2012-2016 DACIA SANDERO SERVICE AND REPAIR MANUAL

5TH GEAR HOUSING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
oil recovery tray

parts always to be replaced:
5th gear housing seal

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Manual gearbox: Precautions for the repair ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).

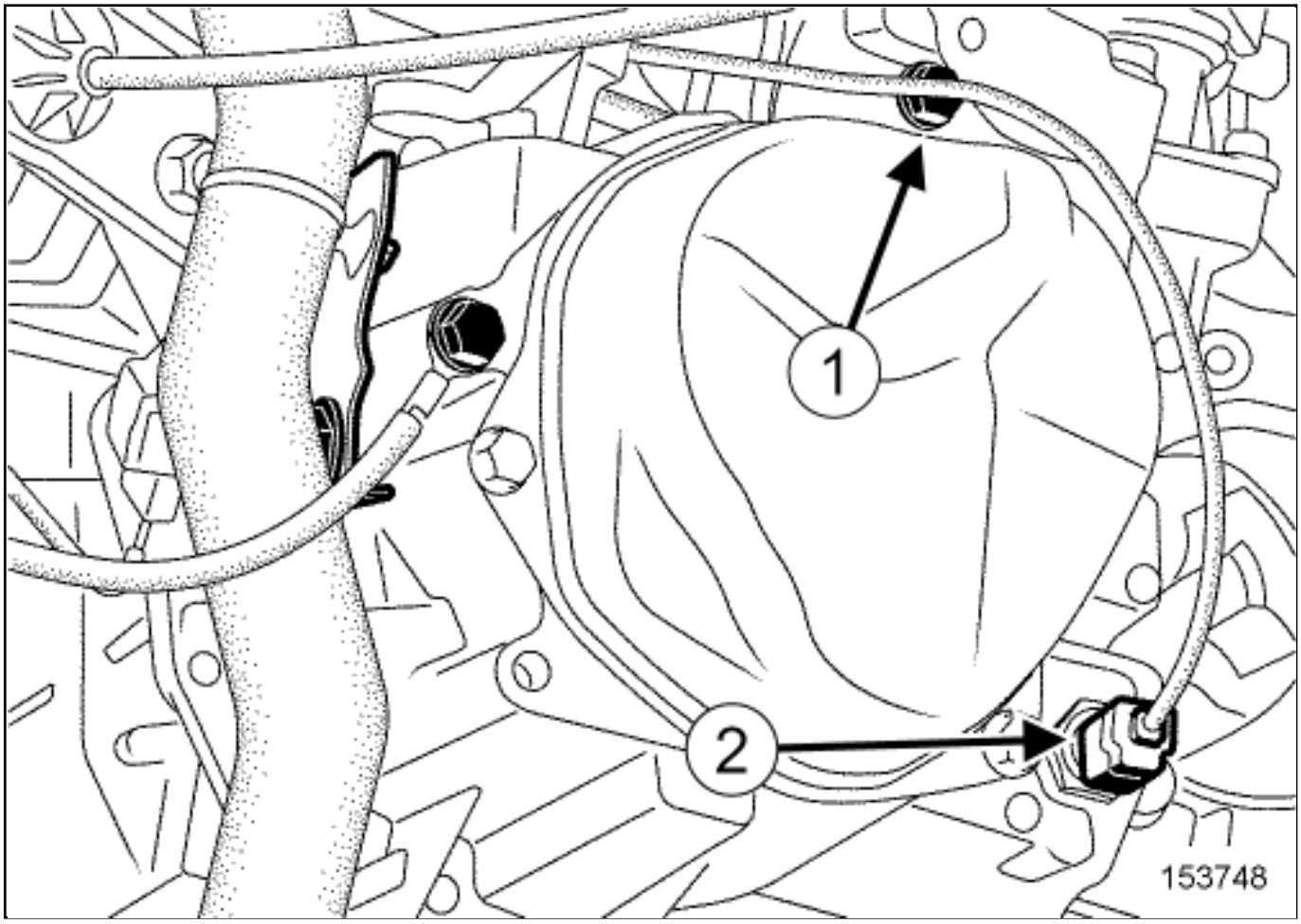
Remove:

- the engine undertray bolts,
- the engine undertray,
- the front left-hand wheelWheel: Removal - Refitting (35A, Wheels and tyres),
- the front left-hand arch side liner(see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

Remove Front axle assembly: Exploded view :

- the tie-rod bolt,
- the tie rod nut,
- the tie rod.

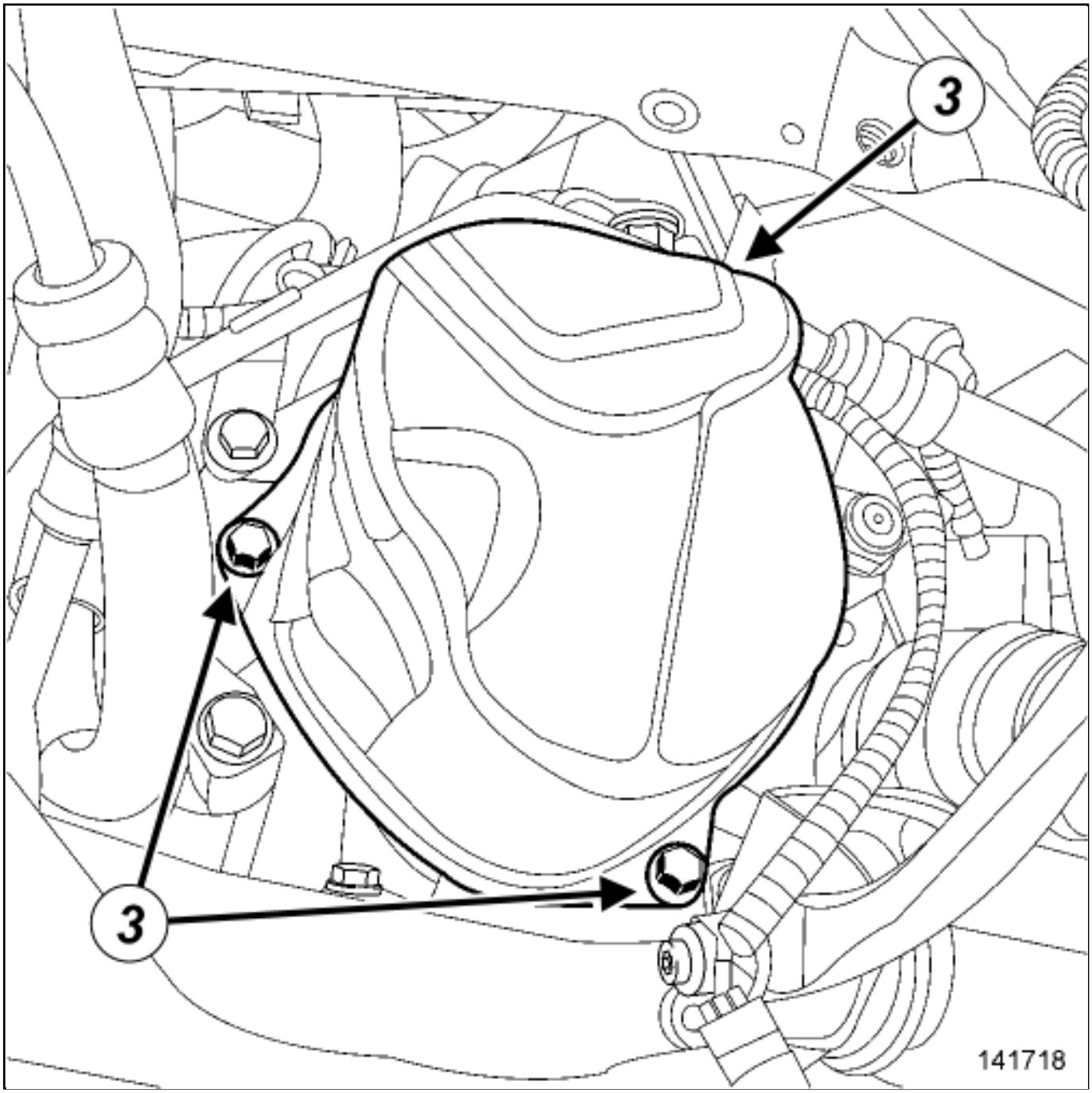
Drain the gearbox(see 21A, Manual gearbox , Manual gearbox oils: Draining - Filling) .



- Unclip the wiring(1) of the reverse gear switch on the 5th gear housing.
- Disconnect the connector(2) from the reverse gear switch.

2. REMOVAL OPERATION

- Fit an oil recovery trayunder the 5th gear housing.



Remove:

- the bolts(3) of the 5th gear housing,
- the 5th gear housing,
- the seal of the 5th gear housing.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: 5th gear housing seal.

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

Use surface cleaner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease the joint face of:

- the 5th gear housing,
- the mechanism housing.

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Torque tighten the 5th gear housing bolts25 N.m.

Fill and check the gearbox oil level(see 21A, Manual gearbox , Manual gearbox oils: Draining - Filling) .

ABS BODYWORK COMPONENT: PREPARATION AND PAINT RANGE

Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Use extra ventilation source.

Note:

Before using the products, consult the manufacturer's technical sheet.

Note:

Never apply pre-treatment primer or primer filler on this type of material.

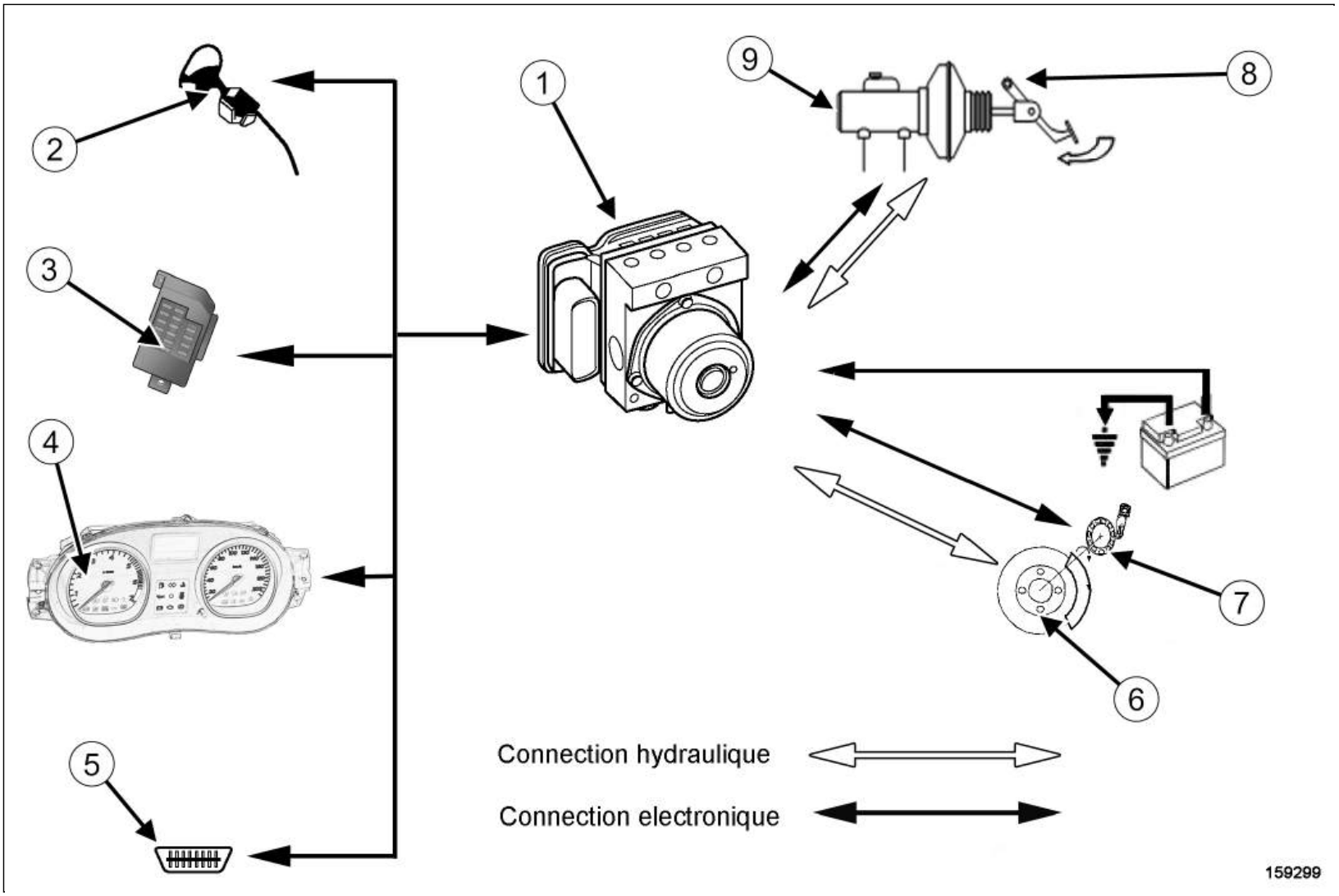
1. PRE PRIMED PARTS

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Sand	P400 - P500dry / P400 - P800with water
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Blow / rub with the abrasive finishing pad	
7	Apply the finishing paint	

2. REPAIRED PARTS

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Sand the defect	P240 dry / orbital sander (mid speed)
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Apply and sand polyester mastic if necessary	Plastic material bodywork component: Repair (50A, General information)
7	Wipe / blow	
8	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
9	Smooth	Grey adhesive pad soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Wipe / blow	
11	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth

12	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
13	Remove solvent / dry	
14	Sand	P400 - P500dry / P400 - P800with water
15	Wipe / blow	
16	Degrease	Lint-free cloth soaked in antistatic thinnerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
17	Blow / rub with an adhesive pad	
18	Apply the finishing paint	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Connection hydraulique
Connection electronique
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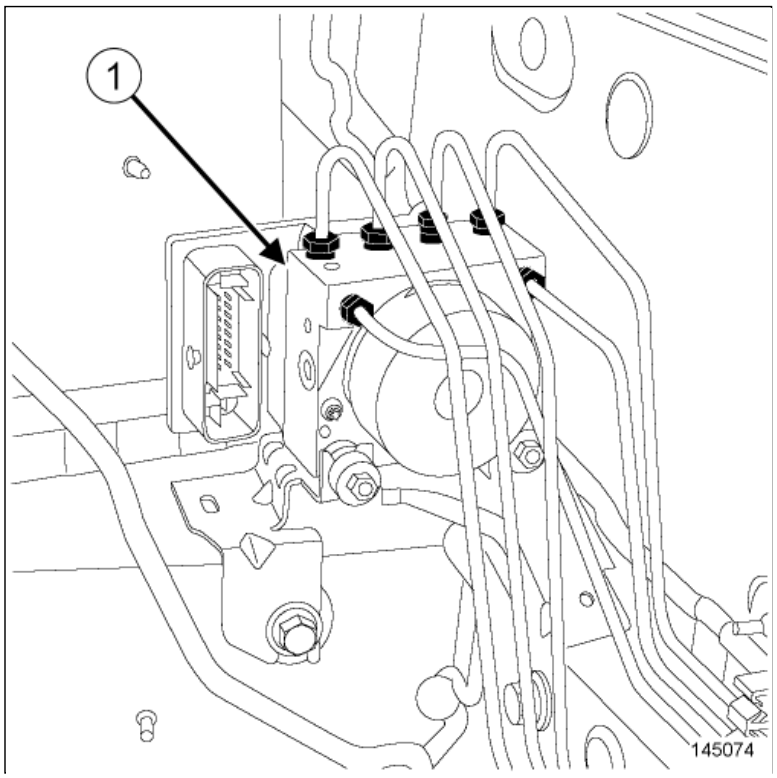
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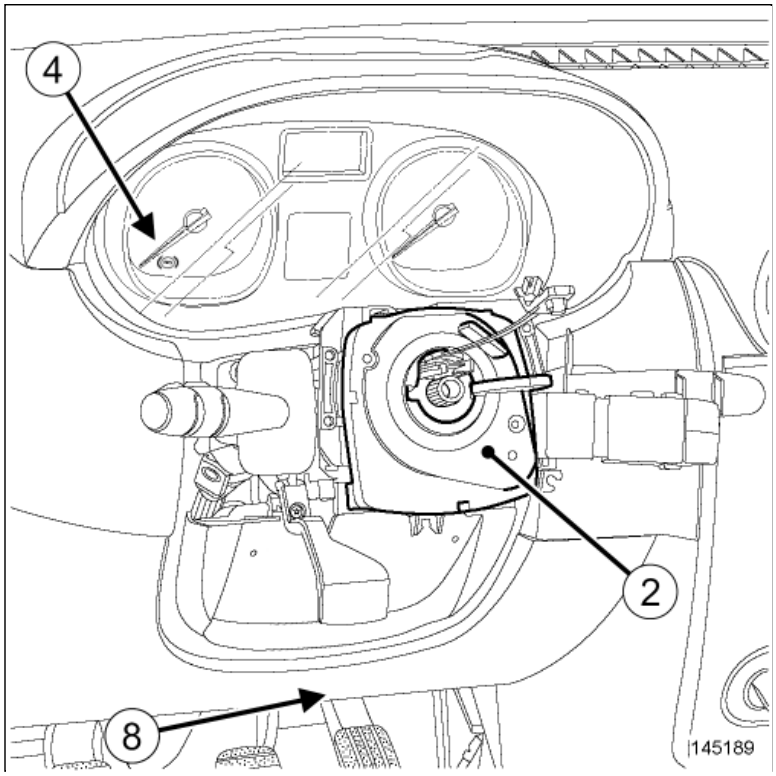
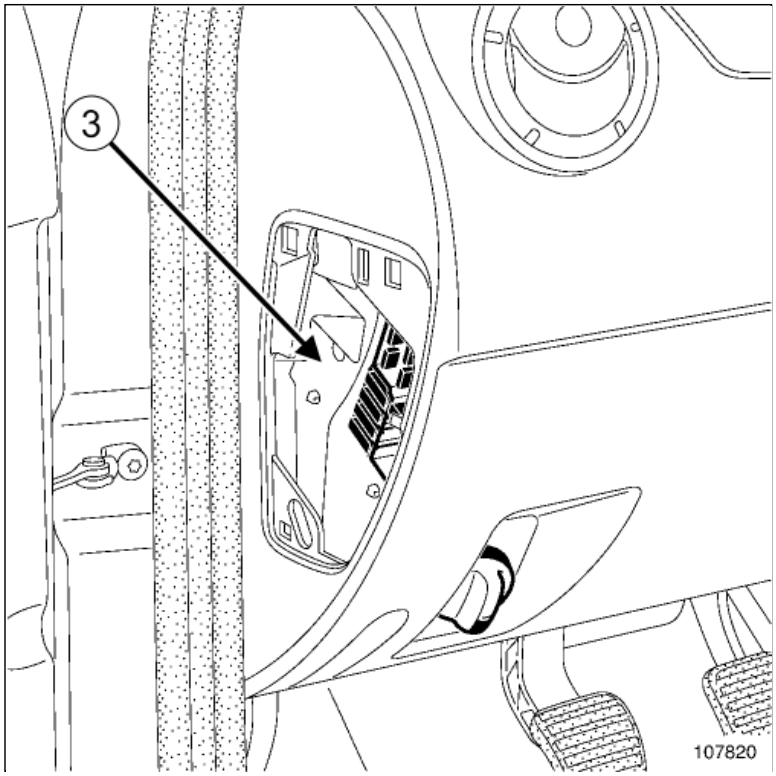
(1) Hydraulic unit



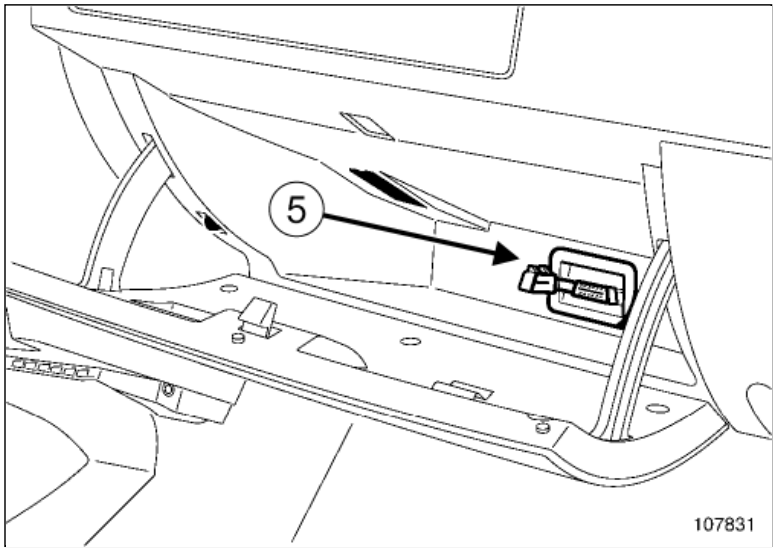
(2) Steering wheel angle sensor

(4) ABS warning light on the instrument panel

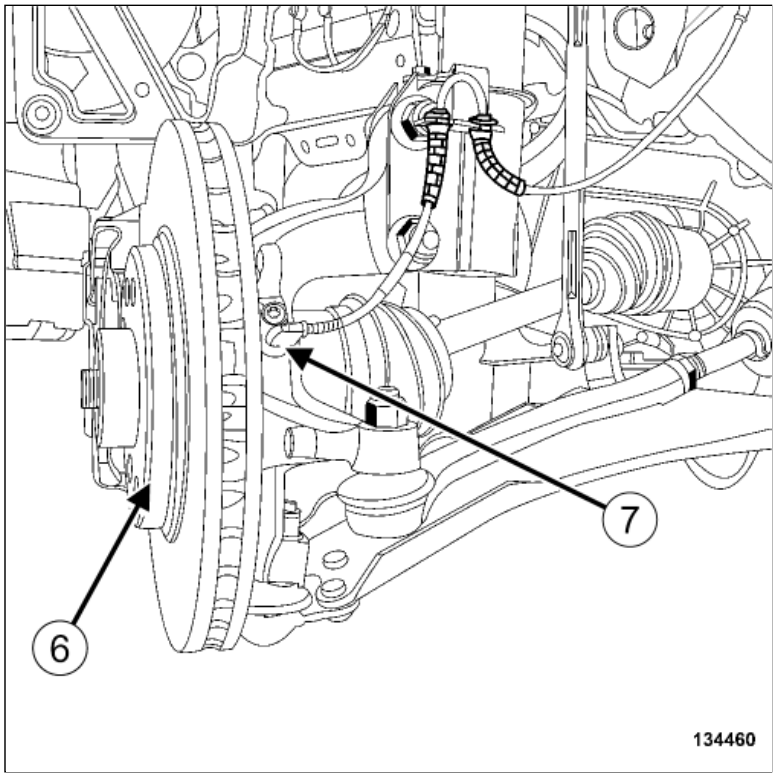
(8) Brake light switch



(3) Fuse box

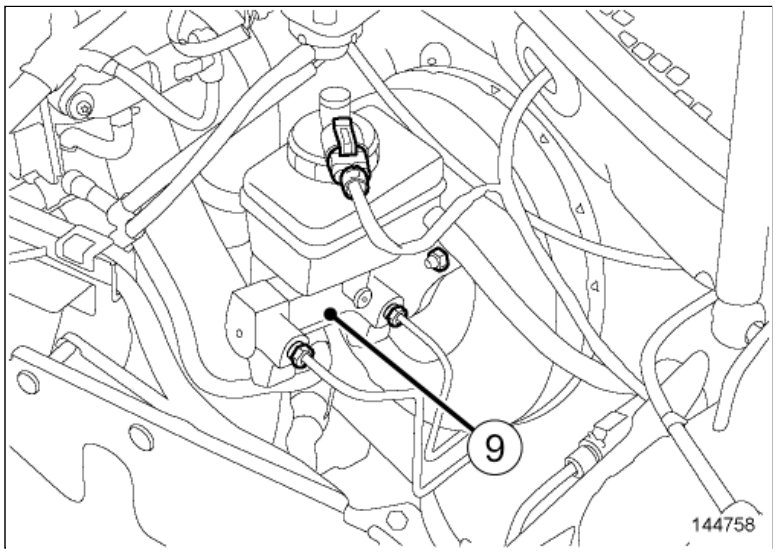


(5) Diagnostic socket



(6) Brake disc with instrumented bearing

(7) Wheel speed sensor



(9) Master cylinder

ABS: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
pedal press

1. SAFETY

If a lift must be used for an operation, observe the safety instructions Vehicle: Towing and lifting .

Protect any bodywork components which could be damaged by brake fluid with covers.

To ensure there is no risk of sparks, do not place any metallic objects on the battery.

Brake fluid is highly corrosive. Carefully clean any brake fluid spilt on parts of the vehicle.

2. CLEANLINESS

Clean around the braking system with brake cleaner Vehicle: Parts and consumables for the repair .

If a component is being replaced by a new one, do not remove the new component from its packaging until its is ready to be fitted onto the vehicle.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

3. GENERAL RECOMMENDATIONS

During an operation which requires the braking circuit to be opened, position a pedal press on the brake pedal to limit the outflow of brake fluid.

After any operation on the ABS, it is essential to confirm the repair with a road test and a check using the Diagnostic tool.

1- YAW SPEED AND LATERAL ACCELERATION SENSOR

The sensor must be fitted facing the vehicle's direction of travel (as shown by the arrow).

Be sure to replace any sensor which has sustained an impact.

2- HYDRAULIC UNIT

CAUTION

Switch off the vehicle ignition so as not to activate the hydraulic unit solenoid valves when bleeding the brake circuit.

3- WHEEL SPEED SENSOR

CAUTION

To ensure that the wheel speed sensor works properly, do not mark the sensor target on the bearing.

CAUTION

- In order to prevent irreversible damage to the front hub bearing:
  - Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
  - Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

4- BRAKE SERVO

WARNING

To avoid breaking the connection between the brake servo pushrod and the brake pedal, check that the safety clevis pin is locked onto the brake servo pushrod by tilting it from the top downwards.

XSL version : 3.02 du 22/07/11

ACCESSORIES BELT - CRANKSHAFT ACCESSORIES PULLEY : REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:
Crankshaft accessories pulley bolts
Accessories belt
Accessories belt tensioning roller
Accessories tensioning roller bolt

WARNING

Wear cut-resistant gloves during the operation.

CAUTION

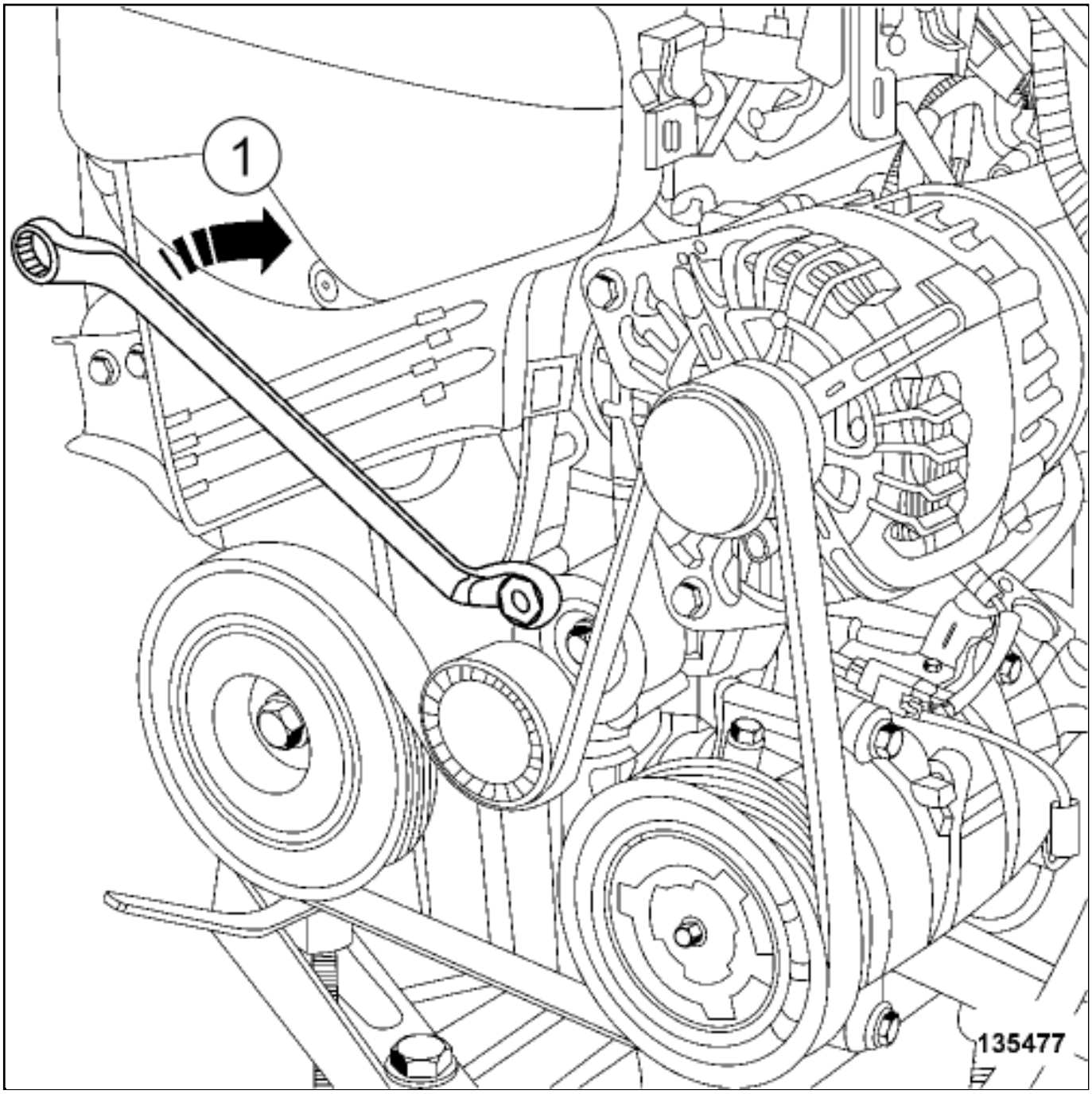
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

REMOVAL

1. REMOVING THE ACCESSORIES BELT

1- REMOVAL PREPARATION OPERATION

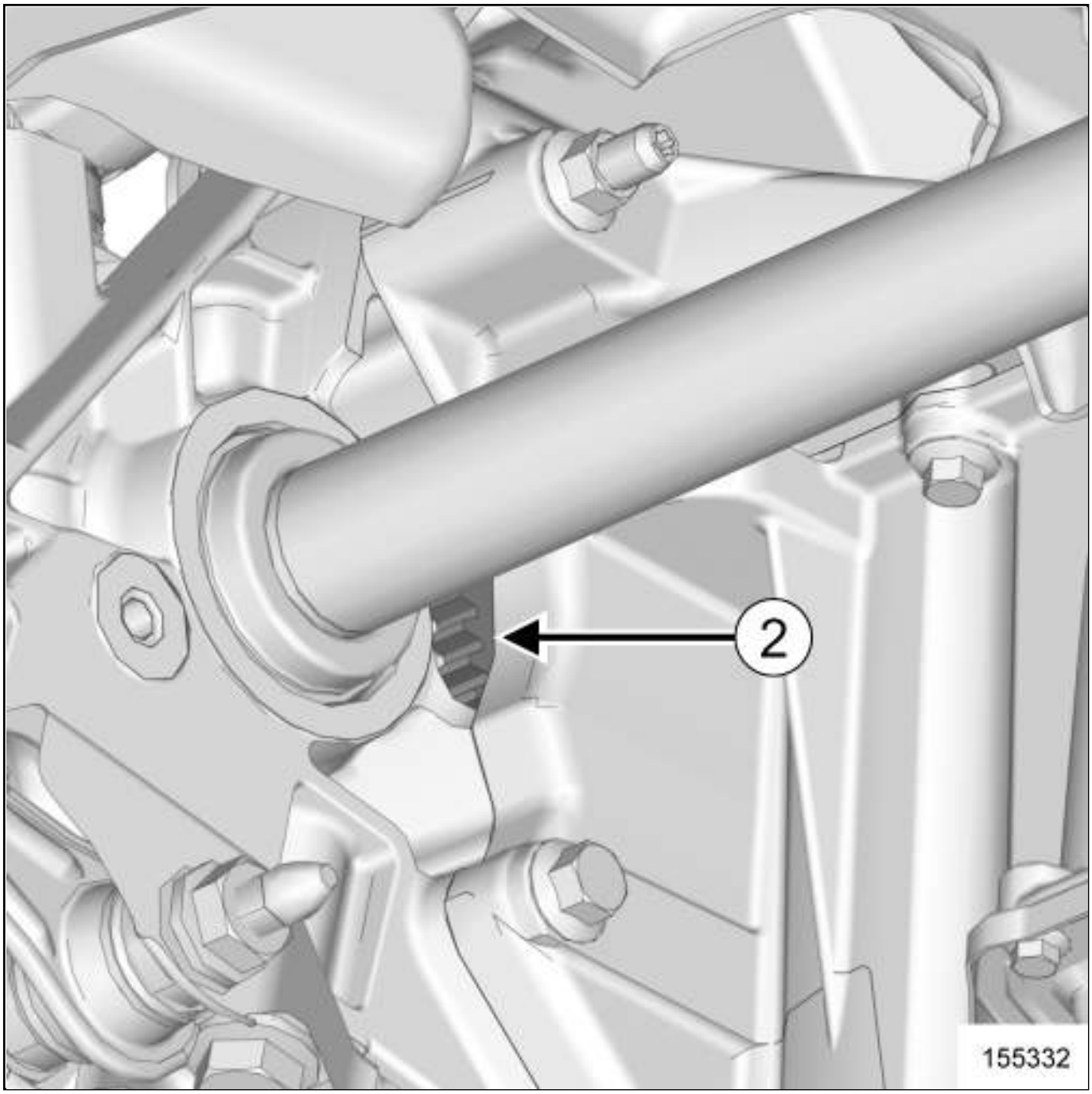
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove:
  - the engine undertray,
  - the front right-hand wheel Front hub carrier assembly: Exploded view ,
  - the front section of the front right-hand wheel arch liner Exterior body front trim assembly: Exploded view .



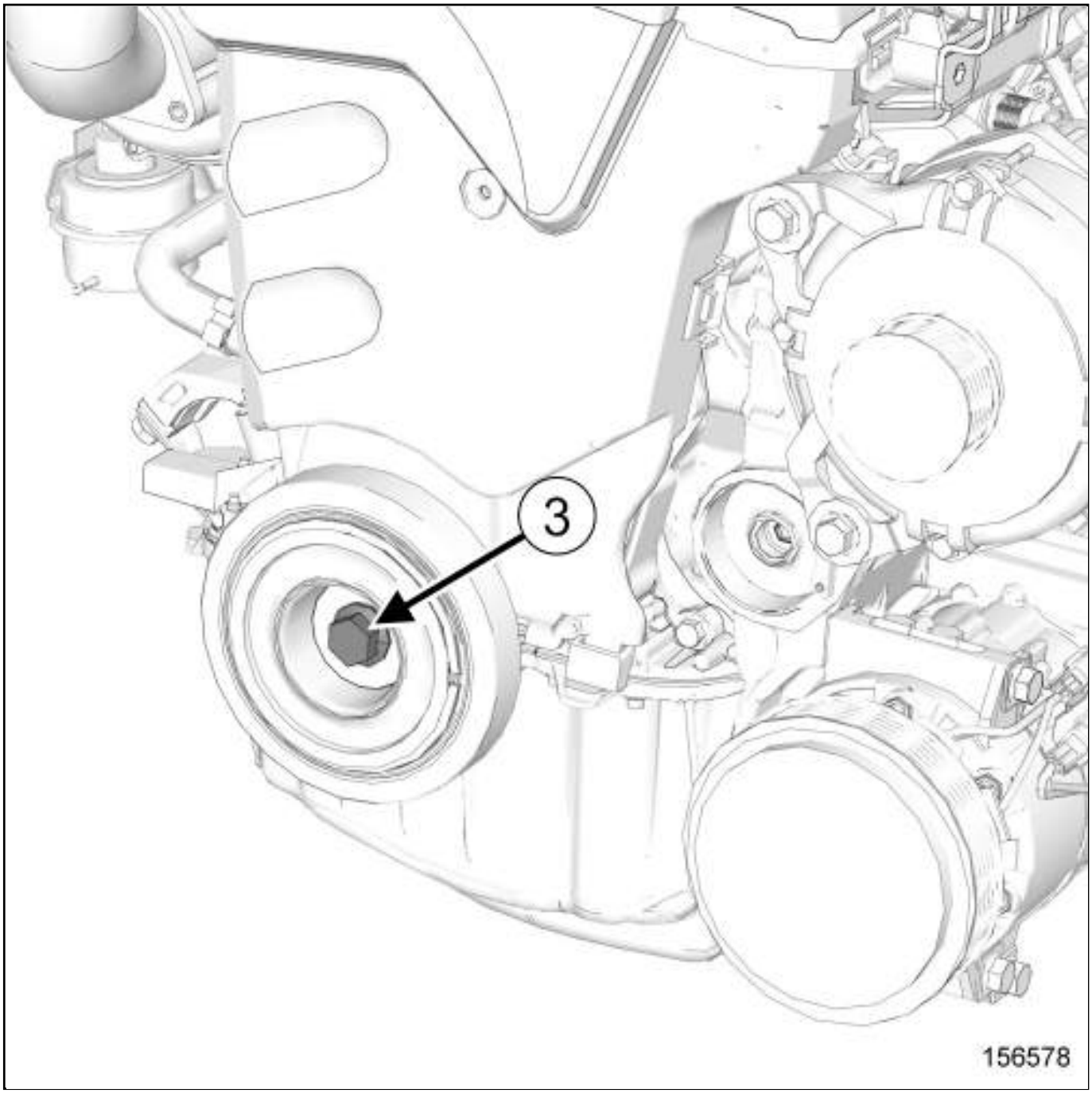
- Rotate the accessories belt auto tensioner clockwise using a 16 mm(1) offset wrench.

- Remove:
  - the accessories belt,
  - the accessories belt tensioning roller bolt,
  - the accessories belt tensioning roller.

2. REMOVING THE CRANKSHAFT ACCESSORIES PULLEY



- Lock the flywheel using a screwdriver at(2) .



Remove:

- the accessories pulley bolt(3) ,
- the accessories pulley.

REFITTING

1. REFITTING THE CRANKSHAFT ACCESSORIES PULLEY

1- REFITTING PREPARATION OPERATION

- If reusing the crankshaft accessories pulley, clean the crankshaft accessories pulley V-grooves with a brush to eliminate any deposits.

CAUTION
Only use brushes with plastic or non-corrosive metal (brass) bristles.

- parts always to be replaced: Crankshaft accessories pulley bolts.

2- REFITTING OPERATION

- Refit the crankshaft accessories pulley.
- Rotate the crankshaft accessories pulley on the crankshaft in order to fit the pulley onto the key groove of the crankshaft.
- Refit a new crankshaft accessories pulley bolt.
- Lock the flywheel using a screwdriver.
- Tighten to torque the crankshaft accessories pulley bolt120 N.m + 90˚ ± 15˚.

Note:

Two operators are necessary.

- Proceed in the reverse order to removal.

2. REFITTING THE ACCESSORIES BELT

1- REFITTING PREPARATION OPERATION

CAUTION
Only use brushes with plastic or non-corrosive metal (brass) bristles.

- Clean the crankshaft accessories pulley V-grooves with a brush to prevent any deposits.

- parts always to be replaced: **Accessories belt**.

- parts always to be replaced: **Accessories belt tensioning roller**.

- parts always to be replaced: **Accessories tensioning roller bolt**.

2- REFITTING OPERATION

- Refit:
  - the new accessories belt tensioning roller,
  - the new accessories belt tensioning roller bolt.

- Tighten to torque the accessories belt tensioning roller bolt40 N.m.

- Refit the new accessories belt.

- Turn the crankshaft twice.

- Proceed in the reverse order to removal.

ADDITIONAL FUEL SYSTEM TANK: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
pneumatic transfer pump for fuels

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Wear goggles with side protectors for this operation.

CAUTION

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

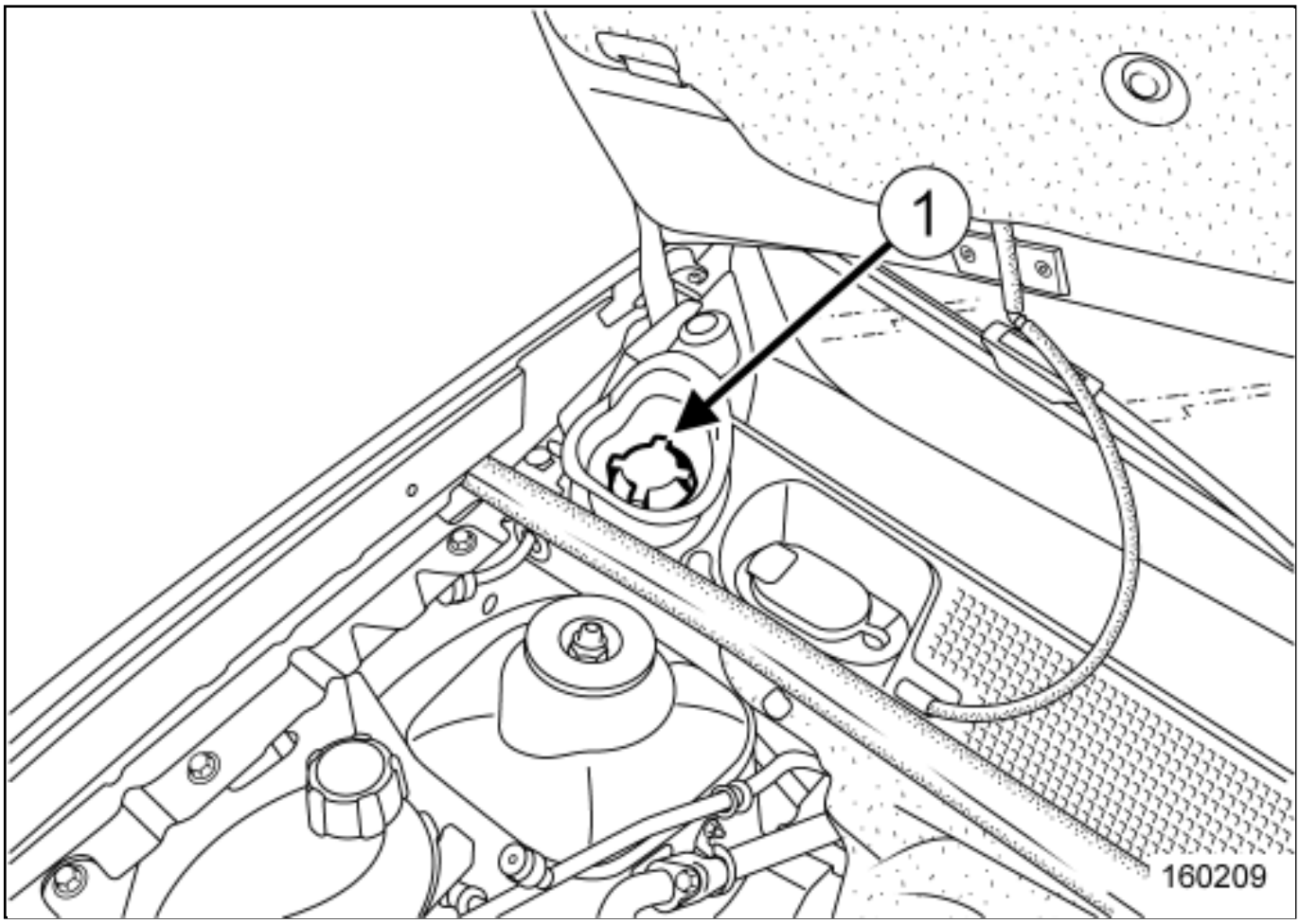
Note:

The additional fuel system tank has a capacity of 0,7 L.

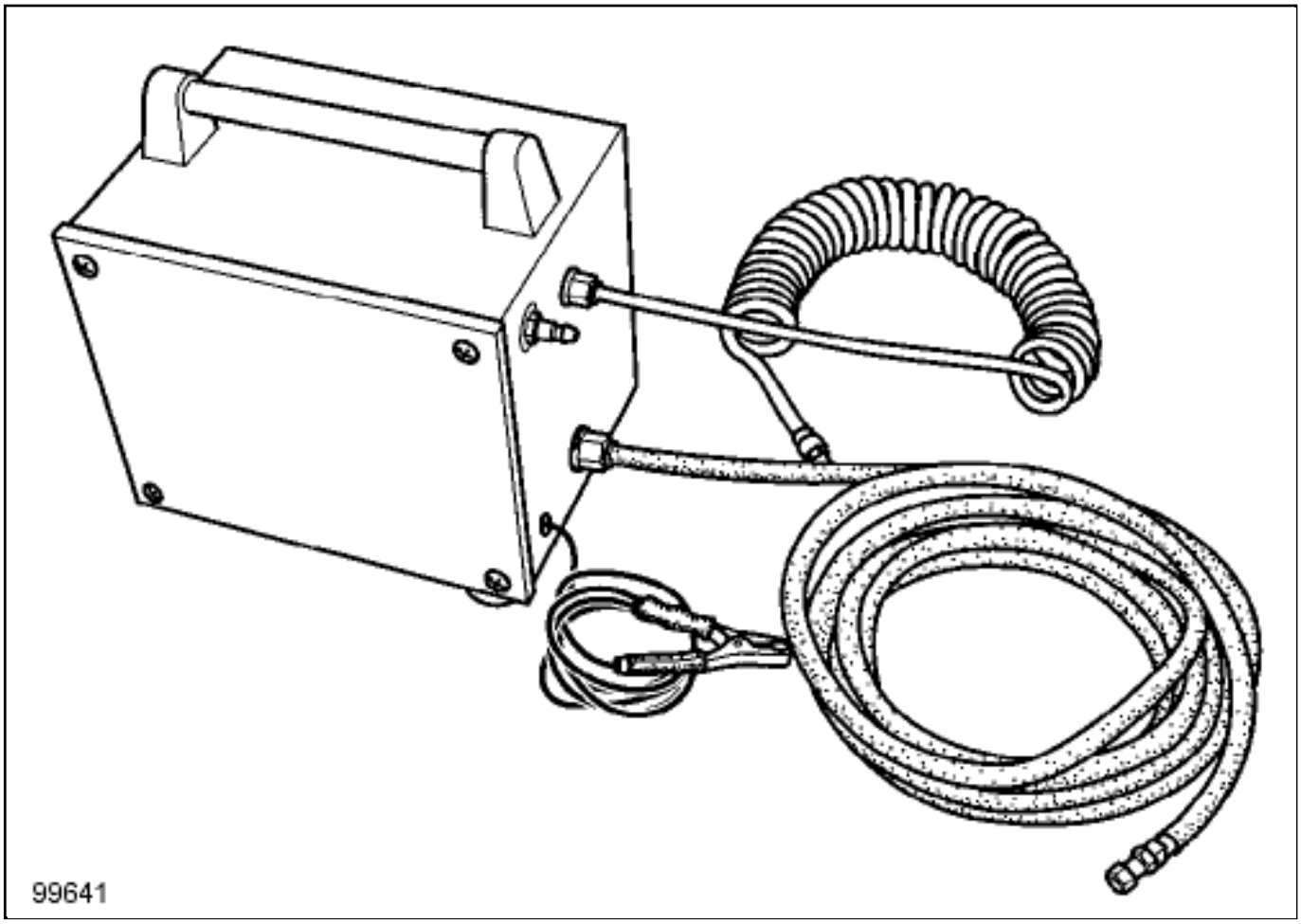
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting (80A, Battery).

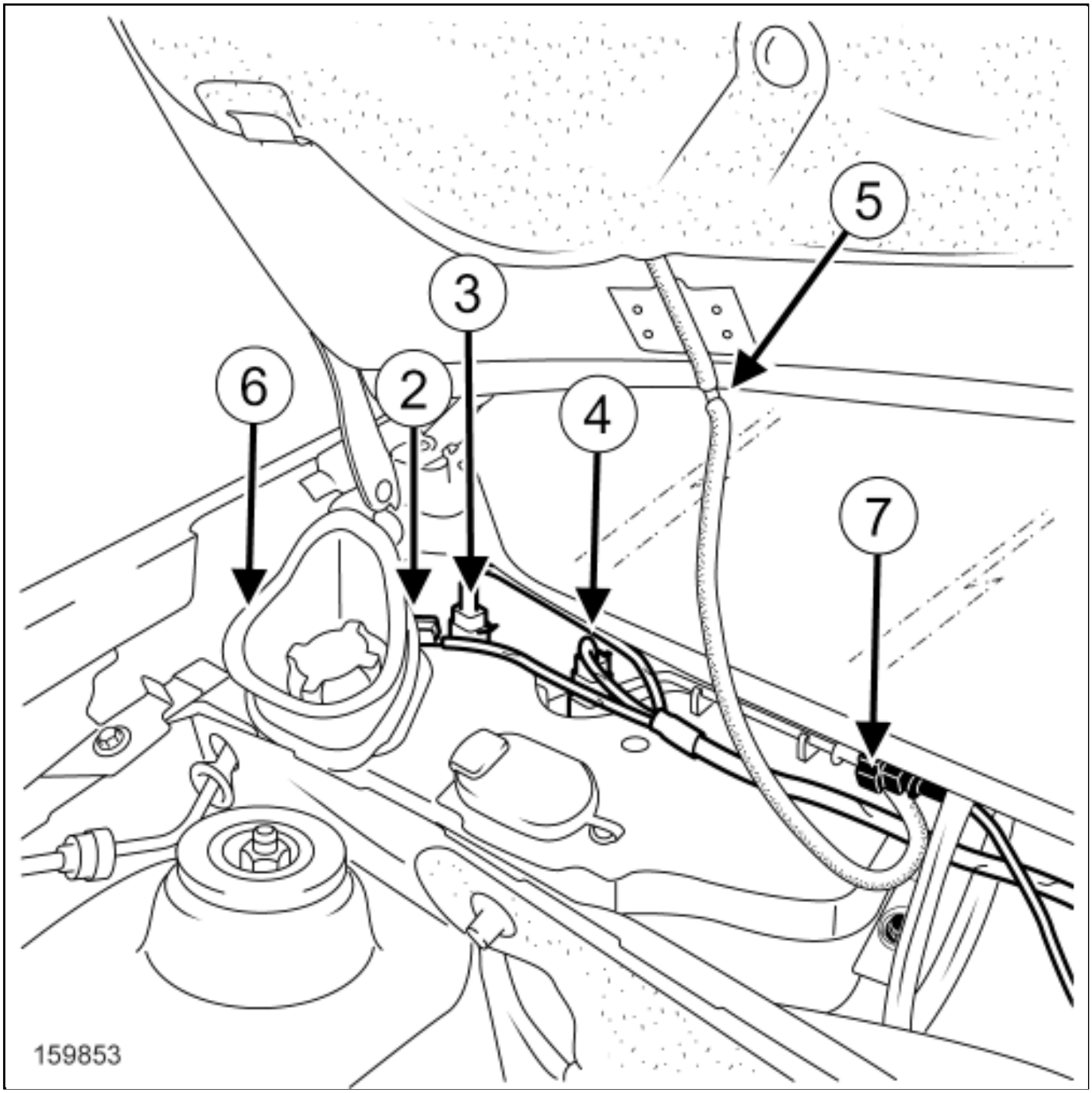


- Remove the cap for the additional fuel system tank(1) .



- Drain the fuel by siphoning it through the filler neck of the additional fuel system tank using the pneumatic transfer pump for fuels.

- Remove the scuttle panel grilleScuttle panel grille: Removal - Refitting

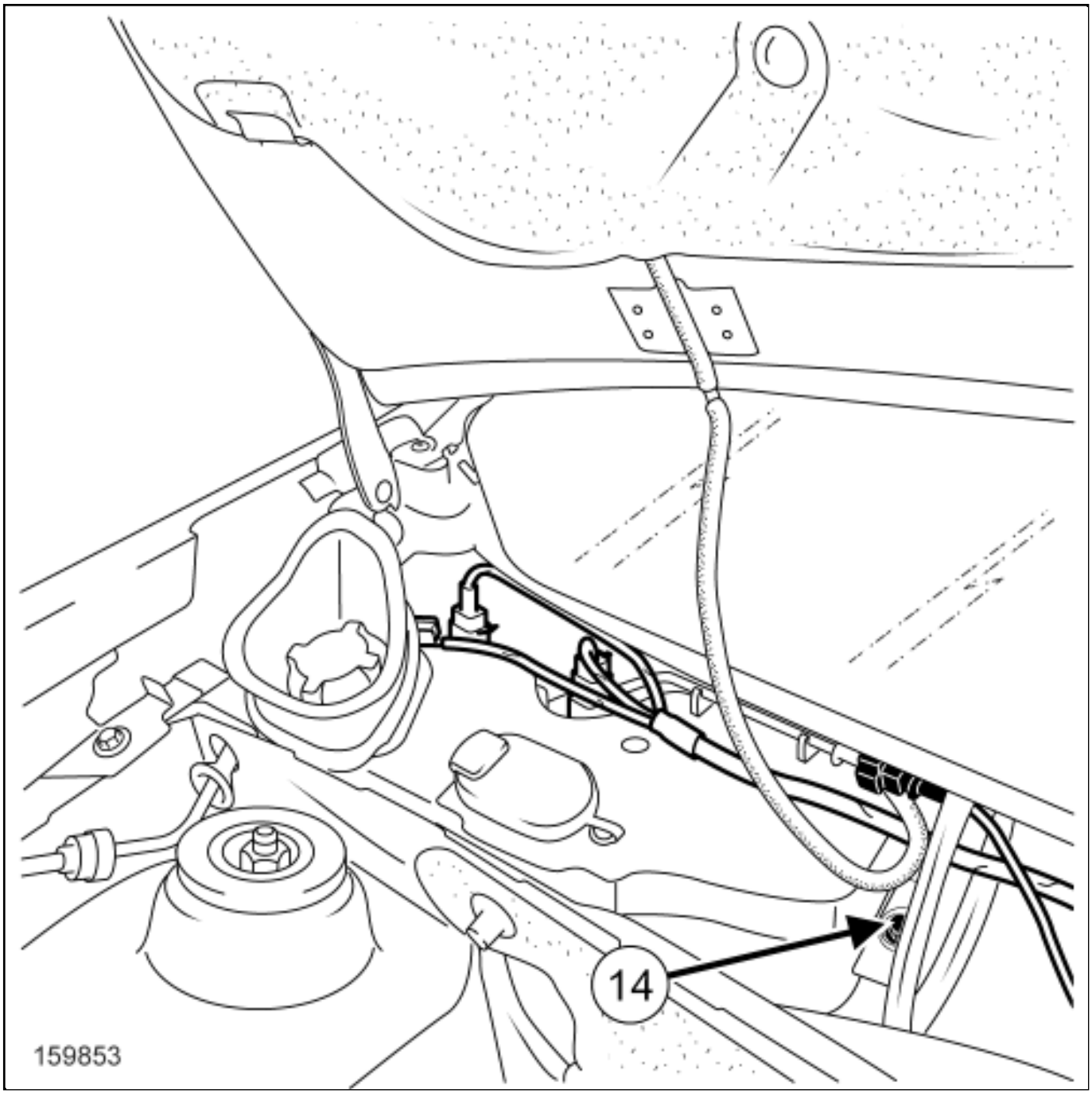


Disconnect:

- the connector of the tank sensor level(2) ,
- the additional fuel system pump connector(3) ,
- the windscreen washer pump connector(4) ,
- the windscreen washer hose(5) ,
- the petrol vapour pipe union(6) ,

the pipe uninon on the fuel supply connector(7) .

2. REMOVAL OPERATION



Remove:

-

- the additional fuel system tank bolt(14) ,

the additional fuel system tank.

REFITTING

1. REFITTING PREPARATION OPERATION

Always replace the clips on the pipes of the additional fuel system.

2. REFITTING OPERATION

Refit the additional fuel system tank.

Torque tighten the bolt of the additional fuel system tank4 N.m.

AIR CONDITIONING: CHECK

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

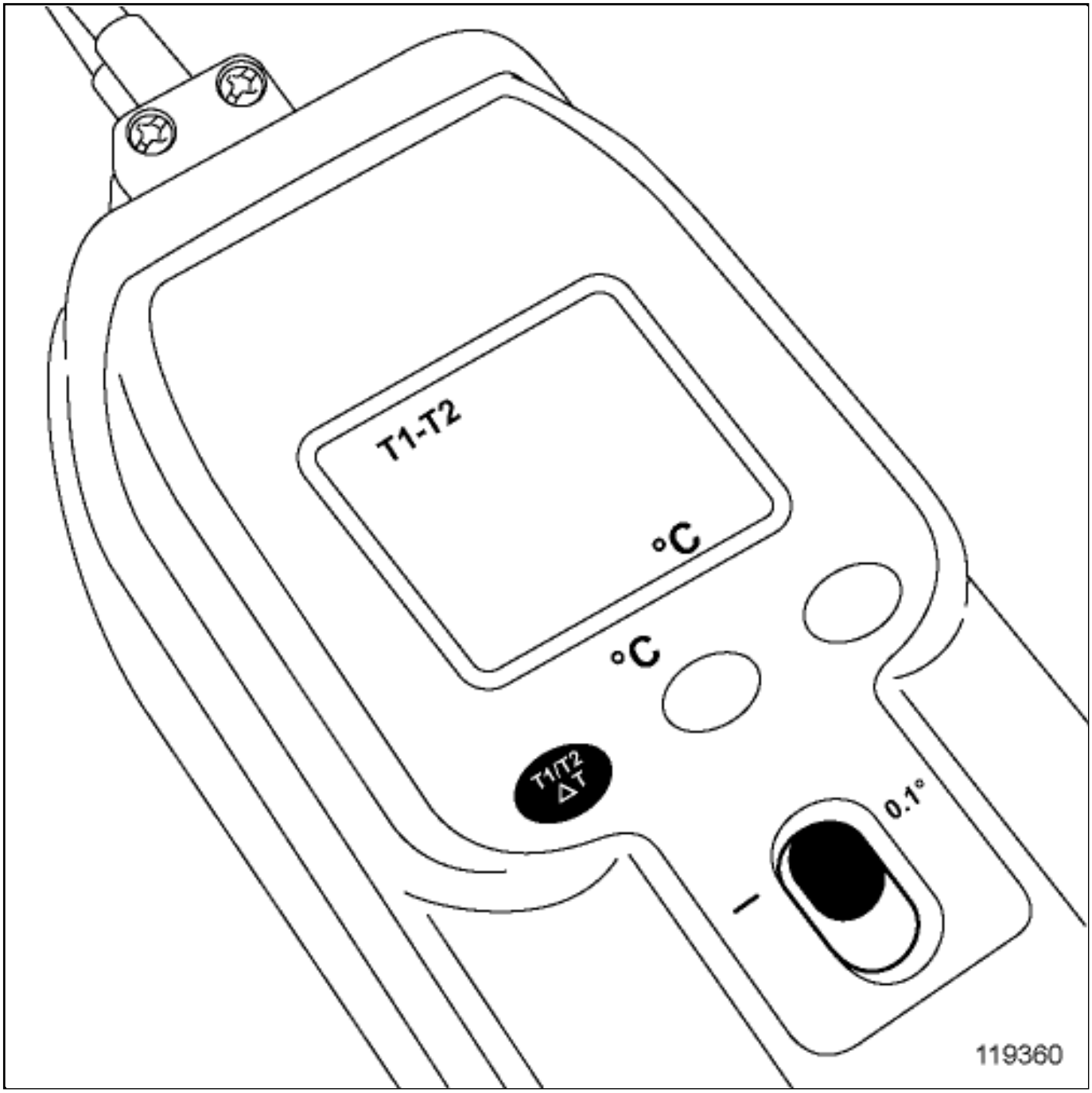
Equipment required
Dual-sensor temperature measuring device

Note:

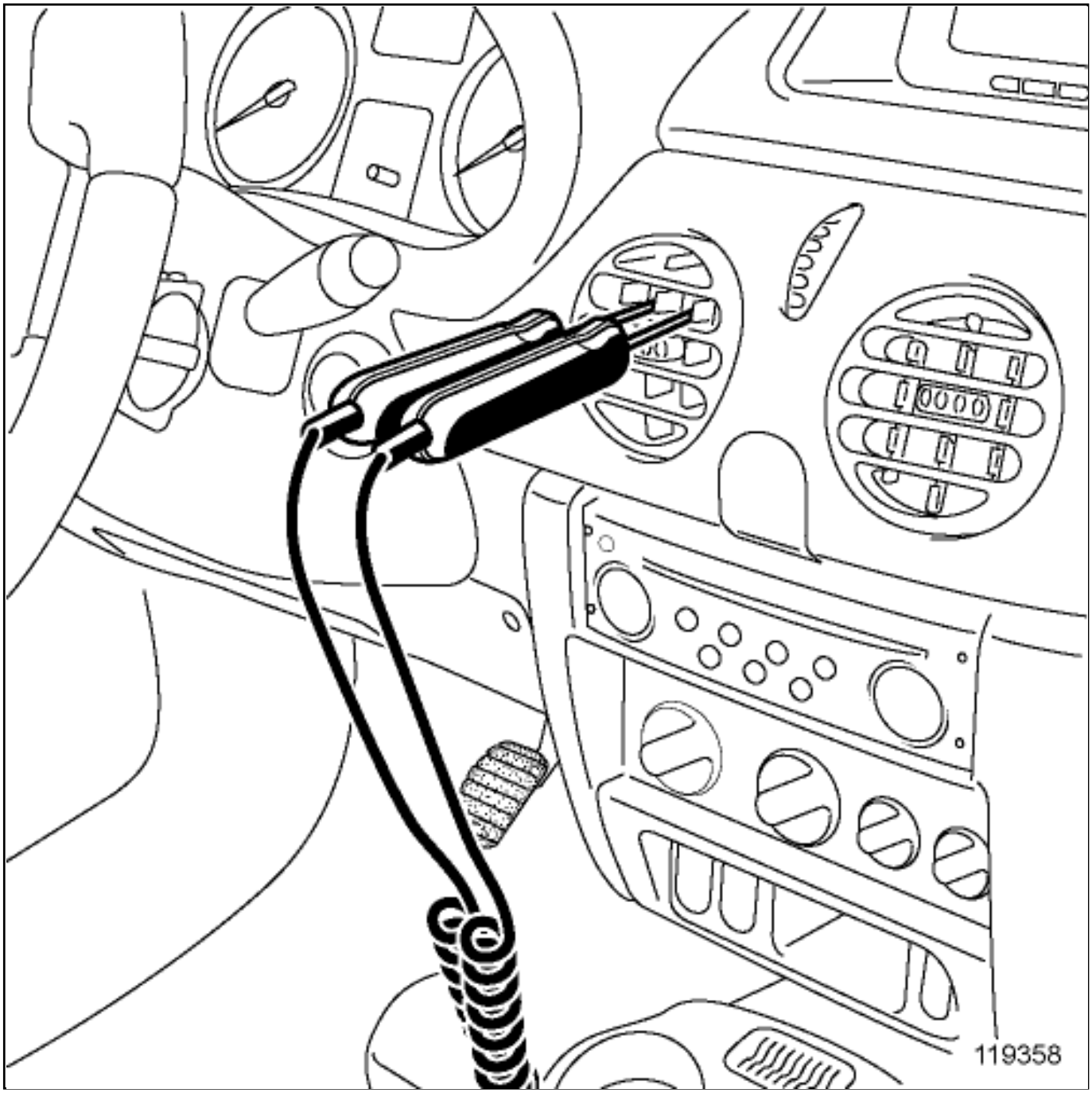
When performing RENAULT maintenance, check the air conditioning system at the end of the vehicle's maintenance program so that the engine will be cold.

1. PREPARATION OPERATION FOR THE MEASUREMENT DEVICE

- Check that the measurement device functions properly (see the device's instruction manual).
- Set units to ˚C.
- Set the device's sensitivity to 0.1˚C.



- Set the reading mode to (ΔT) = (T1 - T2)



Check the two sensors T1 and T2 in order to calculate the correction (Δ) to be applied to the measurement (T1 - T2). the two sensors must indicate the same measurement under the same conditions. Check the sensors by:

- bringing the ends of the 2 sensors together until they touch,
- placing the sensors in the air flow of an air vent,
- setting the passenger compartment fan assembly to top speed.
- waiting for the value to become stable.
- recording the correction value (Δ).

Note:

It is not necessary to start the vehicle. The device display is in mode (ΔT) = (T1 - T2).

CAUTION

Note the difference and sign as soon as the temperature becomes stable.

Calculate the correction (Δ) = - (T1 - T2) to be applied to the measurement (ΔT).

Examples:

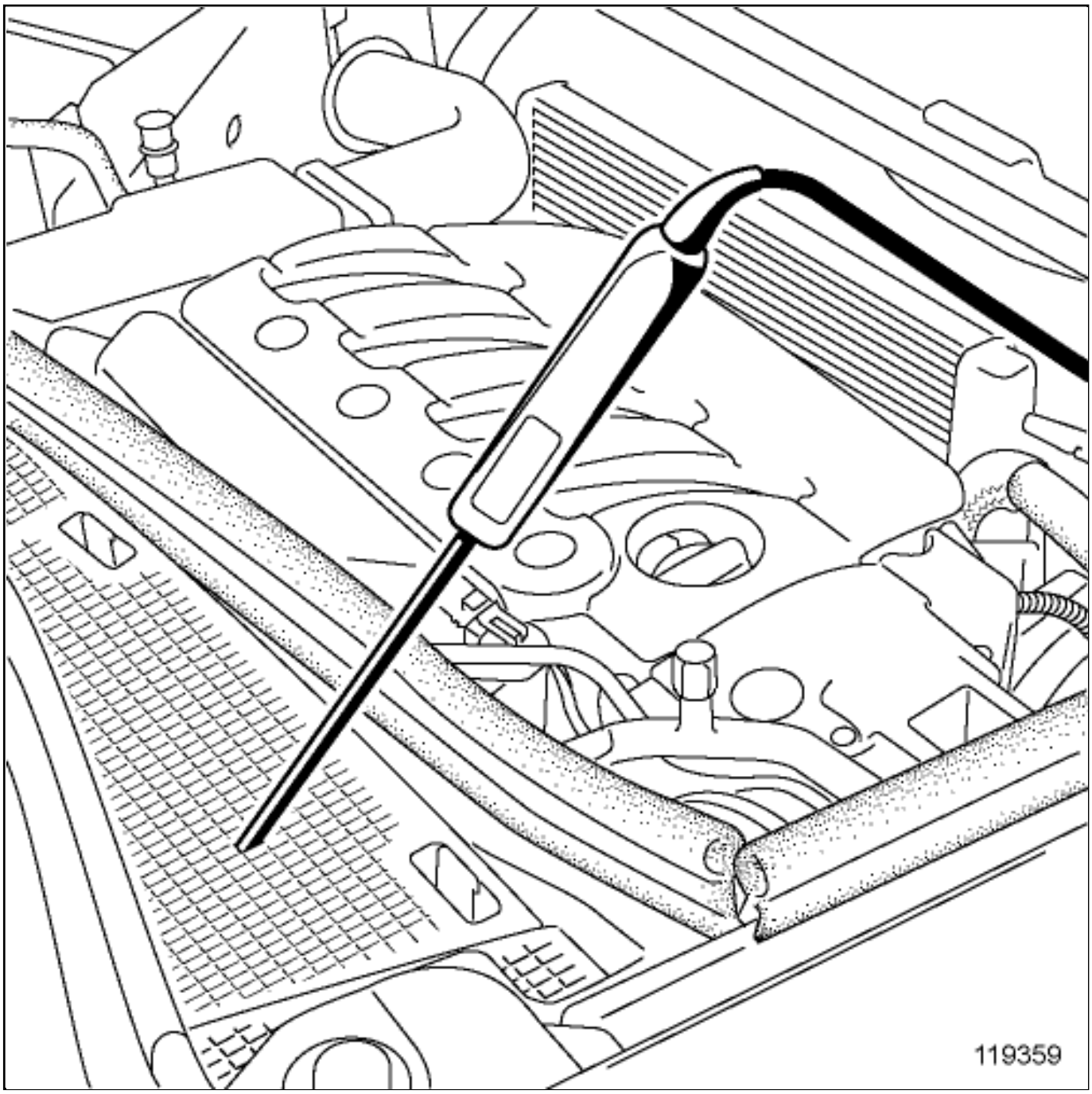
If (T1 - T2) = - 0.3˚C, correct the measurement (ΔT) by (Δ) = + 0.3˚C

If (T1 - T2) = + 0.3˚C, correct the measurement (ΔT) by (Δ) = - 0.3˚C

2. VEHICLE PREPARATION OPERATION

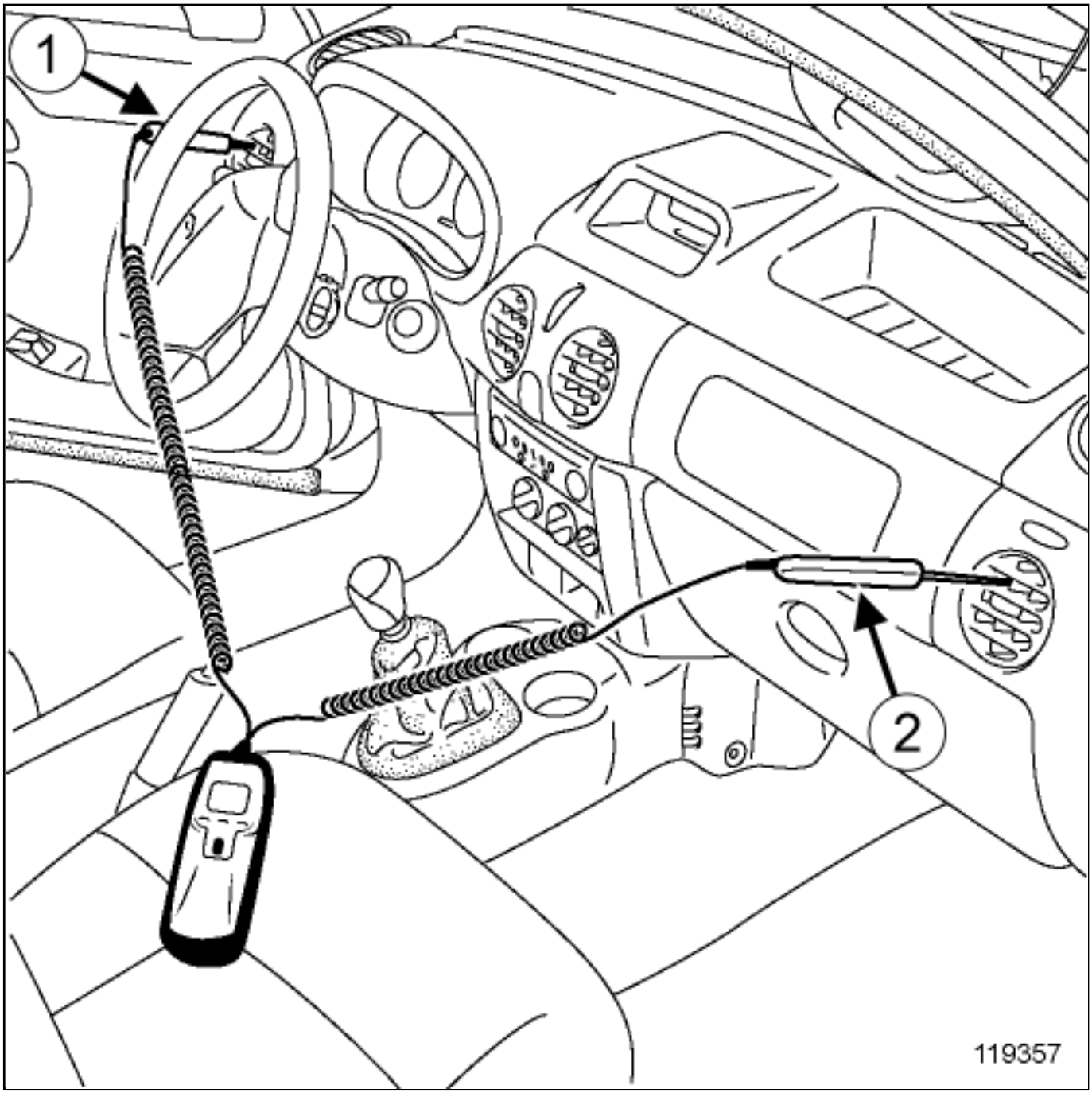
- Put the vehicle in the shade, where the temperature is greater than or equal to 15˚Cminimum.
- Close the bonnet.
- Open the front windows.
- Start the engine and let it idle.
- Set the air conditioning controls with:
  - recirculation mode in the external position,
  - the ventilation distribution in "face" mode,
  - the temperature control to coldest temperature setting in front (and at the back, if it exists),
  - the speed of the passenger compartment fan assembly set to maximum (switch off the rear control if it exists),
  - the front side and centre air vents open with the vanes in a neutral position,
  - the air conditioning system must be turned on (indicator light illuminated).
- Wait 5 minutes with the engine idling before taking any measurements.

3. MEASUREMENTS



Record the air temperature at the scuttle panel grille (T3).

- open the bonnet, depending on the vehicle, to access the scuttle panel grille.
- place the sensor where air is drawn through the scuttle panel grille.
- wait for the value to become stable.
- record the T3 temperature value.
- close the bonnet if it was opened.



- Record the air temperature at the left air vent (T1), and at the right air vent (T2).
  - fit sensor T1 in the left air vent(**1**) .
  - fit sensor T2 in the right air vent(**2**) .

- Record the differences in temperature once the (ΔT) value has stabilised:
  - between T3 and the higher of values T1 or T2, (T3 - highest value).
  - record this difference in temperature.
  - between T1 and T2 (read the (ΔT) value (T1-T2) display mode).
  - record the difference in temperature (ΔT) according to the correction (Δ) to be applied to the measurement.

- If the (ΔT)=(T1-T2) measurement is unstable, follow the procedure below:

Note:

Depending on the vehicle's air conditioning system programming, this check method may not be applicable because the engine cooling fan assembly has been activated. Its operation renders the (ΔT) value between T1 and T2 unstable. To eliminate this error, the fan assembly must be activated for the entire period over which temperature T1 and T2 measurements are recorded.

- Activate the engine cooling fan assembly operation by modifying the engine speed.
  - stabilise the engine speed at 2000 rpm while T1 and T2 temperature measurements are being recorded.
  - check that the engine cooling fan assembly operating.
  - record the temperatures by following the instructions given in the paragraph MEASUREMENTS.

4. FAULT FINDING PROCEDURE

- The following two following conditions must be met:
  - the difference between T3 and the higher of the two values T1 or T2, must be greater than or equal to 5°C,
  - the difference between T1 and T2 must be less than or equal to 2°C.

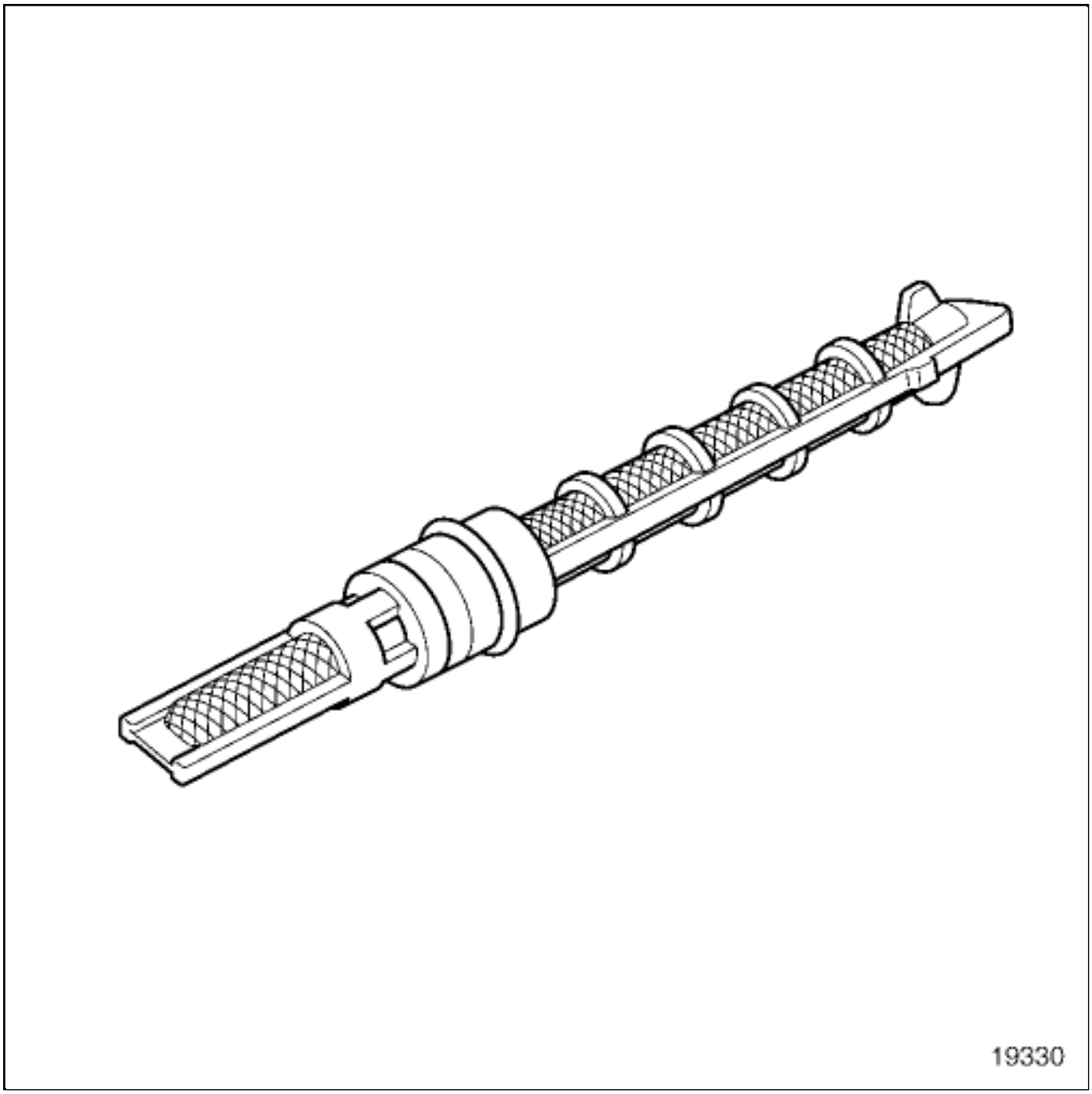
Note:

If one of these two conditions is not met, then the air conditioning system is not working properly. Should this be the case, refer to the fault finding procedure for the air conditioning system for the vehicle concerned.

AIR CONDITIONING DIAGNOSTIC TOOL: USE

1. TO CARRY OUT FAULT FINDING ON A HEATING AND AIR CONDITIONING SYSTEM CIRCUIT:

WITH A CALIBRATED PRESSURE RELIEF VALVE:



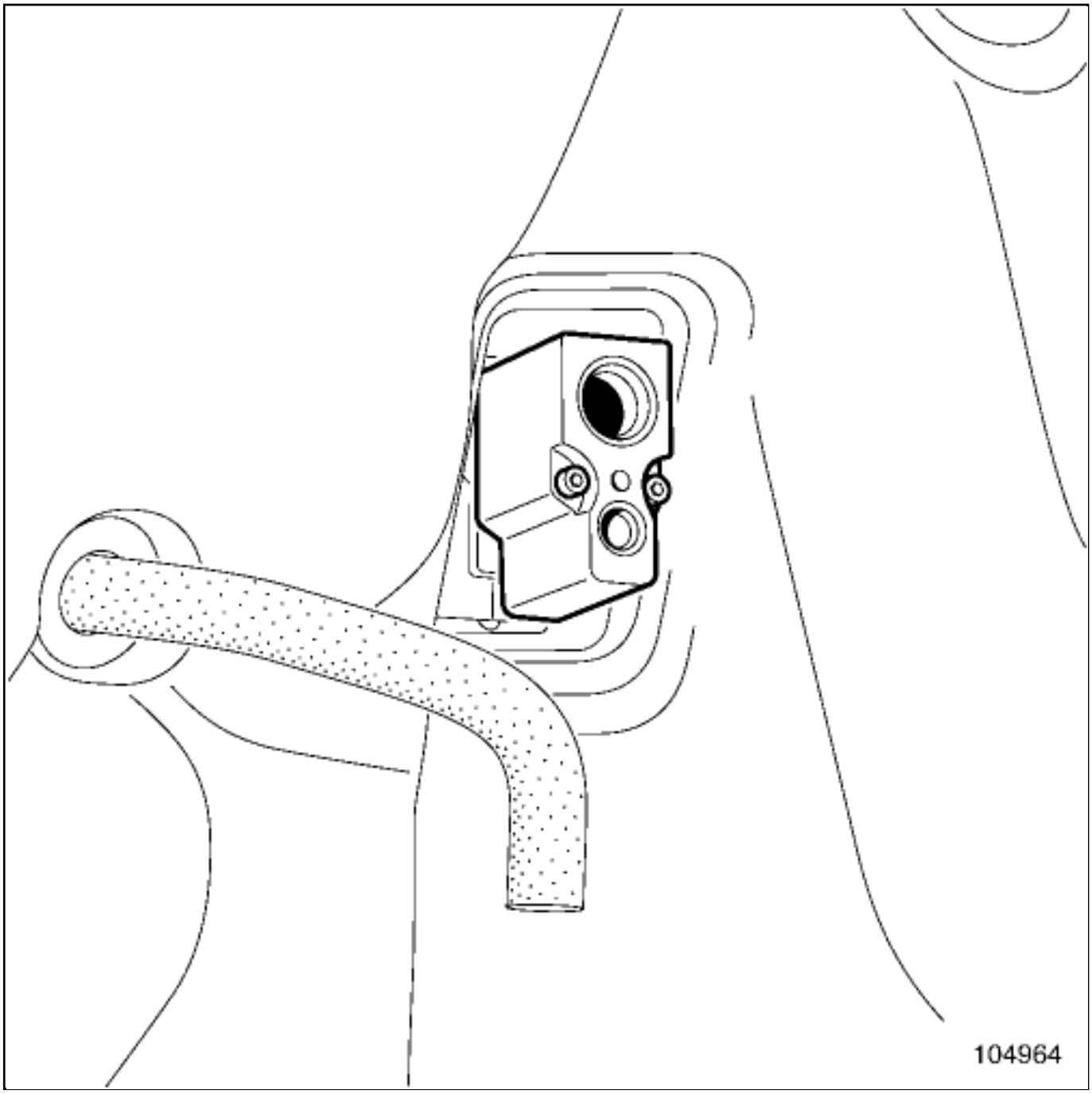
- Use the AIRCODIAGtool to carry out fault finding on:
  - loss of refrigerant pressure or to check the correct pressure of the refrigerant in the circuit.

- Refer to the equipment handbook.

- Do not use the AIRCODIAGtool to carry out fault finding on:

- refrigerant fluid circuit overpressure.
- a blocked dehydrator filter.

WITH A THERMOSTATIC EXPANSION VALVE:



Use the AIRCODIAGtool to carry out fault finding on:

- loss of refrigerant pressure or to check the correct pressure of the refrigerant in the circuit.
- refrigerant fluid circuit overpressure.
- a blocked dehydrator filter.

Refer to the equipment handbook.

XSL version : 3.02 du 22/07/11

AIR CONDITIONING: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. SAFETY

WARNING

- The following must be worn when handling refrigerant:
  - gloves,
  - protective goggles (with side shields if possible).

In the event of refrigerant fluid coming into contact with the eyes, rinse well with clean water continuously for 15 minutes. If possible, have an eye rinse unit available.

If refrigerant comes into contact with your eyes, consult a doctor immediately. Inform the doctor that the burns were caused by R134Arefrigerant.

In the event of contact with other unprotected parts of the body (event though the safety advice has been observed), rinse well with clean water continuously for 15 minutes .

WARNING

Work requiring the use of refrigerant must be carried out in a well-ventilated area.

The refrigerant must not be stored in a shaft, a pit, a hermetically sealed room, etc.

Refrigerants are colourless and odourless fluids.

Refrigerant is heavier than air. As a result there is the danger of asphyxiation for those working close to the ground and less than 5 maway from the working area (pit, well, air vents, etc.).

Switch on gas extraction systems.

At temperatures above 100˚C, the refrigerant will decompose and produce a highly irritant gas.

WARNING

It is forbidden to smoke close to an open refrigerant circuit.

2. GENERAL RECOMMENDATIONS

It is possible to place components in the drying oven after painting or to carry out work near the system if the temperature does not exceed 80˚C.

WARNING

To prevent refrigerant from leaking, never repair a faulty air conditioning circuit component.

Replace all faulty components.

It is essential to follow the routing of the connecting pipes.

Ensure that the refrigerant connecting pipes are correctly fitted so that they will not come into contact with metal parts in the engine compartment.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

CAUTION

To avoid damaging the surface of the air conditioning pipes when removing the seals, do not use a tool with a metallic end piece.

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

CAUTION

Always observe the types and grades of oil for each compressor even when topping up as this could damage the cold loop.

Always close the oil cans again after use to keep moisture out and never use oil contained in a can that has been open for a long time (viscous appearance).

AIR CONDITIONING: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. SAFETY

WARNING

- The following must be worn when handling refrigerant:
  - gloves,
  - protective goggles (with side shields if possible).

In the event of refrigerant fluid coming into contact with the eyes, rinse well with clean water continuously for 15 minutes. If possible, have an eye rinse unit available.

If refrigerant comes into contact with your eyes, consult a doctor immediately. Inform the doctor that the burns were caused by R134Arefrigerant.

In the event of contact with other unprotected parts of the body (event though the safety advice has been observed), rinse well with clean water continuously for 15 minutes .

WARNING

Work requiring the use of refrigerant must be carried out in a well-ventilated area.

The refrigerant must not be stored in a shaft, a pit, a hermetically sealed room, etc.

Refrigerants are colourless and odourless fluids.

Refrigerant is heavier than air. As a result there is a risk of asphyxia for those working close to the ground and less than 5 maway from the working area (pit, well, air vents, etc.).

Switch on gas extraction systems.

At temperatures above 100°C, the refrigerant will decompose and produce a highly irritant gas.

WARNING

It is forbidden to smoke close to an open refrigerant circuit.

2. GENERAL RECOMMENDATIONS

CAUTION

Consult the device's operating manual to avoid incorrect use.

It is possible to place components in the drying oven after painting or to carry out work near the system if the temperature does not exceed 80°C.

WARNING

To prevent refrigerant from leaking, never repair a faulty air conditioning circuit component.

Replace all faulty components.

It is essential to follow the routing of the connecting pipes.

Ensure that the refrigerant connecting pipes are correctly fitted so that they will not come into contact with metal parts in the engine compartment.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

CAUTION

To avoid damaging the surface of the air conditioning pipes when removing the seals, do not use a tool with a metallic end piece.

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857 to plug any openings exposed to the open air. They must be clean. Do not use any plugs which have already been used to plug a fuel circuit.

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

CAUTION

Lubricants are not mutually compatible: always observe the type and quantity of oil recommended for each compressor even when topping up as this could damage the cold loop components.

Always close the oil cans again after use to keep moisture out and never use oil contained in a can that has been open for a long time (viscous appearance).

Consumables:

To avoid the destruction of the components of the cold loop and create electric leakage on high voltage electric vehicles, observe the types and quantities of oil imposed for each compressor including making an extra.

- The following lubricants are not miscible:
  - Planetelf PAG 488 for internal combustion engine vehicle,
  - Sanden SP 10 for internal combustion engine vehicle,
  - POE ND 11 for electric vehicle.

Close systematically oil cans after each use to prevent humidity penetration.

Do not use the oil contained in a can appearance seems begun viscous.

Tool:

Use a refrigerant charging station adapted to each type of lubricant.

There are automatic refrigerant charging stations or semi-automatic (see catalog garage equipment) for the injection of lubricants without mixture.

AIR DISTRIBUTION CABLE: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the dashboardDashboard assembly: Exploded view .
- Turn the air distribution control to the air vent position on the dashboard.
- Disconnect the climate control panel connectors.

2. REMOVAL OPERATION

- From control panel, remove(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :
  - the sheath stop clip,
  - the sheath stop by moving it from its housing.
- Extract the air distribution cable from the control panel.
- Unclip the cable sleeve stop from the distribution unit(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .
- Extract the end of the air distribution control cable.
- Remove the air distribution cable(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REFITTING

- Proceed in the reverse order to removal.
- Check that the air distribution control can move along its whole stroke.

AIR DISTRIBUTION CIRCUIT ASSEMBLY: EXPLODED VIEW

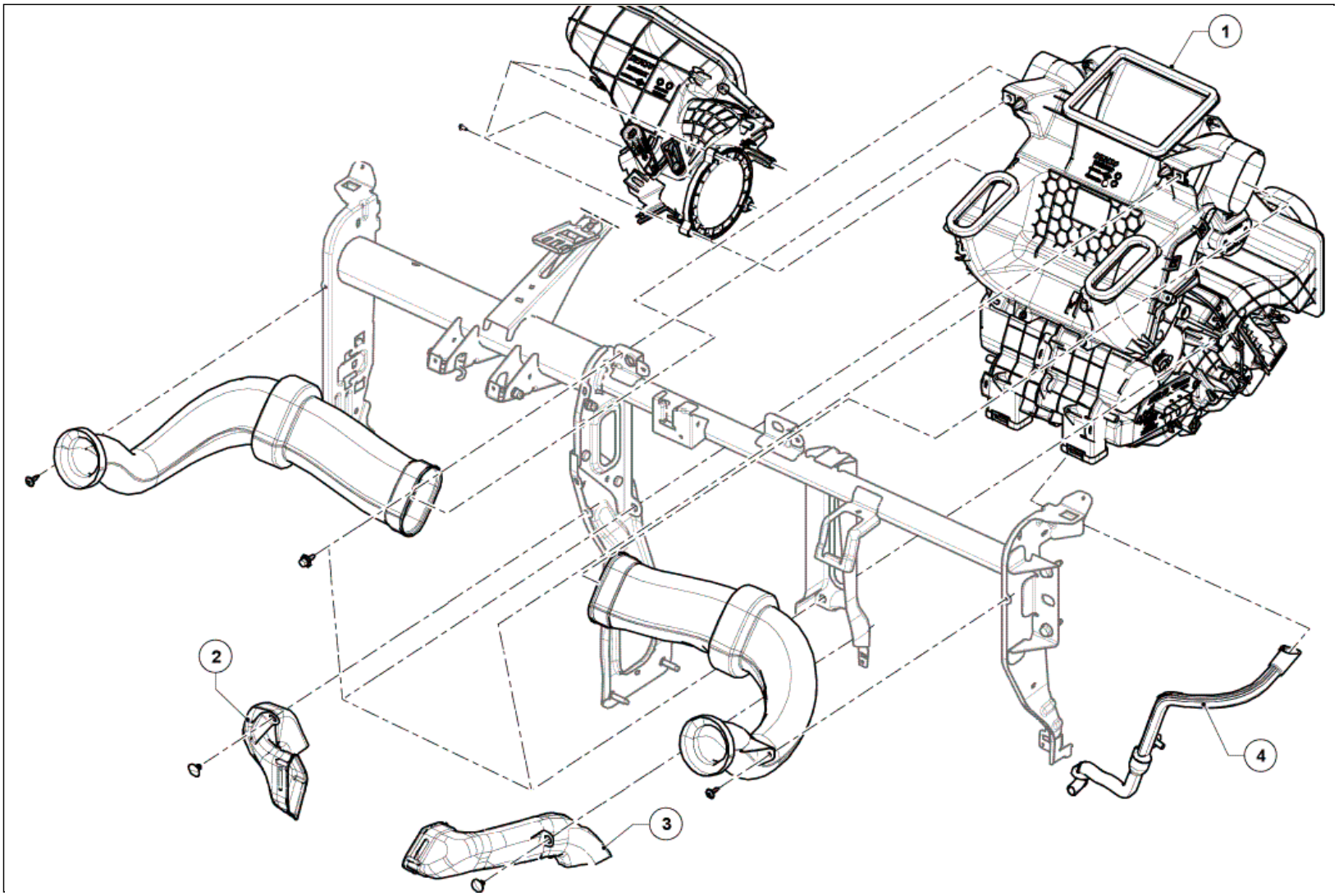


Illustration key: Description Legend .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Distribution unit	(see 61A, Heating, Distribution unit: Removal - Refitting)
2	Front footwell left-hand air distribution duct	(see 61A, Heating, Front footwell air distribution duct: Removal - Refitting)
3	Front footwell right-hand air distribution duct	(see 61A, Heating, Front footwell air distribution duct: Removal - Refitting)
4	Condensation drain pipe	

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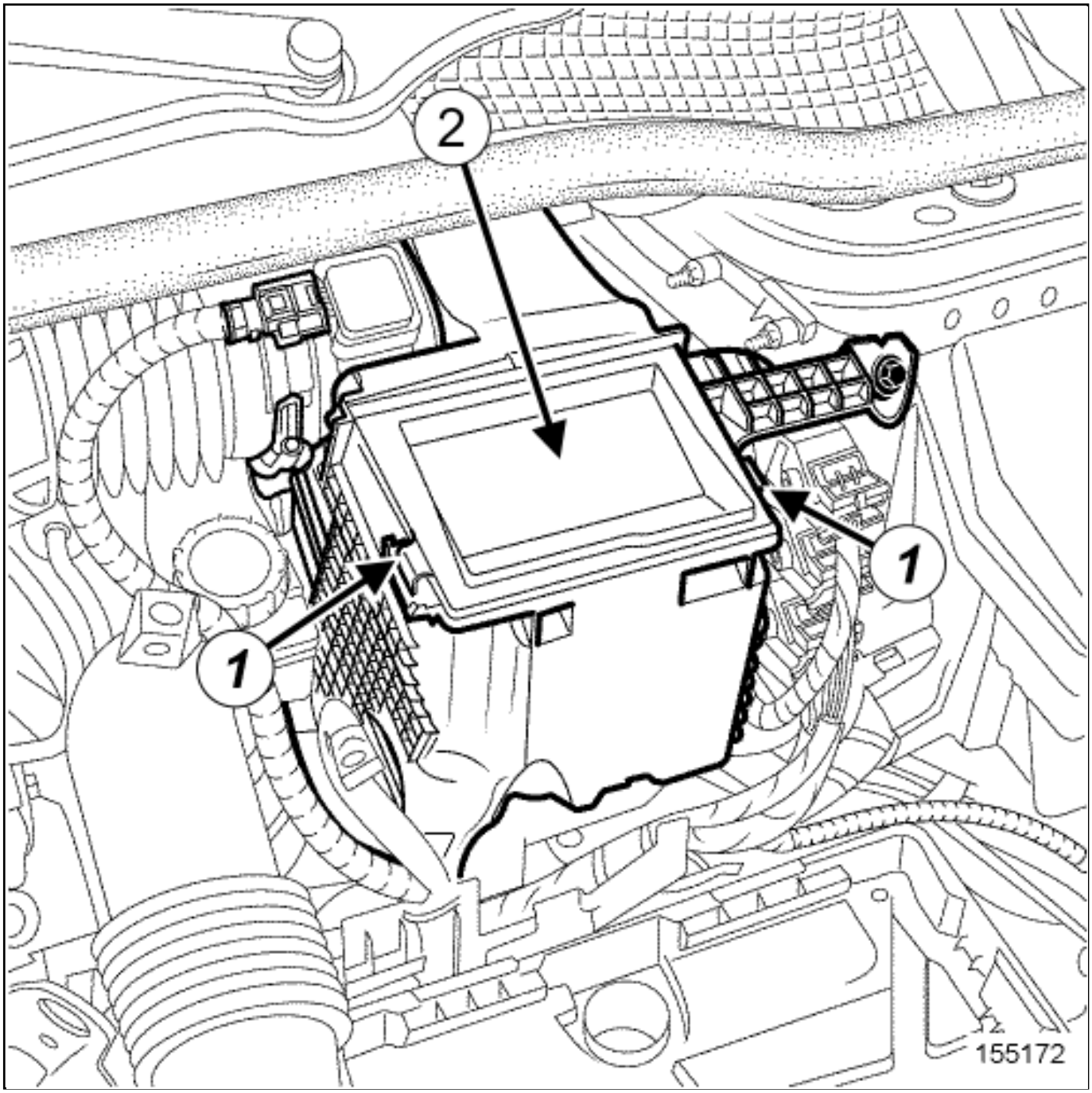
AIR FILTER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

REMOVAL

1. REMOVAL OPERATION



- Unclip the air filter unit cover at(1) .

- Remove:
  - the air filter unit cover(2) ,
  - the air filter.

REFITTING

1. REFITTING PREPARATION OPERATION

- Clean the air filter housing.

2. REFITTING OPERATION

CAUTION

If the air filter is fitted incorrectly in the air filter unit, unfiltered air may enter the engine.

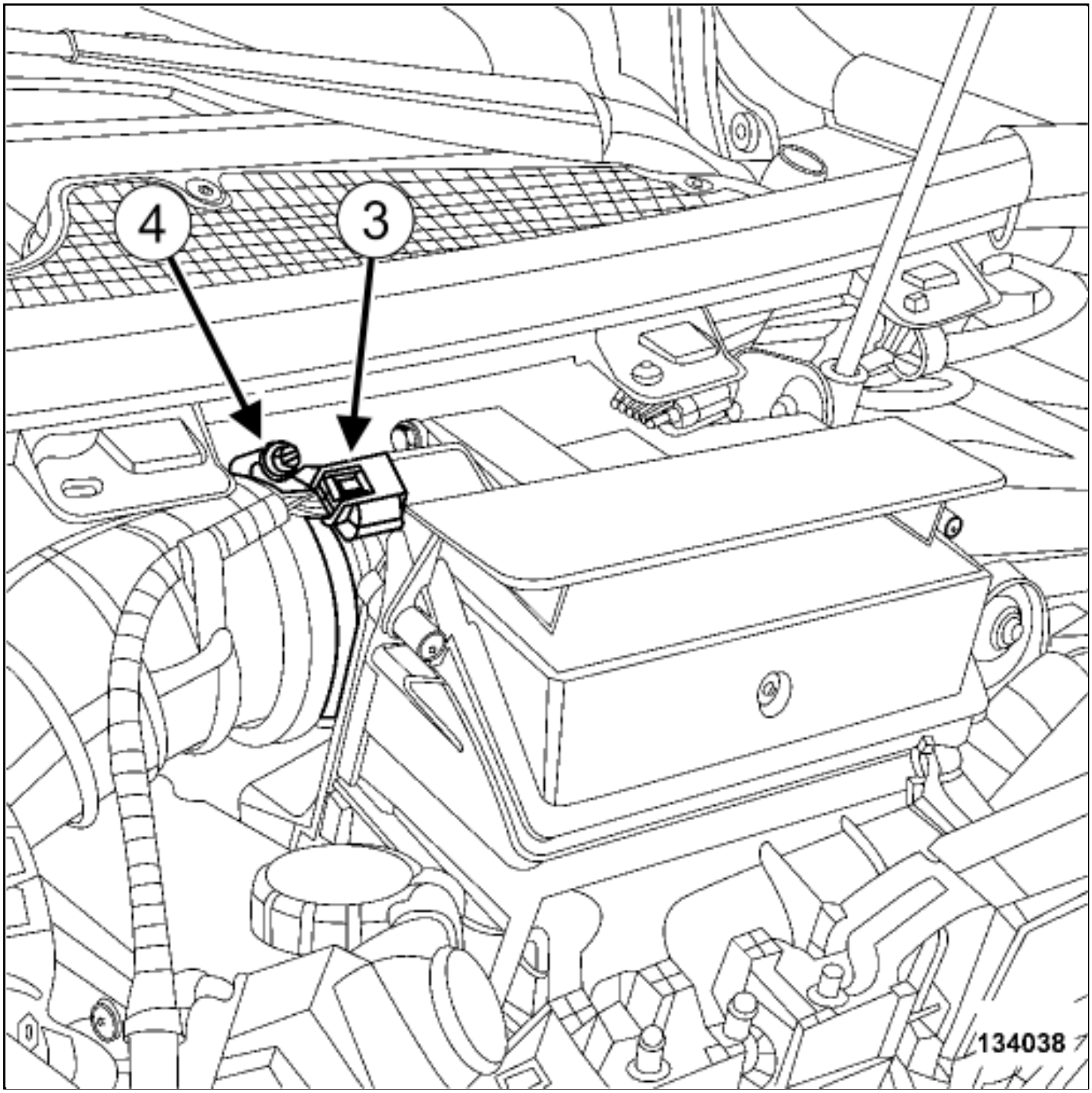
- Proceed in the reverse order to removal.

AIR FILTER UNIT: REMOVAL - REFITTING

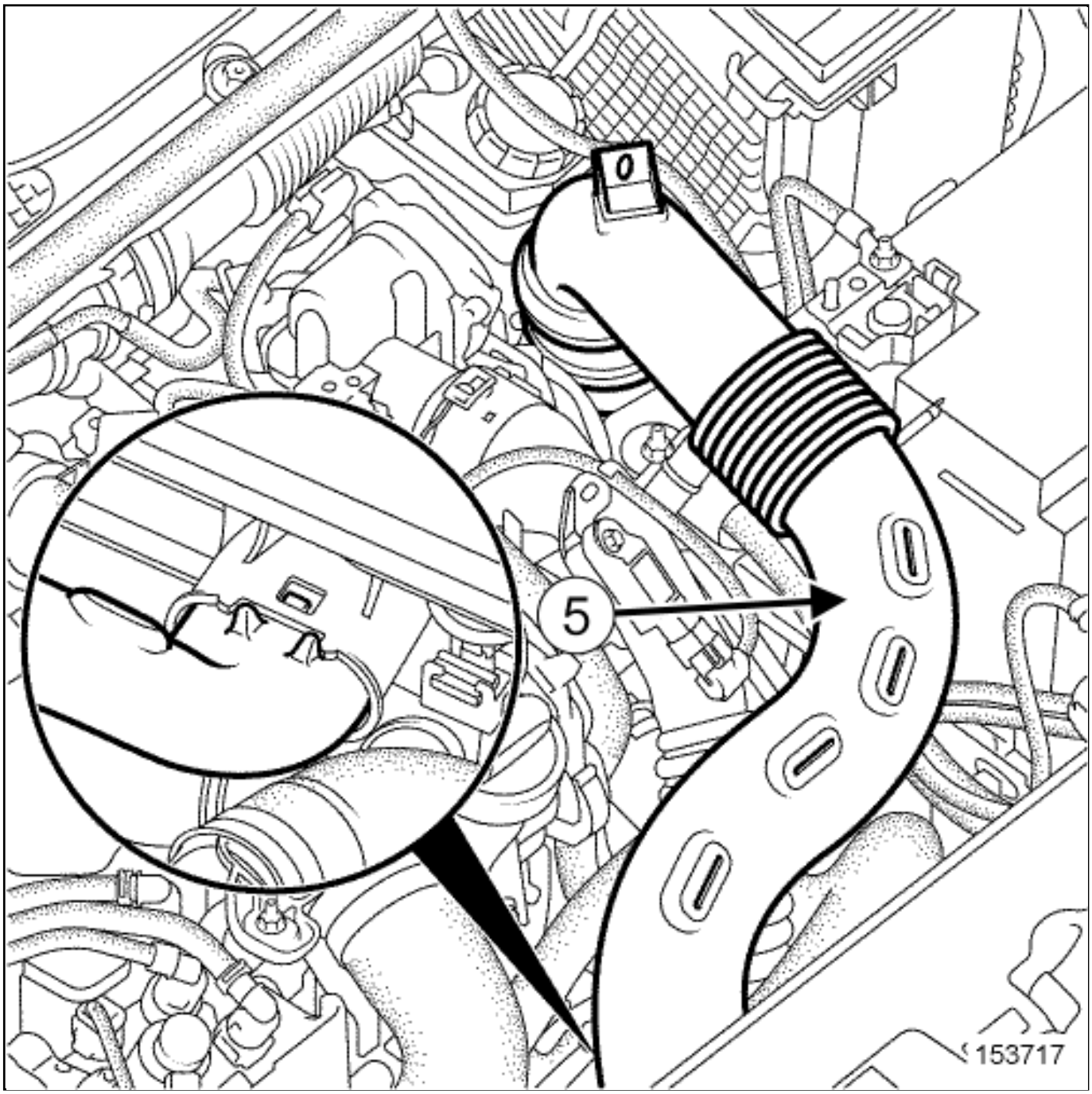
REMOVAL

1. REMOVAL OPERATION PREPARATION

- Remove the battery Battery: Removal - Refitting (80A, Battery).



- Disconnect the air temperature sensor(3) .
- Release the clip(4) .
- Move aside the air filter outlet duct.



- Remove the air filter inlet duct(5) .
- Move aside the cable support.

2. REMOVAL OPERATION

- Remove the bolt(7) .
- Remove the air filter unit.

REFITTING

- Proceed in the reverse order to removal.

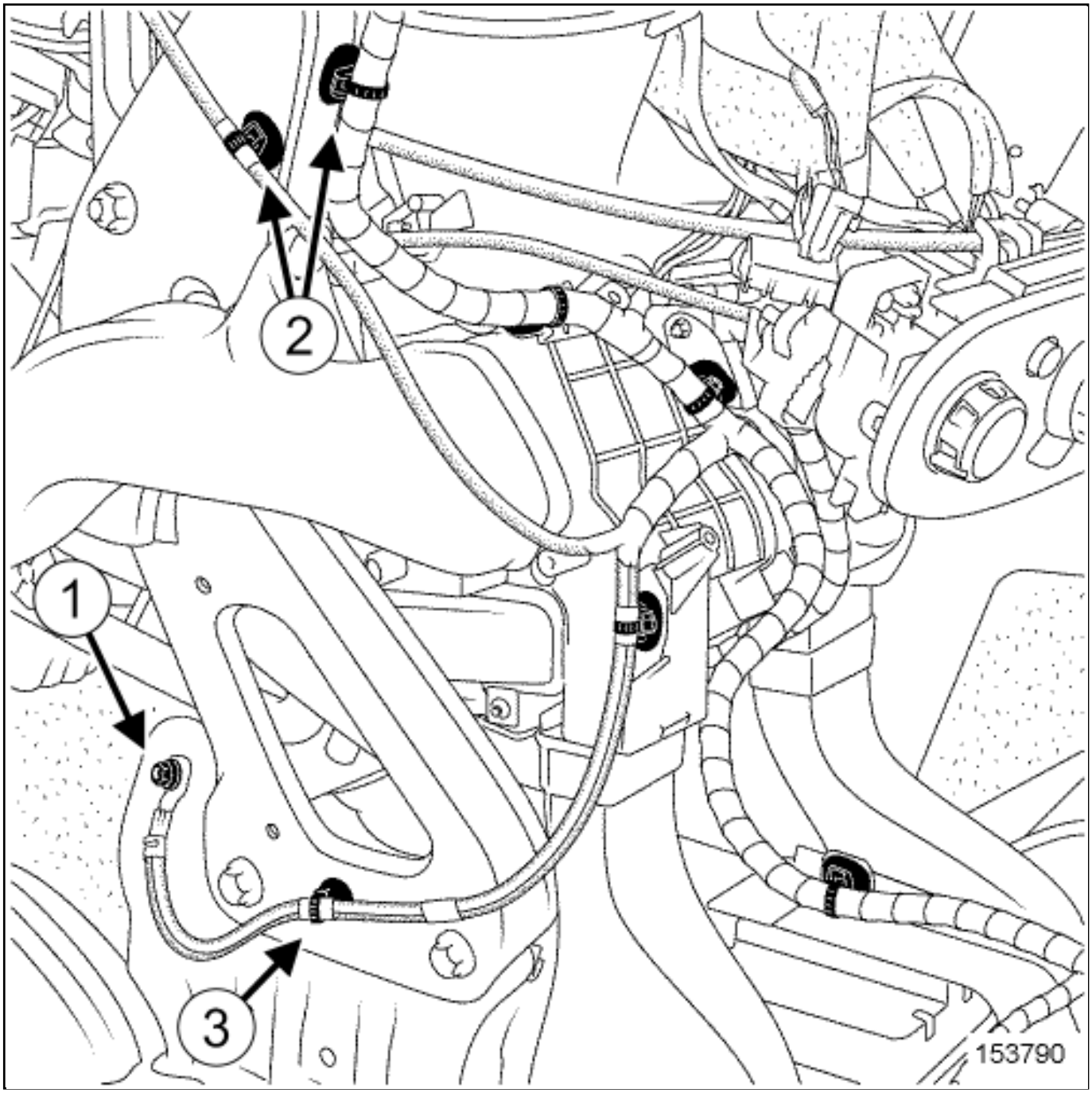
AIR MIXING CABLE: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the dashboardDashboard assembly: Exploded view .
- Turn the heating and air conditioning mixing control to the hottest position.
- Disconnect the climate control panel connectors.
- Partially lift the floor carpetCentre floor front carpet: Removal - Refitting .

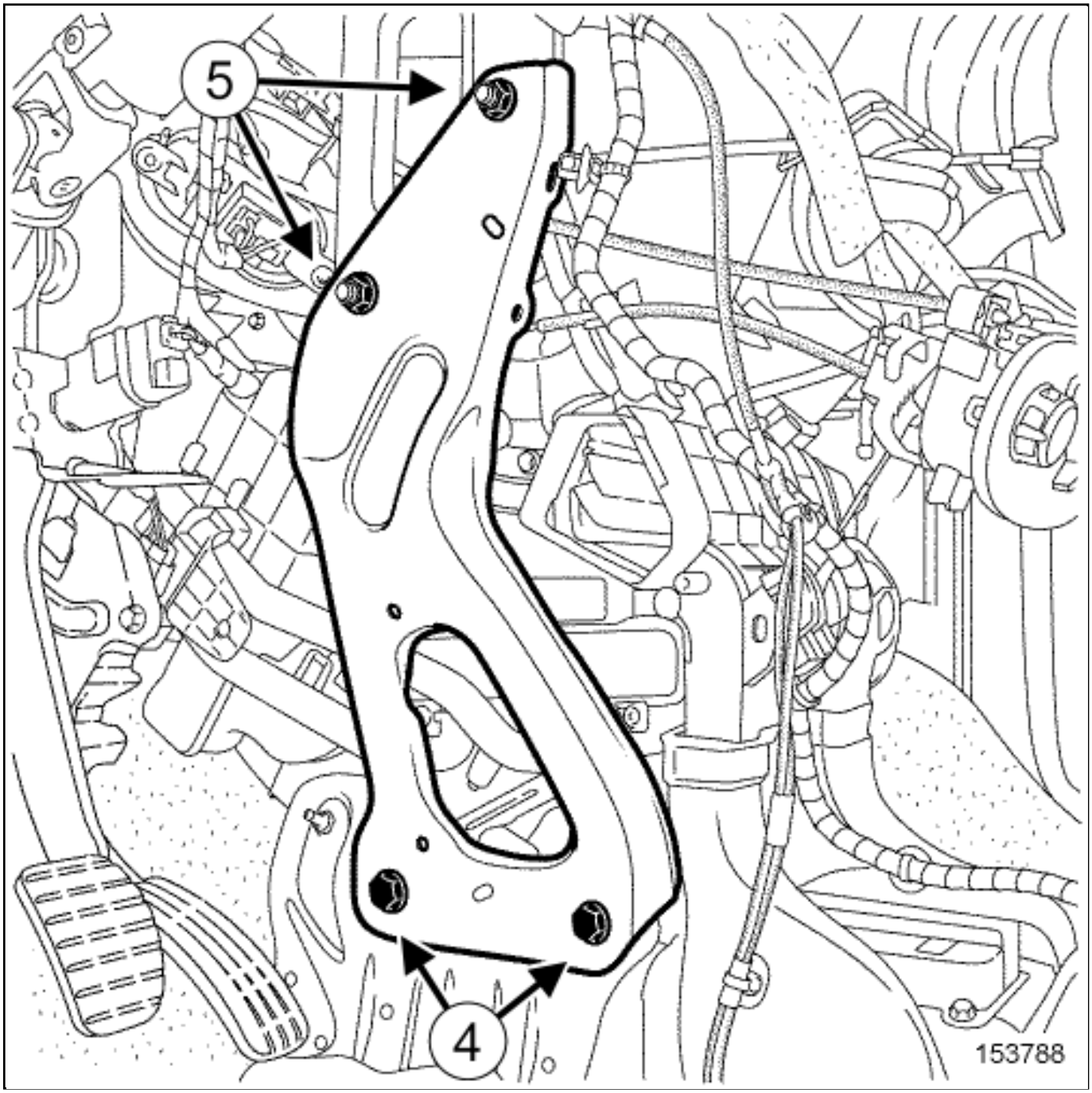


- Remove the nut(1) .

- Unclip :
  - the wiring at(2) ,
  - the wiring at(3) .

- Remove the front left-hand footwell air distribution duct(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

- Mark the position of the strut on the body before removing it.



Remove :

- the bolts(4) ,
- the nuts(5) ,
- the stay.

2. REMOVAL OPERATION

From control panel, remove(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :

- the sheath stop clip,
- the sheath stop by moving it from its housing.

- Extract the air mixing cable from the control panel.

- Unclip the cable sleeve stop from the distribution unit(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

- Extract the end of the air mixing cable.

- Remove the air mixing cable(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REFITTING

- Proceed in the reverse order to removal.

- Check that the air mixing control can move along its whole stroke.

AIRBAG AND PRETENSIONERS: LIST AND LOCATION OF COMPONENTS

Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

1- THE "AIRBAGS AND PRETENSIONERS" EQUIPMENT CONSISTS OF:

- an airbag computer(see 88C, Airbags and pretensioners, Airbag computer: Removal - Refitting)
- a driver's frontal airbag(see 88C, Airbags and pretensioners, Driver's frontal airbag: Removal - Refitting) (NT 5499, 88C, Airbag and pretensioners)

- a passenger frontal airbag(see 88C, Airbags and pretensioners, Passenger's frontal airbag: Removal - Refitting)
- an inhibitor switch(see 88C, Airbags and pretensioners, Inhibitor switch: Removal - Refitting) (NT 5499, 88C, Airbag and pretensioners)

- a side impact sensor(see 88C, Airbags and pretensioners, Side impact sensor: Removal - Refitting)
- a front side airbagFront seat assembly: Exploded view

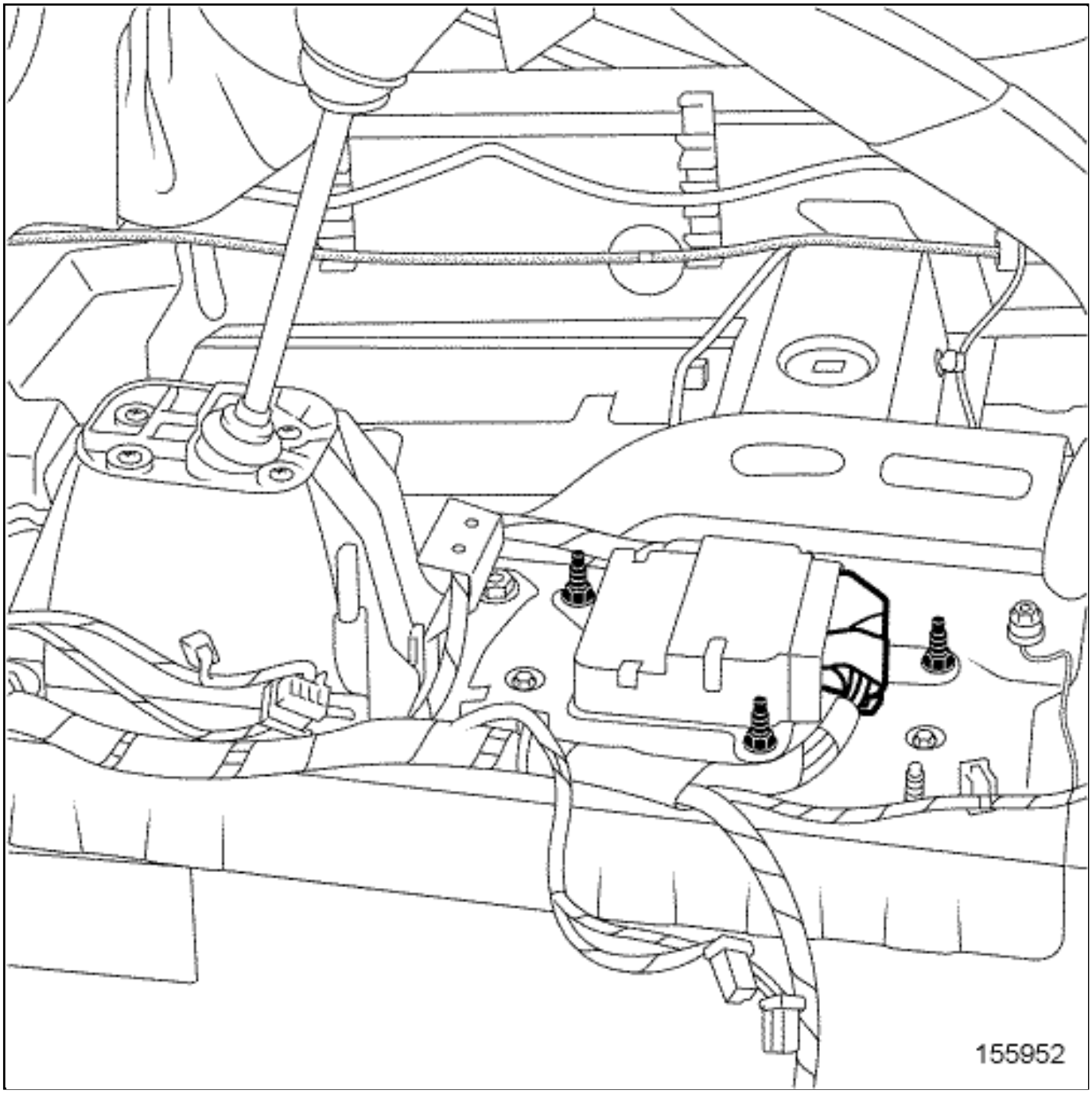
2. LOCATION OF COMPONENTS

Apply the repair procedure using Diagnostic toolDiagnostic tool : Use :

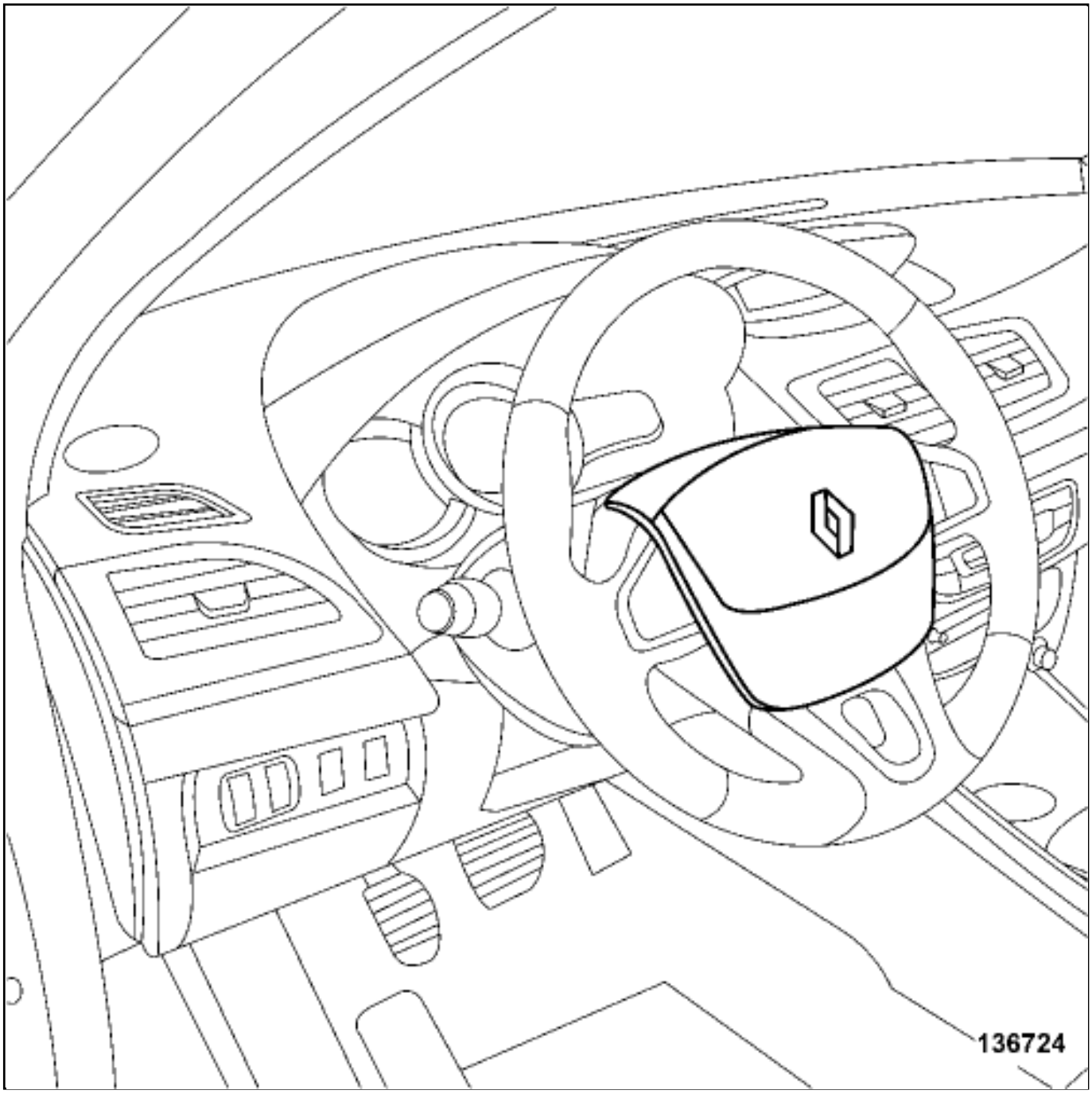
-Calculateur concerned by the before repair procedure:

- "Airbag computer"

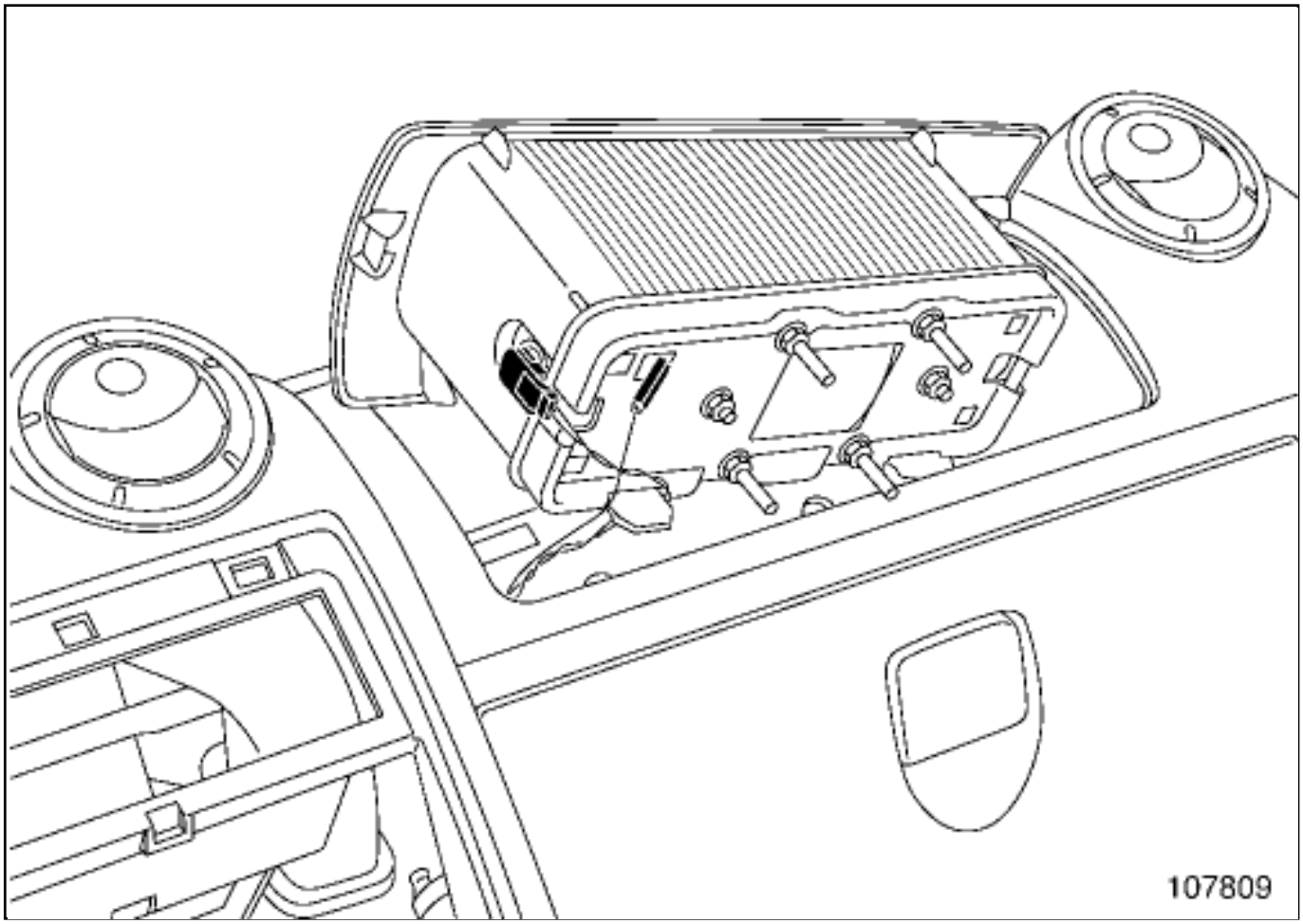
AIRBAG COMPUTER



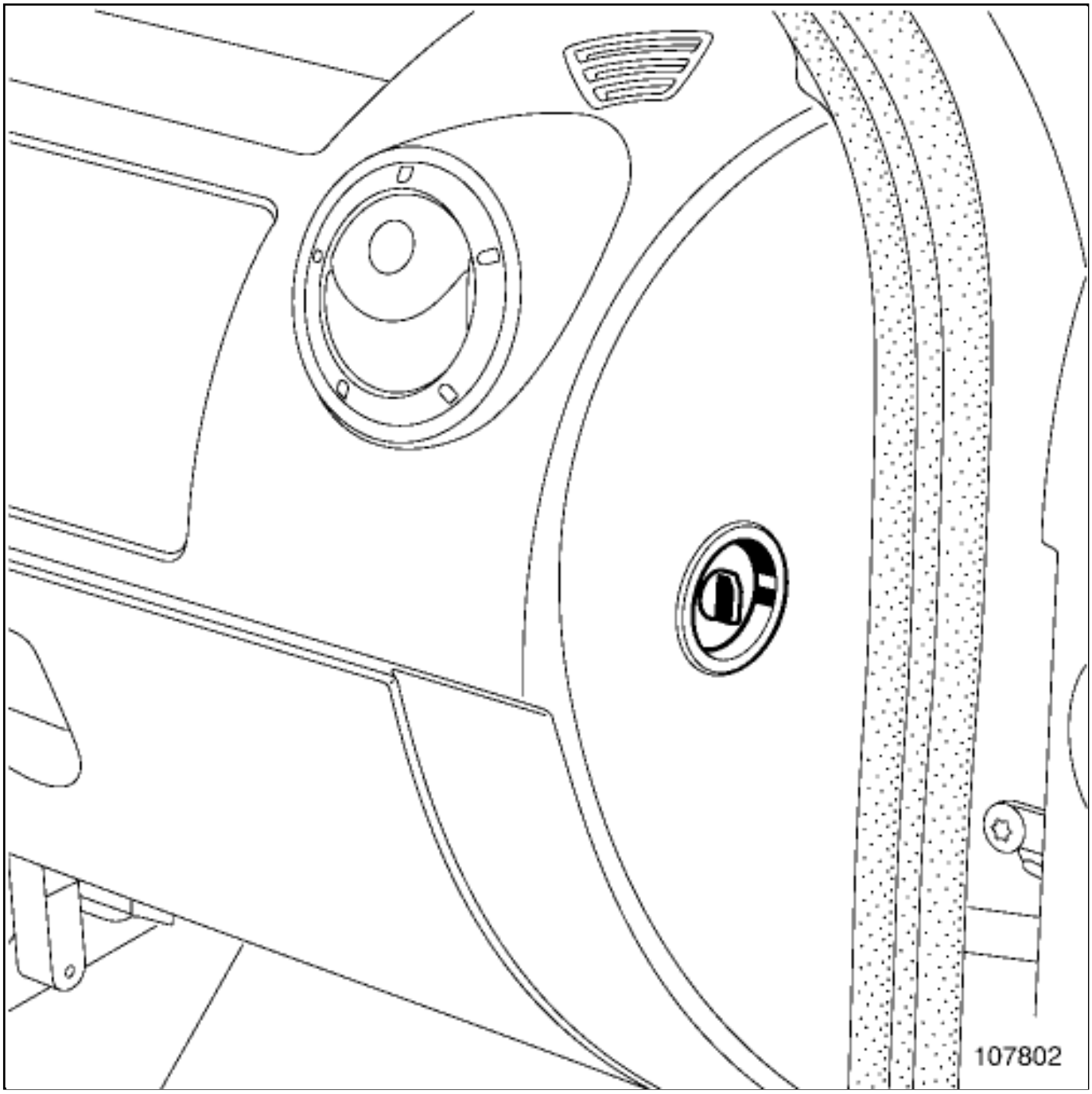
DRIVER'S FRONTAL AIRBAG



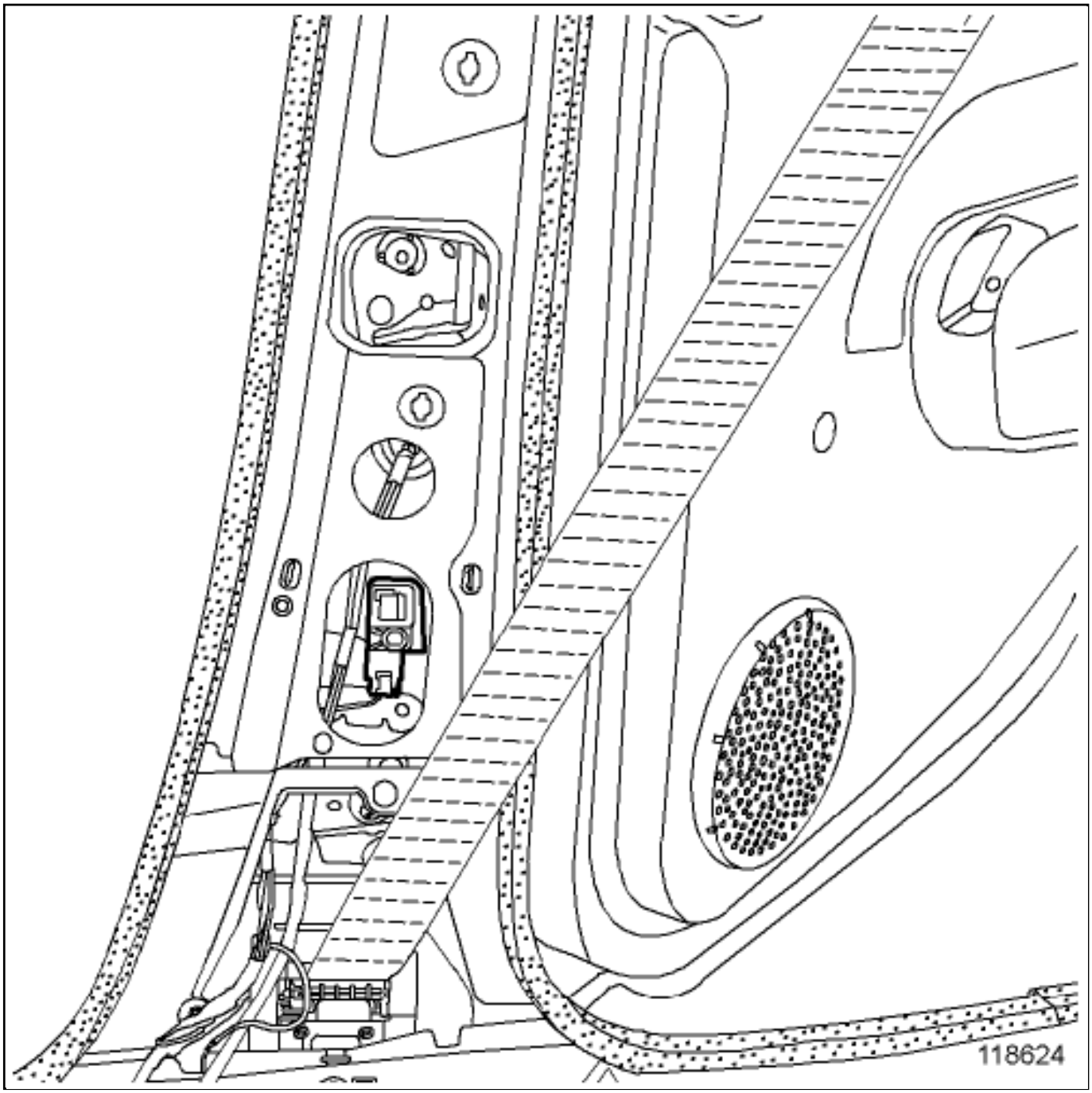
PASSENGER FRONTAL AIRBAG



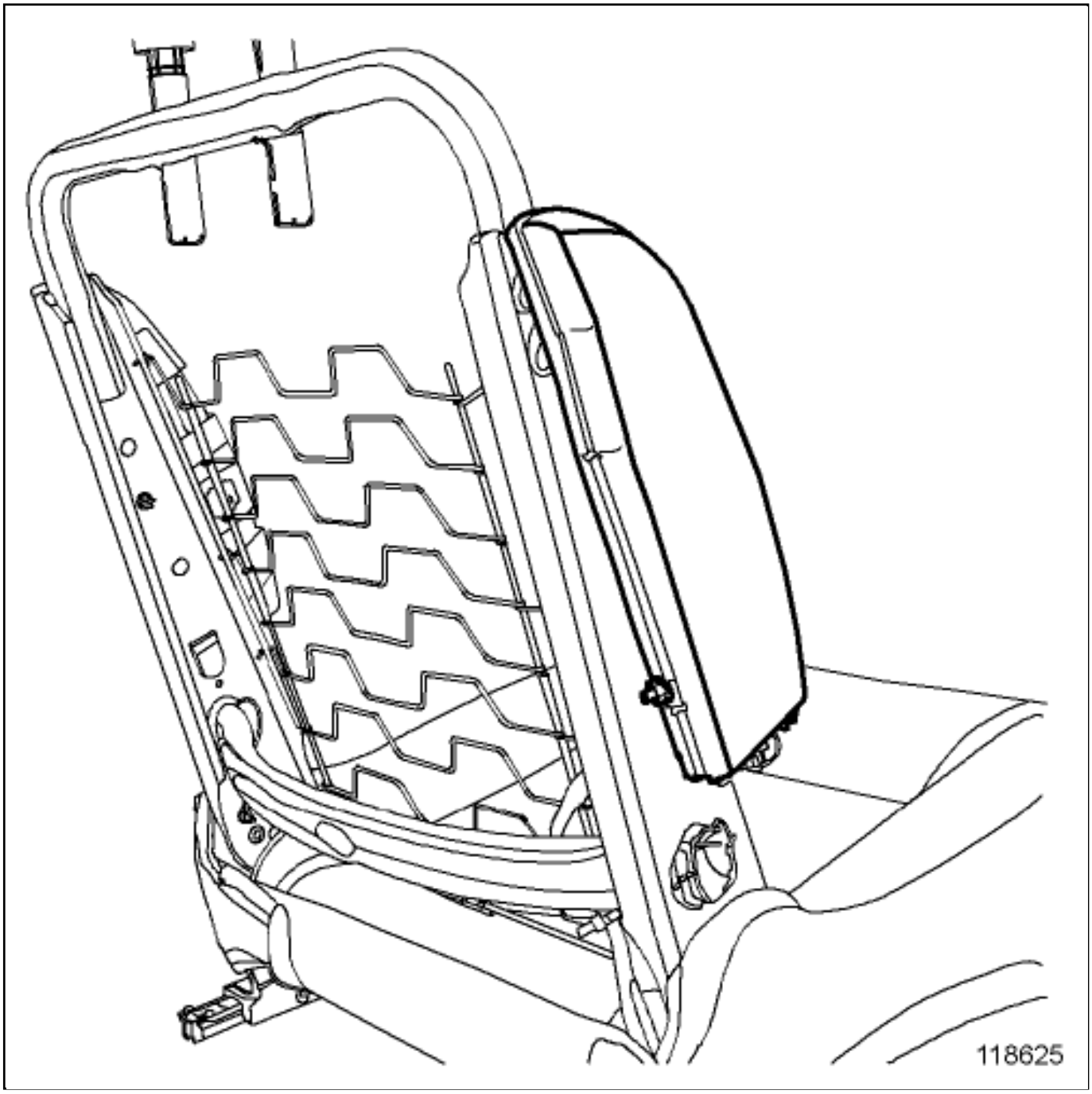
INHIBITOR SWITCH



SIDE IMPACT SENSOR (B-PILLAR)



FRONT SIDE AIRBAG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AIRBAG AND PRETENSIONERS: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

All operations on airbag and pretensioner systems must be carried out by qualified trained personnel.

The airbags have a pyrotechnic gas generator, with an ignition module and bag which must not be separated.

The pretensioners have a pyrotechnic gas generator and an igniter which must, under no circumstances, be separated.

WARNING

Never handle the pyrotechnic systems (pretensioners or airbags) near to a source of heat or naked flame - they may be triggered.

WARNING

To avoid any splashes, do not place anything in the airbag deployment area.

WARNING

To prevent the any component from being thrown upwards, store the airbag with the inflatable cushion facing upwards.

Protect the side impact sensors (with cardboard and adhesive, for example) during an operation near these sensors (risk of damage caused by a falling tool, etc.).

It is essential to replace any pyrotechnic system that has fallen on the ground or shows signs of impact.

It is essential to replace any restraint system that shows deterioration (tears or damage to the strap, damaged appearance parts, cover unclipped, damaged clips or indexing brackets, etc.).

1. PROCEDURE FOR DEACTIVATING AND ACTIVATING THE SAFETY SYSTEMS

Pyrotechnic system component (except occupant management device) **Bodywork component**	**Deactivation**	**Activation**
Operation on (or near) a pyrotechnic component Operation on (or near) an impact detection component Bodywork operation (dent removal, welding, etc.) Upholstery operation (trim removal, etc.)	Lock the airbag computer (see Fault finding - Replacement of components) Disconnect the battery Battery: Removal - Refitting	Unlock the airbag computer (see Fault finding - Replacement of components) Connect the battery Battery: Removal - Refitting

Occupant management device	**Deactivation**	**Activation**
❑ Operation on: ■ inhibitor switch ■ seat belt buckling detection connector (if a non-pyrotechnic buckle)	Switch off the ignition	Switch on the ignition

2. TRIGGERING OF THE SAFETY SYSTEMS

The pyrotechnic systems (pretensioners and airbags) must be checked using the Diagnostic tool:

- after an accident,
- after theft or attempted theft of the vehicle,
- before selling a used vehicle.

After detection of an impact, the airbag computer is definitively locked and the "airbag fault" warning light illuminates on the instrument panel. The airbag computer and the side impact sensors must always be replaced.

WARNING

To eliminate the risk of any accident, do not reuse pyrotechnic components.

It is essential to destroy pretensioners or airbags before scrapping a vehicle or a part only **(see 88C, Airbags and pretensioners, Airbags and pretensioners: Recycling - Destruction)** .

3. DURABILITY OF THE PYROTECHNIC COMPONENTS

The precautions which recommended that pyrotechnic components (airbags and pretensioners) were replaced 10 years after the registration of the vehicle have now been lifted.

Pyrotechnic components (airbags and pretensioners) do not therefore require any maintenance.

AIRBAG COMPUTER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

1. REMOVAL PREPARATION OPERATION

Apply the before repair procedure using Diagnostic toolDiagnostic tool : Use :
-Calculateur concerned by the before repair procedure:

- "Airbag computer"

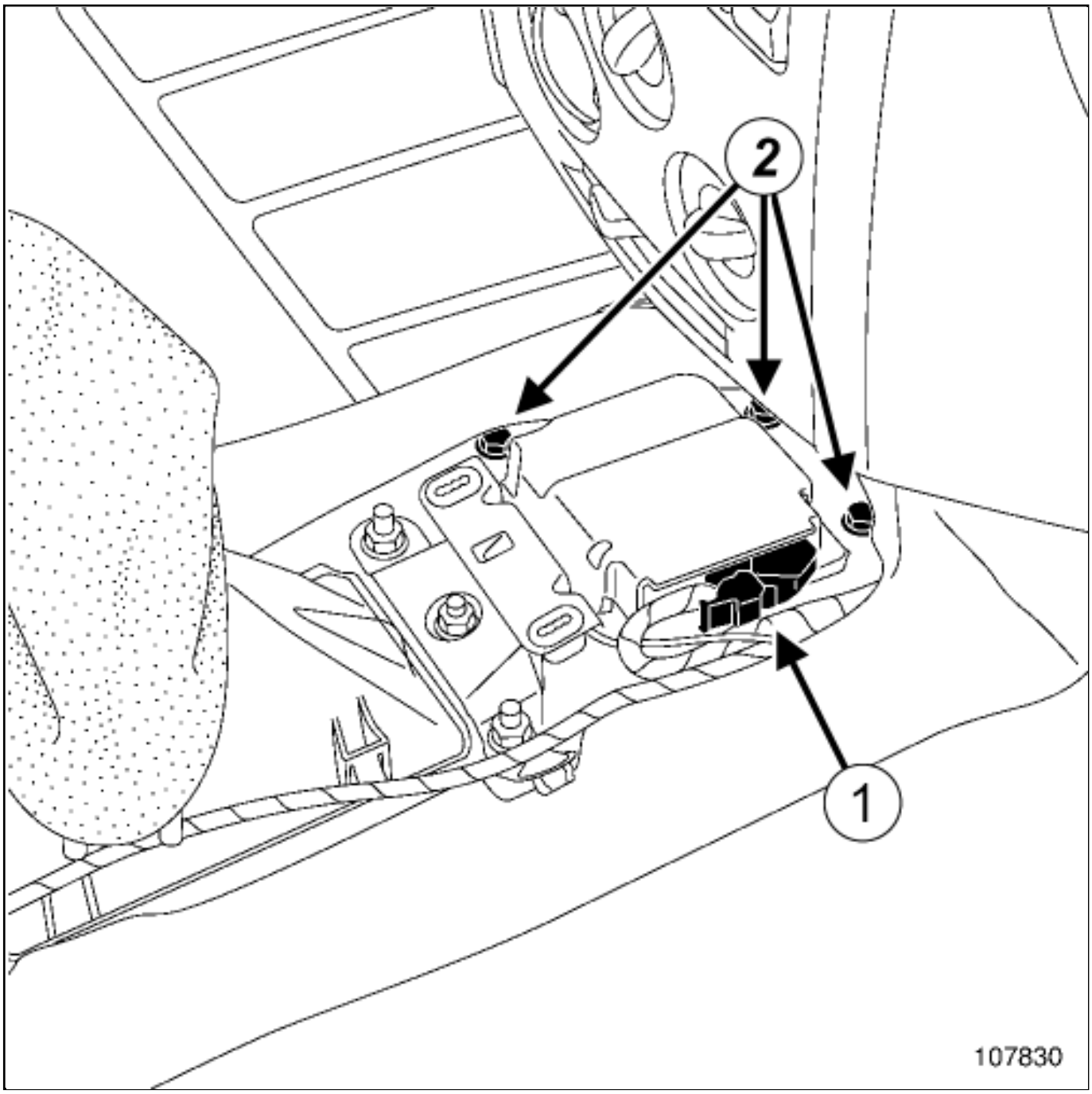
Lock the airbag computer(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

Switch off the ignition.

Disconnect the batteryBattery: Removal - Refitting .

Remove the centre consoleCentre console assembly: Exploded view .

2. REMOVAL OPERATION



- Disconnect the connector(1) .

- Remove:
  - the airbag computer bolts(2) ,
  - the airbag computer.

REFITTING

1. REFITTING OPERATION

- Refit:

- the airbag computer,
- the airbag computer bolts.

Torque tighten the airbag computer bolts8 N.m.

Connect the connector.

2. FINAL OPERATION

Refit the centre console**Centre console assembly: Exploded view** .

Connect the battery**Battery: Removal - Refitting** .

If the airbag computer is being replaced, carry out the necessary operations using the Diagnostic tool (see Fault finding - Replacement of components) (88C, Airbags and pretensioners).

Unlock the airbag computer**(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair)** .

Apply the after repair procedure using Diagnostic tool**Diagnostic tool : Use** :
-Calculateur concerned by the before repair procedure:
- "Airbag computer"

AIRBAGS AND PRETENSIONERS: RECYCLING - DESTRUCTION

Note, one or more warnings are present in this procedure

Special tooling required	
Tool for destroying airbags and pretensioners.	Ele. 1287
Kit of 2 adapters for the airbag and pretensioner destruction tool.	Ele. 1287-02
Kit of 2 adapters for the airbag and pretensioner destruction tool.	Ele. 1812
Adapter for airbag and pretensioner destruction tool	

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair)** .

WARNING

To prevent any risk of an accident when destroying a pyrotechnic component, check that no-one is in the vicinity.

Note:

If triggering is not possible (faulty ignition module) return the part to Techline.

- Always use the toolTool for destroying airbags and pretensioners.(Ele. 1287) and three kits of adapters Kit of 2 adapters for the airbag and pretensioner destruction tool.(Ele. 1287-02) , Adapter for airbag and pretensioner destruction tool andKit of 2 adapters for the airbag and pretensioner destruction tool.(Ele. 1812) .

- Use a wiring connector kit (Ref: 82 00 518 971).

- Attach the wiring connectors (Ref: 82 00 518 971) to the adaptersKit of 2 adapters for the airbag and pretensioner destruction tool.(Ele. 1287-02) to obtain an adapter for each colour (green, orange, blue, etc.) (see Wiring: Repair) (Technical Note 6015A, 88A, Wiring).

- Use a battery to power the destruction tool.

Note:

The airbags must be destroyed outside the workshop, in an area with sufficient space.

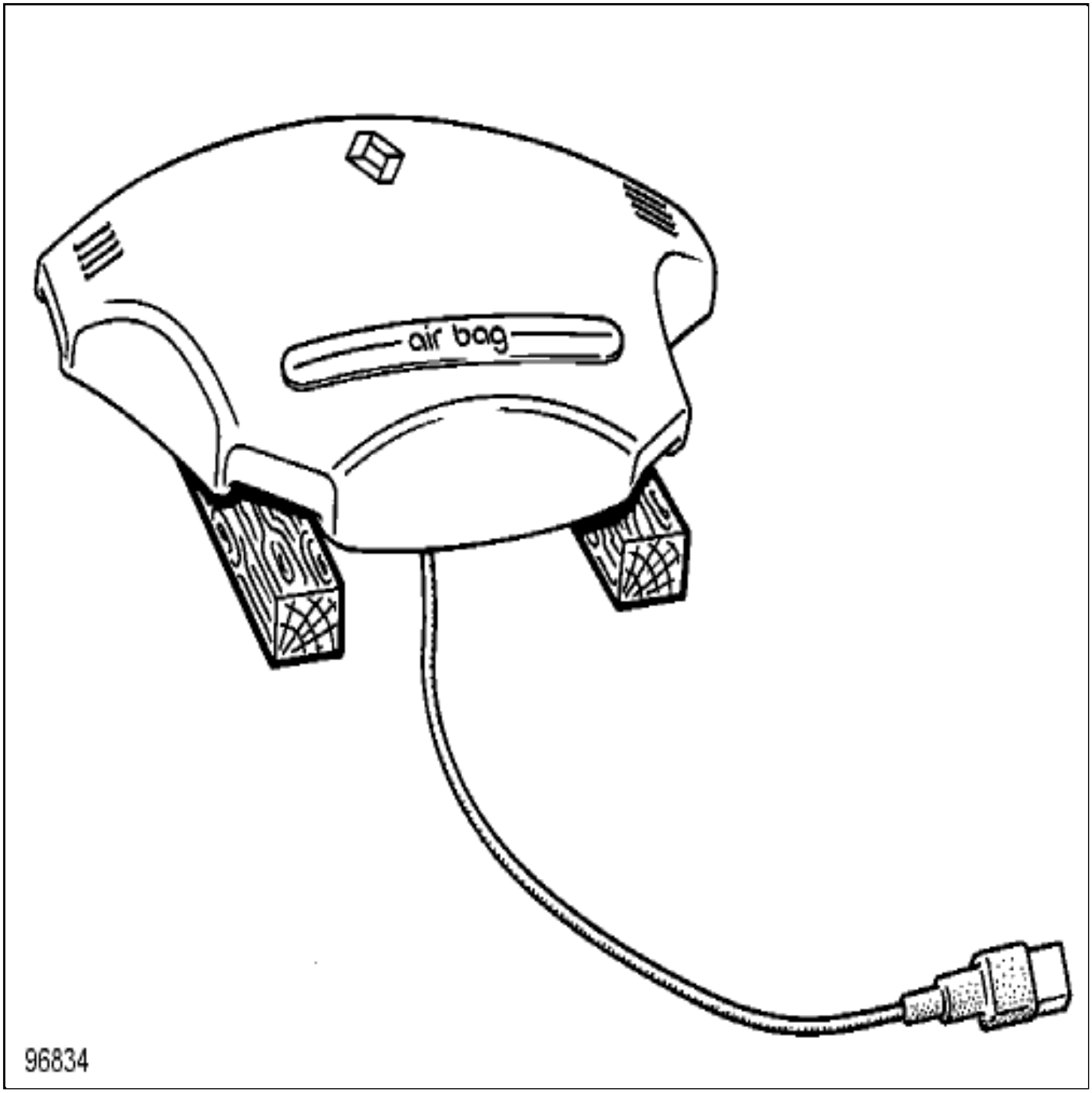
The airbags to be destroyed must be removed.

Note:

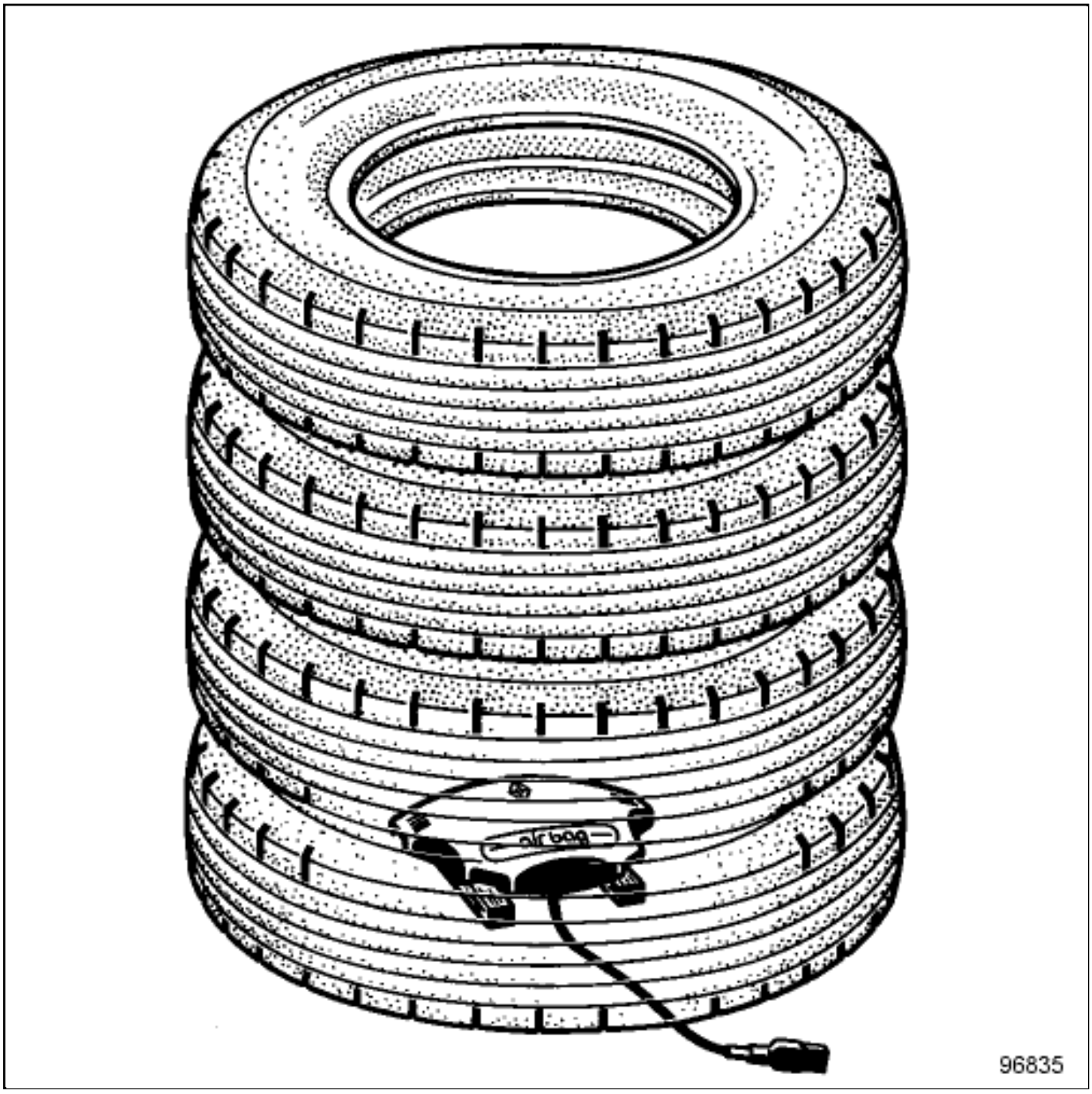
If the airbag has two levels of activation (i.e. it is fitted with two connectors), destroy both connectors.

- Prepare the adapter corresponding to the airbag to be destroyed.

- Connect:
  - the adapter to the destruction toolTool for destroying airbags and pretensioners.(**Ele. 1287**) ,
  - the adapter to the airbag.



- Put the airbag on two wooden blocks.



- The destruction procedure is carried out in a stack of old tyres.

- Make sure that the airbag deployment will not be hindered.

- Unwind the full length of the wiring for the tool, in order to distance it as far away as possible from the pyrotechnic component to be destroyed.

- Connect the two feed wires of the destruction toolTool for destroying airbags and pretensioners.(**Ele. 1287**) to a battery.

- Destroy the airbag by pressing the two push buttons on the tool simultaneously.

2. PYROTECHNIC PRETENSIONERS AND INERTIA REELS

1- DESTRUCTION OF PART FITTED ON THE VEHICLE TO BE SCRAPPED:

- Move the vehicle outside the workshop.
- Mark the adapter corresponding to the pyrotechnic component to be destroyed.
- Connect:
  - the destruction toolTool for destroying airbags and pretensioners.(**Ele. 1287**) to the adapter,
  - the adapter to the pyrotechnic component.
- Unwind the tool wiring fully, so that you are far enough away from the vehicle (approximately ten metres) when the device is triggered.
- Connect the two feed wires of the destruction toolTool for destroying airbags and pretensioners.(**Ele. 1287**) to a battery.
- Destroy the pyrotechnic component by pressing the two push buttons on the tool simultaneously.

2- DESTRUCTION OF PART REMOVED FROM THE VEHICLE:

- Proceed in the same way as for an airbag (in a stack of old tyres).

ALTERNATOR PULLEY: REMOVAL - REFITTING

Essential special tooling	
Kit for replacing alternator freewheels.	Mot. 1732

1. PARTS AND CONSUMABLES FOR THE REPAIRS

Parts always to be replaced:

- the alternator belt,
- the tensioning roller,
- the fixed roller,
- the mechanic tension wheel mounting bolts.

2. PRECAUTIONS DURING REPAIR

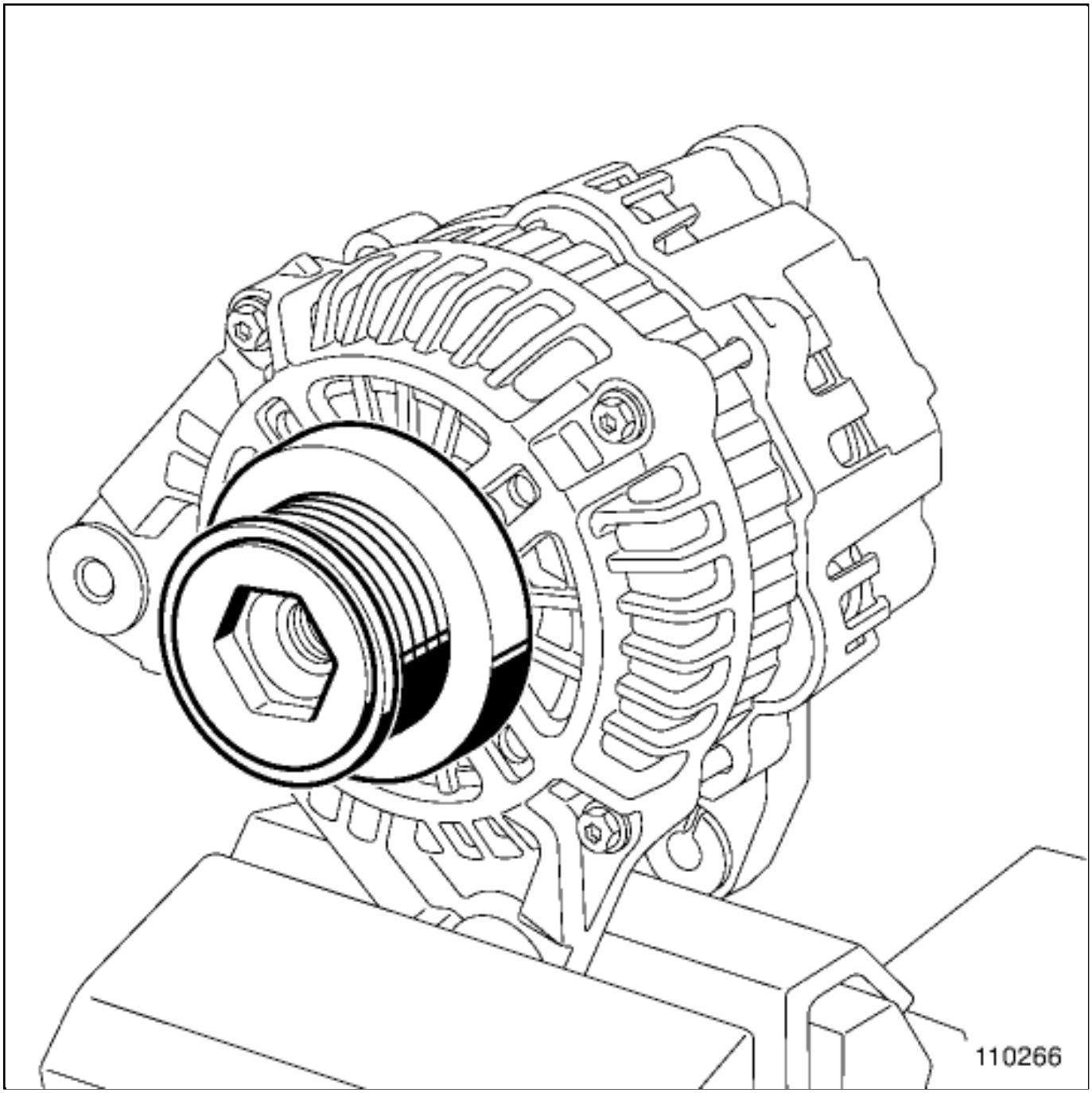
Remplacer impérativement une poulie d'alternateur découpleuse par une poulie découpleuse.

3. EQUIPMENT REQUIRED

- torque wrench that can be used to tighten anticlockwise,
- pneumatic wrench.

4. REMOVAL

Remove the vehicle alternator (see16A, Démarrage - charge, Alternateur



- Place the alternator in a vice jaw.

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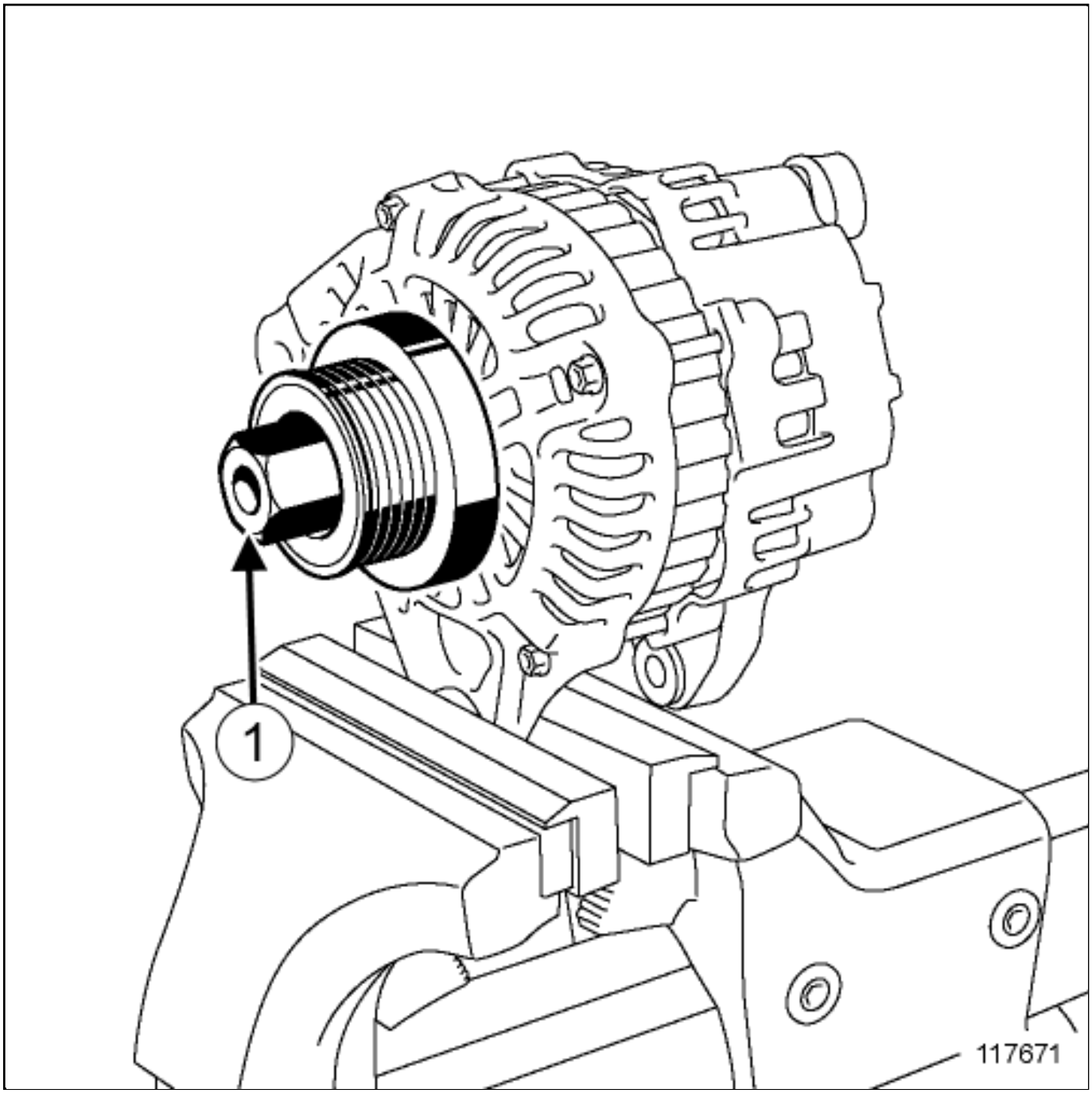
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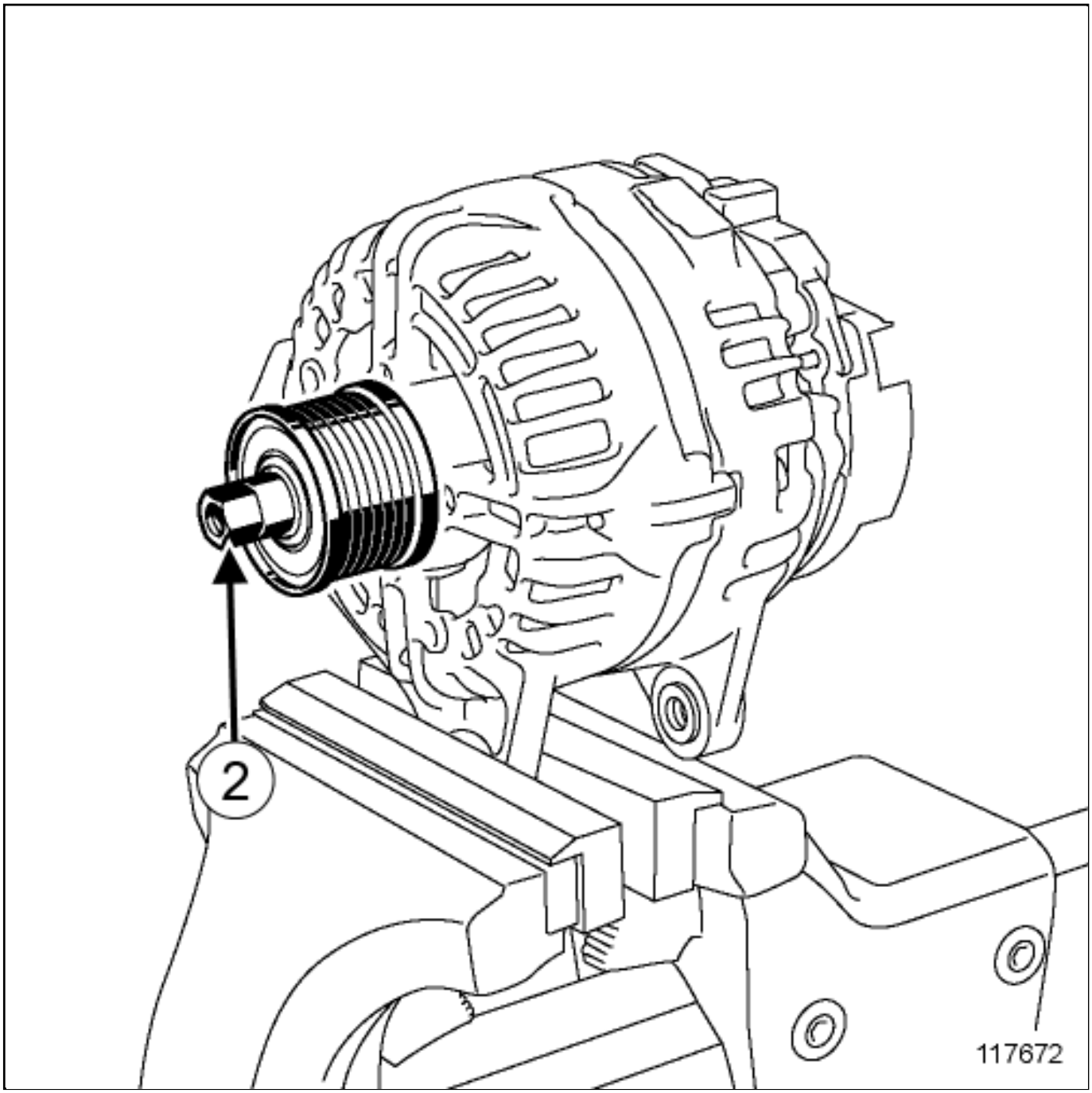
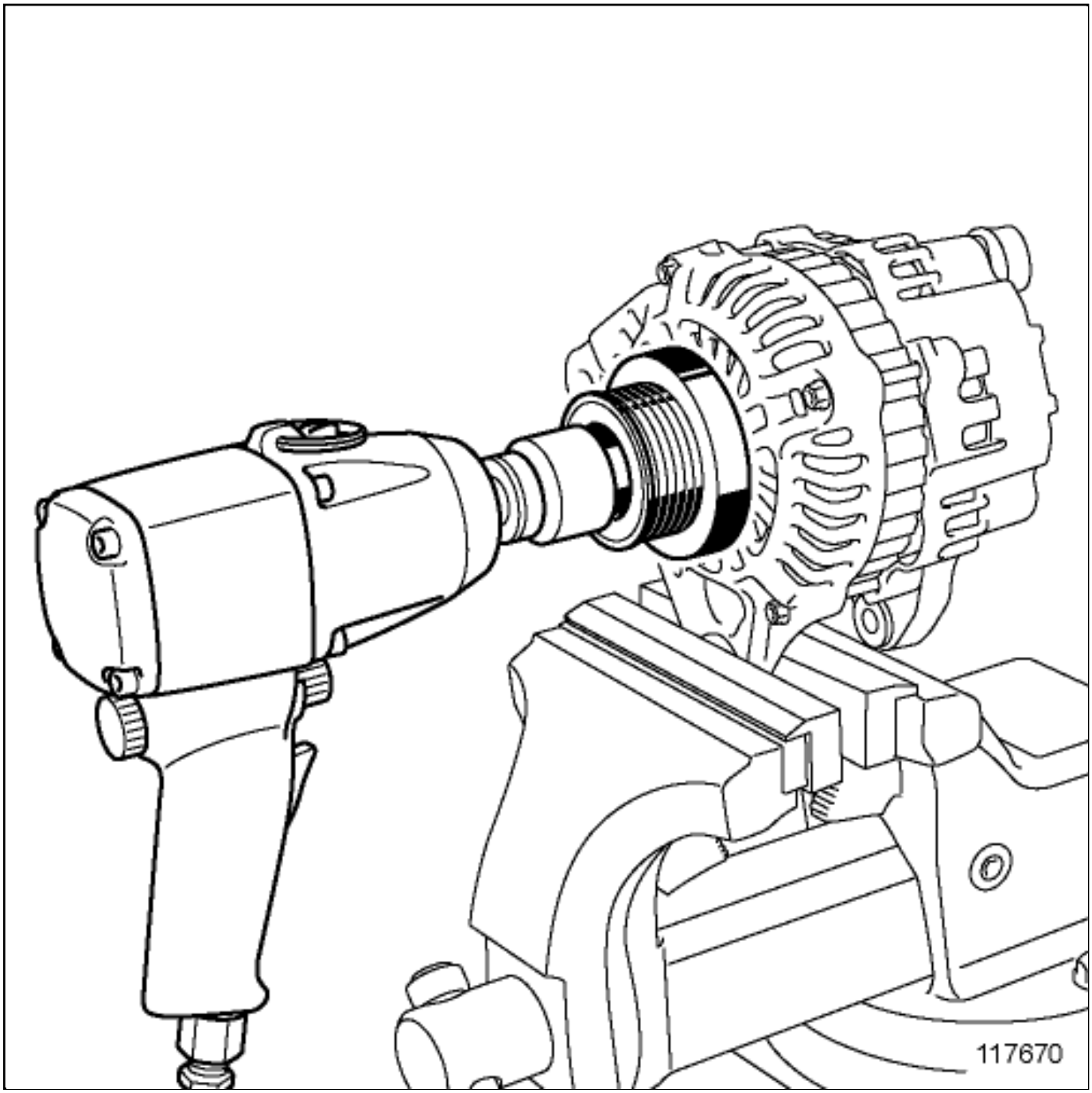


In the alternator pulley, position the hexagonal socket(1) or the splined socket(2) from the tool kit Kit for replacing alternator freewheels.(Mot. 1732) .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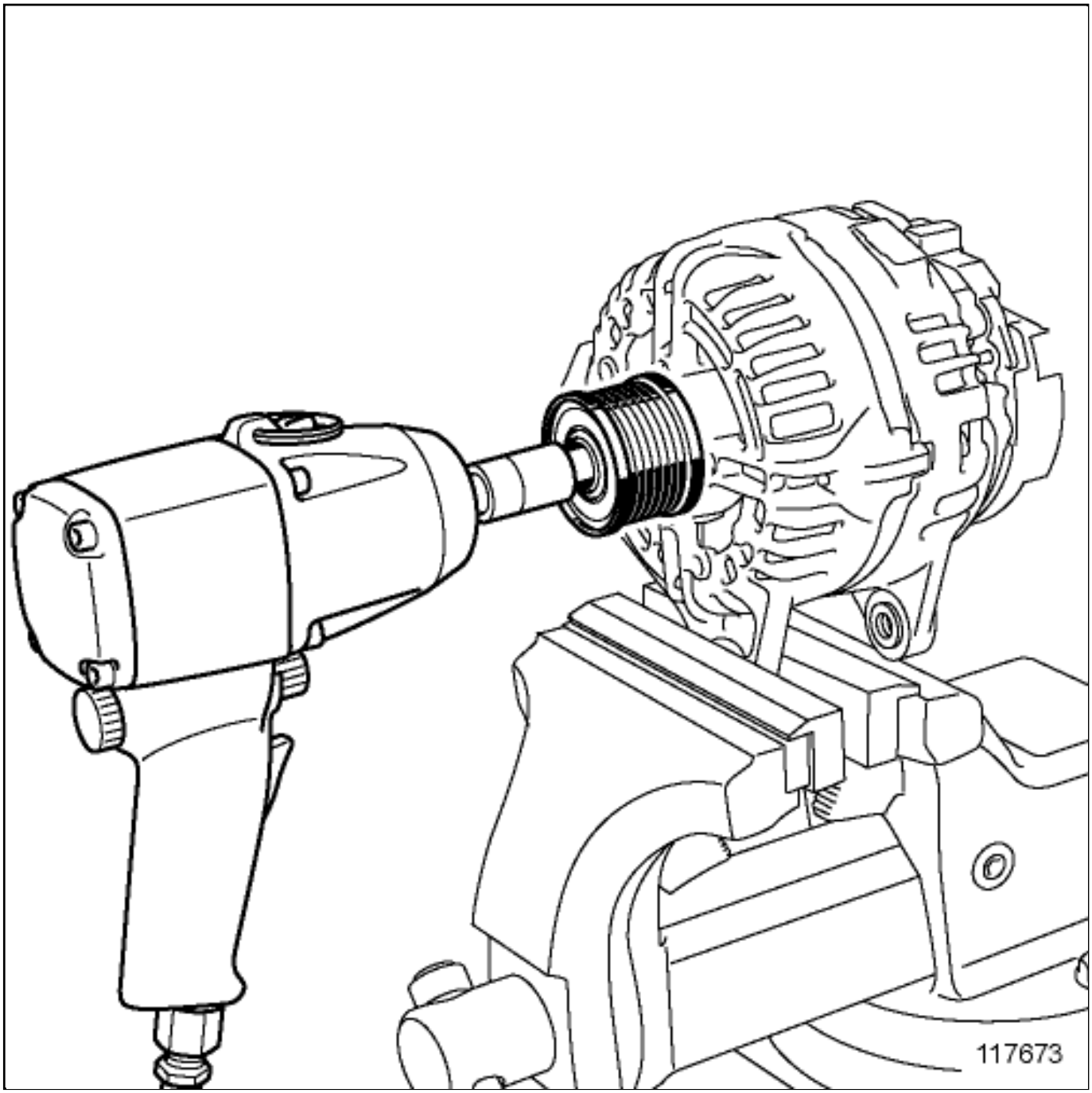
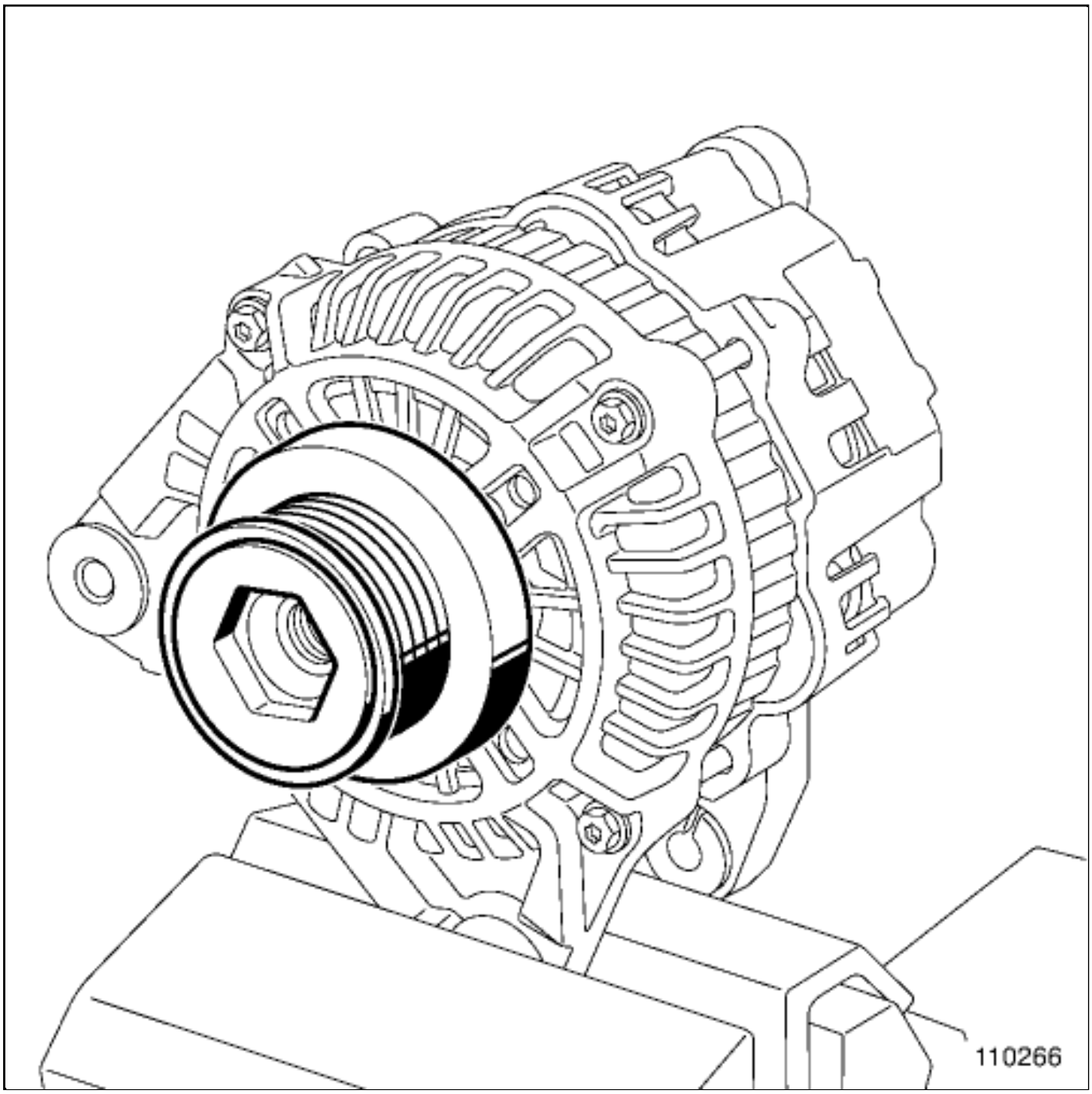


Remove the alternator pulley using a pneumatic wrench.

5. REFITTING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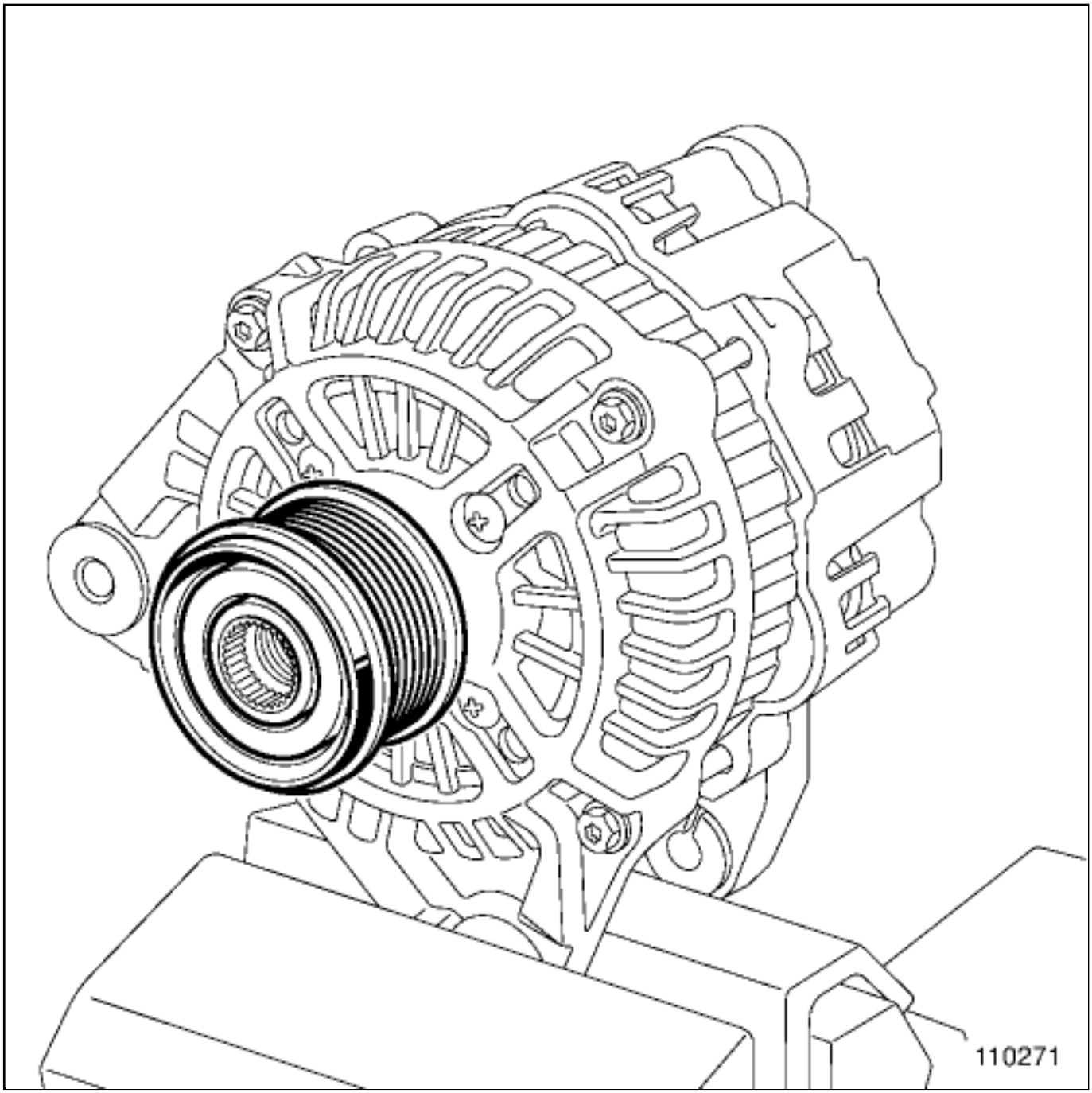
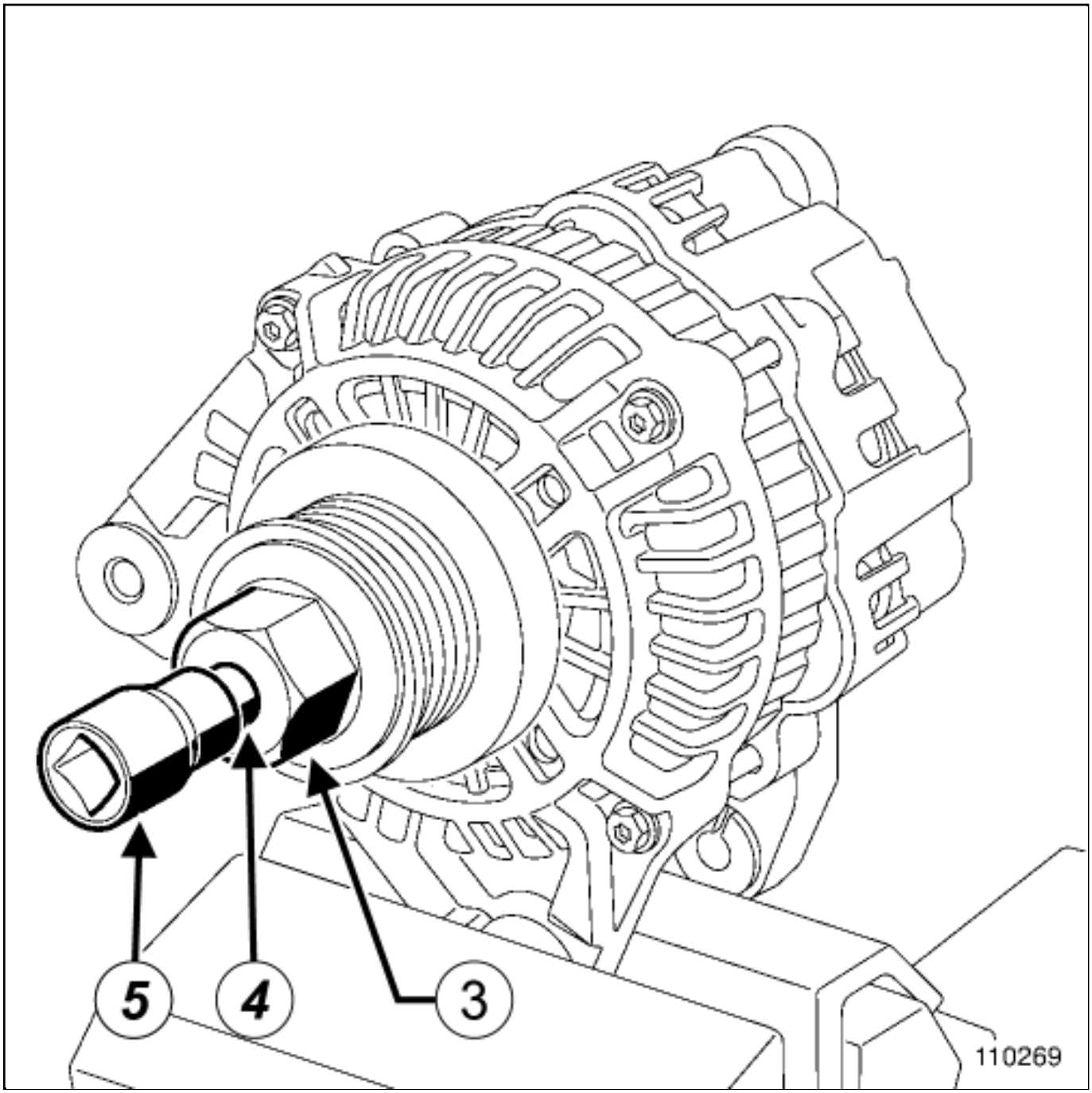


Screw the new alternator pulley onto the alternator rotor.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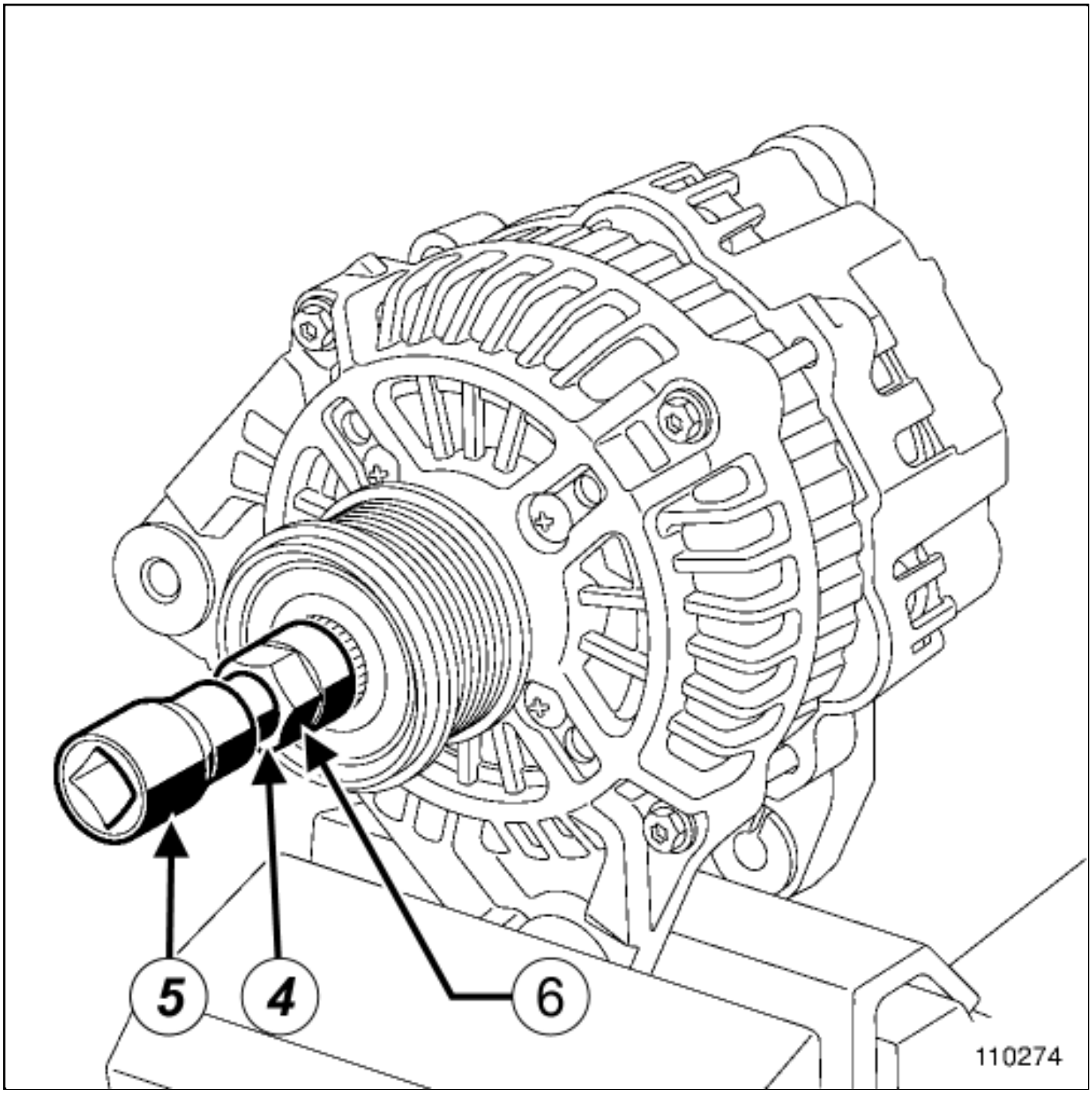
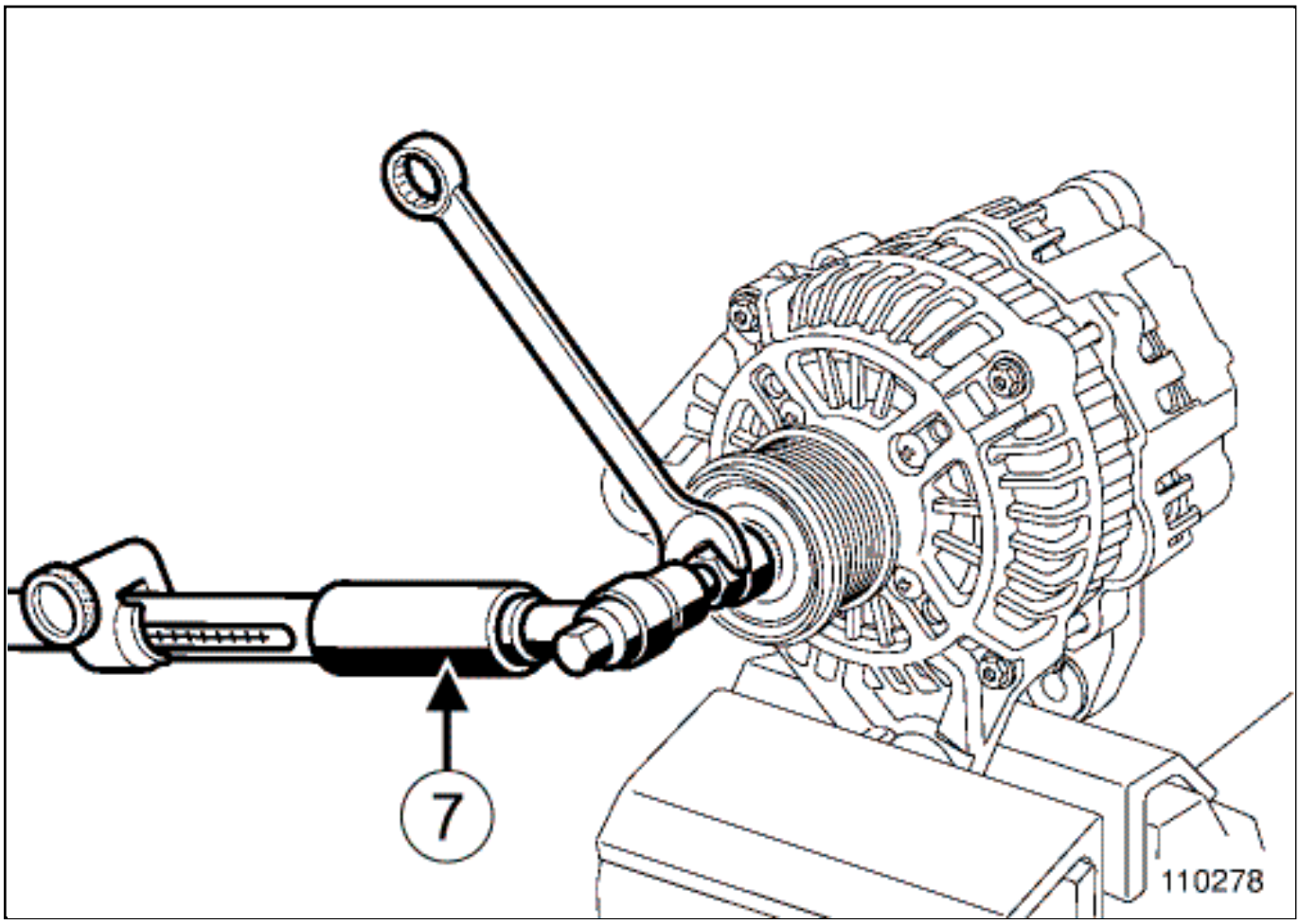


Position:

- the hexagonal socket(1) or the splined socket(8) from the tool kit, in the alternator pulley.
- the adapter(2) (corresponding to the alternator rotor mark),
- the adapter holder(3) on the adapter(2) .

Note:

Check that the torque wrench is capable of tightening anticlockwise.



- Torque tighten the alternator decoupling pulley80 N.musing a torque wrench(7) .

- Refit the vehicle alternator (see16A, Démarrage - charge, Alternateur).

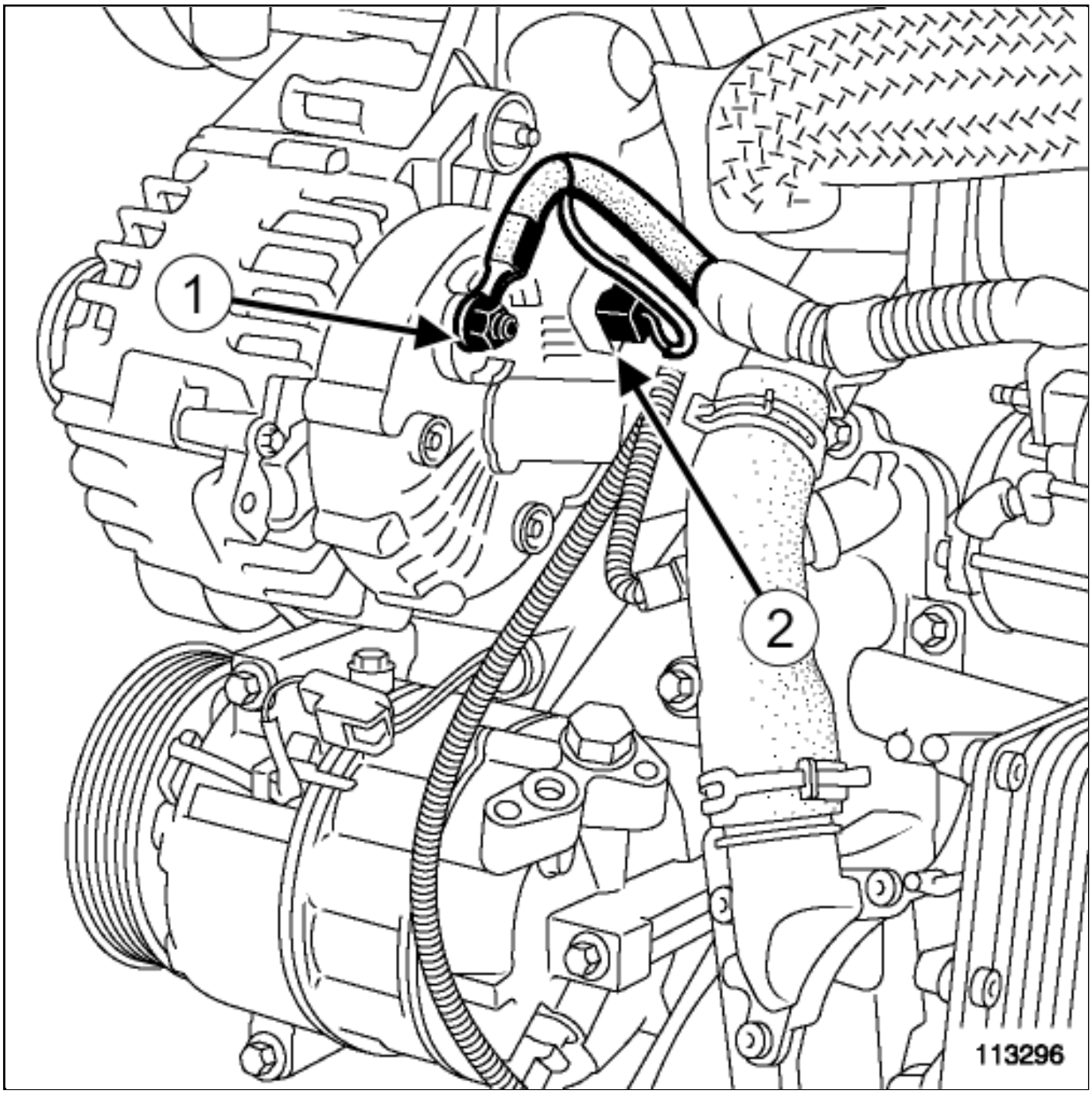
ALTERNATOR: REMOVAL - REFITTING

REMOVAL

1. REMOVAL OPERATION PREPARATION

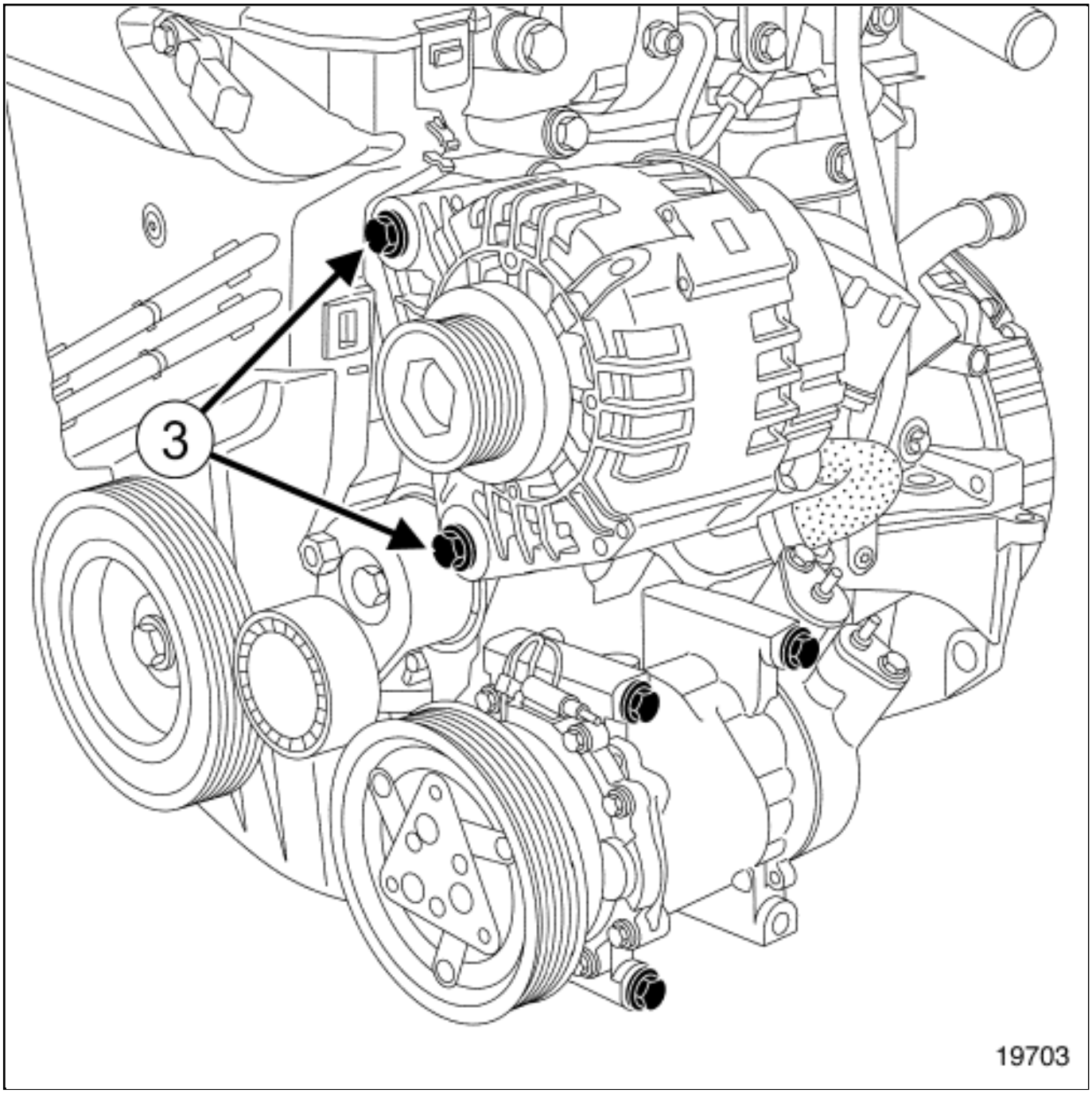
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting (80A, Battery).
- Remove:
  - the front right-hand wheel Wheel: Removal - Refitting ,
  - the accessories belt (see **Accessories belt: Removal - Refitting**) ,
  - the front bumper Front bumper assembly: Exploded view ,
  - the intercooler Intercooler: Removal - Refitting .

2. REMOVAL OPERATION



Remove:

- the alternator lead(1) ,
- the alternator connector(2) .

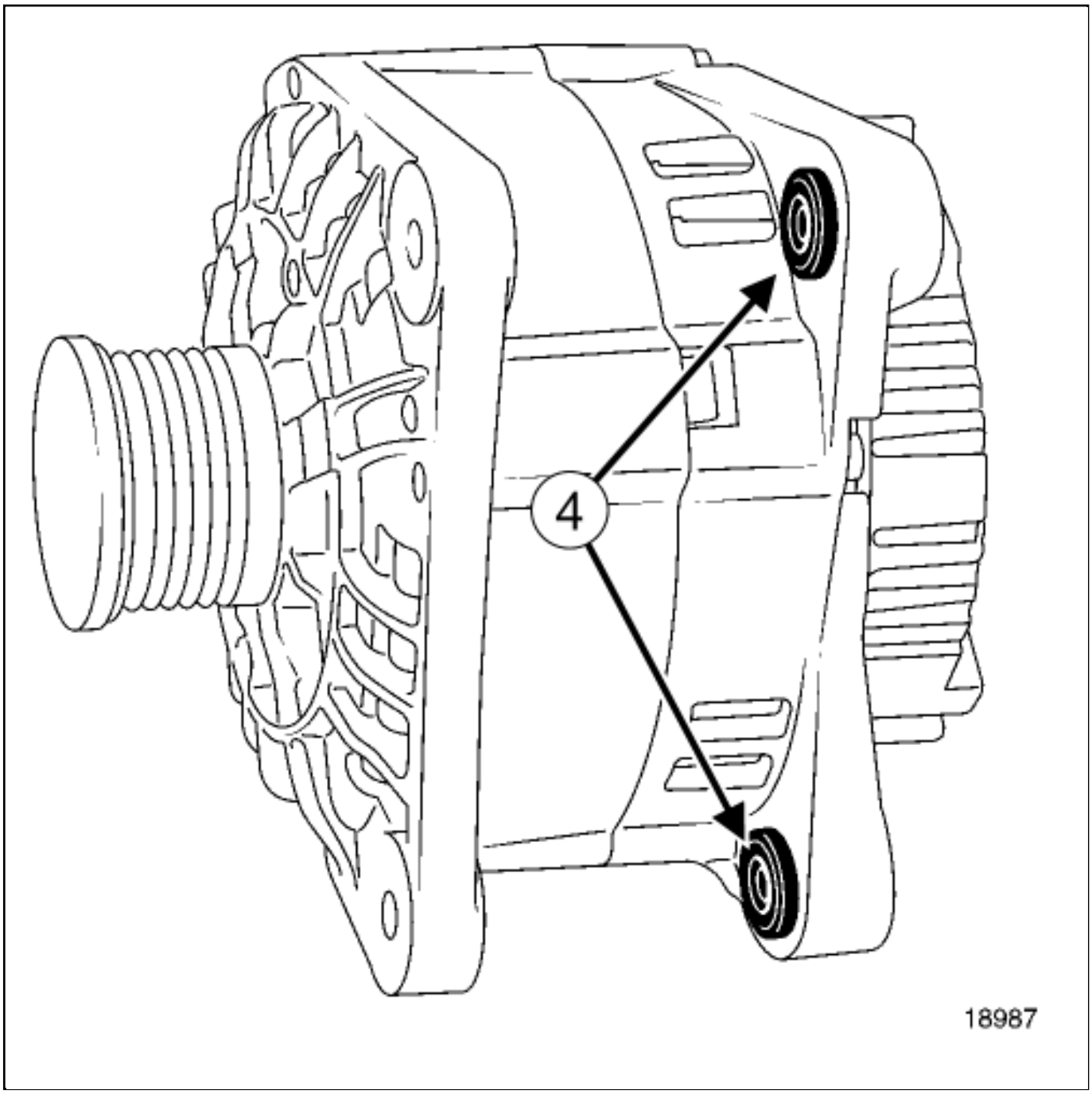


Remove:

- the alternator mounting bolts(3) ,
- the alternator.

REFITTING

1. REFITTING PREPARATION OPERATION



- Compress the alternator rings(4) using pliers or a vice to facilitate fitting the alternator.

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Torque tighten:
  - the alternator mounting bolts25 N.m,
  - the positive terminal nut on the alternator21 N.m.

ANTI-CORROSION PROTECTION BY COLD ELECTRO ZINC PLATING: DESCRIPTION

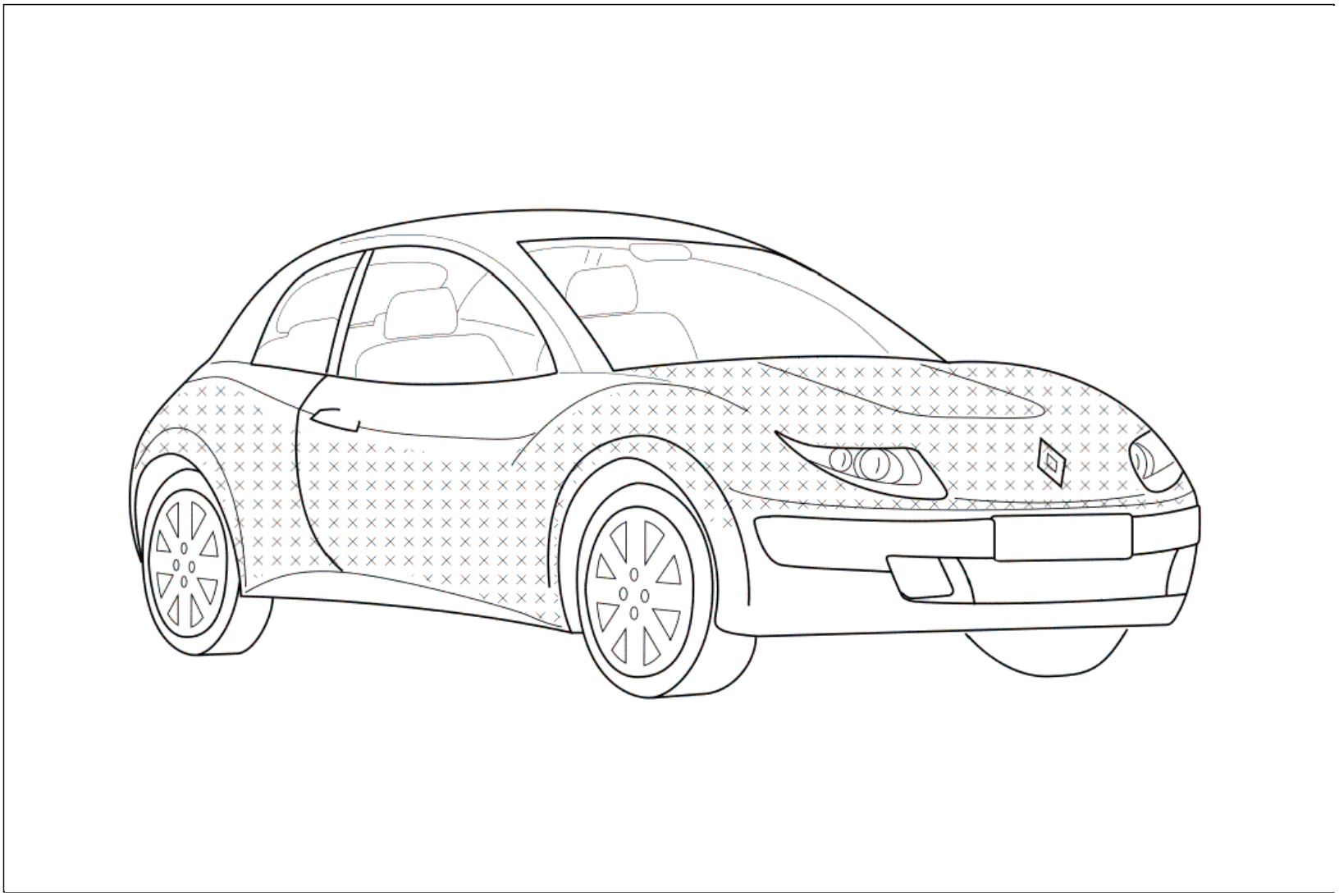
Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

1. ELECTROGALVANISING APPLICATION AREA

ELECTROGALVANISING APPLICATION AREA



Components: Bonnet, side doors, front and rear wings.

Electro zinc plating is applied to a bare steel panel after straightening. This surface will be straightened and free of polyester mastic

2. CONTENTS OF THE CASE

Description	Quantity
8 V generator (to be connected to 220 V) with red and black cables	1
Anode holder (diameter 100mm)	1
Anode holder (diameter 13mm)	1
Anode (diameter 100mm)	1
Anode (diameter 13mm)	2
Plastic pocket	1
Goggles	1

3. CONTENTS OF THE ELECTRO ZINC PLATING KIT

The kit enables a surface of approximately 8 dm² with a thickness of 8 micrometres to be treated.

Description	Quantity
Cap (diameter 13mm)	1
Cap (diameter 100mm)	1
Pair of gloves	1
125 ml can of zinc solution	1

4. CHOICE OF ANODE

Anodes with a diameter of 100mm are to be used on flat surfaces.

Anodes with a diameter of 13mm are to be used on small surfaces. (example: panel butt welding joint).

They can be cut to the desired shape. They may be shaped with a file or an abrasive pad.

Cover all the bare surfaces using the anode with a diameter of 13 mm for areas which are difficult to access.

5. STARTING UP

Steps	Description
1	Connect the generator to 220 V
2	Connect the black cable to the (-)terminal of the generator and attach the clamp to one of the vehicle earths (unpainted). Example: door striker plate
3	Connect the red cable to the (+)terminal of the generator and the other end to the selected anode holder
4	Dampen the selected cap with water to help the zinc solution soak in
5	Screw the anode onto the anode holder
6	Position the cap on the anode
7	Place the assembly in the plastic container and pour on the zinc solution.

6. PREPARING THE SURFACE AND ELECTRO ZINC PLATING

Steps	Description	Special notes
1	Degrease the surface to be treated	Lint-free cloth soaked in surface cleaner
2	Sand the area to be electro zinc plated	P280 dry - P400 slightly damp
3	Clean the surface	Damp cloth
4	Dampen the surface with the cap fixed on the anode which is impregnated with zinc solution	
5	Switch on the power supply to the generator (green indicator light on)	
6	Sweep the surface with the anode holder several times	
7	Rinse the treated surface with water	
8	Dry by wiping or using compressed air	

Note:

After use at the end of the day rinse the caps with water.

The speed of the sweeping must be approximately 25 cm/s.

The cap must always be soaked in zinc solution.

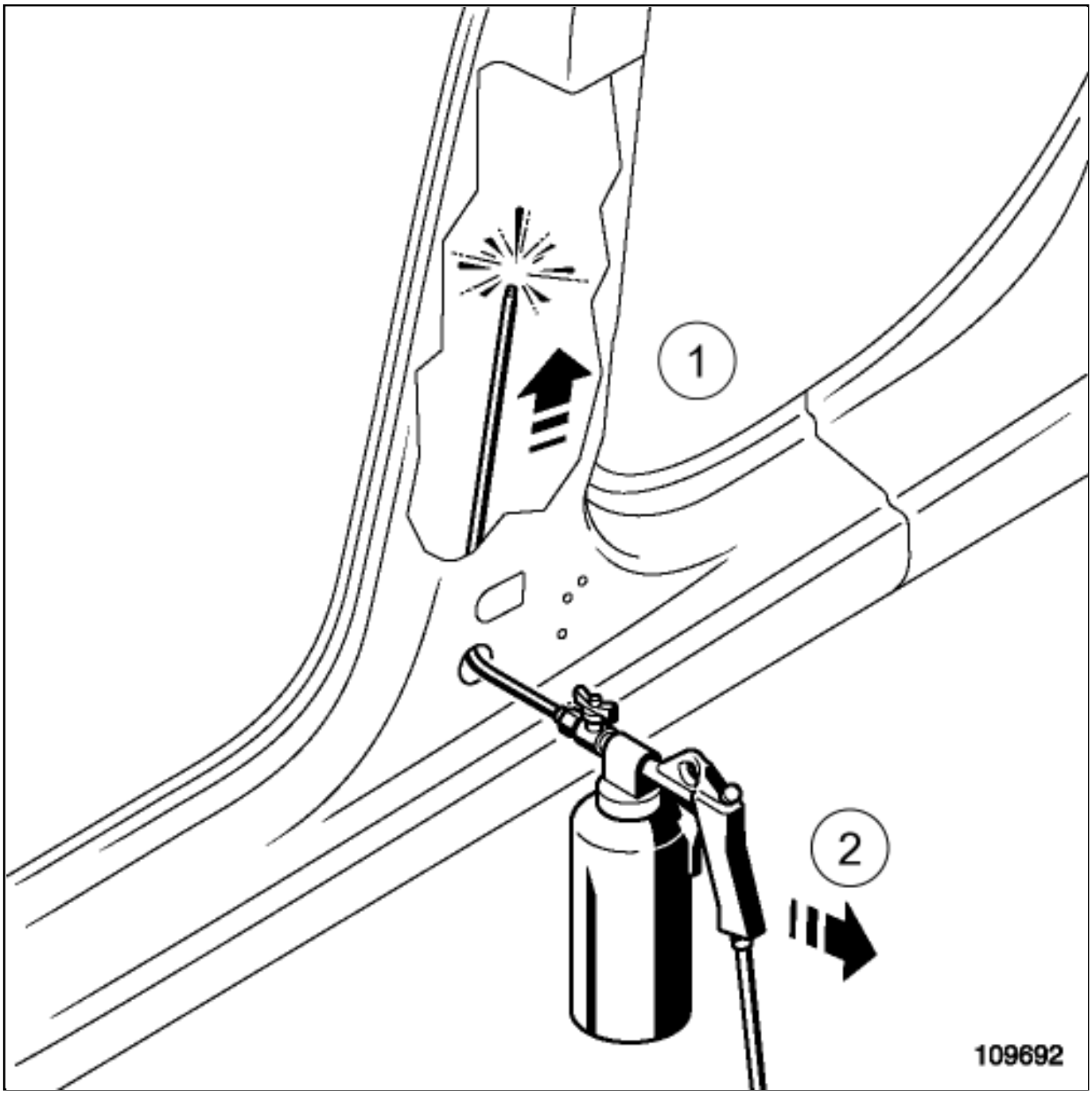
If any black patches appear on the treated area, remove them by gently sanding with a grey abrasive finishing pad.

Painting (see 94A, Paint application range for panels, Steel bodywork component: Preparation and paint range) must be carried out immediately to ensure that the zinc does not oxidise.

ANTI-CORROSION PROTECTION OF JOINTS AFTER WELDING

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

1. PROTECTION IN A HOLLOW SECTION



(1) Insert the probe as far as possible via the access hole into the hollow section.

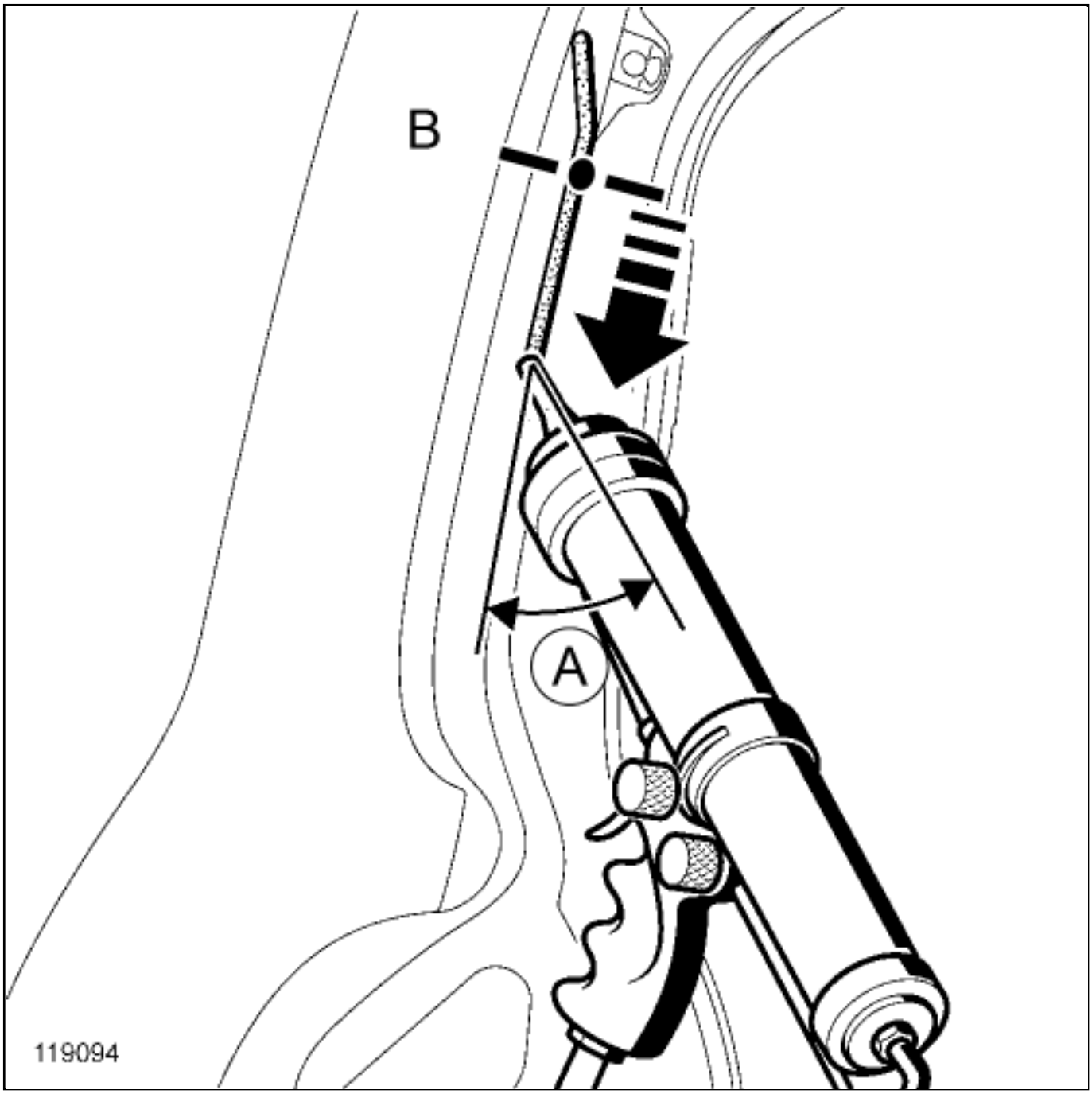
(2) Spray the wax moving the probe slowly and regularly back towards the access hole.

2. PROTECTION ON AN EDGE OR ON A SURFACE

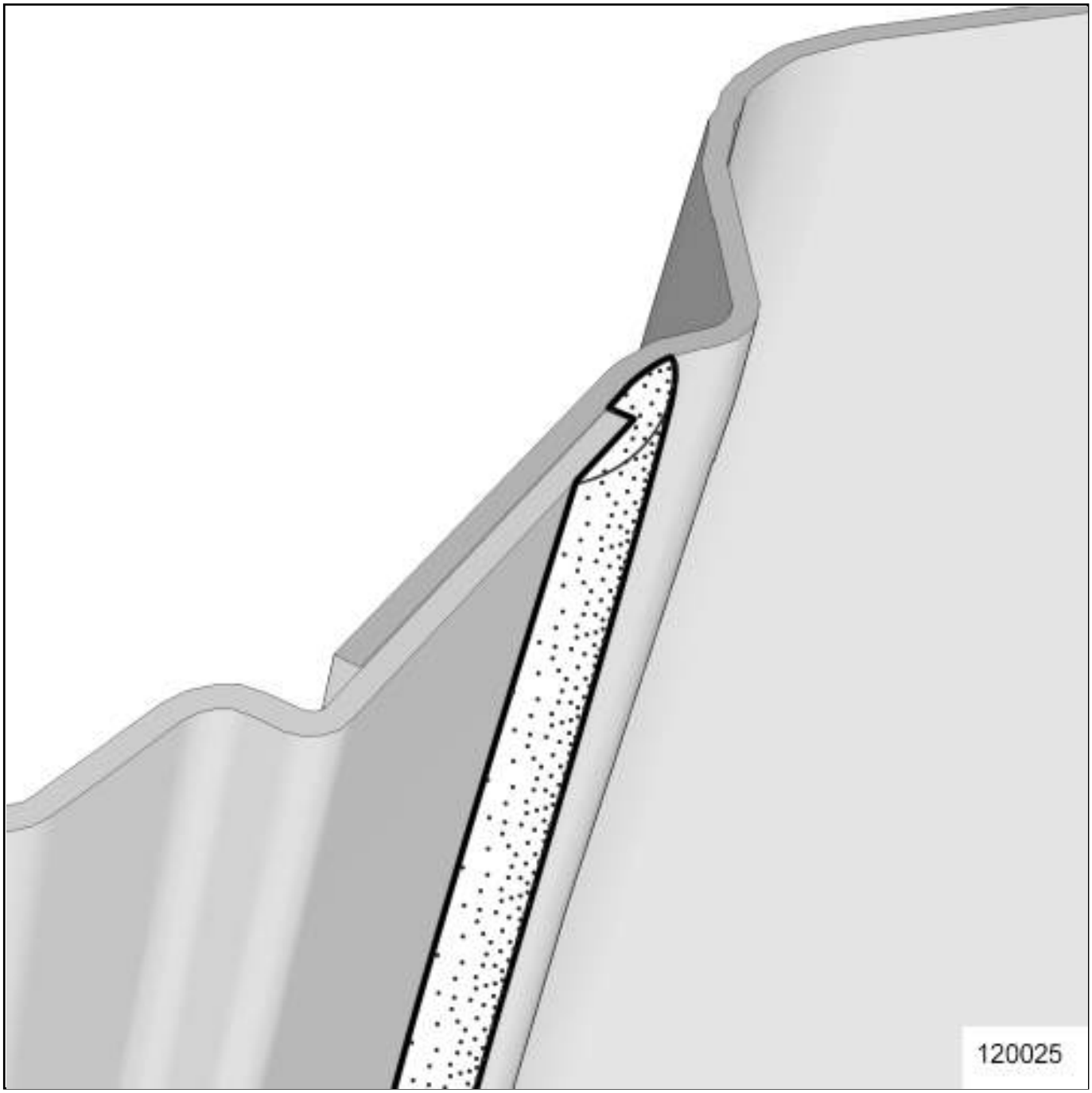
Note:

The following operations are to be carried out on machine finished surfaces which have been dry sanded to P320or scoured with a red abrasive pad.

1- EXTRUDED SEAL



SECTION B

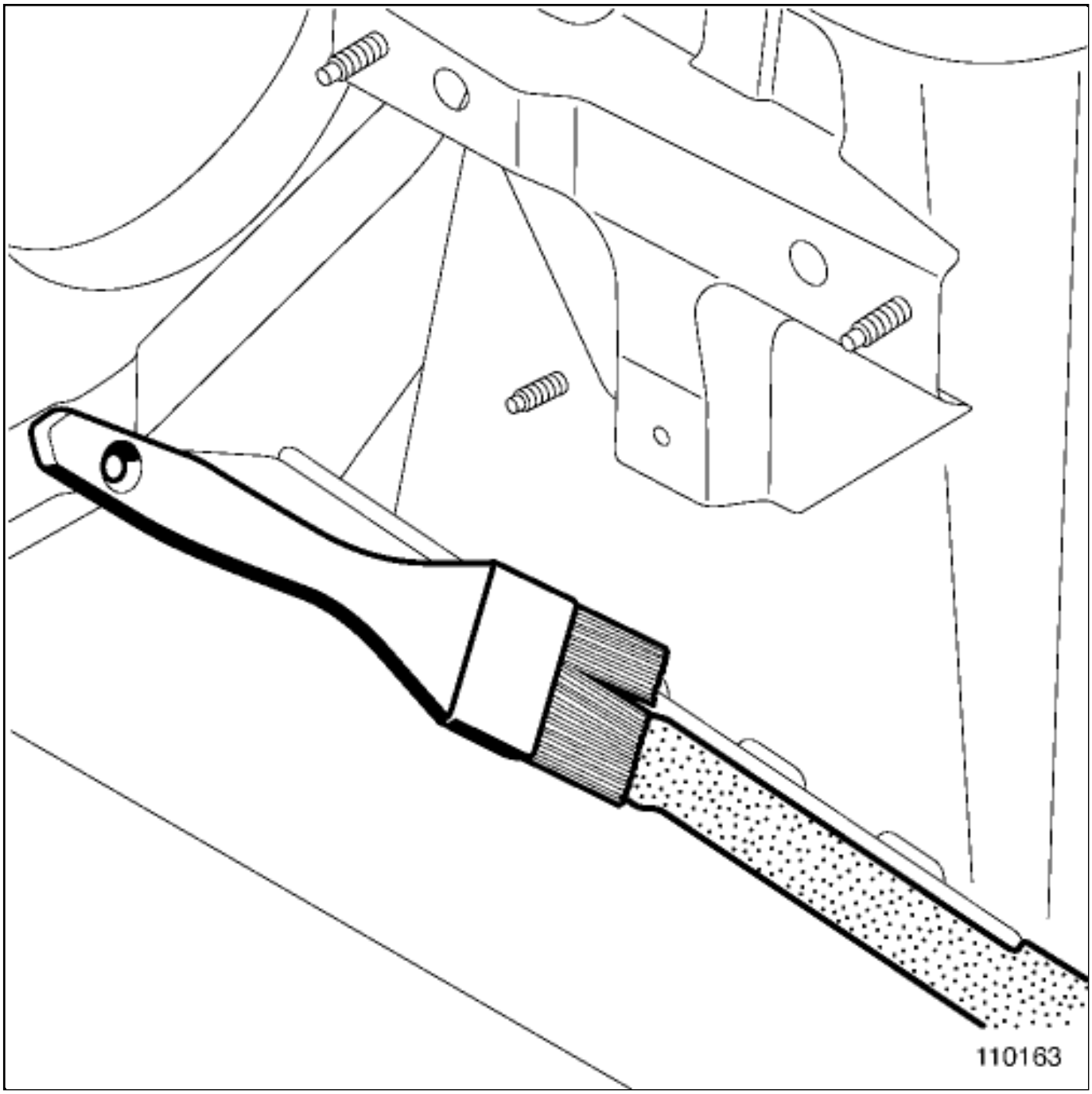


Position the nozzle, which has been previously cut to fit the shape and width of the desired seal, on the edge formed by the panel edge.

The appearance of the seal depends on the application speed and angle(A) of the nozzle in relation to the support.

Extrude the mastic in a uniform bead, observing the original length.

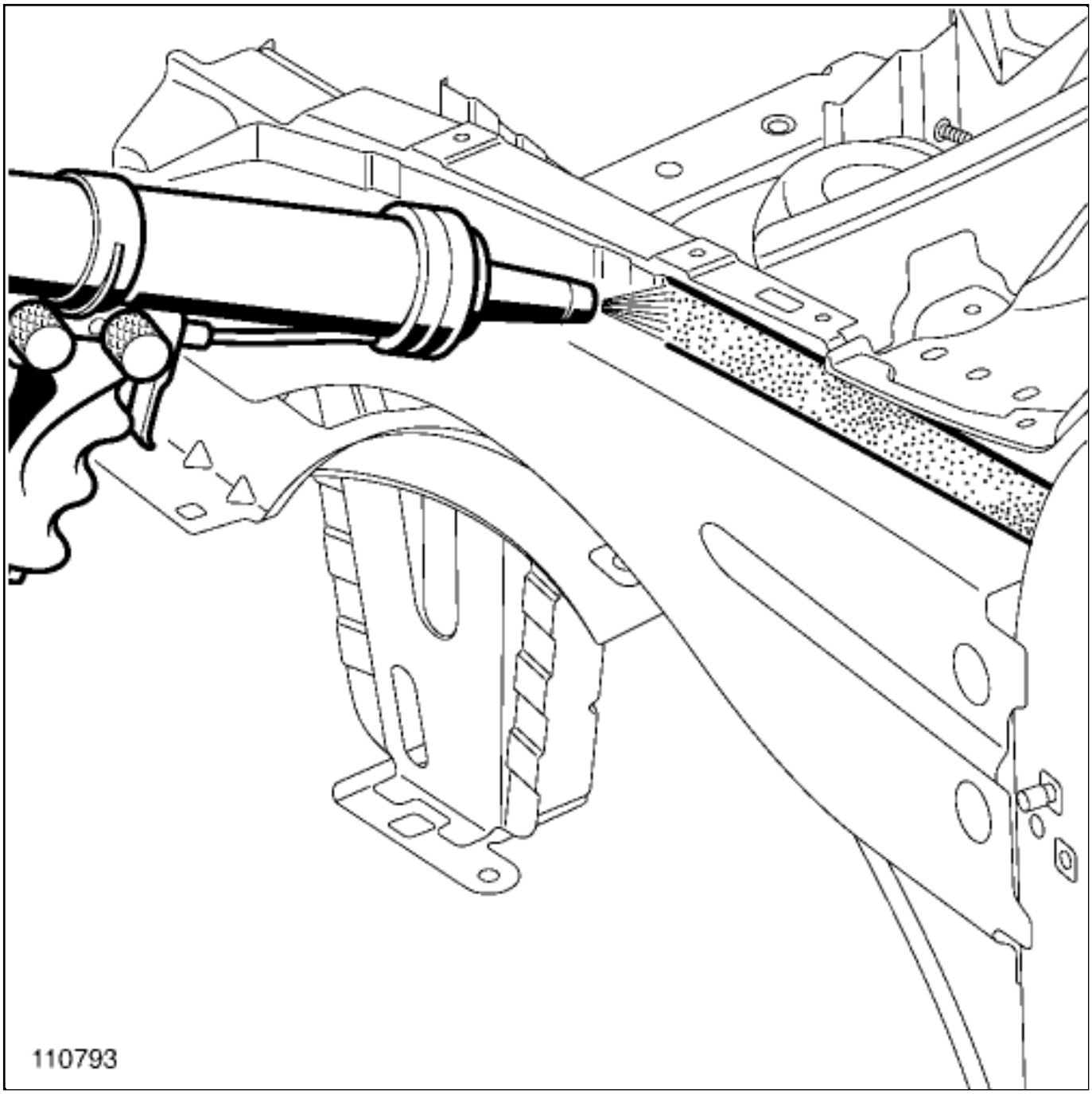
2- BRUSH SEAL



Apply an even seal thickness over the whole area to be treated.

Observing the width and look of the original seal.

3- SPRAYED SEAL



If necessary, protect the adjacent components because of product splashing.

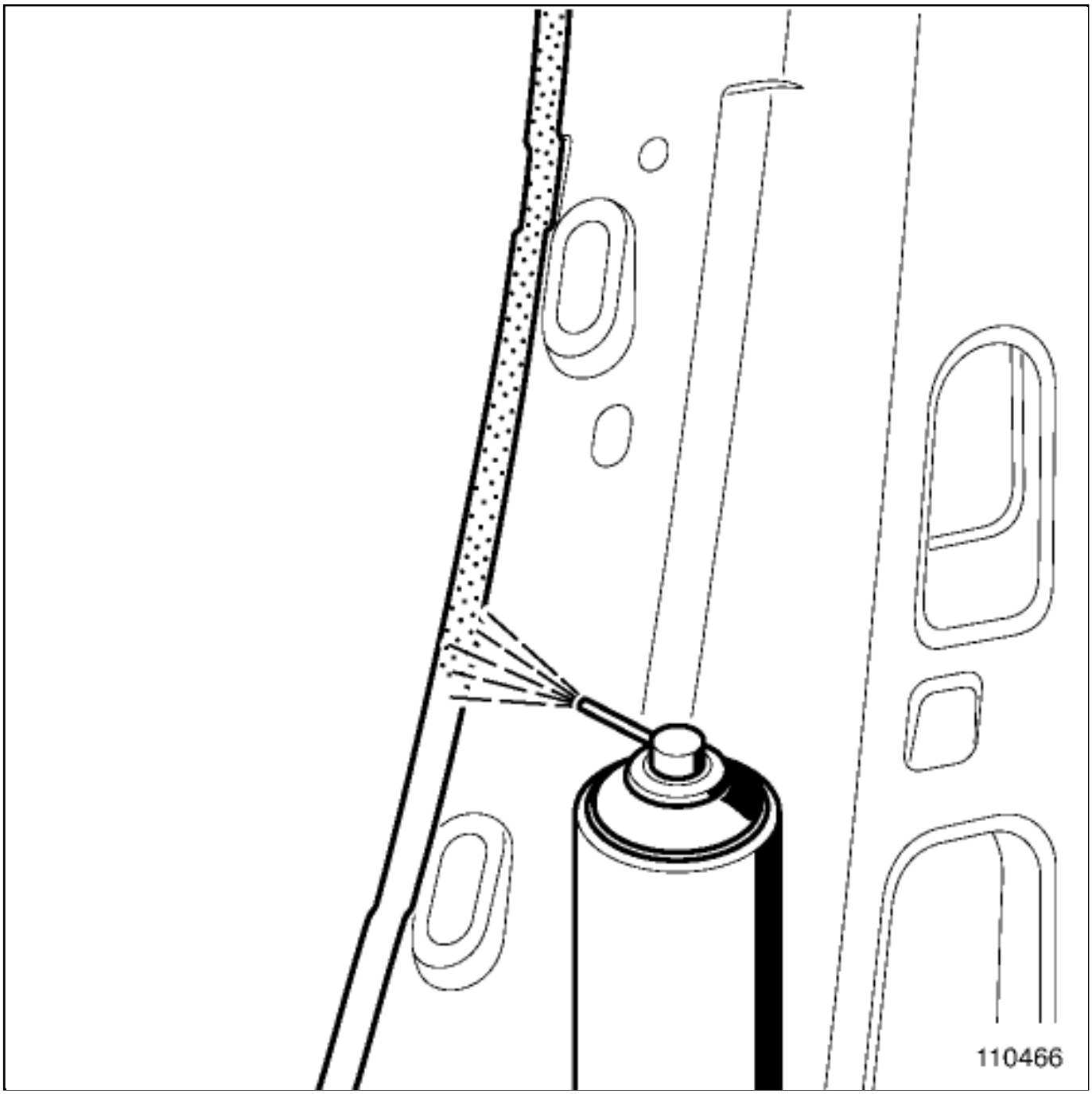
Adjust the jet beforehand to obtain the same look as the original.

Spray the seal evenly and regularly.

ANTI-CORROSION PROTECTION OF JOINTS BEFORE WELDING

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

1. ANTI-CORROSION SPRAY

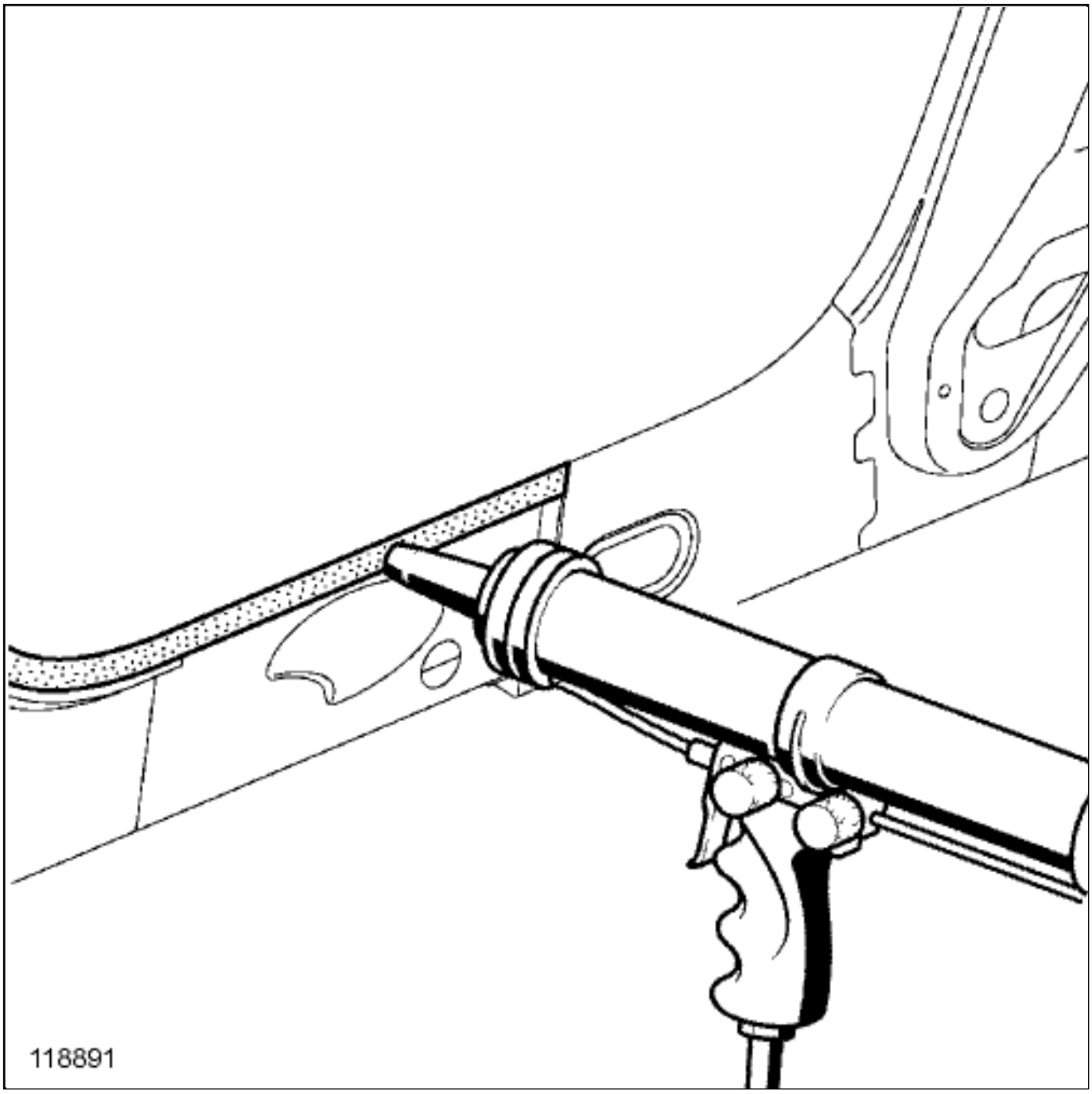


Apply the spray in a thin layer over all the internal joint faces to be treated, on the vehicle and the spare part.

Wait for the product to dissolve before assembly.

After welding, cleaning the remaining product using a cloth which has been slightly moistened with paint degreaser, ensuring that the adhesion of the paint is not affected.

2. WELDABLE MASTIC

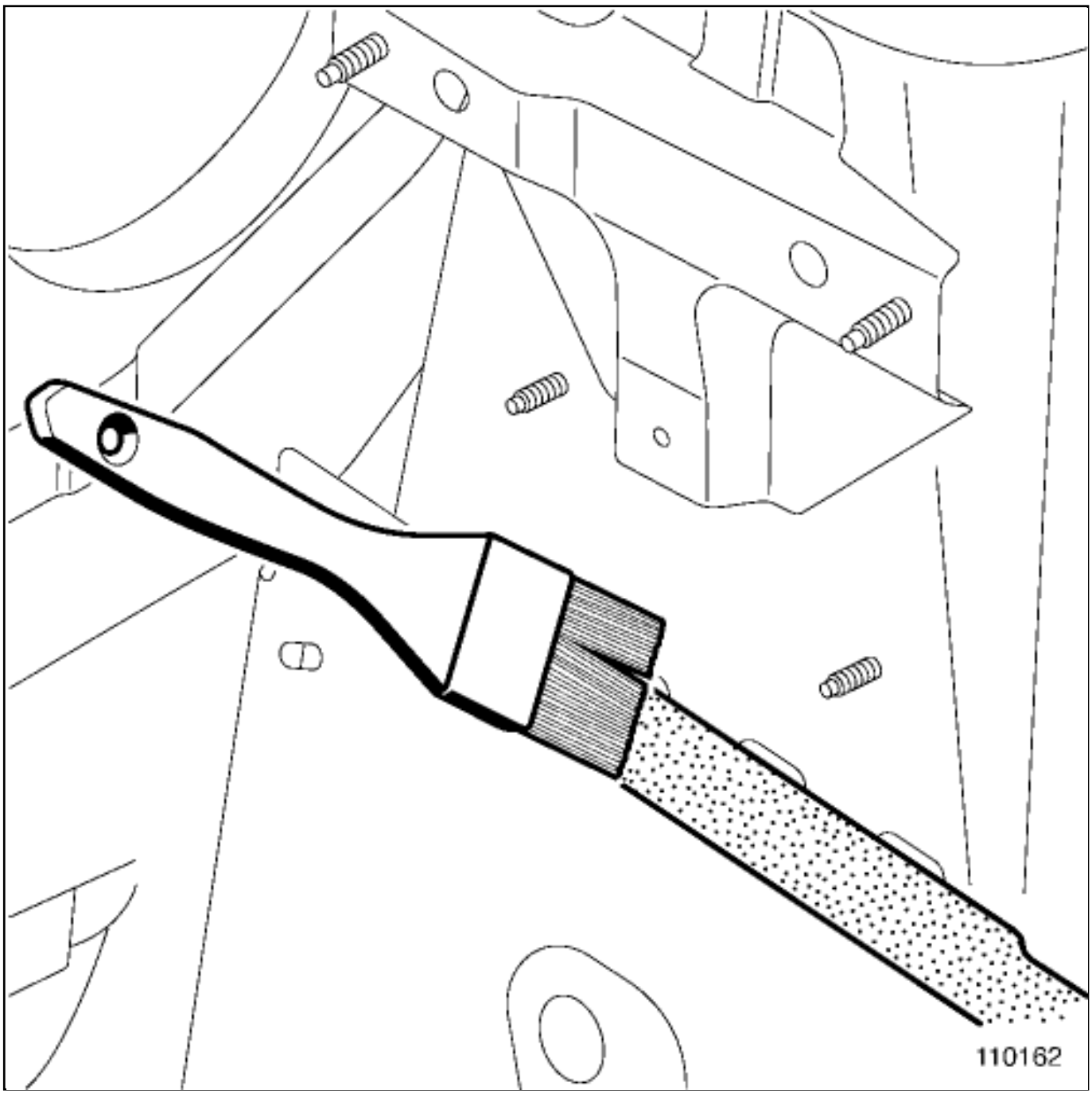


Extrude the mastic in a uniform bead measuring ∅ 4 mmover all of the internal joint face of the vehicle.

Assemble the spare part before the product dries.

Remove the excess product with paint remover before assembly.

3. BRUSH MASTIC



Apply a thick layer of mastic over the vehicle's internal joint faces.

Assemble the spare part before the product dries.

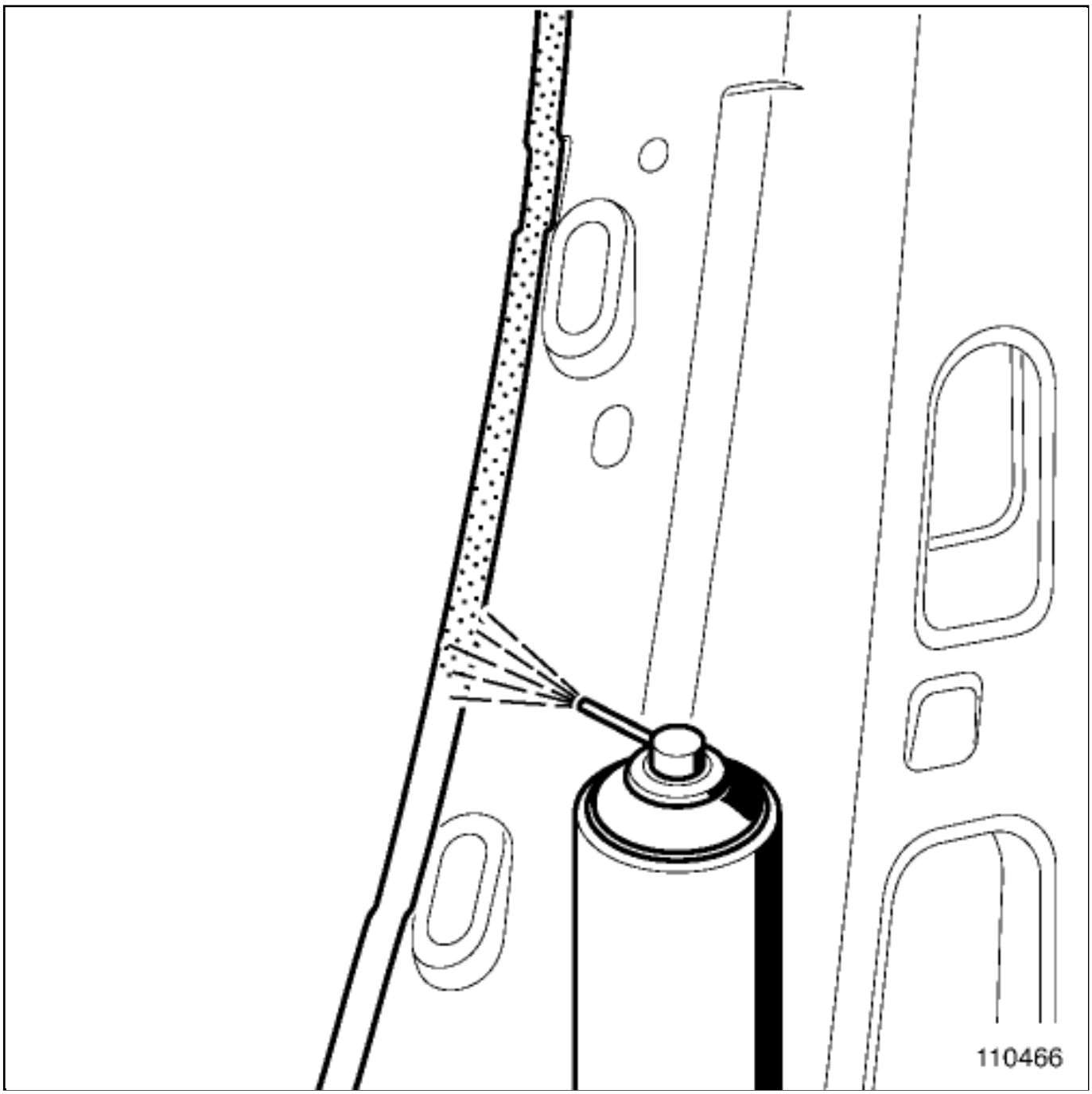
Remove the excess product with paint remover before assembly.

4. PREFORMED MASTIC

XSL version : 3.02 du 22/07/11

ANTI-CORROSIONPROTECTIONPRODUCTBEFOREASSEMBLY

1. ANTI-CORROSION SPRAY



The spray can be applied in the inside mating surfaces for good electrical contact during welding.

Advantages:

- can be arc spot welded,
- very good adhesion on all supports,
- makes it possible to weld using SEFG plug welds.

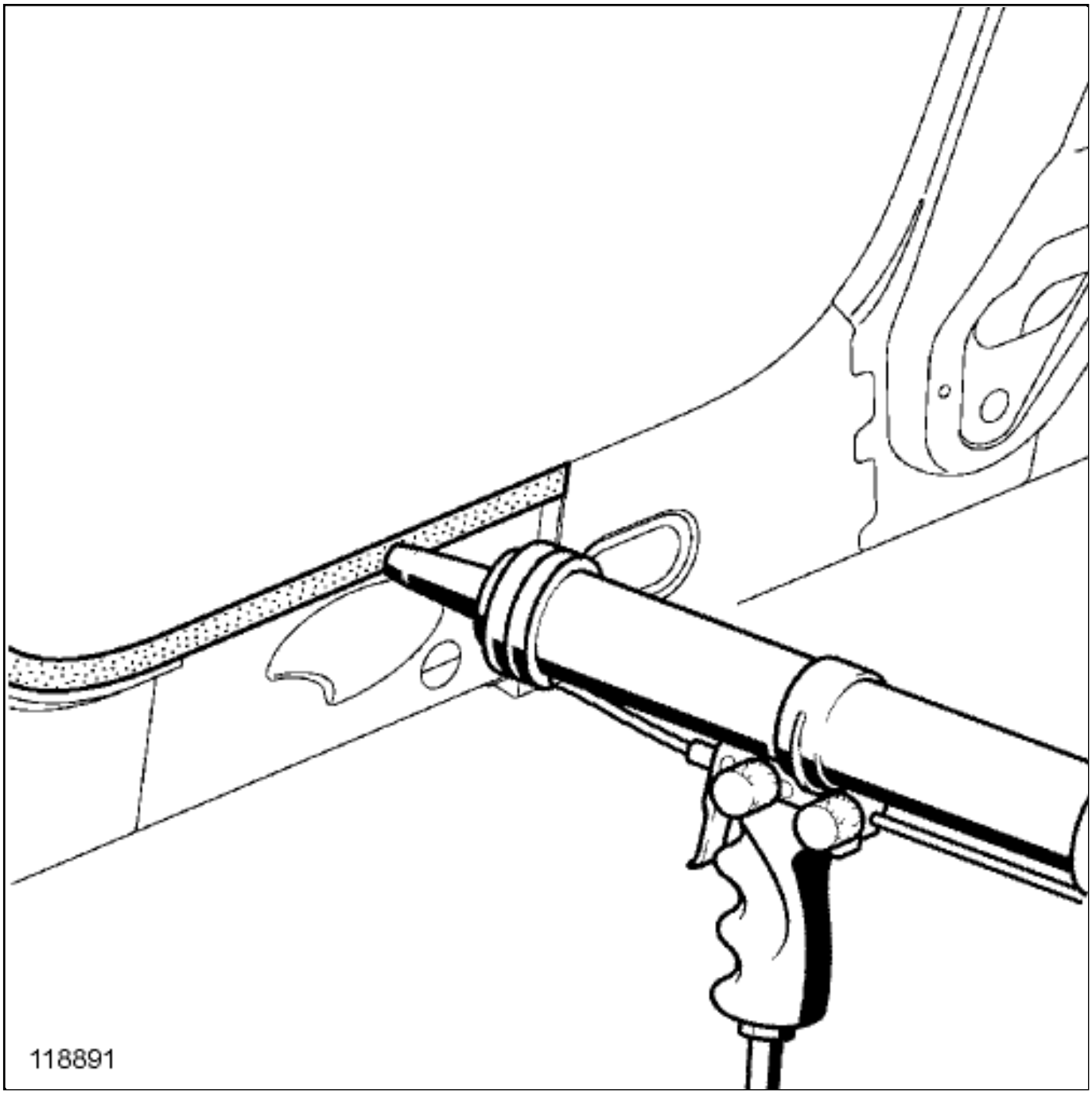
Disadvantage:

- residue has to be cleaned off before painting.

Operator protection:

- use extra ventilation source,
- obligatory hand protection.

2. EXTRUDED MASTIC



Mastic can be applied with a spray gun on the inside mating surfaces for arc weldable sealing.

Advantages:

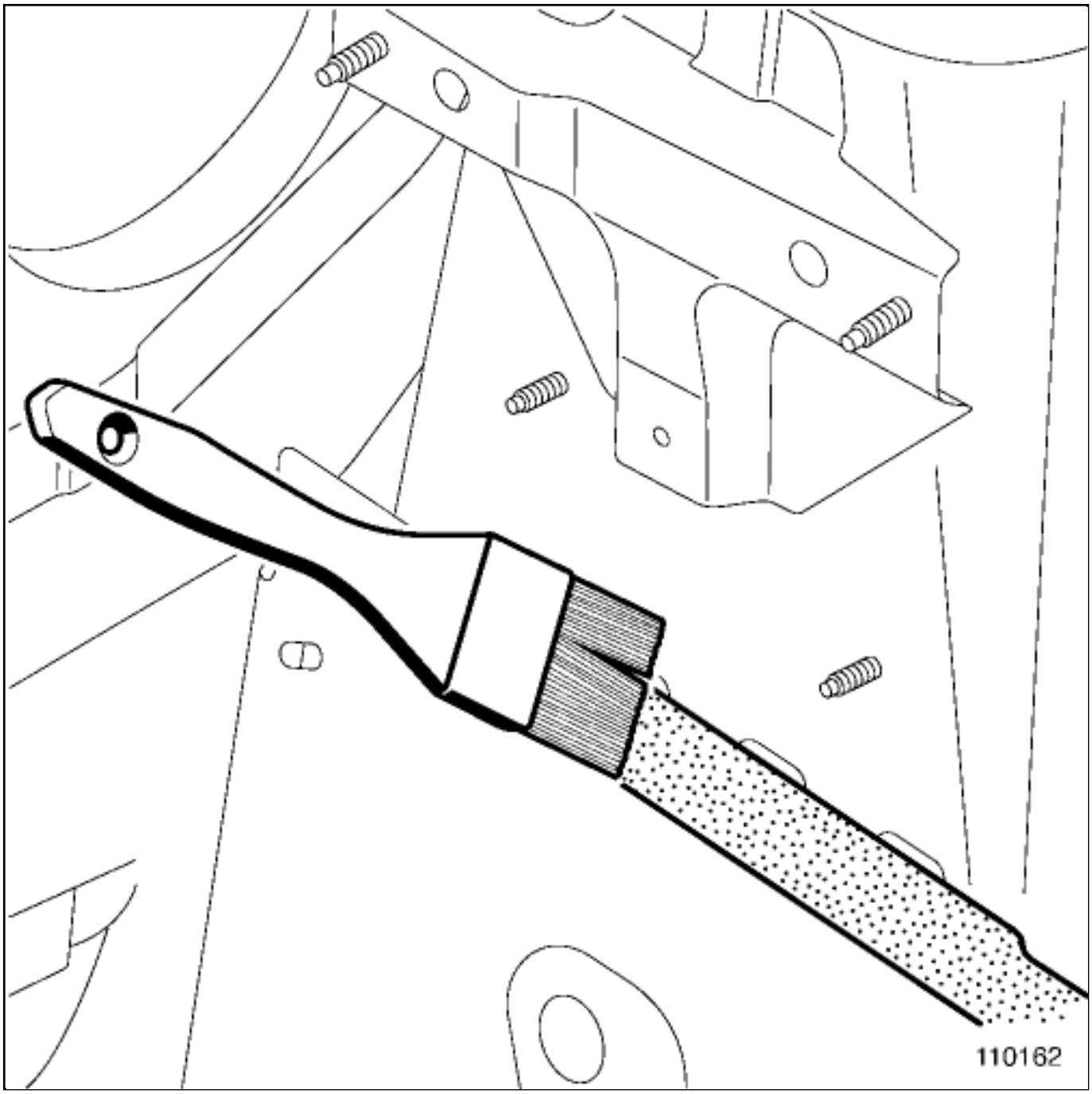
- can be arc spot welded,

- very good adhesion on all supports,
- possibility of smoothing the bead,
- ensures seal of mating surface.

Disadvantages:

- all the components have to be welded before the joint mastic dries,
- does not allow welding using SEFG plug welds.

3. BRUSH MASTIC



The mastic can be applied with a brush. It is used in areas exposed to fuel, oil and water.

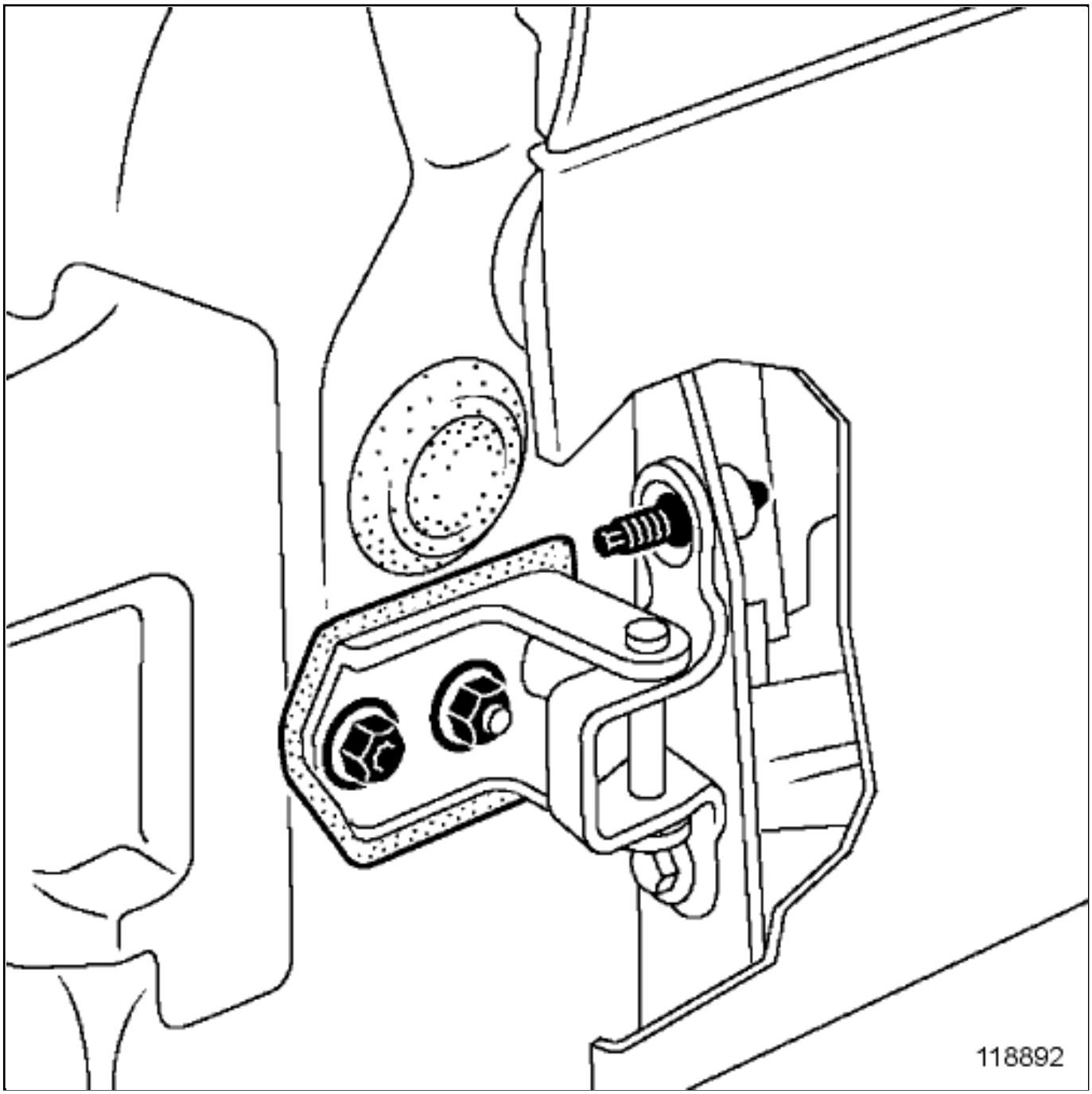
Advantages:

- resists water, oil and fuel,
- is compatible with all paint finishes,
- also ensures seal of mating surface.

Disadvantages:

- the welding has to be completed before the product dries,
- does not allow welding using SEFG plug welds.

4. PREFORMED MASTIC



The mastic is applied on the internal mating faces of the bolted components to seal them.

Advantages:

- simple and quick to use,
- no equipment needed for application,
- ensures sealing and bonding.

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XSL version : 3.02 du 22/07/11

ANTI-CORROSIONPROTECTIONPRODUCT:DESCRIPTION

Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

1. SPECIAL NOTES FOR INJECTING WAX

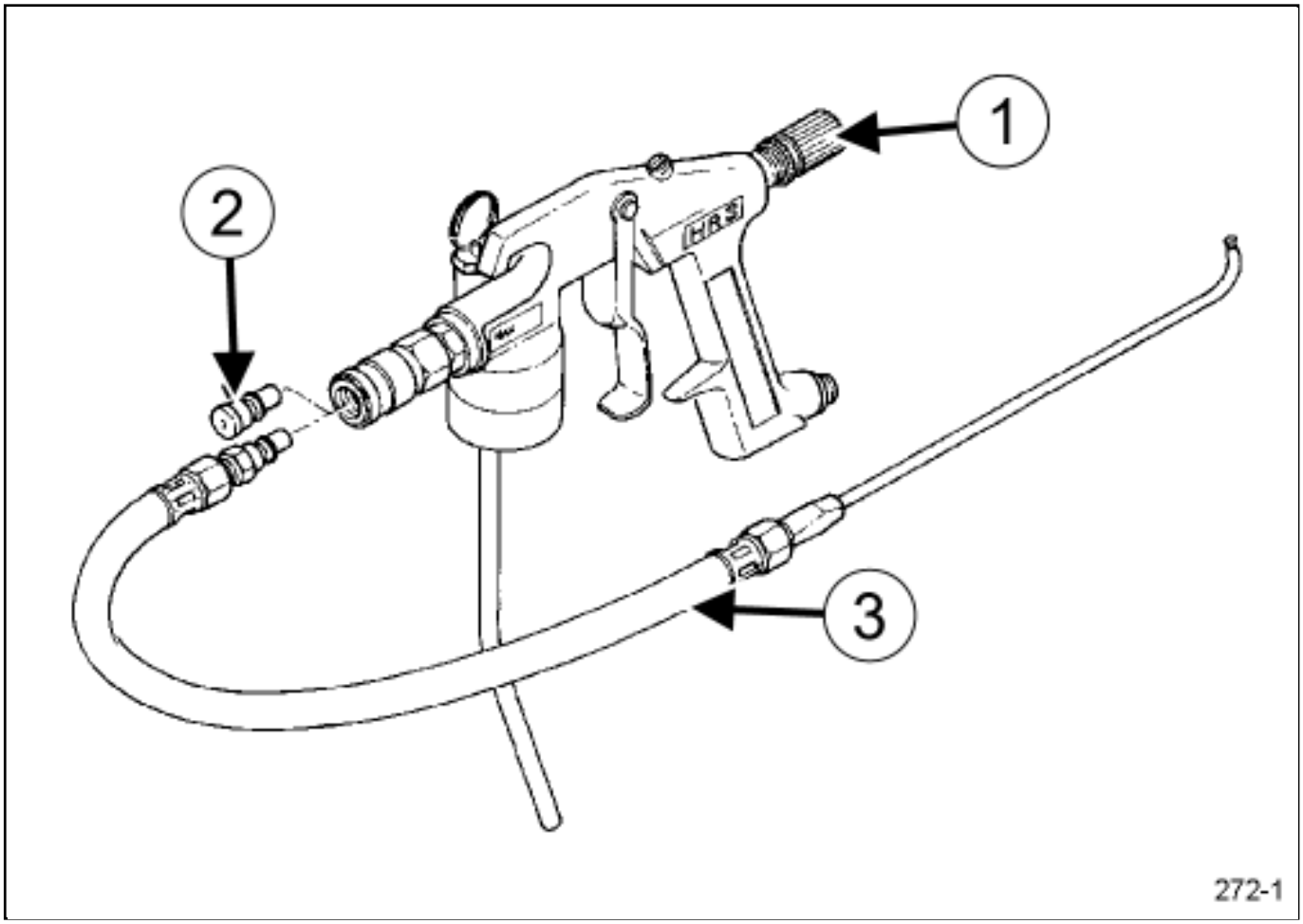
For original fittings, the areas that must be injected with wax are the following:

- hollow sections of the subframe (e.g.: side members),
- sills,
- rear wing sills,
- bonnet nose.

In After-Sales operations, wax must be injected into hollow sections after painting.

2. EQUIPMENT REQUIRED

HOLLOW SECTION NOZZLE: PART NUMBER: 77 01 421 476



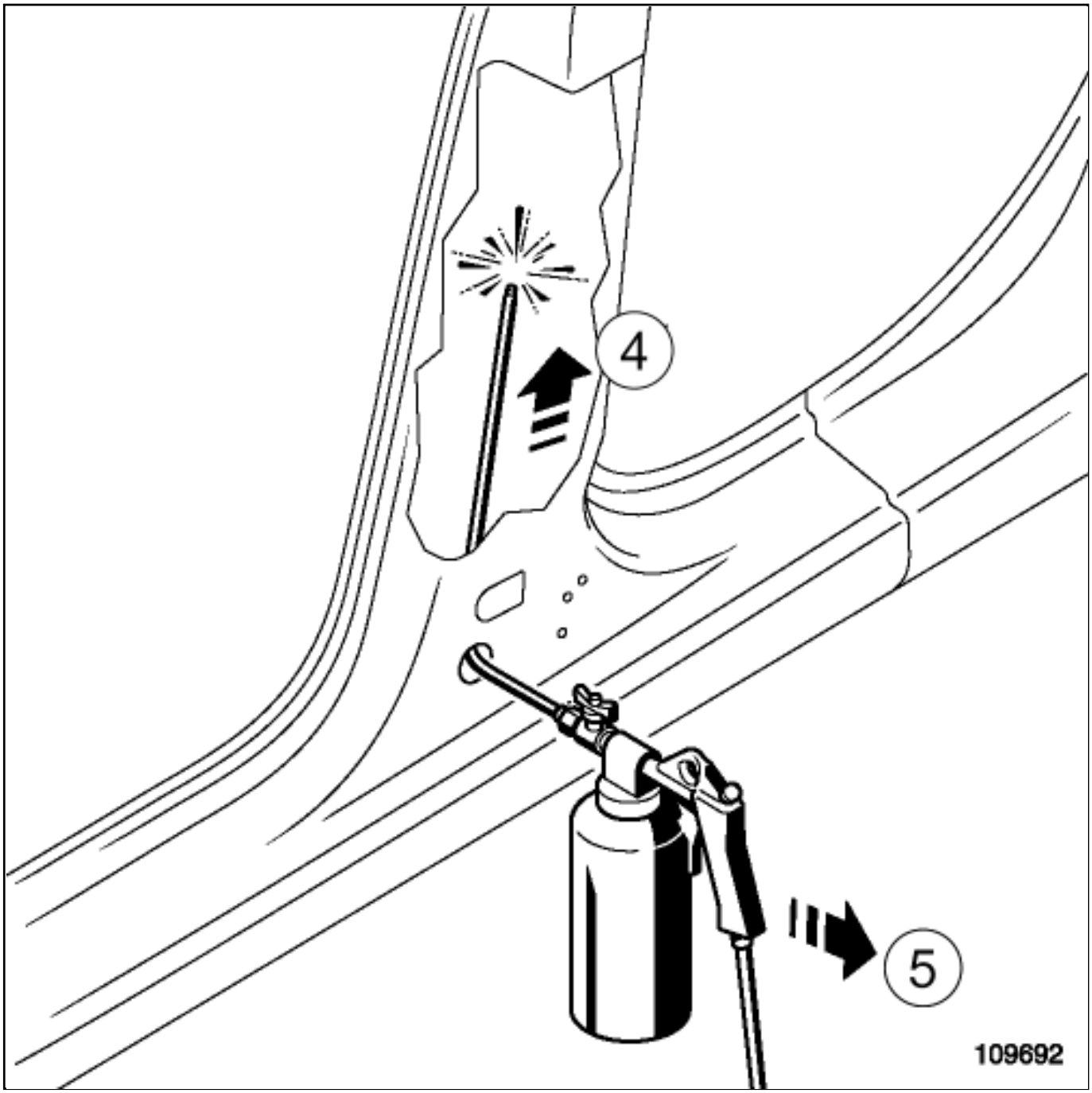
No.	Description
(1)	Wax flow control
(2)	Quick-release union end piece
(3)	Interchangeable injection hose

Note:

Choose the hose most suitable for the operation.

Apply wax to the hollow sections[Vehicle: Parts and consumables for the repair](#) .

3. METHOD OF USE



No.	Description
(4)	Insert the nozzle tip until it reaches the end of the hollow section
(5)	Inject the wax whilst retracting the nozzle tip

XSL version : 3.02 du 22/07/11

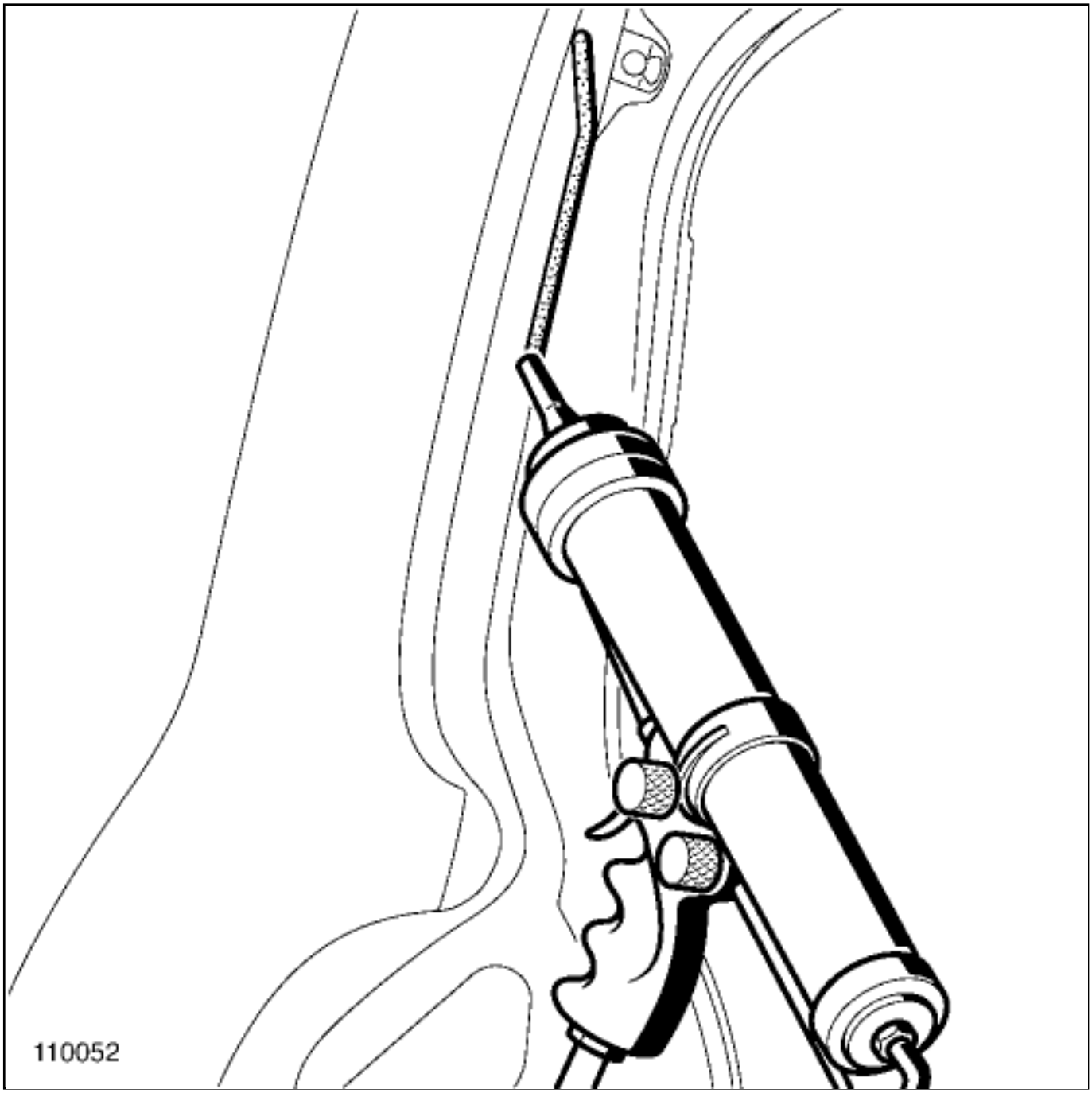
ANTI-CORROSIONPROTECTIONPRODUCTSAFTERASSEMBLY

1. ELECTROGALVANIZING

See Technical Note 592A, Paint application procedure, 94A, Paint application procedure for panels, Electrogalvanizing (steel panels)

2. EXTRUDED MASTIC

Protection used in visible areas requiring a good appearance, especially for protecting crimps.



Advantages:

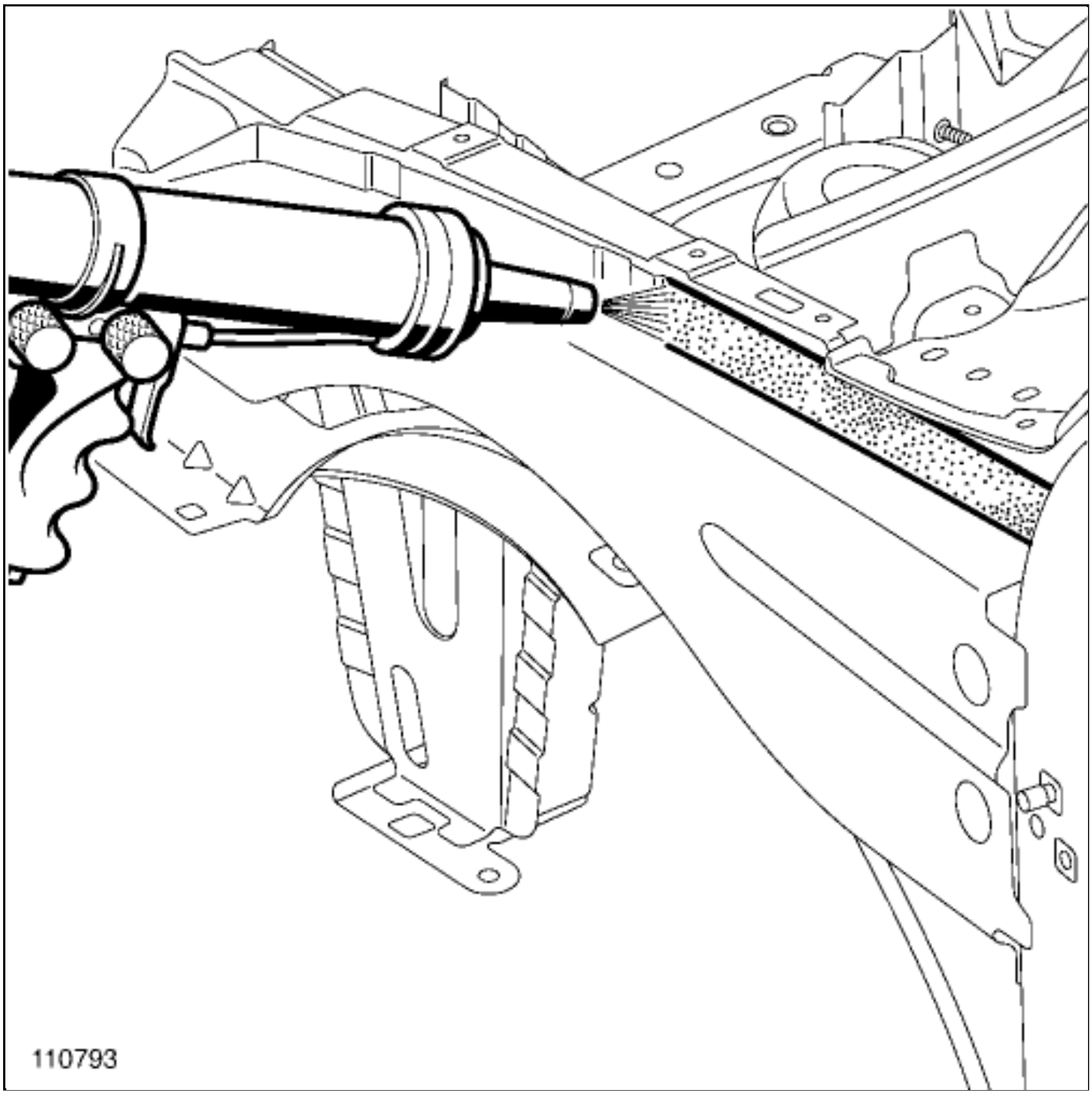
- Possibility of painting after drying.
- excellent adhesion on any base.
- Good edge protection (panel edge).

Disadvantage:

- Original appearance difficult to reproduce without smoothing.

3. POWDERED MASTIC

Mastic suited for protecting the lower parts of the body (anti-grit) or powdered mating surface protection.



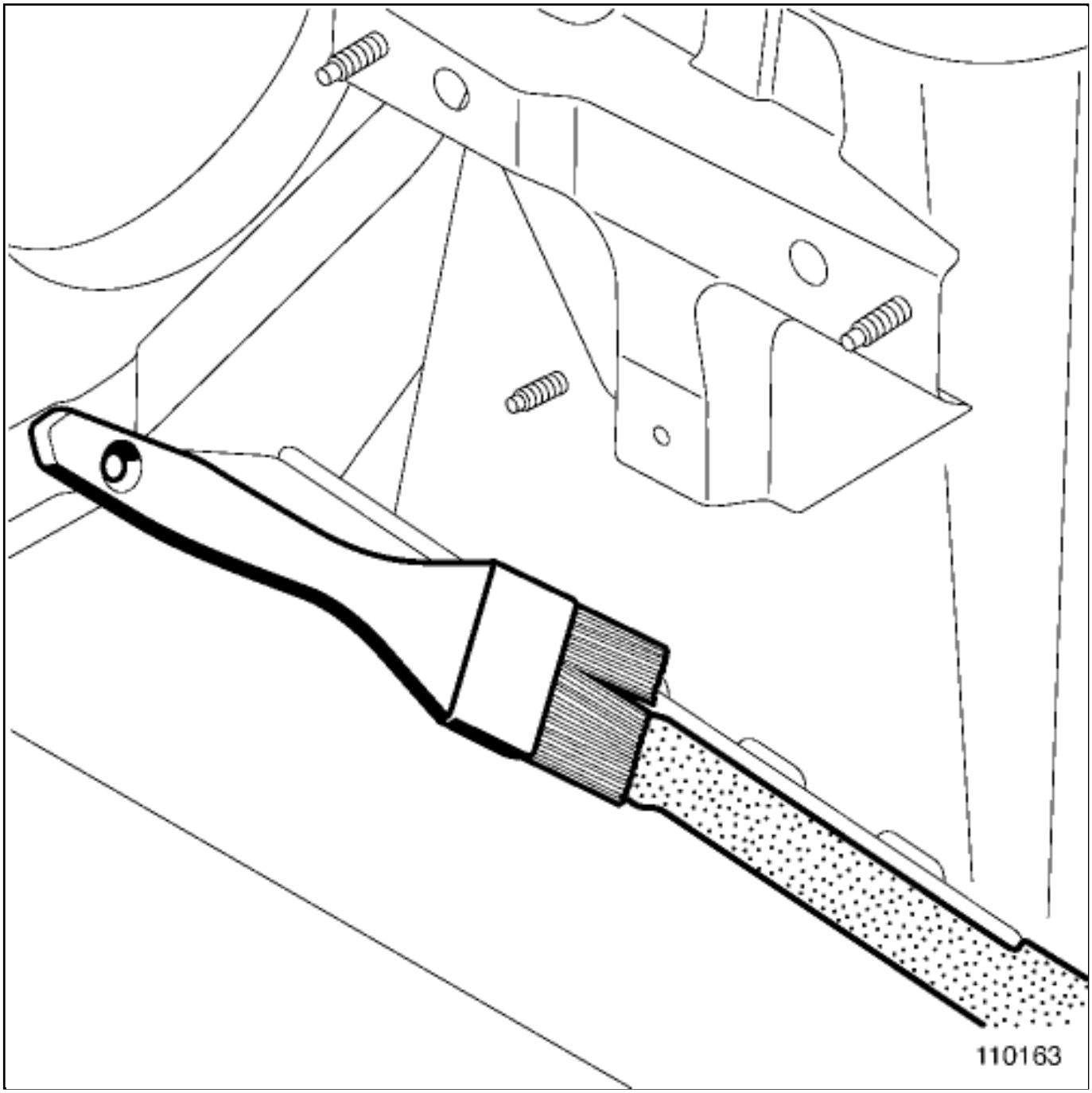
- Advantages:
  - Allows large areas to be treated.
  - Modulable appearance depending on the adjustment of the gun in such a way as to reproduce the original appearance.

- Disadvantage:
  - Possible splashing of the product.

- Operator protection:
  - obligatory respiratory protection,
  - use extra ventilation source.

4. MASTIC FOR BRUSH APPLICATION

Mastic used in the engine compartment or highly exposed areas.



Advantages:

- Resists water, hydrocarbons and oil.
- Can be painted.

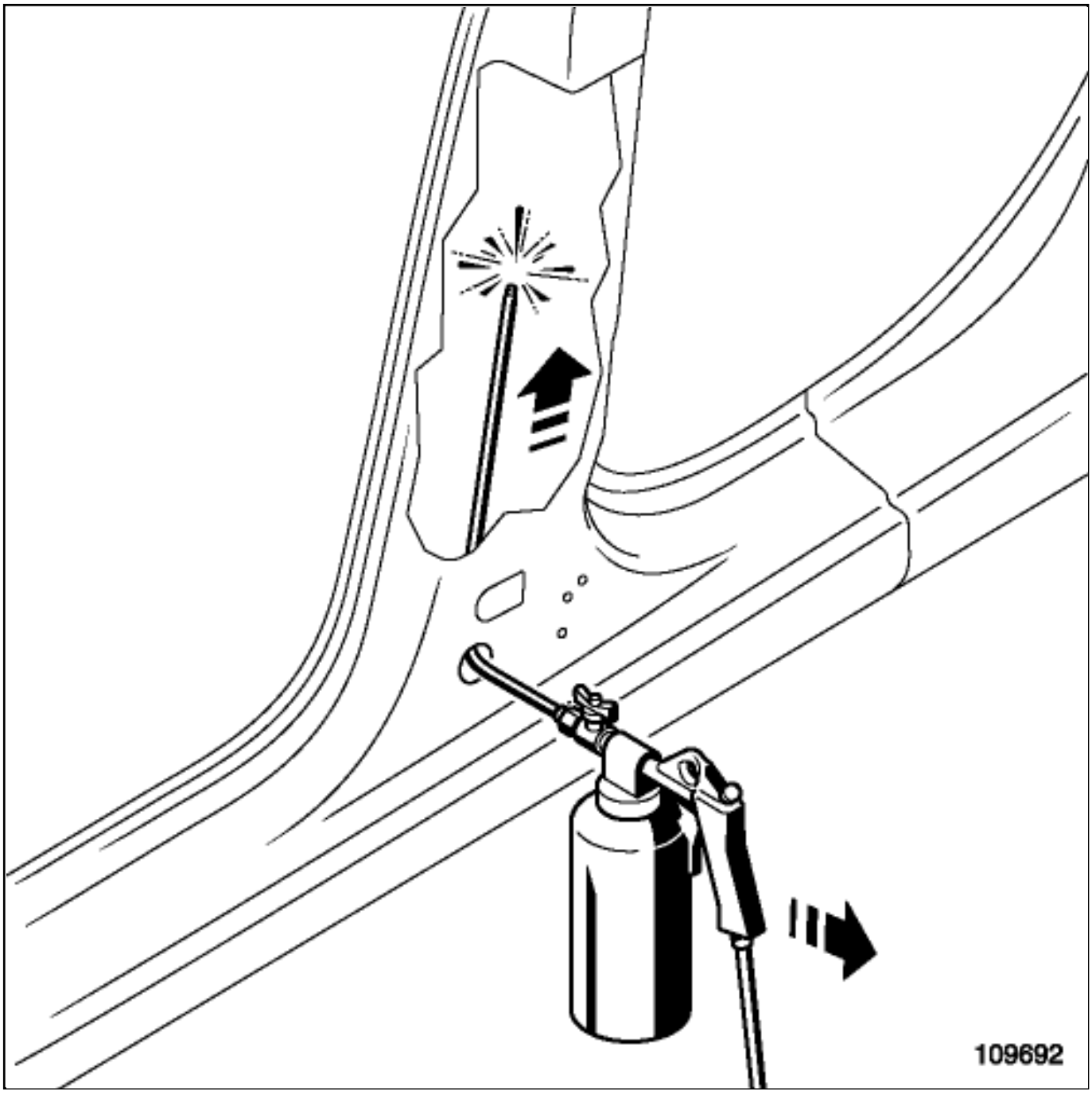
Disadvantages:

- Original appearance difficult to reproduce.
- Edge protection (panel edges).

5. WAX FOR HOLLOW SECTIONS

Wax used for treating hollow sections.

See Technical Note 592A, Paint application procedure, 94B, Protection of hollow sections.



Advantage:

- Excellent anti-corrosion protection.

Disadvantages:

- Blind application.

- Wax spillage onto floor when applied to hollow sections on the underside of the vehicle.

Operator protection:

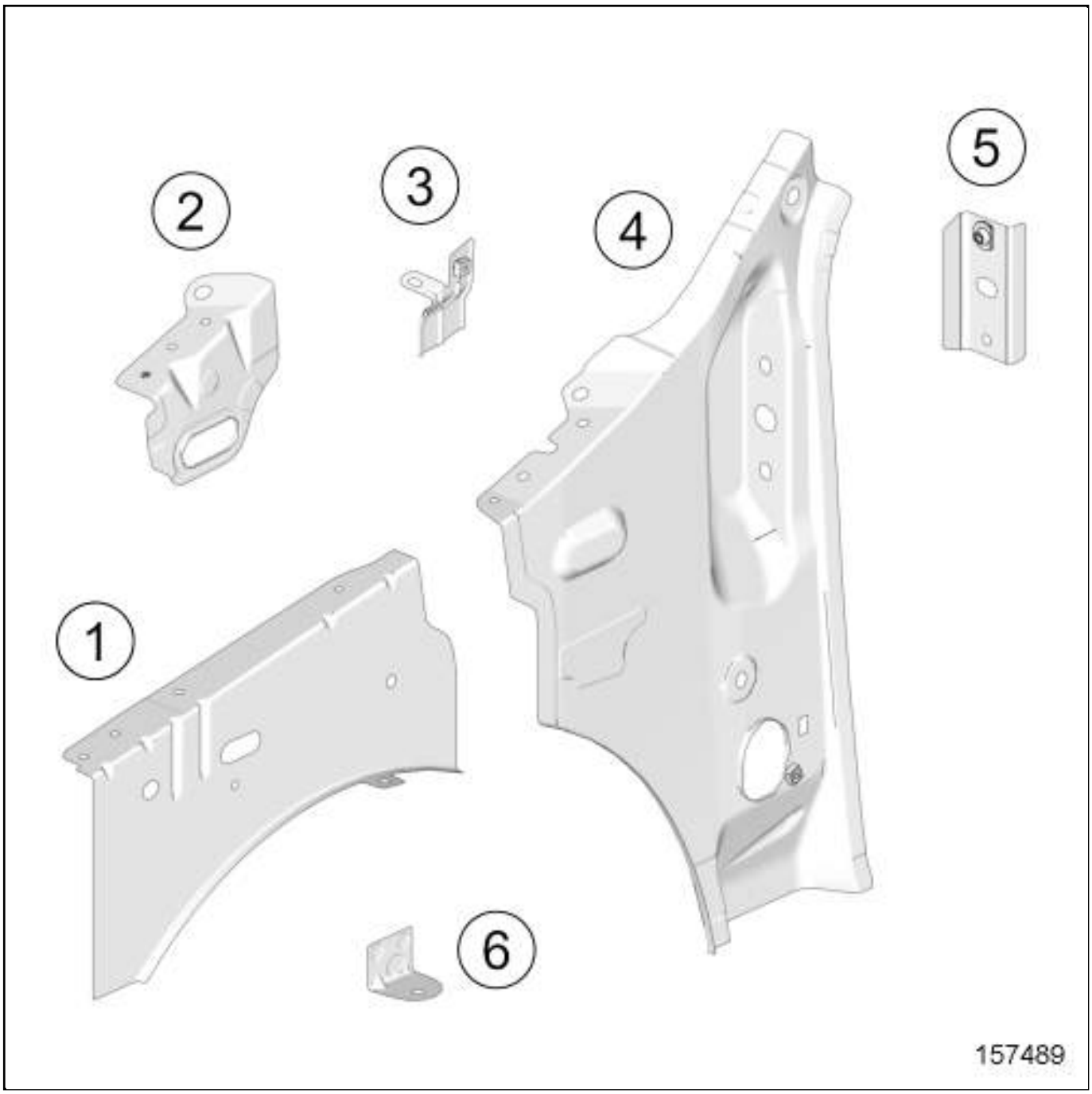
- obligatory respiratory protection,

- use extra ventilation source.

A-PILLARLINING:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

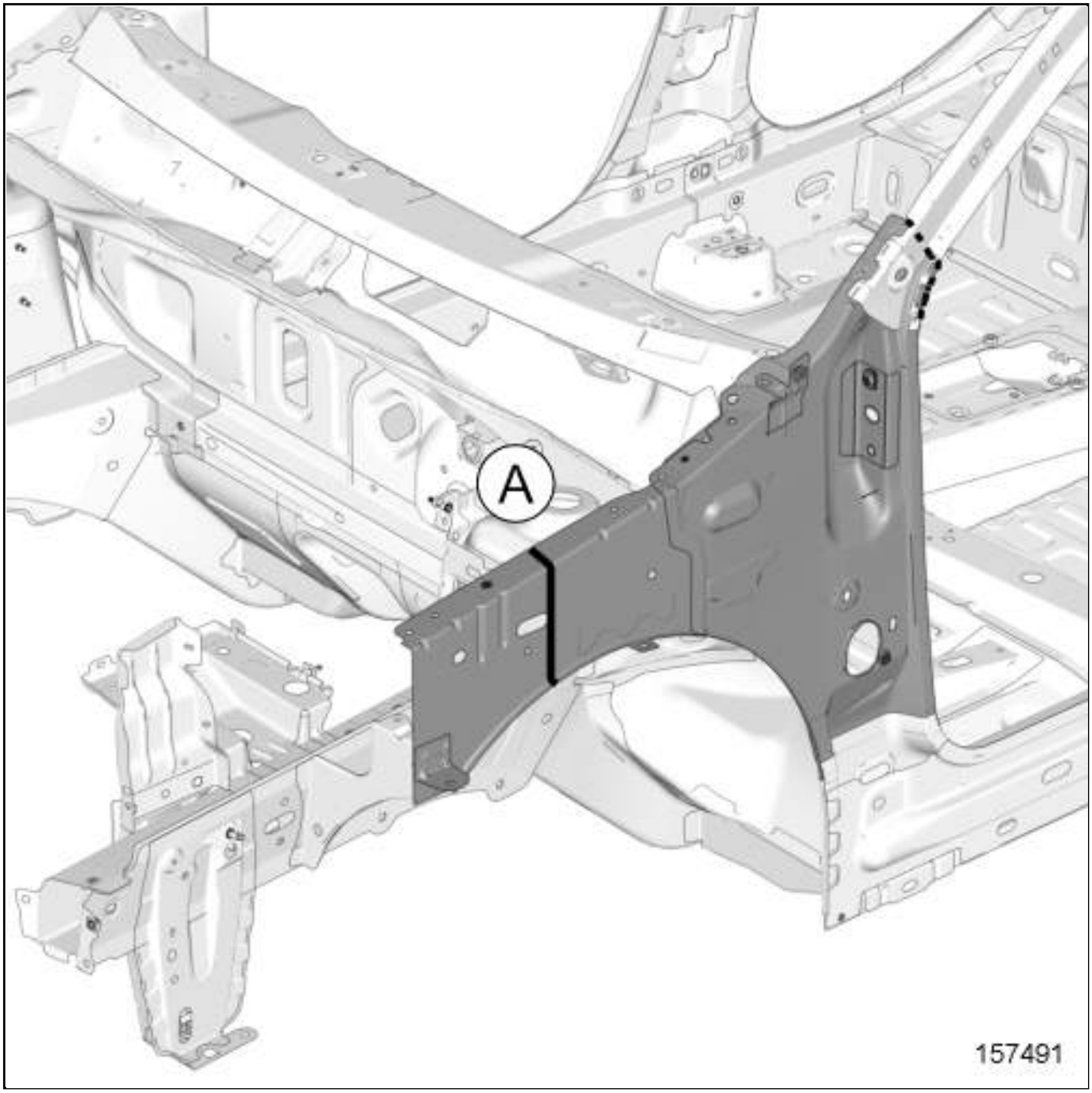


No.	Description	Thickness (mm)
(1)	Front section of A-pillar lining	0.9
(2)	Bonnet hinge mounting reinforcement	1.45
(3)	Front wing rear mounting support	1.2
(4)	Rear section of A-pillar lining	1.2
(5)	Dashboard cross member centre plate	0.9
(6)	Front headlight mounting	1.2

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement along cut A.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

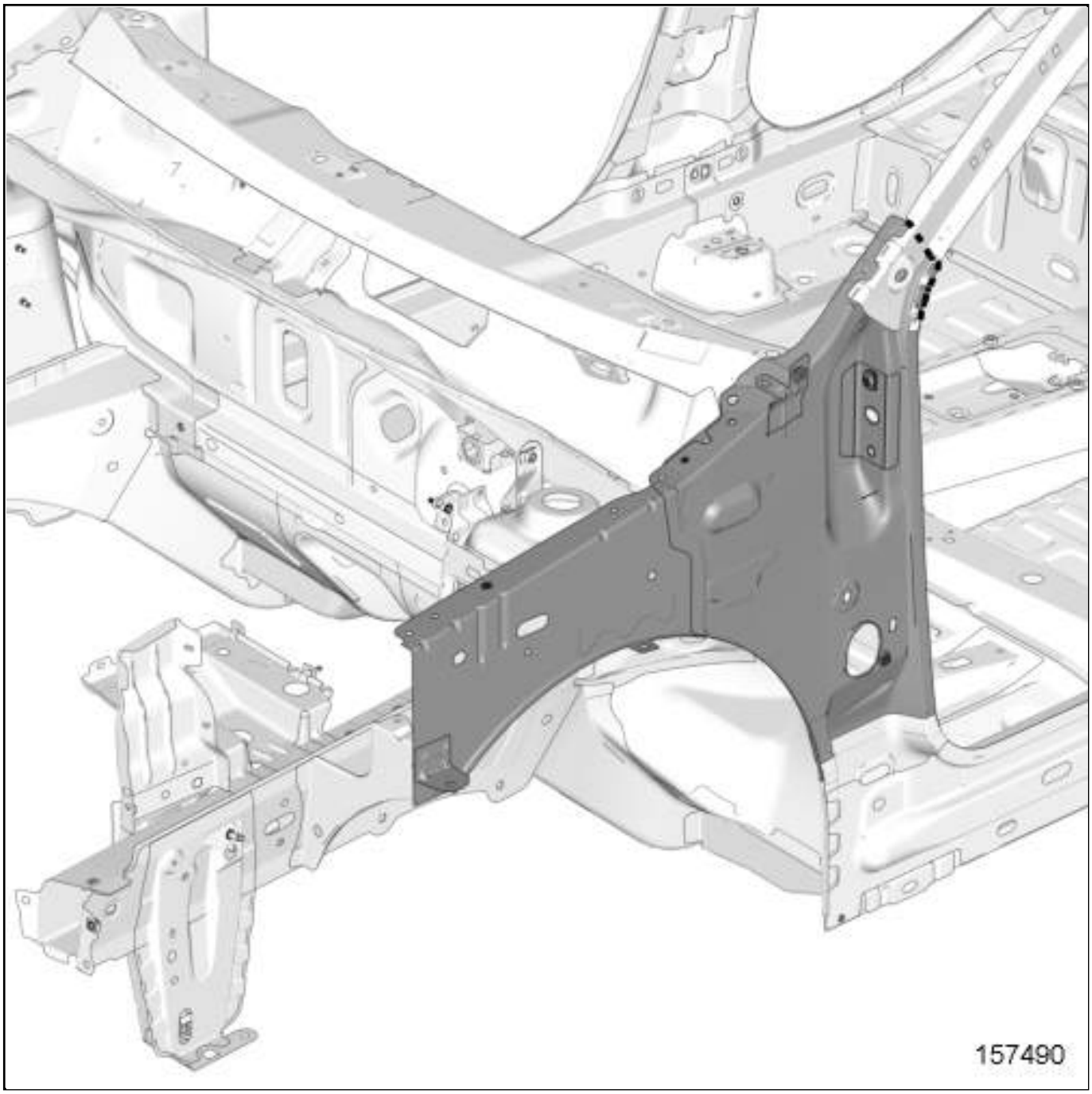
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

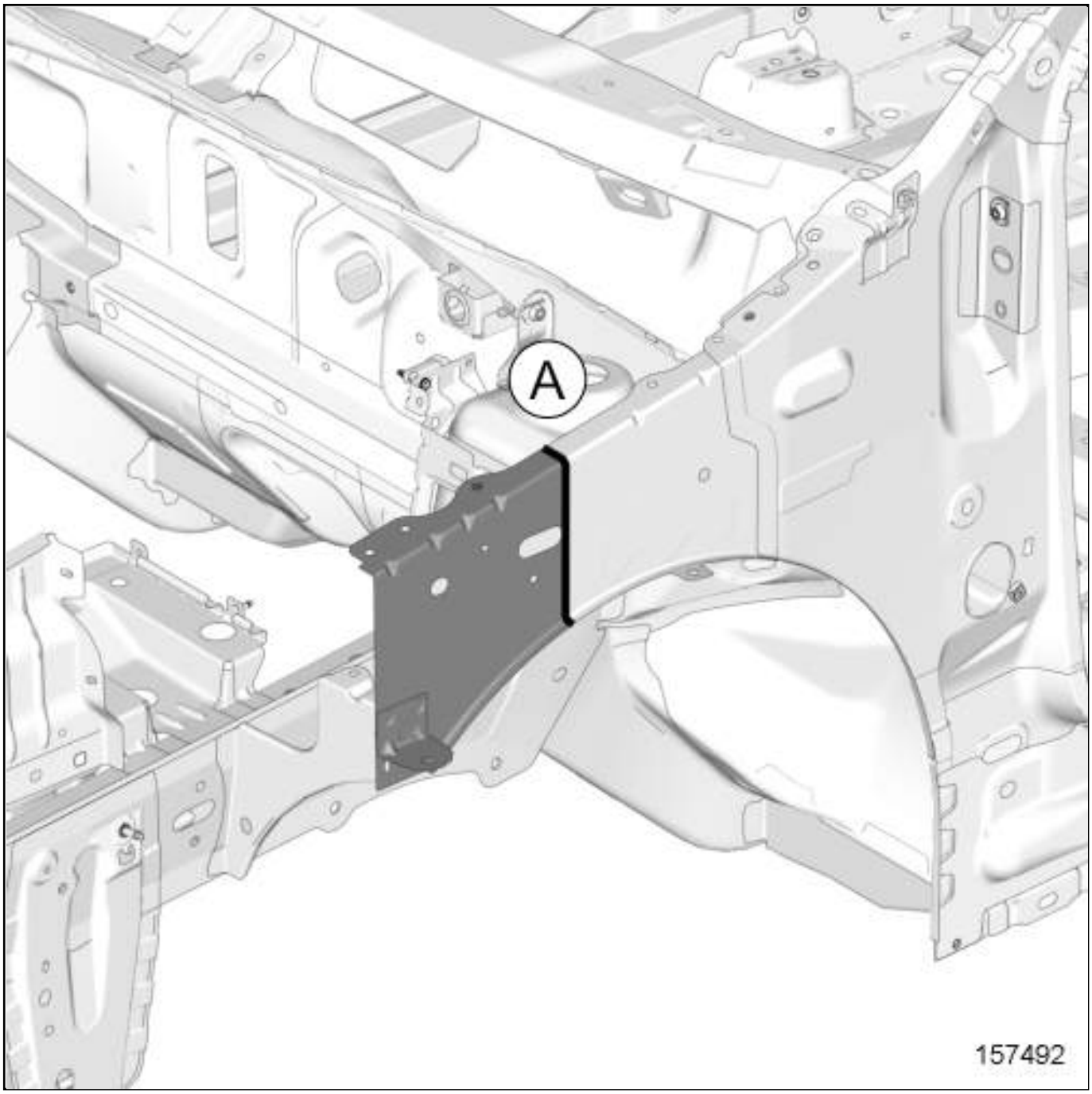
1- COMPLETE REPLACEMENT

1)PART IN POSITION

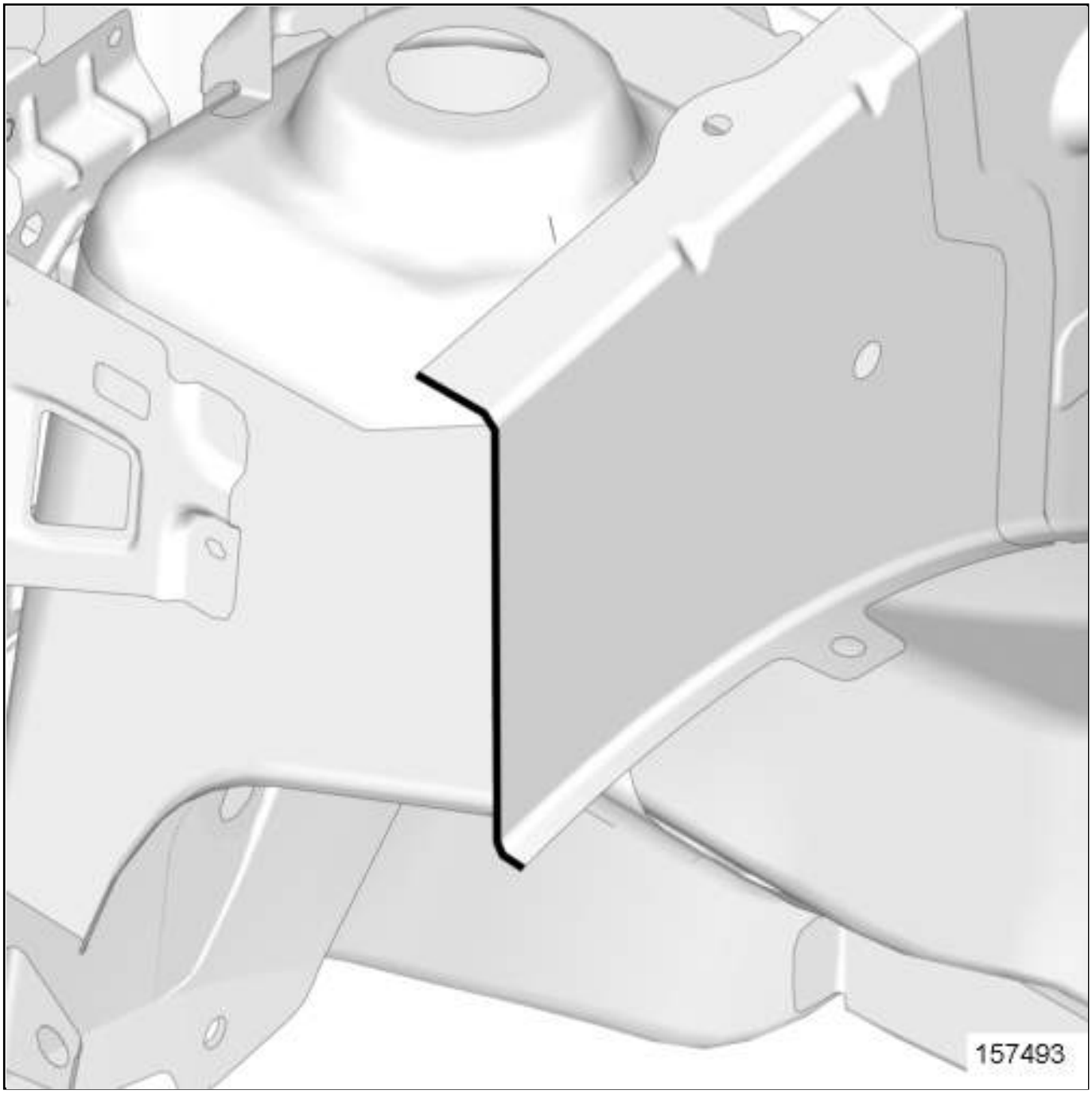


2- PARTIAL REPLACEMENT

1)PART IN POSITION



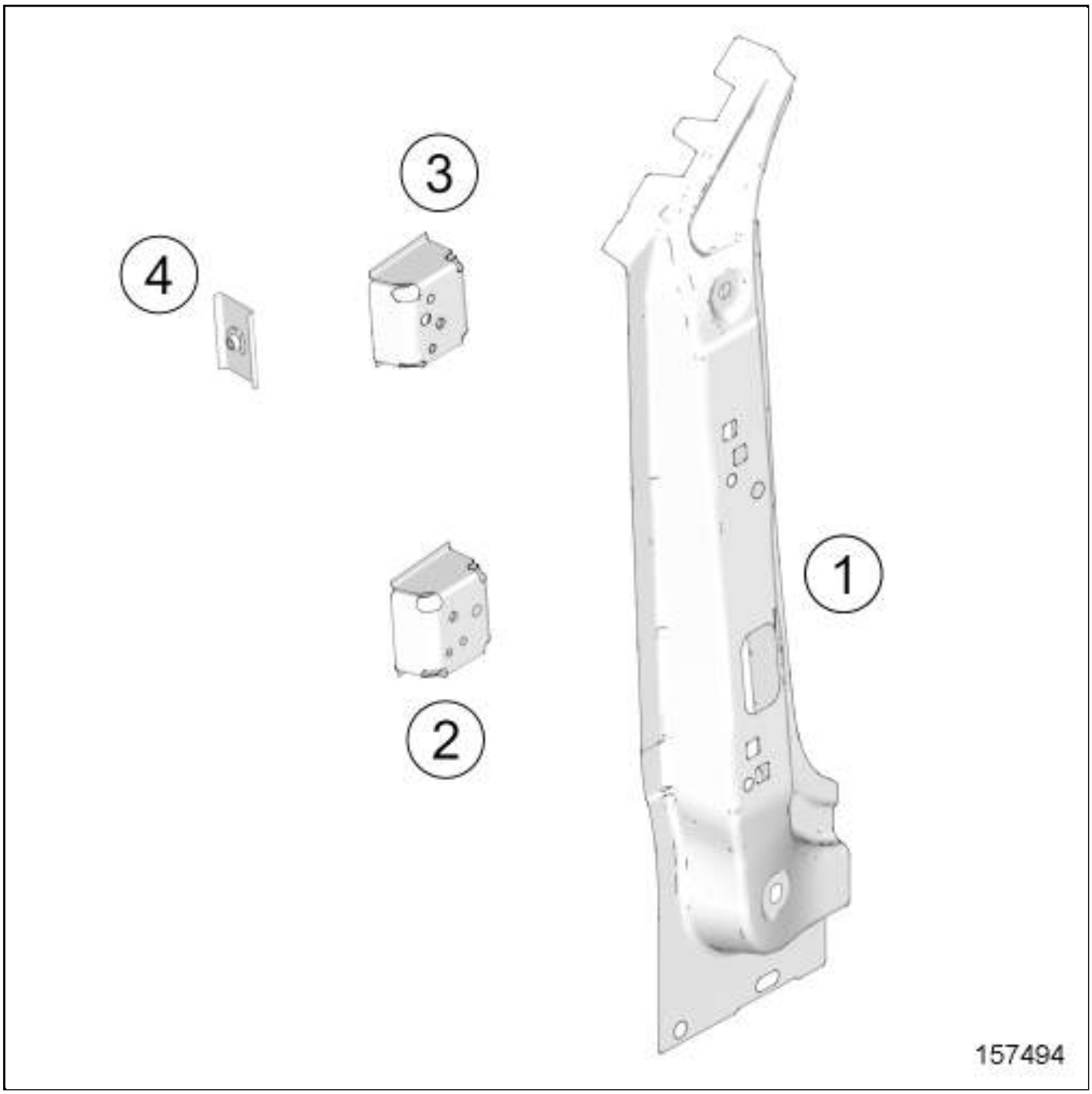
DETAILED VIEW A


157493

A-PILLARREINFORCEMENT:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

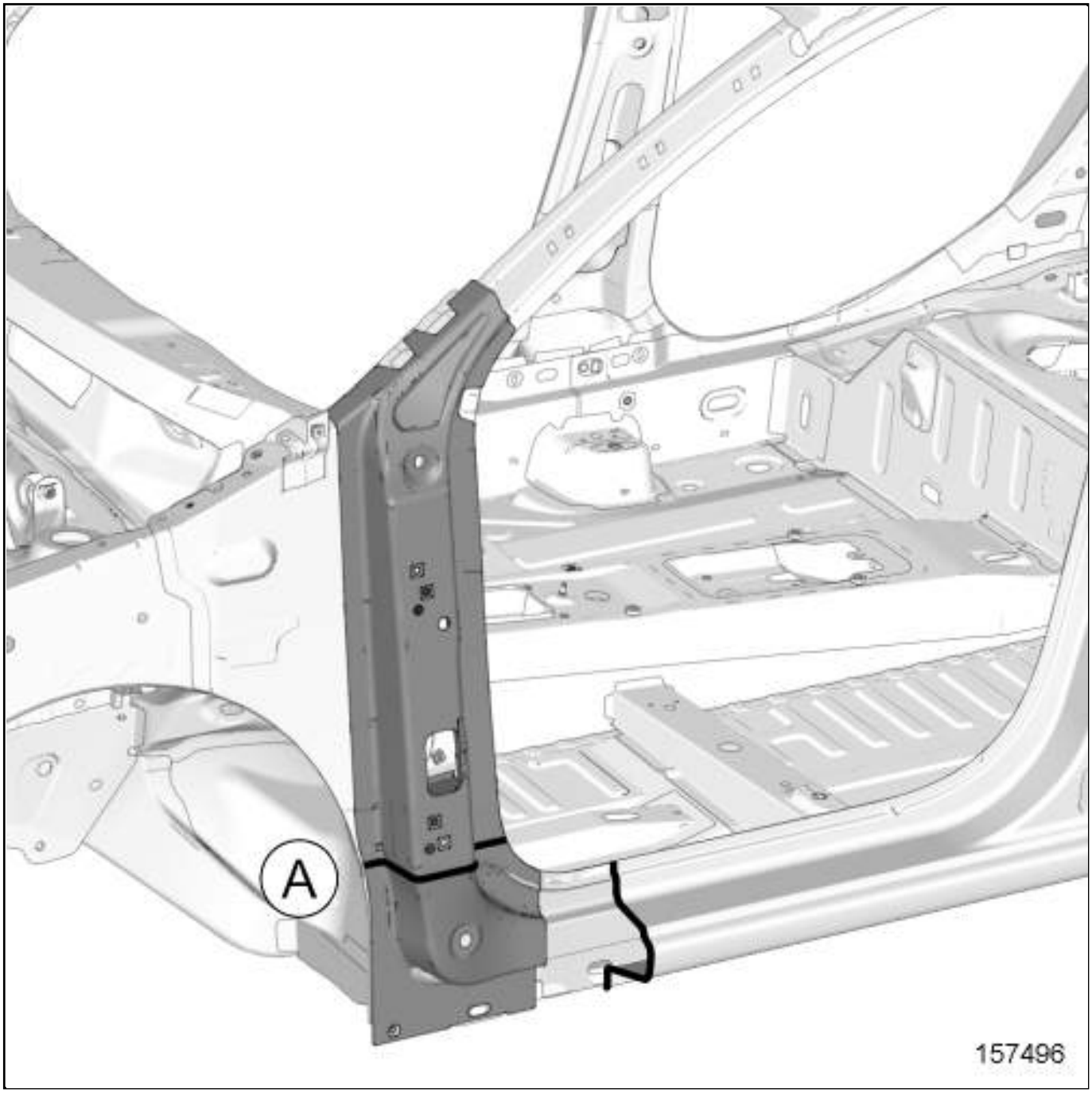


No.	Description	Thickness (mm)
(1)	A-pillar reinforcement	1.3
(2)	Door hinge lower reinforcement	2.0
(3)	Door hinge upper reinforcement	2.0
(4)	Front door stop reinforcement	-

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement along cut A.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

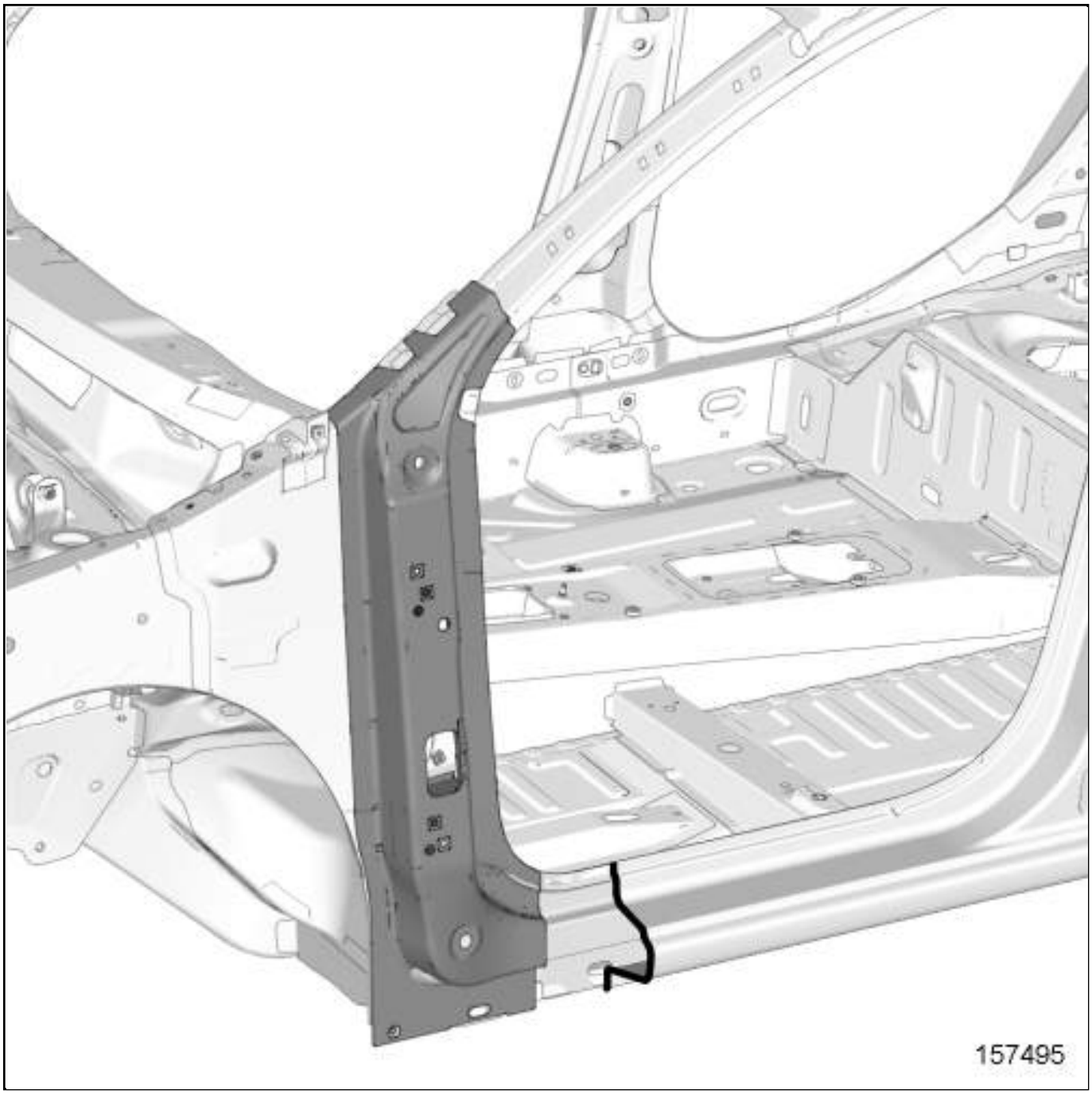
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

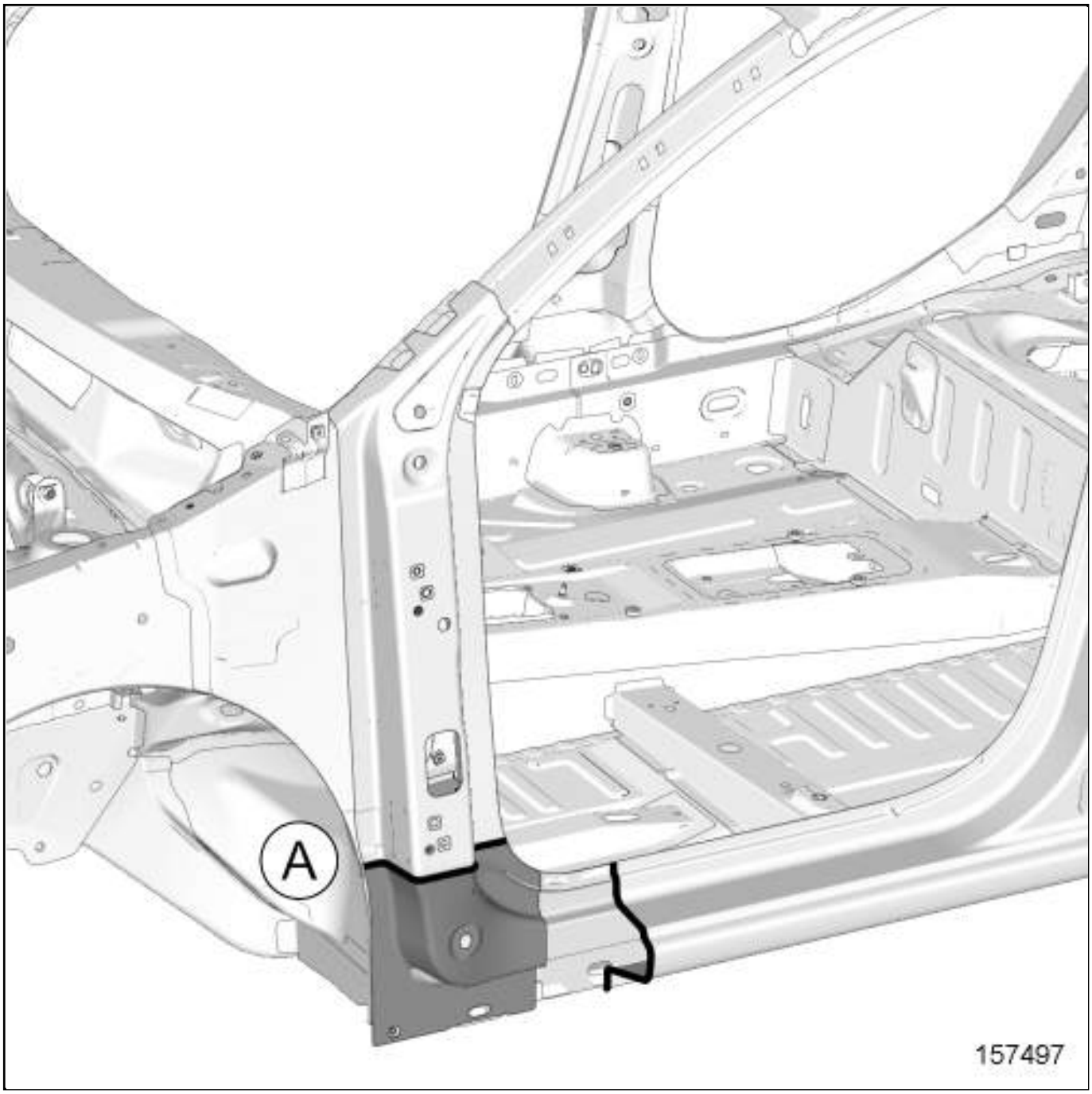
1- COMPLETE REPLACEMENT

1)PART IN POSITION

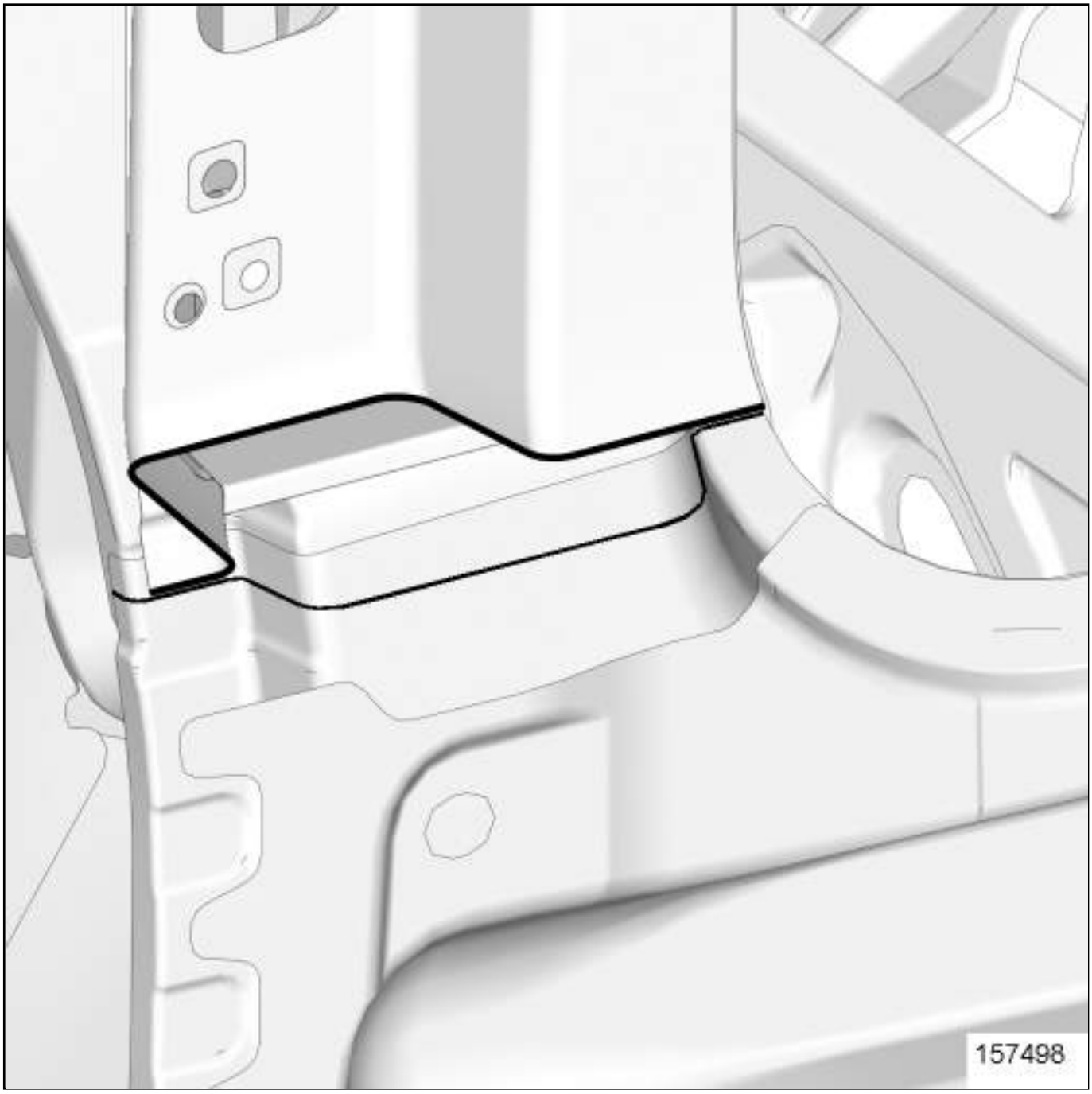


2- PARTIAL REPLACEMENT

1)PART IN POSITION



DETAILED VIEW A


157498

AXIAL BALL JOINT LINKAGE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Steering rack locking tool (TRW).	Dir. 1306-01
Tool for removal - refitting of rack axial ball joint	Dir. 1923

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 36A, Steering assembly, Steering assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 36A, Steering assembly , Steering: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

1. REMOVAL PREPARATION OPERATION

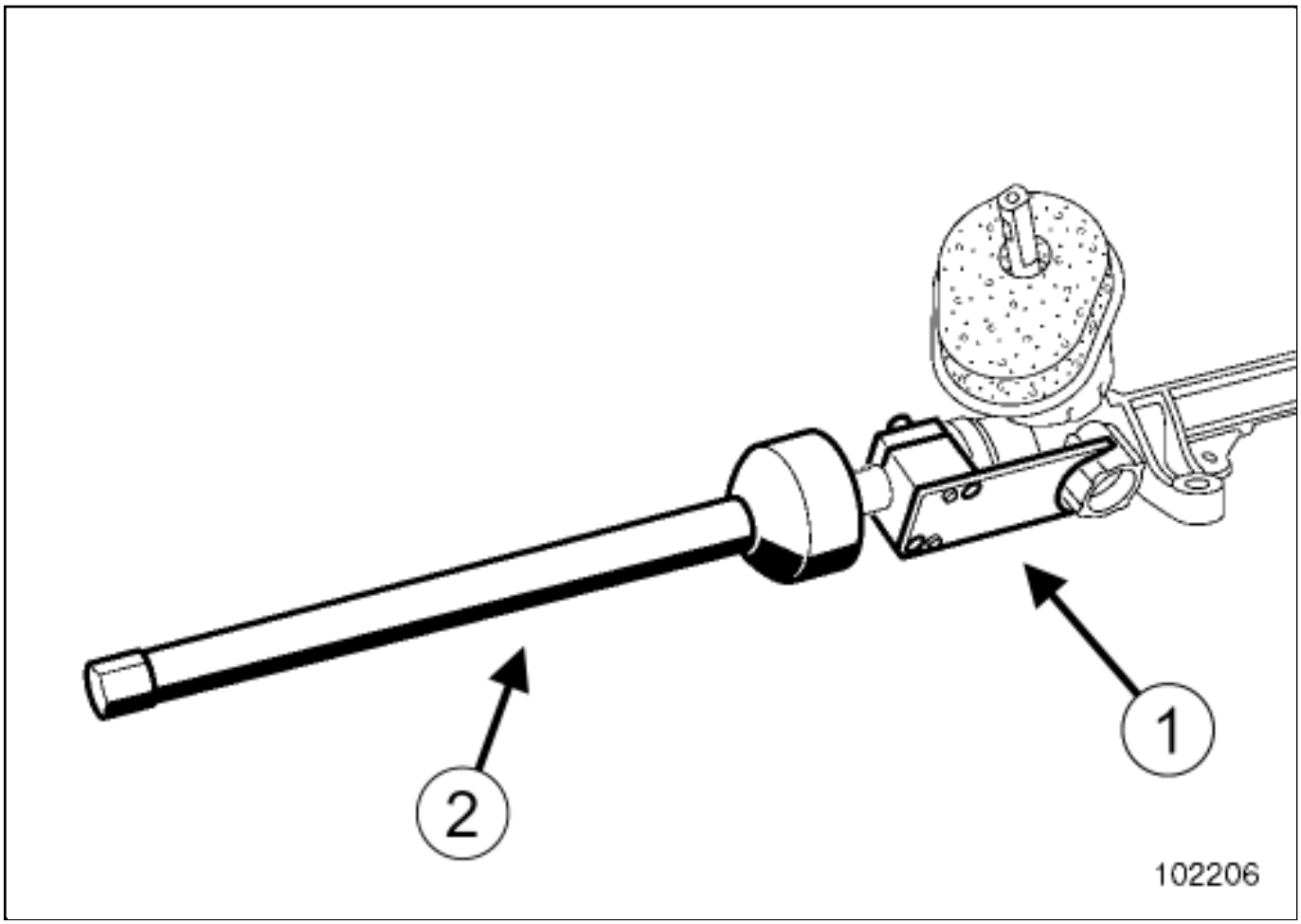
Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove:

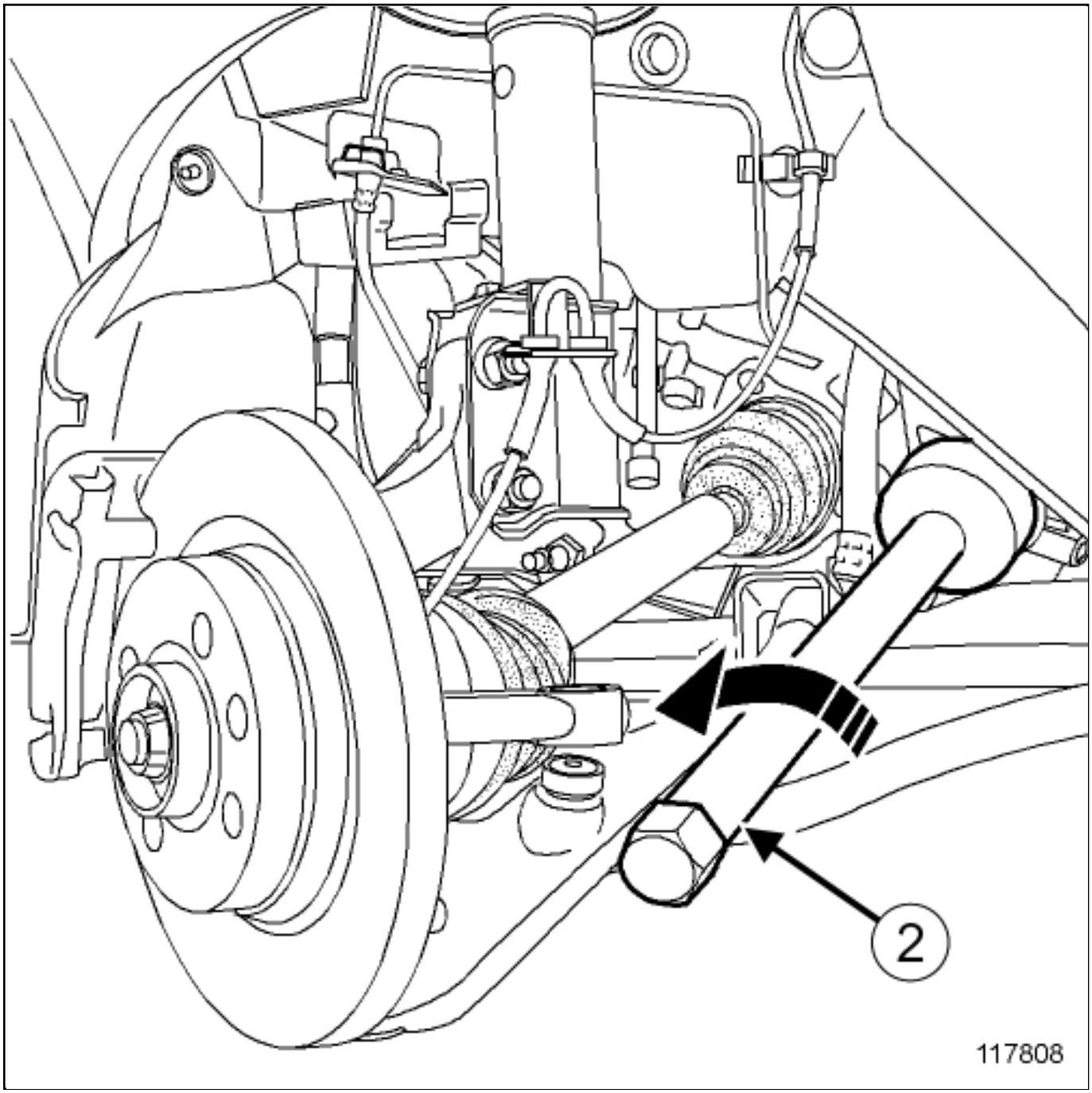
- the front wheelWheel: Removal - Refitting ,
- the track rod(see 36A, Steering assembly , Steering assembly: Exploded view) ,
- the steering box gaiter(see 36A, Steering assembly , Steering assembly: Exploded view) .

Unlock the steering column.

2. REMOVAL OPERATION



- Set up theSteering rack locking tool (TRW).(Dir. 1306-01) (1) on the steering rack, at the pinion end.



- Unlock the axial ball joint using toolTool for removal - refitting of rack axial ball joint(Dir. 1923) (2) .

- Remove the axial ball joint linkage(see 36A, Steering assembly , Steering assembly: Exploded view) .

REFITTING

- Proceed in the reverse order to removal.

- Coat the threading of the axial ball joint with HIGH STRENGTH THREAD LOCKVehicle: Parts and

consumables for the repair .

- Coat the following with SILICONE GREASE Vehicle: Parts and consumables for the repair ,
  - the steering rack,
  - the axial ball joint.
- Check the values of the axle assemblies Front axle assembly: Adjustment values .
- If necessary, adjust the geometry of the axle assemblies Front axle system: Adjustment .

AXLE ASSEMBLIES: CHECK

- Lock the slip plates of the lift.

- Position the vehicle on a lift **Vehicle: Towing and lifting** .

- Check the condition of the following components:
  - track rods,
  - axial ball joint linkages,
  - subframe,
  - lower arm rubber bushes,
  - lower arm ball joints **Front driveshaft lower arm ball joint: Check** ,
  - shock absorbers,
  - tyres.

- Check:
  - the tyre size **Tyres: Identification** ,
  - the tyre inflation pressure(see **Tyre pressure: Identification**) .

- Put the vehicle in the VODM position (vehicle in running order) **(see 30A, General information, Underbody heights: Adjustment value)** :
  - tank full,
  - vehicle empty (without luggage, etc.).

- Consult:
  - the front axle geometry values **(see 30A, General information, Front axle assembly: Adjustment values)** ,
  - the rear axle geometry values **(see 30A, General information, Rear axle assembly: Adjustment values)** .

- Refer to the user manual for the geometry tester.

- Check the geometry using the geometry tester.

- If there is an inconsistency between the manufacturer's values and the measured values:

- Adjust the front axle **(see 30A, General information, Front axle system: Adjustment)** .

BALL-JOINT UNCOUPLING TOOL : USE

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

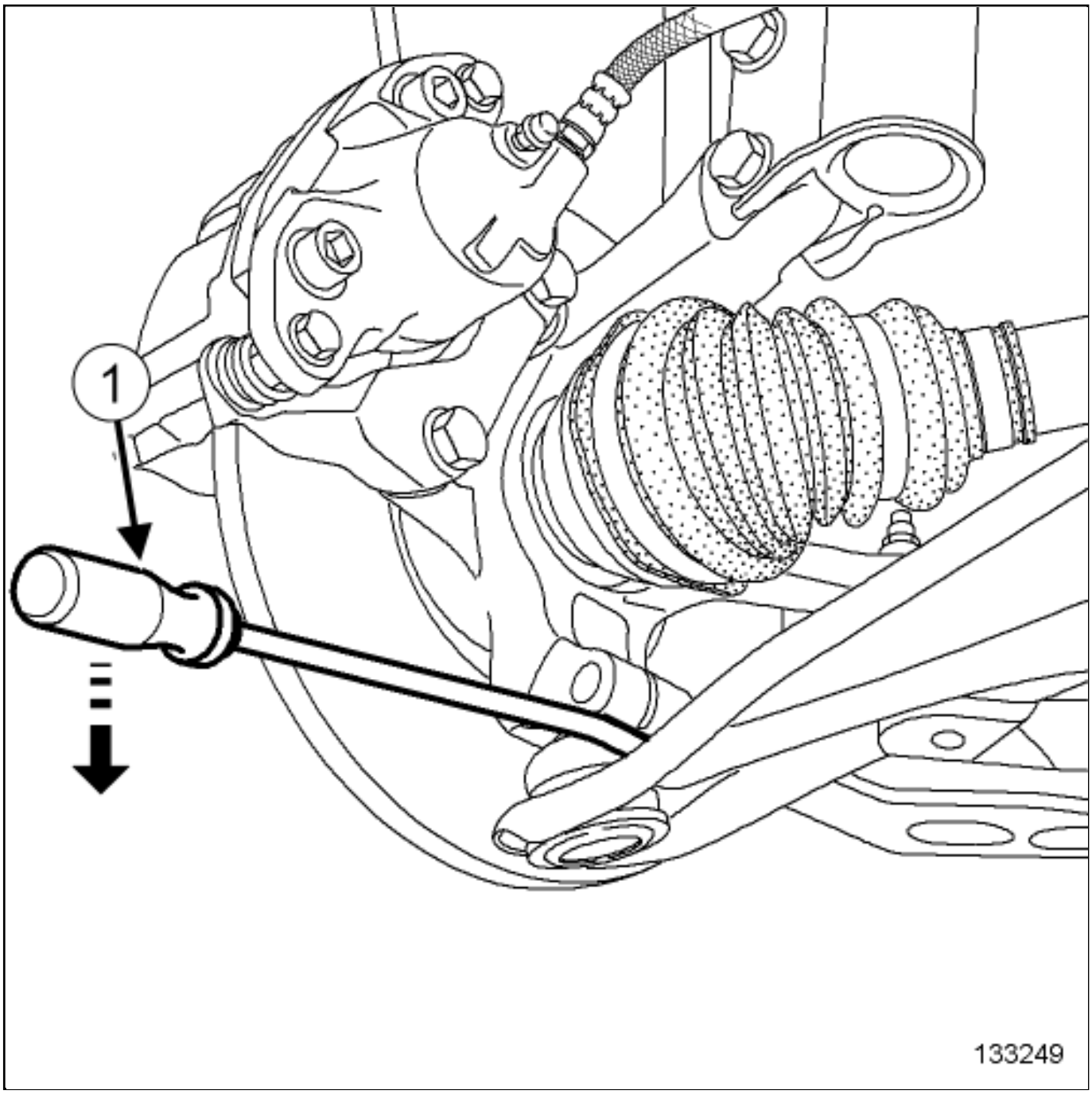
- Front axle components: Precautions for the repair ,
- Vehicle: Precautions for the repair .

Note:

If the lower ball joint is stuck in the stub axle carrier and it will not come out, this document explains how to extract the lower ball joint.

USE

1. USING AN ANGLED LEVER



Extract the lower ball joint from the hub carrier using an angled lever(1) as illustrated in the diagram.

RENAULT

Technical Note 6512A

XXXX

Battery charging

Edition 1 - AUGUST 2007 **Edition Anglaise**

"The repair procedures given by the Manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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80A BATTERY

Battery: General information, equipment to be used 80A-1
Battery: Charging 80A-2
Battery: Advice 80A-3

Battery: General information, equipment to be used

GENERAL INFORMATION

This Technical Note describes the procedure for charging the battery, as well as the equipment to use.

This note applies to all charging operations in the network.

RECHARGING EQUIPMENT TO BE USED

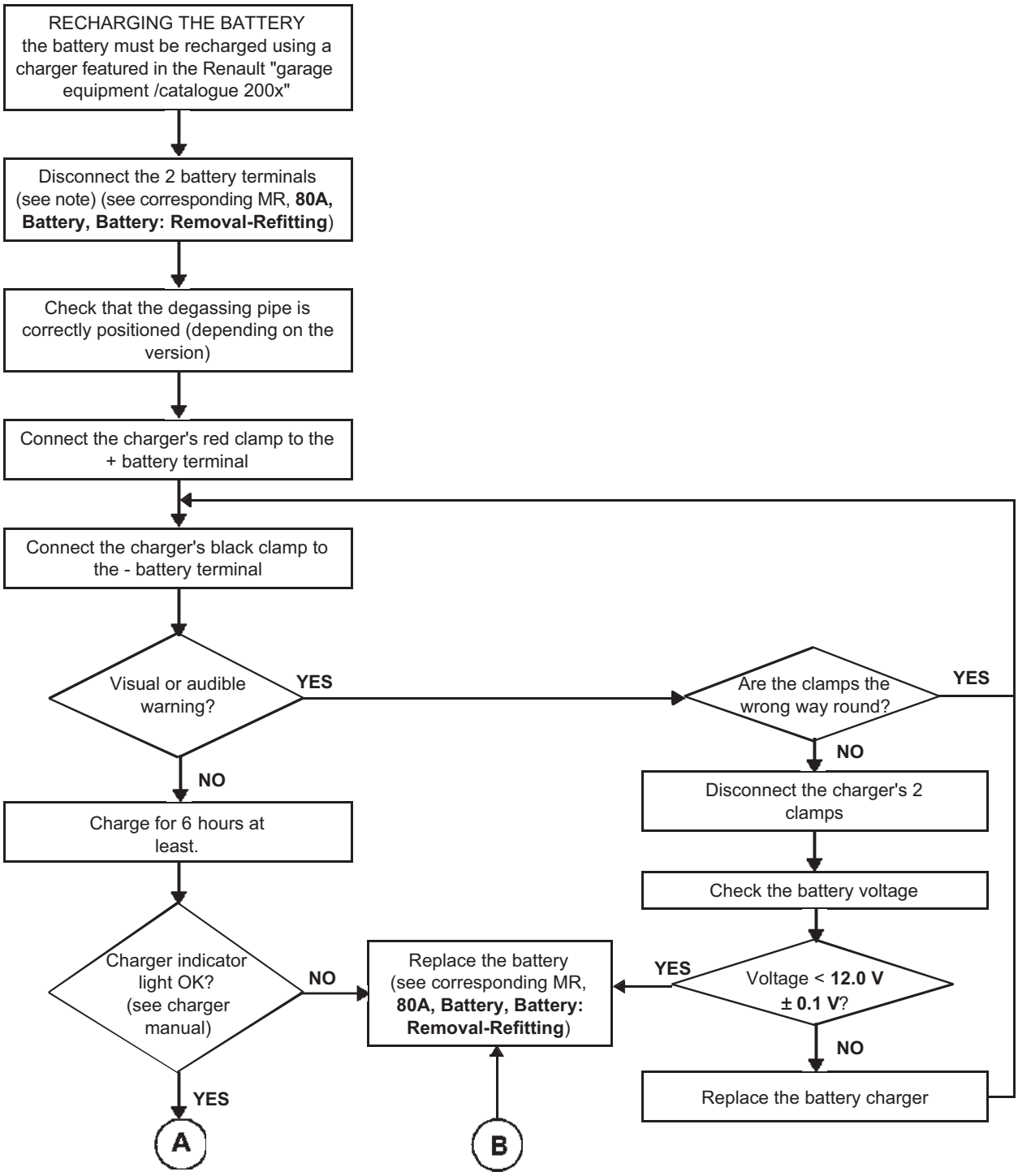
It is essential to use a charger from the list of special equipment selected by Renault in the catalogue **"Garage equipment / Catalogue 200x"**.

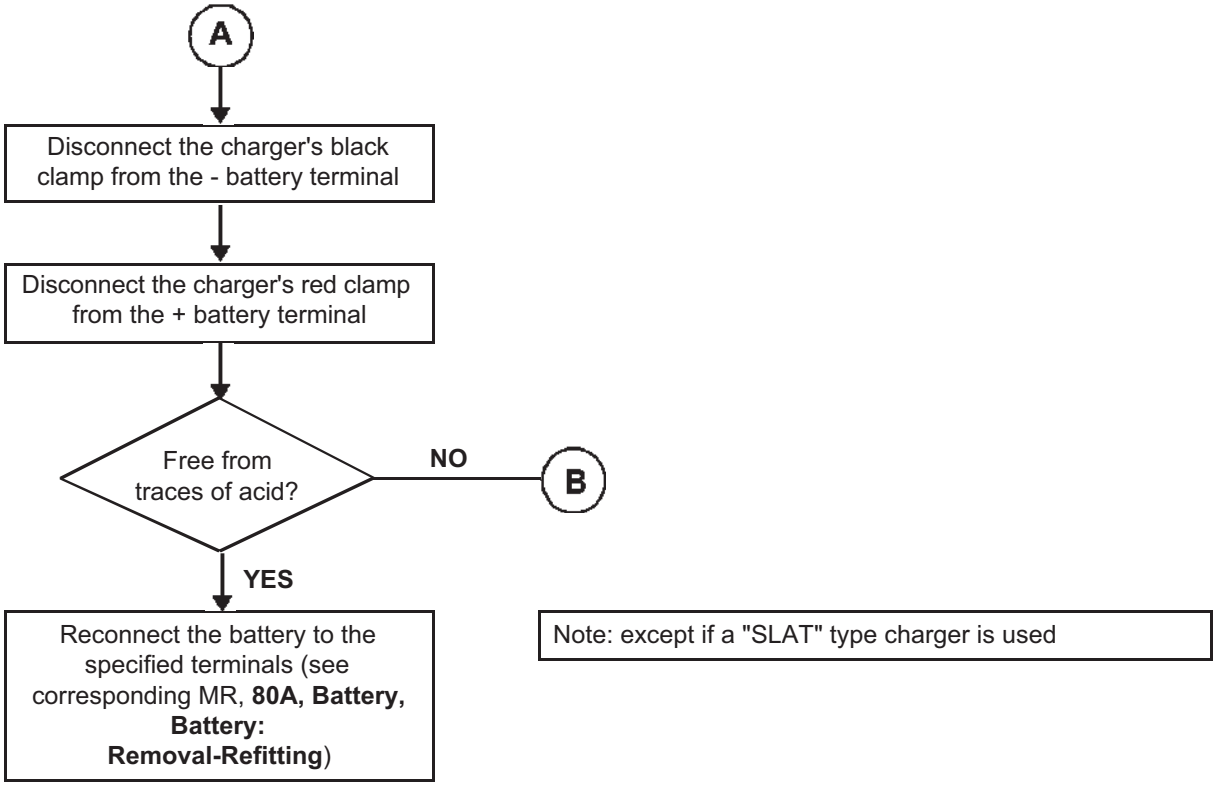
PRECAUTIONS:

The 2 battery terminals must be disconnected (see **corresponding MR, 80A, Battery, Battery: Removal-Refitting**).

Check that the degassing pipe is correctly positioned (depending on the equipment).

IMPORTANT
All these vehicles are equipped with a low water consumption battery.
Opening the battery and topping up the electrolyte level are prohibited.


RECHARGING THE BATTERY
the battery must be recharged using a charger featured in the Renault "garage equipment /catalogue 200x"
Disconnect the 2 battery terminals (see note) (see corresponding MR, 80A, Battery, Battery: Removal-Refitting)
Check that the degassing pipe is correctly positioned (depending on the version)
Connect the charger's red clamp to the + battery terminal
Connect the charger's black clamp to the - battery terminal
Visual or audible warning?
YES
NO
Are the clamps the wrong way round?
YES
NO
Disconnect the charger's 2 clamps
Check the battery voltage
Voltage < 12.0 V ± 0.1 V?
YES
NO
Replace the battery charger
Charge for 6 hours at least.
Charger indicator light OK? (see charger manual)
NO
YES
Replace the battery (see corresponding MR, 80A, Battery, Battery: Removal-Refitting)
A
B


A
Disconnect the charger's black clamp from the - battery terminal
Disconnect the charger's red clamp from the + battery terminal
Free from traces of acid?
NO
B
YES
Reconnect the battery to the specified terminals (see corresponding MR, 80A, Battery, Battery: Removal-Refitting)
Note: except if a "SLAT" type charger is used

CLAIM COMPLETION AND CODING

…Operation time:

Additional battery recharge
- …Operation code: 8210
- …Allocated time: 0.3 hours

Battery replacement
- …Operation code: 8207
- …Time allowed: See Operation time.

…Part to be indicated: part number of faulty battery (if replaced).
Or indicate OT code concerned: battery recharge (if recharged).

BELT TENSION CHECKING TOOL: USE

Note, one or more warnings are present in this procedure

Special tooling required	
Belt tension setting tool (frequency meter)	Mot. 1505
Belt tension checking tool (frequency indicator).	Mot. 1715

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

1. INTRODUCTION

Frequency meters Belt tension setting tool (frequency meter)(Mot. 1505) or Belt tension checking tool (frequency indicator). (Mot. 1715) allow the tension of the timing and accessories belts to be checked during a fault finding procedure or when a belt is refitted.

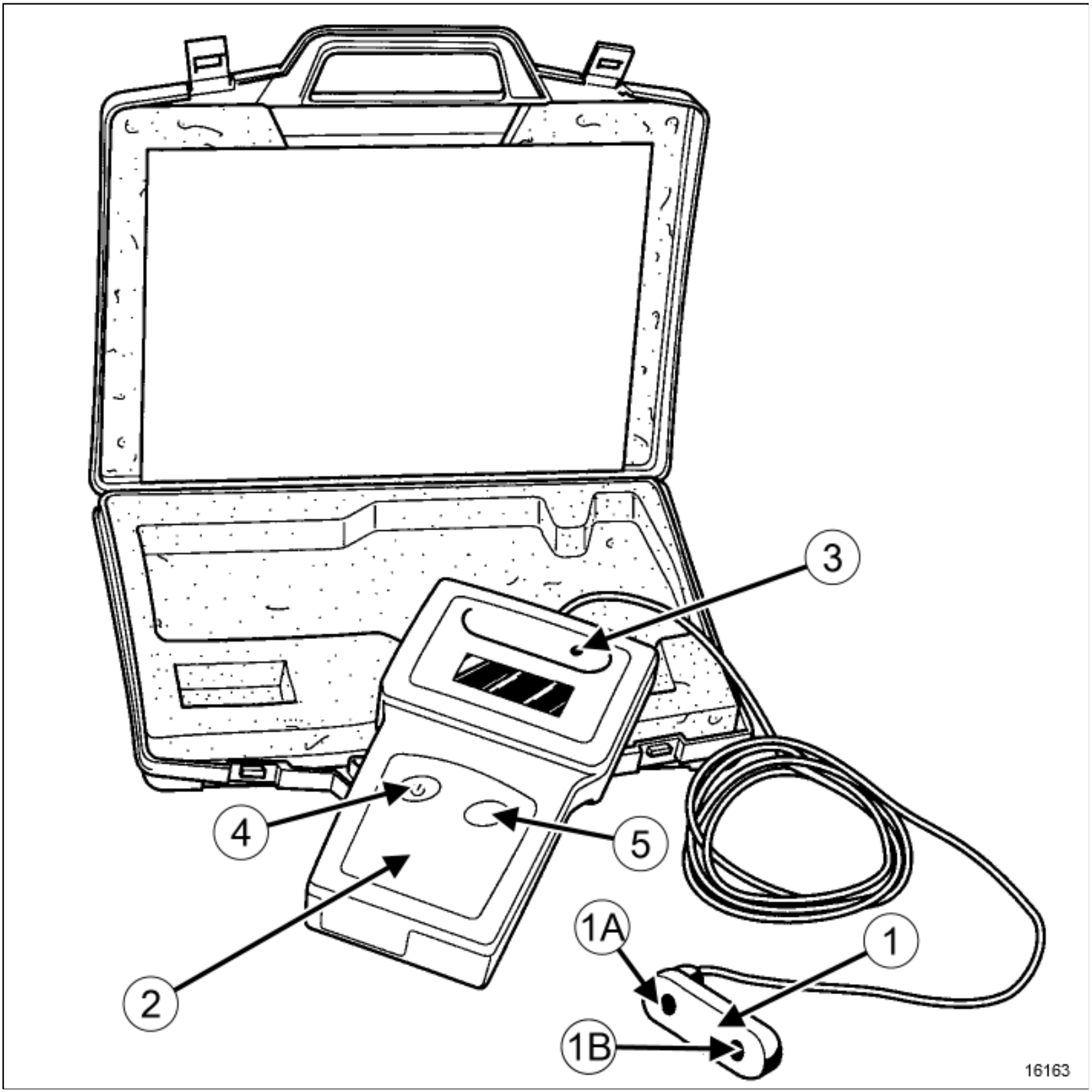
This note describes the use of these tools as an addition to the replacement and checking procedures for belts given in the vehicle repair methods.

The procedures and tension values recommended by the manufacturer must always be adhered to as they affect the service life of the drive systems.

An incorrect belt tension may cause noise, loss of power, engine cut-outs or even irreparable damage to the engine.

2. TOOL MOT.1505

1- DESCRIPTION



The tool is comprised of:

- a reading head(**1**) including two sensors(**1A**) and (**1B**) ,
- a display unit(**2**) ,
- a calibrated frequency generator(**3**) (512 ± 1 Hz) integrated into the display unit(**2**) ,
- a power switch(**4**) ,
- a tester switch(**5**) for checking the calibration of the equipment.

2- CALIBRATING

Note:

The tool must be calibrated every month

The calibrated frequency generator(3) integrated into the display unit(2) allows the calibration of the tool to be checked.

- Switch the tool on by pressing switch(4) .
- Position the sensor(1A) on the calibrated frequency generator(3) .
- Press on the tester switch(5) .
- Read the value shown on the display.
- Reapply the procedure to check sensor(1B) .

If the value read on the display is not 512 ± 1 Hz, for both sensors, return the tool to the address below:

ONE TOO

1 ZAC de Saint Esteve

06640 Saint-Jeannet les Plans

Tel: +33 (0)4 92 12 04 80

Fax: +33 (0)4 92 12 04 66.

3- OPERATION

1)PRINCIPLE

- This device measures the frequency of the belt to be checked in Hertz (Hz).

Frequency is a physical unit which here reflects the belt tension level very accurately.

The measurement must not be made with just one sensor, the other is used as a reference, and should be outside the measurement field.

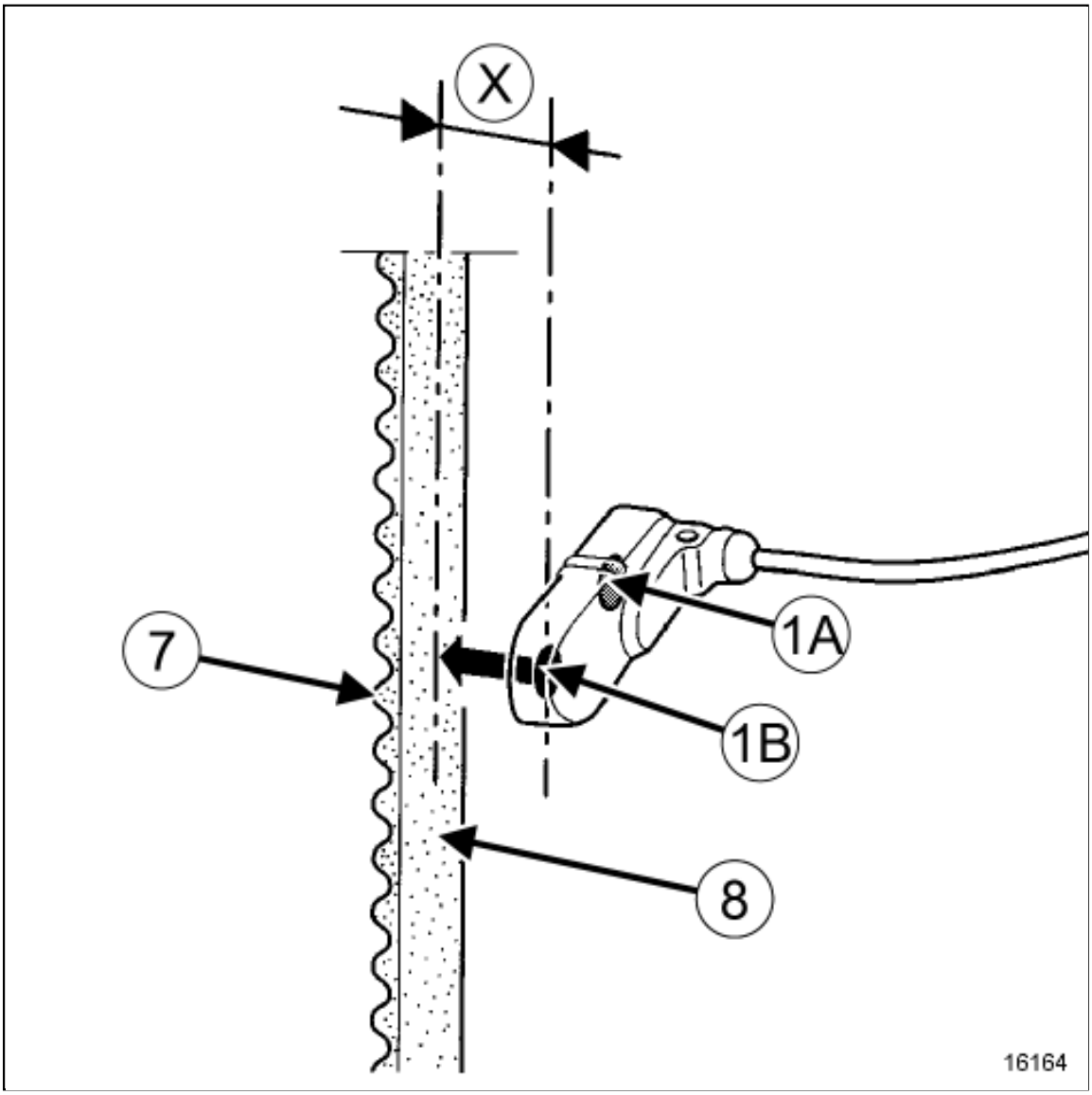
Both of these sensors can be used either as a measuring sensor or as a reference sensor.

Measuring range: 30 to 520 Hz.

Uncertainty: ± 1 Hz < 100 Hzand 1% > 100 Hz.

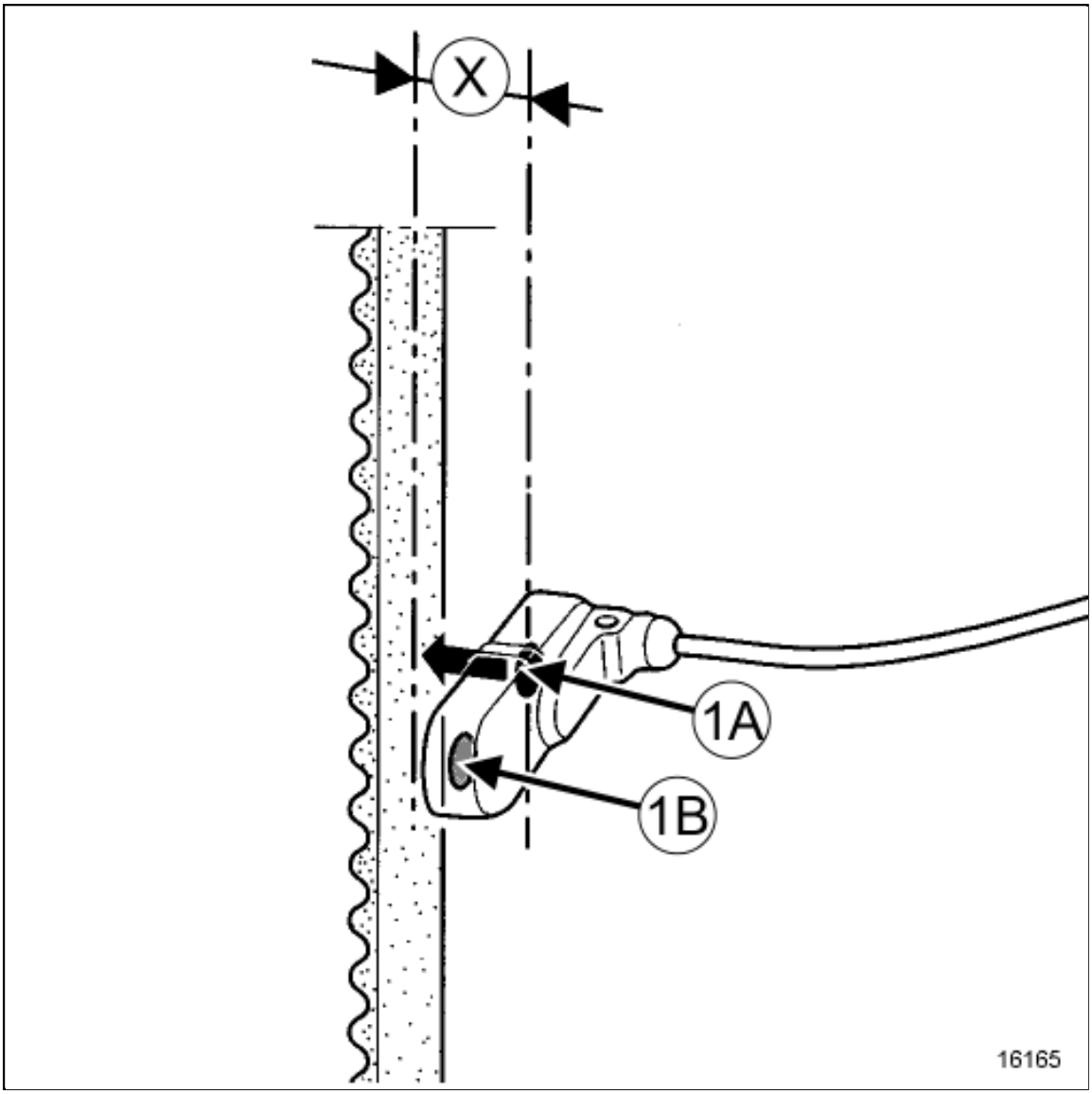
2)USE

- Switch the tool on using switch(4) .
- Bring the reading head(1) up to the belt section to be measured.

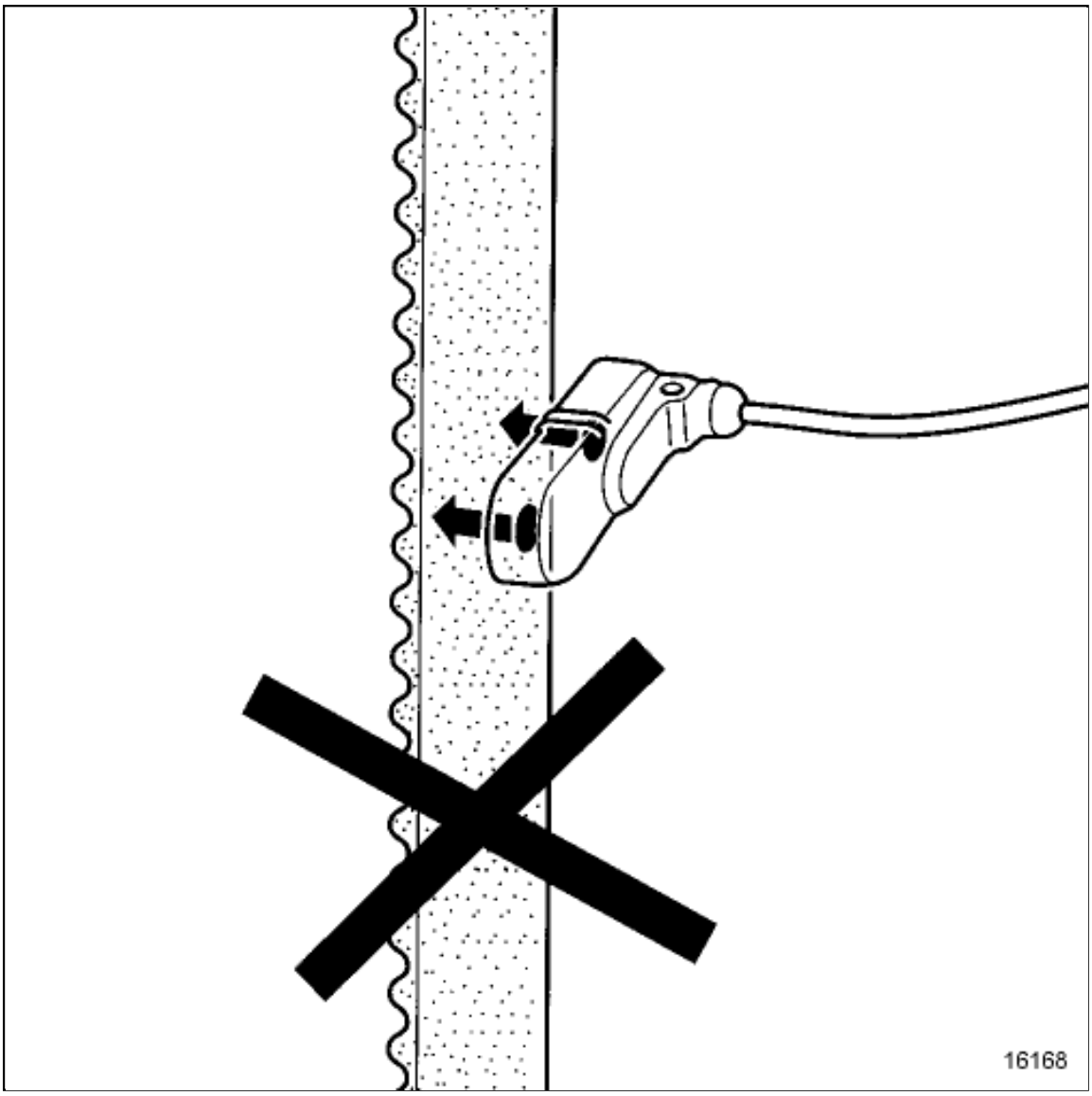


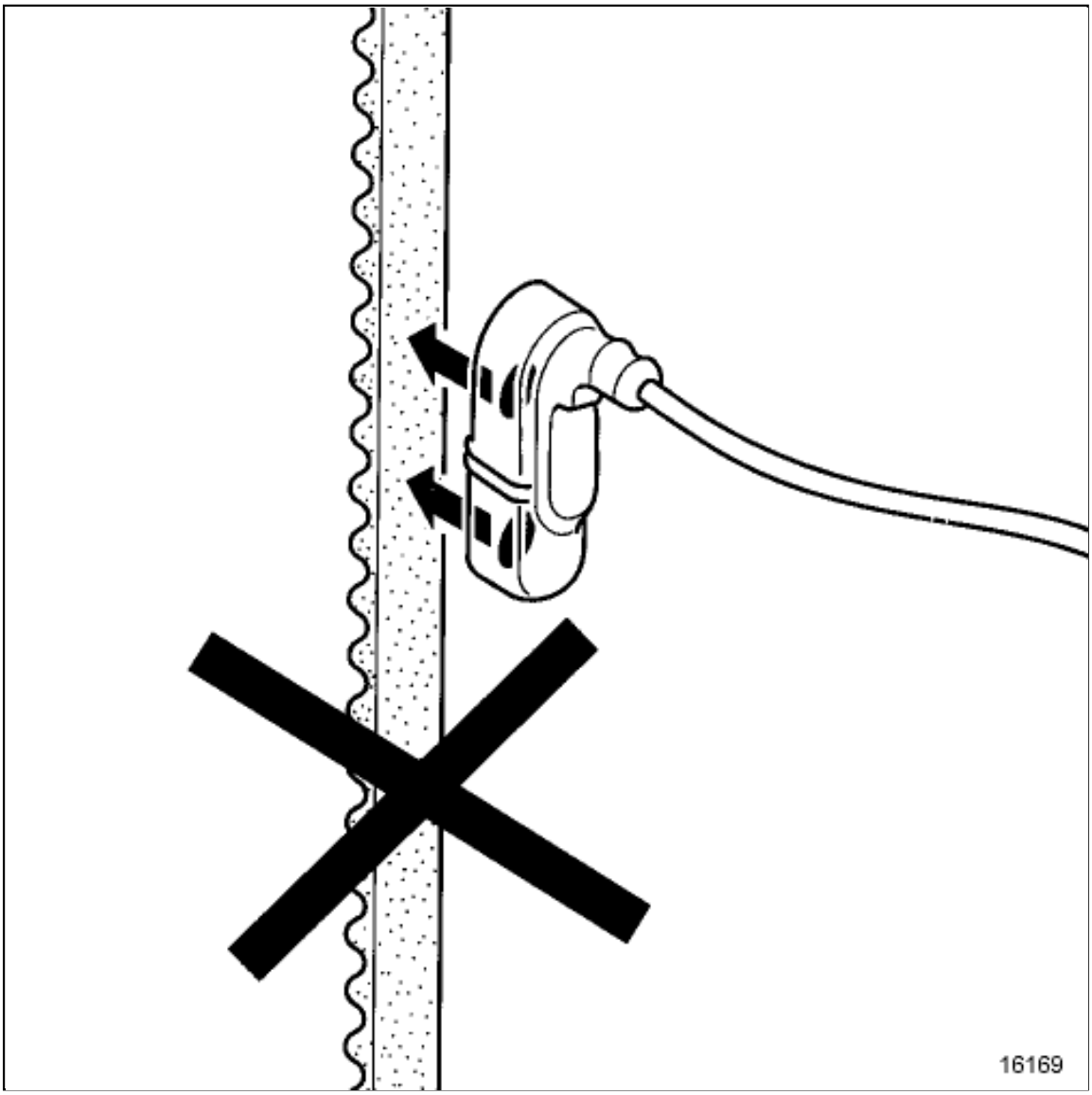
- Position the reading head(1) at a distance (x) between approximately 5and 10 mminclusive from the belt.

The measurement can be made on either face(7) or (8) of the belt, according to the dimensions.

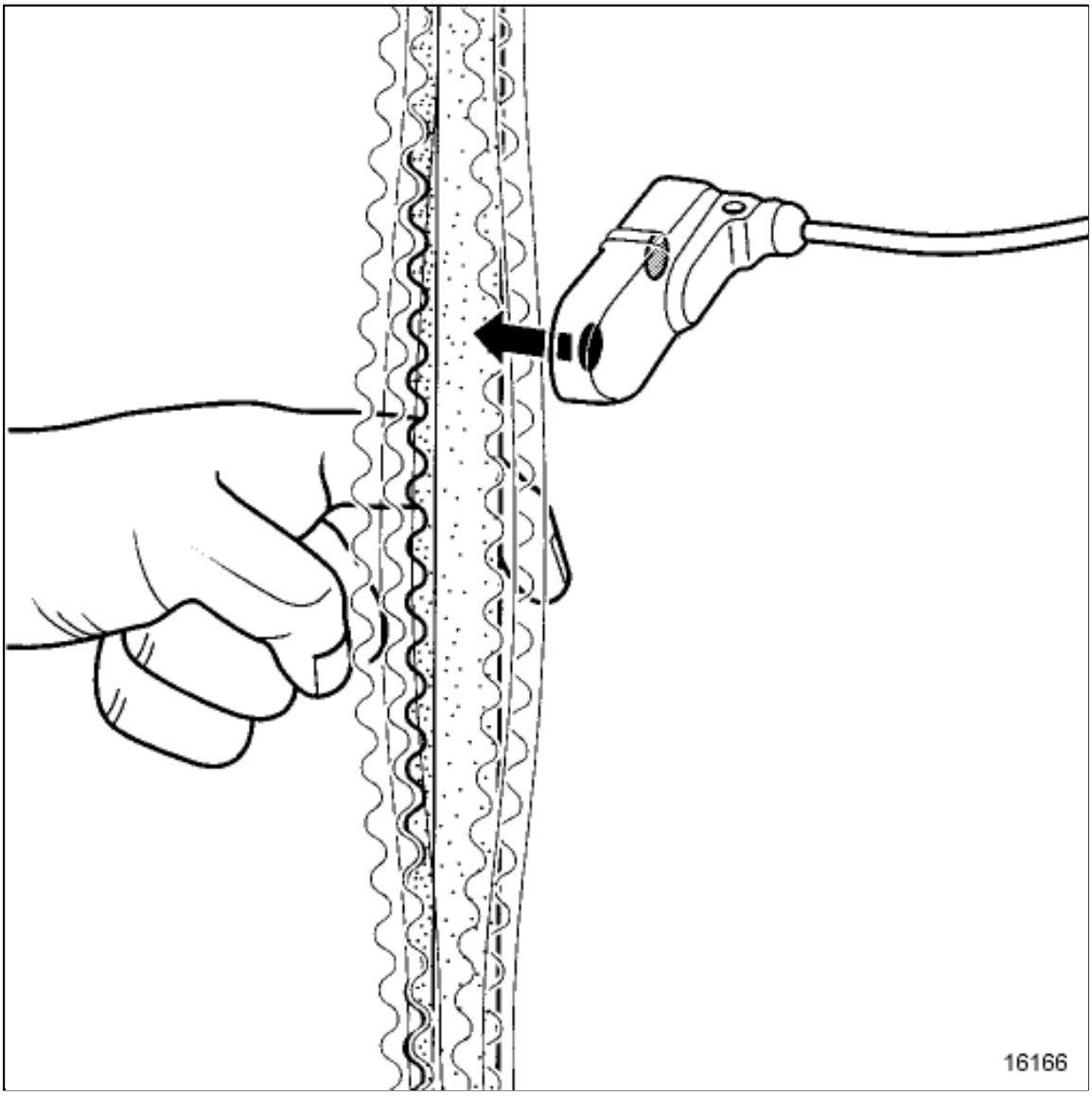


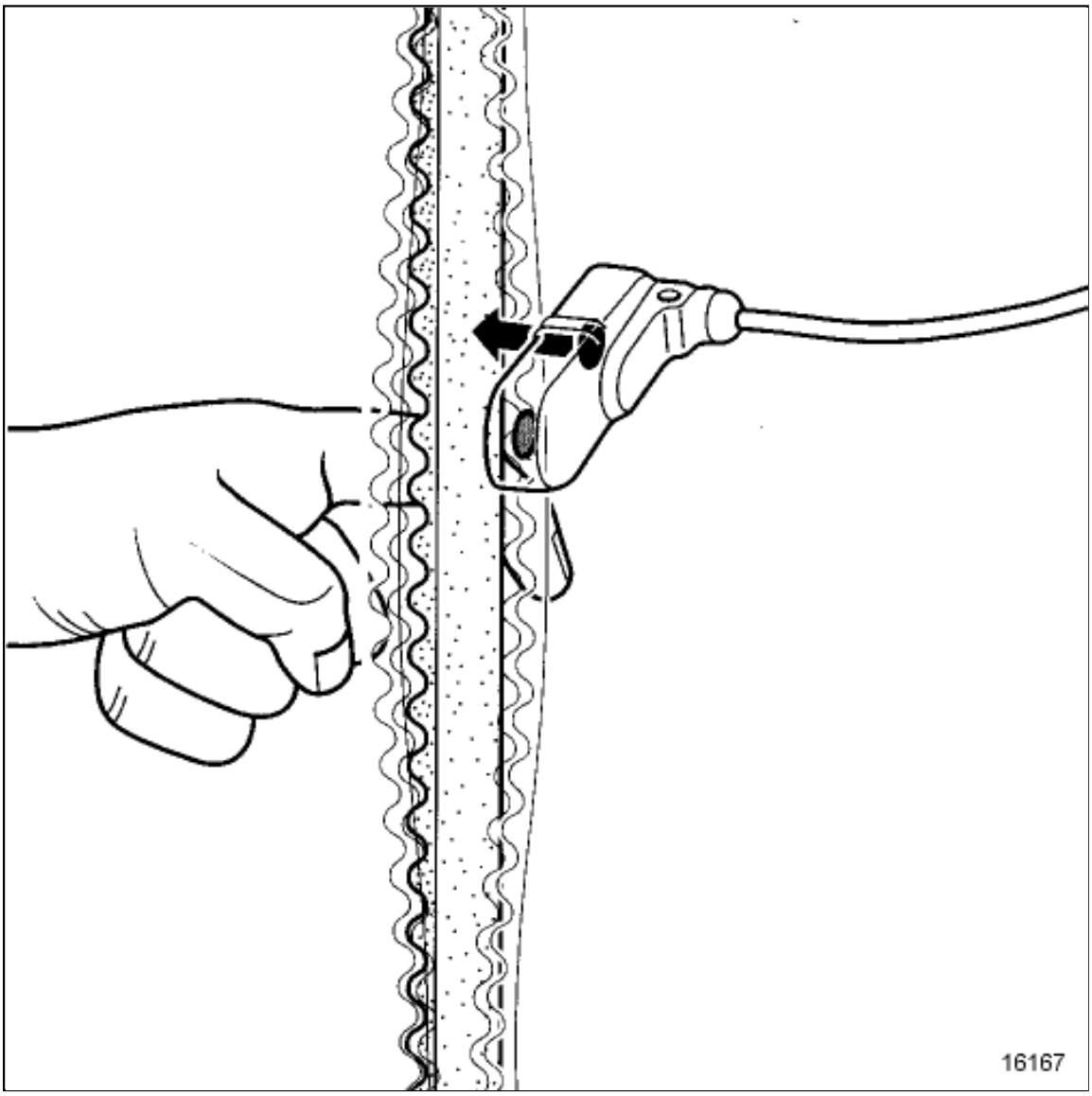
- Either sensor (1A) or (1B) can be used, as long as the sensor used for reference is outside the measurement field.


16168



- Under no circumstances should the two sensors be facing the belt simultaneously during measurement.


16166

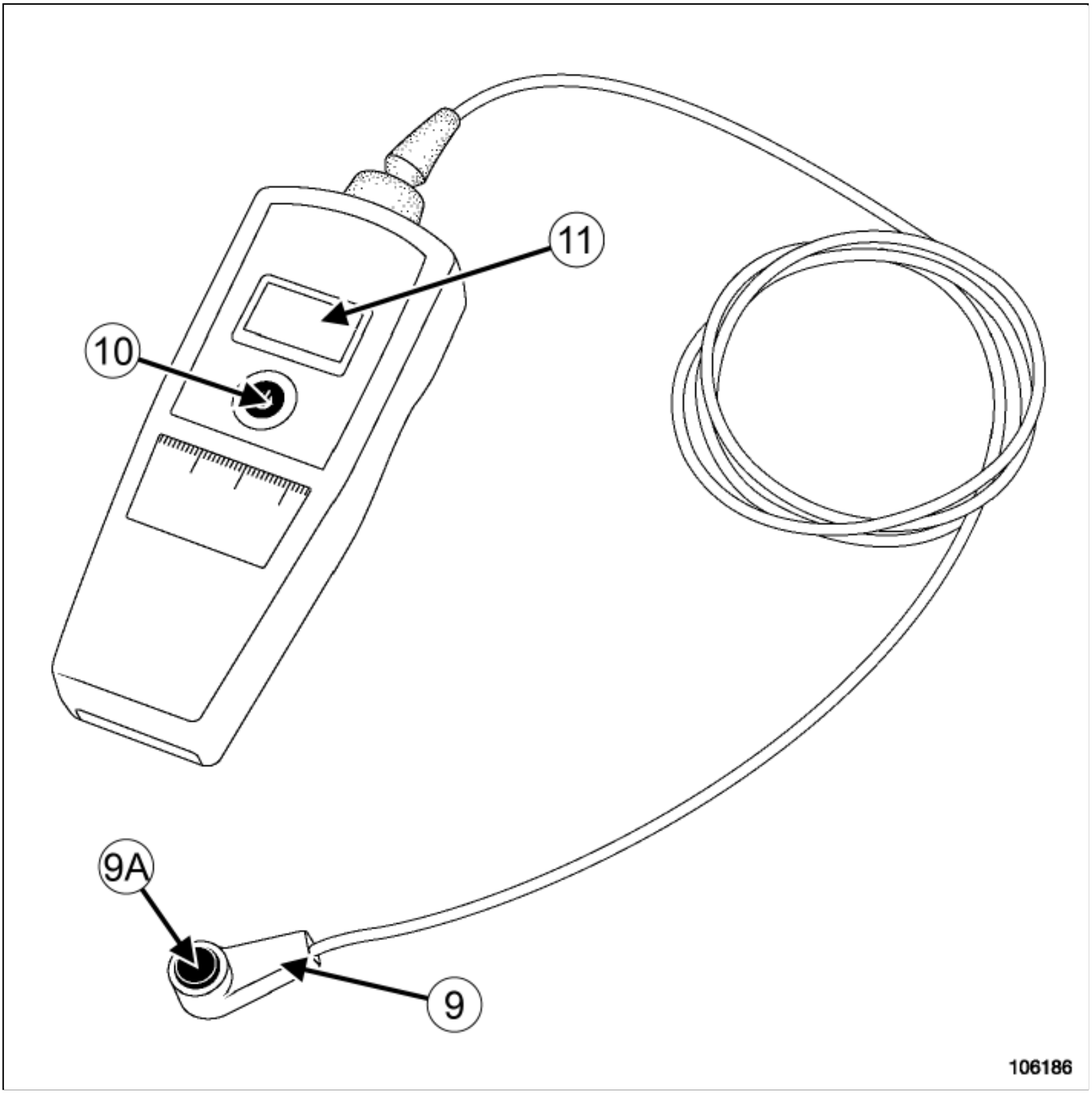


- Make the measurement after setting the belt vibrating with a finger.

The measurement is validated by a bleep.

3. TOOL MOT.1715

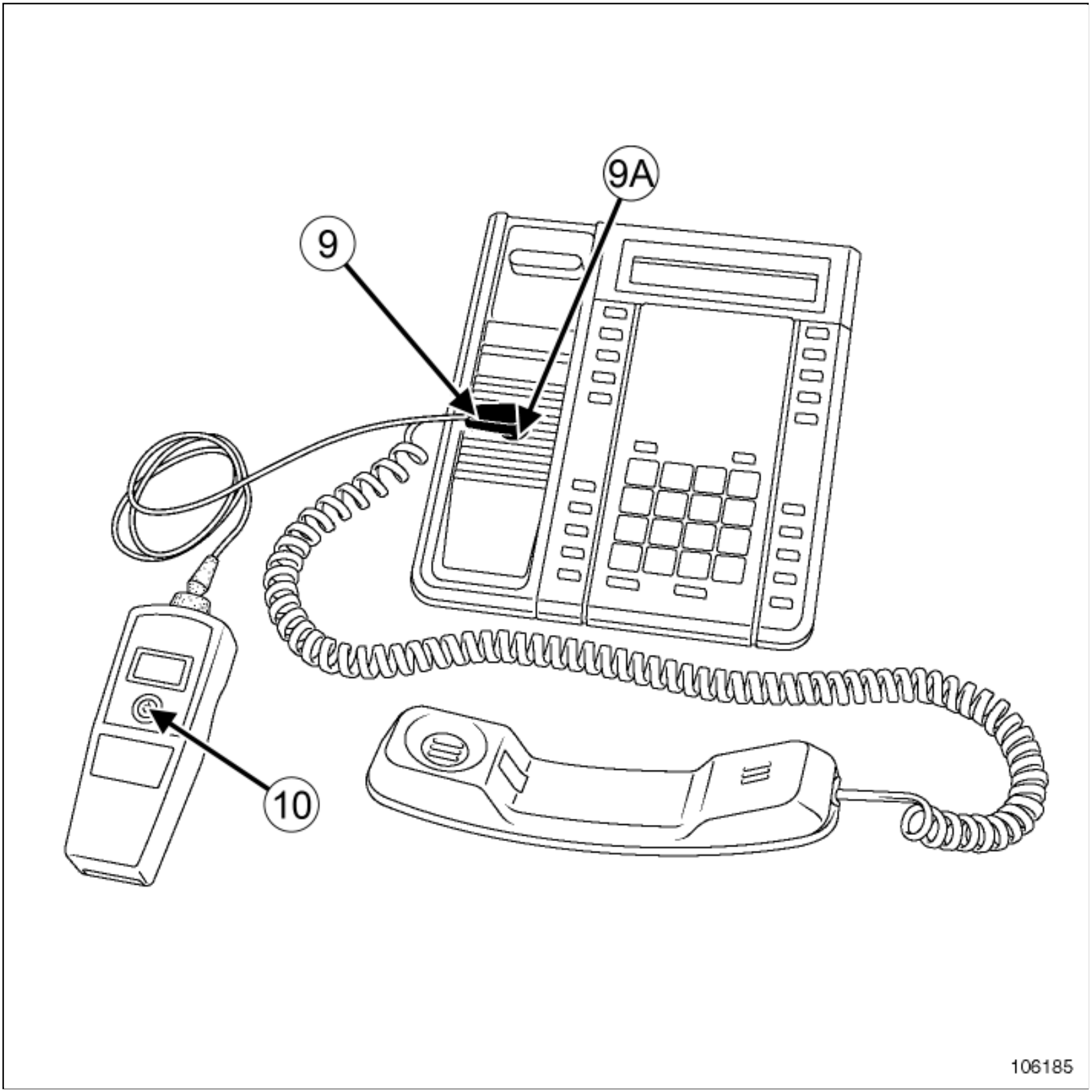
1- DESCRIPTION



The tool is comprised of:

- a reading head(**9**) including one sensor(**9A**) ,
- a power switch(**10**) ,
- a display(**11**) .

2- CALIBRATION



Note:

The tool must be calibrated every month.

This operation allows the calibration of the tool to be checked using a telephone.

- Switch the tool on by pressing on switch(10) .
- Take the telephone receiver off the hook.
- Dial +33 (0)4 92 12 06 54(this number is free to call).

Do not hang up the call.

- Turn up the volume to maximum.
- Position the sensor(9A) on the speaker.
- Read the value shown on the display.

If the value read on the display is not 440 ± 2 Hz, return the tool to the address below:

ONE TOO

1 ZAC de Saint Esteve

06640 Saint-Jeannet les Plans

Tel: +33 (0)4 92 12 04 80

Fax: +33 (0)4 92 12 04 66.

3- OPERATION

1)PRINCIPLE

- This tool measures the frequency of the belt to be checked in Hertz (Hz).

Frequency is a physical unit which here reflects the belt tension level very accurately.

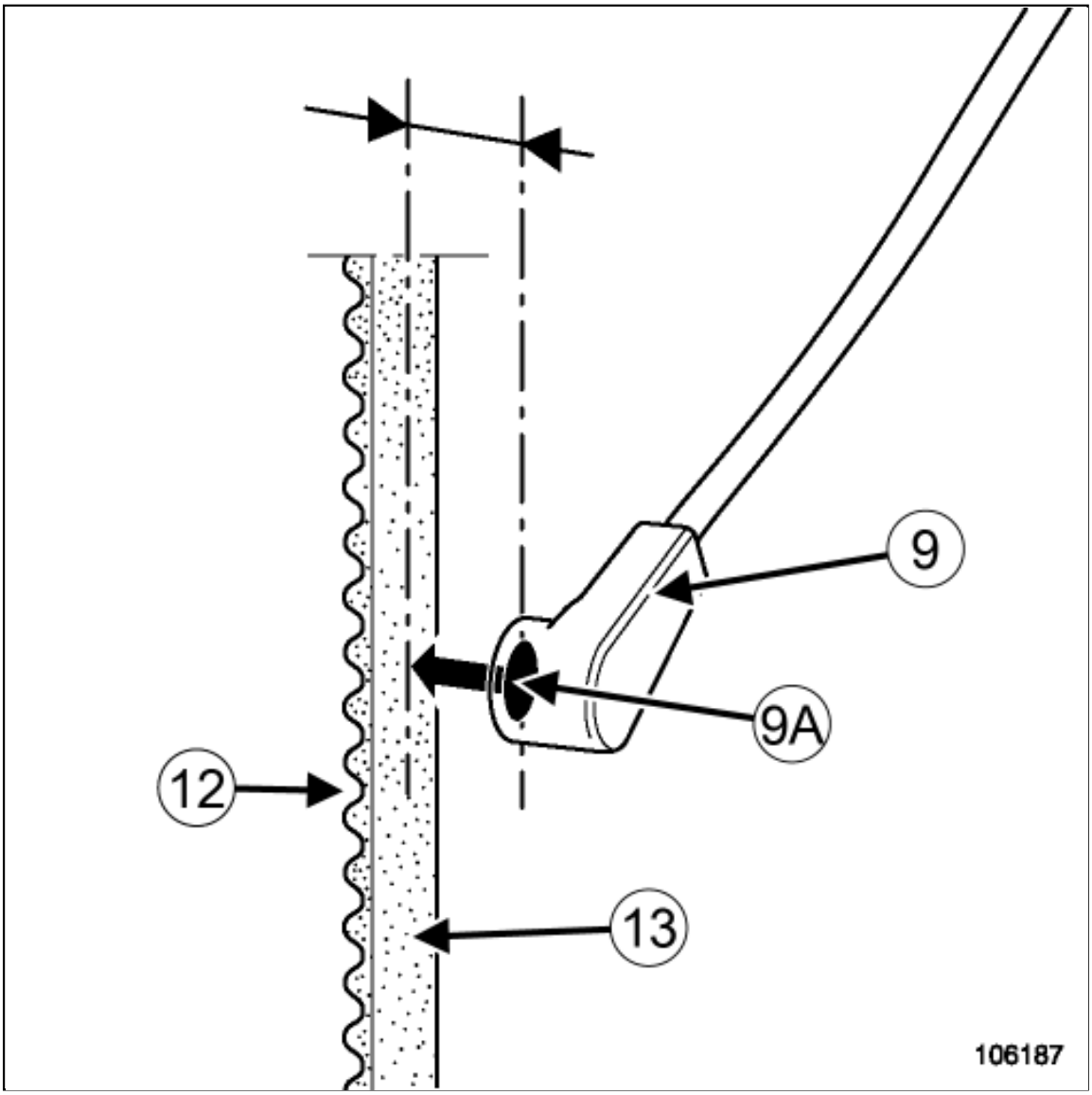
Measuring range: 30 to 520 Hz.

Uncertainty: ± 1 Hz < 100 Hzand 1% > 100 Hz.

2)USE

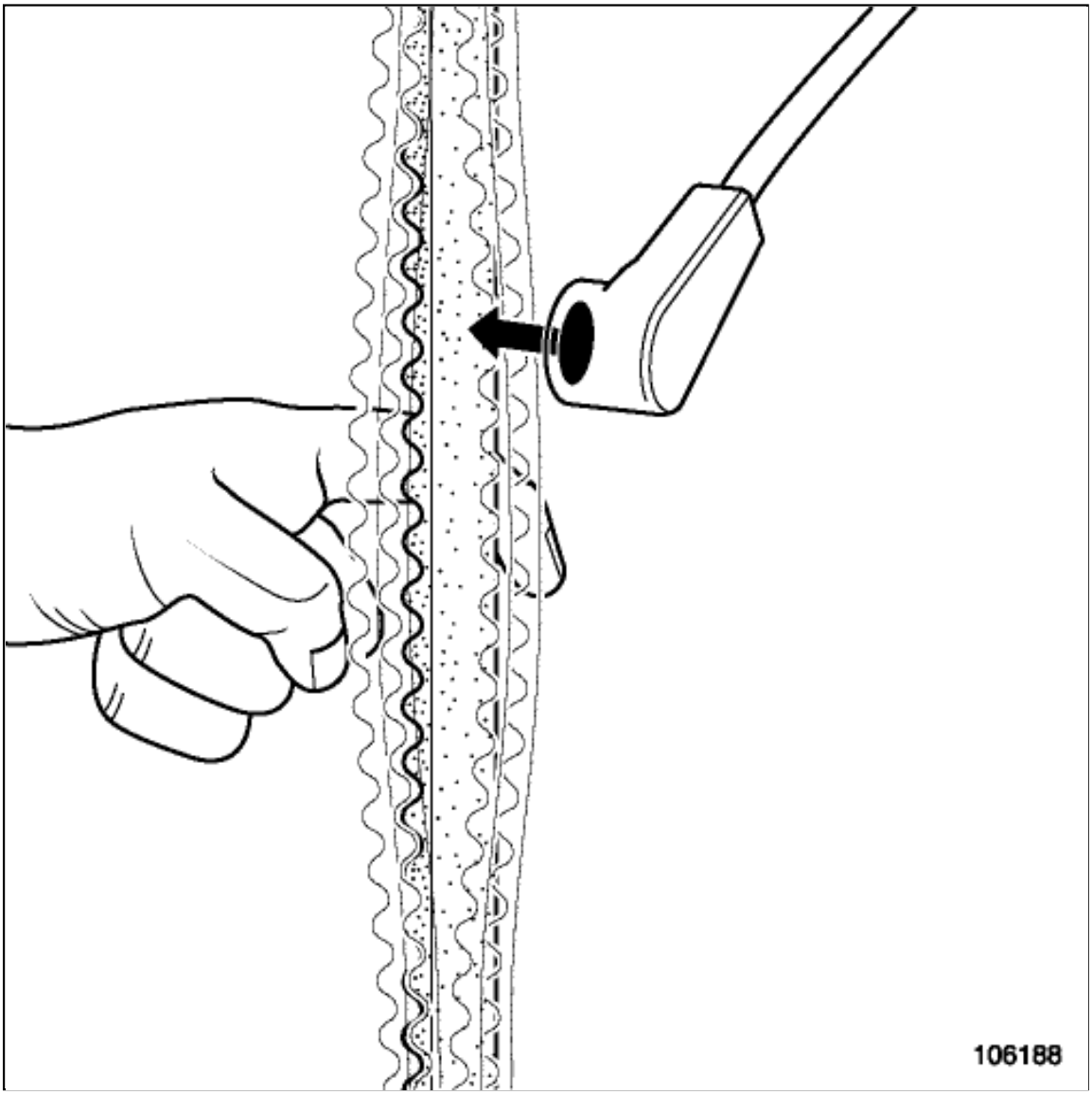
- Switch the tool on by pressing on switch(10) .

Bring the reading head(9) up to the belt section to be measured.



Position the reading head(9) at a distance (x) between approximately 5and 10 mminclusive from the belt.

The measurement can be made on either face(12) or (13) of the belt, according to the dimensions.

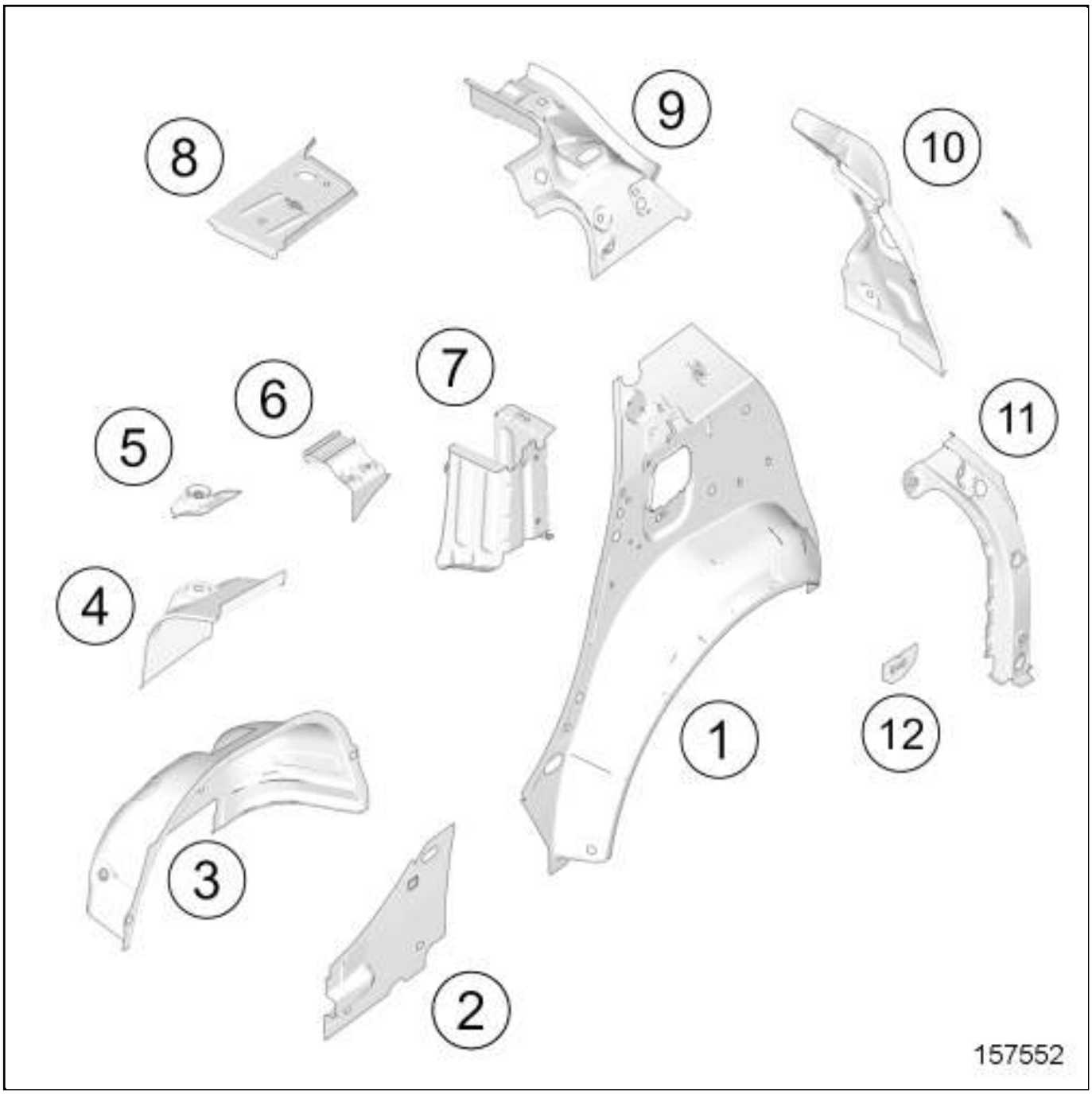


Make the measurement after setting the belt vibrating with a finger.

BODY SIDE REAR LINING: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Outer rear wheel arch	0.65
(2)	Lower connection component of rear inner wheel arch	1.2
(3)	Inner rear wheel arch	0.8
(4)	Shock absorber mounting reinforcement	2
(5)	Rear shock absorber cup	2.5
(6)	Mounting reinforcement plate of second row rear seat	2
(7)	Quarter panel lining reinforcement	1.2
(8)	Rear side parcel shelf	1.2
(9)	Rear upper reinforcement on body side	1.3
(10)	Light mounting lining	0.65
(11)	Rear lower reinforcement on body side	0.7
(12)	Mounting reinforcement for locking seat, second row	1.8

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

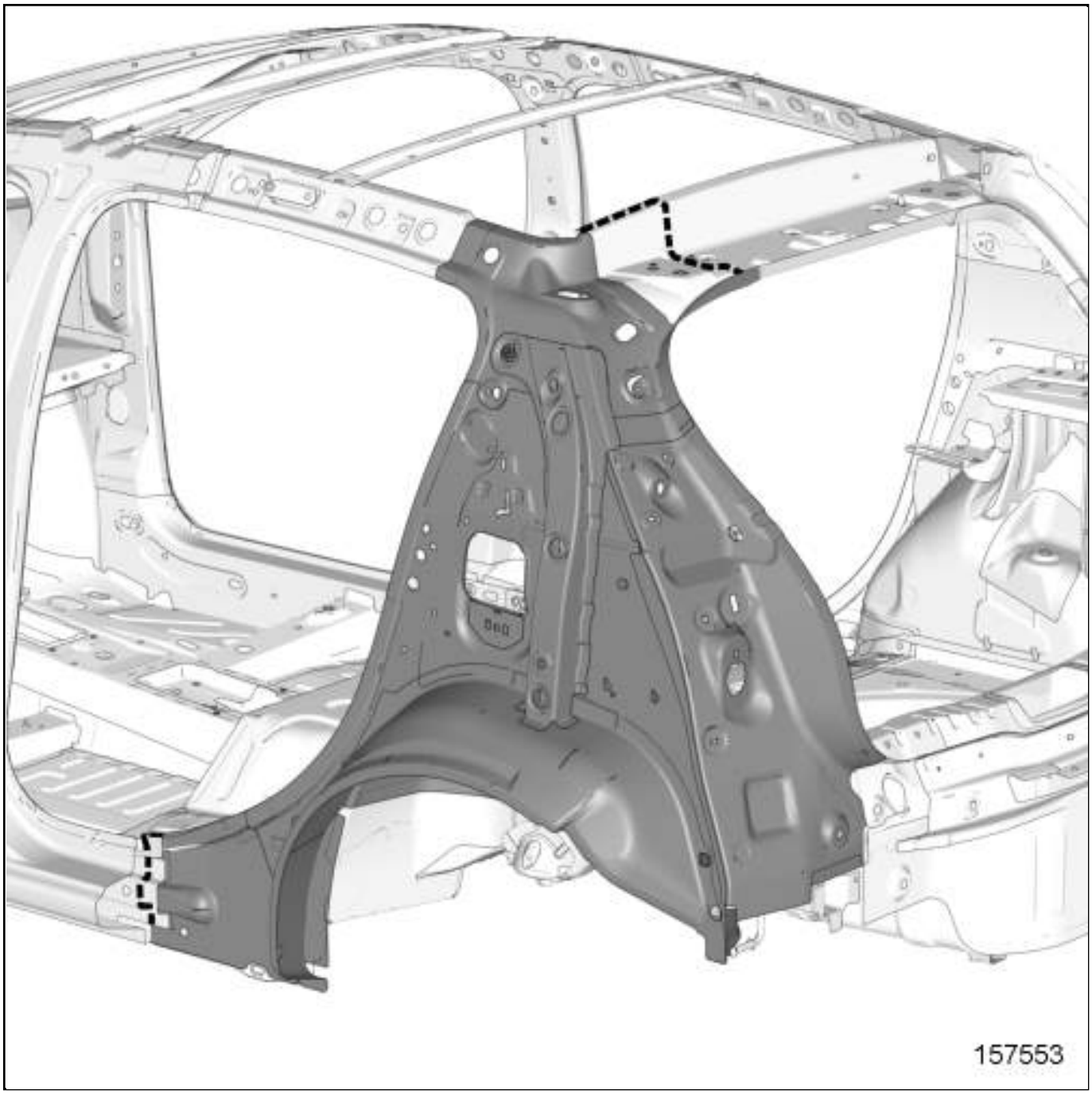
Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT

WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1)PART IN POSITION



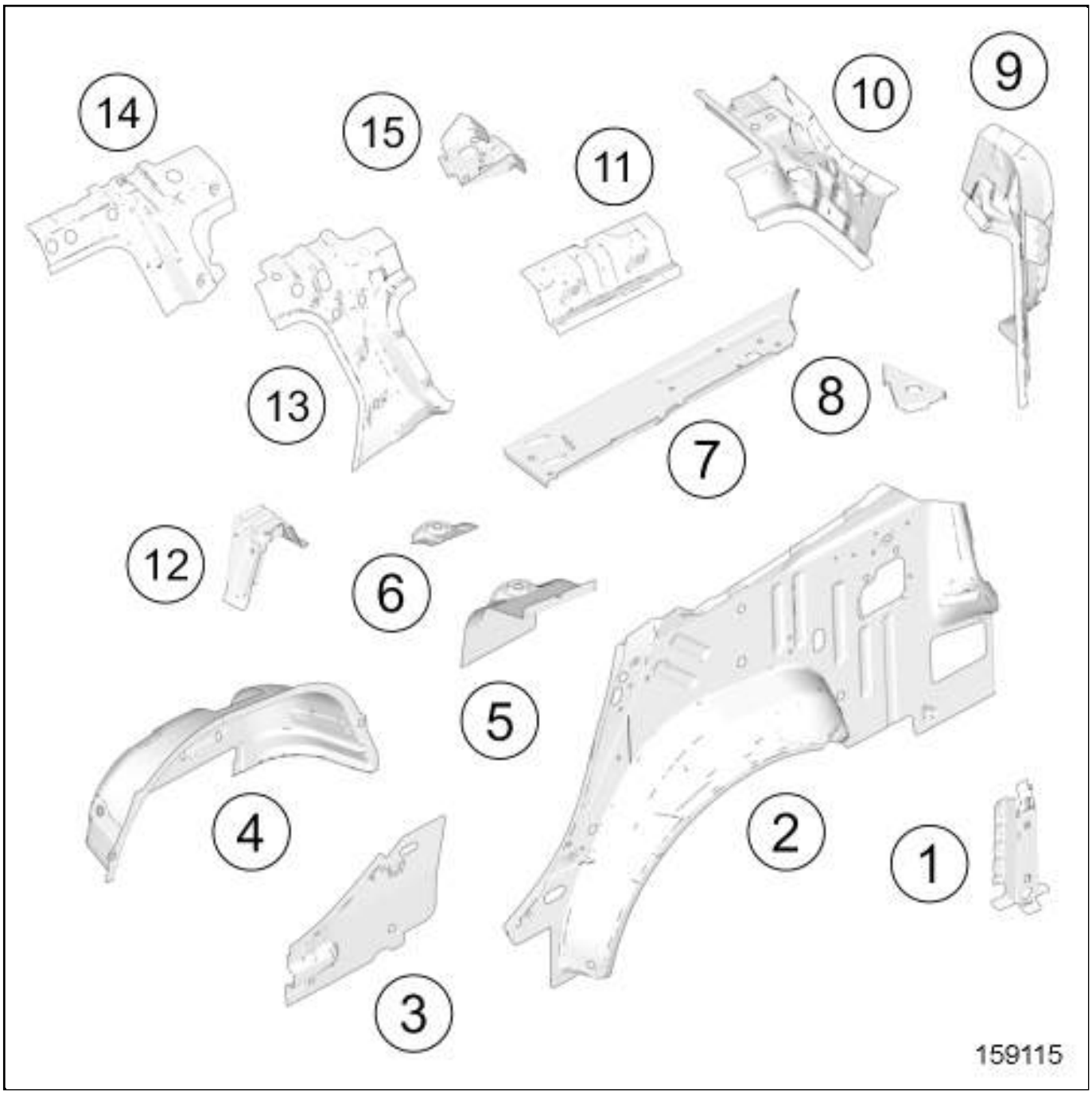
2)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURES TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

Remove the roof**Roof: Replacement** .

BODY SIDE REAR LINING: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Quarter panel front lower reinforcement	0.75
(2)	Outer rear wheel arch	0.65
(3)	Sill panel rear reinforcement	1.2
(4)	Inner rear wheel arch	0.8
(5)	Shock absorber mounting reinforcement	2
(6)	Rear shock absorber cup reinforcement	2.5
(7)	Rear side parcel shelf	1.2
(8)	Stiffener of quarter panel rear reinforcement	1.2
(9)	Quarter panel rear lower reinforcement	0.95
(10)	Quarter panel rear upper reinforcement	1.5
(11)	Side roof rail lining	1
(12)	Mounting reinforcement for locking seat, second row	1.5
(13)	Seat belt anchorage point reinforcement	1
(14)	Rear side roof rail reinforcement	1.2
(15)	Rear seat belt anchorage centre reinforcement	1.2

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

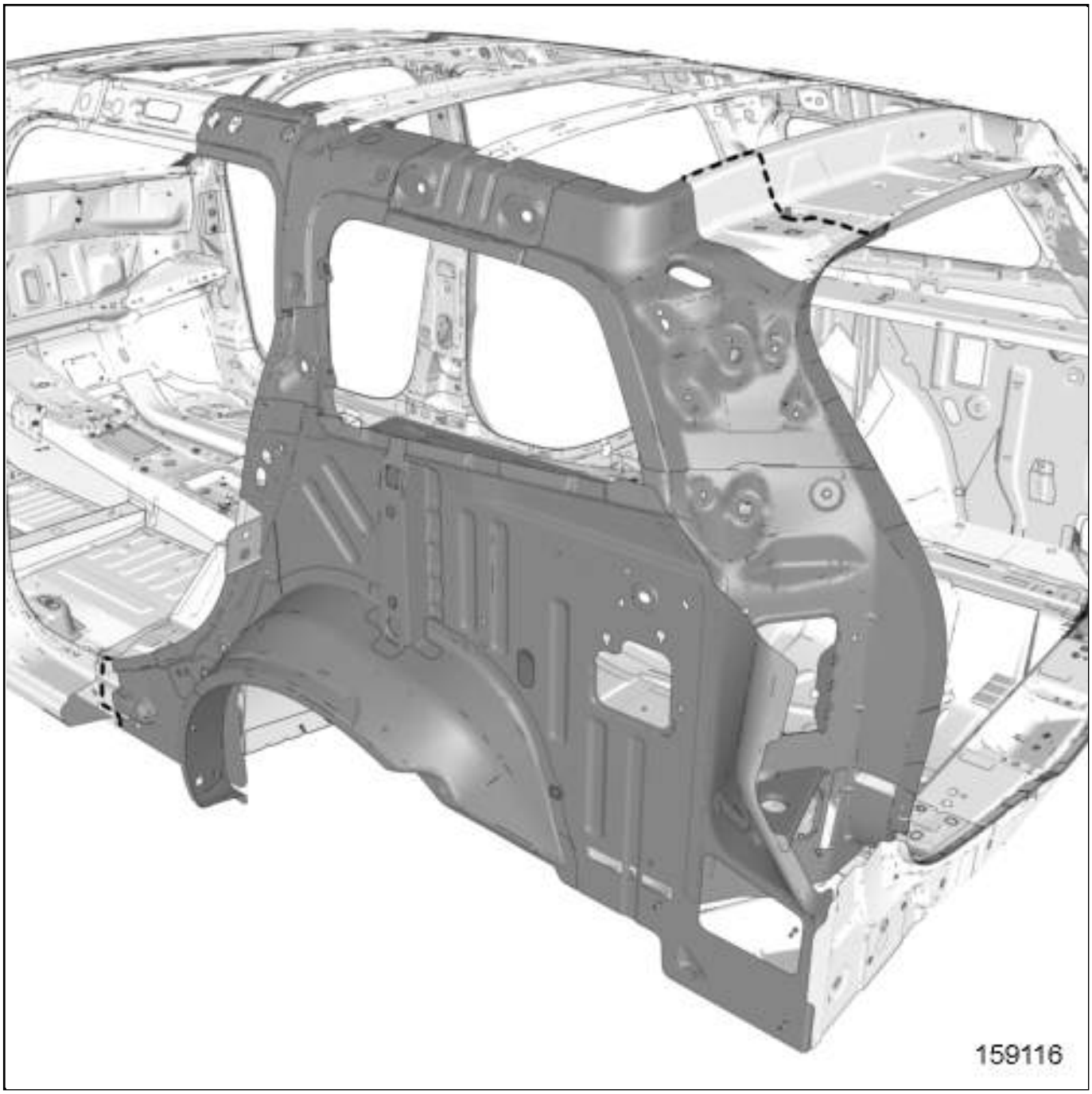
Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT

WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1)PART IN POSITION



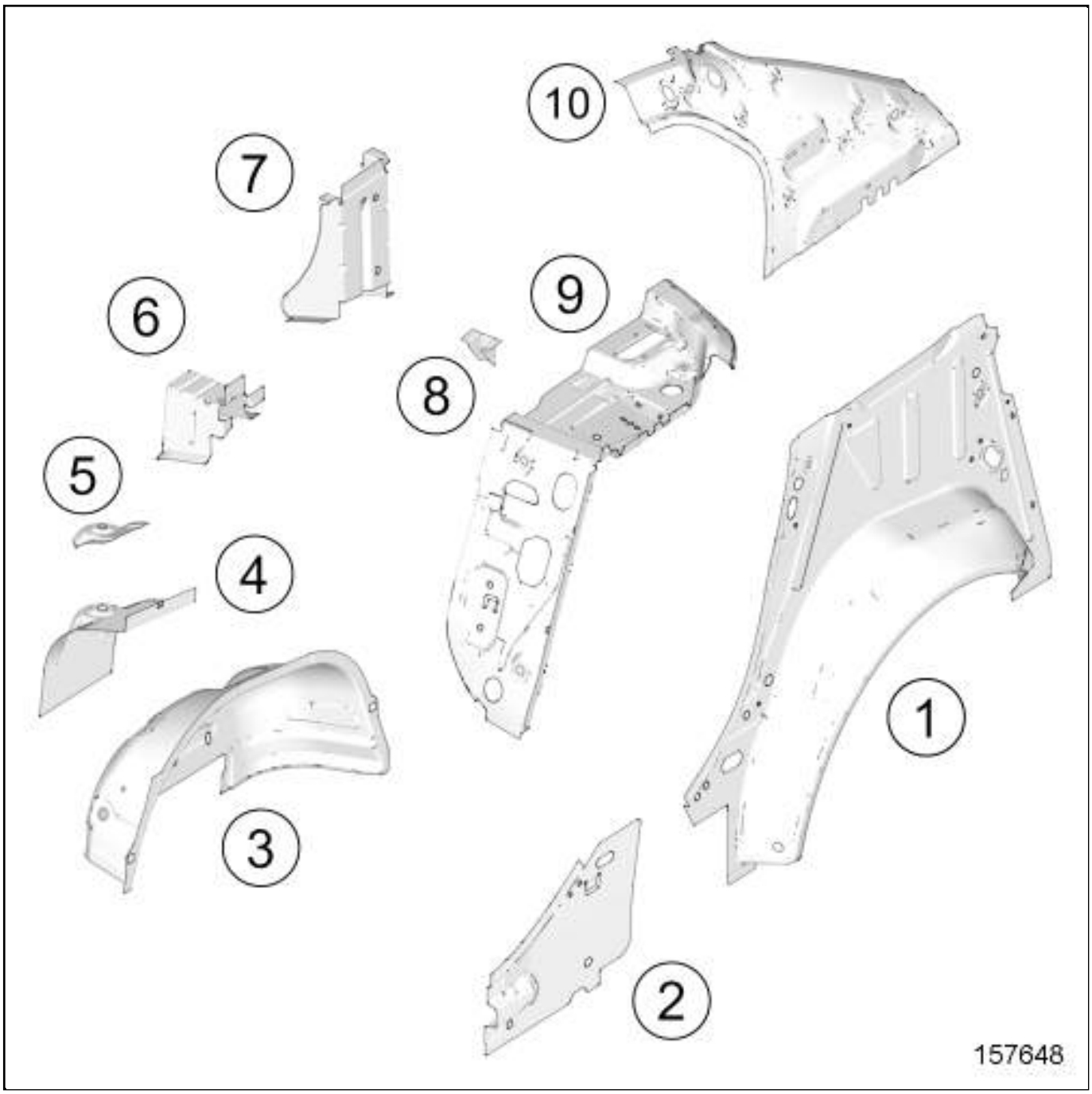
2)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURES TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

Remove the roof**Roof: Replacement** .

BODY SIDE REAR LINING: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Outer rear wheel arch	0.65
(2)	Lower connection component of rear inner wheel arch	1.2
(3)	Inner rear wheel arch	0.8
(4)	Shock absorber mounting reinforcement	2
(5)	Rear shock absorber cup	2.5
(6)	Mounting reinforcement plate of second row rear seat	1.5
(7)	Quarter panel lining reinforcement	1.2
(8)	Luggage compartment light switch mounting bridge piece	0.95
(9)	Rear side parcel shelf	1.2
(10)	Quarter panel lining	0.65

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

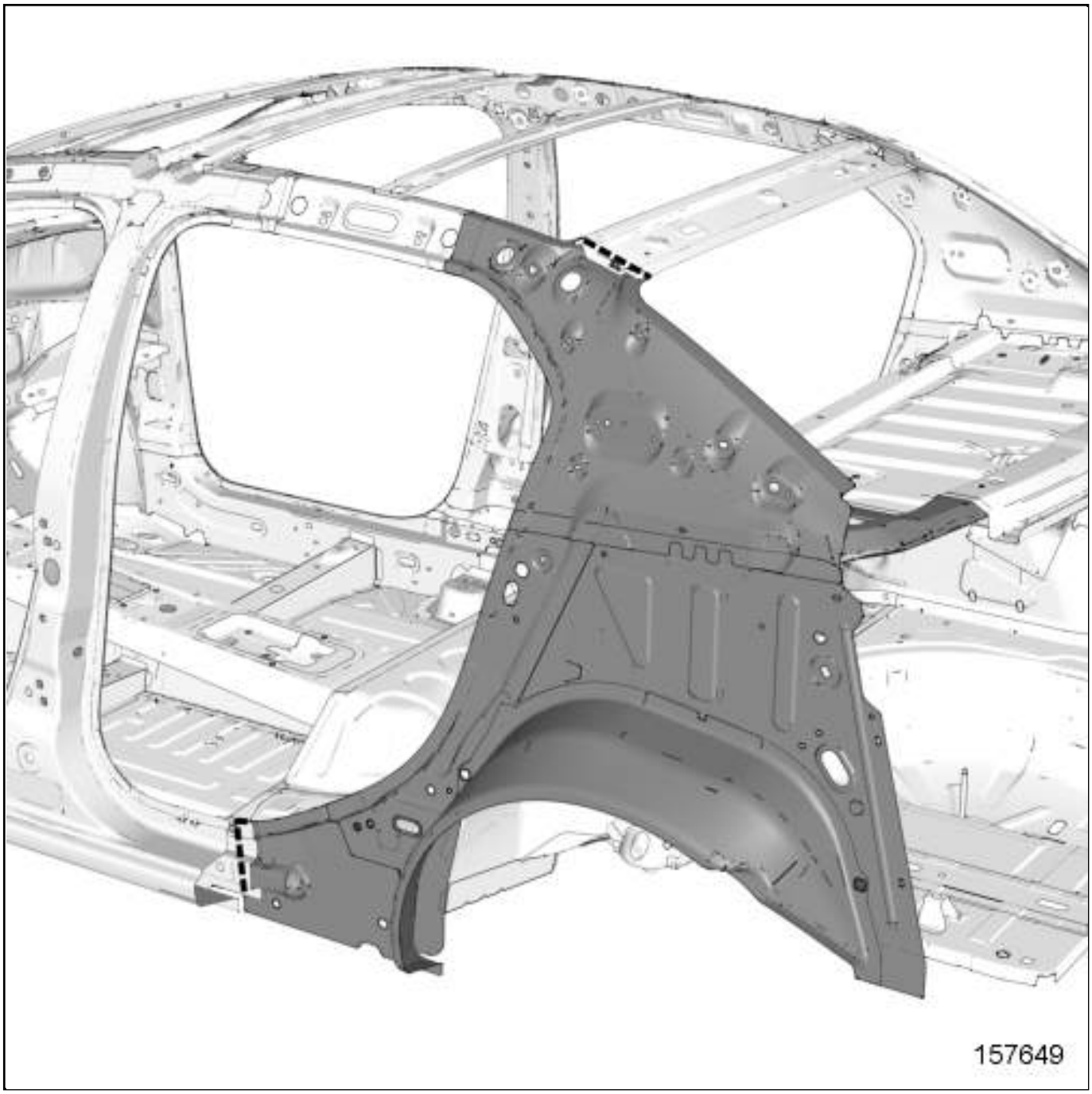
Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT

WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1)PART IN POSITION



2)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURES TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

Remove the roof**Roof: Replacement** .

BODY SIDE, FRONT SECTION: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

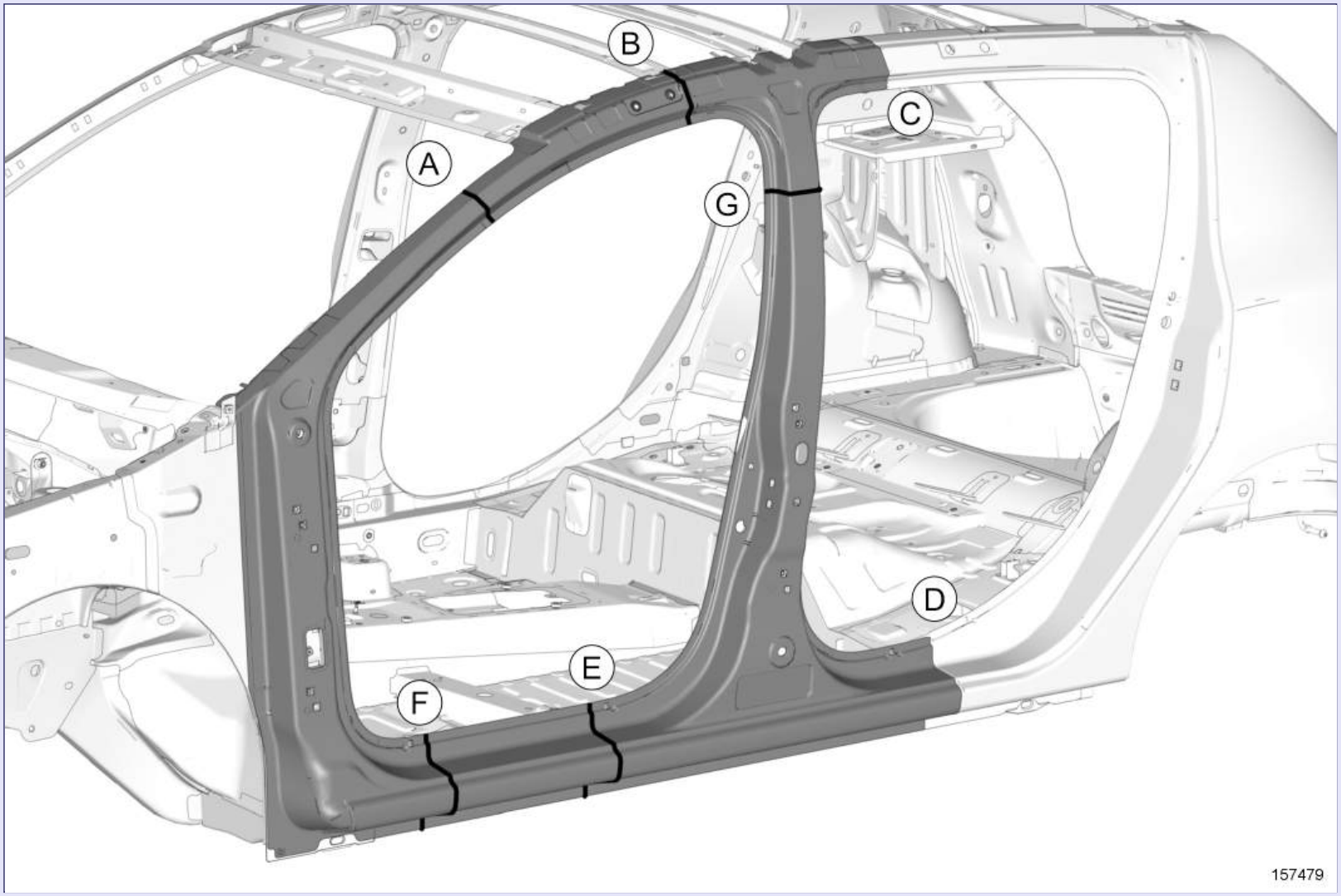
No.	Description	Thickness (mm)
(1)	Body side, front section	0.65

2. IN THE EVENT OF REPLACEMENT

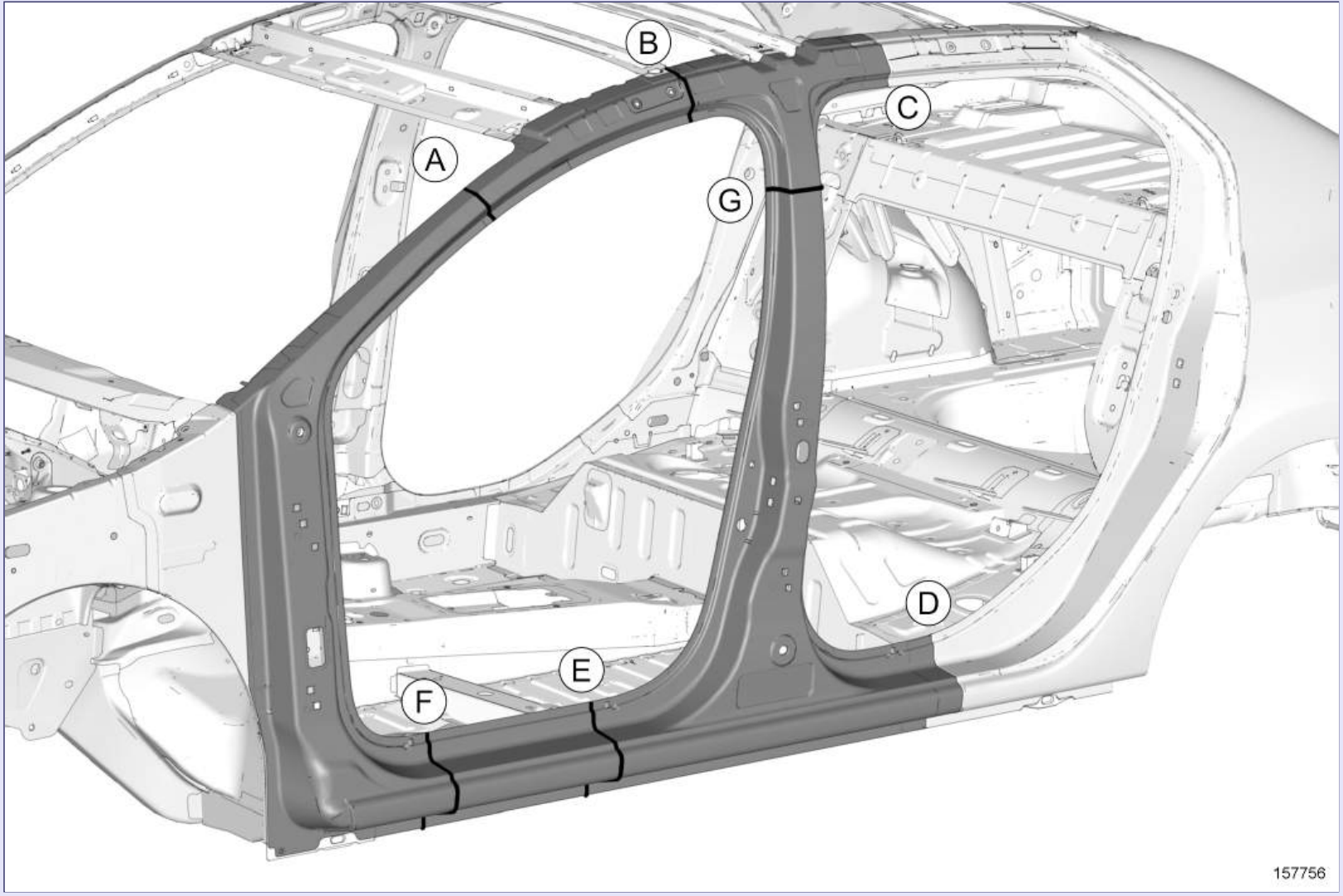
The options for replacing this part are as follows:

- complete replacement C-D,
- partial replacement A-E,
- partial replacement A-D-G,
- partial replacement B-C-D-F,
- partial replacement D-F-G.

B52(B52)



L52(L52)



CAUTION
If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

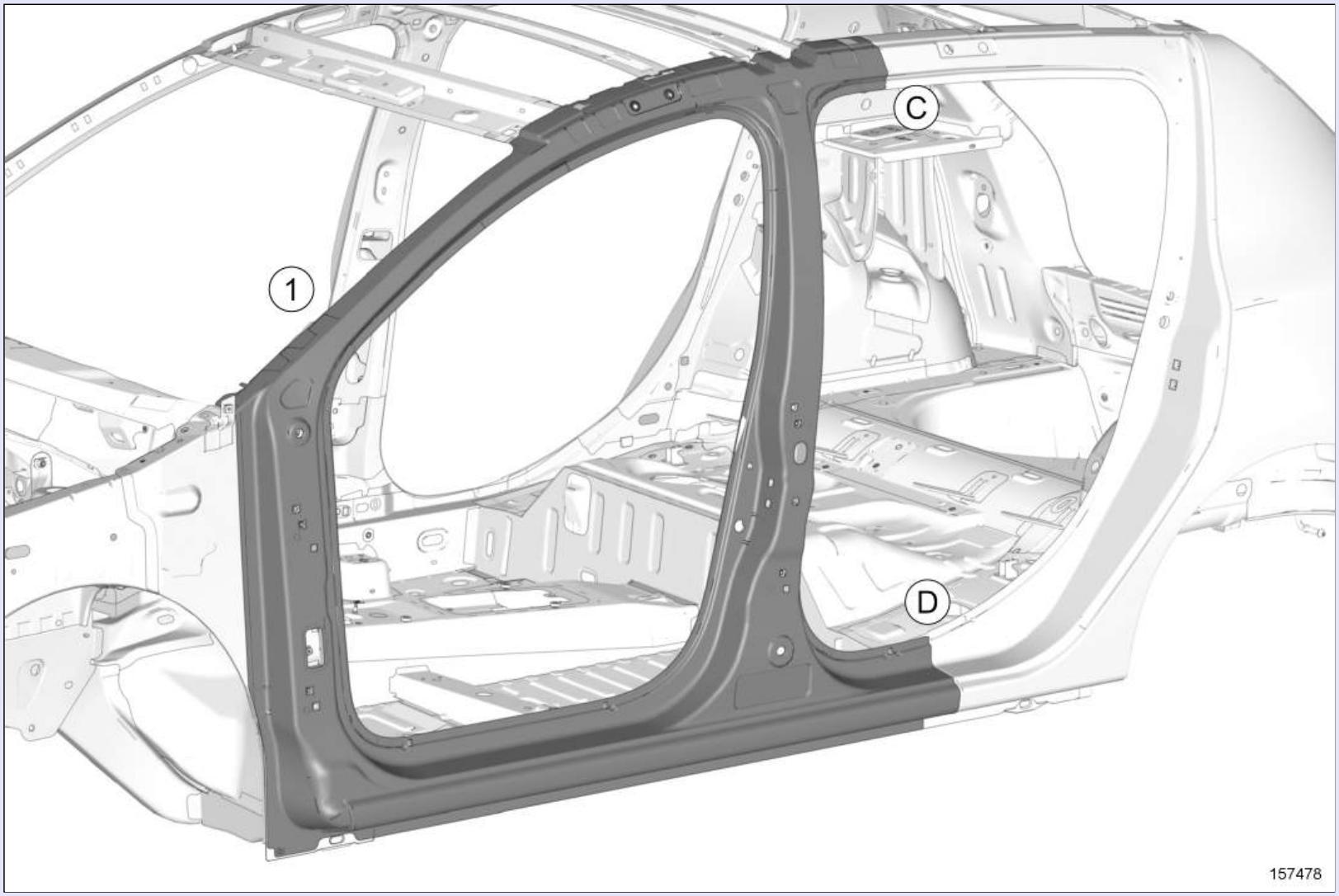
Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

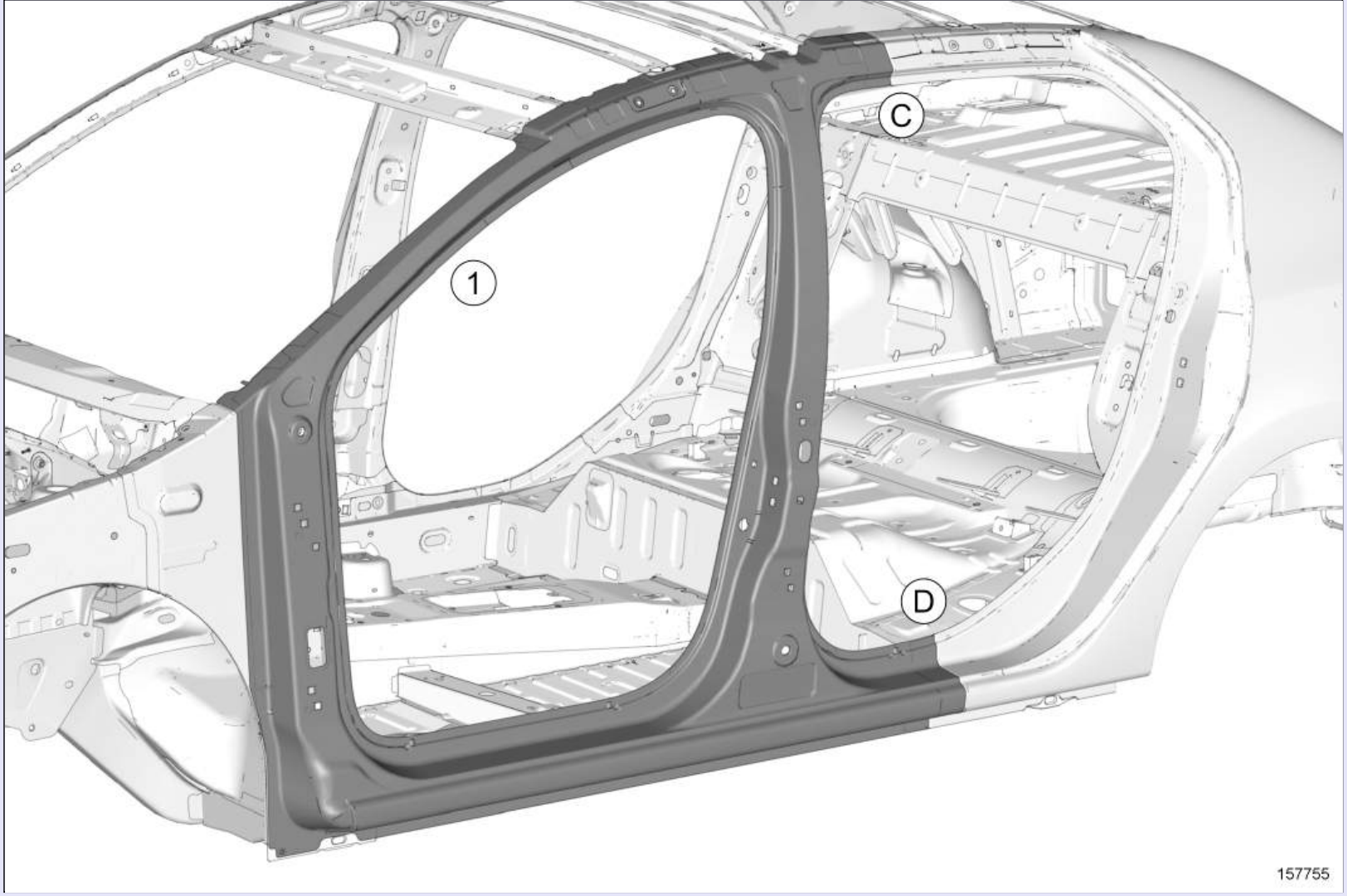
1- COMPLETE REPLACEMENT C-D

1)PART IN POSITION

B52(B52)



L52(L52)

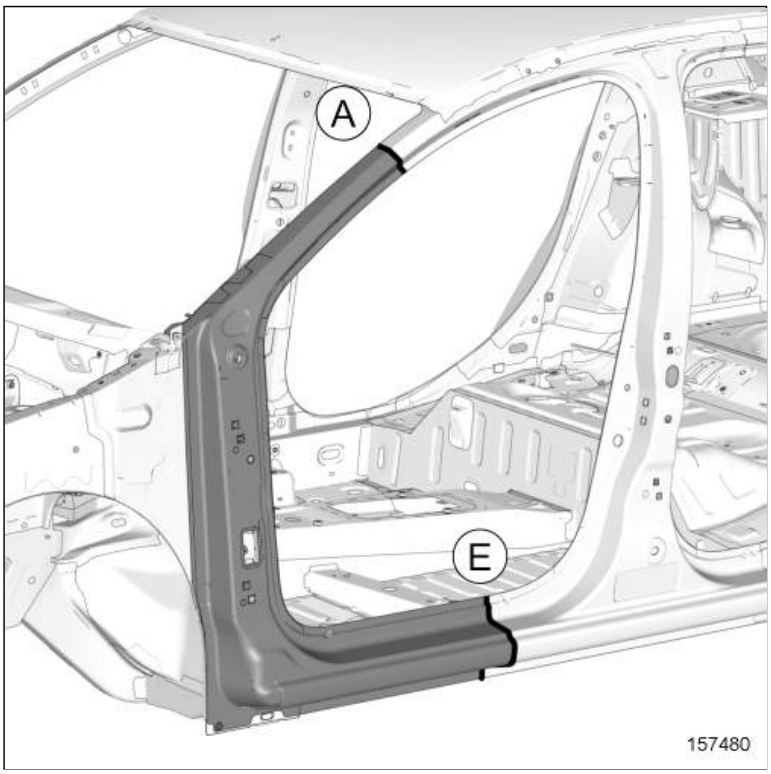


2)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURAL COMPONENTS TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

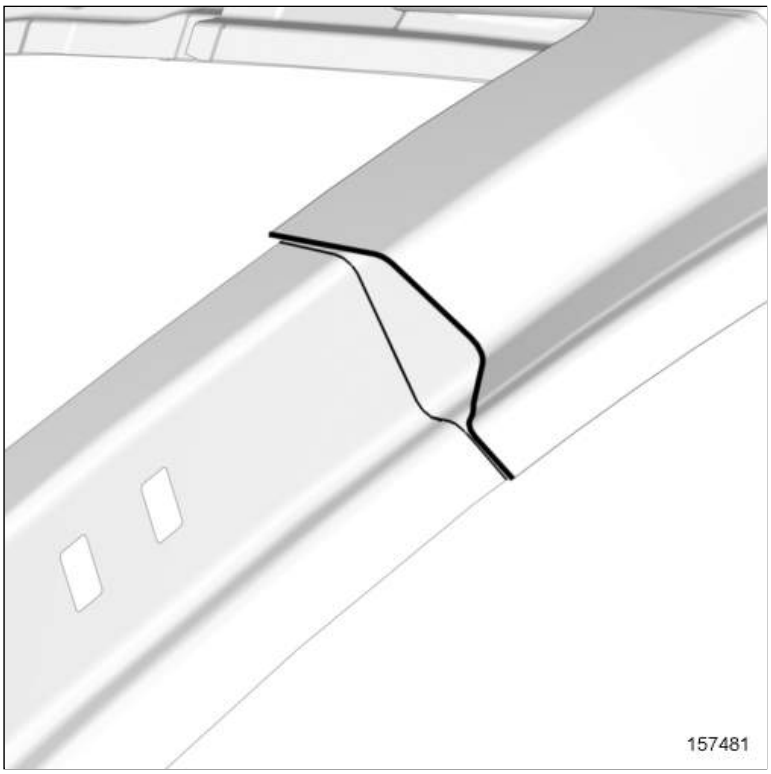
Remove the roofRoof: Replacement .

2- PARTIAL REPLACEMENT A-E

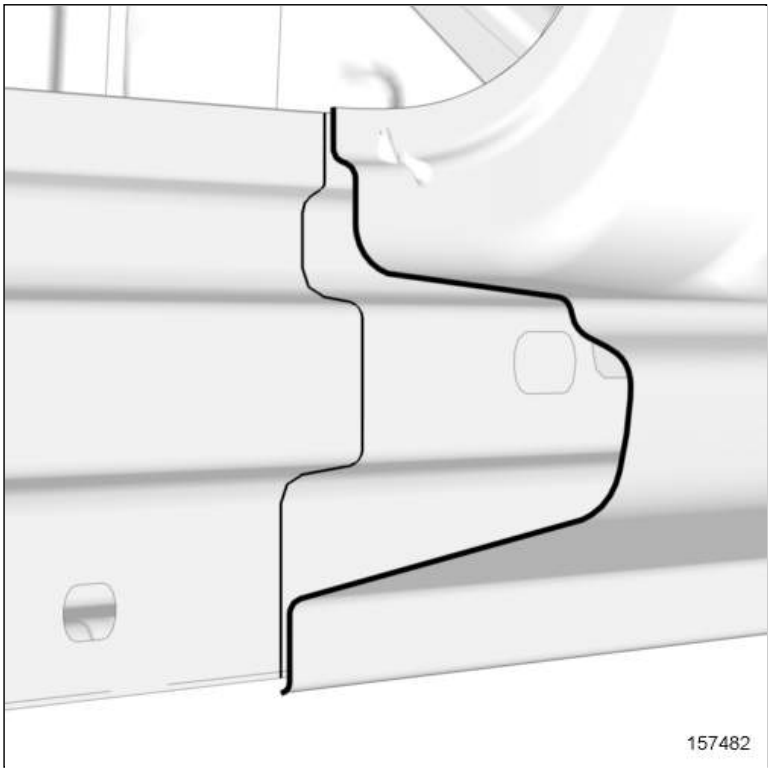
1)PART IN POSITION



DETAILED VIEW A



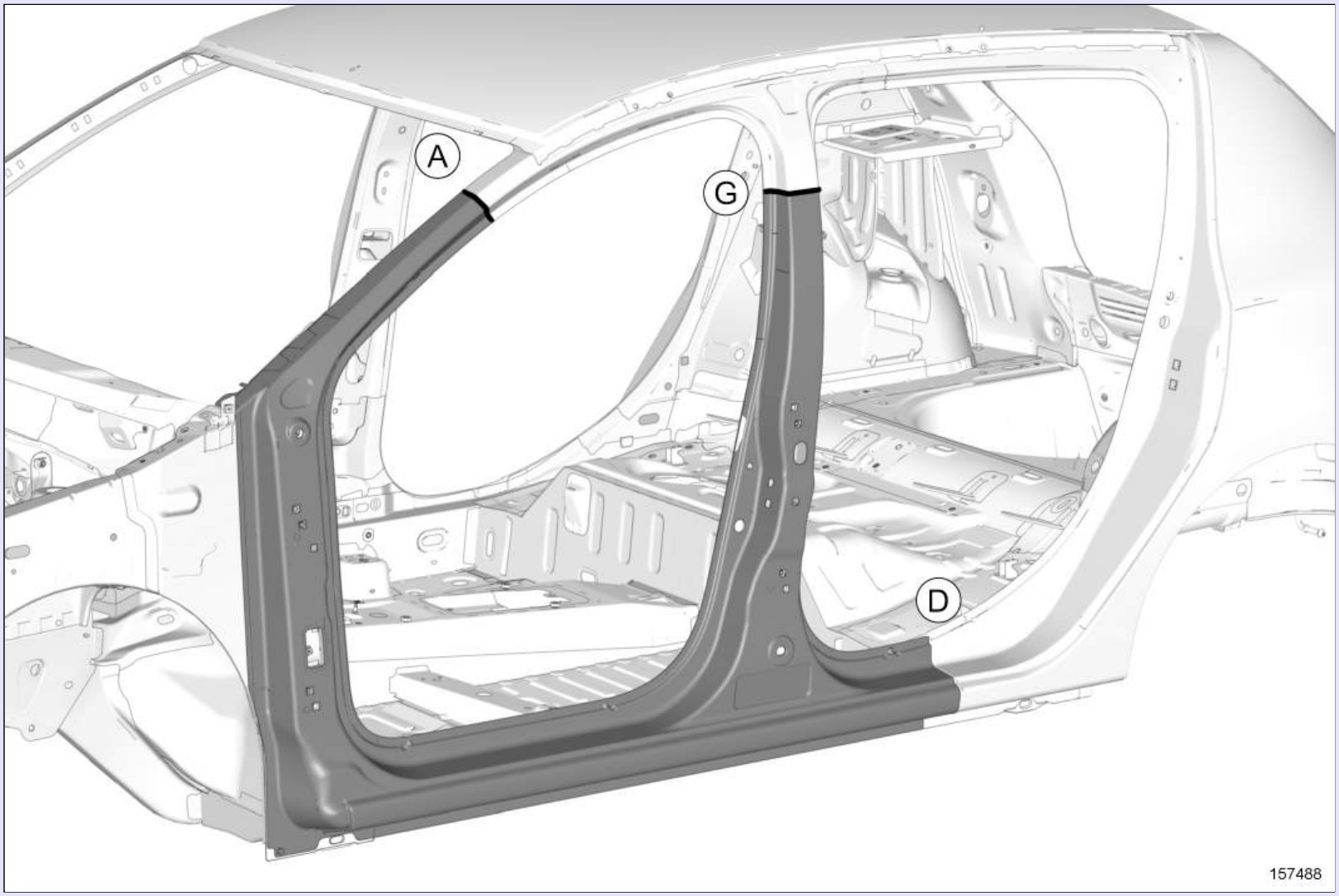
DETAILED VIEW E



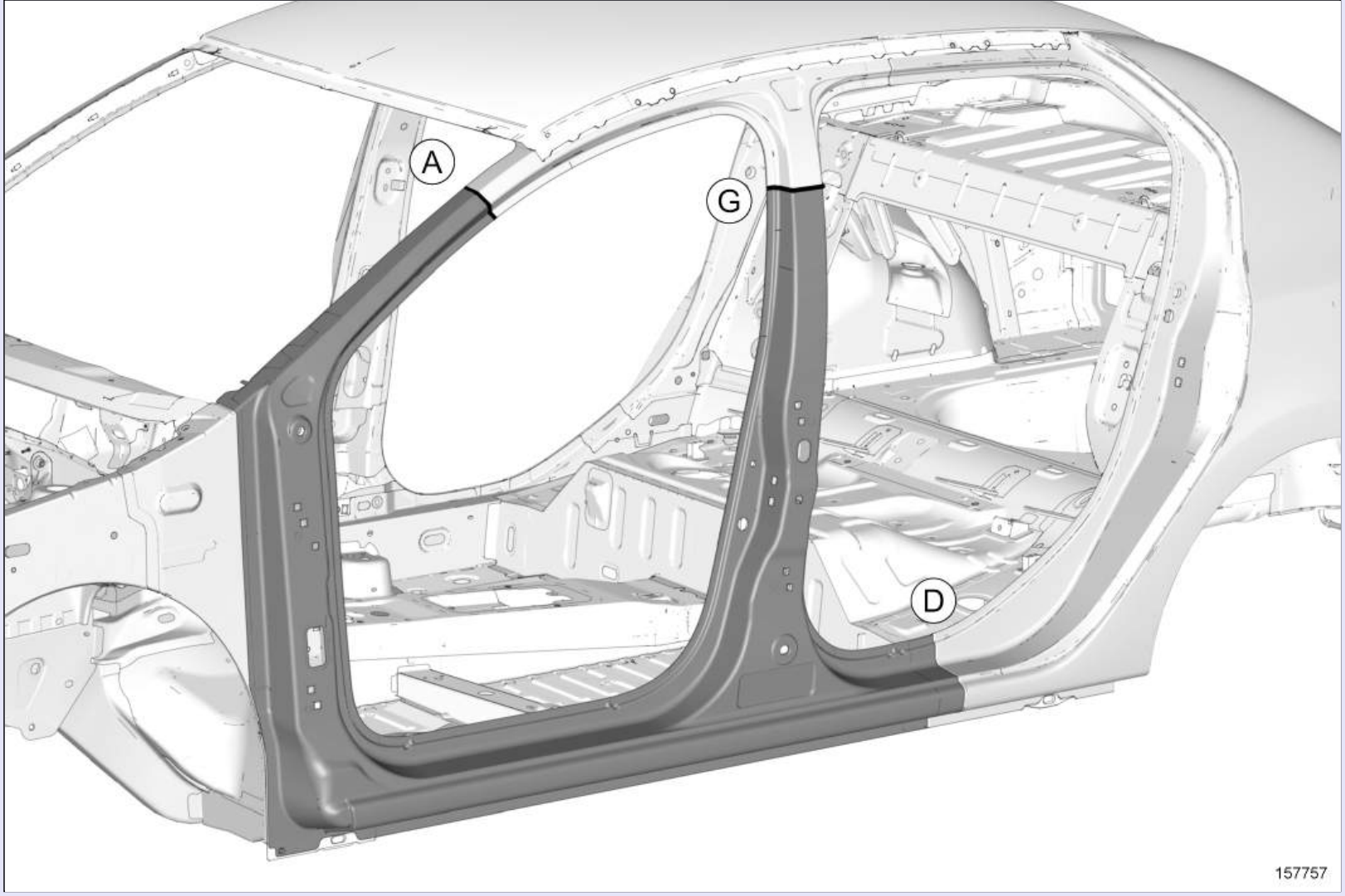
3- PARTIAL REPLACEMENT A-D-G

1)PART IN POSITION

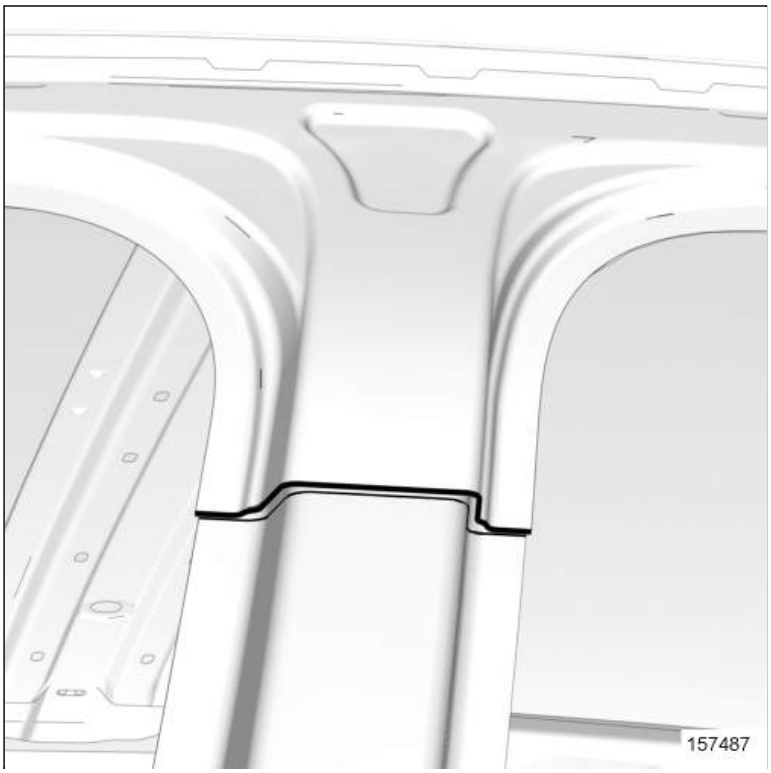
B52(B52)



L52(L52)

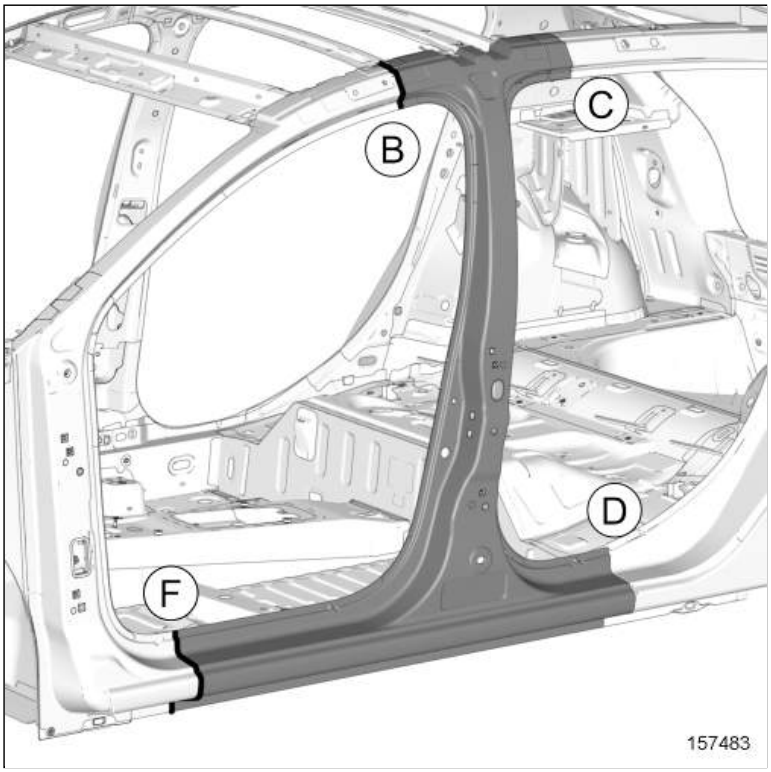


DETAILED VIEW G

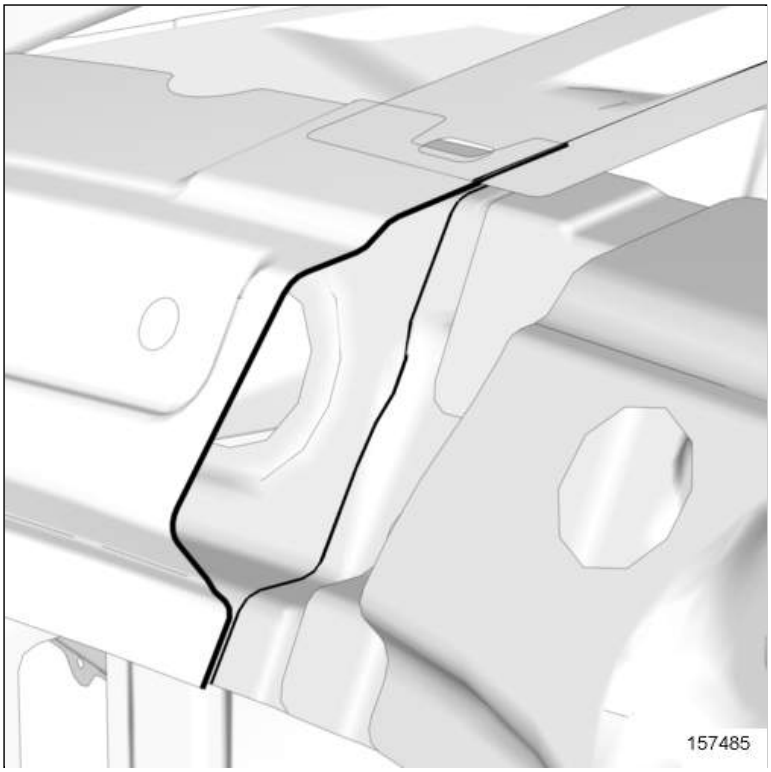


4- PARTIAL REPLACEMENT B-C-D-F

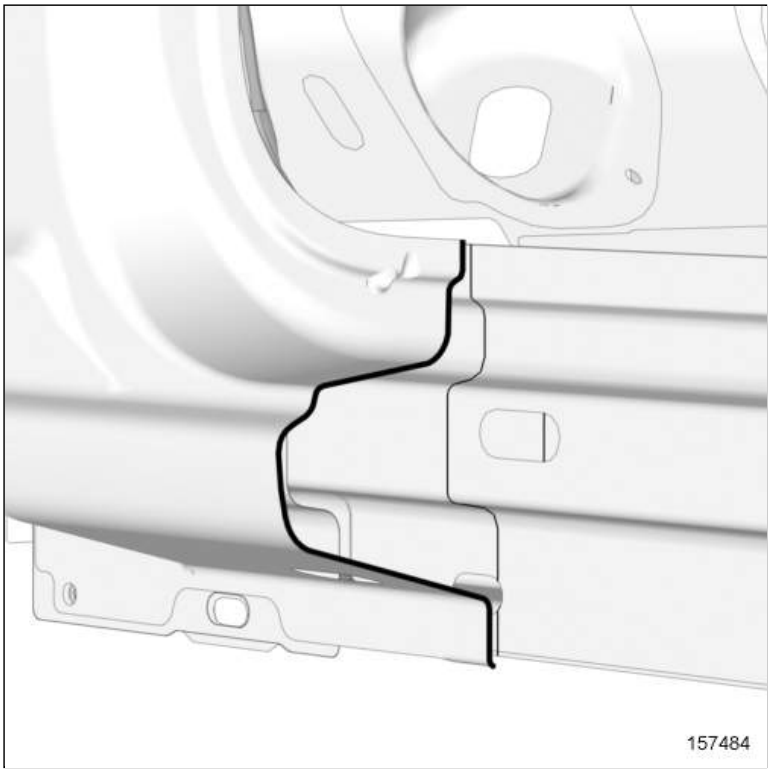
1)PART IN POSITION



DETAILED VIEW B



DETAILED VIEW F

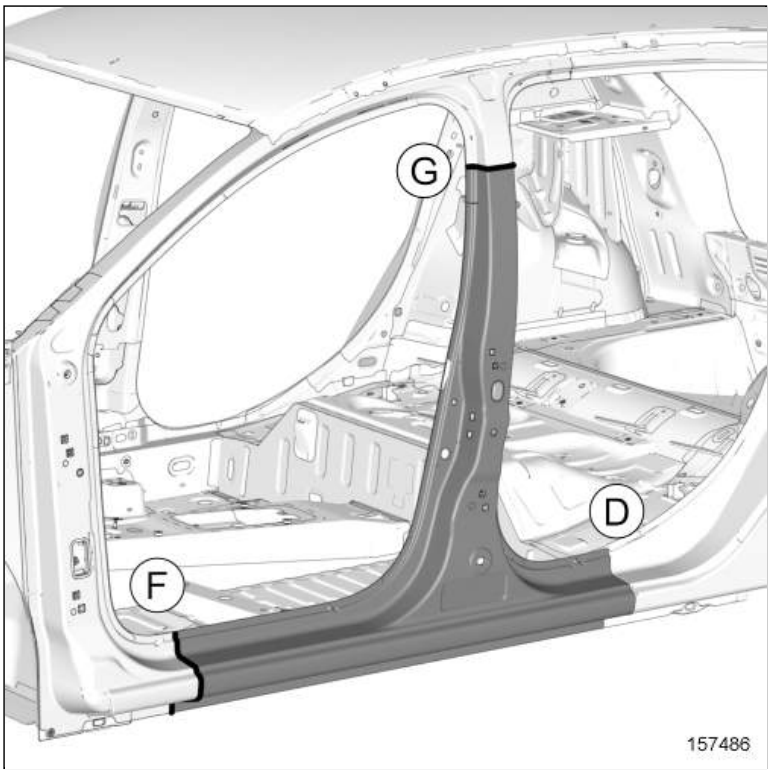


2)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURAL COMPONENTS TO BE REMOVED IN ORDER TO CARY OUT THE REPLACEMENT OPERATION

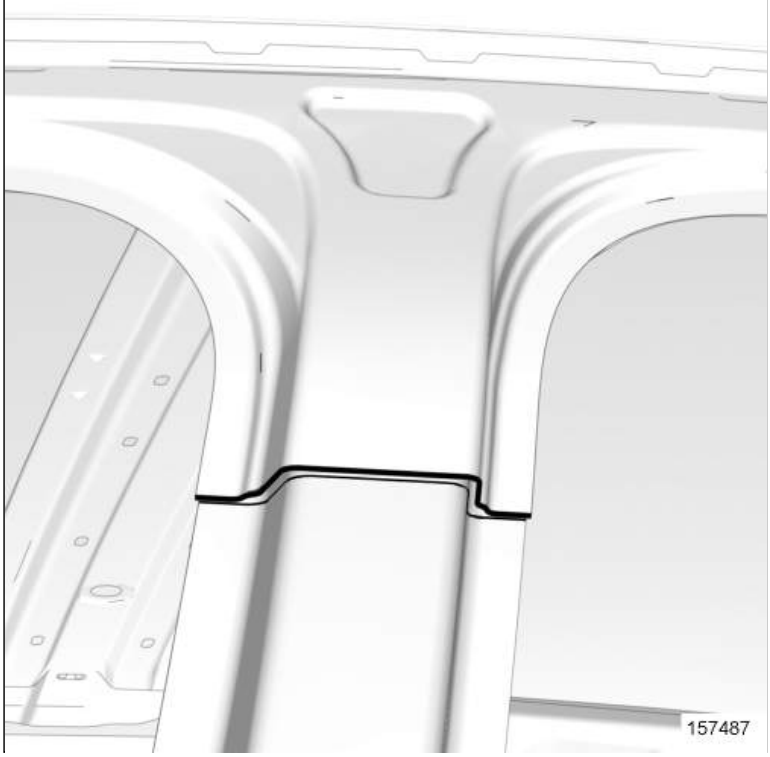
Remove the roofRoof: Replacement .

5- PARTIAL REPLACEMENT D-F-G

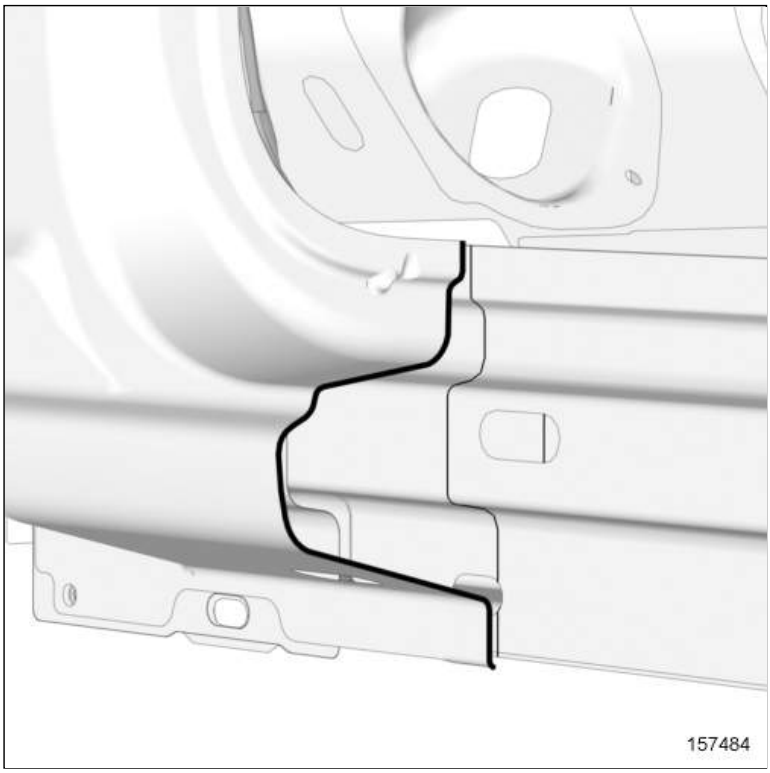
1)PART IN POSITION



DETAILED VIEW G



DETAILED VIEW F



BODYWORK: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. INTRODUCTION

All the operations described in the repair methods guarantee conformity of the mechanical contents and release the repairer from his responsibilities.

The timings necessary to calculate time for coded operations are carried out according to these methods and with the tools contained in the ranges.

2. GENERAL RULES

As far as possible, reproduce the vehicle's original quality features: regarding impact, endurance, corrosion, acoustics and appearance.

If for feasibility reasons in the repair, the original connection or appearance cannot be reproduced, replacement solutions validated by the "Repair Method Engineering" department are indicated either in the MR of the vehicle concerned, or in the general and fundamental methods(see 40A, General information, Structural bodywork documentation: Description) .

For all operations that necessitate beating the bodywork of the vehicle (e.g.: hammer or "nail puller"): lock the airbag computer and disconnect the battery.

For all welding operations (e.g.: Resistance welding, Electric welding with shielding gas or "nail welding"): lock the airbag computer, disconnect the battery and the vehicle's electrical circuit earths located near the area to be welded(see **General information**) .

WARNING

DANGER: HIGH VOLTAGE VEHICLE.

Risks of serious burns or electric shock that may prove fatal.

Before carrying out any work on the vehicle, it is essential that you adhere to the instructions regarding vehicle voltage cut-off. This work must be carried out by an employee who is qualified and authorized to work on a high-voltage onboard network Vehicle: Precautions for the repair .

Before carrying out bodywork operations on an electric vehicle, disconnect the vehicleVehicle: Lockout - Removal of lockout .

3. REPAIRING THE VEHICLE

Fault finding:(see 40A, General information, Impact fault finding: Description) .

Straightening: (see 40A, General information, Straightening a component: Description) .

Replacing components:(see 40A, General information, Replacing a non-removable component: Description) .

For a significant impact, it can be necessary to carry out preliminary jacking to release the electric wiring harnesses, certain mechanical components or simply to access detaching of strategic connections. In some cases, it will be necessary to carry out preliminary cutting on the part damaged by the impact.

4. SAFETY INSTRUCTIONS FOR REPAIRING BODYWORK STRUCTURES

SYMBOL KEY :

(1) Obligatory ears protection

(2) Obligatory eye protection

(3) Obligatory respiratory protection

(4) Obligatory eye and face protection

(5) Fire risk danger

(6) Obligatory hand protection

(7) Use extra ventilation source

(8) Protection of interior fittings

(9) Protection of internal and external window faces

(10) External bodywork protection

BODYWORK SEALING PRODUCTS

1. BODYWORK SEALING PRODUCTS

1- PRODUCTS TO ASSIST THE SEARCH FOR WATER INGRESS

- bodywork cleaning shampoo(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

2- PRODUCTS FOR REPAIRING THE SEALING OF BONDED WINDOWS

- monopac evolution adhesive kit(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- additional monopac evolution cartridge + nozzle(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- S-P adhesive kit(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- additional S-P kit cartridge + nozzle(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- bipac evolution adhesive kit(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

3- PRODUCTS FOR REPAIRING THE SEALING OF FITTED WINDOWS

- window sealing mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

4- PRODUCTS FOR REPAIRING THE SEALING OF OPENING ELEMENT TRIMS

- bead of preformed sealing mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

5- PRODUCTS FOR REPAIRING THE SEALING OF THE MATING SURFACES OF PANELWORK

- mastic for brush application(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- white or black extruded mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

6- PRODUCTS FOR REPAIRING THE SEALING OF THE MATING SURFACES OF REMOVABLE PANELWORK COMPONENTS

- filler mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

7- FINISHING PRODUCTS FOR REPAIRING THE SEALING

- anti-gravel mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

XSL version : 3.02 du 22/07/11

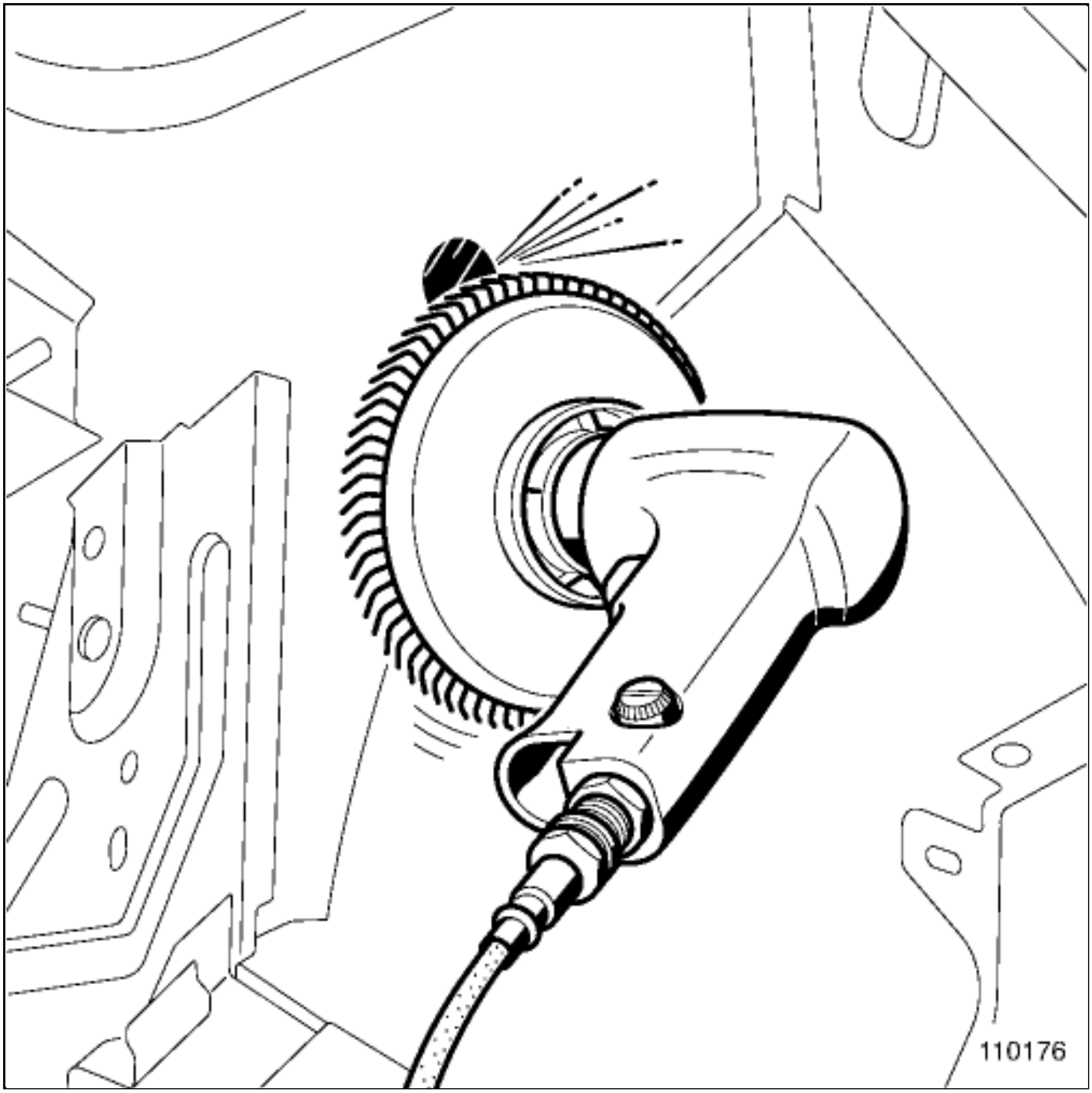
BOLTED CONNECTION FOR EARTH

Fitting the electrical earth stud can be done following two possible procedures:

- by resistance welding,
- by fitting of crimped stud.

1. ASSEMBLY BY RESISTANCE WELDING

1- PREPARATION OF THE JOINT

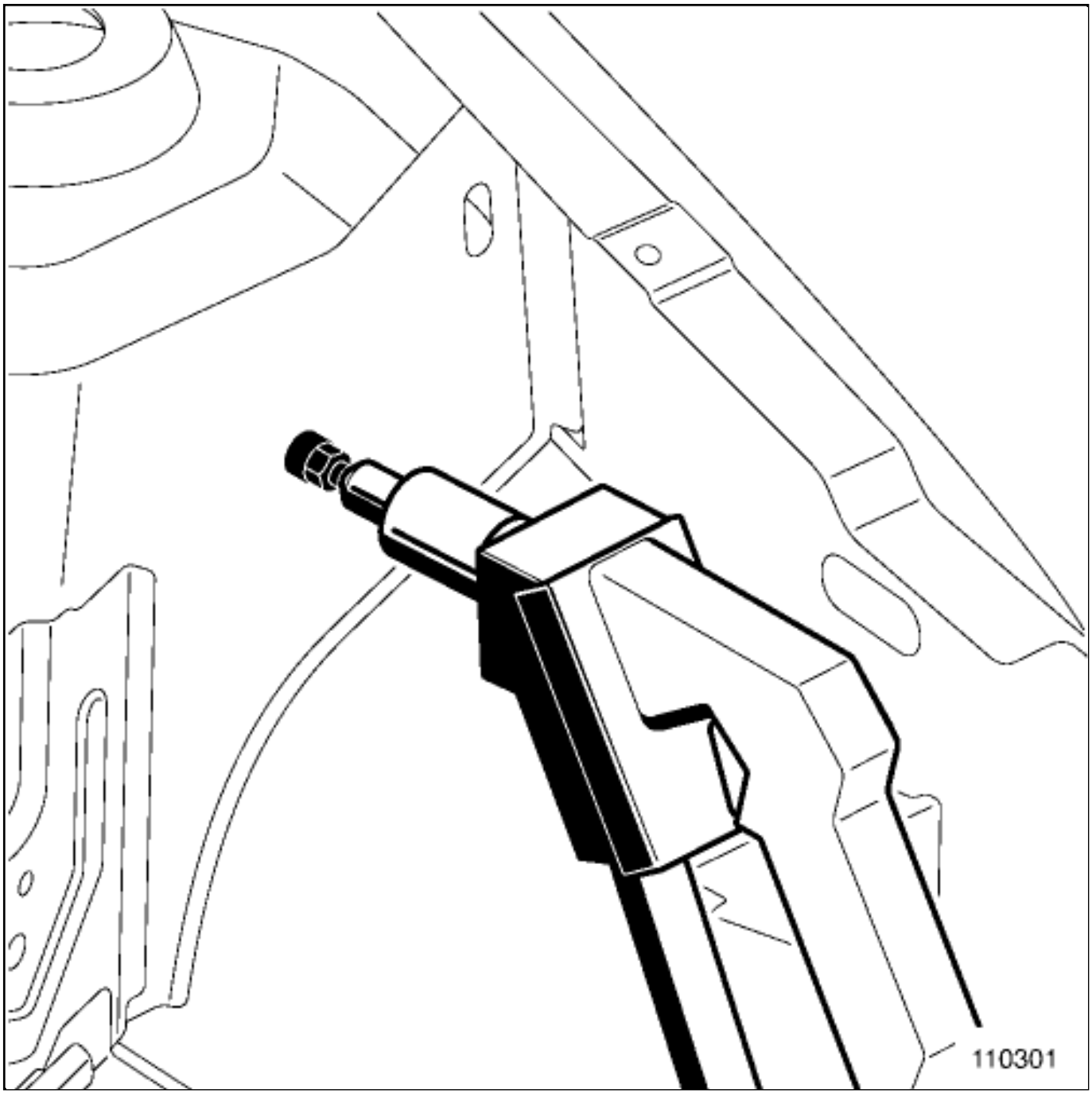


Scour the external face of the part at the location of the earth stud:

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use) ,

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use) .

2- WELDING



Weld the stud using a resistance welding equipped with the adapted nozzle, using the studs supplied with the welding device.

Manually control the hold of the stud(see 40H, Bolted connections, Bolted connections: Precautions for the repair) .

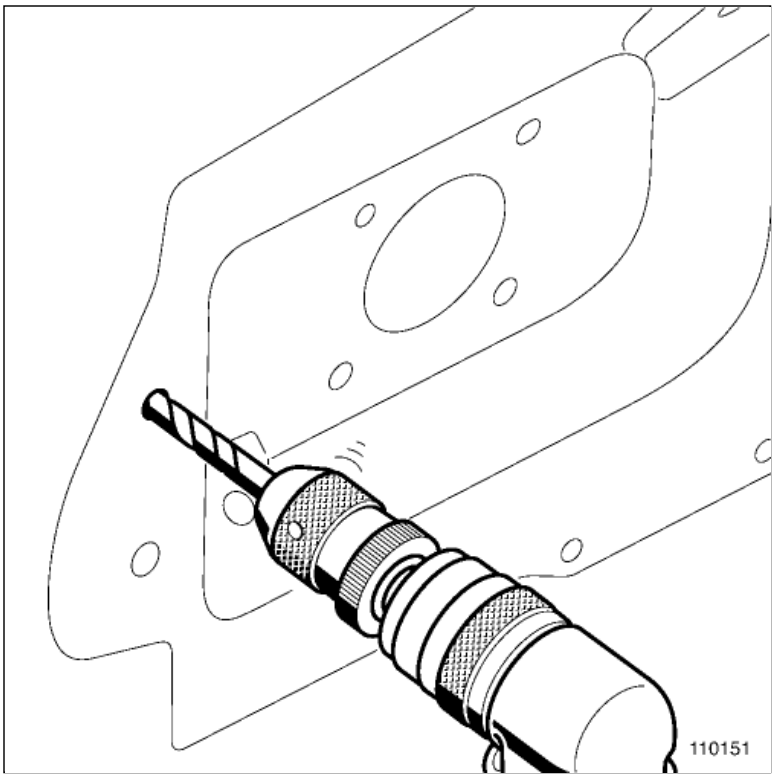
BOLTED CONNECTION WITH CRIMPED MOUNTING

Special tooling required	
Tool for fitting crimped nuts.	Car. 1504

Note:

This operation cannot be carried out for an earth mounting; it does not guarantee the current will be properly conducted from the contact with the structure.

1. PREPARATION

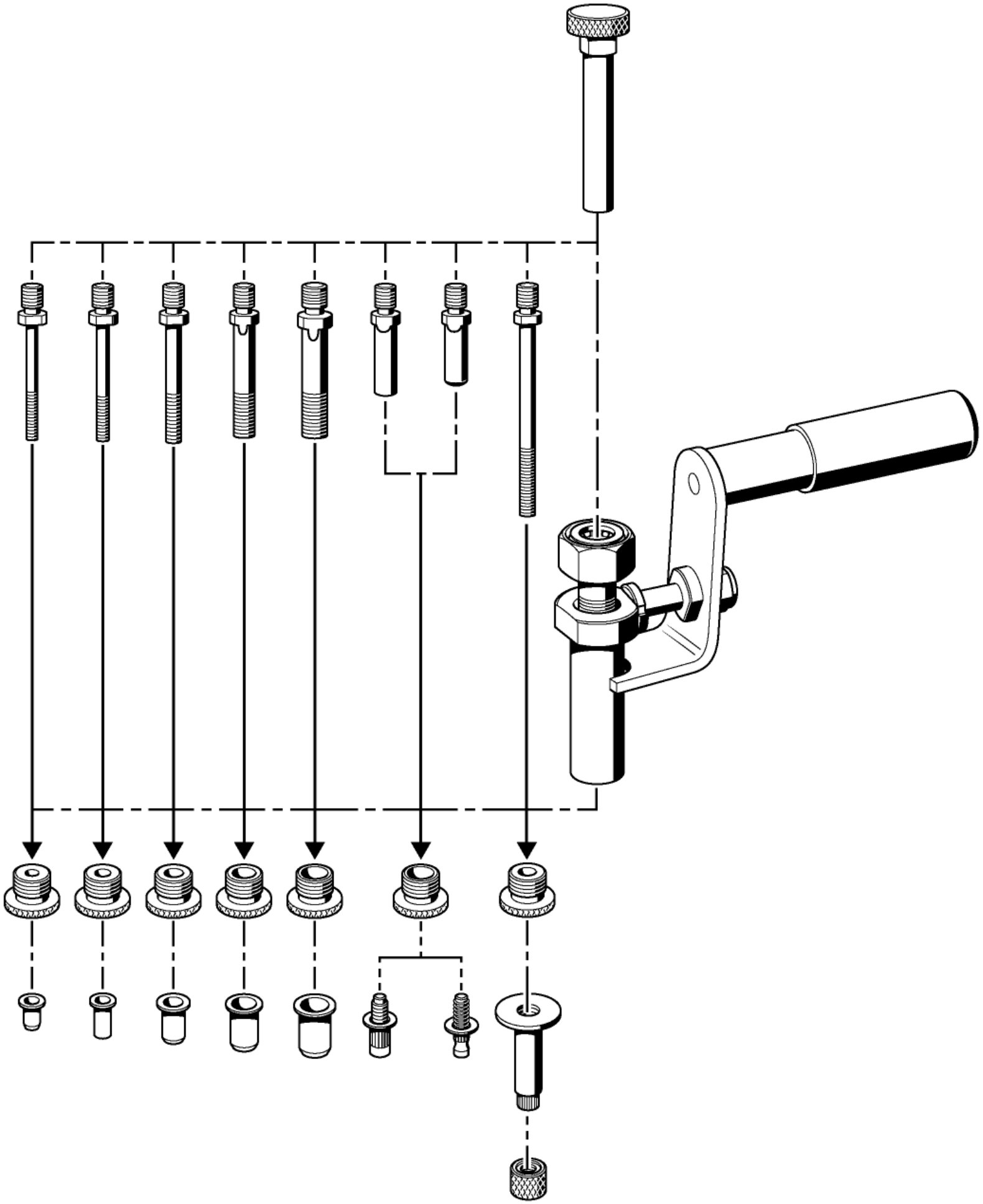


Drill the support panel using a drill bit which is adapted to the nominal diameter of the mounting, see table below.

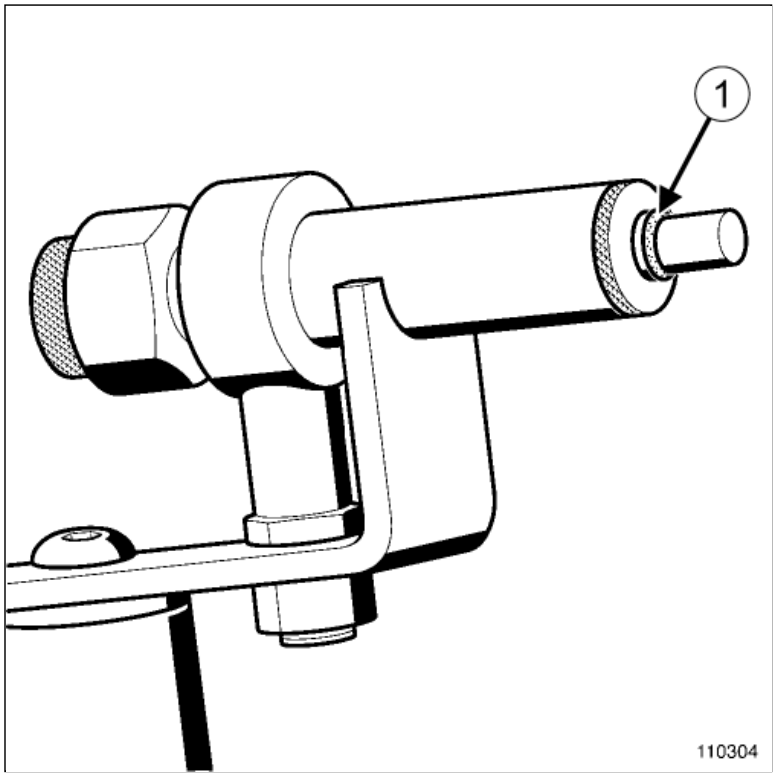
	Ø nominal	Ø drilling hole (mm)
nuts	M6 x 100	10.2
	M8 x 125	13.5
	M10 x 150	15.5
studs	Fc5	8.2
	M6	10.2

If it is a hollow section, insert wax to stabilise the shavings.(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

Fit the pull rod and the guide rod adapted to the fixation type to be crimped.

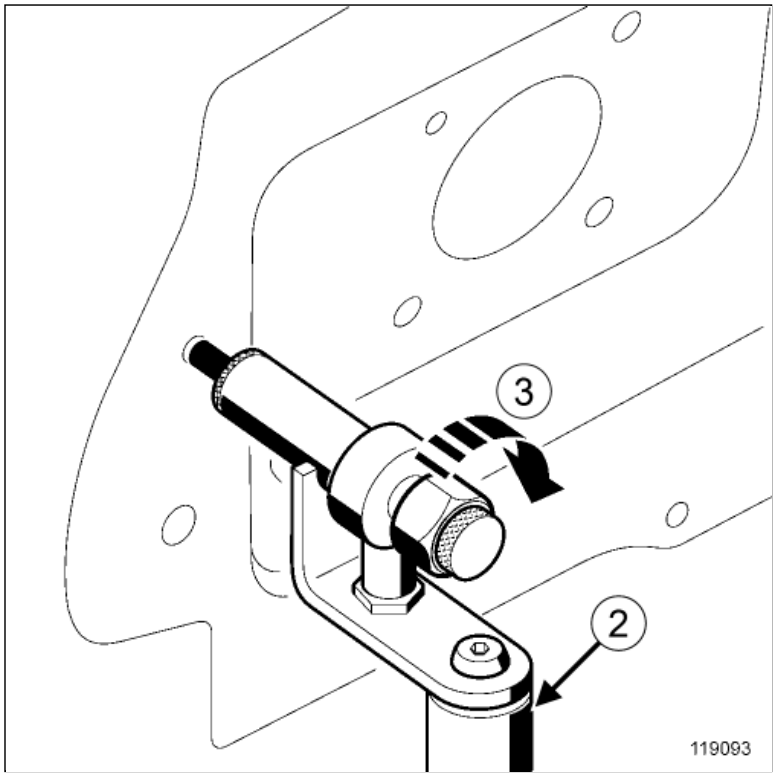


2. FITTING THE CRIMPED MOUNTING USING TOOL CAR. 1504

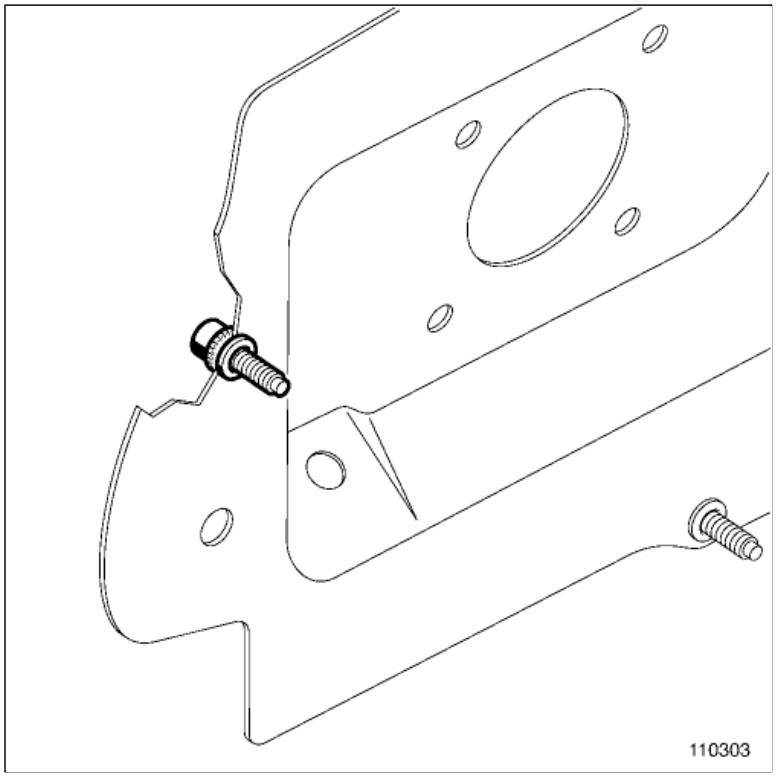


Screw the crimped nut or stud onto theTool for fitting crimped nuts.(Car. 1504) .

Place anti-corrosive sealing mastic(1) around the insert shaft.



Position and crimp the fixing, manually steadying the tool using the handle(2) and turning the nut(3) of the tool in the direction of the arrow.



Check that the mounting is perpendicular before the end of the crimping operation.

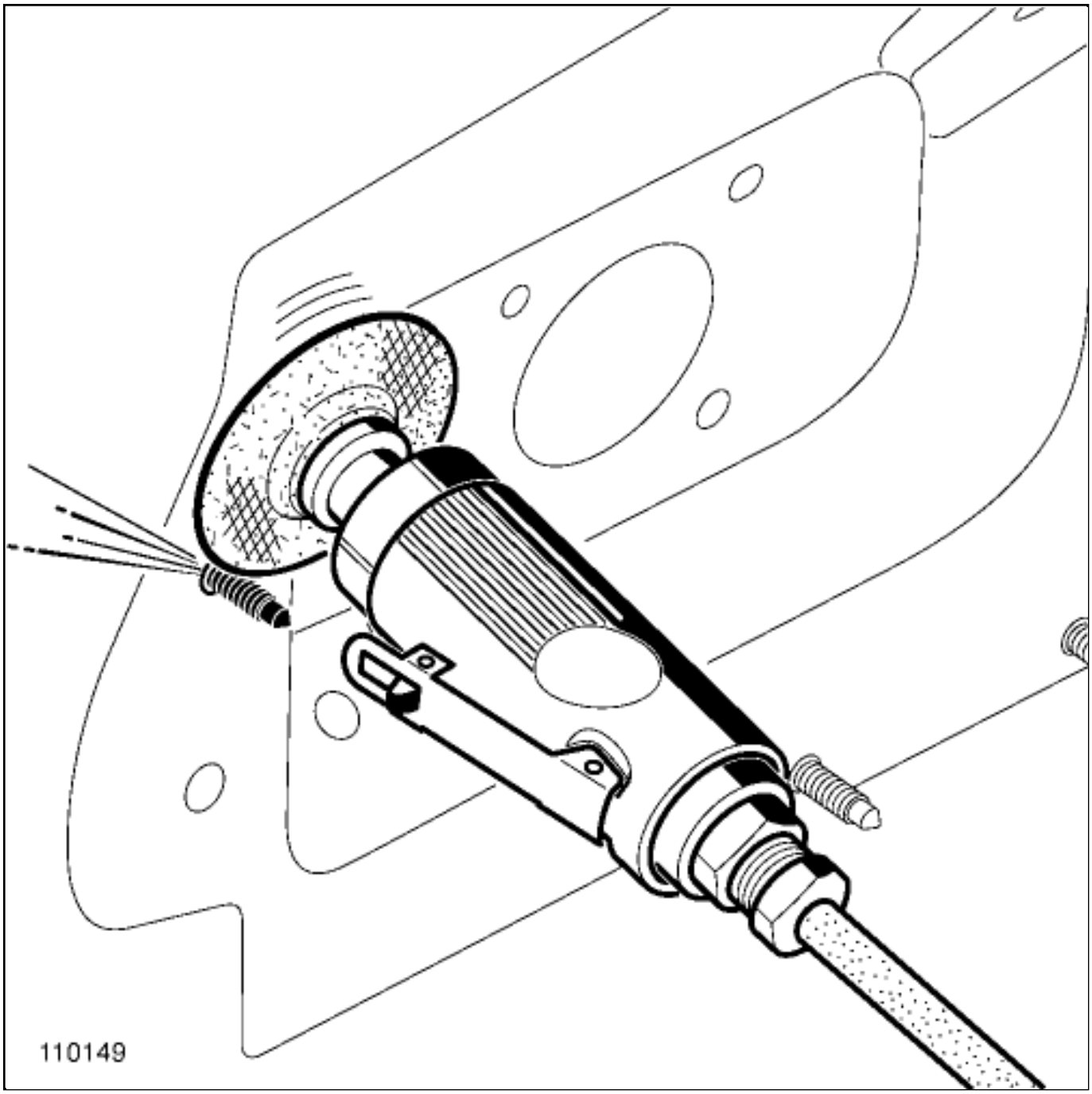
BOLTED CONNECTION WITH CRIMPED MOUNTING: REPAIR

Special tooling required	
Tool for fitting crimped nuts.	Car. 1504

Repairing a crimped fixing is done by replacement. Fitting is carried out using theTool for fitting crimped nuts. (Car. 1504) .

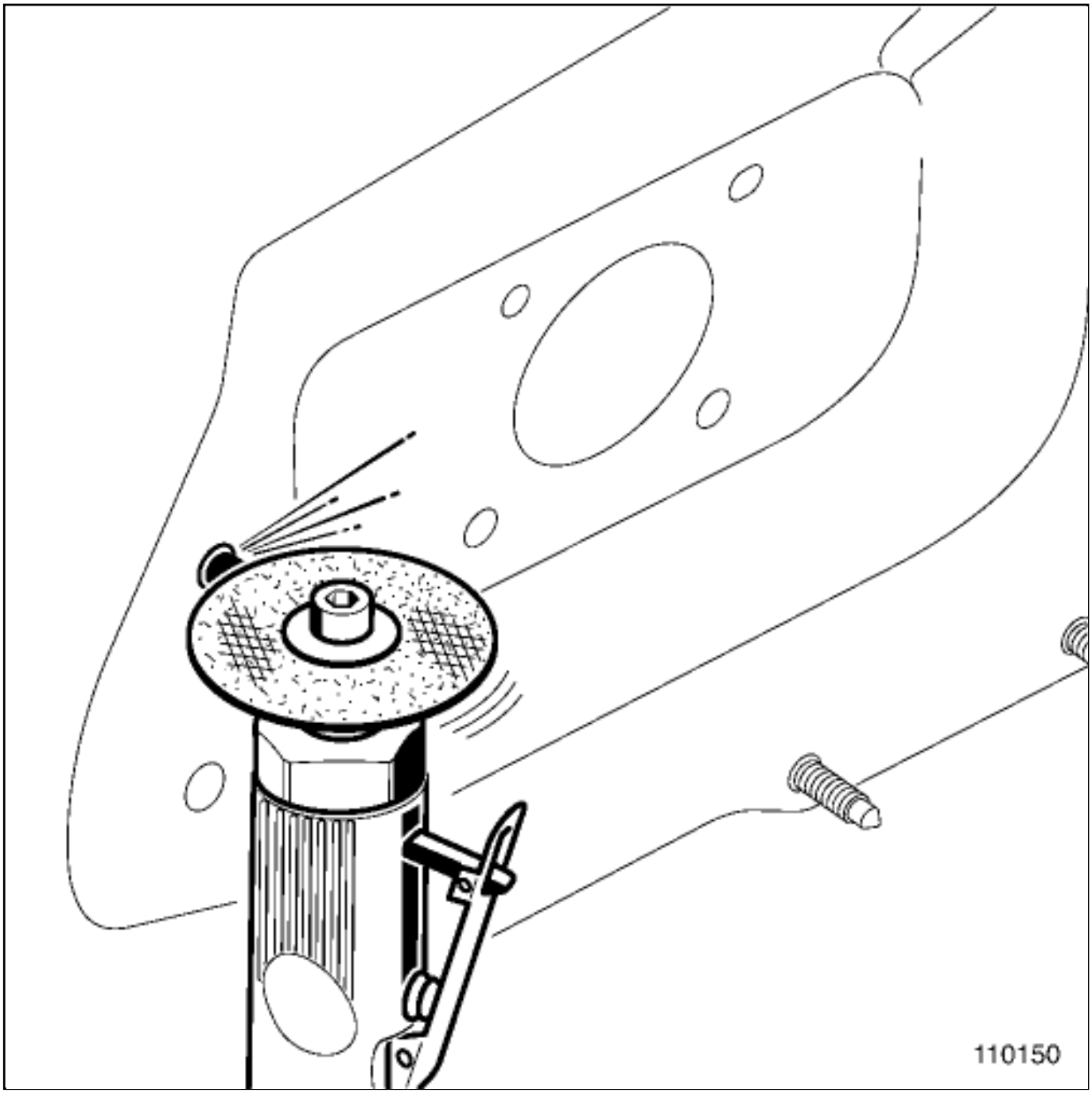
1. DISASSEMBLY

1- DISASSEMBLY OF A CRIMPED STUD



- Cut the stud around the flange, if it is still present.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

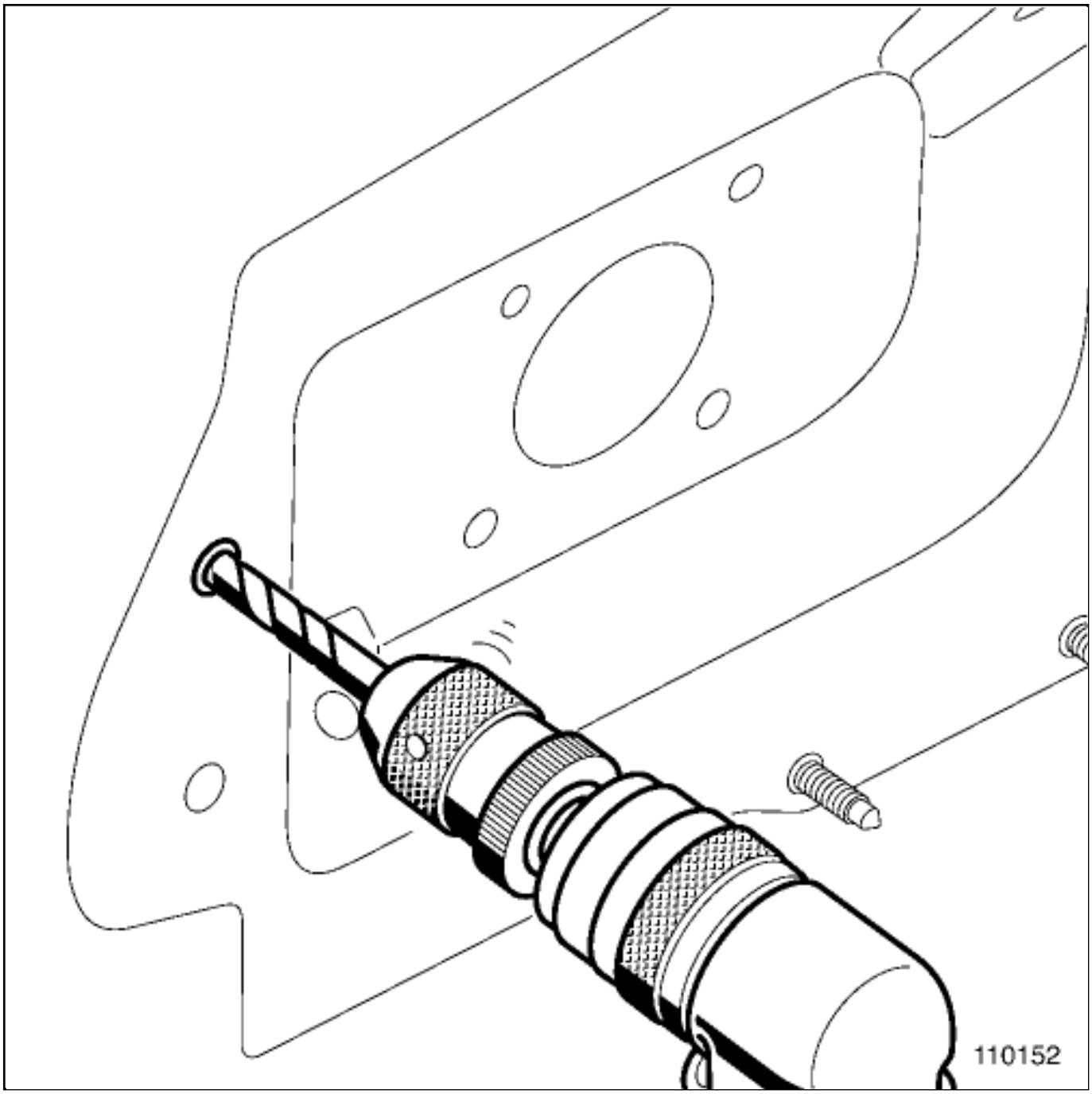


- Shave the flange.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

- Remove the rest of the stud.

2- DISASSEMBLY OF A CAPTIVE NUT



- Drill the nut using a drill bit which is slightly bigger than the internal diameter of the flange.

Note:

Do not damage the support during the drilling operation as this could make the hole larger and prevent the nut from holding.

Note:

If the crimped fixing falls into a hollow section when removed, inject wax to immobilise the residual fixing in the hollow section.

2. ASSEMBLY

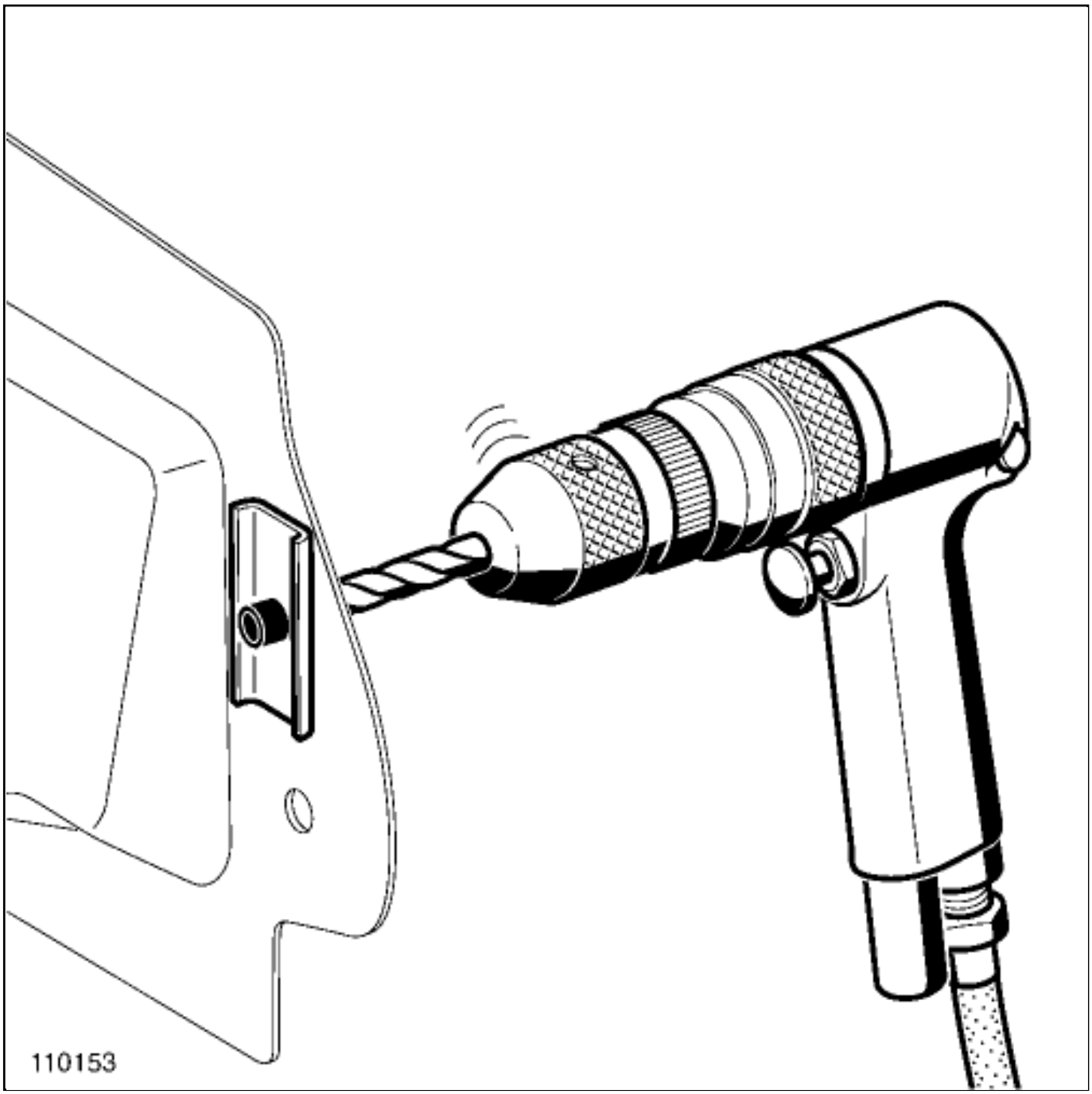
(see 40H, Bolted connections, Screw connection with crimped mounting: Description)

BOLTED CONNECTION WITH FLOWDRILLED NUT

Special tooling required	
Tool for fitting crimped nuts.	Car. 1504

Fluo tapped threading is repaired by fitting of captive nut(see 40H, Bolted connections, Screw connection with crimped mounting: Description) and using theTool for fitting crimped nuts.(Car. 1504) .

1. PREPARATION



Drill the fluo tapped nut, observing the nominal diameter of the insert, see table.

∅ nominal	∅ drilling hole (mm)
M6 x 100	10.2
M8 x 125	13.5
M10 x 150	15.5

2. ANTI-CORROSION PROTECTION

If it is a hollow section, inject wax to stabilise the swarf and protect the parts which have been bared during the drilling operation.

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

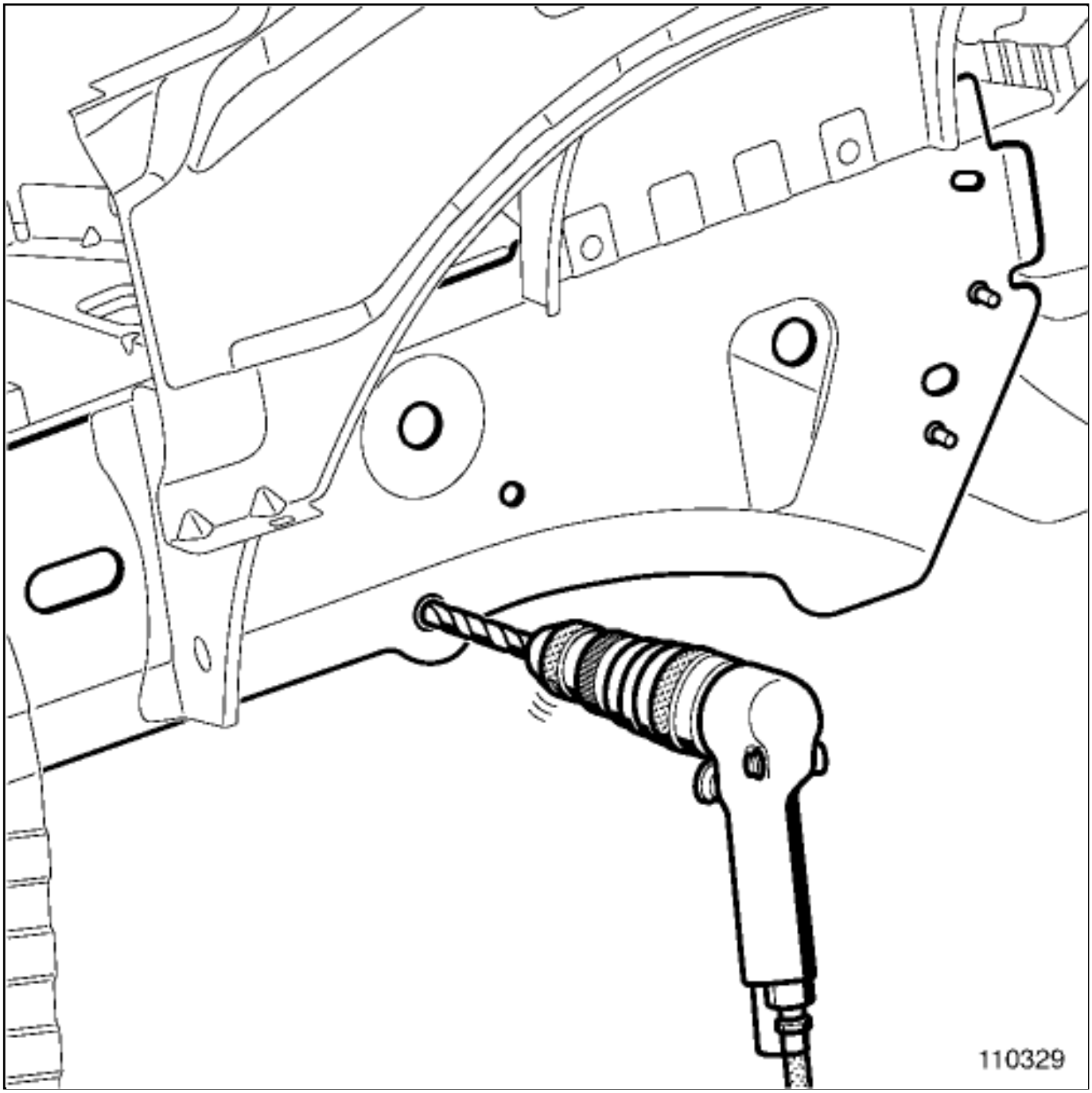
3. FITTING THE CAPTIVE NUT

Fitting the captive nut(see 40H, Bolted connections, Screw connection with crimped mounting: Description) .

BOLTED CONNECTION WITH WELDED NUT

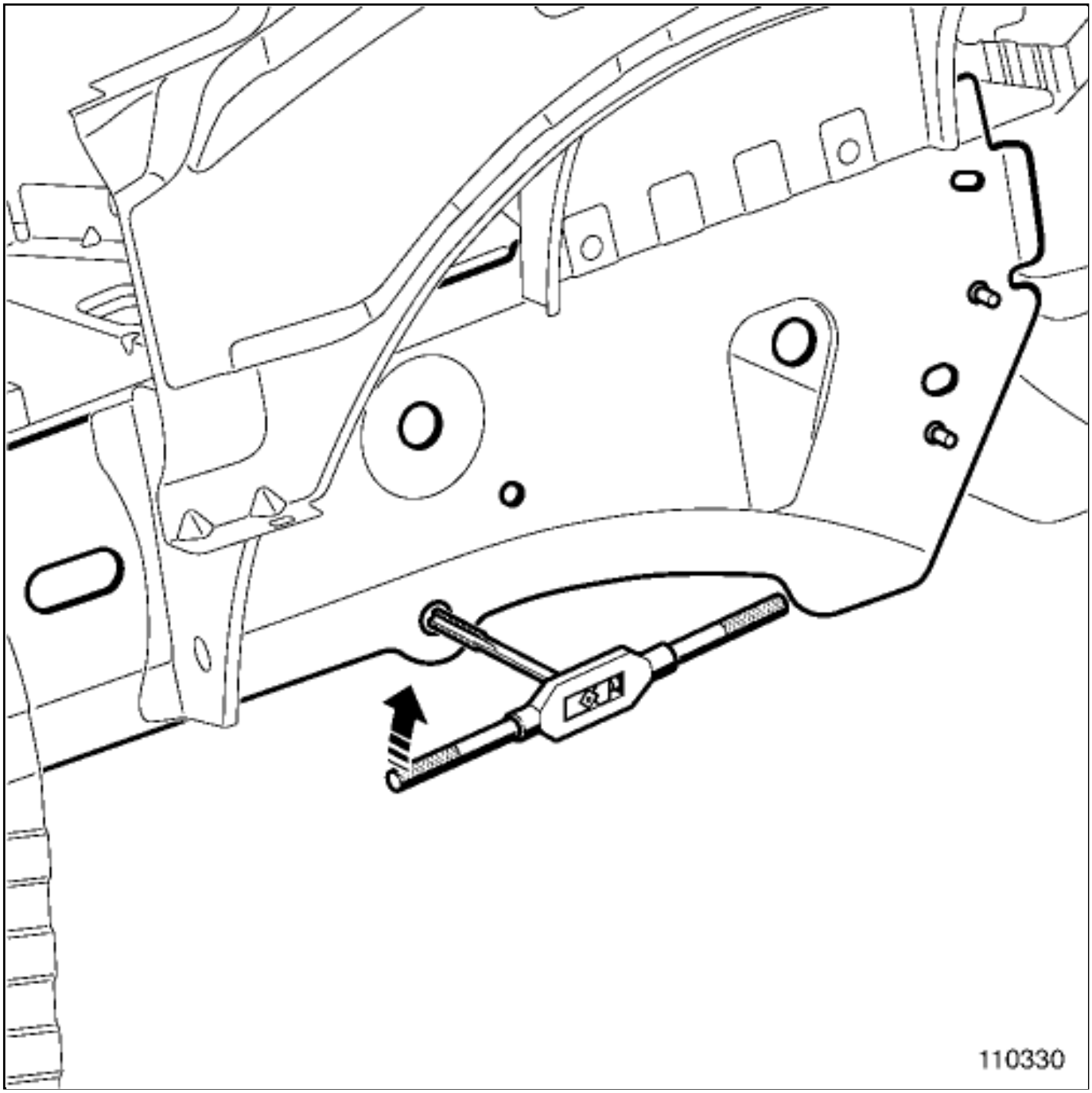
Repairing a welded nut is done using a helical thread insert from "helicoil" type, to be ordered at a supplier's as well as the appropriate material.

1. PREPARATION



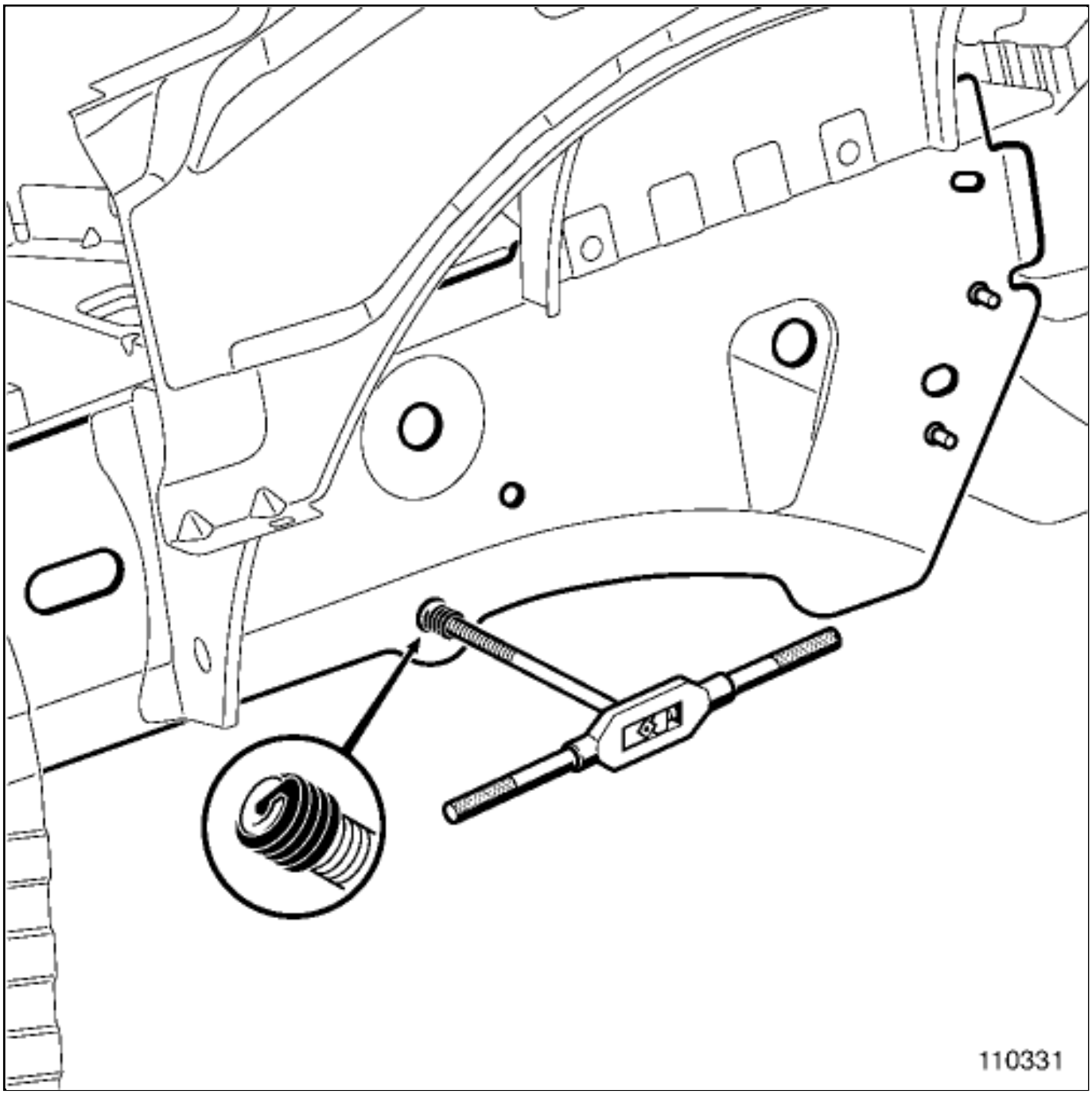
Drill a front hole according to the nominal diameter of the thread, see table below.

∅ nominal	∅ drill bit (mm)
M4	4.2
M5	5.2
M6	6.3
M8	8.4
M10	10.5
M12	12.5
M14	12.5



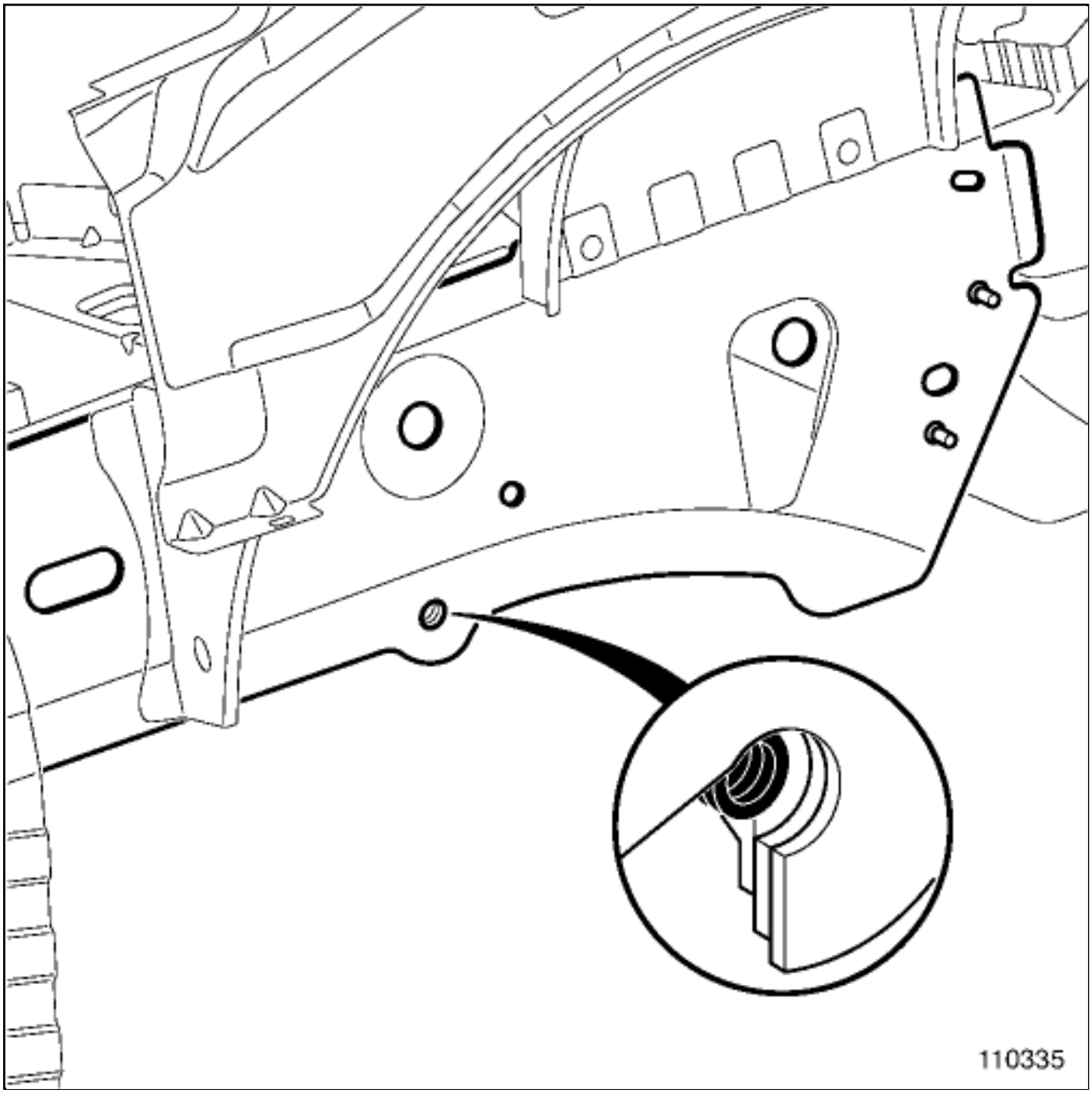
Tap the drilling hole using the tap provided with the helical thread inserts, do not forget to lubricate during the operation to evacuate the shavings.

2. FITTING THE HELICAL THREAD INSERT



Insert the helical thread insert on to the adapted pin by placing the driving plate pin in the neck provided.

Turn the pin in the drilling hole.

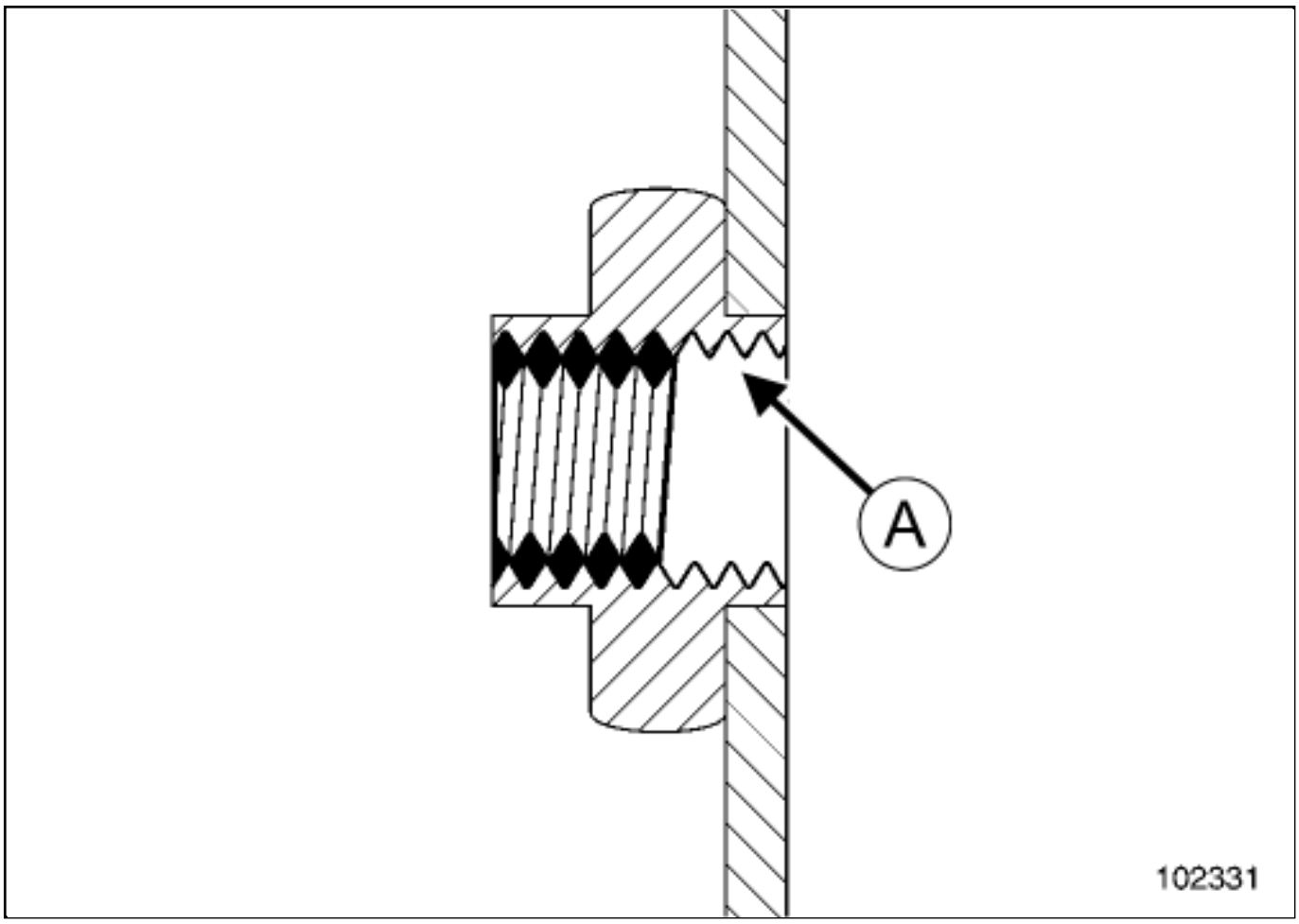


Note:

For perfect insertion of the helical thread insert at 0.25pitch below the surface of the part.

Break the driving plate pin using a jet.

3. ANTI-CORROSION PROTECTION



After fitting the helical thread insert, apply anti-corrosion protection to the section(A) of the insert which has been re-tapped. To do this, inject some protective wax for hollow sections in the captive nut before refitting the bolt.

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

BOLTED CONNECTION WITH WELDED STUD

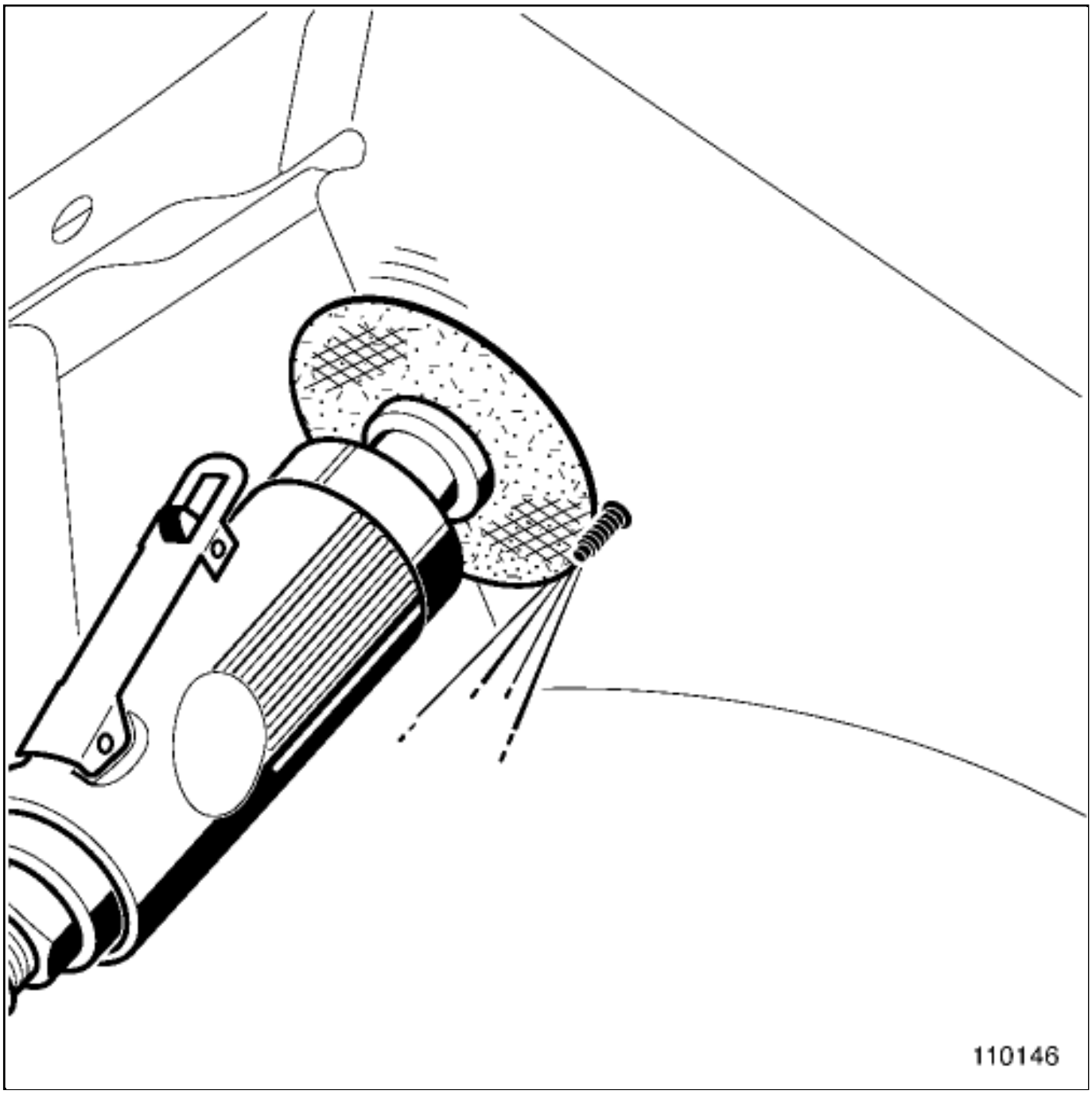
Repairing a welded stud is done according three possibilities:

- by identical to the origin welding of a welded stud, if the operator is equipped with a resistance welding device with a specific nozzle by using studs supplied with the material,
- by fitting of a crimped stud**(see 40H, Bolted connections, Screw connection with crimped mounting: Description)** .

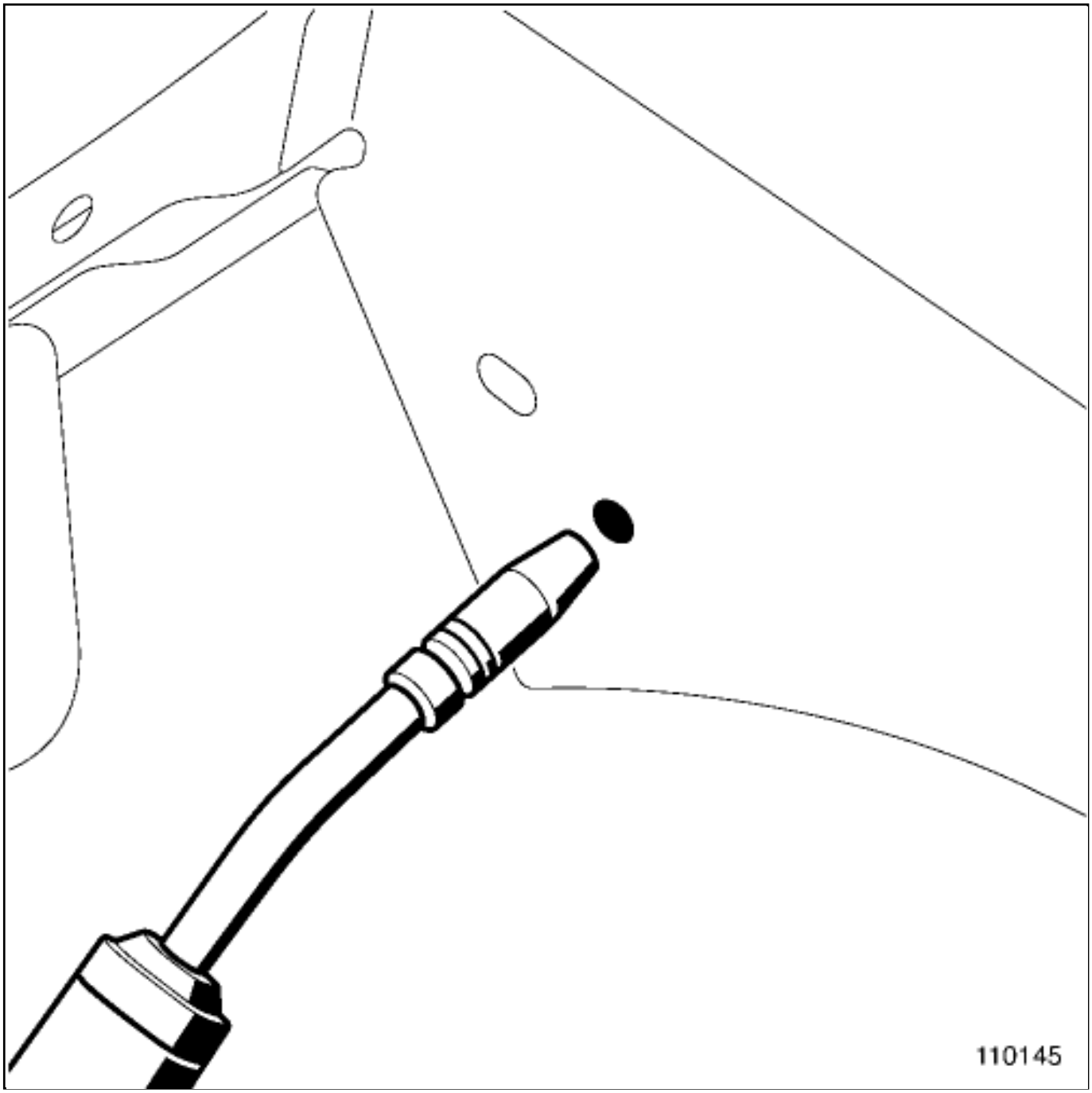
Note:

If it is about a D5 stud at "lying thread", it is possible to fit a riveted stud.

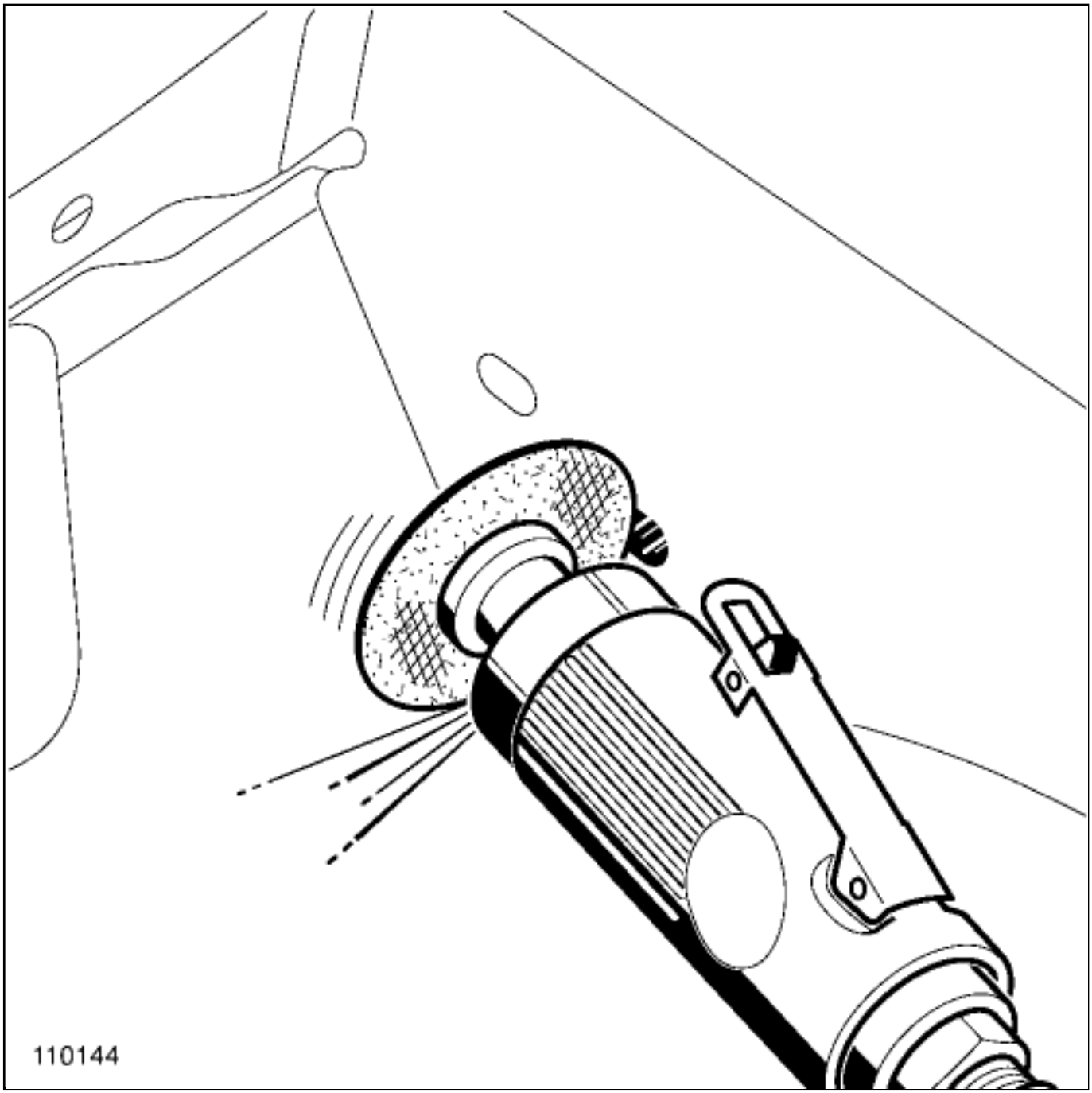
1. DISASSEMBLY



Cut the stud close to the panel mounting(see 05B, Equipment and Tools, Tools for cutting a structural component: Use) .



If the panel tears when the stud ruptures, use an electric welding process with shielding gas(see **Products and equipment for welded assembly: Use**) .



Level off the residual stud or weld(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use) .

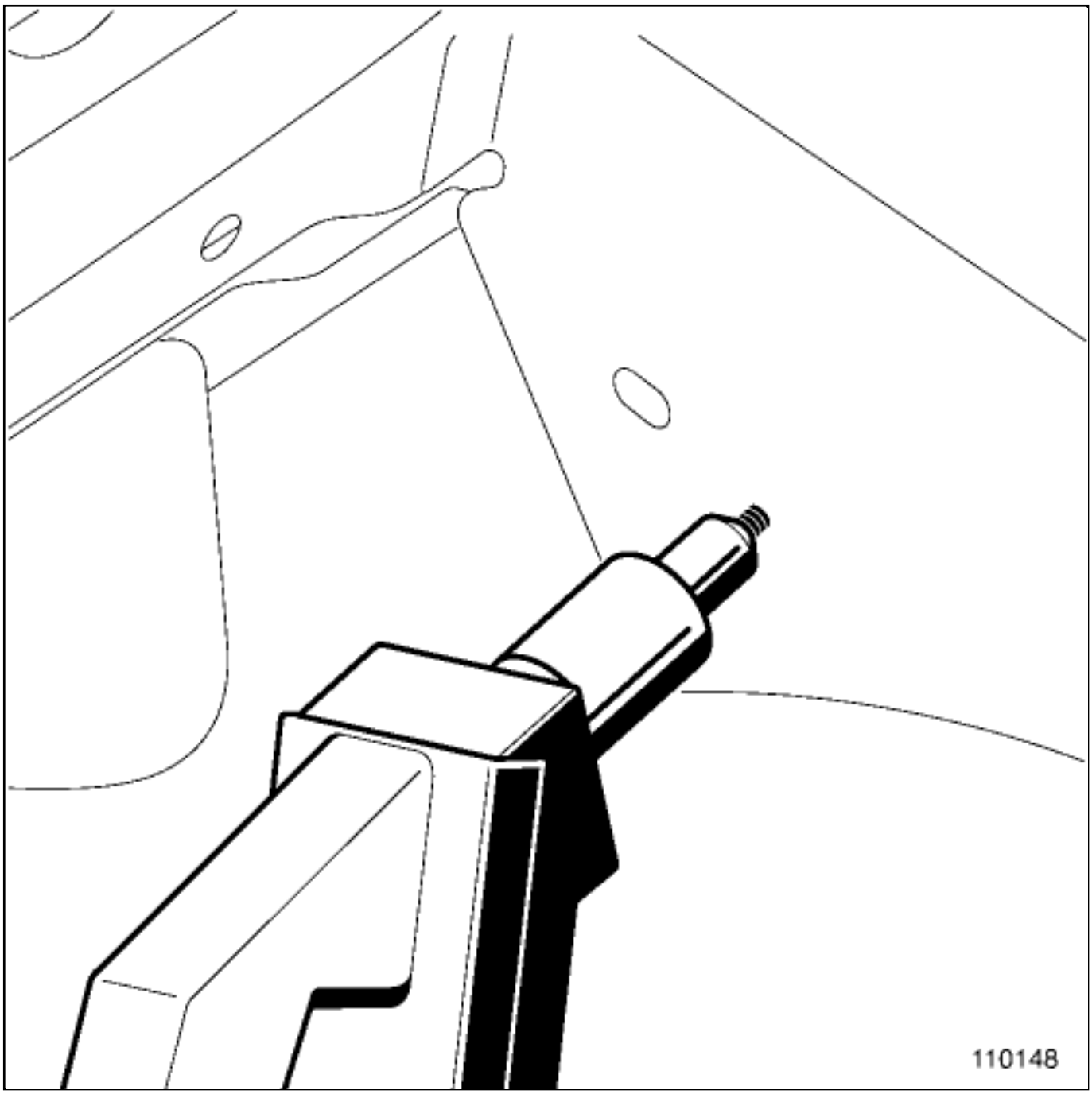
Note:

Do not strike or damage the panel.

2. FITTING A WELDED STUD IDENTICAL TO THE ORIGIN

The following procedure is used:

- before painting the part,
- on a component which is at risk from water infiltration (e.g.: floor).



Weld the stud using a resistance welder equipped with an adapted nozzle, use the studs to be welded given by the supplier of the welding equipment.

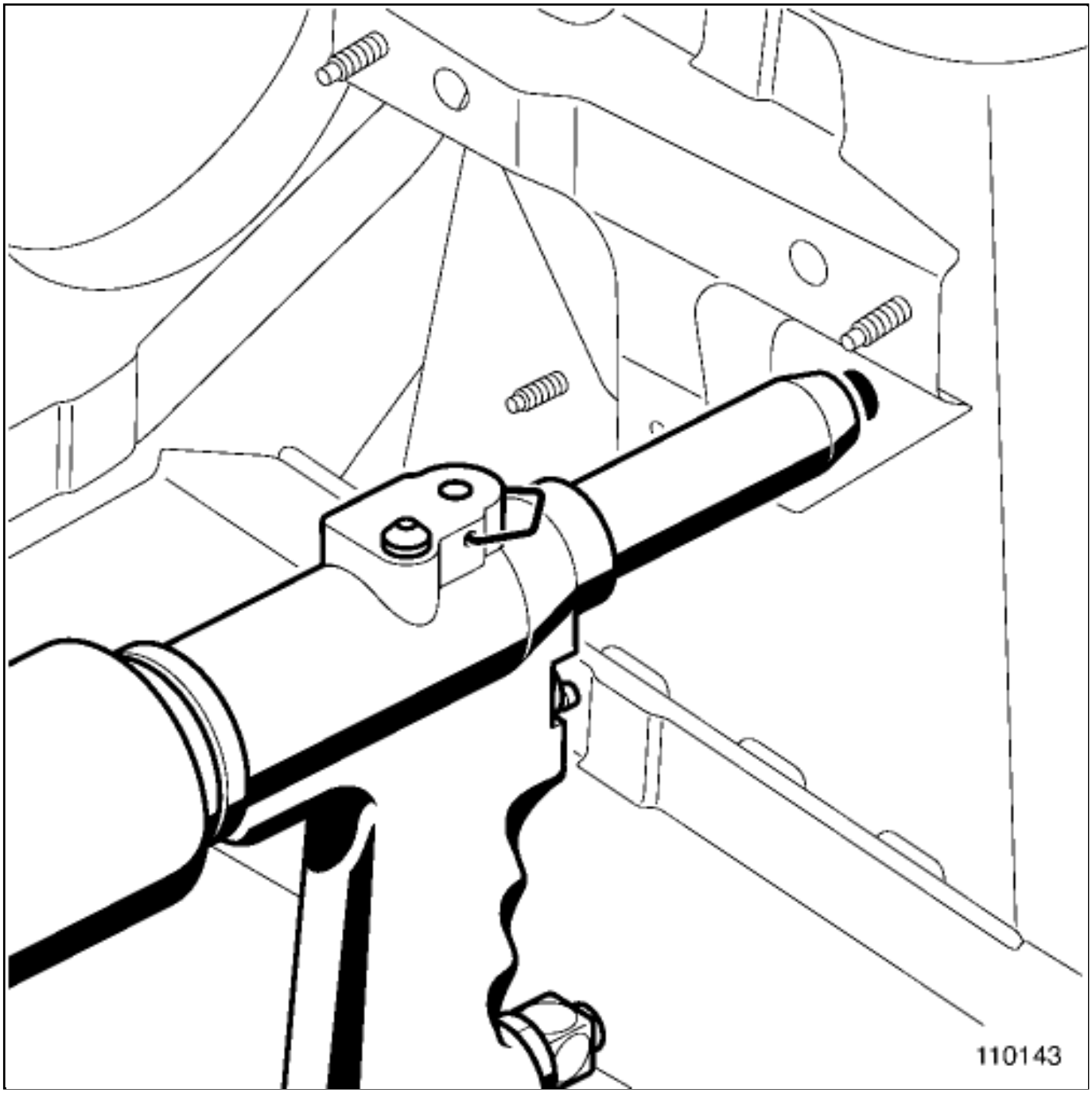
3. FITTING A CRIMPED STUD

(see 40H, Bolted connections, Screw connection with crimped mounting: Description) .

4. FITTING A RIVETED STUD

The following procedure is used:

- after painting the part,
- if there is a hollow section.



Rivet the stud using a pneumatic rivet squeezer(see 04F, Bodywork products and mountings, Products and

equipment for bolted assembly: Use) .

Repair-40x01x34x08-02x21-1-1-1.xml

XSL version : 3.02 du 22/07/11

BOLTED CONNECTIONS: PRECAUTIONS FOR THE REPAIR

1. SAFETY COMPONENT MOUNTINGS

The body mountings of the following safety components must not be redone if they have deteriorated:

- Seat belts,
- Seat belt buckles,
- Seats with safety belts board.

If the mounting is damaged, the component on which it is mounted must be replaced.

2. TIGHTNESS OF THE MOUNTING

1- CRIMPED MOUNTINGS

After fitting the crimped mounting, check the crimping by performing a tightening test on the mounting before fitting the component on the mounting.

In the event of incorrect crimping, remove the mounting and refit a new one.

2- WELDED MOUNTINGS

After fitting the welded mounting, check the weld by performing a tightening test on the mounting before fitting the component on the mounting.

In the event of an incorrect weld, redo the connection or remove the mounting and refit a new one.

3- REPAIRING BY HELICAL THREAD INSERT

After fitting the helical thread insert, check the position of the helical thread insert by performing a tightening test on the mounting before fitting the component on the mounting.

If the helical thread insert is incorrectly positioned, remove the helical thread insert and refit a new one.

In case of an insert thread breakdown, proceed to the replacement of the original fastening item.

3. ANTI-CORROSION PROTECTION

Before fitting a crimped mounting, apply anti-corrosion protection to the drilling hole, as well as around the shaft of the crimped mounting.

XSL version : 3.02 du 22/07/11

B-PILLARREINFORCEMENT:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

No.	Description	Thickness (mm)
(1)	B-pillar reinforcement	1.6
(2)	B-pillar lower reinforcement	0.9
(3)	Rear door striker panel reinforcement	2.5
(4)	Lower hinge reinforcement of rear side door on body	1.5
(5)	Upper hinge reinforcement of rear side door on body	1.5
(6)	B-pillar impact reinforcement	1.8

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

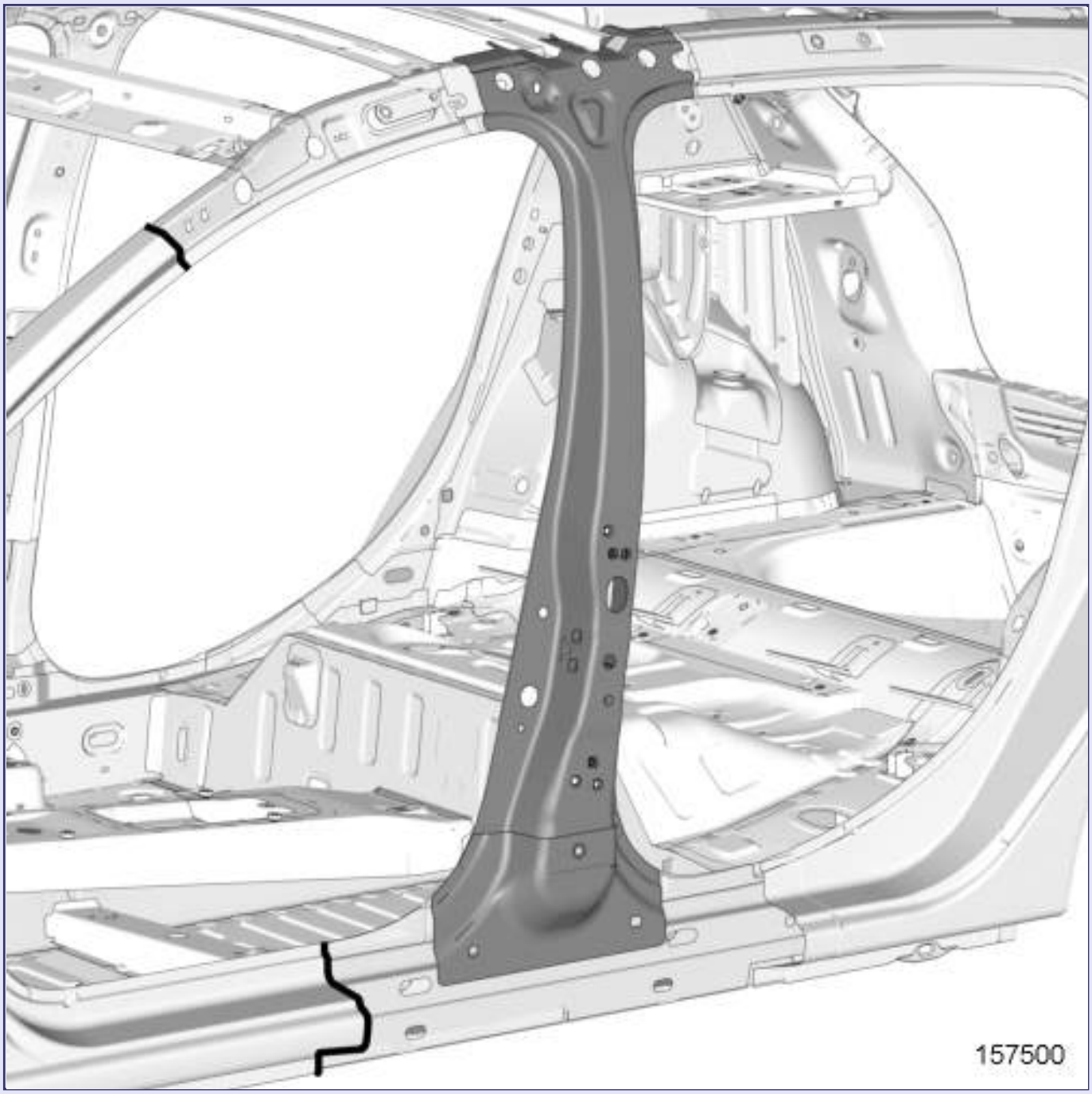
Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

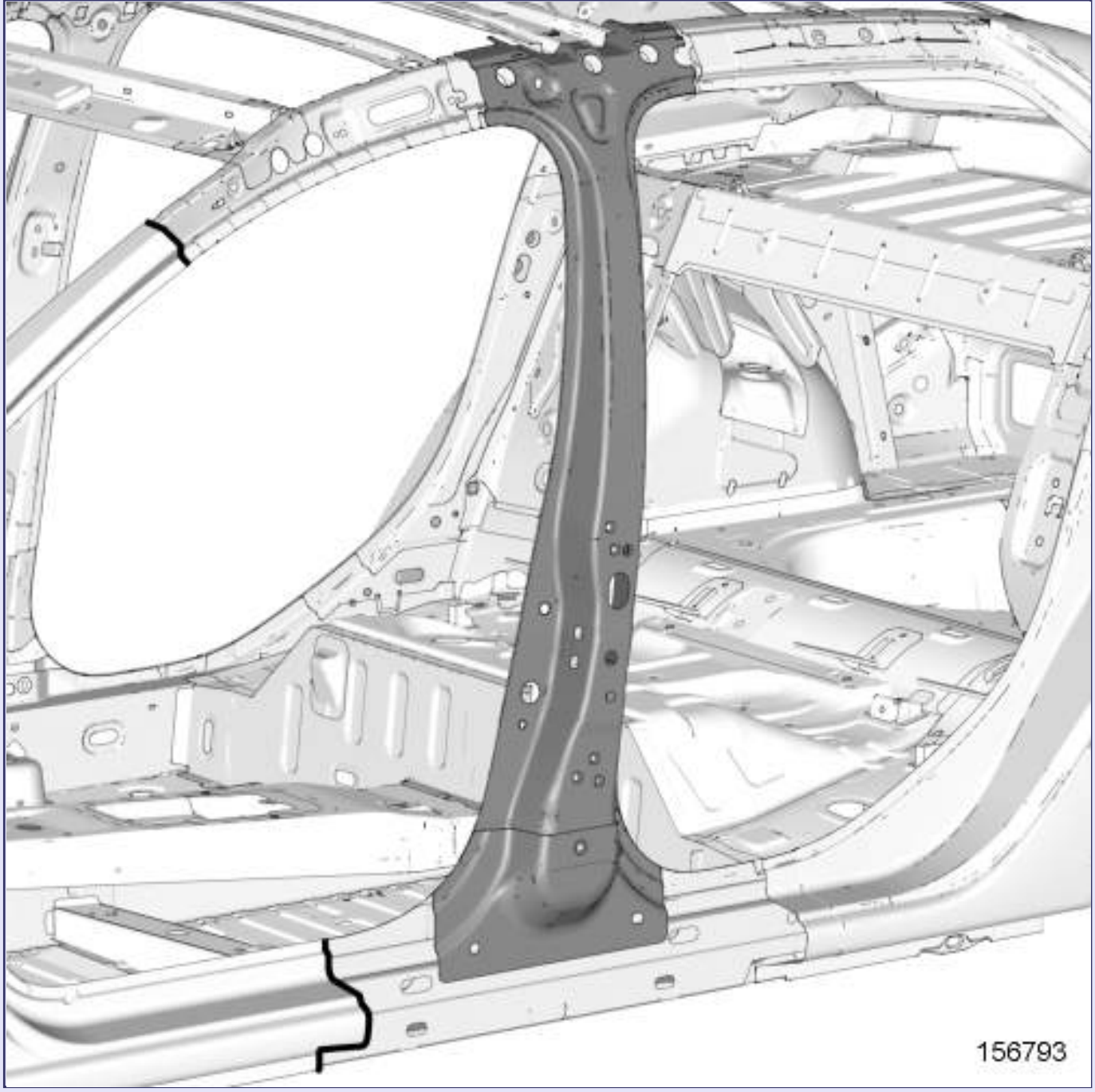
1- COMPLETE REPLACEMENT

1)PART IN POSITION

B52(B52)

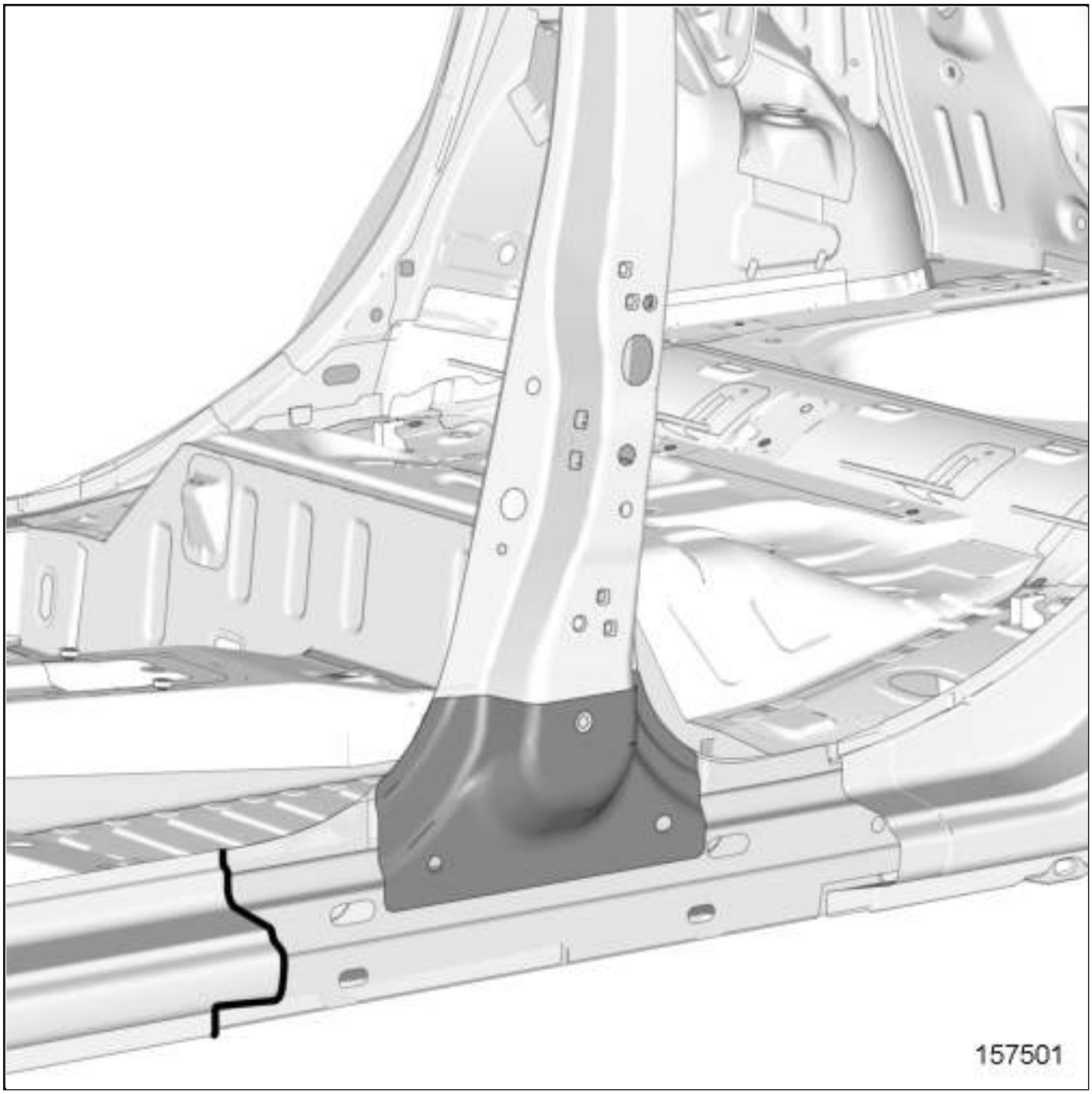


L52(L52)

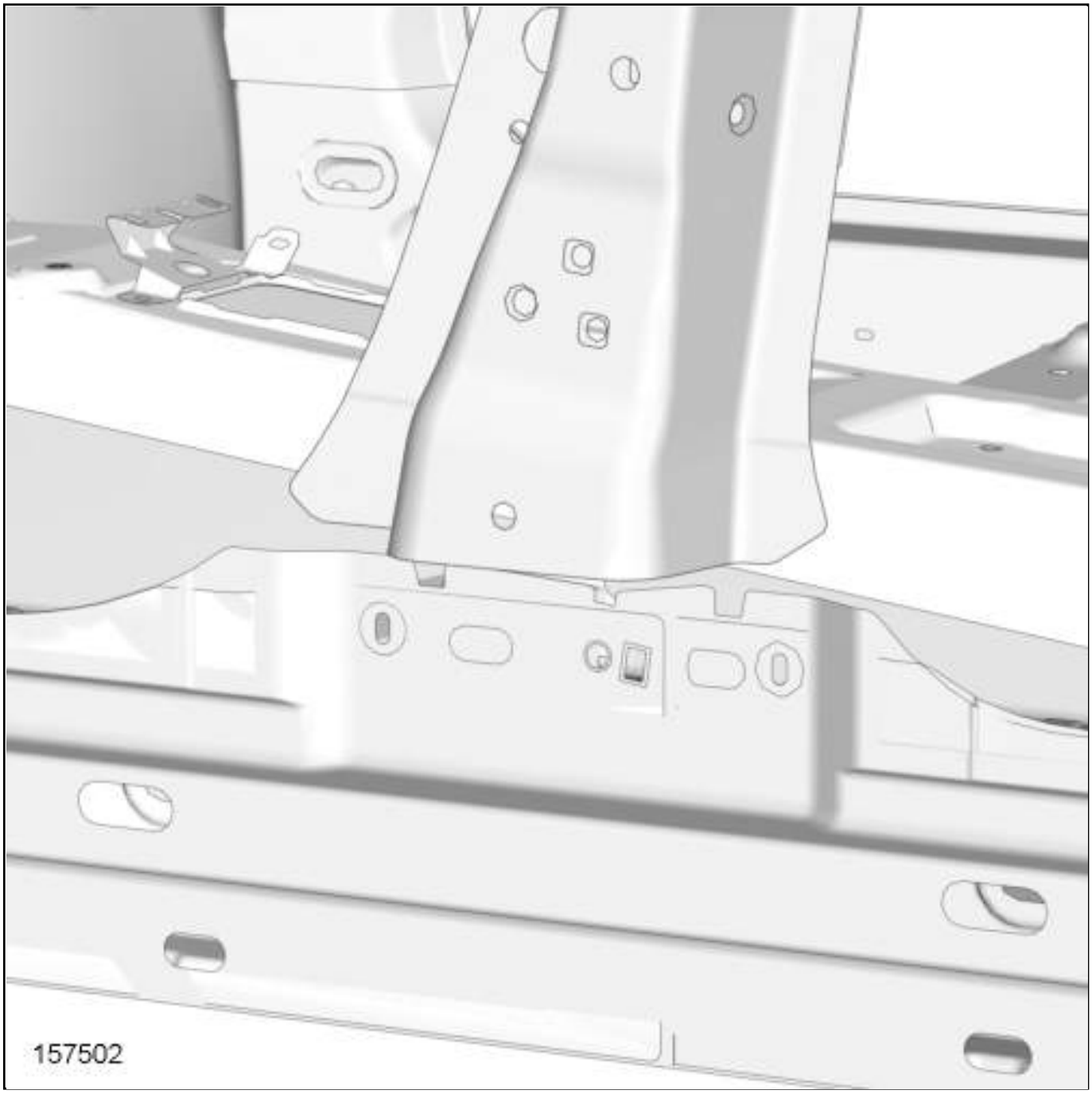


2- PARTIAL REPLACEMENT

1)PART IN POSITION



DETAILED VIEW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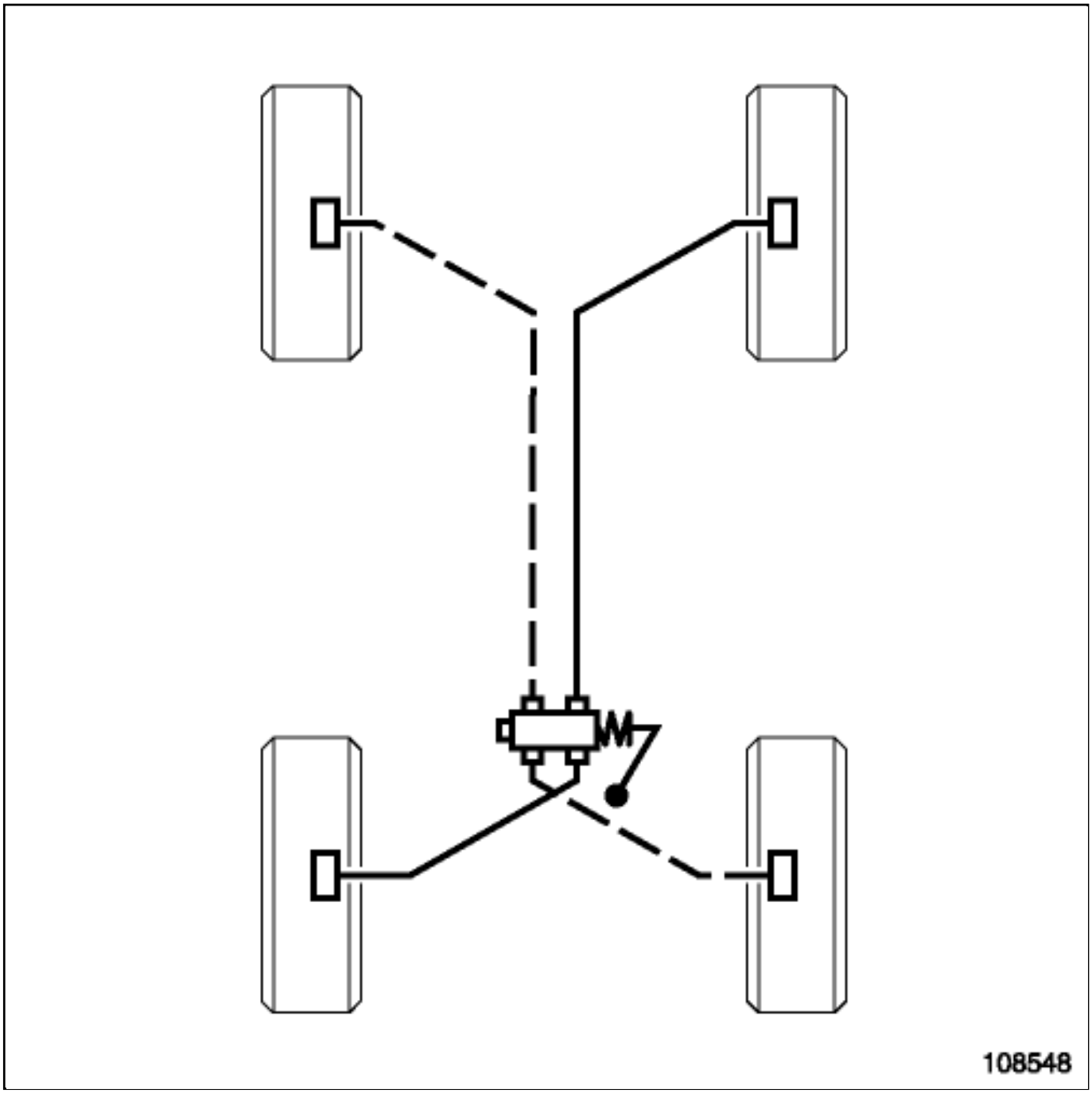
BRAKECIRCUIT:OPERATINGDIAGRAM

Note, one or more warnings are present in this procedure

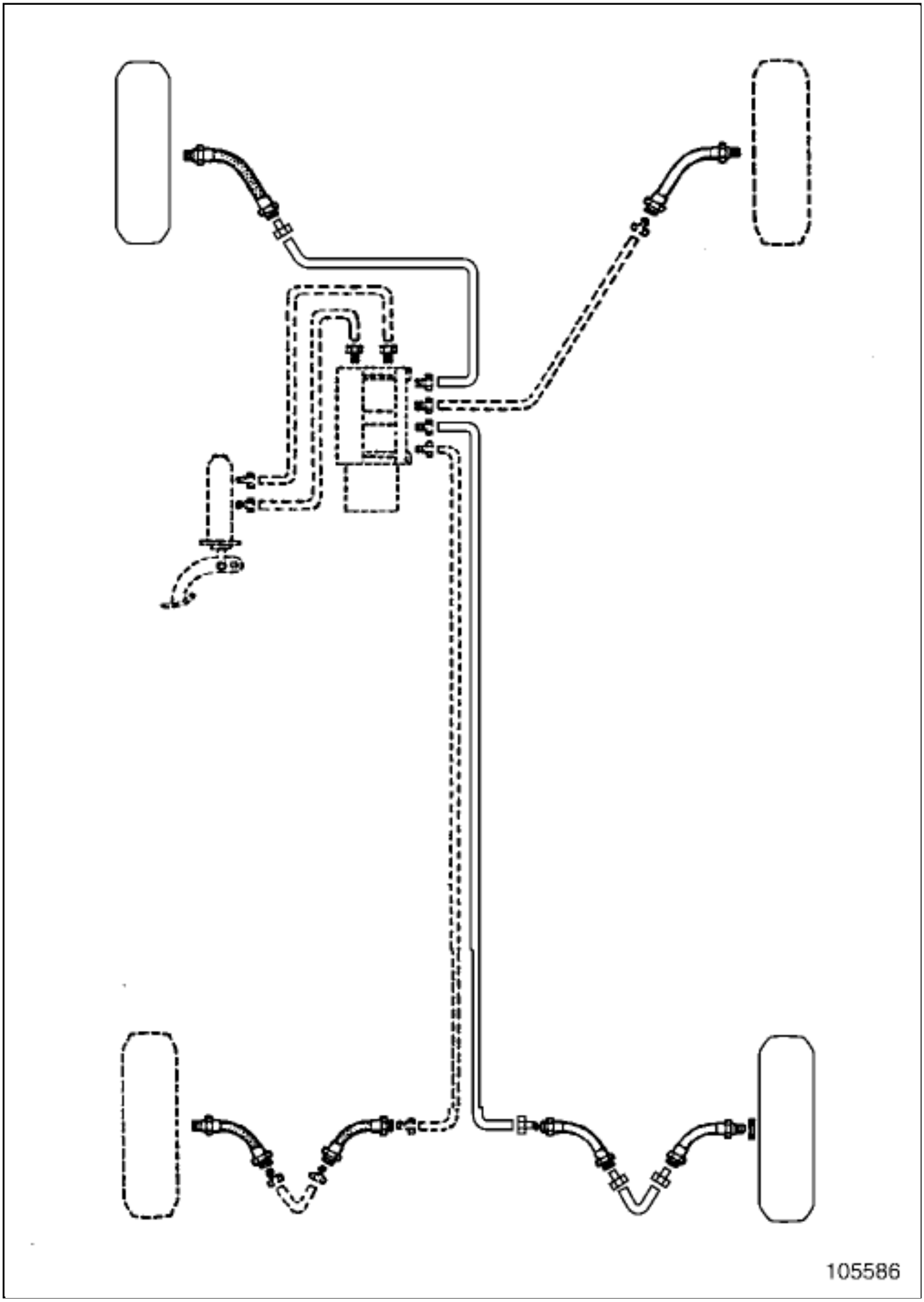
"X" BRAKING SYSTEM WITH LOAD-SENSITIVE COMPENSATOR



WARNING

This is a diagram of the general principle, do not use it as a reference for take-off points or circuit allocation. When replacing components in a vehicle's braking circuit, always mark the pipes before removing them.

"X" BRAKING SYSTEM WITH ABS


105586

WARNING

This is a diagram of the general principle, do not use it as a reference for take-off points or circuit allocation. When replacing components in a vehicle's braking circuit, always mark the pipes before removing them.

Repair-13x03x01-02x52-1-4-1.xml

XSL version : 3.02 du 22/07/11

BRAKE CIRCUIT: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

The brake regulation circuit must be free of all hydraulic and electrical faults.

In case of incorrect handling, the brake fluid can cause serious injury and damage. Follow the manufacturer's instructions for brake fluid.

To prevent dust from entering the master cylinder reservoir and the brake circuit, the plug must be removed just before filling and closed immediately afterwards,

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Do not press on the brake pedal during work on the brake system.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

Use brake fluids that comply with the Renault standard Vehicle: Parts and consumables for the repair .

Check the brake fluid levels in the braking circuit and the bleeding device.

Check that the pressure of the bleeding device is between 1.5 bar and 2 bar.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Fit blanking plugs recommended for the Siemens K9K injection system at the end of each pipe and in all the openings of the disconnected components of the brake circuit.

Clean around the braking system with brake cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

3. GENERAL RECOMMENDATIONS

When replacing brake pads, always replace the pads on the other side as well.

When replacing a disc, always replace the disc on the opposite side.

When replacing brake discs, you must replace the brake pads.

CAUTION

- In order not to damage the brake hose:
  - do not tension the hose,
  - do not twist the hose,
  - check that there is no contact with the surrounding components, regardless of the position of the wheels.

WARNING

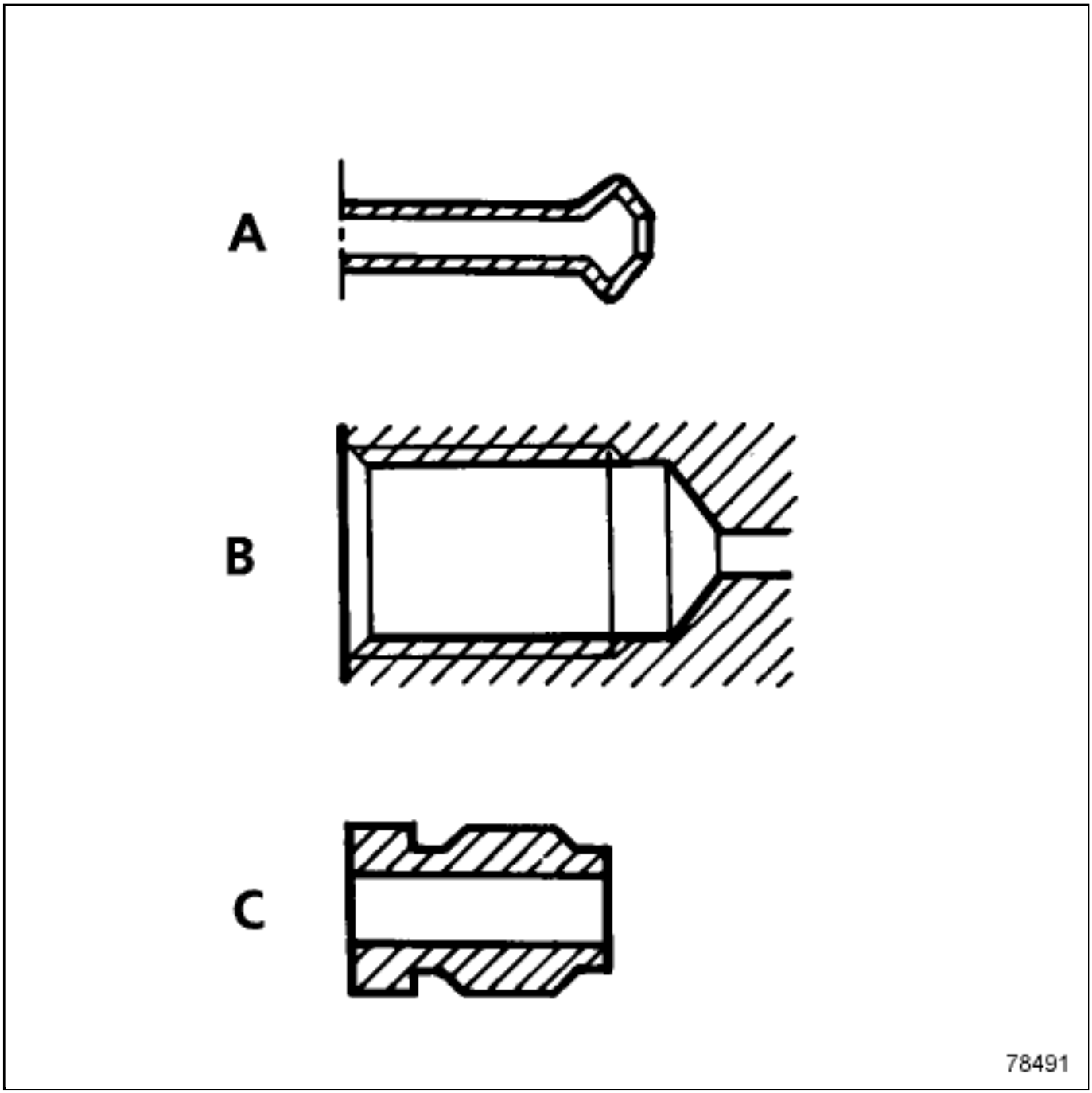
To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

Always replace the rigid brake pipe clips.

- Reminder:

■ The pipes between the master cylinder, callipers and the hydraulic assembly are connected using threaded unions with a metric thread.

■ Therefore, only parts specified in the Parts Catalogue for this vehicle should be used.



Parts identification:

■ shape of steel or copper pipe end piece (A),

■ shape of connecting points on components (B),

■ shape of unions (C): 11 mm hexagonal.

Precautions to be taken before and during the brake circuit bleeding operation:

■ use brake fluid which conforms to the Renault standard Vehicle: Parts and consumables for the repair (04B, Consumables - Products),

■ check the brake fluid levels in the brake circuit and the bleeding device,

- the braking regulation circuit must be free from all hydraulic and electrical faults,
- check that the pressure of the bleeding device is between 1.5 bars and 2 bars.

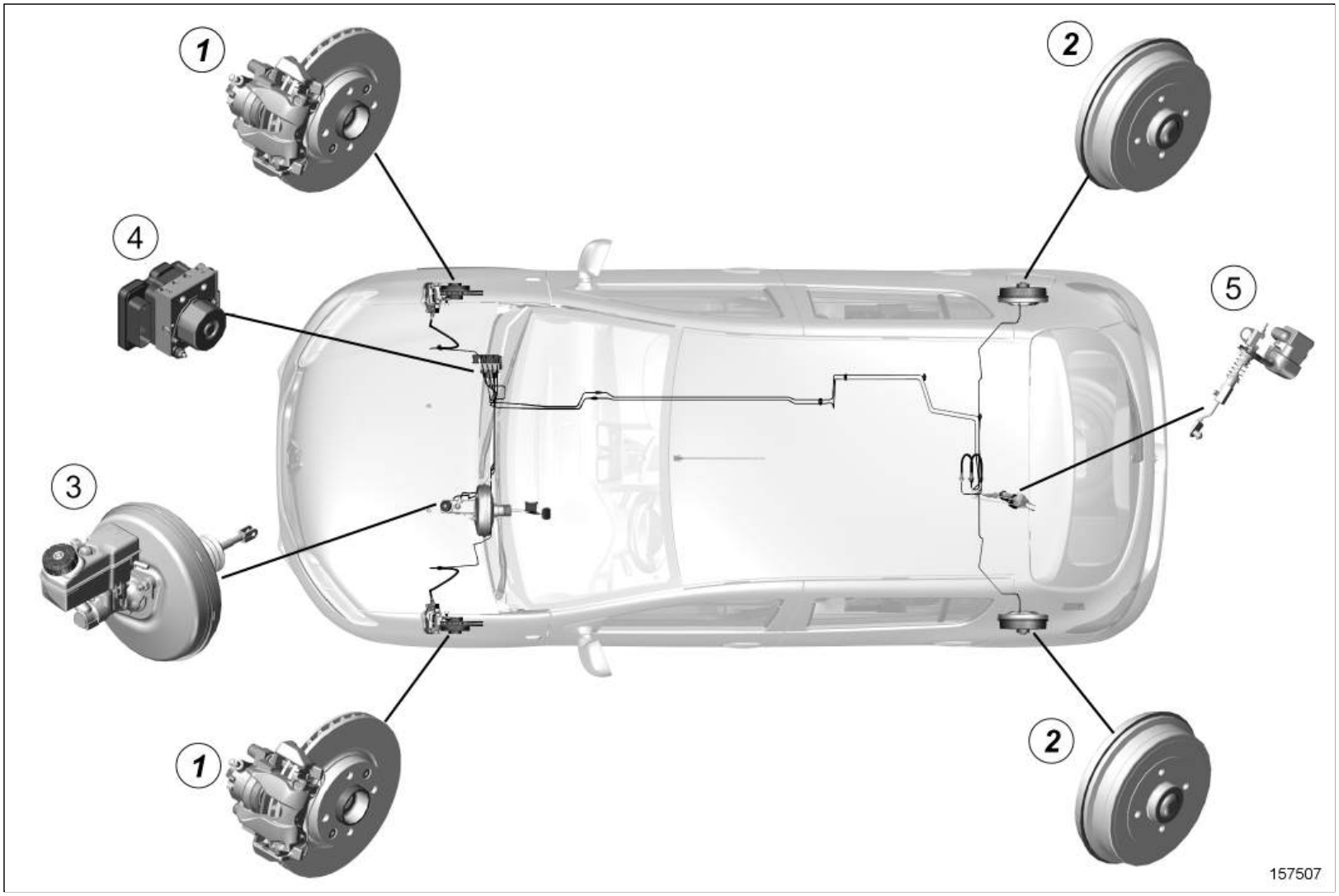
BRAKE CIRCUIT: TIGHTENING TORQUE

Description	Tightening torque (N.m)
Brake hose on brake pipe	14
Underbody rigid brake pipe unions	10
Hydraulic unit bolts on the mounting	8
Hydraulic unit mounting bolts on body	21
Hydraulic unit output pipes	14

Description	Tightening torque (N.m)
Hydraulic unit inlet pipes	20

BRAKE CIRCUIT : LIST AND LOCATION OF COMPONENTS

1. LIST AND LOCATION OF COMPONENTS



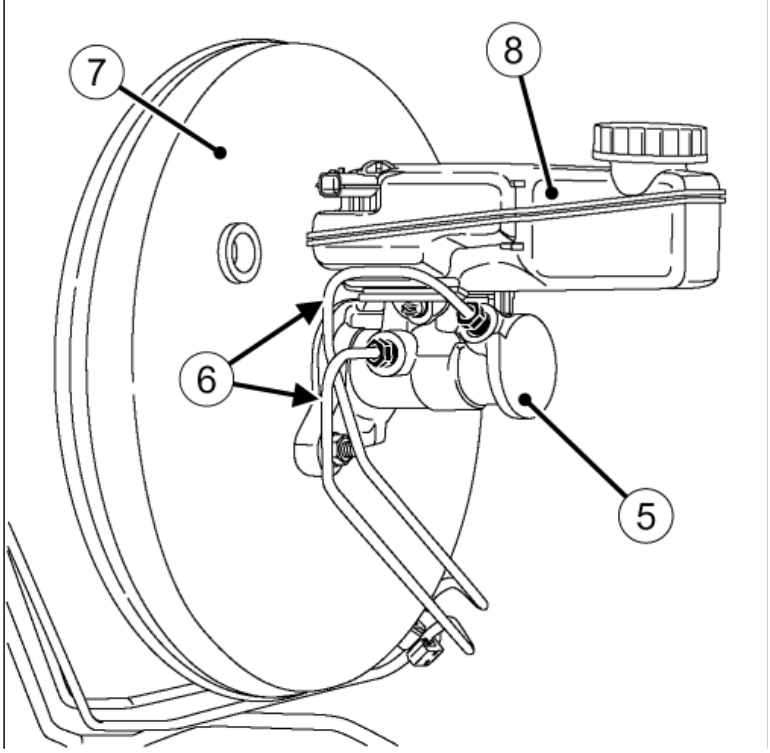
(1) Front brake calliper assembly Front brake calliper assembly: Exploded view

(2) Rear drum brake assembly Rear drum brake assembly : Exploded view

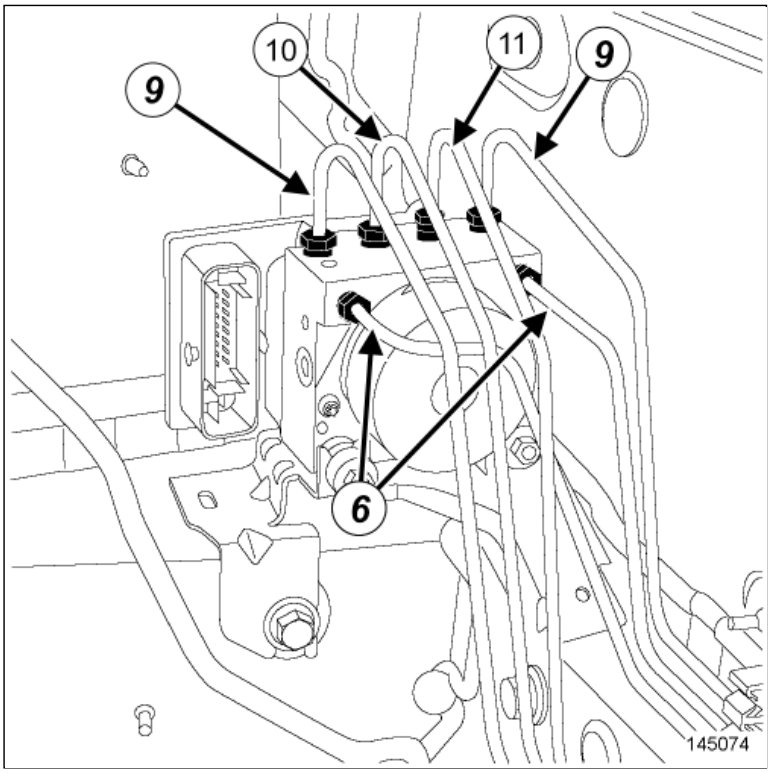
(3) Braking control assembly Braking control assembly: Exploded view

(4) Hydraulic brake unit Hydraulic brake unit: Removal - Refitting

BRAKING CONTROL ASSEMBLY



HYDRAULIC BRAKE UNIT



(5) Master cylinder

(6) Hydraulic unit - master cylinder brake pipe

(7) Brake servo

(8) Brake fluid reservoir

(9) Hydraulic unit - underbody union brake pipe

(10) Hydraulic unit - front left-hand calliper brake pipe

(11) Hydraulic unit - front right-hand calliper brake pipe

xSL version : 3.02 du 22/07/11

BRAKEFLUID:SPECIFICATIONS

1. BRAKE FLUID REPLACEMENT INTERVAL

Our braking technology, and in particular the disc brakes (hollow pistons which conduct little heat, have a low volume of fluid in the cylinder, sliding callipers avoiding the need for a fluid reserve in the least cooled area of the wheel), has allowed us to prevent the risk of "vapour lock" as far as possible, even with heavy braking (mountainous area). However, current brake fluids are subject to minor deterioration during the first months of use due to slight humidity intake. This is why it is recommended that you change the brake fluid: see maintenance booklet for the vehicle.

1- TOPPING UP THE LEVEL

Wear of the brake pads will result in a gradual drop in the fluid level in the reservoir.

Do not top up the fluid, as the level will rise again when the pads are next changed. The brake fluid level must not fall below the minimum mark.

2- APPROVED BRAKE FLUID

- Using a mixture of two incompatible brake fluids in the brake circuit may give rise to:
  - significant risk of leaks mainly due deterioration of the cups,
  - impaired operation of the ESP system.

To avoid such risks, it is essential to only use RENAULT standard approved brake fluids**Vehicle: Parts and consumables for the repair** .

BRAKE MECHANISM: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

- Using a mixture of two incompatible brake fluids in the brake circuit may give rise to:
  - serious risk of leakage due mainly to deterioration of the cups,
  - degradation of the ESP system.

To avoid such risks, only ever use brake fluids which comply with the RENAULT standard Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

CAUTION

Switch off the vehicle ignition so as not to activate the hydraulic unit solenoid valves when bleeding the brake circuit.

- Reminder:
  - The pipes between the master cylinder, the callipers, and the hydraulic unit are connected using threaded unions with a metric thread.
  - Therefore, only parts specified in the Parts Catalogue for this vehicle should be used.

WARNING

To ensure that the ABS and ESP systems operate correctly, check that the underbody brake pipes are clipped in place and are not crossed.

WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

To avoid contaminating the brake circuit, do not allow the brake circuit components to drop on the ground.

Clean around the braking system with brake cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products).

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

3. GENERAL RECOMMENDATIONS

1- MASTER CYLINDER - BRAKE SERVO

Always replace the master cylinder seals.

Check that the brake servo seal is in place. Replace the seal if it is damaged.

Always replace the master cylinder - brake servo assembly when the master cylinder leaks into the brake servo. The brake servo becomes unusable when the rubber diaphragm is contaminated with brake fluid.

WARNING

To avoid breaking the connection between the brake servo pushrod and the brake pedal, check that the safety clevis pin is locked onto the brake servo pushrod by tilting it from the top downwards.

2- BRAKE HOSE

CAUTION

- In order not to damage the brake hose:
  - do not tension the hose,
  - do not twist the hose,
  - check that there is no contact with the surrounding components.

BRAKE PEDAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 37A, Mechanical component controls, Pedal assembly: Exploded view) and(see 37A, Mechanical component controls, Braking control assembly: Exploded view) .

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 37A, Mechanical component controls, Pedal assembly mechanism: Precautions for the repair)
  - Vehicle: Precautions for the repair

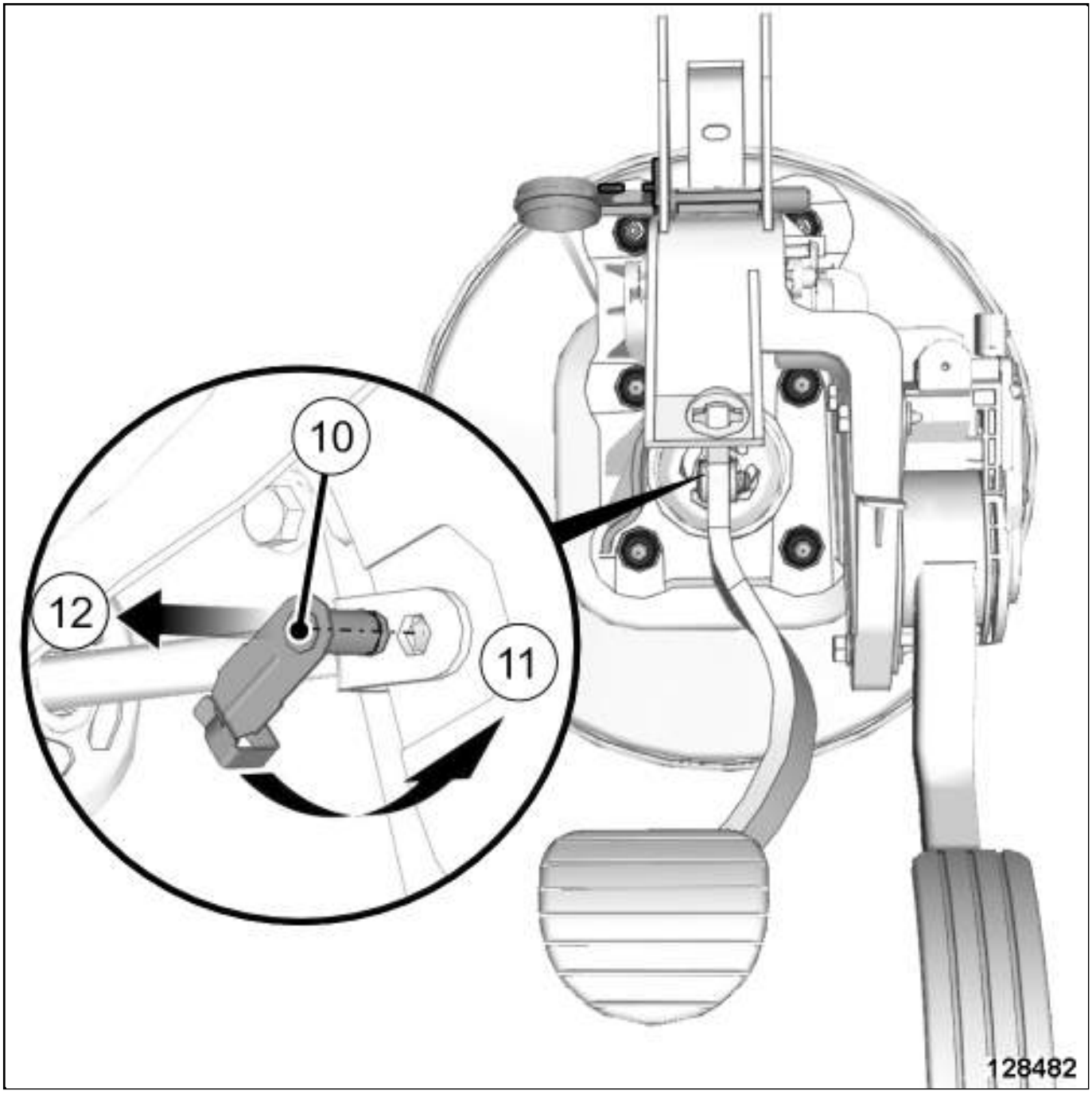
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the dashboard lower absorbent (if fitted to the vehicle).

- Disconnect the connector from the brake pedal switch.
- Remove the brake pedal switch by turning it a quarter of a turn anti-clockwise.
- Disconnect the accelerator pedal connector.
- Remove the accelerator pedal(see 37A, Mechanical component controls, Pedal assembly: Exploded view) .

2. REMOVAL OPERATION



- Remove the connecting shaft(10) between the brake pedal and the brake servo pushrod:
  - unlock the shaft in accordance with(11) ,
  - extract the shaft in accordance with(12) .

- Remove (see 37A, Mechanical component controls, Pedal assembly: Exploded view) :
  - the brake pedal shaft,
  - the brake pedal.

REFITTING

1. REFITTING PREPARATION OPERATION

- Check the condition of the parts.

- Replace any faulty parts.

- Coat the shaft with multipurpose greaseVehicle: Parts and consumables for the repair .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Adjust the brake pedal switch(see 37A, Mechanical component controls, Pedal switches: Adjustment) .

BRAKE SERVO: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
refrigerant charging station

parts always to be replaced:
Connecting shaft between the brake pedal and the brake servo pushrod

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 37A, Mechanical component controls, Braking control assembly: Exploded view) and(see 37A, Mechanical component controls, Pedal assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Brake circuit: Precautions for the repair ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

WARNING

To avoid a loss of braking efficiency, do not bend the brake servo pipe.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .

- Remove the air filter box Air filter unit: Removal - Refitting .

- Remove (see 37A, Mechanical component controls, Braking control assembly: Exploded view) :
  - the master cylinder,
  - the non-return valve at the servo.

2. REMOVAL OPERATION

- Tilt the connecting part downwards and remove the safety clevis pin between the brake servo pushrod and the brake pedal on the passenger compartment side.

- Remove (see 37A, Mechanical component controls, Pedal assembly: Exploded view) :
  - the brake servo nuts, on the passenger compartment side (the nuts mounting the pedal mounting to the servo),
  - the brake servo.

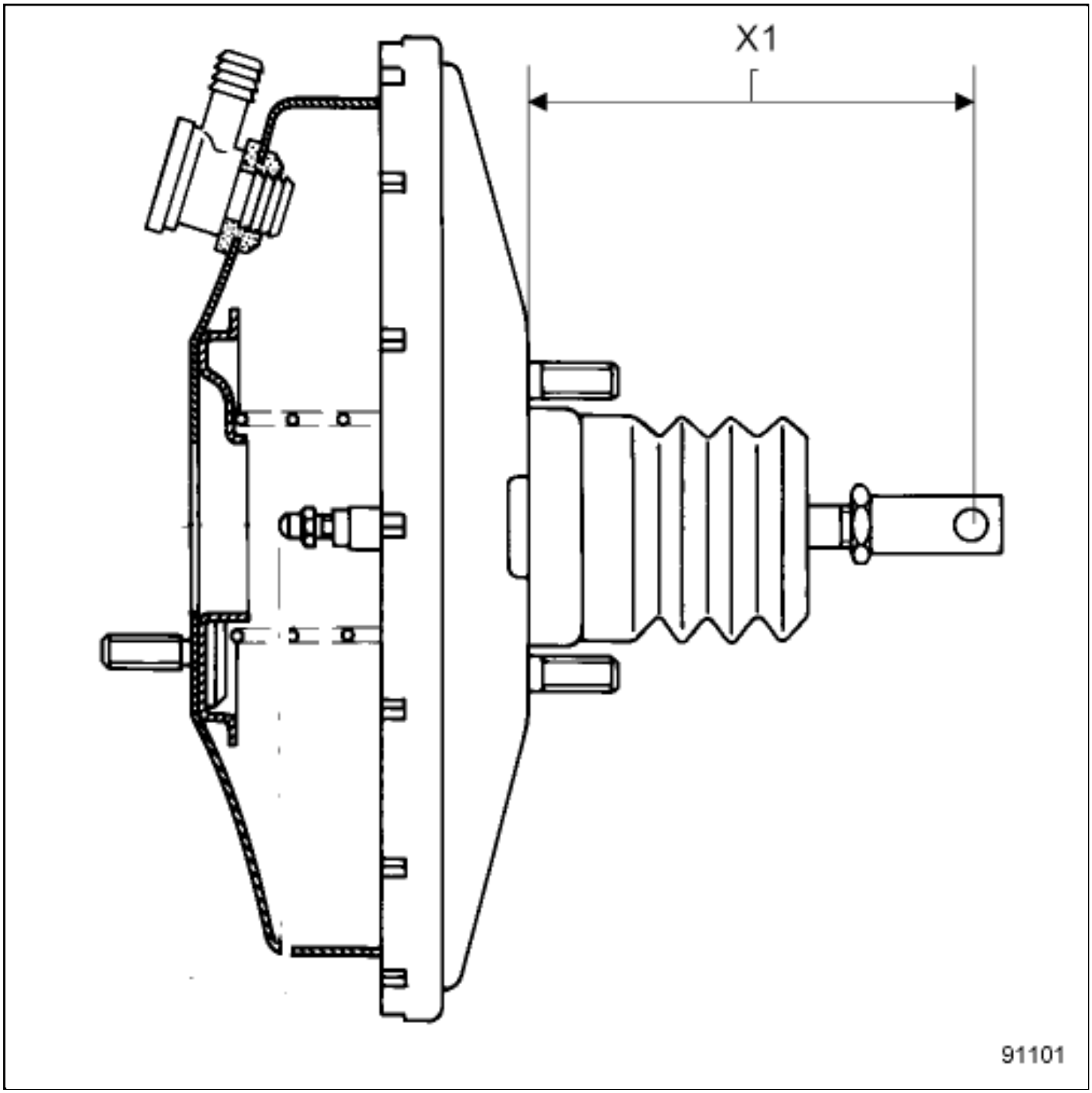
REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: Connecting shaft between the brake pedal and the brake servo pushrod

- Check that the brake servo seal is present; replace the seal if it is faulty.



- Before refitting, check the following dimension(X1) = 155.55 mm.

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Torque tighten the brake servo nuts(see 37A, Mechanical component controls, Pedal assembly: Exploded view) .

WARNING

To avoid breaking the connection between the brake servo pushrod and the brake pedal, check that the safety clevis pin is locked onto the brake servo pushrod by tilting it from the top downwards.

- Bleed the braking circuit Braking circuit: Bleed .

- Bleed the clutch circuit (see 37A, Mechanical component controls, Clutch circuit: Bleed) .

BRAKESPECIFICATIONS

Front brakes (mm)		
Piston diameter	48	
Disc diameter	258	259
Disc thickness	22	12
Minimum disc thickness (1)	19.8	10.6
Maximum disc run-out	0.03	
Brake lining thickness (including backplate)	17.5	18.2
Minimum brake lining thickness (including backplate)	7.5	8

B52(B52) AND (L52)

Rear brakes (mm)	
Piston diameter	**17.5**
Drum diameter	**203.3**
Maximum drum wear diameter	**204.4**
Brake lining thickness (without backplate)	**4.75**

Rear brakes (mm)	
Piston diameter	**19**
Drum diameter	**227.6**
Maximum drum wear diameter	**229.5**
Brake lining thickness (without backplate)	**4.85**

Master cylinder (mm)	
Diameter	22.2
Stroke	36

(1) Brake discs cannot be reground. If they are too heavily worn or scratched they must be replaced.

BRAKING CIRCUIT: BLEED

Note, one or more warnings are present in this procedure

Equipment required
brake circuit bleeding device
pedal press

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair **(see 30A, General information, Brake circuit: Precautions for the repair)** .

CAUTION

To avoid residual air being present in the brake circuit, the parking brake must be released before starting the bleeding process.

This procedure must be applied after one of the following components has been removed or replaced:

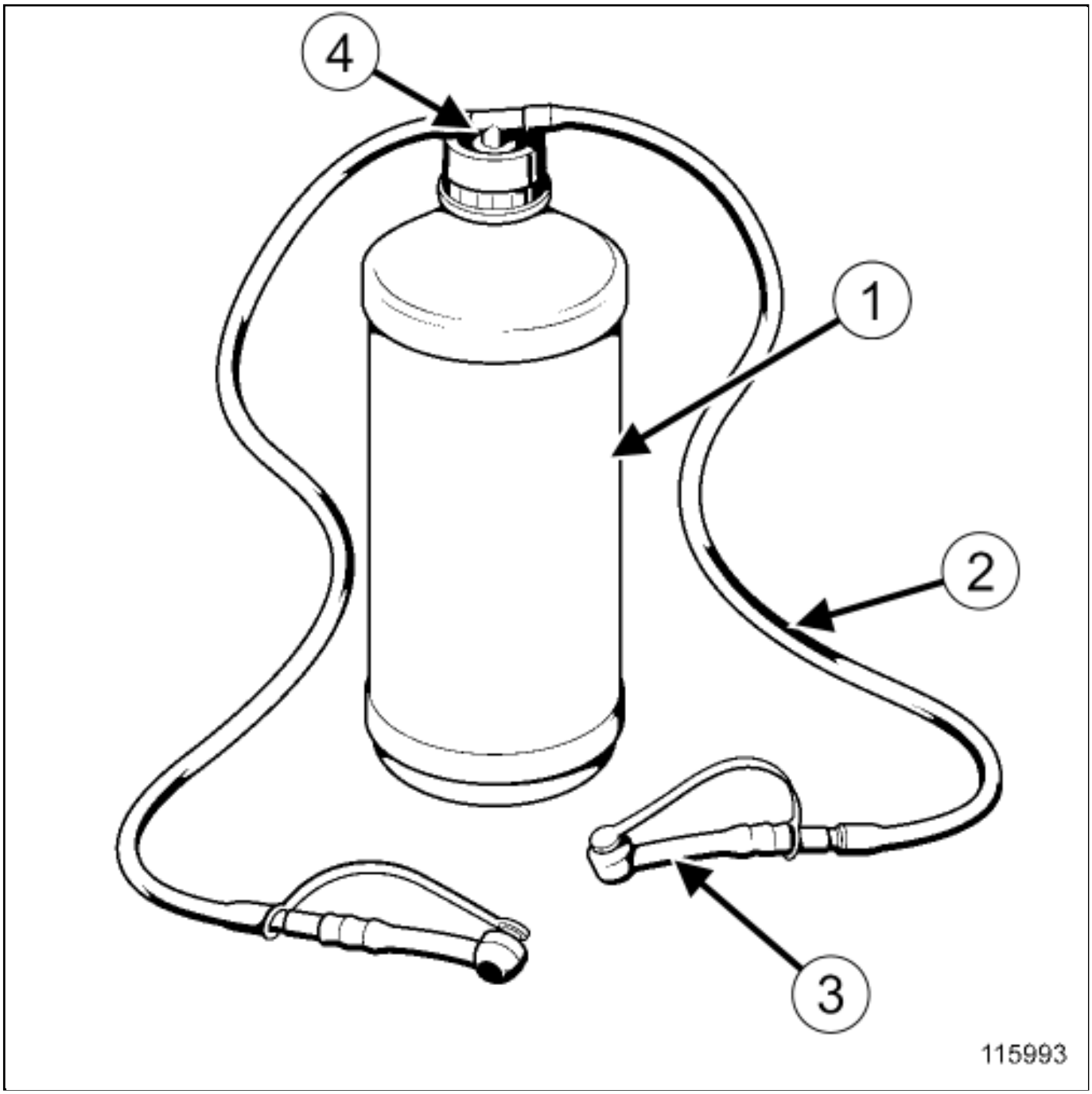
- the master cylinder,
- the brake fluid,
- the hydraulic unit,
- a rigid pipe,
- a hose,
- the reservoir,
- a calliper.

CAUTION

Switch off the vehicle ignition so as not to activate the hydraulic unit solenoid valves when bleeding the brake circuit.

CAUTION

The level must be between the "MIN" and "MAX" markings on the reservoir.



- Use locally produced containers to collect the used brake fluid.

- Front and rear callipers:
  - 2 washer fluid containers(1) (1 litre),
  - 4 mmdiameter transparent pipes(2) ,
  - 4 pipettes(3) ,

- 2 T-unions(4) .

Note:

The new hydraulic unit is pre-filled.

When working on one of the following components, position a pedal pressto limit the outflow of brake fluid and prevent any air from entering the master cylinder and the circuits downstream of the master cylinder:

- hydraulic unit,
- pipes between the hydraulic unit and brake callipers,
- brake hoses,
- brake calliper.

Remove the pedal pressbefore carrying out the braking system bleeding procedure.

Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .

Switch off the vehicle ignition.

Connect the brake circuit bleeding device(after having received Renault approval) to the master cylinder reservoir (see the instructions for the equipment).

Pressurise the brake circuit.

Adjust the pressure to between 1.5 bar< P < 2 barfor 3 minutesto stabilise it in the braking circuit.

Close the circuit between the bleed screw and brake fluid reservoir without dumping the pressure.

Note:

The circuit between the bleed screw and brake fluid reservoir is closed in different ways depending on the type of equipment used:

- valve,
- switch.

Fit the bleed containers to the six bleed screws of the callipers.

Note:

Some callipers are equipped with several bleed screws. In this case, turn the bolts one after another to perform the brake circuit bleed.

- Undo the calliper bleed screws:
  - front left-hand,
  - front right-hand,
  - rear left-hand,
  - rear right-hand.

- Open the circuit between the bleed screw and brake fluid reservoir and allow the liquid to run until all the air bubbles have been released.

- Tighten the bleed screws in the following order:
  - front left-hand,
  - front right-hand,
  - rear left-hand,
  - rear right-hand.

- Undo the calliper bleed screw:
  - front left-hand,
  - allow the fluid to run until all the air bubbles have been released,
  - tighten the bleed screw on the calliper.

- Carry out the previous operation on the callipers:
  - front right-hand,
  - rear left-hand,
  - rear right-hand.

- Close the bleed screw to dump the pressure in the brake circuit.

- Remove the brake circuit bleeding devicefrom the master cylinder reservoir.

- Check pedal travel and resistance. If it is not correct, finish bleeding the brake circuit with the help of a second operator. Start the bleed operation by bleeding the calliper that is the furthest away from the master cylinder:
  - hold down the brake pedal,
  - open the circuit bleed screw to release the air from the brake circuit,
  - close the circuit bleed screw,
  - release the brake pedal.

- Top up the brake fluid level in the reservoir, if necessary. Check the sealing of the front and rear bleed screws and ensure that the sealing covers are in placeFront brake calliper assembly: Exploded view and Rear drum brake assembly : Exploded view .

During a road test, trigger braking regulation to confirm that the brake pedal travel is correct.

Clean off any traces of brake fluid on the vehicle using brake cleaning product**Vehicle: Parts and consumables for the repair** .

1. BLEEDING THE BRAKING ASSISTANCE CIRCUIT

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XSL version : 3.02 du 22/07/11

BRAKING CONTROL ASSEMBLY: EXPLODED VIEW

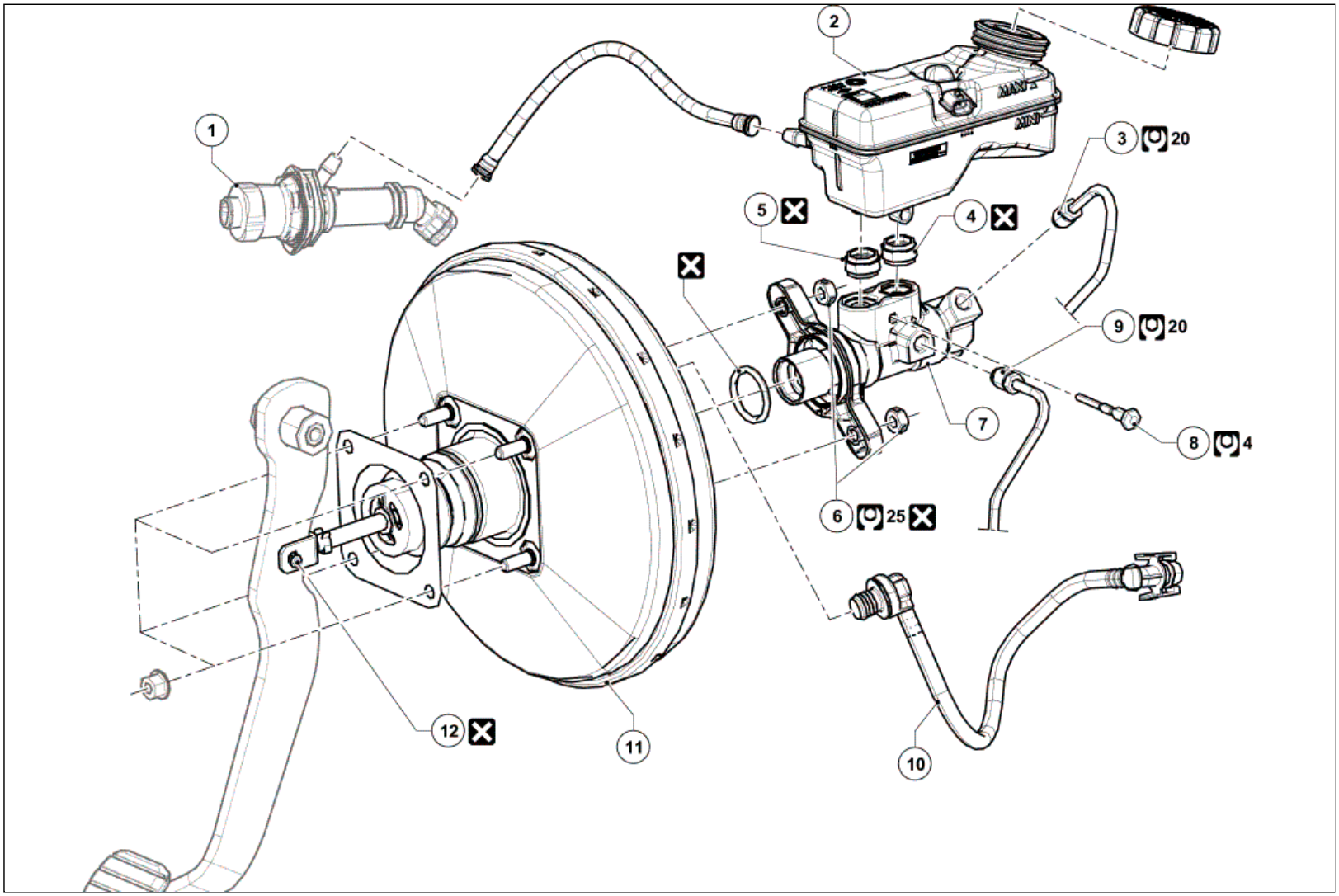


Illustration key: Description Legend .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Clutch master cylinder	Clutch assembly: Exploded view
2	Brake fluid reservoir	
3	Brake pipe between master cylinder and hydraulic unit	Brake circuit : List and location of components
4	Master cylinder seal on brake fluid reservoir side	
5	Master cylinder seal on brake fluid reservoir side	
6	Master cylinder nut	
7	Master cylinder	(see 37A, Mechanical component controls, Master cylinder: Removal - Refitting)
8	Brake fluid reservoir pin	
9	Brake pipe between master cylinder and hydraulic unit	Brake circuit : List and location of components
10	Brake servo non-return valve	
11	Brake servo	(see 37A, Mechanical component controls, Brake servo: Removal - Refitting)
12	brake pedal - servo rod connecting pin	

CABIN FILTER: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the absorbing material under the dashboard clip.
- Move aside the absorbing material under the dashboard.

2. REMOVAL OPERATION

Note:

Foreign bodies (leaves, insects etc.) are likely to accumulate in the passenger compartment filter.

Remove the cabin filter with care so as to prevent foreign bodies getting into the evaporator.

- Remove (see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :
  - the cabin filter cover,
  - the cabin filter.

REFITTING

1. REFITTING PREPARATION OPERATION

- Check for foreign bodies in the passenger compartment filter housing, and clean thoroughly if necessary.

2. REFITTING OPERATION

Note:

The arrows, indicating the direction of the air flow, must be oriented towards the interior of the vehicle.

- Proceed in the reverse order to removal.

CAMSHAFT POSITION SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

parts always to be replaced:
camshaft sensor seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair** .

REMOVAL

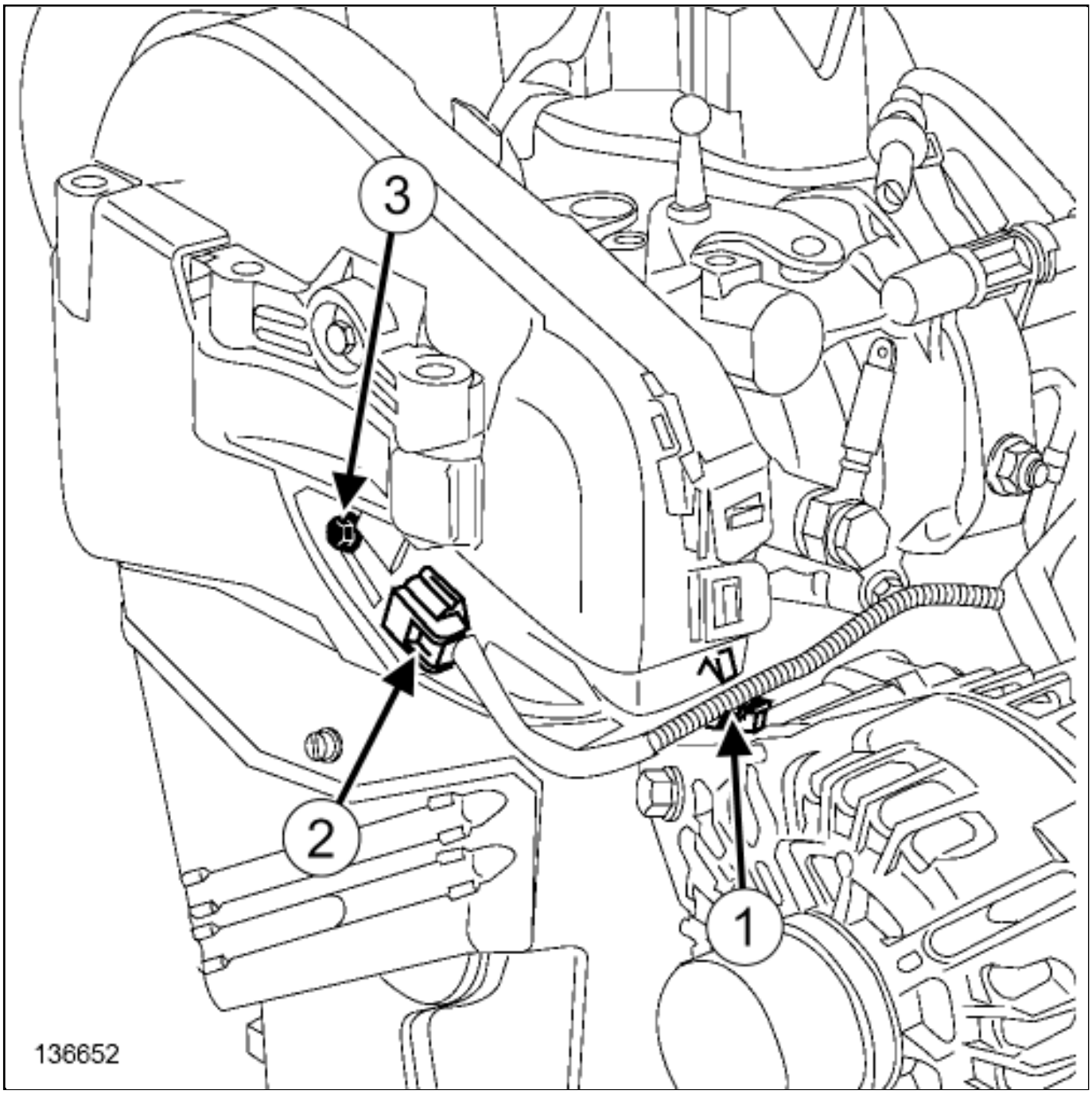
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .

- Remove:
  - the engine undertray bolts,
  - the engine undertray.

- Remove:
  - the lower engine tie-bar**Lower engine tie-bar: Removal - Refitting** ,
  - the right-hand suspended engine mounting**Right-hand suspended engine mounting: Removal - Refitting** .

2. REMOVAL OPERATION



- Unclip the camshaft position sensor wiring from the upper timing cover(1) .
- Disconnect the connector(2) from the camshaft position sensor.
- Remove:
  - the bolt(3) from the camshaft position sensor,
  - the camshaft position sensor.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: camshaft sensor seal.

Lubricate the camshaft position sensor seal.

2. REFITTING OPERATION

Refit the camshaft position sensor fitted with a new seal.

Connect the camshaft position sensor connector.

Clip the wiring of the camshaft position sensor onto the upper timing cover.

3. FINAL OPERATION

Refit:

- the right-hand suspended engine mounting Right-hand suspended engine mounting: Removal - Refitting ,
- the lower engine tie-bar Lower engine tie-bar: Removal - Refitting .

Refit:

- the engine undertray,
- the engine undertray bolts.

Apply the After repair procedure using the Diagnostic tool:

-Computer concerned by the After repair procedure:

- "Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

- "Camshaft sensor" .

CATALYTIC CONVERTER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

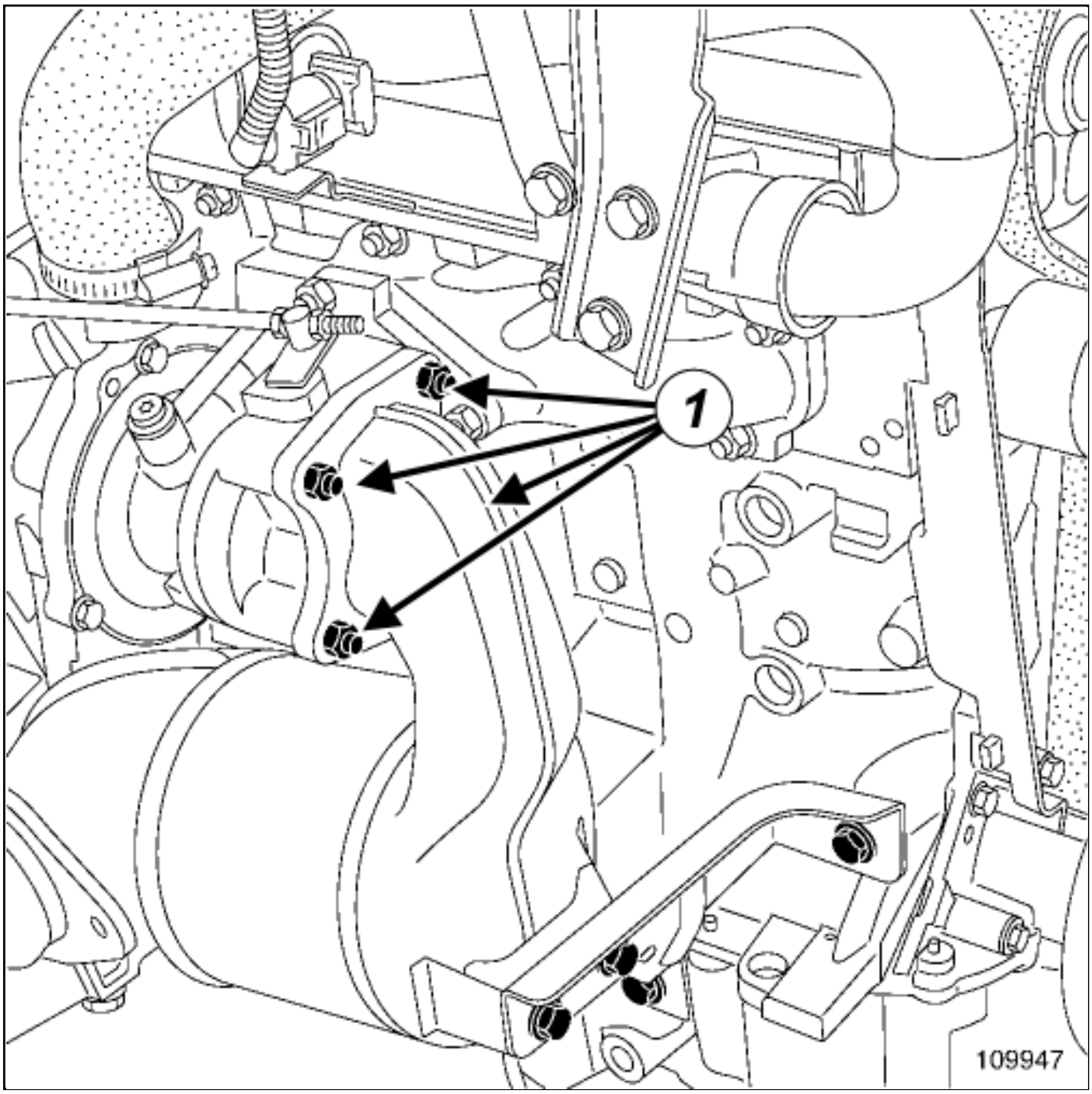
Before carrying out work on the catalytic converter(see 19B, Exhaust, Exhaust: Precautions for the repair) .

REMOVAL

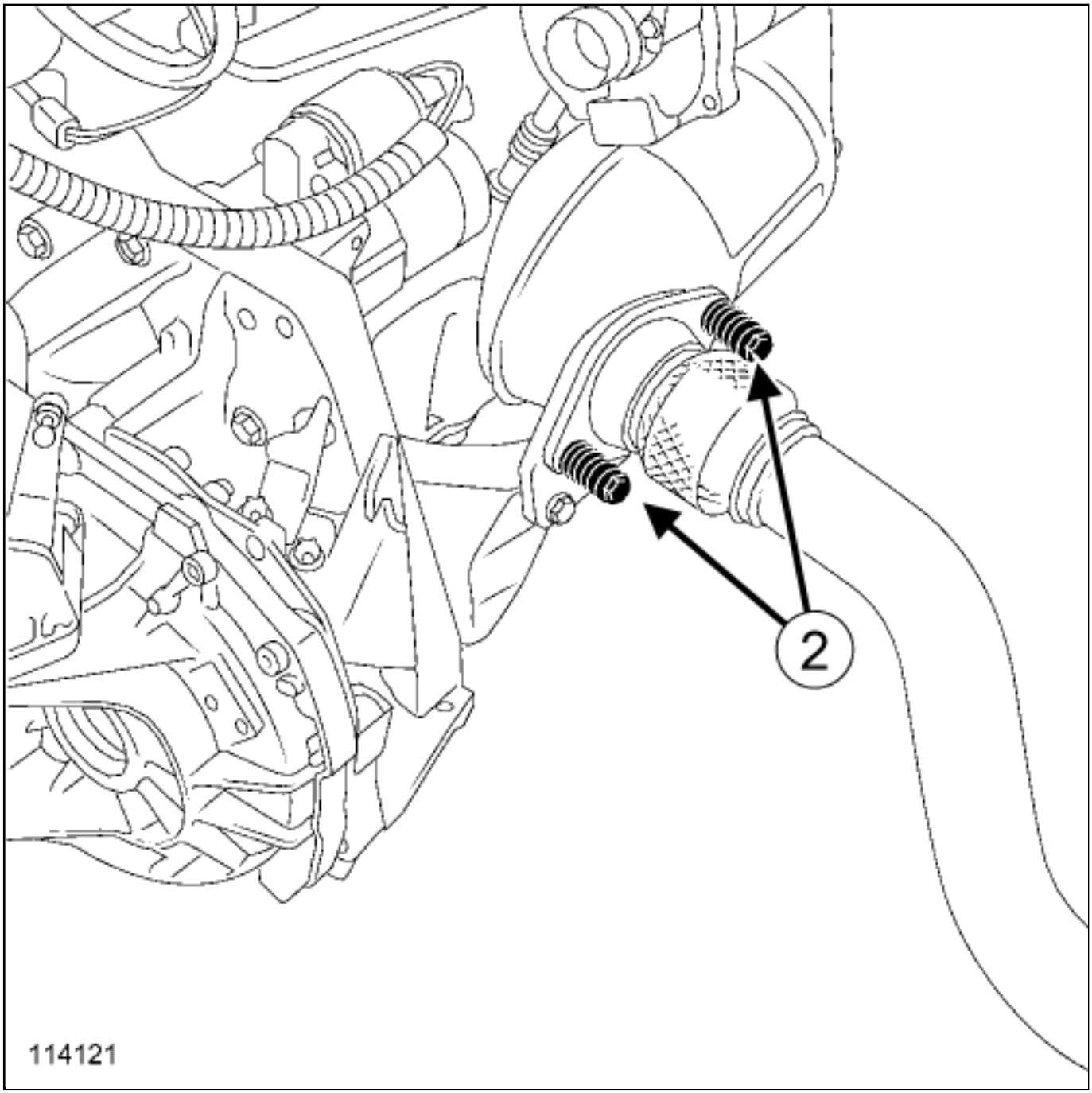
1. REFITTING PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting (MR 388, 02A, Lifting equipment).
- Disconnect the batteryBattery: Removal - Refitting (MR 388, 80A, Battery).
- Remove:
  - the engine cover,
  - the air filter boxAir filter unit: Removal - Refitting ,
  - the front right-hand wheel.

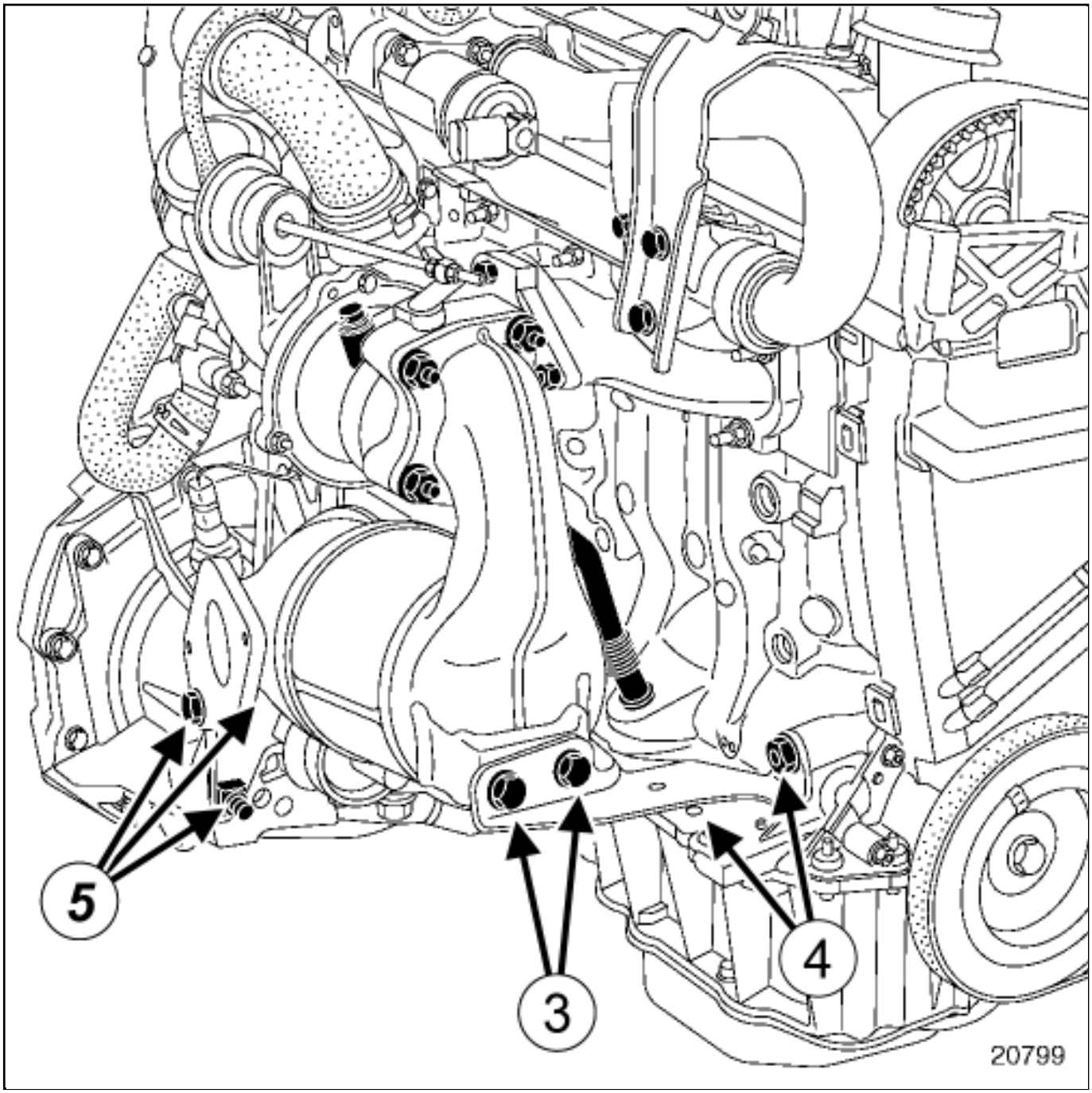
2. OPERATION FOR REMOVAL OF PART CONCERNED



- Remove the nuts(1) mounting the catalytic converter on the turbocharger.



- Remove the mountings(2) from the exhaust flange.
- Move the exhaust pipe to one side.

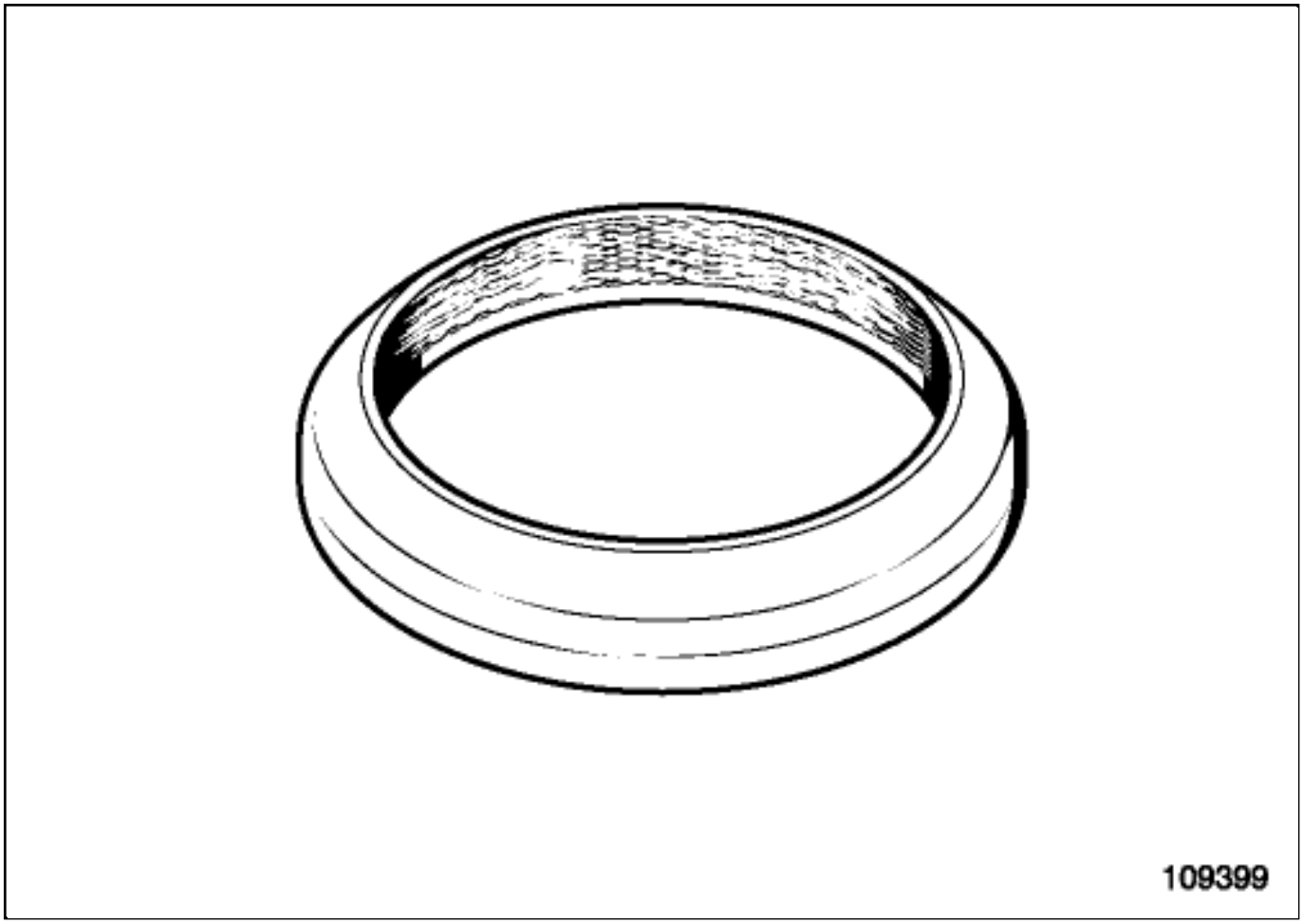


Remove:

- the catalytic converter mounting bolts(3) on the upstream stay,
- the bolts(4) mounting the upstream stay on the engine,
- the downstream stay mounting bolts(5) ,
- the downstream stay,
- the catalytic converter.

REFITTING

1. REFITTING PREPARATION OPERATION



CAUTION

All damaged shields must be replaced.

The sealing between the exhaust manifold and the catalytic converter must be perfect.

All removed seals must be replaced.

Take care not to damage the catalytic converter during removal and refitting.

2. REFITTING OPERATION FOR PART CONCERNED

- Torque tighten the turbocharger output studs9 Nm.
- Fit the catalytic converter

Tighten in order and until contact:

- the upstream stay bolts on the engine,
- the downstream stay bolts on the gearbox,
- the upstream stay bolts on the catalytic converter,
- the downstream stay bolt on the catalytic converter,
- the catalytic converter-turbocharger mounting nuts.

Torque tighten and in order:

- the catalytic converter mounting nuts on the turbocharger26 Nm ,
- the bolts mounting the upstream stay on the engine44 Nm ,
- the bolts mounting the downstream stay on the gearbox21 Nm ,
- the bolts mounting the upstream stay on the catalytic converter26 Nm ,
- the bolt mounting the catalytic converter on the downstream stay21 Nm .

Note:

Make sure there is no contact between the catalytic converter and the turbocharger oil return pipe.

Torque tighten the exhaust bracket bolts21 Nm .

3. FINAL OPERATION

Check:

- that all the exhaust pipe heat shields are in place and properly attached,
- that there is no contact with the underbody.

Refit:

- the front right-hand wheel,
- the air filter box**Air filter unit: Removal - Refitting** ,
- the engine cover.

Connect the battery**Battery: Removal - Refitting** (MR 388, 80A, Battery).

CENTRE CONSOLE ASSEMBLY: EXPLODED VIEW

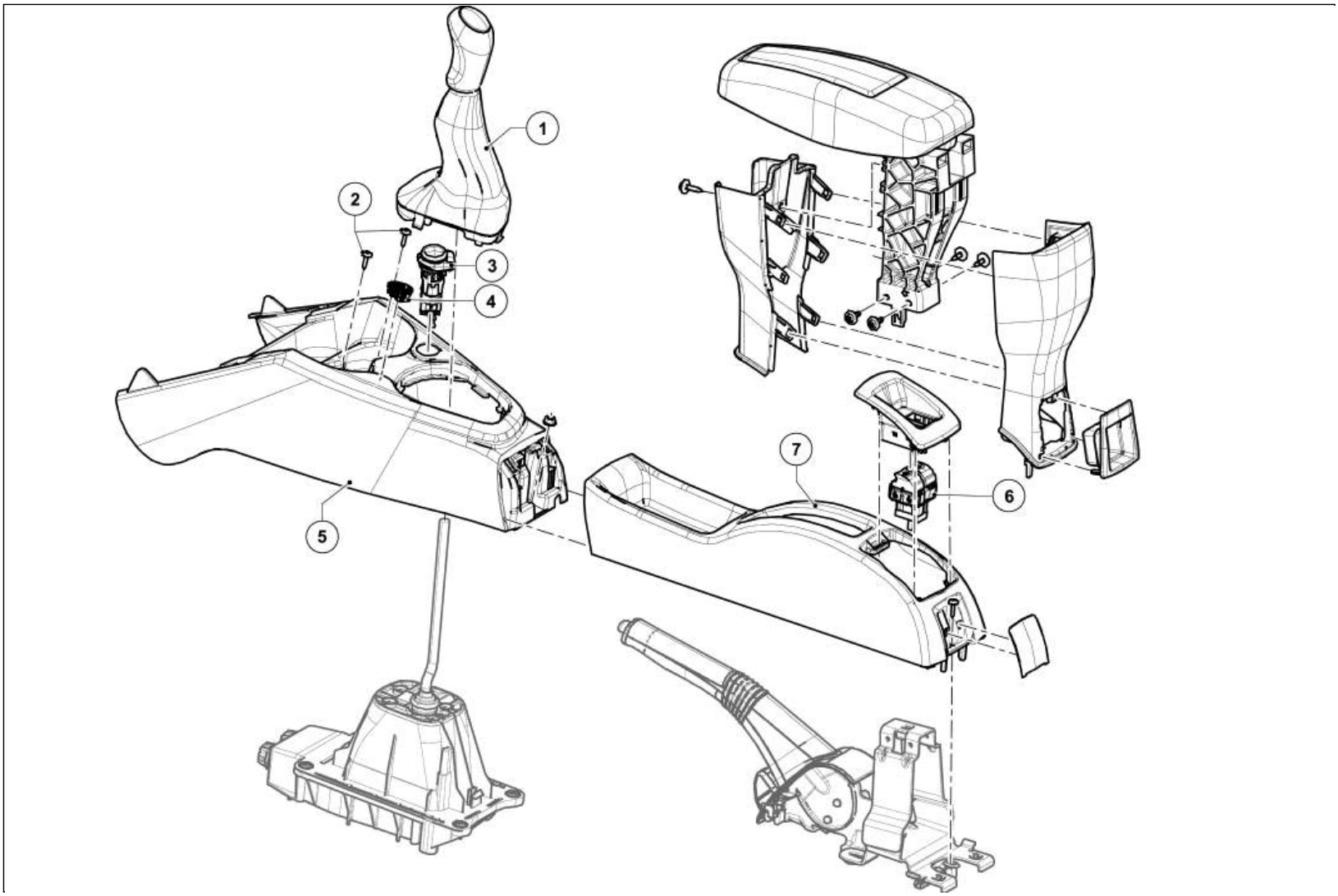


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Gear lever gaiter	
2	Centre console bolt	
3	Analogue accessories socket	
4	Switch GPL	
5	Centre console front section	
6	Rear window winder control	
7	Centre console rear section	

CENTRE CONSOLE: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 57A, Interior equipment, Centre console assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Tilt the armrest of the centre console.

- Remove (see 57A, Interior equipment, Centre console assembly: Exploded view) :
  - the front cover armrest bolt of the centre console,
  - the front cover armrest of the centre console,
  - the front mounting armrest bolts of the centre console.

- Unclip the rear window winder switch plate(see 57A, Interior equipment, Centre console assembly: Exploded view) .

- Disconnect the rear window winder switch connector.

- Remove (see 57A, Interior equipment, Centre console assembly: Exploded view) :
  - the rear cover armrest of the centre console,
  - the rear mounting armrest bolts of the centre console,
  - the armrest of the centre console.

2. REMOVAL OPERATION

- Remove the cover from the upper section of the centre console(see 57A, Interior equipment, Centre console assembly: Exploded view) .

- Remove (see 57A, Interior equipment, Centre console assembly: Exploded view) :
  - the upper section bolt of the centre console,
  - the upper section of the centre console,
  - the lower section nut of the centre console.

- Unclip the gaiter from the lower section of the centre console(see 57A, Interior equipment, Centre console assembly: Exploded view) .

- Remove the lower section bolts of the centre console(see 57A, Interior equipment, Centre console

assembly: Exploded view) .

- Partially remove the lower section of the centre console(see 57A, Interior equipment, Centre console assembly: Exploded view) .

- Disconnect the cigarette lighter connector.

- Remove (see 57A, Interior equipment, Centre console assembly: Exploded view) :
  - the cigarette lighter,
  - the lower section of the centre console.

REFITTING

- Proceed in the reverse order to removal.

CENTRE FLOOR FRONT CARPET: REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove :
  - the front seats Front seat assembly: Exploded view ,
  - the rear bench seat base Rear bench seat assembly: Exploded view ,
  - the centre console Centre console assembly: Exploded view ,
  - the side door seals partially.

- Remove:
  - the B-pillar upper trim (see 71A, Body internal trim, Interior body side trim assembly: Exploded view) ,
  - the B-pillar lower trim (see 71A, Body internal trim, Interior body side trim assembly: Exploded view) .

L52(L52)

- the C-pillar lower trim (see 71A, Body internal trim, Interior body side trim assembly: Exploded view) .

2. REMOVAL OPERATION

- Remove the plastic nuts (see 71A, Body internal trim, Floor trim assembly: Exploded view) .

- Unclip (see 71A, Body internal trim, Floor trim assembly: Exploded view) :
  - the rear side clips using the unclipping pliers,
  - the right side front clips using the unclipping pliers.
  - the left side front clips using the unclipping pliers,

- Remove:
  - the bonnet release catch,
  - the centre floor front carpet (see 71A, Body internal trim, Floor trim assembly: Exploded view) .

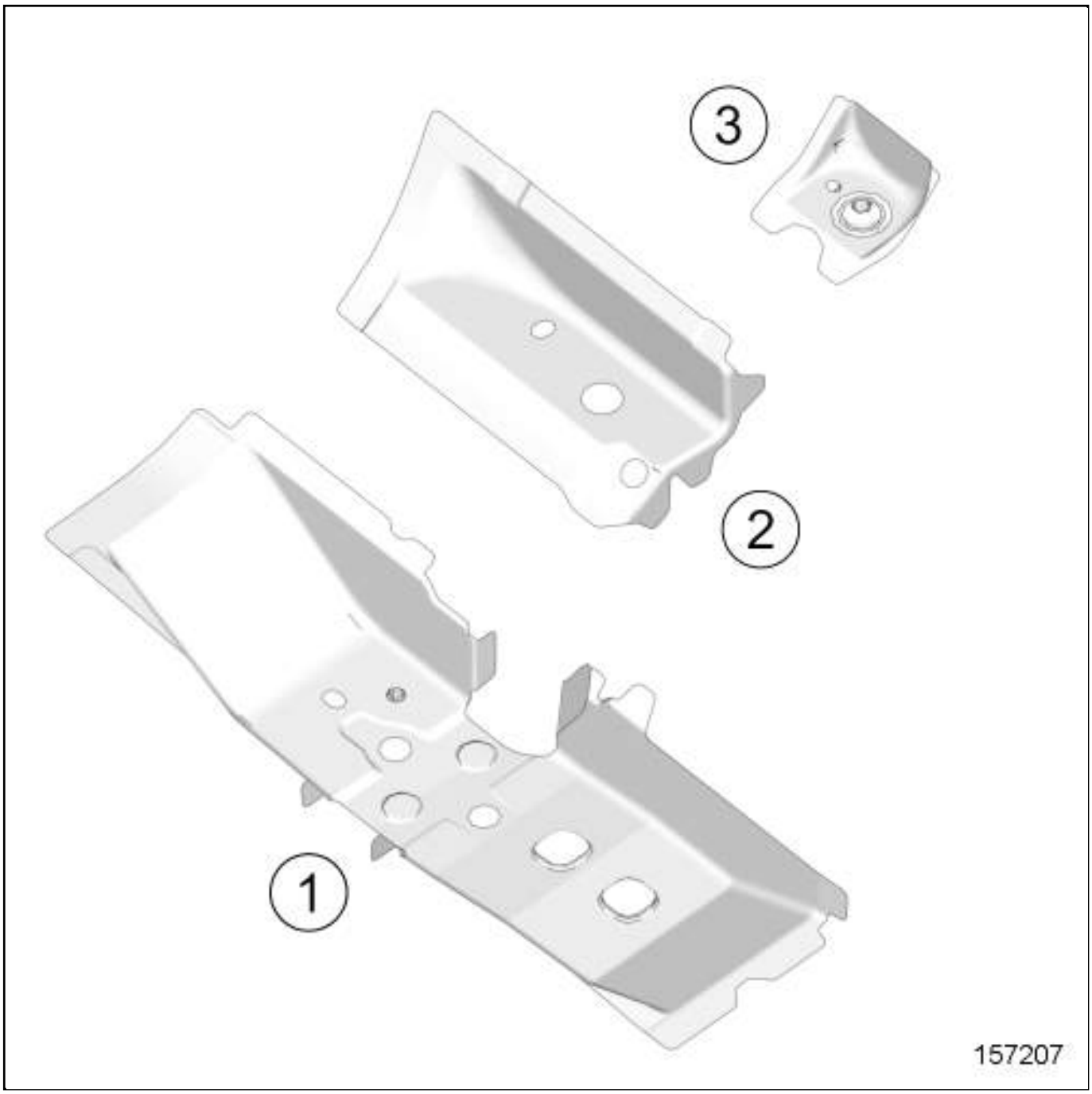
REFITTING

- Proceed in the reverse order to removal.

CENTRE FLOOR FRONT SIDE CROSS MEMBER: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

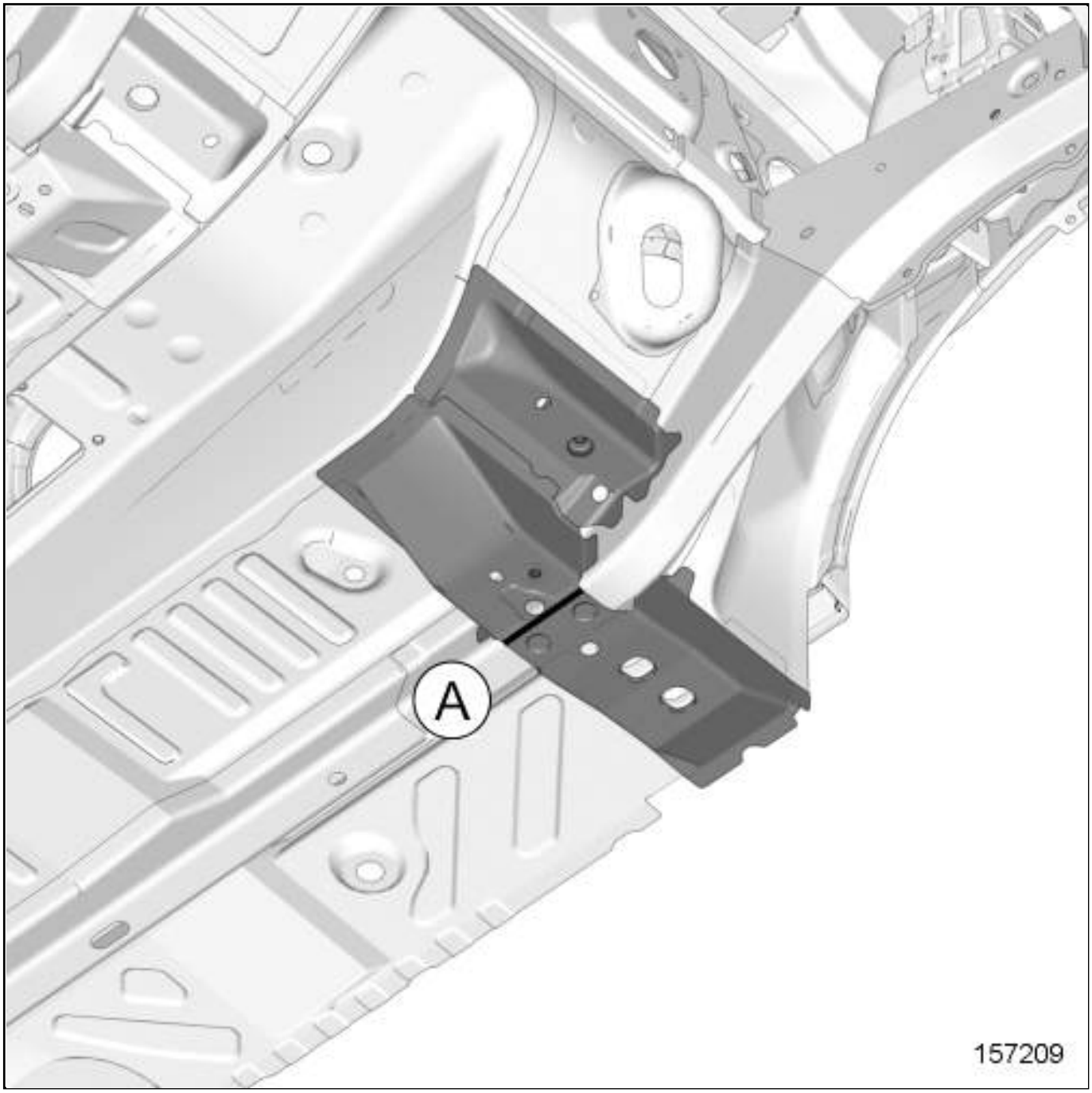


No.	Description	Thickness (mm)
(1)	Centre floor front side cross member	0.95
(2)	Rear mounting unit of front subframe	1.95
(3)	Front subframe rear mounting reinforcement	1.95

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement along cut A.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

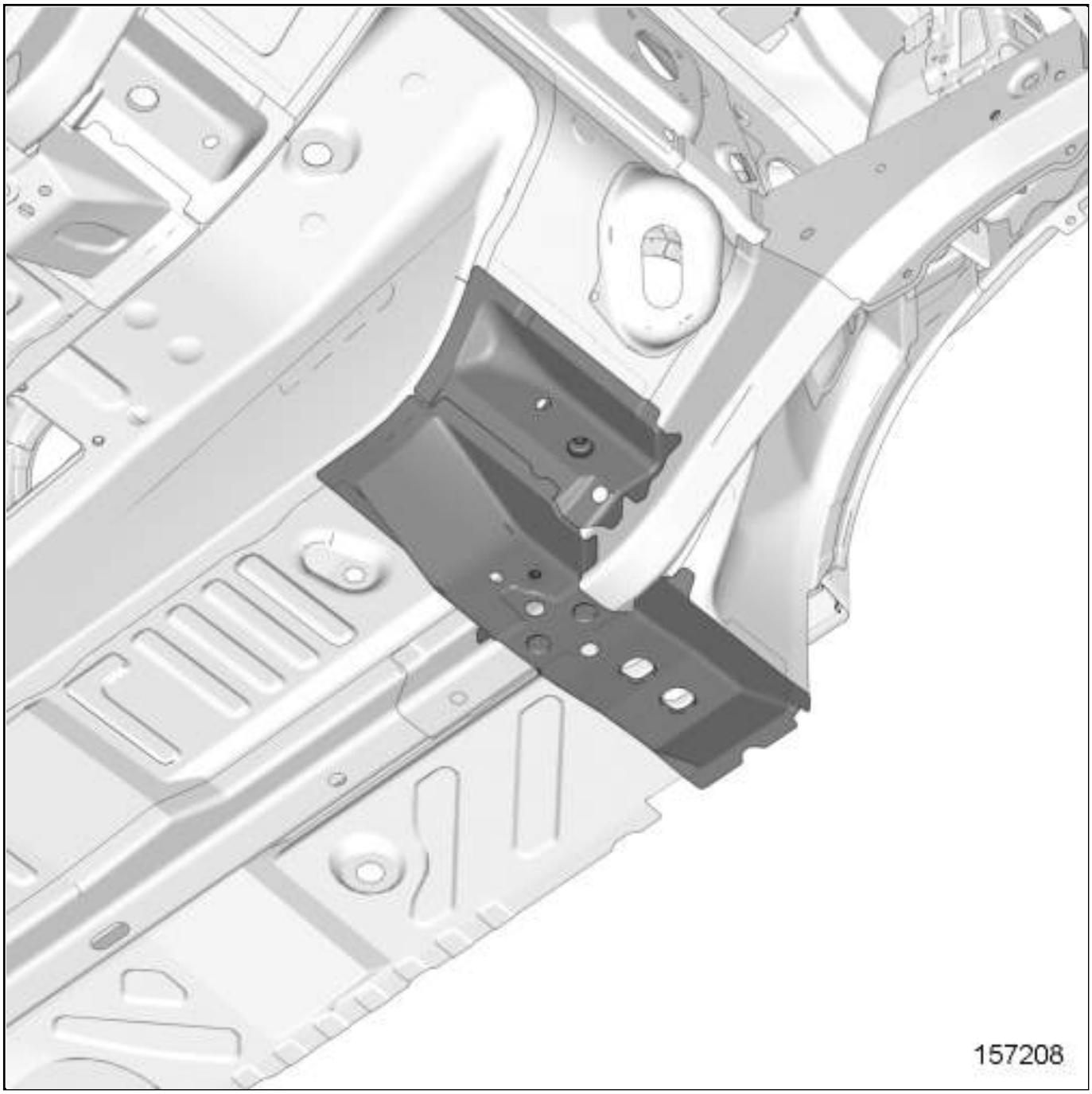
Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT

WARNING

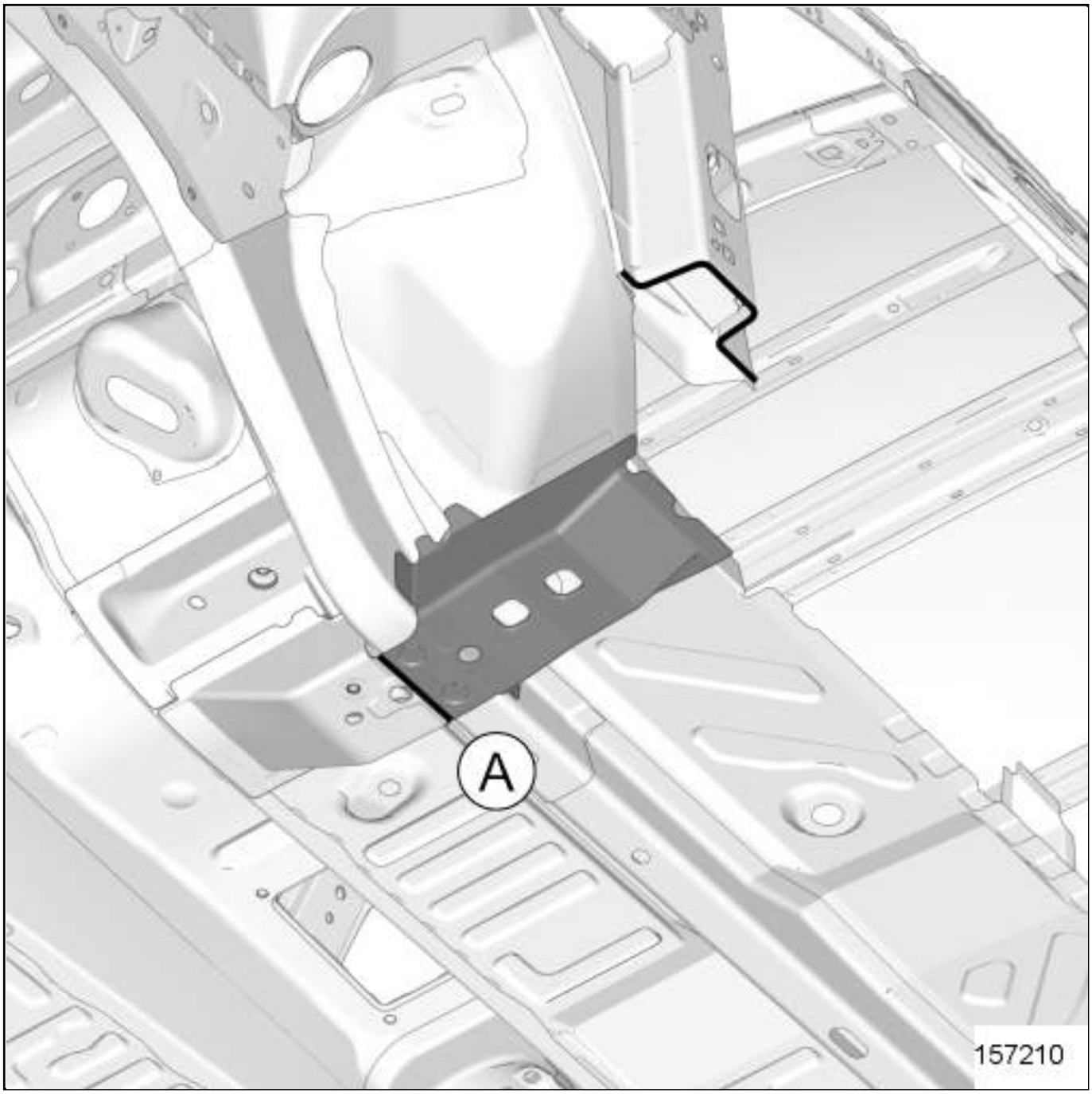
Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1)PART IN POSITION

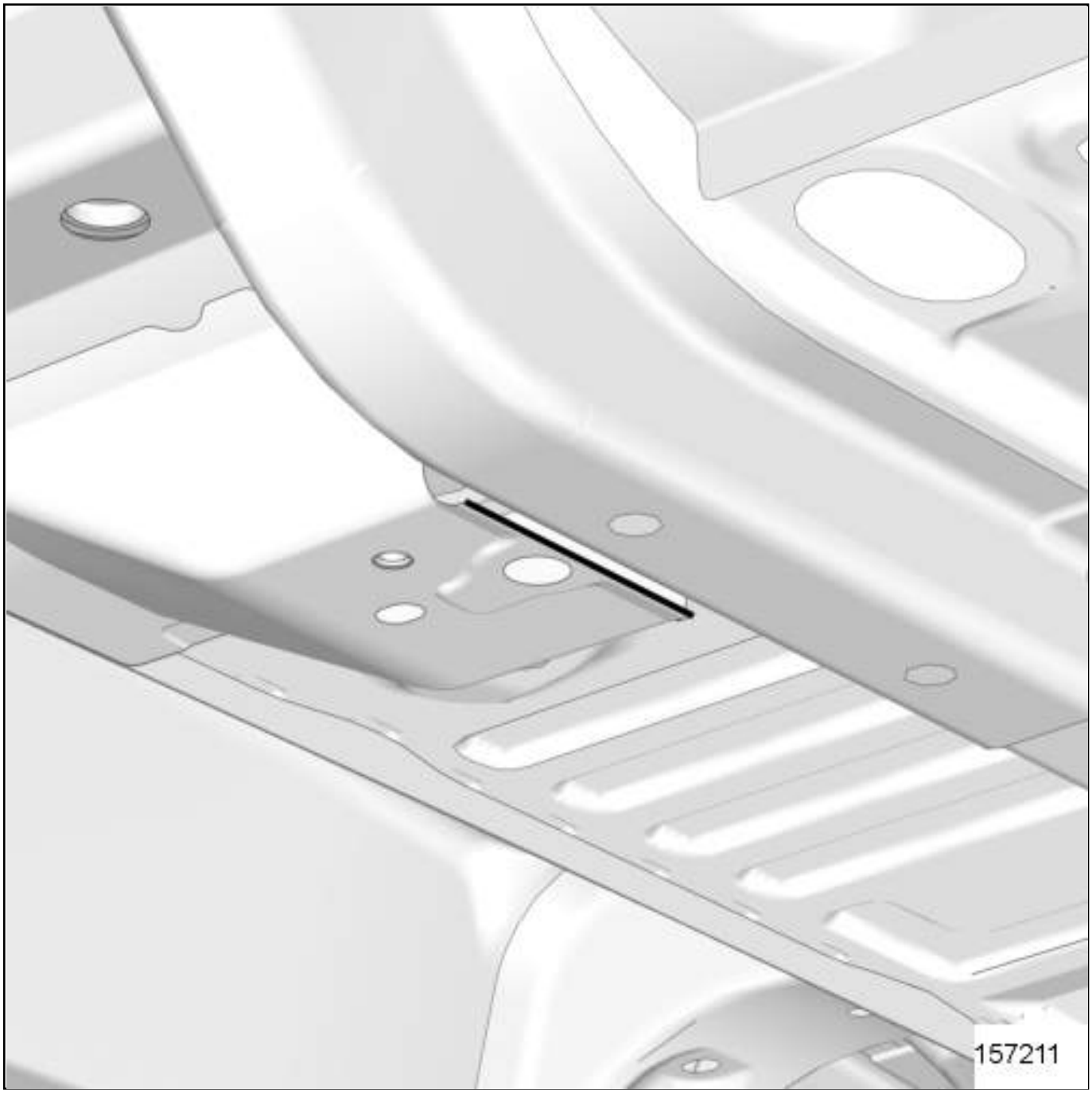


2- PARTIAL REPLACEMENT ALONG CUT A

1)PART IN POSITION



DETAILED VIEW A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CENTRE FLOOR, SIDE SECTION: REPLACEMENT

Note, one or more warnings are present in this procedure

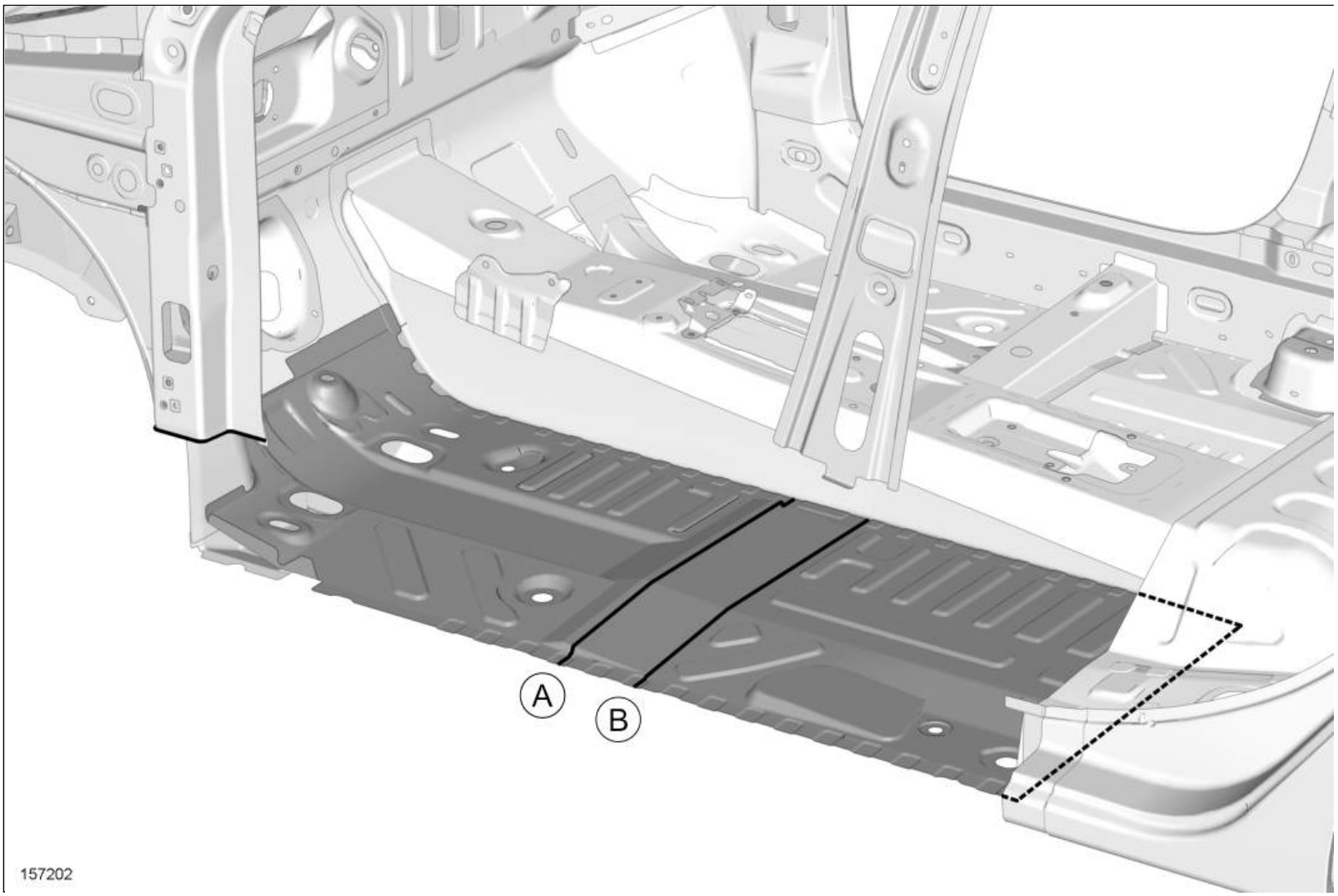
1. COMPOSITION OF THE SPARE PART

No.	Description	Thickness (mm)
(1)	Centre floor, side section	0.65

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement along cut A,
- partial replacement along cut B.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

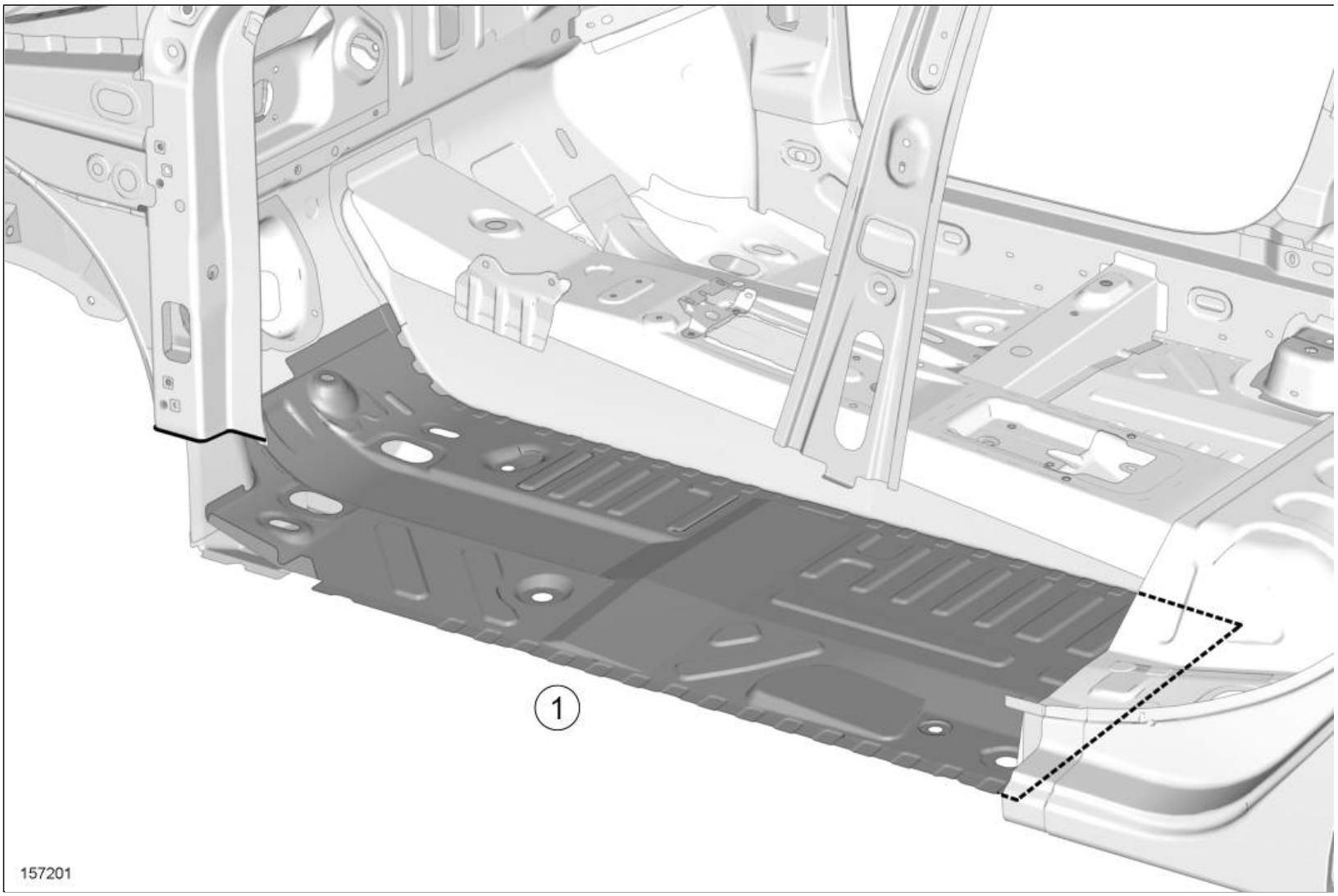
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld areaEarths on body: List and location of components .

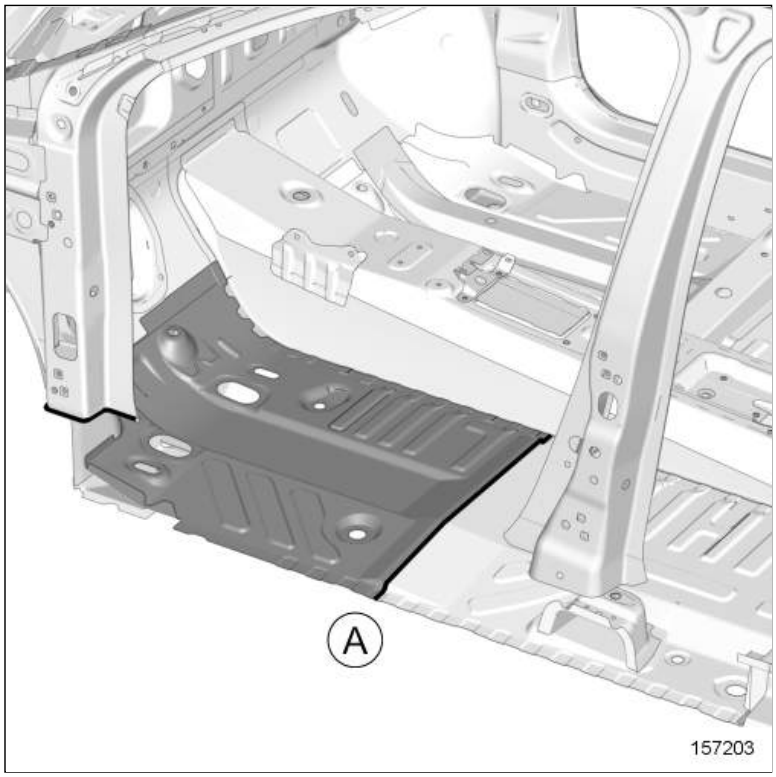
1- COMPLETE REPLACEMENT

1)PART IN POSITION

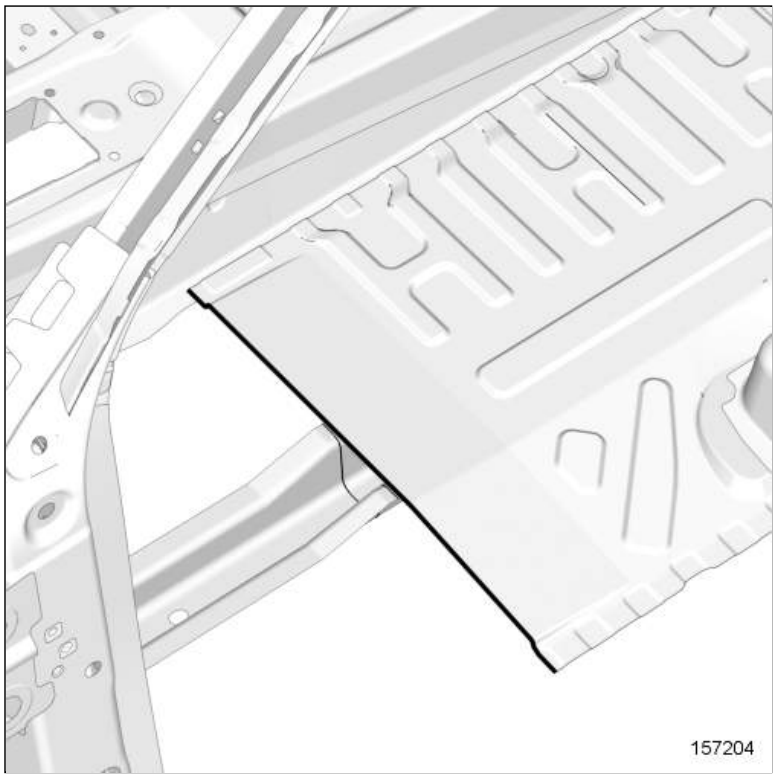


2- PARTIAL REPLACEMENT ALONG CUT A

1)PART IN POSITION

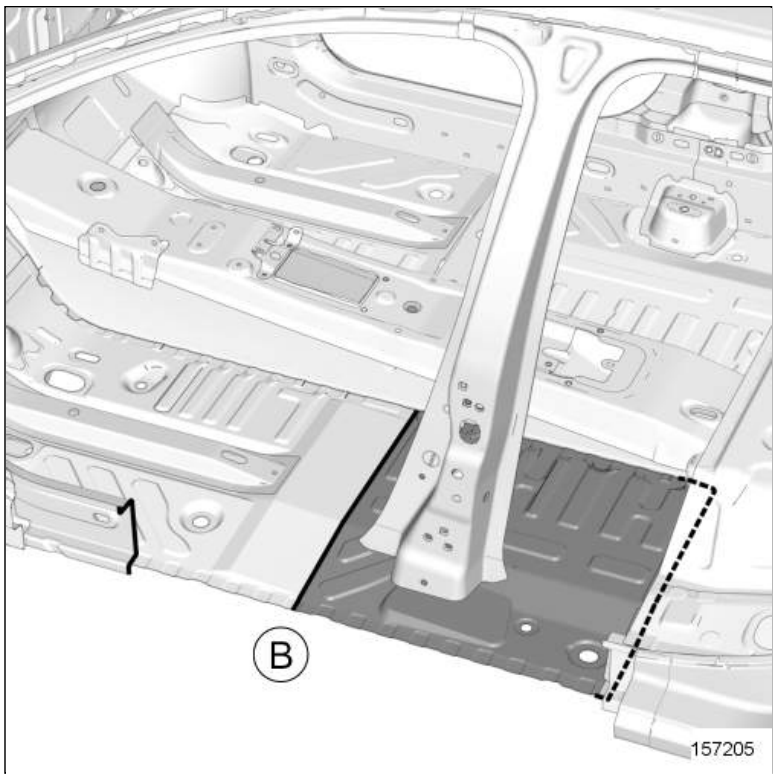


DETAILED VIEW A

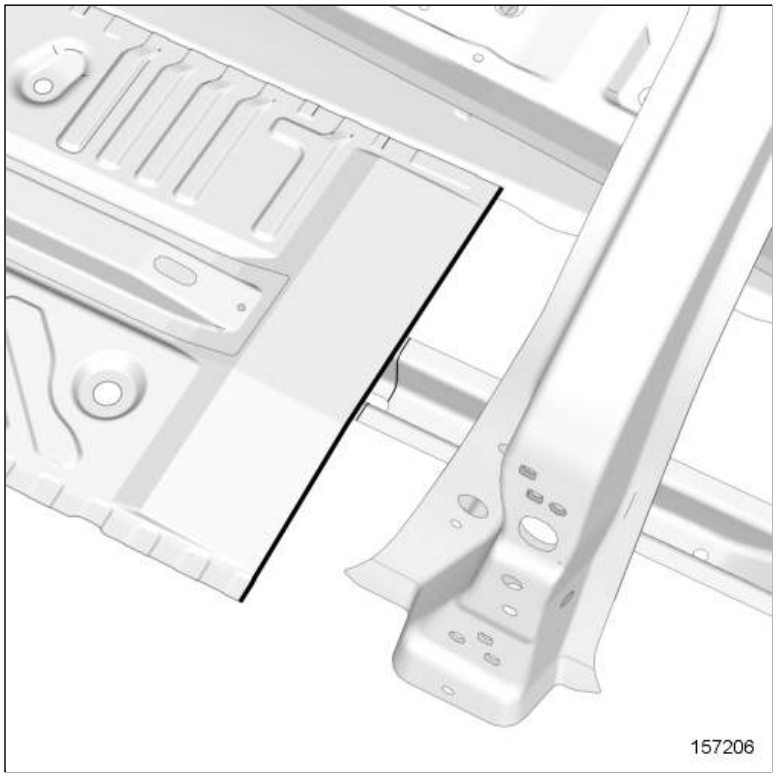


3- PARTIAL REPLACEMENT ALONG CUT B

1)PART IN POSITION



DETAILED VIEW B



RENAULT

Technical Note 3682A

Basic manual: Technical Note 3598A

Checking batteries before delivering New Vehicles

77 11 323 862 Edition 10 - June 2011 Edition Anglaise

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which its vehicles are constructed."

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Contents

		Page
80A	**BATTERY**	
	Battery: General information	80A-1
	Battery: Checking	80A-2
	Battery: Advice	80A-5

GENERAL INFORMATION

Apply this Technical Note if battery non-conformity was detected during the 1st inspection carried out by the preparation mechanic for new vehicles (see **Technical Note 3598A, Preparation of a new vehicle before it is handed over**). In this case, the Technical Note allows a more technical check of the condition of the battery to be performed when the new vehicle is prepared.

To ensure that the new vehicle is delivered with a sound battery, the inspection must be carried out as late as possible (as close as possible to the delivery of the new vehicle to the customer), allowing for any time needed for recharging or replacing the battery.

This must allow for the different cases of discharge encountered between preparation and delivery: exposure, storage, etc.

If the vehicle does not start when removed from storage, the battery must be replaced, (see **MR of corresponding vehicle, 80A, Battery, Battery: removal - refitting**).

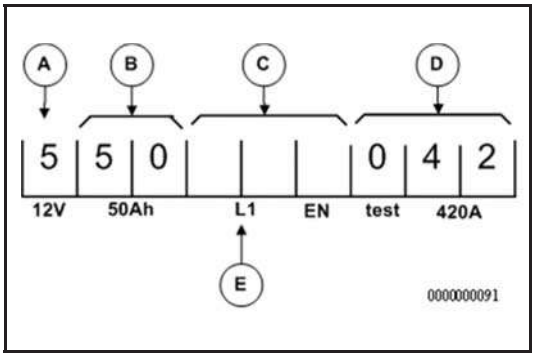
Special notes for VRLA* batteries:

VRLA* batteries can be identified by a label affixed on the top of the battery, where the name VRLA is given.

VRLA* batteries do not have a visual indicator.

DESCRIPTION OF THE BATTERY LABEL

If the battery is replaced, refer to Dialogys or to the description on the label below to select the spare part.



A- + 12 V code.
B- Electrical capacity.
C- Location of terminals, size of tray, quality, performance level (if shown).
D- Maximum current when starting (e.g. 420 A, is written 042).
E- Size code (LB = low height).

The battery's date of manufacture is engraved on the cover in the format "DDMMYY".

*VRLA: Valve Regulated Liquid Acid

CHECK AROUND THE BATTERY

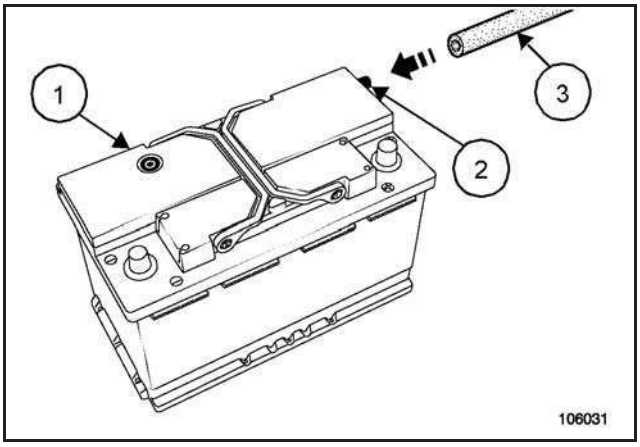
– Check the tightness of the bracket mounting bolt: it must be attached with the correct tightening torque (see **the MR for the relevant vehicle, 80A, Battery, Battery: Removal - Refitting**). Excessive tightening is not beneficial and can be dangerous, as it can damage, or even break, the battery. Conversely, insufficient tightening allows too much play, and there may be wear caused by battery movement and breakage caused by impact.

– Check the tightness of the battery terminal mountings: check that the battery terminals are correctly inserted and secure. The terminals must be attached with the correct tightening torque (see **the MR for the relevant vehicle, 80A, Battery, Battery: Removal - Refitting**).

– Check the tightness of the battery terminal stud nuts: check that the battery terminal stud nuts are correctly inserted and secure. The nuts must be tightened to the correct tightening torque (see the **MR for the corresponding vehicle, 80A, Battery, Battery: Removal - Refitting**).

CHECKING THE BATTERY

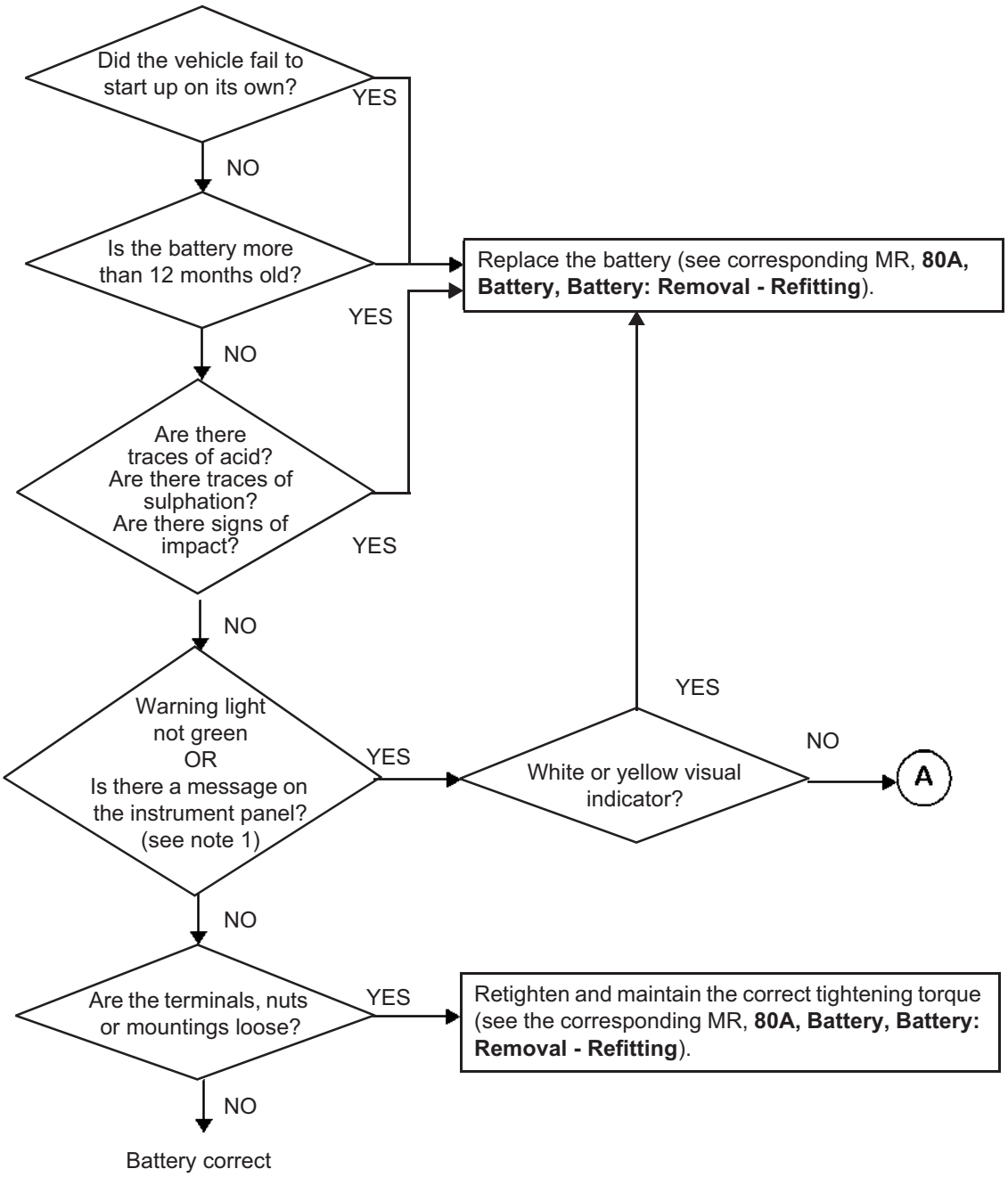
1- Replace all batteries with a date of manufacture over 1 year ago (date engraved on the cover).
2- Check that there are no cracks or breaks, traces of acid, or creepage (sulphation) on the terminals.
If any of the above are present, replace the battery and clean the surrounding area.
3- Check that the degassing pipe (depending on the version) is properly connected to the battery vent.
4- Ensure that the degassing pipe (3) is correctly positioned.
5- The battery charge status check is carried out differently depending on the presence or visibility of a visual indicator (1), known as the "Magic eye". See Flow charts opposite.



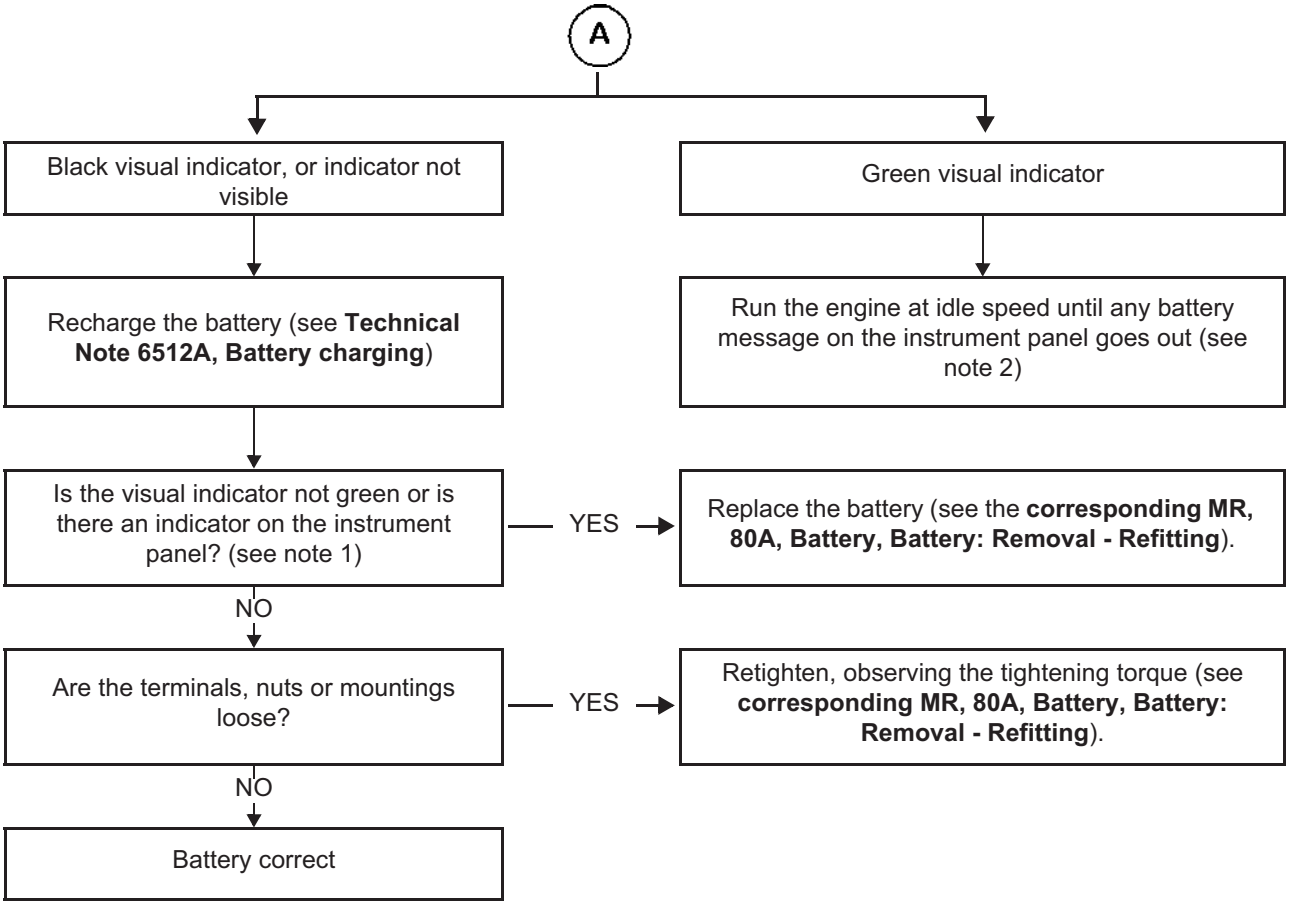
1- Visual indicator
2- Degassing vent
3- Degassing pipe

WARNING
All these vehicles are equipped with a low water consumption battery.
Opening the battery and topping up the electrolyte level are prohibited.

WARNING
The MIDTRONIC must not be used to check the batteries on new vehicles.



Note 1:
The visual indicator (also called the "magic eye") is visible depending on the equipment (VRLA, etc.).
The information on the instrument panel can be either:
– Text message: "battery needs recharging" or "battery low, start the engine"
– Flashing of the battery charge warning light.



Note 1:
The visual indicator (also called the "magic eye" "ME") is visible depending on the equipment (VRLA etc.).
The information on the instrument panel can be either:
– Text message: "battery needs recharging" or "battery low, start the engine"
– Flashing of the battery charge warning light.

Note 2:
It is normal for the message "BATTERY LOW, START THE ENGINE" to switch to "BATTERY CHARGING"; wait for any messages to disappear completely before switching the engine off.

REMINDER

Battery charge **(see Technical Note 6512A, Battery charge)**

CLAIM COMPLETION AND CODING
– Operation time:

Additional battery recharge
– Operation code: 8210
– Allocated time: 0.3 hours

Battery replacement
– Operation code: 8207
– Allocated time: **See Operation Time**

– Faulty part to be indicated: part number of battery (if replaced).
– Or Operation Time code to be indicated: battery recharge (if recharged).

RENAULT

Technical Note 6002A

XXXX

Checking the batteries before vehicle delivery for After Sales and Second-hand vehicle preparation

77 11 327 942 Edition 6 - MAY 2013 Edition Anglaise

"The repair procedures given by the Manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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80A BATTERY

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Battery: Result	80A-6
Battery: Advice	80A-7

General information
This Technical Note deals with the battery checking procedure, and the equipment to be used for preparing a used vehicle or for After-Sales.

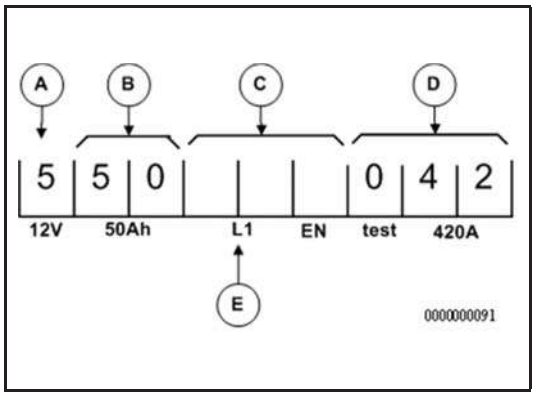
The battery must be kept charged throughout the used vehicle's storage period, with regular checks following the procedure described in this note.

To ensure that the used vehicle is delivered with a sound battery, the battery must be checked as late as possible (as close as possible to the delivery of the used vehicle to the customer), allowing for any time needed for recharging or replacing the battery.

This should enable you to deal with the various cases of discharge encountered between preparation and delivery: display, storage, etc.

If the battery is equipped with a warning light (1), this is reserved for preparing a new vehicle and must not be used for After-Sales

Description of the battery label:
If the battery is replaced, refer to Dialogys or to the description on the label below to select the spare part.



A- + 12 V code.
B- Electrical capacity.
C- Location of terminals, size of tray, quality, performance level (if shown).
D- Maximum current when starting (e.g. 420 A, is written 042).
E- Size code (LB = low height).

The manufacture date of the battery is engraved on the cover in DDMMYY format.

Special notes for VRLA* batteries:
VRLA* batteries can be identified by a label affixed on the top of the battery, where the name VRLA is given.

VRLA* batteries do not have a visual indicator.
*VRLA: Valve Regulated Liquid Acid

Checking around the battery:

– Check the tightness of the bracket mounting bolt: it must be attached with the correct tightening torque (see **the MR for the relevant vehicle, 80A, Battery, Battery: Removal - Refitting**).
Excessive tightening is not beneficial and can be dangerous, as it can damage, or even break, the battery.
Conversely, insufficient tightening allows too much play, and there may be wear caused by battery movement and breakage caused by impact.

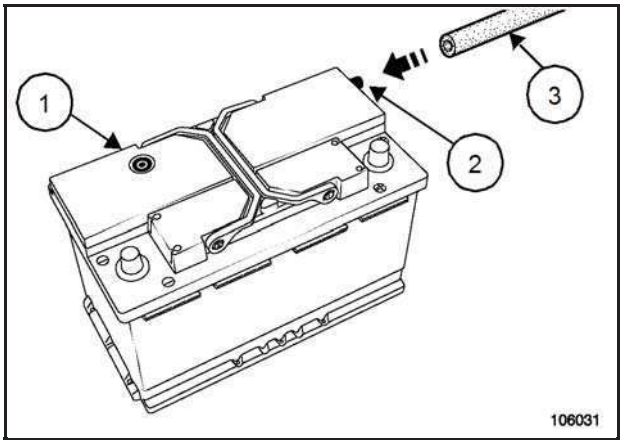
– Check the tightness of the battery terminal mountings: check that the battery terminals are correctly inserted and secure.
The terminals must be attached with the correct tightening torque (see **the MR for the relevant vehicle, 80A, Battery, Battery: Removal - Refitting**).

– Check the tightness of the battery terminal stud nuts: check that the battery terminal stud nuts are correctly inserted and secure. The nuts must be attached with the correct tightening torque (see **the MR for the relevant vehicle, 80A, Battery, Battery: Removal - Refitting**).

Checking the battery

Make sure there are no cracks or breakages, traces of acid, or creepage (sulphation) on the terminals. If any of the above are present, replace the battery and clean the surrounding area.
Check that the degassing pipe (depending on the version) is properly connected to the battery vent.

Check that the degassing pipe (3) is correctly positioned.



1- Visual indicator
2- Degassing vent
3- Degassing pipe

WARNING
All these vehicles are equipped with a low water consumption battery.
Opening the battery and topping up the electrolyte level are prohibited.

Test procedure using the MIDTRONICS tool

Special tooling required	
Elé. 1593	Battery tester MIDTRONICS R330

Test conditions

The measurement must be taken when the vehicle is stationary and the ignition is off.

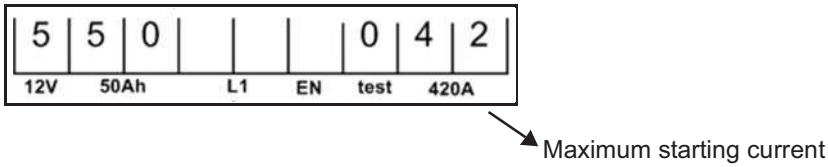
If the engine has been run in the last hour, switch the battery status to test and carry out the following operations:
– engine switched off,
– switch on the main beam headlights for **2 minutes**.
– switch off the main beam headlights,
– wait for **2 minutes**,
– switch off the ignition.

Equipment to be used:
– Tester approved by the Service Department: MIDTRONICS MICRO R330.
– Tool available as part no.: Elé. 1593.
– Equipment available in France from the Parts Department.
– Tool available in 6 languages.
For other countries, consult your contact in your country.

WARNING
Failure to observe the procedure or poorly maintained equipment may result in incorrect measurements, which could be:
– detrimental to the customer (the battery is not sound),
– detrimental to RENAULT (unnecessary replacement of a sound or rechargeable battery),
– detrimental to the dealership (if the battery is tested as sound or rechargeable for a part return under warranty, the warranty reimbursement request will be cancelled).

Mode (test on vehicle)

– Connect the tool directly to the battery terminals, without disconnecting the vehicle battery, as close as possible to the battery terminal but ensuring it is not after the fuse (on-vehicle test) or carry out the battery test after disconnecting the two terminals (see **note**),
– check that the vehicle ignition is switched off,
– select the "battery connected to the vehicle" or "battery disconnected" test using buttons ⏶ and ⏷ . Confirm by pressing the green key ↵
– The test is carried out to the EN standard by default. Confirm with the green ↵ button.
– Select the starting power on the battery label using buttons ⏶ and ⏷.



– Confirm with the green ↵ button.
– The tool displays **TEST IN PROGRESS**.
– The MIDTRONICS tool carries out the test and gives the results of the fault finding procedure.

To set the tool language, carry out the following operations:
– before connecting the tool, simultaneously press buttons ⏶ and ⏷,
– connect the device to the battery,
– release the keys,
– scroll through the languages using buttons ⏶ and ⏷,
– confirm with the green ↵ button.

Note:
The battery must always be disconnected in the following order:
– Wait for at least **1 minute** between switching the ignition off and disconnecting the battery, to enable the computer systems to go on standby.
– Wait for the engine cooling fan to stop completely.
– Disconnect the negative terminal first.

CHECKING USING THE MIDTRONICS R330 TOOL

Has the engine been running in the last hour?

NO →

YES ↓

– Stop the engine and switch off the ignition.
– Switch on the main beam headlights for **2 minutes**.
– Switch off the main beam headlights.
– Wait for **2 minutes**.

TEST WITH THE MIDTRONICS R330 TOOL **(Elé. 1593)**
– Switch off the ignition.
– Switch off all the electrical consumers.
– Adjust the tool **Elé. 1593** (MIDTRONICS R330).
– carry out the test.

The tool displays **"Battery OK + recharge"** or **"Charge + re-test"**

→ Recharge the battery **(see Technical Note 6512A, Battery charge).**

The tool displays **"Test impossible"**

→ Is the message appearing for the first time?

NO →

YES ↓

Check that the tool is correctly connected to the battery. Switch off all the electrical consumers.

↑ (return to TEST WITH THE MIDTRONICS R330 TOOL)

The tool displays
– **"Component faulty"**
– or **"Replace battery"**
– or **"Disconnect battery"**

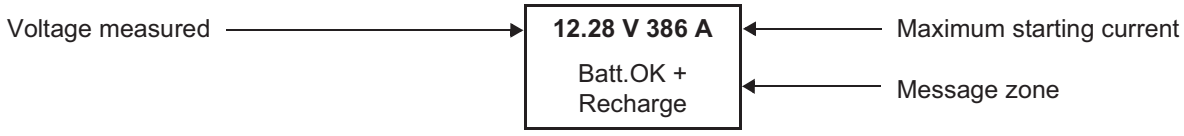
→ Make sure that only the battery is faulty by starting the test again with the battery disconnected. If the result of the test is identical, replace the battery (see MR for the corresponding vehicle, **80 A, Battery, Battery: Removal - Refitting**).

The tool displays **"Battery OK"**

→ The battery is charged. Reconnect the degassing pipe and put the heat shield back in position, if fitted to the vehicle.

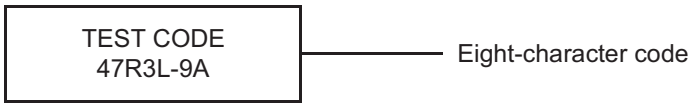
RESULTS OF MEASUREMENT

1st results screen (example):



Confirm using the green ↵ button.

2nd results screen (example):



To stop the test, disconnect the tool.

Each code issued by the MIDTRONICS R330 tool is unique and varies according to:
– the type of battery,
– and its charge status.

Reminders

Battery charge (see **Technical Note 6512A, Charging batteries**)

Reinitialisation of systems after the batteries are disconnected (see **Technical Note 3682A, Checking batteries before new vehicle delivery, Battery: Advice**)

Claim completion and coding

Relating to the preparation of used vehicles:
The used vehicle pre-delivery battery check is complete after:
– the message **Battery OK** is displayed,
– the MIDTRONICS R330 code corresponding to the**"Battery OK"** message is noted down on the used vehicle checklist.

Relating to an operation on the battery:
– If the operation is covered by the warranty, enter the code given by the MIDTRONICS R330 tool in the "Comments" field of the Warranty reimbursement request, which provides justification for recharging or replacement.

Operation time:
Additional battery recharge
– Operation code: 8210
– Allocated time: 0.3 hours

Battery replacement
– Operation code: 8207
– Time allowed: See Operation time.

Part to be indicated: part number of faulty battery (if replaced).
Or indicate OT code concerned: battery recharge (if recharged).

CIGARETTE LIGHTER: REMOVAL - REFITTING

REMOVAL

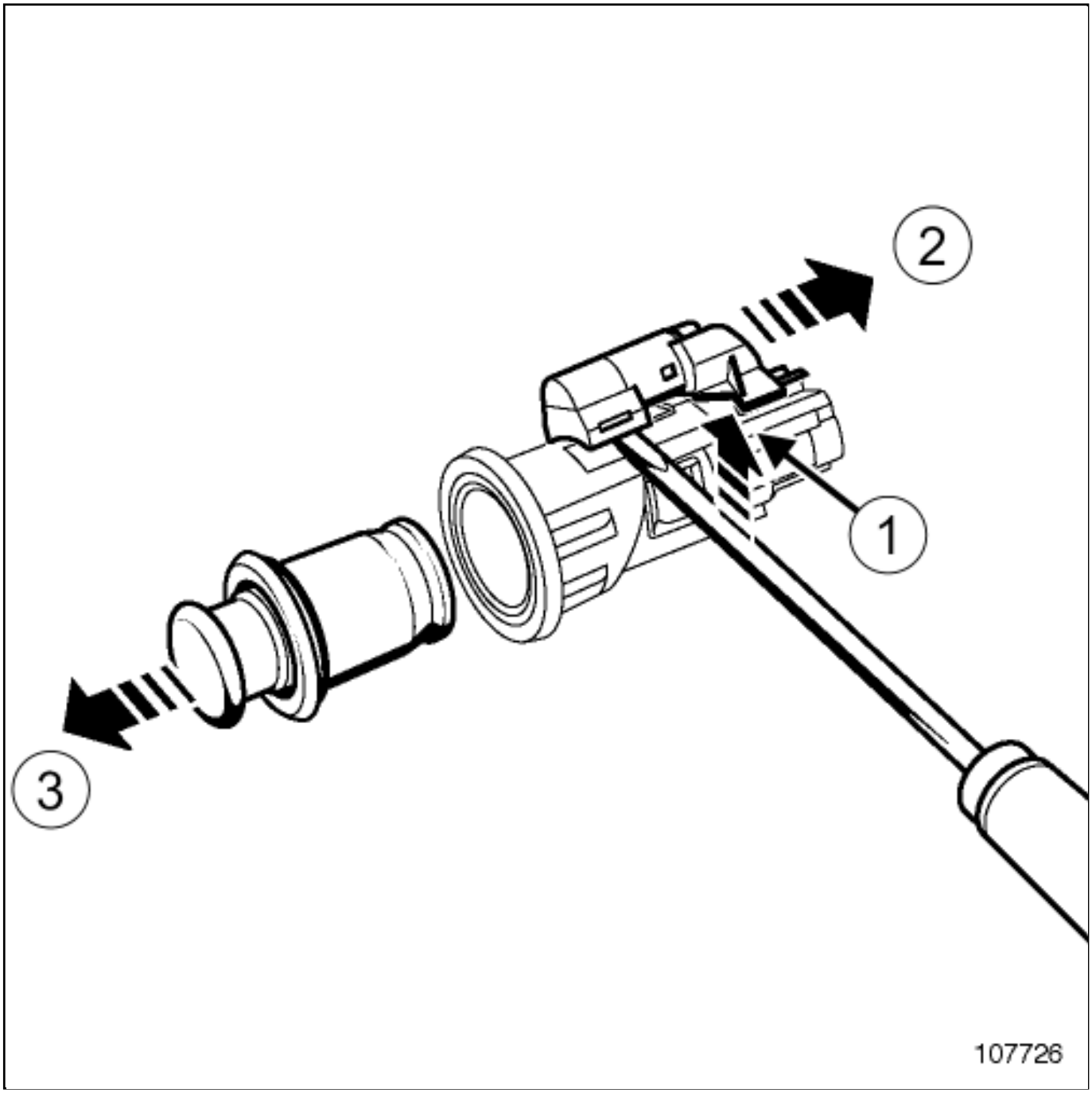
1. REMOVAL PREPARATION OPERATION

- Switch off the ignition.

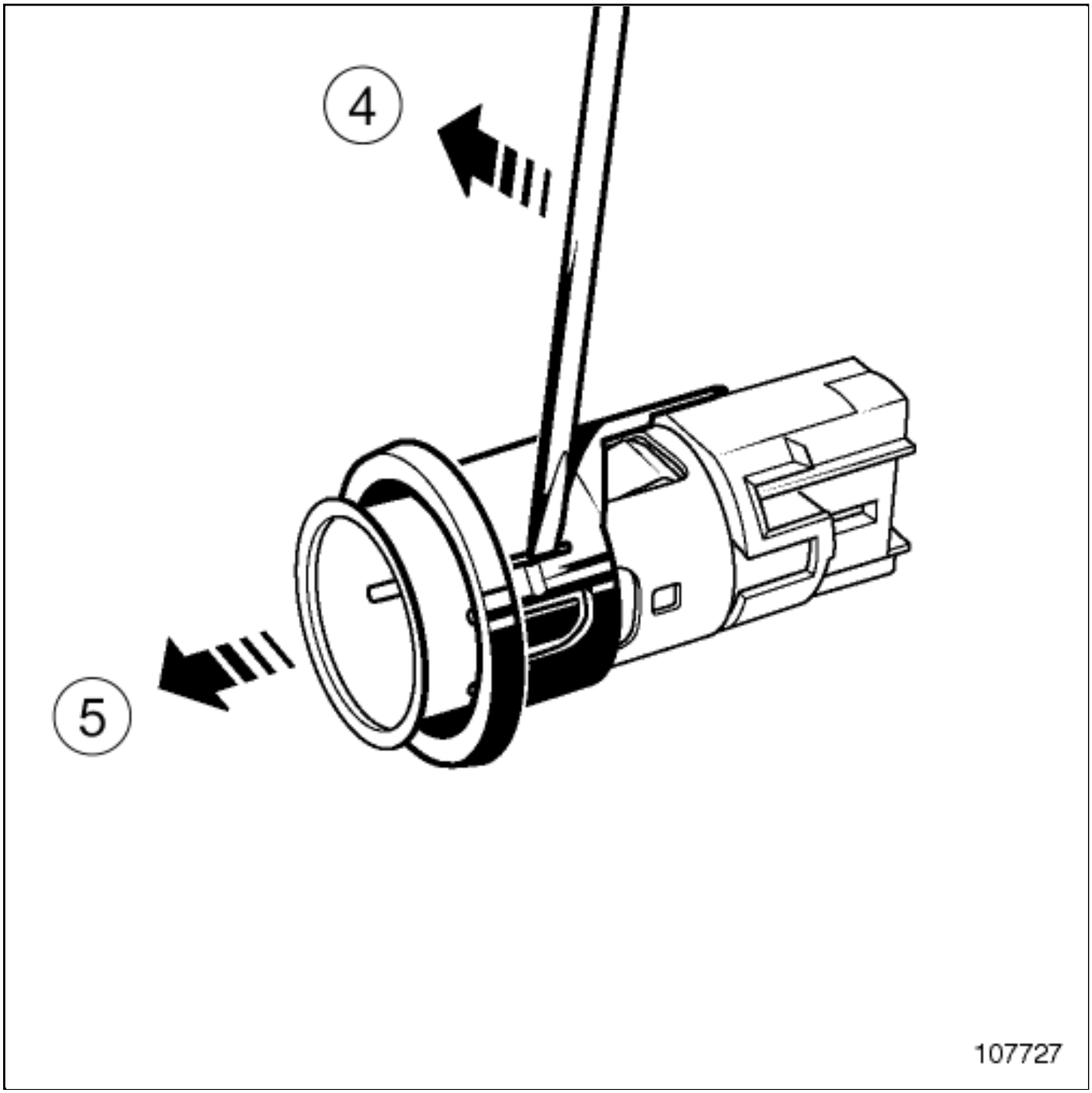
- Remove the centre console Centre console assembly: Exploded view .

2. REMOVAL OPERATION

- Disconnect the cigarette lighter connector.



- Unclip the bulb support with a flat-blade screwdriver at(1) and (2) .
- Remove the resistor support(3) .



- Keep the plastic support unlocked at(4) .
- Pull the cigarette lighter at(5) .
- Unclip the plastic support from the console.

REFITTING

- Proceed in the reverse order to removal.

CLUTCH ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 20A, Clutch, Clutch: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

HYDRAULIC CLUTCH CONTROL

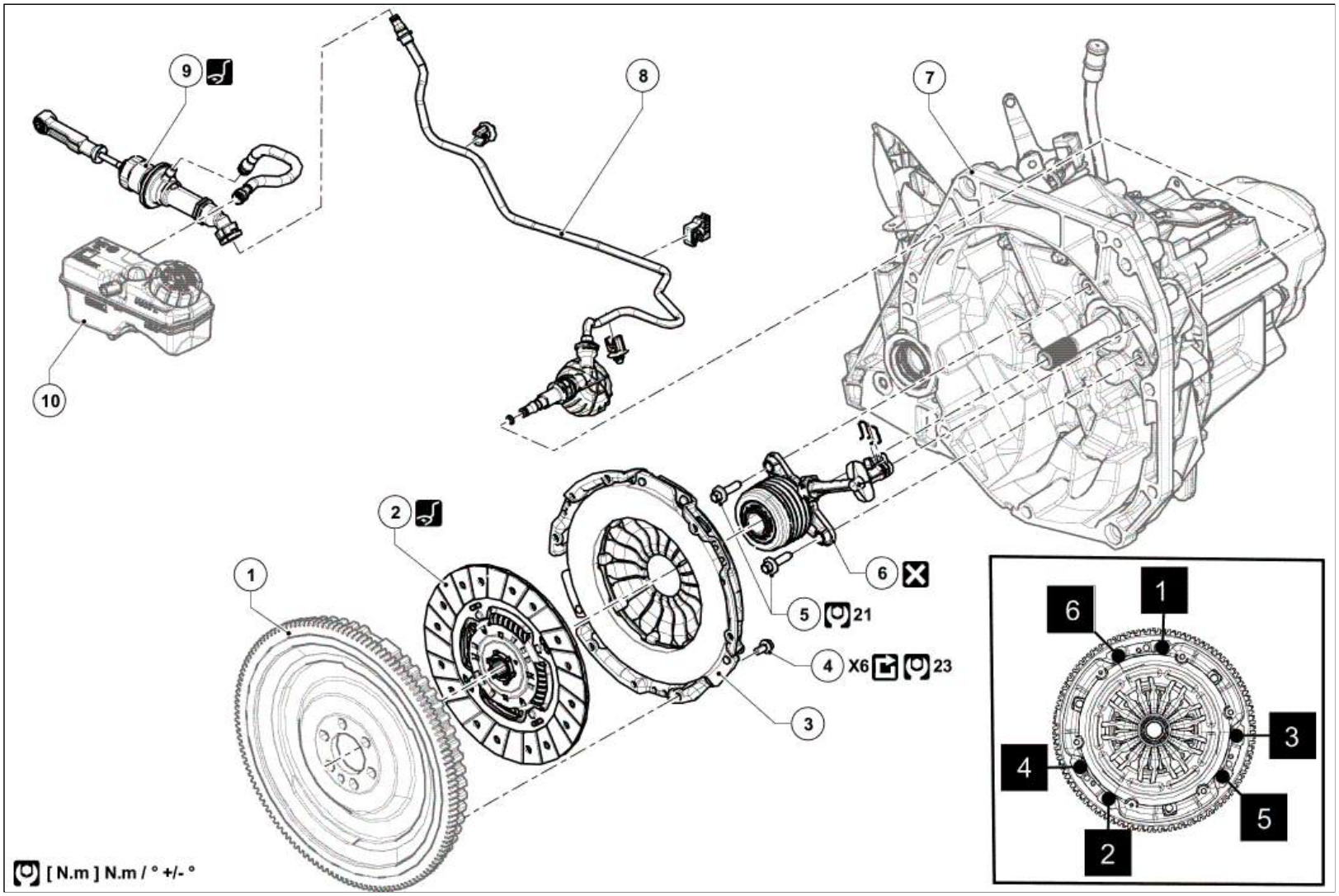


Illustration key: Description Legend .

Marks	Designations	Informations
1	Engine flywheel	Flywheel: Removal - Refitting
2	Clutch plate	(Emb. 1780)
3	Clutch pressure plate	(see 20A, Clutch, Clutch: Removal - Refitting)
4	Clutch pressure plate bolt	
5	Clutch slave cylinder bolt	
6	Clutch slave cylinder	
7	Gearbox	Manual gearbox: Removal - Refitting
8	Clutch control pipe	Clutch circuit: Removal - Refitting
9	Clutch master cylinder	(Emb. 1797) Clutch master cylinder: Removal - Refitting
10	Brake fluid reservoir	

CLUTCH CABLE: REMOVAL - REFITTING

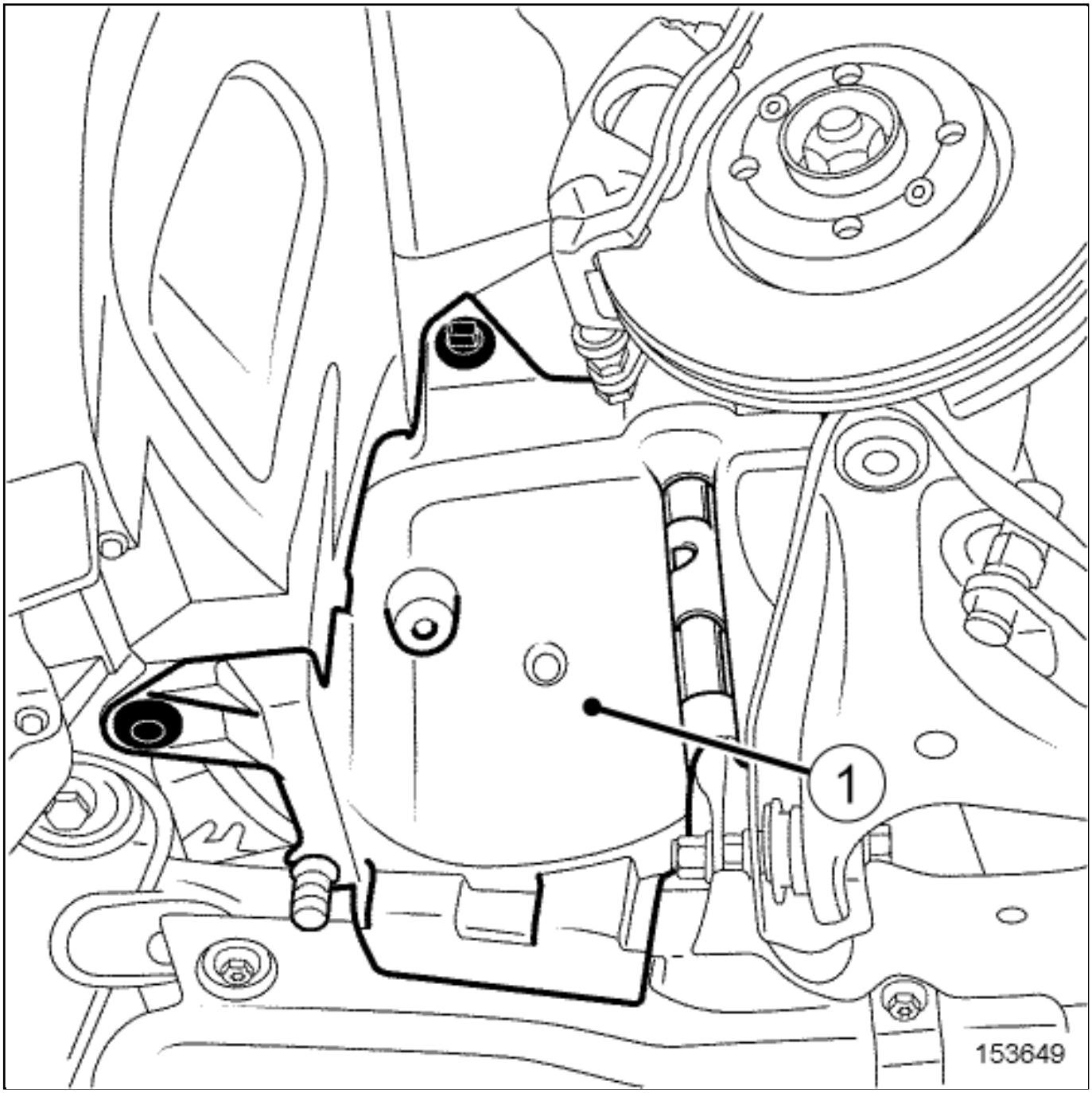
- Location and specifications (tightening torques, parts always to be replaced, etc.)Clutch assembly: Exploded view .

- For vehicles equipped with clutch cable.

REMOVAL

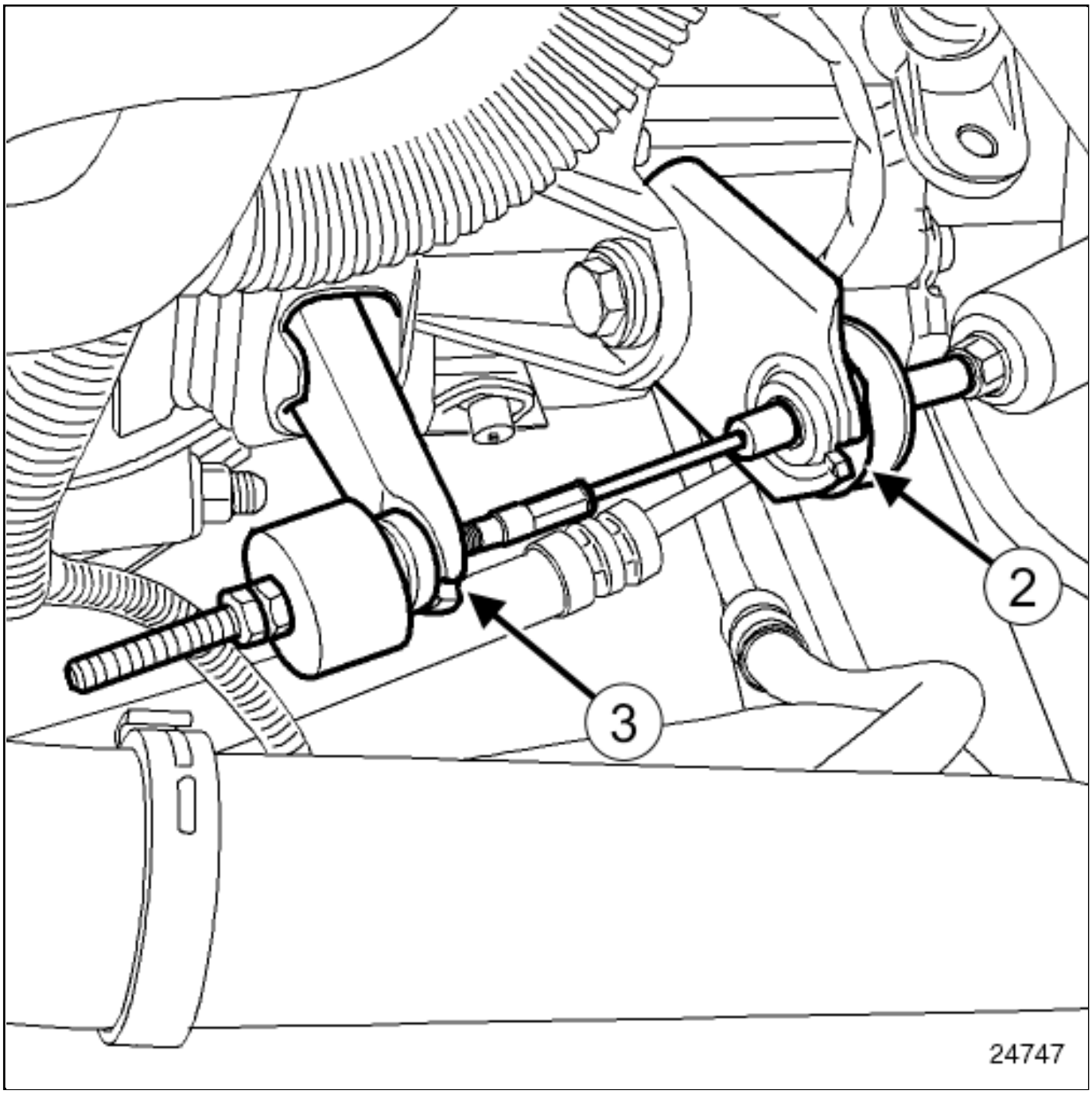
1. REMOVAL PREPARATION OPERATION

- Remove the engine undertray.



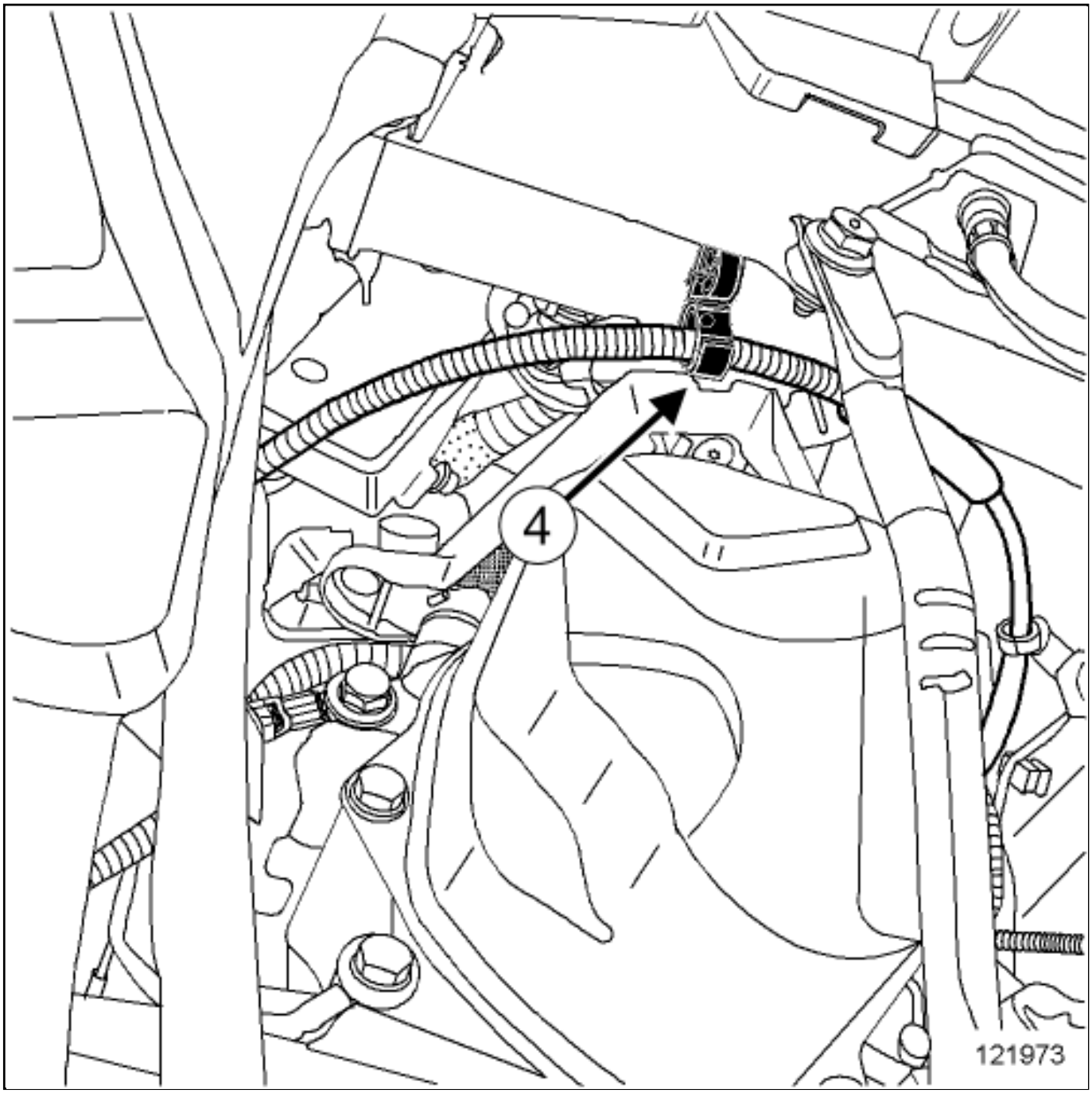
- Remove the front left wheel arch liner(1) .

2. REMOVAL OPERATION



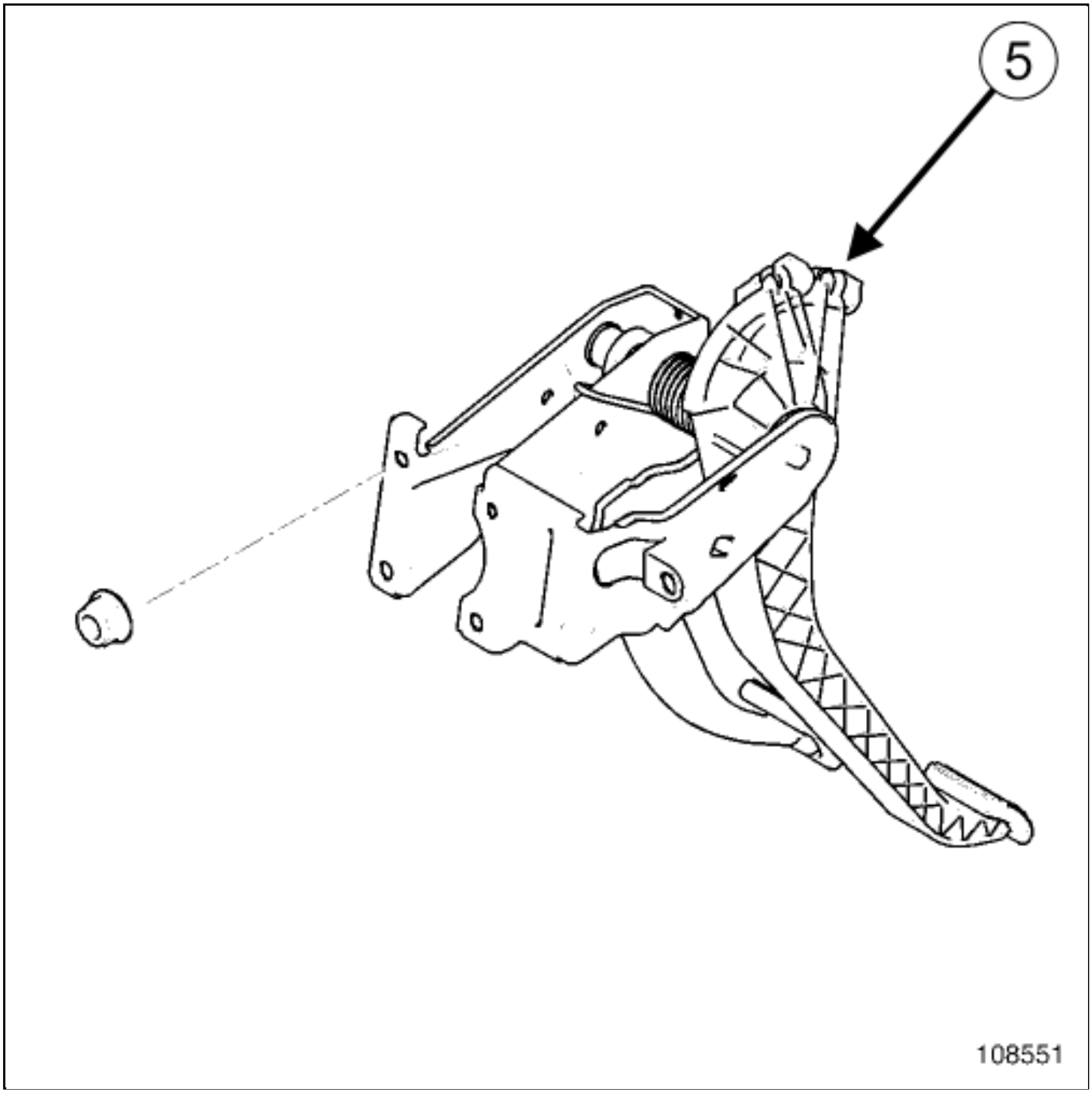
Remove:

- the clutch control cable from the sleeve stop(**2**) ,
- the clutch control cable from the clutch fork(**3**) .



- Unclip the cable at(4) .

- Press on the pedal to bring the cable back into the passenger compartment.



Remove the cable from the pedal housing(5) , by lifting the pedal and placing the cable perpendicular to the pedal.

Push the cable sleeve stop into the engine compartment.

REFITTING

1. REFITTING OPERATION

Thread the cable into the passenger compartment via the engine compartment.

Fit the cable into the notch in the pedal.

Note:

Check that the cable fits perfectly in the groove provided for it on the pedal.

Fit the cable onto the clutch fork.

Press the clutch pedal to clip the cable sleeve stop into position on the bulkhead.

Clip the clutch cable into its clip(s).

CLUTCH CIRCUIT: BLEED

Note, one or more warnings are present in this procedure

Equipment required
brake circuit bleeding device
hydraulic circuit bleed syringe

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

- Bleed in the event of:
  - dead travel,
  - pedal at mid-travel,
  - pedal to the floor,
  - poor gear changing.

- For vehicles equipped with hydraulic clutch system.

1. PRECAUTIONS DURING REPAIR

1- RISKS RELATING TO CONTAMINATION

- The hydraulic clutch circuit is highly sensitive to contamination. The risks caused by contamination are:
  - impossible to change gears,
  - damage to or destruction of the clutch system,
  - leaks on the hydraulic circuit.

All the operations on the clutch hydraulic circuit system must be carried out under very clean conditions. This ensures that no impurities enter the hydraulic circuit during the operation.

The cleanliness principles apply to all components of the hydraulic clutch circuit.

- Items causing contamination are:
  - metal or plastic swarf,

-fibres:

■cardboard,■brushes,■paper,■clothing,■cloth,■dust and particles in the air,■etc.

1- CLEANING CLOTHS

- Use lint-free cleaning cloths Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Each cloth must only be used once.

1- THERE ARE TWO TYPES OF EQUIPMENT USED TO BLEED THE CLUTCH CIRCUIT:

- ARC50 via the brake fluid reservoir.
- Syringe via the bleed hole located on the clutch slave cylinder.

1- THERE ARE TWO PROCEDURES USED TO BLEED THE CLUTCH CIRCUIT:

- If parts of the hydraulic clutch circuit are removed:
  - Carry out the bleed operation using the ARC50 via the brake fluid reservoir or using a new syringe via the bleed hole located on the clutch slave cylinder.

- If no parts of the clutch hydraulic circuit are removed:
  - Only carry out the bleed operation using a new syringe by injecting the brake fluid via the bleed hole on the clutch slave cylinder.

Note:

- Even the tiniest air bubble in the circuit can cause faulty operation (pedal failing to return properly, crunching sound when changing gear, etc.).
- Incorrect bleeding can lead to incorrect detection of faults and unnecessary part replacements.

1- CONSUMABLES FOR THE REPAIR:

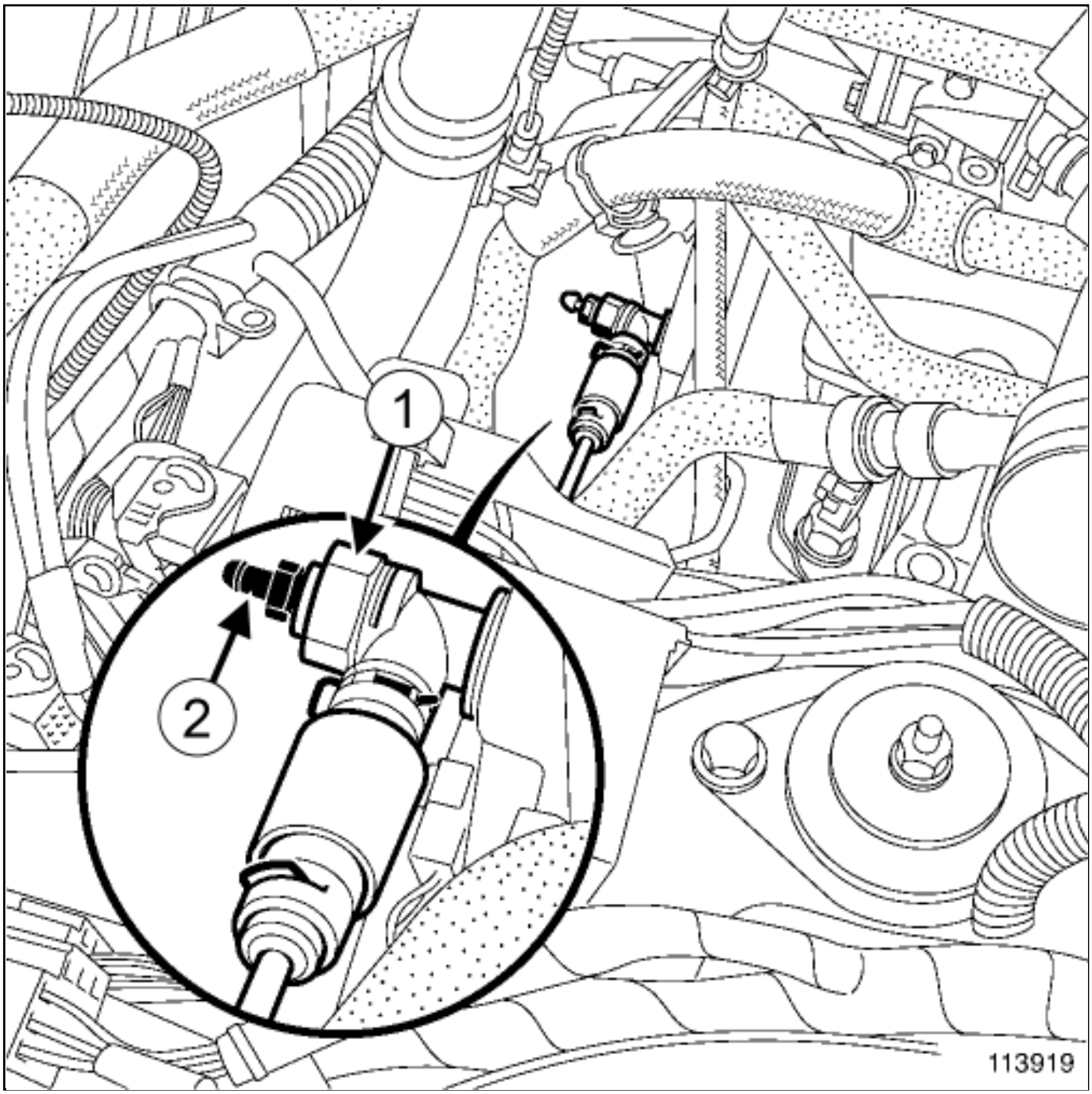
- Bleed the clutch circuit using approved brake fluid Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

2. PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).
- Remove the engine undertray.

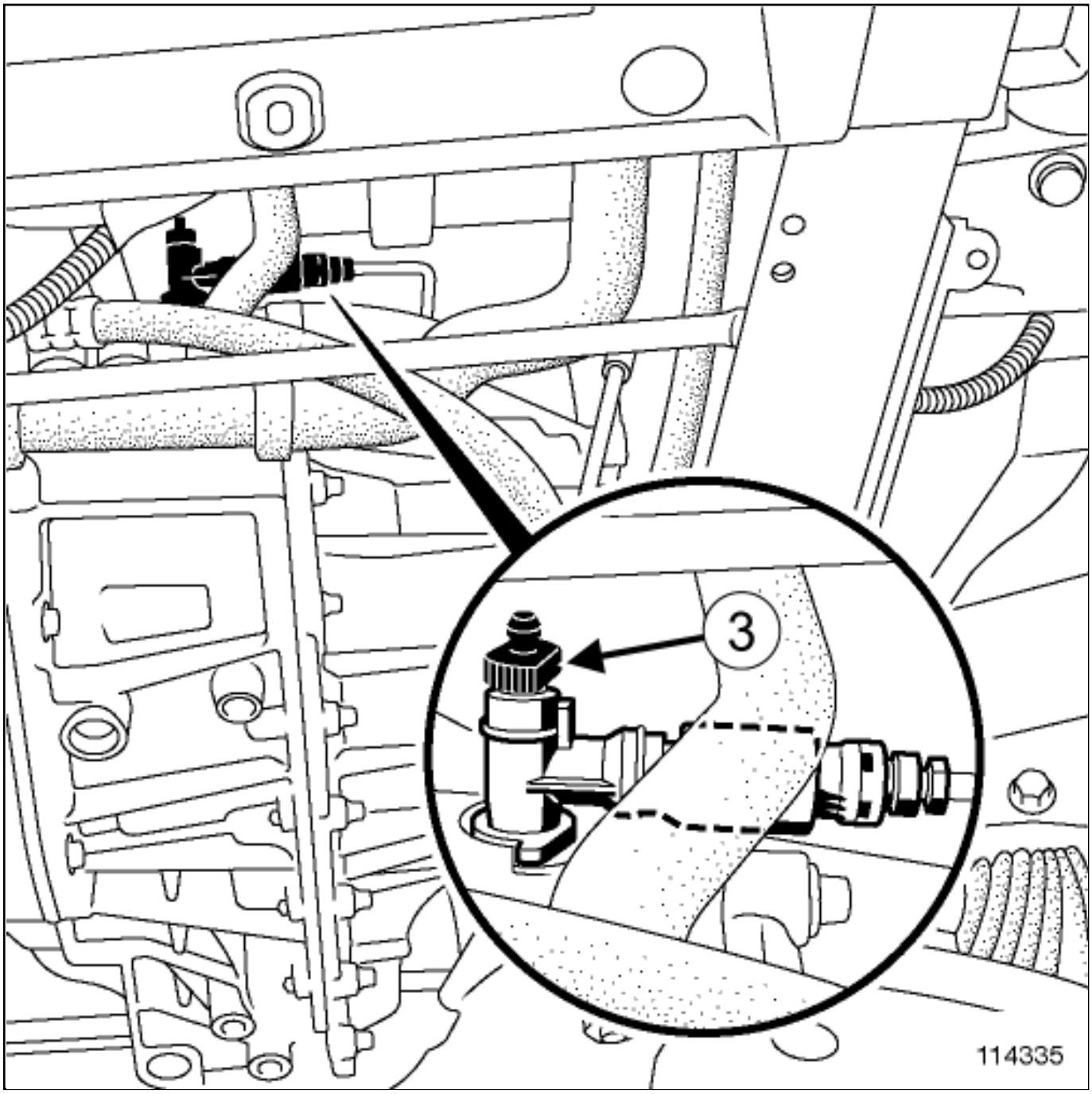
1- THERE ARE SEVERAL VERSIONS OF BLEED SCREW:

SCREW TYPE BLEED SCREW



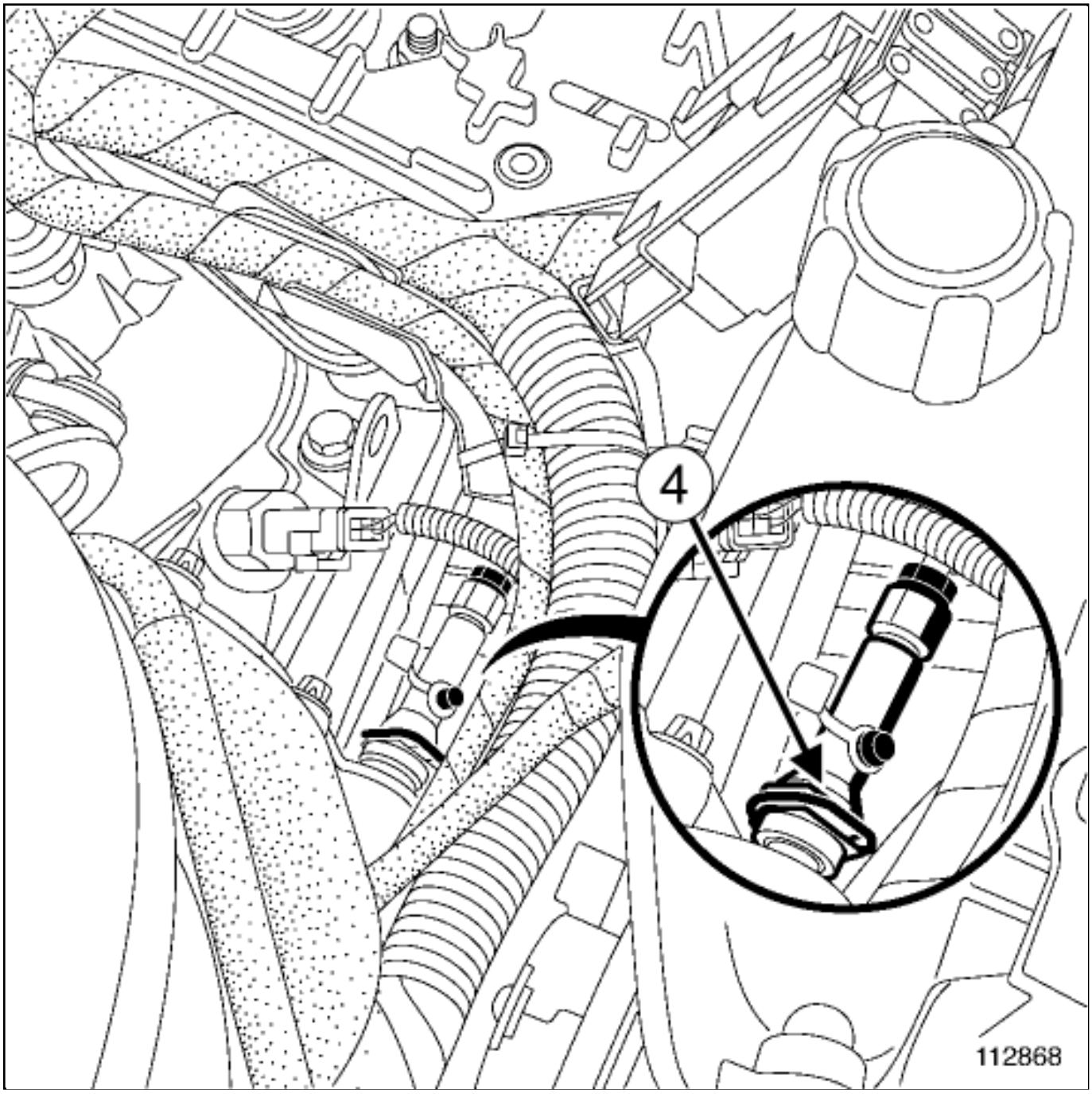
- To open the bleed screw, hold the plastic union(1) using a ring spanner and undo the bleed screw(2) .

HALF-TURN BLEED SCREW



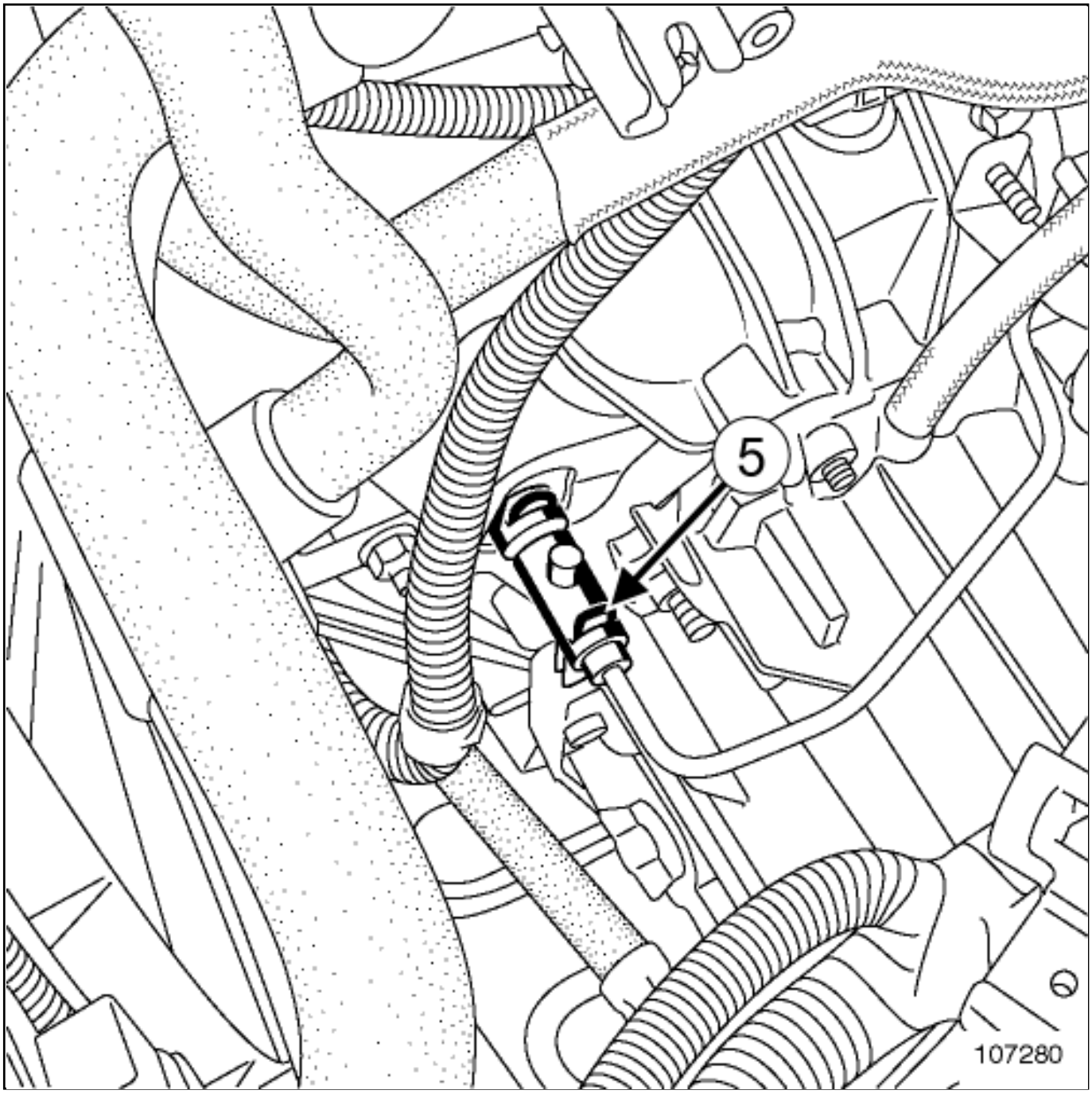
- To open the bleed screw, fully turn the bleed screw(3) by hand.

BLEED SCREW WITH A CLIP



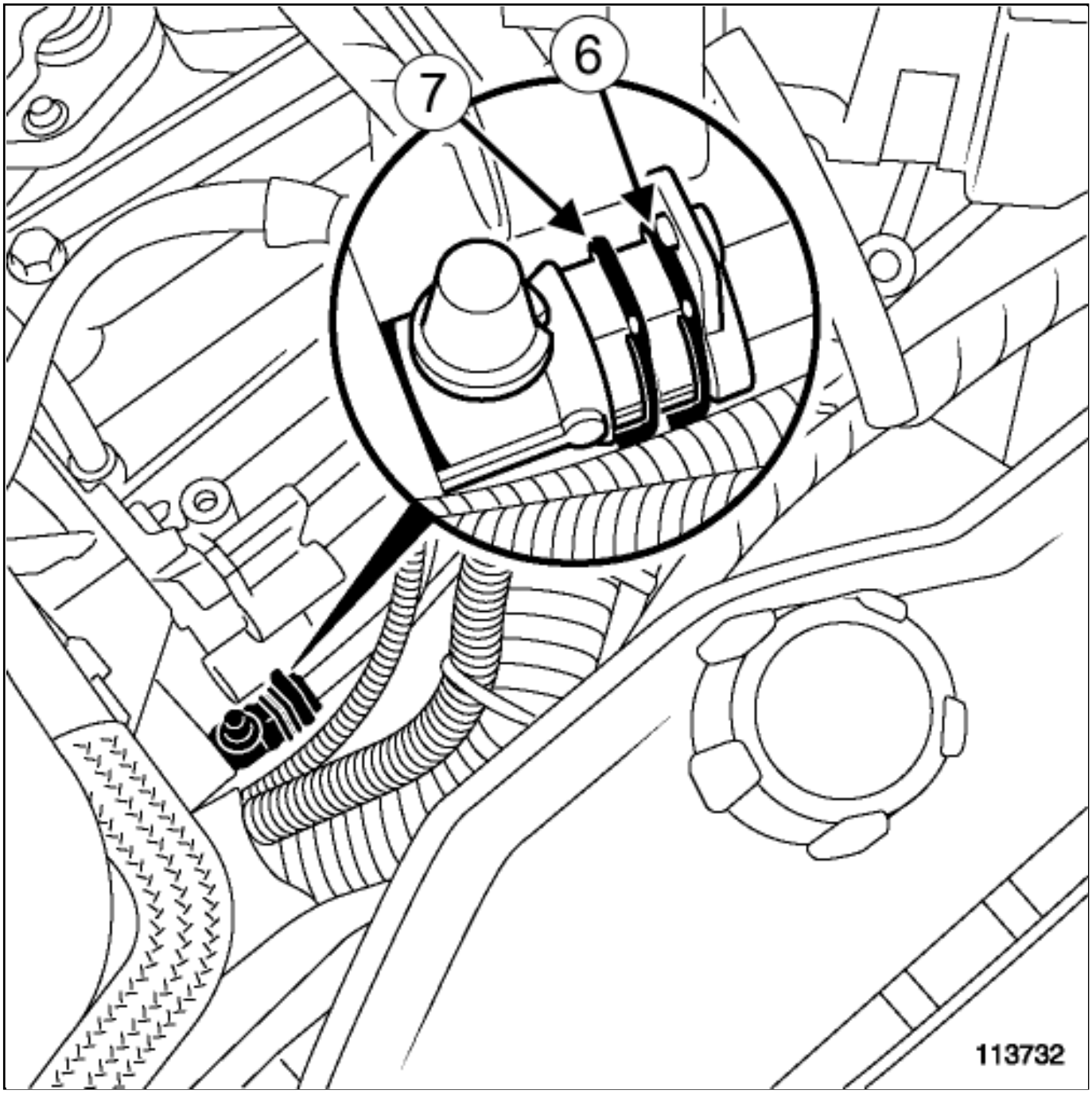
- To open the bleed screw, press and hold the clip(4) while pulling by one notch.

BLEED SCREW WITH A CLIP



- To open the bleed screw, lift the clip(5) while pulling by one notch.

BLEED SCREW WITH TWO CLIPS



- To open the bleed screw, lower the clip(6) and lift the clip(7) while pulling by one notch.

3. BLEED PROCEDURE IF NO PARTS OF THE HYDRAULIC CIRCUIT ARE REMOVED

1- BLEED USING THE ARC50

- Keep the clutch pedal in the upper position using a strap attached to the steering wheel to ensure continuity of the hydraulic circuit during the bleed operation.

Note:

Take care not to disrupt the adjustment of the clutch start of travel switch.

- Connect the brake circuit bleeding device(after having received Renault approval) to the master cylinder reservoir (see the instructions for the equipment).
- Remove the bleed plug from the clutch slave cylinder.
- Connect a transparent pipe to the bleed hole running to an empty container placed under the bleed hole.
- Open:
  - the bleed screw,
  - the circuit between the bleeding device and the brake fluid reservoir.
- Let the brake fluid run until all air bubbles have been released.
- Stop the bleeding device to dump the pressure in the clutch circuit.
- Close the bleed screw.
- Remove the transparent pipe from the bleed hole.
- Refit the bleed plug.
- Top up the brake fluid level in the master cylinder reservoir after disconnecting the bleed device.
- Disengage and engage the clutch quickly around twenty times.
- Check that the clutch system is operating correctly.
- Repeat the bleed operation if necessary.
- Check the adjustment of the clutch pedal switch(see 37A, Mechanical component controls, Pedal switches: Adjustment) .

2- BLEED USING A NEW SYRINGE

- Keep the clutch pedal in the upper position using a strap attached to the steering wheel to ensure continuity of the hydraulic circuit during the bleed operation.

Note:

Take care not to disrupt the adjustment of the clutch start of travel switch.

- Remove the bleed plug from the clutch slave cylinder.
- Connect a transparent pipe of sufficient length to the bleed hole (at least thirty centimetres) in order to place it at the same height as the reservoir.
- Open the bleed screw.
- Fill the brake fluid master cylinder reservoir until brake fluid flows out of the bleed screw.

Note:

The transparent pipe must remain at the same height as the master cylinder reservoir to prevent air from entering inside the clutch circuit.

- Connect a new hydraulic circuit bleed syringe to the end of the transparent pipe filled with 60 ml of approved brake fluid.
- Slowly inject the entire contents of the syringe into the hydraulic clutch circuit without injecting any of the air from the top section of the syringe.
- Close the bleed screw.
- Remove the transparent pipe from the bleed hole.
- Refit the bleed plug.
- Top up the brake fluid level in the master cylinder reservoir.
- Disengage and engage the clutch quickly around twenty times.
- Check that the clutch system is operating correctly.
- Repeat the bleed operation if necessary.
- Check the adjustment of the clutch pedal switch (see 37A, Mechanical component controls, Pedal switches: Adjustment) .

4. BLEED PREPARATION PROCEDURE IF PARTS OF THE HYDRAULIC CIRCUIT ARE REMOVED

CAUTION

Prepare for the flow of fluid and protect the surrounding components.

Note:

The master cylinder pipe must be disconnected from its take-off point on the brake fluid reservoir, to avoid any foreign matter penetrating inside the hydraulic brake circuit.

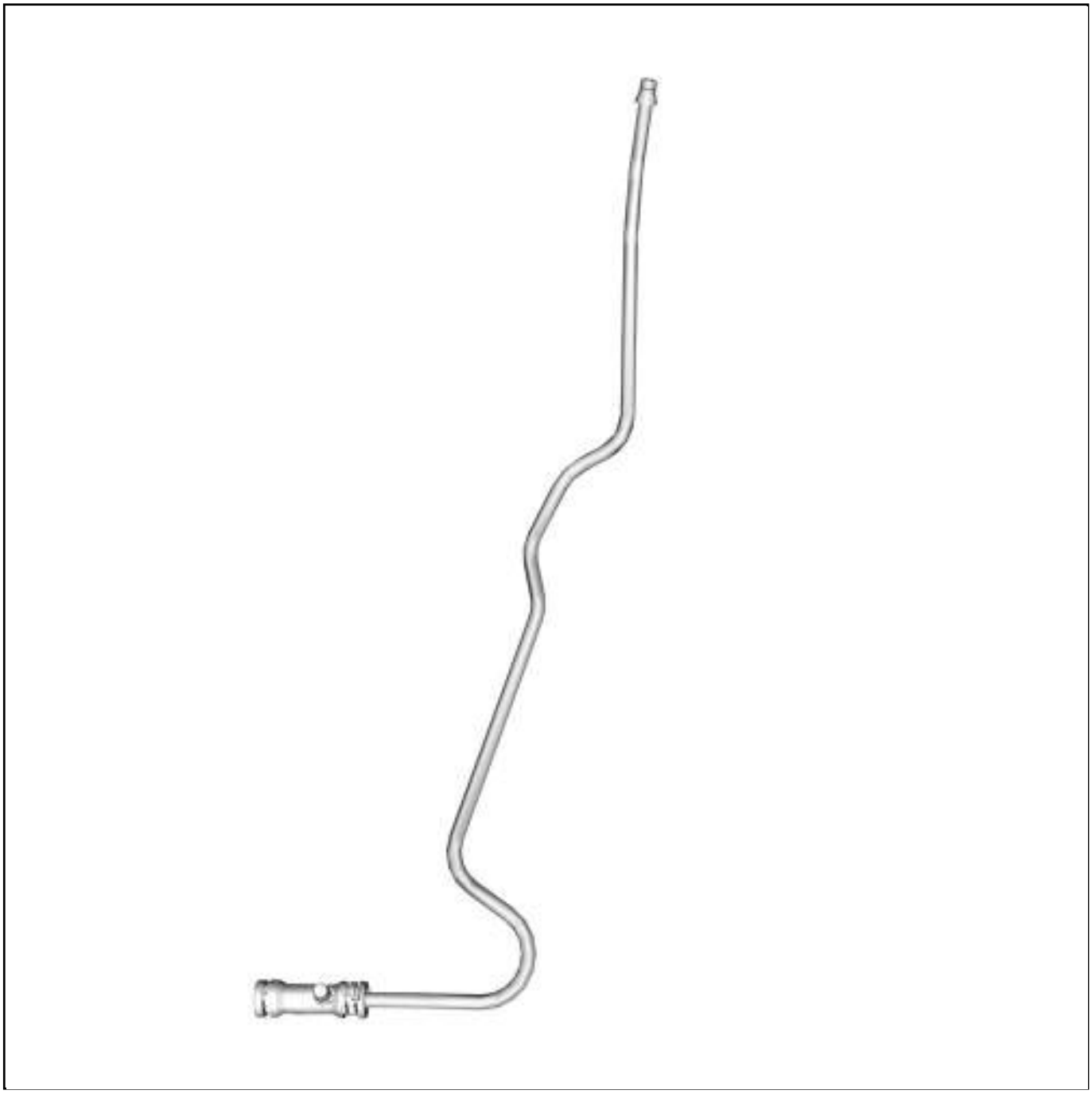
Note:

Prefill the hydraulic circuit pipe equipped with a filter.

Position the filter head facing downwards to ensure that it fills.

1- THERE ARE SEVERAL VERSIONS OF PIPE WITH AND WITHOUT A FILTER:

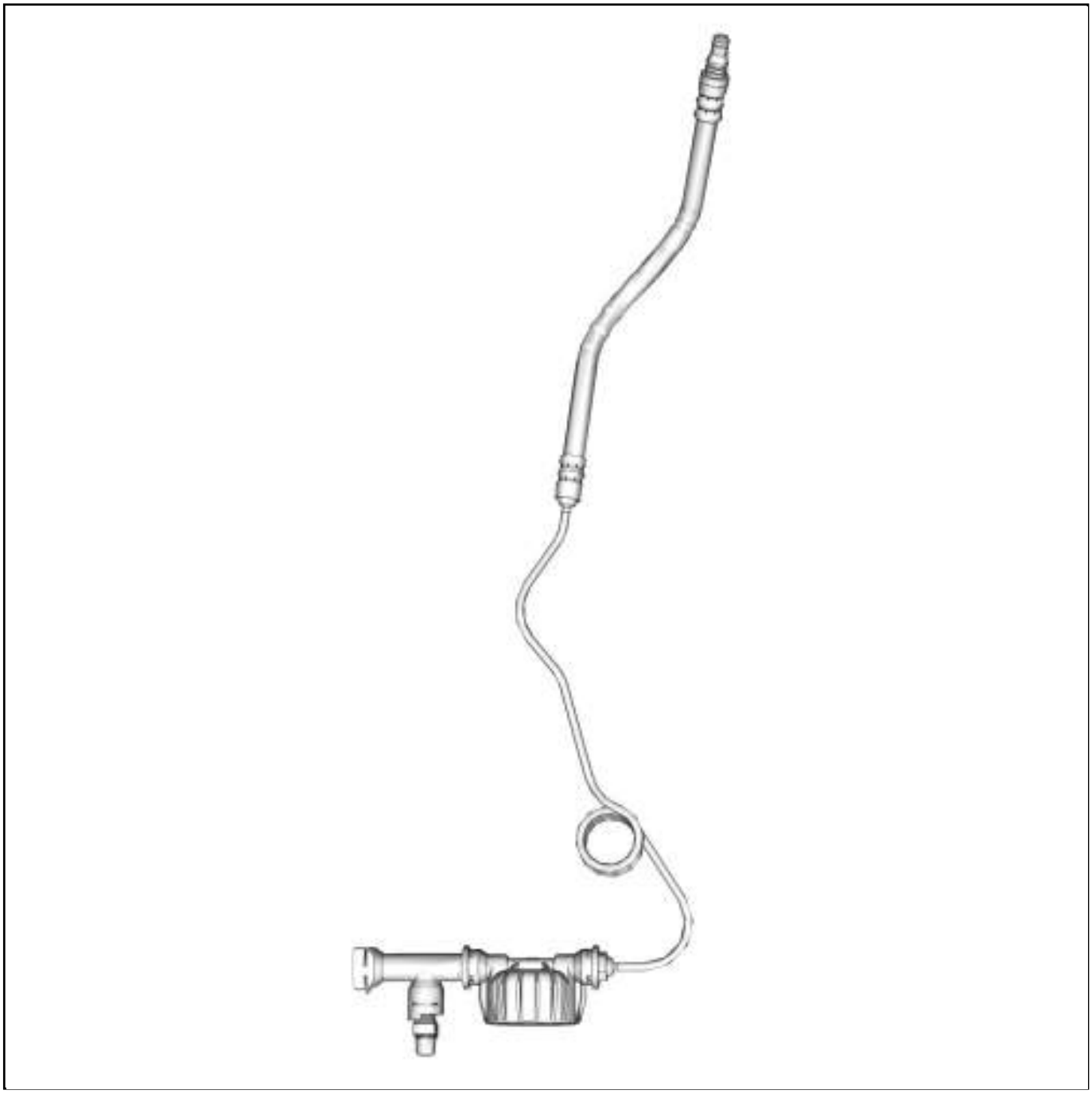
PIPE WITHOUT FILTER



FILLING POSITION FOR PIPE WITH FILTER

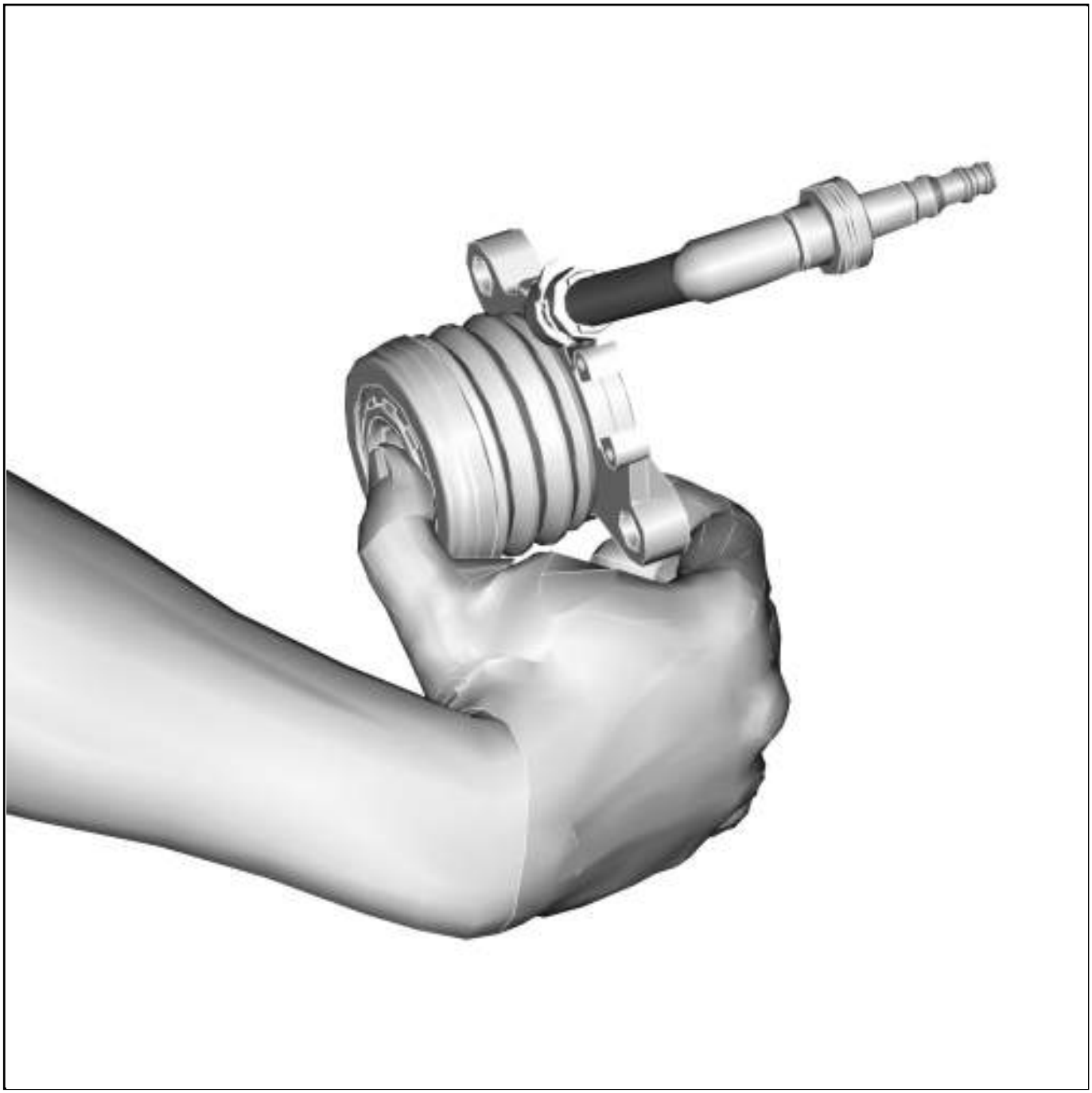
FILLING POSITION FOR PIPE WITH FILTER

FILLING POSITION FOR PIPE WITH FILTER



Prefill the clutch pipe using the syringe.

Plug the prefilled pipe on the master cylinder end to stop any brake fluid from escaping.



Prefill the hydraulic tappet by gravity using the syringe.

Refit the part(s) concerned.

5. BLEED OPERATION AFTER REMOVING A HYDRAULIC CIRCUIT PART

Keep the clutch pedal in the upper position using a strap attached to the steering wheel to ensure continuity of the hydraulic circuit during the bleed operation.

Note:

Take care not to disrupt the adjustment of the clutch start of travel switch.

- Remove the bleed plug from the clutch slave cylinder.
- Connect a transparent pipe of sufficient length to the bleed hole (at least thirty centimetres) in order to place it at the same height as the reservoir.
- Open the bleed screw.
- Fill the brake fluid master cylinder reservoir until brake fluid flows out of the bleed screw.

Note:

The transparent pipe must remain at the same height as the master cylinder reservoir to prevent air from entering inside the clutch circuit.

- Connect a new syringe to the end of the transparent pipe filled with 60 ml of approved brake fluid.
- Slowly inject the entire contents of the syringe into the hydraulic clutch circuit without injecting any of the air from the top section of the syringe.
- Close the bleed screw.
- Remove the transparent pipe from the bleed hole.
-

Refit the bleed plug.

Top up the brake fluid level in the master cylinder reservoir.

Disengage and engage the clutch quickly around twenty times.

Check that the clutch system is operating correctly.

Repeat the bleed operation if necessary.

Check the adjustment of the clutch pedal switch(see 37A, Mechanical component controls, Pedal switches: Adjustment) .

6. FINAL OPERATION

Refit the engine undertray.

CLUTCH CIRCUIT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Note:

Each time an operation is carried out on the hydraulic clutch system, bleed the clutch circuit.

- Location and specifications (tightening torques, parts always replaced, etc.)Clutch assembly: Exploded view .

- For vehicles equipped with hydraulic clutch system.

REMOVAL

1. REMOVAL PREPARATION OPERATION

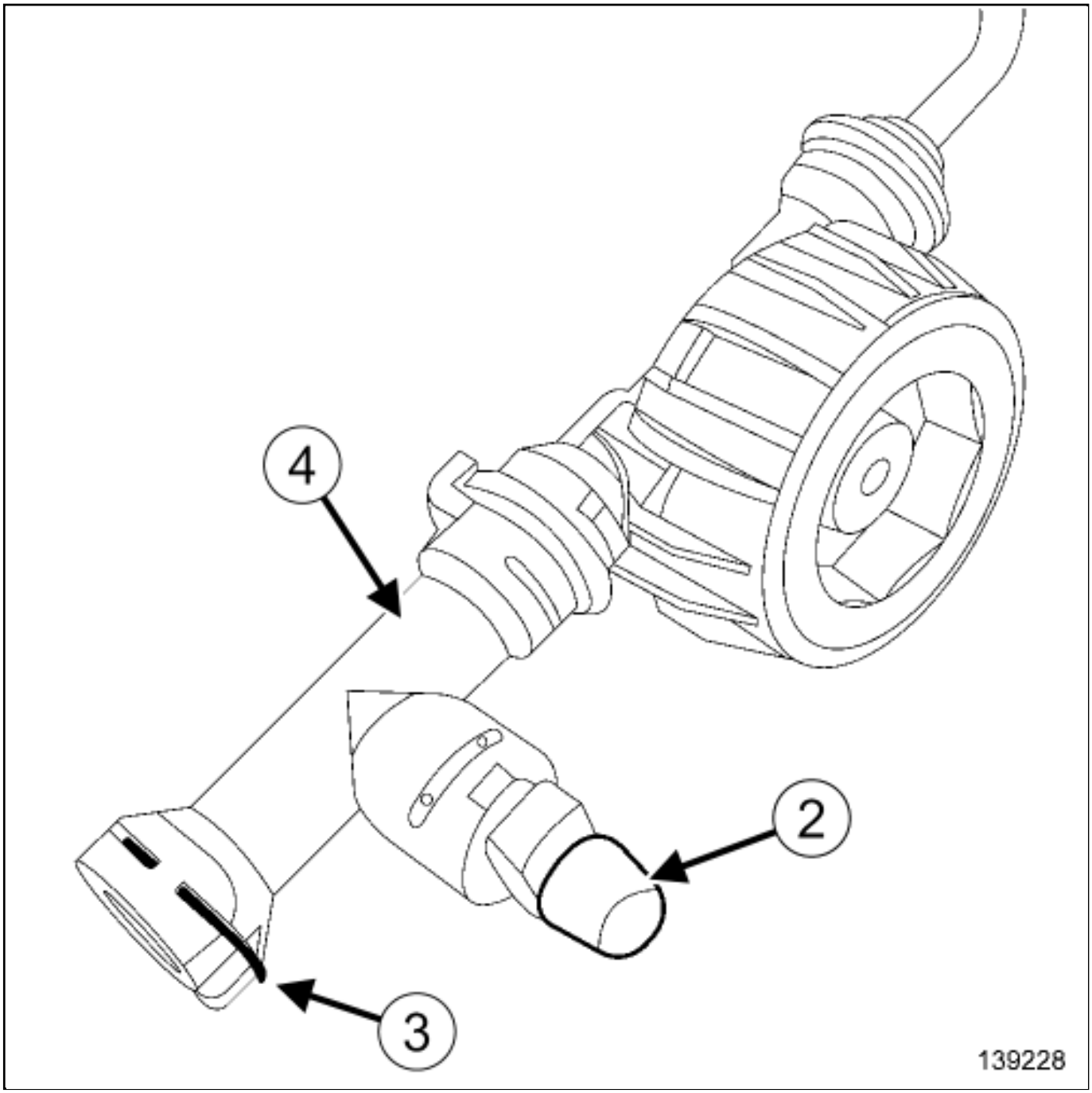
- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the engine undertray bolts,
  - the engine undertray.

- Remove the air filter unitAir filter unit: Removal - Refitting .

- Remove the brake fluid filler cap.
- Drain the brake fluid reservoir until the fluid level is below the clutch master cylinder supply opening.

2. REMOVAL OPERATION



- Remove the plug from the bleed hole(2) .

- Place a cloth under the clutch slave cylinder.
- Press the clip(3) .

CAUTION

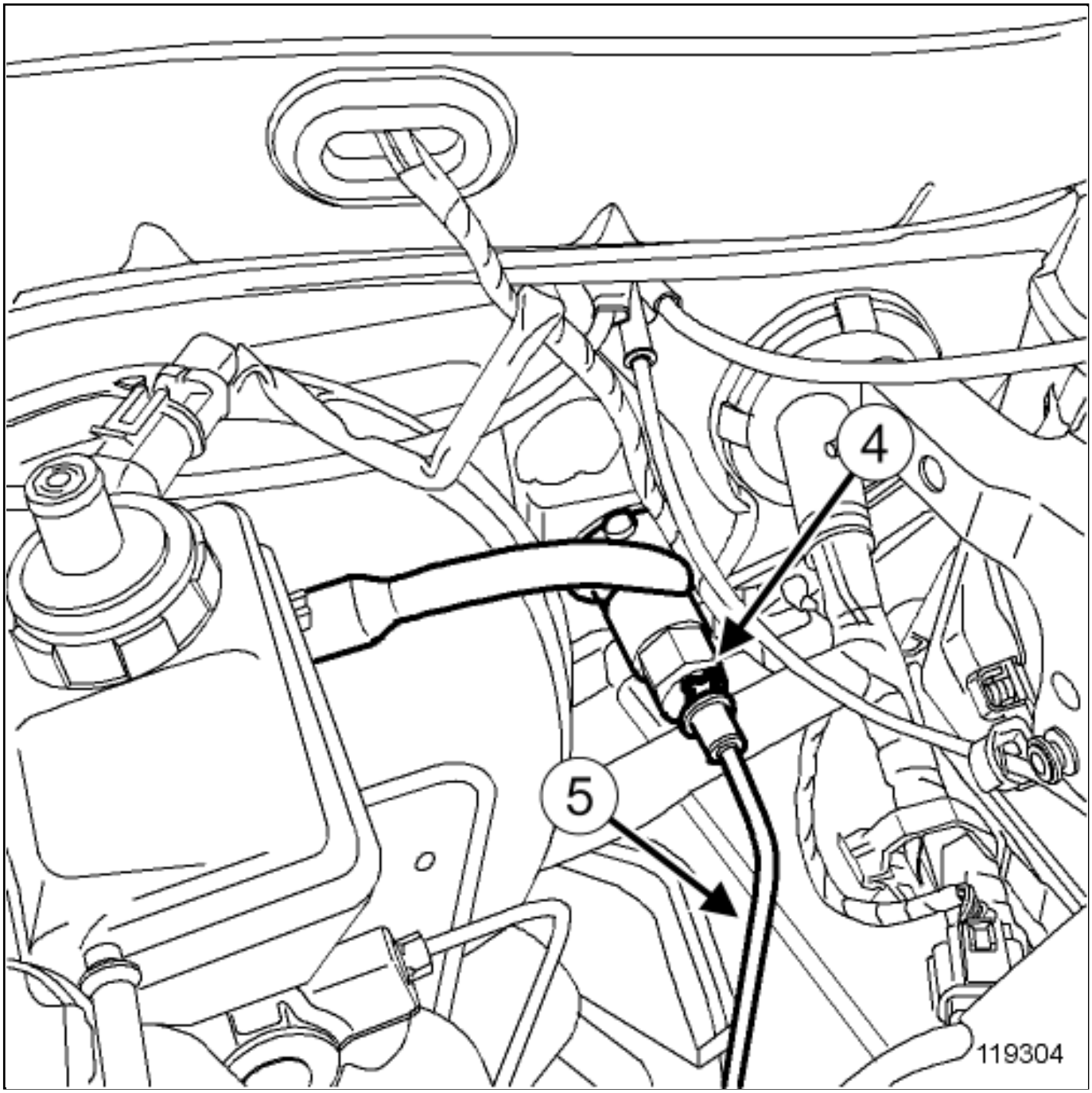
Do not pull the clip. If it is incorrectly handled in any way, the pipe will need to be replaced.

- Pull out the clutch control pipe(4) by one notch to free the bleed hole.

Note:

Expect some brake fluid to run out.

- Connect a transparent pipe to the bleed hole and place an empty jar under the bleed hole.
- Depress the clutch pedal with your hand (to drain the master cylinder and the clutch pipe).
- Press the slave cylinder clip(3) .
- Uncouple the pipe (4) from the slave cylinder and place plugs on each opening.



- Remove the clip(4) securing the master cylinder - slave cylinder connecting pipe to the master cylinder.
- Place a cloth under the master cylinder.
- Disconnect the pipe (5) on the master cylinder in the engine compartment.
- Place plugs in each opening.
- Unclip the clutch control pipe.

- Remove the clutch control pipe between the master cylinder and the clutch slave cylinderClutch assembly: Exploded view .

REFITTING

1. REFITTING PREPARATION OPERATION

- Check the condition of the seals and replace them if necessary.
- Remove the plugs from the openings.

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

> Note:
>
> As you lock the clutch control pipe, you should hear a safety click.

- Fill the brake fluid reservoir to the correct level.
- Bleed the clutch circuit(see 37A, Mechanical component controls, Clutch circuit: Bleed) .

CLUTCH HOUSING BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Tool for fitting the primary shaft seal.	Bvi. 1601

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair** .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 21A, Manual gearbox , Manual gearbox: Precautions for the repair)** .

REMOVAL

1. REMOVAL PREPARATION OPERATION

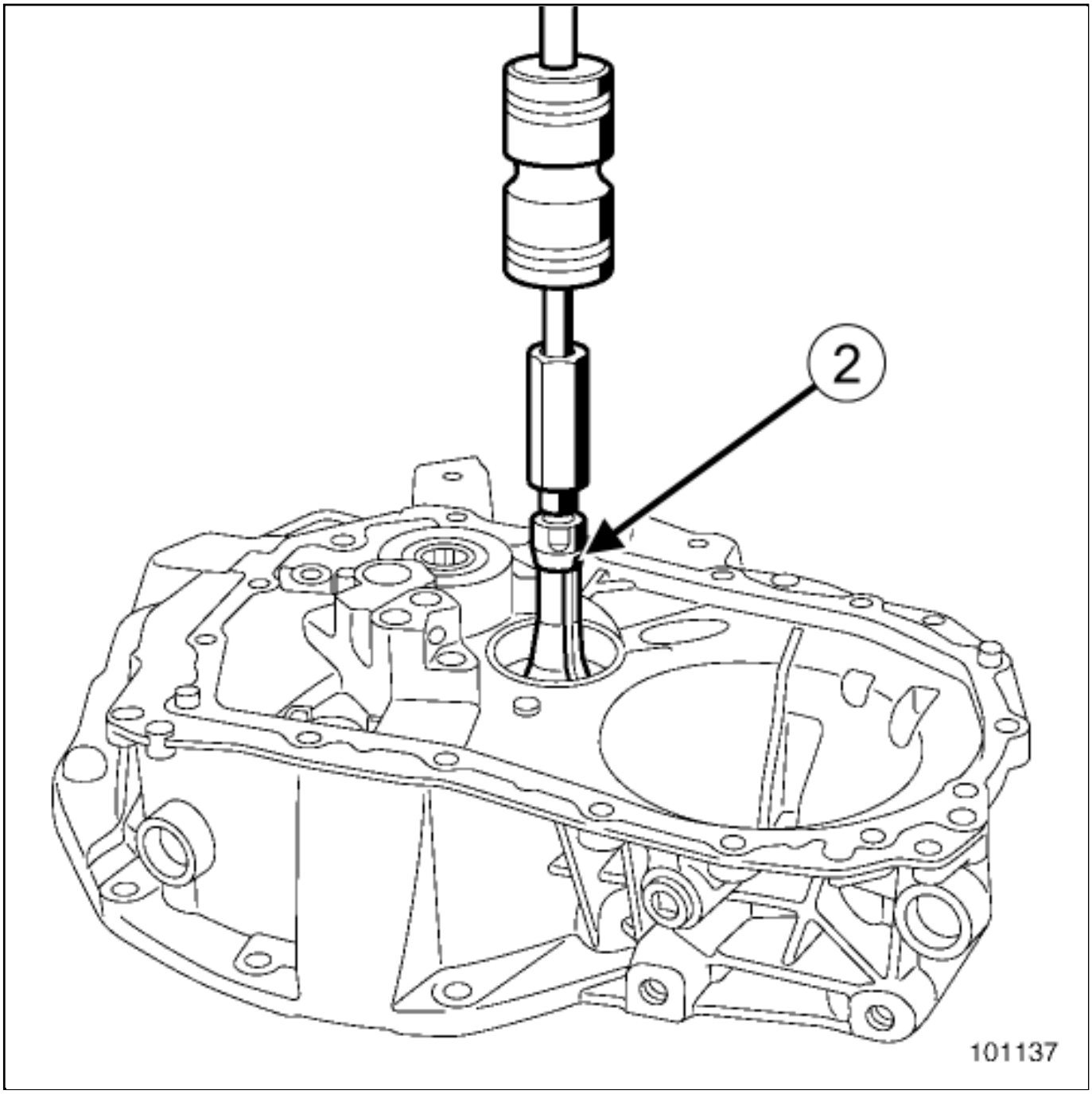
- Remove the gearboxManual gearbox: Removal - Refitting .

- Position the gearbox on the component support(see 21A, Manual gearbox , Gearbox support equipment: Use) .

- Remove:
  - the fifth gear housing5th gear housing: Removal - Refitting ,
  - the fifth gear synchroniser and pinions5th gear sprockets and synchronisers: Removal - Refitting ,
  - the mechanism housing(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
  - the gearbox shafts(see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) ,
  - the differential(see 21A, Manual gearbox , Manual gearbox differential: Removal - Refitting) .

2. OPERATION FOR REMOVAL OF PART CONCERNED

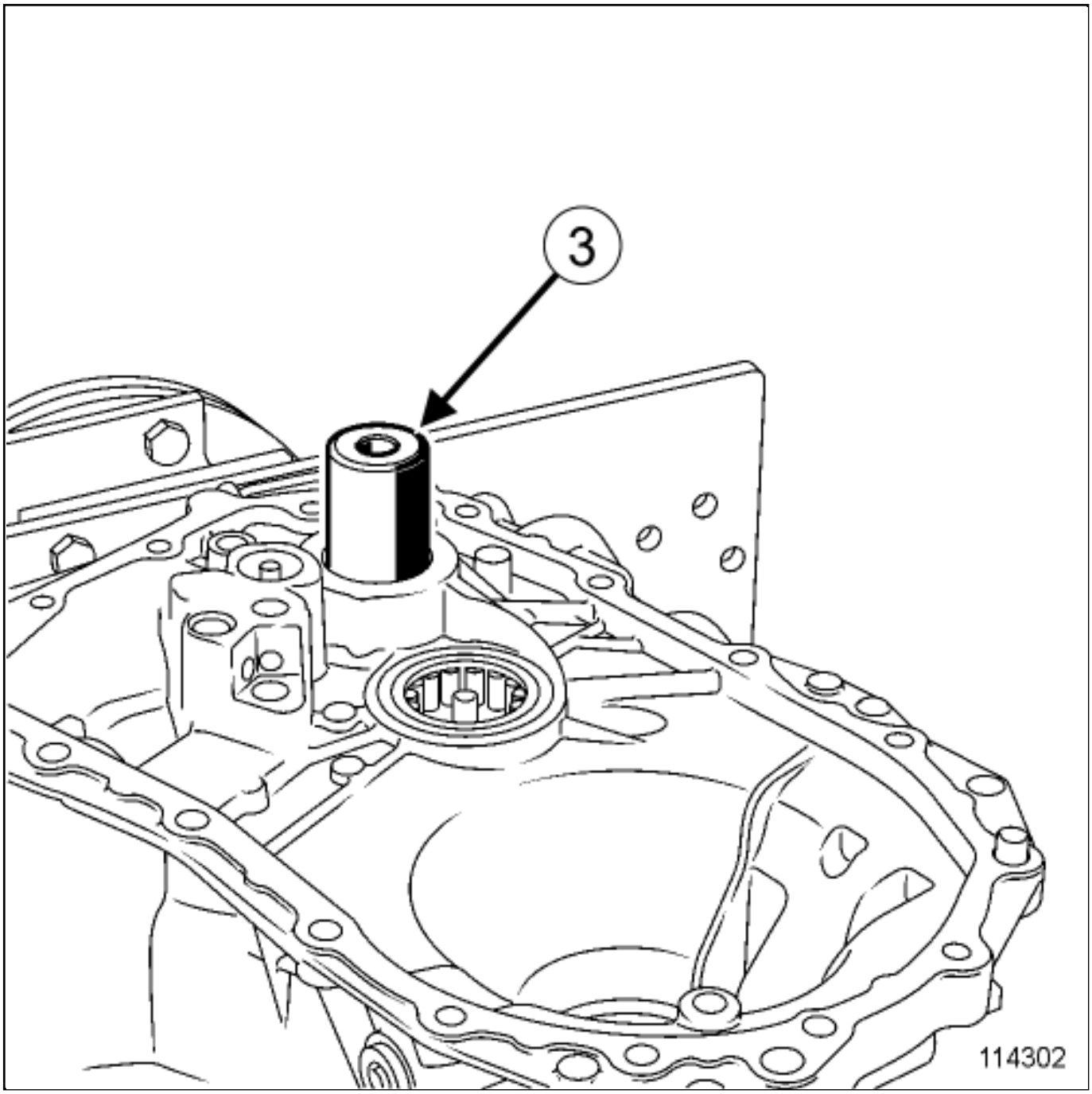
1- REMOVING THE OUTPUT SHAFT BEARING



- Cut the base of the plastic hollow tube located at the centre of the bearing.

- Remove the output shaft bearing cup from the clutch housing using a slide hammer(2) .

2- REMOVING THE INPUT SHAFT BEARING



- Use a press to remove the input shaft bearing using a 38 mmdiameter tube (3) .

REFITTING

1. REFITTING PREPARATION OPERATION

- Use SURFACE CLEANERVehicle: Parts and consumables for the repair to clean:
  - the shafts,
  - the shaft mating surfaces,
  - the differential,

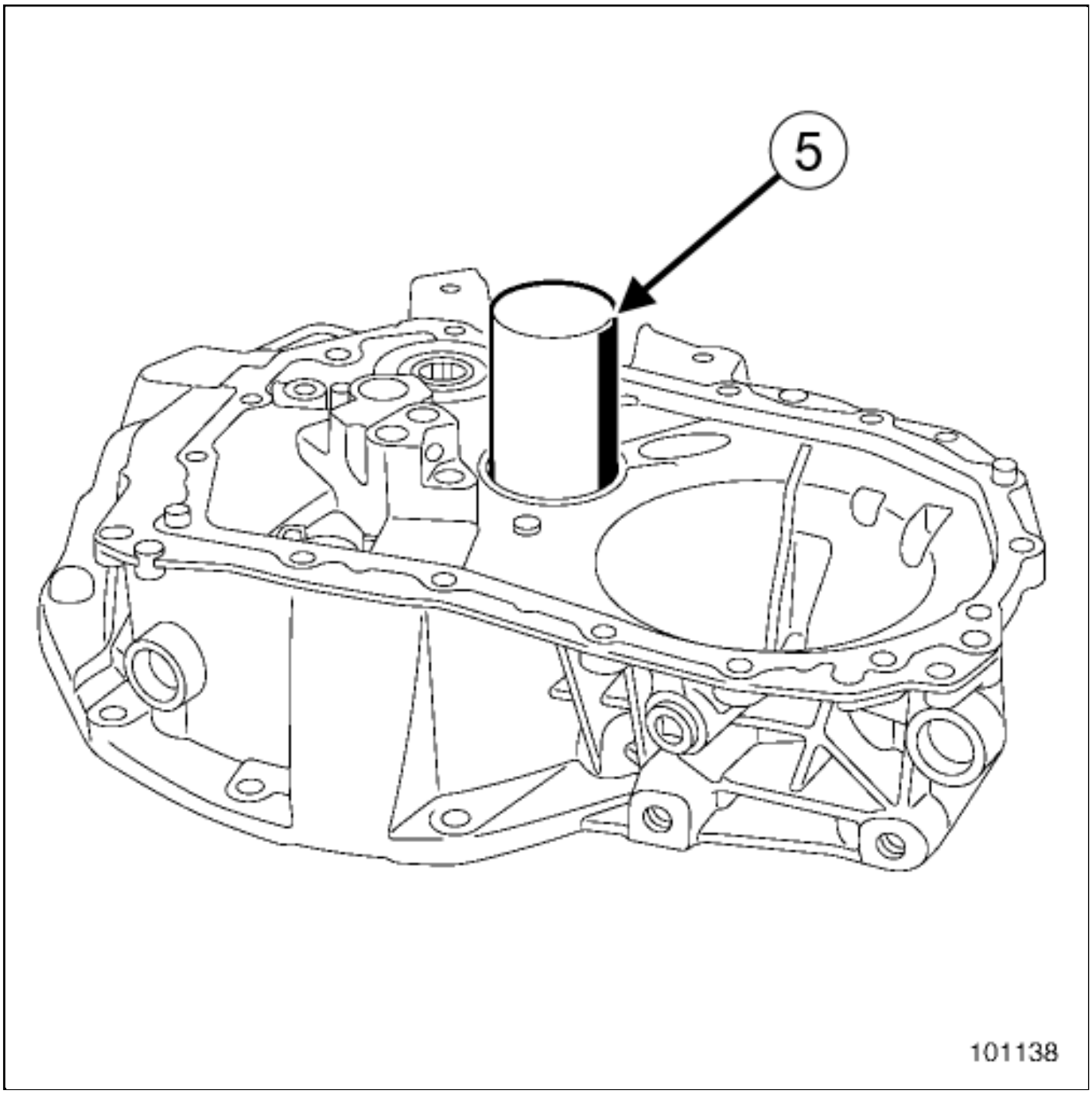
- the mechanism housing,
- the differential housing.

Parts always to be replaced:

- the lip seals,
- the O-rings,
- the clutch thrust bearing guide
- the gear lock rings,
- the roll pins,
- the input and output shaft bearing circlips,
- the selector rod hub springs,
- the hydraulic clutch slave cylinder (if fitted),
- the magnet,
- the lock ring of the differential,
- the differential retaining nut.

2. REFITTING OPERATION FOR PART CONCERNED

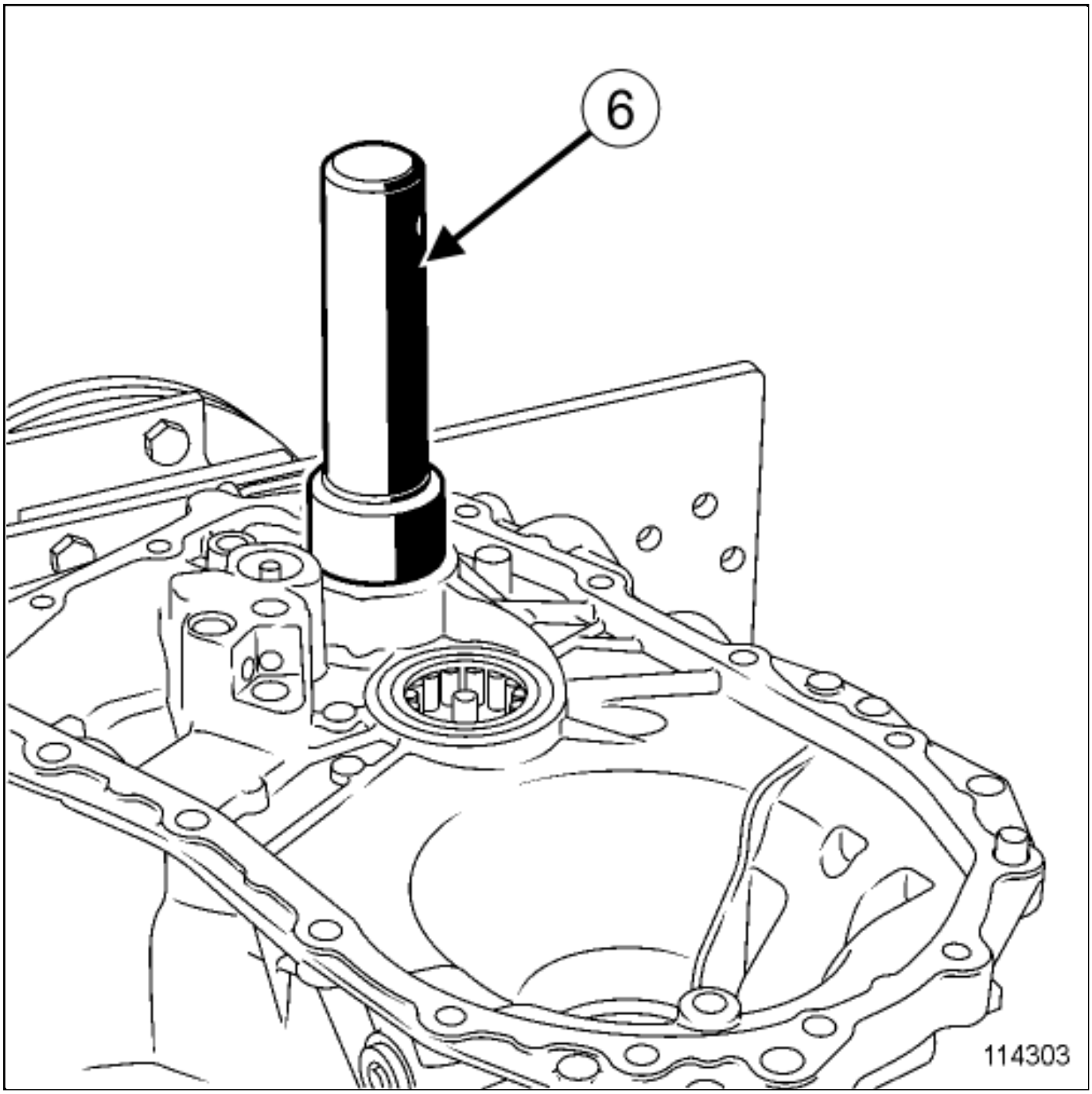
1- REFITTING THE OUTPUT SHAFT BEARING



- Position a new deflector.

- Refit the output shaft bearing cup using a 55 mmdiameter tube (5) .

2- REFITTING THE INPUT SHAFT BEARING



Use the press to refit the input shaft bearing using toolTool for fitting the primary shaft seal.(Bvi. 1601) (6) .

3. FINAL OPERATION

Refit:

- the differential(see 21A, Manual gearbox , Manual gearbox differential: Removal - Refitting) ,
- the gearbox shafts(see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) ,
- the mechanism housing(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,

- the fifth gear synchroniser and pinions **5th gear sprockets and synchronisers: Removal - Refitting** ,
- the fifth gear housing **5th gear housing: Removal - Refitting** .

Remove the gearbox from the component support **(see 21A, Manual gearbox , Gearbox support equipment: Use)** .

Refit the sequential gearbox **Sequential gearbox: Removal - Refitting** .

Refit the gearbox **Manual gearbox: Removal - Refitting** .

CLUTCH MASTER CYLINDER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Socket (24 mm) for removal - refitting of the clutch master cylinder	Emb. 1797

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Note:

Each time an operation is carried out on the hydraulic clutch system, bleed the clutch circuit.

- Location and specifications (tightening torques, parts always to be replaced, etc.)Clutch assembly: Exploded view .

- For vehicles equipped with hydraulic clutch system.

REMOVAL

1. REMOVAL PREPARATION OPERATION

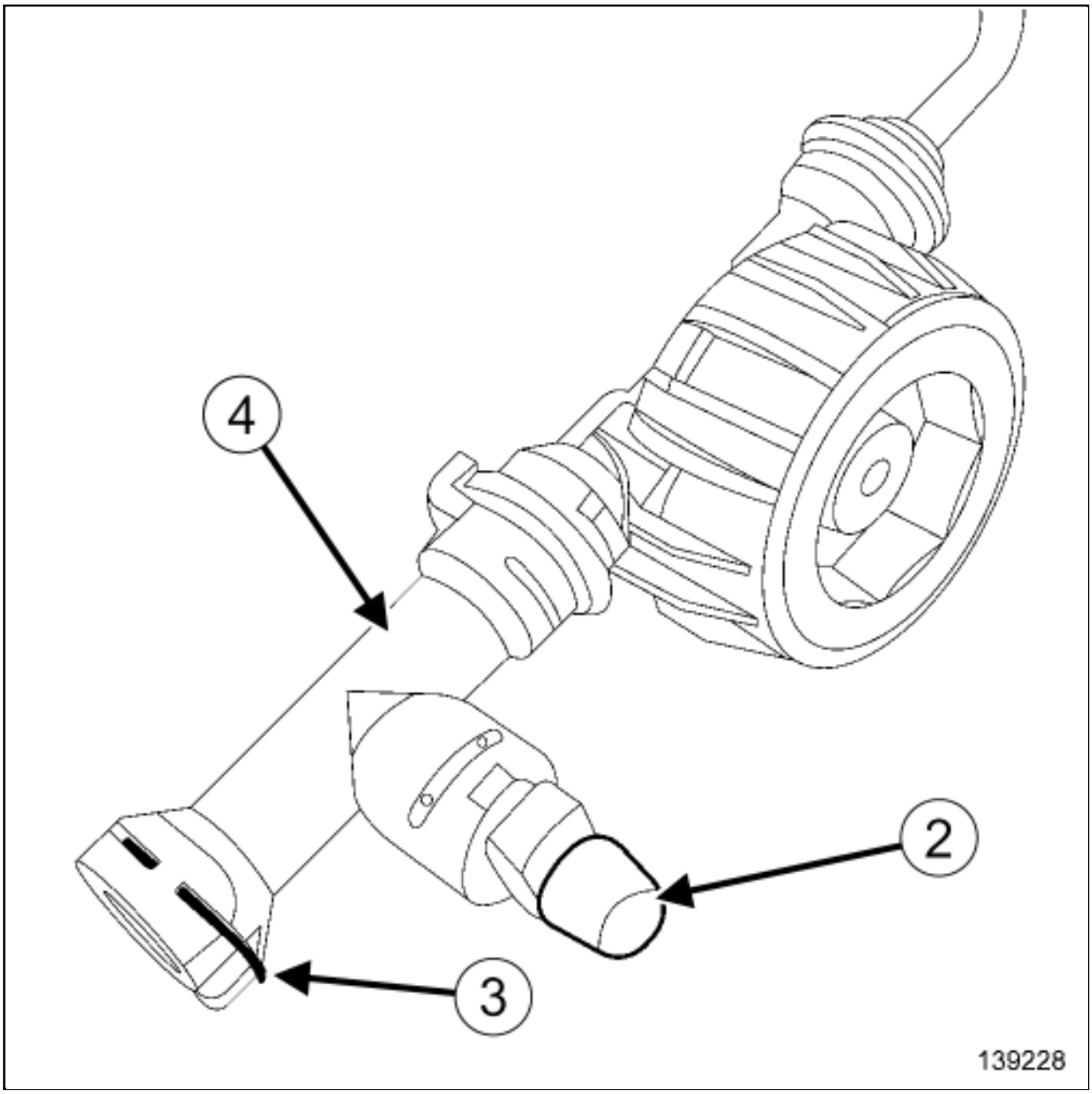
- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the engine undertray bolts,
  - the engine undertray.

- Remove the air filter boxAir filter unit: Removal - Refitting .

- Disconnect the brake fluid level sensor connector from the reservoir.
- Remove the brake fluid filler cap.
- Drain the brake fluid reservoir until the fluid level is below the clutch master cylinder supply opening.
- Fit plugs into the openings.

2. REMOVAL OPERATION



- Place a cloth under the clutch slave cylinder.

- Remove the plug from the bleed hole(2) .

- Press the clip(3) .

CAUTION

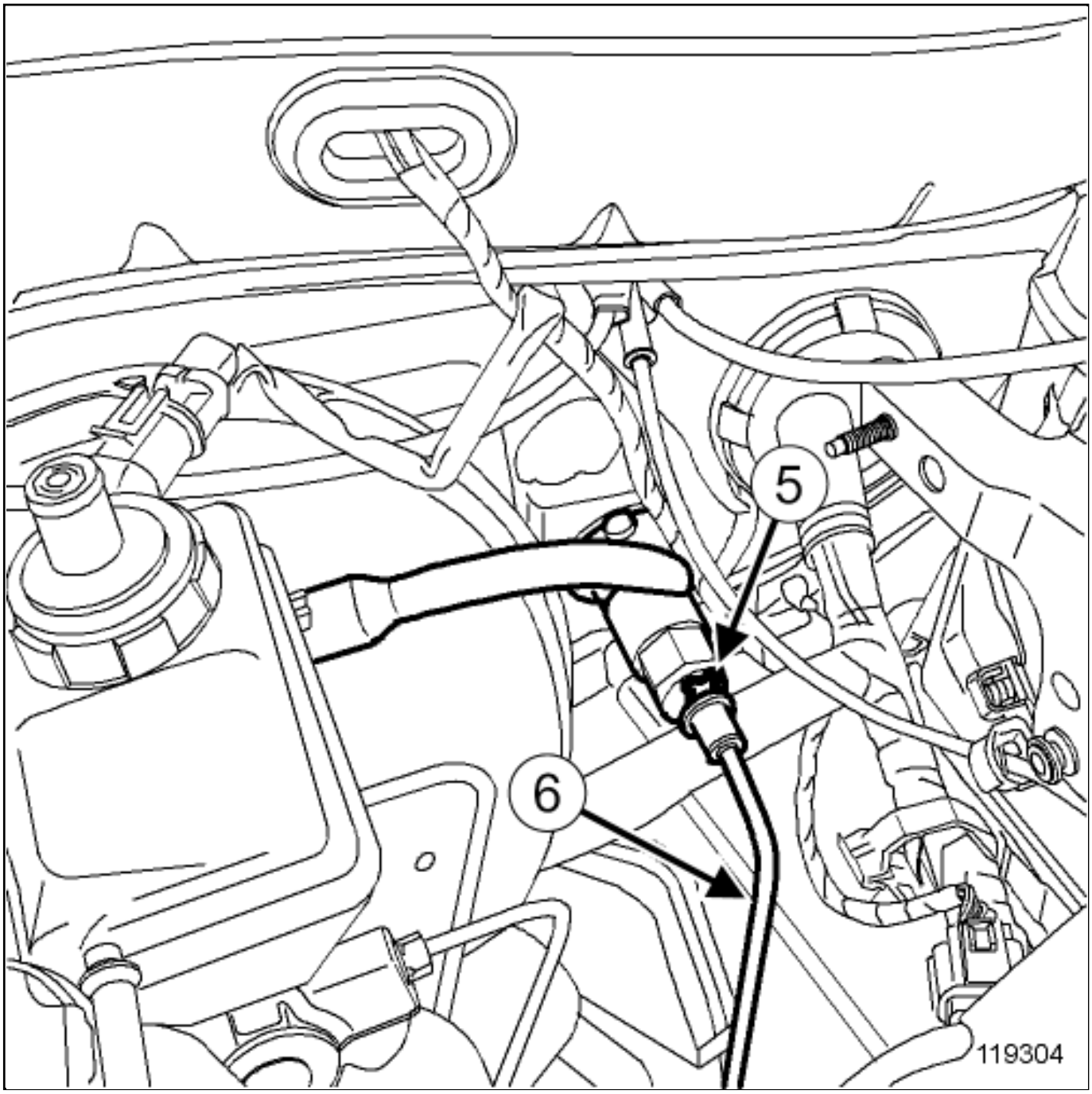
Do not pull the clip. If it is incorrectly handled in any way, the pipe will need to be replaced.

- Pull out the clutch control pipe(4) one notch to free the bleed hole.

Note:

Expect some brake fluid to run out.

- Connect a transparent pipe to the bleed hole and place an empty jar under the bleed hole.
- Depress the clutch pedal with your hand (to drain the clutch master cylinder and the clutch pipe).



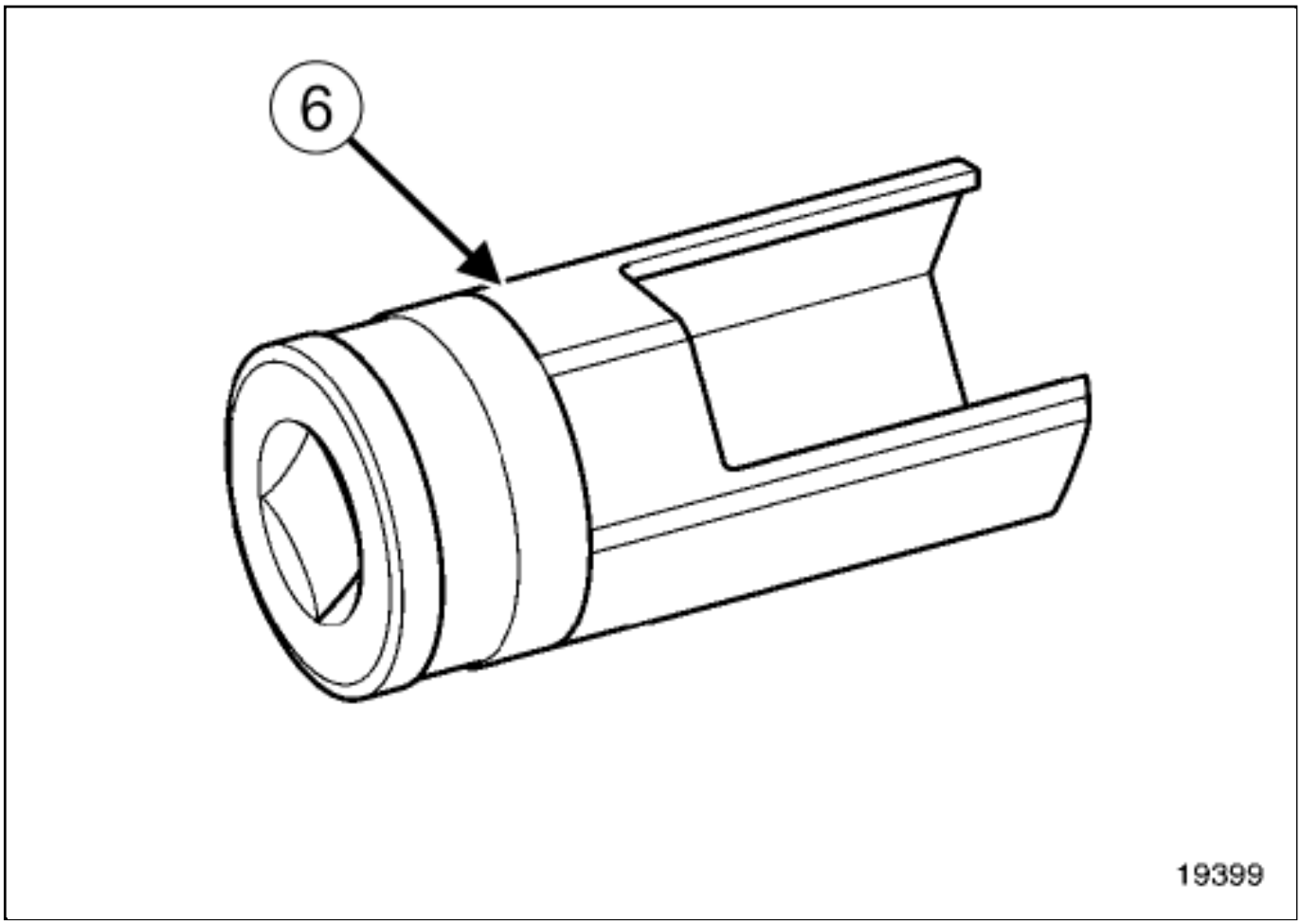
- Remove the retaining clip(5) of the clutch master cylinder - slave cylinder connecting pipe on the clutch master cylinder.

- Place a cloth under the clutch master cylinder.

- Disconnect the pipe (6) from the clutch master cylinder.

- Fit plugs into the openings.

- Disconnect the master cylinder ball joint from the clutch pedal in the passenger compartment.



- Remove the clutch master cylinder on the bulkhead by turning it a quarter of a turn clockwise in the engine compartment (bayonet-type mounting) using the toolSocket (24 mm) for removal - refitting of the clutch master cylinder(Emb. 1797) (6) .

REFITTING

1. REFITTING PREPARATION OPERATION

- Check the condition of the seals and replace them if necessary.

Note:

The clutch master cylinder features a foolproofing device, and only one position allows it to be fitted correctly.

CAUTION

Do not use the take-off pipes as a support when fitting.

- Remove the plugs from the openings.

2. REFITTING OPERATION

- Refit the clutch master cylinder by turning it a quarter of a turn anti-clockwise (bayonet-type mounting) using the toolSocket (24 mm) for removal - refitting of the clutch master cylinder(Emb. 1797) .

- Proceed in the reverse order to removal.

Note:

As you lock the clutch control pipe, you should hear a safety click.

Note:

Lubricate both ends of the clutch supply pipe with brake fluid to facilitate fitting on the brake fluid reservoir take-off pipe.

- Fill the brake fluid reservoir to the correct level.

- Bleed the clutch circuit(see 37A, Mechanical component controls, Clutch circuit: Bleed) .

XSL version : 3.02 du 22/07/11

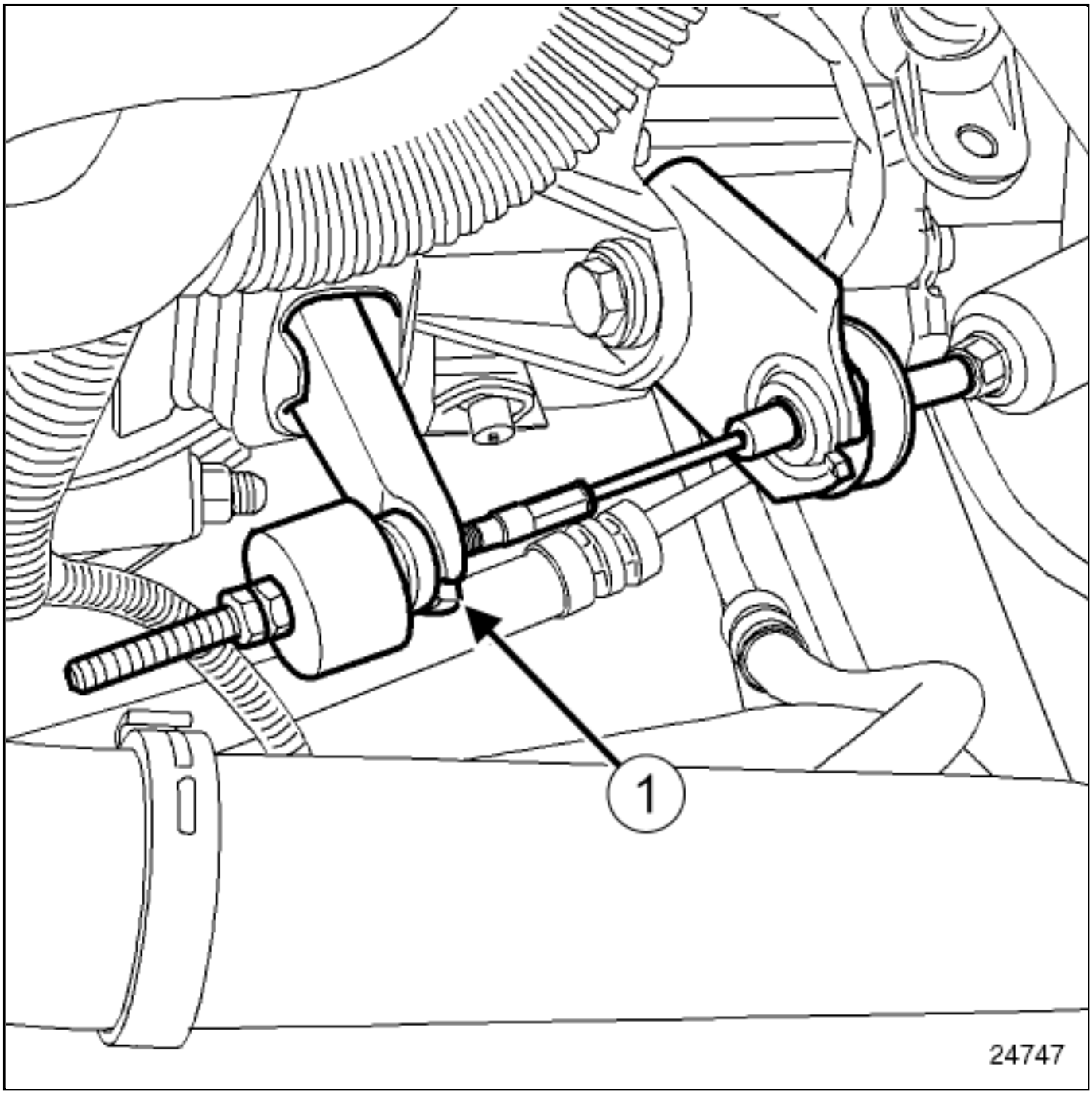
CLUTCH PEDAL: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 37A, Mechanical component controls, Pedal assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

FOR VEHICLES EQUIPPED WITH CLUTCH CABLE



- Remove the clutch control cable from the sleeve stop(1) to loosen the cable.

- Remove the dashboard lower absorbent (if fitted to the vehicle).

2. REMOVAL OPERATION

- Remove the clutch cable from the pedal housing, by lifting the pedal and placing the cable perpendicular to the pedal.

Note:

For vehicles equipped with clutch cable.

- Unclip the clutch master cylinder ball joint.

Note:

For vehicles equipped with hydraulic clutch system

- Disconnect the connector from the clutch pedal position sensor.

- Remove the clutch pedal sensor by turning it a quarter of a turn anti-clockwise.

- Remove the clutch pedal(see 37A, Mechanical component controls, Pedal assembly: Exploded view) .

REFITTING

- Proceed in the reverse order to removal.

- Adjust the clutch pedal switch (if fitted to the vehicle)(see 37A, Mechanical component controls, Pedal switches: Adjustment) .

- Fit the cable in place in its notch on the pedal (see Procedure for removing).

Note:

For vehicles equipped with clutch cable.

- Check that the cable fits perfectly in the groove provided for it on the pedal.

- Check the clutch control cable clearance at its gearbox end.

CLUTCH: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

Special tooling required	
Set of clutch plate centring mandrels.	Emb. 1780

Before removing the clutch, check:

- the direction of fitting for the clutch plate.

Before refitting the clutch, check:

- the flywheel friction track (no scratches or blue stains),
- the crankshaft bearing (no sticking),
- the engine and gearbox seals (replace if necessary),
- the sliding action of the clutch plate on the output shaft,
- the guide of the thrust bearing and clutch fork (no wear or scratches).

CAUTION

To prevent the clutch from juddering or slipping, do not grease the output shaft or the clutch plate hub.

During refitting:

Check the direction of the clutch plate.

Centre the clutch plate using theSet of clutch plate centring mandrels.(**Emb. 1780**) .

Gradually torque tighten the clutch pressure plate bolts.

After refitting, check:

- the clutch play (for a cable operated vehicle),
- bleeding of the hydraulic circuit (for vehicles with hydraulic controls).

XSL version : 3.02 du 22/07/11

CLUTCH: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Flywheel locking tool.	Mot. 582-01
Flywheel locking tool.	Mot. 1431

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 20A, Clutch, Clutch assembly: Exploded view) .

WARNING

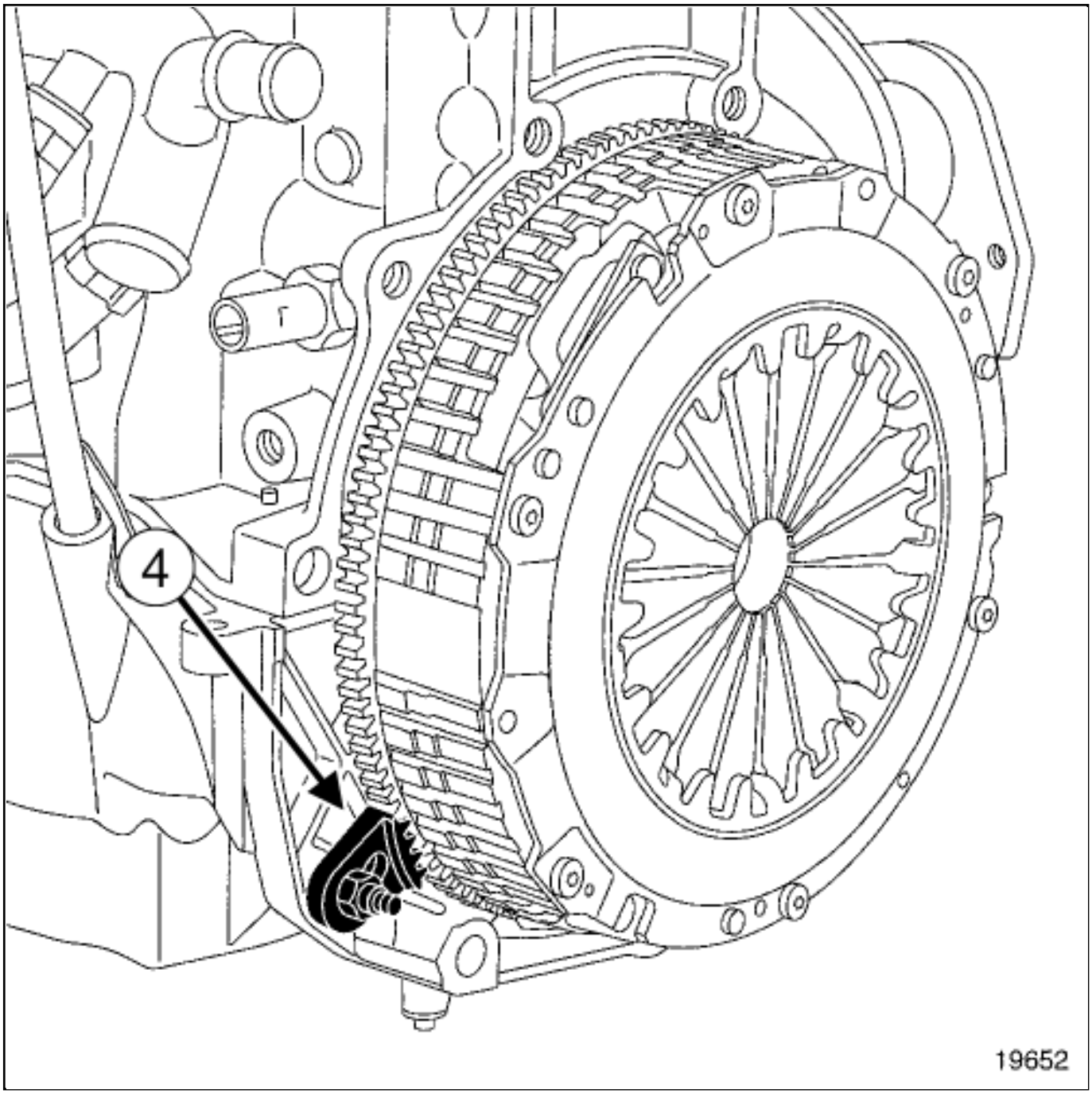
- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 20A, Clutch, Clutch: Precautions for the repair) ,
  - Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the manual gearboxManual gearbox: Removal - Refitting .

2. REMOVAL OPERATION



- Lock the flywheel using theFlywheel locking tool.(Mot. 582-01) at (4) .

- Remove (see 20A, Clutch, Clutch assembly: Exploded view) :
  - the clutch pressure plate bolts,
  - the clutch plate and pressure plate.

REFITTING

1. REFITTING PREPARATION OPERATION

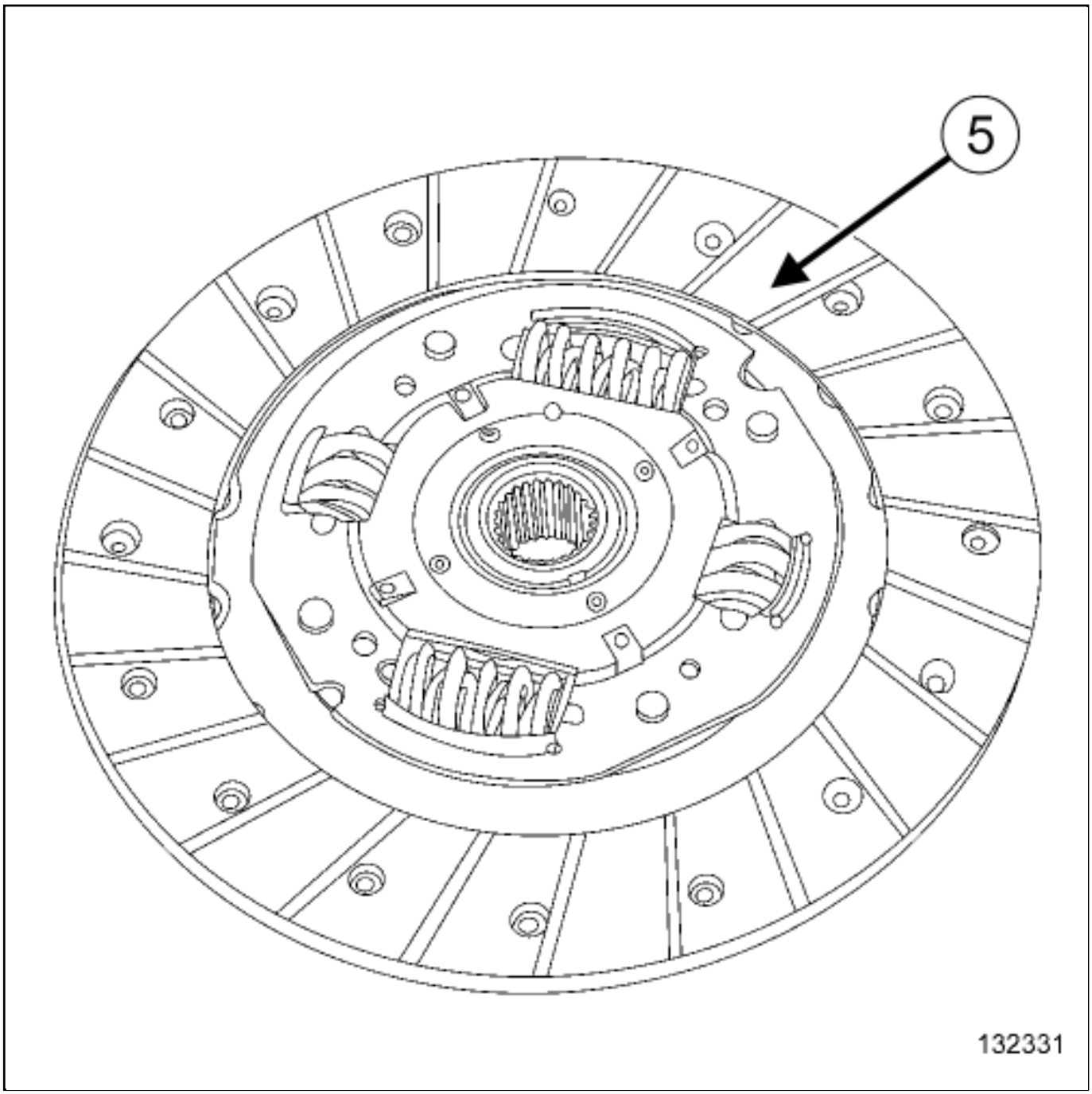
Use surface cleanerVehicle: Parts and consumables for the repair to clean and degrease:

- the flywheel friction face,
- the clutch shaft splines.

CAUTION

Do not grease the clutch shaft splines.

2. REFITTING OPERATION



- Fit the clutch plate, with the face(5) to the clutch pressure plate end.

- Refit (see 20A, Clutch, Clutch assembly: Exploded view) :
  - the clutch plate and pressure plate,
  - the clutch pressure plate bolts.

- Torque tighten in the order the clutch pressure plate bolts(see 20A, Clutch, Clutch assembly: Exploded view) .

- Proceed in the reverse order to removal.

TECHNICAL NOTE
EDITION ANGLAISE

July 2012
77 11 344 642

5037A
Service 0465

Type S/Section

All types

XXX X

82A

This note cancels and replaces Technical Note 3315E, part no. 77 11 206 336 and previous versions of Technical Note 5037A

01B-82A-87B-86A-86C **CODE SUPPLY PROCEDURE**

- Engine: **XXX**
- Gearbox: **XXX**

Basic manual:

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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0) Introduction

Since 1st June 2005 there has been a single service available for supplying the following codes:

- Engine immobiliser
- Radio
- Video network
- Reprogramming key (NRE)

This service is Code Management (GDC) on RENAULT NET or importers' RENAULT NET.

Information required for use:

Immobiliser code:
VIN (17 characters)
number marked on the key head (old vehicles, 8 characters maximum)
Programming key supplied by diagnostic tool (new vehicles, 24 characters)

Note:
The programming key is obligatory from CLIP CD65, i.e. from June 2006.

Radio code:
VIN (17 characters)
Pre-code or serial number of the radio

Radio pre-code if the first code obtained using the VIN is not correct
Pre-code = 1 letter + 3 digits
Refer to the detailed procedure §2.2.2 "Finding the radio pre-code"

Radio without pre-code:
Radio manufacturer: Philips/Blaupunkt/Pioneer/Alpine/Becker

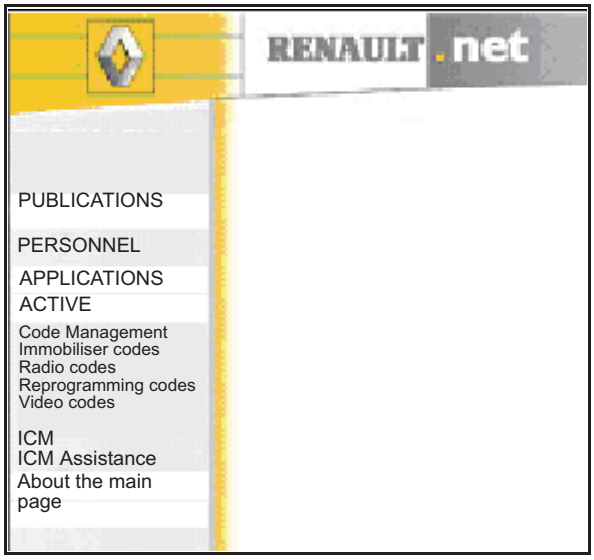
Video control code specific to Vel Satis:
VIN of the vehicle (17 characters)
Four-digit code supplied by the video control
Refer to the corresponding repair manual.

Reprogramming key (only in disconnected mode):
*Note: this key is an authorisation code provided by the diagnostic tool to the operator in order to obtain the reprogramming key from the code server.
VIN of the vehicle (17 characters)
Reprogramming key supplied by the diagnostic tool

WARNING
Access to the "code management" application is restricted to authorised personnel.
To use the code server, access rights are required.
These access rights (certificate) are integrated into the Tokens.
All code requests are recorded in a database. This database can be accessed by the police authorities.
Any member of personnel found to be making fraudulent use of management codes will be subject to corporate and legal proceedings.

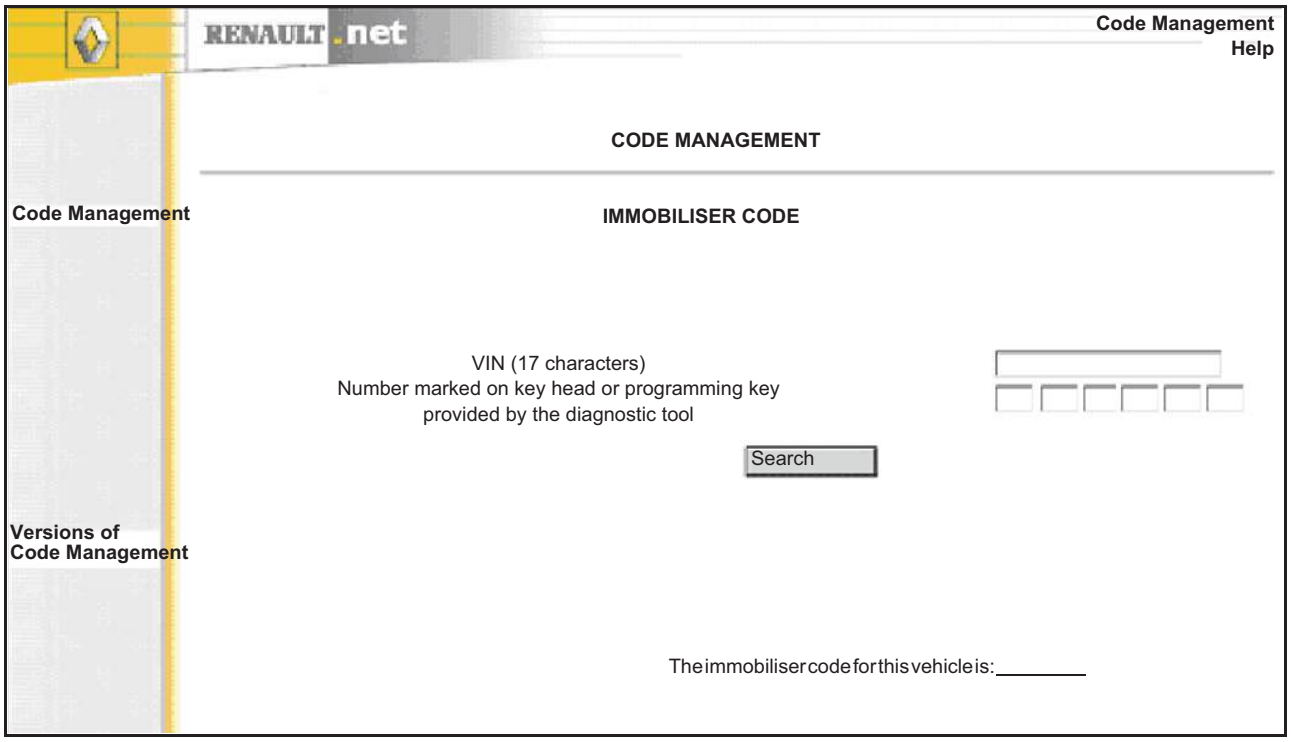
Using the Code Management server to find codes:

1) Main menu in Renault Net, under Applications you will find Code Management:



2) Finding a code in Code Management:
2.1 Immobiliser code:

Note:
To find out whether a vehicle is governed by the old or the new procedure, just start the programming procedure using your diagnostic tool. If the tool displays a **programming key**, this vehicle is governed by the new procedure.



2.1.1 Old procedure

– Enter the VIN
– Confirm with the "Search" button
– Immobiliser code supplied in the following form:
  4 digits (old vehicles)
  8 digits (MEGANE 1 and AVANTIME only)
  12 characters (digits and letters for other vehicles)

If the immobiliser code supplied is not correct and you have the key head number, resubmit your request with the same VIN and **key head number**:

Note:
The key head number is required for old vehicles; if the four-digit code supplied by the code server does not correspond to the vehicle, the key head code is used to recalculate the new four-digit code.

– Re-enter the VIN of the vehicle
– Enter the key head number (marked on the key head) 8 characters maximum (5 figures or 7 alphanumeric characters, or even 8 alphanumeric characters)
– Confirm with the "Search" button
– The immobiliser code (4 figures) is supplied

2.1.2 New procedure:
This new procedure affects vehicles from LAGUNA II, and new vehicles.
This has been compulsory since June 2006.

In disconnected mode:
– Enter the VIN + programming key supplied by the diagnostic tool.
– Confirm with the "Search" button
– The immobiliser code is supplied in the form of programming keys of 24, 40 or 28 characters, then supplied in the form of 13, 34 or 39 characters

In connected mode:
– The immobiliser code can be searched for and supplied automatically via the diagnostic tool.

2.1.3 Error messages and procedure to follow

MANAGEMENT CODE ERROR MESSAGE	PROCEDURE TO FOLLOW
All vehicles	
The VIN is not found on the World Vehicle Database	Re-enter the VIN. If the fault is still present, contact the Techline.
The diagnostic tool programming key is compulsory.	The vehicle corresponding to the VIN entered is subject to the new procedure described in paragraph 2.1.2. CLIP version 65 or a more recent version is required.
A new code cannot be supplied.	contact your technical assistance network
Old procedure	
The immobiliser code cannot be obtained by entering the VIN alone. For old vehicles with a four-digit security code, you must enter the code marked on the key head in addition to the VIN. If no number is marked on the key head, contact your technical assistance network	The immobiliser code cannot be obtained from the server; the key head code is required to calculate the immobiliser code. Open the key head to obtain the key head code. If the code does not appear on the key head, check the customer documents (e.g. invoice) to find the code. If this number cannot be found, contact your technical assistance network quoting the error message.
The immobiliser code cannot be obtained with values entered. Check that the values are correct. If they are correct, contact your technical assistance network	If the key head code is incorrect, the immobiliser code cannot be calculated by the server. Check the key head code.
New procedure	
1. Check the programming key. 2. Check that the VIN from the CLIP main menu is correct.	The programming key does not correspond to the VIN entered. 1. Check the programming key (6 x 4 characters); the programming key does not contain: the letters O and Q as these may be confused with the number 0 the letter I as it may be confused with the number 1. 2. In the CLIP main menu, enter the correct VIN of the vehicle (17 characters)

2.1.3 Error messages and procedure to follow (continued)

MANAGEMENT CODE ERROR MESSAGE	PROCEDURE TO FOLLOW
New procedure (continued)	
The Renault card (or key) stored by CLIP in the "insertion" section of the programming scenario cannot be found on the server. 1. Check the programming key. 2. Check that the Renault card (or key) was ordered directly by the production workshop in France with the VIN (new procedure). 3. Check that the Renault card (or key) corresponds to the vehicle (the VIN is included on the document supplied with the part).	1. Check the programming key. 2. Renault cards and keys must be ordered according to the new procedure: from June 2006, directly from the central manufacturing workshop (in France), with the vehicle's VIN. The Renault cards and keys can only be used with the VIN for which they have been ordered. The VIN is written on the sheet attached to the packet containing the part. 3. If the fault is still present, contact the Techline.
The immobiliser code is not available on the database. follow the emergency procedure (see 2.1.4)	Check the VIN and the programming key. If the fault is still present, follow the emergency procedure (see 2.1.4).
Another immobiliser chain computer has recently been programmed on this vehicle. You are not authorised to perform this operation. Follow the emergency procedure (see 2.1.4).	1. Check the programming key. 2. Restart the procedure with CLIP. 3. If the fault is still present, follow the emergency procedure (see 2.1.4)

2.1.4 Emergency procedure

From 2007, the help mail will be replaced by a text file.
Once the code has been requested, a button will appear: "create a text file".
This creates a text file which can be saved to the hard drive or to a mobile device.

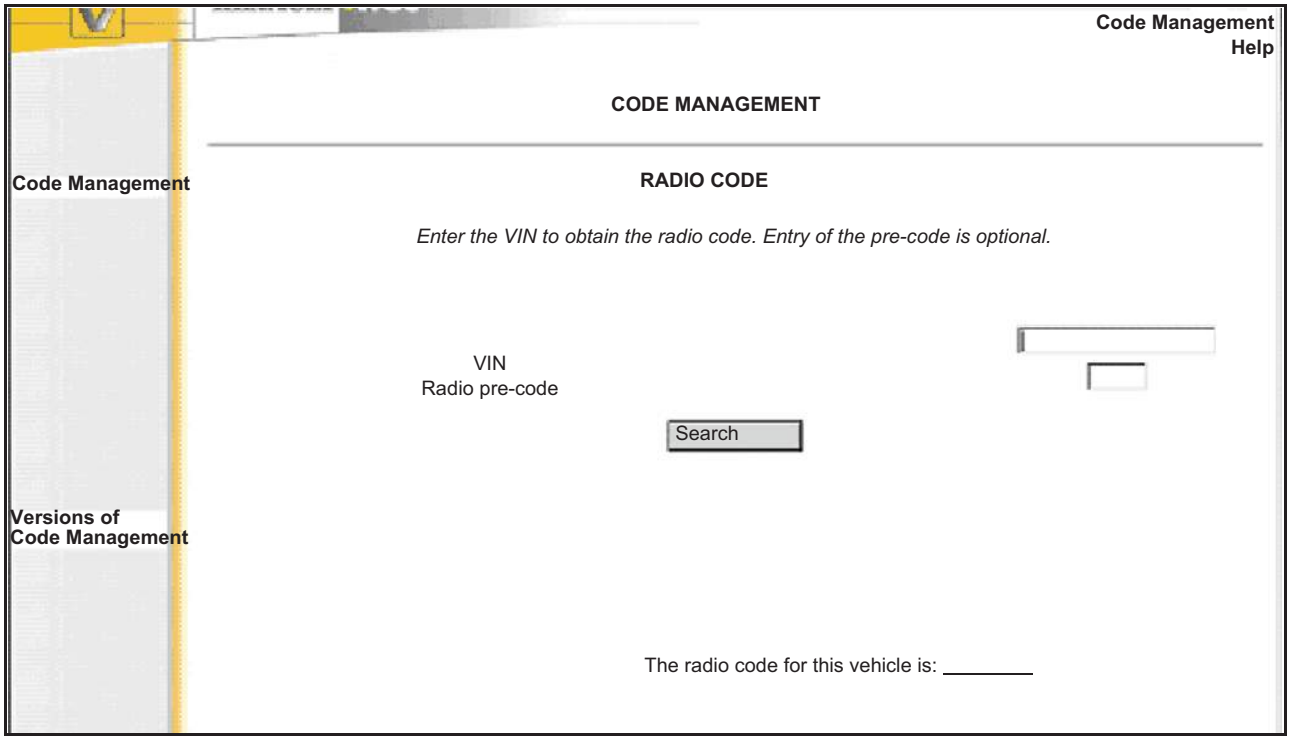
In the event of a fault, this text file contains all the information needed by the Techline :

- The VIN
- the key head code or programming key
- the message displayed

It is recommended that you use this text file to contact your technical assistance network.

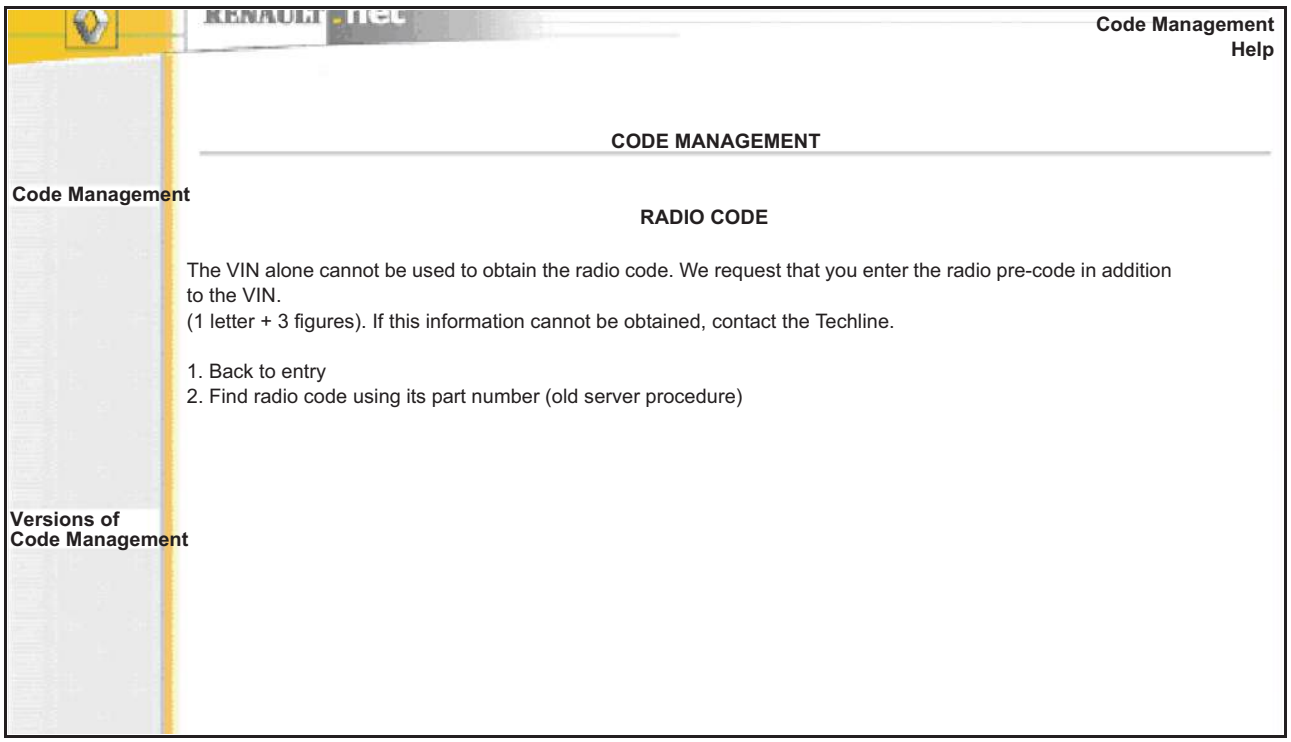
2.2 Radio code:

– Enter the VIN only
– Confirm with the "Search" button
– Radio code supplied



WARNING
It is not possible to obtain more than three radio codes for a single VIN.
The error message reads "A new code cannot be supplied".

2.2.1 "Enter pre-code" error screen



The radio code cannot be supplied by the server; the radio pre-code is required to calculate the radio code.
To find the radio pre-code, see paragraph 2.2.2.

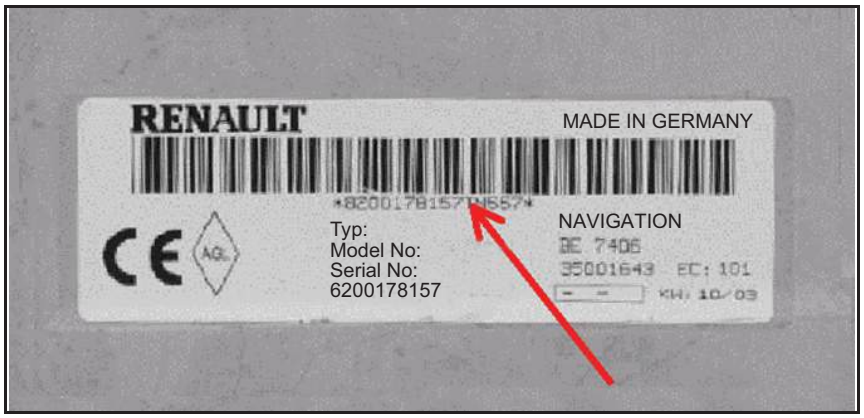
Once you have obtained the pre-code:
– Select option no. 1: "Return to entry"
– Enter the radio pre-code
– Confirm with the "Search" button
– Radio code supplied

Option no. 2, "Find radio code using its part number (old server procedure)" refers to old radios without a pre-code, see paragraph 2.2.4.

2.2.2 Finding the radio pre-code

Depending on the type of radio, recover the pre-code, either:
- from the radio display using the self-test procedure,
- by removing the radio; the pre-code is found on the label affixed to the radio.
- Vehicles with ITS Navigation: it is necessary to use the diagnostic tool obtain the pre-code

Note:
The pre-code consists of a letter and three digits (example below, N557).



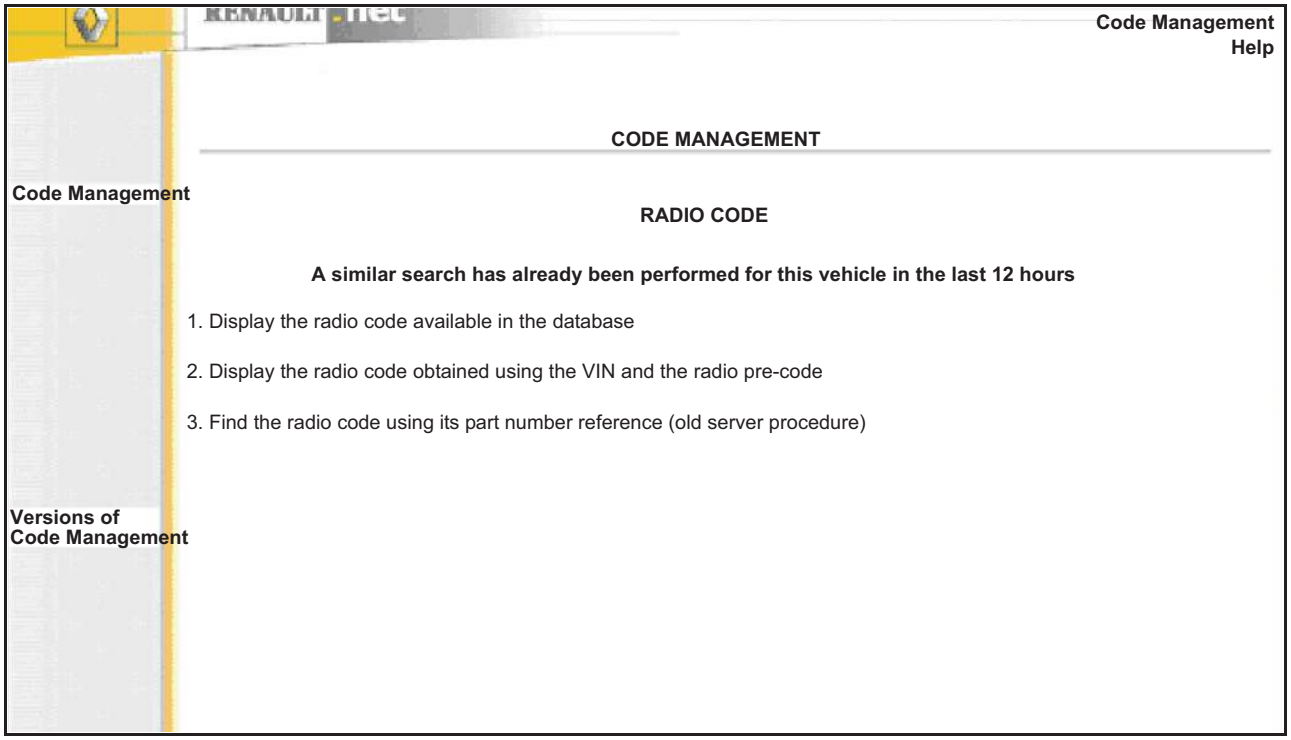
The pre-code is found after the Renault part number (8200 XXX XXX or 7700 XXX XXX) and the letter T

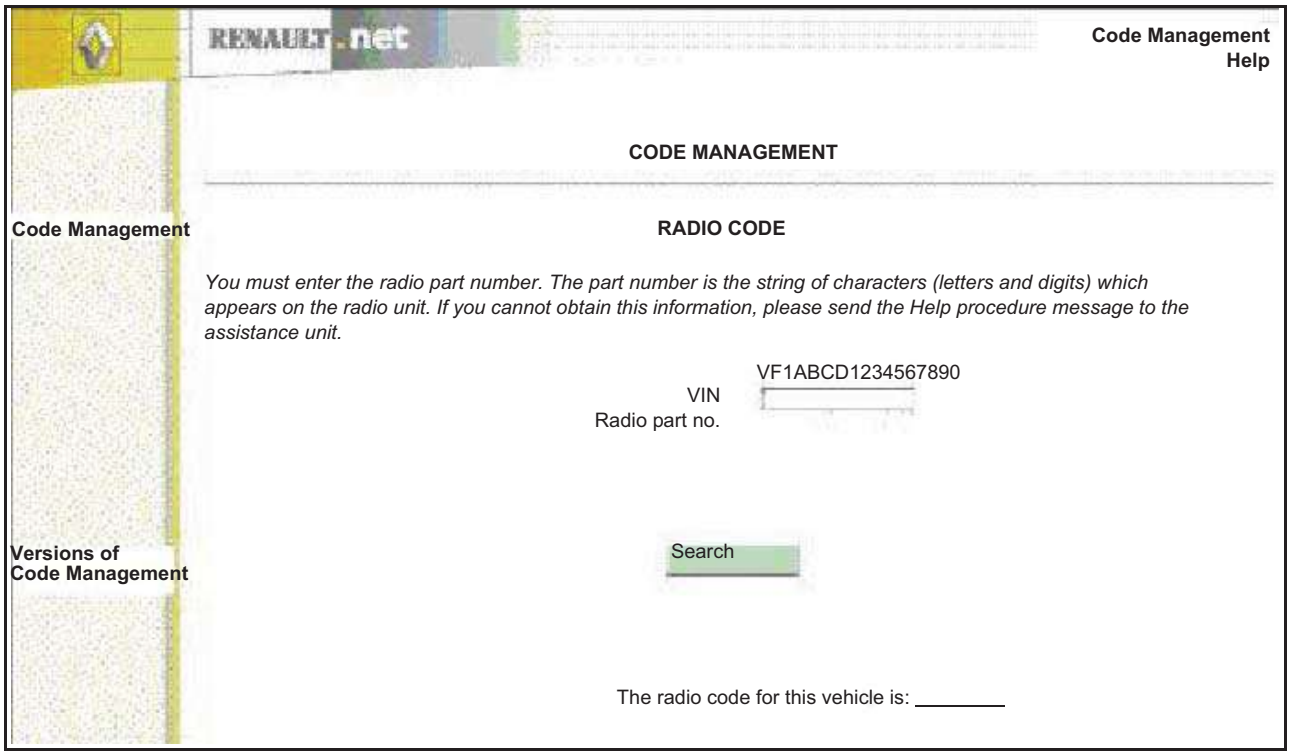
Example above: 8200178157T**N557**

2.2.3 The code supplied is not correct

If the code supplied from the first request with the vehicle VIN alone is not accepted by the radio, resend your request with the radio pre-code (paragraph 2.2.2).
– Re-enter the VIN of the vehicle
– Enter the radio pre-code
– Confirm with the "Search" button
– New radio code supplied

2.2.4 Old radios without pre-code:
To find a radio code using the radio part number (old minitel and voice server procedures), select:
"Find radio code using its part number (old server procedure)".





– Enter the radio part number in the "Radio part number" field

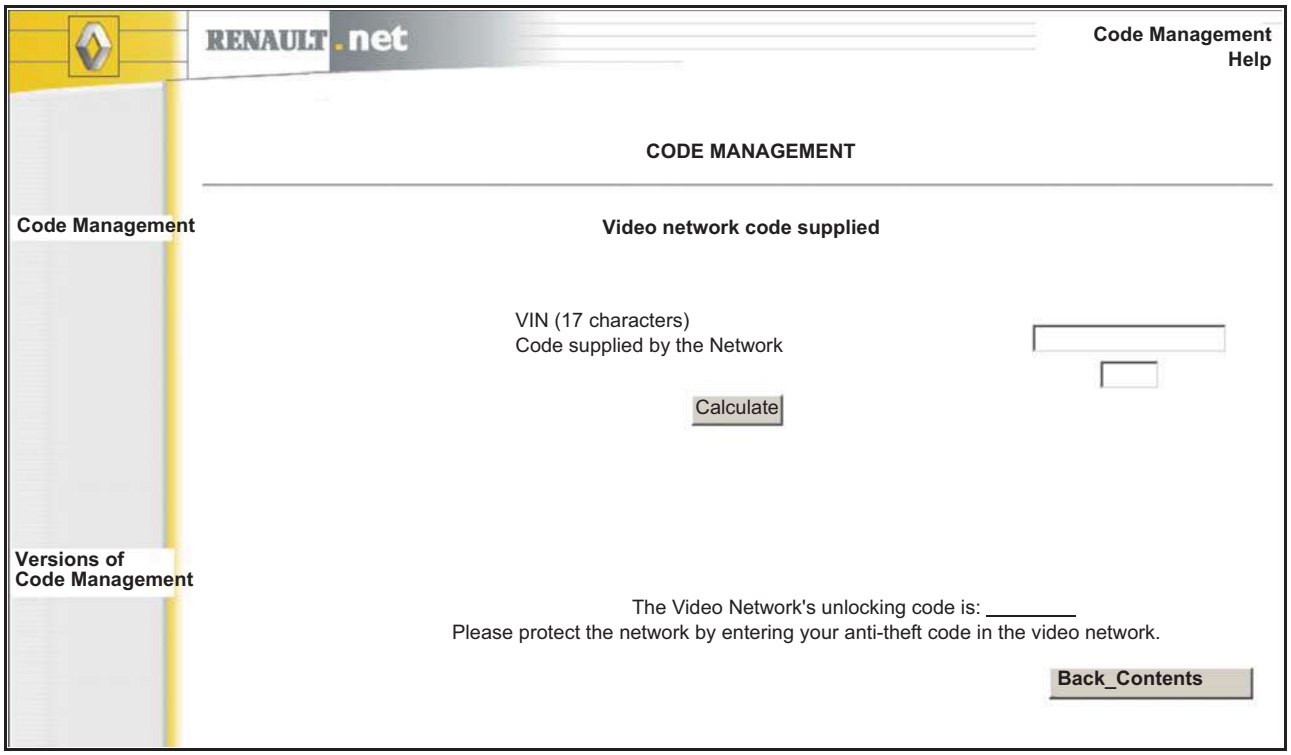
Example:

Radio part no.:
Philips = RN + 3 digits + 2 letters + 7 digits
Blaupunkt = BP + 4 digits + 1 letter + 7 digits
Pioneer = RN2006 + 1 letter + 7 digits or 1 letter + 7 digits (old models)
Alpine = AL + 9 digits
Becker = B or E + 7 digits

– Confirm with the "Search" button
– Radio code supplied

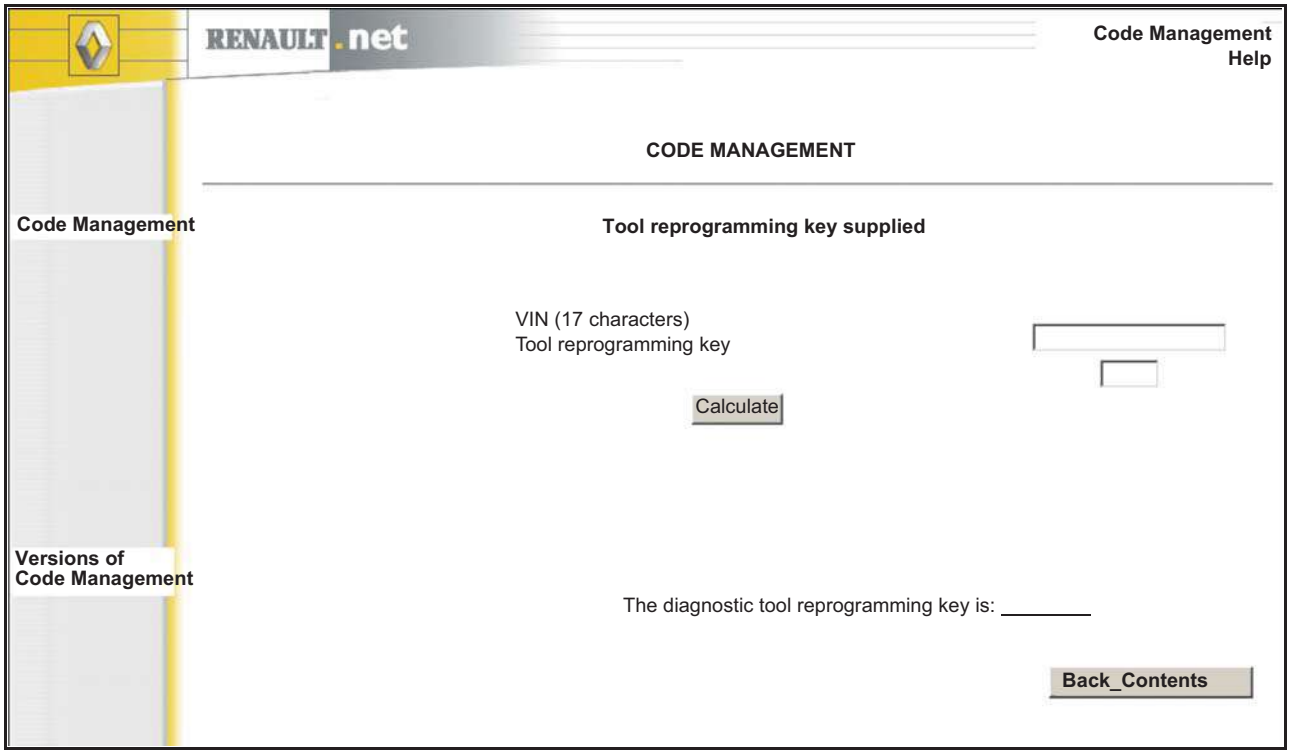
2.3 Video network code

– Enter the VIN of the vehicle
– Enter the four-digit code generated by the vehicle's video control
– Confirm with the "Calculate" button
– Four-digit code supplied by the code server



2.4 Tool reprogramming key:

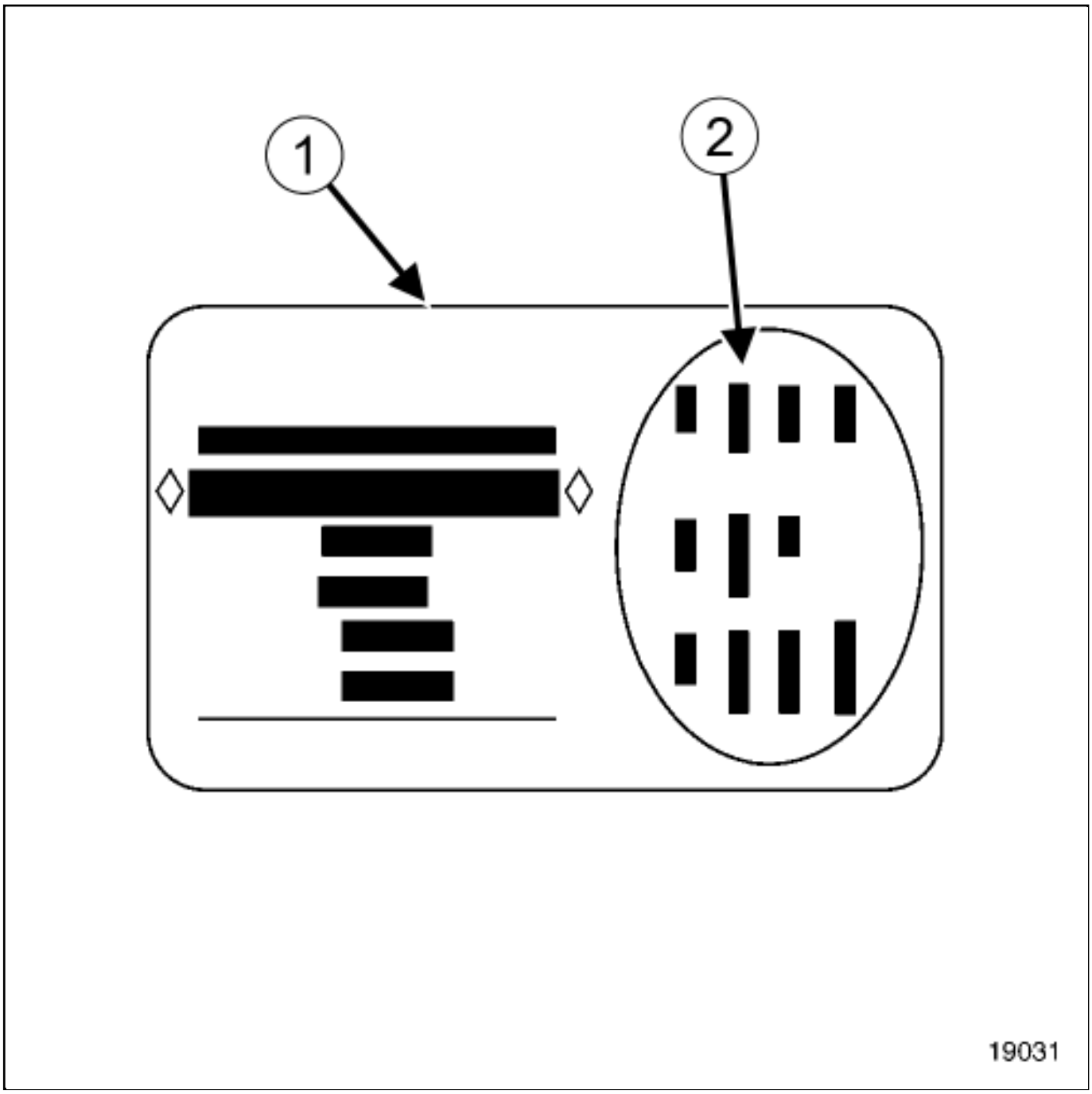
– Enter the VIN of the vehicle
– Enter the six-digit code generated by the diagnostic tool
– Confirm with the "Calculate" button
– Six-character (letters and digits) reprogramming key supplied, to be entered in the diagnostic tool.



COLOURCODE:IDENTIFICATION

1. EXAMPLE LOCATION OF THE VEHICLE IDENTIFICATION PLATE

2. EXAMPLE DETAIL OF THE VEHICLE IDENTIFICATION PLATE



(1) Vehicle identification plate

(2) Paintwork reference number

Note:

For all additional information concerning vehicle identification, see the MR of the vehicle concerned , (01C, Vehicle: Identification).

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COMPLETE REAR AXLE SYSTEM: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
component jack
pedal press
safety strap(s)

- Location and specifications (tightening torques, parts always to be replaced, etc.):
  - (see 33A, Rear axle components, Rear axle assembly: Exploded view) ,
  - (see 33A, Rear axle components, Rear drum brake assembly) ,
  - (see 33A, Rear axle components, Rear hub carrier assembly: Exploded view) .

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 33A, Rear axle components, Rear axle components: Precautions for the repair) ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

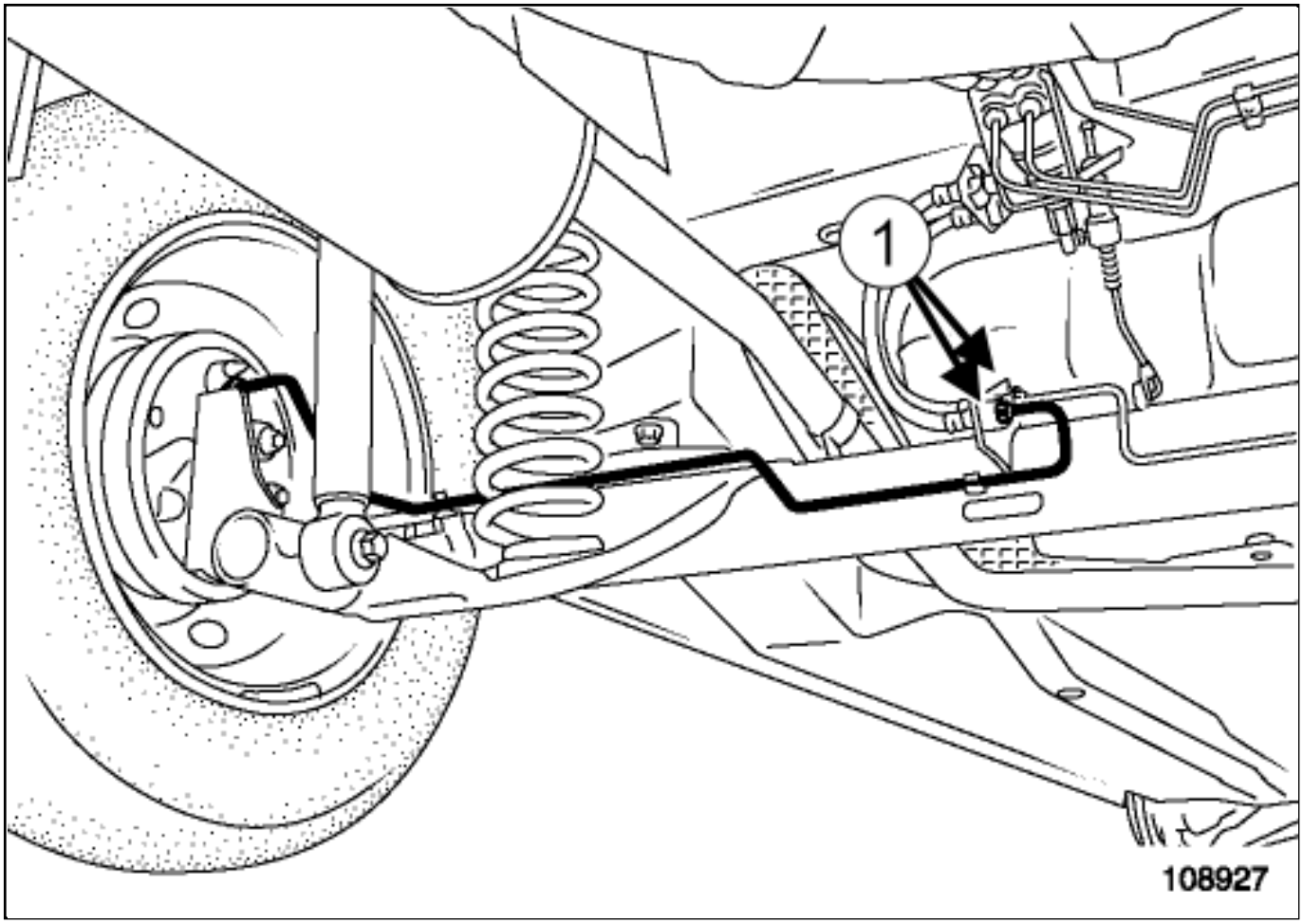
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Release the parking brake.
- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove:
  - the rear wheelsWheel: Removal - Refitting ,
  - the rear axle guard.

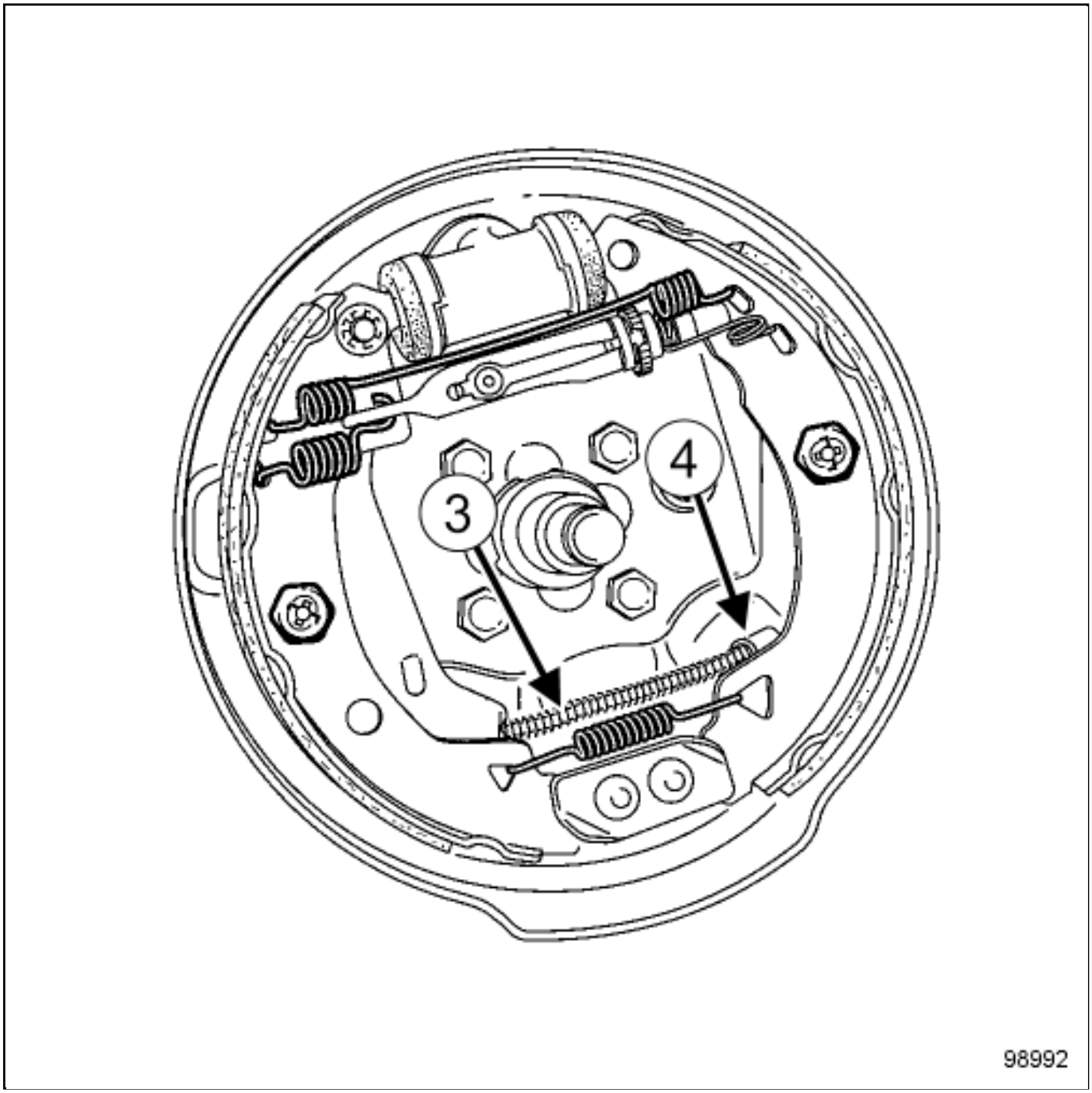
- Fit the pedal pressto the brake pedal to limit the outflow of brake fluid.

2. REMOVAL OPERATION



- Undo the rigid brake pipe unions on the rear brake hoses(1) .

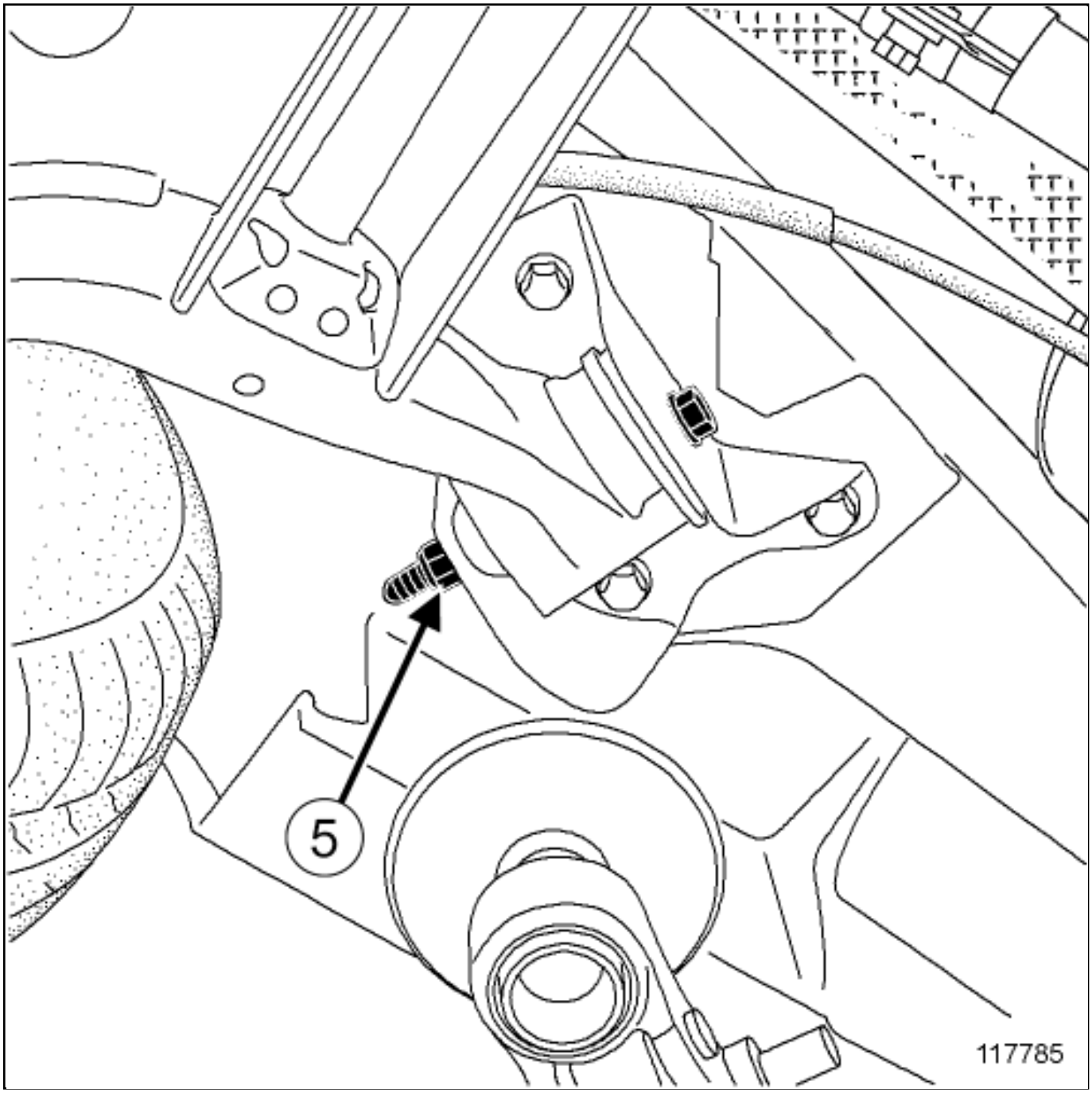
- Remove the rear brake drums(see 33A, Rear axle components, Rear drum brake assembly) .



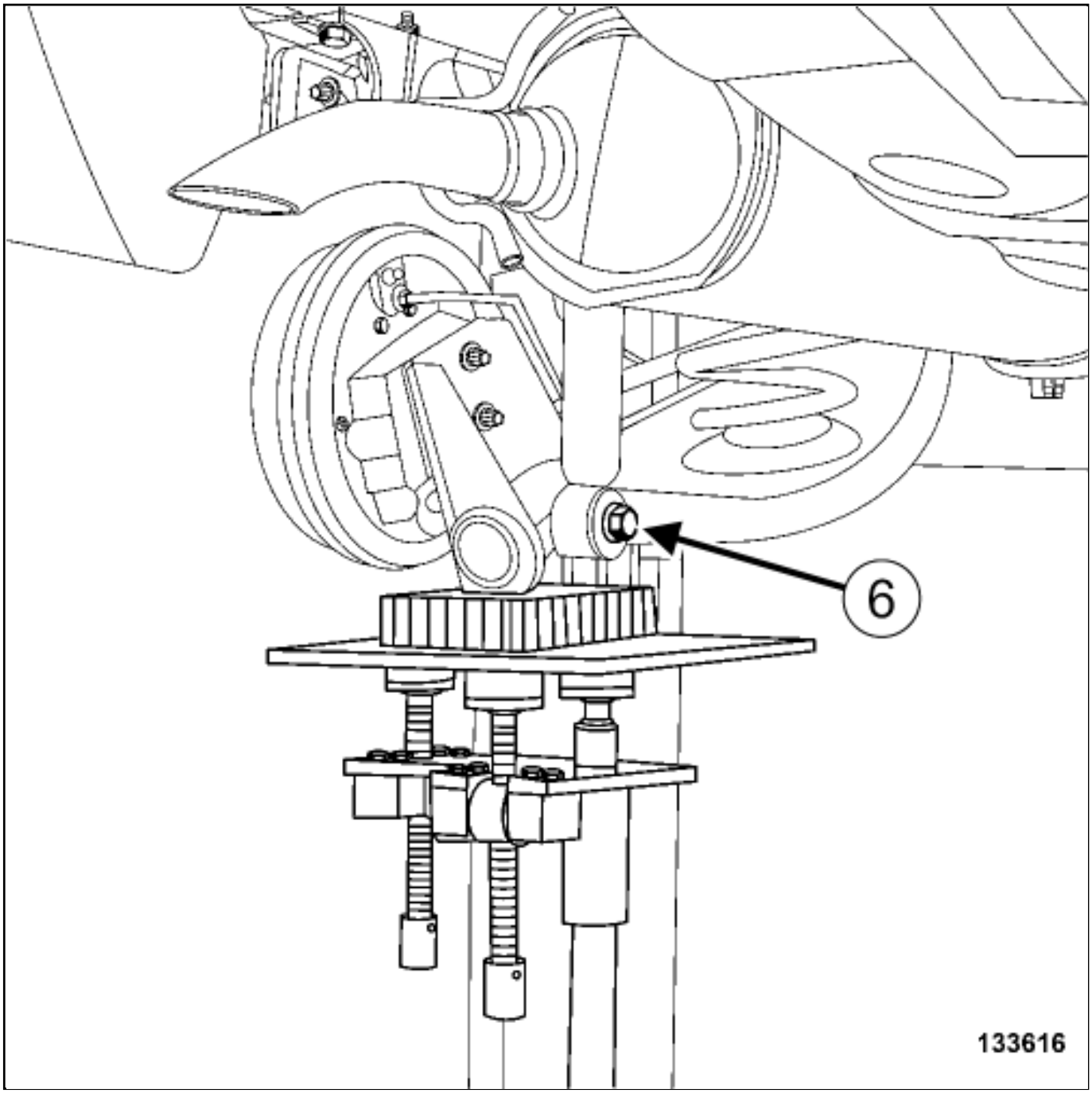
- Remove the parking brake cable(3) from the lever using pliers and a screwdriver.

- Unclip Parking brake assembly: Exploded view :
  - the parking brake cables(4) from the brake back-plates,
  - the parking brake cables from the rear axle.

- Unclip the wheel speed sensors from the rear axle(see 33A, Rear axle components, Rear hub carrier assembly: Exploded view) .

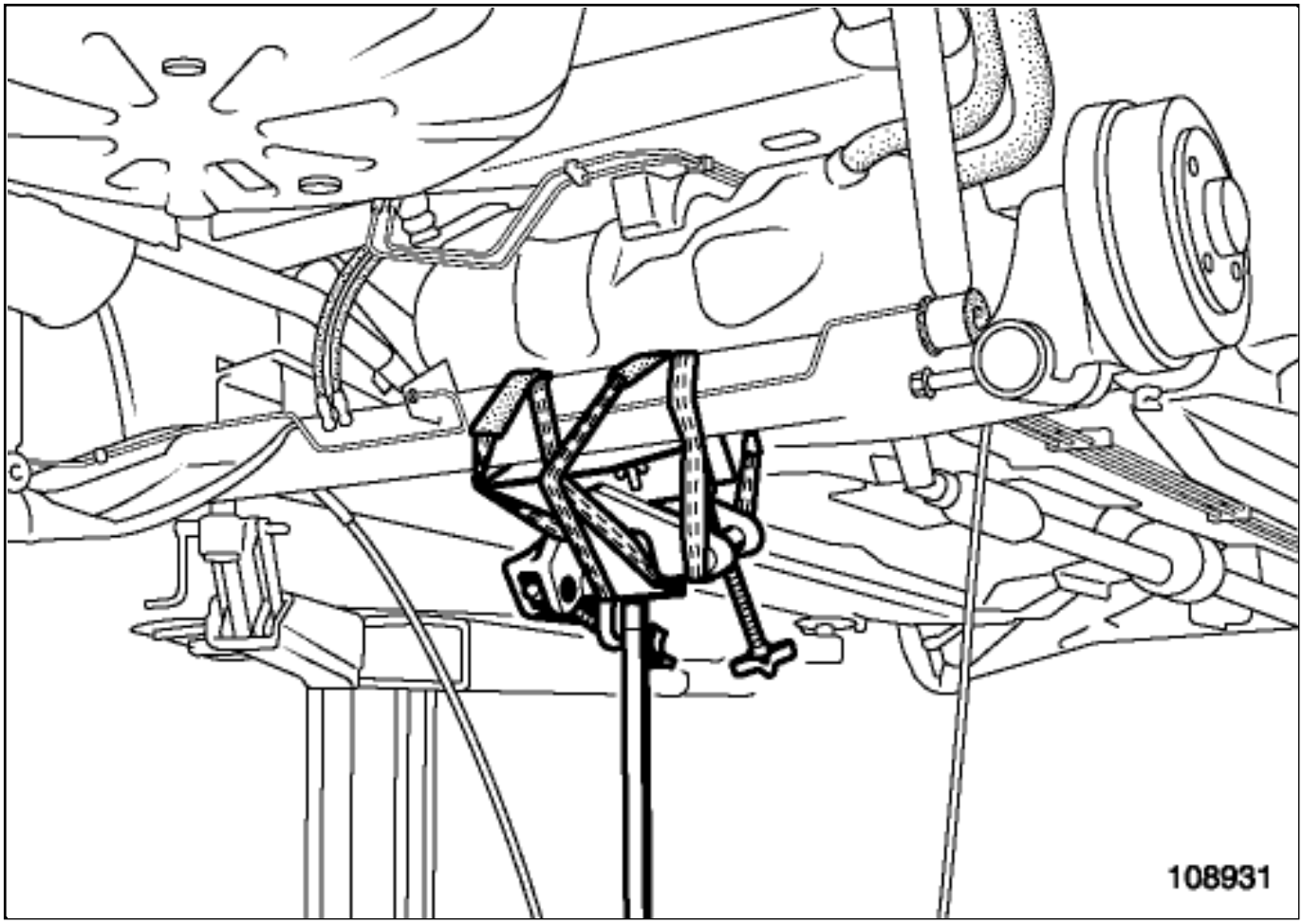


- Loosen the nut(5) of the rear axle rubber bearing on each side of the vehicle.



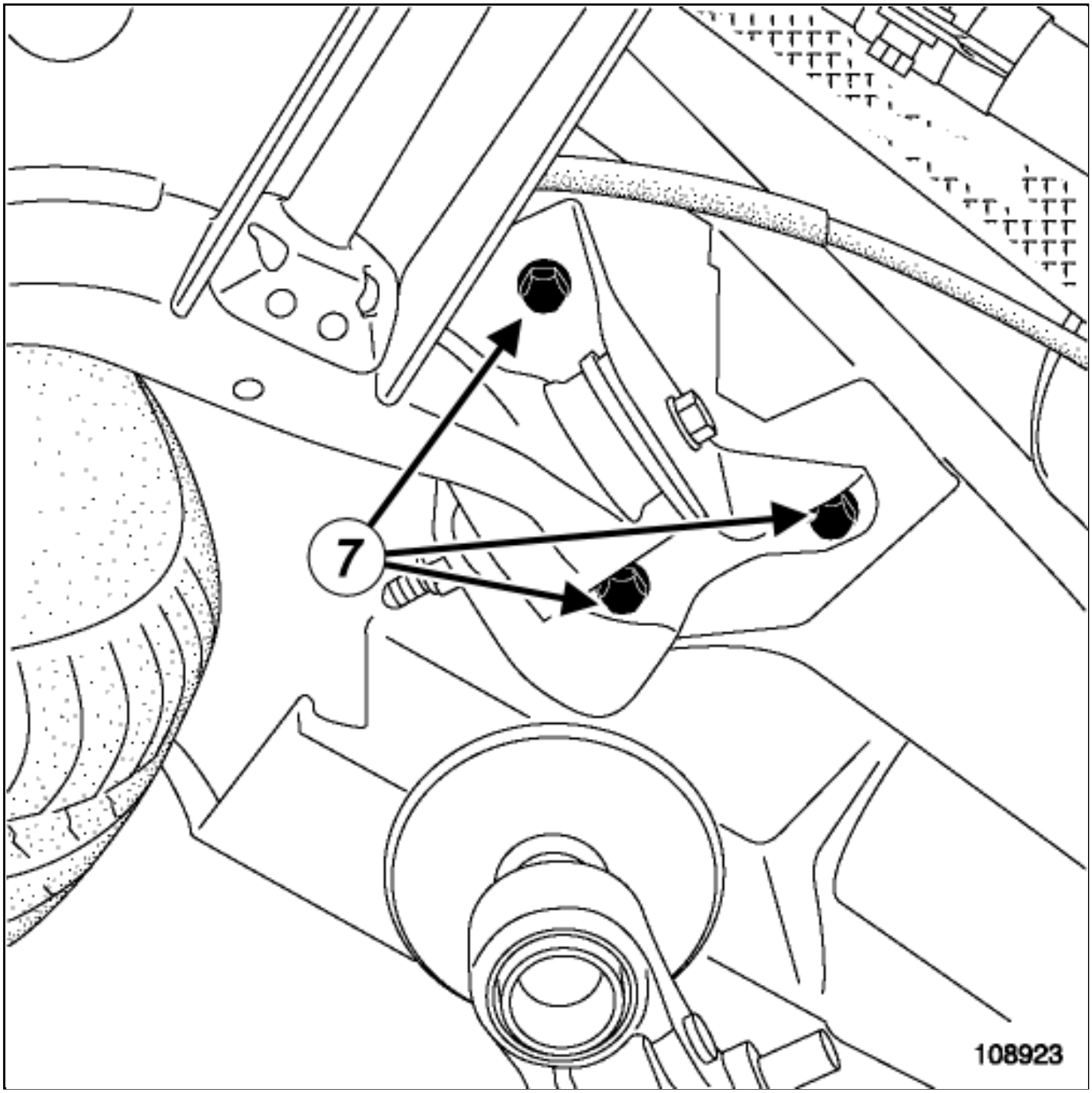
- Fit a component jack under the shock absorber spring cup.

- Remove:
  - the shock absorber lower bolt (6) (on each side of the vehicle),
  - the rear suspension springs (see 33A, Rear axle components, Rear axle assembly: Exploded view).



- Fit a component jack under the rear axle to support it during the removal operation.

- Attach the rear axle to the component jack using a safety strap(s).



Remove (see 33A, Rear axle components, Rear axle assembly: Exploded view) :

- the rear axle bearings bolts(7) from the body,
- the rear axle.

3. STRIPPING

Remove:

- the rear suspension springs supports(see 33A, Rear axle components, Rear axle assembly: Exploded view) ,

- the rigid brake pipes (see 33A, Rear axle components, Rigid brake pipe: Removal - Refitting),
- the rear stub axle carriers (see 33A, Rear axle components, Rear hub carrier assembly: Exploded view),
- the rear axle bearings (see 33A, Rear axle components, Rear axle assembly: Exploded view).

REFITTING

1. REBUILDING

Refit:

- the rear axle bearings without torque tightening the bolts (see 33A, Rear axle components, Rear axle assembly: Exploded view),
- the rear stub axle carriers (see 33A, Rear axle components, Rear hub carrier assembly: Exploded view),
- the rigid brake pipes (see 33A, Rear axle components, Rigid brake pipe: Removal - Refitting),
- the rear suspension springs supports (see 33A, Rear axle components, Rear axle assembly: Exploded view).

2. REFITTING OPERATION

Refit the rear axle on a component jack.

Attach the rear axle to the component jack using a safety strap(s).

Refit the rear axle onto the vehicle (see 33A, Rear axle components, Rear axle assembly: Exploded view).

Torque tighten the rear axle bearing bolts on body (see 33A, Rear axle components, Rear axle assembly: Exploded view).

Refit:

- the rear suspension springs (see 33A, Rear axle components, Rear axle assembly: Exploded view),
- the lower shock absorbers bolts,
- the parking brake cables Parking brake assembly: Exploded view,
- the rear brake drums (see 33A, Rear axle components, Rear drum brake assembly),
- the rigid brake pipe unions on the rear brake hoses Brake circuit: Tightening torque.

Refit the wheel speed sensors (see 33A, Rear axle components, Rear hub carrier assembly: Exploded view).

Refit the rear wheels Wheel: Removal - Refitting.

Position the vehicle on its wheels.

Torque tighten (see 33A, Rear axle components, Rear axle assembly: Exploded view):

- the shock absorbers lower bolts,
- the rear axle rubber bearings bolts.

3. FINAL OPERATION

Remove the pedal press.

Bleed the brake circuit **Braking circuit: Bleed** .

Check the geometry of the axle assemblies **Axle assemblies: Check** .

COMPRESSOR - CONDENSER CONNECTING PIPE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
refrigerant charging station

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair(see 62A, Air conditioning, Air conditioning: Precautions for the repair) .

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857to plug any openings exposed to the open air. They must be clean. Do not use any which have already been used to plug a fuel circuit.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).
- Remove the front bumperFront bumper assembly: Exploded view (55A, Exterior protection).
- Drain the refrigerant circuit using the refrigerant charging station.
- Remove the intercoolerIntercooler : Removal - Refitting .

2. REMOVAL OPERATION

- Remove (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :
  - the bolt from the retaining bracket of the "compressor - condenser" connecting pipe on the condenser,
  - the bolt from the retaining bracket of the "compressor - condenser" connecting pipe on the compressor.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

- Disconnect (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :
  - the "compressor - condenser" connecting pipe on the condenser,
  - the "compressor - condenser" connecting pipe from the compressor.

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

- Insert the blanking plugs.

- Remove the "compressor - condenser" connecting pipe(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

- Clean the seals of the refrigerant circuit pipes (see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Consult the refrigerant and oil quantity values before filling the circuit (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

- Perform the following operations:
  - fill the refrigerant circuit using the refrigerant charging station,
  - check for leaks .

- Check that the air conditioning system is operating correctly (see 62A, Air conditioning, Air conditioning: Check) .

COMPRESSOR - INTERMEDIATE PIPE CONNECTING PIPE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
refrigerant charging station

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 62A, Air conditioning, Air conditioning: Precautions for the repair)** .

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857to plug any openings exposed to the open air. They must be clean. Do not use any which have already been used to plug a fuel circuit.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).

- Remove the front bumper Front bumper assembly: Exploded view (55A, Exterior protection).
- Drain the refrigerant circuit using the refrigerant charging station.
- Remove the intercooler Intercooler : Removal - Refitting .

2. REMOVAL OPERATION

- Remove (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :
  - the bolt from the retaining bracket of the "compressor - intermediate pipe" connecting pipe on the compressor,
  - the bolt from the retaining bracket of the "compressor - intermediate pipe" connecting pipe on the "expansion valve - intermediate pipe" connecting pipe at the expansion valve outlet.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

- Disconnect (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :
  - the "compressor - intermediate pipe" connecting pipe on the compressor,
  - the "compressor - intermediate pipe" connecting pipe on the "expansion valve - intermediate pipe" connecting pipe at the expansion valve outlet.
- Insert the blanking plugs.
- Remove the "compressor - intermediate pipe" connecting pipe (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition.
The seal and the surface must be clean and scratch free.

❑ Clean the seals of the refrigerant circuit pipes(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

2. REFITTING OPERATION

❑ Proceed in the reverse order to removal.

❑ Consult the refrigerant and oil quantity values before filling the circuit(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

❑ Perform the following operations:

- fill the refrigerant circuit using the refrigerant charging station,
- check for leaks .

❑ Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

XSL version : 3.02 du 22/07/11

COMPRESSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
refrigerant charging station

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair(see 62A, Air conditioning, Air conditioning: Precautions for the repair) .

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857to plug any openings exposed to the open air. They must be clean. Do not use any which have already been used to plug a fuel circuit.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).
- Disconnect the batteryBattery: Removal - Refitting (80A, Battery).
- Remove the front bumperFront bumper assembly: Exploded view (55A, Exterior protection).
- Drain the refrigerant circuit using the refrigerant charging station(see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .

- Remove the intercooler Intercooler : Removal - Refitting .

- Remove :
  - the front right-hand wheel Wheel: Removal - Refitting (35A, Wheels and tyres),
  - the front right-hand wheel arch liner Exterior body front trim assembly: Exploded view (55A, Exterior protection),
  - the accessories belt Accessories belt: Removal - Refitting (11A, Top and front of engine),
  - the bolts from the connecting pipe brackets on the compressor (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

- Uncouple the connecting pipes from the compressor.

- Move aside the compressor connecting pipes.

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

- Fit blanking plugs on the openings of the connecting pipes and the compressor.

2. REMOVAL OPERATION

- Disconnect the compressor connector.

- Remove the compressor Engine accessories assembly: Exploded view .

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

- Clean the seals of the refrigerant circuit pipes(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Consult the refrigerant and oil quantity values before filling the circuit(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

- Perform the following operations:
  - fill the refrigerant circuit using the refrigerant charging station(see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
  - check for leaks(see 62A, Air conditioning, Refrigerant circuit: Check) .

- Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

RENAULT

Technical Note 3585A

ALL TYPES

Subsection concerned: 01B

COMPUTER REPROGRAMMING AND CALIBRATION PROCEDURE

This Technical Note relates to onboard computer Reprogramming and Calibration operations using a RENAULT.NET connection or a Reprogramming CD (Part No.: 77 11 298 859).

77 11 338 820 **Edition 4 - OCTOBER 2007** **EDITION ANGLAISE**

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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V4

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GENERAL INFORMATION

Two types of operation can be carried out in after-sales, either *programming or reprogramming* of the computer. These operations apply to all vehicles and all types of (re)programmable computer (e.g: Injection, Gearbox, Air conditioning, Instrument panel, Parking brake, UCH).

The two types of operation are carried out with the RENAULT CLIP diagnostic tool using either RENAULT.NET, or the Calibration - Reprogramming CD Part No. 77 11 298 859.

The reprogramming data available via RENAULT.NET is always more up to date than that available on the CD (Part no. 77 11 298 859).

The CD is edited and distributed every month in the same way as the diagnostic tools update.
Each CD cancels and replaces the previous one.

Tooling required:
- CLIP with the most recent update.
- 1 connection to RENAULT.NET (requires a CLIP with a RF kit and a RENAULT.NET certificate)
  or
  1 reprogramming CD, Part No. 77 11 298 859 from the current month.
- 1 RENAULT approved battery charger.
- The FAULT FINDING REPAIR MANUAL relevant to the vehicle and the system to be (re)programmed.
- 1 RENAULT.NET connection to the NRE reprogramming codes server for each calibration - reprogramming with a reprogramming CD (See **CODE SERVER PROCEDURE**).

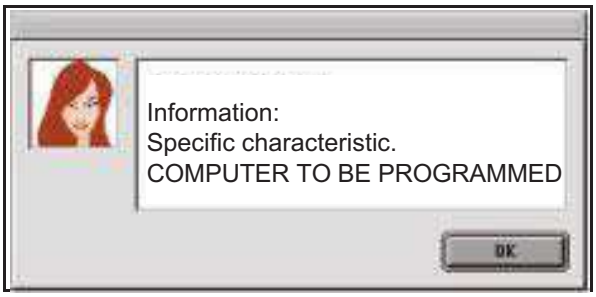
Computer
The operation consists of downloading the calibration using the RENAULT CLIP **diagnostic tool**.

It affects computers supplied as *non operational* (also known as blank) by the Parts Department for all vehicles in the RENAULT range, but only for certain types of computer.

The types of computers which are delivered blank and to be calibrated are, to date, engine management (Petrol, Diesel and GPL injection), automatic and sequential gearboxes and ABS/ESP computers.

When To Program:

The operation is carried out as part of a computer replacement operation.
The *non operational* status of the computer, as delivered by the Parts Department, is specified in DIALOGYS by the message:



Reprogramming
The operation consists of exchanging the software and/or calibration for the most recent version using the RENAULT CLIP diagnostic tool.

This relates to computers already fitted to the vehicle as well as computers supplied as *operational* (also called "full". E.g: Air conditioning) by the Parts Department, for the entire RENAULT range.

It enables systematic replacement of the computer to be avoided.

After having entered the VIN in the main menu, the types of (re)programmable computer are displayed in the RENAULT CLIP diagnostic tool REPROGRAMMING menu.

When To Reprogram:

The operation is carried out within the framework of:

- an OTS or a Technical Note arising from a fault resulting from an After-Sales problem, or a functional improvement.
- RENAULT Technical Directives or following a request from the Techline.

OPERATING PROCEDURE (Programming and reprogramming a computer)

The operating procedure for Calibration and Reprogramming operations is strictly identical.

The operation is carried out using the RENAULT CLIP diagnostic tool, either connected to RENAULT.NETor with the reprogramming CD.

WARNING
To prevent any computer malfunctioning or locking, the following operations **must be carried out** before (re)programming.

Preparing the RENAULT CLIP diagnostic tool
- Always use the latest available version of the CLIP update.
- Always use the RENAULT.NET connection if available, in preference to the CD.

The reprogramming data available via RENAULT.NET is always more up to date than that available on the CD.

- Whenever the CD mode is being used for calibration - reprogramming, always use the latest available version of the CD.

- **Connect CLIP to the mains.**

- Set the Windows screen saver time for the RENAULT CLIP diagnostic tool to NONE or 60 minutes minimum.

  Setting the RENAULT CLIP diagnostic tool Windows monitor screen locking delay:
  In the RENAULT CLIP diagnostic tool Windows system:
  - Right click on the mouse and select **Properties**.
  - In the new **Display Properties window**, select the **Screen Saver tab**.
    Then set the screen saver to **(None)** or set the **Wait** time delay to a minimum of 60 minutes.
  - Confirm and close the display windows.

Preparing the vehicle

- **Connect an approved battery charger** to the vehicle.

- Switch off all the vehicle's electrical consumers (Lights, Interior lighting, Air conditioning, CD Radio, etc).

- Switch on the ignition (+ forced + after ignition, See Procedure).

Programming - reprogramming phase

- **Enter the exact VIN of the vehicle** in the RENAULT CLIP **diagnostic tool** main menu.

WARNING
Using a VIN which is not allocated to the vehicle risks compromising the correct running of the programming - reprogramming operation, as well as the conformity of the vehicle

Apply the correct pre-reprogramming Procedure for the vehicle and for the system to be reprogrammed.
- For example, in the case of a diesel injection: Backup the computer data if the command is available.
- For example, in the case of an Automatic Transmission: Put the gear lever in the P position.

- Find the Parts Department reference number for the computer to be reprogrammed (see **CONSULTING THE COMPUTER IDENTIFICATION FRAME**), which is necessary in the event of an **EMERGENCY PROCEDURE**.

- During any calibration and reprogramming:

WARNING
DO NOT WORK ON THE VEHICLE OR OPERATE THE DIAGNOSTIC TOOL.

In the CD mode only, enter a reprogramming code: see **CODE SERVER PROCEDURE**.

- At the end of calibration and reprogramming, observe the following instructions:
- Proceed to the WARRANTY SCREEN by pressing the NEXT button.

Apply the pre-reprogramming procedure to the vehicle and to the system to be reprogrammed.
- For example, in the case of a diesel injection: Write the saved computer data if the command is available.
- **Enter the VIN** into the computer.

Always deal with faults in all computers (when a computer is being reprogrammed, it cannot transmit data to the multiplex network. As a result, faults will be generated in other computers connected to the multiplex network).

Note the CODECAL and the SUPPLIER CODE and transfer them to the Repair Order.
If the CODECAL and the SUPPLIER CODE are lost, they can be recovered: see **CONSULTING THE TOOL LOG**.

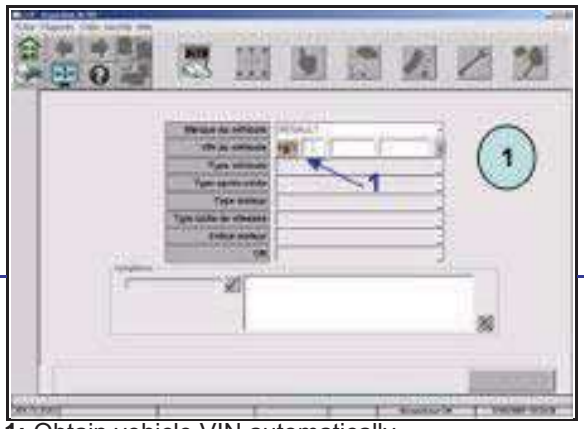
Returning the vehicle
- Test all the computers and **deal with any faults present**.

- Check that all the vehicle's current systems are correctly configured.

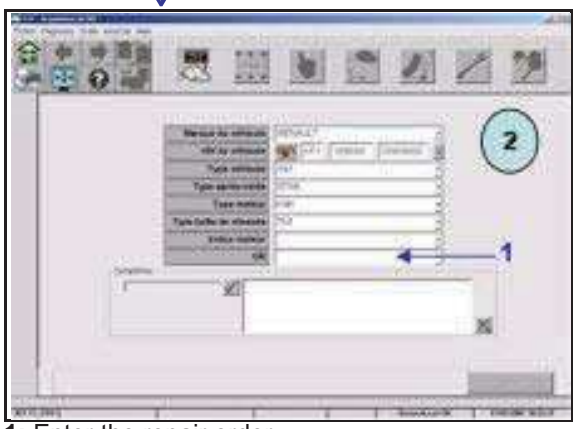
CLIP screens depending on programming – reprogramming step

Screen	Step		Commentary
02 **12**	CLIP home		CLIP determines, via the VIN, the Technical Specification of the vehicle. **Warning:** To ensure that reprogramming is carried out effectively, enter the correct VIN for the vehicle (17 characters).
02 **12**	Reprog home		Select REPROGRAMMING and the system to (re)program.
15	Choice of computer		
16	Connecting		CLIP identifies the computer concerned and recovers the technical data necessary for the (re)programming operation.
17	Entering and confirming repair order/ Entering Vehicle Technical Specification		Enter the After-Sales information necessary for the warranty. **Note:** Enter the repair order if it has not been written in the main menu. The "*Vehicle Technical Specification*" field is to be filled in at the request of Techline or if required in a reprogramming Technical Note.
18	Pre-reprogramming Message		Description of the environment to be set up before any reprogramming. **Warning:** Follow the instructions which can differ from one computer and vehicle to the next.
19	Checking battery voltage		CLIP automatically checks the voltage level necessary for the correct running of the re-programming operation.
20	Select the reprogramming mode		Choose the technical resource: either RENAULT.NET or CD.
21	Finding the file(s)	**RENAULT.NET**	CLIP finds the technical data to download to the computer. In RENAULT.NET mode, a password is needed for authentication.
22		**CD**	
23	File selection		Confirm the operation by selecting the *Software reference* to be downloaded.
24	Enter the reprogramming code in CD mode. See **CODES SERVER PROCEDURE**		**In CD mode only:** • CLIP provides a *reprogramming code*. • Provide the code management server with the *reprogramming code* and the VIN. • The server issues an "*After-Sales reprogramming code*". • Enter this code in CLIP.
25	File downloading		CLIP downloads the technical data to the computer.
26	Post-reprogramming Message		Description of the actions to carry out to finish the reprogramming operation and return the conforming vehicle. **Warning:** Follow the instructions which can differ from one computer and vehicle to the next.
27	Warranty screen		CLIP provides the warranty screen describing the operation performed and the CODECAL necessary for the Warranty procedure.

Order of the screens

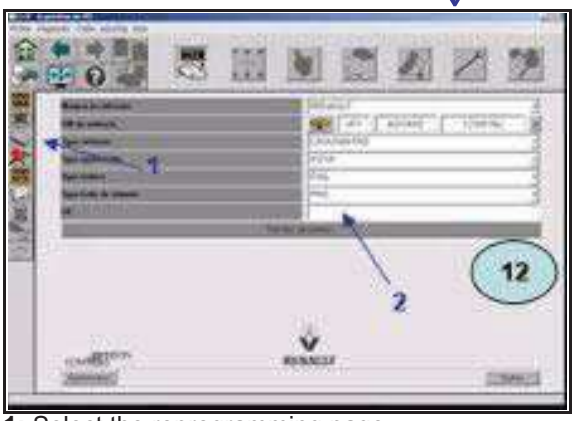


1: Obtain vehicle VIN automatically.



1: Enter the repair order.

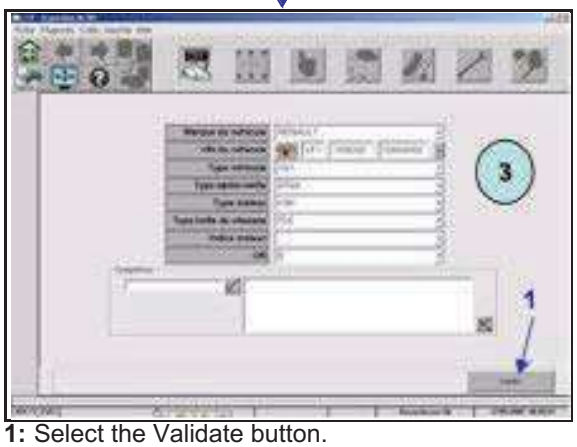
See New Interface



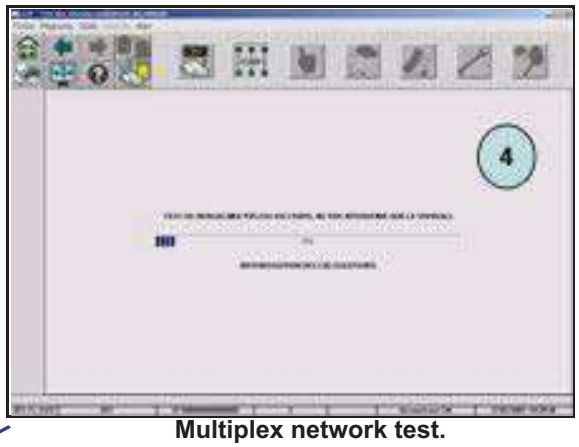
1: Select the reprogramming page.
2: Enter the repair order.

See Interface 2

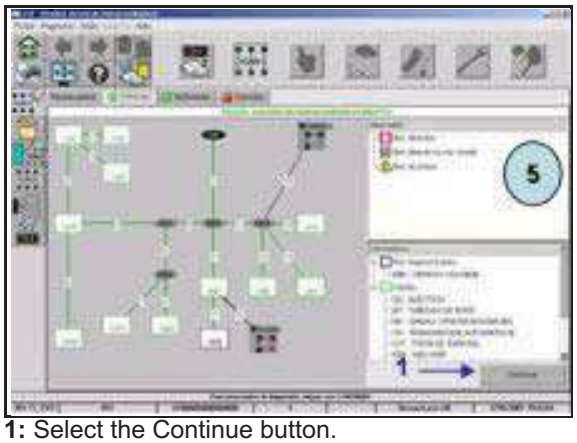
New Interface (2)



1: Select the Validate button.

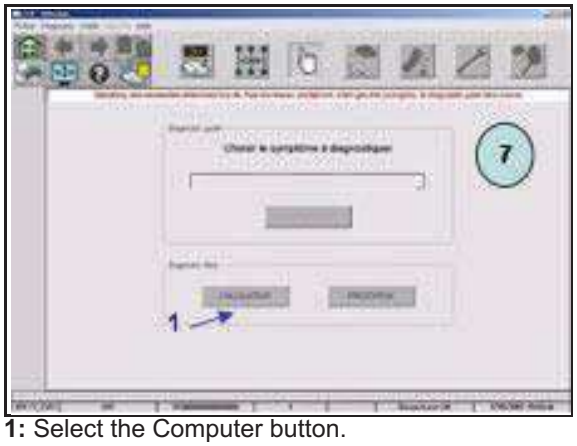


Multiplex network test.

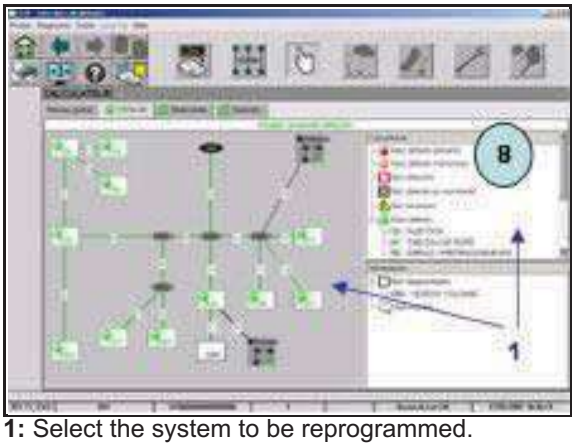


1: Select the Continue button.

Analyse data and Read faults.



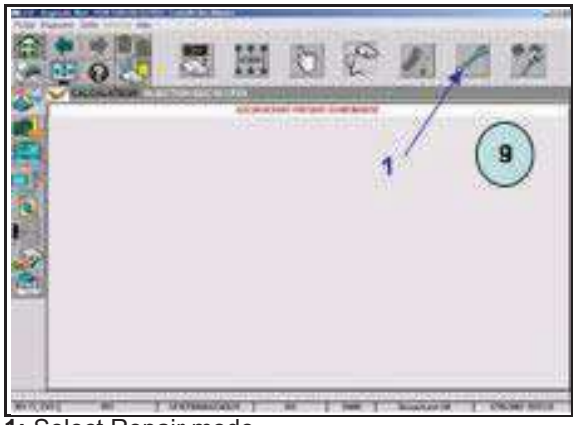
1: Select the Computer button.



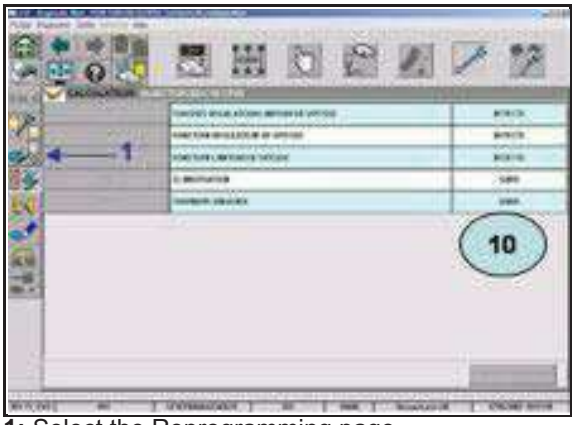
1: Select the system to be reprogrammed.

(9)

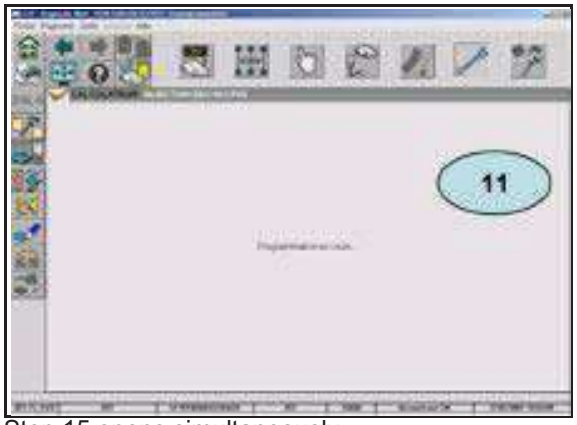
8



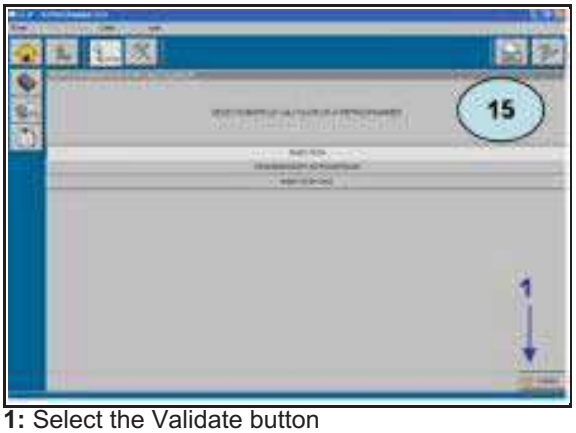
1: Select Repair mode.



1: Select the Reprogramming page.



Step 15 opens simultaneously.



1: Select the Validate button

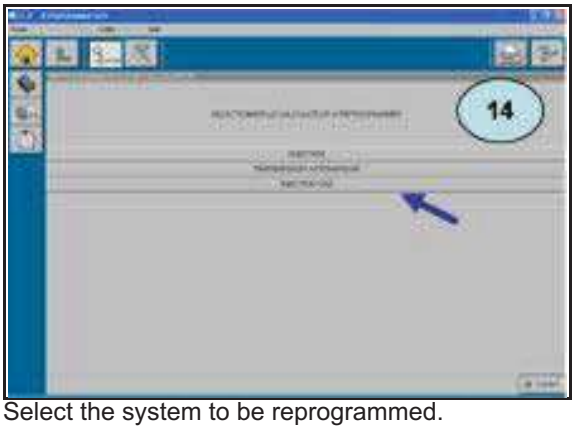
16

See reprogramming interface

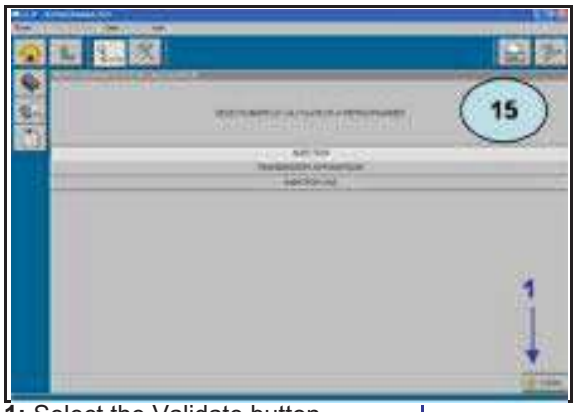
Interface 2

12

1: Select the Reprogramming button.



Select the system to be reprogrammed.



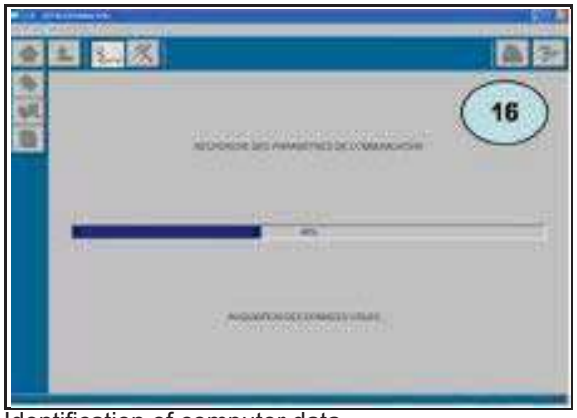
1: Select the Validate button.

16

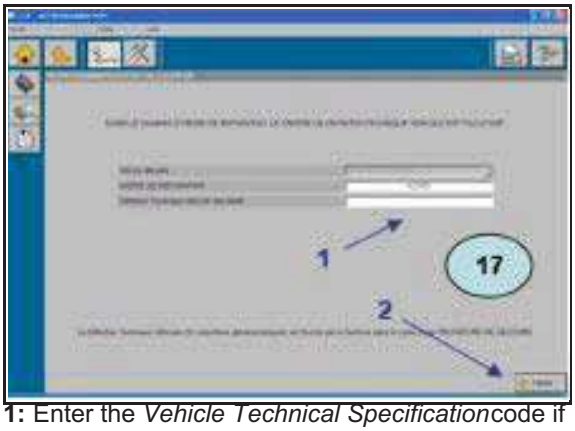
See reprogramming interface

Interface Reprogramming

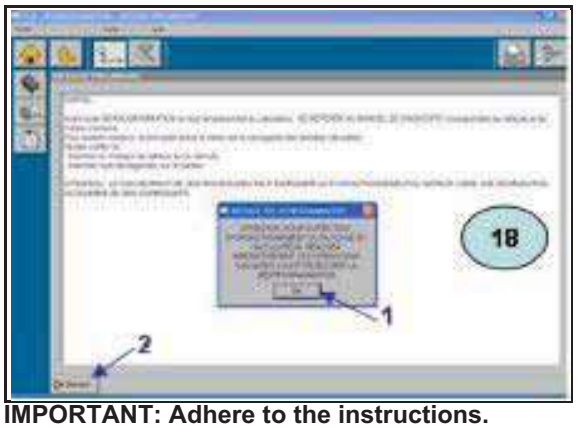
15



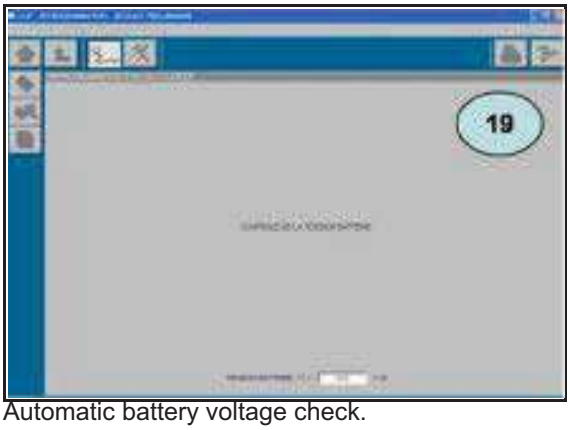
Identification of computer data.



1: Enter the *Vehicle Technical Specification* code if requested.
2: Select the Validate button.



IMPORTANT: Adhere to the instructions.
1: Select the OK button.
2: Select the next button.



Automatic battery voltage check.

Select the reprogramming mode.

RENAULT.NET

Enter the Renault.Net password.

CD-ROM

22

RENAULT.NET

23

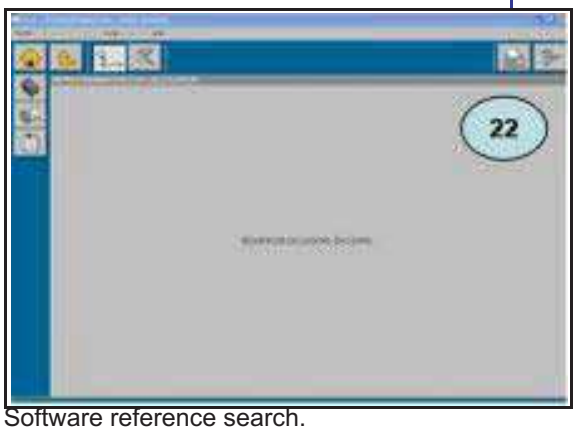
20

CD-ROM

CD-ROM

21

RENAULT.NET

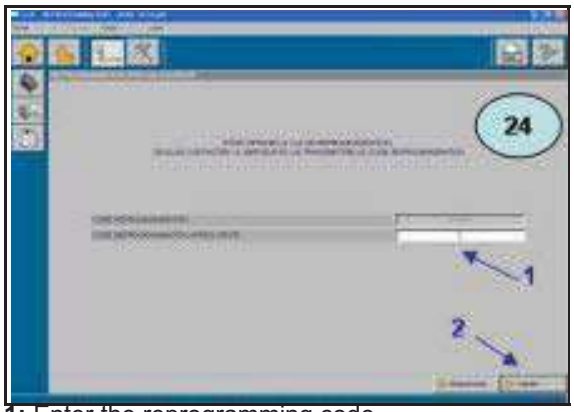


Software reference search.

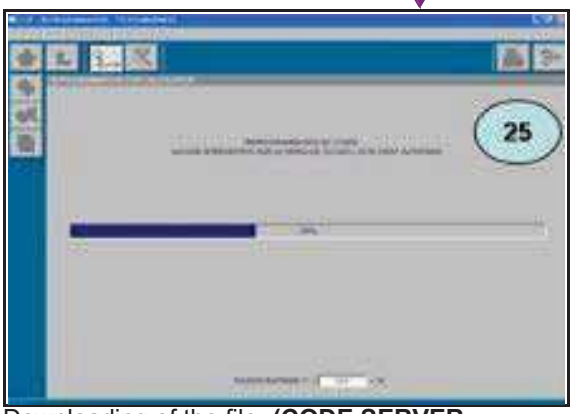
1: Select the software reference.
2: Select the Validate button.

CD-ROM

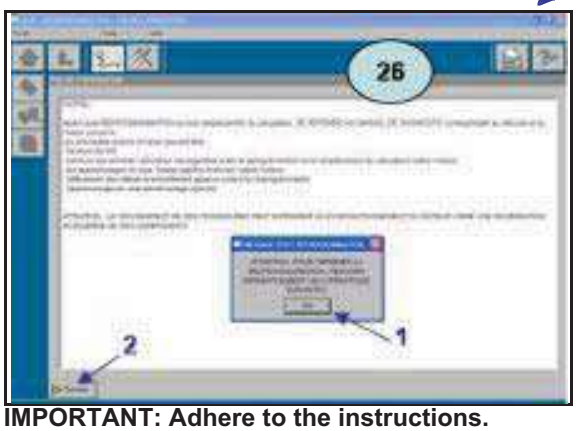
RENAULT.NET



1: Enter the reprogramming code.



Downloading of the file. **(CODE SERVER PROCEDURE)**
2: Select the Validate button



IMPORTANT: Adhere to the instructions.
1: Select the OK button.
2: Select the next button.

END. Return to the welcome screen.

CLIP SCREEN ERROR MESSAGES AND PROCEDURE TO FOLLOW

SCREE	CLIP ERROR MESSAGE	ORIGIN	PROCEDURE TO FOLLOW
01	**THE VEHICLE CANNOT BE IDENTIFIED WITH THIS VIN…**	After the VIN has been entered into the main menu	• Re-enter the VIN. *Note:* the VIN does not contain: – the letter O as it can be confused with the number 0. – the letter I as it can be confused with the number 1.
01	**The AUTOMATIC IDENTIFICATION HAS FAILED…**	After the VIN automatic search button has been pressed	• Check the sensor/PC and vehicle/sensor connections. *Note:* Ensure that the 4 green and red sensor LEDs are illuminated. • If the fault is still present, contact the CLIP After-Sales service.
15	**CLIP INTEGRITY PROBLEM…**	After the reprogramming button has been pressed	• Reinstall CLIP with the latest available version. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
15	**THIS VEHICLE HAS NO REPROGRAMMABLE COMPUTERS**	After the reprogramming button has been pressed	• CLIP integrity error: Reinstall CLIP with the latest available version. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
16	**CANNOT COMMUNICATE WITH THE COMPUTER…**	Following selection of the computer to reprogram	• Check the connections. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
16	**OPERATION INTERRUPTED: CANNOT ACQUIRE NECESSARY DATA…**	Following selection of the computer to reprogram	• Restart operation. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
16	**IMPORTANT: THE VIN READ IN THE COMPUTER TO BE REPROGRAMMED DOES NOT CORRESPOND…**	Following selection of the computer to reprogram	• As a default, use the VIN of the computer (not that from the main menu).
17	**THE REPAIR ORDER NUMBER MUST NOT EXCEED 6 CHARACTERS**	After a repair order number has been entered	• Check that the order number entered is correct (6 alphanumerical characters).
17	**THE TECHNICAL SPECIFICATION CRITERION MUST BE COMPOSED OF 10 CHARACTERS**	After the Vehicle Technical Specification has been entered at the request of Techline or as described in a Technical Note.	• Check that the Vehicle Technical Specification contains 10 alphanumerical characters. E.g: 0000CR347B • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
19	**BATTERY VOLTAGE TOO LOW or TOO HIGH**	At any point in the reprogramming procedure	• Connect an approved battery charger to the vehicle.
20	**TO CARRY OUT REPROGRAMMING VIA RENAULT.NET …**	After the battery voltage has been checked	• Check that the wireless connection device is working. • If the fault is still present, contact the CLIP After-Sales service, • or use the latest version of the reprogramming CD.

SCREE	CLIP ERROR MESSAGE	ORIGIN	PROCEDURE TO FOLLOW
20	**NO CD-ROM IN THE READER…**	When the reprogramming mode is being selected	• Insert the latest available version of the reprogramming CD. • If the fault is still present, contact the CLIP After-Sales service.
20	**THE REPROGRAMMING CD-ROM IN USE IS TOO OLD…**	When the reprogramming mode is being selected	• Insert the latest available version of the reprogramming CD. • If the fault is still present, contact the CLIP After-Sales service.
20	**THE CD-ROM TO INSERT IS THE REPROGRAMMING CD-ROM**	When the reprogramming mode is being selected	• Check that the CD being used is a reprogramming CD. • If the fault is still present, contact Techline or the CLIP After-Sales Service.
20	**THE CD-ROM READER IS NOT FUNCTIONING CORRECTLY…**	When the reprogramming mode is being selected	• Follow the on-screen instructions. • If the fault is still present, contact the CLIP After-Sales service.
	After-Sales Service ERROR 650 **After-Sales Service ERROR 651**	After having selected the Renault. Net mode	• CLIP integrity error in RENAULT.NET mode. • Restart the reprogramming procedure. • If the fault is still present, contact your IT representative or the CLIP After-Sales Service.
	After-Sales Service ERROR 652 **After-Sales Service ERROR 653** **After-Sales Service ERROR 654** **After-Sales Service ERROR 655** **After-Sales Service ERROR 656**	After selecting the reprogramming method	• CLIP integrity error (in RENAULT.NET mode) or reprogramming CD error (in CD mode). • In mode RENAULT.NET mode, reinstall CLIP • In CD mode, restart with another reprogramming CD (previous version if necessary). • If the fault is still present, contact the After-Sales Service or carry out the **EMERGENCY PROCEDURE**.
21	**TRANSMISSION PROBLEM…**	During authentication on Renault. Net	• Check the Renault.Net connection. • If the fault is still present, contact your IT representative or the CLIP After-Sales Service.
21	**TRANSMISSION PROBLEM…**	Whilst searching Renault. Net for the file to download	• Restart the reprogramming procedure. • If the fault is still present, contact your IT representative or the CLIP After-Sales Service.
22	**DEFECTIVE DATABASE, …**	Whilst finding the file to download	• Check faults linked to the CD (operation, presence or version of the CD). • Try with another CD (same or previous version). • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
22	**VEHICLE TECHNICAL SPECIFICATION NOT RECOGNISED IN RENAULT DATABASE…**	Whilst finding the file to download	• Enter the Vehicle Technical Specification, checking it is correct (10 alphanumerical characters). E.g: 0000CD347B • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
22	**ERROR 10X: … (X = 1 to 9), EMERGENCY PROCEDURE**	Whilst finding a file	• Carry out the **EMERGENCY PROCEDURE**.

SCREE	CLIP ERROR MESSAGE	ORIGIN	PROCEDURE TO FOLLOW
22	**COMPUTER ALREADY REPROGRAMMED, CANNOT PERFORM OPERATION…**	Whilst finding a file	• RENAULT.NET mode: the computer does not need to be reprogrammed. • CD mode: Restart the operation using the latest available version of the CD. If the message remains, the computer does not need to be reprogrammed.
22	**VIN NOT RECOGNISED IN RENAULT DATABASE…**	Whilst finding a file	• Restart the reprogramming procedure, checking that the VIN corresponds to that of the vehicle. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**. • *Note:* In CD mode, it is possible that CLIP will not recognise the VIN if the vehicle has been recently manufactured.
24	**THE AFTER-SALES REPROGRAMMING KEY ENTERED IS INCORRECT**	After the After-Sales reprogramming code has been entered	• Re-enter the reprogramming code. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
25	**CANNOT COMMUNICATE WITH THE COMPUTER…**	Whilst downloading a file	• Follow the on-screen instructions.
25	**COMPUTER FAULT: CANNOT UNLOCK…**	Whilst downloading a file	• Check that the pre-reprogramming instructions have been followed: see [01B-4]. • Restart the programming - reprogramming operation. • If the fault is still present, print the computer identification screen and the history and carry out the **EMERGENCY PROCEDURE**.
25	**COMPUTER FAULT: CANNOT DELETE…**	Whilst downloading a file	• Check that the pre-reprogramming instructions have been followed: see [01B-4]. • Restart the programming - reprogramming operation. • If the fault is still present, print the computer identification screen and the history and carry out the **EMERGENCY PROCEDURE**.
25	**COMPUTER FAULT: DOWNLOAD INTERRUPTED…**	Whilst downloading a file	• Check the connections and the battery voltage and restart the operation. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
25	**NON LOCKING ERROR OCCURRED DURING WRITING…**	At the end of downloading a file	• The computer's history is full. This is not a critical error and it will not affect the reprogramming of the vehicle.
25	**THE COMPUTER HAS NOT RESPONDED TO THE LAST REQUEST…**	At the end of downloading a file	• Try to re-establish dialogue with the computer. • If the vehicle no longer starts, carry out the **EMERGENCY PROCEDURE**.

CODE SERVER PROCEDURE (in CD mode only)

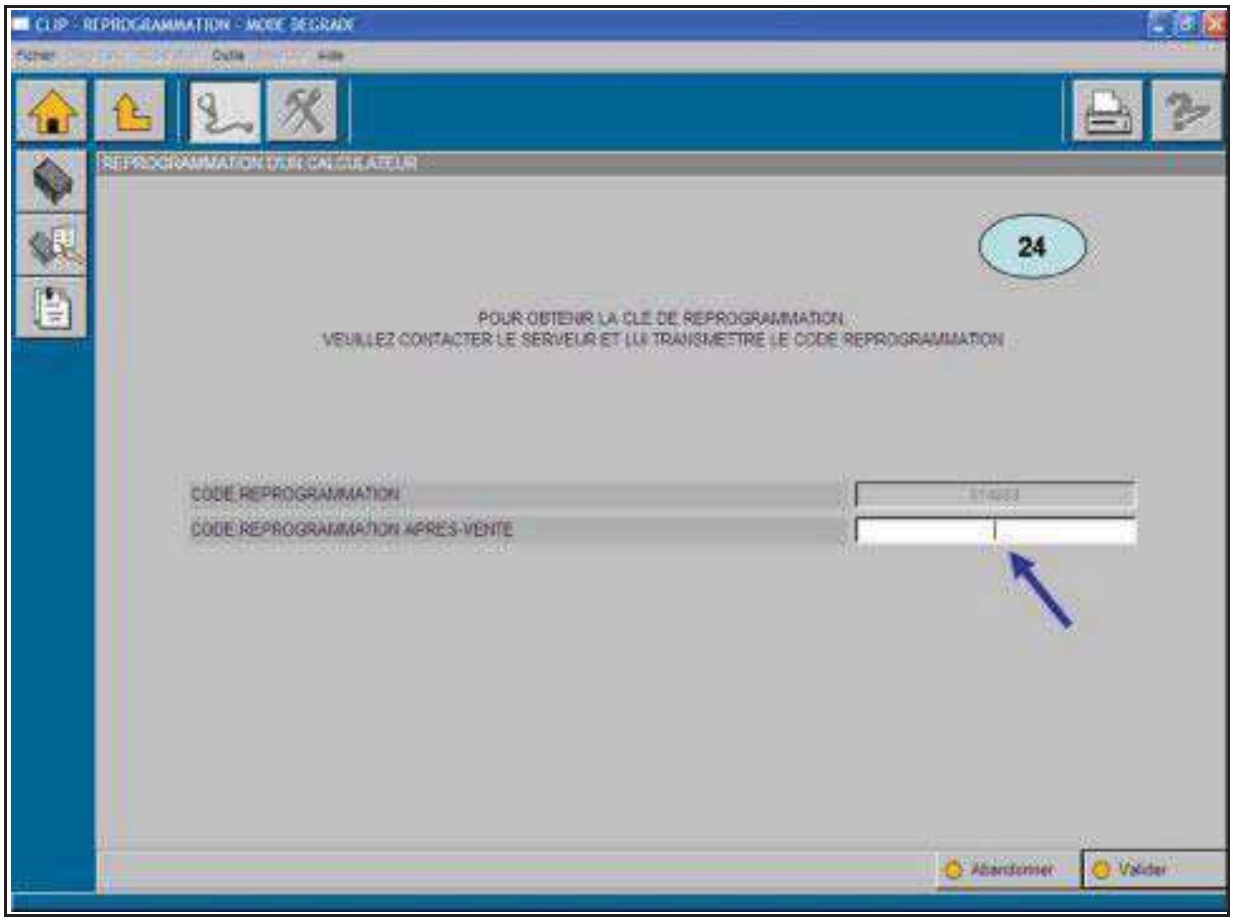
When Calibrating - reprogramming with the reprogramming CD Part No. **77 11 298 859**, enter an *After-Sales reprogramming code* to be able to carry out the operation.

This code is provided by the code management server on RENAULT.NET after having entered the VIN and the reprogramming code displayed on screen **24** of the RENAULT CLIP diagnostic tool.

Refer to the **Technical Note CODE DELIVERY PROCEDURE**, section **Tool reprogramming key** for more details.

Steps:

1. CLIP provides a *reprogramming code*.
2. Provide the code management server with the *reprogramming code* and the VIN of the vehicle.
3. The server issues an *After-Sales reprogramming code*.
4. Enter this code in CLIP.



EMERGENCY PROCEDURE

The EMERGENCY PROCEDURE must be carried out when Calibration - reprogramming is interrupted by a message advising you to contact Techline.

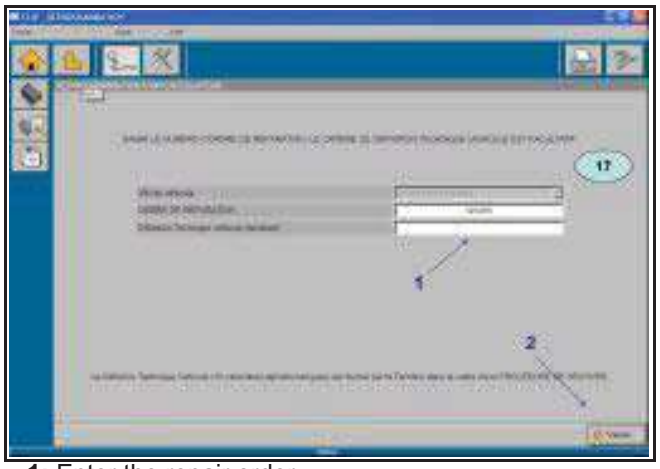
Example: **ERROR 10X** (X = 1 to 9)
EMERGENCY PROCEDURE, PLEASE CONTACT YOUR TECHLINE

The EMERGENCY PROCEDURE consists of using ACTIS or a Fax to produce a customer fault log, to be sent to Techline, containing the following information:

- The VIN of the vehicle.
- The fabrication number of the vehicle.
- The code or error message specified in CLIP (e.g: ERROR 105).
- The type of computer (INJECTION, AIR CONDITIONING, etc).
- The Parts Department reference number for the computer read using the tool in the COMPUTER identification fault finding screen: see **CONSULTING THE IDENTIFICATION FRAME**.
- The Hardware Part No. for the computer read using the tool in the COMPUTER identification fault finding screen: see **CONSULTING THE IDENTIFICATION FRAME**

The speed and relevance of the solution provided by Techline will depend on the accuracy with which this information is entered into the customer fault log.

Following Techline's analysis of the fault, a **10 character code** (e.g: 0000CD347B) should be sent back to you. Repeat the Calibration - reprogramming procedure and enter the *Vehicle Technical Definition* code in screen **17** of the RENAULT CLIP diagnostic tool.



1: Enter the repair order.
2: Enter the *Vehicle Technical Definition* code.

If necessary, an unconventional error could lead Techline to demand:
- the computer IDENTIFICATION FRAME: see **CONSULTING THE IDENTIFICATION FRAME**
- the HISTORY: see **CONSULTING THE HISTORY**
- the consultation of the TOOL LOG: see **CONSULTING THE TOOL LOG**
- the creation of a trace file: see **TRACE FILE**

CONSULTING THE COMPUTER IDENTIFICATION FRAME

Consulting the computer identification frame can help a problem to be better understood during an **EMERGENCY PROCEDURE**.

It allows the current (dummy) component Part No. of the computer to be consulted and to confirm that the (re)programming has been correctly carried out.

On the request of Techline, print this information screen and send it to Techline:

- Access the identification frame screen:
  MULTIPLEX NETWORK TEST/COMPUTER FAULT FINDING/IDENTIFICATION FRAME
- Press the button Print screen Syst on the top right of the keypad of the RENAULT CLIP diagnostic tool.
- Open WORDPAD(**Start → Programs→Accessories→WordPad**),
  in the **Edit** menu, **Paste** the print screen,
  then: print the document to send by fax to Techline,
  or copy it onto a disk to send by mail to Techline,
  or register the document to add it as an attachment in ACTIS.

CONSULTING THE COMPUTER HISTORY

Consulting the computer's history can help a problem to be better understood during an **EMERGENCY PROCEDURE**.

It allows the last 8 reprogramming operations stored in the computer to be consulted and displays, among others, the different (dummy) component part numbers of the computer by (re)programming date.

On the request of Techline, print this screen of information and fax it to them.
See **CONSULTING THE COMPUTER IDENTIFICATION FRAME**for how to print a screen.

1 - Icon: COMPUTER CONSULTATION
2 - Tab: HISTORY

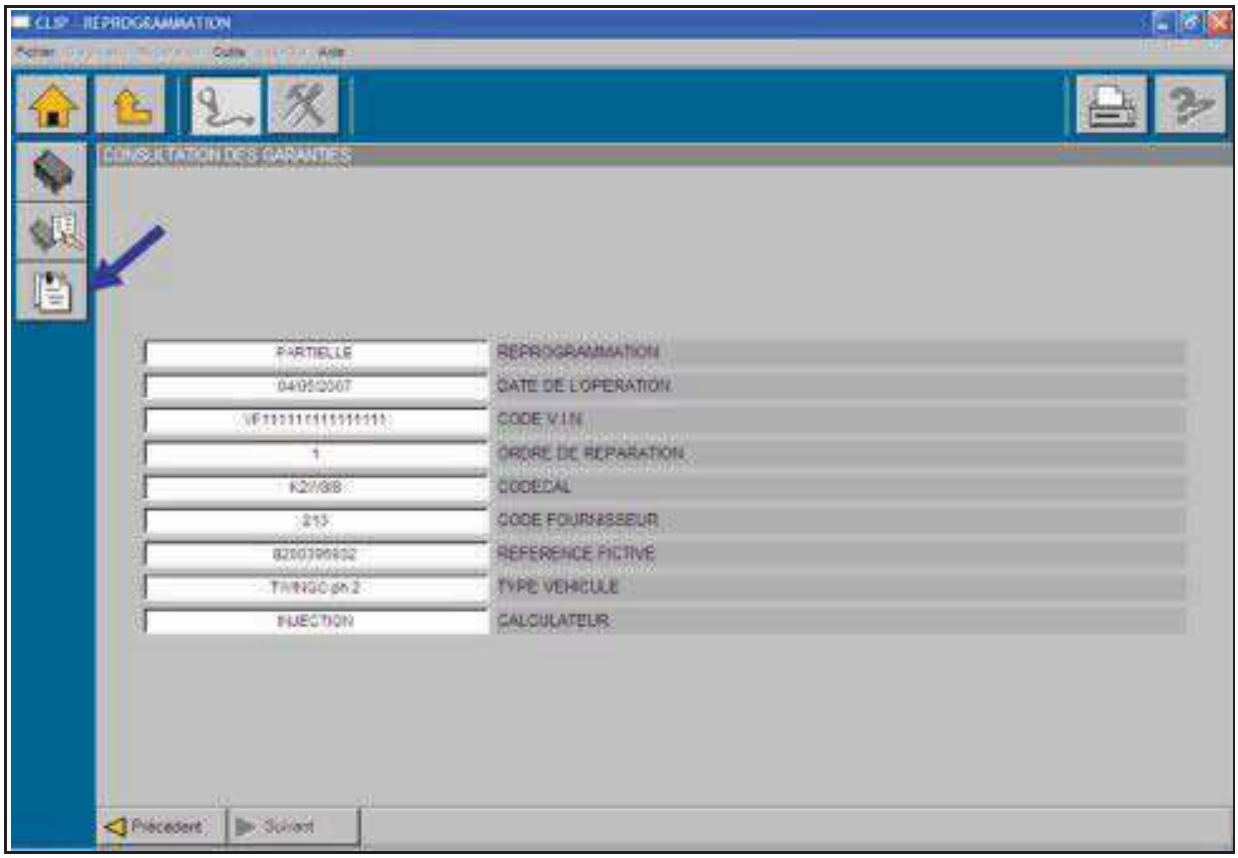
CONSULTING THE DIAGNOSTIC TOOL LOG

Consulting the RENAULT CLIP diagnostic tool log can aid:
- understanding of a fault during an **EMERGENCY PROCEDURE**.
- the recovery of CODECAL from the last reprogramming operations carried out.

This log enables the last 50 reprogramming operations stored in the RENAULT CLIP diagnostic tool to be consulted, displayed in chronological order with the most recent first.

This screen will provide, amongst other information:
- The vehicle's VIN.
- The Repair Order.
- The programming - reprogramming CODECAL.
- The new (dummy) Part No. for the computer in addition to that read in the **CONSULTING THE COMPUTER IDENTIFICATION FRAME**.

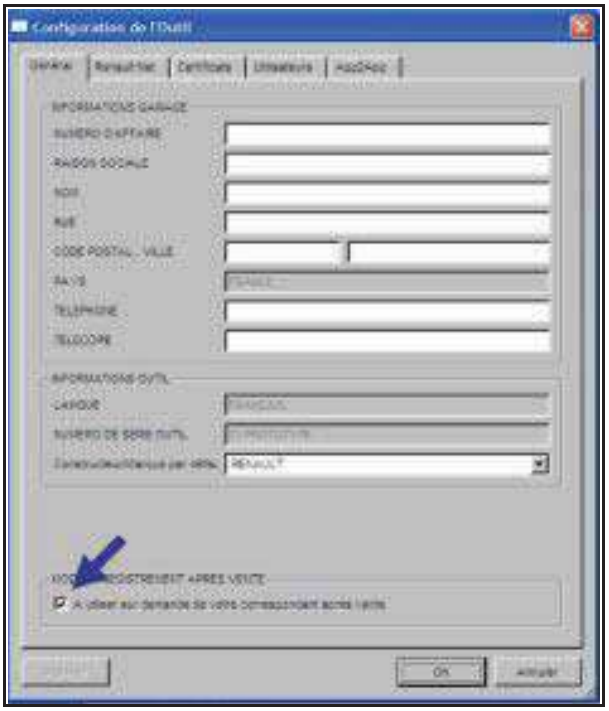
Upon the request of Techline, print the screen containing this information and fax it to them.
See **CONSULTING THE COMPUTER IDENTIFICATION FRAME** for how to print a screen.



TRACE FILE (upon the request of Techline)

Creating the trace file

- After starting up the **CLIP** software, click on the **Tools** tab, then on **Tool configuration**.



- In the **Tool configuration** window.

  Tick the **AFTER-SALES SAVE MODE** box, then confirm with **OK**.

- Carry out the Calibration - reprogramming until the error message is displayed.

Recovering the trace file after programming - reprogramming

- Close the CLIP application (Return to the CLIP home page then EXIT).
- In the Windows **Start** menu (bottom left-hand corner of the Windows screen), select **My Computer**. Then select (double left click) the following: **Local disc (C:) / CLIP / DATA/ USER / LOGS**.

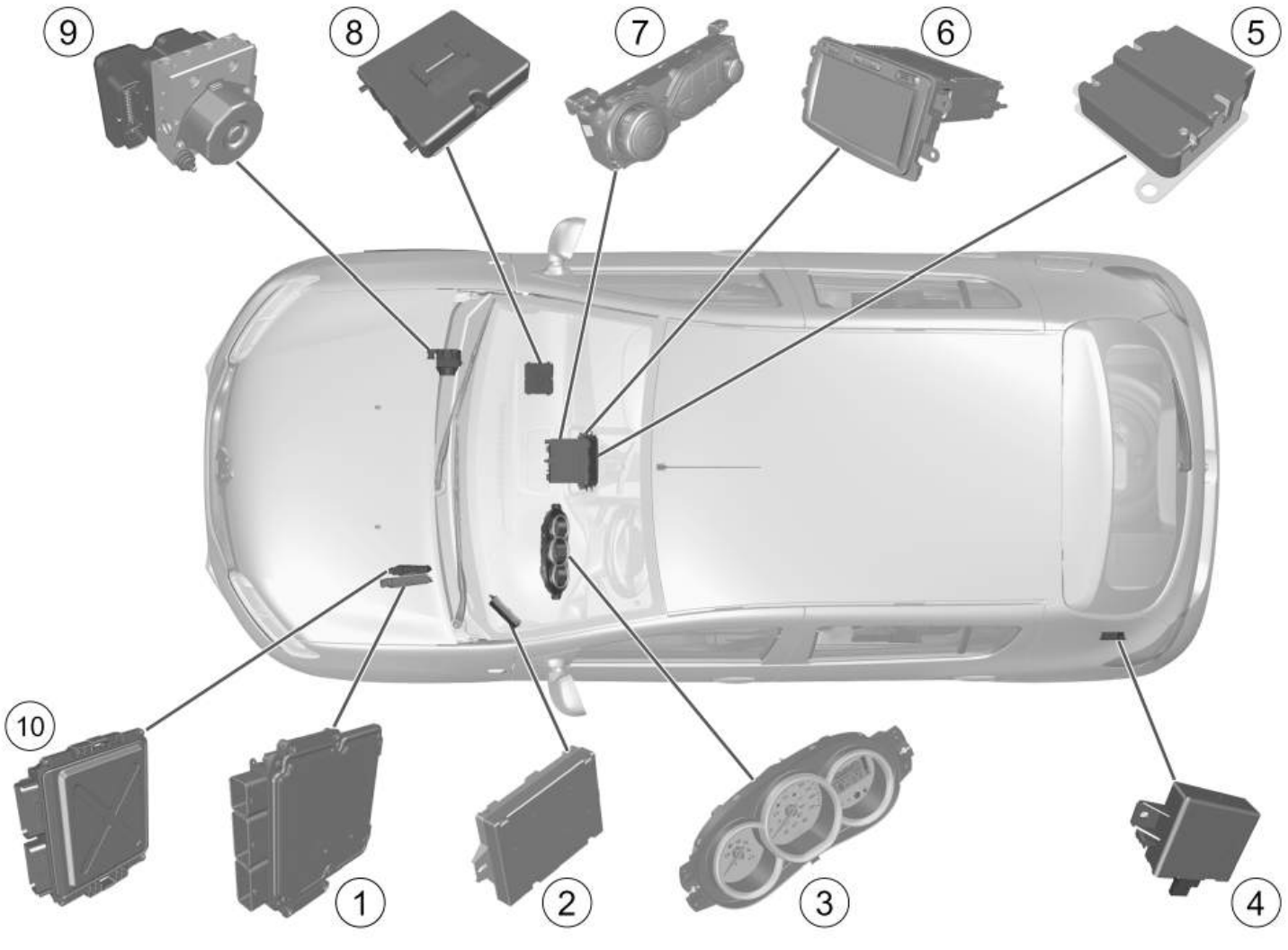
Send this file to your Techline by e-mail.

Note:
For all RENAULT CLIP diagnostic tools under **Windows XP**, compress the file "clip.log":

- Select the **clip.log** trace file.
- Right click the on the **clip.log** file, and select **Properties**.
- Then **send_to Compressed (zipped) folder**.

COMPUTERS: LIST AND LOCATION OF COMPONENTS

1. LIST AND LOCATION OF COMPONENTS



List of vehicle computers:

- Petrol injection computer or diesel injection computer(1) Petrol injection computer: Removal - Refitting orDiesel injection computer: Removal - Refitting
- UCH(2) UCH: Removal - Refitting
- Instrument panel(3) Instrument panel: Removal - Refitting
- Airbag computer(5) Airbag computer: Removal - Refitting

RADIO 45A(Radio 45A)

- Radio(6) Radio: List and location of components
- ABS computer(9) Hydraulic brake unit: Removal - Refitting
- LPG computer(10) LPG computer: Removal - Refitting

Repair-32x05x16-02x51-1-23-1.xml

XSL version : 3.02 du 22/07/11

CONDENSER - INTERMEDIATE PIPE CONNECTING PIPE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
refrigerant charging station

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair(see 62A, Air conditioning, Air conditioning: Precautions for the repair) .

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857to plug any openings exposed to the open air. They must be clean. Do not use any which have already been used to plug a fuel circuit.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).

Remove the front bumper Front bumper assembly: Exploded view (55A, Exterior protection).

Drain the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .

Remove the bolt of the "condenser - intermediate pipe" connecting pipe on the cooling radiator (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

2. REMOVAL OPERATION

Remove (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :

- the bolt from the retaining bracket of the "condenser - intermediate pipe" connecting pipe on the condenser,
- the bolt from the retaining bracket of the "condenser - intermediate pipe" connecting pipe on the "expansion valve - intermediate pipe" connecting pipe at the expansion valve inlet.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

Disconnect (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :

- the "condenser - intermediate pipe" connecting pipe on the condenser,
- the "condenser - intermediate pipe" connecting pipe on the "expansion valve - intermediate pipe" connecting pipe at the expansion valve inlet.

Insert the blanking plugs.

Remove the "condenser - intermediate pipe" connecting pipe (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

- Clean the seals of the refrigerant circuit pipes(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Consult the refrigerant and oil quantity values before filling the circuit(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

- Perform the following operations:
  - fill the refrigerant circuit using the refrigerant charging station(see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
  - check for leaks(see 62A, Air conditioning, Refrigerant circuit: Check) .

- Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

CONDENSER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
refrigerant charging station

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair(see 62A, Air conditioning, Air conditioning: Precautions for the repair) .

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857to plug any openings exposed to the open air. They must be clean. Do not use any which have already been used to plug a fuel circuit.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Drain the refrigerant circuit using the refrigerant charging station(see 62A, Air conditioning, Refrigerant circuit:

Draining - Filling) .

- Remove :
  - the front bumperFront bumper assembly: Exploded view ,
  - the engine cooling fan assemblyCoolant circuit assembly: Exploded view .
- Move aside the "radiator - condenser" assembly.
- Remove the air deflectorCoolant circuit assembly: Exploded view .

2. REMOVAL OPERATION

- Remove (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :
  - the bolt from the retaining bracket of the "compressor - condenser" connecting pipe on the condenser,
  - the bolt from the retaining bracket of the "condenser - intermediate pipe" connecting pipe on the condenser.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

- Disconnect (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :
  - the "compressor - condenser" connecting pipe on the condenser,
  - the "condenser - intermediate pipe" connecting pipe on the condenser.
- Insert the blanking plugs.
- Remove the condenser(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

- Clean the seals of the refrigerant circuit pipes(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Consult the refrigerant and oil quantity values before filling the circuit(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

- Perform the following operations:
  - fill the refrigerant circuit using the refrigerant charging station(see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
  - check for leaks(see 62A, Air conditioning, Refrigerant circuit: Check) .

- Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

CONNECTIONS BY ARC WELDING UNDER SHIELDING GAS: DESCRIPTION

1. DISASSEMBLY

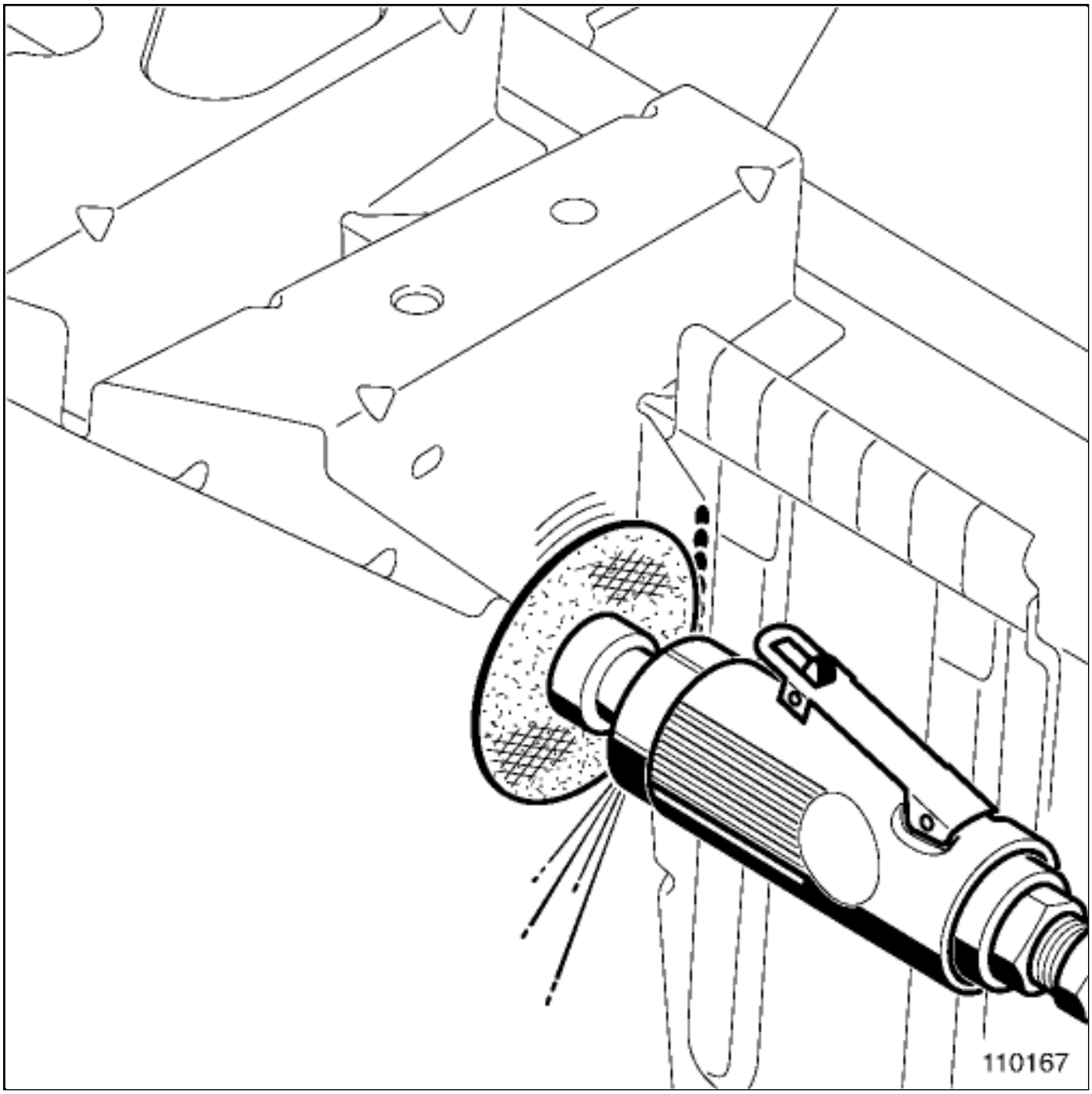
1- SCOURING

If necessary, scour the joint line to bring out the weld bead:

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- UNPICKING

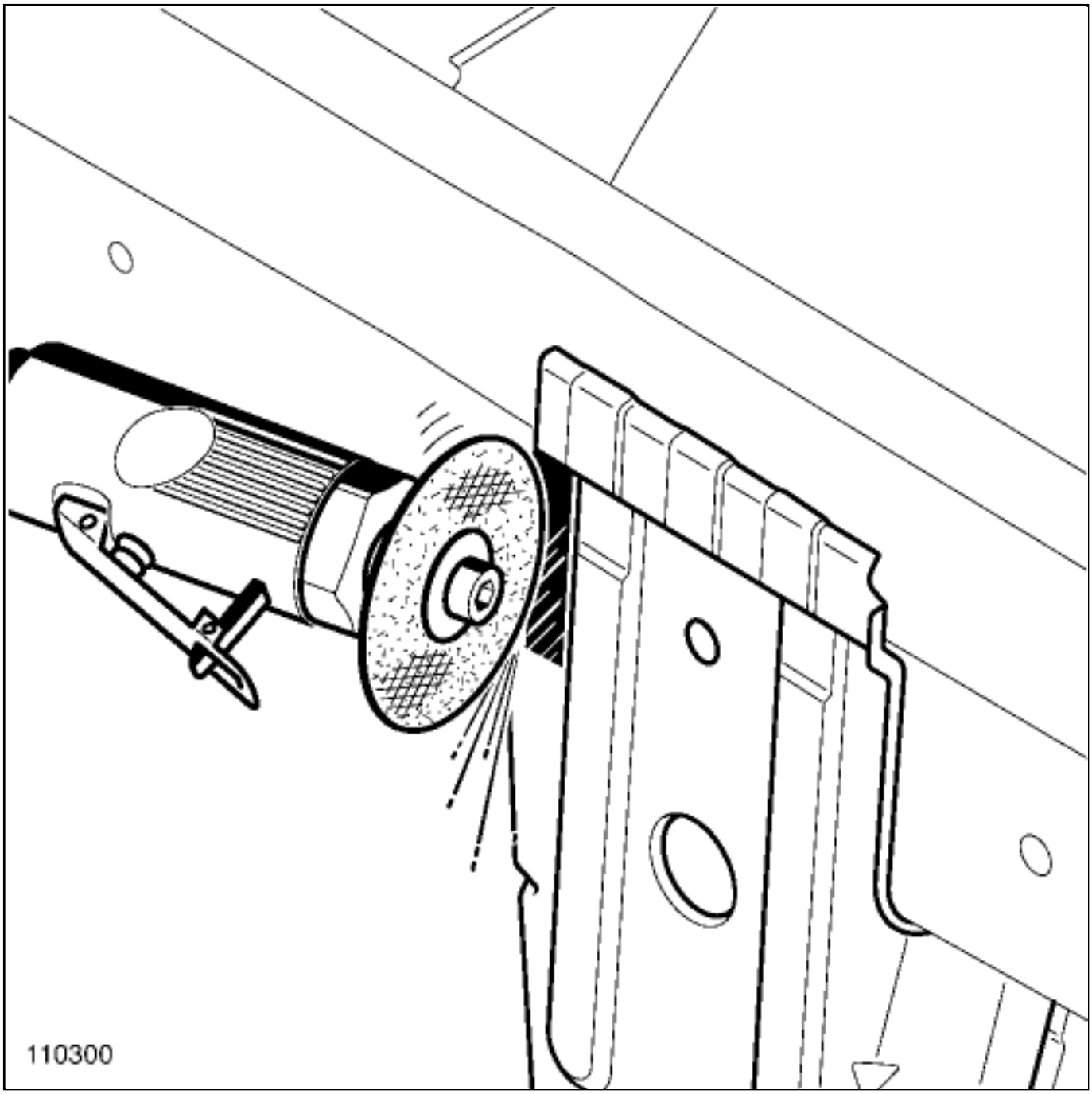


Unpick the weld bead.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

3- GRINDING



Grind the welding residue.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface the mating face.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

2. PREPARATION BEFORE ASSEMBLY

1- POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

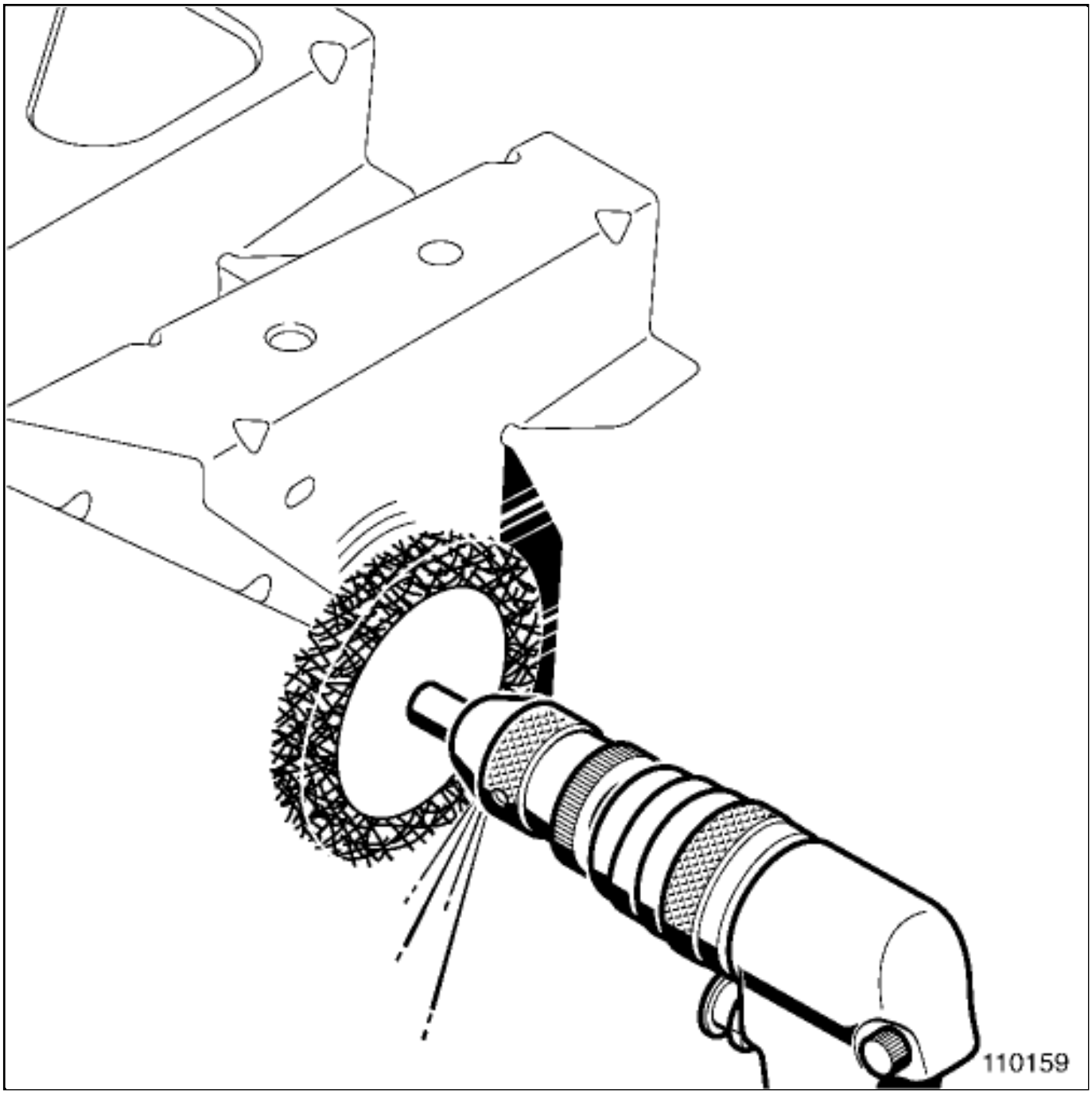
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint zones.

Remove the replacement part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART



Scour the external mating face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal joint mating faces.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3. ASSEMBLY

1- POSITIONING AND ADJUSTING THE REPLACEMENT PART

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

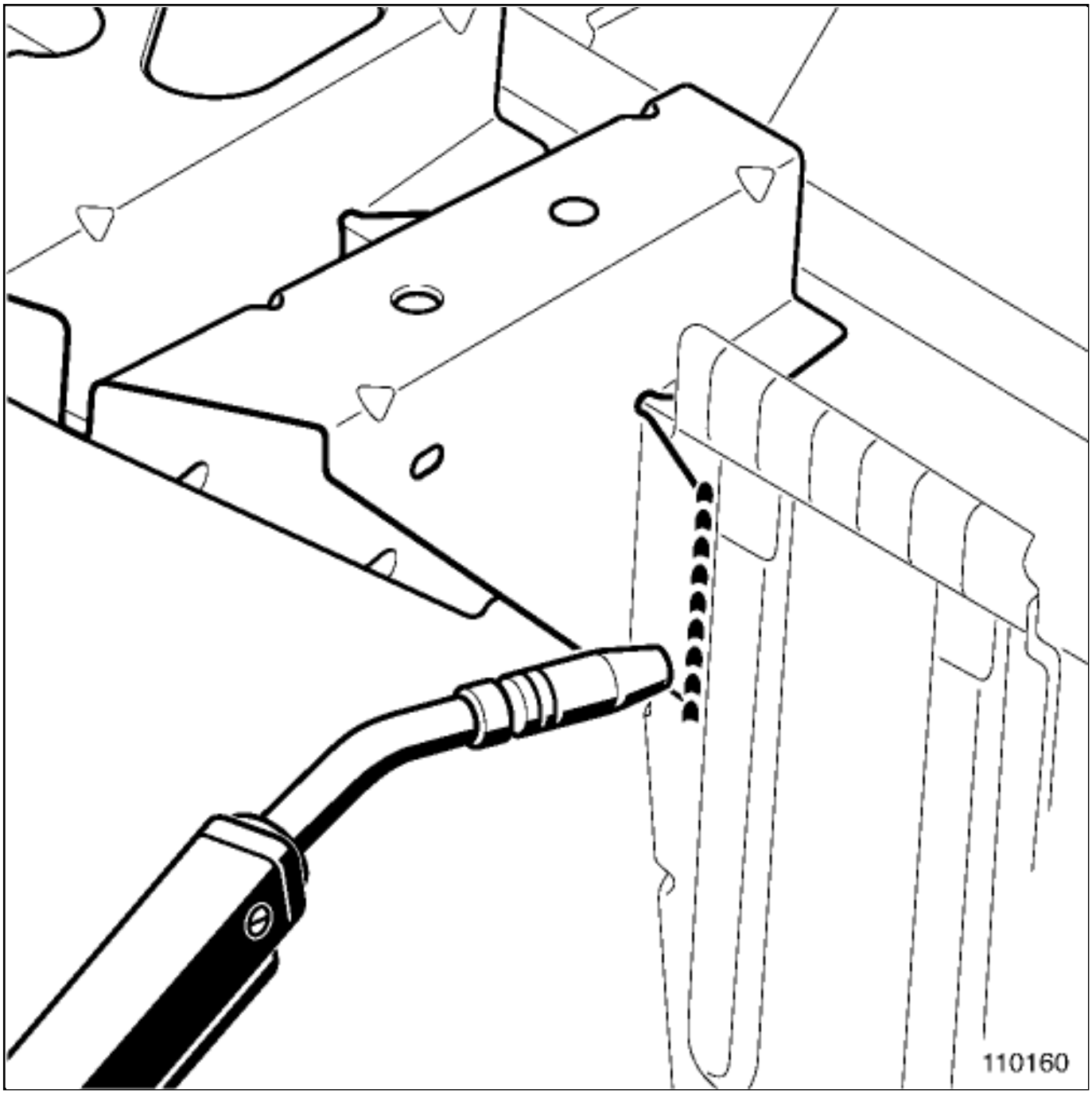
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- ADJUSTING THE WELDER

Before working on the vehicle, follow the procedure below:

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

3- WELDING



Make the weld bead, the same length and in exactly the same position as the original.

4- FINISHING

No finishing is required on this type of weld; the appearance should be identical to the original.

CONNECTIONS BY ARC WELDING UNDER SHIELDING GAS: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

Special tooling required	
Kit for checking weld seams.	Car. 1779
Set of replacement test pieces for tool Car. 1779	Car. 1800

1. INTRODUCTION

1- PURPOSE

The purpose of this document is to provide the information necessary for making quality GMAW welds by describing the procedure to apply to define the correct resistance weld parameters, for three types of joint:

- fillet weld,
- butt weld,
- plug weld.

These tests alone validate the weld parameters and guarantee the result in terms of repair quality.

Note:

These procedures should be applied before each welding operation, according to the joint and/or stack.

2- PROCEDURE

- Consult the vehicle MR,
- Carry out the weld test,
- Interpret the results,
- Use the remedial measures if necessary.

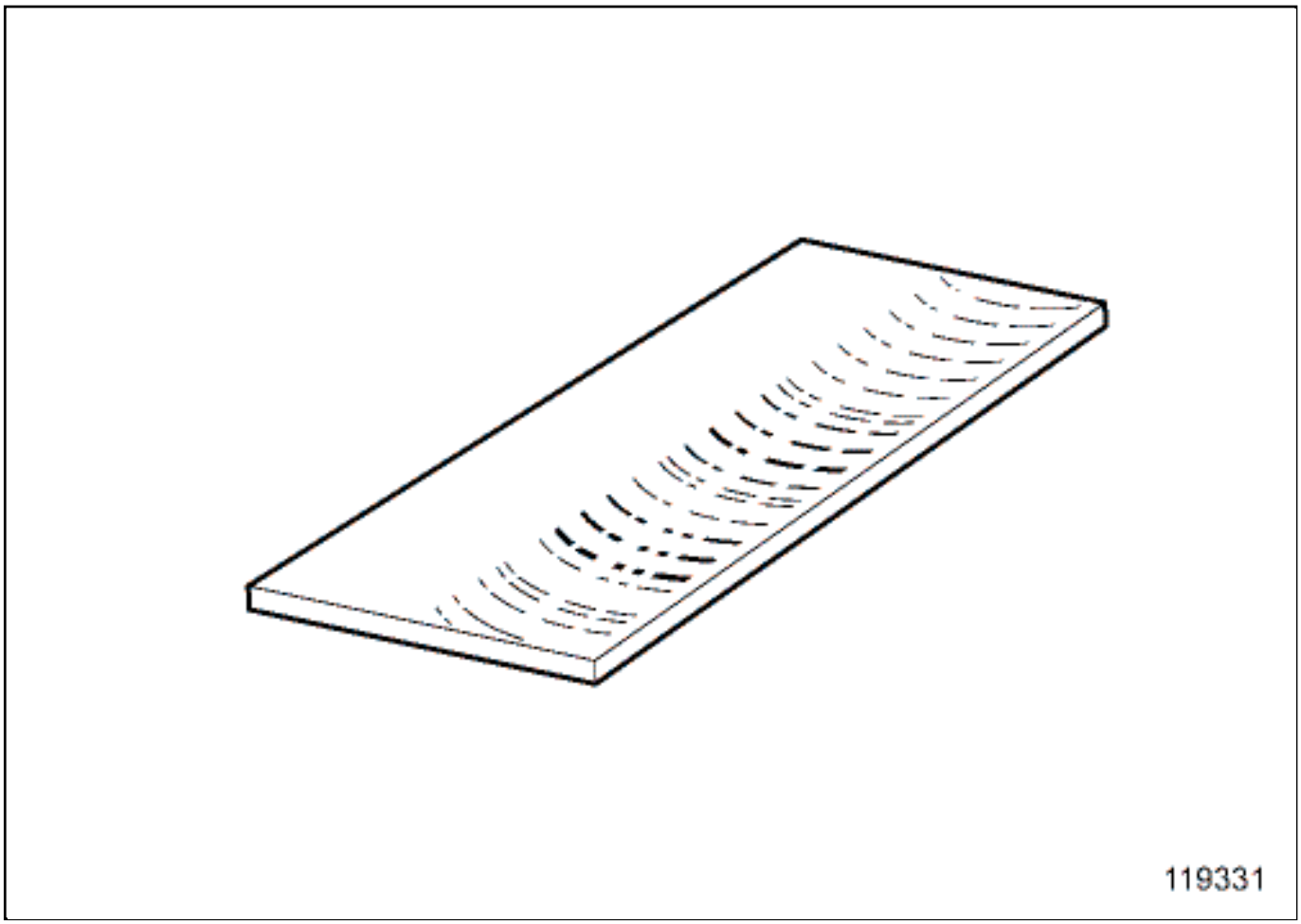
3- TEST PERFORMANCE CONDITIONS

All tests should be performed using the weld validation kitKit for checking weld seams.(Car. 1779), and the set of replacement part test specimensSet of replacement test pieces for tool Car. 1779(Car. 1800).

2. BUTT WELDING TEST PROCEDURE

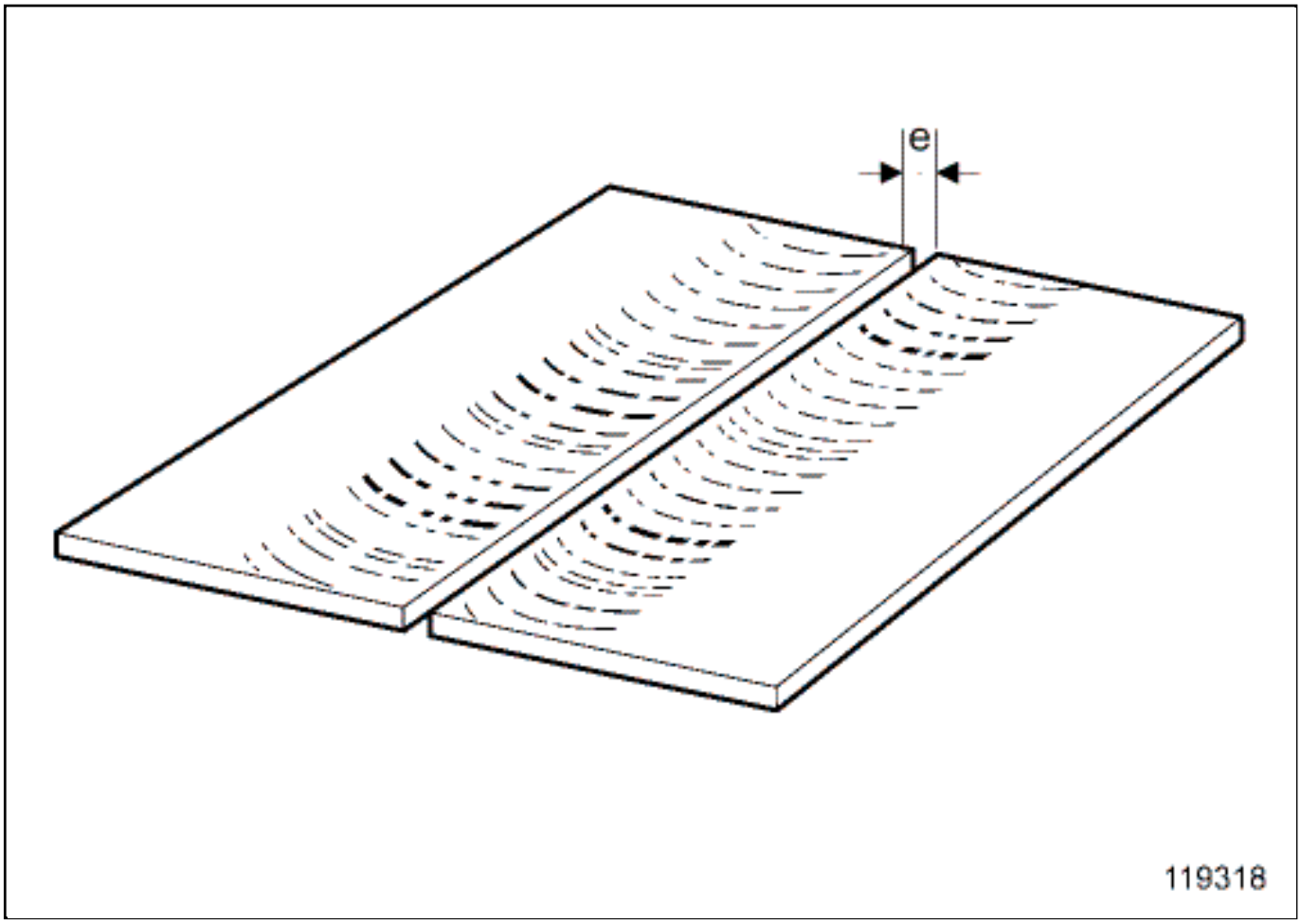
1- PREPARATION BEFORE ASSEMBLY

Select test specimens that are representative of the assembly being tested.

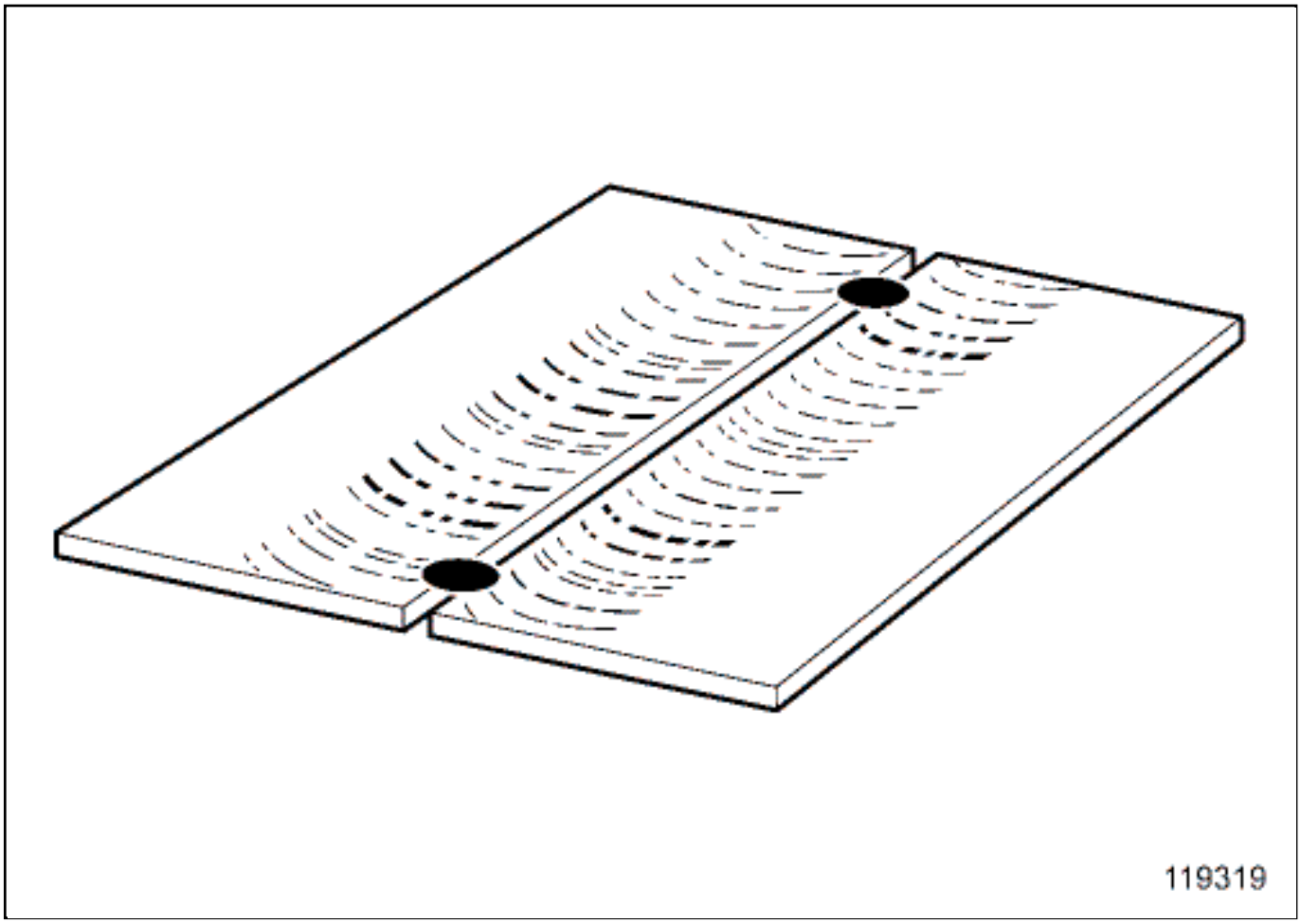


Prepare the test specimens in the same way as the vehicle.

(see 40E, Partial replacement connections, Connections for edge to edge partial replacements: Description)

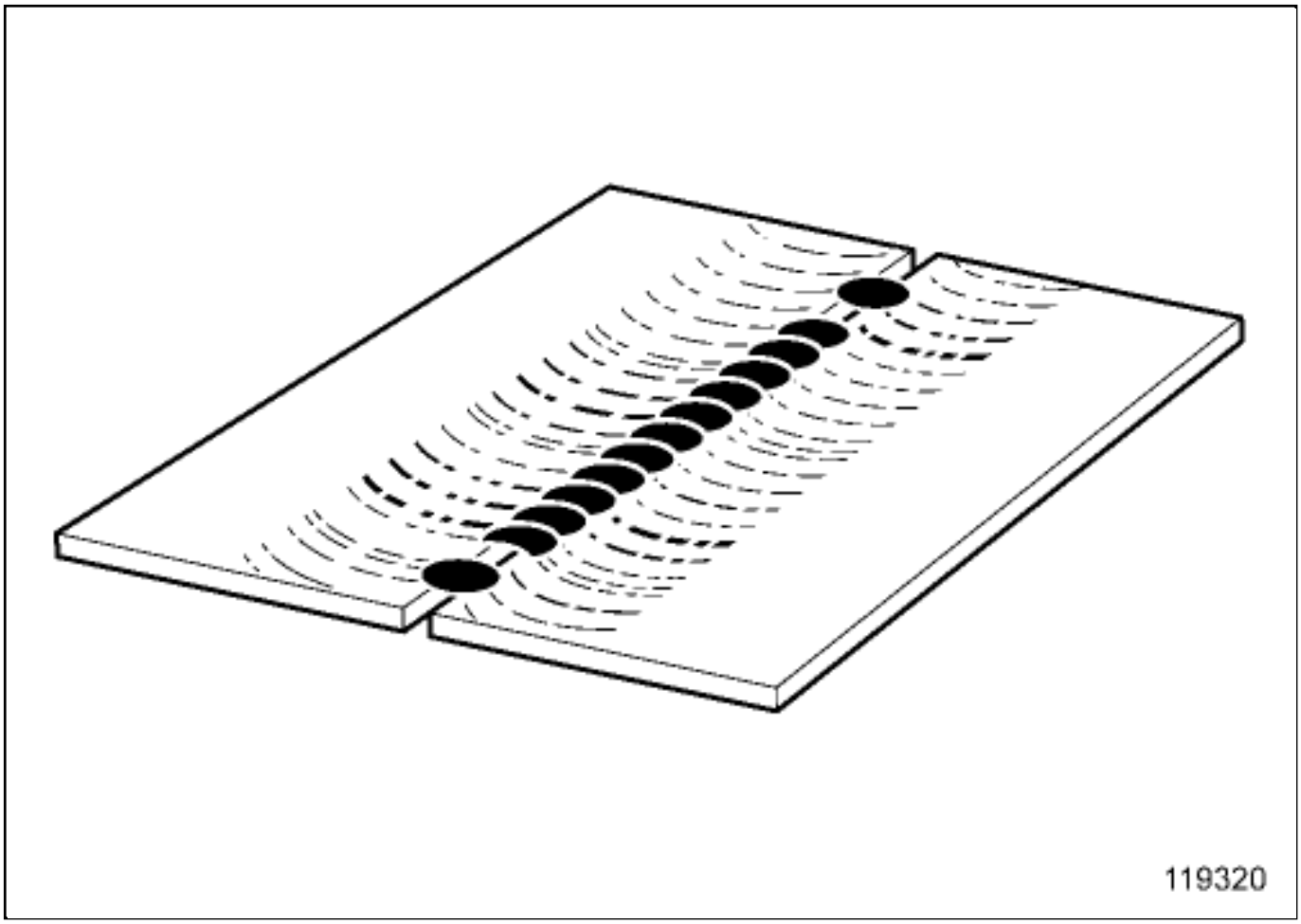


Adjust and secure the test specimens, leaving a clearance(e) equal to the thinnest measurement.



Make two holding spots at each end.

2- ASSEMBLY

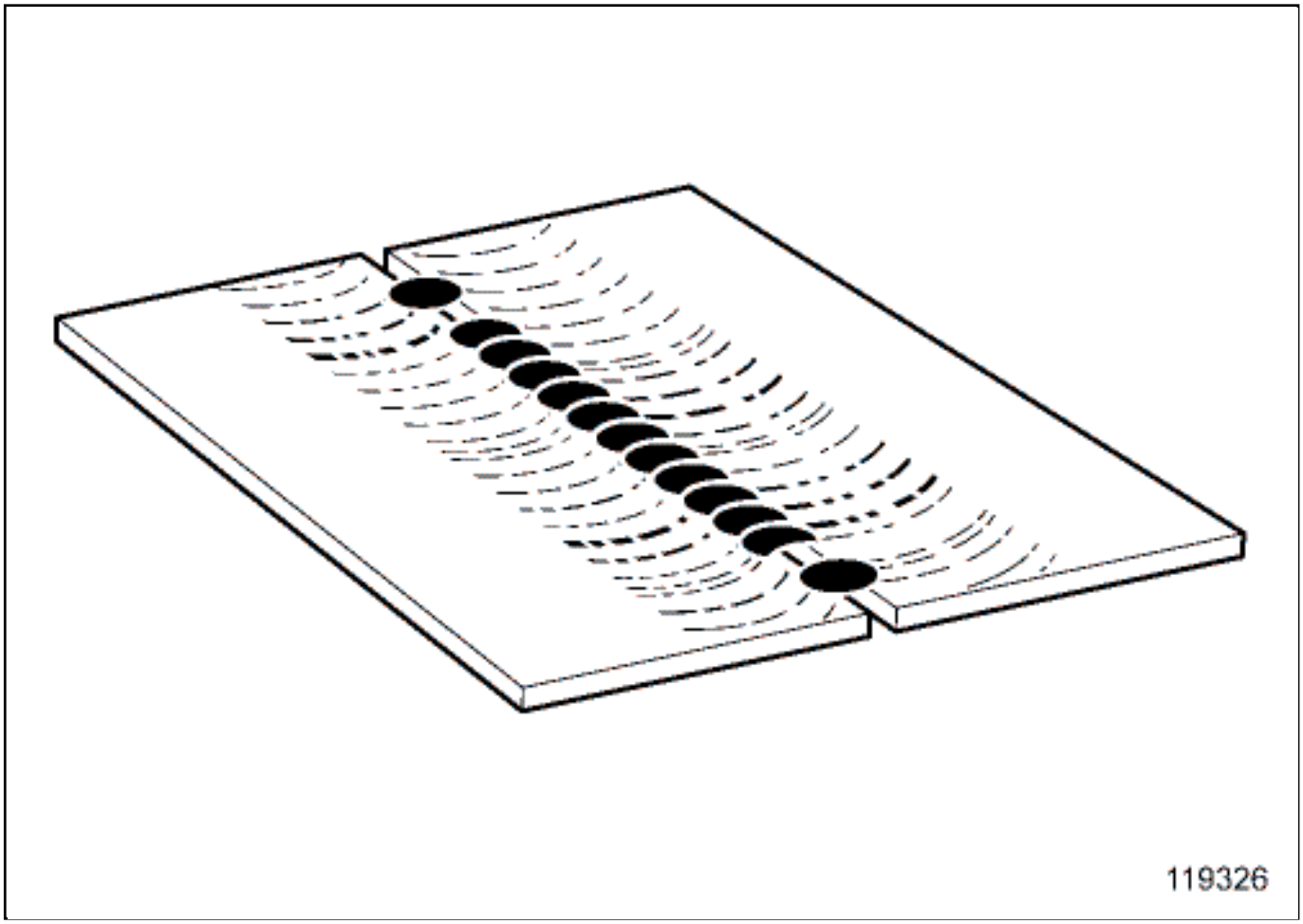


Make an 80 mmlong bead of chain weld.

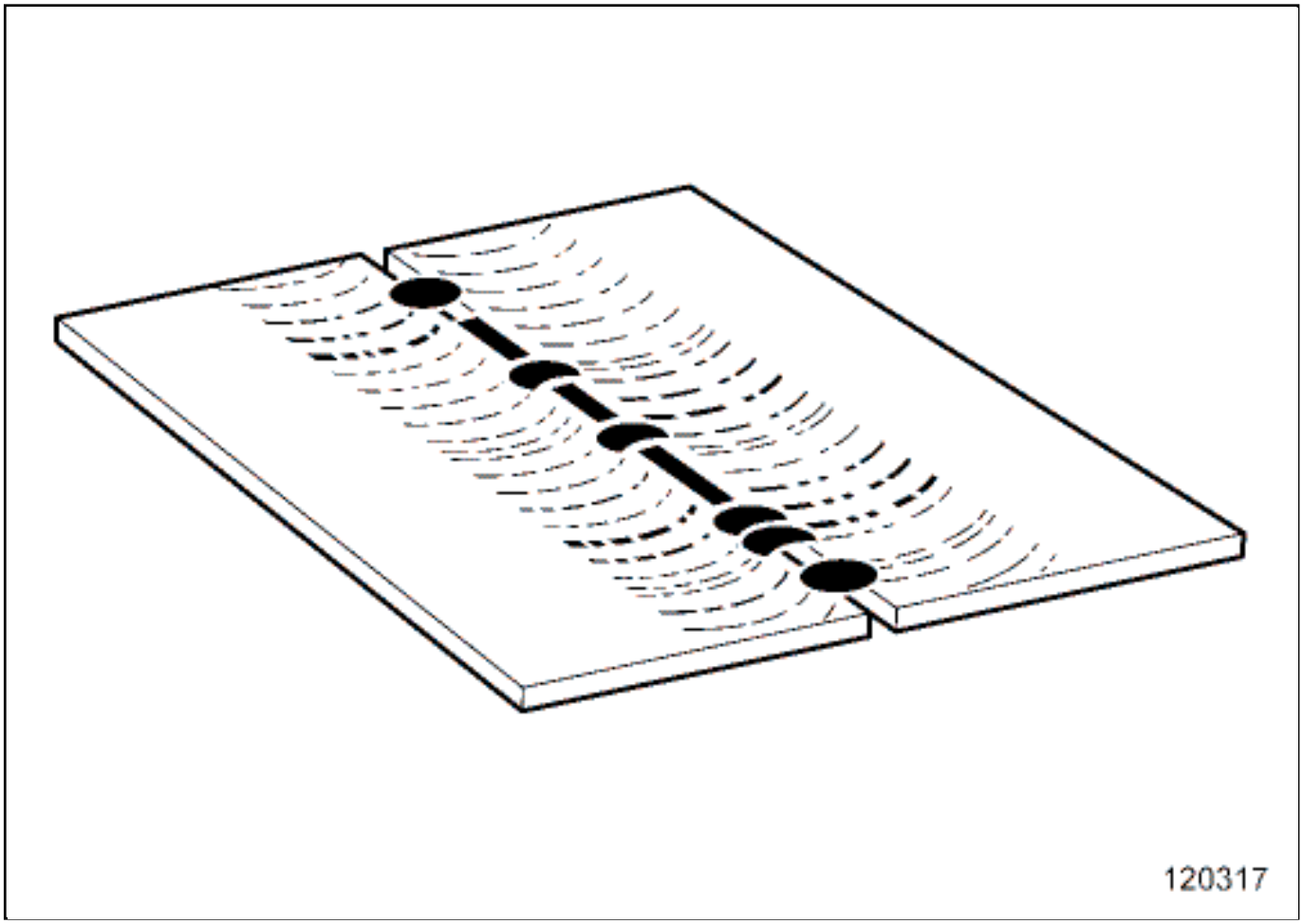
3- CHECK

Check that the bead of chain weld has penetrated the internal face of the assembly.

ACCEPTABLE CHAIN WELD BEAD - CONTINUOUS PENETRATION



UNACCEPTABLE CHAIN WELD BEAD - INCOMPLETE PENETRATION



Penetration should be continuous along the length of the weld.

The bead of chain weld should be as wide on the internal face as on the external face.

4- SOLUTIONS

- If there is incomplete or no penetration:
  - Increase the weld current to improve its penetration,
  - If the current is already at maximum, increase the gap between the panels and the weld time.

Note:

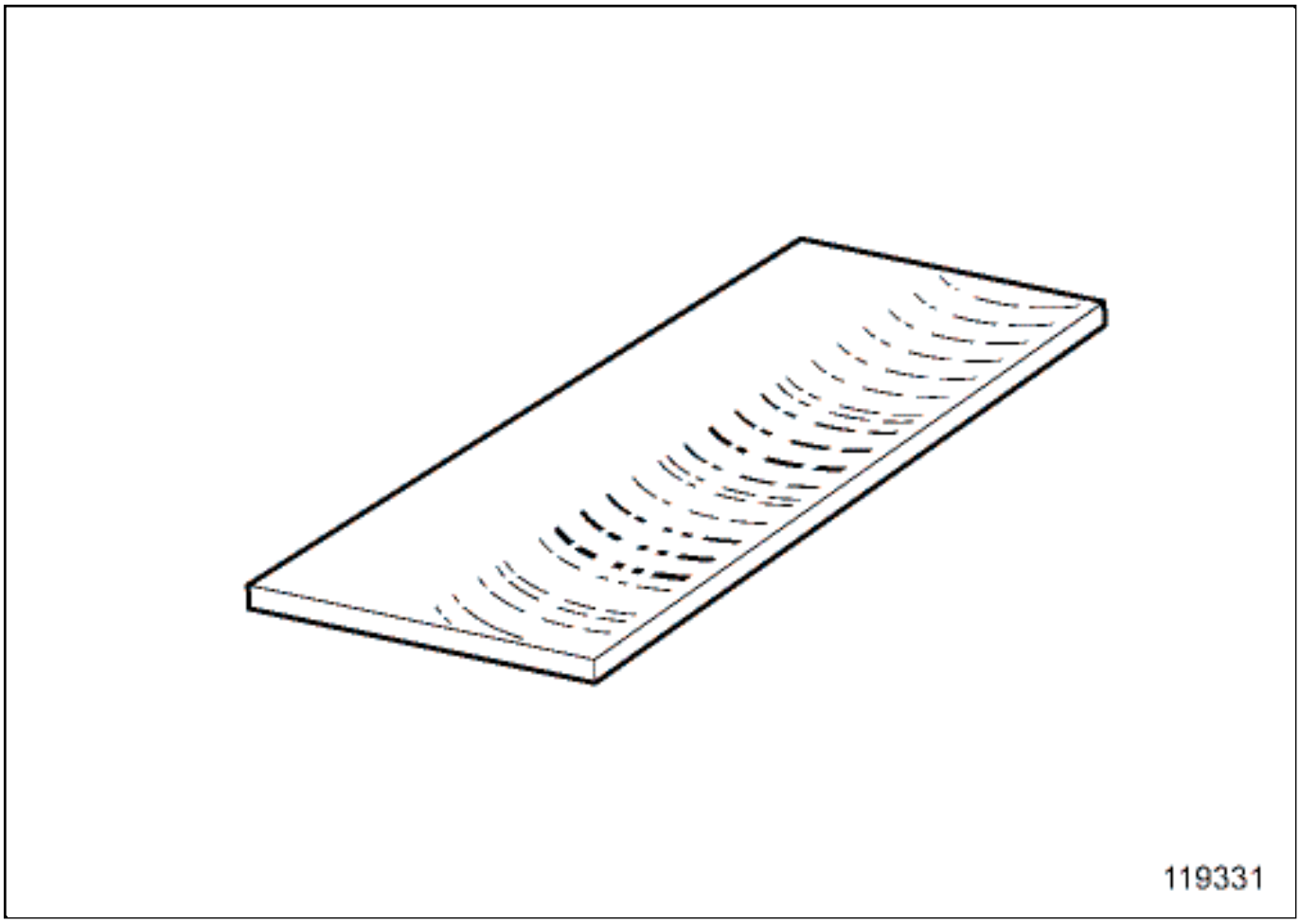
A new weld check must be carried out if any settings are adjusted.

3. FILLET WELD TEST PROCEDURE

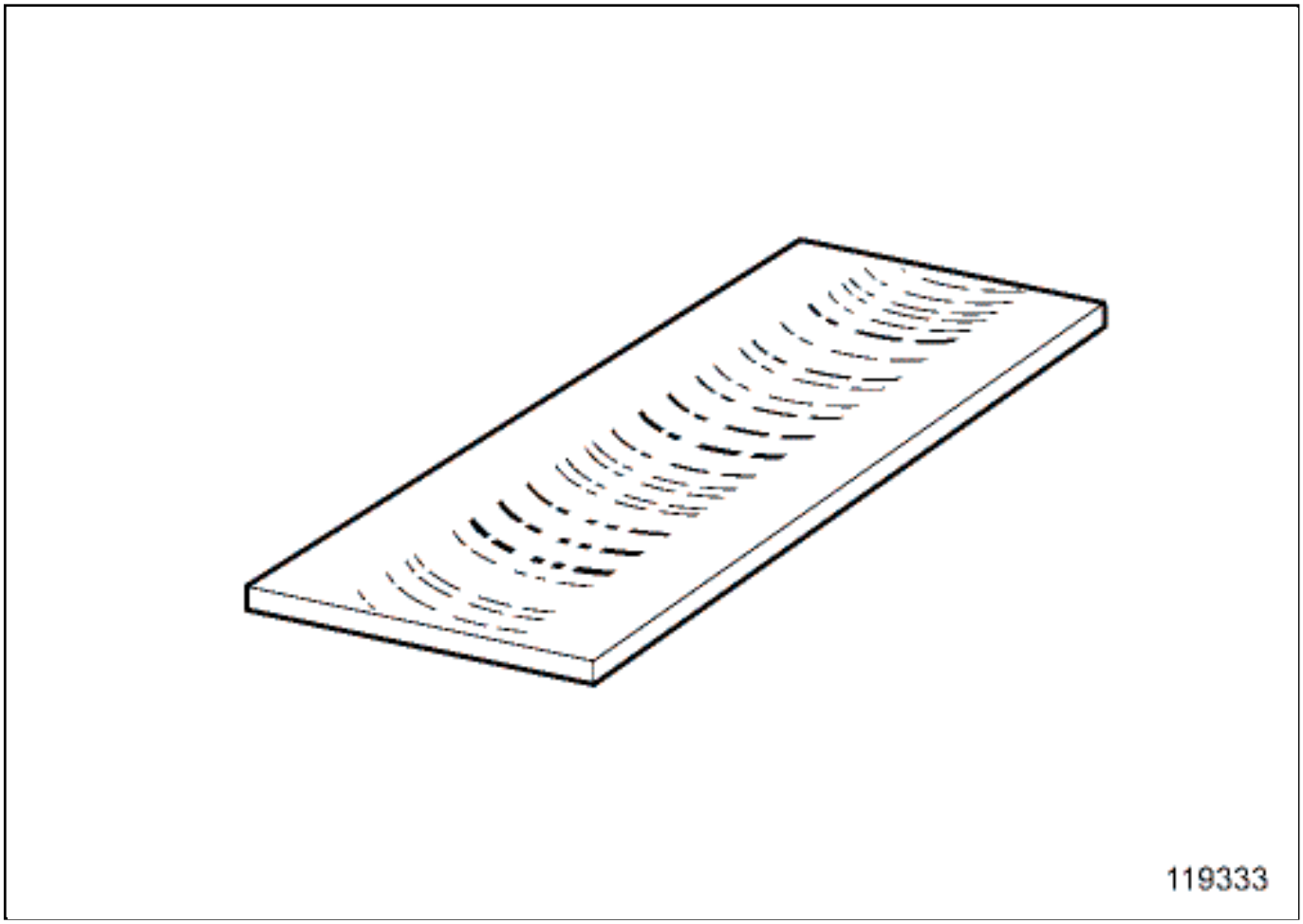
1- PREPARATION BEFORE ASSEMBLY

Select test specimens that are representative of the assembly being tested.

UPPER TEST SPECIMEN

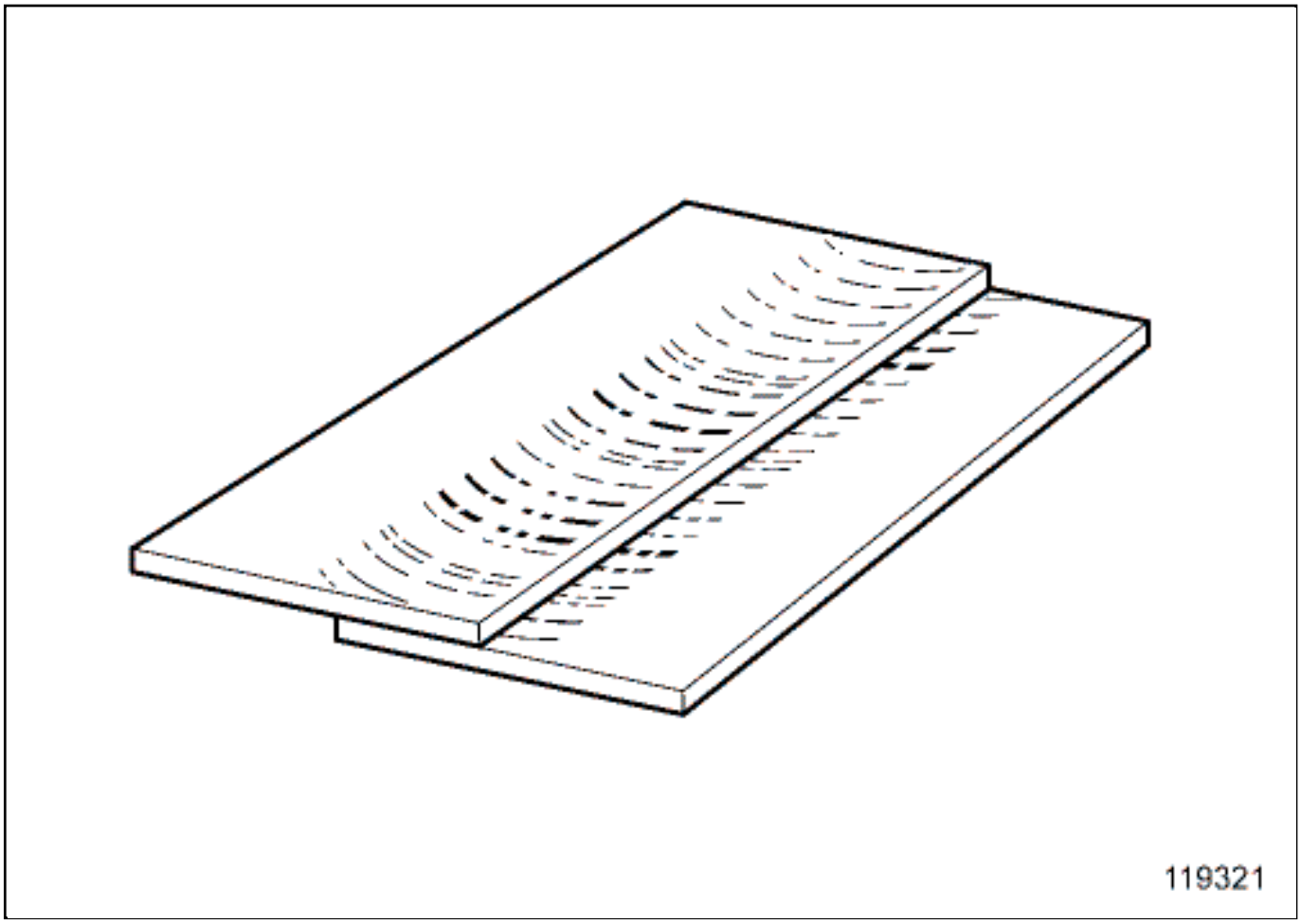


LOWER TEST SPECIMEN

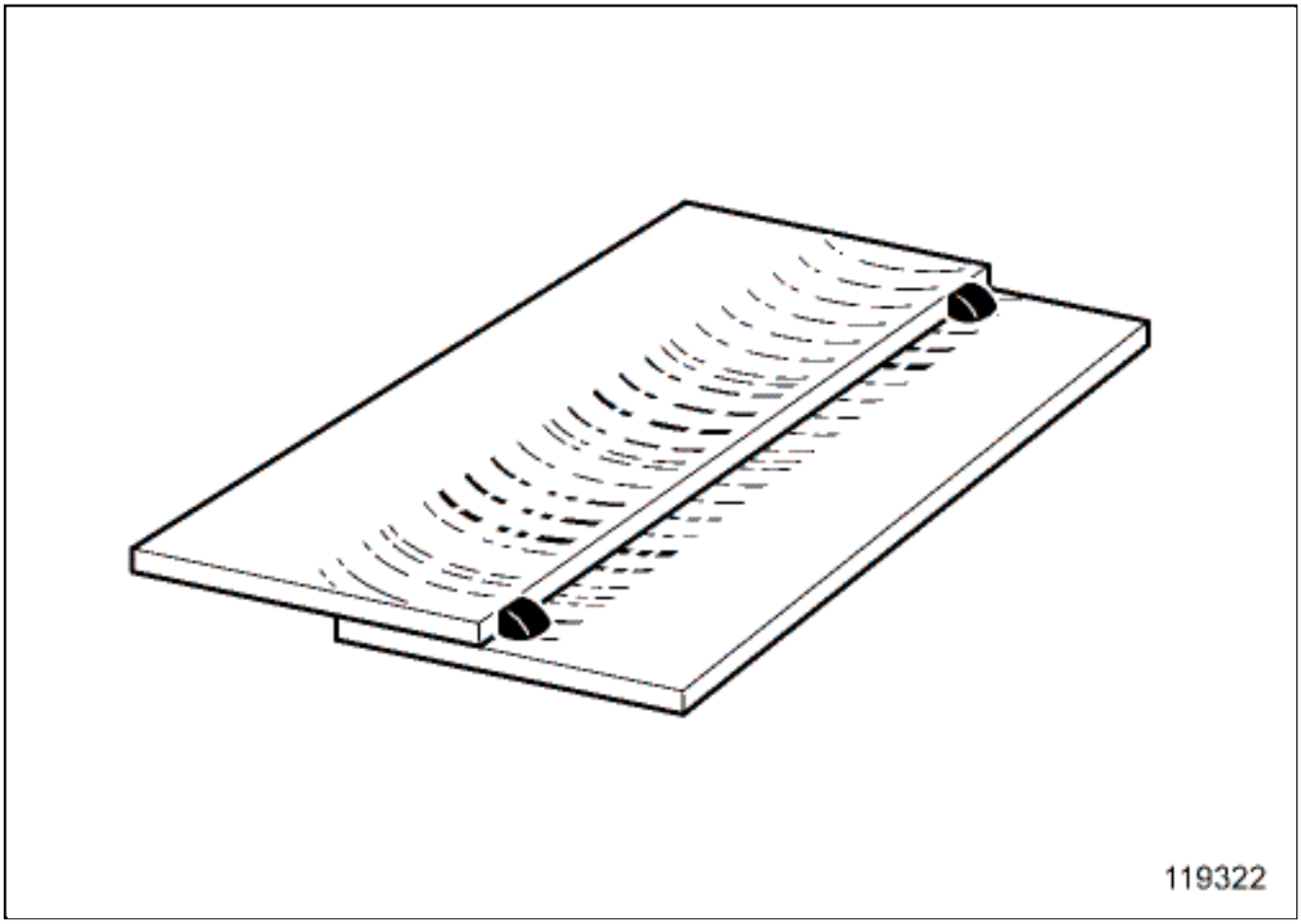


Prepare the test specimens in the same way as the vehicle.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

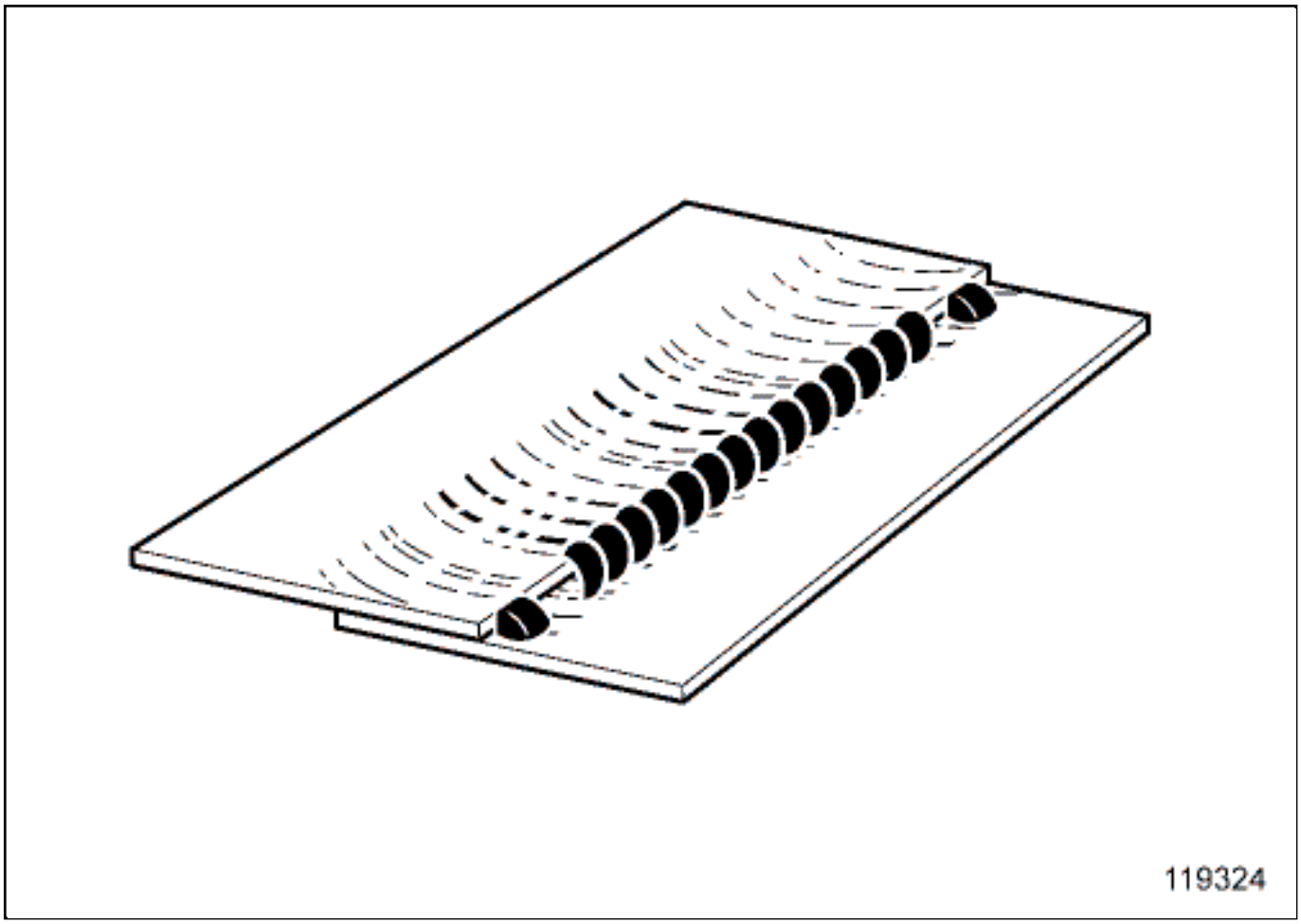


Adjust and secure the test specimens, half overlapping them.

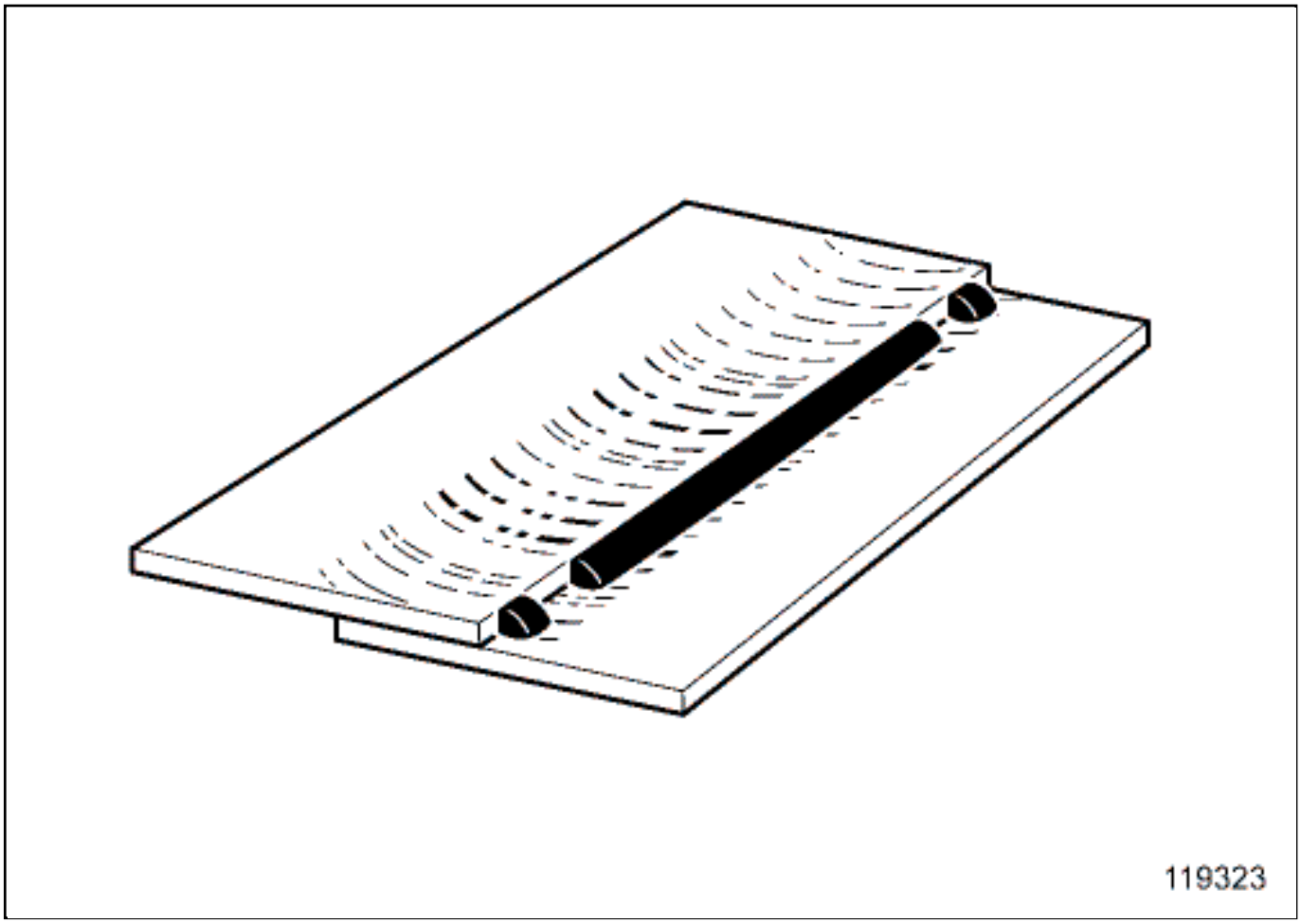


Make two holding spots at each end.

2- ASSEMBLY

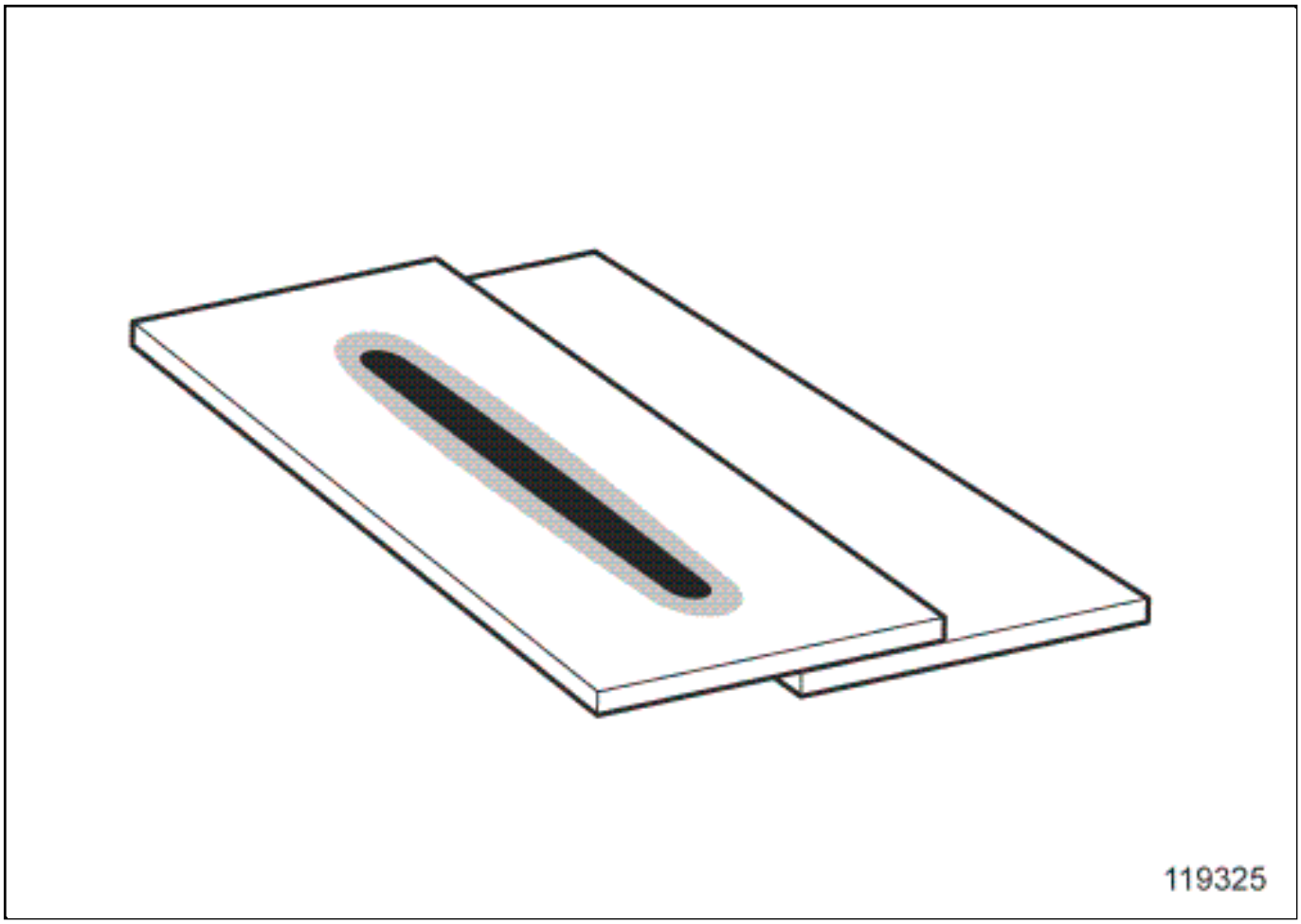


Make an 80 mmlong bead of chain weld, for thin assemblies= "less than 1.5 mm".



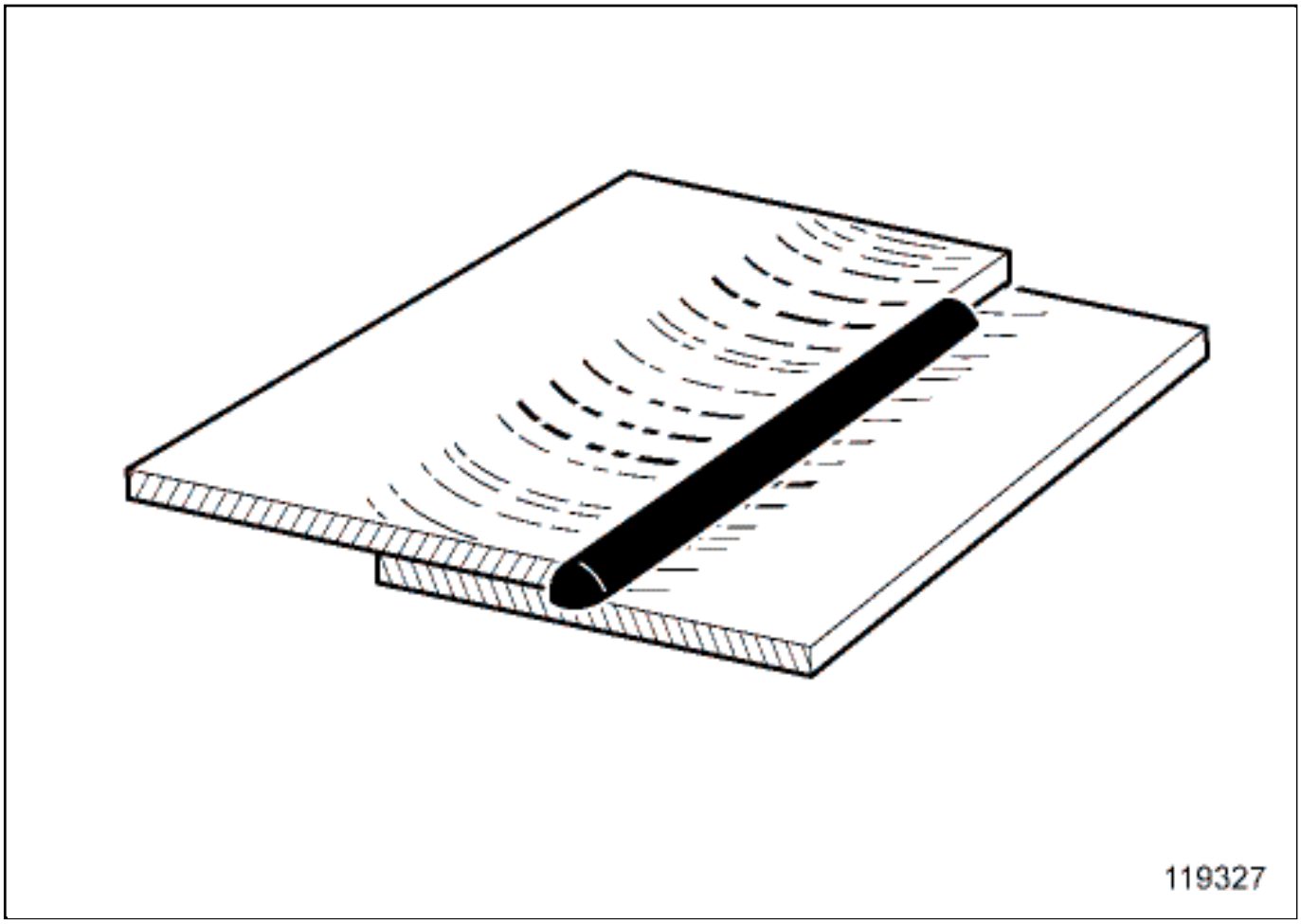
Make an 80 mm long continuous weld bead, for thick assemblies= "greater than 1.5 mm"

3- CHECK



Check that the bead has penetrated the internal face of the assembly.

Penetration should be continuous along the length of the weld.



Note:

For thick assemblies, penetration is not always visible on the internal face.

Cut the assembly in the middle.

Check that the bead has penetrated.

4- SOLUTIONS

If there is incomplete or no penetration:

- Increase the weld current to improve its penetration,
- If the current is already at maximum, increase the welding time.

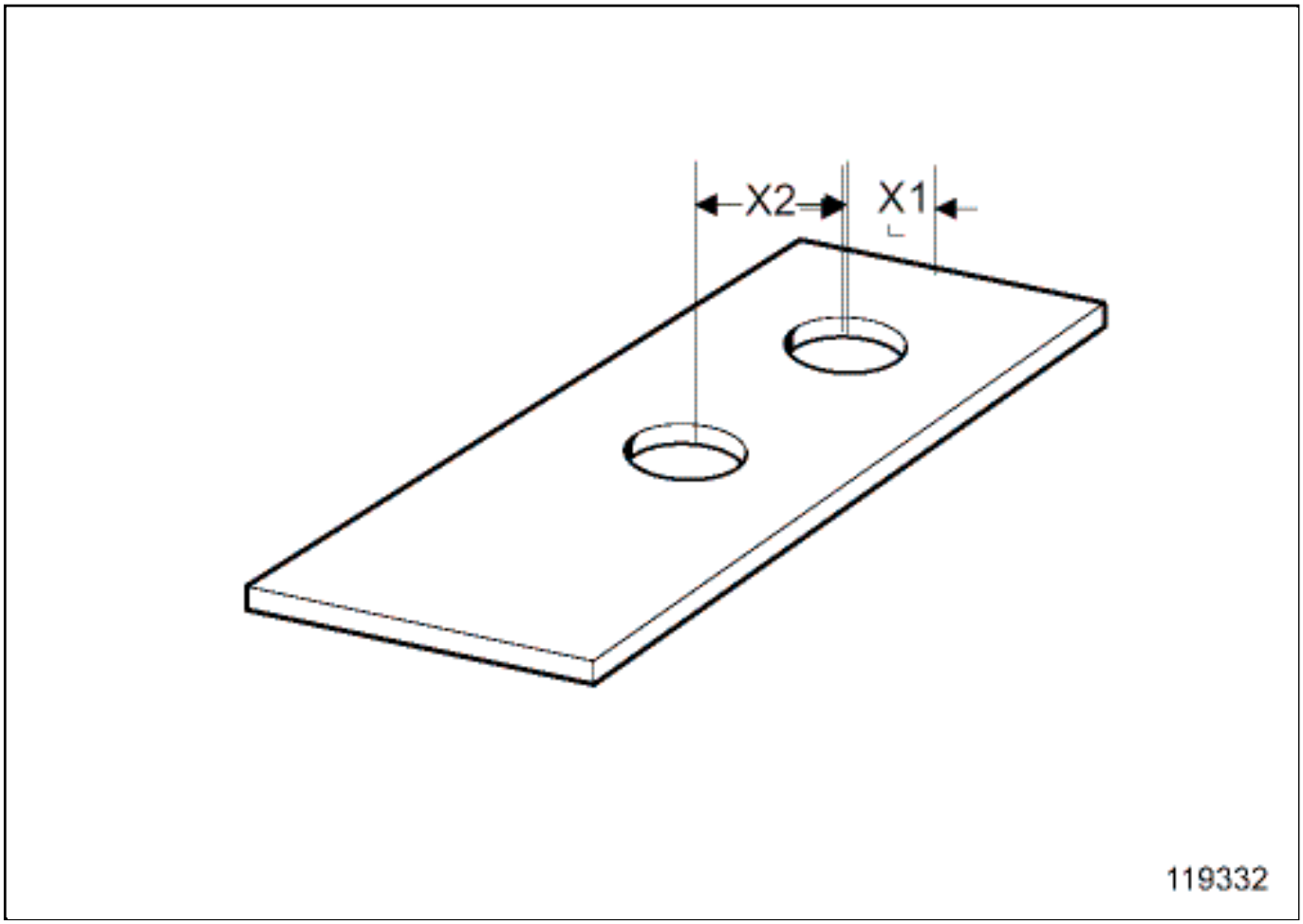
Note:

A new weld check must be carried out if any settings are adjusted.

4. PLUG WELD TEST PROCEDURE

1- PREPARATION BEFORE ASSEMBLY

Select test specimens that are representative of the assembly being tested.

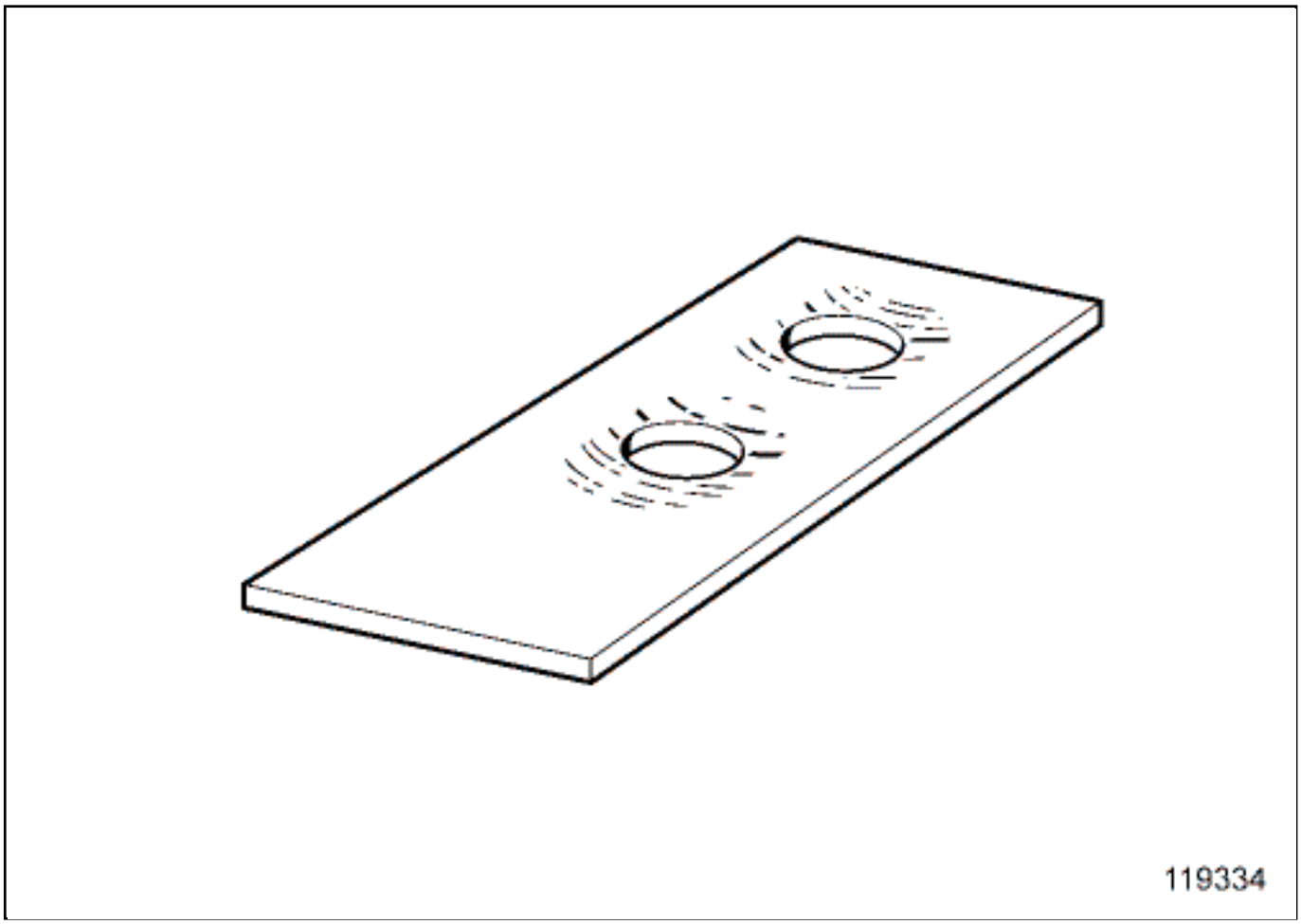


Drill the test specimen, respecting the positioning values, and the following table for the drilling diameters:

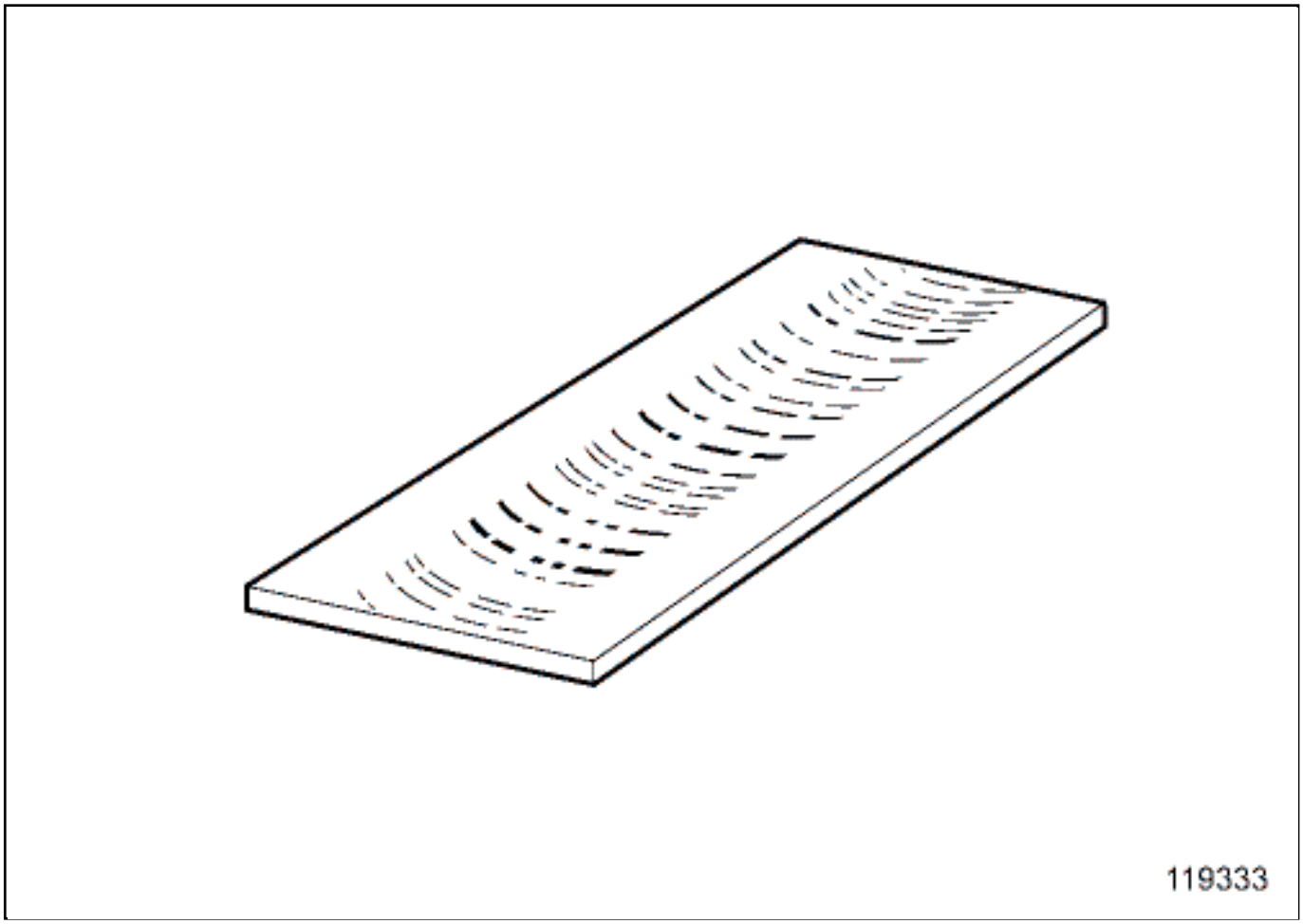
- (X1) = 20 mm
- (X2) = 40 mm

Thickness (mm)	Drill bit diameter (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10

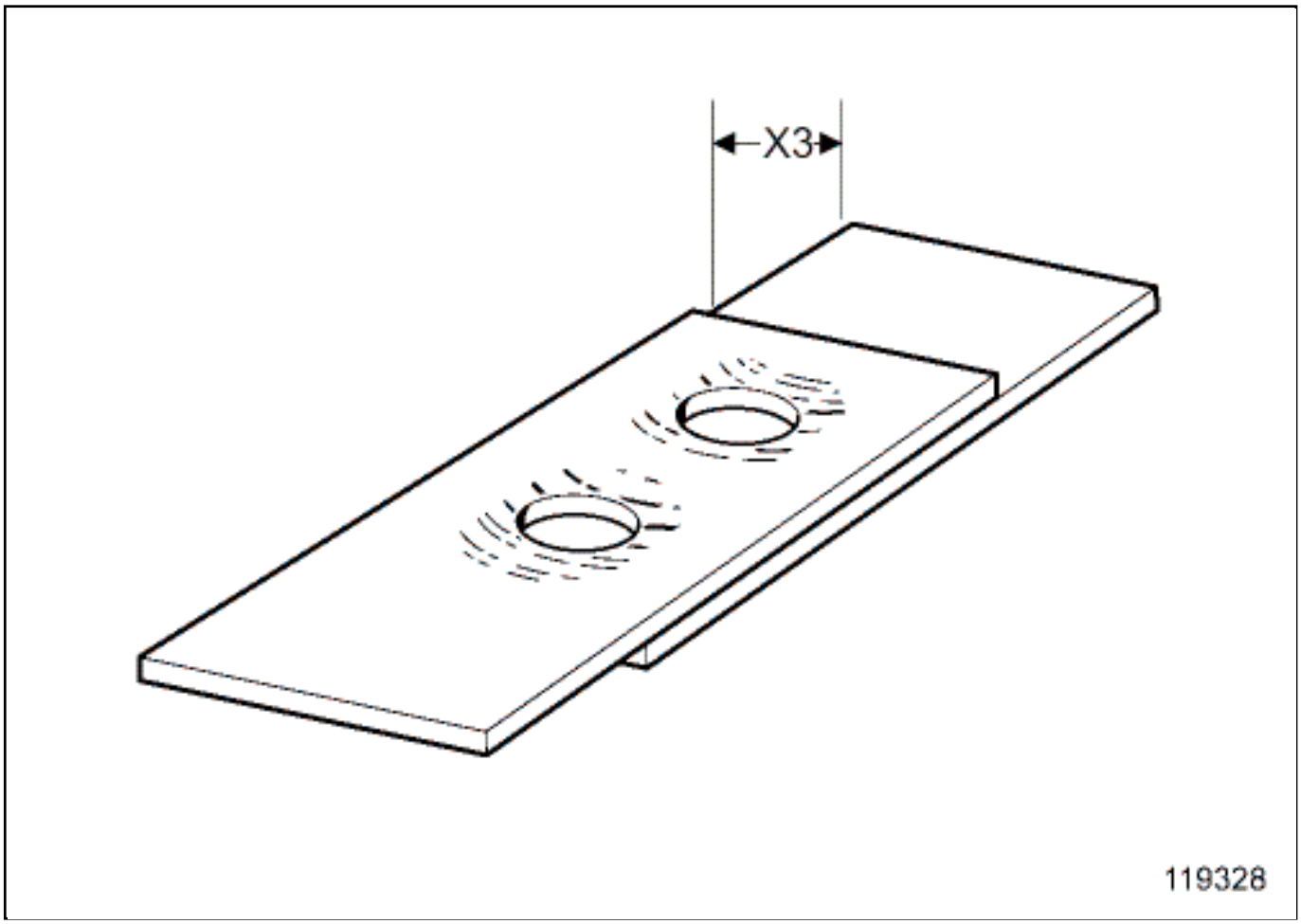
UPPER TEST SPECIMEN



LOWER TEST SPECIMEN

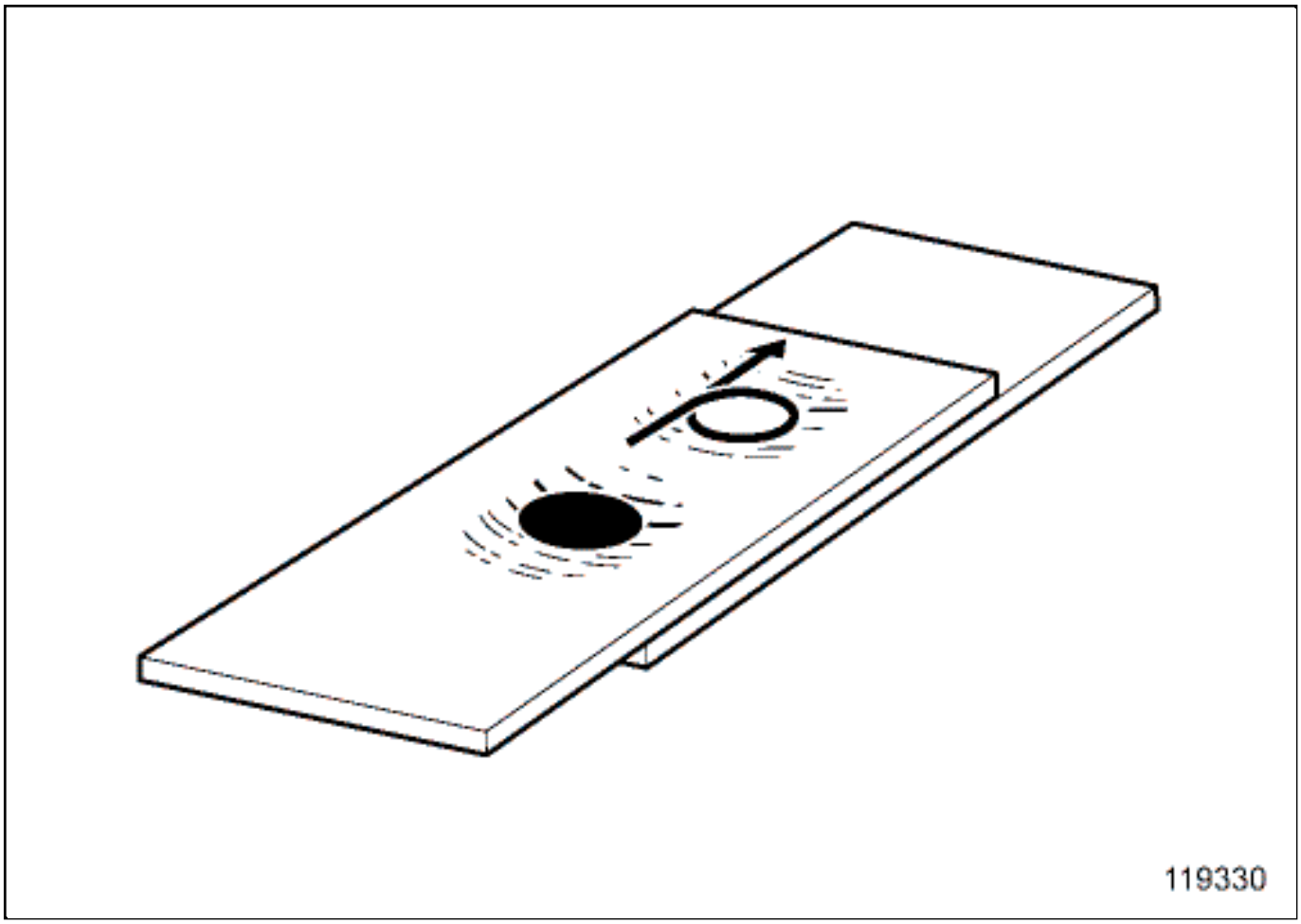


Prepare the test specimens in the same way as the vehicle.



Adjust and secure the test specimens, offsetting them by(X3) = 20 mm.

2- ASSEMBLY

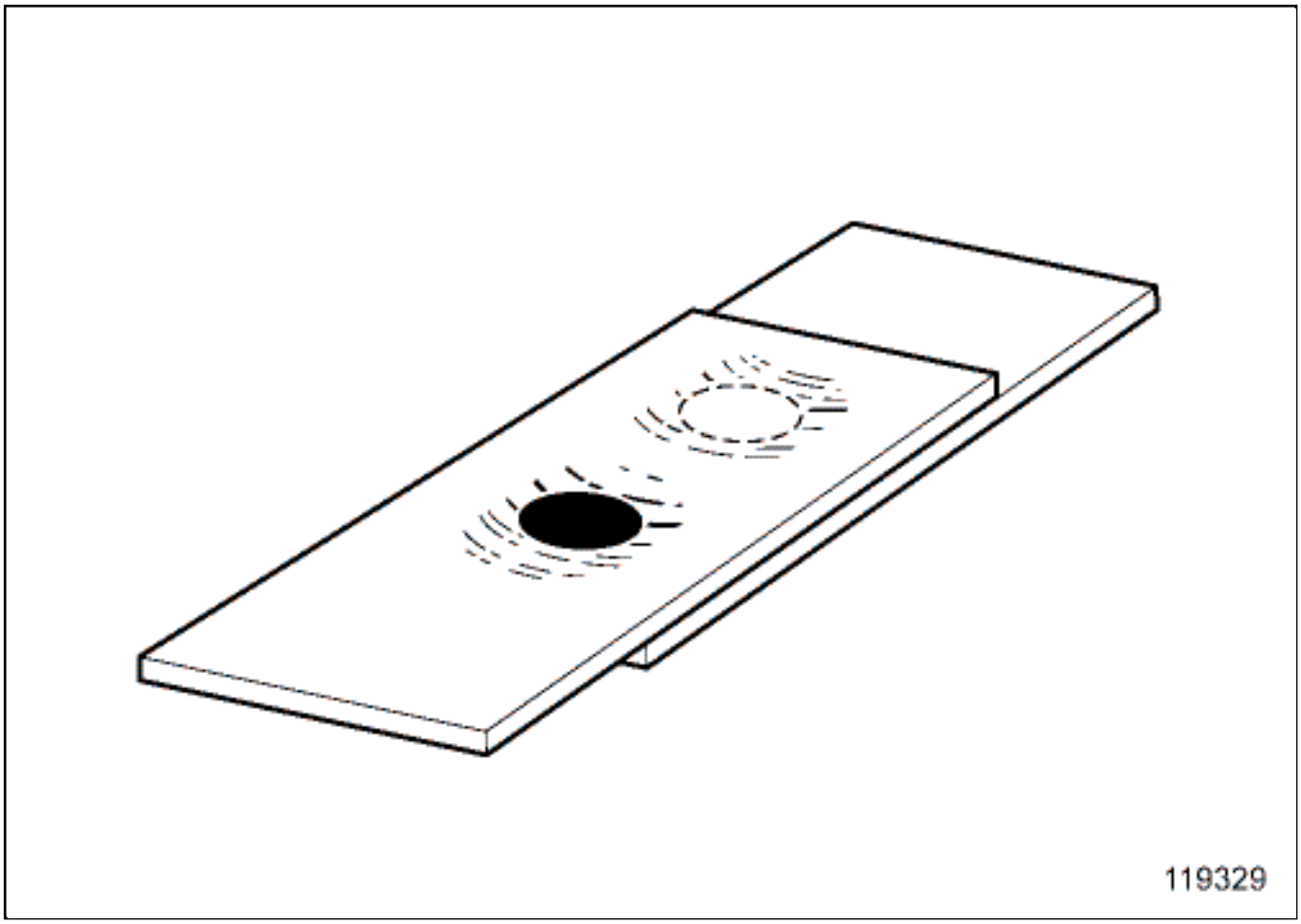


Do the plug welds.

Note:

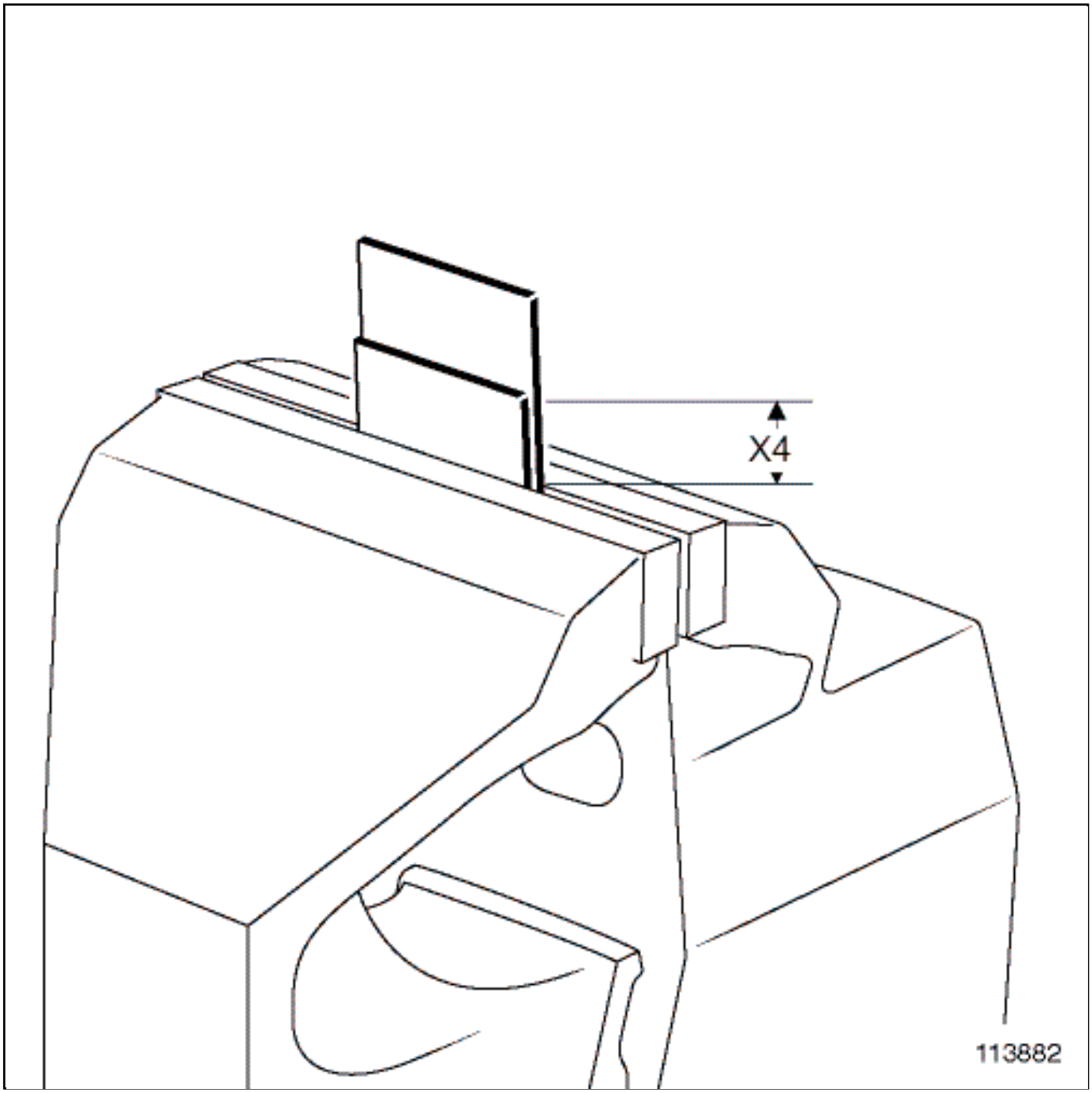
The illustration shows a loop type welding method.

3- CHECK

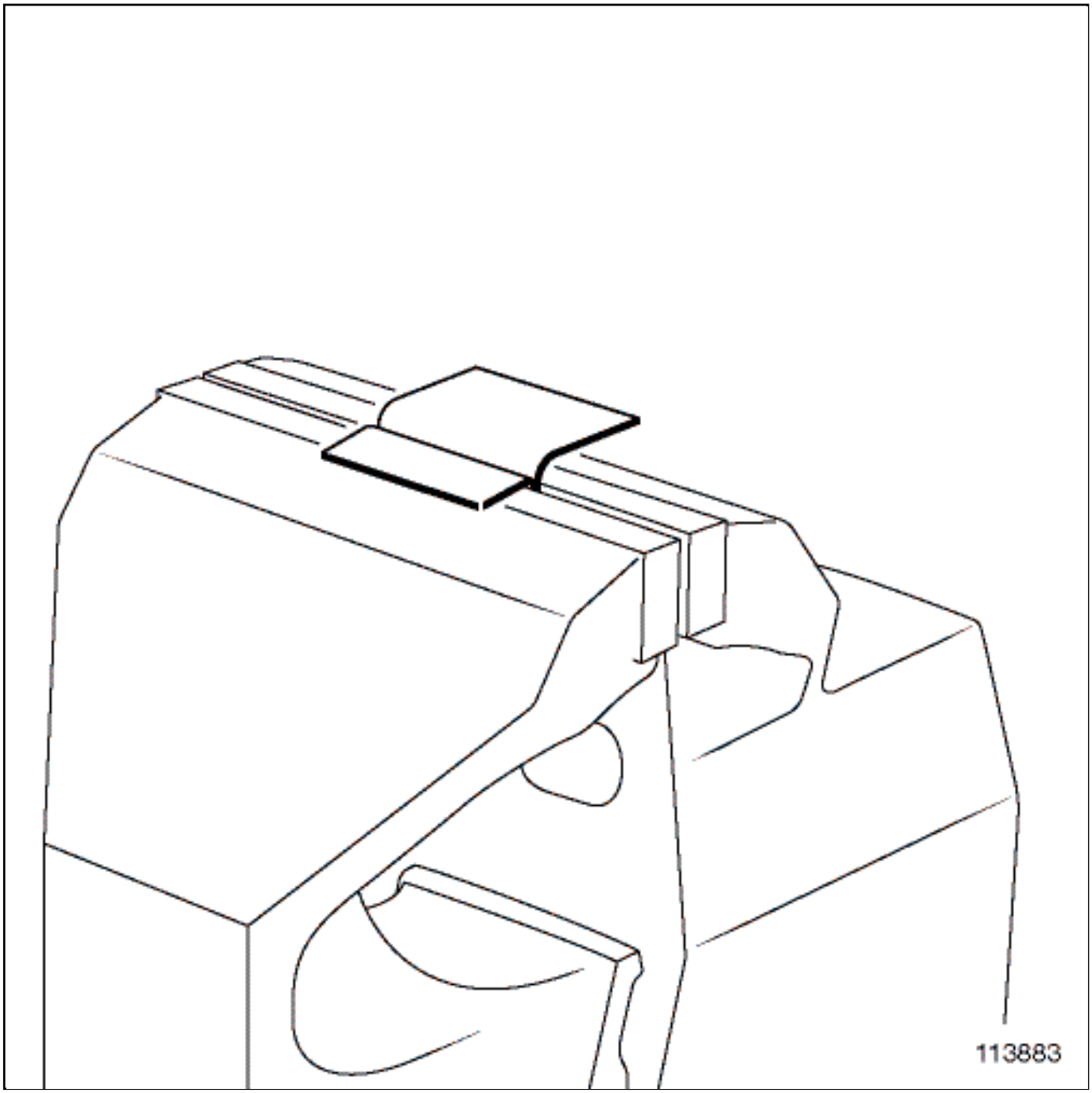


If necessary, level off the plug weld to be tested, to reproduce it as it will appear on the vehicle.

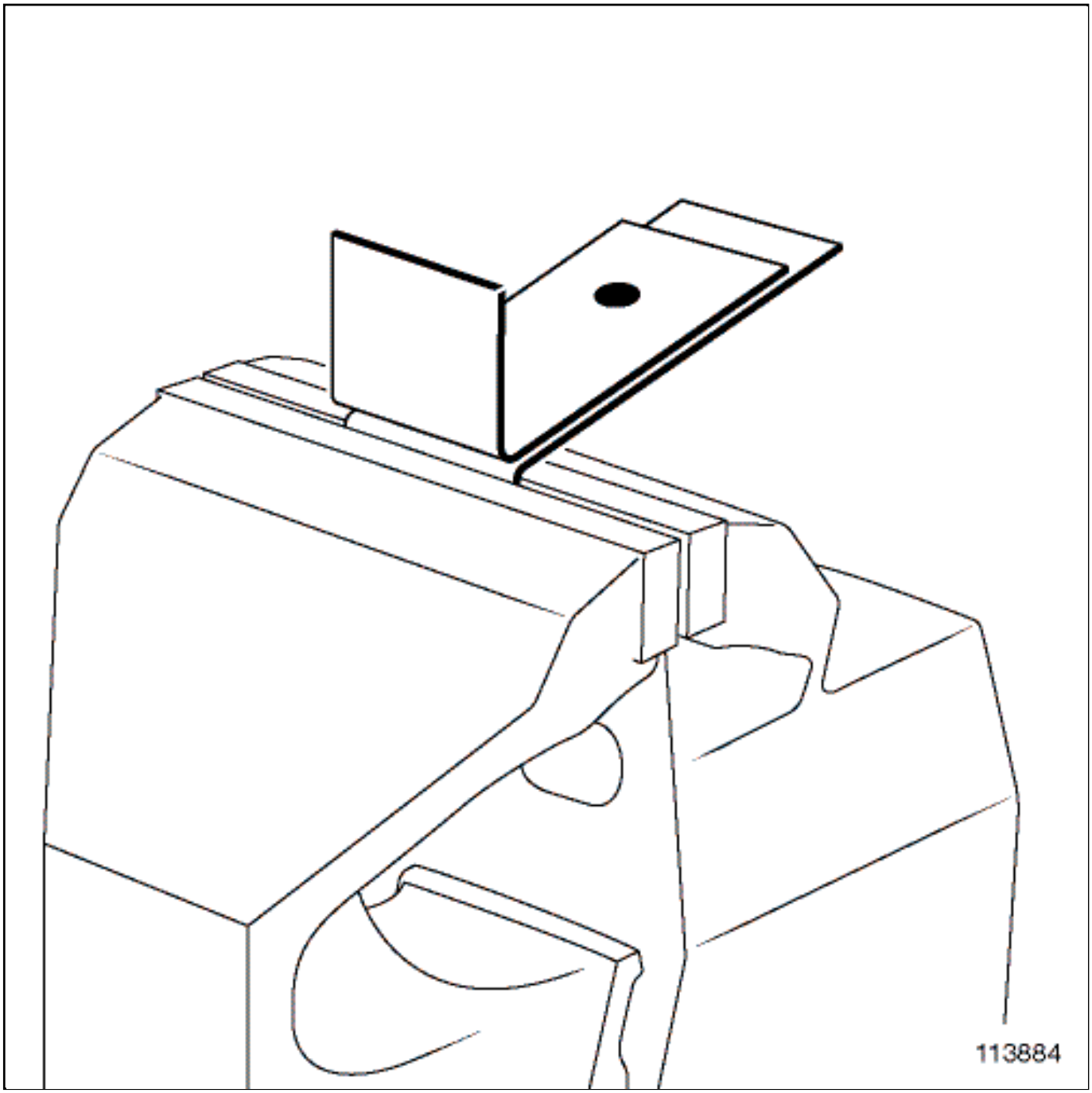
(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)



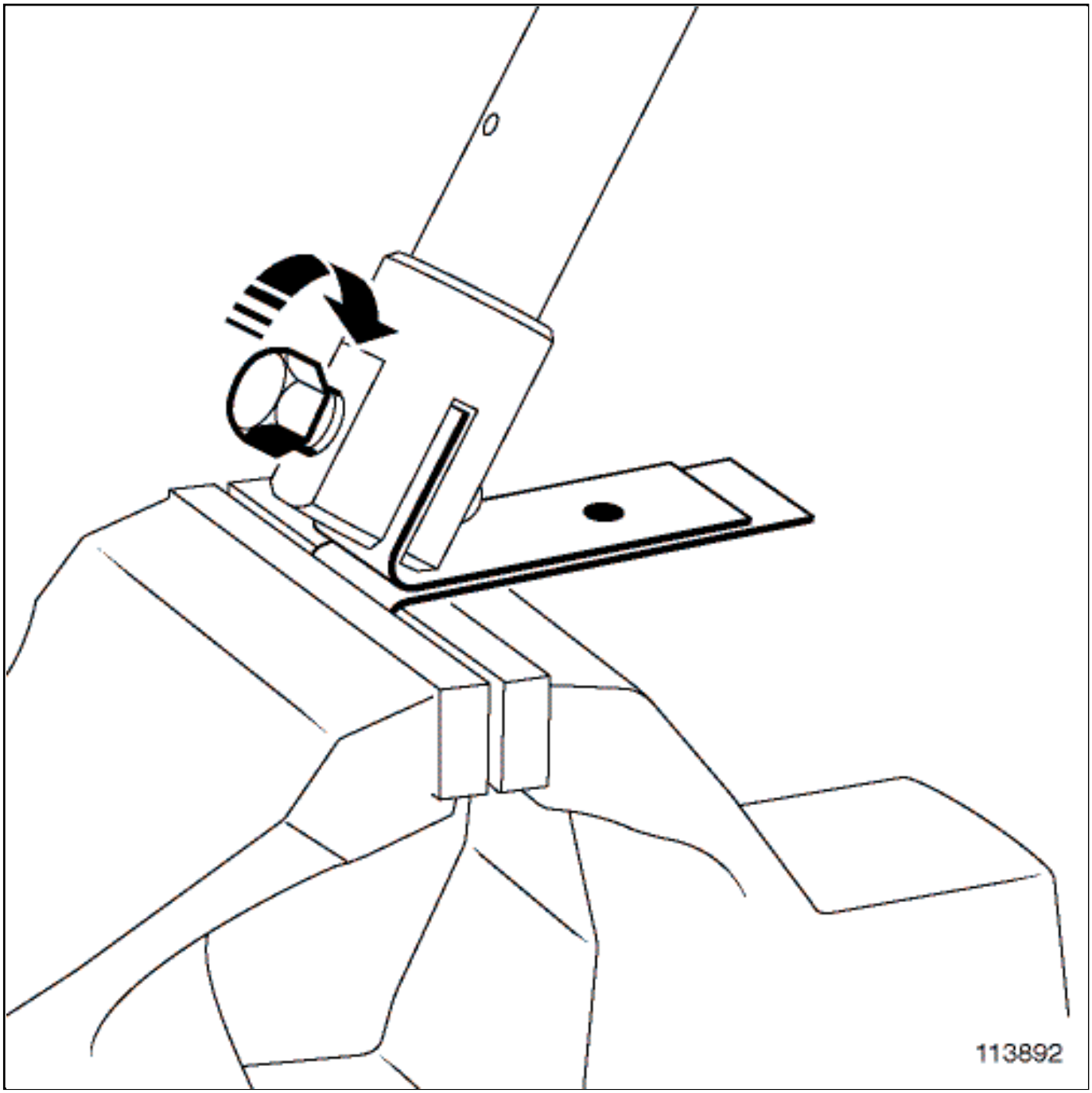
Secure the test specimens in the vice(x_4) = 15 mmto avoid damaging the plug weld during the following stage.



Fold down the test specimens, as shown in the illustration.



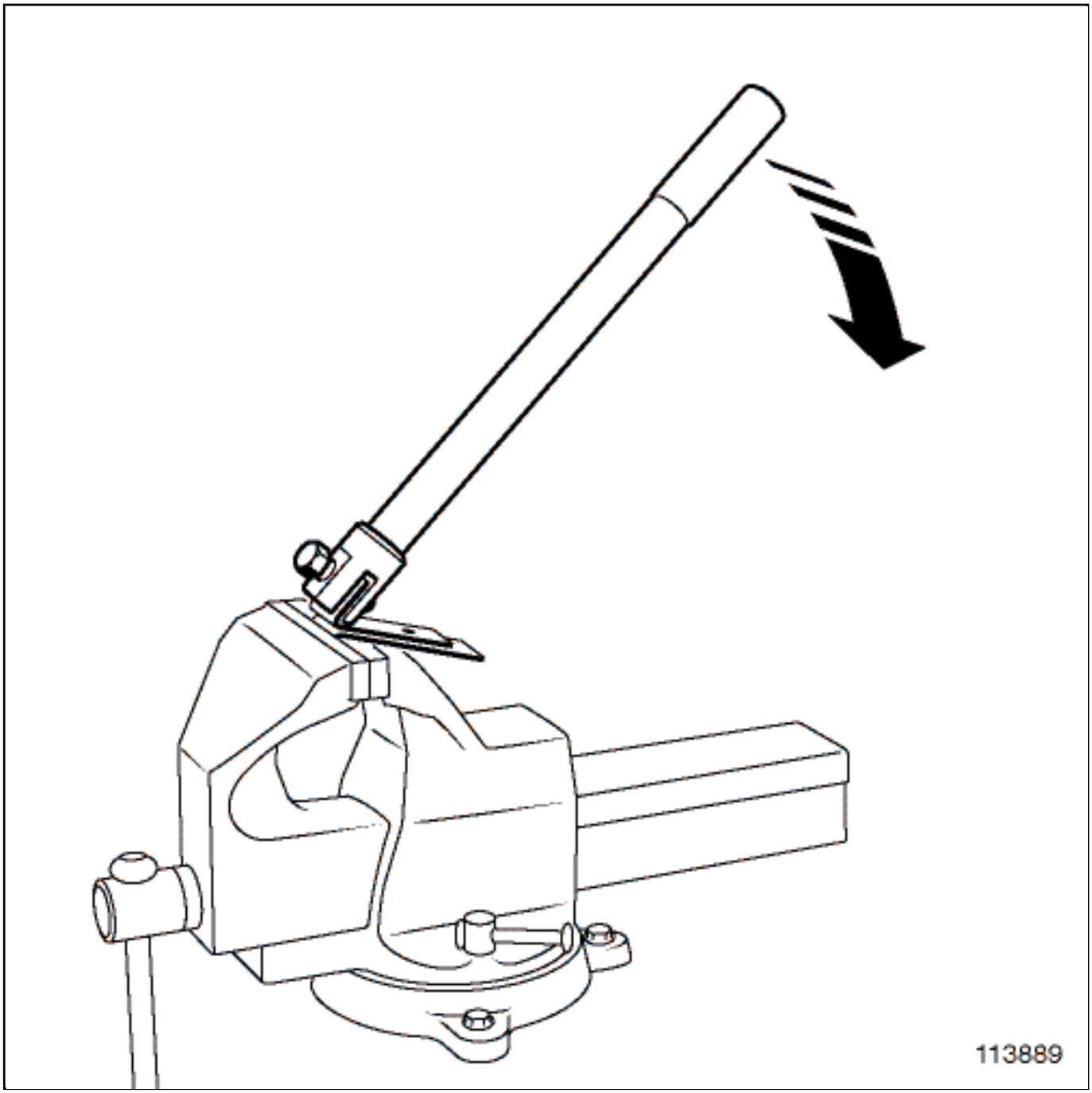
Re-secure the test specimens in the vice.



Secure the jaw of the peeling tool.

WARNING

To avoid any accidents, tighten the jaw of the tool to prevent slipping during peeling.

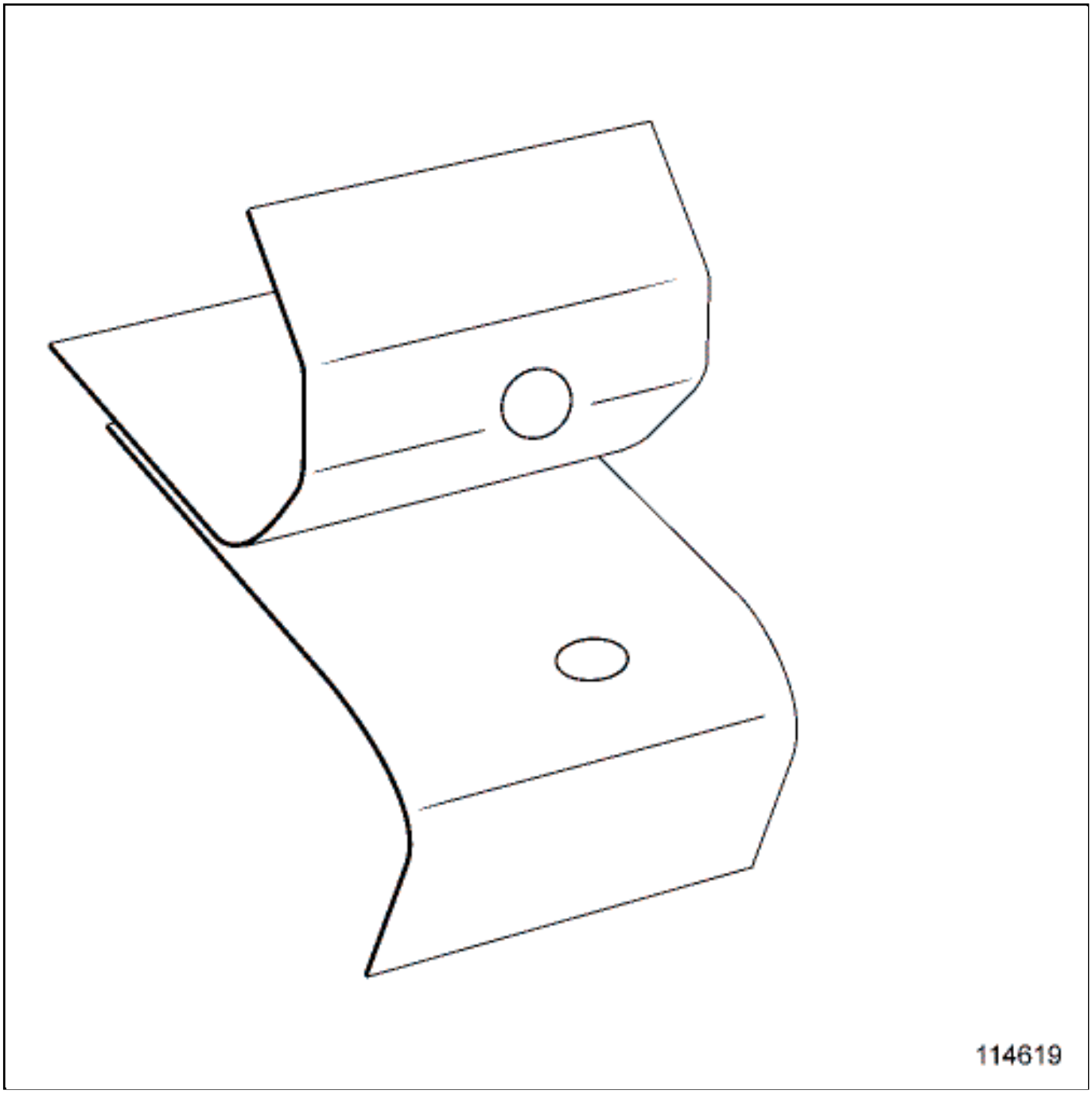


Peel the assembly, applying continuous pressure.

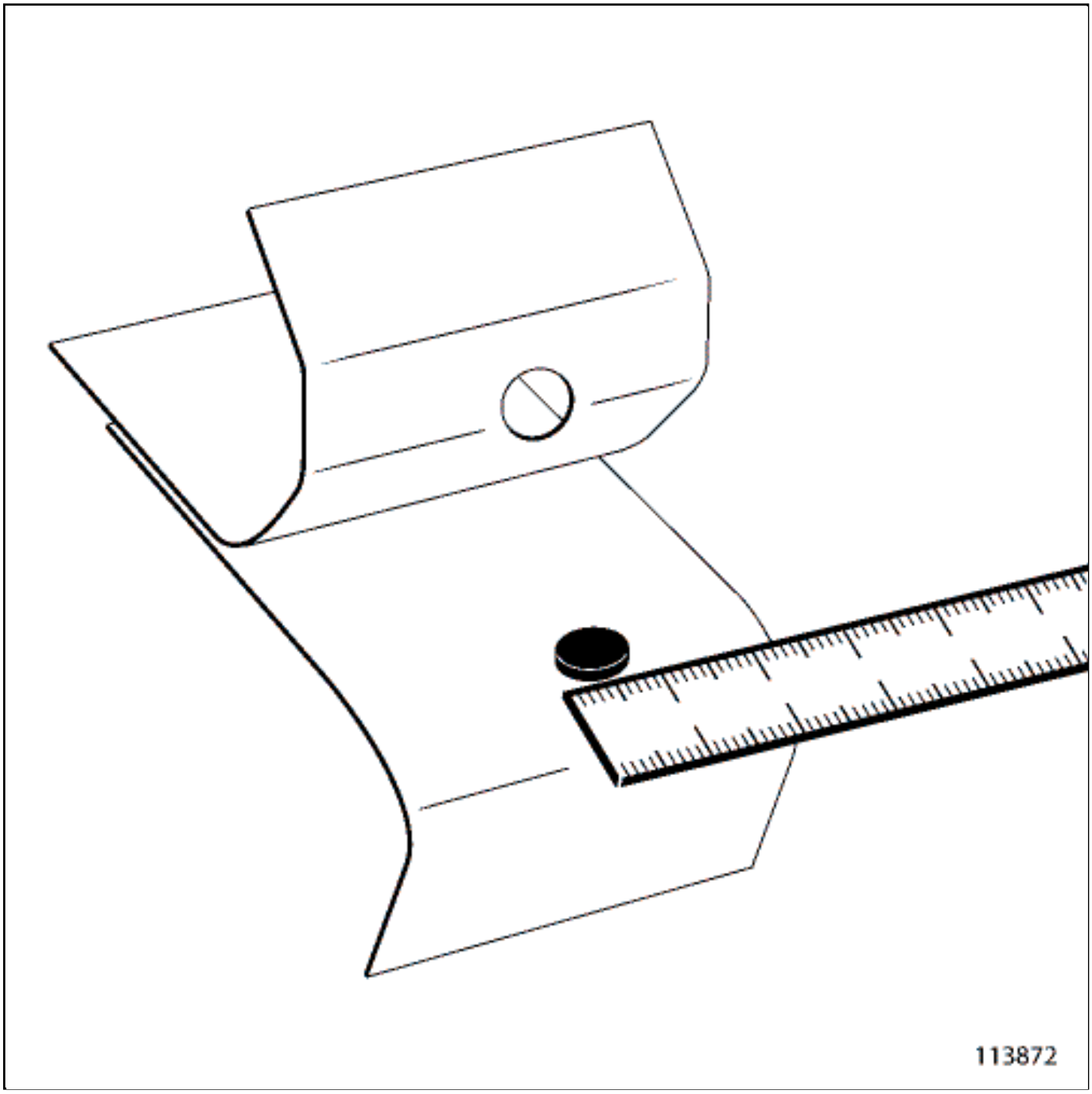
4- RESULTS: INTERPRETATION

this test is based on the presence or absence of a material rivet after peeling of the plug weld.

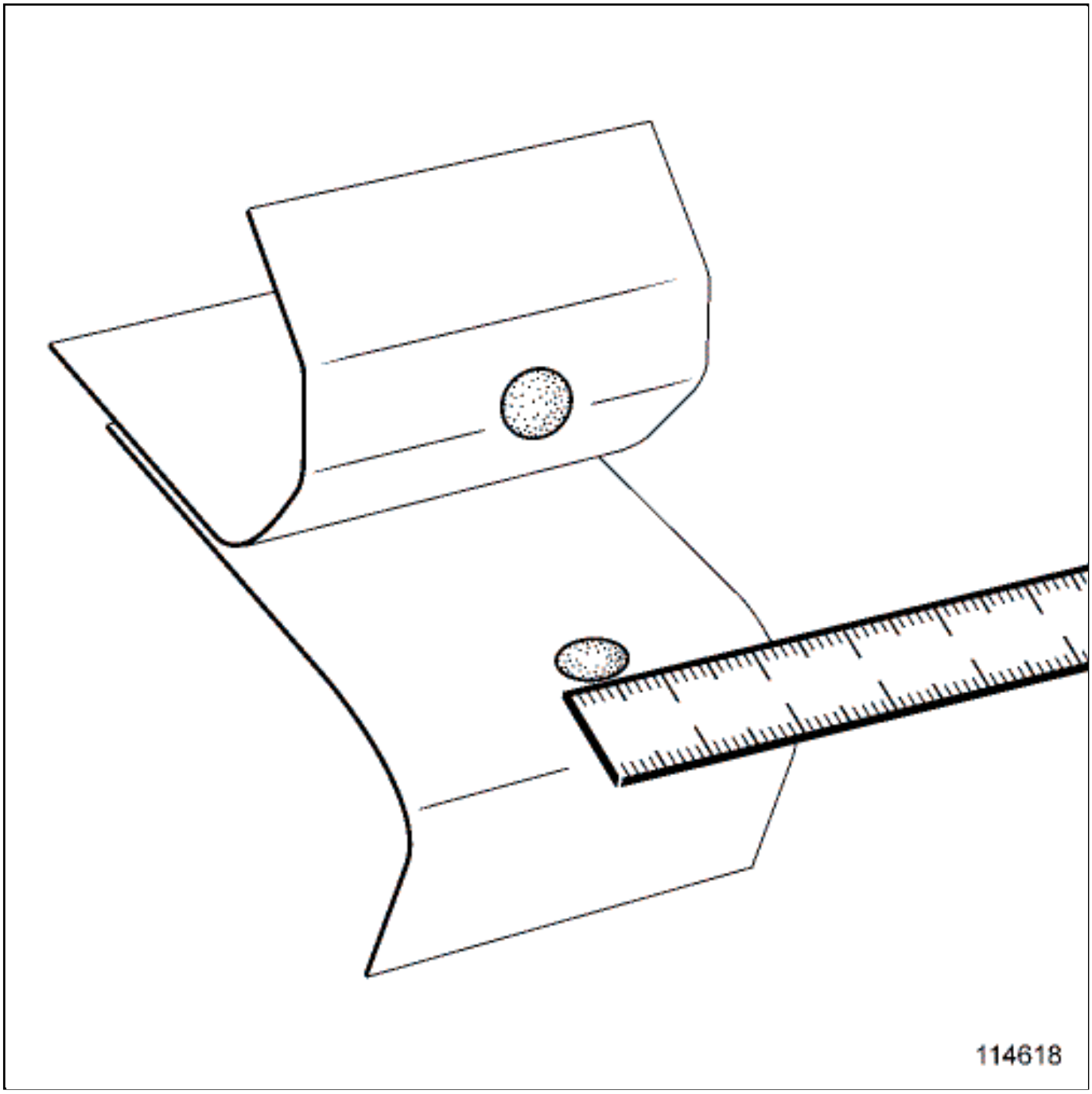
CEMENTED SPOT: UNACCEPTABLE



SPOT WITH MATERIAL RIVET: ACCEPTABLE IF DIAMETER SUFFICIENT



SPOT WITH MATERIAL PULLING OFF: ACCEPTABLE IF DIAMETER SUFFICIENT



Check that the diameter of the material rivet meets the criteria in the following table, with regard to the reference thickness.

thickness (mm)	material rivet diameter (mm)
0.6 to 1.2	4
1.2 to 2	6
2 and more	8

5- SOLUTIONS

If the material rivet is absent or too small:

- Increase the weld current to improve its penetration,

If the current is already at maximum, increase the drilling diameter and the weld time.

Note:

A new peeling test must be performed if any settings or drilling parameters are modified.

CONNECTIONS BY BONDING: PRECAUTIONS FOR THE REPAIR

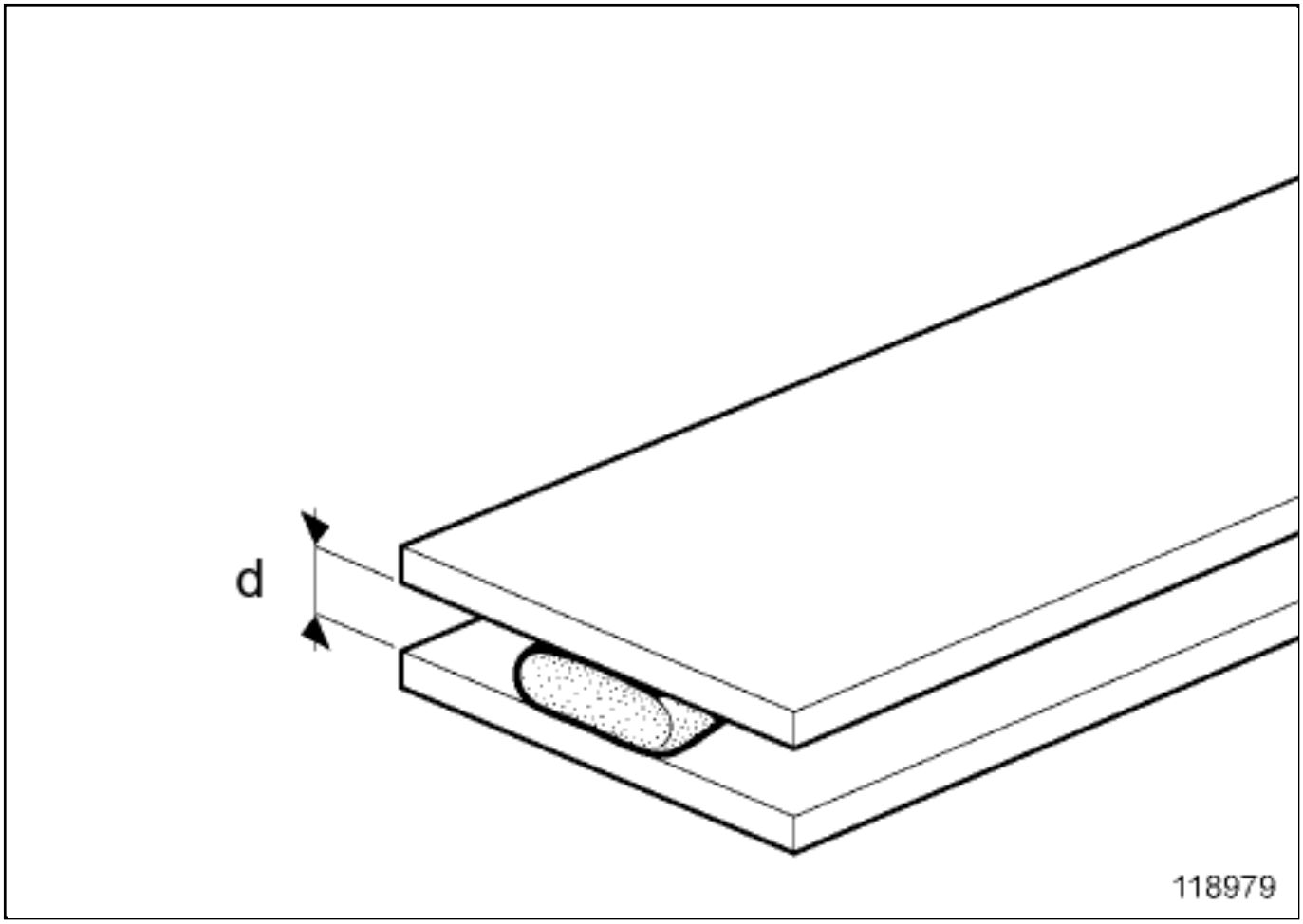
1. INTRODUCTION

The purpose of this document is to provide the information necessary for making a high quality bonded joint.

The main requirement is good preparation of the surfaces to be bonded; the mating faces must be clean, and free from any contamination which could prevent the cement from holding (e.g.: grease or dust).
(see 40F, Bonded connections, Connections by rigid bonding: Description)

2. PRELIMINARY TESTS AND OPERATIONS

1- VALIDATING THE BEAD DIAMETER



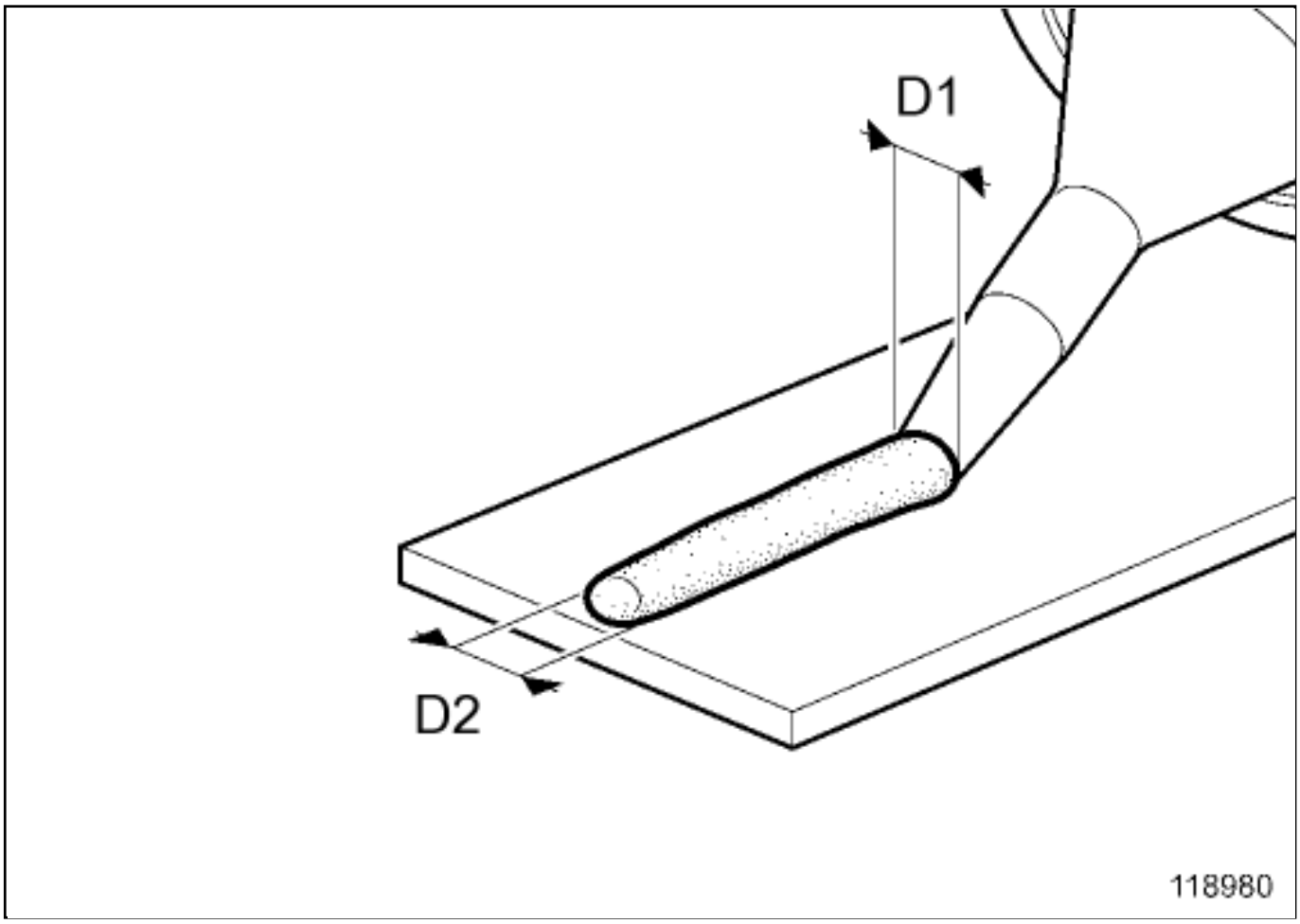
Depending on the gap between the parts to be assembled, adjust the diameter of the cement bead, cutting the end of the cartridge nozzle accordingly. To do this, after adjusting the part to be assembled, use a set of feeler gauges to measure the joint gap:

- for rigid bonding, d should be between 0 and 2 mm,

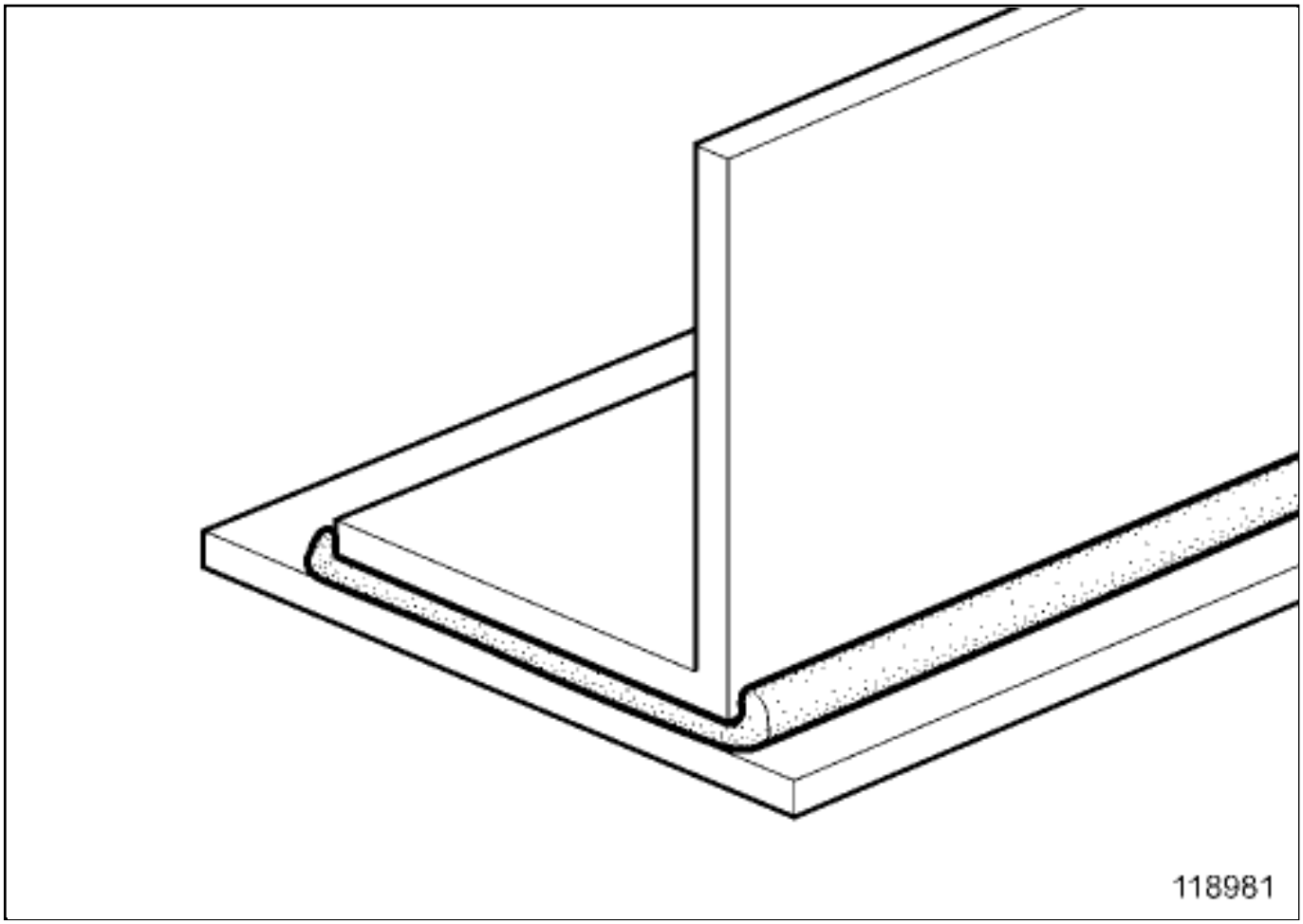
- for elastic bonding, d should be between 2 and 4 mm.

Select the required diameter of the extruded bead according to the following table.

Distance d measured between panels (mm)	Diameter D2 extruded bead average (mm)
Up to 2	4
3	6
4	8



Cut the end of the nozzle to a diameter D1, 1 mm smaller than the required diameter of the bead D2 after extrusion.



If the joint between the two parts to be bonded is limited to the width of the mating face, check that the cement overlaps the two sides of the bonding zone.

2- VALIDATING THE PRODUCT MIXTURE FOR DUAL COMPONENT BONDING CEMENT

When testing the bead diameter, check that the dual component mixture has a uniform colour.

1)REMINDER:

If the bonded joint is associated with a plug welded joint, the cement bead should be broken 1 cmeither side of each weld point so that the cement does not alter the weld point.

CONNECTIONS BY BRAZING: CONNECTIONS BY BRAZING

To replace an original braze connection, apply a GMAW weld bead.

1. DISASSEMBLY

1- SCOURING

If necessary, scour the joint line to bring out the weld bead:

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- UNPICKING

Unpick the braze bead.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

3- GRINDING

Grind the brazing residues.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface finish the mating face.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Remove all brazing residue, in order not to contaminate the GMAW bead joint.

Note:

Do not strike or damage the support panel.

2. PREPARATION BEFORE ASSEMBLY

1- POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Remove the replacement part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

Scour the external mating face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- APPLY THE PROTECTION BEFORE ASSEMBLY

Apply the anti-corrosion protection to the internal joint mating faces.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3. ASSEMBLY

1- POSITIONING THE REPLACEMENT PART

Position the replacement part, adjust it and fix it.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- ADJUSTING THE WELDER

Before working on the vehicle, follow the procedure below:

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

3- CARRYING OUT THE WELDING

Make the weld bead, the same length and in exactly the same position as the original.

4- FINISHING

Reproduce the original appearance of the connection by brazing.

CONNECTIONS BY RIGID BONDING: DESCRIPTION

Special tooling required	
Levelling tool for bodywork seal	Car. 1786

Equipment required
safety strap(s)

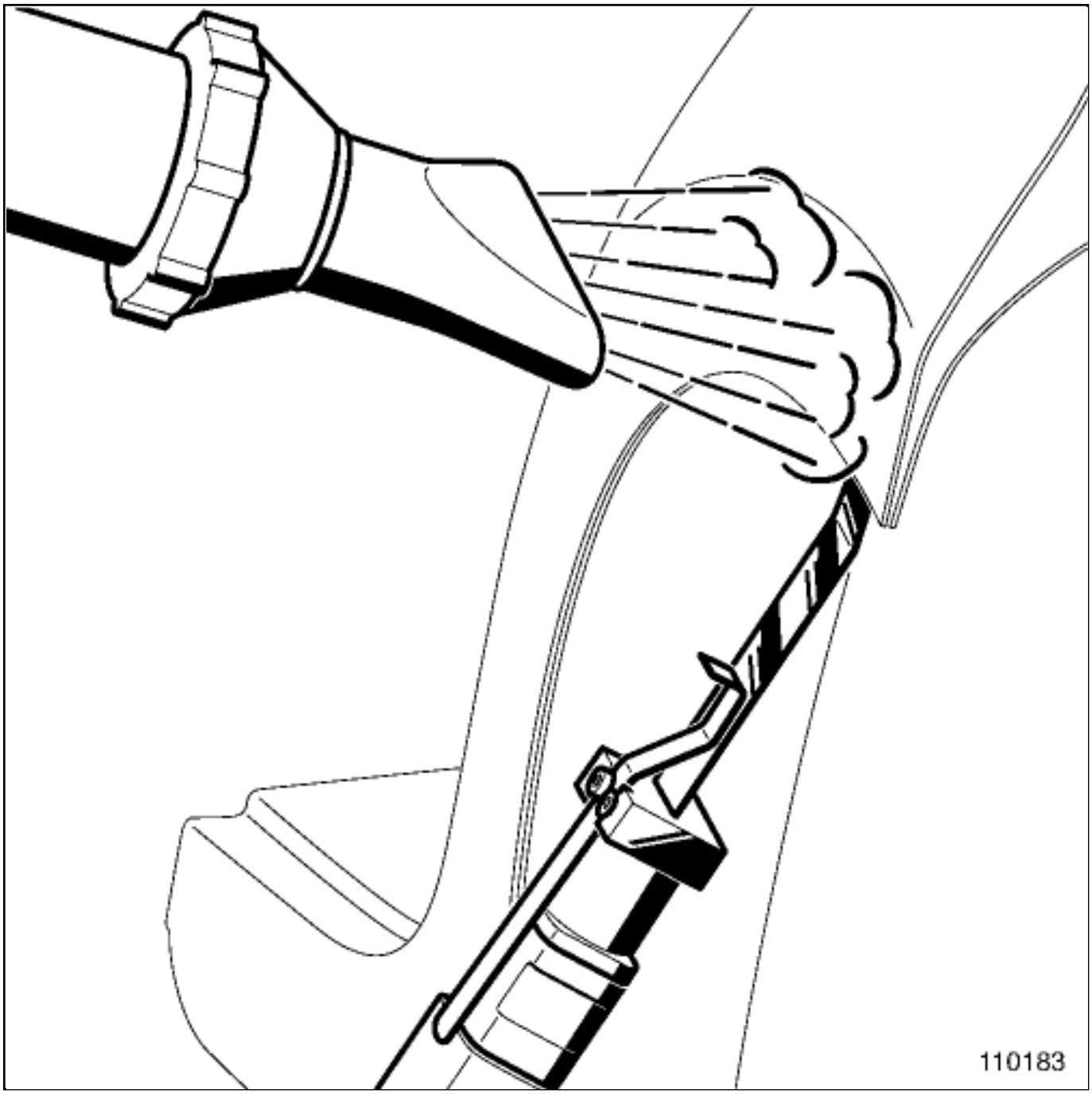
1. DISASSEMBLY

A rigid bonded joint can be associated with a variety of joints:

- crimped,
- resistance welded,
- riveted,
- bolted.

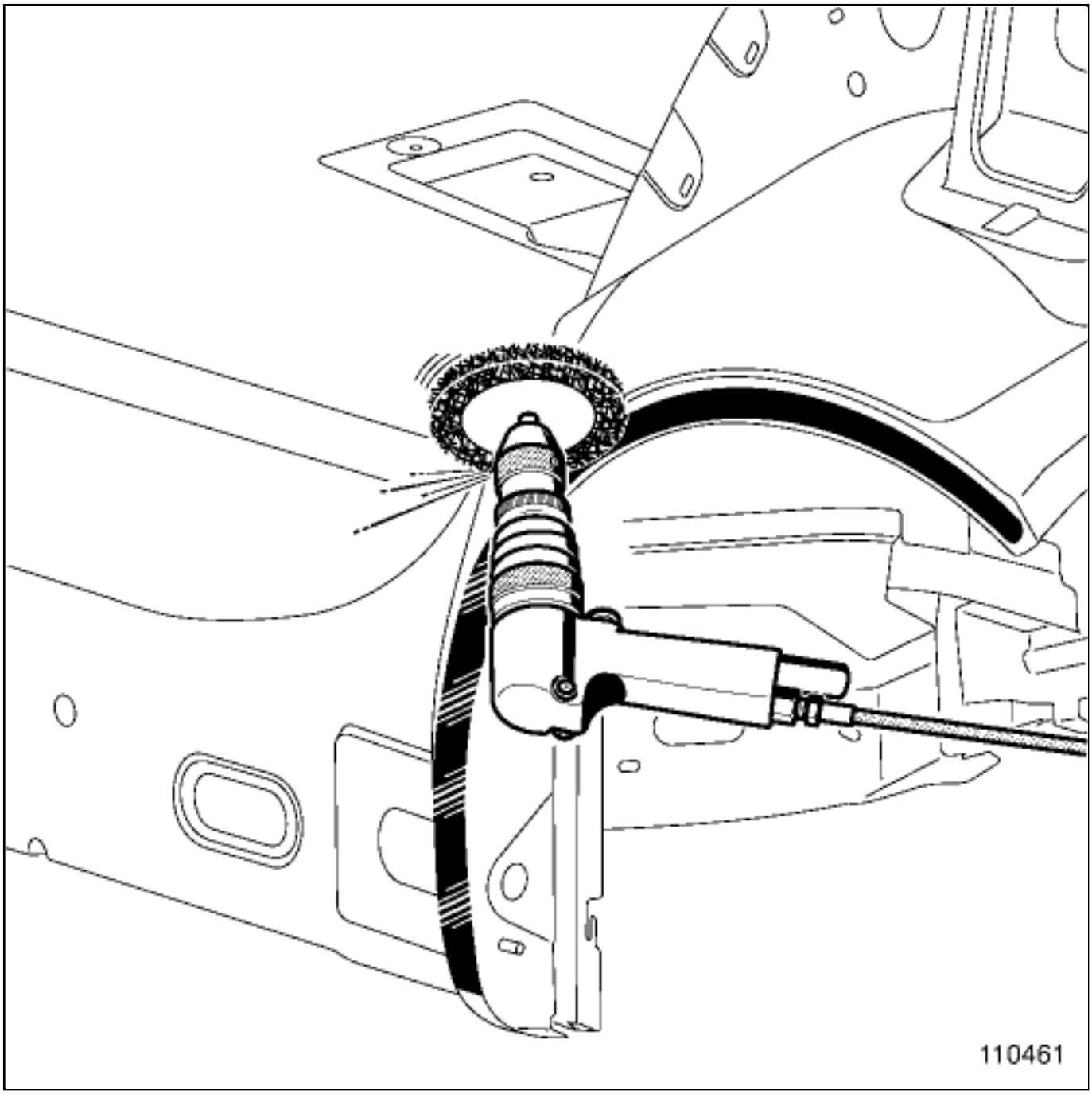
Disassemble these joints to allow access to the cement bead (see documentation corresponding to the relevant associated joint).

1- UNSTICKING



Remove the damaged part, by simultaneously heating with a heat stripper to destroy the bonding.

2- SCOURING



Scour the cement residue left on the vehicle(see **Tools for stripping hard mastics and paint: Use**) .

2. PREPARATION BEFORE ASSEMBLY

1- ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.**(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)**

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Remove the replacement part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

Sand using P320dry sand paper or a red abrasive pad, without removing the protection.

Clean the internal joint face with surface cleaner.

4- PREPARATION OF THE JOINTS ON THE VEHICLE

Clean the internal joint face with surface cleaner.

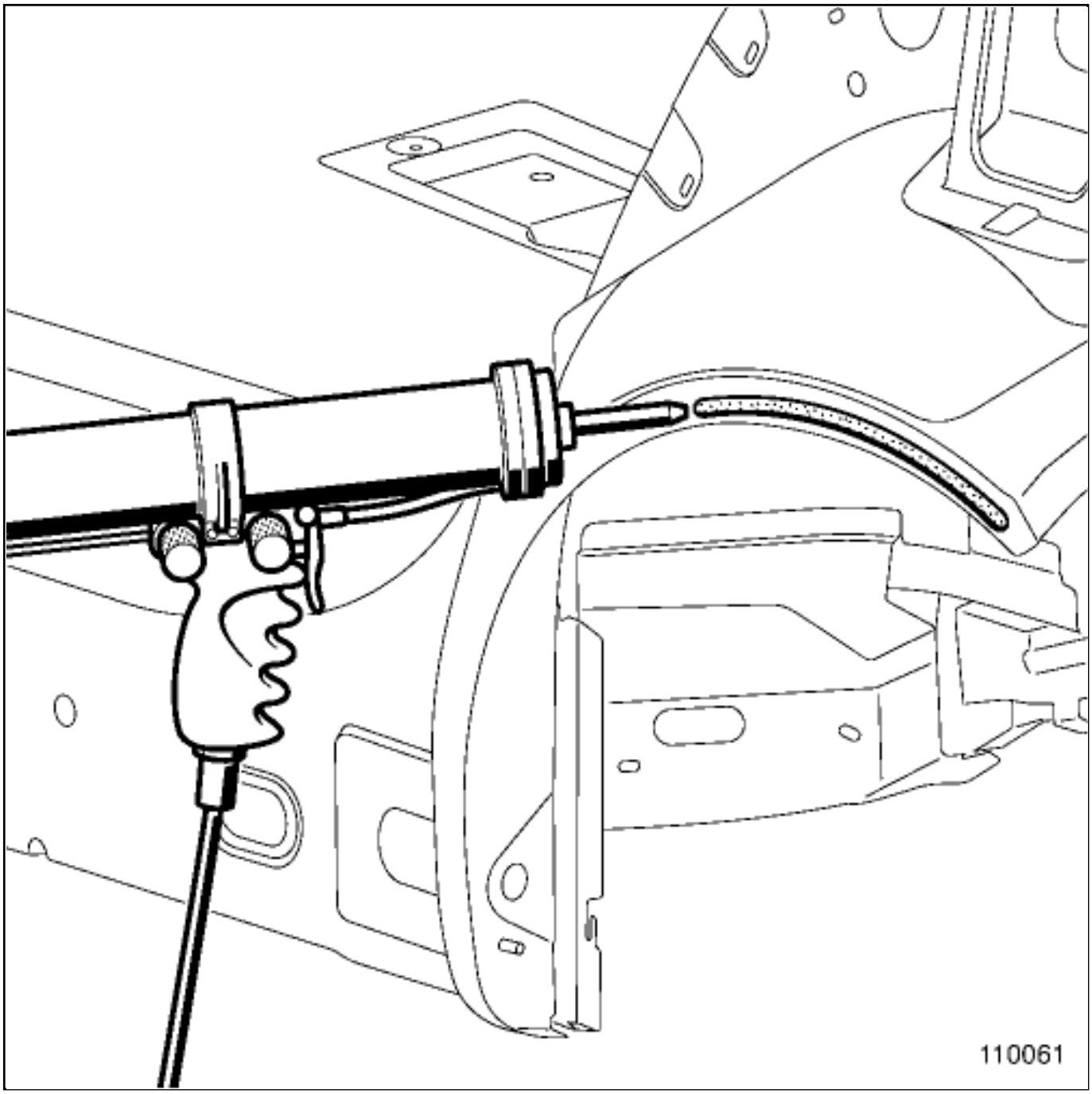
5- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

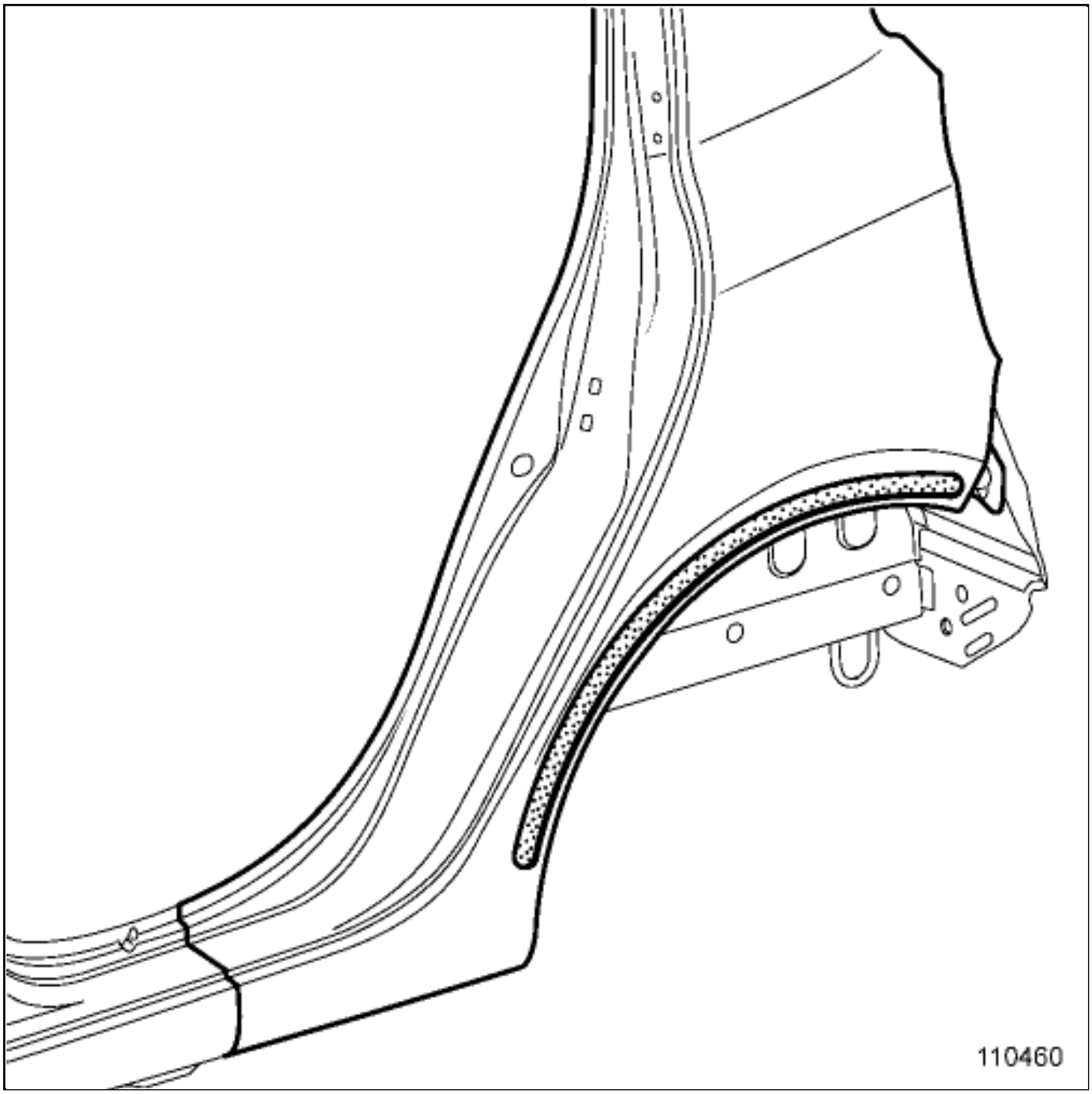
3. ASSEMBLY

1- APPLICATION OF THE BONDING PRODUCT



Apply the relevant bonding product for the type of joint concerned(see 40F, Bonded connections, Connections by bonding: Precautions for the repair) (see 04F, Bodywork products and mountings, Products and equipment for bonded assembly: Use)

2- FITTING AND ADJUSTING THE REPLACED PARTS



Position the part on the vehicle.

Tighten the joint using C-clamps to flatten the seal and ensure bonding.

Insert the plastic protector shims between the C-clamps and the part so that it is not marked.

3- FINISHING

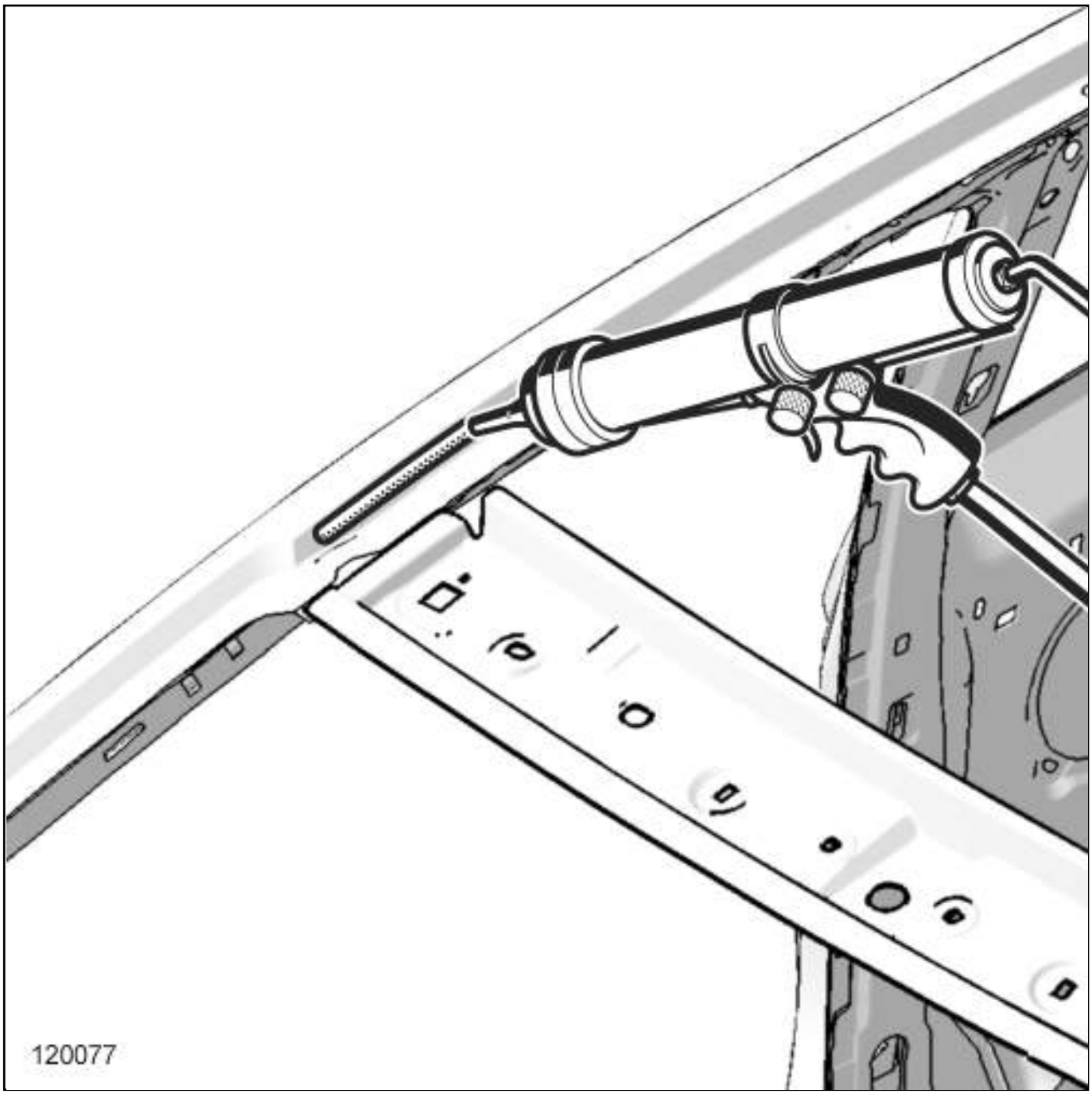
Remove the excess cement with thinner before drying.

Make the original associated joint (see procedure corresponding to the relevant associated joint).

Note:

If the bonded joint is associated with a resistance welded joint, the joint face is not accessible using the spot welder and the spot welds are replaced by plug welds, the cement bead must be broken at the plug welds so as not to alter the spot quality.

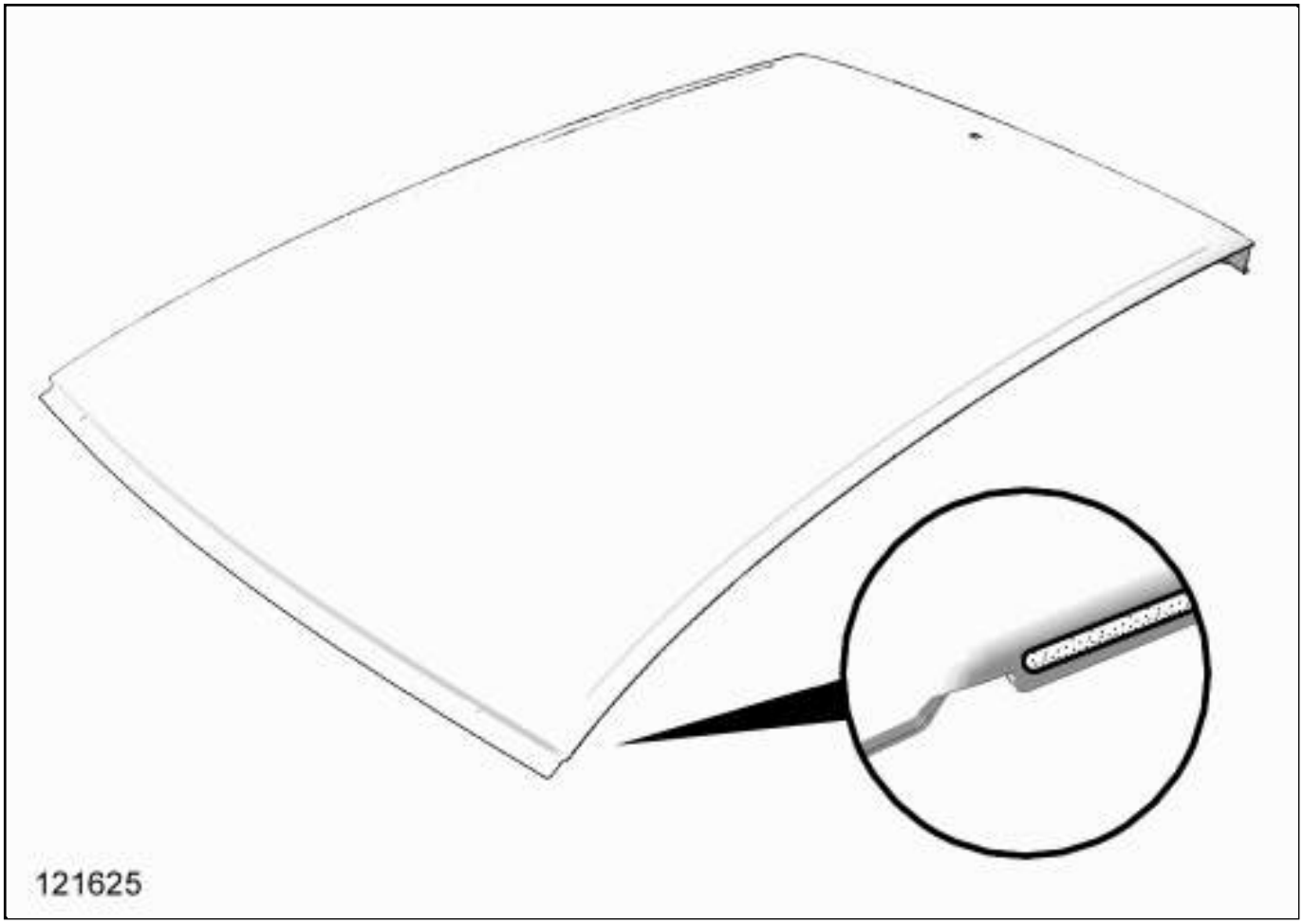
4. SPECIAL NOTES ON ROOF ASSEMBLY: DESCRIPTION



Apply a cement bead to the roof cross members.

Apply a bead of high performance structural adhesiveover the whole internal joint face on the body side (see 40F, Bonded connections, Connections by rigid bonding: Description) (MR400, 40F, Bonded connections).

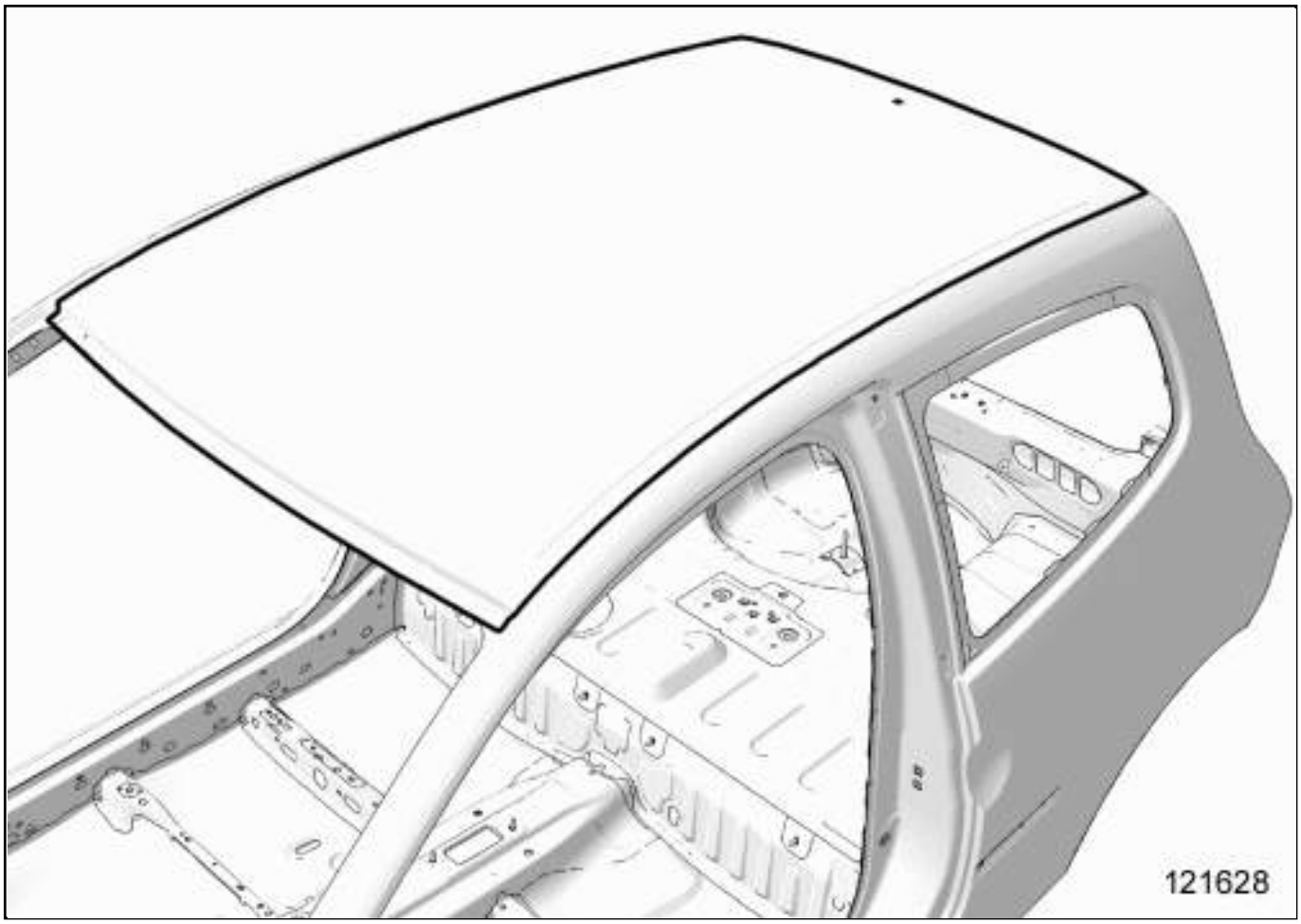
Smooth the high performance structural adhesiveusing a small brush.

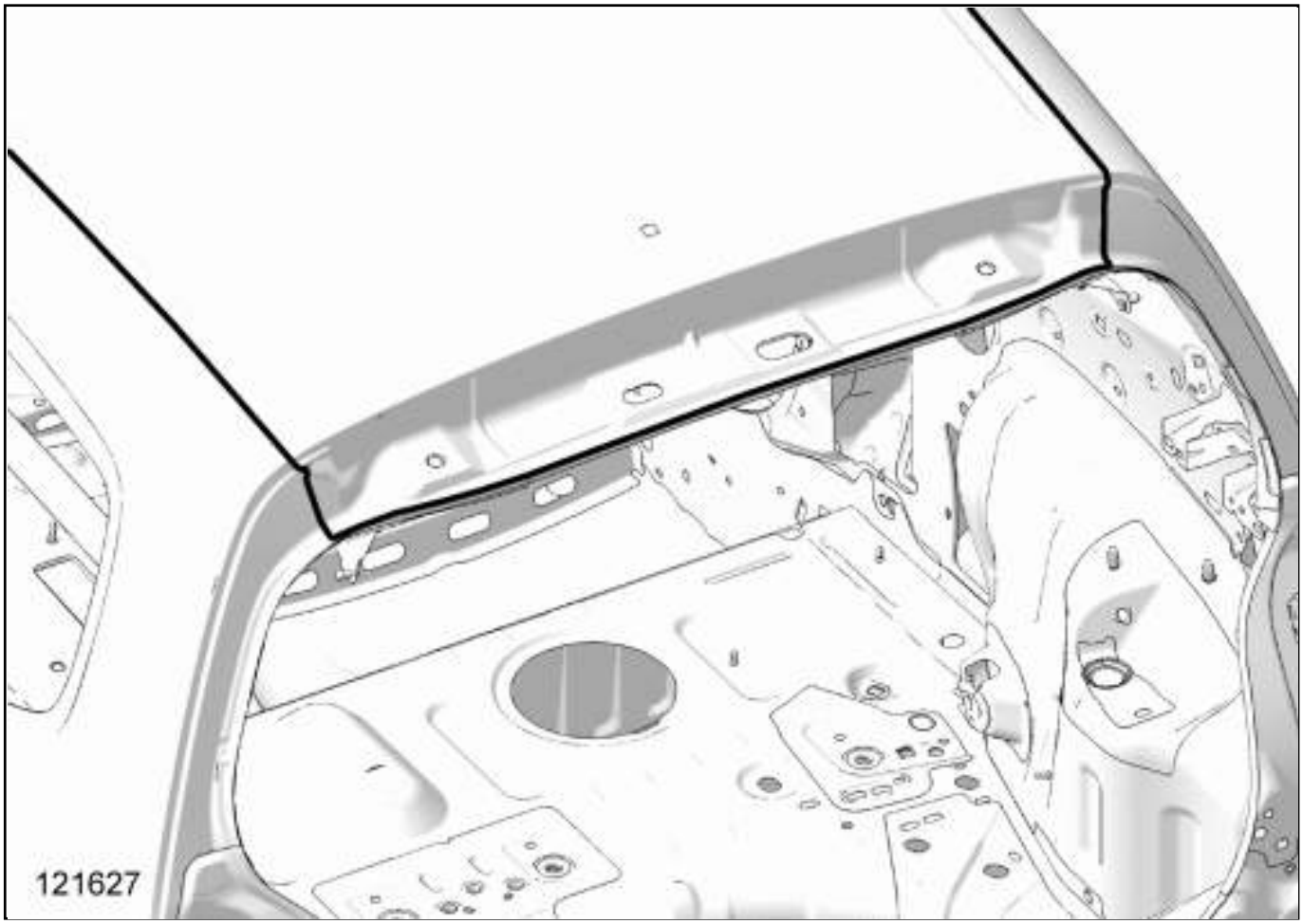


Apply a bead of high performance structural adhesiveto the spare part.

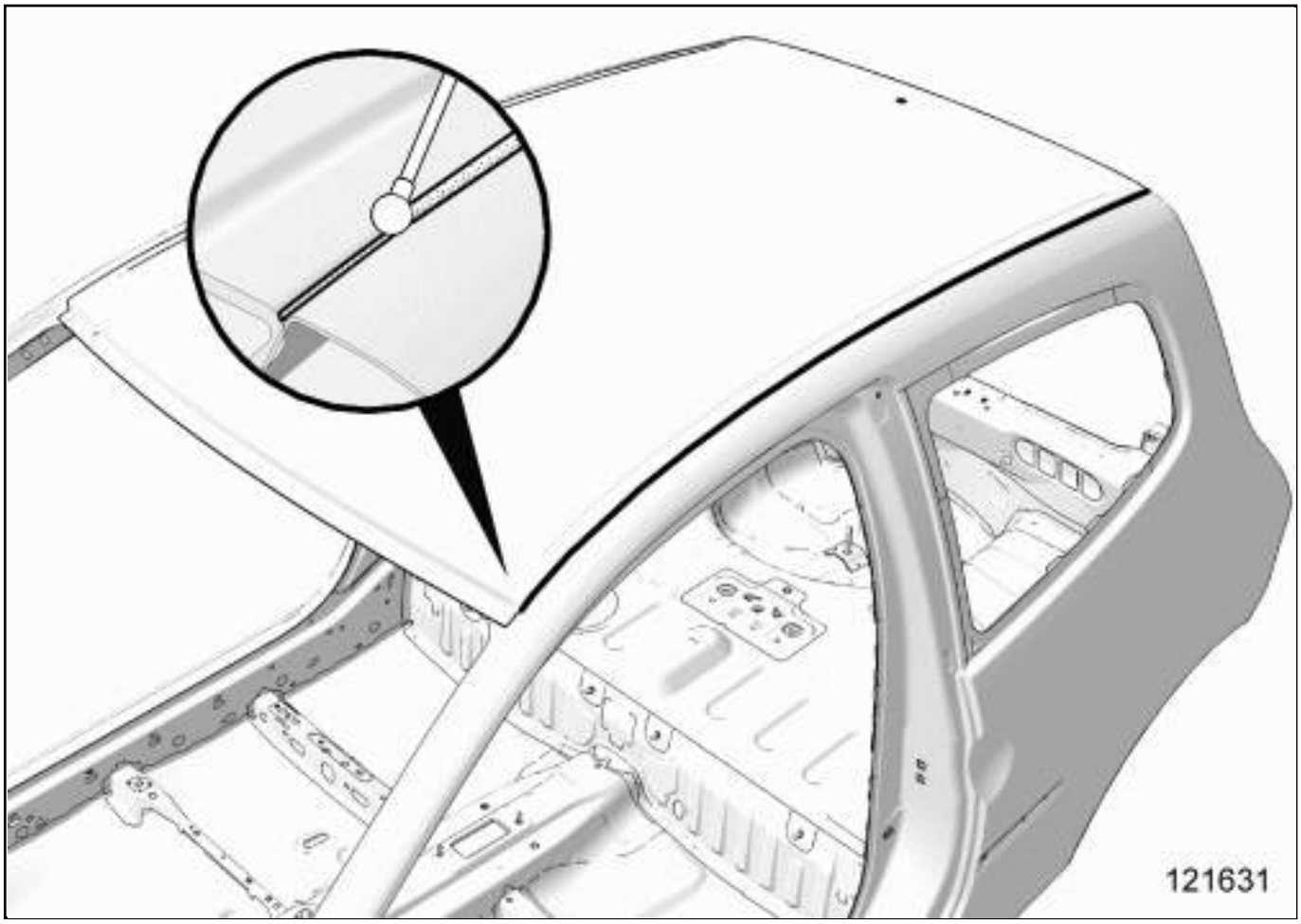
1-

1)FITTING AND ADJUSTING THE REPLACED PARTS

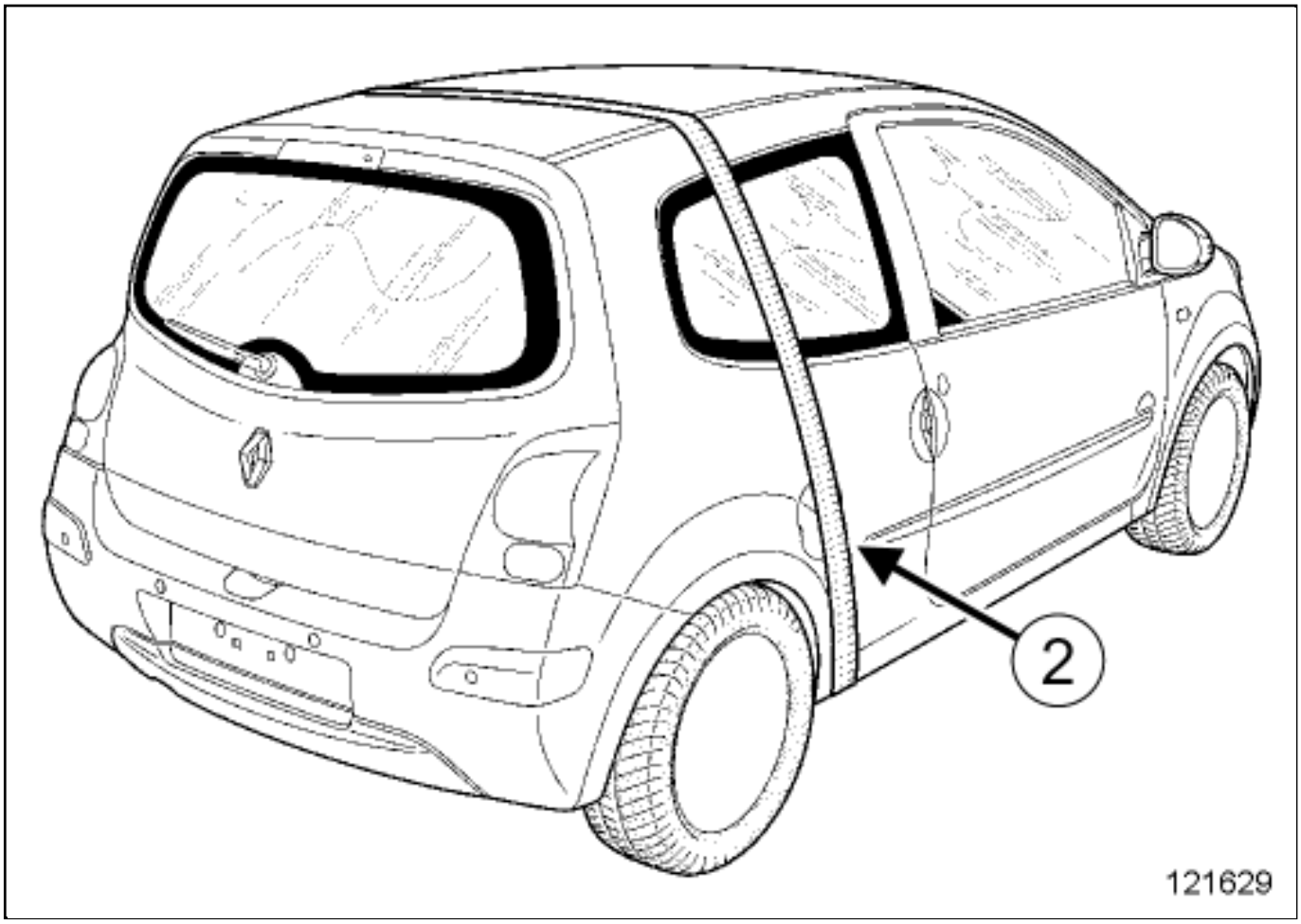

121628



Position the replacement part on the vehicle.



Scrape off the surplus adhesive before it dries using theLevelling tool for bodywork seal(Car. 1786) .


2
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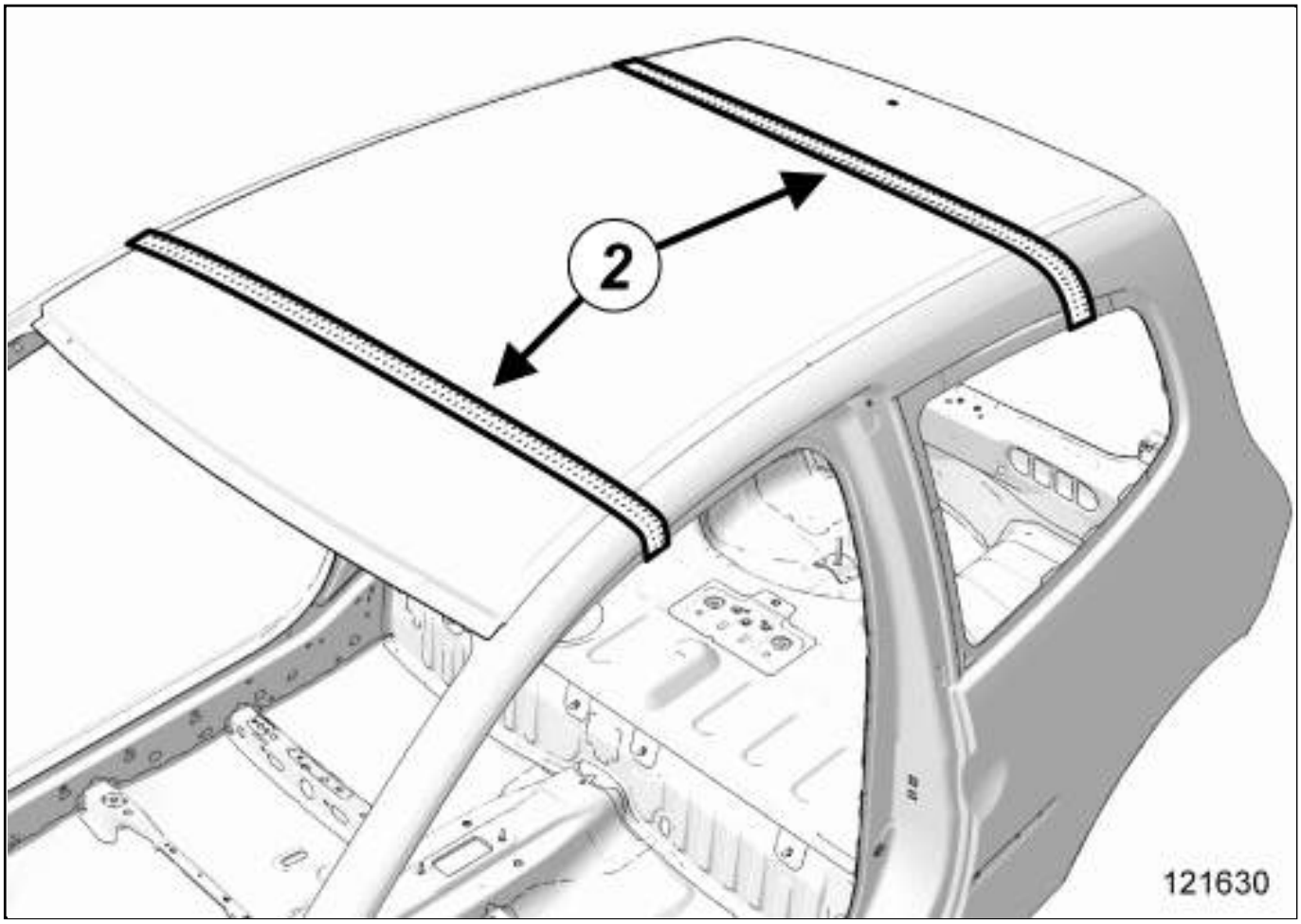


Hold the replacement part with the locking pliers (at the front and rear cross members) and the safety strap (s) to position it securely according to the markings made earlier(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use) (MR400, 05B, Bodywork equipment and tooling).

Note:

To fit the safety straps without removing the quarter panel windows, use 3safety straps.

Let the adhesive dry for 10 hoursat an ambient temperature or for 2 hoursat 60˚C.

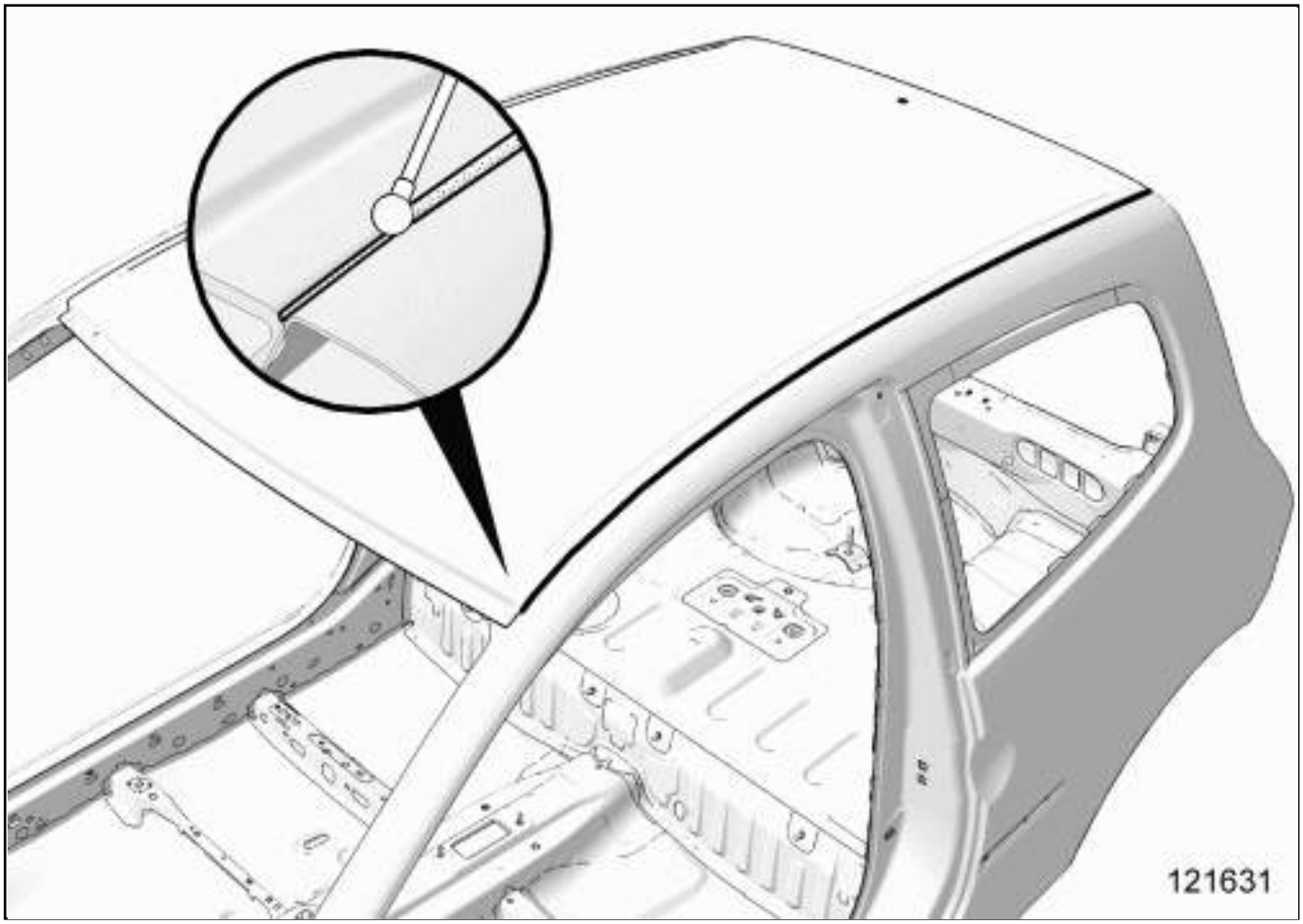
2)MAKING THE OTHER JOINTS

Make the rest of the replacement part joints.

2- FINISHING AFTER ASSEMBLY

1)APPLYING FINISHING PRODUCT

Prime the side bonding areas.



Apply a finishing seal, to the side bonding areas.

Scrape off the surplus adhesive before it dries using theLevelling tool for bodywork seal(Car. 1786) .

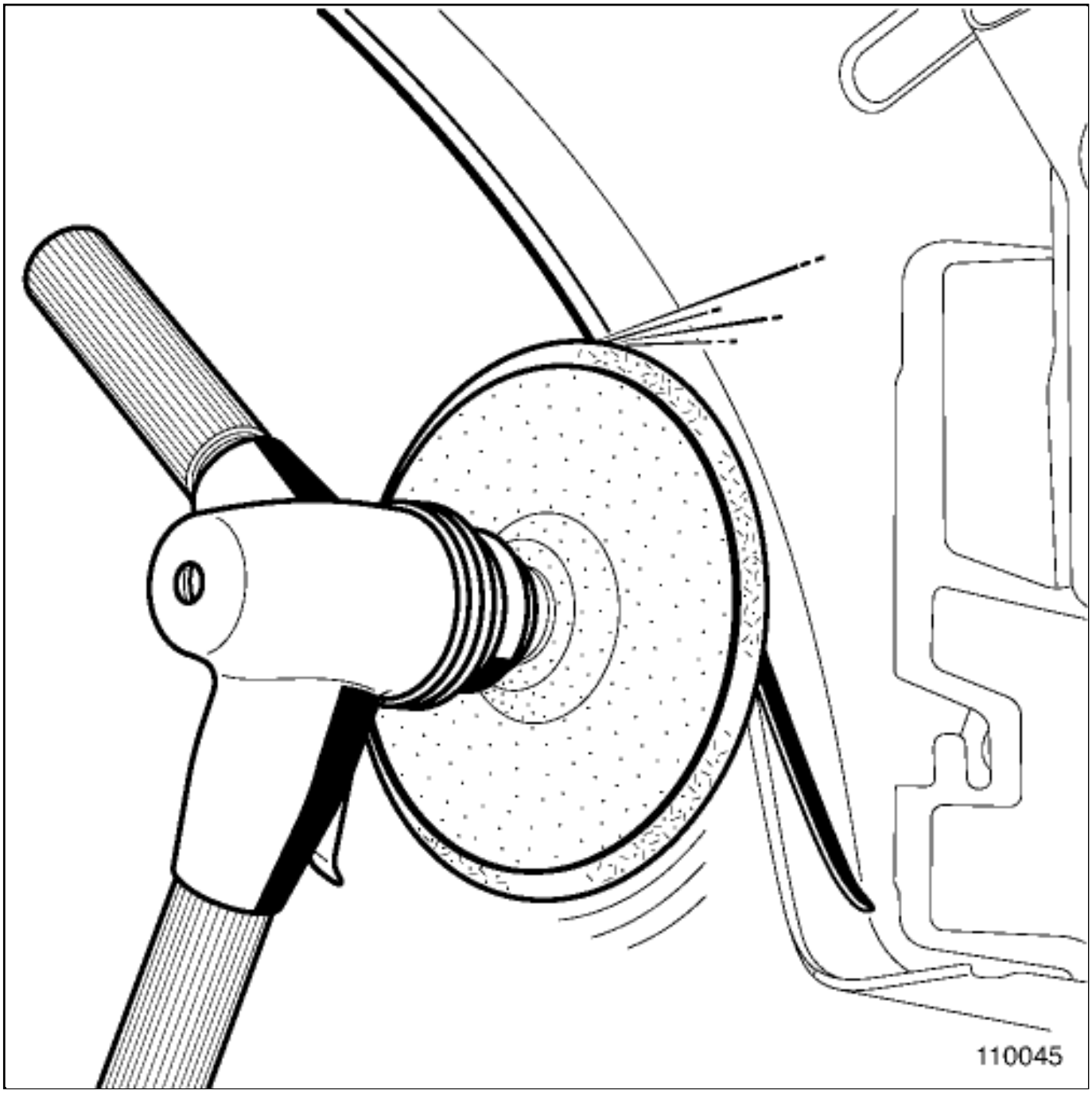
CONNECTIONS BY RIGID BONDING WITH CRIMPING: DESCRIPTION

Special tooling required	
Pliers for uncrimping door panels.	Car. 1657

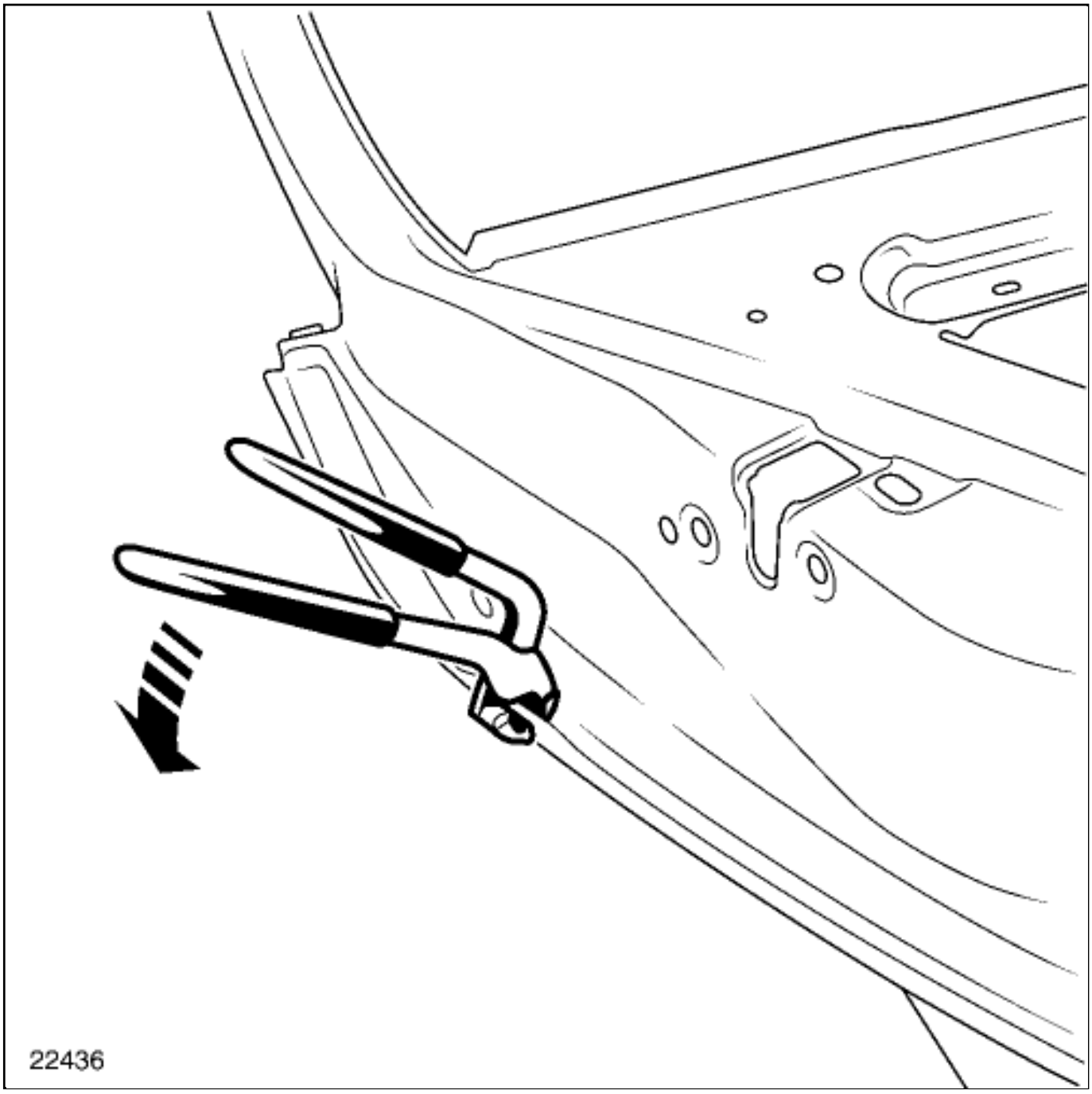
1. DISASSEMBLY

1- DECRIMPING

There are two methods for decrimping a component.



Grind down the folded edge of the component crimp.

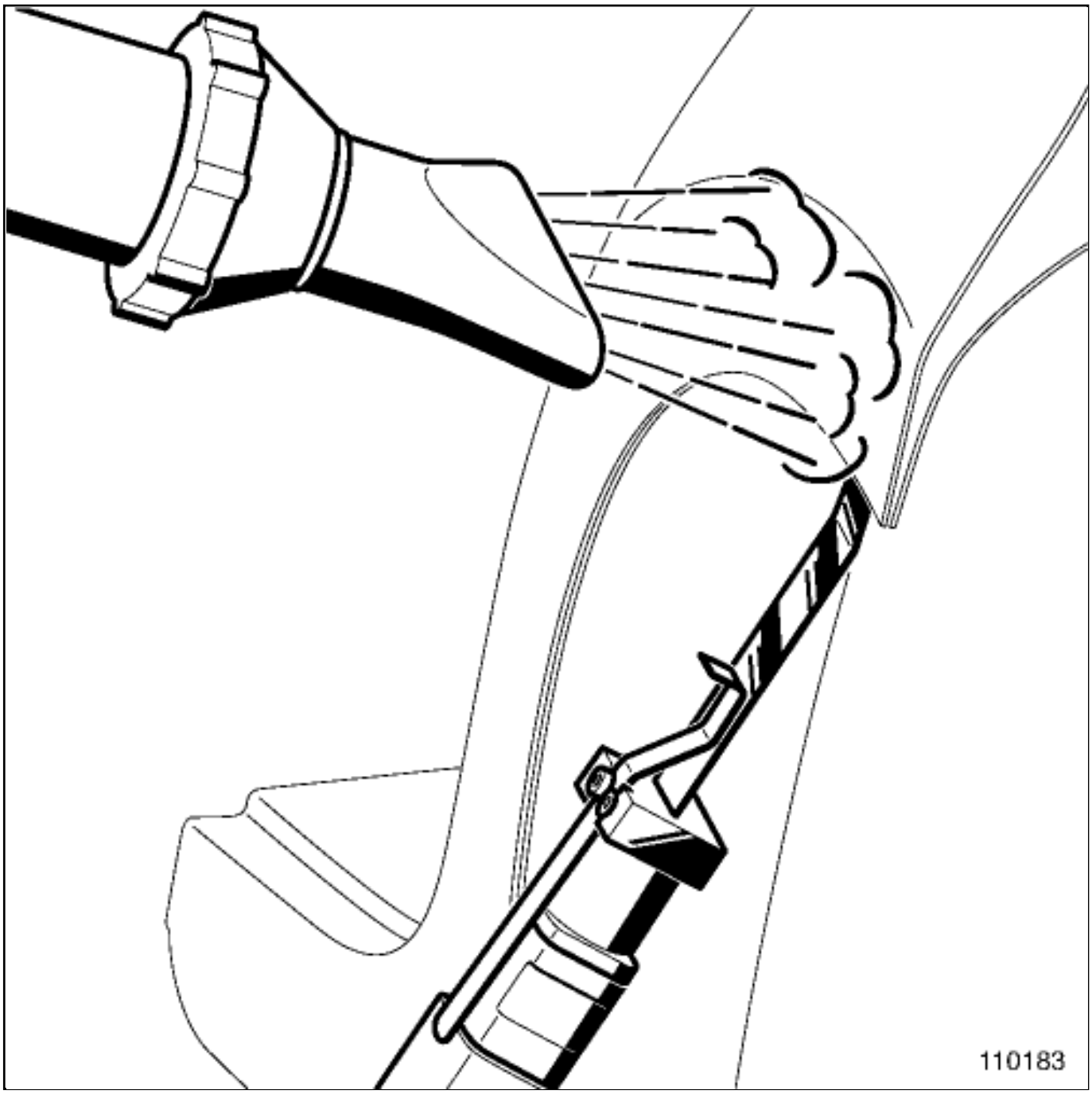


Remove the component using thePliers for uncrimping door panels.(Car. 1657) .

Note:

It is forbidden to use the grinder on aluminium components when there is no extraction and filtration system specifically for aluminium.

2- REMOVING



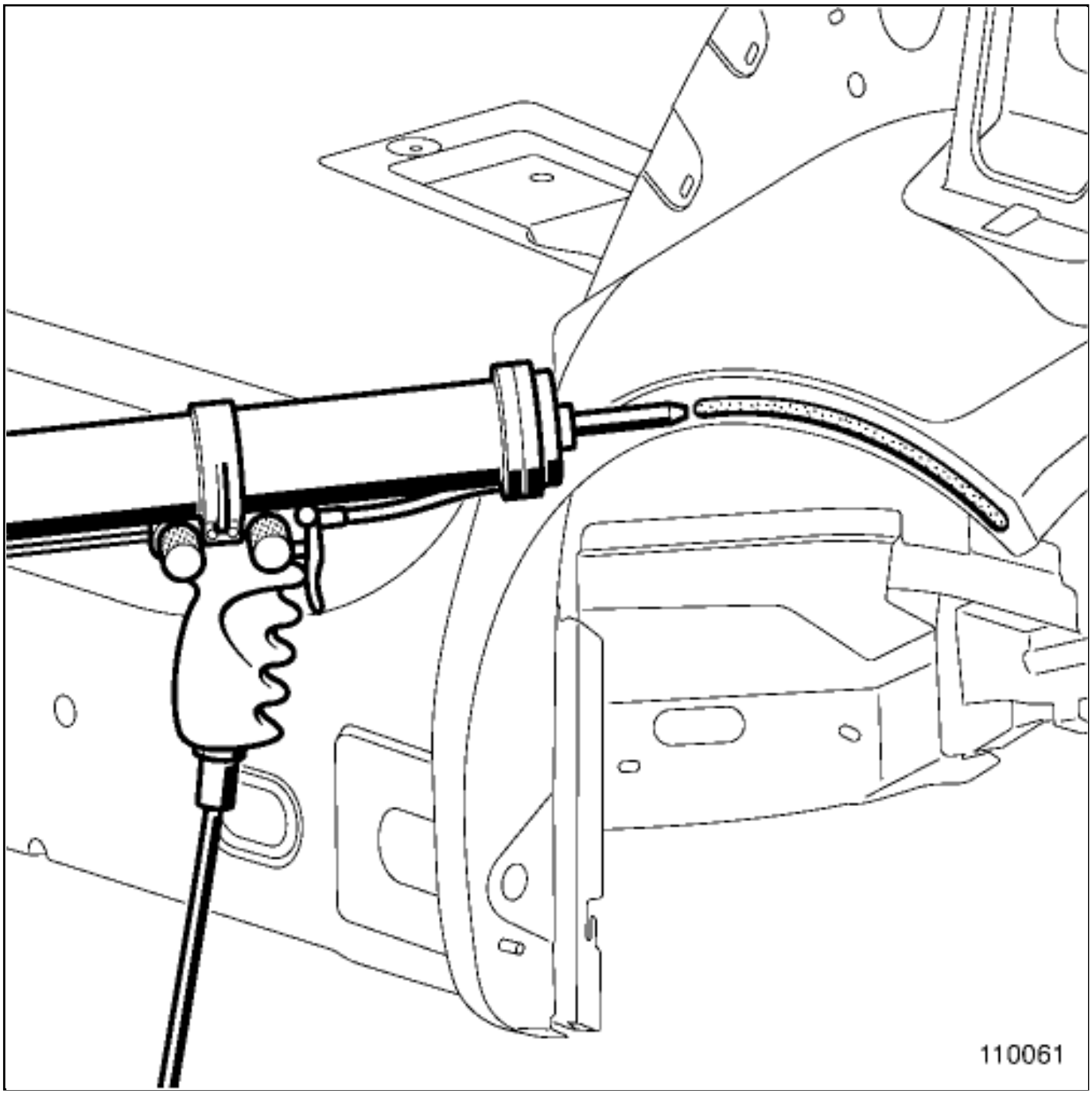
Detach whilst simultaneously heating using a heat stripper.

3- SCOURING

Scour the adhesive residue on the component.(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use) .

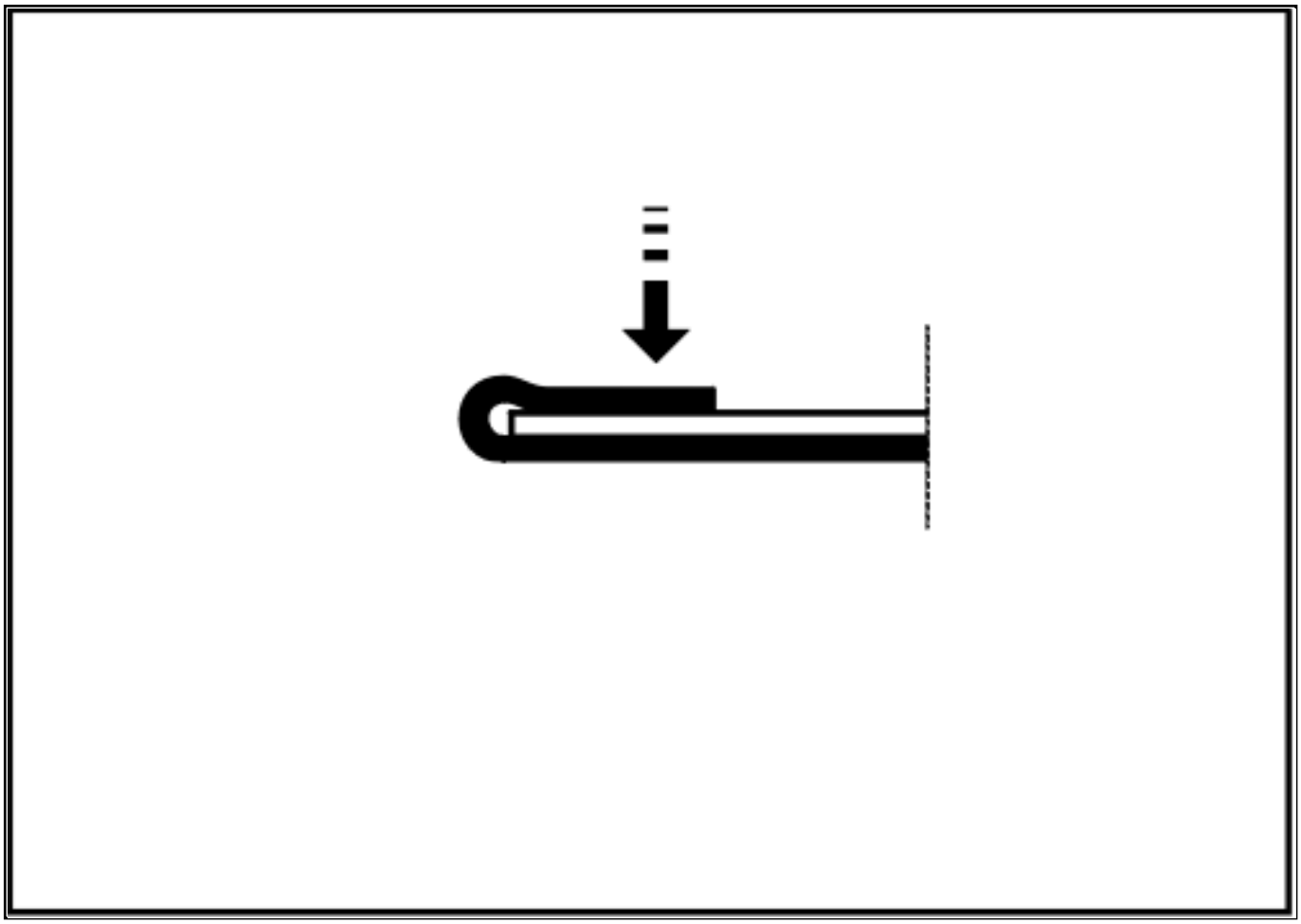
2. ASSEMBLY

1- BONDING



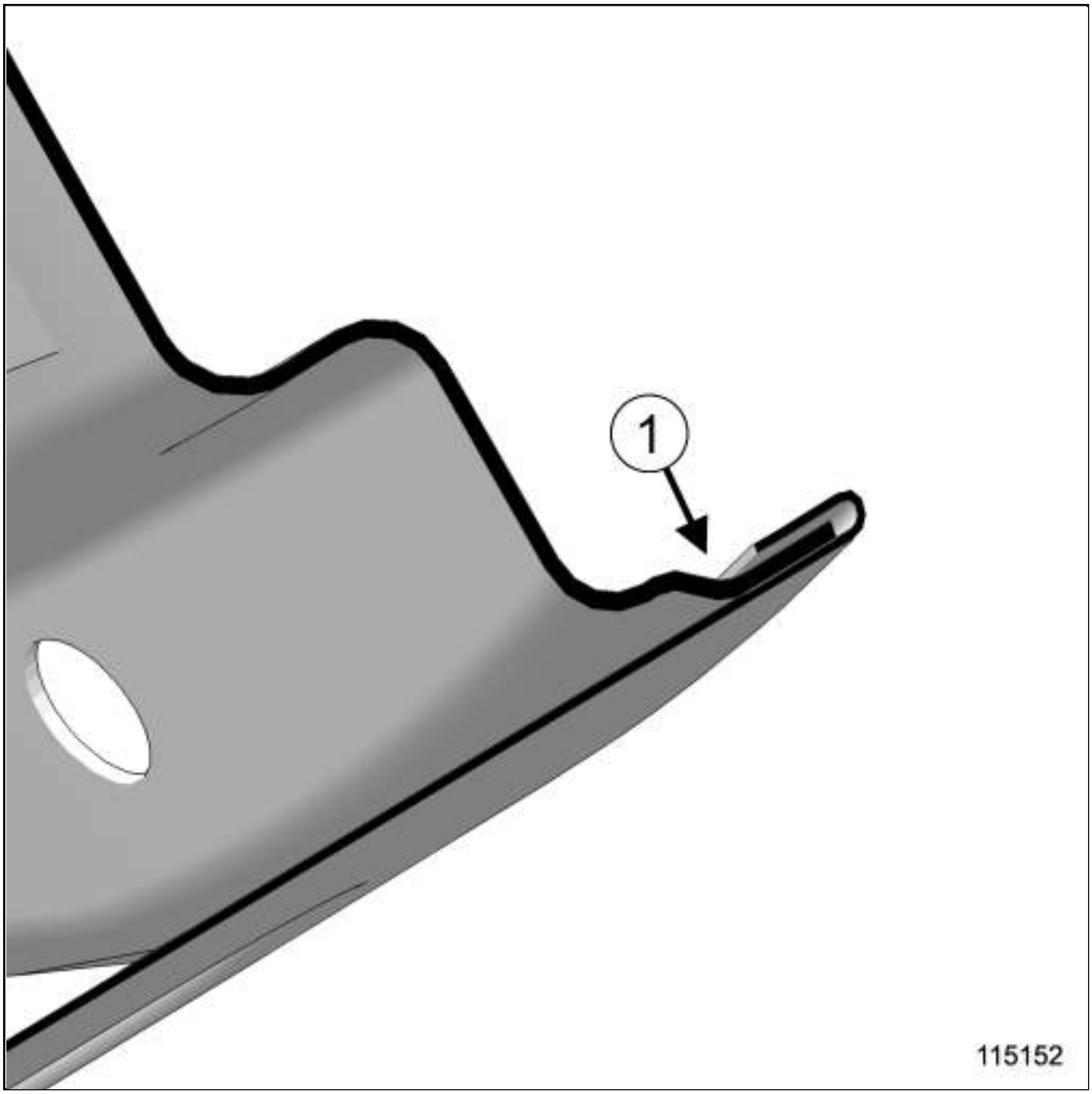
Apply the cement bead(see 40F, Bonded connections, Connections by rigid bonding: Description) .

2- CRIMPING



Crimp the component into the shape of a water drop, taking care not to crush the folded edge.

3- FINISHING

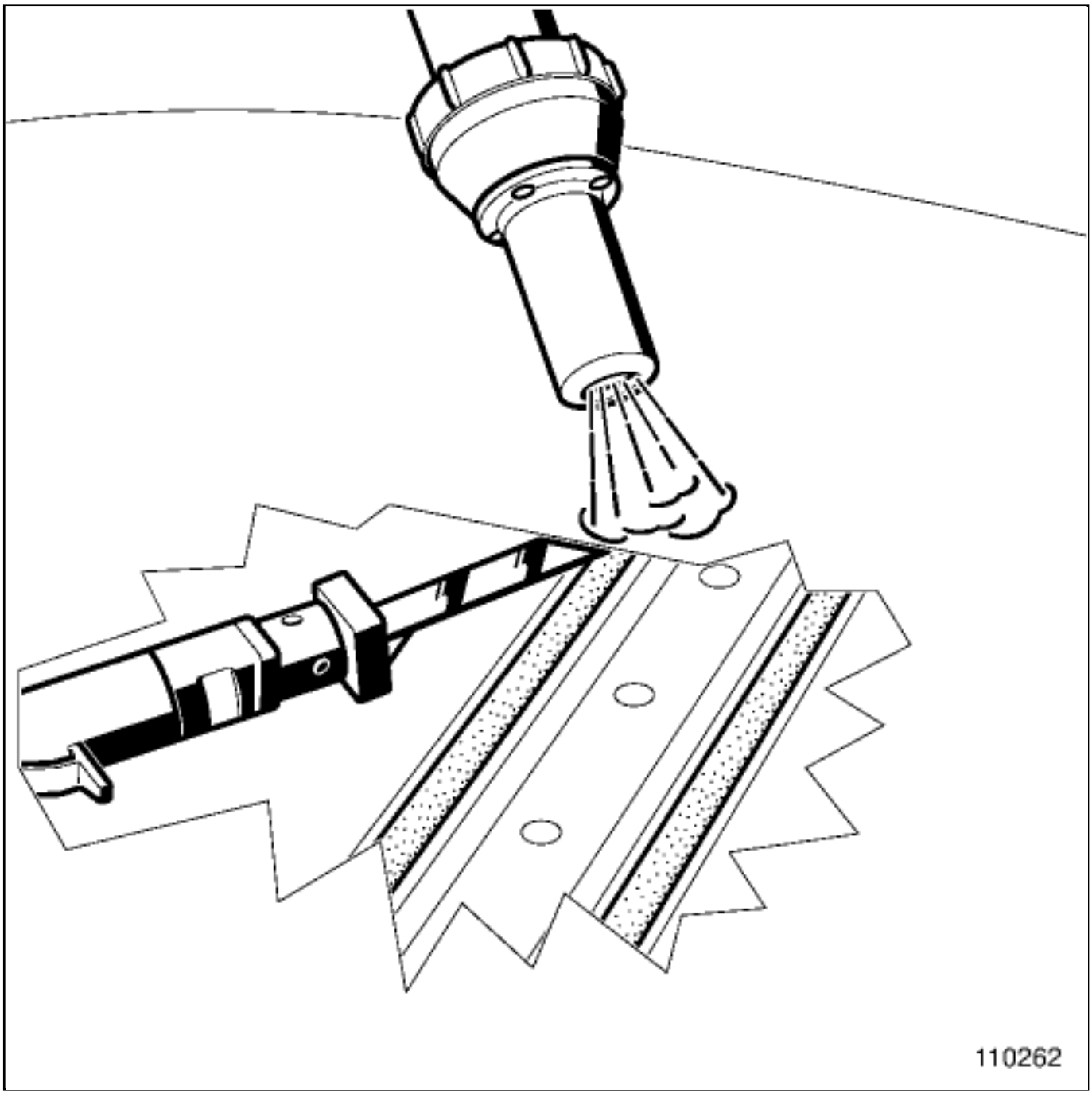


Apply an extruded seal at(1) **(see 40J, Protective devices , Anti-corrosion protection of joints after welding: Description)** .

CONNECTIONS BY SOFT BONDING: DESCRIPTION

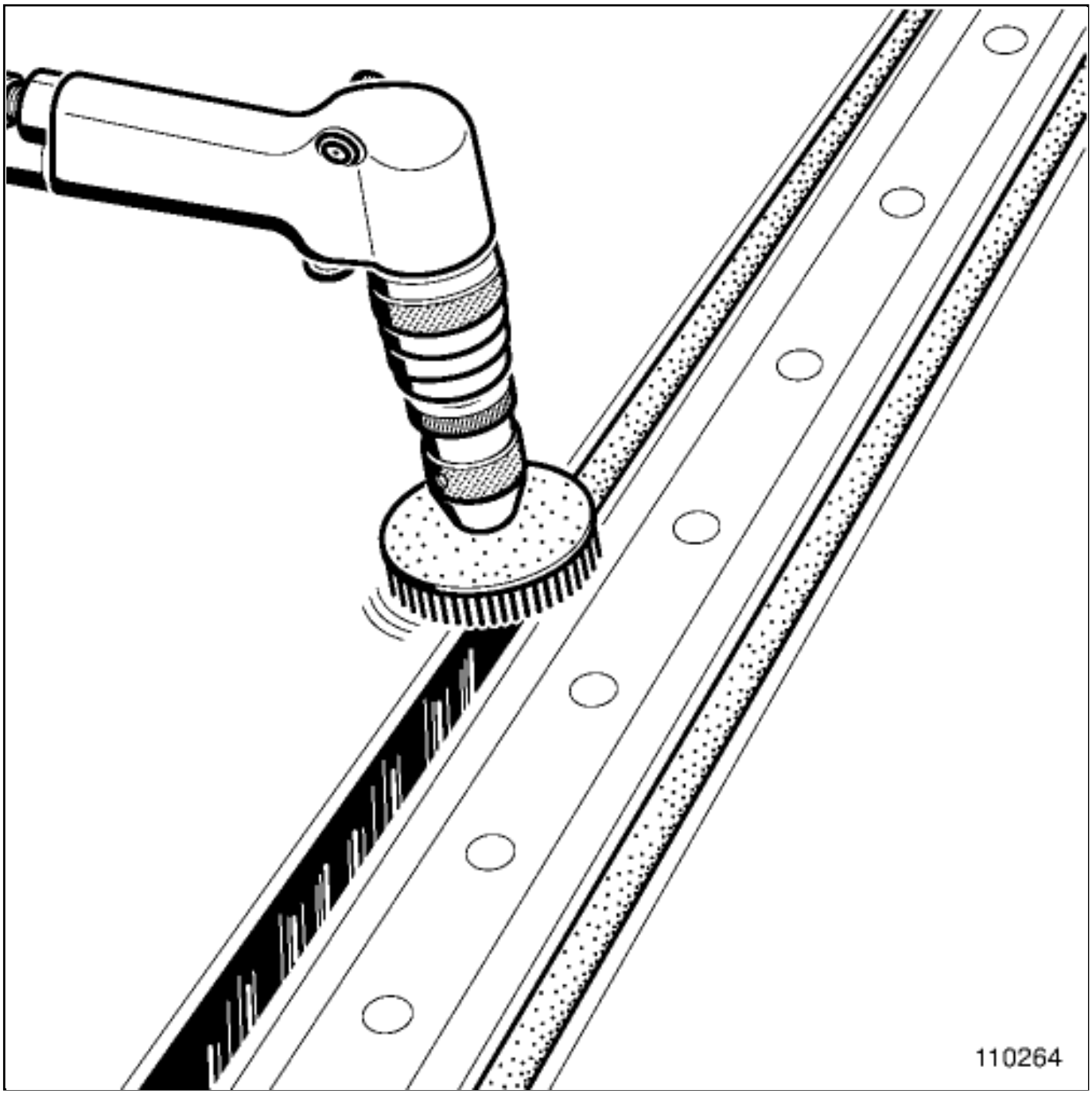
1. DISASSEMBLY

1- CUTTING, SCOURING



Detach the damaged part, by simultaneously heating with a heat stripper to destroy the cement.

2- SCOURING



Using the most suitable tool(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use) , scour the excess cement left on the vehicle.

2. PREPARATION BEFORE ASSEMBLY

1- ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use) .

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Measure the distance between the panels at the location of the joint.

Remove the replacement part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

Sand using P320dry sand paper or a red abrasive pad, without removing the cataphoretic protection.

Clean the joint face with surface cleaner.

4- PREPARATION OF THE JOINTS ON THE VEHICLE

Clean the joint face with surface cleaner.

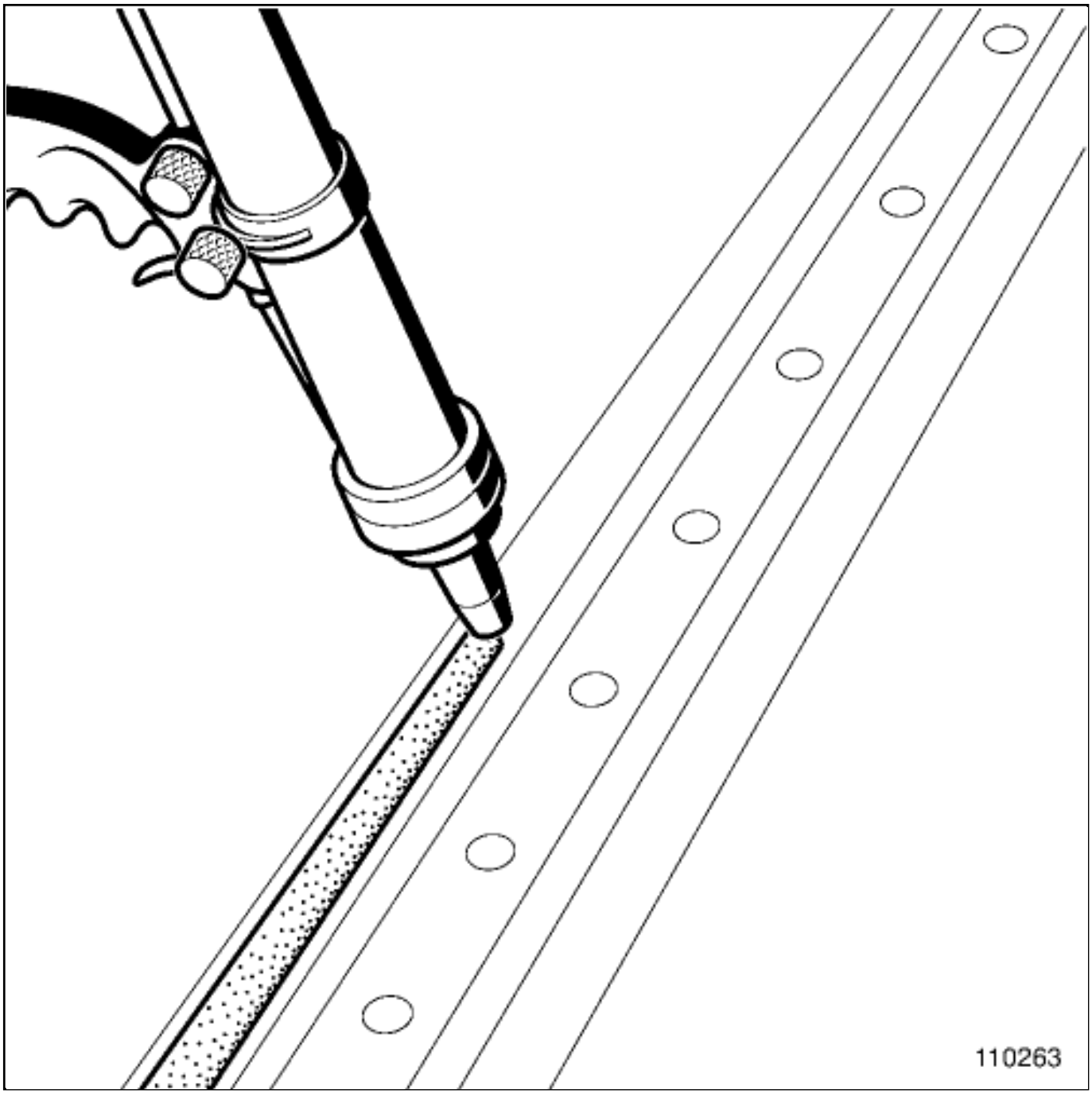
5- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

3. ASSEMBLY

1- APPLICATION OF THE BONDING PRODUCTS



On the vehicle mating face apply an even cement bead with a diameter of 4 to 10 mmdepending on the distance between the panels measured during the adjustment.

The width of the bead after squeezing depends on the application diameter of the extruded product and on the distance between the panels(see 40F, Bonded connections, Connections by bonding: Precautions for the repair) (see 04F, Bodywork products and mountings, Products and equipment for bonded assembly: Use) .

2- FITTING AND ADJUSTING THE REPLACED PARTS

Position the part on the vehicle.

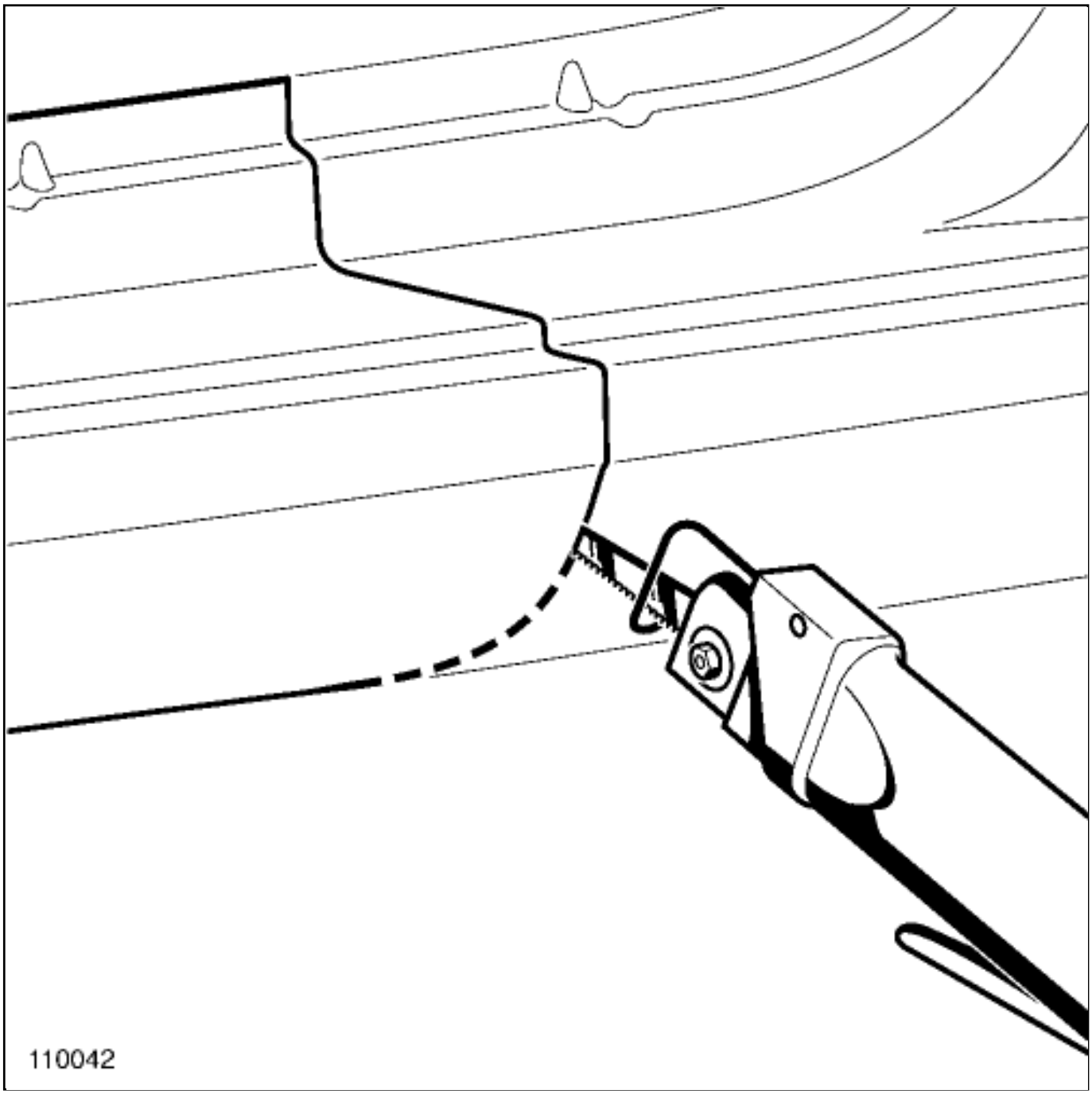
3- FINISHING

Wipe the excess product away using a cloth lightly soaked in surface cleaner.

CONNECTIONS FOR EDGE TO EDGE PARTIAL REPLACEMENTS

1. DISASSEMBLY

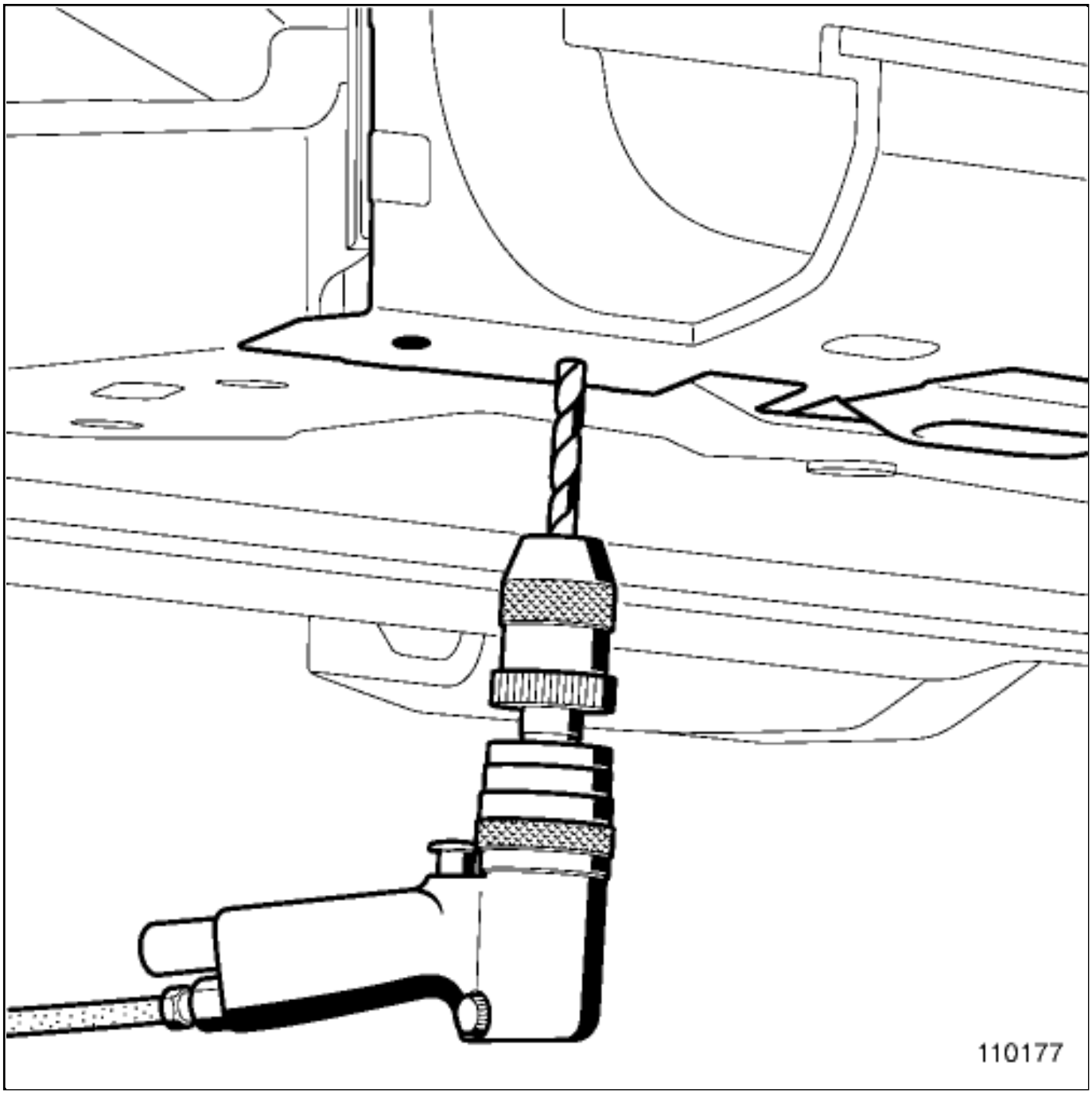
1- CUTTING



Cut the damaged part approximately 25 mmabove the cut defined in the MR of the vehicle concerned.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

2- UNPICKING

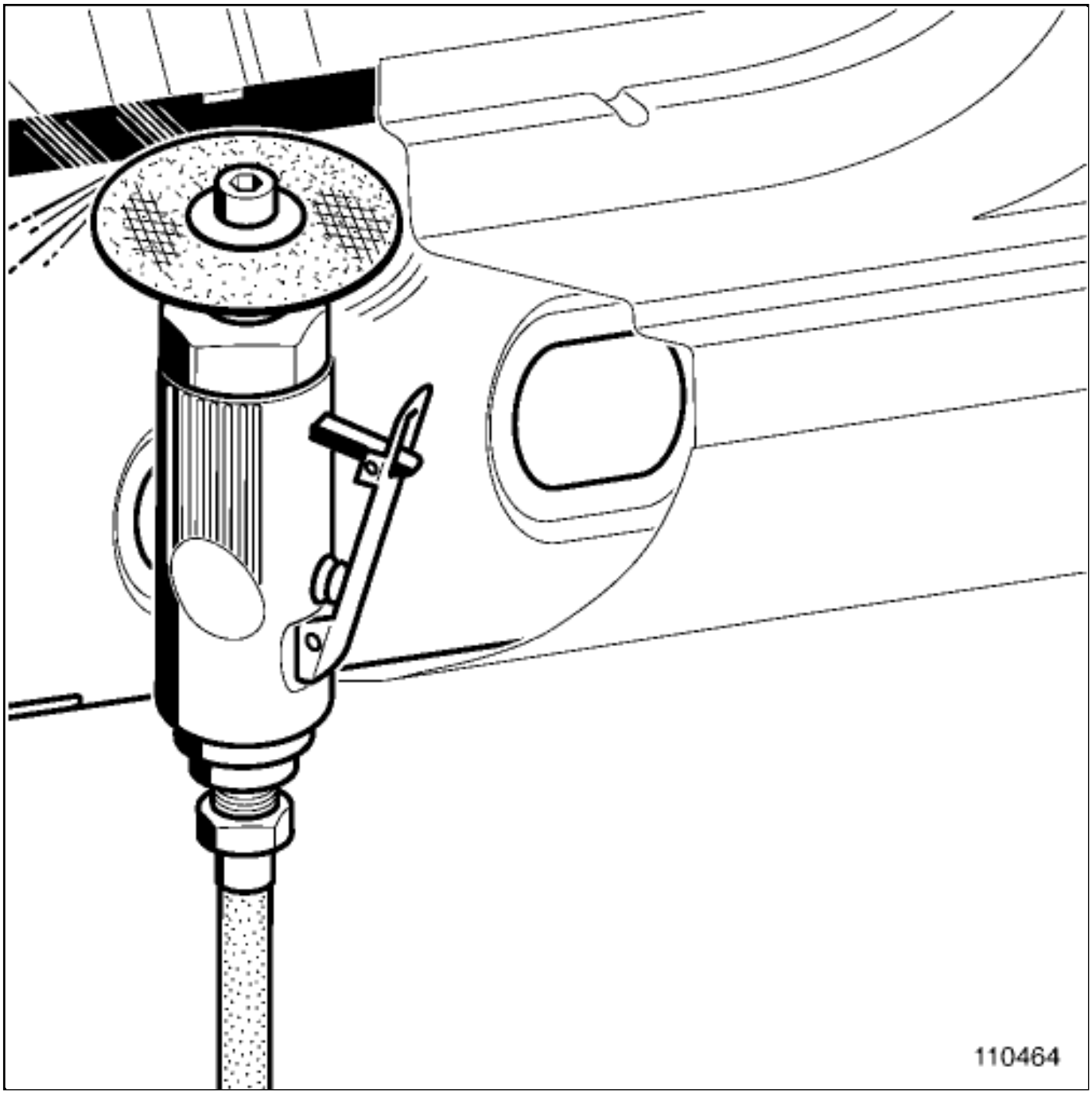


Unpick the part's welded connections.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

3- GRINDING



Level off all the welding residue as well as that left by the cutting.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Put the support faces flat so as not to penalise the joint.

Surface the internal mating faces.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

2. PREPARATION BEFORE ASSEMBLY

1- ADJUSTMENT FOR SUPERIMPOSITION CUTTING

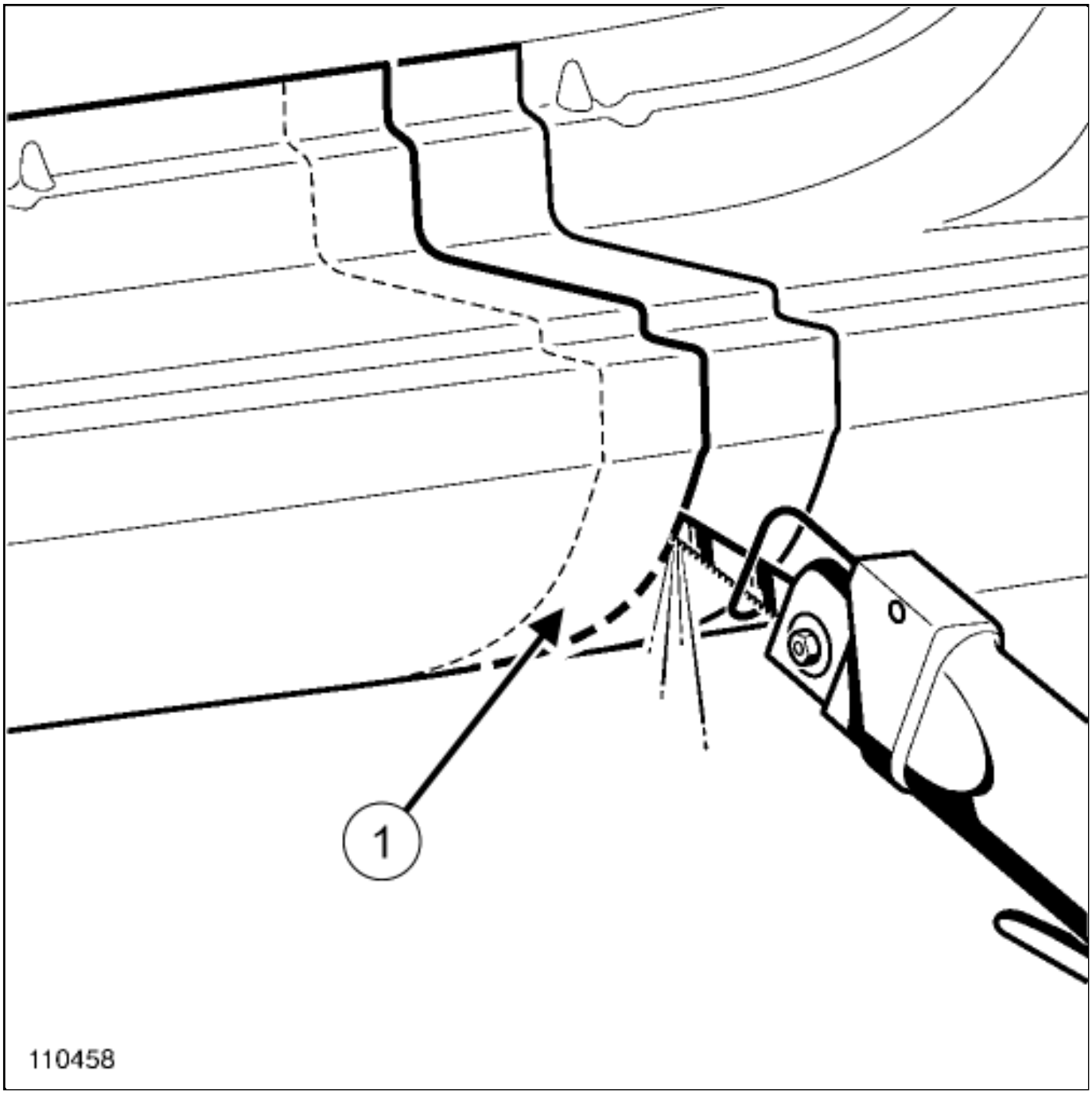
Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the mating zones.

2- OVERLAPPING CUT



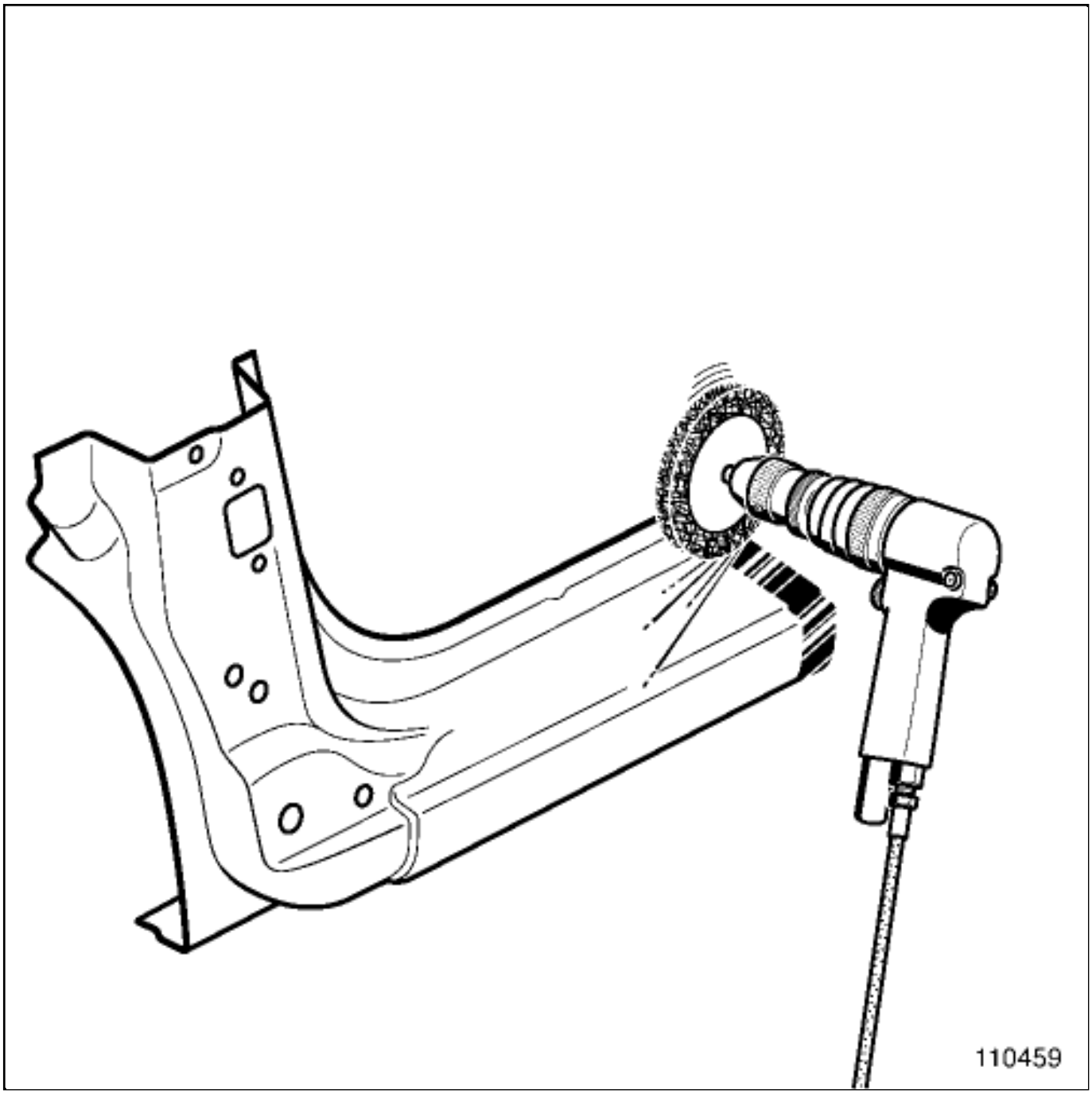
Cut the two parts simultaneously, approximately 25 mmfrom the cut made on the vehicle.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

Remove the part and detach the panel cut off(1) on the vehicle.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

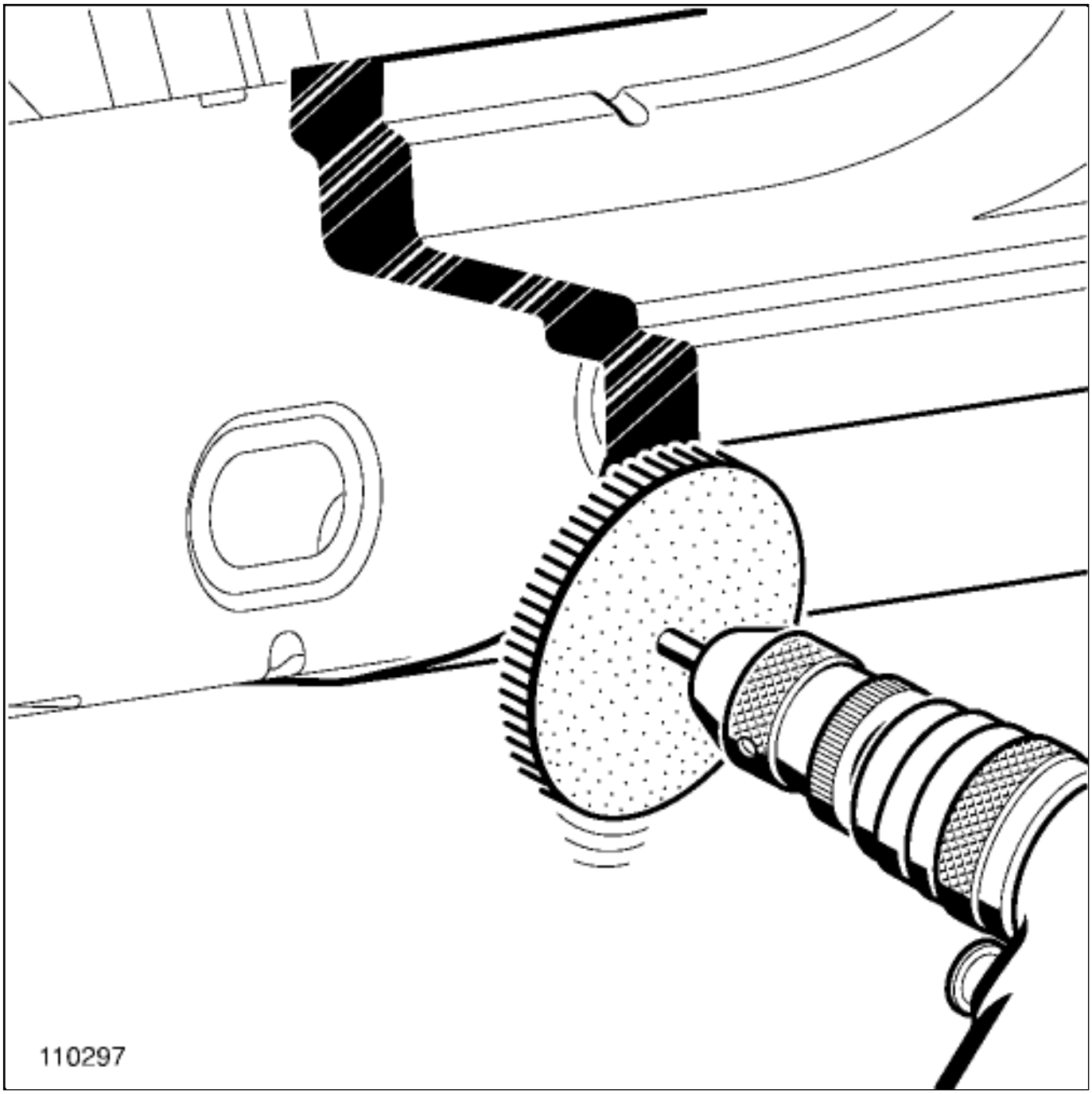


Scour the external face around the edge to edge cutting.

(see **Tools for stripping hard mastics and paint: Use**)

Prepare the rest of the replacement part, according to the chosen joint types and the available access to the mating faces.

4- PREPARATION OF THE JOINTS ON THE VEHICLE



Scour the external face around the edge to edge cutting.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see **Tools for stripping hard mastics and paint: Use**)

Prepare the rest of the vehicle, according the chosen joint types and the available access to the mating faces.

5- FITTING PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

(see 40J, Protective devices , Structural acoustic protection: Description)

Apply the joint anti-corrosion protection according to the type of weld.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

(see 40J, Protective devices , Anti-corrosion protection of joints before welding: Description)

3. ASSEMBLY

1- ADJUSTING THE WELDERS.

Butt welding is by GMAW weld bead.

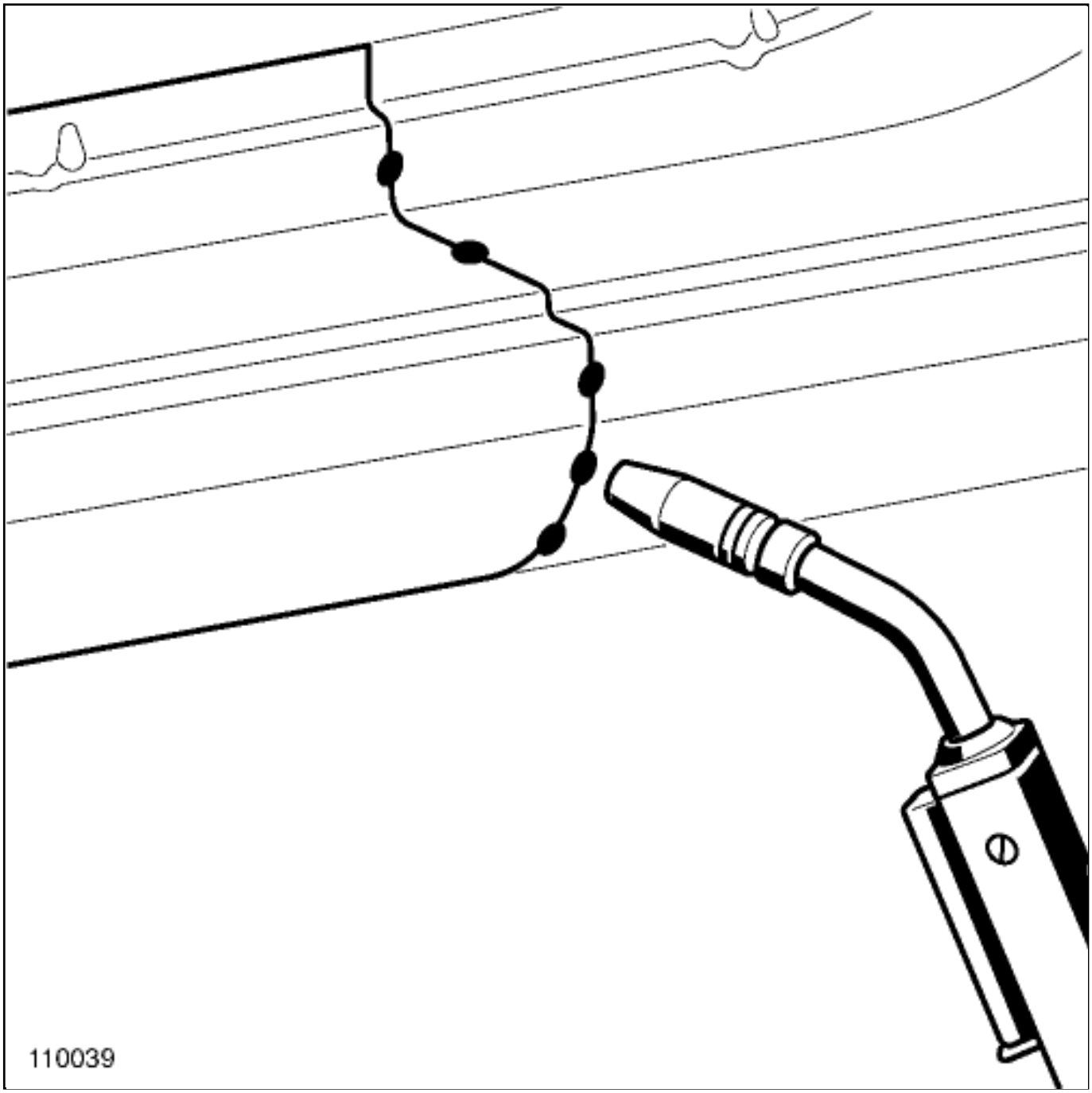
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2- FITTING AND ADJUSTING THE REPLACED PARTS

Reassemble, adjust and fix the part in place; if necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

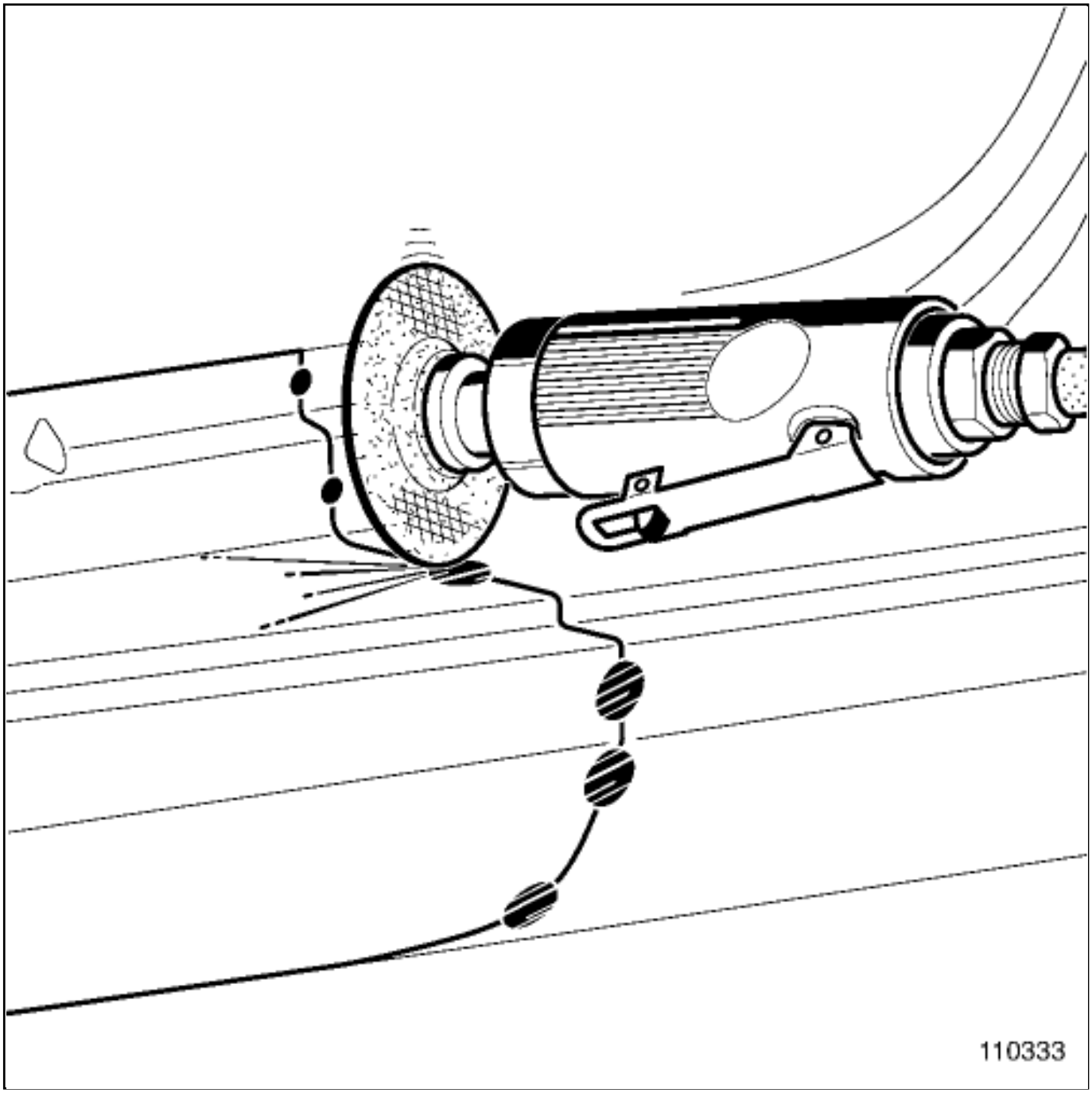
The distance between the two panels at the continuous butt welding locations must be equal to the thickness of the thinnest panel.



Tack the panels with spots 20 mmapart, avoiding edges and square corners.

Tack the parts starting from the middle, then make a spot on each side of it alternately.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

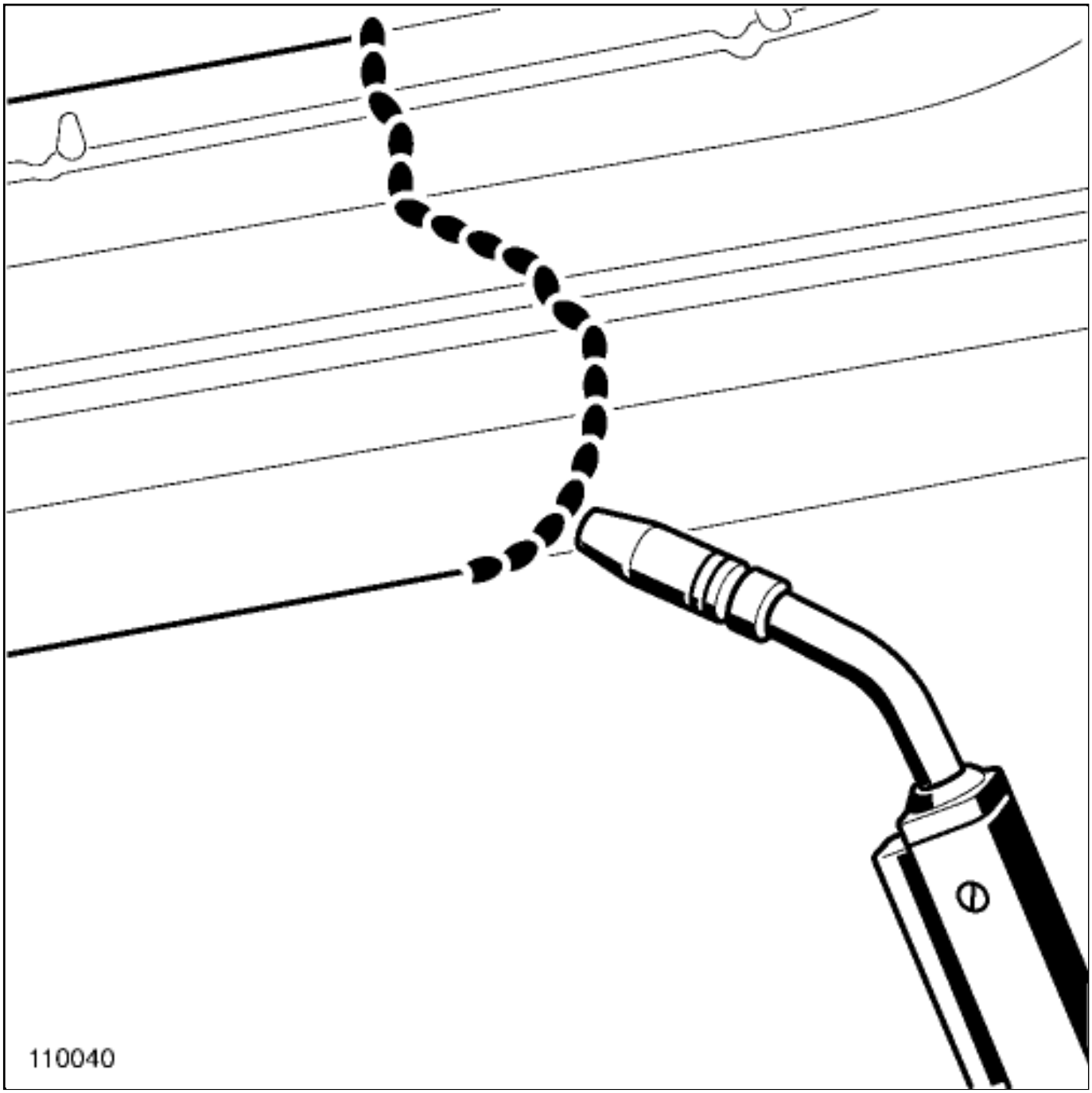


Grind the maintenance points, after checking for good exposure.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

3- CARRYING OUT THE WELDING

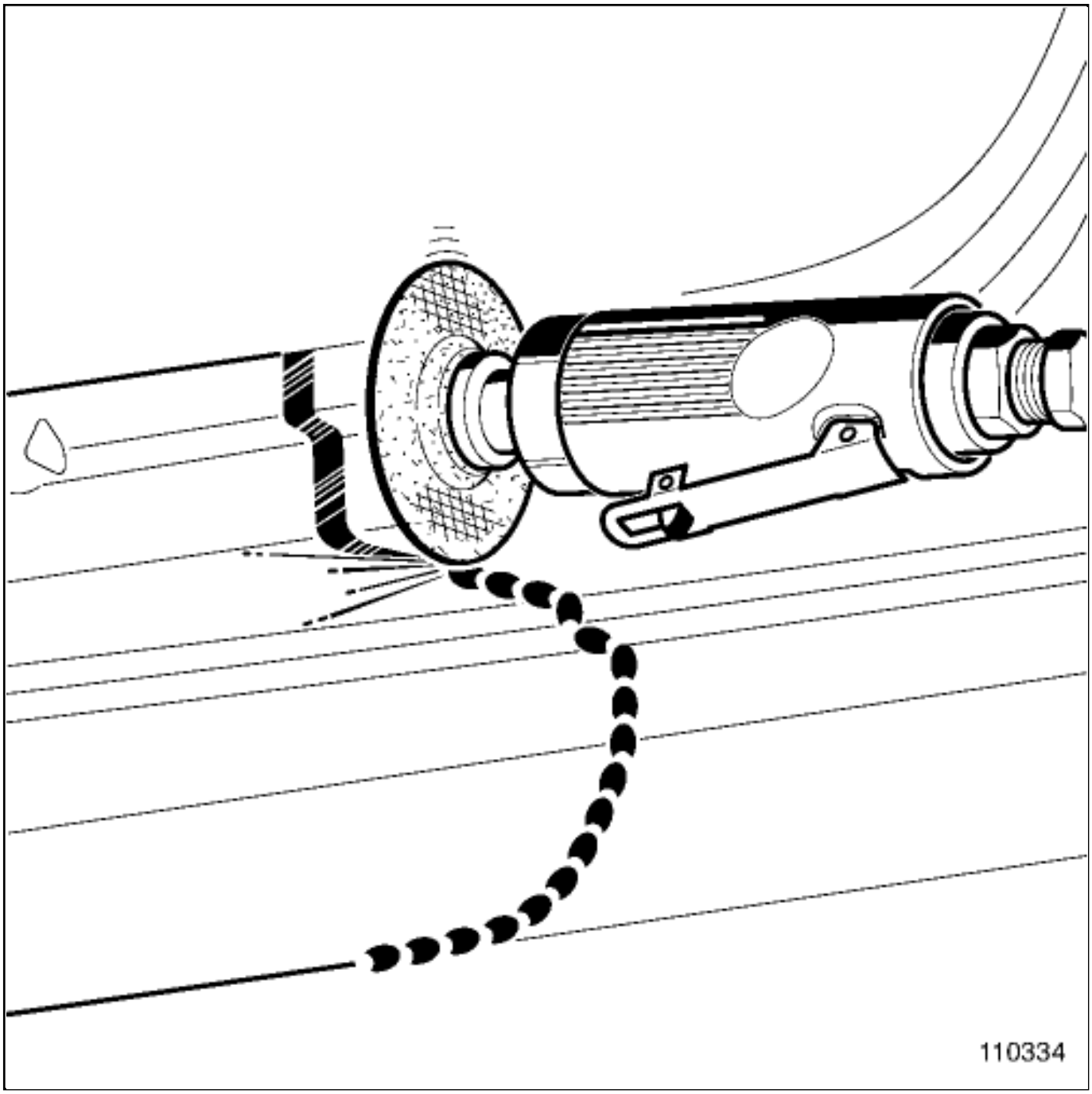
Carry out the different connections of the part.



Carry out the continuous weld, by small sections, if the weld is very long.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

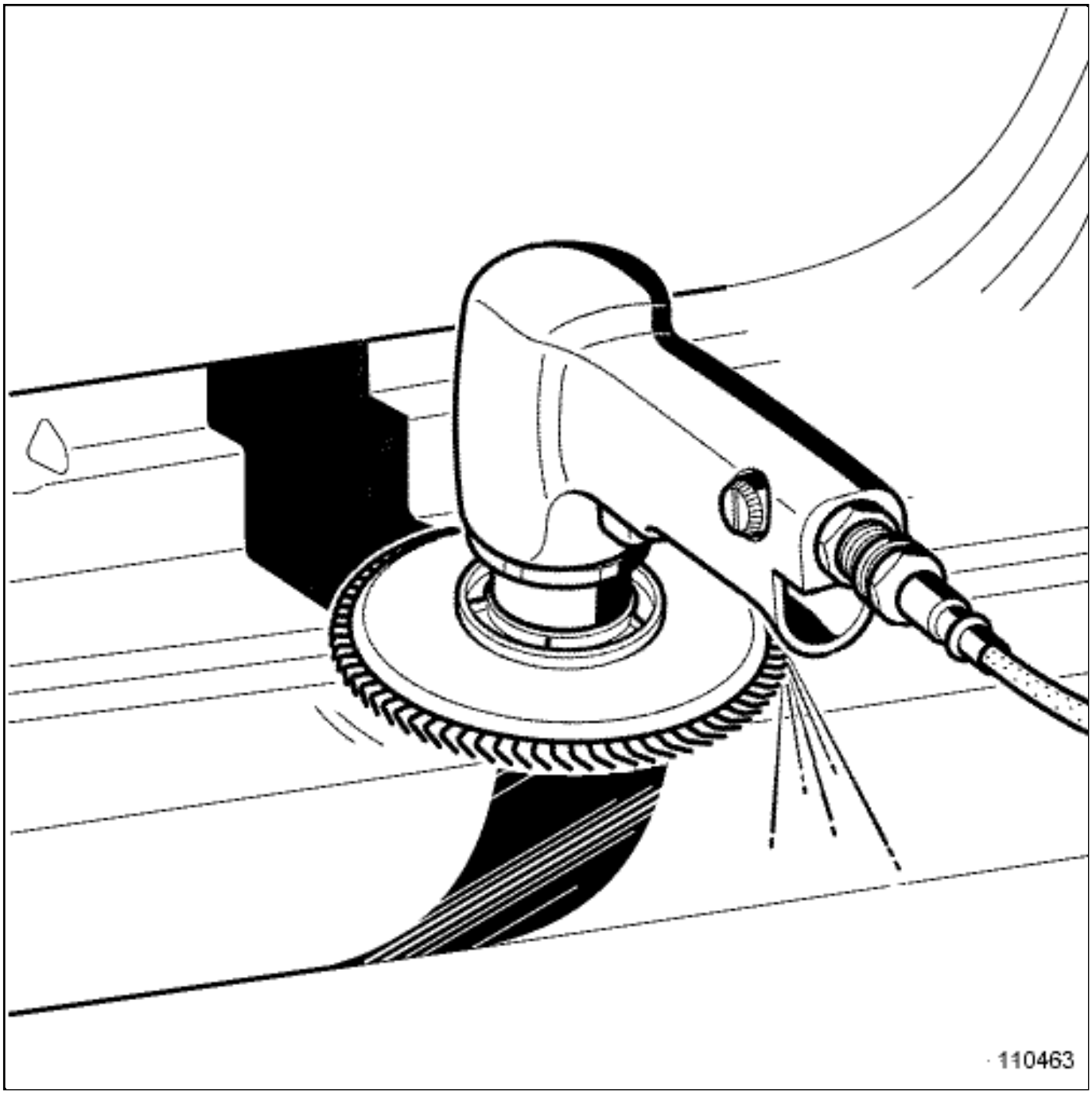
4- GRINDING THE WELDS



Grind the continuous weld.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

5- FINISHING AND SHAPING



Surface the assembly area.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

If necessary, surface finish the visible parts.

(see 04F, Bodywork products and mountings, Panelwork finishing products: Use) (see 05B, Equipment and Tools, Tools for sanding a structural component: Use)

6- FITTING PROTECTION AFTER ASSEMBLY

Apply the anti-corrosion protection.

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

(see 40J, Protective devices , Anti-corrosion protection of joints after welding: Description)

Fit the soundproofing.

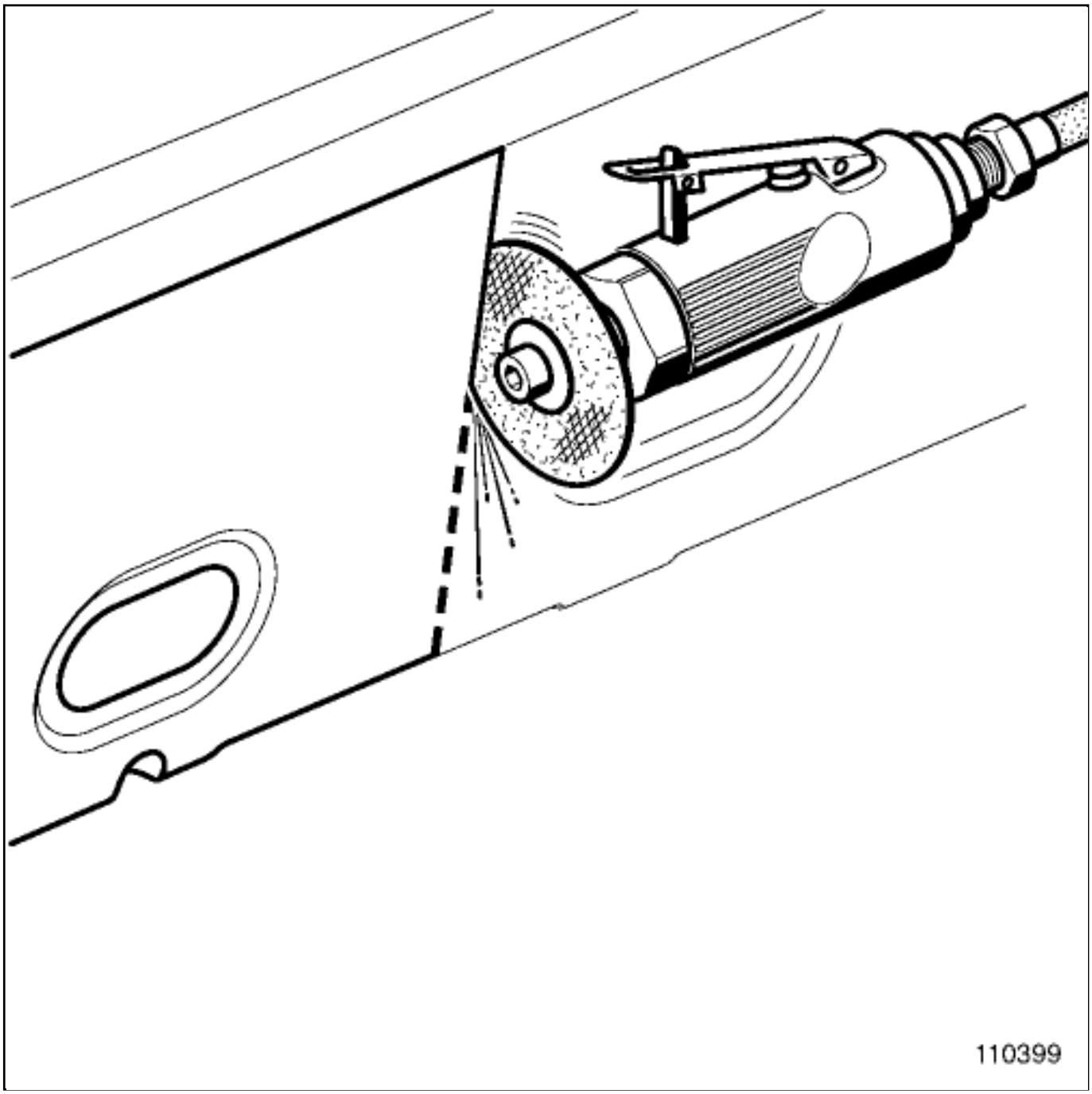
(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

(see 40J, Protective devices , Structural acoustic protection: Description)

CONNECTIONS FOR PARTIAL REPLACEMENT BY JOGGLING

1. DISASSEMBLY

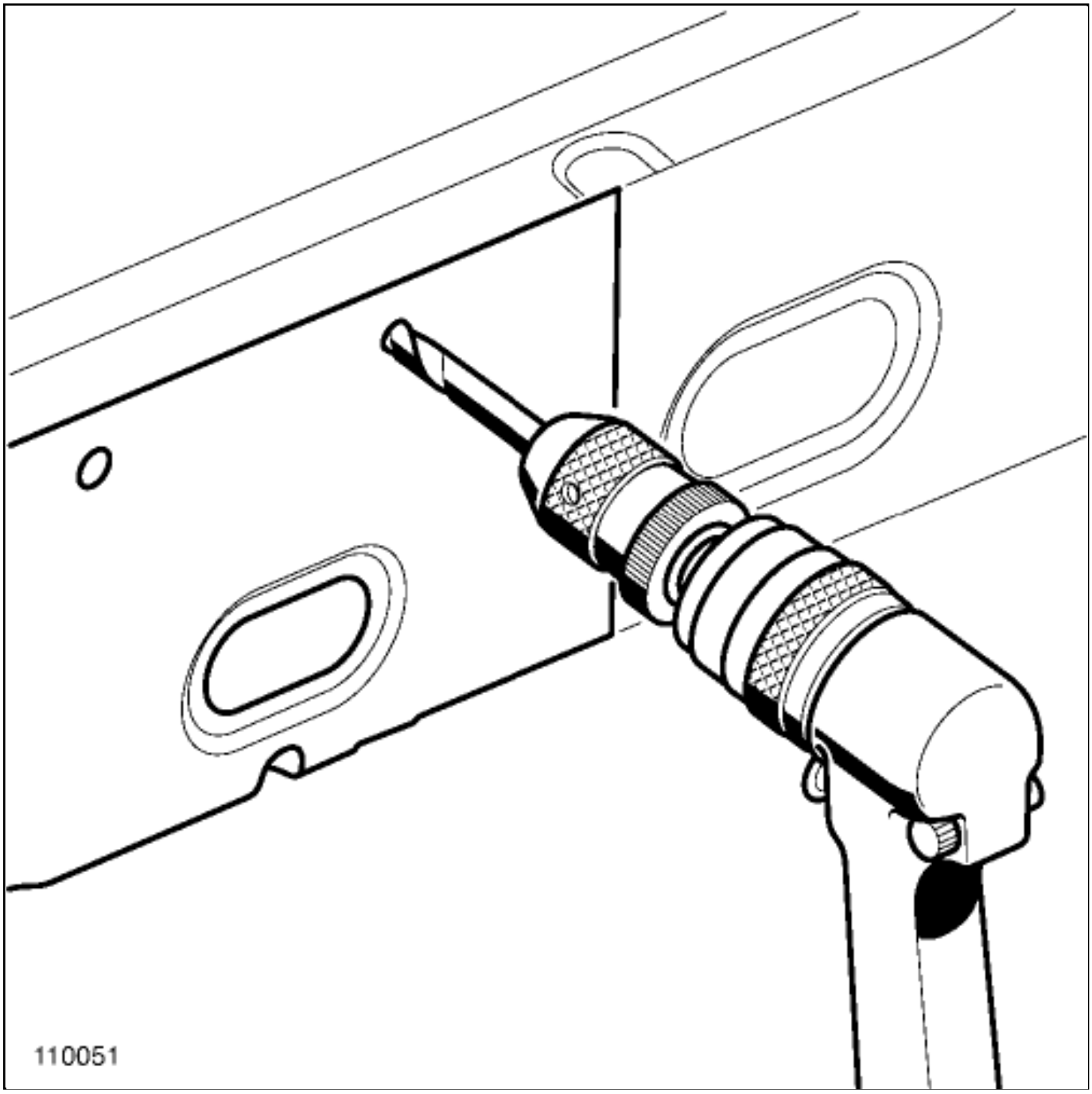
1- CUTTING



Cut the damaged part, adhering to the area defined in the MR of the vehicle concerned.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

2- UNPICKING

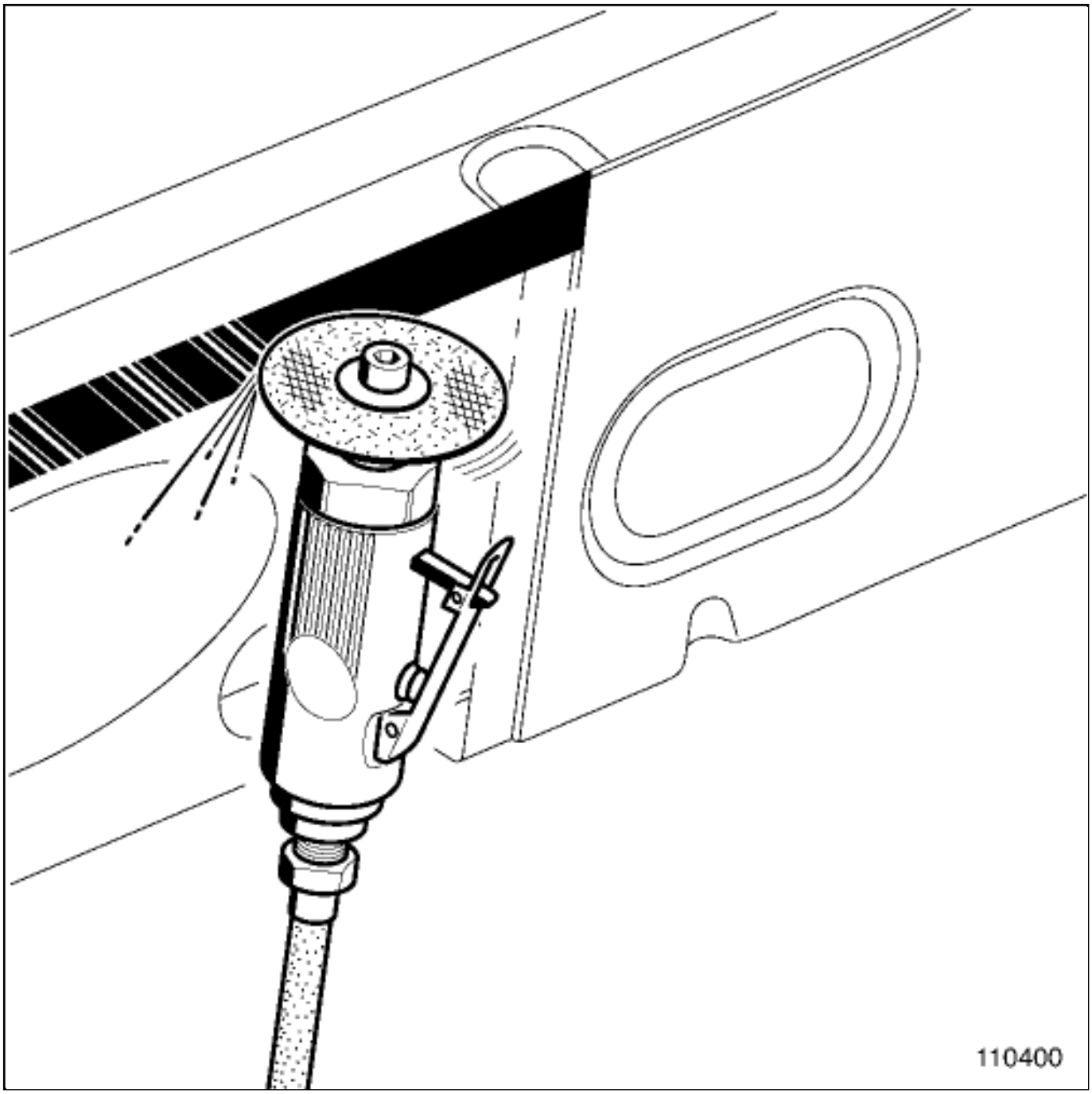


Unpick the retaining points of the damaged part.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

3- GRINDING



Level off the welding residue, as well as that from the cut.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface finish the mating faces.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

2. ASSEMBLY METHOD

The step drilling joint can be made in two ways, depending on the available access to the mating faces:

- Two face access, resistance spot welding (RSW).
- Single face access, gas metal arc plug welding (GMAW).

In both cases, refer to the indications given in the vehicle MR to find out the weld points.

For visible areas, apply a bead of chain weld (GMAW).

3. TWO FACE ACCESS

1- PREPARATION BEFORE ASSEMBLY

1)ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2)MARKING AND IDENTIFYING THE JOINTS

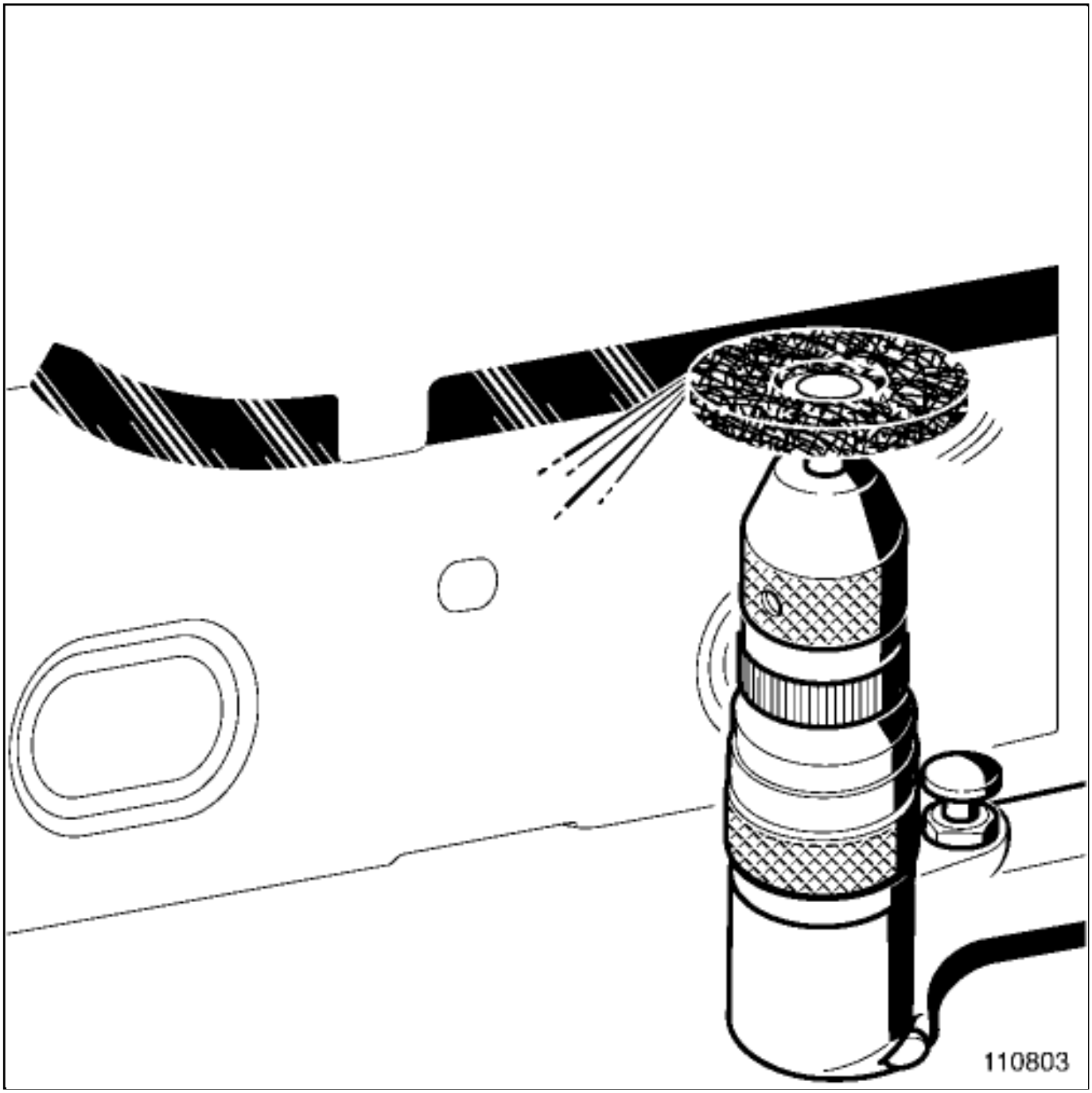
Mark the joint and cut zones.

Remove the replacement part.

3)PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

Cut the replacement part according to the marks.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

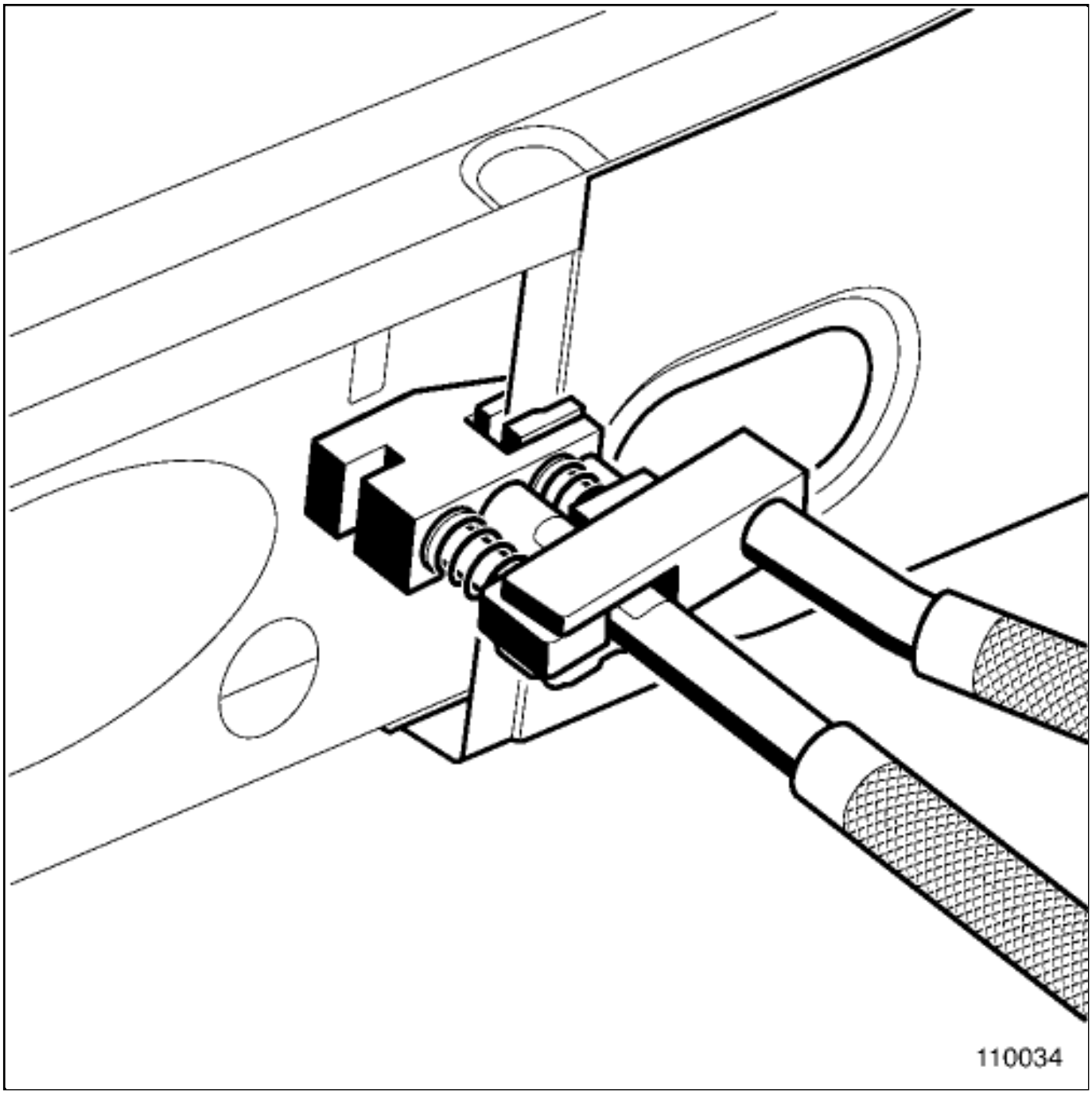


Scour the internal and external mating faces at the drilling location.

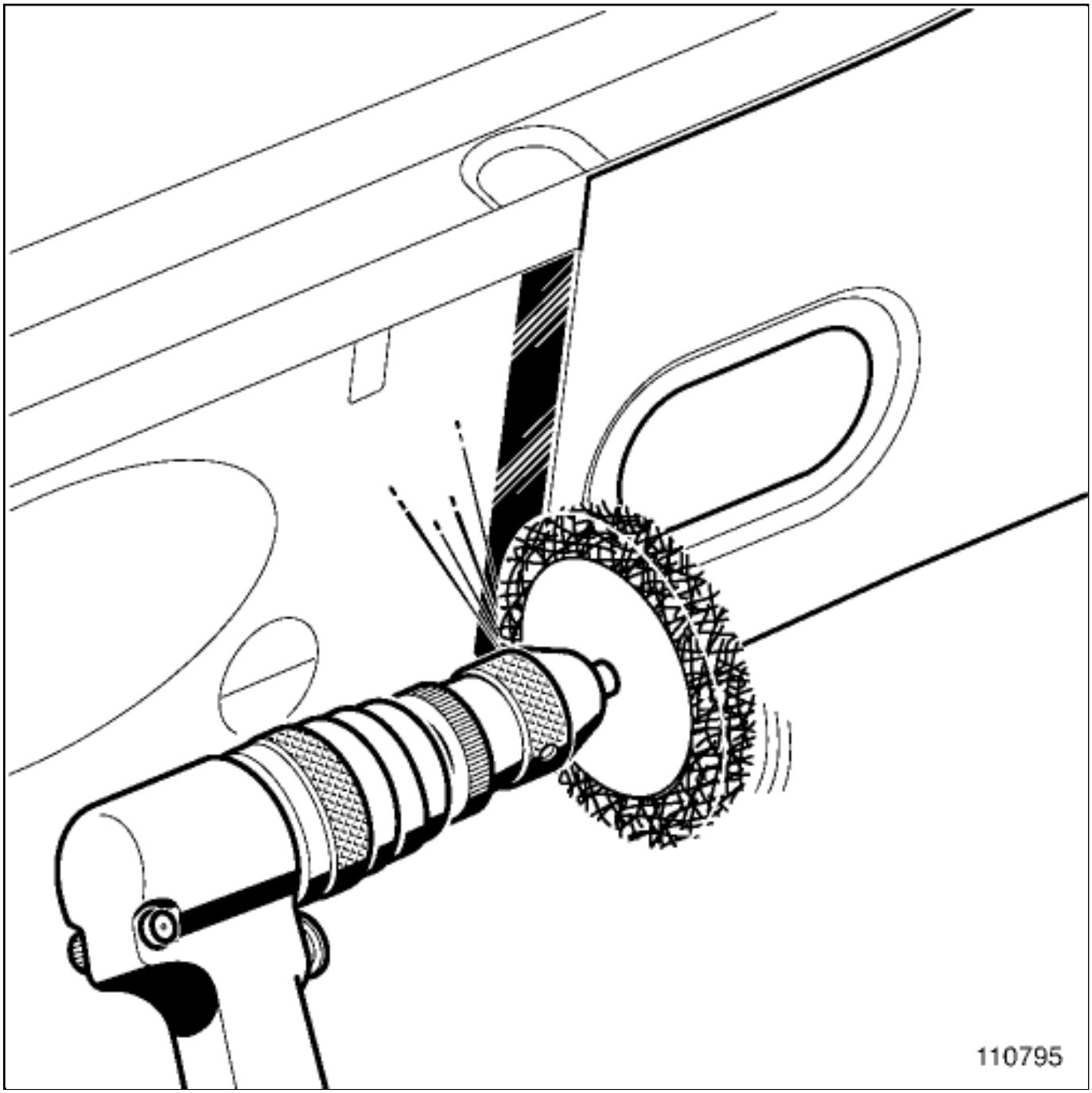
(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

Prepare the rest of the replacement part according to the chosen joint types, in accordance with the available joint face access.

4)PREPARATION OF THE JOINTS ON THE VEHICLE



Carry out the drilling, at the cutting location.



Scour the internal and external mating faces at the drilling location.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

Prepare the rest of the vehicle, according to the chosen joint types.

5)APPLYING PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal joint faces.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

2- ASSEMBLY

1)FITTING AND ADJUSTING THE REPLACED PARTS

Reposition the replacement part, adjust it and fix it using the locking pliers.

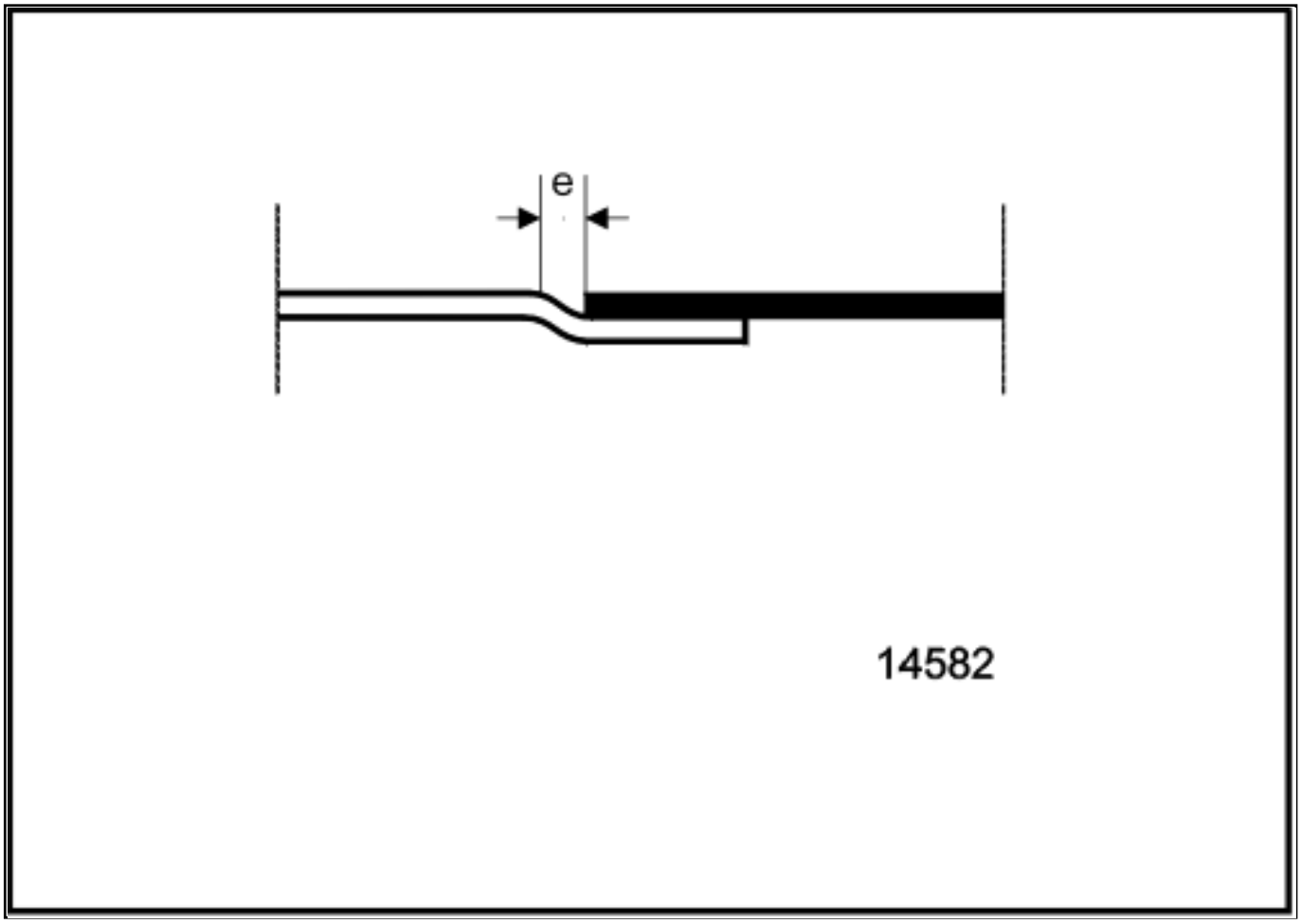
If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Note:

Leave a clearance(e) between the cut and the step drilling angle.

The clearance should be equal to the panel thickness.



2)ADJUSTING THE WELDERS

Before making the joints on the vehicle, carry out the tests required for adjusting the welders.

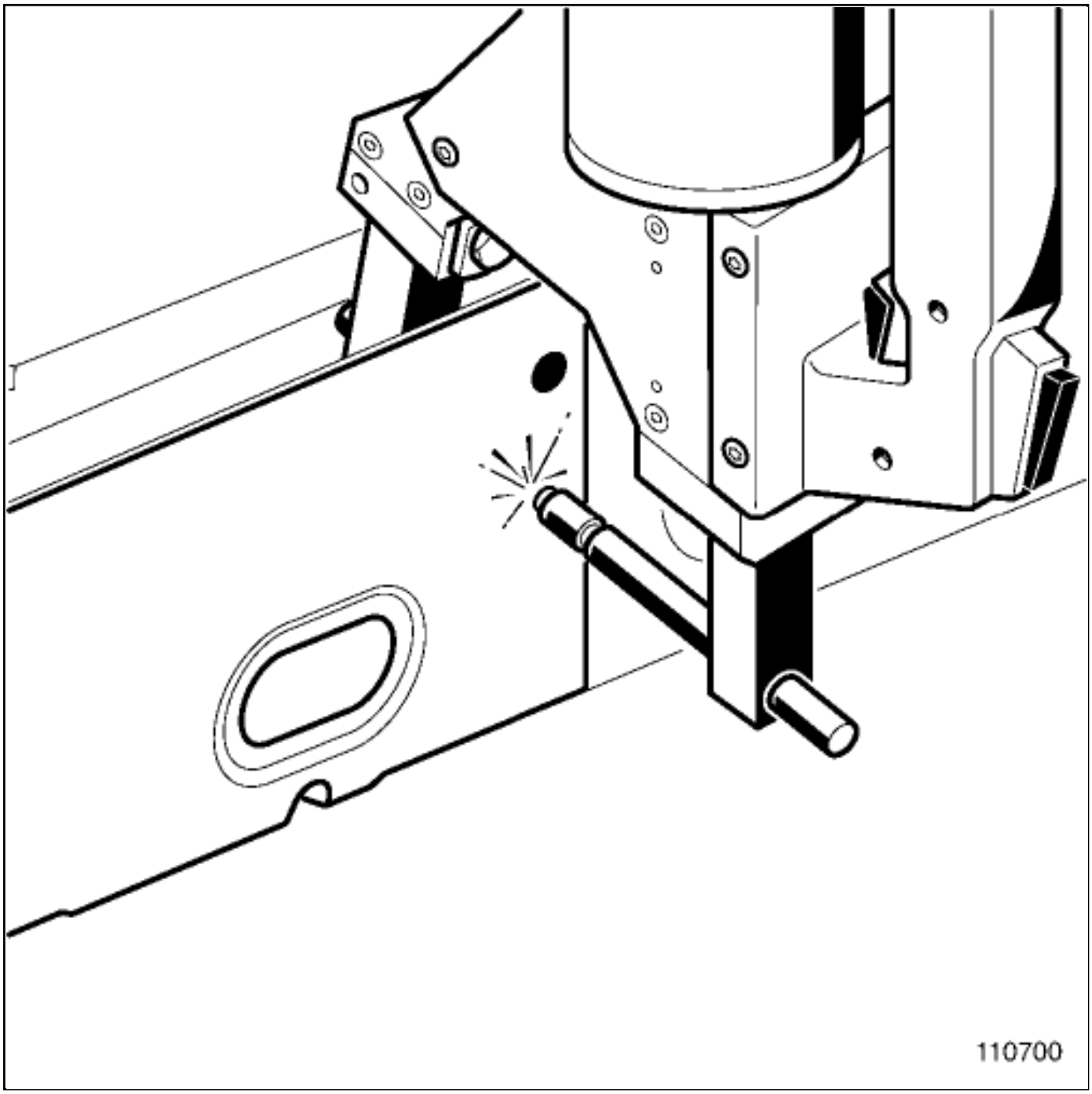
Resistance welding joint.

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection: Precautions for the repair)

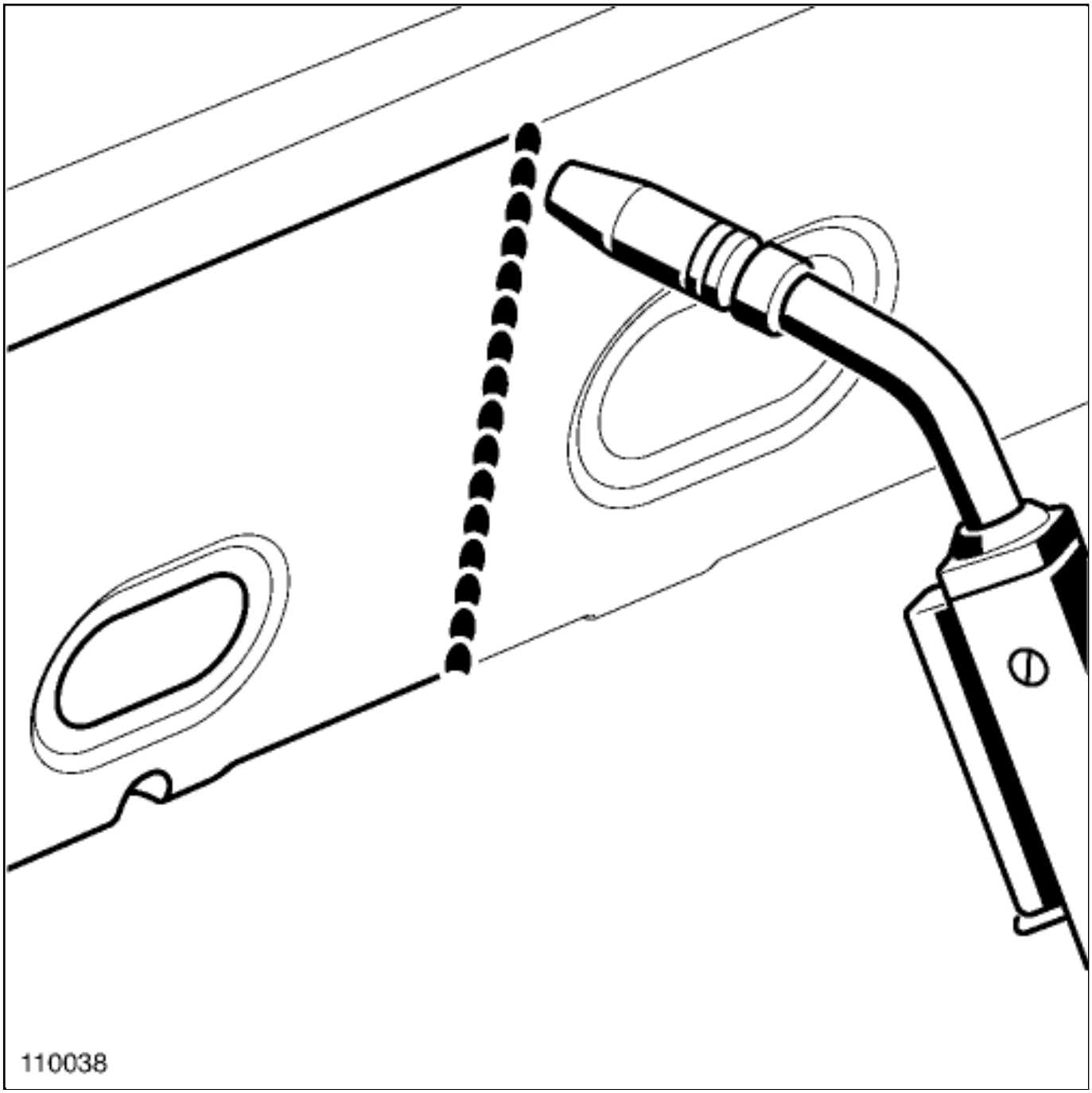
GMAW joint, if necessary with a bead of chain weld in the visible area.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

3)CARRYING OUT THE WELDING



Weld the replacement part.



Apply a bead of chain weld along the whole cut.

4. SINGLE FACE ACCESS

1- PREPARATION BEFORE ASSEMBLY

1)ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2)MARKING AND IDENTIFYING THE JOINTS

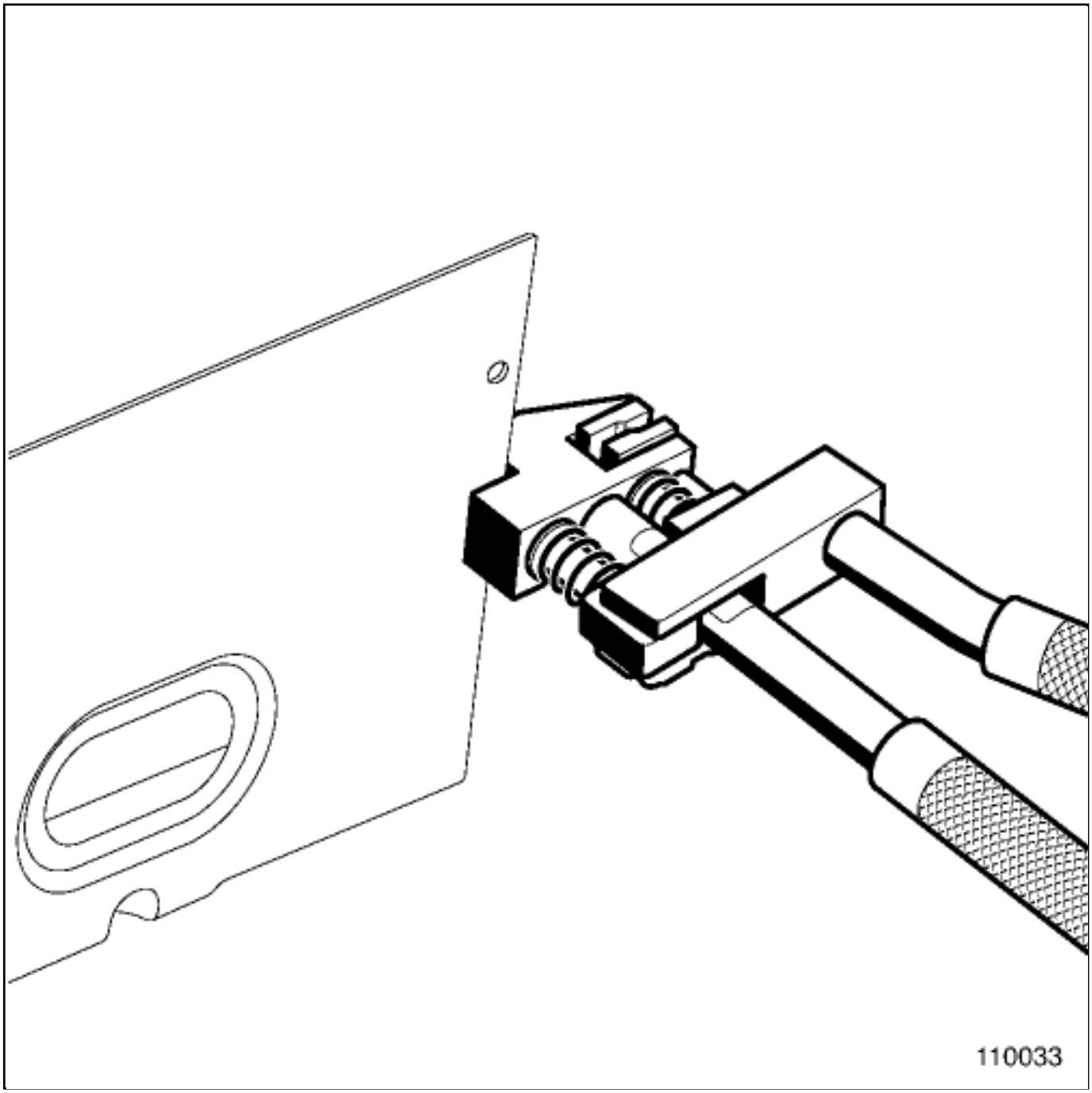
Mark the joint and cut zones.

Remove the replacement part.

3)PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

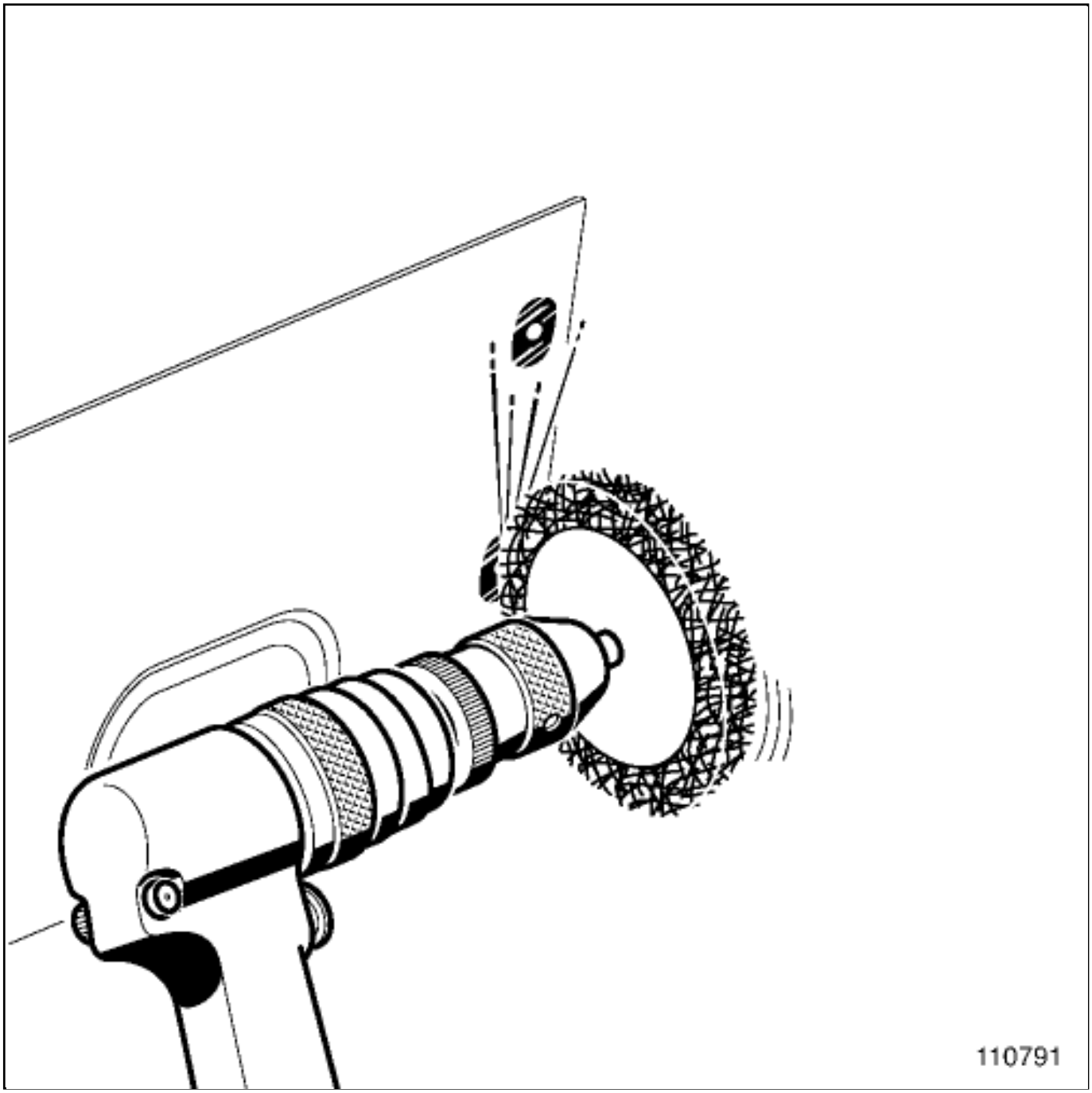
Cut the replacement part according to the marks.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)



Drill or pierce via the internal face at the drilling position, see table below.

Panel thickness (mm)	Drill bit diameter (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10

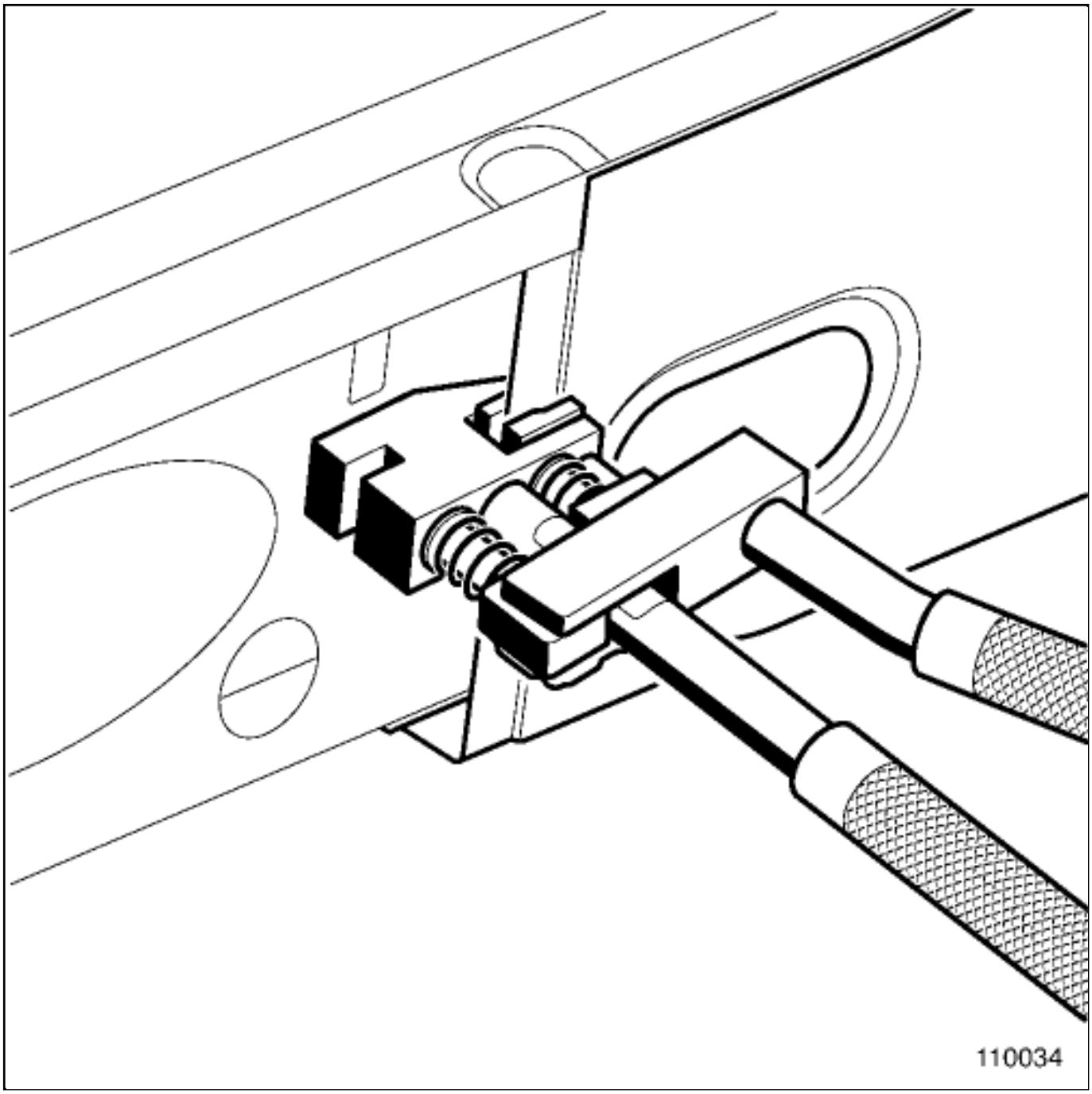


Scour the edges of the drilling holes and the external joint face along the length of the cut.

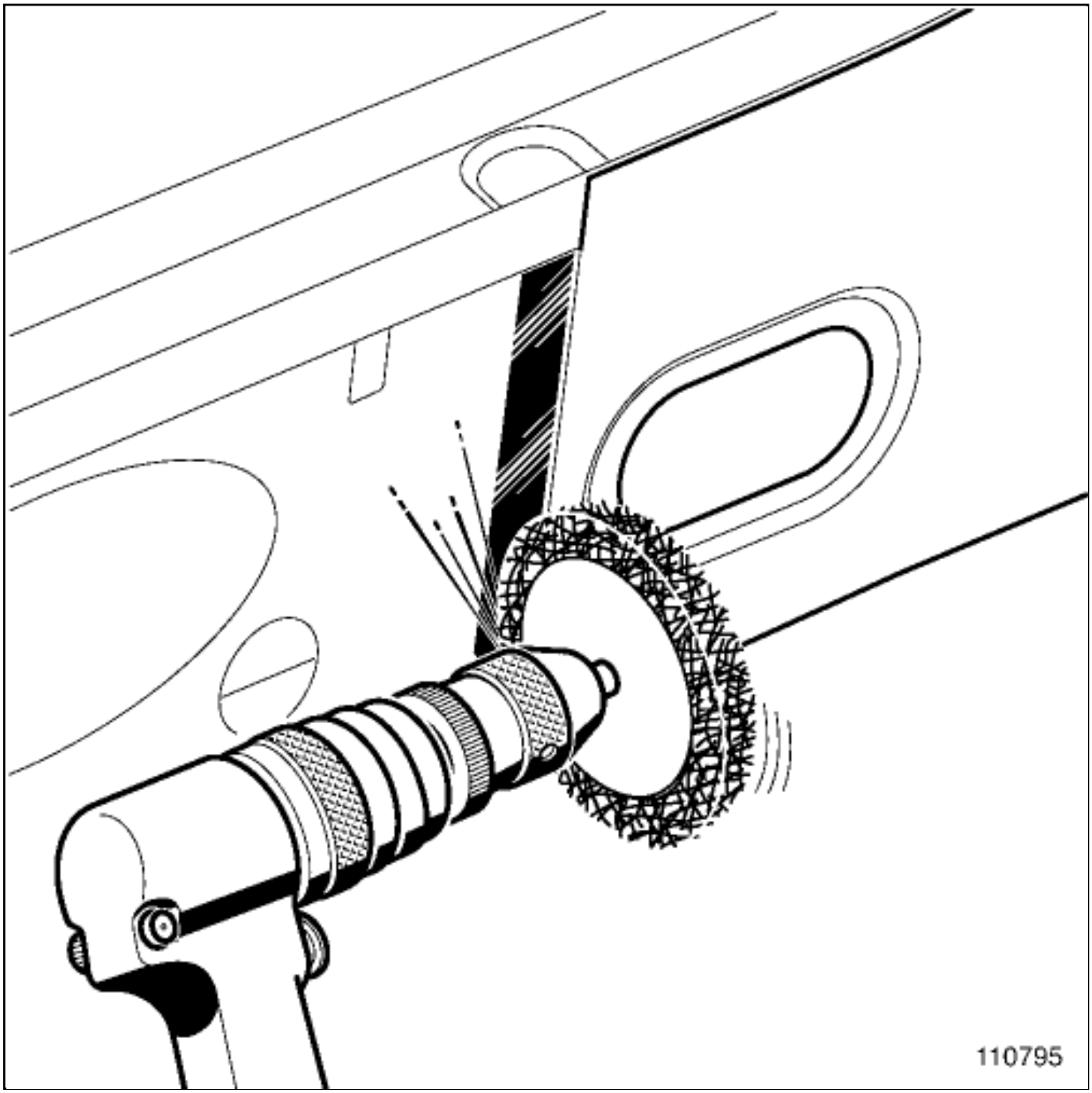
(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

Prepare the rest of the replacement part according to the chosen joint types, in accordance with the available joint face access.

4)PREPARATION OF THE JOINTS ON THE VEHICLE



Carry out the drilling, at the cutting location.



Scour the internal mating face at the step drilling location.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

Prepare the rest of the vehicle, according to the chosen joint types.

5)APPLYING PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal joint faces.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

2- ASSEMBLY

1)FITTING AND ADJUSTING THE REPLACED PARTS

Reposition the replacement part, adjust it and fix it using the locking pliers.

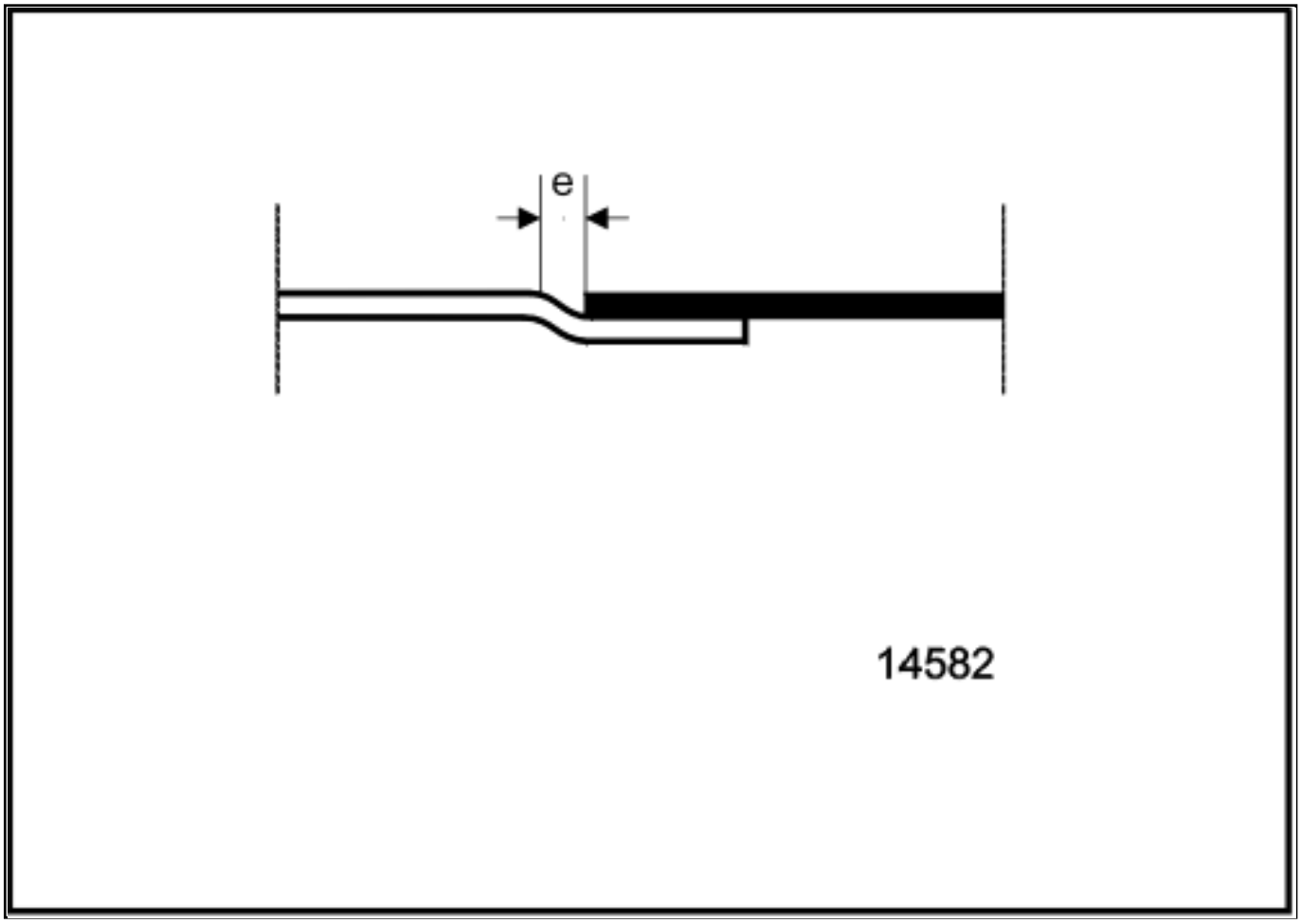
If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Note:

Leave a clearance(e) between the cut and the step drilling angle.

The clearance should be equal to the panel thickness.



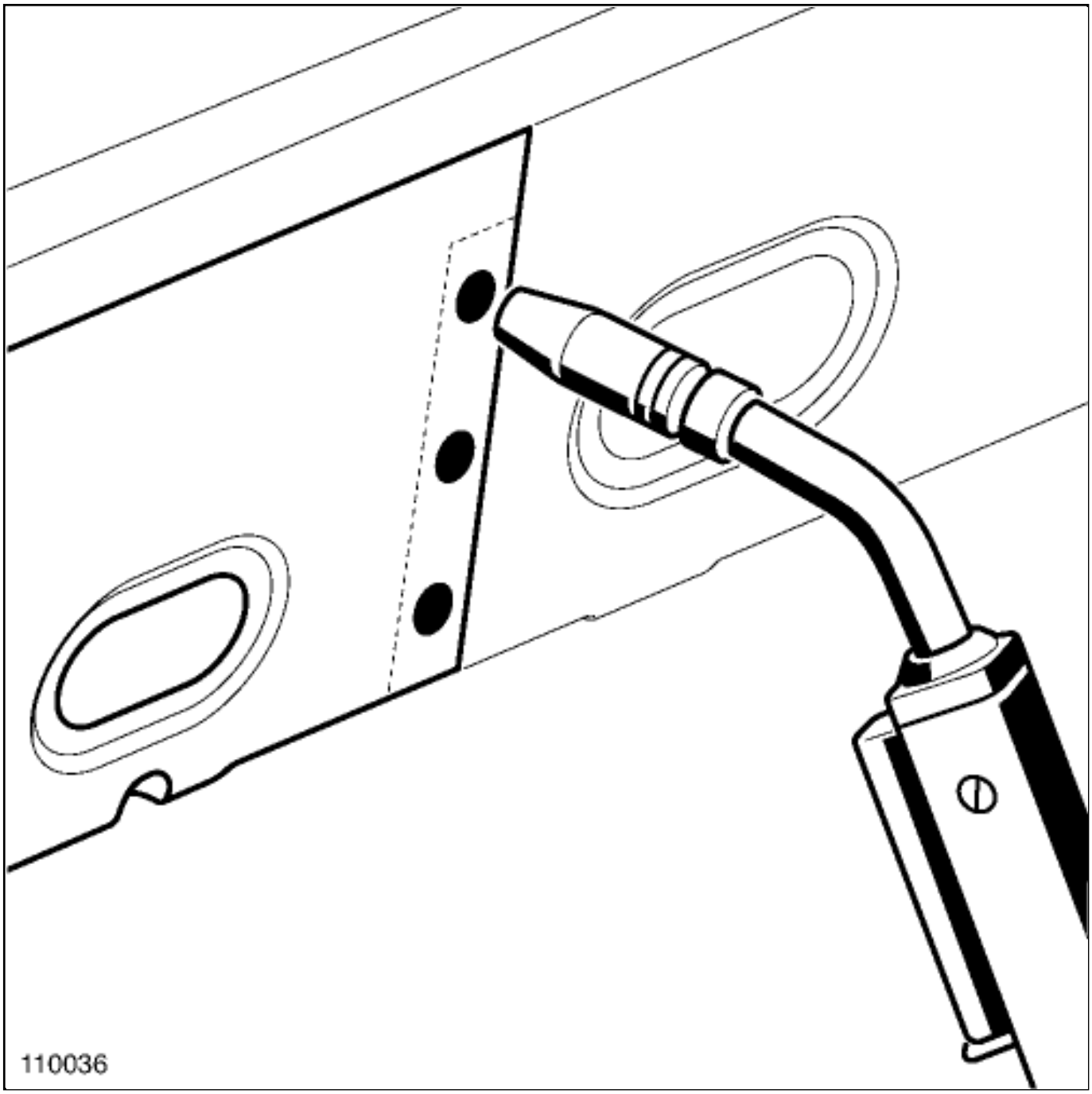
2)ADJUSTING THE WELDERS

Before making the joints on the vehicle, carry out the tests required for adjusting the welders.

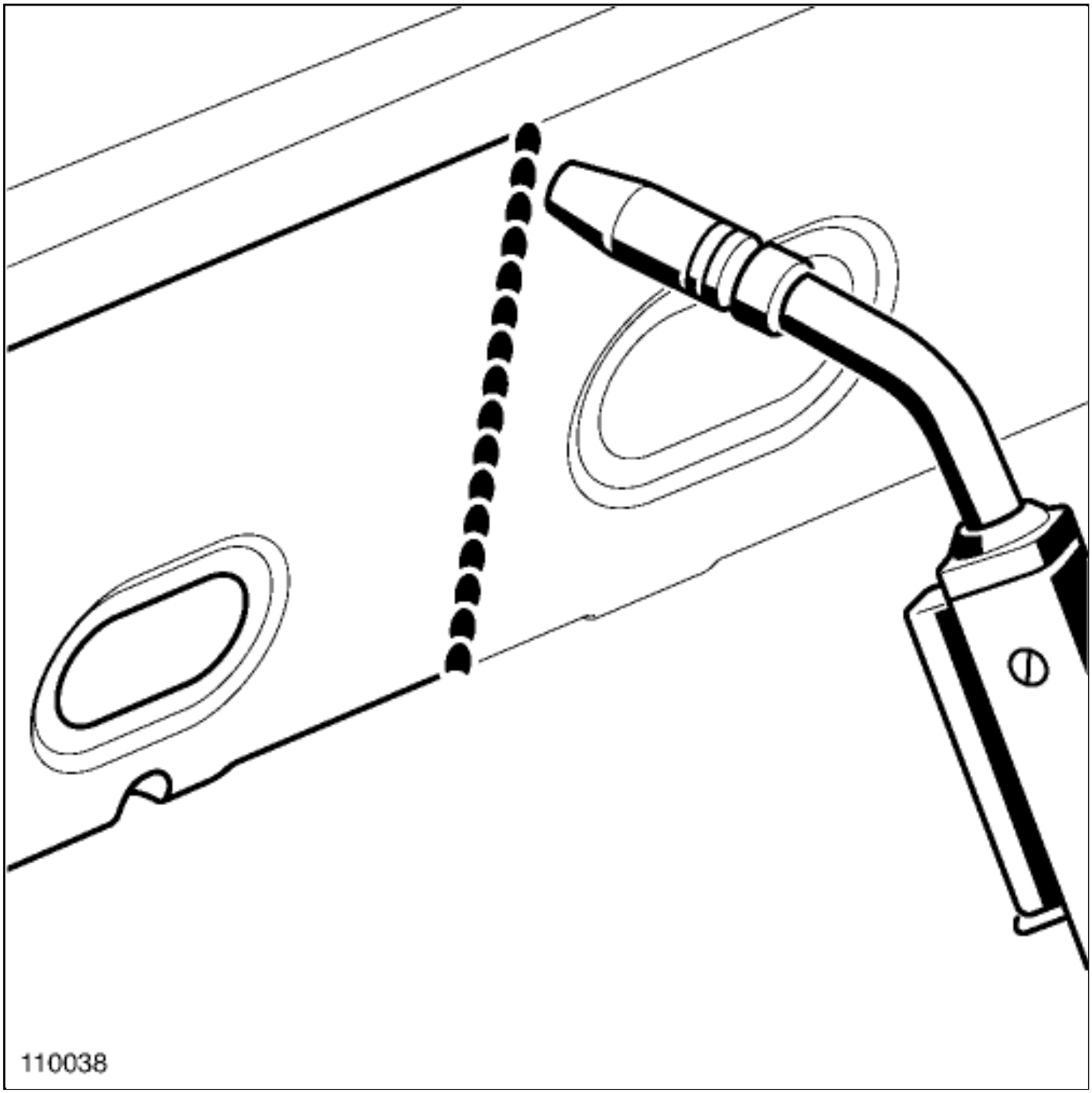
GMAW joint.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

3)CARRYING OUT THE WELDING

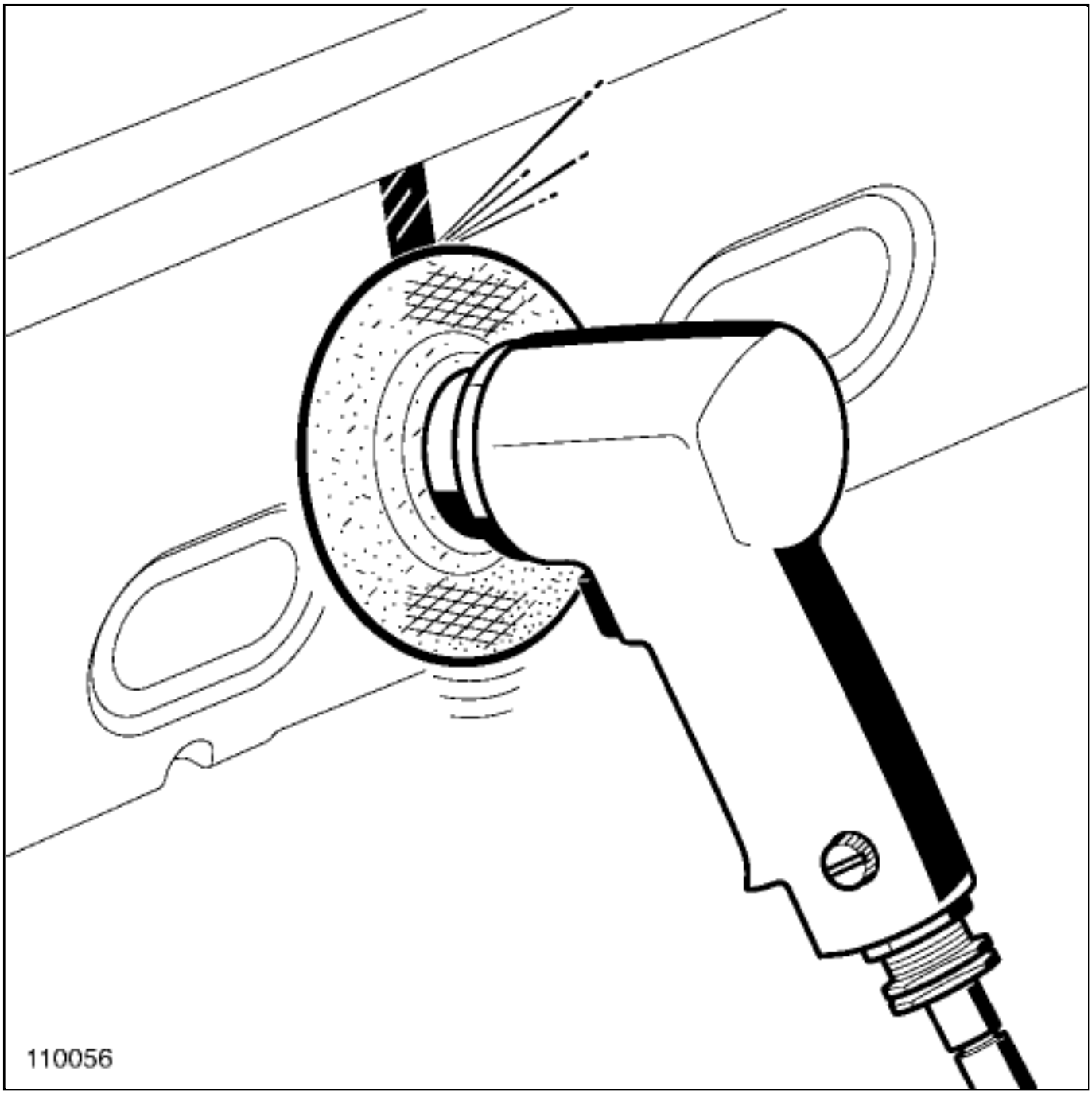


Do the plug welds.



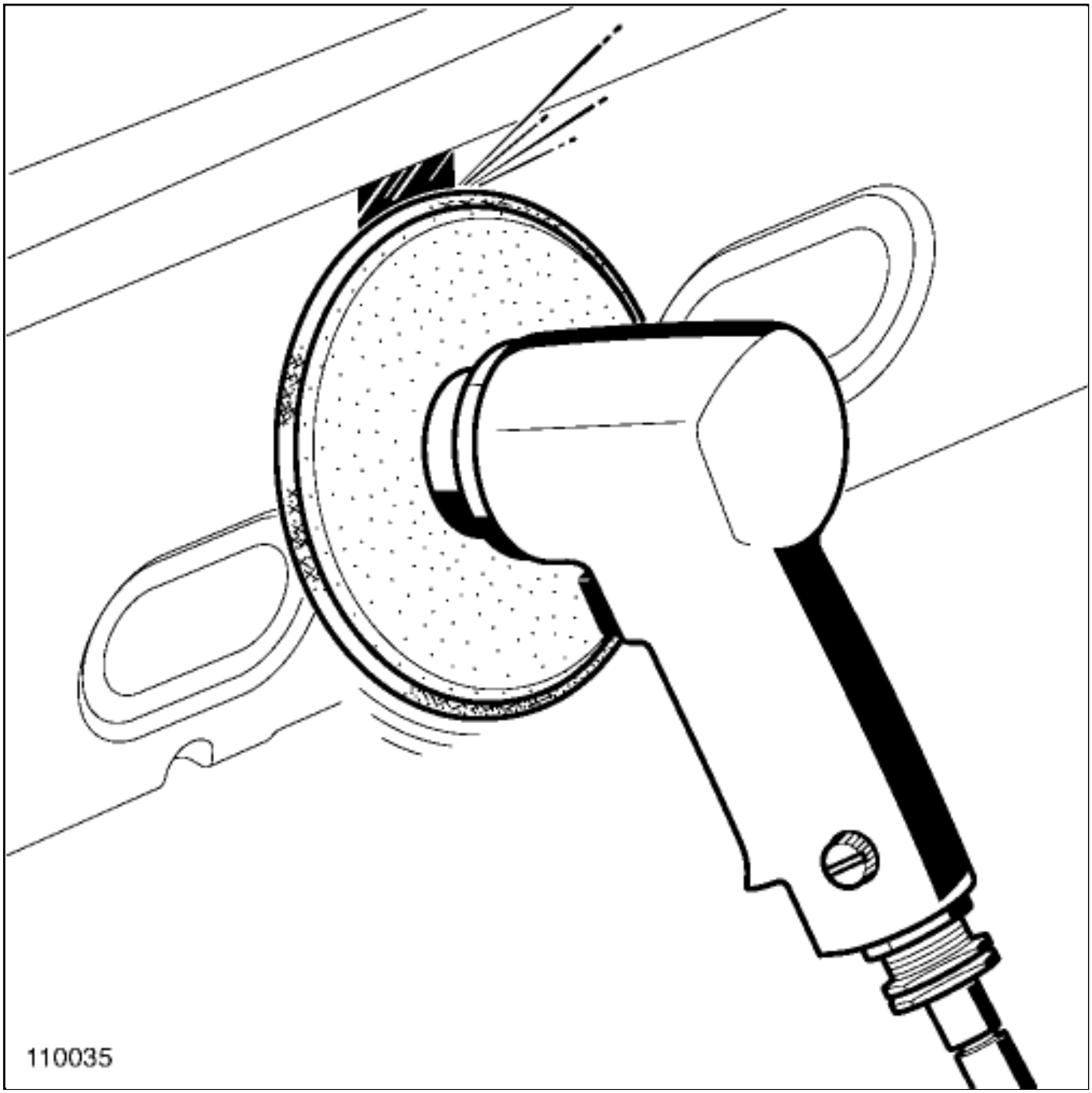
Apply a bead of chain weld along the whole cut.

3- FINISHING



Grind the continuous weld and the plug welds.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)



Surface the assembly area.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

If necessary, carry out surface finishing.

(see 04F, Bodywork products and mountings, Panelwork finishing products: Use)

1)FITTING PROTECTION AFTER ASSEMBLY

Fit the soundproofing.

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

Apply the anti-corrosion protection.

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

CONNECTIONS FOR PARTIAL REPLACEMENT BY OVERLAPPING

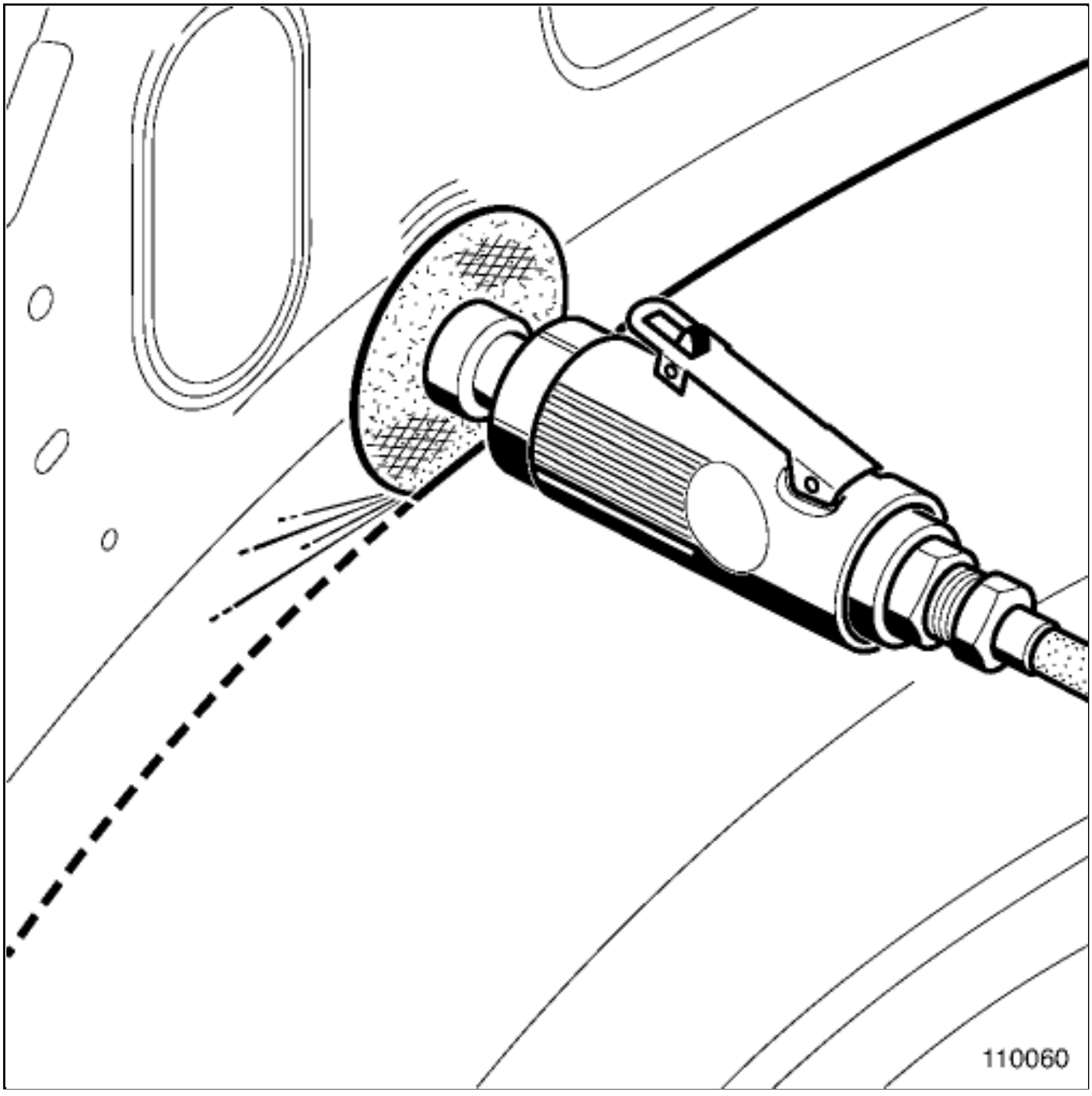
1. DISASSEMBLY

1- SCOURING

If necessary, scour the joint areas.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

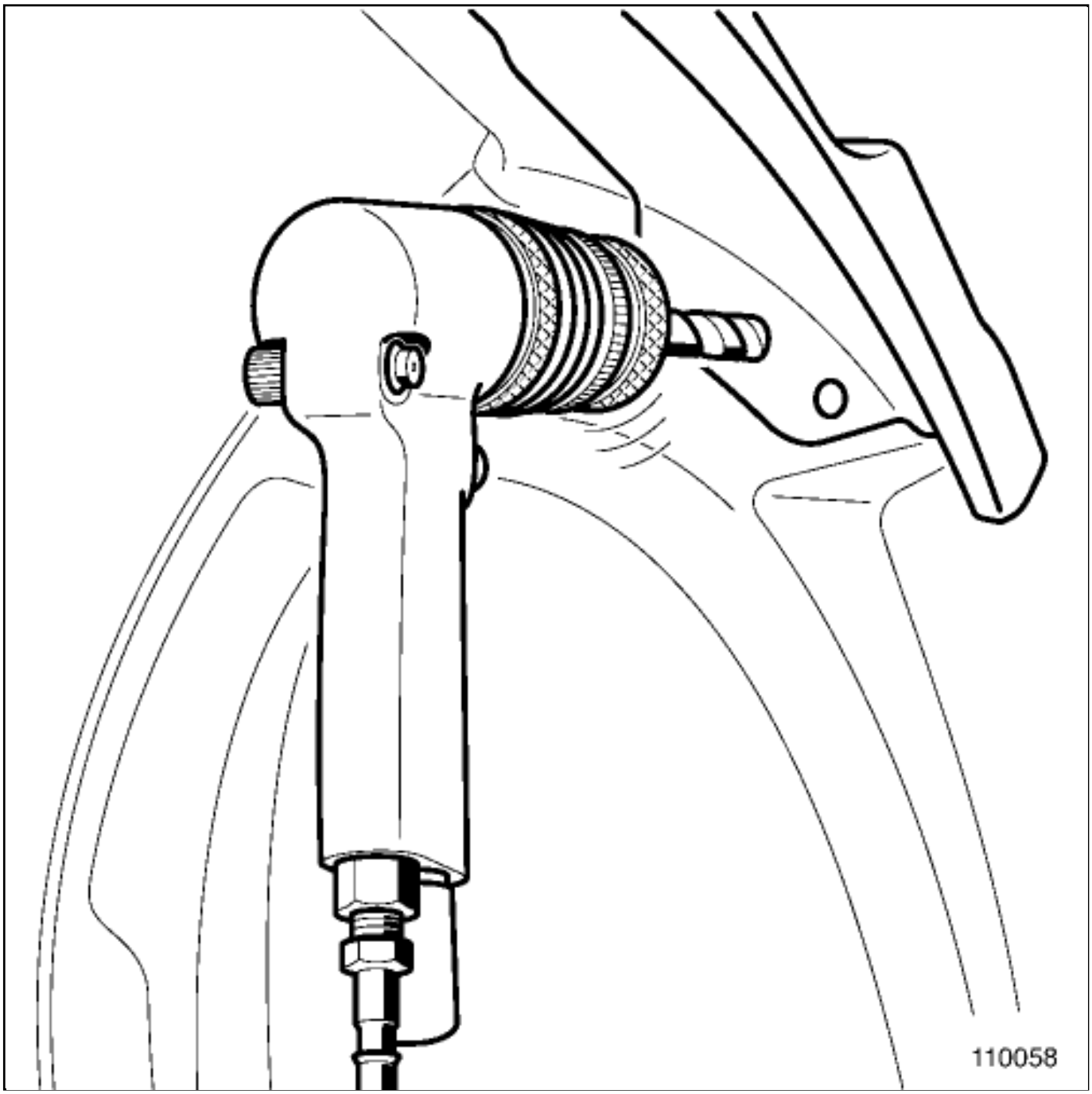
2- CUTTING



Cut the damaged part; refer to the MR for the vehicle concerned.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

3- UNPICKING



Unpick the part's welded connections.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

Note:

Do not strike or damage the panel.

4- GRINDING

Grind the unpicking and cutting residue.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface the internal mating face.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

2. TWO FACE ACCESS

1- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

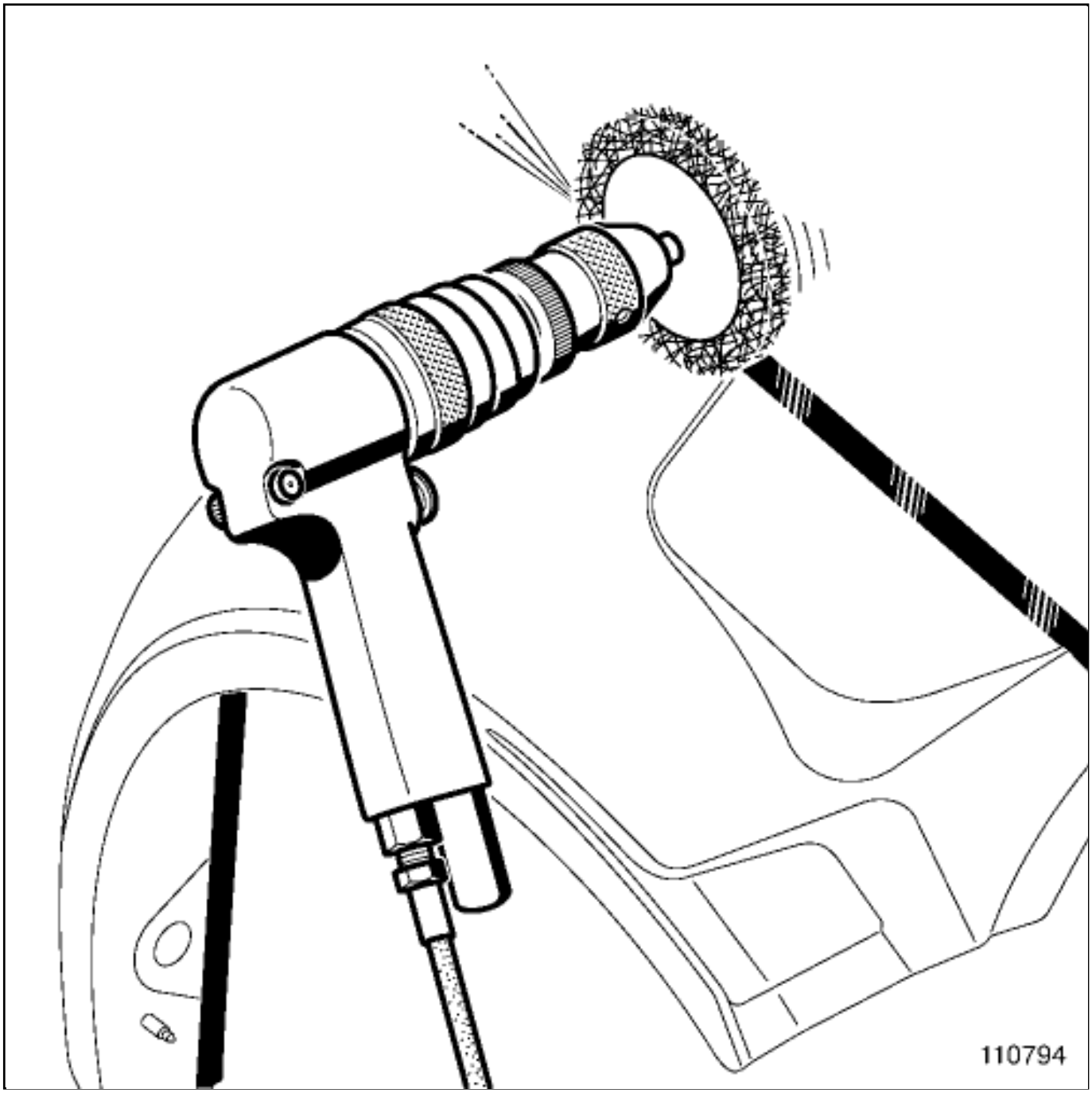
Mark the joint faces; refer to the MR for the vehicle concerned.

Disassemble the replacement part.

2- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

Cut the replacement part according to the marking.

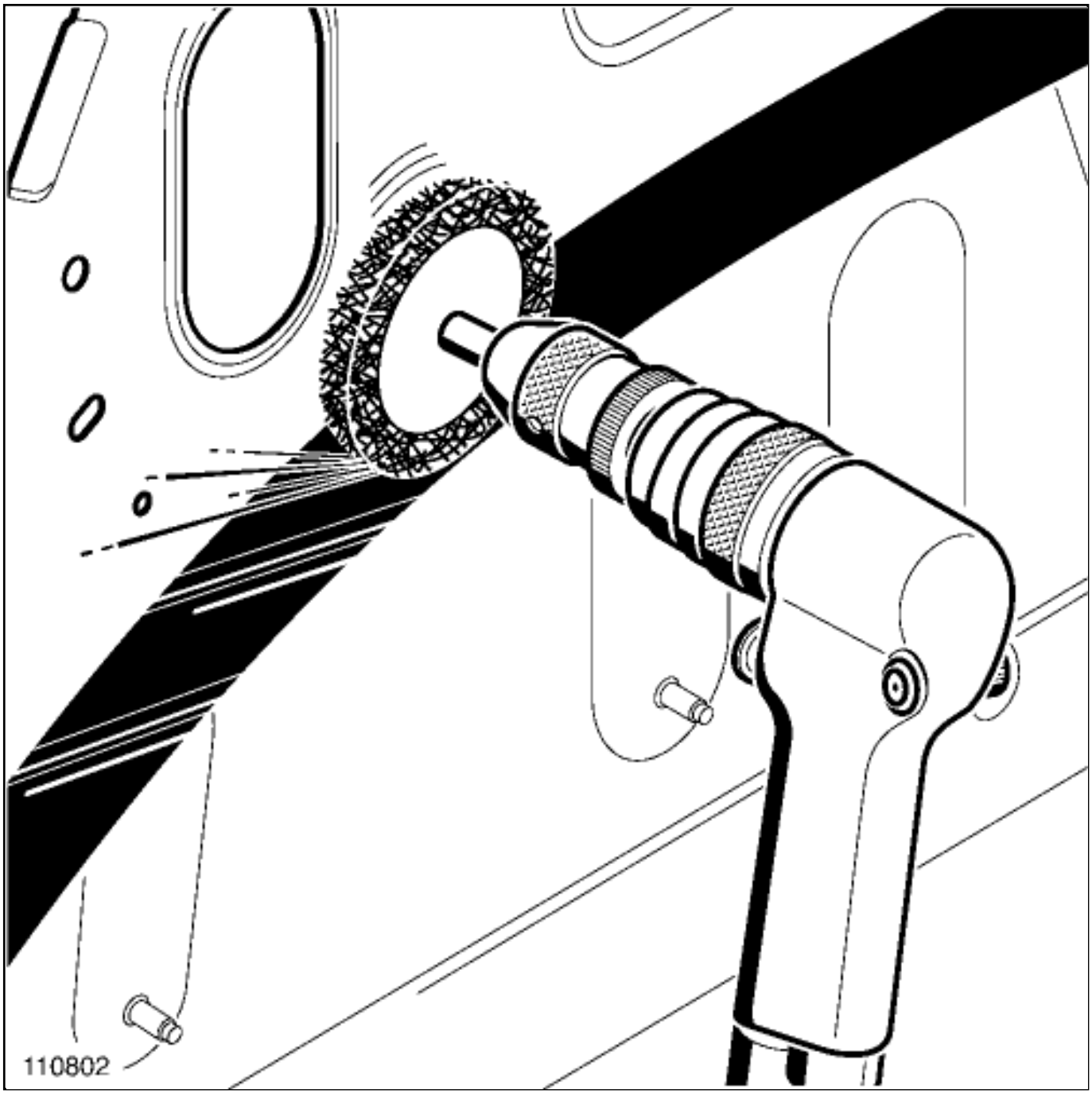
(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)



Scour the internal and external joint faces around the cut.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- PREPARATION OF THE JOINTS ON THE VEHICLE



Scour the internal and external joint faces.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

Apply the anti-corrosion protection to the internal faces.

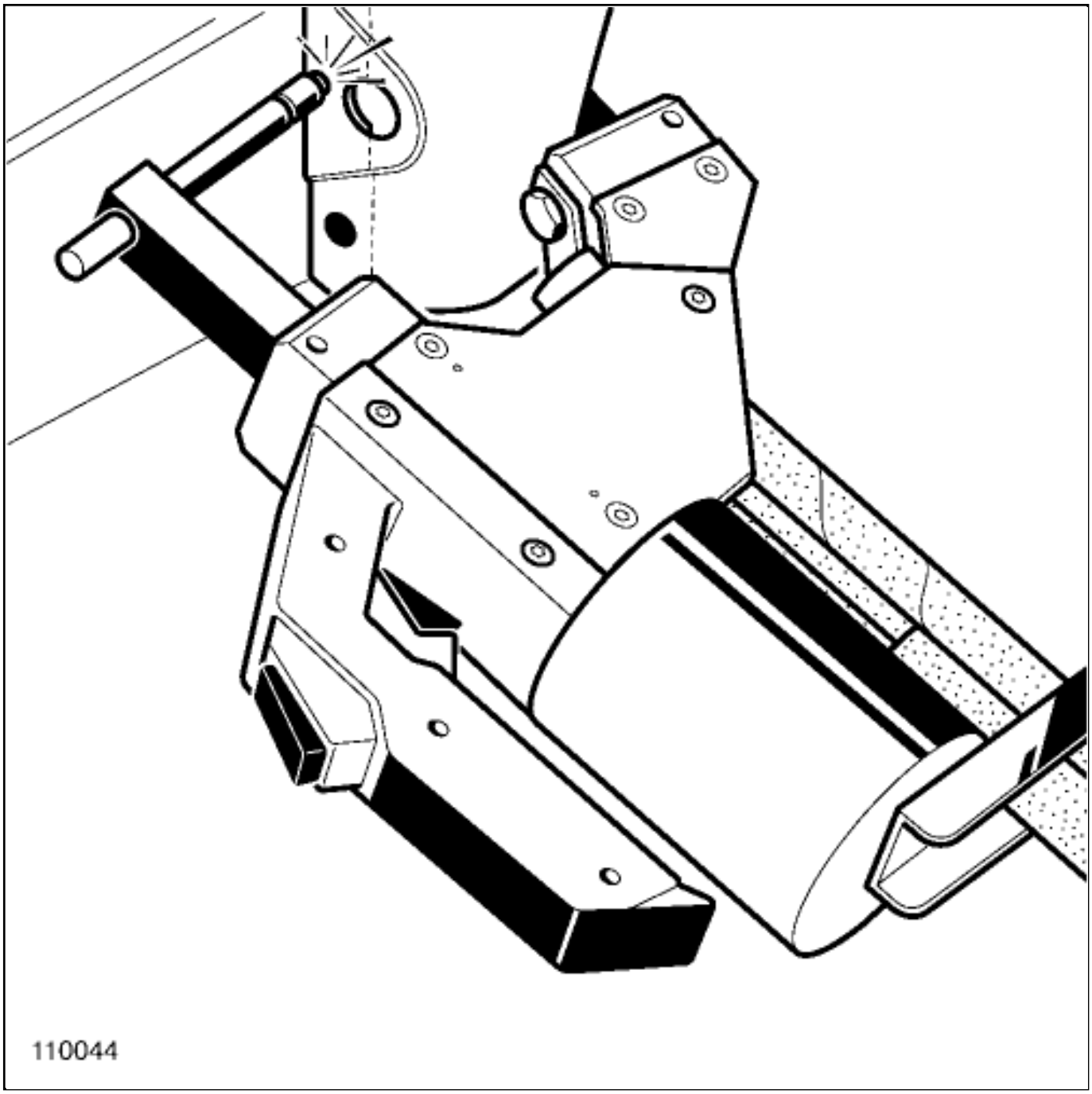
(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

5- CARRYING OUT THE WELDING

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Weld the part checking for good part jointing.

3. SINGLE FACE ACCESS

1- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

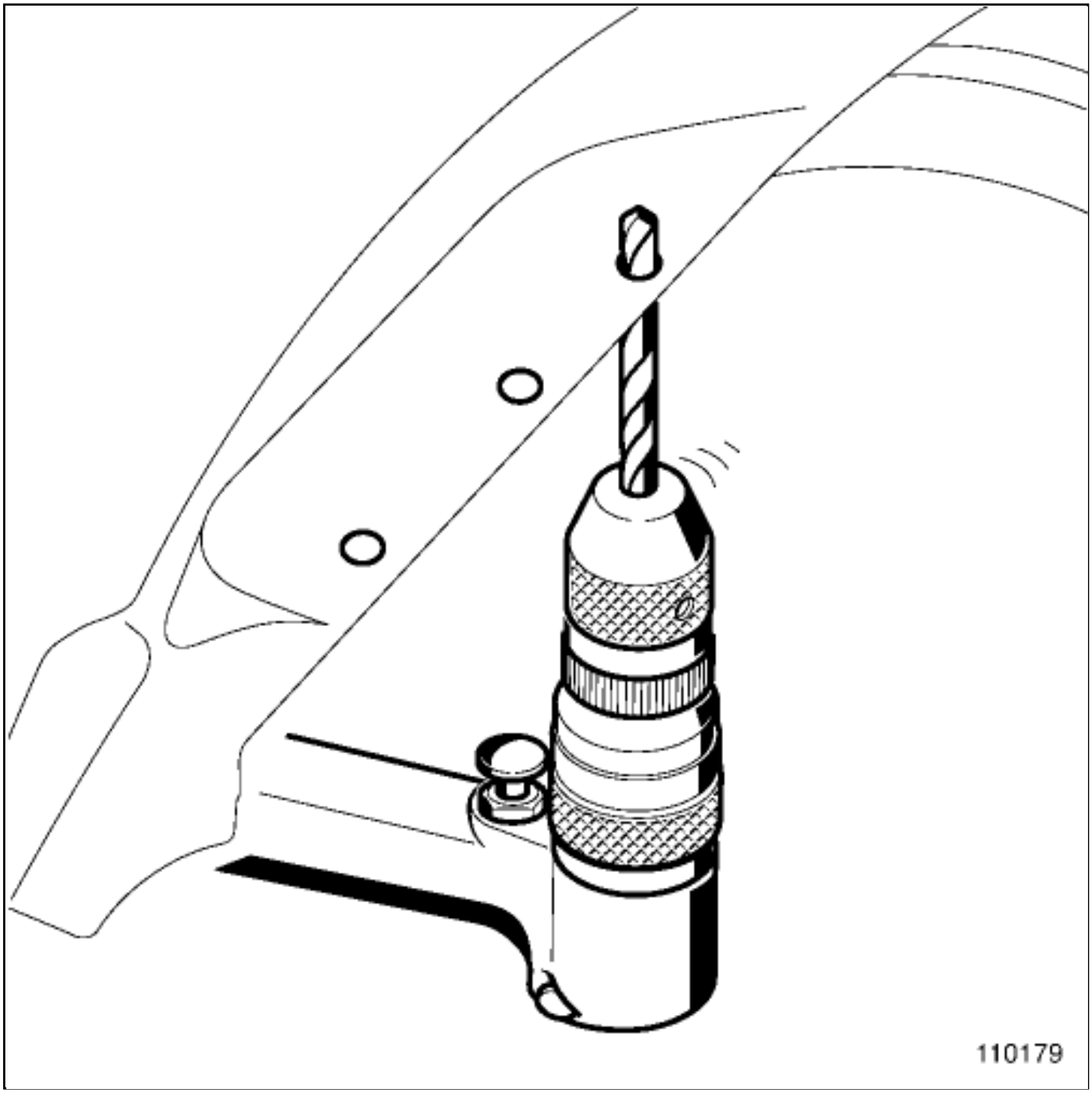
Mark the joint faces; refer to the MR for the vehicle concerned.

Remove the replacement part.

2- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

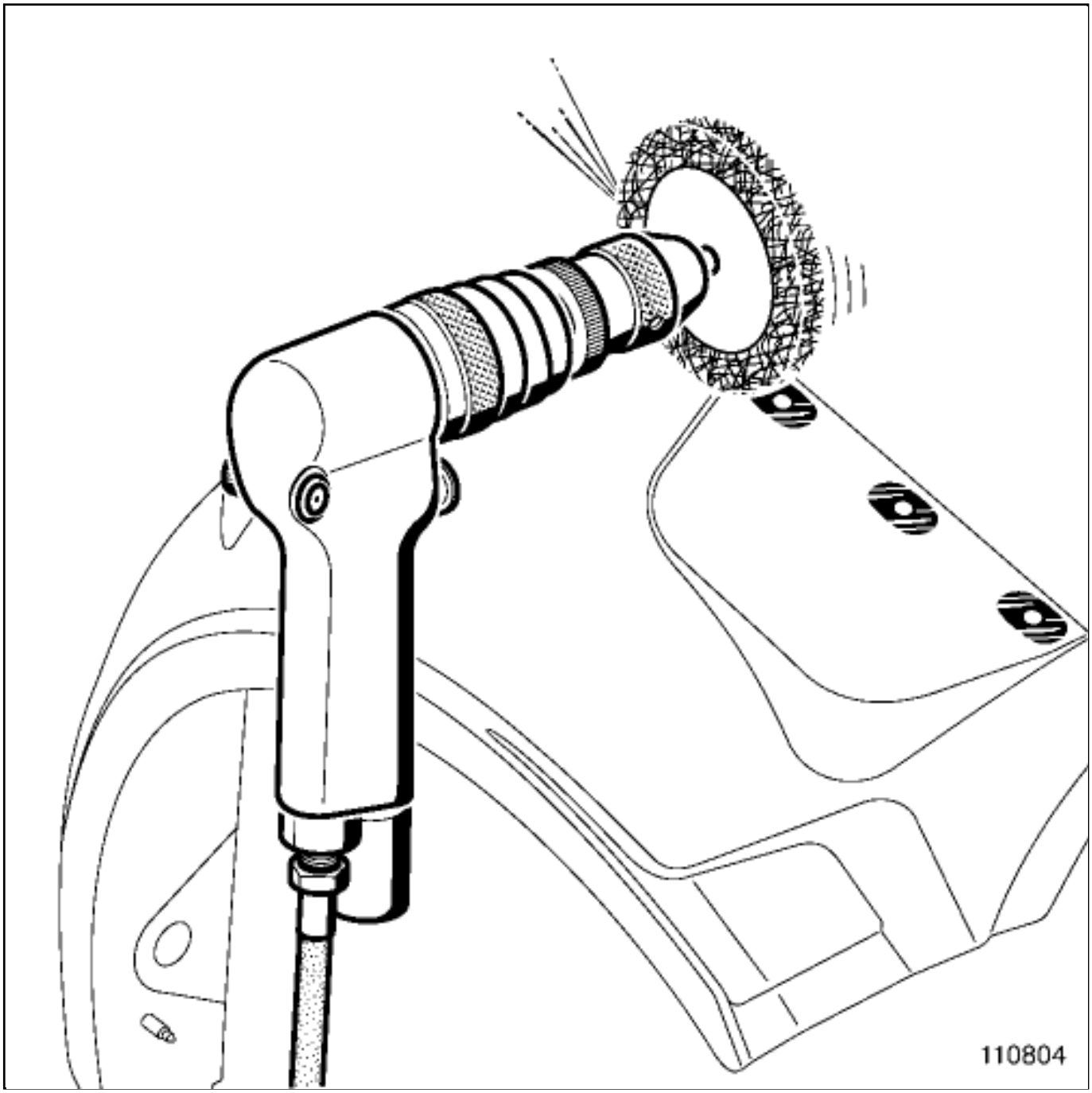
Cut the replacement part according to the marking.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)



Drill or pierce the holes for the plug welds via the internal face, following the table below.

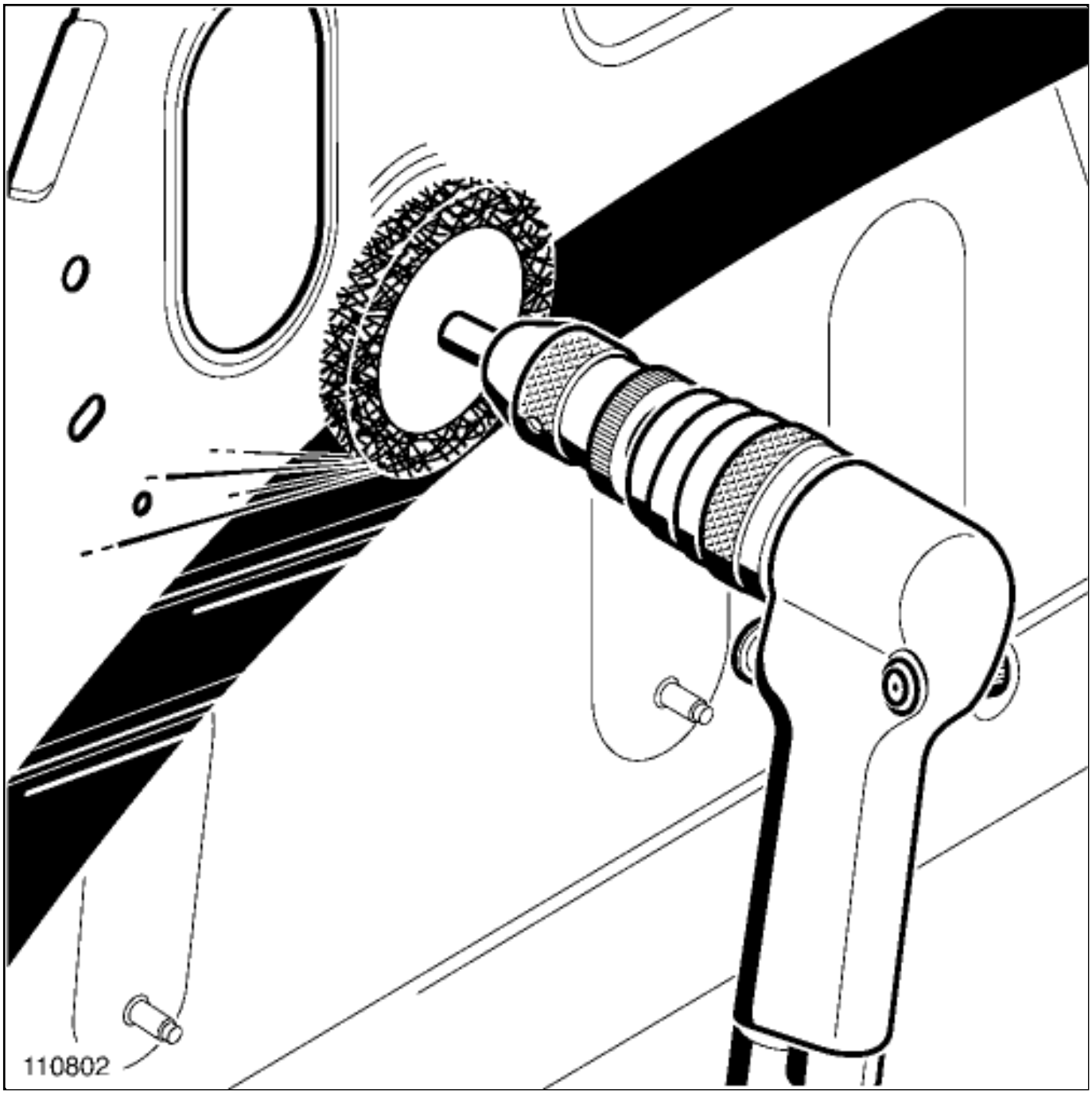
Panel thickness (mm)	Drill bit diameter (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10



Scour the edges of the holes on the external joint faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- PREPARATION OF THE JOINTS ON THE VEHICLE



Scour the internal mating faces.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

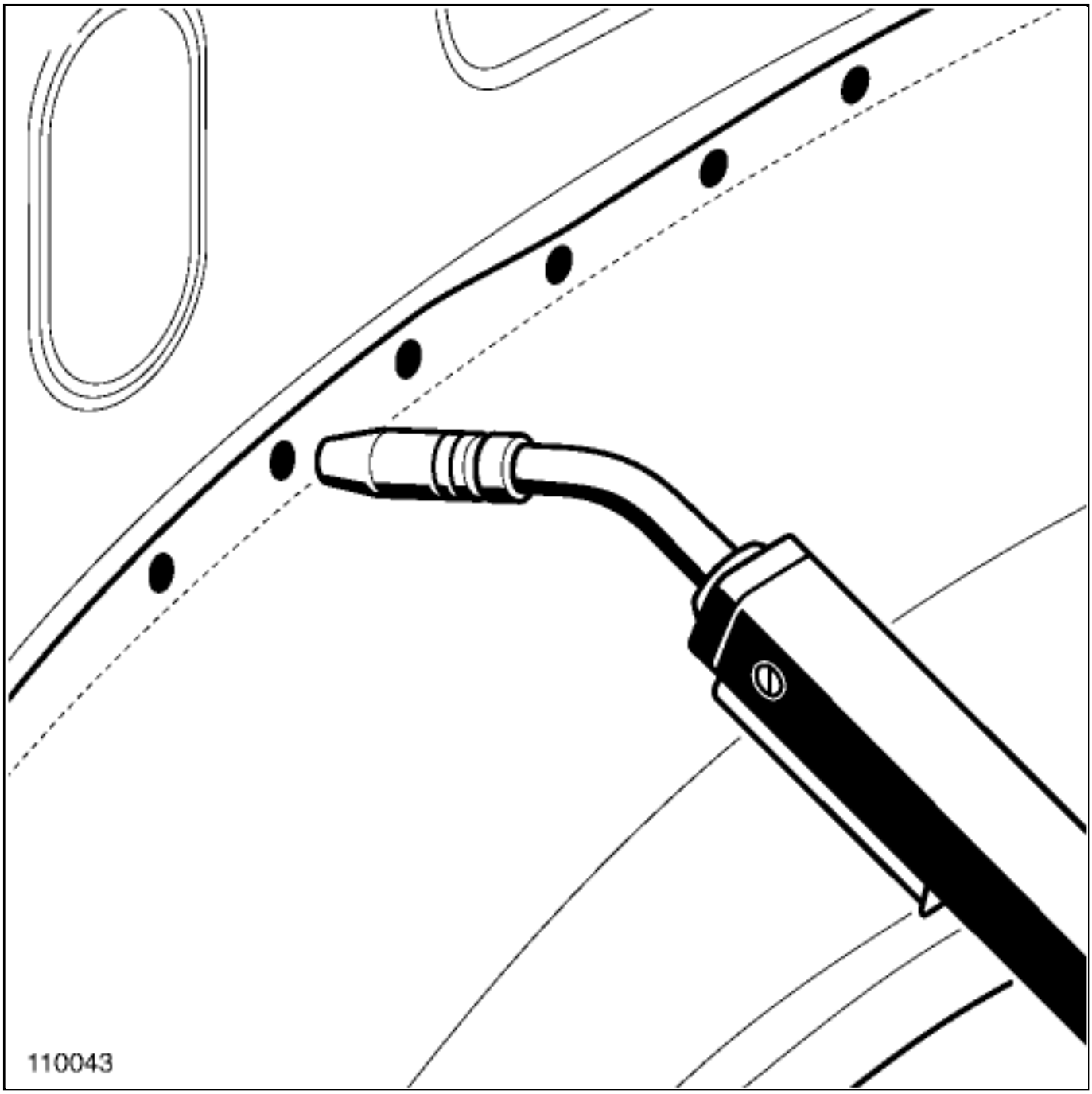
(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- CARRYING OUT THE WELDING

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

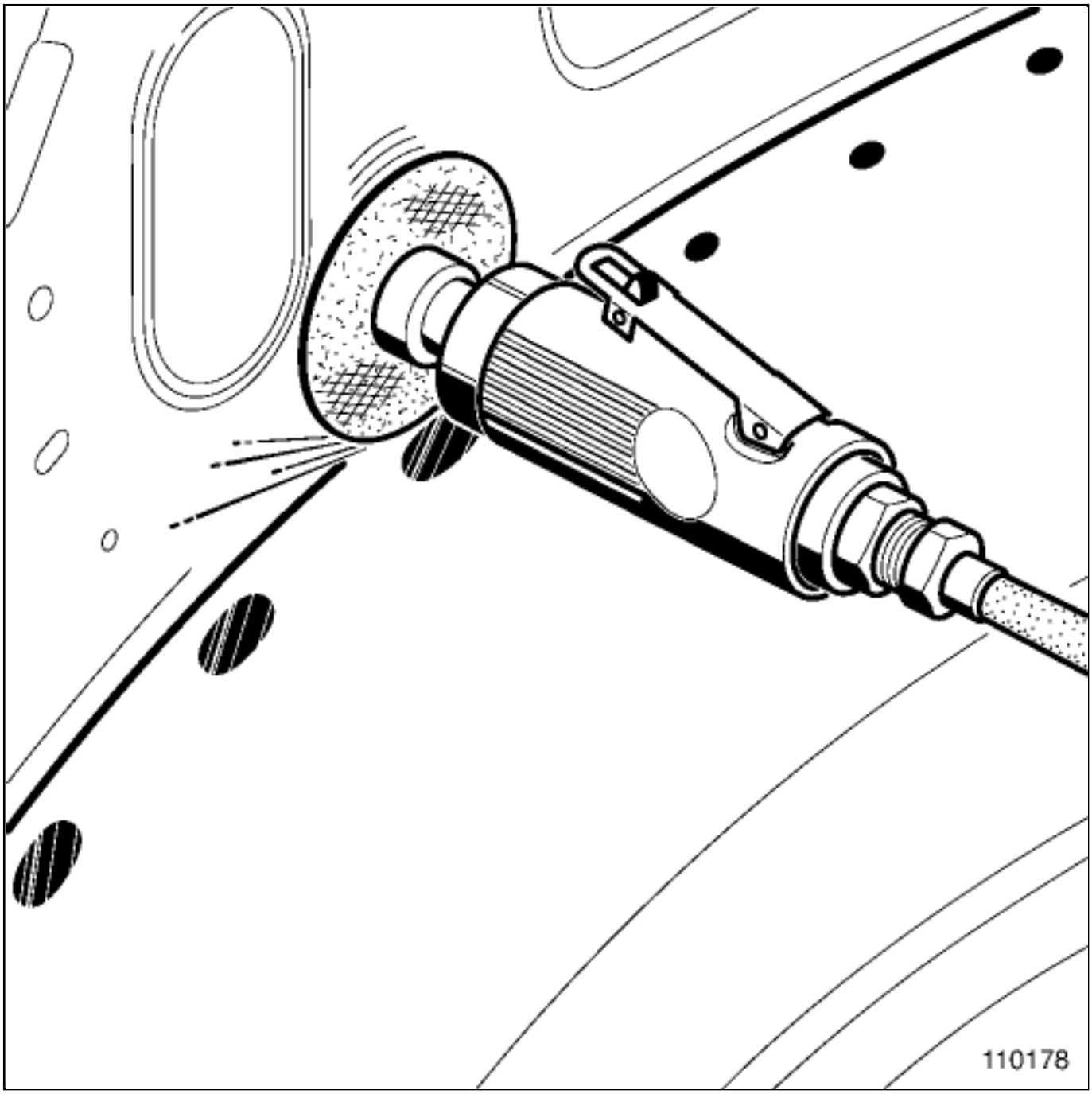
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

5- FINISHING



Grind the plug welds.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface the joint areas.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

Note:

In the previous example, apply a bead of paint sealing mastic between the replaced part and the support on the vehicle before refitting the wing panel.

Repair-40x01x28x08-02x21-1-1-1.xml

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CONNECTIONS FOR PARTIAL REPLACEMENT BY PATCH DRILLING

1. DISASSEMBLY

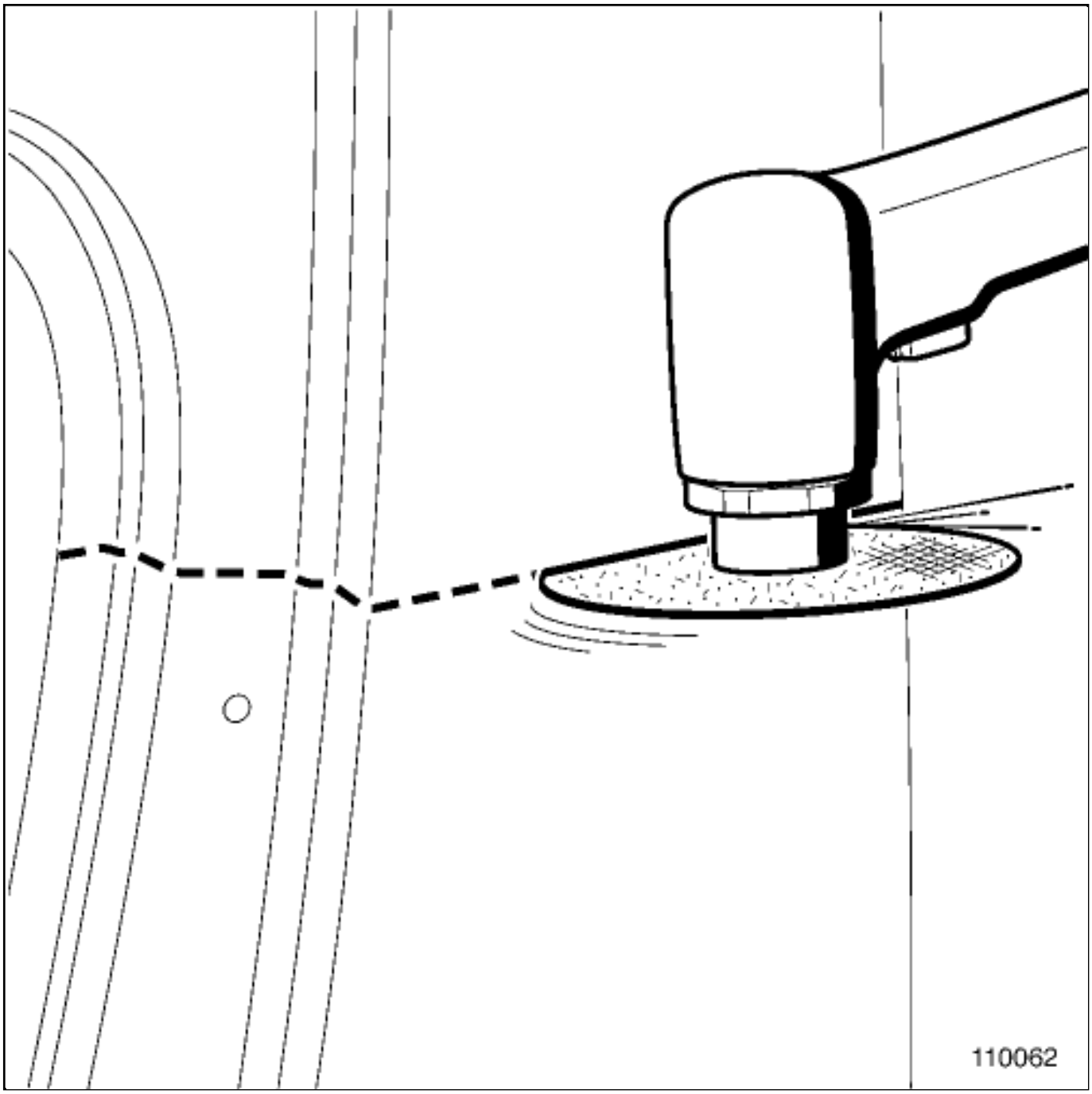
1- SCOURING

If necessary, scour the area where the partial cut will be made.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

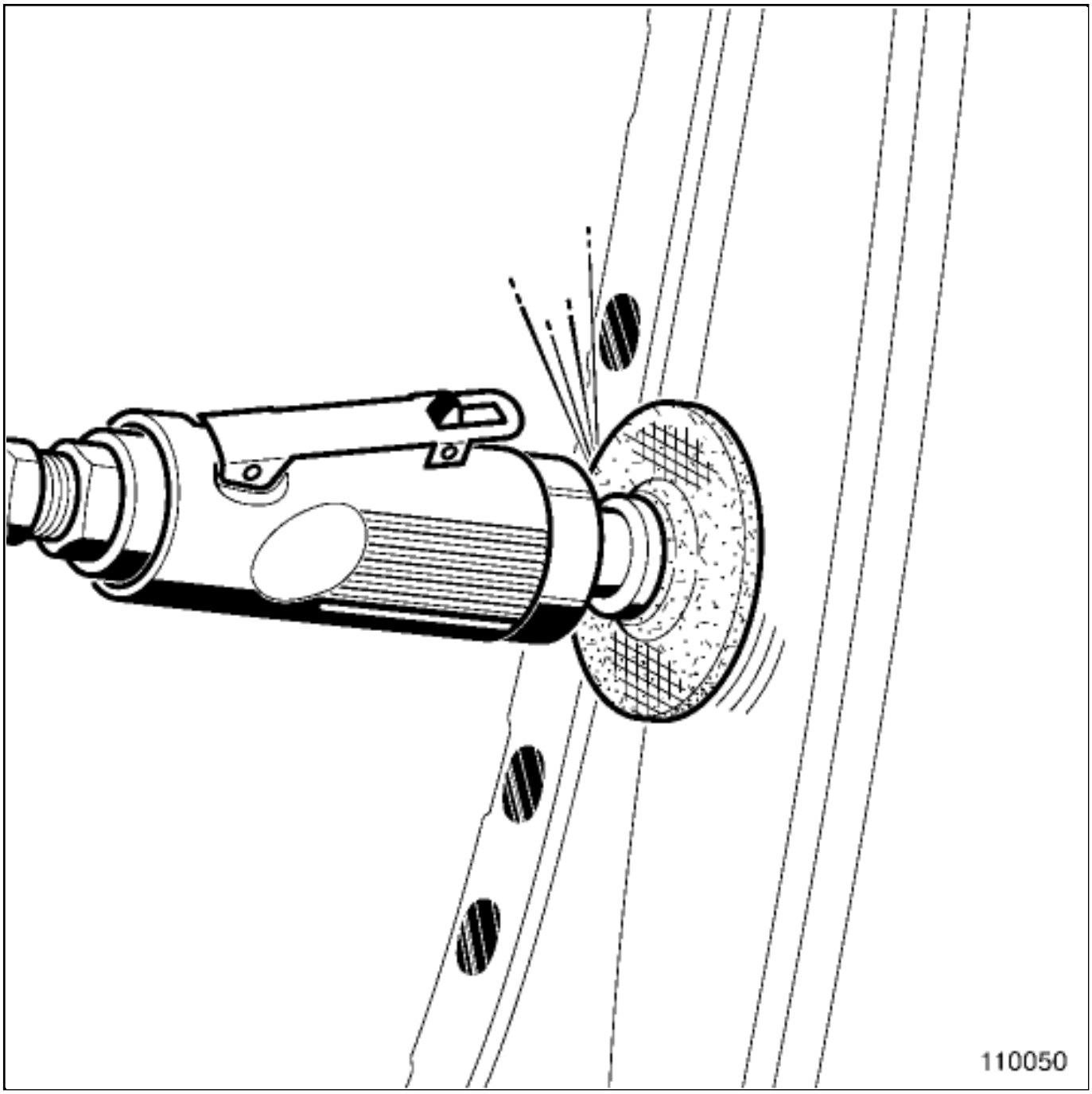
2- CUTTING



Cut the damaged part on the vehicle approximately 40 mmfrom the definitive cut; refer to the MR for the vehicle concerned.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

3- UNPICKING



Unpick the spots holding the part on the vehicle.

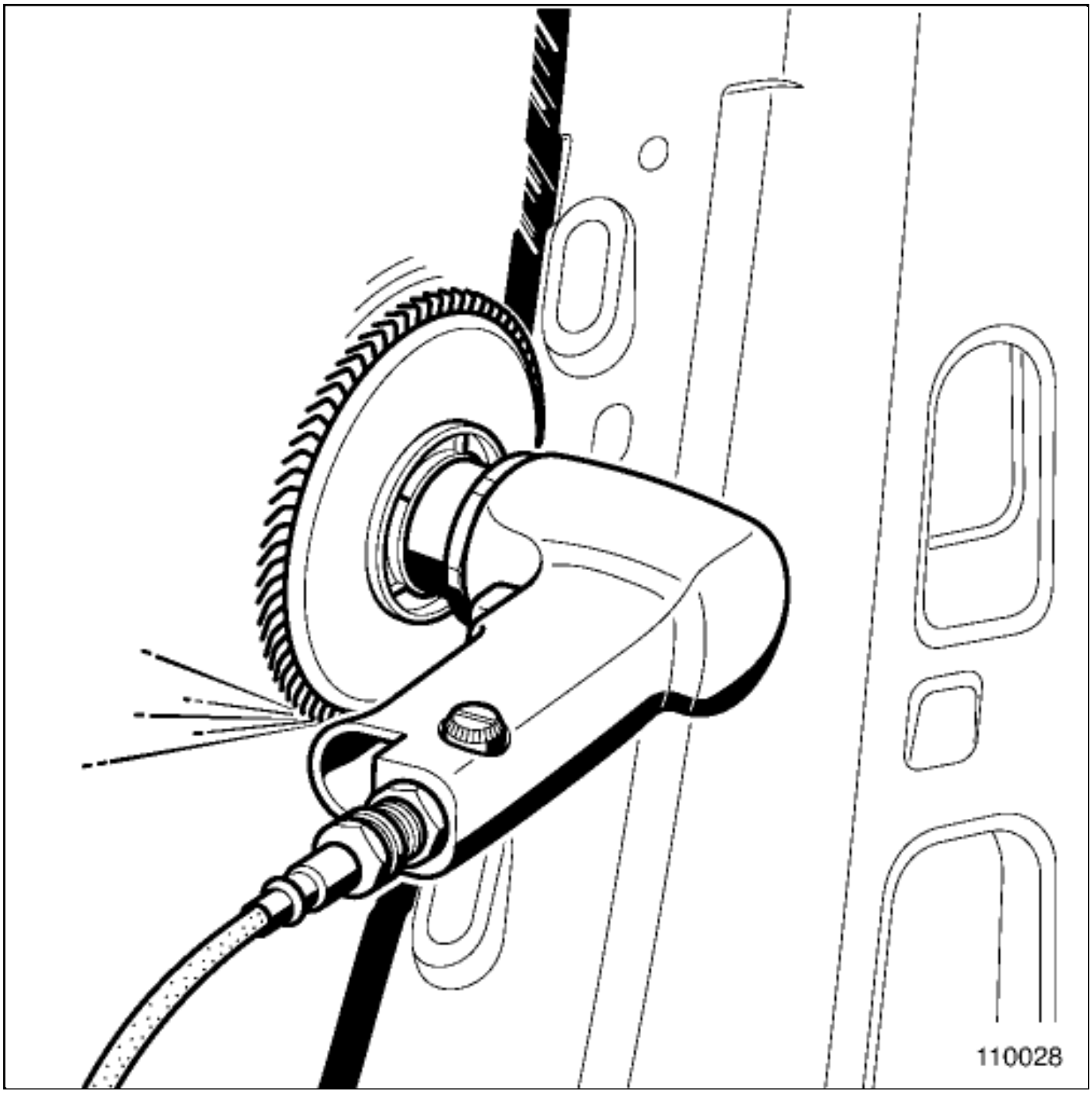
(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

Note:

Do not strike or damage the panel.

4- GRINDING



Level off all the welding residue as well as that left by the cutting.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

2. PREPARATION BEFORE ASSEMBLY

1- LOCATION OF THE WELDS AND NUMBER OF POINTS.

- The step drilling patch joint can be made in two ways:
  - Resistance spot welding:

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection with direct access: Description)

  - Gas metal arc spot welding (GMAW):

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

In both cases, refer to the indications given in the vehicle's MR to find out the weld locations.

Apply a bead of chain weld in visible areas.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

Cut the replacement part 80 mmlarger than the section removed from the damaged part to ensure coverage.

2- ADJUSTMENT BEFORE ASSEMBLY

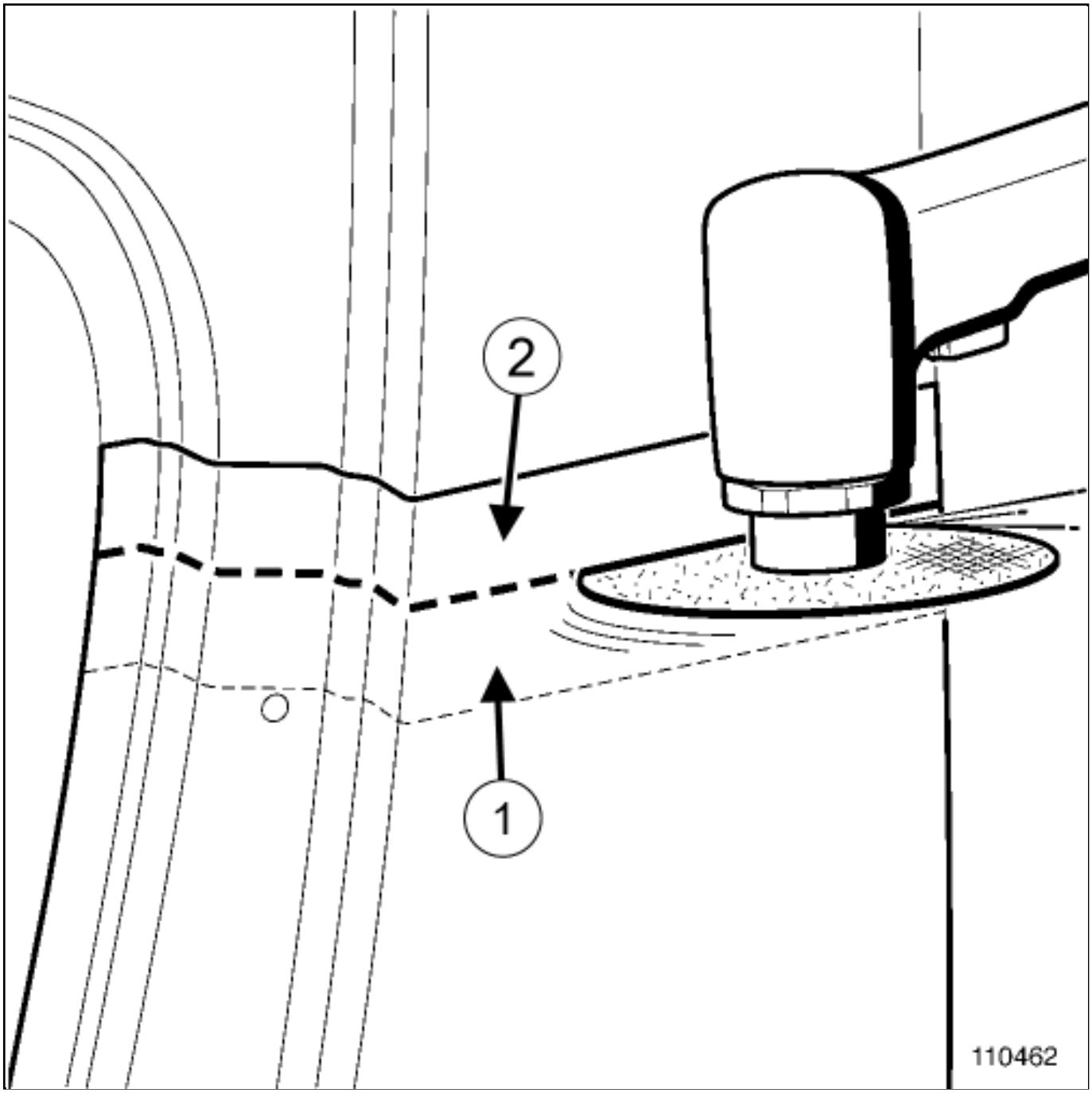
Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

3- MARKING AND IDENTIFYING THE JOINTS

Mark the areas to be scoured in accordance with each type of joint.



Cut the two components simultaneously approximately 40 mmfrom the cut previously made.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

Remove the part and unpick the remaining metal strip(1) on the vehicle.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

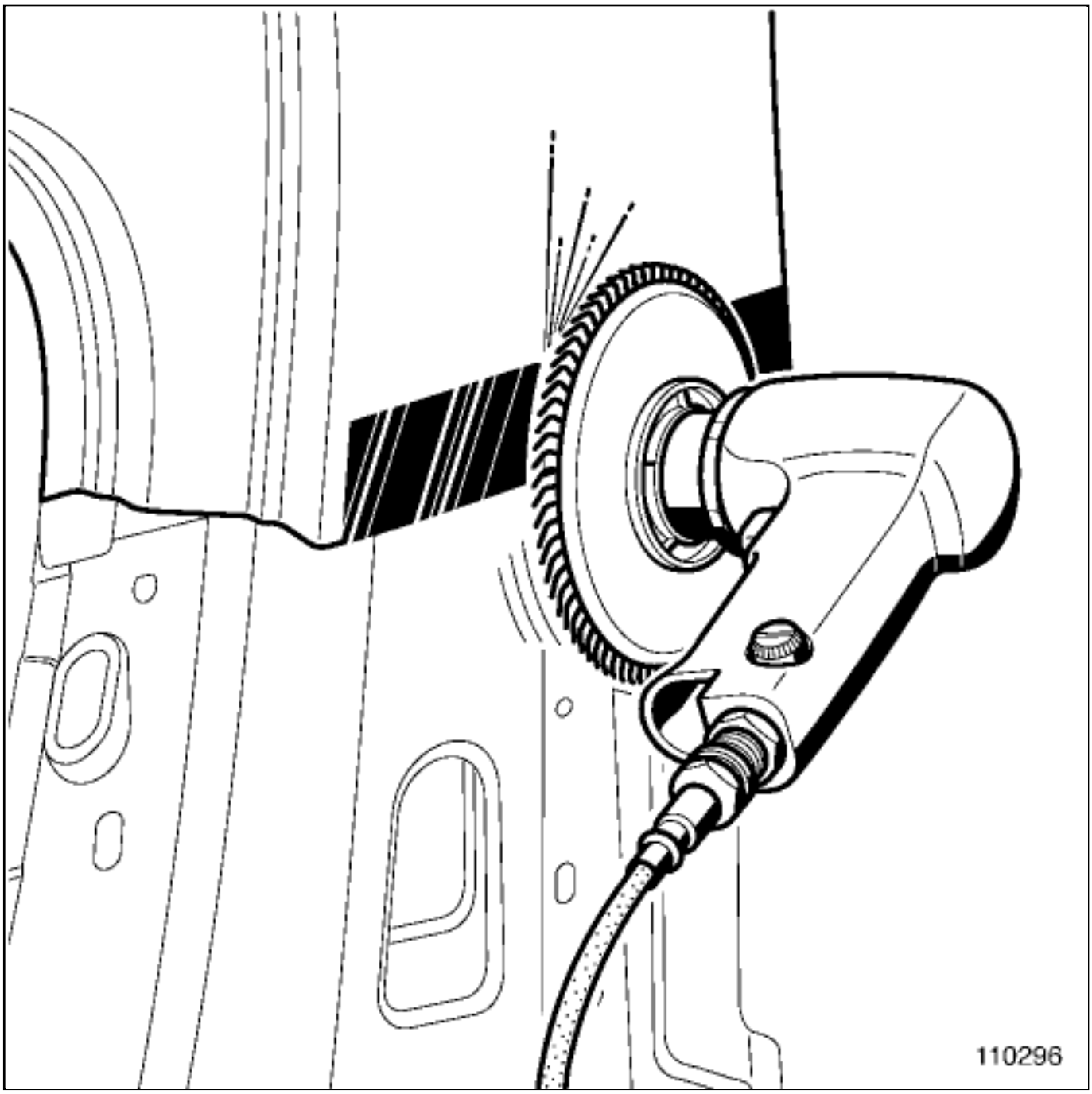
Recover the cut off(2) from the replacement part.

From the cut off section of the replacement part, take a strip of metal approximately 40 mmwide, adapted to the length of the step drilling area.

Scour both faces of the strip.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

5- PREPARATION OF THE JOINTS ON THE VEHICLE



Scour the internal and external mating faces of the cut at the patch location.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

6- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

(see 40J, Protective devices , Structural acoustic protection: Description)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

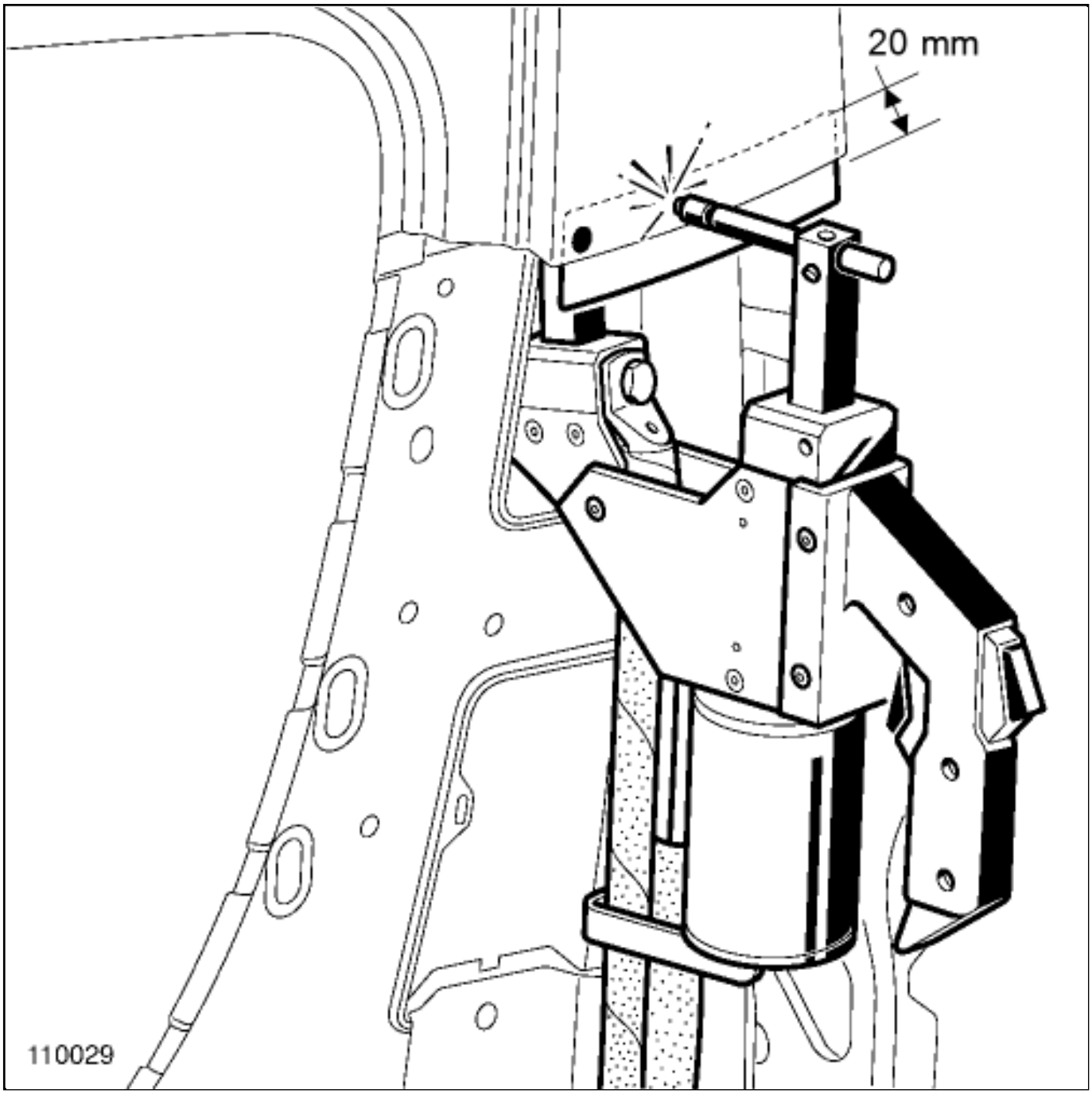
(see 40J, Protective devices , Anti-corrosion protection of joints before welding: Description)

7- ADJUSTING THE WELDERS.

Before making the joints on the vehicle, carry out the tests required for adjusting the welders.

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection: Precautions for the repair)

8- WELDING THE PATCH



Weld the patch with resistance spot welds, respecting the spacing indicated in the vehicle's MR.

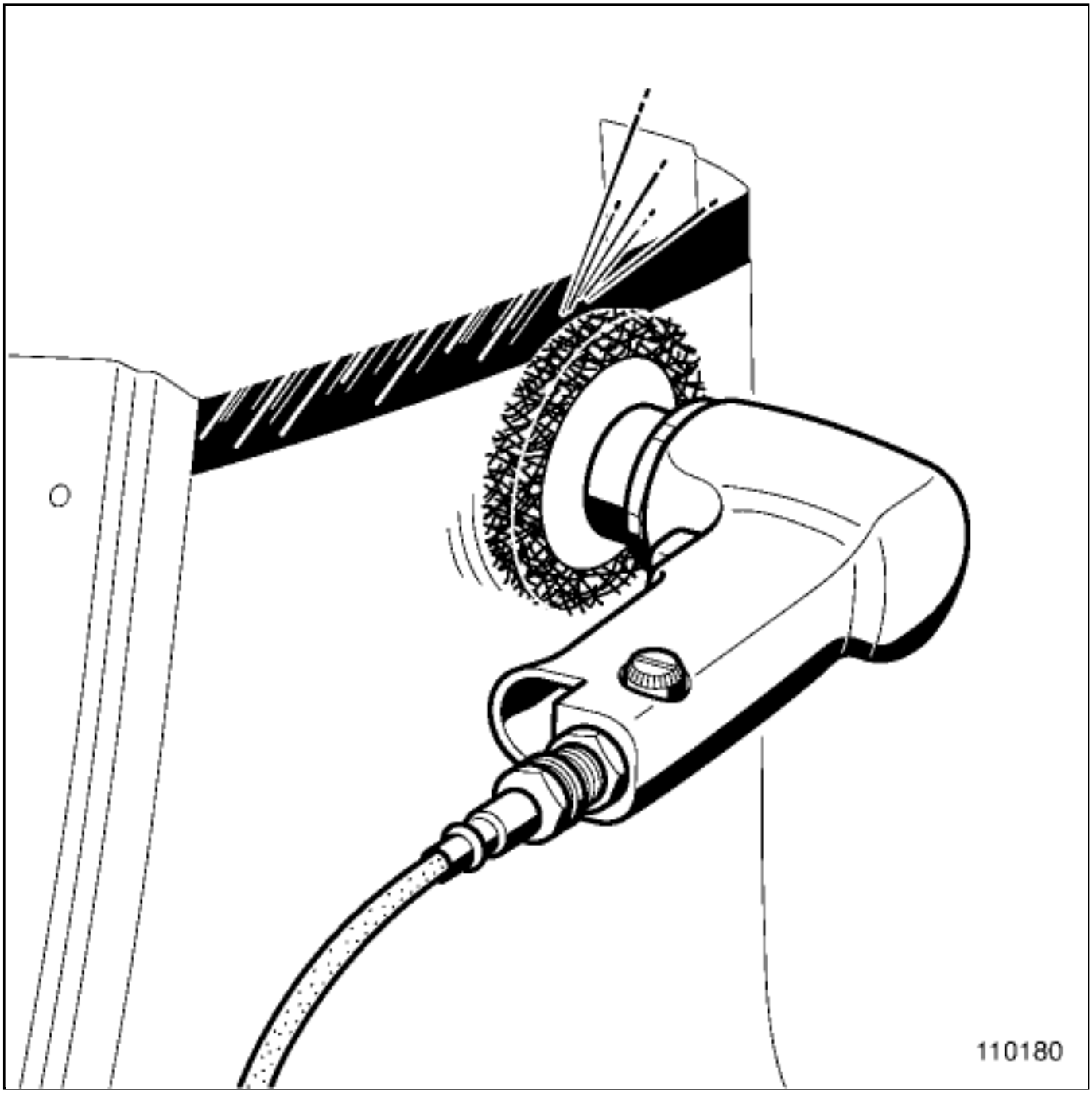
(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection with direct access: Description)

9- FITTING AND ADJUSTING THE REPLACED PARTS

Position the patch, adjust it and fix it using locking pliers; the two panels overlap by approximately 20 mm .

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

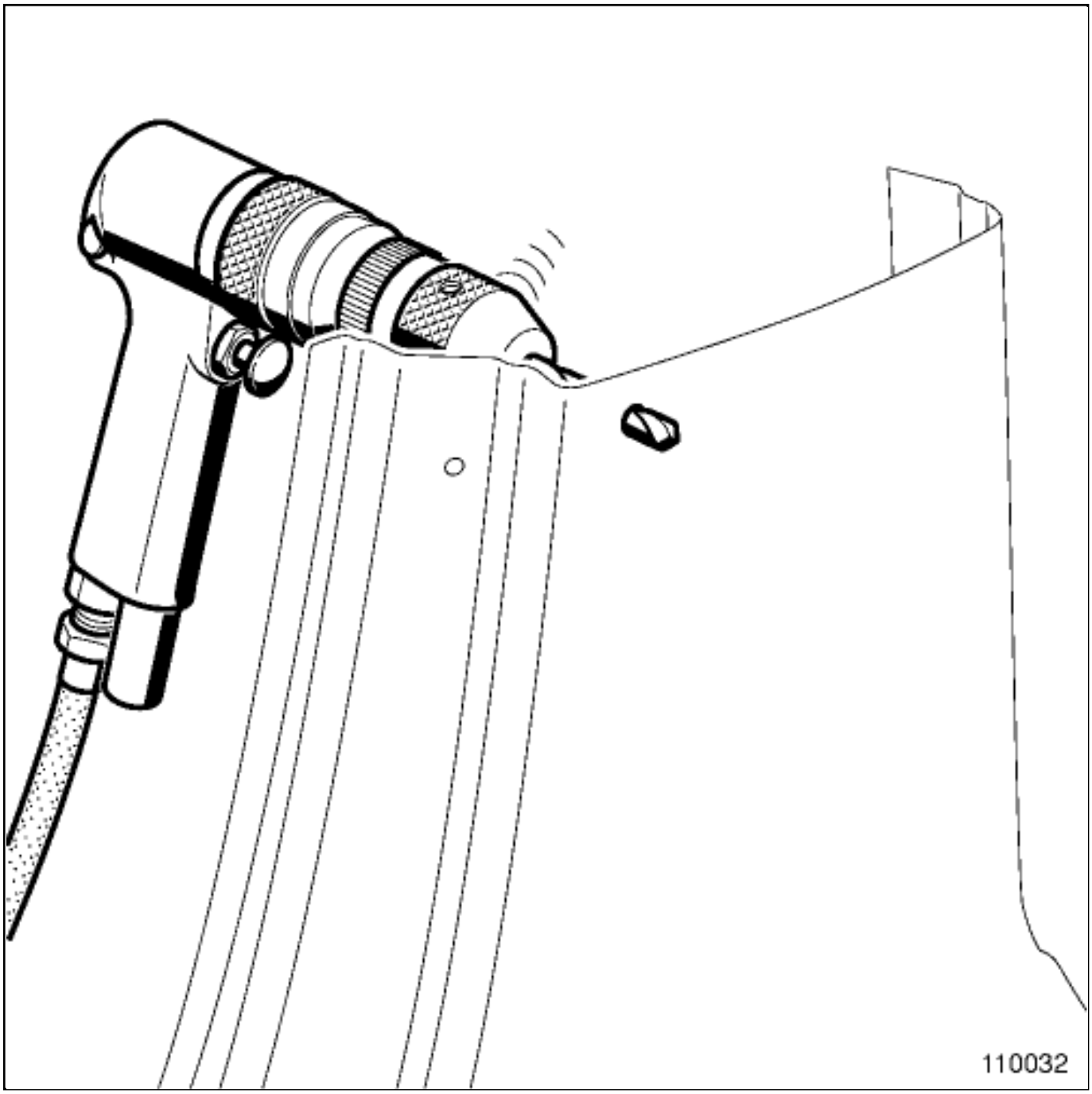
10- PREPARING THE JOINT FACES OF THE REPLACEMENT PART WITH TWO FACE ACCESS



Scour the internal and external mating faces of the cut at the patch location.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

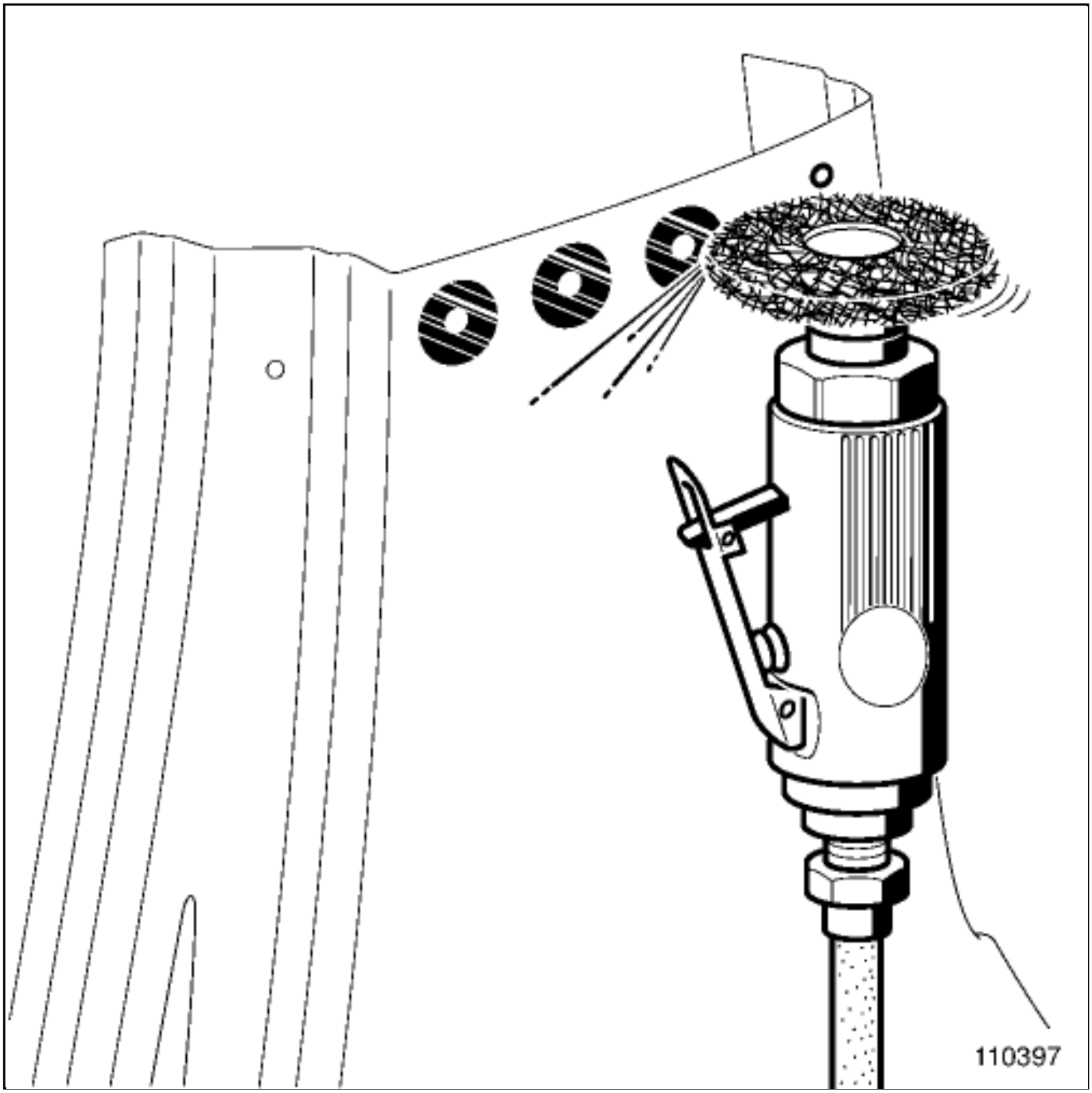
11- PREPARING THE JOINT FACES OF THE REPLACEMENT PART WITH SINGLE FACE ACCESS



Drill or pierce the replacement part from the inside at the location of the patch, respecting the spacing indicated in the vehicle's MR.

See following table:

Panel thickness (mm)	Drill bit diameter (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10



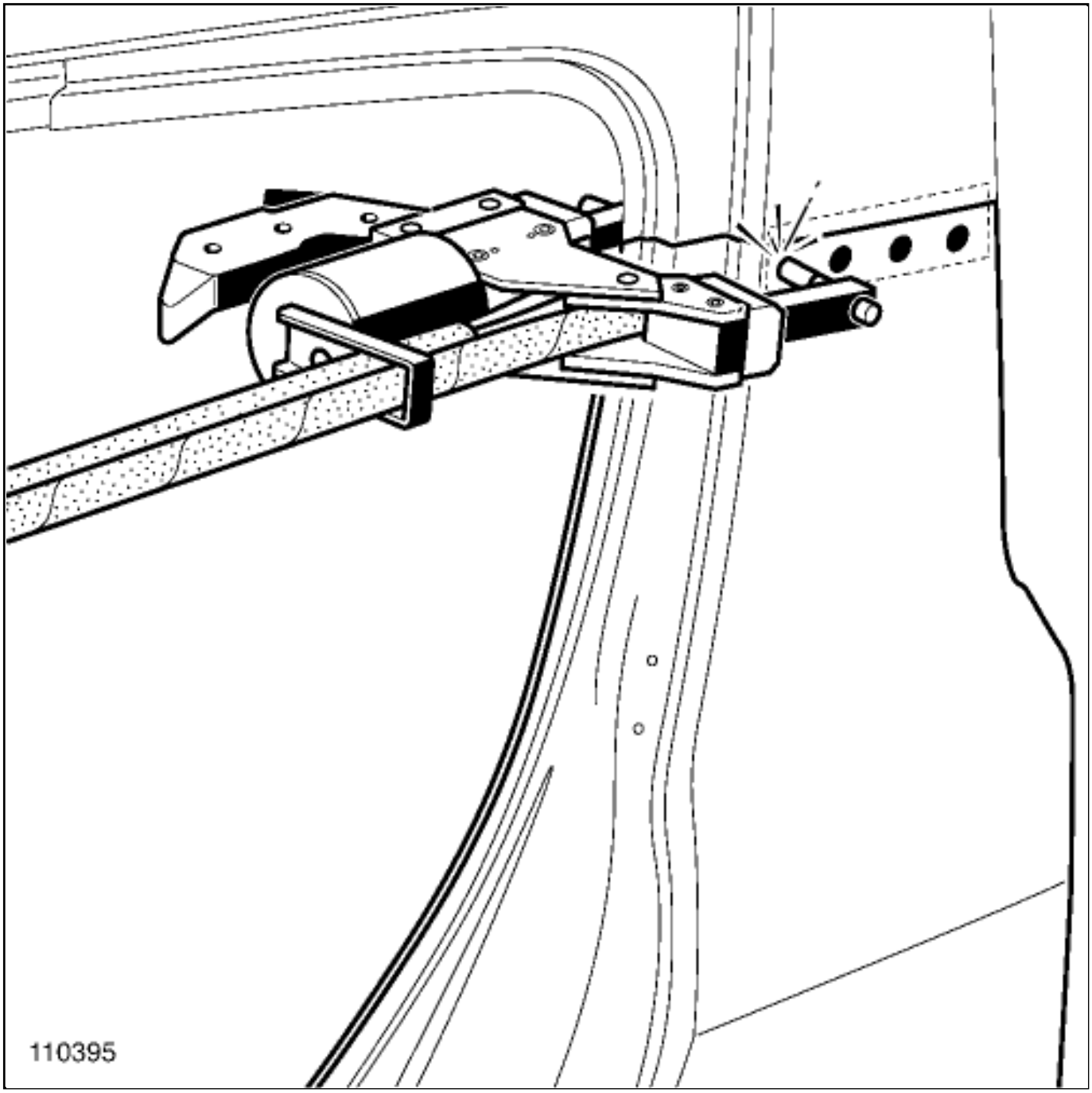
Scour the external mating face along the cut and the edges of the holes.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

Prepare the rest of the replacement part according to the different connections.

3. ASSEMBLIES

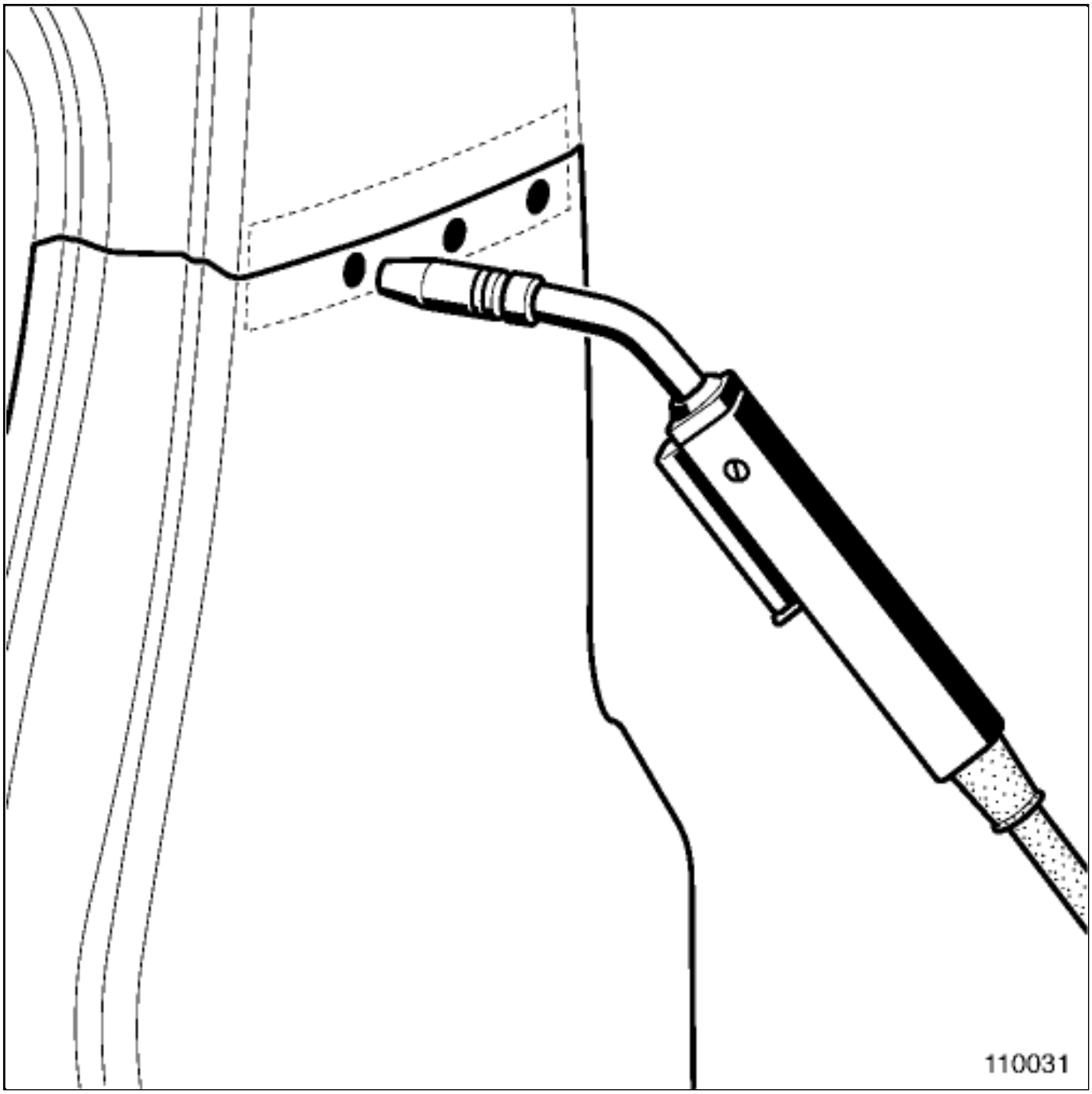
1- WELDING AND ASSEMBLING THE NEW PART WITH TWO FACE ACCESS



Weld the replacement part with resistance spot welds, respecting the spacing indicated in the vehicle's MR.

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection with direct access: Description)

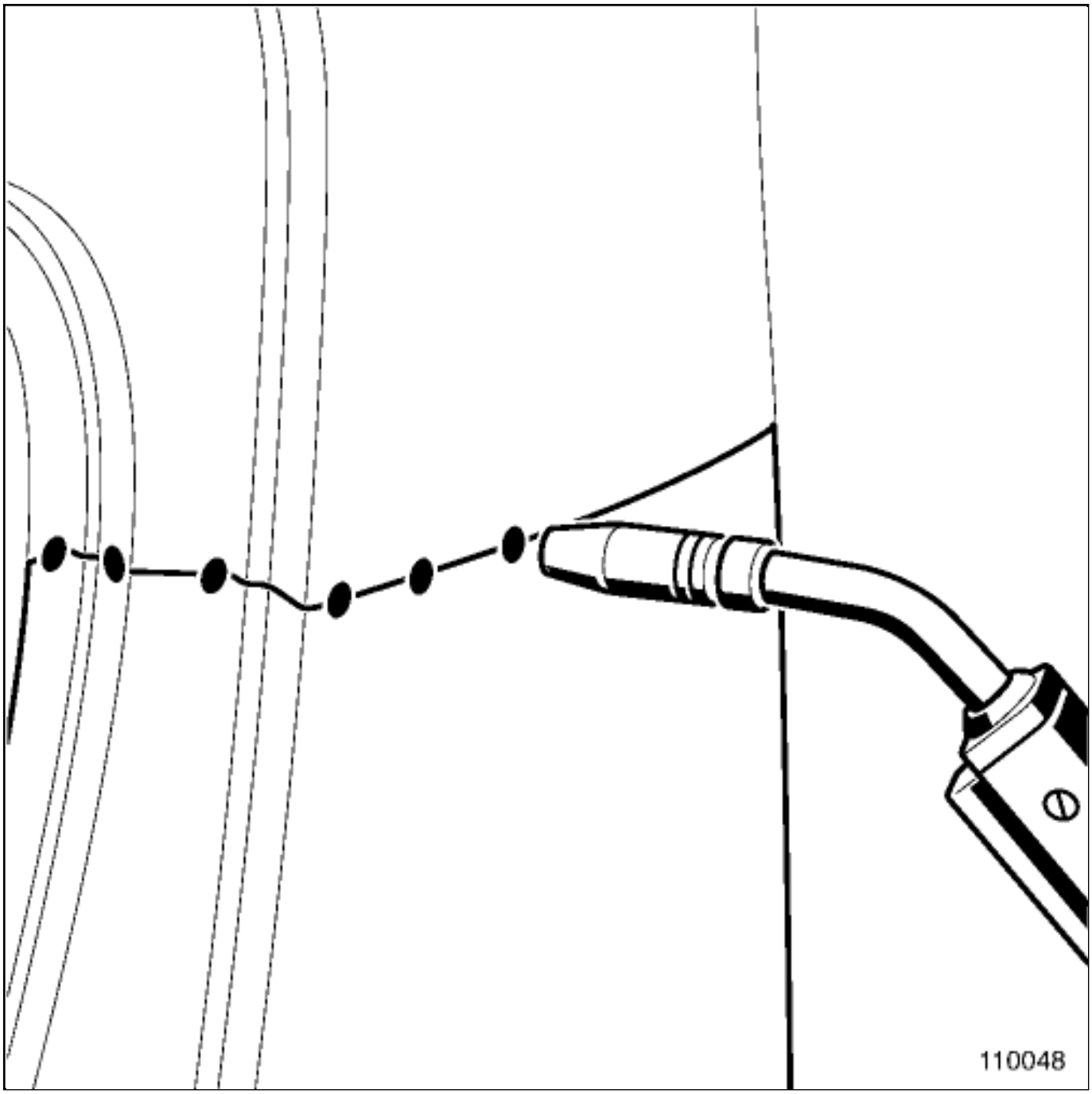
2- CARRYING OUT WELDING, ASSEMBLY WITH ONE FACE ACCESS



Weld the replacement part with GMAW plug welds

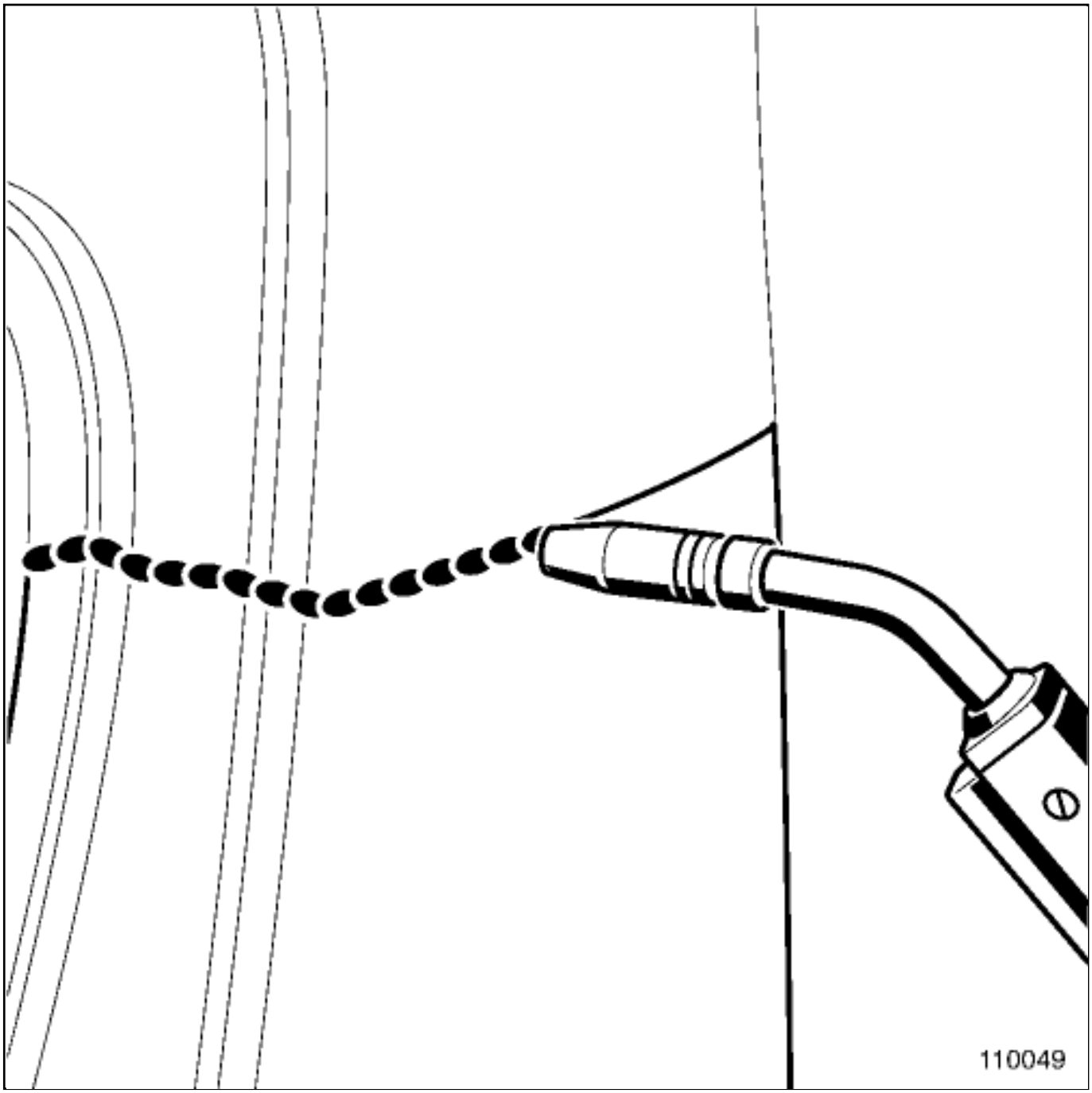
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

3- SPECIAL FEATURES OF REINFORCING AN ASSEMBLY BY PATCH DRILLING



Make the anchoring points on the partial cut lines.

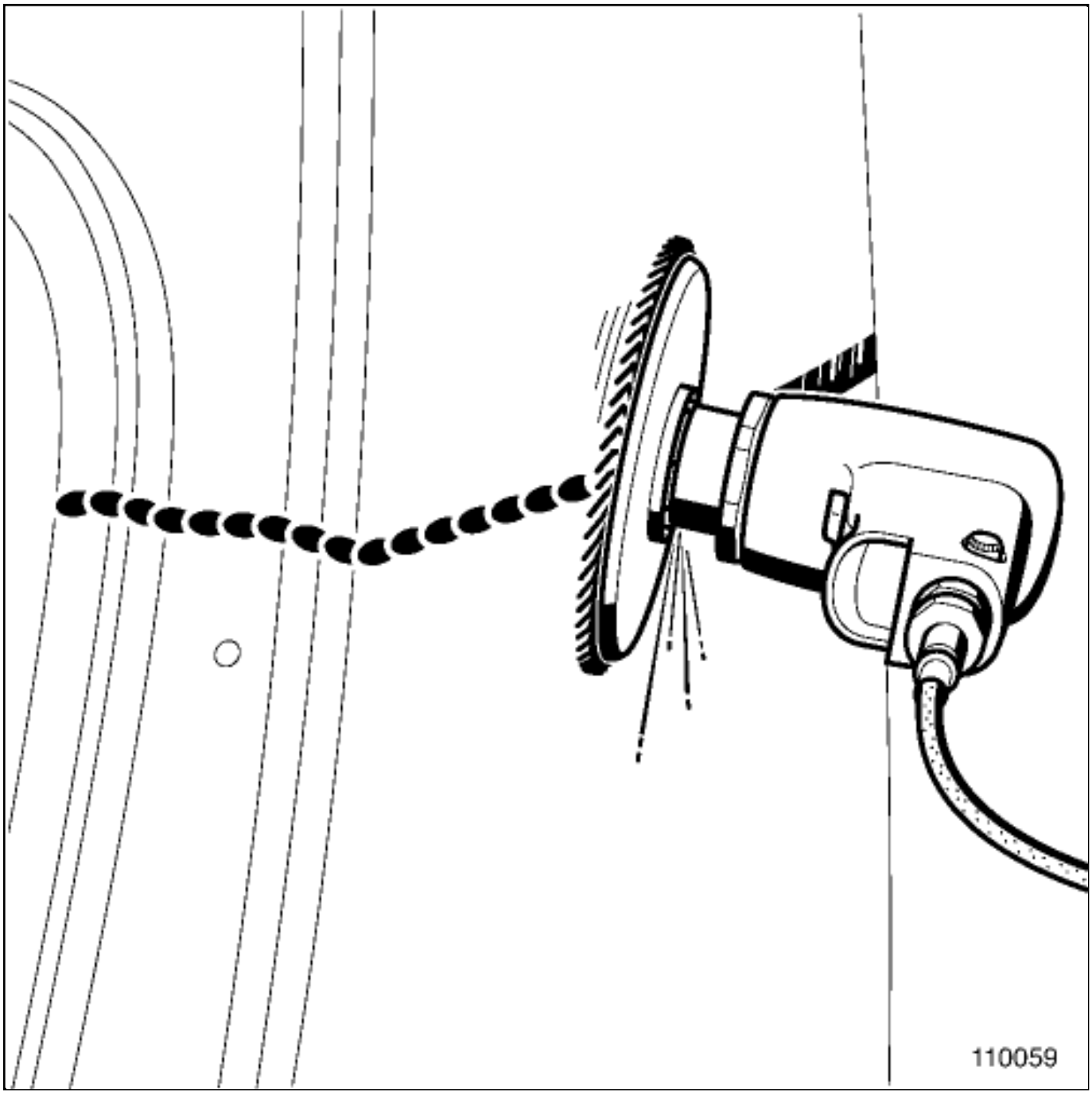
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)



Carry out the continuous weld along the whole cut.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

4- GRINDING THE WELDS

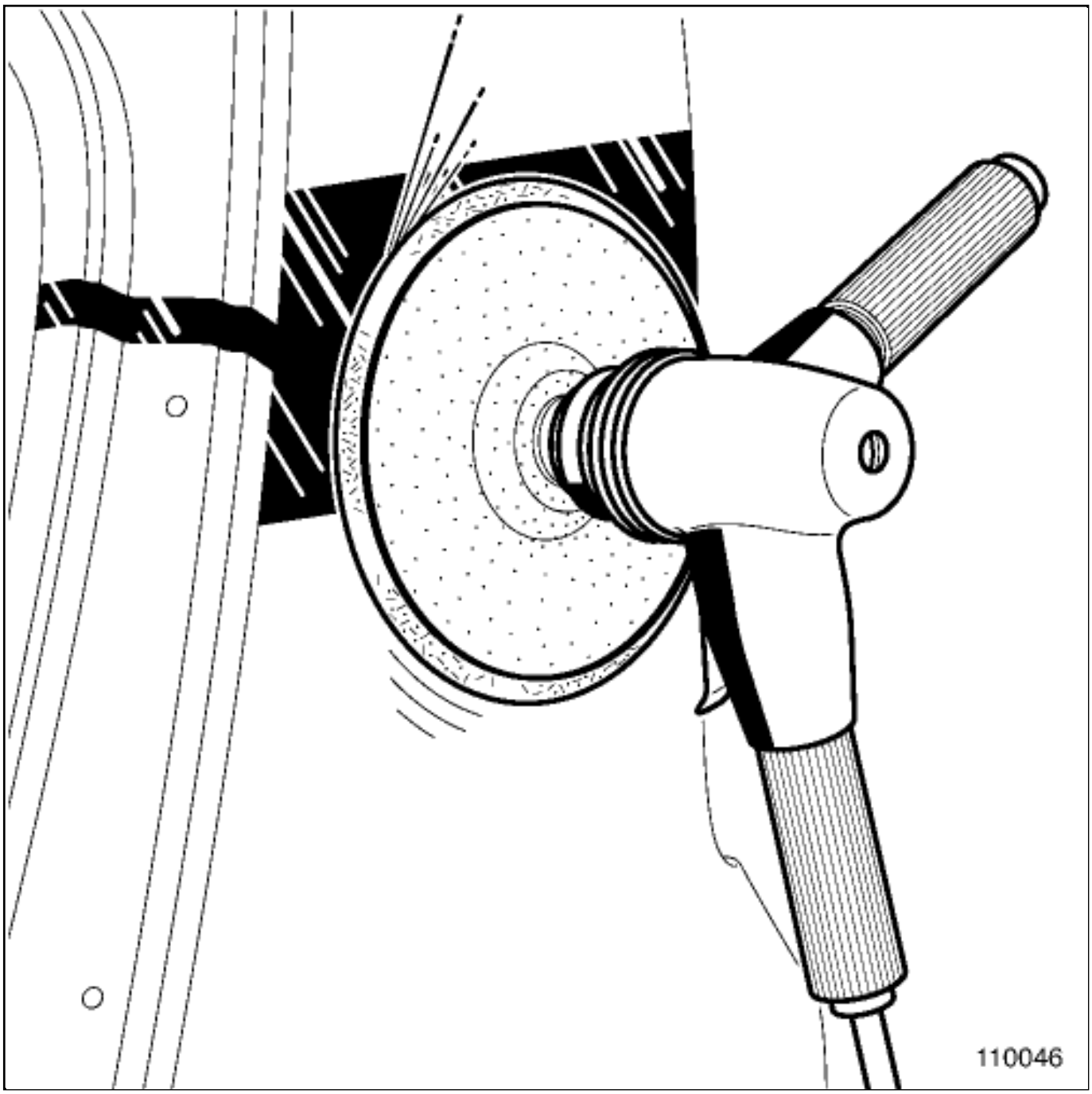


Grind the continuous weld.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

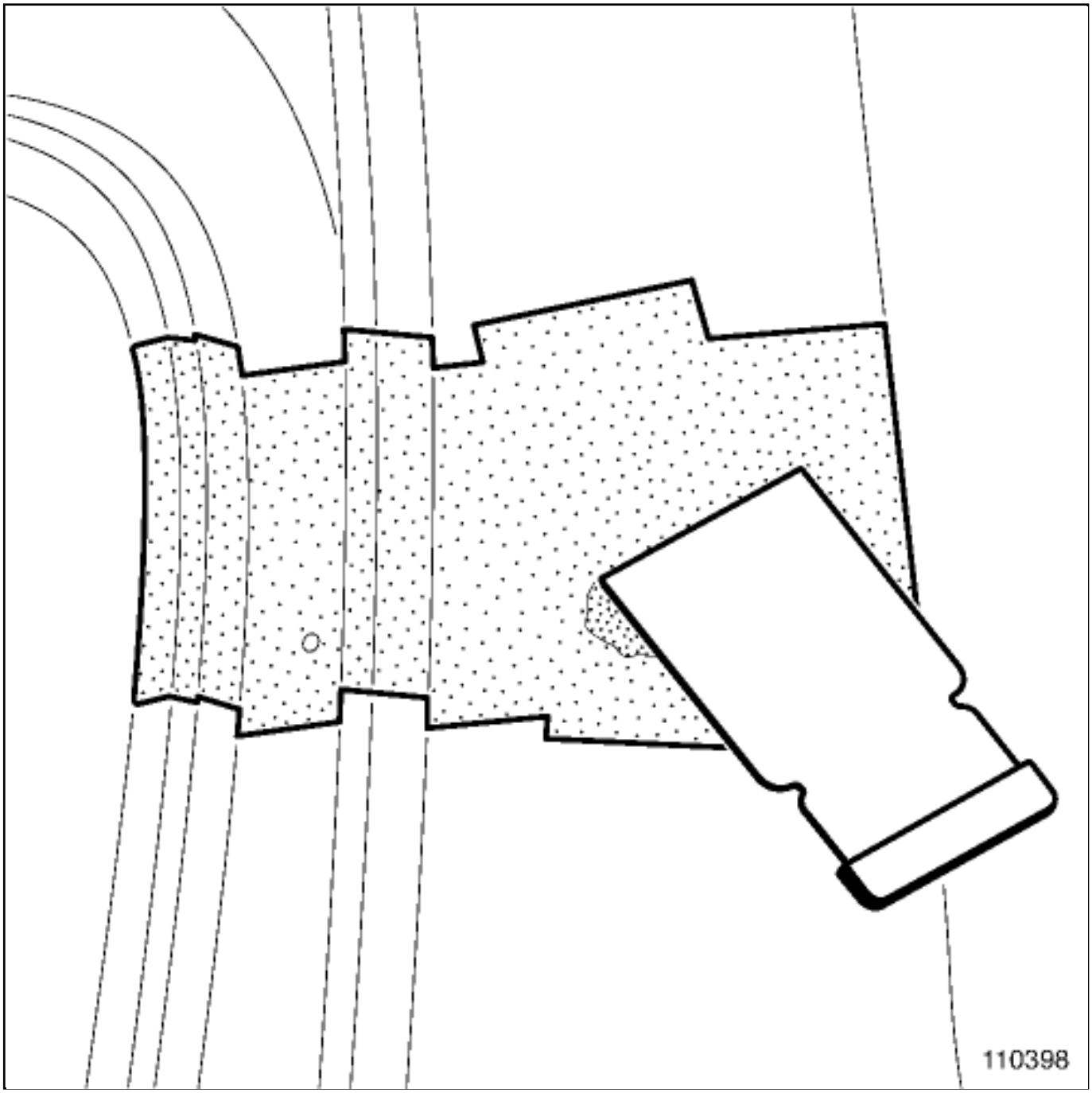
Note:

Do not strike or damage the panel.



Surface the assembly area.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)



Apply a surface finish to the visible parts.

(see 04F, Bodywork products and mountings, Panelwork finishing products: Use)

(see 05B, Equipment and Tools, Tools for sanding a structural component: Use)

6- FITTING PROTECTION AFTER ASSEMBLY

Apply the anti-corrosion protection after assembly.

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

(see 40J, Protective devices , Anti-corrosion protection of joints after welding: Description)

Fit the soundproofing after assembly

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

(see 40J, Protective devices , Structural acoustic protection: Description)

CONTROL - SIGNALS: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

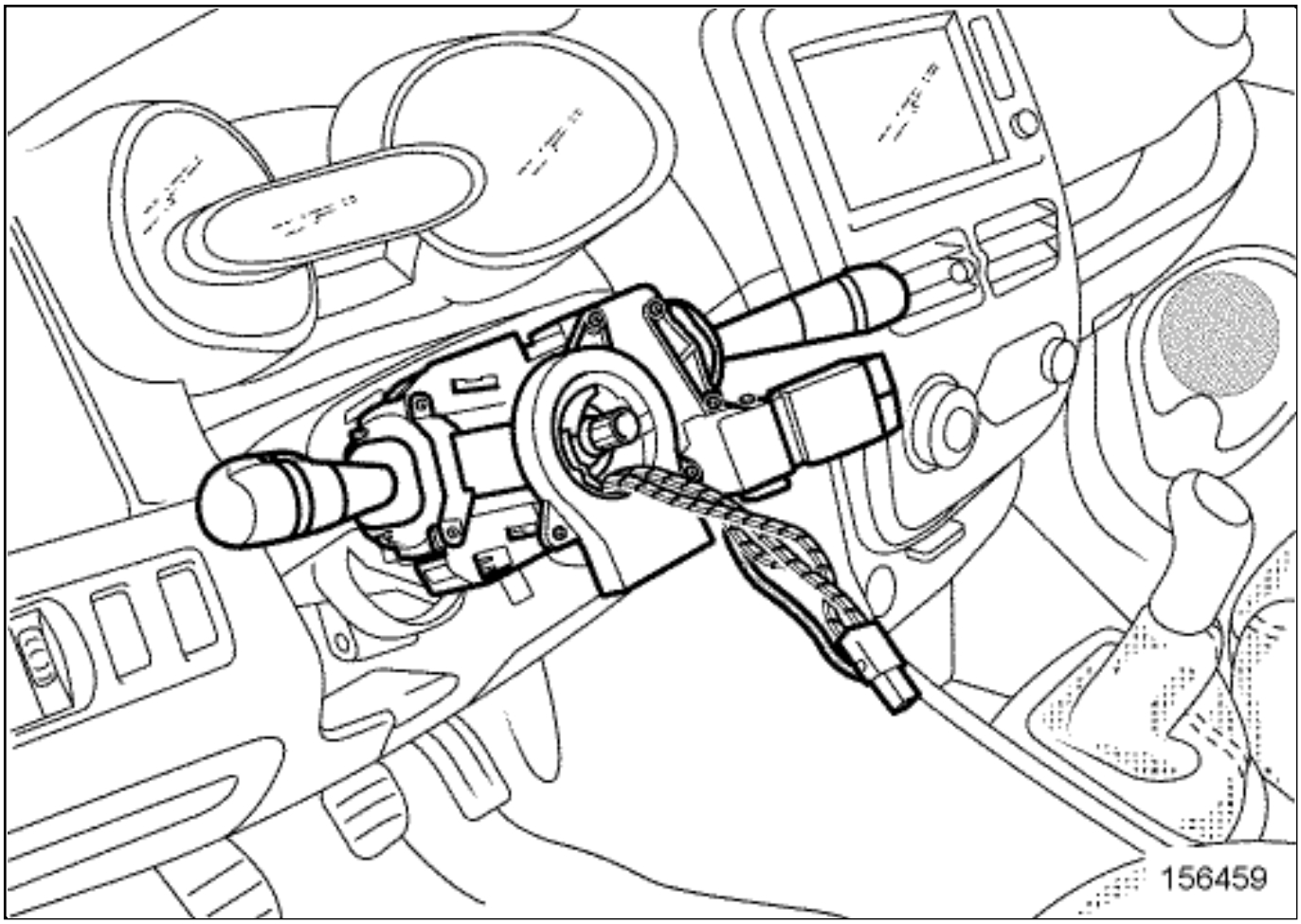
1. LIST OF COMPONENTS

1- THE CONTROL - SIGNALLING ASSEMBLY CONSISTS OF:

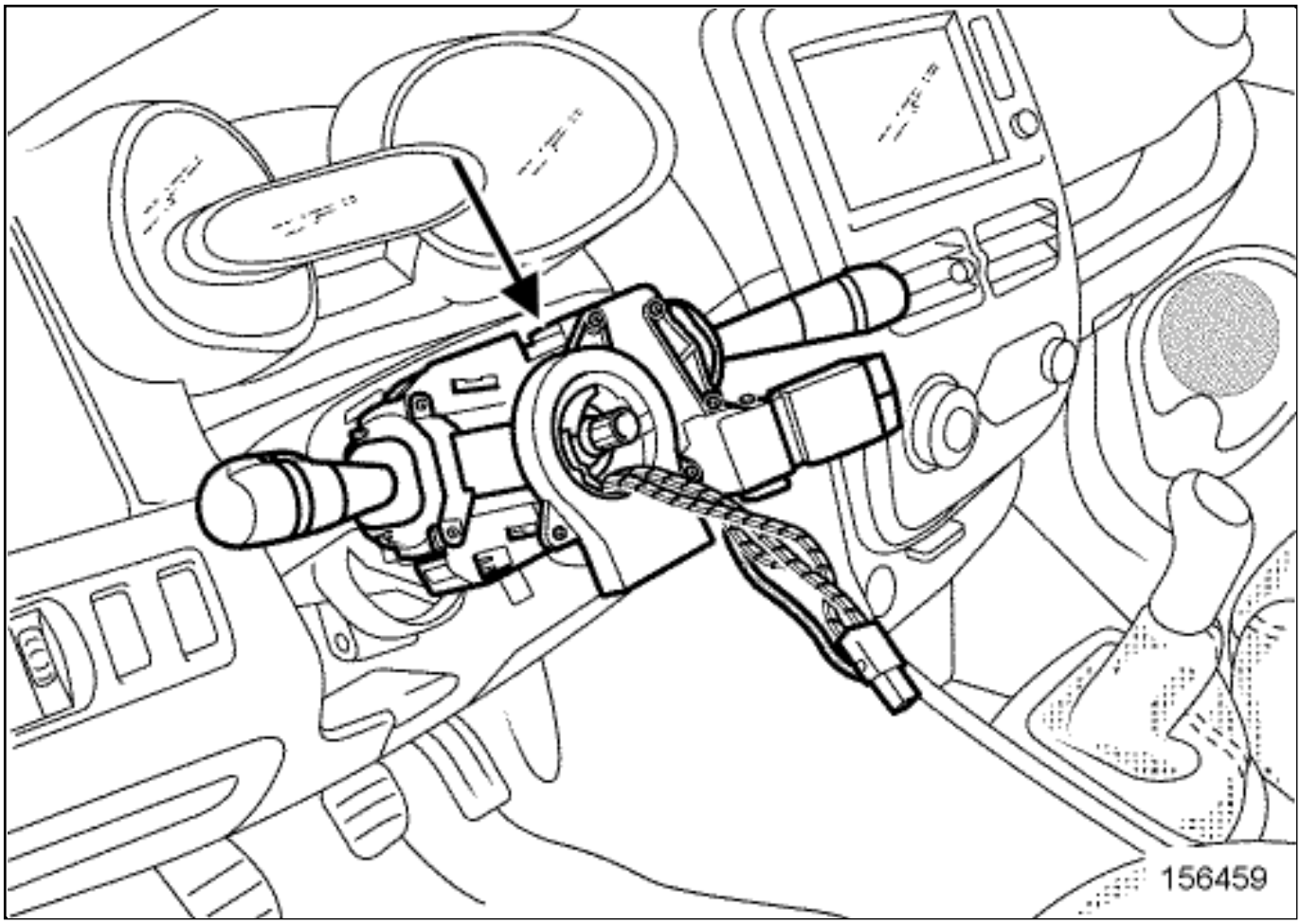
- a steering wheel control assembly
- a rotary switch
- a windscreen wiper switch
- a signalling light switch
- a central door locking and hazard warning lights control **(see 84A, Control - Signals, Hazard warning lights and central door control: Removal - Refitting)**

2. LOCATION OF COMPONENTS

1- STEERING WHEEL CONTROL ASSEMBLY



2- ROTARY SWITCH



CAUTION

Incorrect wheel alignment may damage the rotary switch.

CAUTION

To prevent damaging the rotary switch, do not turn the mobile section of the rotary switch.

Note:

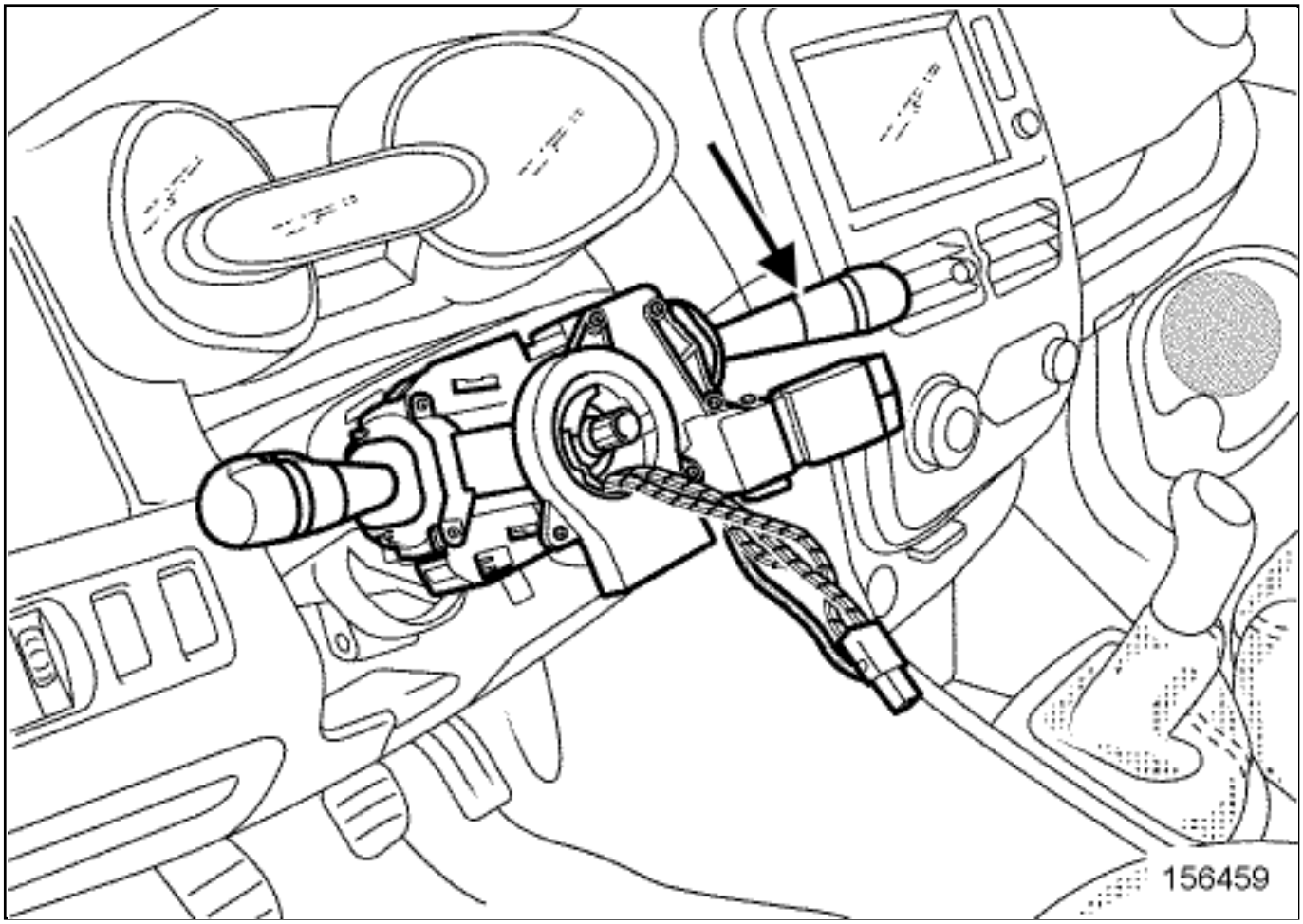
Always keep the rotary switch immobilised throughout the removal operation.

- After refitting, check the operation of the rotary switch:

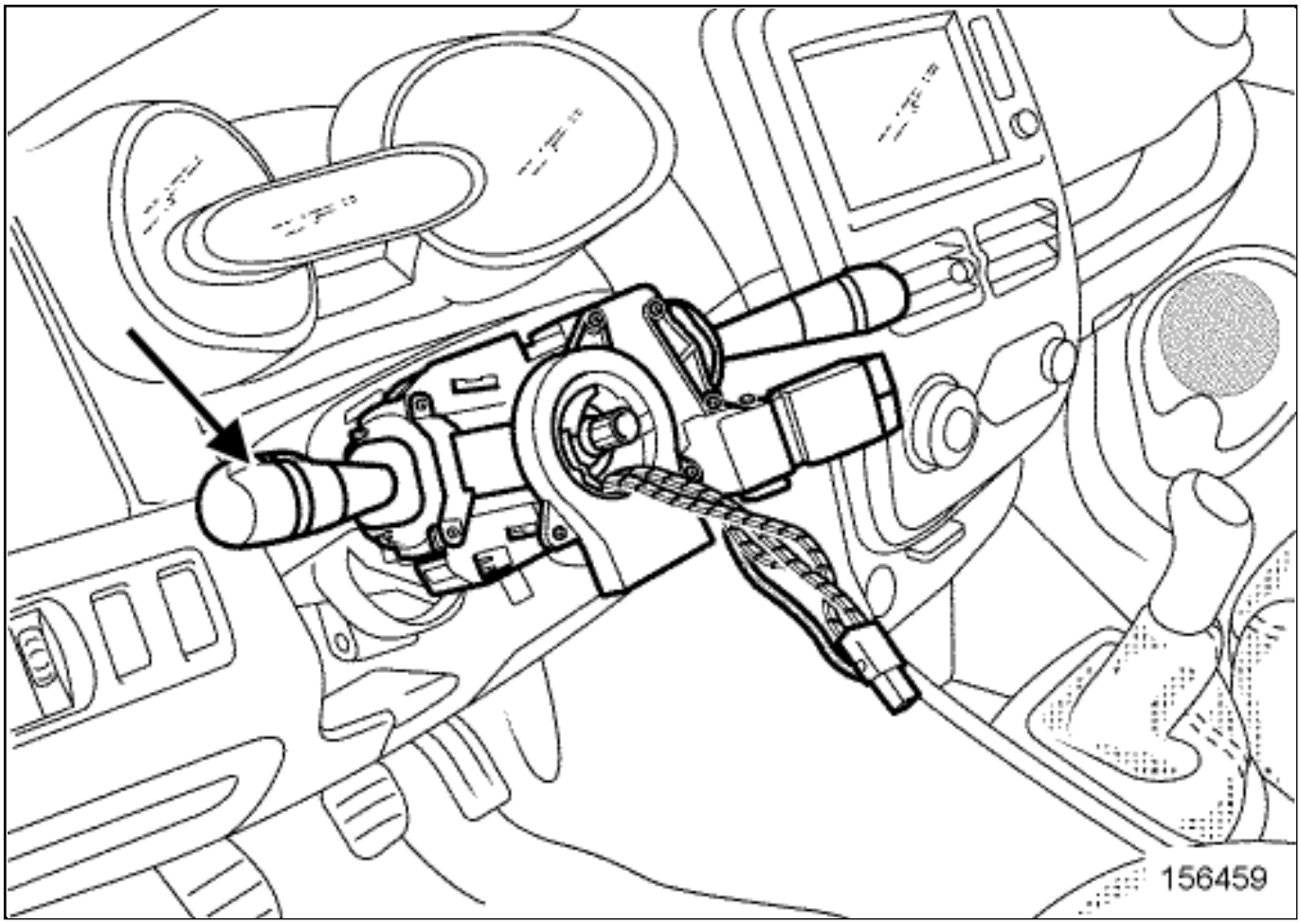
- turn the steering wheel to the left until it stops,
- turn the steering wheel to the right until it stops,
- bring the steering wheel back to the central position,

check that there are no faults on the instrument panel.

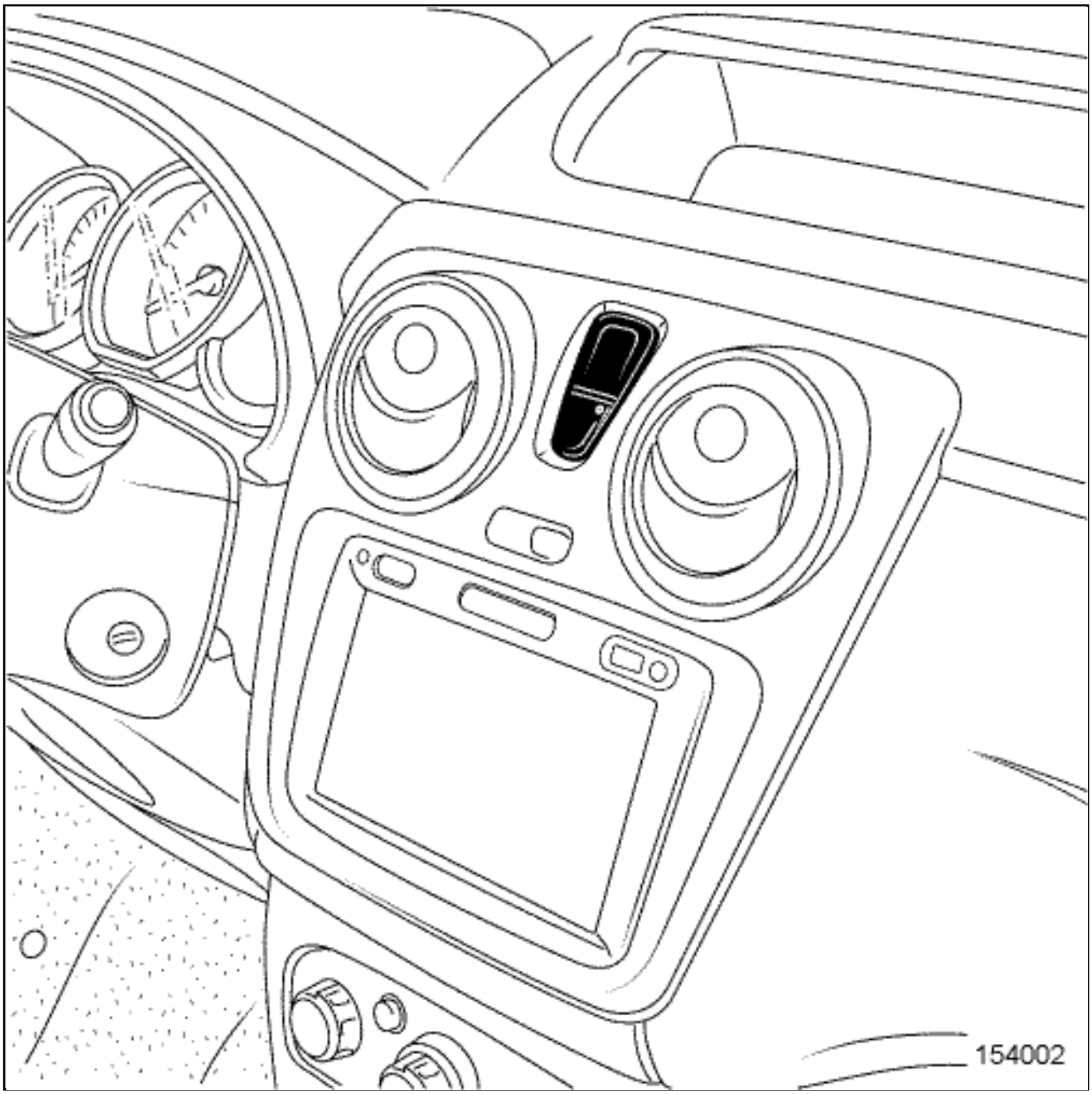
3- WINDSCREEN WIPER SWITCH



4- SIGNALLING LIGHT SWITCH



5- CENTRAL DOOR LOCKING AND HAZARD WARNING LIGHTS CONTROL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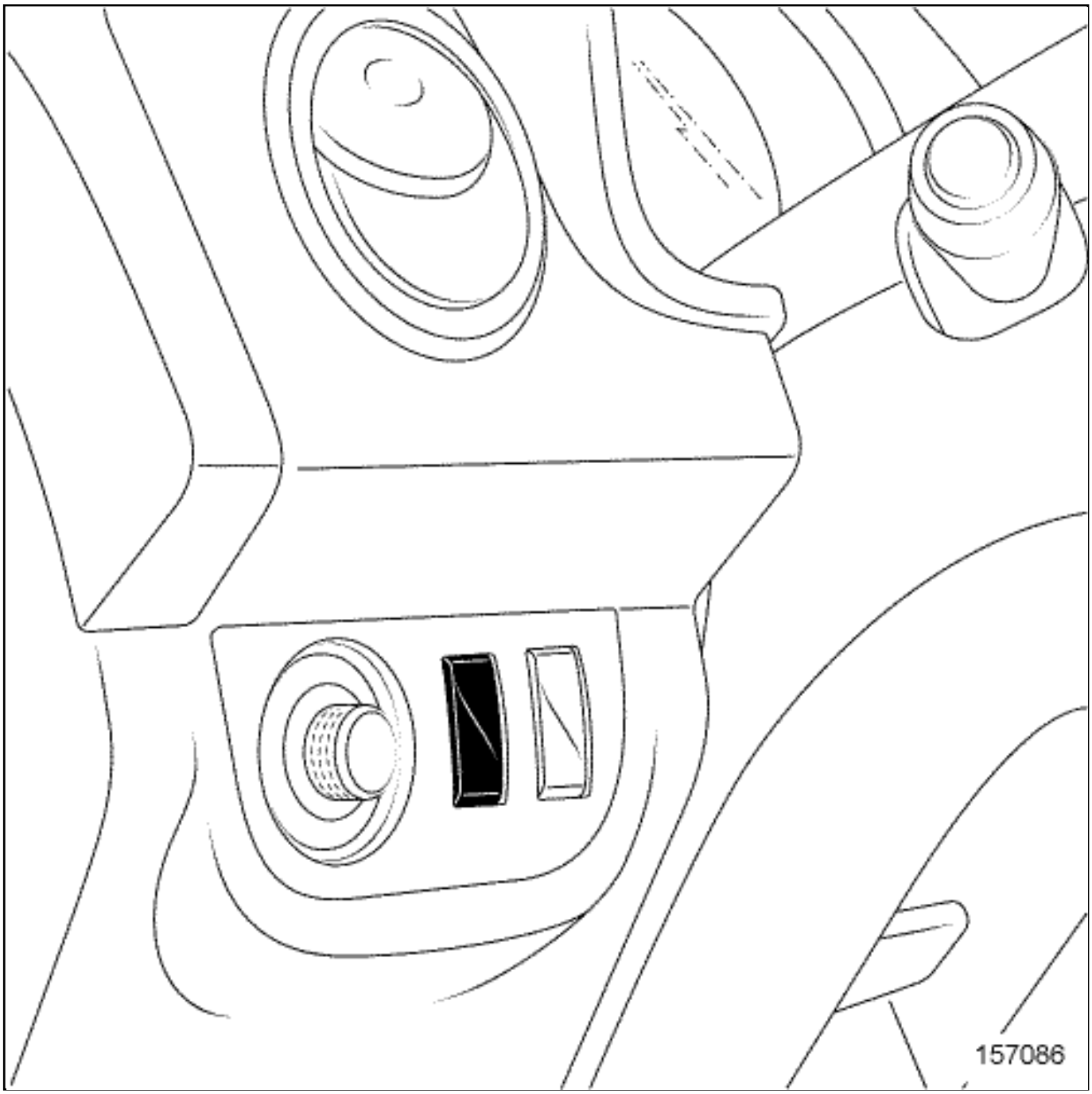

Apply the after repair procedure using the Diagnostic tool(see **Diagnostic tool : Use**) :

-Computer concerned by the After repair procedure:

"Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

""ECO" switch" .

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CONTROL - SIGNALS: PRECAUTIONS FOR REPAIR

Note, one or more warnings are present in this procedure

1. ROTARY SWITCH

CAUTION

Incorrect wheel alignment may damage the rotary switch.

During an operation on the steering column switch assembly, the wheels of the vehicle must be set straight ahead.

CAUTION

In order not to damage the rotary switch, do not turn the movable part of the rotary switch (except if adjusting).

To avoid damage, the rotary switch must be in the neutral position when refitting the steering wheel.

CAUTION

To ensure that the electronic systems operate correctly, do not damage the locking systems of the connectors.

In order not to damage the wiring harness, observe the original routing when refitting the steering column switch assembly.

CONTROL PANEL: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)Dashboard assembly: Exploded view .

REMOVAL

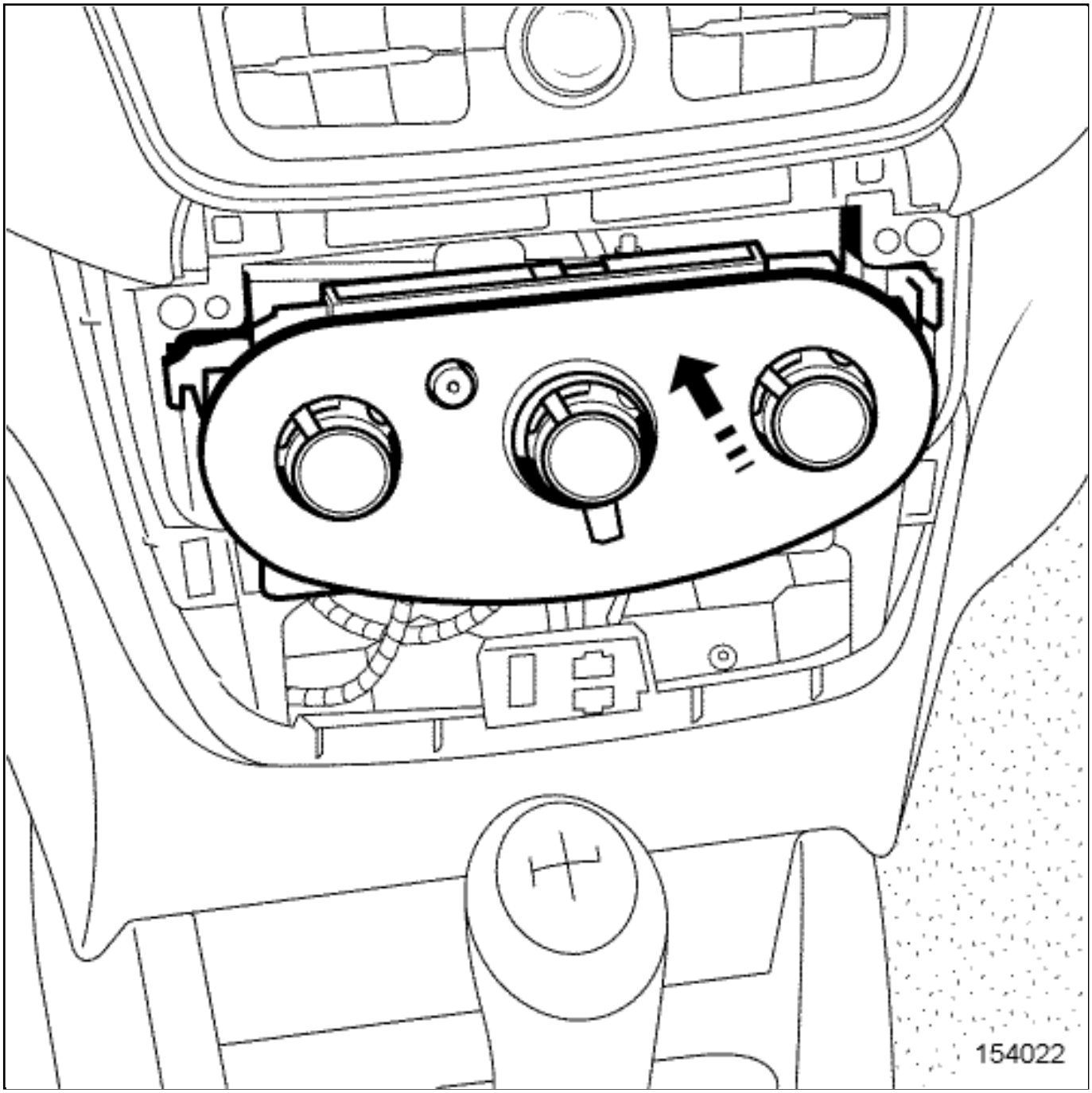
1. REMOVAL PREPARATION OPERATION

- Unclip Dashboard assembly: Exploded view :
  - the dashboard centre front panel,
  - the dashboard central trim,
  - the control panel trim.

- Place:
  - the air mixing control to the hottest position,
  - the air distribution control to the air vent position on the dashboard,
  - the air recirculation switch to the air recirculation position.

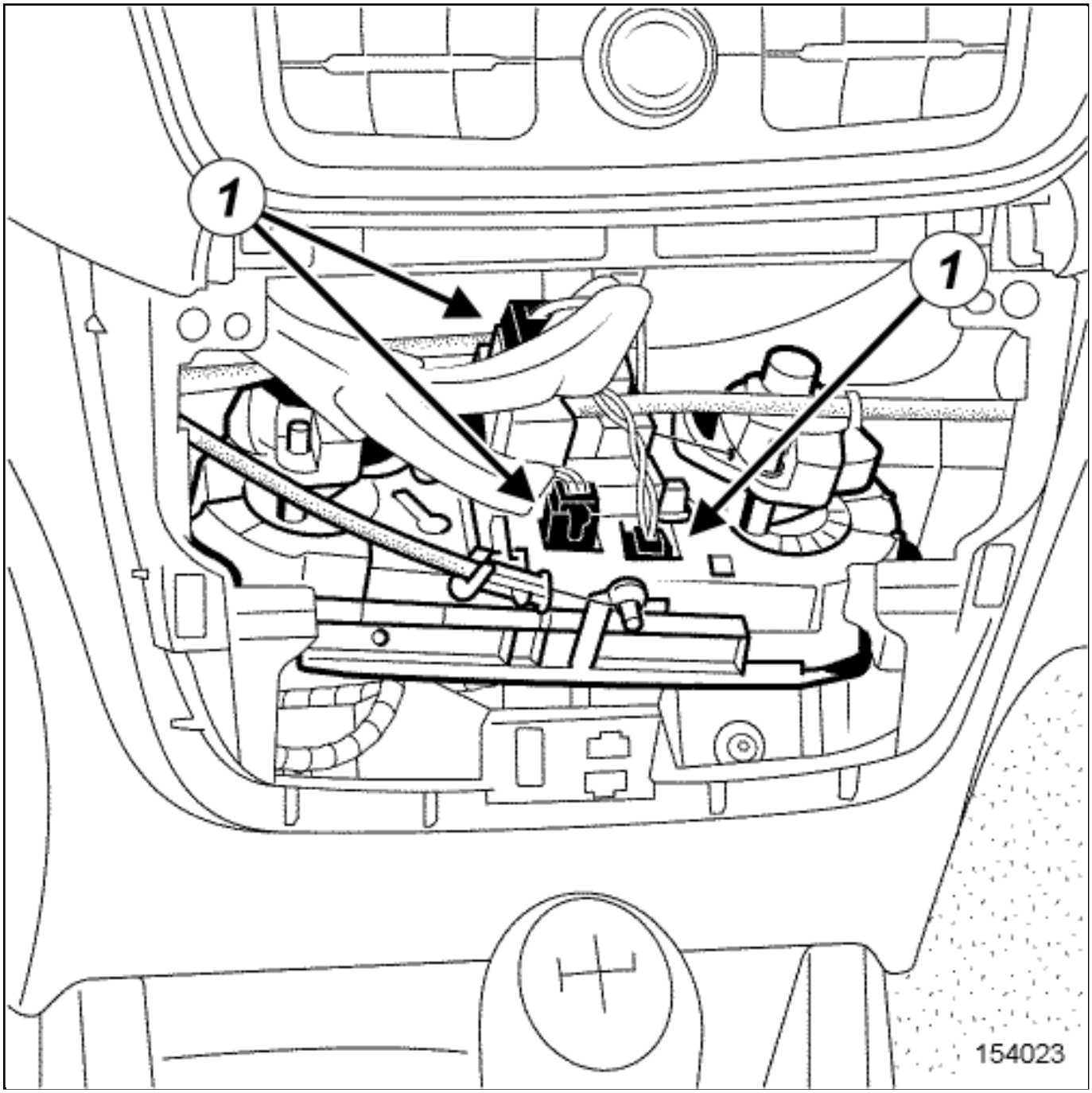
2. REMOVAL OPERATION

- Remove the control panel boltsDashboard assembly: Exploded view .



- Tilt the control panel in the direction of the arrow.

- Move aside the control panel.



- Disconnect the control panel connectors(1) .

- For the air recirculation cable, remove(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :
  - the sheath stop clip,
  - the sheath stop by moving it from its housing,
  - the control panel cable.

- For the air distribution control cable, remove(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :
  - the sheath stop clip,
  - the sheath stop by moving it from its housing,
  - the control panel cable.

For the air mixing cable, remove(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :

- the sheath stop clip,
- the sheath stop by moving it from its housing,
- the control panel cable.

Remove the control panel.

REFITTING

Proceed in the reverse order to removal.

Check that the controls can be moved to their fullest extent.

COOLANT CIRCUIT ASSEMBLY: EXPLODED VIEW

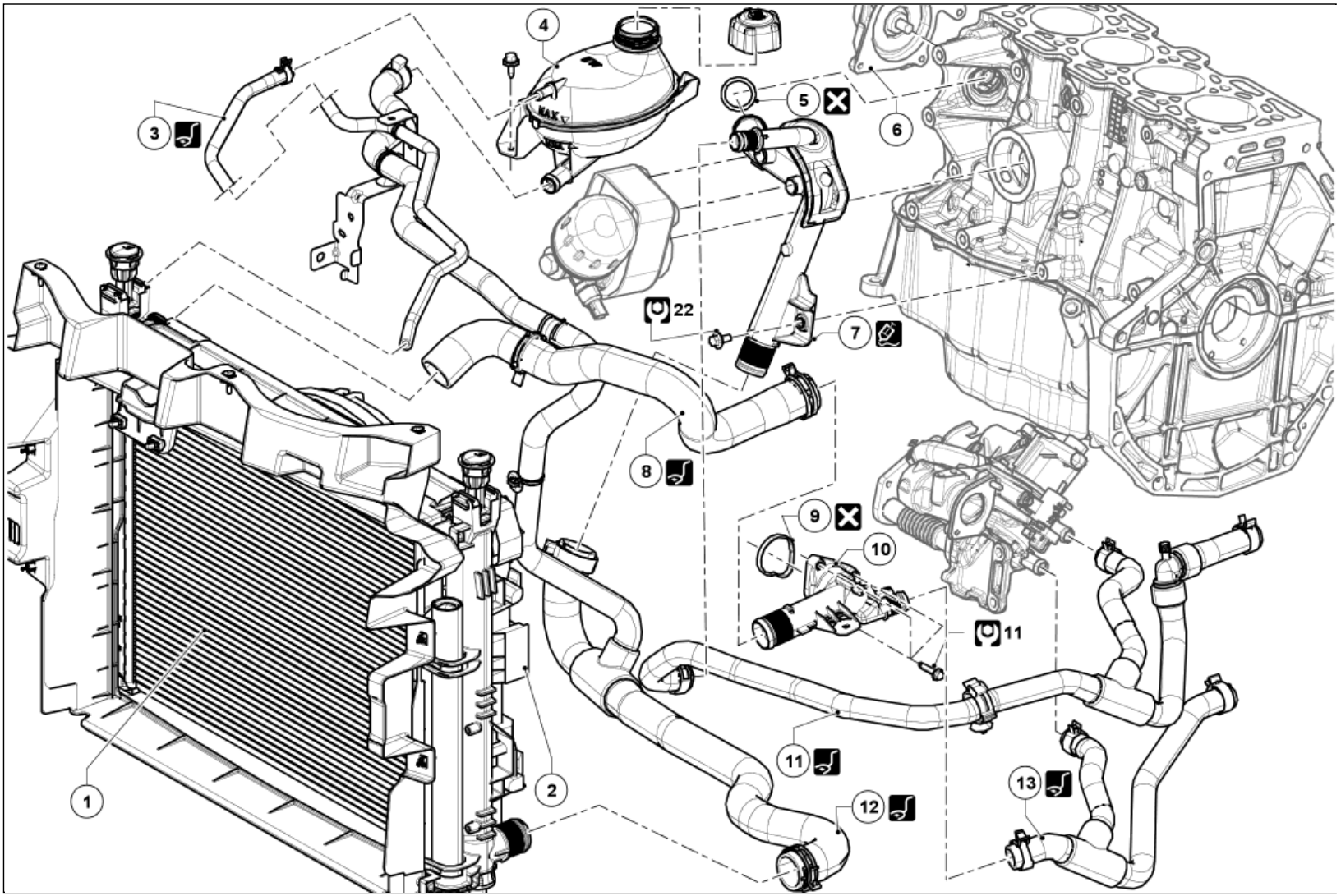


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Cooling radiator	(see 19A, Cooling, Cooling radiator: Removal - Refitting)
2	Engine cooling fan assembly	(see 19A, Cooling, Engine cooling fan assembly: Removal - Refitting)
3	Cooling radiator degassing pipe	(Mot. 1202-01; Mot. 1202-02; Mot. 1448)
4	Expansion bottle	(see **Expansion bottle: Removal - Refitting**)
5	Coolant pump inlet pipe seal	
6	Water pump	(see 19A, Cooling, Coolant pump: Removal - Refitting)
7	Coolant pump inlet pipe	(see 19A, Cooling, Coolant pump inlet pipe: Removal - Refitting)
8	Cooling radiator inlet pipe	(Mot. 1202-01; Mot. 1202-02; Mot. 1448)
9	Water chamber seal	(see 19A, Cooling, Cooling unit : Removal - Refitting)
10	Water chamber	(see 19A, Cooling, Cooling unit : Removal - Refitting)
11	Heater matrix coolant outlet pipe	(Mot. 1202-01; Mot. 1202-02; Mot. 1448)
12	Cooling radiator outlet pipe	(Mot. 1202-01; Mot. 1202-02; Mot. 1448)
13	Heater matrix coolant inlet pipe	(Mot. 1202-01; Mot. 1202-02; Mot. 1448)

COOLANT PUMP INLET PIPE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Disconnect the battery(see **Battery: Removal - Refitting**) .

- Remove:
  - the engine undertray bolts,
  - the engine undertray,
  - the front bumper Front bumper assembly: Exploded view ,
  - the intercooler air outlet pipe Intercooler air outlet pipe: Removal - Refitting .

- Drain the cooling system (see 19A, Cooling, Cooling system: Draining - Refilling) .

- Remove the oil-water heat exchanger Oil-coolant heat exchanger: Removal - Refitting .

- Disconnect the cooling hoses from the coolant pump inlet pipe (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

2. REMOVAL OPERATION

- Remove (see 19A, Cooling, Coolant circuit assembly: Exploded view) :
  - the coolant pump inlet pipe,
  - the coolant pump inlet pipe seal.

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

- Use SURFACE CLEANER(see **Vehicle: Parts and consumables for the repair**) to clean and degrease:
  - the coolant pump inlet pipe seal housing if it is being reused,
  - the seal housing in the cylinder block.

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Fill and bleed the cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

COOLANT PUMP: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:
coolant pump seal

WARNING

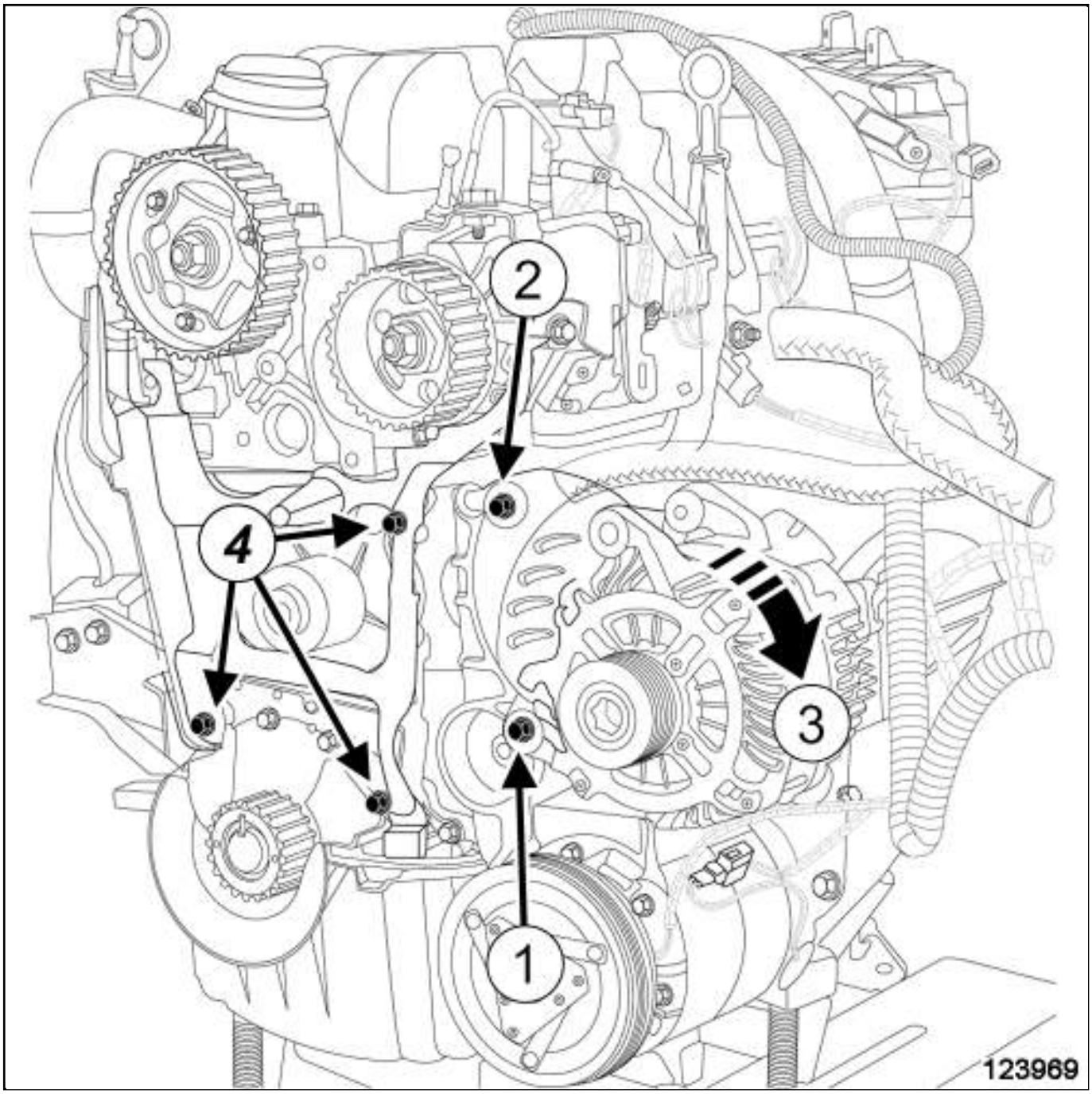
Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

REMOVAL

1. REMOVAL PREPARATION OPERATION

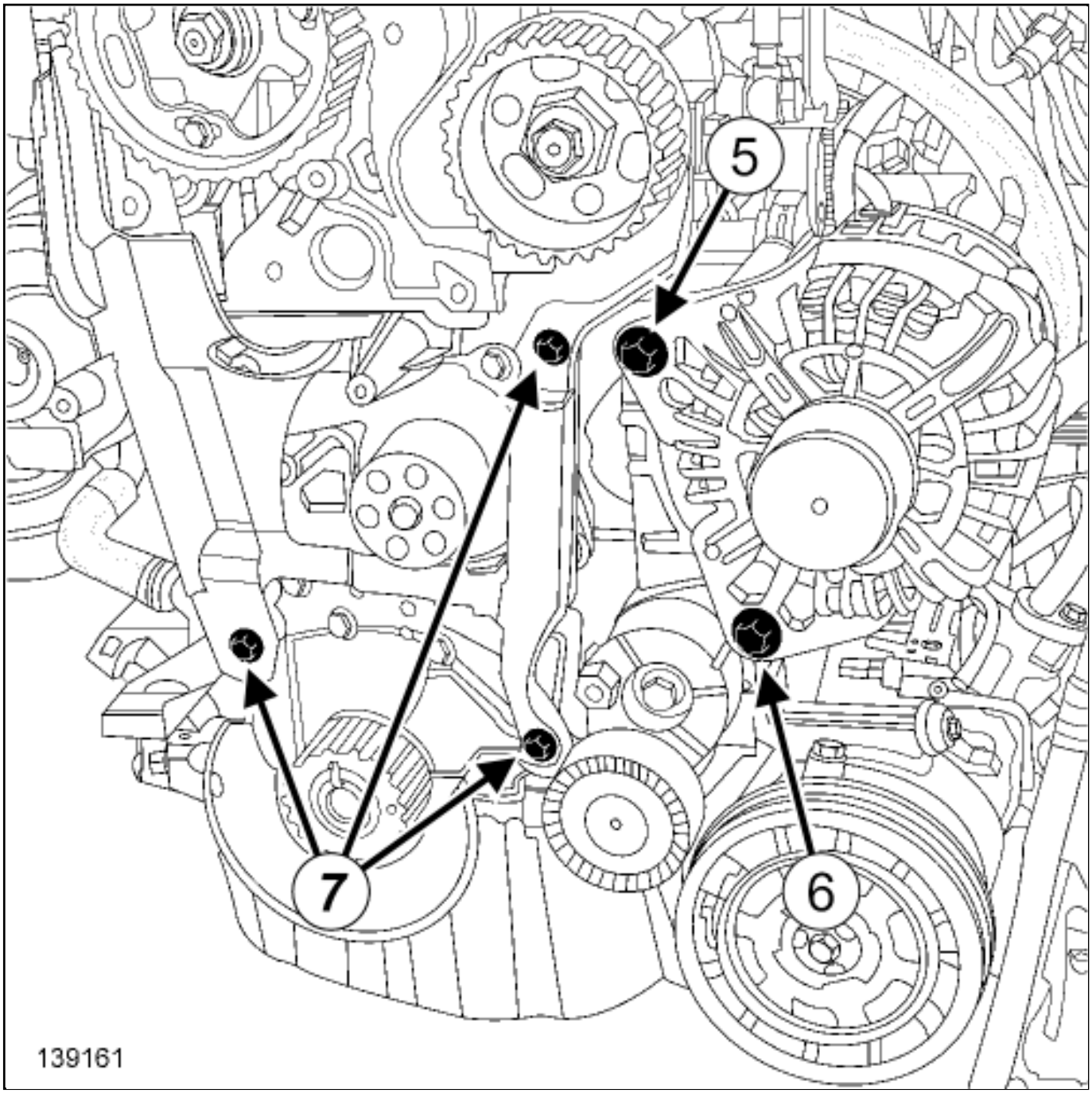
- Position the vehicle on a two-post lift**Vehicle: Towing and lifting** (02A, Lifting equipment).
- Disconnect the battery**Battery: Removal - Refitting** (80A, Battery).
- Remove the timing belt**Timing belt: Removal - Refitting** .

1- FIRST FITTING



- Undo the alternator lower bolt(1) .
- Remove the alternator upper bolt(2) .
- Tip (3) the alternator towards the front of the vehicle.
- Remove:
  - the inner timing cover bolts(4) ,
  - the inner timing cover.

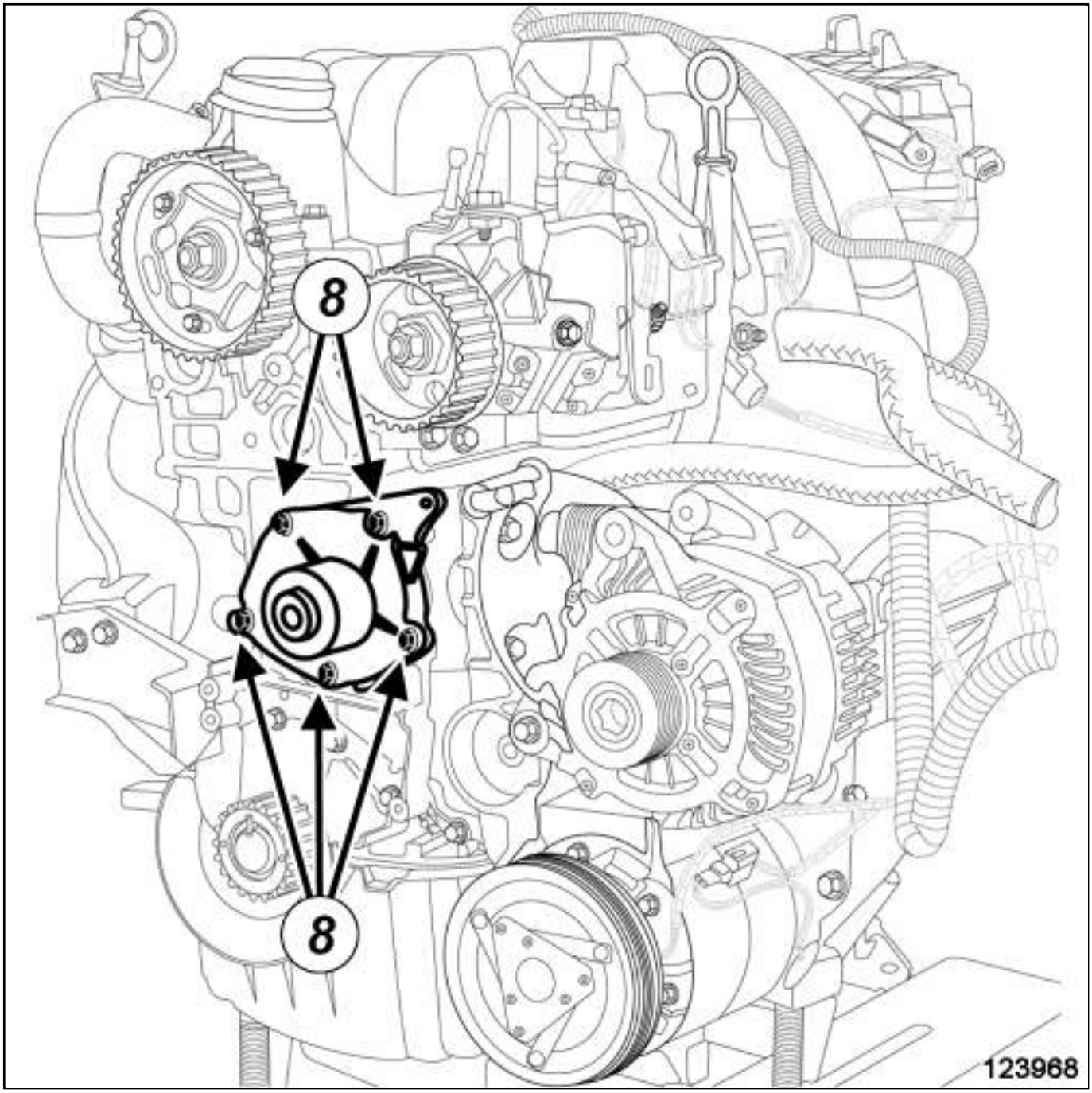
2- SECOND FITTING



- Loosen the lower bolt(6) from the alternator.
- Remove the alternator upper bolt(5) .
- Tilt the alternator slightly towards the front of the vehicle.
- Remove:
  - the inner timing cover bolts(7) ,
  - the inner timing cover.

2. OPERATION FOR REMOVAL OF PART CONCERNED

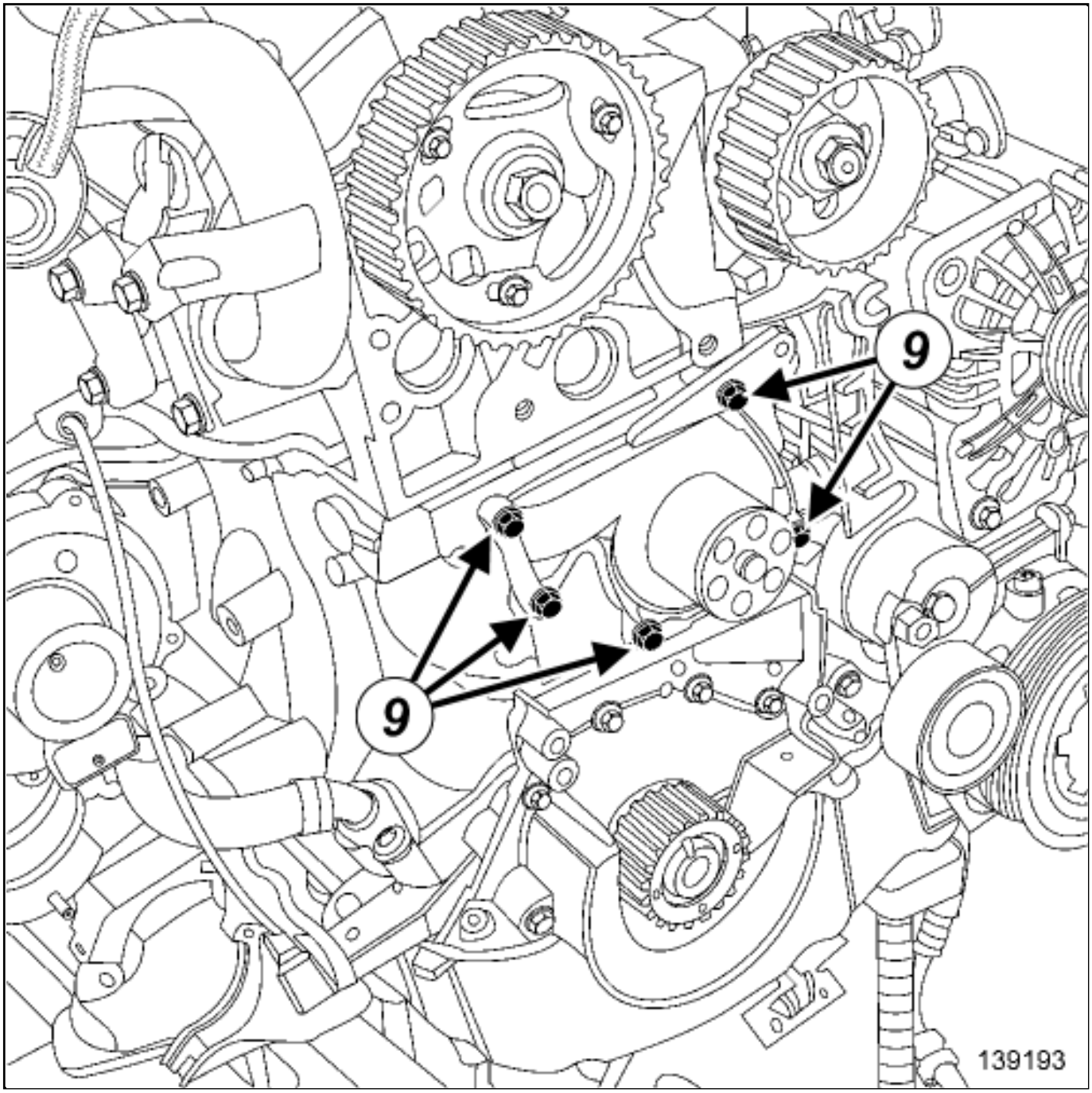
1- FIRST FITTING



Remove:

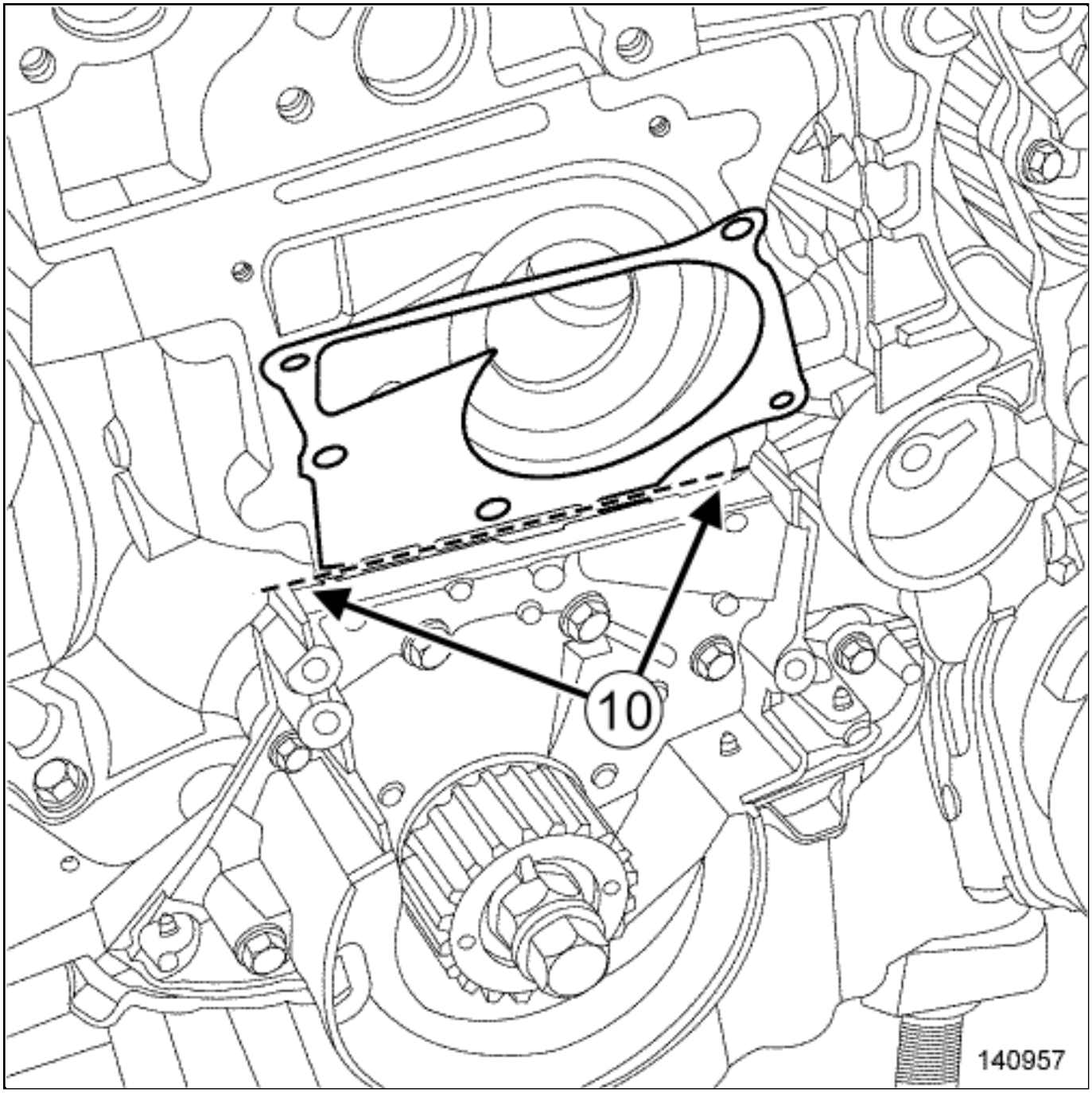
- the coolant pump bolts(8) ,
- the coolant pump,
- the coolant pump seal.

2- SECOND FITTING



Remove:

- the coolant pump bolts(9) ,
- the coolant pump.



- Fold the coolant pump seal at(10) .
- Cut the coolant pump seal.
- Remove the coolant pump seal.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: coolant pump seal.

WARNING

Wear goggles with side protectors for this operation.

CAUTION

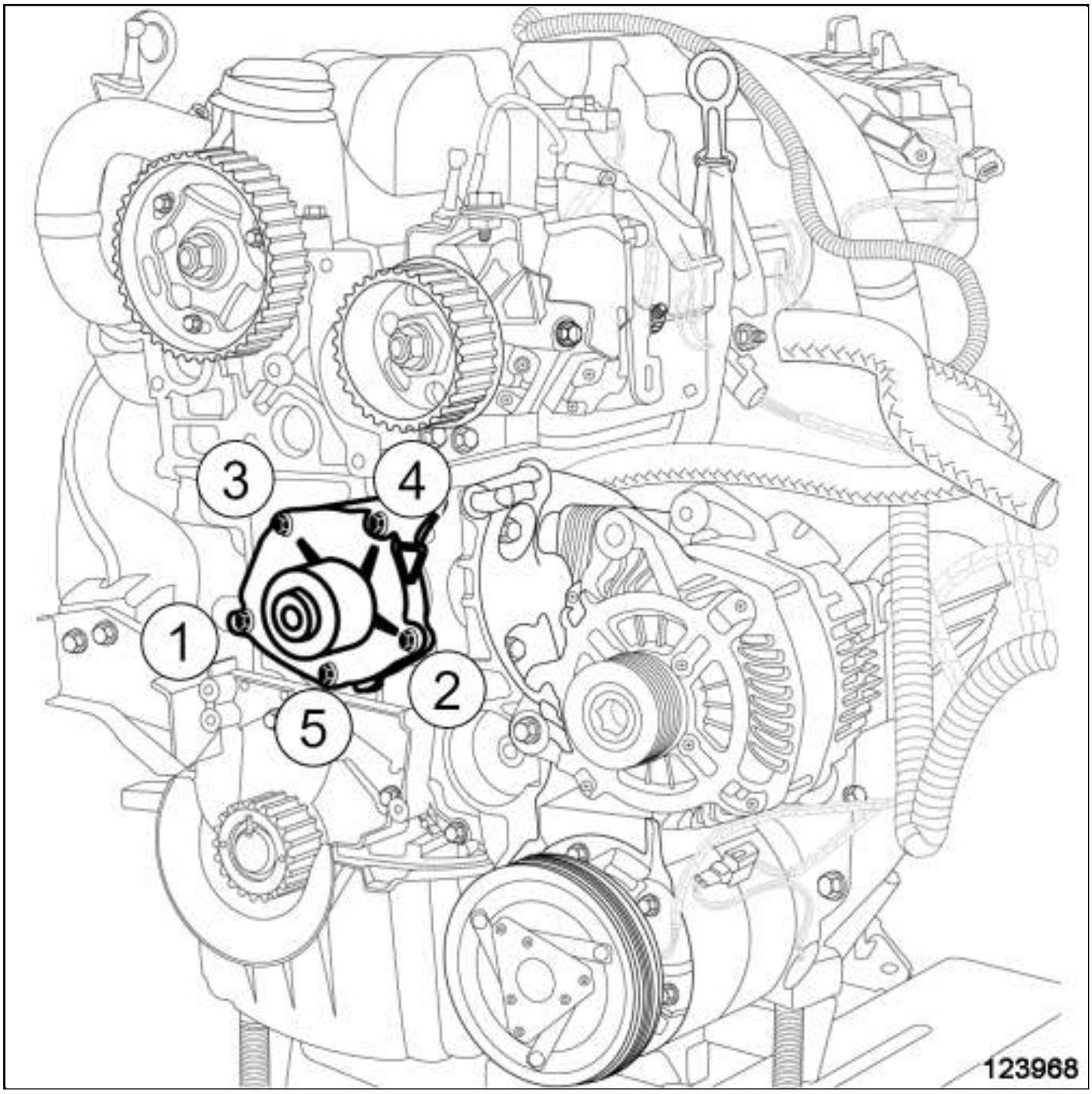
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

Use surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean and degrease:

- the cylinder block gasket face,
- the coolant pump gasket face if it is to be reused.

2. OPERATION FOR REFITTING PART CONCERNED

1- FIRST FITTING

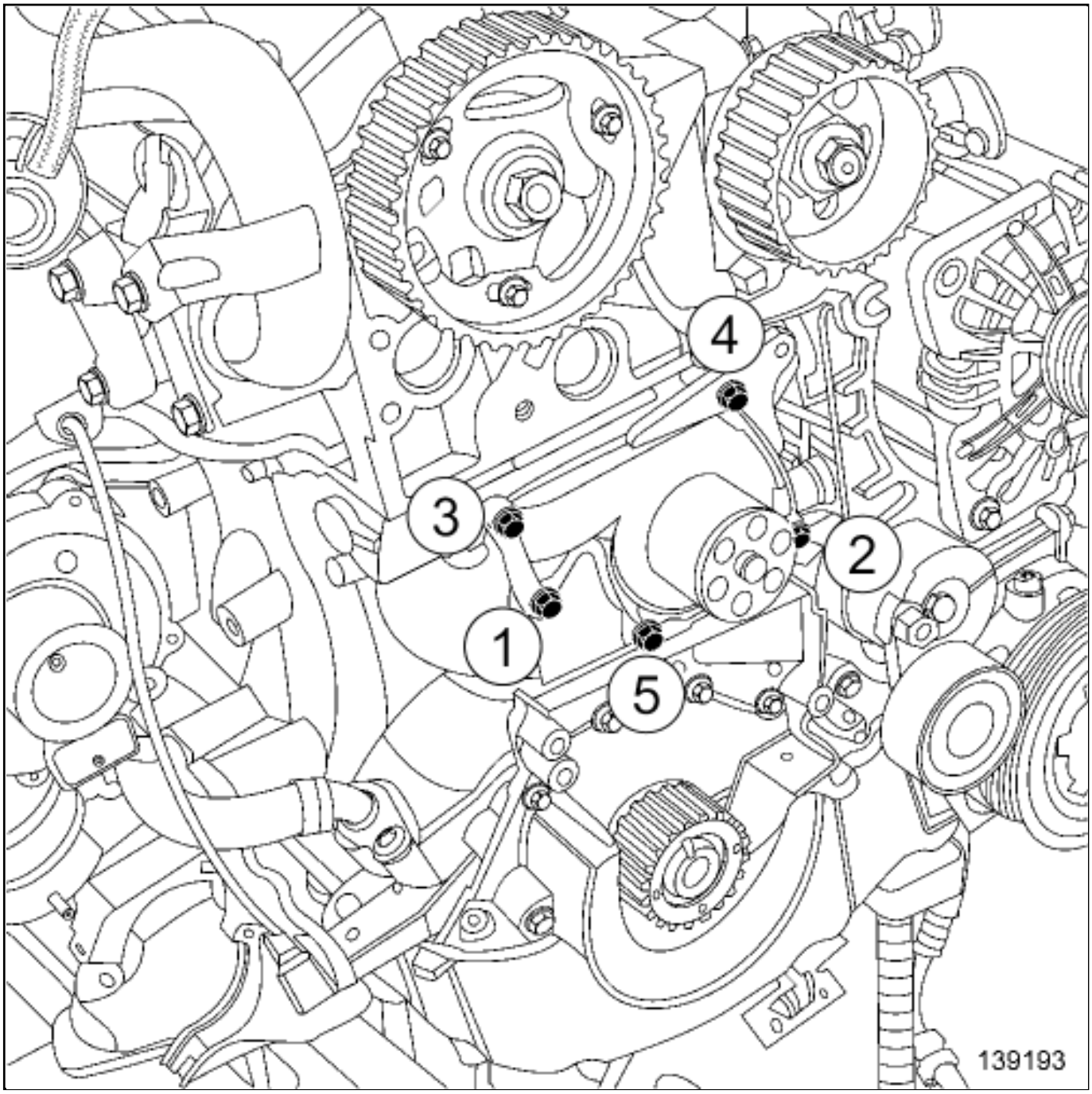


- Refit:
  - a new coolant pump seal,
  - the coolant pump,
  - the bolts(2) and (5) of the coolant pump.

- Coat the coolant pump bolt(3) with one or two drops of FRENETANCHE Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Refit the bolts(3) , (1) and (4) of the coolant pump.

- Torque tighten in order the coolant pump bolts10 N.m.



Refit:

- a new coolant pump seal,
- the coolant pump,
- the bolts(2) and (5) of the coolant pump.

Coat the coolant pump bolt(1) with one or two drops of FRENETANCHE Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Refit:

- the bolt(1) of the coolant pump,
- the bolts(3) and (4) of the coolant pump.

- Torque tighten in order the coolant pump bolts(10 N.m).

3. FINAL OPERATION

- Proceed in the reverse ordre to removal.
- Connect the battery**Battery: Removal - Refitting** (80A, Battery).
- Fill and bleed the cooling system**(see 19A, Cooling, Cooling system: Draining - Refilling)** .

COOLING FAN ASSEMBLY RESISTOR : REMOVAL - REFITTING

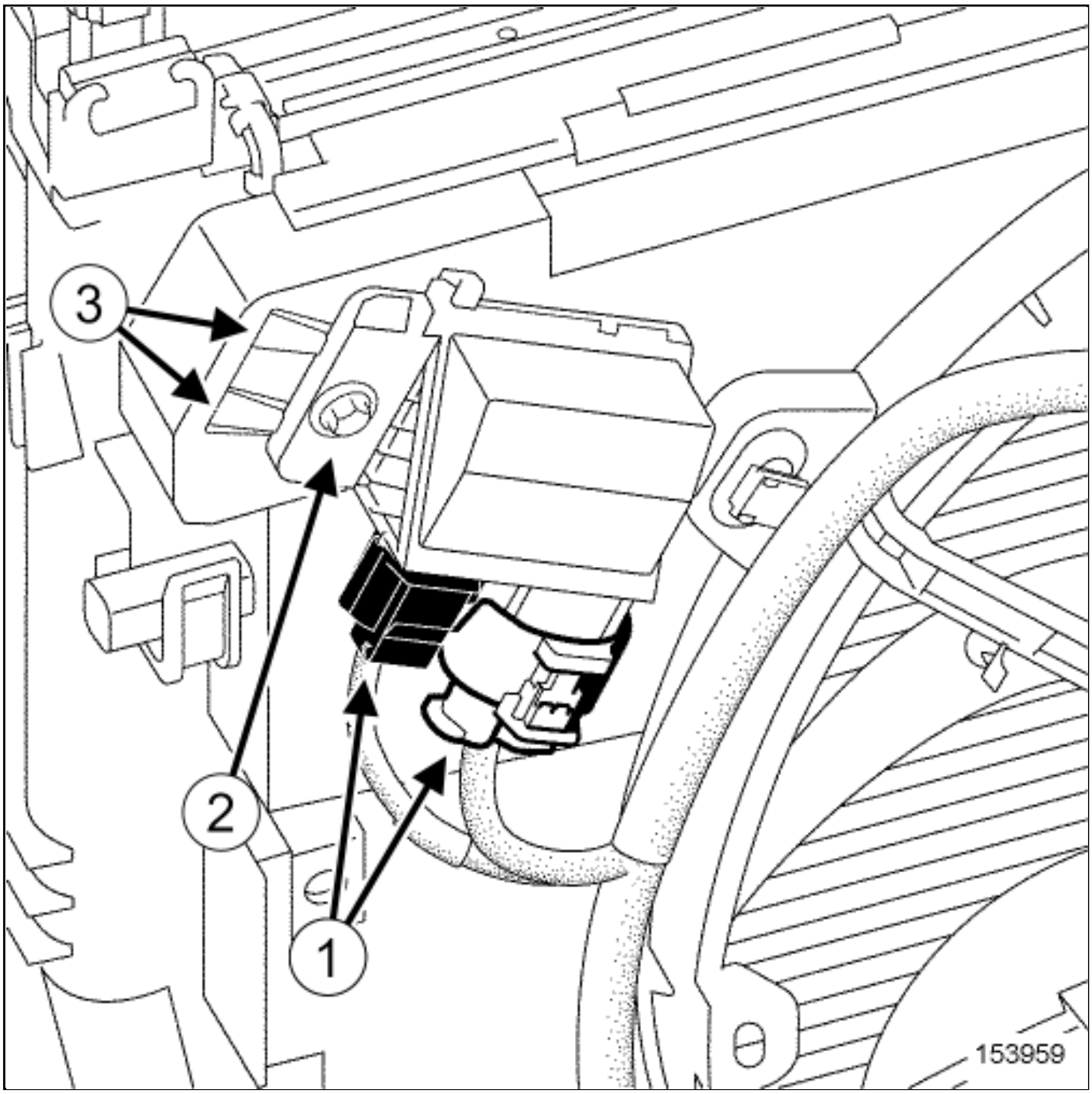
Note, one or more warnings are present in this procedure

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .

2. REMOVAL OPERATION



CAUTION

Do not damage the cooling unit vanes (radiator, condenser, etc) during handling.

Disconnect the engine cooling fan assembly resistor connector(1) .

Remove :

- the engine cooling fan assembly resistor bolt(2) ,
- the engine cooling fan assembly resistor by pressing the clips(3) .

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.

Repair-10x06x05x06-01x37-1-2-1.xml

XSL version : 3.02 du 22/07/11

COOLING RADIATOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448

Equipment required
refrigerant charging station

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

- To avoid any risk of serious burns when the engine is hot:
  - do not open the expansion bottle cap,
  - do not drain the cooling system,
  - do not open the bleed screw(s).

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

- The criteria to be met are:
  - protection down to -25°C ± 2for cold and temperate countries,
  - protection down to -40°C ± 2for "extreme cold" countries.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a liftVehicle: Towing and lifting .
- Disconnect the batteryBattery: Removal - Refitting .
- Remove:
  - the engine undertray bolts,
  - the engine undertray,
  - the front bumperFront bumper assembly: Exploded view ,
  - the fan assembly(see 19A, Cooling, Engine cooling fan assembly: Removal - Refitting) .
- Remove the intercoolerIntercooler : Removal - Refitting .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair .

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857to plug any openings exposed to the open air. They must be clean. Do not use any which have already been used to plug a fuel circuit.

- Drain the refrigerant circuit using the refrigerant charging station.
- Remove the condenserPassenger compartment cooling assembly: Exploded view .
- Drain the engine cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

2. REMOVAL OPERATION

- Using the toolRemote operation pliers for hose clips.(Mot. 1448) , separate the following from the cooling radiator(see 19A, Cooling, Coolant circuit assembly: Exploded view) :
  - the cooling radiator inlet pipe clip,
  - the cooling radiator degassing pipe clip.
- Disconnect the following from the cooling radiator(see 19A, Cooling, Coolant circuit assembly: Exploded view) :
  - the cooling radiator inlet pipe,
  - the cooling radiator degassing pipe.
- Remove the engine cooling radiator from underneath the vehicle.

REFITTING

- Proceed in the reverse order to removal.
- Consult the refrigerant and oil quantity values before filling the circuitAir conditioning: Parts and consumables for the repair .
- Perform the following operations:

- fill the refrigerant circuit using the refrigerant charging station,
- check for leaks .

Check that the air conditioning system is operating correctly**Air conditioning: Check** .

Fill and bleed the cooling system**(see 19A, Cooling, Cooling system: Draining - Refilling)** .

COOLING SYSTEM FILLING AND DIAGNOSTIC TOOL: USE

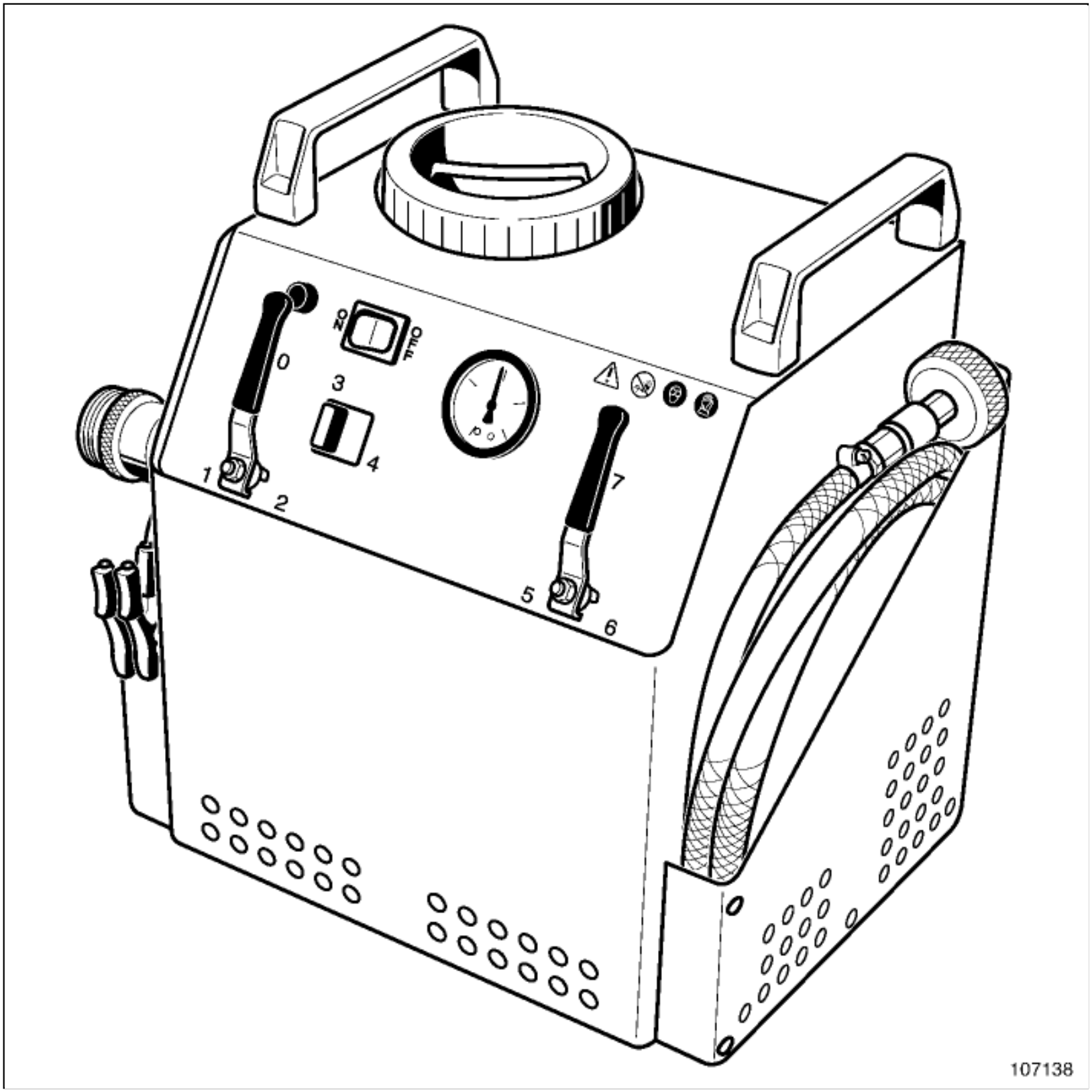
Note, one or more warnings are present in this procedure

Special tooling required	
Fault finding and filling - bleeding the cooling circuit.	Mot. 1700

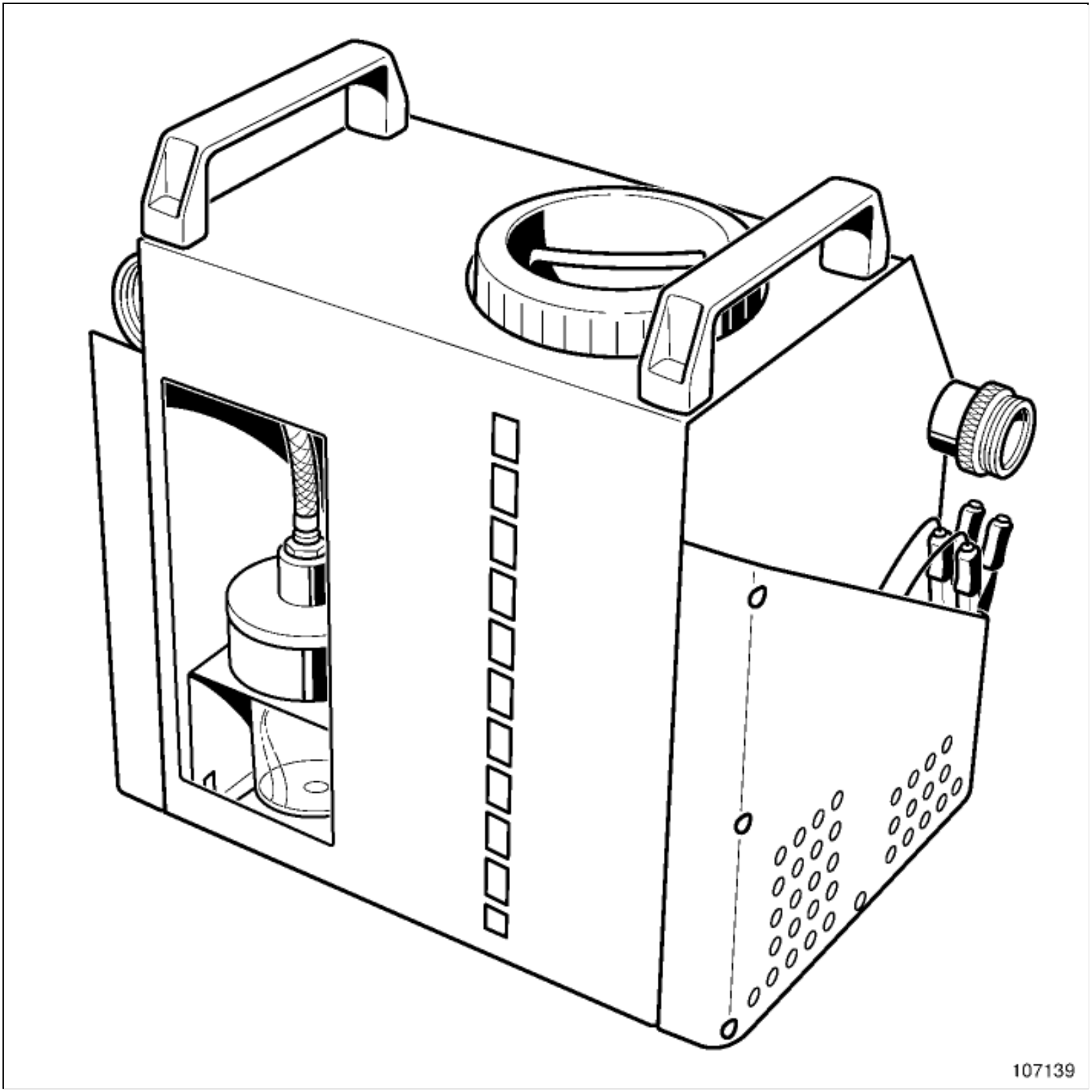
WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

DESCRIPTION OF THE TOOL MOT. 1700


ON
OFF
0
1
2
3
4
5
6
7
107138

(1)	Connection control between the vehicle's cooling system and tool Mot. 1700
(2)	Pressure gauge
(3)	Electric pump air inlet and outlet selection control
(4)	Vacuum or pressure creation selection control
(5)	Electric supply
(6)	Socket for expansion bottle cap
(7)	Electric pump protection fuse
(8)	Electric pump stop/start switch
(9)	Connecting pipe between the vehicle's cooling system and tool Mot. 1700


107139

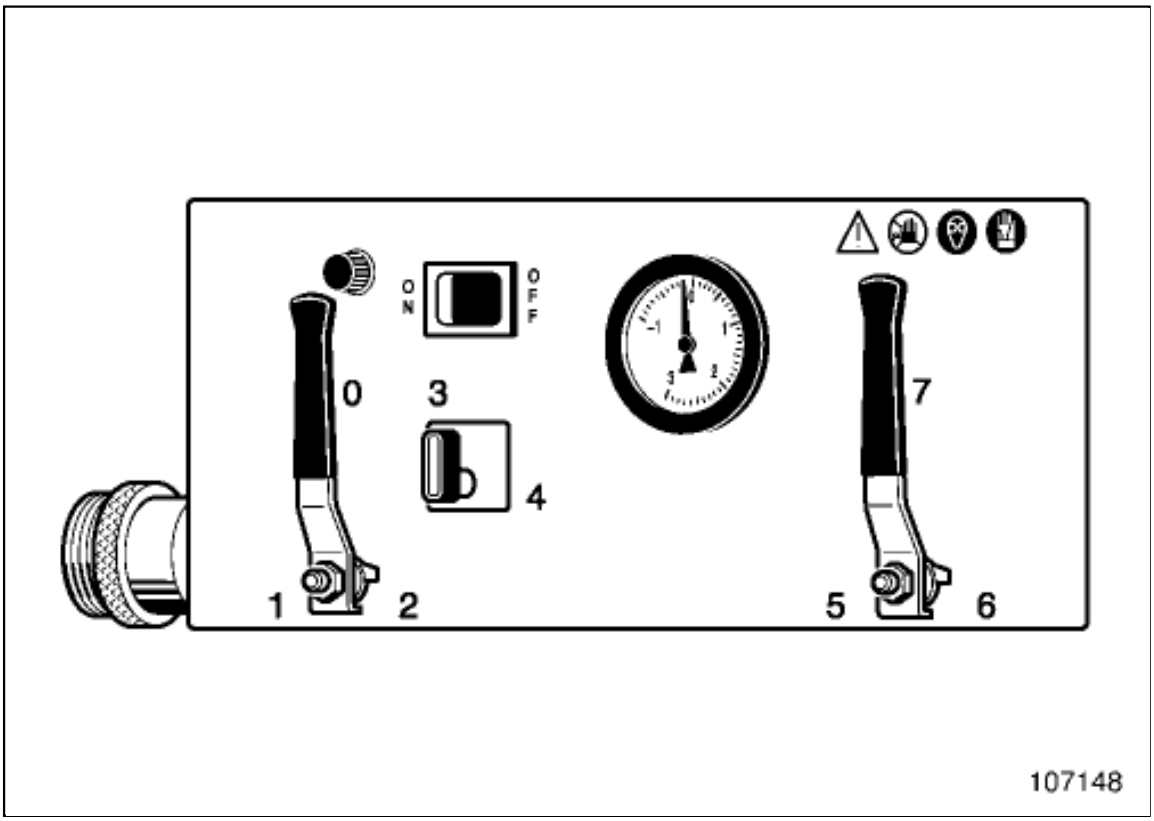
(10)	Decanting bottle
(11)	Indicator for reading the coolant level in the reservoir
(12)	Reservoir filling opening

1. FAULT FINDING PROCEDURE FOR THE ENGINE COOLING SYSTEM

CAUTION

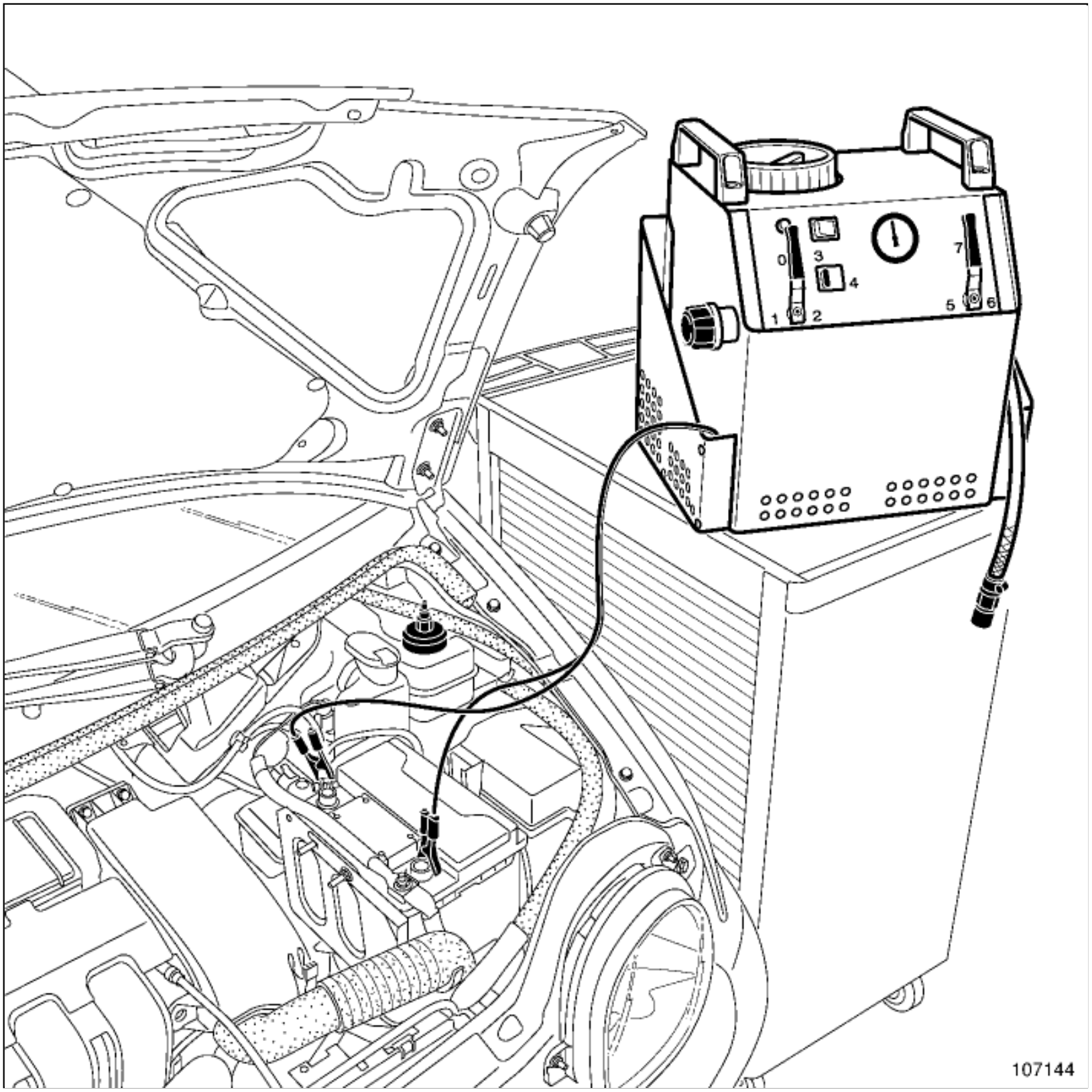
Failure to observe the following procedure can lead to the destruction of the engine.

1- FAULT FINDING PROCEDURE FOR THE EXPANSION BOTTLE CAP



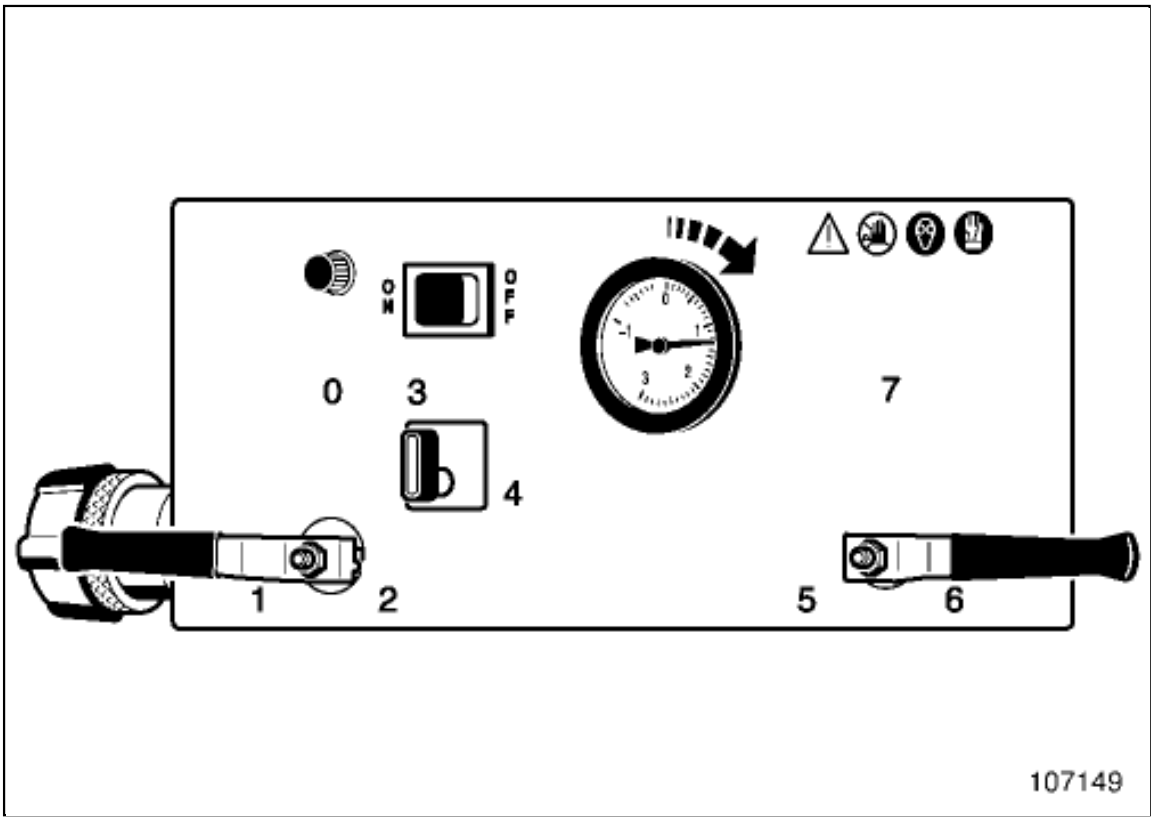
Position:

- Control(1) to "0" ,
- Control(2) to "3" ,
- Control(3) to "7" ,
- The on/off switch(4) to "OFF" .



- Screw on:
  - The expansion bottle cap at(5) on the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) ,
  - The adapter plug(6) (without the pipe) to the vehicle expansion bottle.

- Connect the wires to the battery, observing the correct polarity.



- Position:
  - Control(1) to "1" ,
  - Control(3) to "6" ,
  - The on/off switch(4) to "ON" .

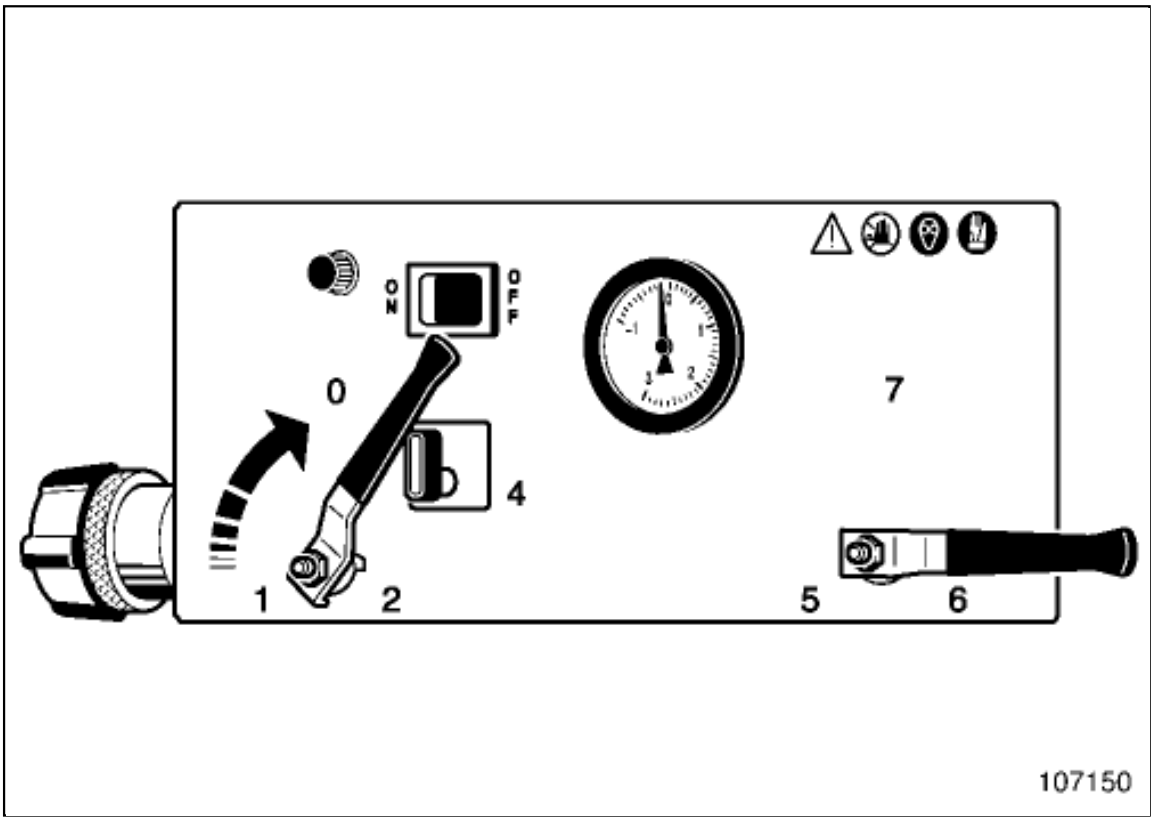
Note:

The pressure gauge needle should point to a pressure value and should settle at the expansion bottle valve cap valve rating. If the needle does not indicate the rating or exceeds 2 bar, replace the expansion bottle cap because the rating is incorrect.

- Set the on/off switch(4) to "OFF" .

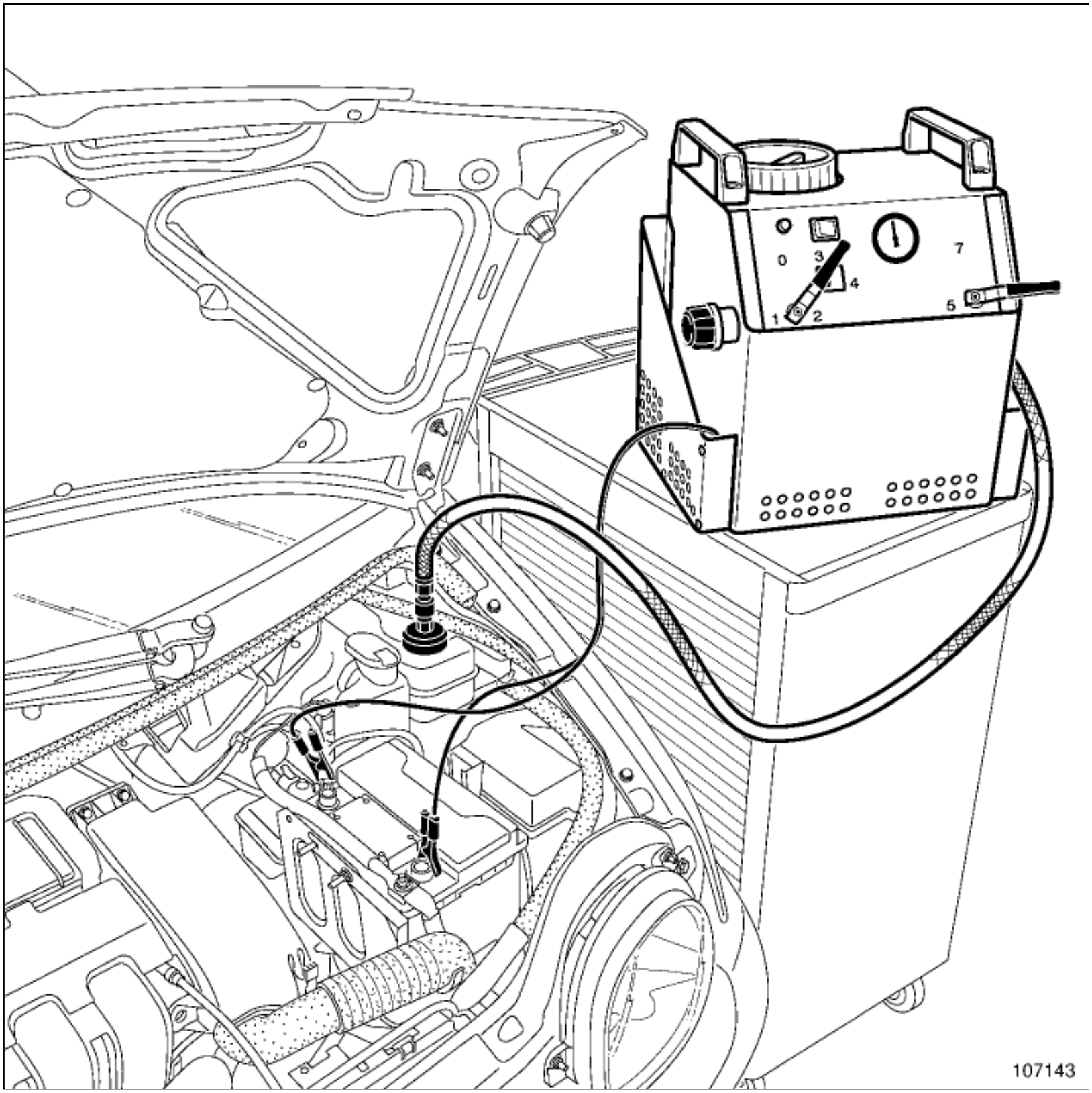
Note:

The needle of the pressure gauge must remain at the expansion bottle cap valve rating. If the needle drops back down, replace the expansion bottle cap as it is leaking.

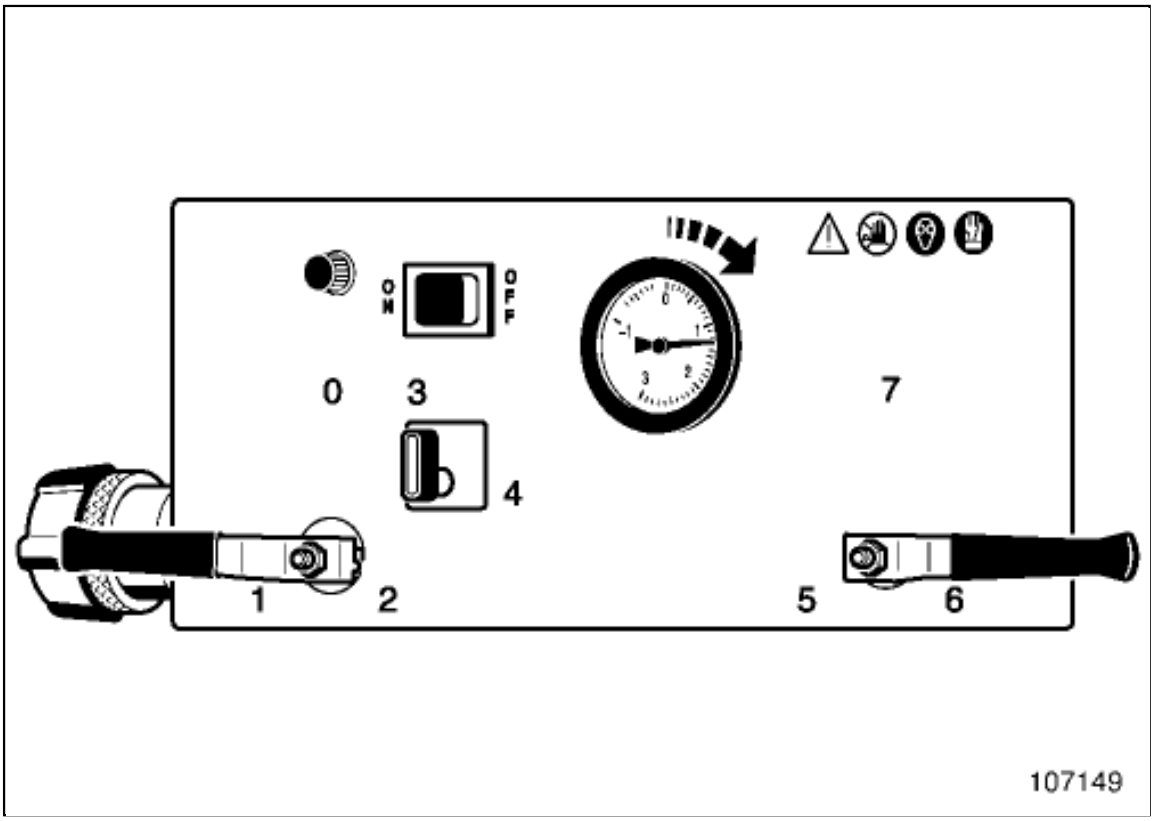


- Dump the pressure by turning the control(1) in the direction shown by the arrow.

2- FAULT FINDING PROCEDURE FOR THE ENGINE COOLING SYSTEM



- Connect the pipe of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) to the adapter plug.

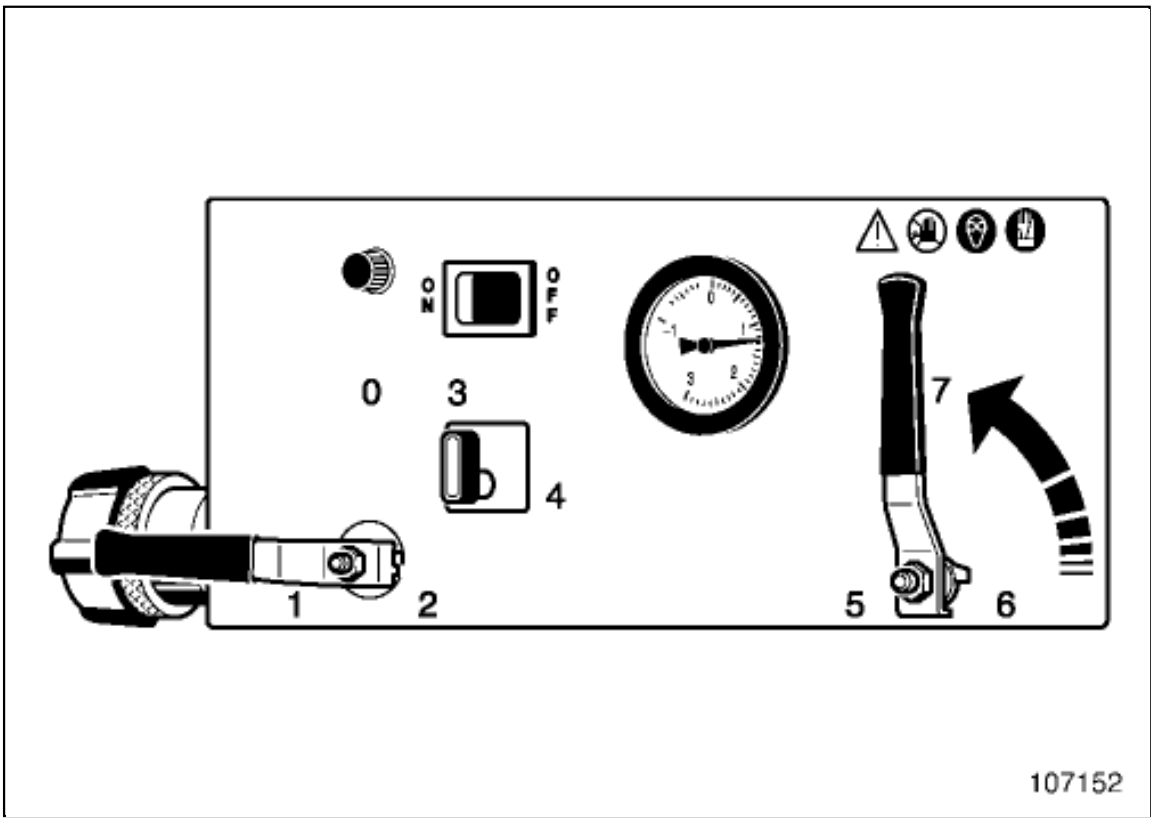


- Position:
  - Control(1) to "1" ,
  - Control(3) to "6" ,
  - The on/off switch(4) to "ON" .

Note:

The pressure gauge needle should point to a pressure value and should settle at the expansion bottle valve cap valve rating.

- Set the on/off switch(4) to "OFF" .

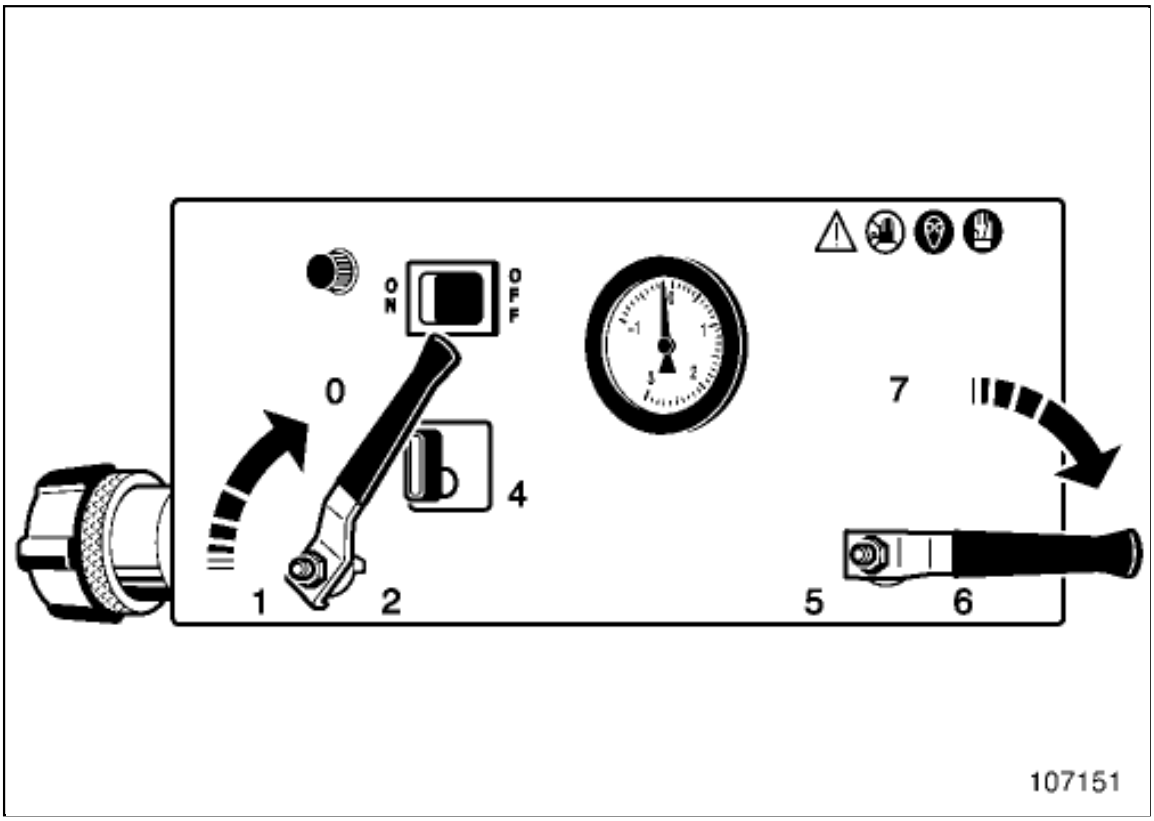


- Set the control(3) to "7" .

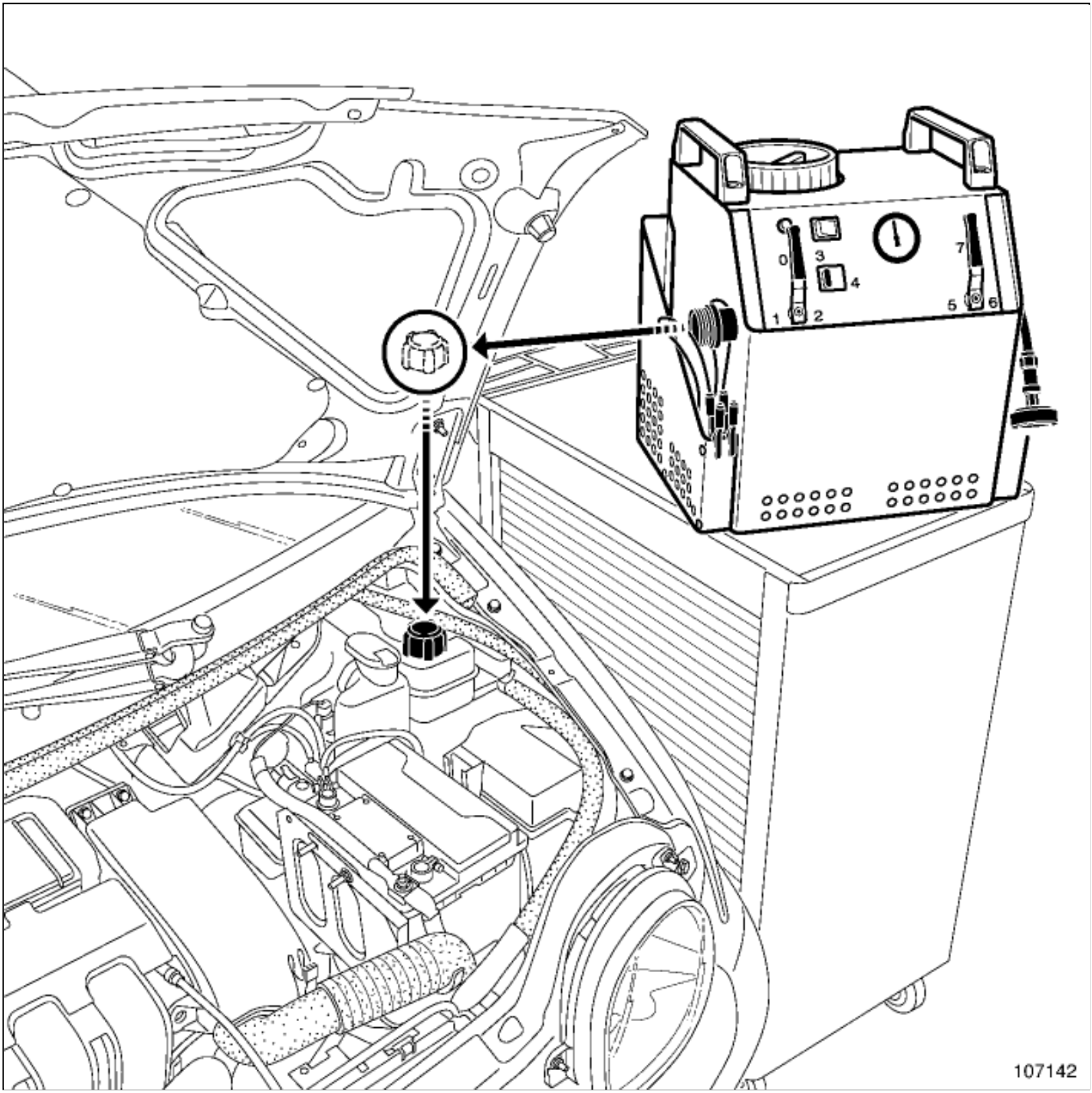
Note:

The pressure gauge needle should not move. If it does not, find and repair any leaks on the cooling system.

After repair, repressurise the cooling circuit (by restarting the previous operations).



- Set the control(3) to "6" .
- Gradually dump the pressure by turning the control(1) in the direction shown by the arrow.



- Disconnect the tool Fault finding and filling - bleeding the cooling circuit.(Mot. 1700) from the vehicle.
- Refit the expansion bottle cap.

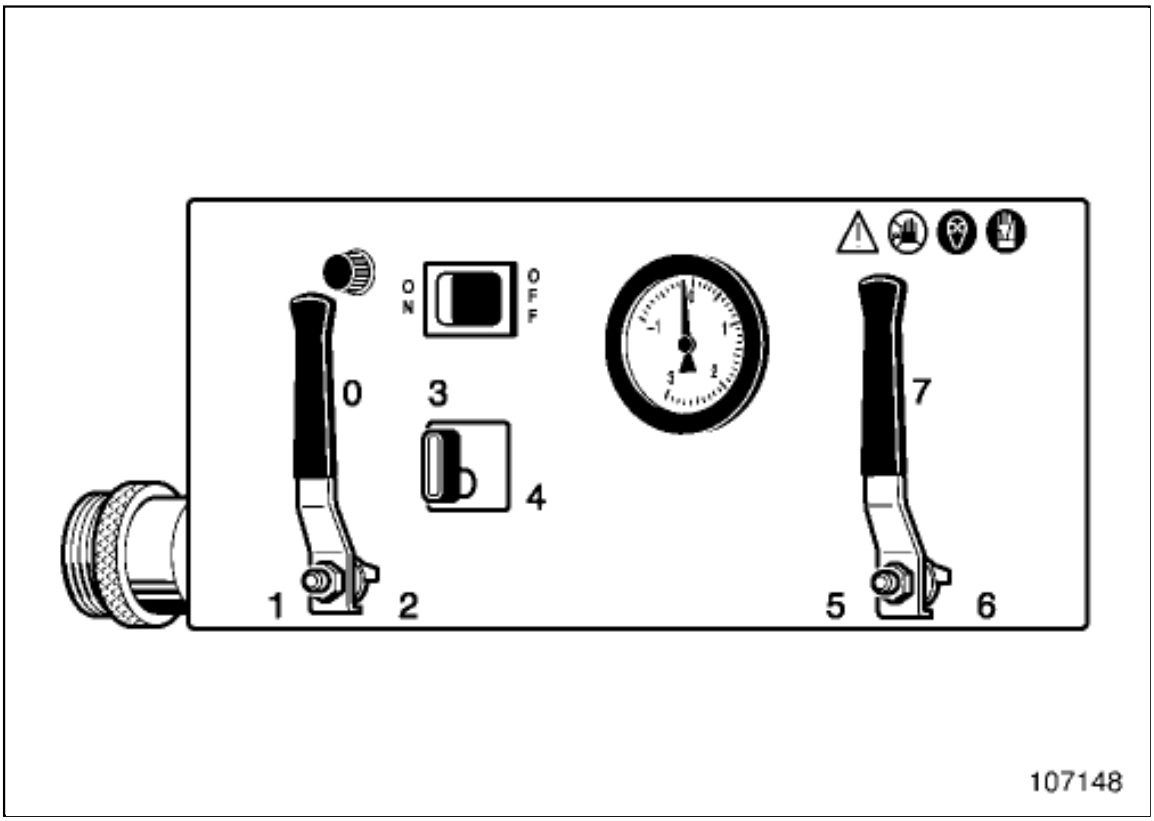
2. FILLING THE COOLING CIRCUIT

This filling operation can be carried out after the cooling circuit has been totally or partially drained, and does not need the bleed screws to be open. The cooling circuit is filled by vacuum.

CAUTION

Failure to observe the following procedure can lead to the destruction of the engine

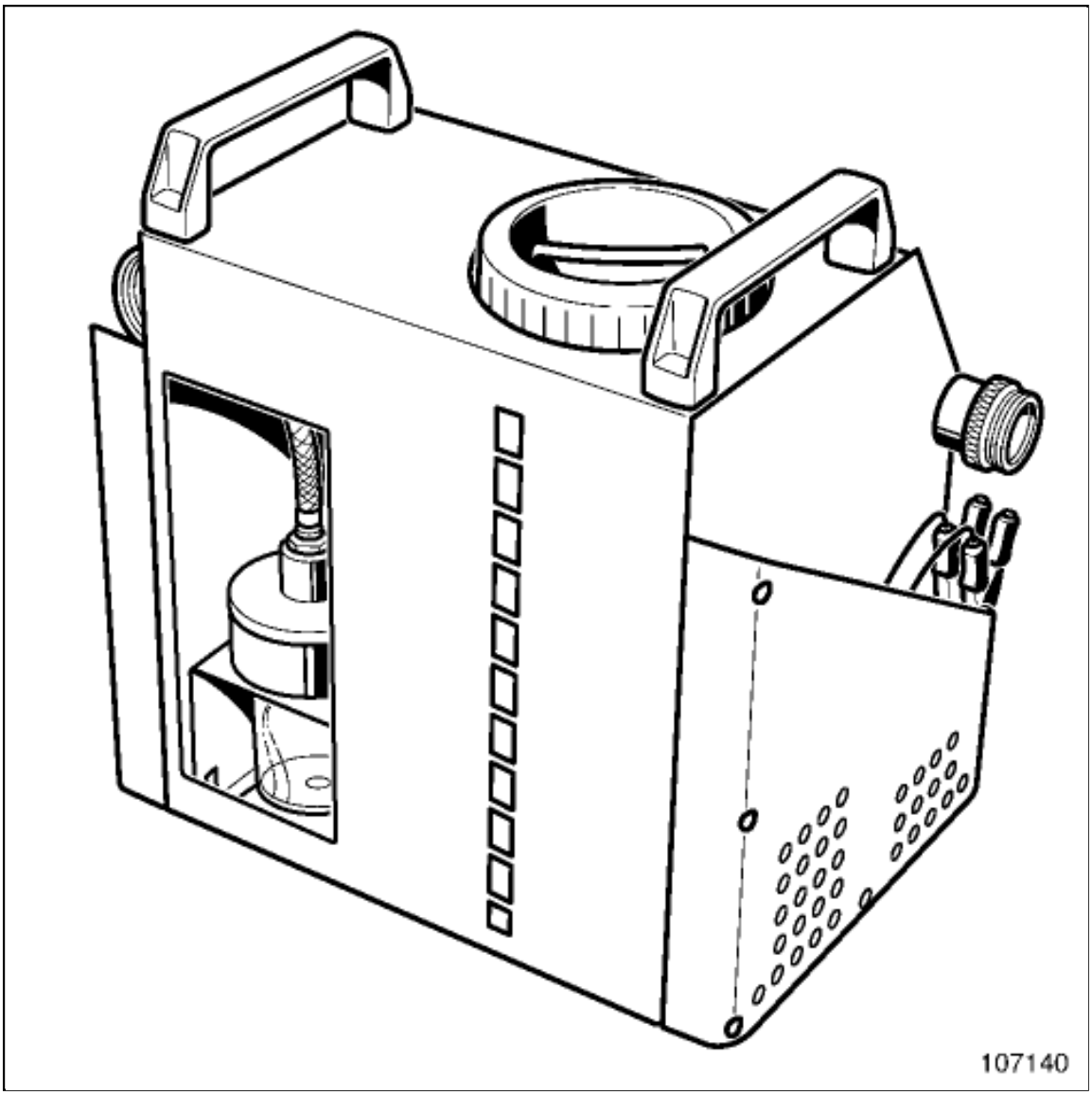
1- CREATING A VACUUM IN THE ENGINE COOLING SYSTEM



Position:

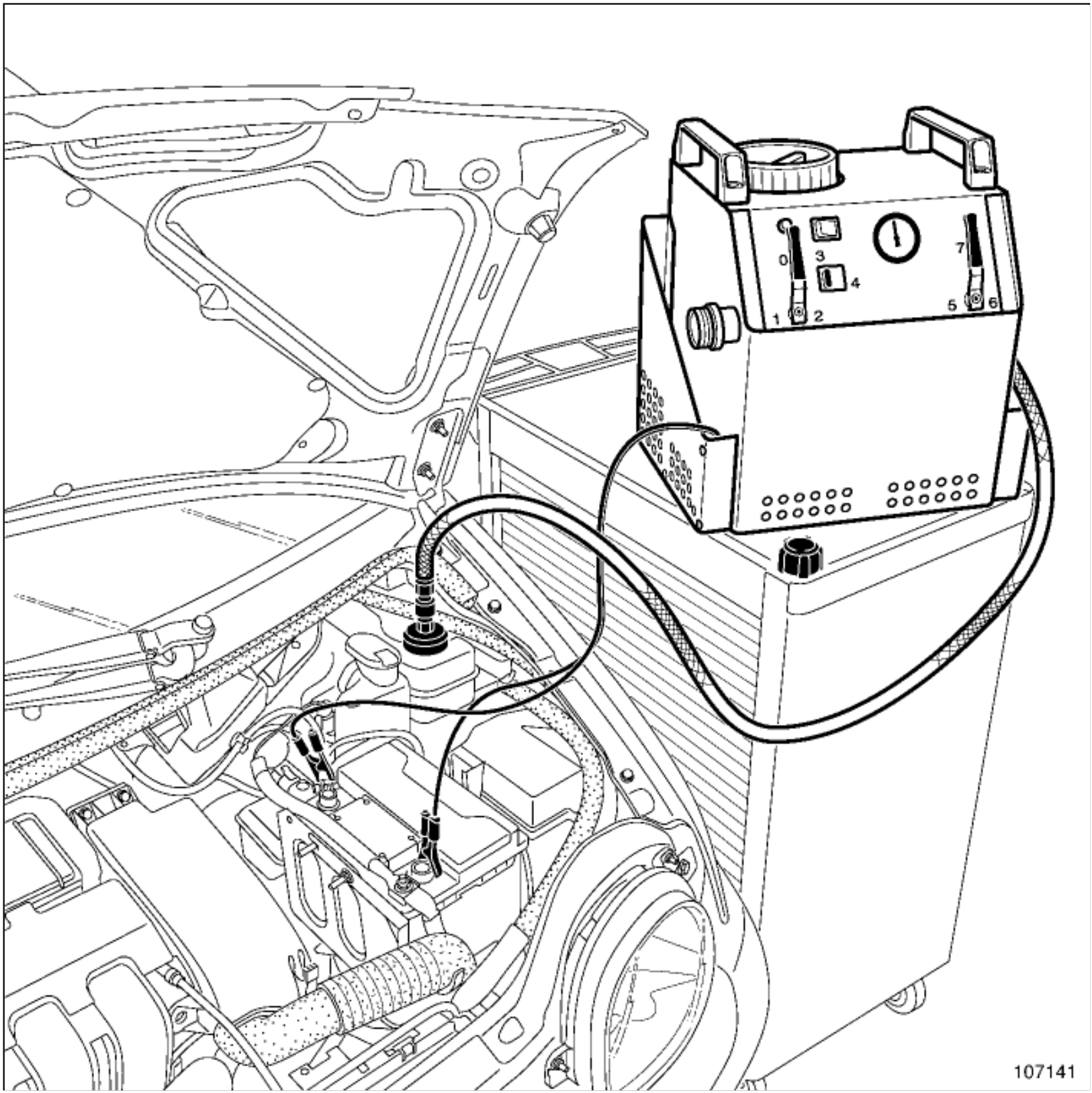
- Control(1) to "0" ,
- Control(2) to "3" ,
- Control(3) to "7" ,

The on/off switch(4) to "OFF" .



Check that:

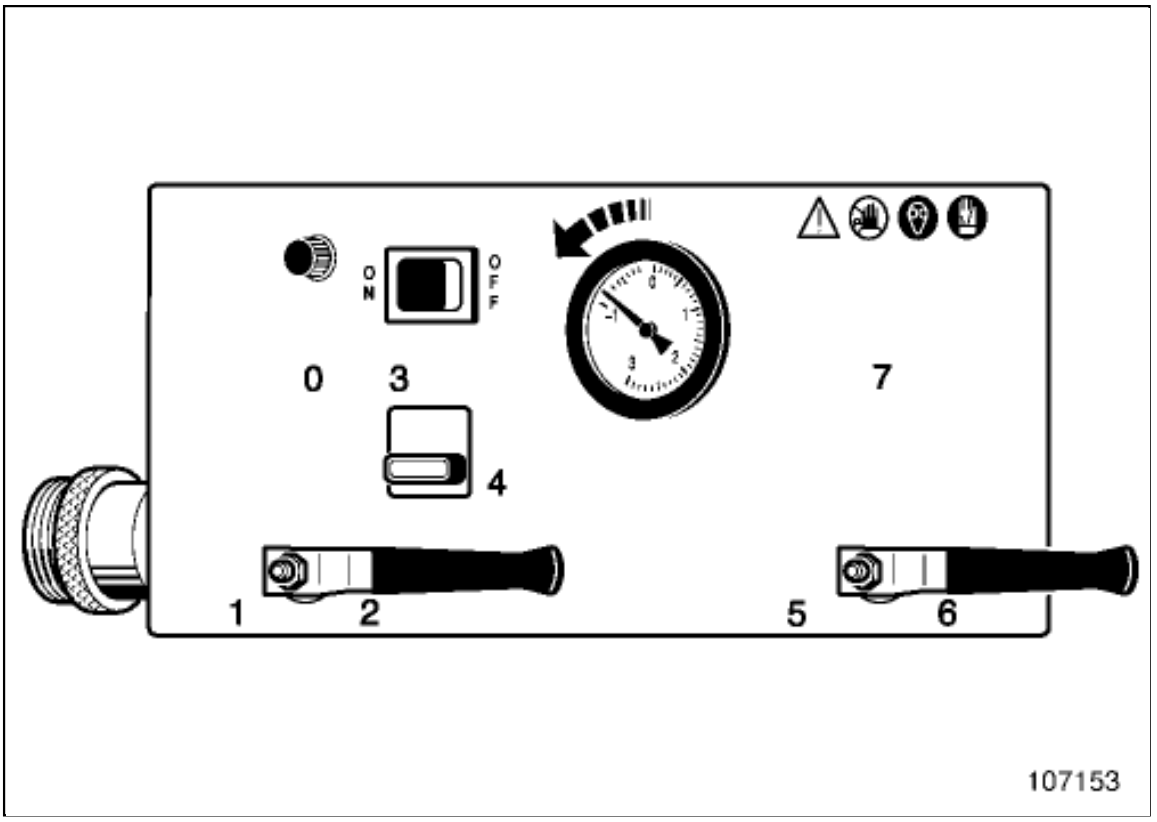
- The decanting bottle(5) is empty,
- There is enough coolant in the reservoir of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .



- Fit the adapter plug to the vehicle's expansion bottle.
- Connect the pipe of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) to the adapter plug.
- Connect the wires to the battery, observing the correct polarity.

Note:

During the operation, do not fit the expansion bottle cap on tool Mot. 1700



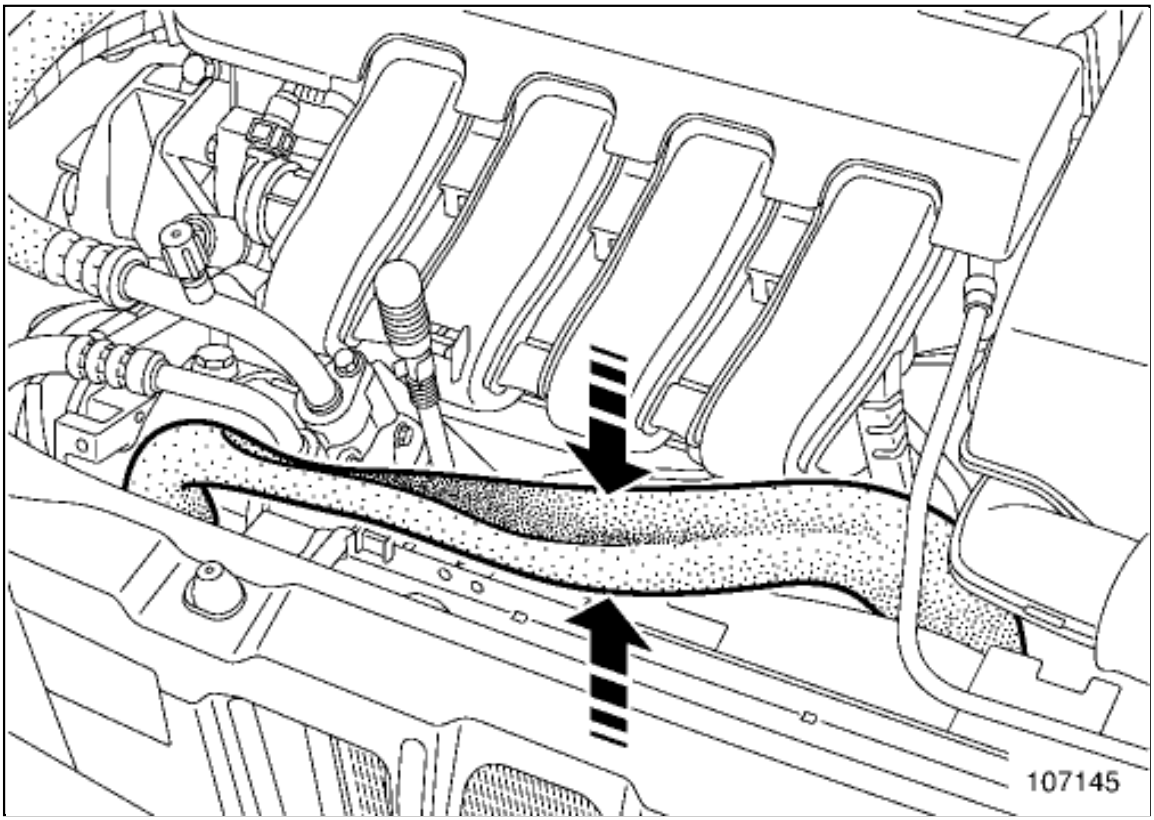
Position:

- Control(1) to "2" ,
- Control(2) to "4" ,
- Control(3) to "6" ,

The on/off switch(4) to "ON" .

Note:

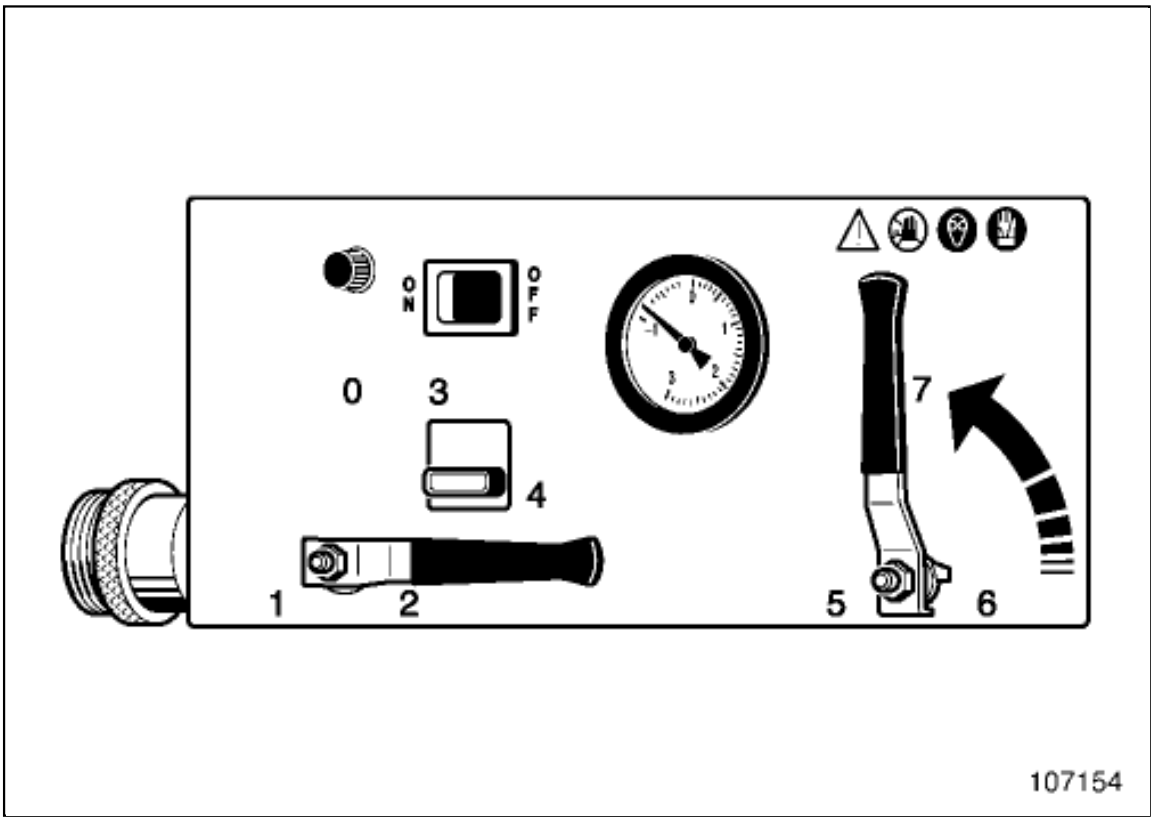
The pressure gauge needle should show a vacuum.



The cooling system hoses flatten.

Note:

If replacing a part which not does require the cooling system to be completely drained, it is essential to position the switch (4) to "OFF" and the control (3) to "7" when the coolant starts to rise in the connecting pipe between the expansion bottle and Mot. 1700.



When the pressure gauge needle shows a vacuum of between 0.85and 0.95bar (depending on the vehicle), position:

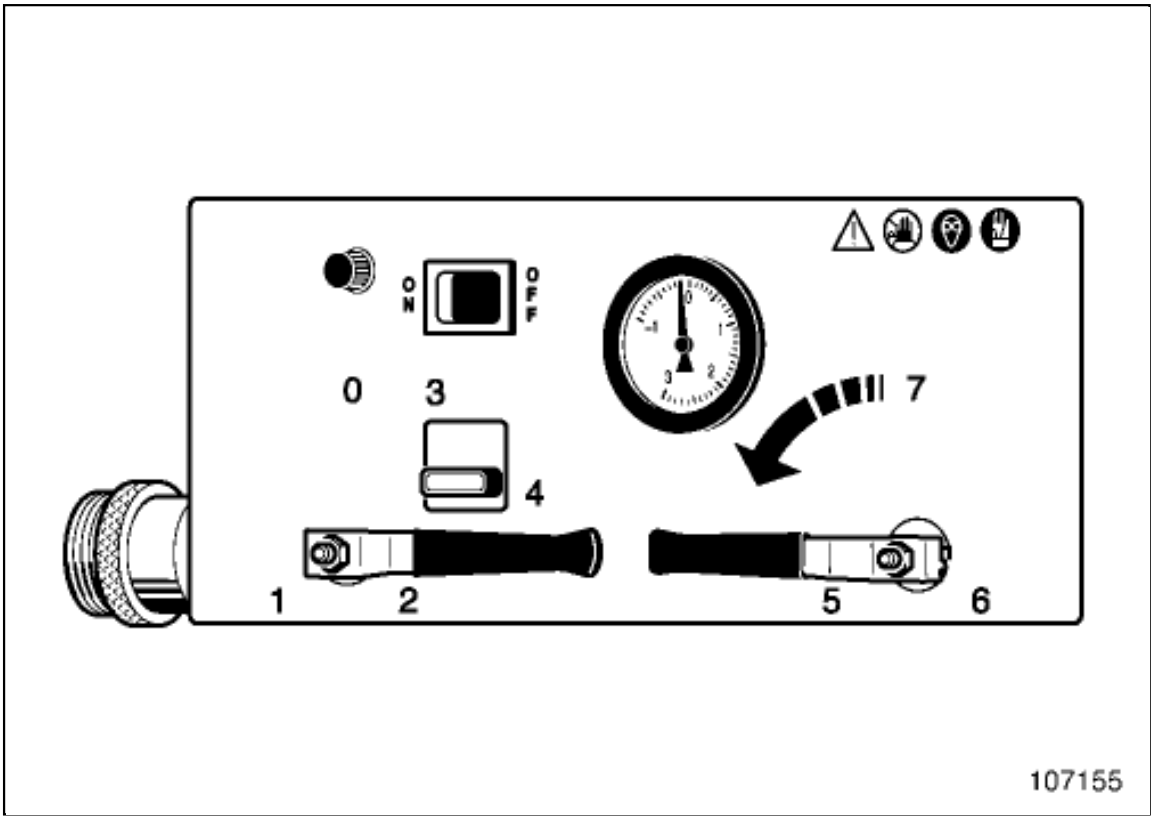
- The on/off switch(4) to "OFF" ,
- Control(3) to "7" .

Note:

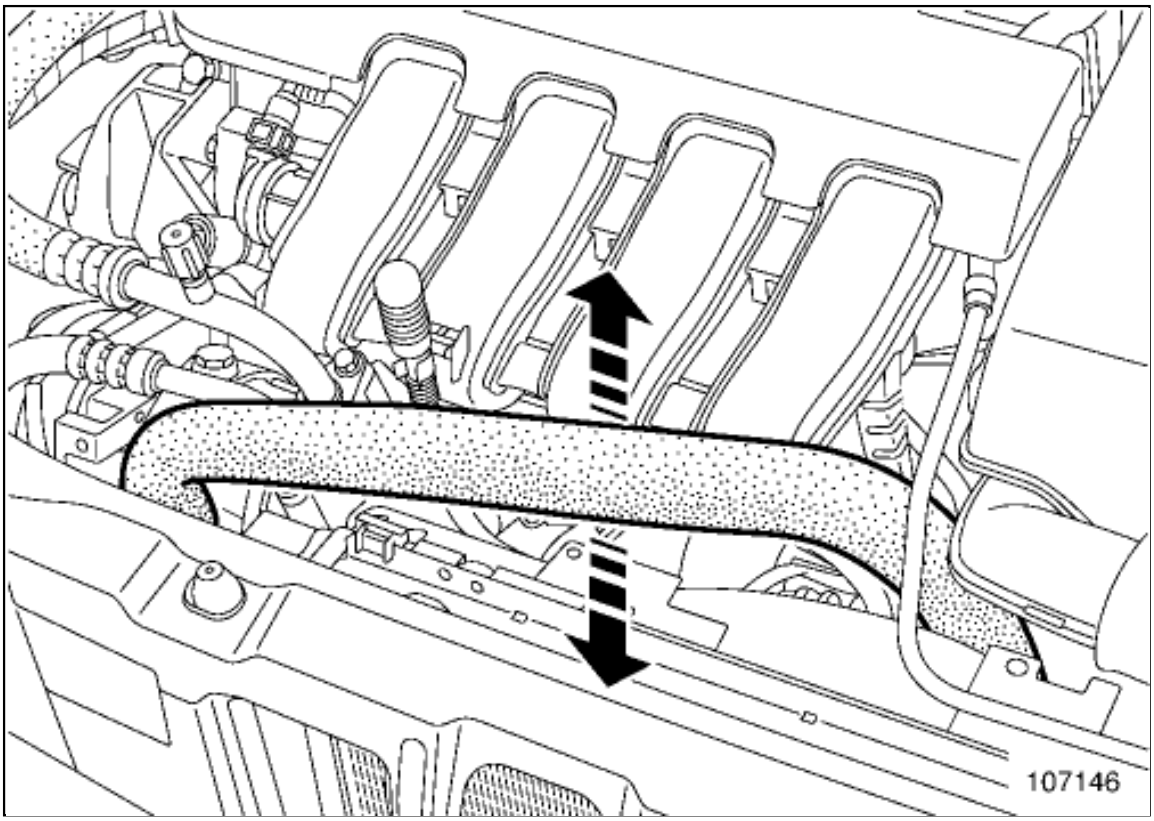
The pressure gauge needle should not move. If it does not, find and repair any leaks on the cooling system.

After repair, create a vacuum in the cooling circuit (by restarting the previous operations).

2- FILLING THE COOLING CIRCUIT



Set the control(3) to "5" .



The hoses return to their original form.

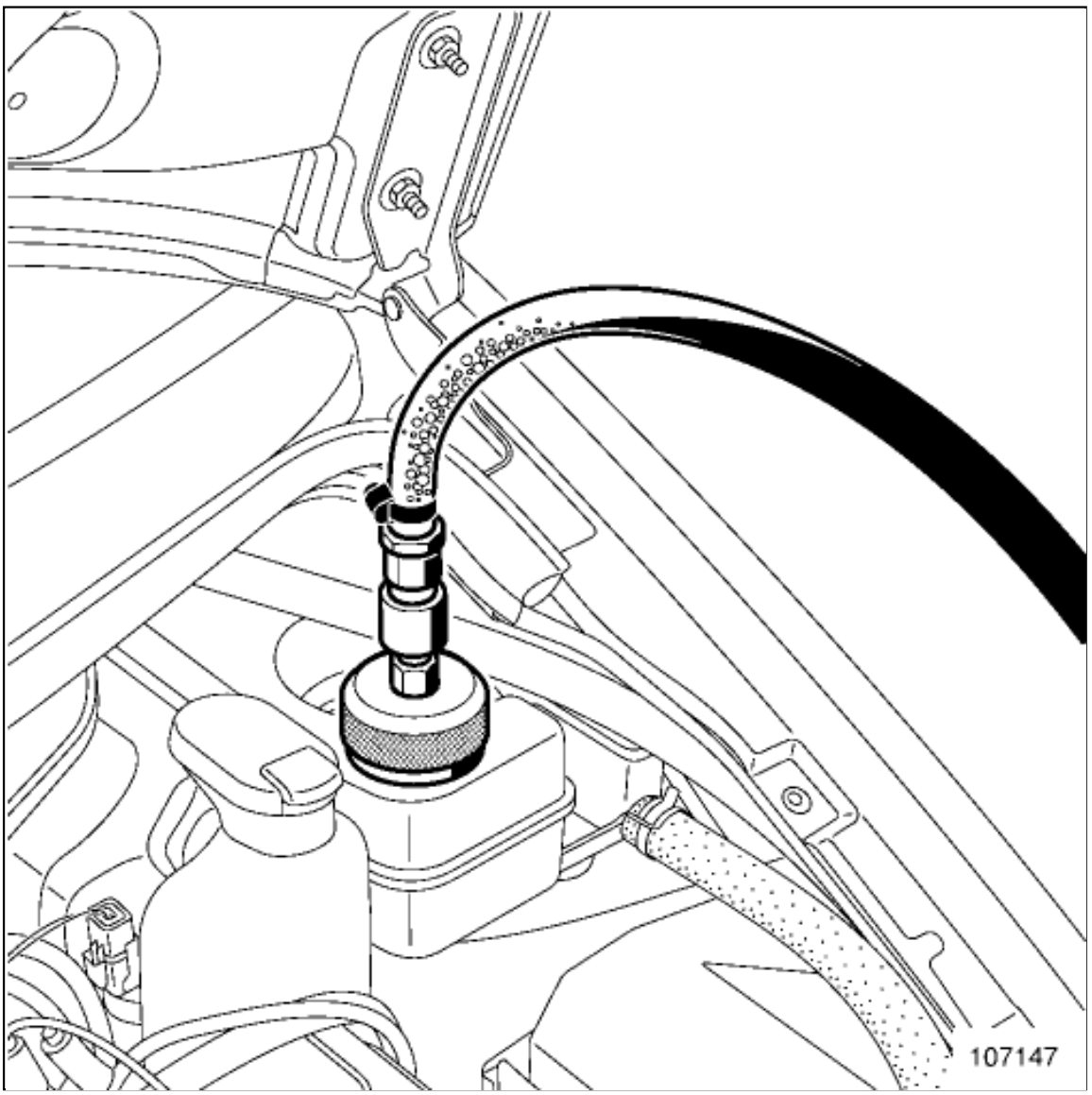
The pressure gauge needle returns to zero.

Note:

For cooling systems with a coolant capacity greater than 10 litres, stop filling the cooling system before the reservoir is empty.

To carry out this operation:

- Position the control (3) to "7" ,
- Readjust the coolant level in the reservoir.
- Set the control (3) to "5" to fill the cooling system again.



The cooling system is full once bubbles appear in the connecting pipe(7) between the expansion bottle and toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .

Set the control(2) to "3" .

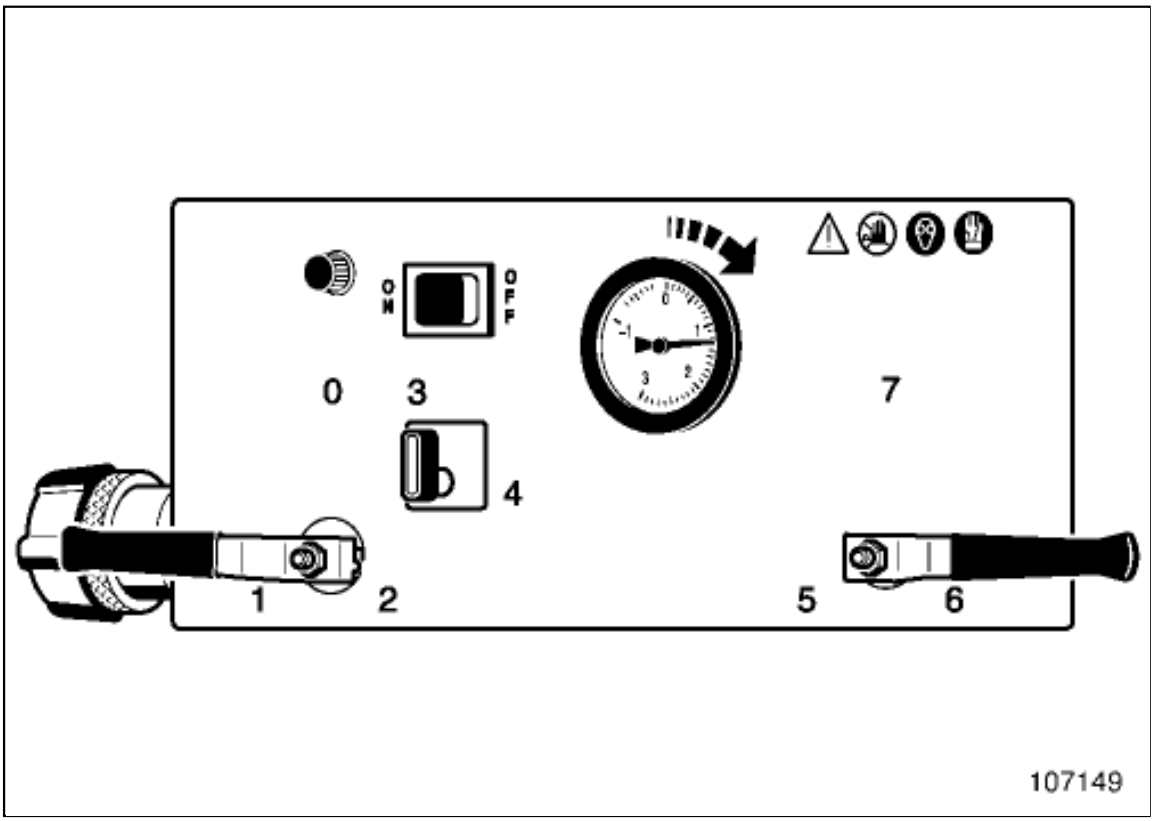
Disconnect the pipe (7) from the adapter plug.

Remove the adapter plug(6) .

Connect the adapter plug to the pipe to empty the remaining liquid in the pipe into the reservoir of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .

3- PRESSURIZING THE COOLING SYSTEM

Refit the adapter plug and the pipe to the vehicle's expansion bottle in order to pressurise the cooling circuit to check the cooling circuit sealing.



Refit the expansion bottle cap(8) on the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .

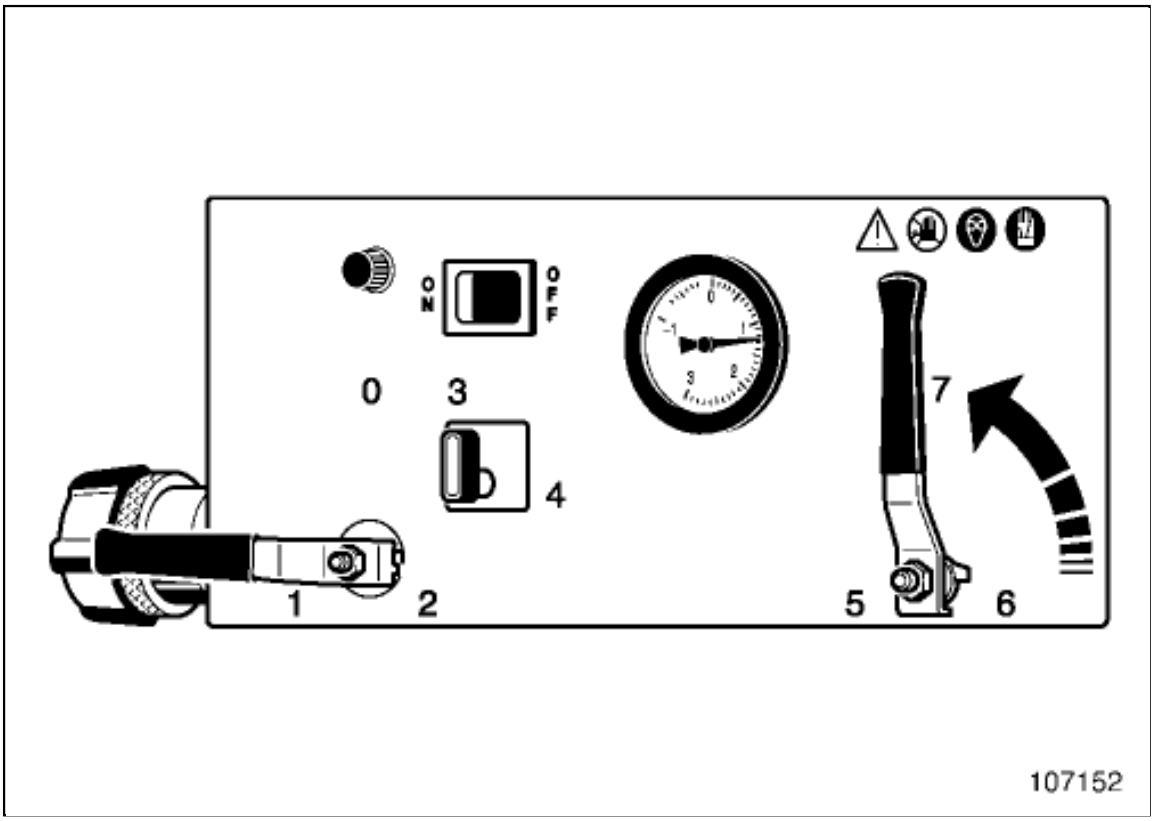
Position:

- Control(1) to "1" ,
- Control(2) to "3" ,
- Control(3) to "6" ,
- The on/off switch(4) to "ON" .

Note:

The pressure gauge needle should point to a pressure value and should settle at the expansion bottle valve cap valve rating.

Set the on/off switch(4) to "OFF" .

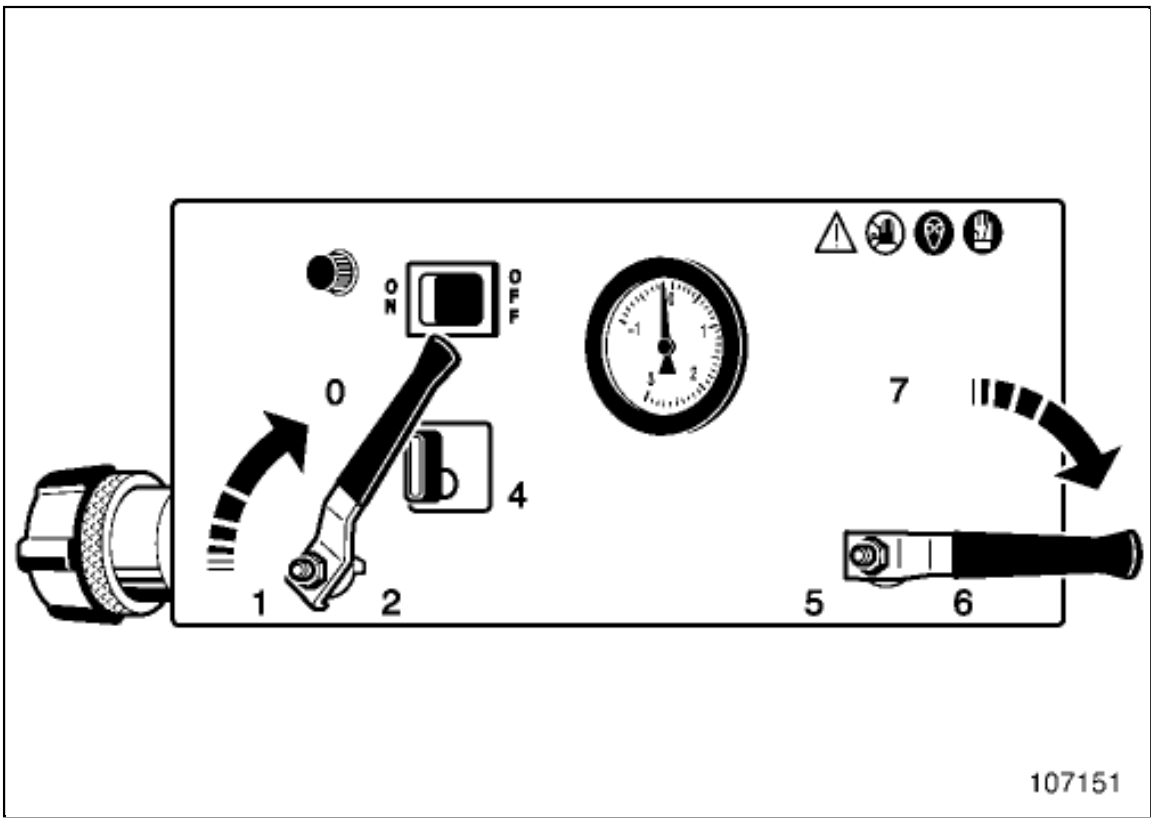


Set the control(3) to "7" .

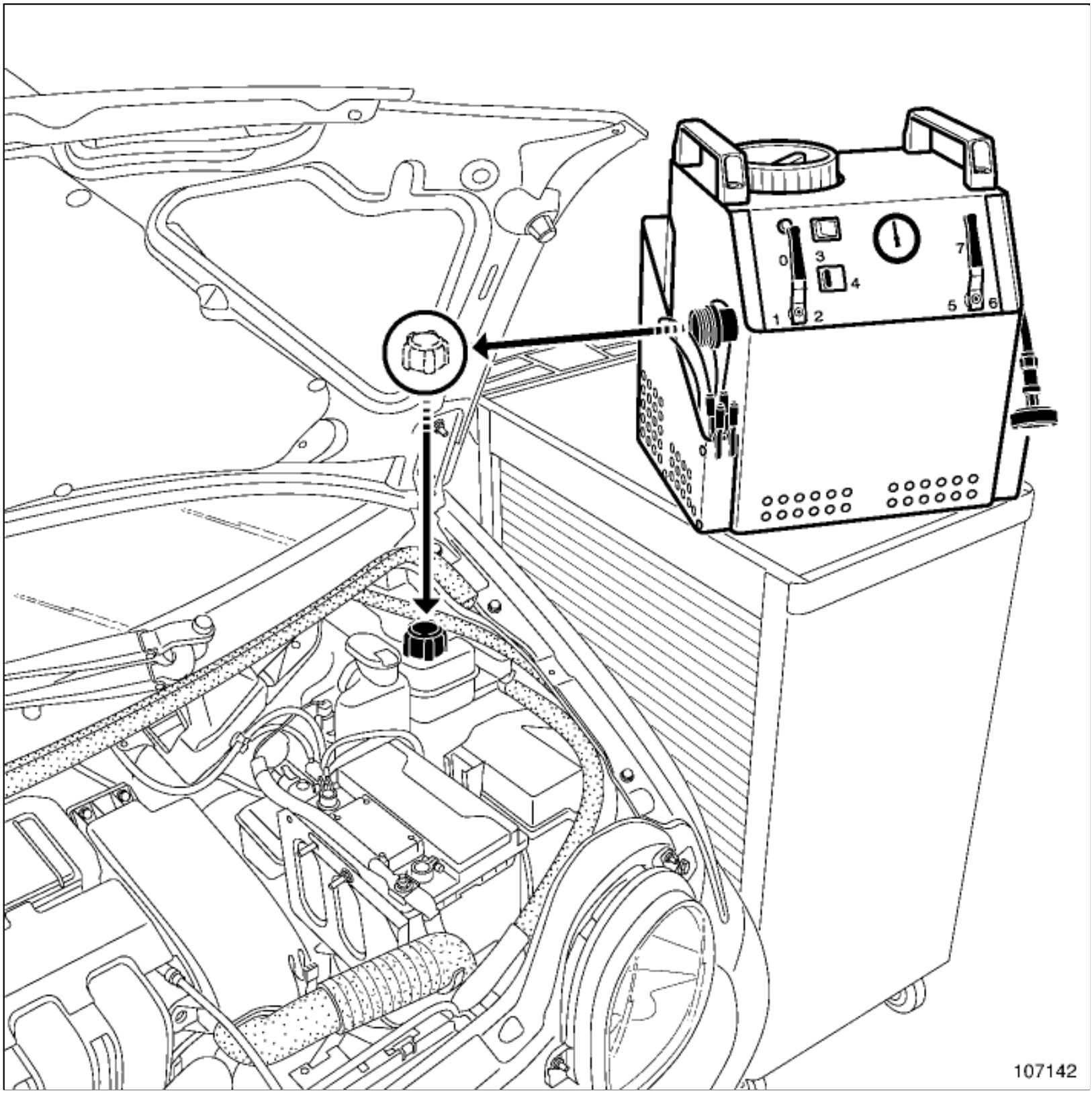
Note:

The pressure gauge needle should not move. If it does not, find and repair any leaks on the cooling system.

After repair, repressurise the cooling circuit (by restarting the previous operations).



- Set the control(3) to "6" .
- Gradually dump the pressure by turning the control(1) in the direction shown by the arrow.
- Disconnect the tool Fault finding and filling - bleeding the cooling circuit.(Mot. 1700) from the vehicle.
- Fill the expansion bottle to overflow (only after a total draining of the cooling system).



- Refit the expansion bottle cap.

- Bleed the engine cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

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CRANKSHAFT POSITION SENSOR: REMOVAL - REFITTING

Equipment required
Diagnostic tool

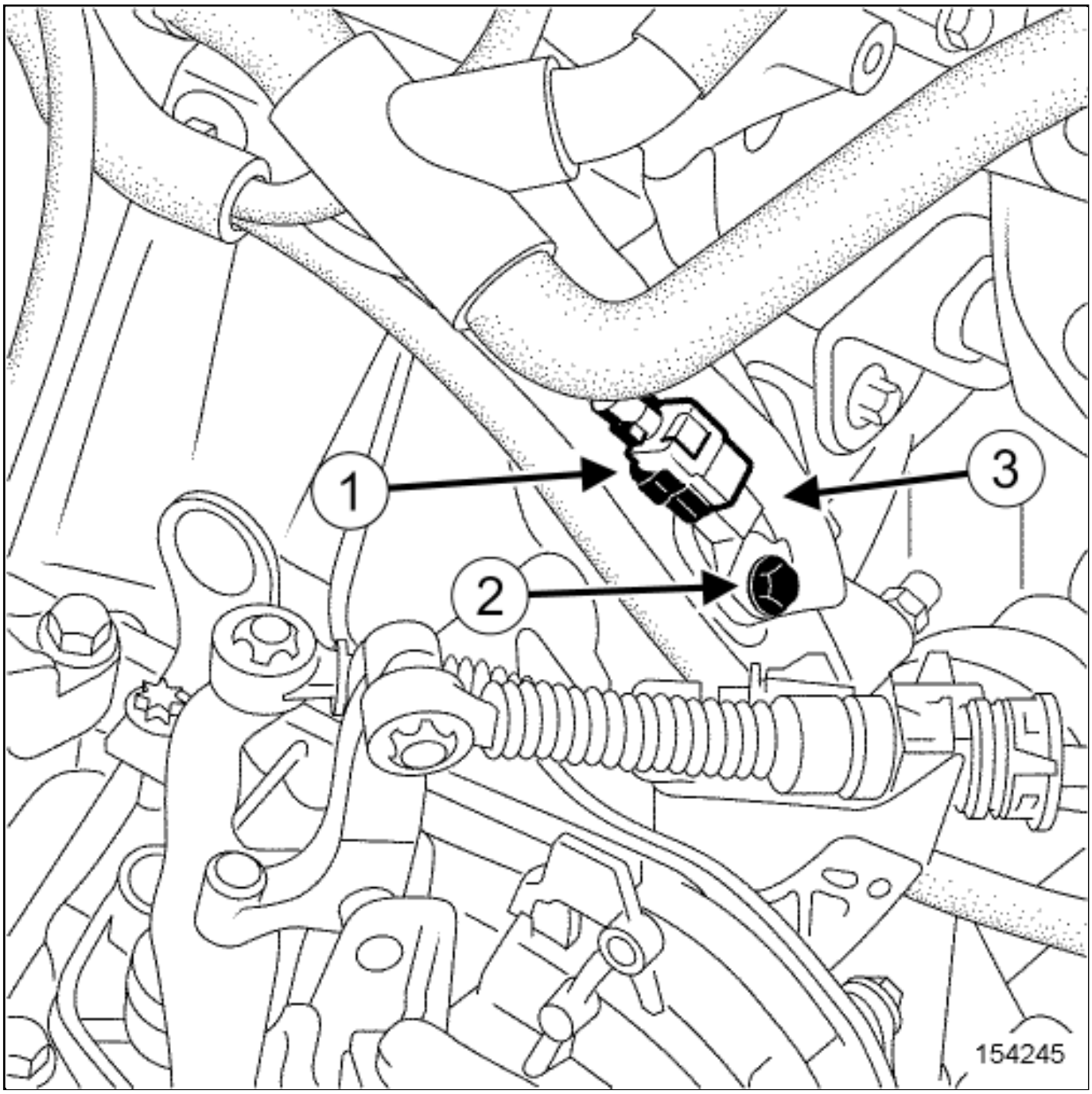
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the engine undertray bolts,
  - the engine undertray.

2. REMOVAL OPERATION



- Disconnect the crankshaft position sensor connector(1) .

- Remove:
  - the crankshaft position sensor bolt(2) ,
  - the crankshaft position sensor protector(3) ,
  - the crankshaft position sensor.

REFITTING

- Proceed in the reverse order to removal.

Apply the after repair procedure using Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the after repair procedure:

■"Injection computer"

-Component concerned by the after repair procedure :

■"TDC sensor"

CRUISE CONTROL - SPEED LIMITER: LIST AND LOCATION OF COMPONENTS

Equipment required
Diagnostic tool

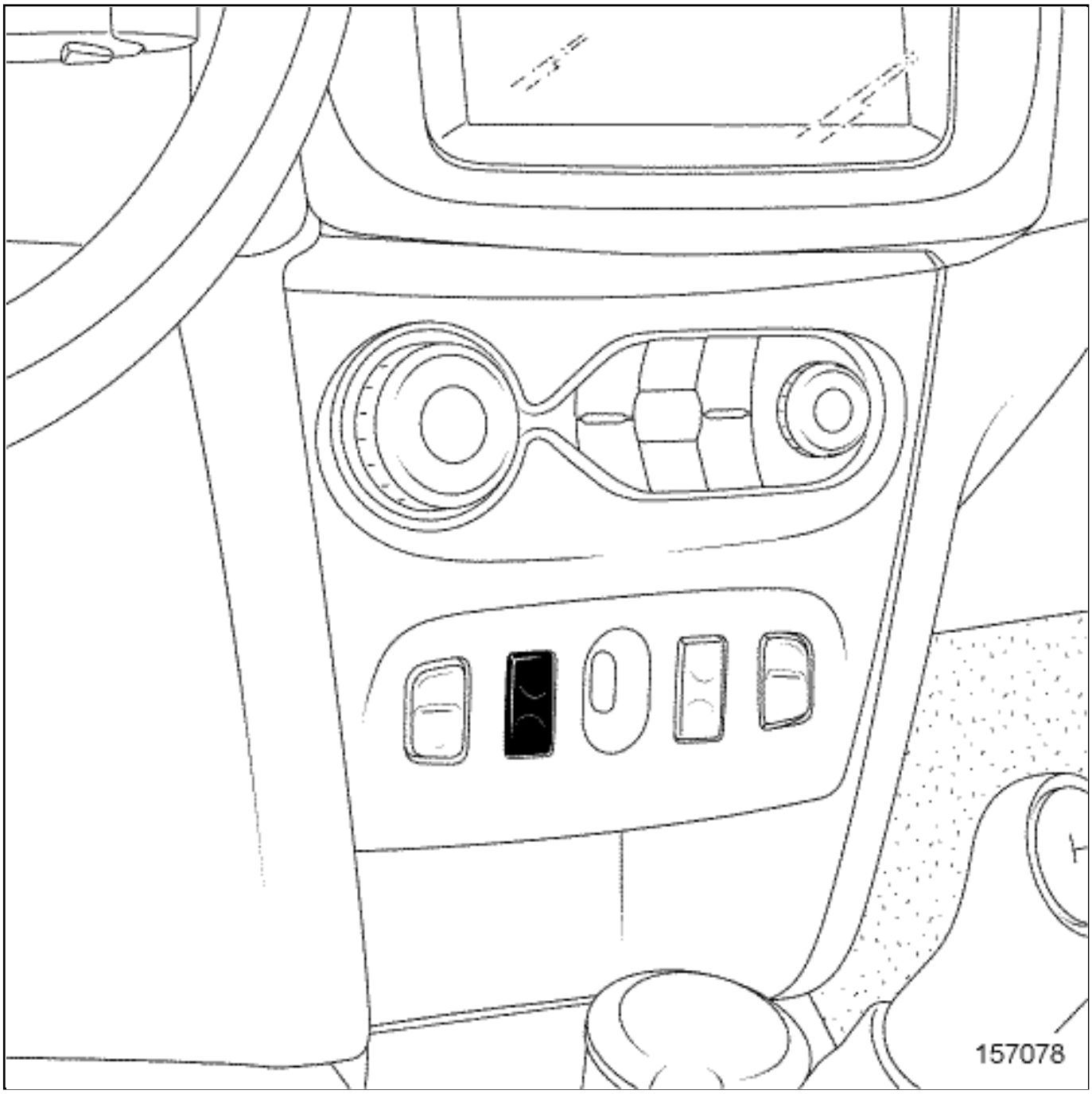
1. LIST OF COMPONENTS

1- THE "CRUISE CONTROL" FUNCTION IS COMPOSED OF:

- a control switch
- steering column switches**Steering assembly: Exploded view**
- a brake pedal switch**Pedal assembly: Exploded view**
- a clutch pedal switch**Pedal assembly: Exploded view**

2. LOCATION OF COMPONENTS

1- CONTROL SWITCH



Apply the before / after repair procedure using the Diagnostic tool(see **Diagnostic tool : Use**) :

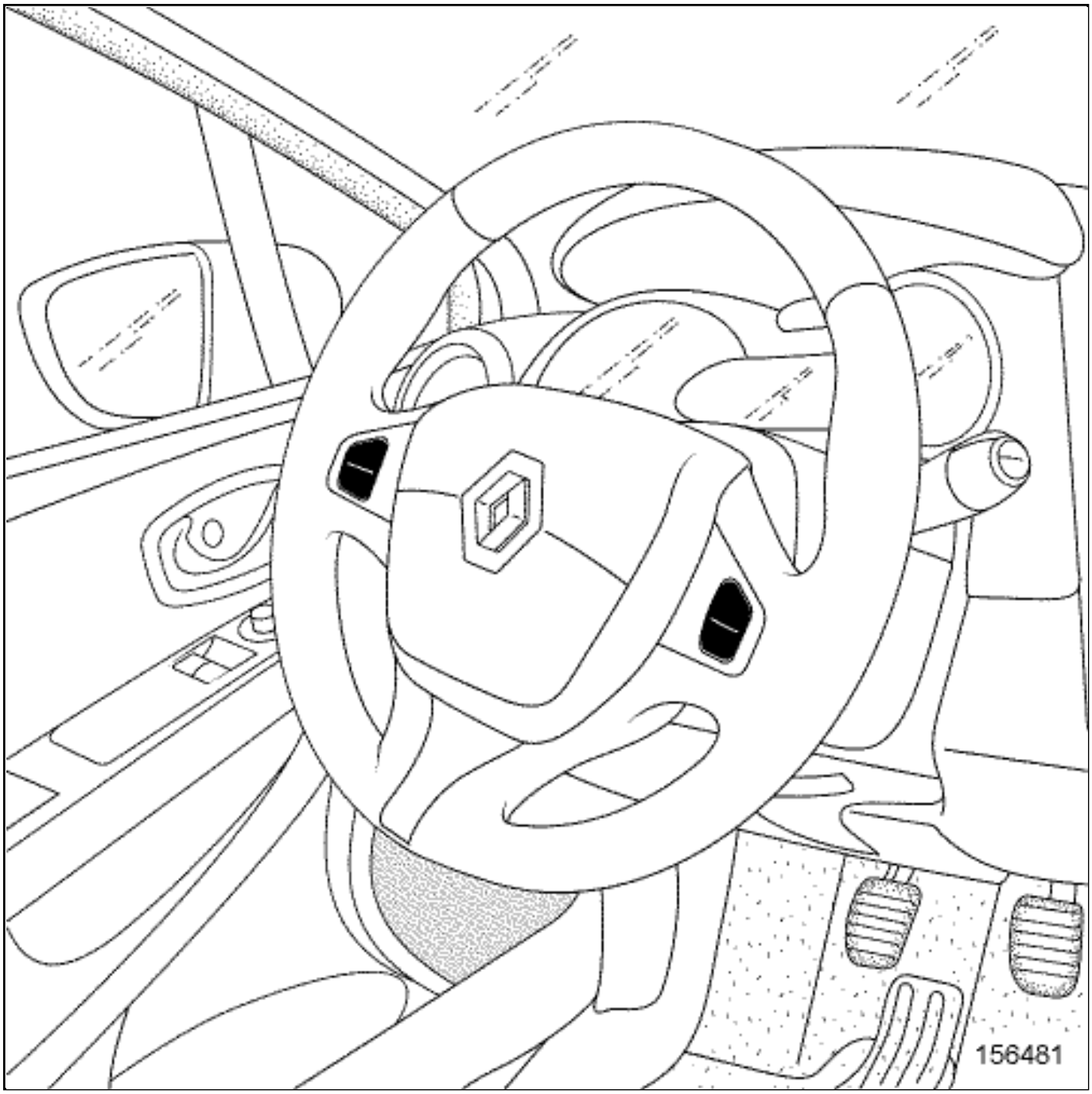
-Computer concerned by the Before / After repair procedure:

■"Injection computer" ,

-Component controlled by this computer concerned by the Before / After repair procedure:

■"Cruise control and speed limiter control" .

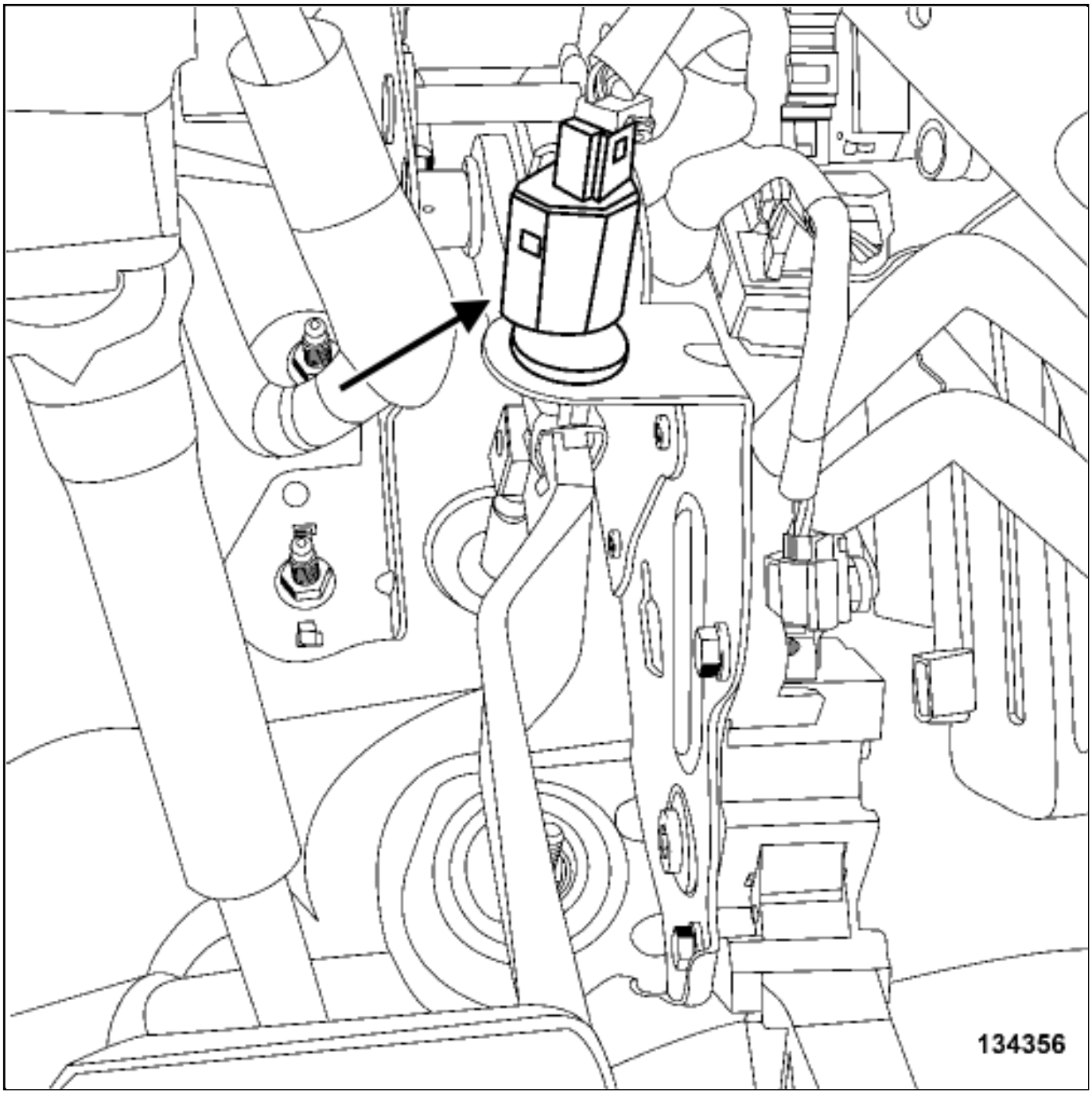
2- STEERING COLUMN SWITCHES



The steering column switches cannot be separated from the steering wheel.

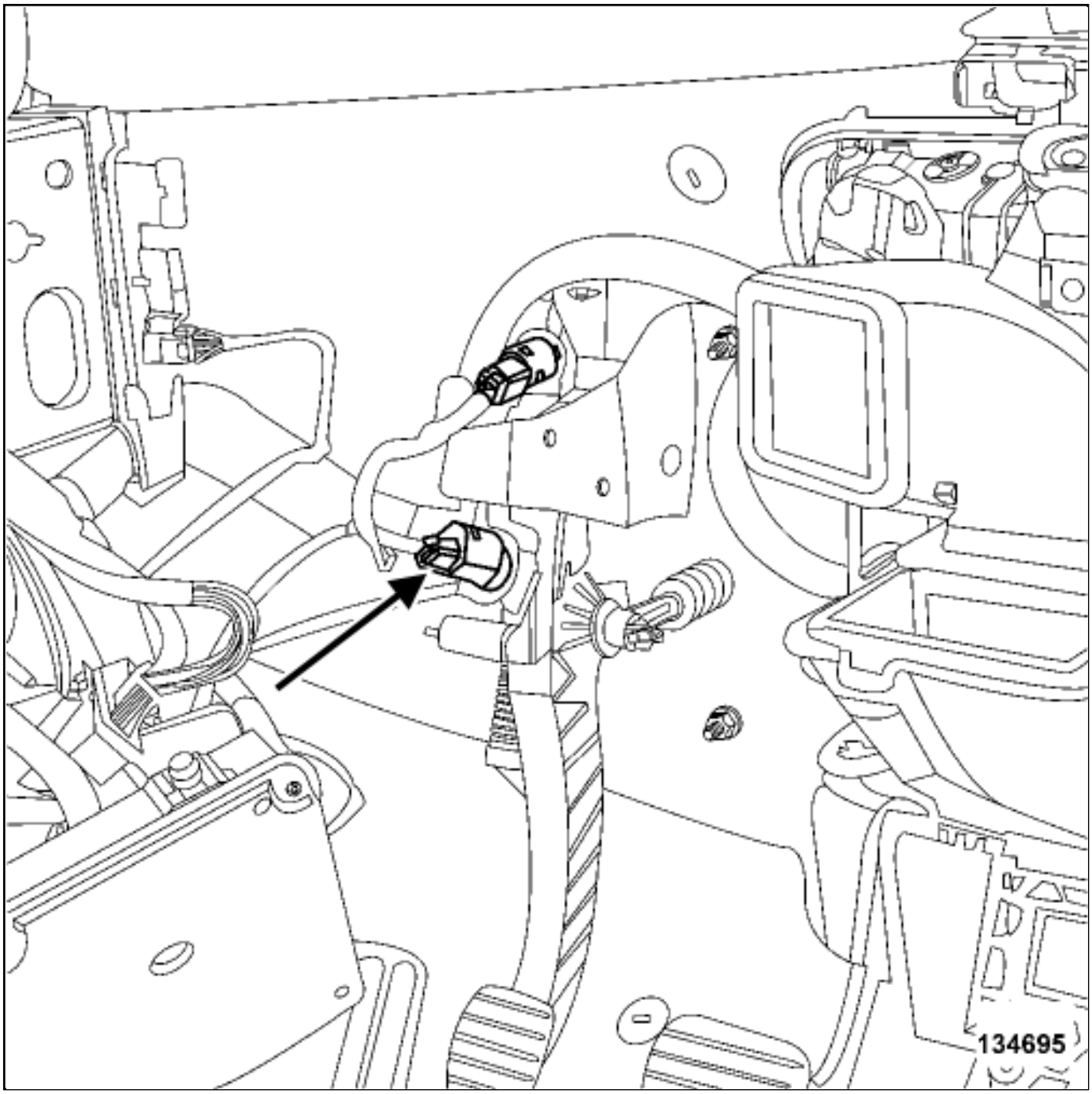
In the event of any faults, replace the steering wheel Steering assembly: Exploded view .

3- BRAKE PEDAL SWITCH



Pedal assembly: Exploded view

1- CLUTCH PEDAL START OF TRAVEL SWITCH



Pedal assembly: Exploded view

Apply the after repair procedure using the Diagnostic tool(see **Diagnostic tool : Use**) :

-Computer concerned by the After repair procedure:

"Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

"Clutch pedal start of travel switch" .

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DASHBOARD ASSEMBLY: EXPLODED VIEW

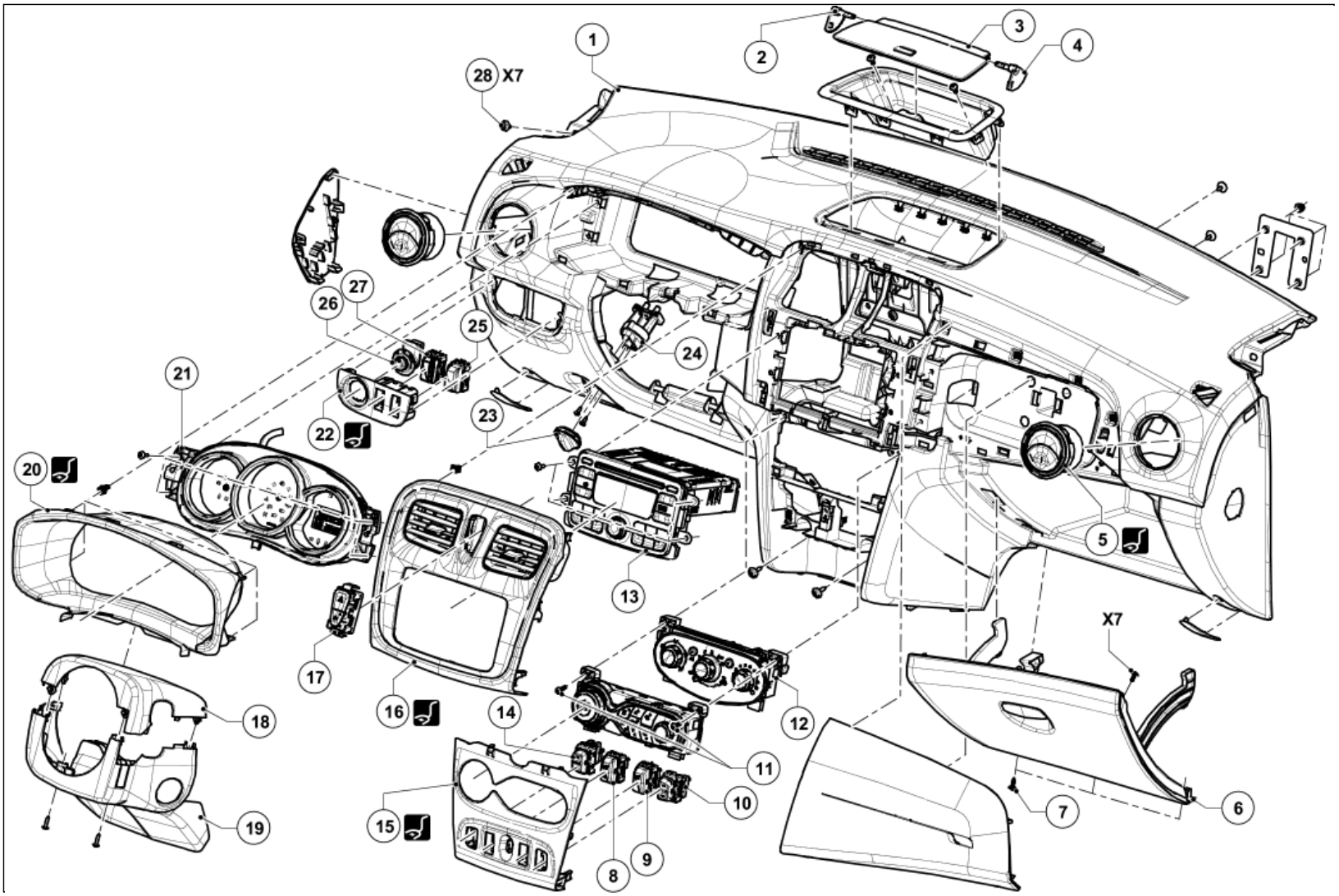


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Dashboard	(see 57A, Interior equipment, Dashboard: Removal - Refitting)
2	Left-hand glovebox cover hinge pins	
3	Glovebox cover	
4	Right-hand glovebox cover hinge pins	
5	Dashboard air vent	(Car. 1363)
6	Glovebox cover	
7	Right-hand glovebox cover barrel screw	
8	Speed limiter switch	
9	Rear electric window switch	
10	Right-hand electric window switch	
11	Air conditioning control panel bolt	
12	Air conditioning control panel	Passenger compartment heating and ventilation assembly: Exploded view
13	Car radio	
14	Left-hand electric window switch	
15	Air conditioning control panel trim	(Car. 1363)
16	Trim radio tray	(Car. 1363)
17	Hazard warning light switch	
18	Steering wheel cover	
19	Under steering wheel shell	
20	Instrument panel front trim	(Car. 1363)
21	Instrument panel	
22	Commands mirror trim	(Car. 1363)
23	Button	
24	Commande de reglage phar en site	
25	Switch helps parking	
26	Door mirror control	
27	Switch ESP	
28	Dashboard screws	

DASHBOARD: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Airbag and pretensioners: Precautions for the repair ,
- Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 57A, Interior equipment, Dashboard assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

WARNING

Never handle the pyrotechnic systems (pretensioners or airbags) near to a heat source or flame - they may be triggered.

Lock the airbag computerAirbag and pretensioners: Precautions for the repair .

Disconnect the batteryBattery: Removal - Refitting .

Remove:

- the windscreen pillar trimsInterior body side trim assembly: Exploded view ,
- the driver's front airbagDriver's frontal airbag: Removal - Refitting ,
- the steering wheelSteering assembly: Exploded view ,
- the steering column switch assemblySteering column switch assembly: Removal - Refitting ,
- the transponder ring(see **Transponder ring: Removal - Refitting**) ,
- the intrument panel(see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the centre console(see 57A, Interior equipment, Centre console assembly: Exploded view) ,
- the dashboard centre front panel(see 57A, Interior equipment, Dashboard assembly: Exploded view) .

Disconnect :

- the hazard warning lights control connector,
- the door lock control swich connector.

- Remove (see 57A, Interior equipment, Dashboard assembly: Exploded view) :
  - the radio,
  - the central upper trim,
  - the central trim.

VEHICLE WITHOUT RADIO(Vehicle without radio)

- Remove the radio tray(see 57A, Interior equipment, Dashboard assembly: Exploded view) .

- Remove the control panel bolts(see 57A, Interior equipment, Dashboard assembly: Exploded view) .
- Unclip the control panel.
- Remove the fuse access flap(see 57A, Interior equipment, Dashboard assembly: Exploded view) .
- Unclip the adjustment knob(see 57A, Interior equipment, Dashboard assembly: Exploded view) .
- Remove :
  - the diagnostic socket,
  - the switch plate on the dashboard(see 57A, Interior equipment, Dashboard assembly: Exploded view) .
- Disconnect the switch plate connectors on the dashboard .

2. REMOVAL OPERATION

- Remove (see 57A, Interior equipment, Dashboard assembly: Exploded view) :
  - the dashboard bolts,
  - the dashboard (this operation requires two people).

Note:

Mark the position of the various wiring before removing the dashboard.

REFITTING

1. REFITTING OPERATION

CAUTION

To prevent damage to the wiring harness when refitting, observe the original routing.

CAUTION

To guarantee a good electrical connection, make sure that the wiring does not place any stress on the connectors or the surrounding components.

- Proceed in the reverse order to removal.

2. FINAL OPERATION

- Connect the battery Battery: Removal - Refitting .
- Unlock the airbag computer Airbag and pretensioners: Precautions for the repair .
- Carry out a function test on all functions.

DECORATIVE STRIP : PRECAUTIONS FOR THE REPAIR

1. ENVIRONMENTAL RECOMMENDATIONS

1- THE LAYING OF VARIOUS DECORATIVE STRIPS WILL BE PERFORMED ACCORDING TO THE FOLLOWING CONDITIONS:

Note:

In the event of a painting, the laying of decorative strips will be performed 48 hafter painting.

- in a temperature range between 15˚Cand 30˚C,
- storage of the vehicle as well as decorative strips at workstation 6to 12 hbefore use is necessary to avoid shocks,
- avoid temperature difference at 10˚Cbetween the decorative strip and the support,
- the laying must be performed in a dust-free local, without airflow (preparation area or painting booth),
- alignment process will be provided by the installation instructions and fitting order in case of decorative strips in several elements,
- use the kit of squeegees for laying decorative strips**Vehicle: Parts and consumables for the repair** ,
- according to the size of the decorative strips (ie decorative strips for roof panel), two people are required to perform the laying.

Note:

Do not wash the vehicle before 48 hafter the operation.

XSL version : 3.02 du 22/07/11

DECORATIVESTRIP :REPLACEMENT

Note, one or more warnings are present in this procedure

Equipment required
heat stripper

1. REMOVAL

1- REMOVAL PREPARATION OPERATION

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 55A, Exterior protection, Decorative strip : Precautions for the repair) ,
- Vehicle: Precautions for the repair .

2- REMOVAL OPERATION

Use a heat stripperto take off the decorative strips.

Note:

It is essential to move the heat stripper back and forth continously and not too close to the element, to avoid damaging the support.

Clean any traces of residual adhesive using a lint-free clothsoaked in heptaneVehicle: Parts and consumables for the repair .

Note:

It is recommended to sand and polish any paint grain on the bonding area of the decorative strip.

Wipe the bonding area using a lint-free clothsoaked in heptane[Vehicle: Parts and consumables for the repair] .

2. REFITTING

1- REFITTING PREPARATION OPERATION

Wipe the bonding area using a clean, dry lint-free clothin one direction only.

Note:

Check for any dirt on the clean, dry lint-free cloth. If any traces of dirt are found, repeat the cleaning operation.

Note:

In the event of a painting, the laying of decorative strips will be performed 48 hafter painting.

2- REFITTING

Alignment process and fitting order of the decorative strip are specific for each model. Installation instructions, depending on the model, is supplied with the decorative strip.

Two operators are required for laying of decorative strips of large surface area.

Laying a decorative strip is usually done from the middle of the support and then by swiping outward with the squeegee.

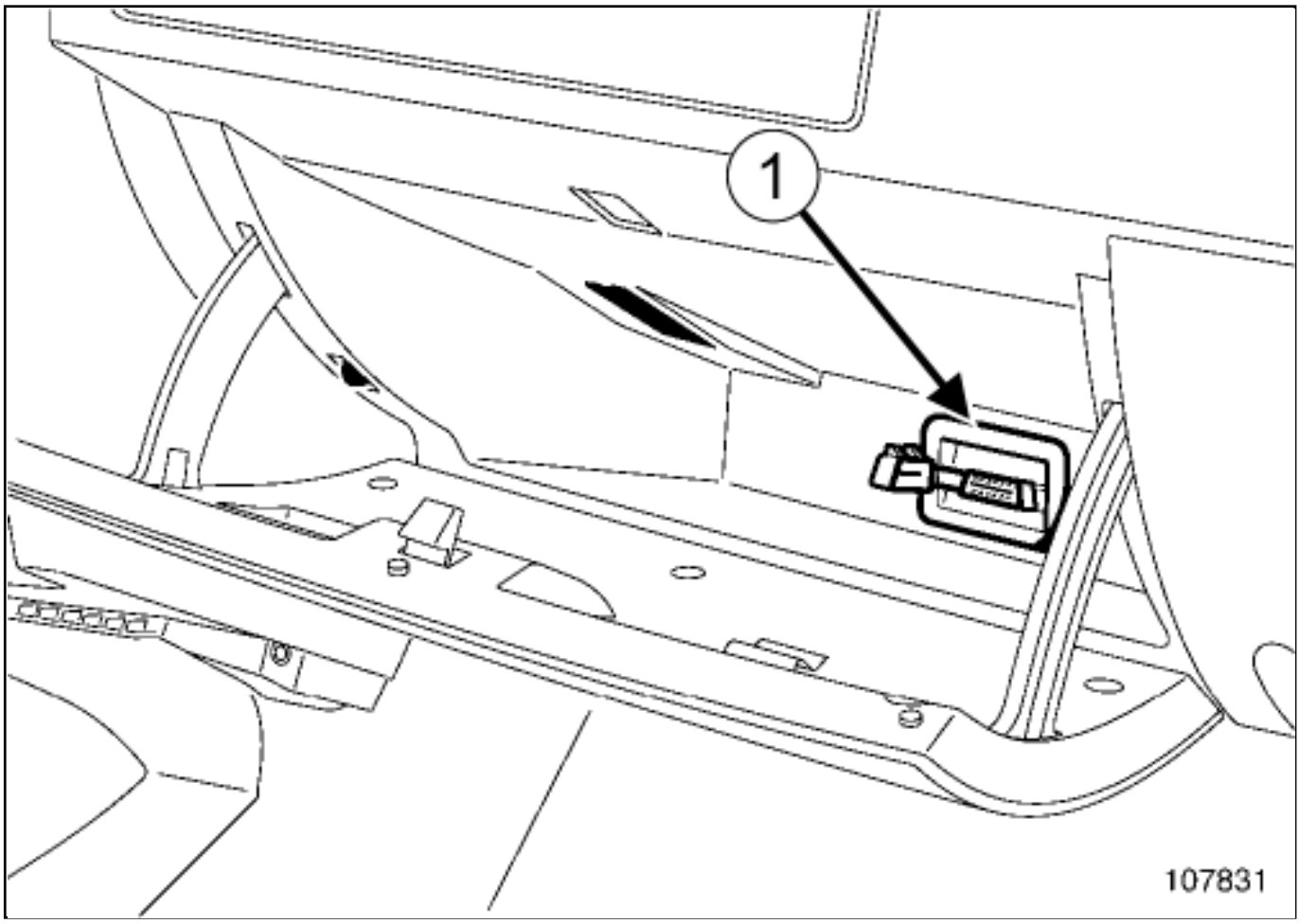
Once the alignment process has been carried out, remove the central strip to finalise the position.

After laying, a line may appear on the central strip area on the decorative strip. It will disappear a few minutes or hours in paint booth to 60˚C.

DIAGNOSTIC SOCKET: LIST AND LOCATION OF COMPONENTS

1. LIST AND LOCATION OF COMPONENTS

1- DIAGNOSTIC SOCKET



The diagnostic socket(1) is located in the glovebox.

DIAGNOSTIC TOOL : USE

Equipment required
Diagnostic tool

1. BEFORE / AFTER REPAIR PROCEDURE

- Switch on the ignition.
- Connect the Diagnostic tool.
- Select the concerned computer.
- Go to repair mode.
- Display the "Before / After repair procedure" for the computer selected.
- If necessary, select the concerned component in the "List of components stored in the computer" section.
- Carry out the operations described in the "Before repair procedure" section or in the "After repair procedure" section, according to the case.
- Switch off the ignition.

DIESEL INJECTION COMPUTER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

CAUTION

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

CAUTION

If the connections are corroded, repair the wiring (see Wiring: Precautions for repair)(Technical Note 6015A, 88A, Wiring).

REMOVAL

1. REMOVAL PREPARATION OPERATION

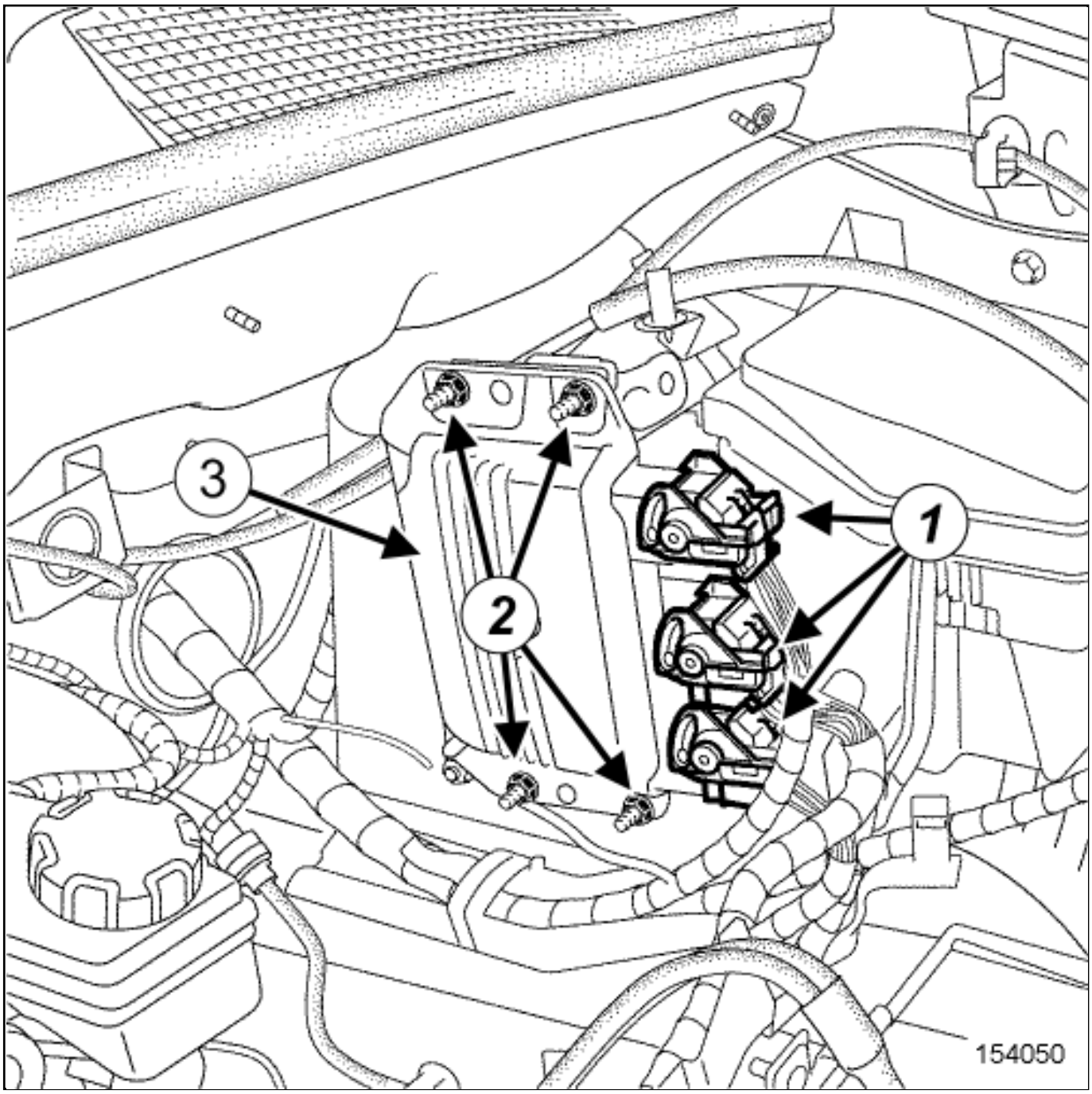
- Apply the procedure before repair using Diagnostic tool Diagnostic tool : Use :

-Computer concerned by the before repair procedure:

- "Injection computer"

- Disconnect the battery Battery: Removal - Refitting .
- Remove de air filter unit Air filter unit: Removal - Refitting .

2. REMOVAL OPERATION



Disconnect the injection computer connectors(1) .

Remove:

- the injection computer nuts(2) ,
- the injection computer(3) .

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Torque tighten the injection computer mounting nuts8 N.m.

2. FINAL OPERATION

- Apply the procedure after repair using Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the after repair procedure:

■"Injection computer"

DIESEL INJECTION: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. RISKS LINKED TO CONTAMINATION

The high-pressure direct injection system is highly sensitive to contamination. The risks caused by contamination are:

- damage to or destruction of the high pressure injection system,
- a component seizing,
- a component not being properly sealed.

All After-Sales operations must be performed under very clean conditions. Having carried out an operation in good conditions means that no impurities (particles a few microns in size) have penetrated the system during dismantling.

The cleanliness principle must be applied from the filter to the injectors.

What are the sources of contamination?

- metal or plastic swarf,
- paint,
- foreign bodies such as hair,
- ambient air,
- etc.

-fibres:

■cardboard,■brushes,■paper,■clothing,■cloth,

ATTENTION

Cleaning the engine using a high pressure washer is prohibited because of the risk of damaging connections. In addition, moisture may collect in the connectors and create electrical connection faults.

1- CLEANING CLOTHS

Use lint free cleaning cloths (part number 77 11 211 707).

It is prohibited to use cloths or ordinary paper towels: these produce lint and lose fibres, which then contaminate the fuel circuit.

Each cloth must only be used once.

2- BLANKING PLUGS

The blanking plugs are used to cap the fuel circuit once it is opened and to therefore prevent contaminants from entering.

A set of blanking plugs should be used once only and used plugs must be discarded after use: once used, the plugs are soiled and cleaning them is not sufficient to make them reusable.

Unused plugs must also be discarded and must not be used when carrying out work on an injection system.

- Blanking plug set part number:
  - F5R: 77 01 206 382
  - F8Q: 77 01 206 340
  - F9Q: 77 01 208 229
  - G9T and G9U: 77 01 208 229
  - K9K (DELPHIinjection): 77 01 206 804
  - K9K (SIEMENSinjection): 77 01 476 857
  - M9R: 77 01 209 062
  - P9X: 77 01 474 730
  - ZD3: 77 01 208 229

3- PROTECTIVE BAGS

Use hermetically-resealable plastic bags, using adhesive tape, for example, to store components which will be removed and reused. Stored parts will therefore be less subject to the risk of contamination.

These bags must be used once only: they must be discarded after use.

4- CLEANING PRODUCTS

- Two cleaning products can be used:
  - an injector cleaner (part number 77 11 224 188),
  - an aerosol spray brake cleaner (part number 77 11 226 128).

To use the injector cleaner, be sure to have a clean brush in good condition (the brush must not lose any bristles) as well as a clean container which has no impurities in it.

Note:

Use a new injector cleaner each time work is carried out (a used cleaning agent will contain impurities).

2. ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

1) Carry out the work in a clean working area and take care to protect removed components from dust using plastic bags which are hermetically-resealable, for example.

2) Always order the following from the Parts Department before carrying out work:

- a new set of blanking plugs, specific to the engine,
- enough lint-free cleaning cloths.
- one of the two cleaning productsfor fuel pipe unions,
- the parts that are always to be replacedafter each removal operation, mentioned in the operational procedures specific to the vehicle (see related Workshop Repair Manual).

3) Wear safety goggles fitted with side shields to prevent the cleaning product from splashing the eyes.

4) Wear latex safety gloves to avoid prolonged contact with the skin.

Note:

When using leather safety gloves, wear a pair of latex safety gloves over the top.

5) Before carrying out work on the injection system, use plastic bags or clean cloths, for example, to protect:

- the accessories and timing belts,
- the electrical accessories (starter, alternator, power-assisted steering pump, sensors and electrical connectors),
- the flywheel face.

3. INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Wash your hands before and while carrying out the work.

Change the latex safety gloves if they become soiled or damaged.

All components removed from the injection system must be stored in a hermetically sealed plastic bag once they have been capped.

Reseal the bag hermetically, for example using adhesive tape, even if the bag must be opened shortly afterwards: ambient air can be a source of impurities.

After opening the fuel circuit, the use of brushes, cleaning agents, air blow guns, rifle-type brushes or standard cloths is strictly prohibited: these items are likely to allow impurities to enter the system.

When replacing a component with a new one or when refitting it after storing it in a plastic bag, do not unpack it until it is time to fit it on the vehicle.

4. CLEANING

There are currently two procedures for cleaning the fuel circuit before opening it in order to carry out work in the workshop.

These procedures enable the fuel circuit to be cleaned to prevent contamination from entering: they both have the same end result and neither is preferred over the other.

1- CLEANING USING INJECTOR CLEANER

Clear the access to the unions that need opening, following the work procedures specific to the vehicle (see the relevant Workshop Repair Manual).

Protect sections which are sensitive to fuel leaks.

Pour the injector cleaning agent into a container which is free from impurities.

IMPORTANT

Wear latex safety gloves when using the cleaning agent.

Dip a clean brush, which is not shedding bristles, into the container of injector cleaning agent.

IMPORTANT

Wear safety goggles fitted with side shields during this operation.

Clean the unions carefully using the brush and the injector cleaning agent.

Blast the components that have been cleaned with compressed air (tools, workbench, and also parts, unions and around the injection system). Check that no bristles from the brush have come away and that the area is clean.

Wipe the sections that were cleaned with fresh cleaning cloths.

Open the circuit at the unions and immediately fit the relevant blanking plugs.

ATTENTION

To prevent impurities from entering, once the fuel circuit is opened, it must not be blasted with compressed air. Use cleaning cloths only, if necessary.

2- USING THE BRAKE CLEANER

Clear the access to the unions that need opening, following the work procedures specific to the vehicle (see the relevant Workshop Repair Manual).

Protect sections which are sensitive to fuel leaks.

IMPORTANT

Wear latex safety gloves when using the cleaning agent.

IMPORTANT

Wear safety goggles fitted with side shields during this operation.

Spray the brake cleaner onto the unions to be opened.

Clean the unions carefully using fresh cleaning cloths.

Blast the components that have been cleaned with compressed air (tools, workbench, and also parts, unions and around the injection system). Check that no bristles from the brush have come away and that the area is clean.

Open the circuit at the unions and immediately fit the relevant blanking plugs.

ATTENTION

To prevent impurities from entering, once the fuel circuit is opened, it must not be blasted with compressed air. Use cleaning cloths only, if necessary.

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DIESEL INJECTOR FUEL RETURN RAIL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Diesel injector fuel return rail

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 13B, Diesel injection, Diesel injection: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

The part removed is subject to customer safety controls, the safety instructions detailed in this procedure must be observed when removing and refitting.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

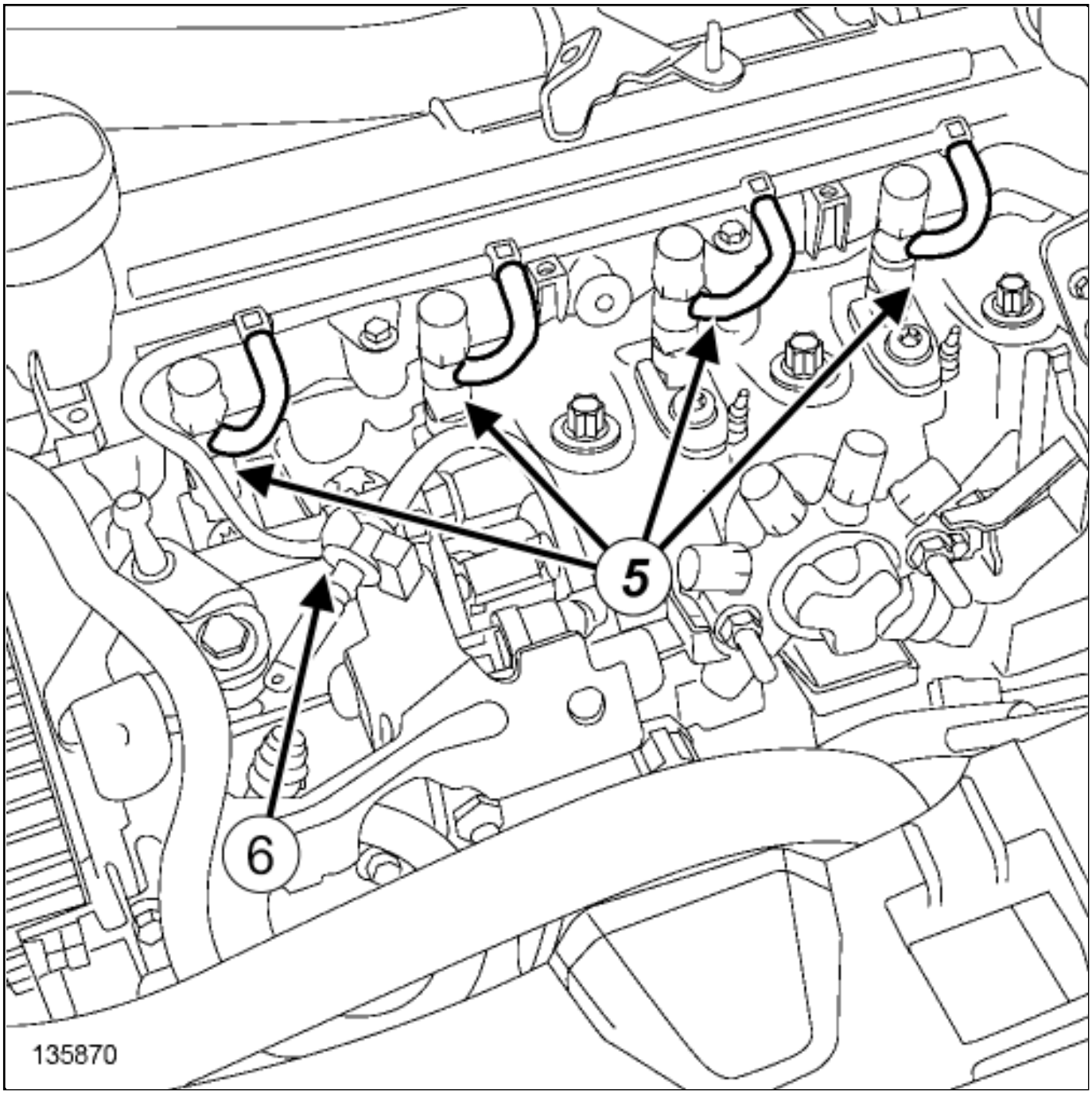
1. REMOVAL PREPARATION OPERATION

Disconnect the battery Battery: Removal - Refitting .

Remove:

- the intercooler air inlet pipe Intercooler air inlet pipe: Removal - Refitting ,
- the injector rail protector (see 13B, Diesel injection, Injector rail protector: Removal - Refitting) .

2. REMOVAL OPERATION



Disconnect:

- the diesel injector fuel return rail from the diesel injectors(5) ,
- the diesel injector fuel return rail union from the high pressure pump at(6) .

- Remove the diesel injector fuel return rail and discard it.

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: Diesel injector fuel return rail.

CAUTION

Always replace the diesel injector fuel return rail to avoid the risk of leaks due to rail damage during removal.

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

DIESEL INJECTOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
open-ended spanner
Diagnostic tool
compressed air nozzle

parts always to be replaced:
injector seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair** .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 13B, Diesel injection, Diesel injection: Precautions for the repair)** .

WARNING

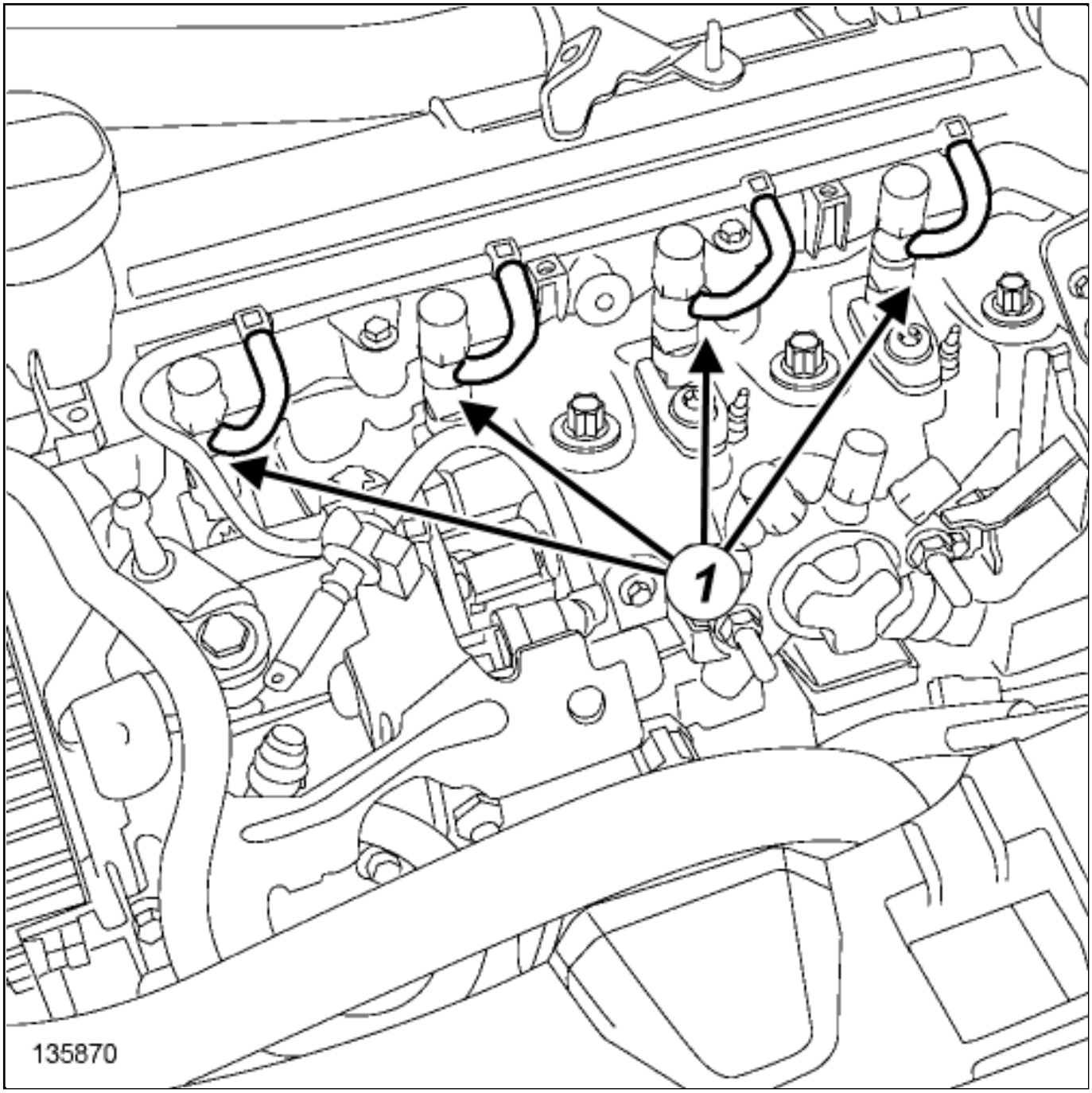
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .

- Remove the high pressure pipe(s) between the injector rail and the diesel injector(s) (see 13B, Diesel injection, High pressure pipe between rail and injector: Removal - Refitting) .



- Clean the unions of the diesel injector return rail at the diesel injectors (see 13B, Diesel injection, Diesel injection: Precautions for the repair) .

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

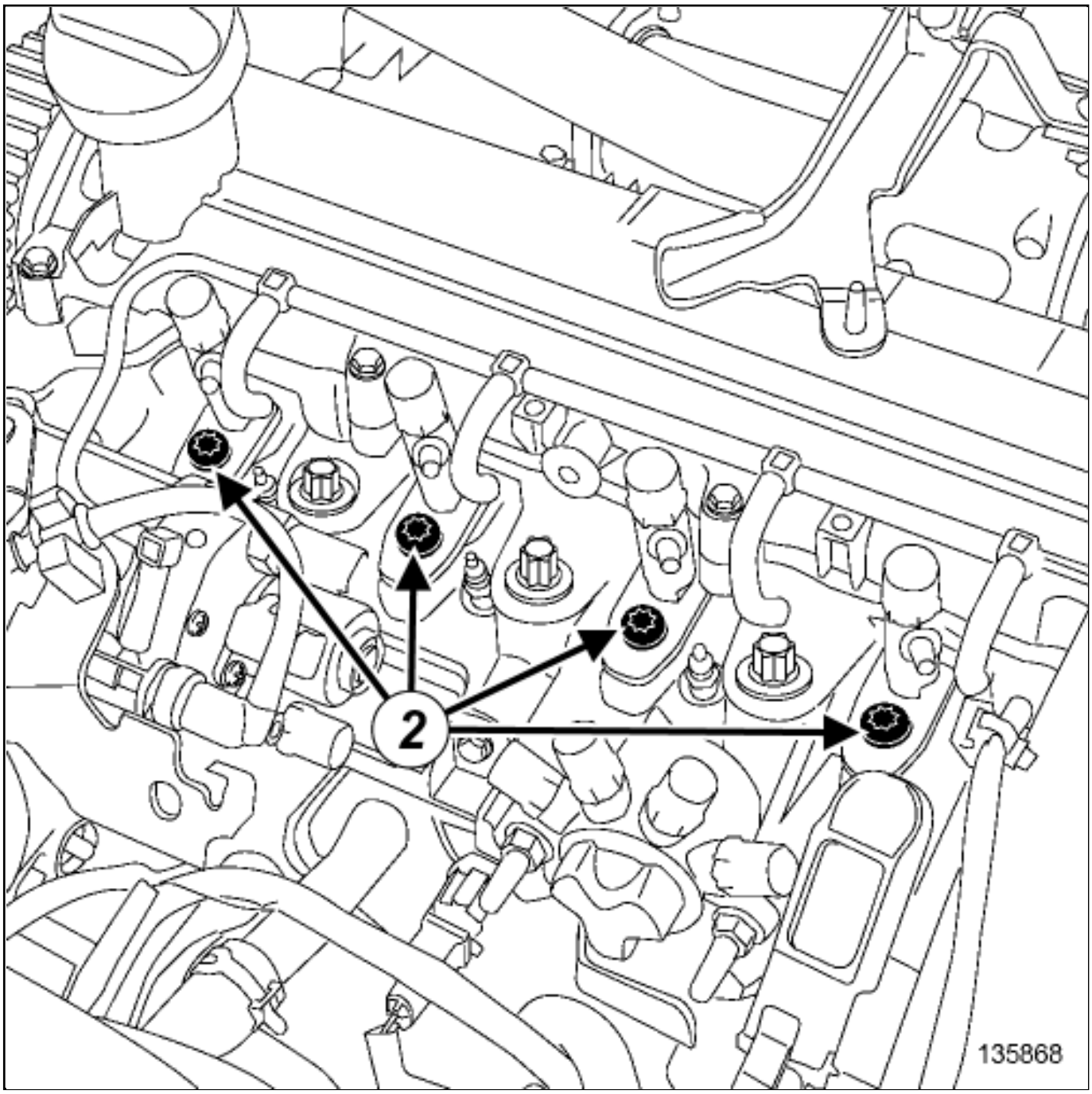
- Disconnect the diesel injector fuel return rail from the diesel injectors(1) .

- Fit an appropriate blanking plug on each diesel injector.

Note:

It is essential to fit an appropriate blanking plug to the Venturi to avoid depriming the fuel return circuit.

2. REMOVAL OPERATION



Note:

If reusing one or more diesel injectors, it is essential to mark the injector in relation to its cylinder before removing it. If reusing the diesel injector(s) keep them in a hermetically sealed bag throughout the removal operation.

Remove:

- the bolt(2) from the bracket on the diesel injector(s) concerned,
- the diesel injector bracket,
- the compression washer located at the bottom of the diesel injector well concerned.

Note:

If the diesel injector is stuck in the well and does not come out, turn the diesel injector at the flat surface of the diesel injector bracket using an open-ended spanner.

- Fit the appropriate blanking plug on the diesel injector nose.

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

-

parts always to be replaced: injector seal.

1- CLEANING THE DIESEL INJECTOR WELL

CAUTION

- It is strictly forbidden to clean the injectors with:
  - a wire brush,
  - an emery cloth,
  - an ultrasonic cleaner.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

Soak the diesel injector(s) in injector cleaning product Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Clean the diesel injector nozzle:

- either using cleaning cloths Vehicle: Parts and consumables for the repair soaked in injector cleaning product Vehicle: Parts and consumables for the repair ,
- or using a small brush with plastic bristles.

CAUTION

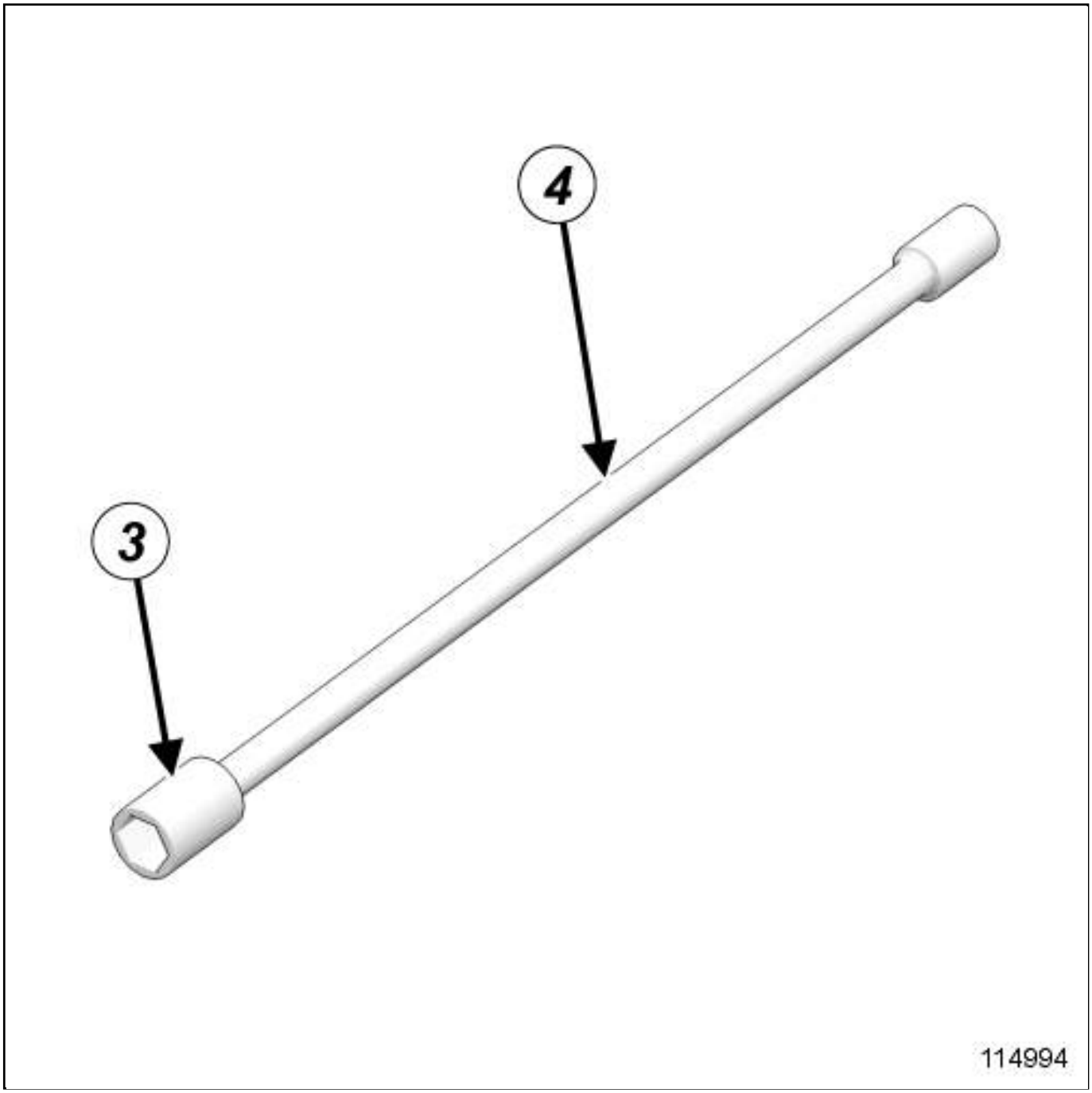
It is strictly forbidden to clean the injectors with:

- a wire brush,
- an emery cloth,
- an ultrasonic cleaner.

Wipe using cleaning rags Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

WARNING

Wear leaktight gloves (Nitrile type) for this operation.



- Fit an 11mmby 1/4"socket (3) (socket outer Ø = washer Ø) on an extension piece(4) .

- Wrap a cleaning cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products) around the "socket - extension piece" assembly.

- Soak a cleaning clothin injector cleaning product Vehicle: Parts and consumables for the repair .

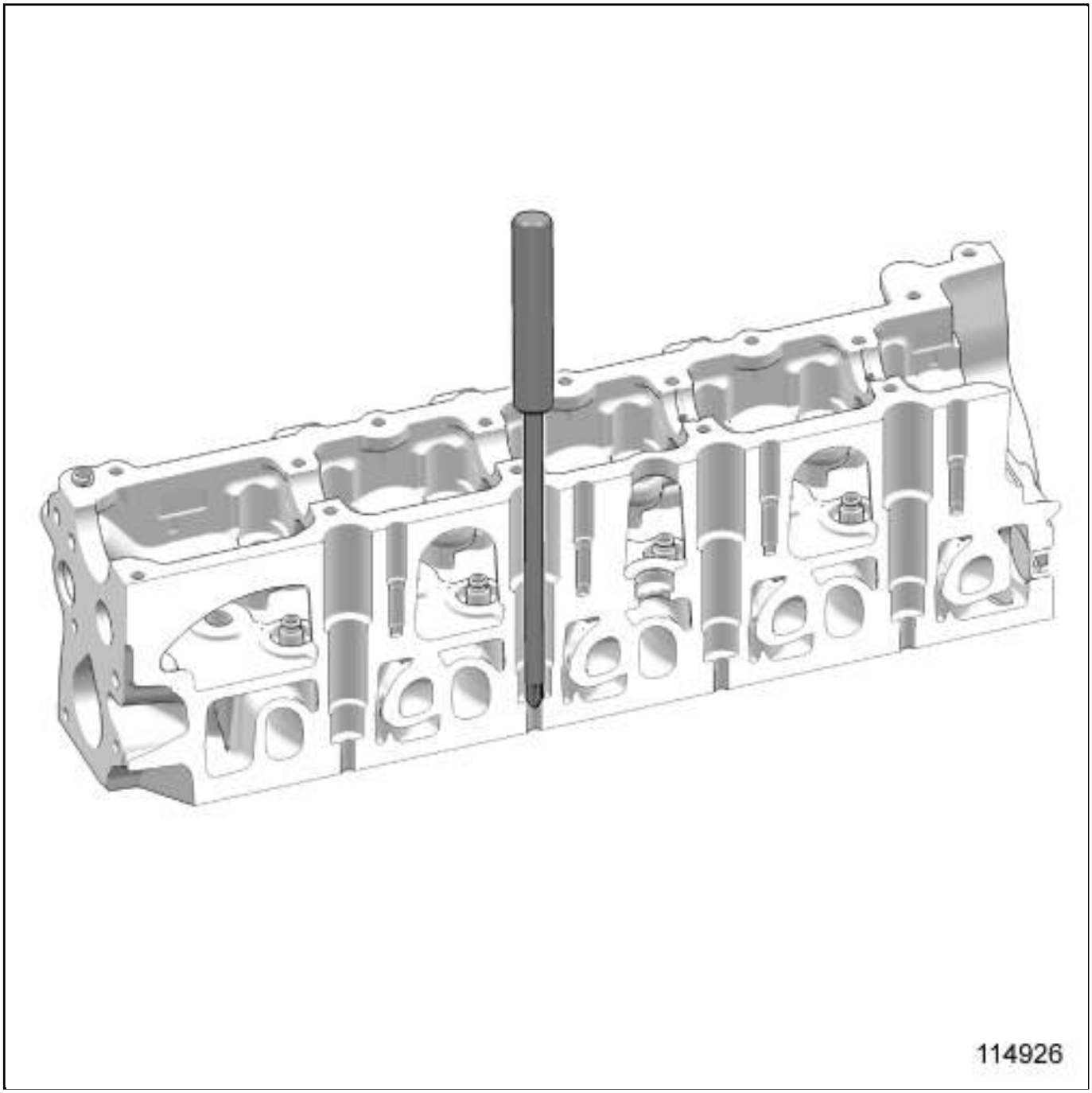
- Insert the wipe-covered extension piece and end piece down into the bottom of the well.

- Clean the diesel injector well (pay particular attention to the mating face of the washer).

Note:

Swivel the cloth covered socket and extension piece around inside the well.

- Remove the cleaning clothfrom the well.



- Insert a large diameter Phillips screwdriver (Ø > 8 mm) into the well to block the opening to the combustion chamber.

❏ Blast out any scale residue in the well using a compressed air nozzle.

❏ Remove the screwdriver and repeat the cleaning operation for the injector well(s) concerned twice in succession.

2. REFITTING OPERATION

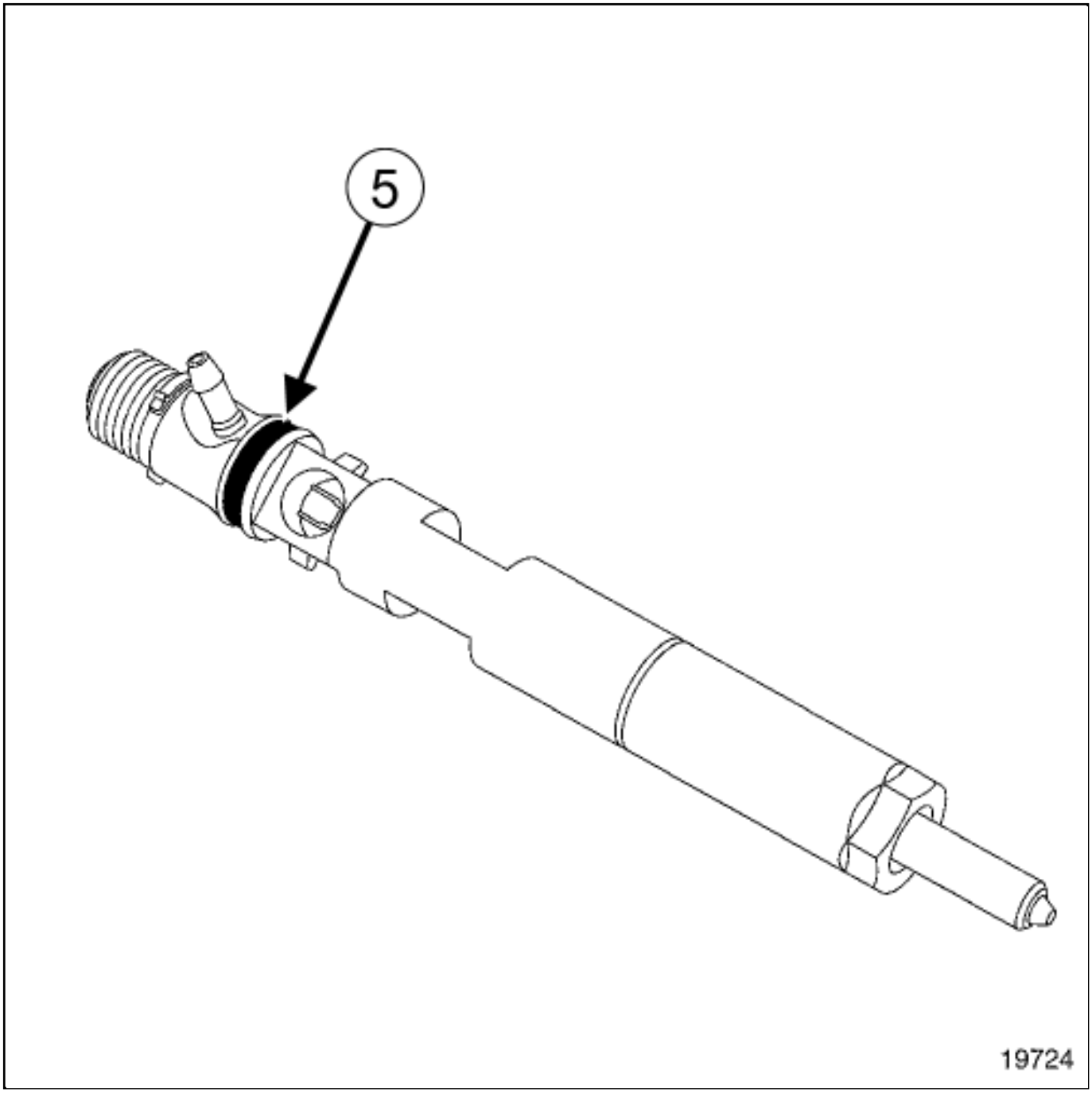
CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

❏ Refit:

- a new compression washer,
- the diesel injector(s),
- the diesel injector bracket,
- the bolt of the diesel injector bracket.



Note:

If reusing a diesel injector, refit the injector in the cylinder marked beforehand. If reusing a diesel injector, note the alphanumeric code(5) of the injector and the cylinder on which it is fitted.

- Torque tighten the bolts of the diesel injector bracket28 N.m.

3. FINAL OPERATION

- Remove the blanking plug of each diesel injector.

- Refit the high pressure pipe(s) between the injector rail and the diesel injector(s)(see 13B, Diesel injection , High pressure pipe between rail and injector: Removal - Refitting) .

- Connect the diesel injector fuel return rail to the diesel injector.

- Check that there are no fuel leaks.

- Connect the batteryBattery: Removal - Refitting .

- Apply the after repair procedure using the Diagnostic tool:
  - connect the Diagnostic tool,
  - select "Injection computer",
  - go to repair mode,
  - display the "Before/after repair procedure" for the computer selected,
  - select "Injectors" in the "List of components stored by this computer" section,
  - carry out the operations described in the "After repair procedure" section.

DIFFERENTIAL OUTPUT SEAL: REMOVAL - REFITTING

Special tooling required	
Mandrel for fitting the sunwheel seal.	Bvi. 945
Tool for fitting differential output seals on JR / JH gearboxes	Bvi. 1960

parts always to be replaced:
Differential output seal

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).

- Remove:
  - the engine undertray bolts,
  - the engine undertray.

- Drain the gearbox (see 21A, Manual gearbox , Manual gearbox oils: Draining - Filling) .

1- WHEN REPLACING THE DIFFERENTIAL OUTPUT SEAL ON THE LEFT-HAND SIDE

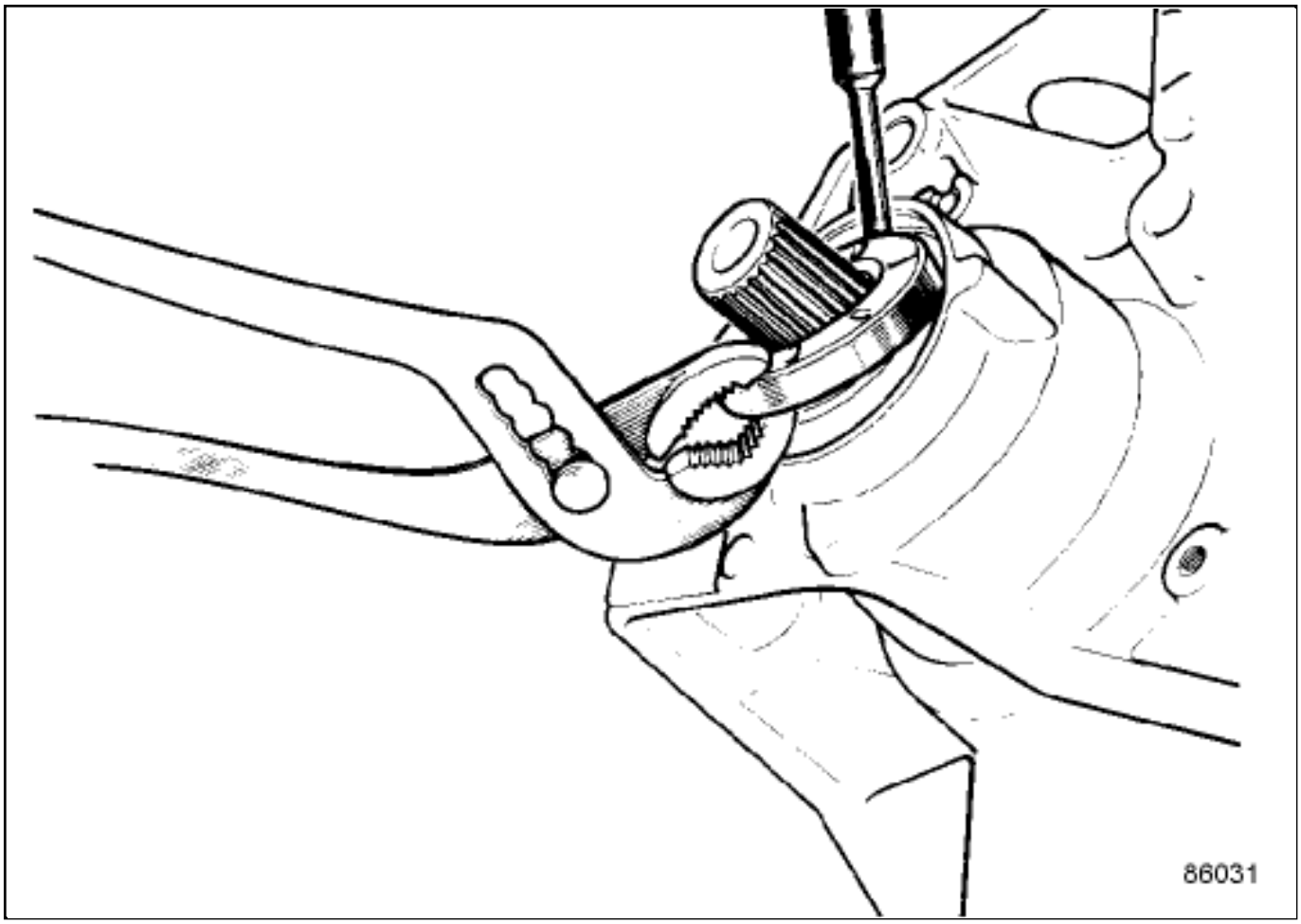
- Remove:
  - the front left-hand wheel Wheel: Removal - Refitting (35A, Wheels and tyres),
  - the front left-hand wheel driveshaft Front left-hand driveshaft: Removal - Refitting (29A, Driveshafts).

2- WHEN REPLACING THE DIFFERENTIAL OUTPUT SEAL ON THE RIGHT-HAND SIDE

- Remove:
  - the front right-hand wheel Wheel: Removal - Refitting (35A, Wheels and tyres),
  - the front right-hand wheel driveshaft Front right-hand driveshaft: Removal - Refitting (29A, Driveshafts).

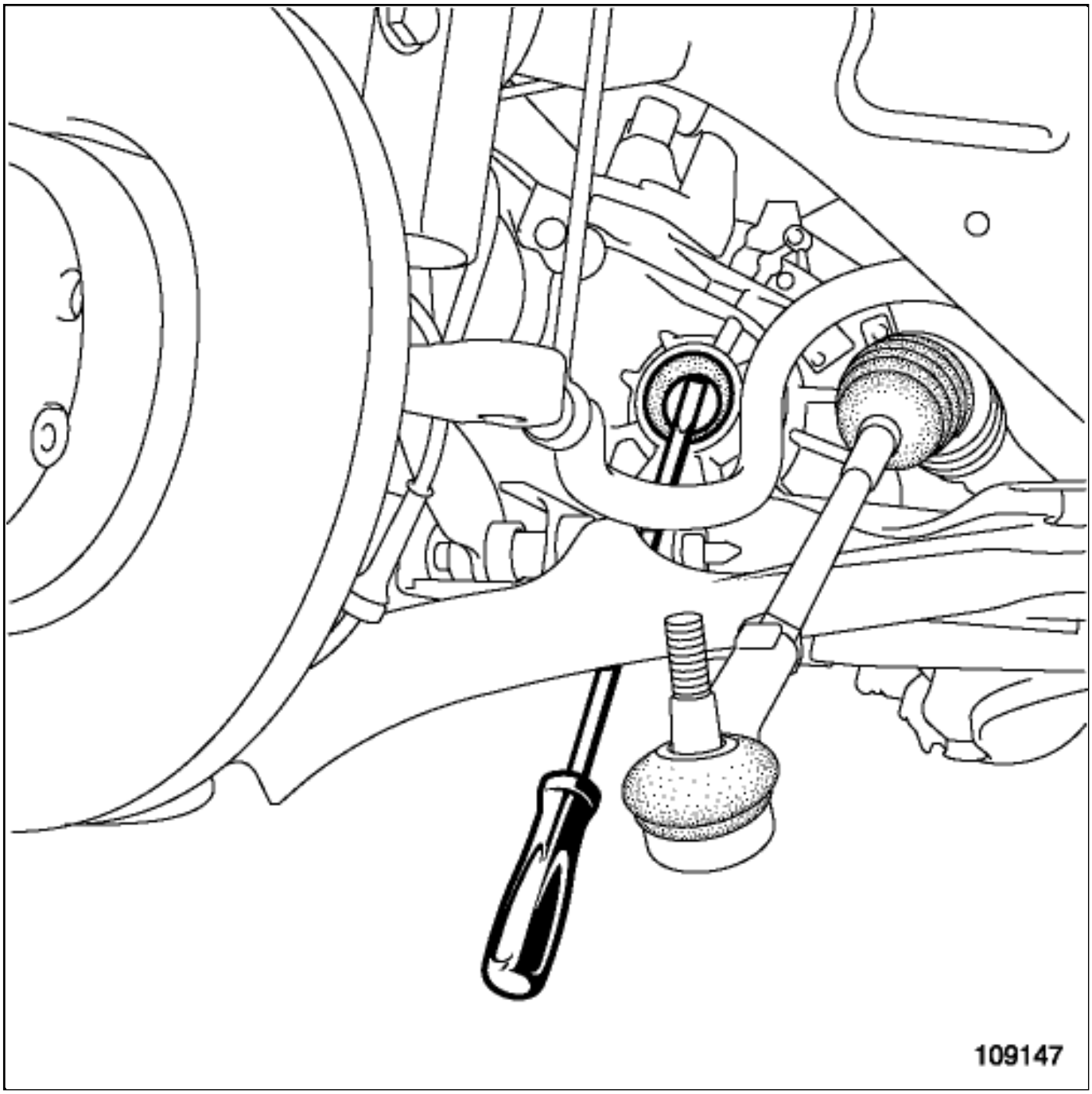
2. REMOVAL OPERATION

1- OPENED DIFFERENTIAL GEARBOX



- Tap the base of the lip seal using a drift and a small hammer to pivot it in its housing.
- Remove the seal using pliers, taking care not to damage the sunwheel splines.

2- CLOSED DIFFERENTIAL GEARBOX



- Tap the base of the lip seal using a drift punch and a small hammer to release it and cause it to turn in its housing.

- Withdraw the lip seal using a screwdriver, taking care not to damage the differential housing.

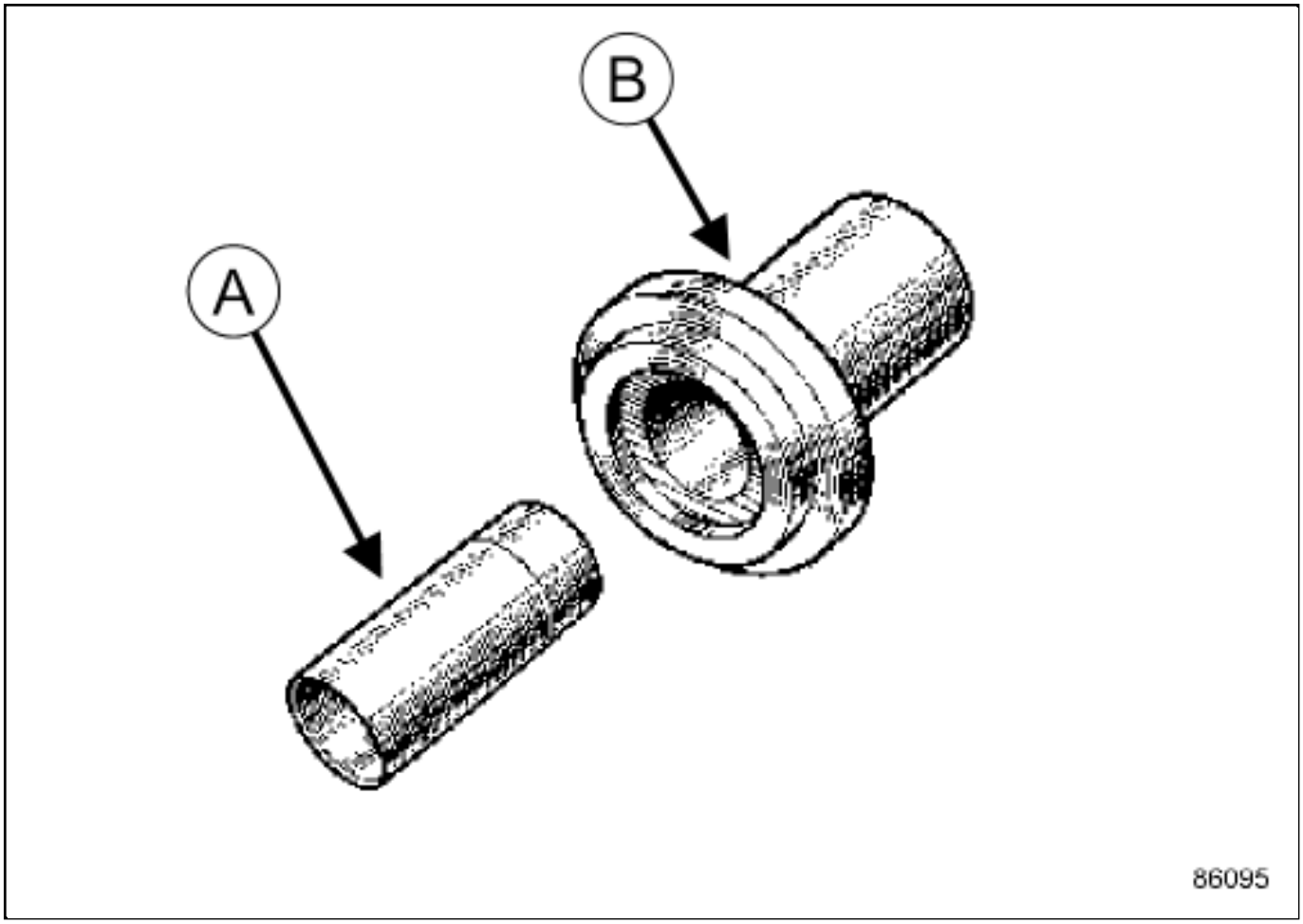
REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Differential output seal .

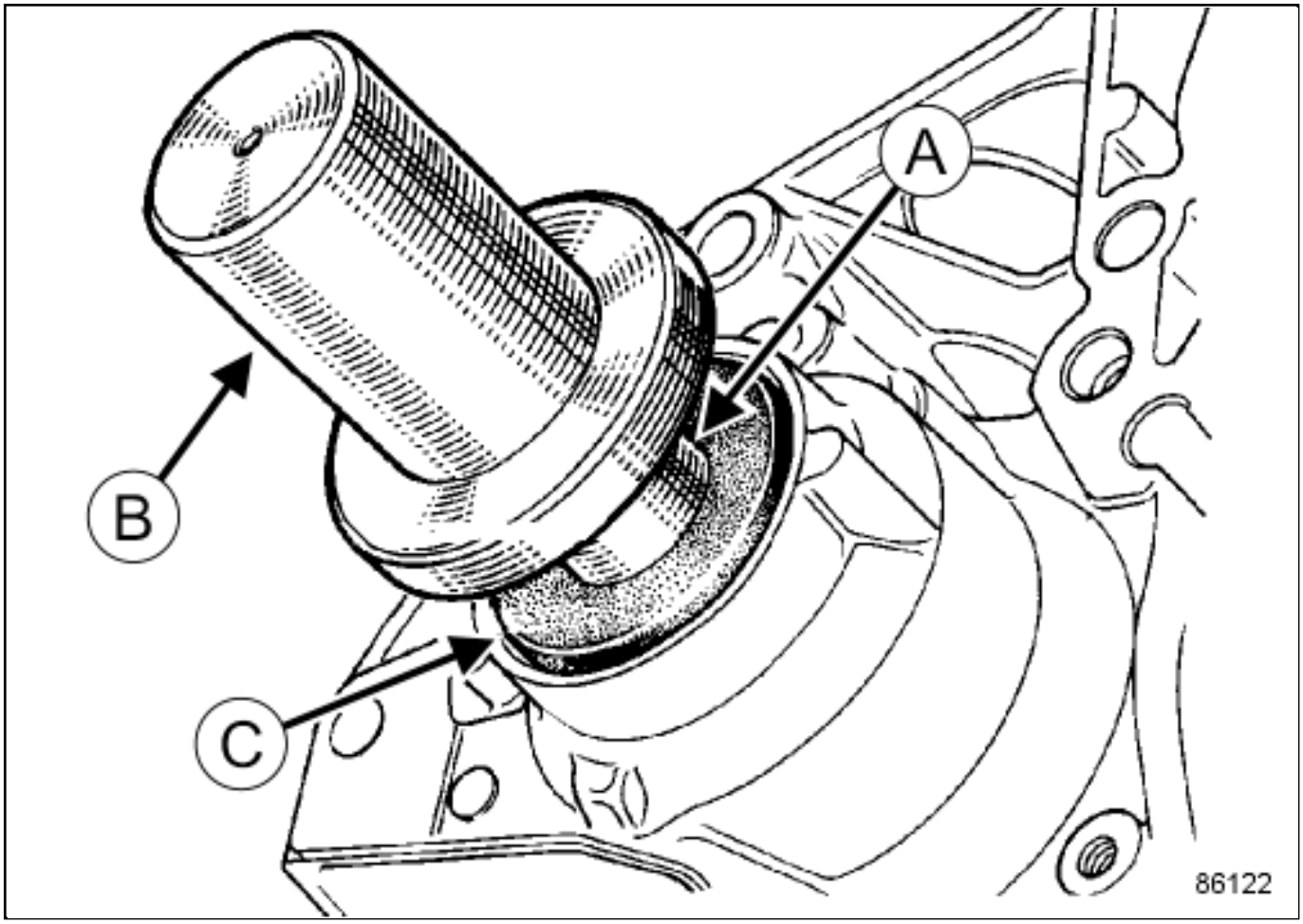
2. REFITTING OPERATION

1- OPENED DIFFERENTIAL GEARBOX



The differential output seal is refitted using theMandrel for fitting the sunwheel seal.(**Bvi. 945**) consisting of:

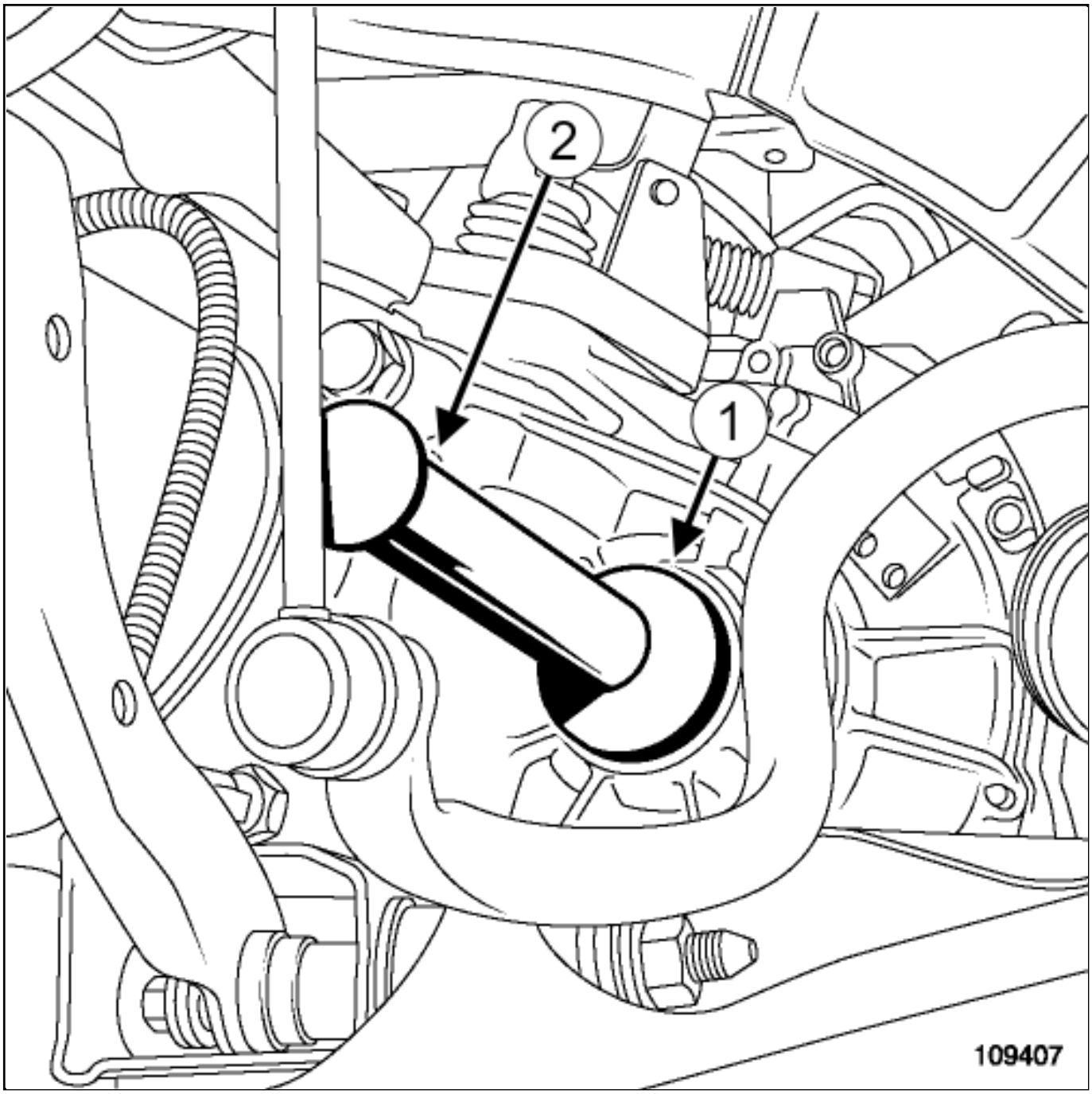
- a seal protector(**A**) ,
- a tool for fitting the seal(**B**) .



- Fit the lubricated protector(A) on the sunwheel.
- Position the lubricated differential output seal(C) with the tool(B) .

2- CLOSED DIFFERENTIAL GEARBOX

1)DIFFERENTIAL OUTPUT SEAL ON THE LEFT-HAND DRIVESHAFT

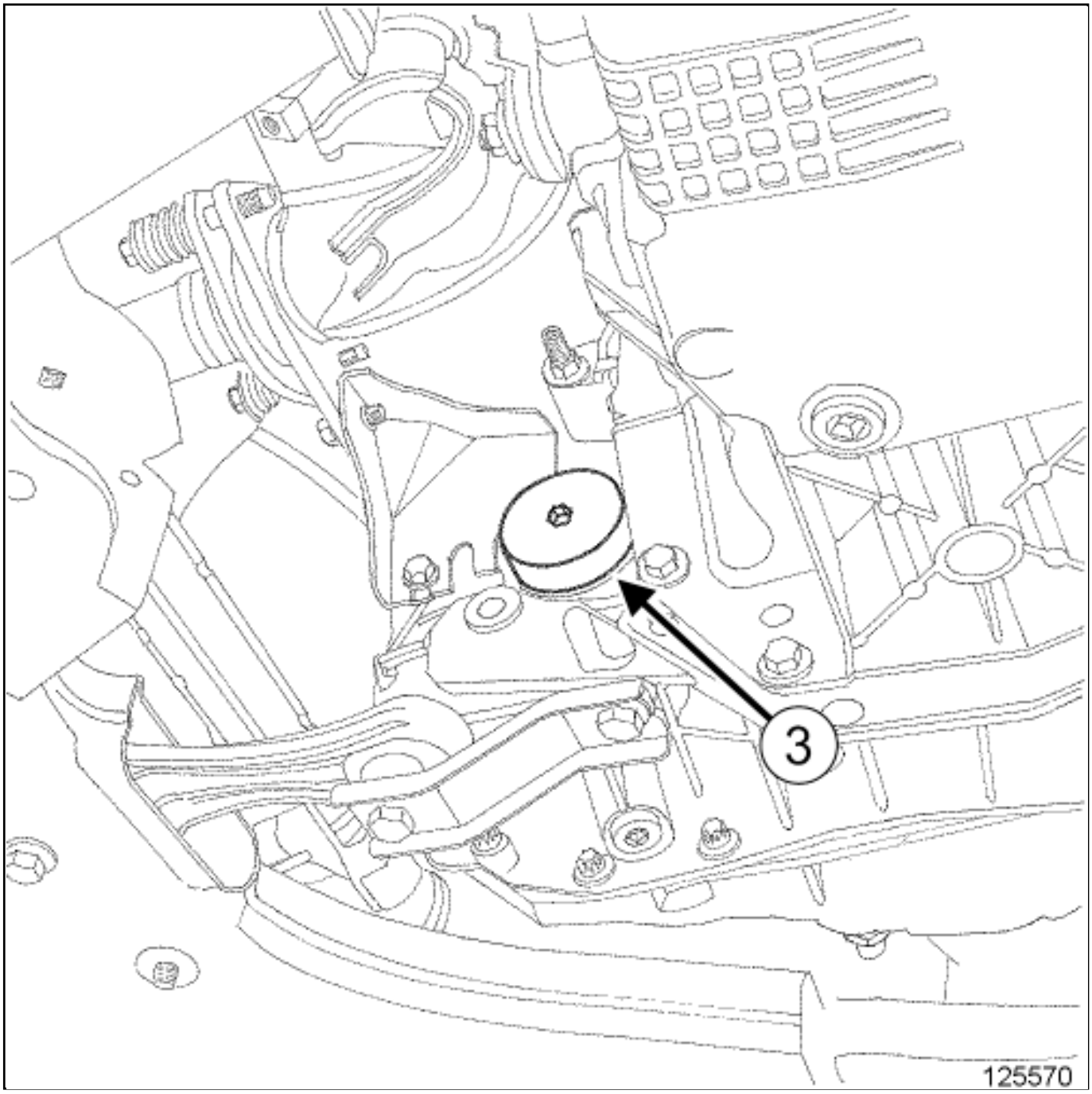


- Refit the new left-hand side differential output seal using the toolTool for fitting differential output seals on JR / JH gearboxes(Bvi. 1960) (1) with a component L.

- Tap the toolTool for fitting differential output seals on JR / JH gearboxes(Bvi. 1960) with a copper hammer (2) to fit the new differential output seal fully.

2)DIFFERENTIAL OUTPUT SEAL ON THE RIGHT-HAND DRIVESHAFT

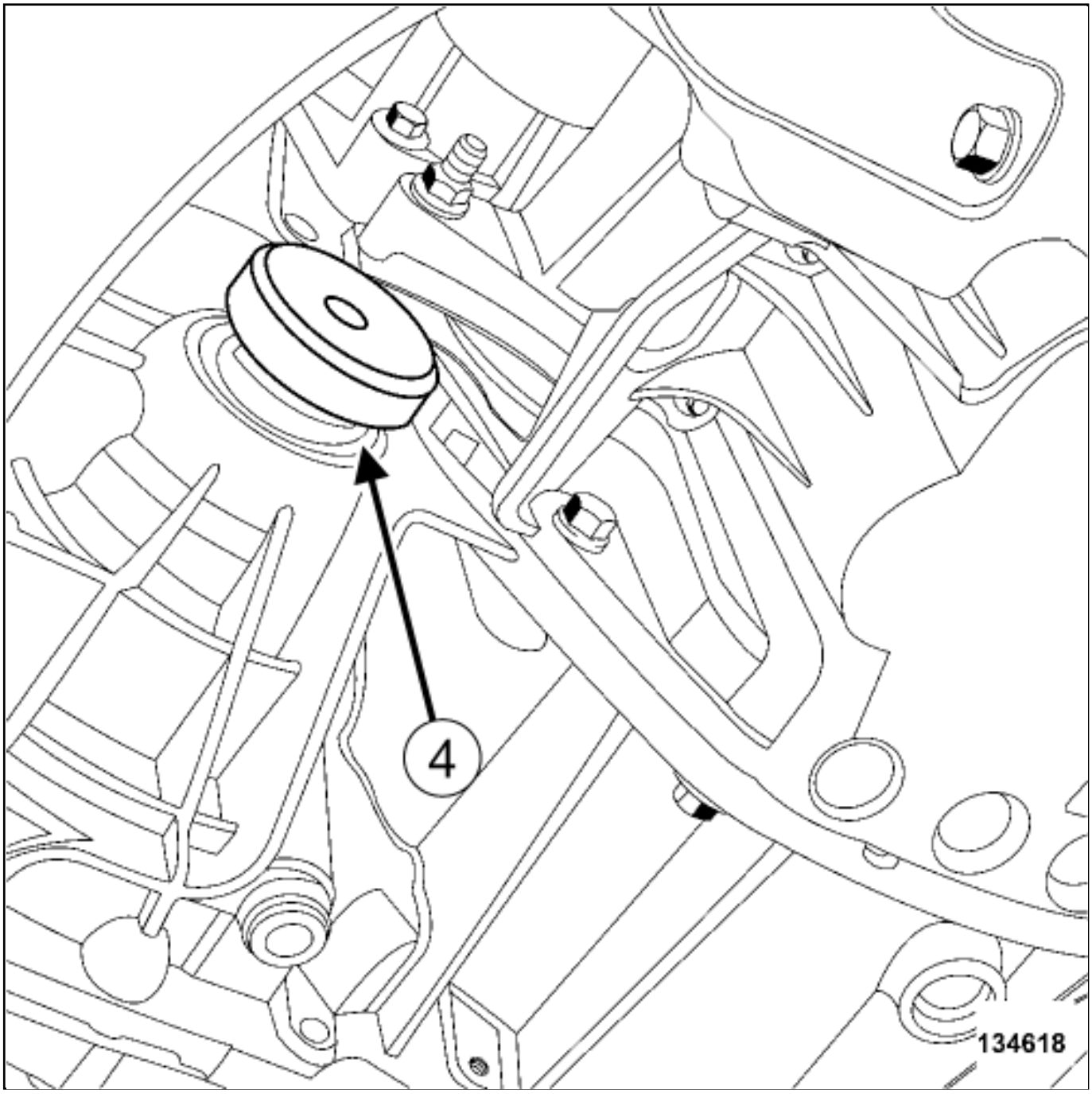
FOR DRIVESHAFT WITH RELAY BEARING



- Refit the new right-hand side differential output seal using the toolTool for fitting differential output seals on JR / JH gearboxes(Bvi. 1960) (3) with a component R.

- Tap the toolTool for fitting differential output seals on JR / JH gearboxes(Bvi. 1960) with a copper hammer to fit the new differential output seal fully.

FOR DRIVESHAFT WITHOUT RELAY BEARING



- Refit the new right-hand side differenatial output seal using the toolTool for fitting differential output seals on JR / JH gearboxes(Bvi. 1960) (4) with a component L.

- Tap the toolTool for fitting differential output seals on JR / JH gearboxes(Bvi. 1960) with a copper hammer to fit the new differential output seal fully.

3. FINAL OPERATION

-

Proceed in the reverse order to removal.

Top up the gearbox(see 21A, Manual gearbox , Manual gearbox oils: Draining - Filling) .

DISTRIBUTION UNIT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Pipe clamps.	Ms. 583

Equipment required
refrigerant charging station

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the batteryBattery: Removal - Refitting .

WARNING

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair .

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857to plug any openings exposed to the open air. They must be clean. Do not use any which have already been used to plug a fuel circuit.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

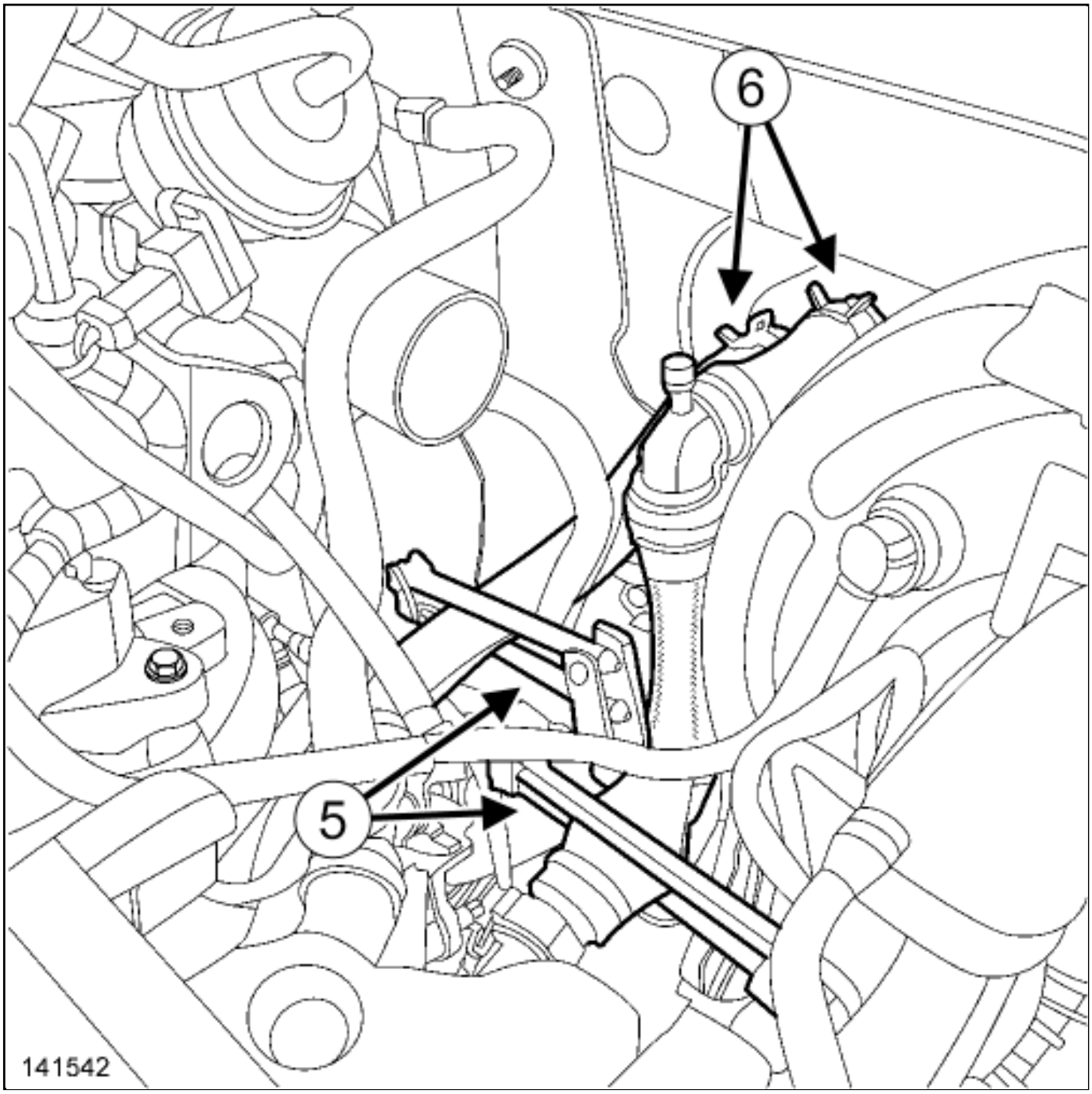
- Uncouple the connecting pipes from the expansion valve(see **Air conditioning and heating control assembly: Exploded view**) .

- Move aside the expansion valve connecting pipes.

CAUTION

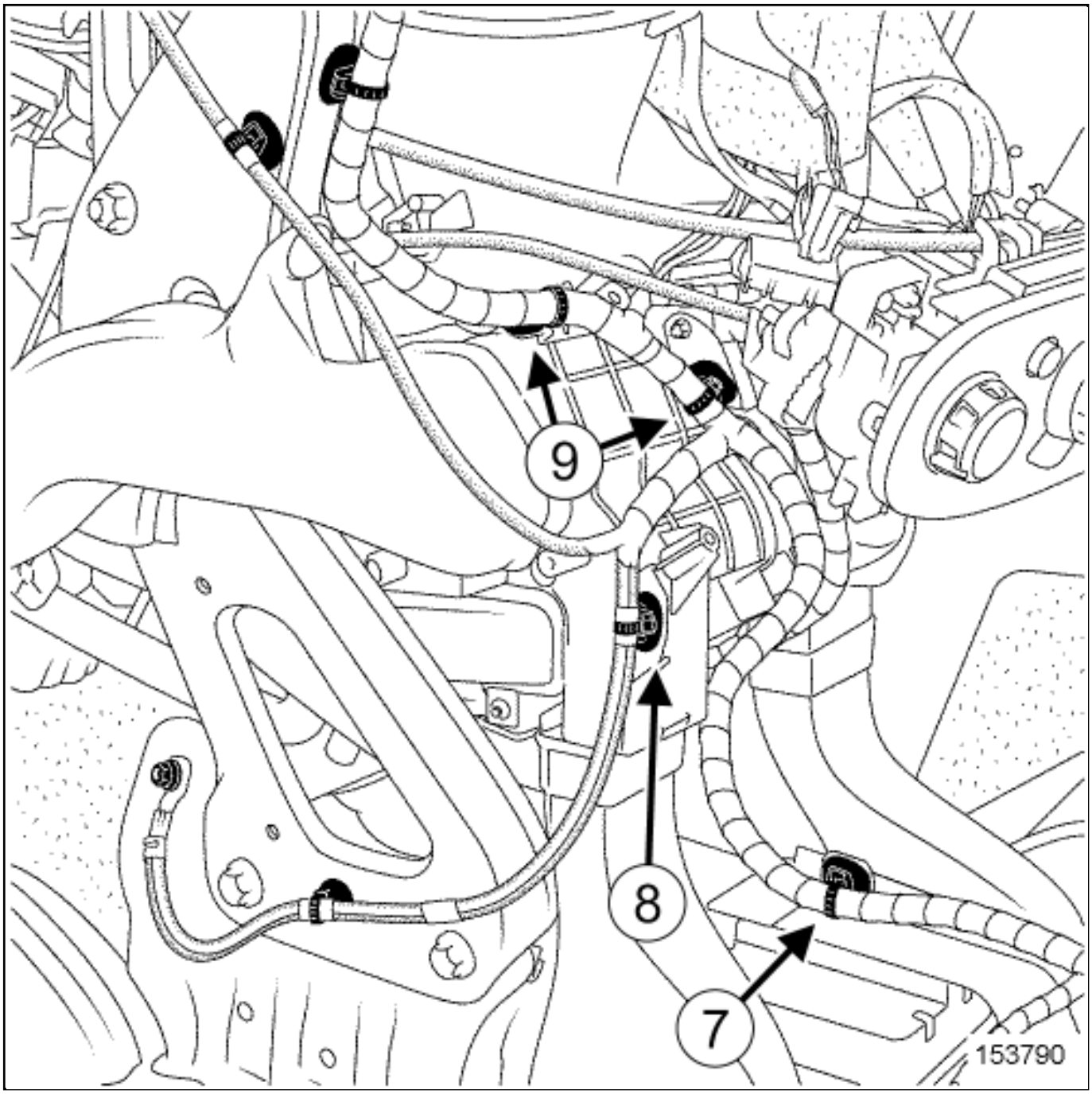
To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

- Fit blanking plugs on the openings of the connecting pipes and the expansion valve.



- Fit hose clampsPipe clamps.(Ms. 583) at (5) .
- Remove the clips(6) from the heater hoses.
- Disconnect the heater hoses.

- Remove :
  - the dashboardDashboard assembly: Exploded view ,
  - the front air distribution ducts(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view)
  - the steering columnSteering assembly: Exploded view .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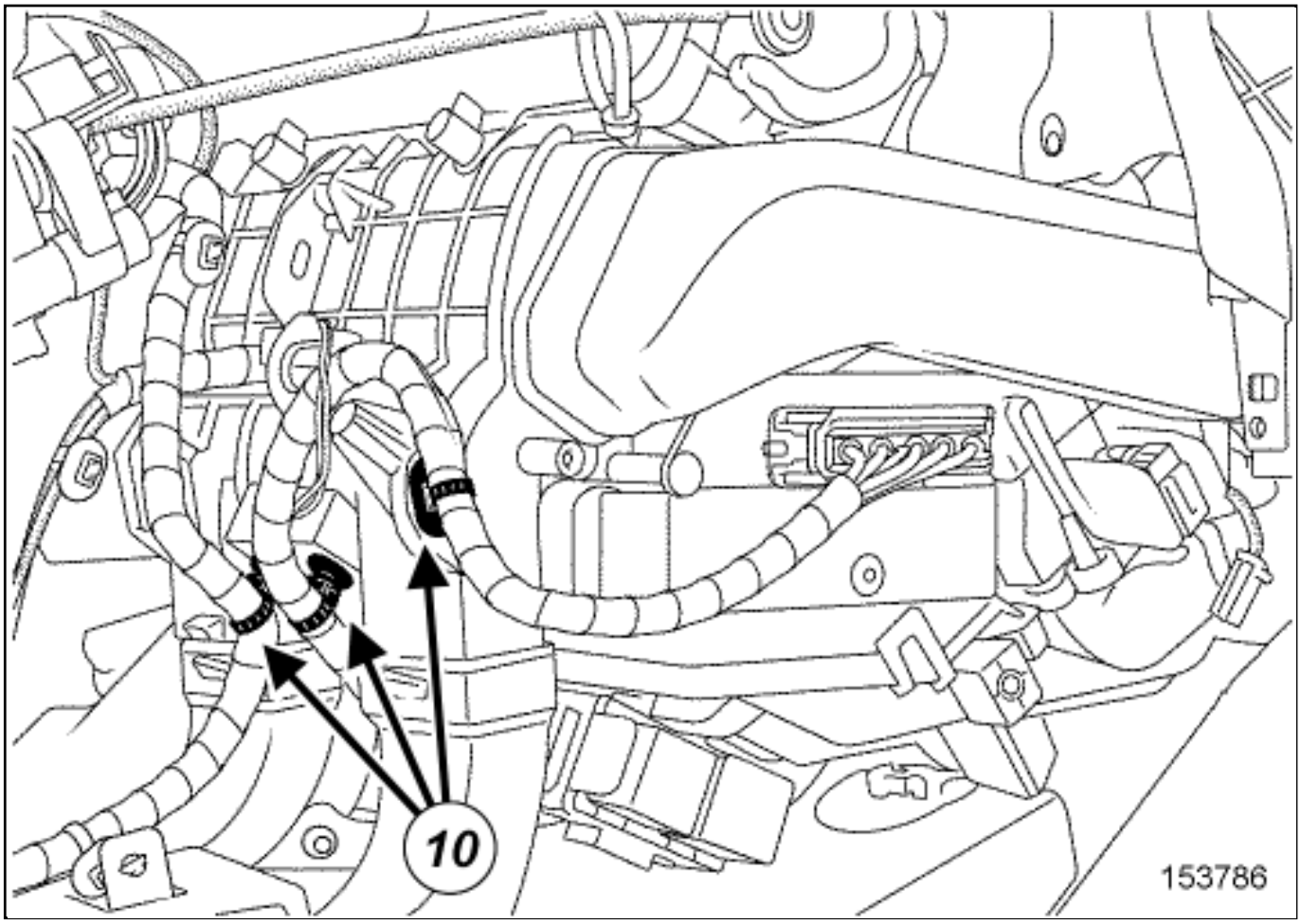
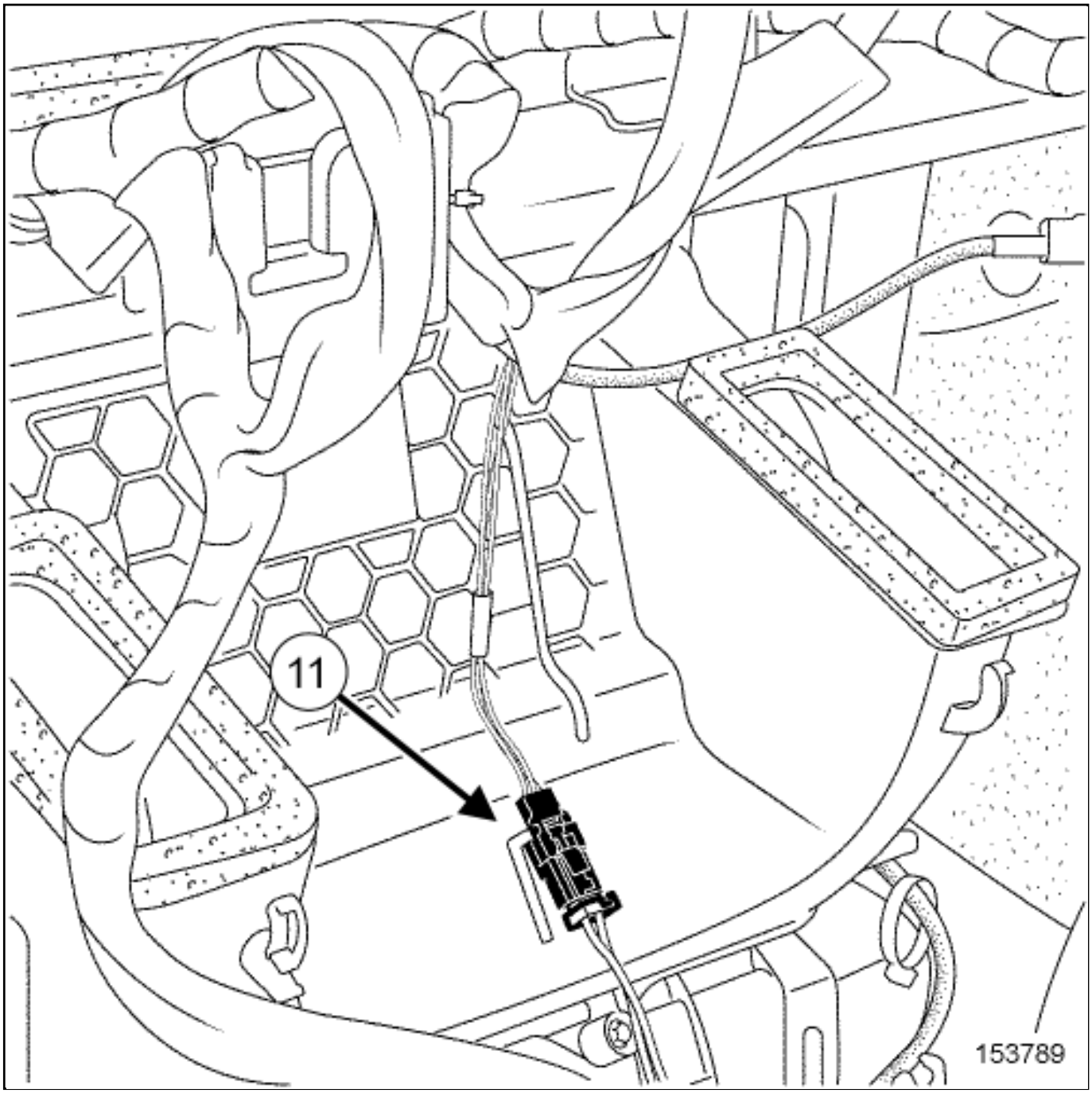


Unclip :

- the wiring at(**7**) ,
- the wiring at(**8**) ,
- the wiring at(**9**) ,
- the wiring at(**10**) .

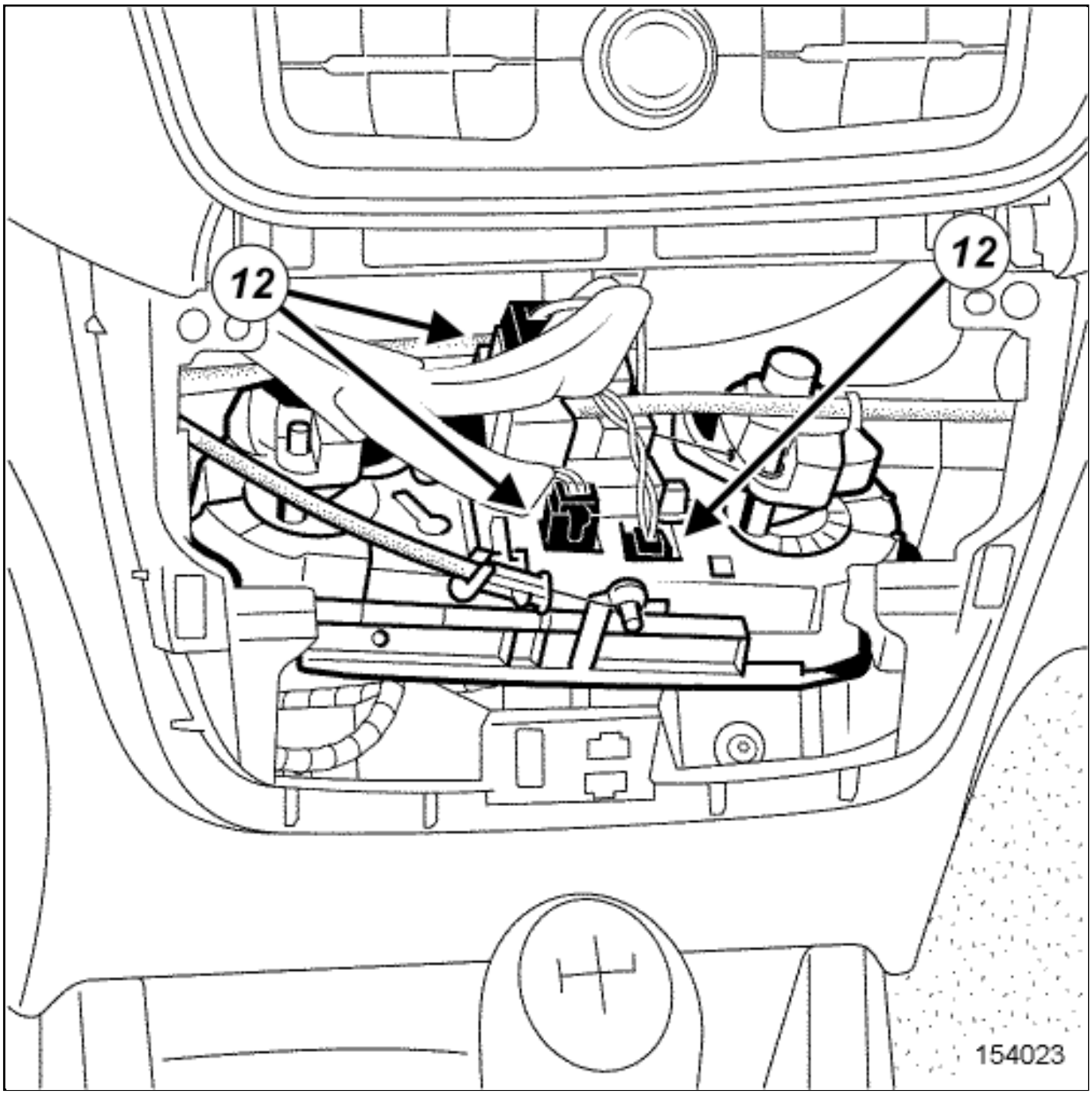


- Disconnect the connector(11) .

- Unclip the distribution unit connector.

- Remove the front footwell air distribution ducts(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

2. REMOVAL OPERATION



- Disconnect the control panel connectors.

- Disconnect (see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :
  - the fan assembly connector,
  - the heating resistor connector,
  - the modulate variation of speed of fan assembly for passenger compartement connector.

- Put a container in place to recover the coolant.

- Remove the distribution unit(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

- Remove from the distribution unit(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded

view) :

- the control panel,
- the air recirculation control cable,
- the air distribution cable,
- the air mixing cable,
- the fan assembly,
- modulate variation of speed of fan assembly for passenger compartment,
- the heating resistor,
- the heater matrix pipes,
- the heater matrix,
- the evacuation ring.

Remove from the distribution unit:

- the evaporator sensor,
- the expansion valve.

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

- Clean the seals of the refrigerant circuit pipes Refrigerant circuit pipe seal: Cleaning .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.
- Fill up and bleed the cooling system Cooling system: Draining - Refilling .
- Check the cooling circuit Engine cooling system: Check .
- Consult the refrigerant and oil quantity values before filling the circuit Air conditioning: Parts and consumables for the repair .
- Perform the following operations:
  - fill the refrigerant circuit using the refrigerant charging station Refrigerant circuit: Draining - Filling ,

check for leaksRefrigerant circuit: Check .

Check that the air conditioning system is operating correctlyAir conditioning: Check .

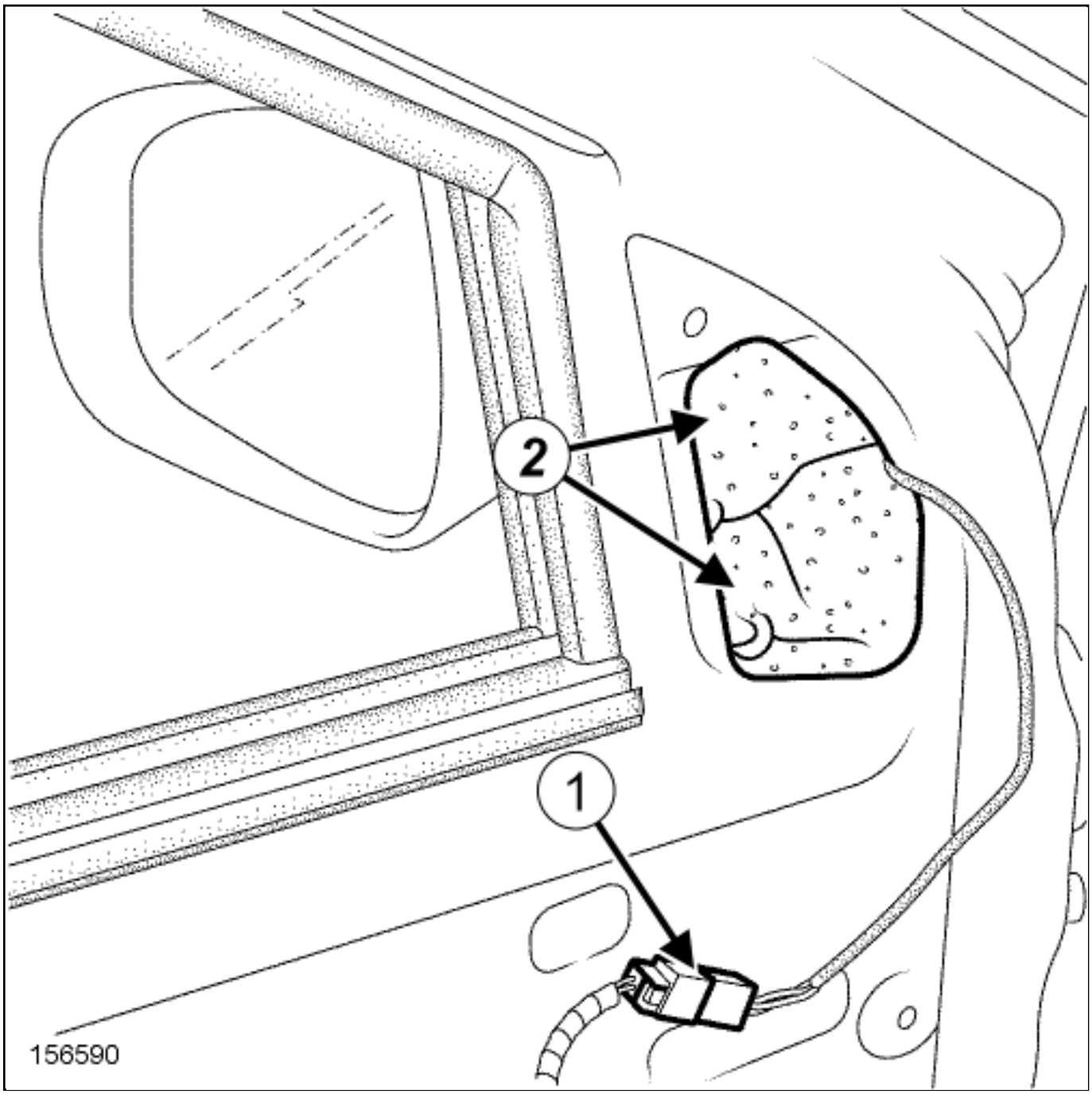
XSL version : 3.02 du 22/07/11

DOOR MIRROR: REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the front side door trim Front side opening element assembly on the passenger compartment side: Exploded view .



- Disconnect the door mirror connector(1) (depending on equipment level).

Remove the sponges at(2) .

2. REMOVAL OPERATION

Remove:

- the door mirror boltsExterior front side opening element assembly: Exploded view ,
- the door mirror.

REFITTING

Proceed in the reverse order to removal.

DRIVER'S FRONTAL AIRBAG: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) ,
  - Vehicle: Precautions for the repair .

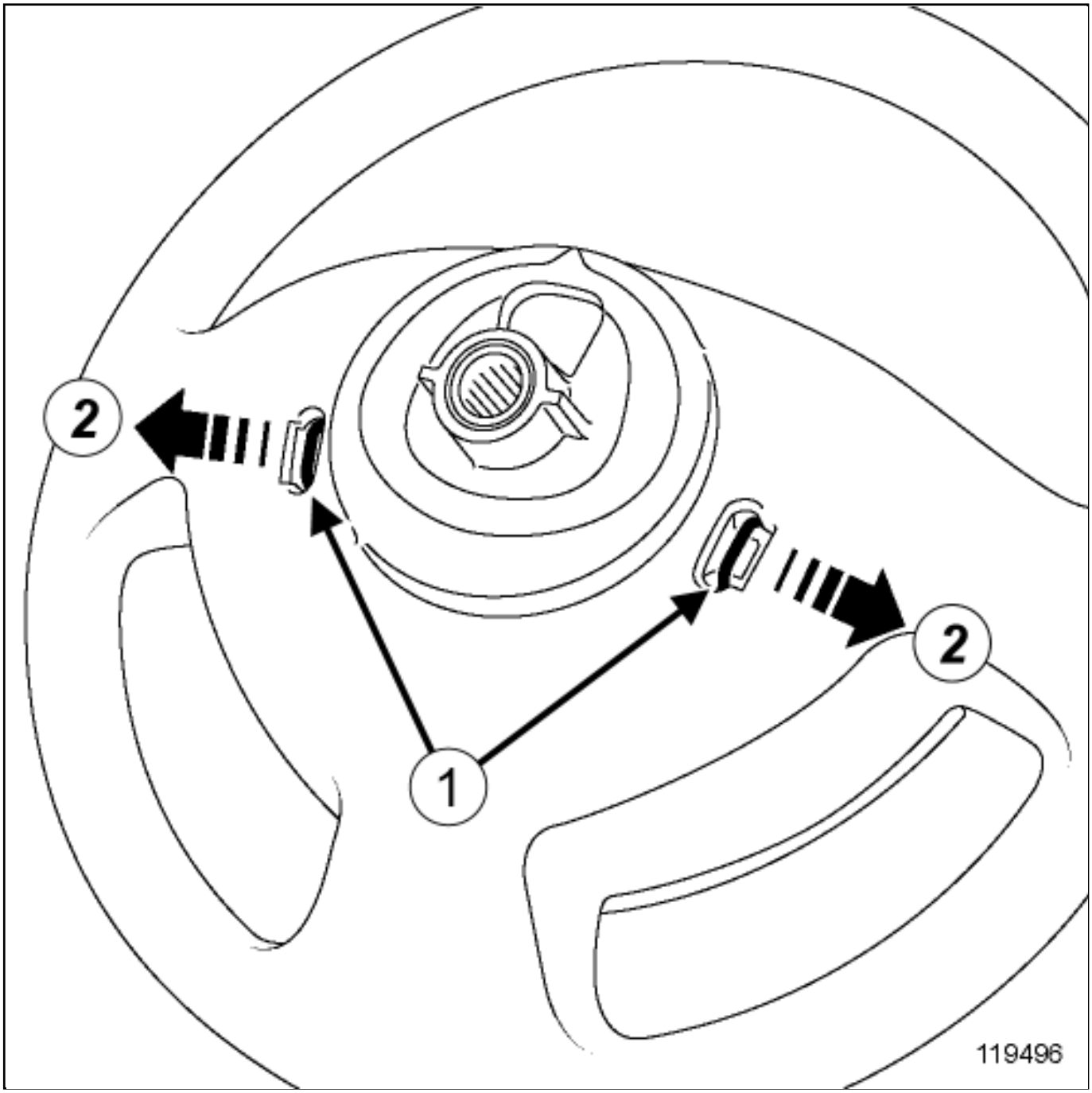
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Apply the procedure for deactivating the safety systems(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

2. REMOVAL OPERATION

- Turn the steering wheel one quarter of a turn.



- Unclip one of the clips(1) by pressing in the direction(2) using a flat-blade screwdriver.
- Proceed in the same manner to unclip the other side of the airbag.

- Unlock the connector(s) of the driver's frontal airbag.
- Disconnect the connector(s).
- Remove the driver's frontal airbag.

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

2. FINAL OPERATION

- Apply the procedure for activating the safety systems(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

3. CHECKING AFTER REPAIR

- Switch on the ignition.
- Check that there are no faults on the instrument panel.

DRIVESHAFT: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. GENERAL RECOMMENDATIONS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting .

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

CAUTION

- In order to prevent irreversible damage to the front hub bearing:
  - Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
  - Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

Lubricate the base of the driveshaft bearing with BR2 + Grease Vehicle: Parts and consumables for the repair to prevent the bearing from sticking.

Make sure that the O-ring is correctly positioned in the base of the relay bearing, if the bearing has one.

Note:

A gearbox oil leak at the driveshaft may destroy it.

- Always replace:
  - the O-ring, if fitted to the bearing,
  - the left-hand driveshaft locking spring ring, if the driveshaft has one,
  - the differential output seals every time a driveshaft is removed.

EARTHS ON BODY: LIST AND LOCATION OF COMPONENTS

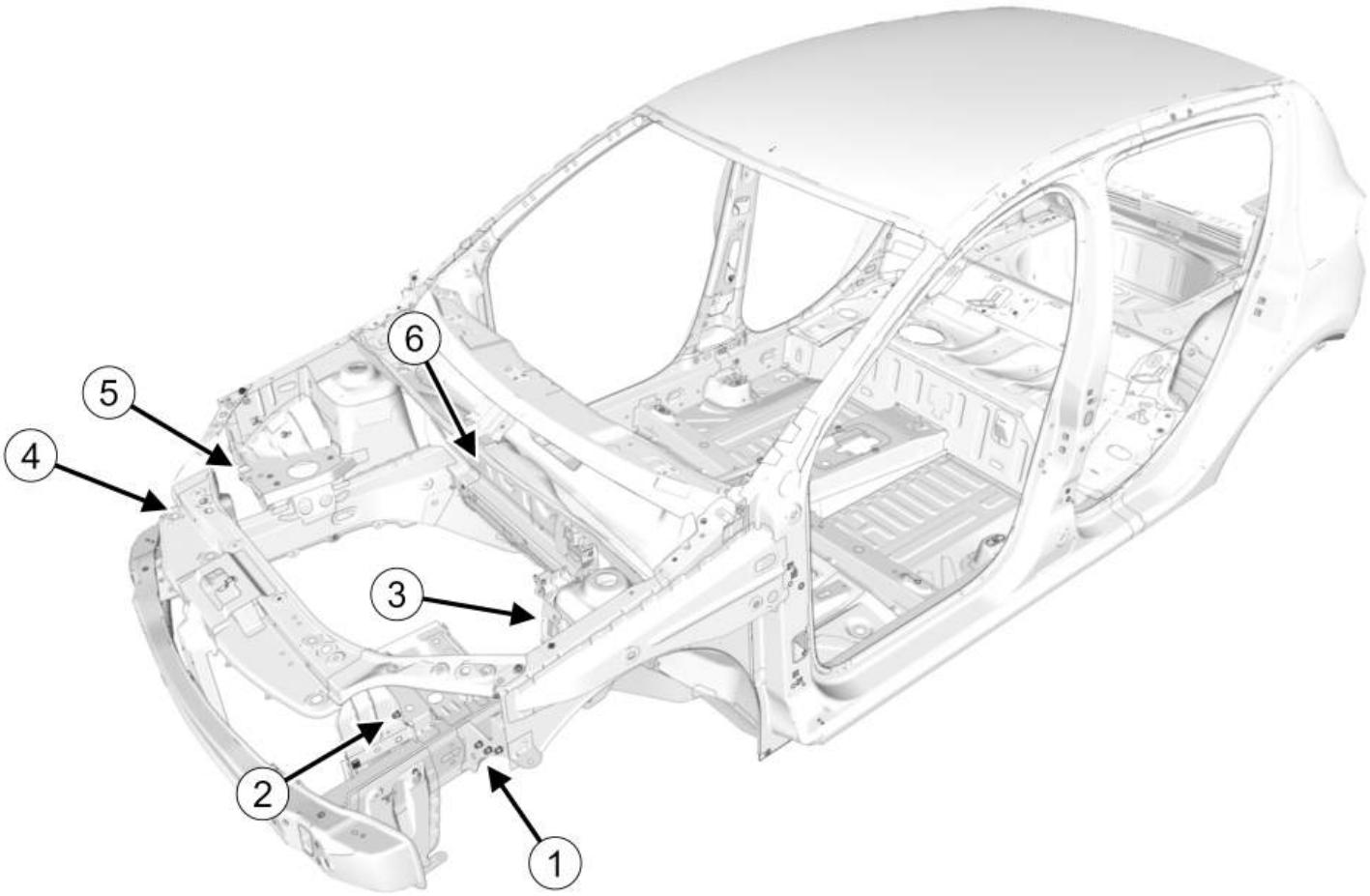
Note, one or more warnings are present in this procedure

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

For the earth stud fitting procedure Earth screw connection: Description .



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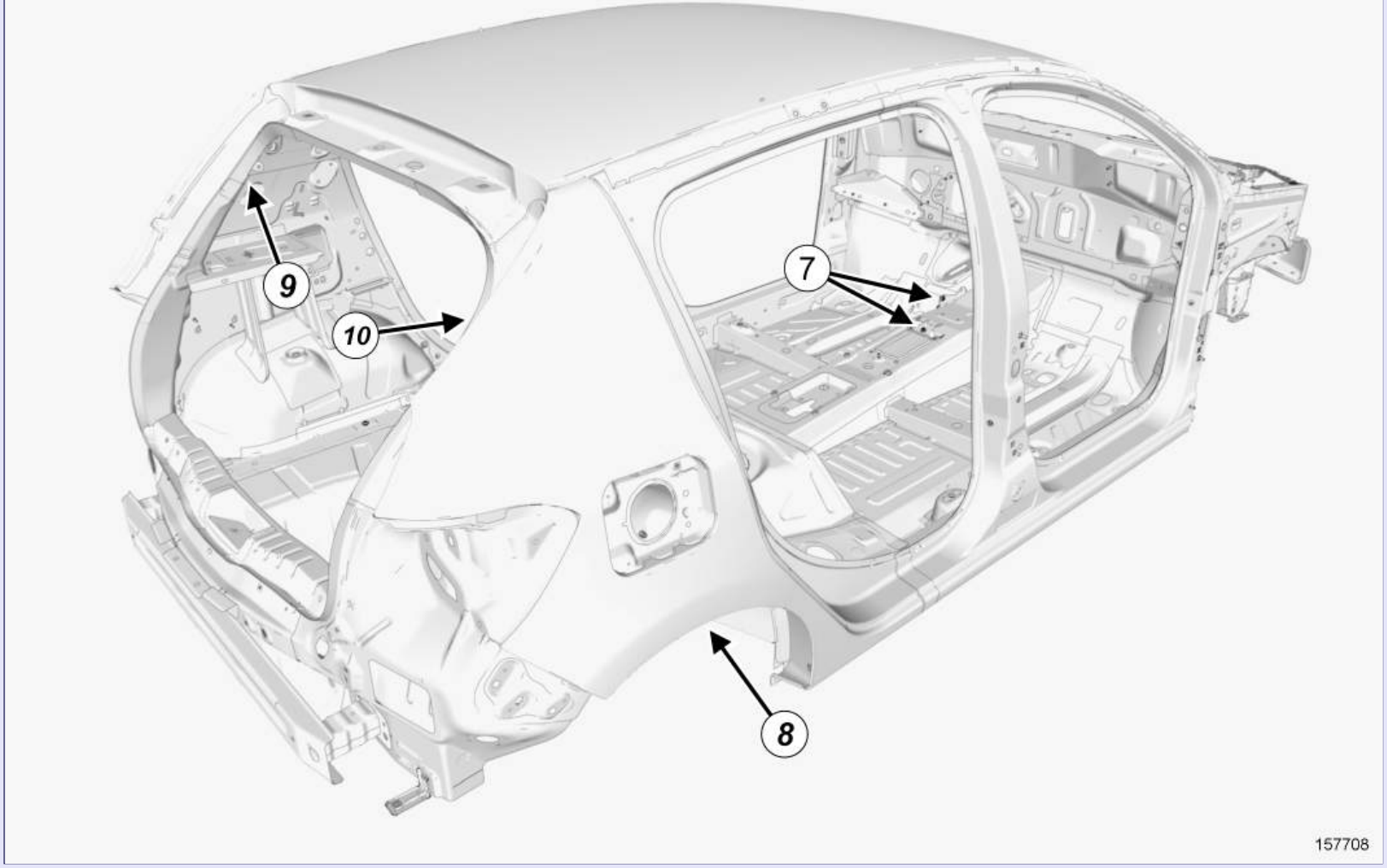
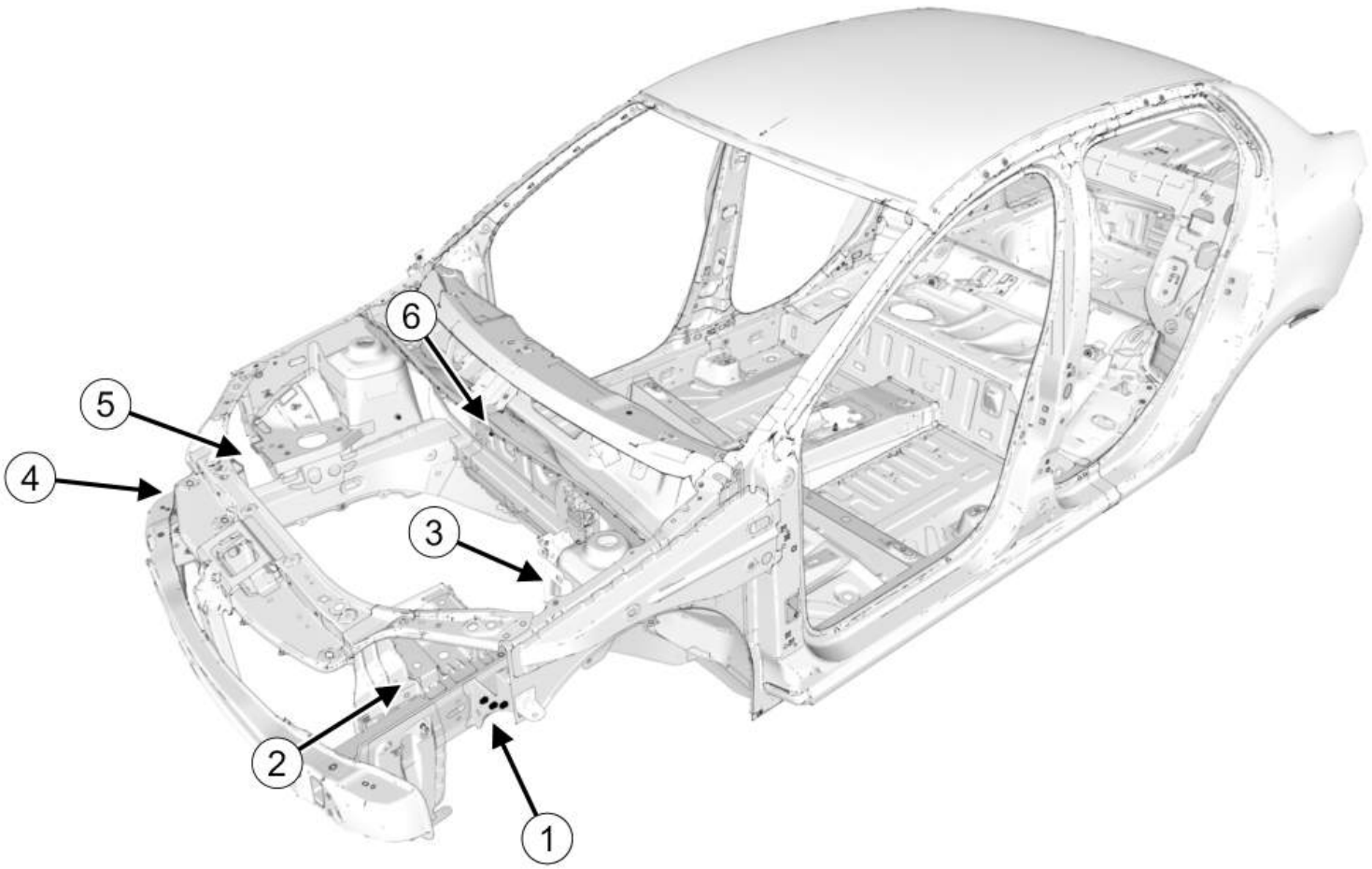


L52(L52)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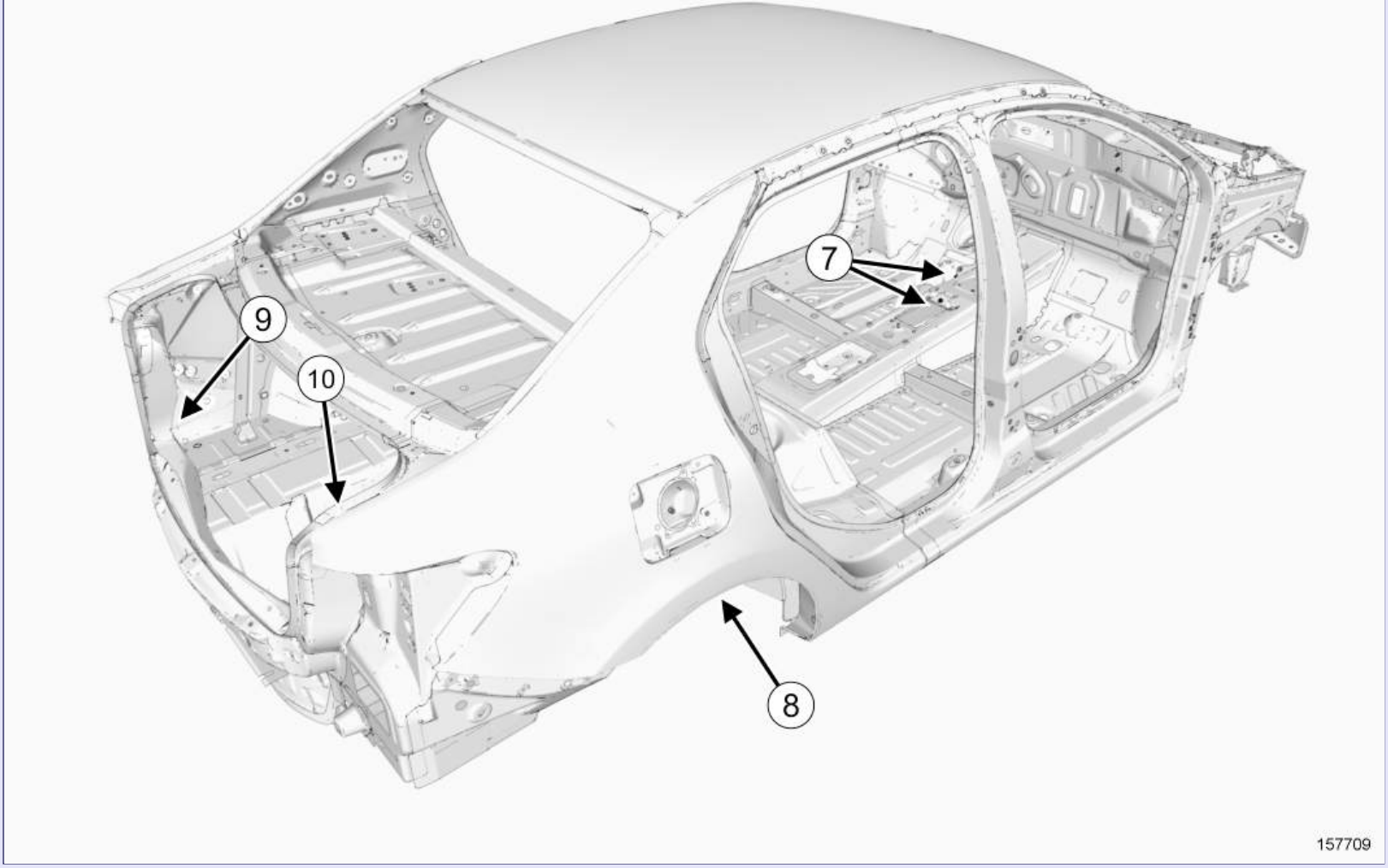
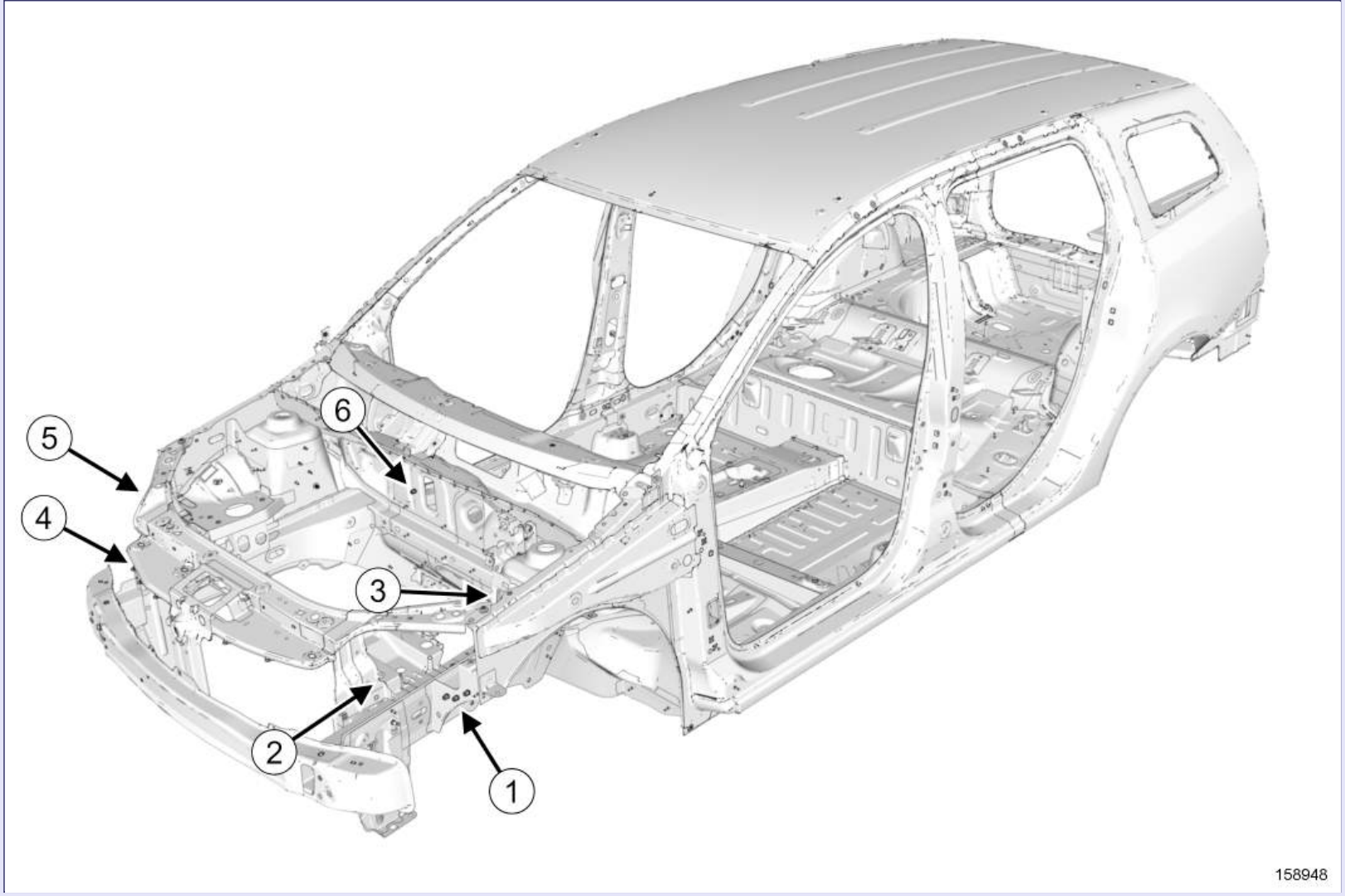
5
4
3
2
1
157282



K52(K52)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6
4
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2
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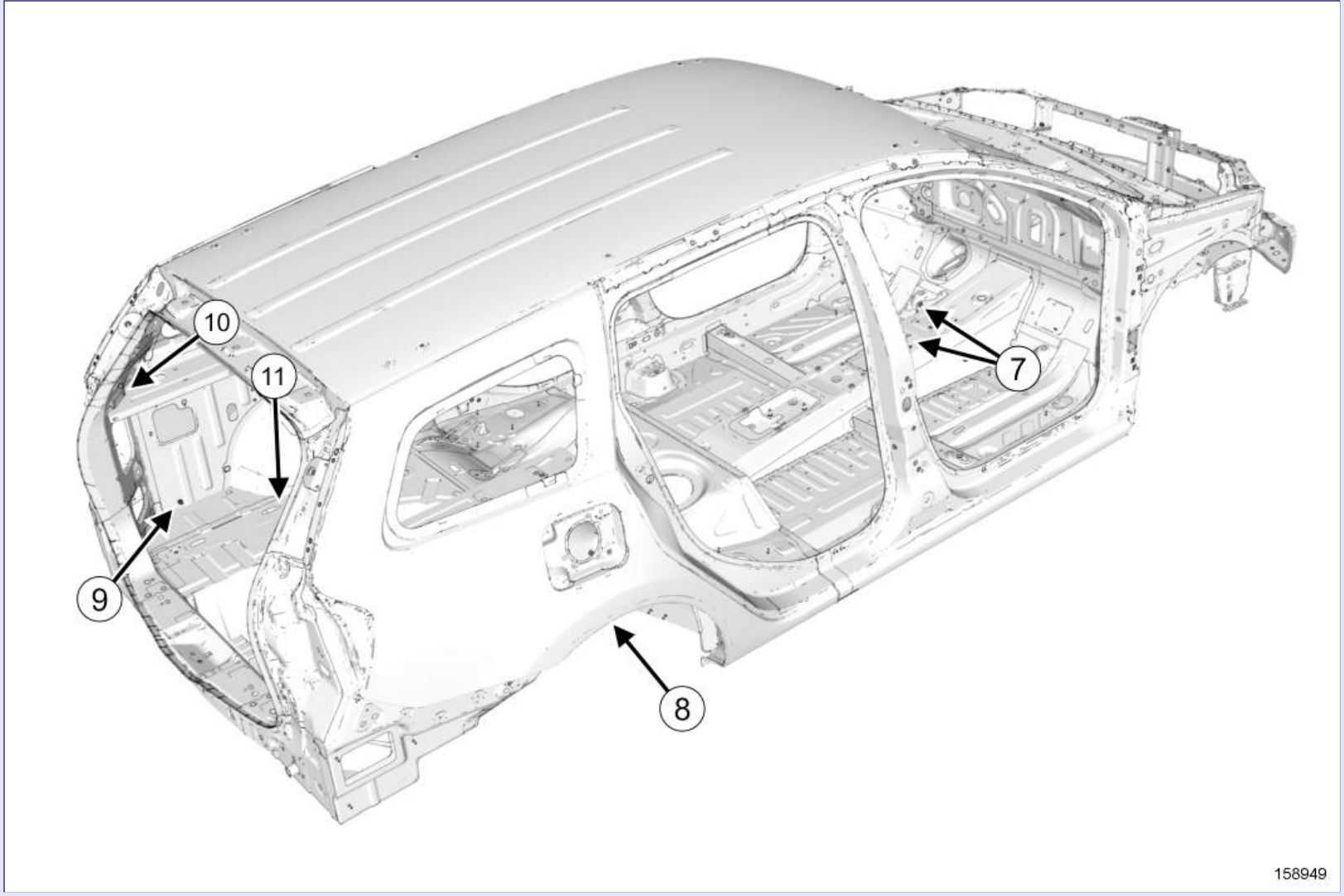
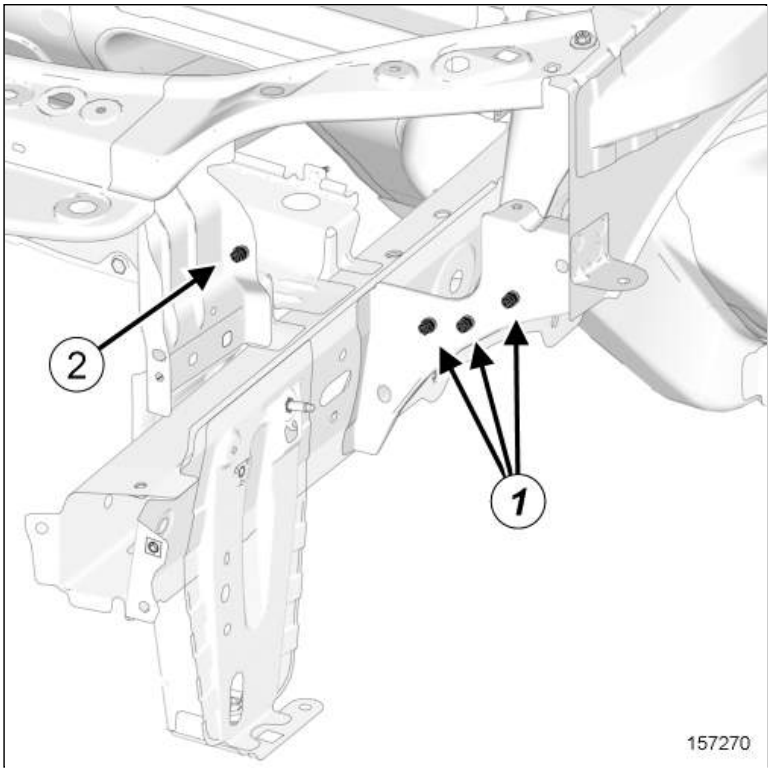
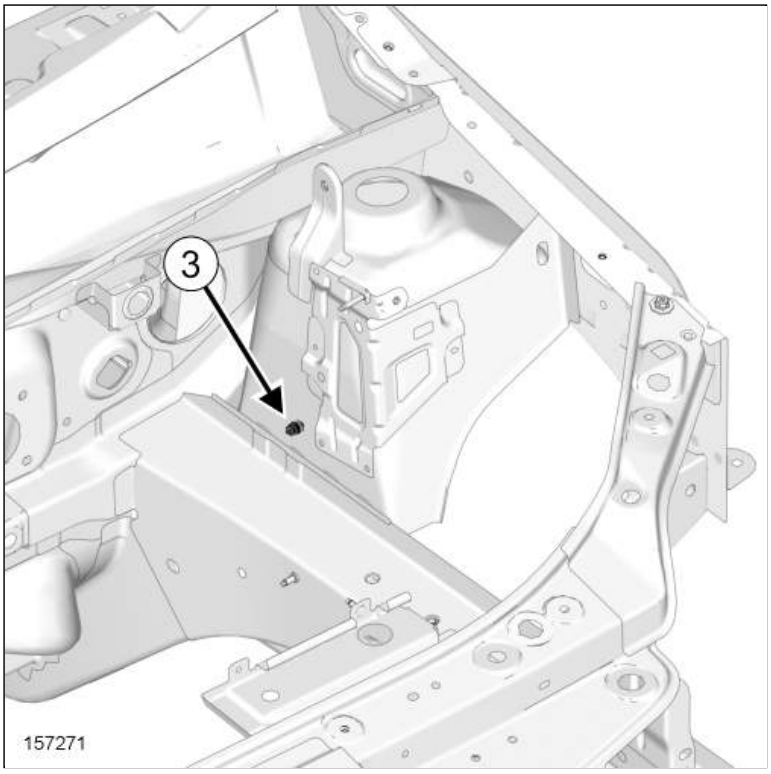


1. DETAILED VIEW OF THE POSITION OF ELECTRICAL EARTHS ON THE VEHICLE

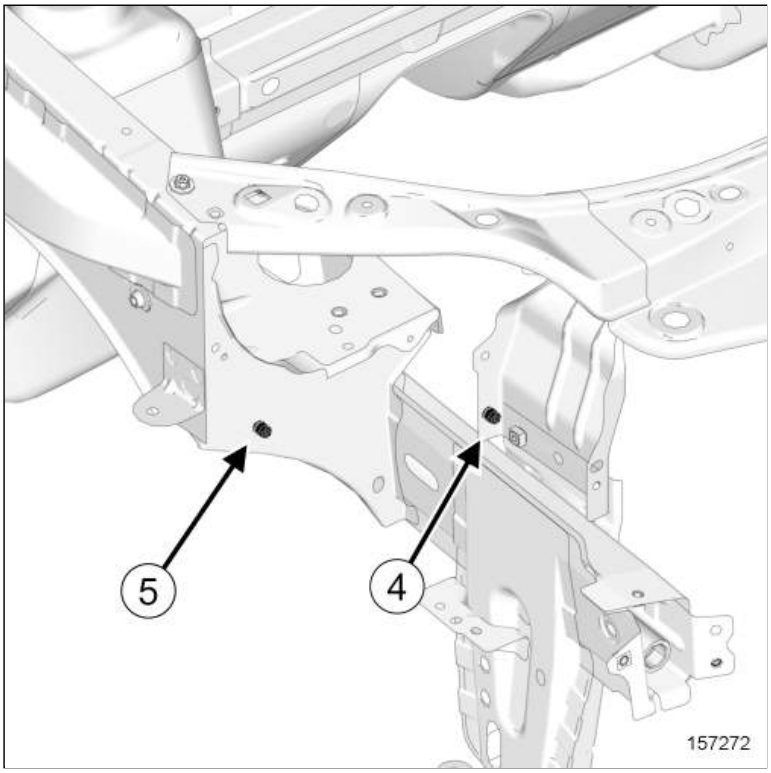


Earth studs on:

- the front left-hand end side cross member(1) ,
- the front end panel upper cross member mounting(2) .

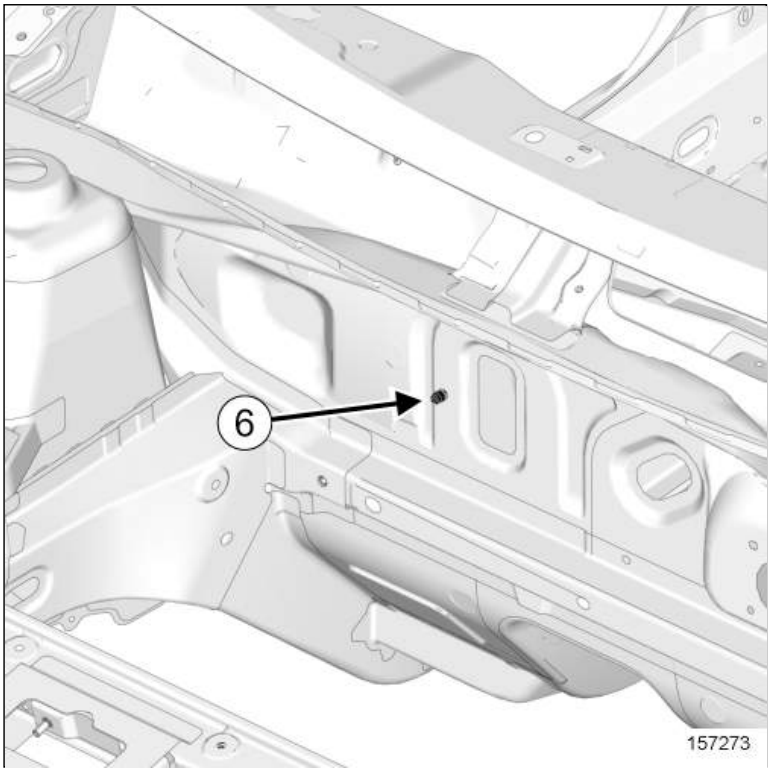


Earth stud on the shock absorber cup(3) .

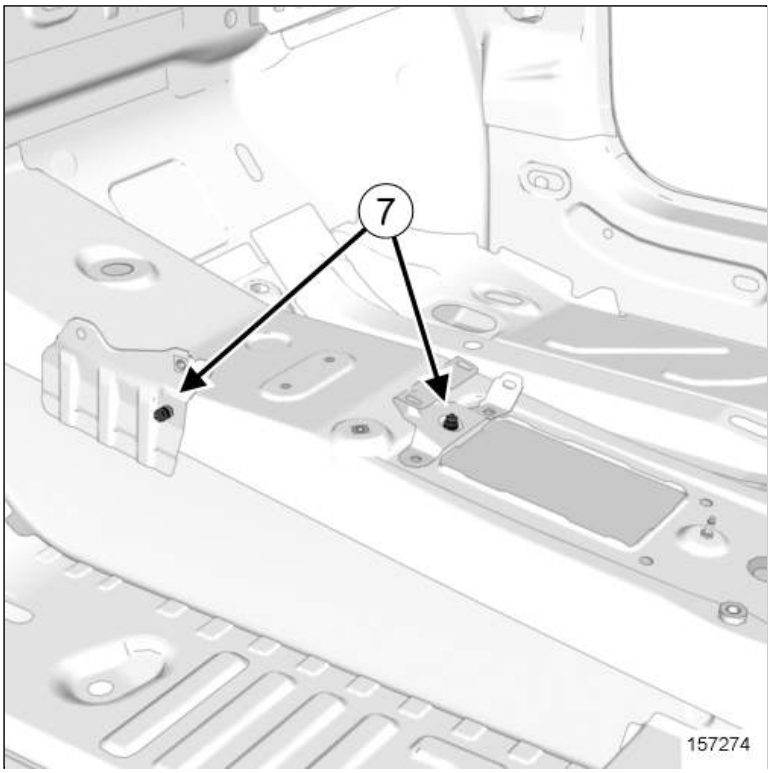


Earth studs on:

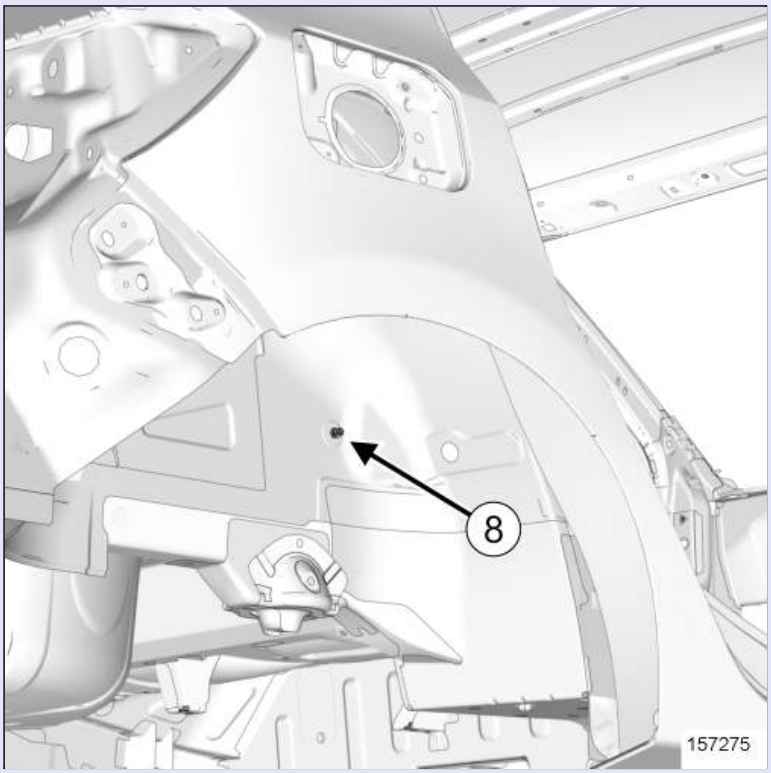
- the front end panel upper cross member mounting(4) ,
- the front left-hand end side cross member(5) .



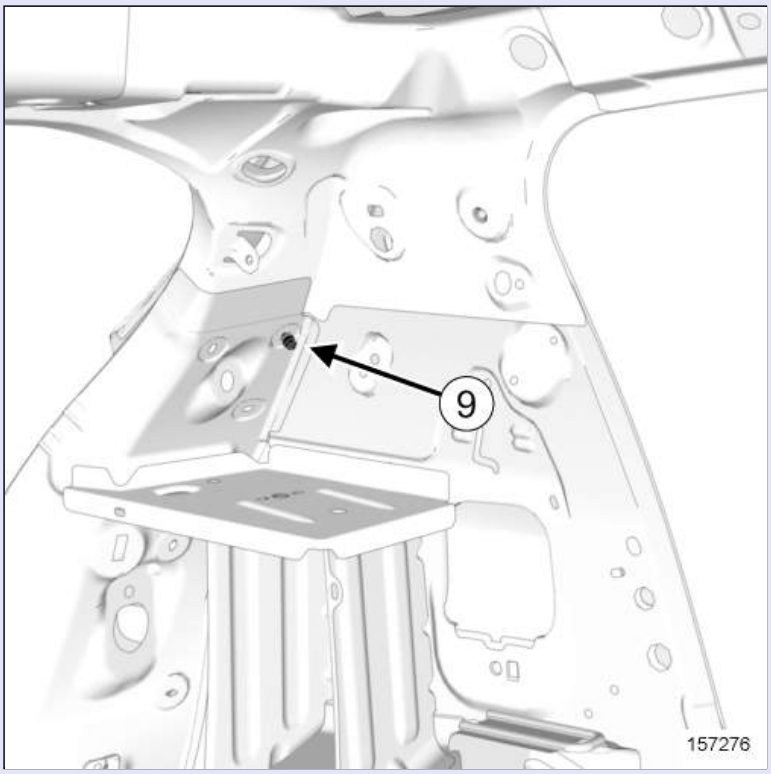
Earth stud on bulkhead(6) .



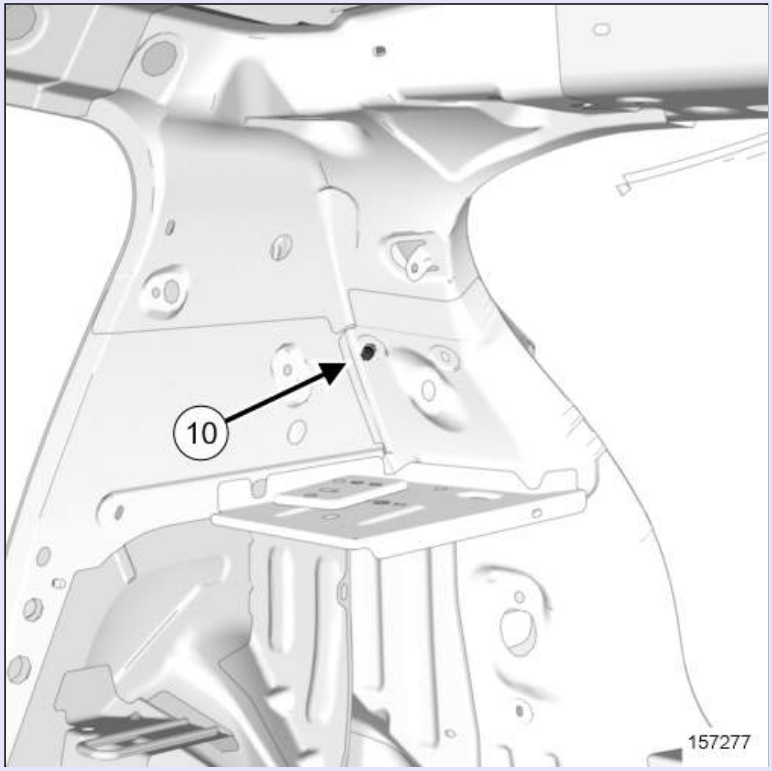
Earth studs on the tunnel(7) .



Earth stud on the right-hand inner rear wheel arch(8) .

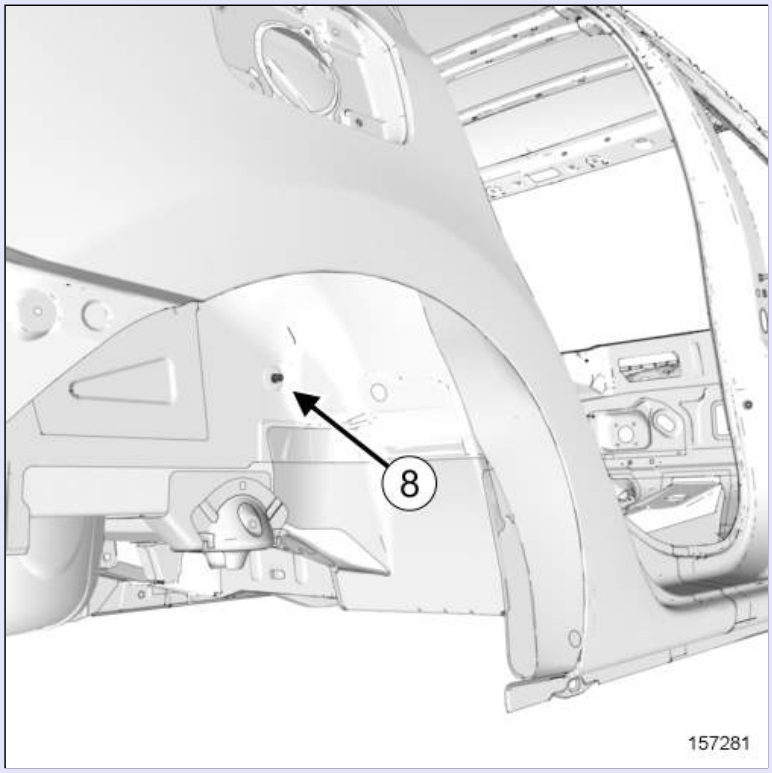


Earth stud on left-hand light mounting lining(9) .

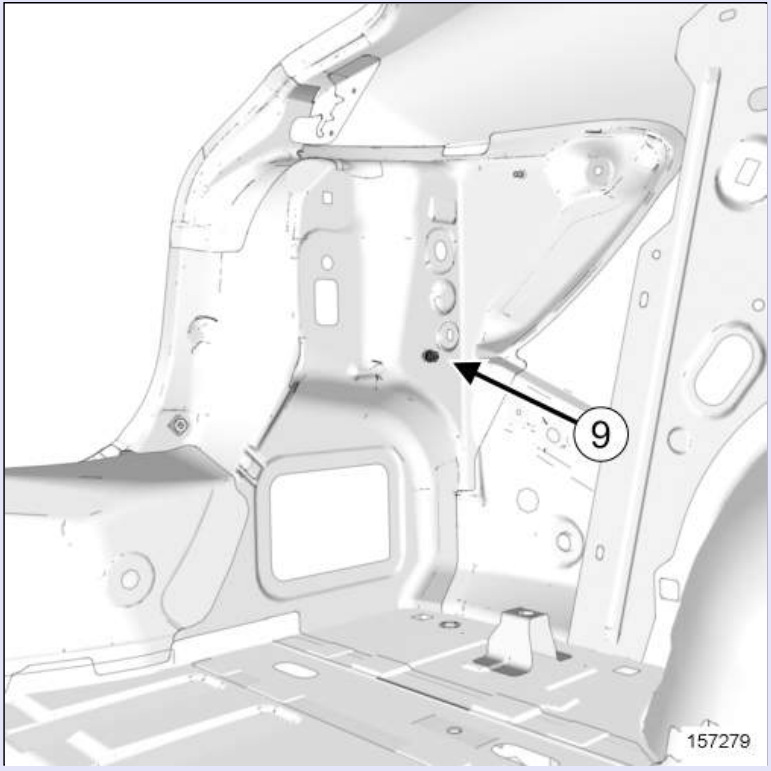


Earth stud on right-hand light mounting lining(10) .

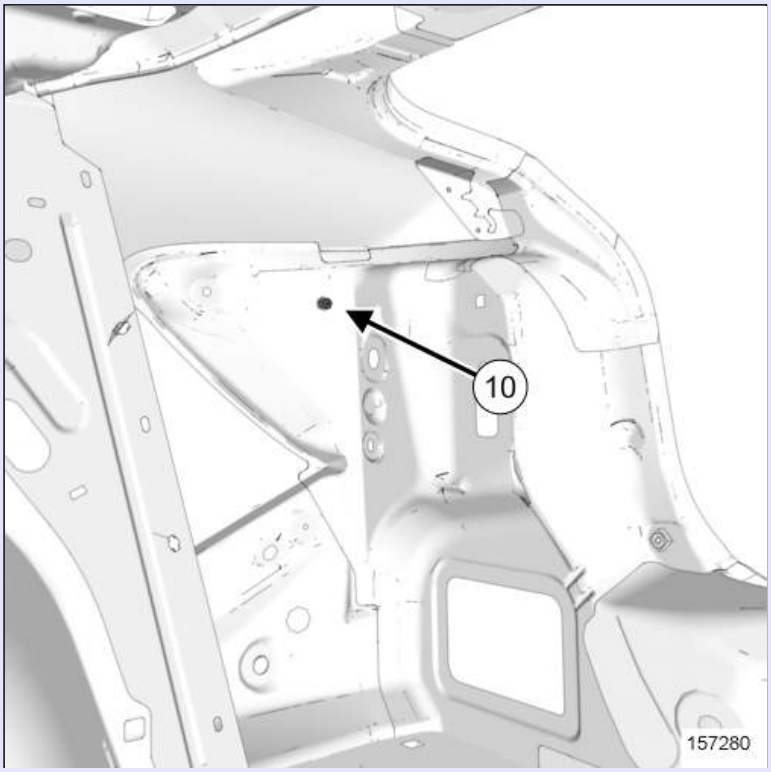
L52(L52)



Earth stud on the right-hand inner rear wheel arch(8) .

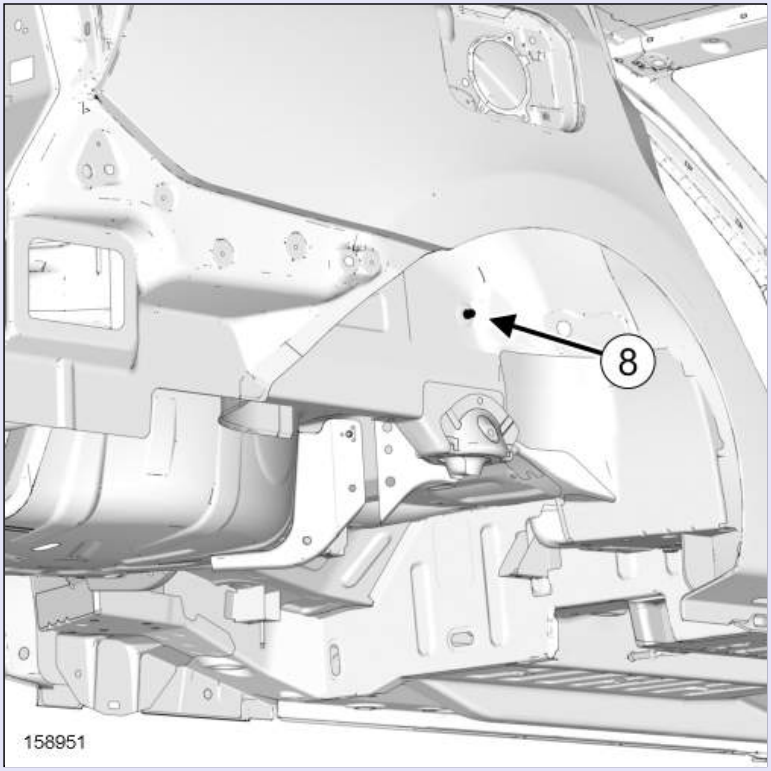


Earth stud on left-hand light mounting(9) .

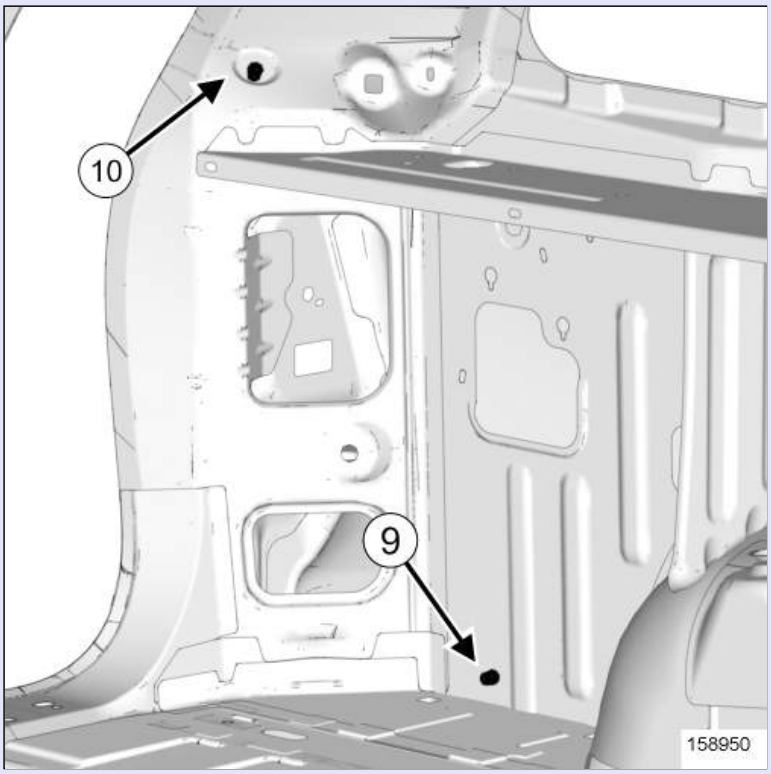


Earth stud on right-hand light mounting(10) .

K52(K52)

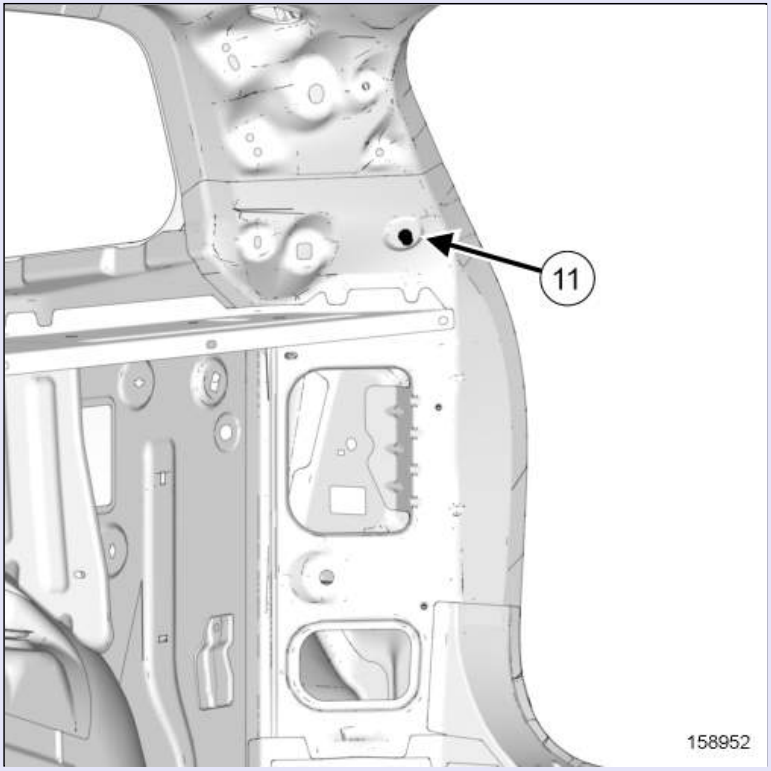


Earth stud on the right-hand inner rear wheel arch(8) .



Earth studs on:

- the left-hand outer rear wheel arch(9) ,
- the left-hand rear quarter panel lining(10) .

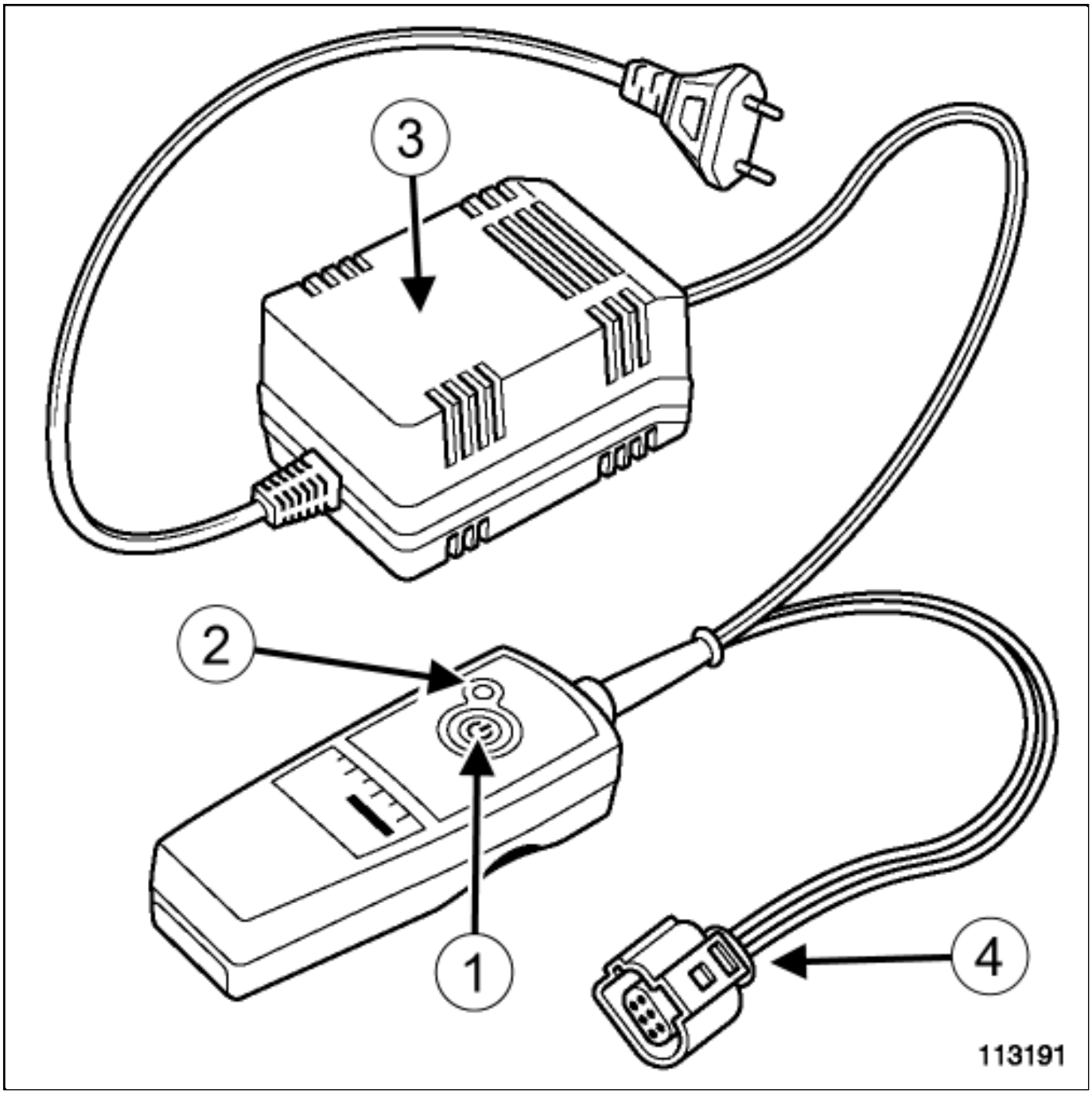


Earth stud on the right-hand rear quarter panel lining(11) .

EGR SOLENOID VALVE ACTUATOR: USE

Special tooling required	
EGR valve actuator.	Mot. 1757

1. DESCRIPTION



(1) Control button

(2) Indicator light

(3) Electrical adapter

(4) Connector

Once the EGR solenoid valve has been removed, theEGR valve actuator.(**Mot. 1757**) allows it to be controlled in preparation for cleaning.

2. OPERATION

The EGR valve actuator.(**Mot. 1757**) enables the following to be carried out:

- a solenoid valve opening command,
- operating the solenoid valve opening/closing cycle.

1- CONNECTING THE TOOL

Connect the connector(4) of theEGR valve actuator.(**Mot. 1757**) to the solenoid valve.

Note:

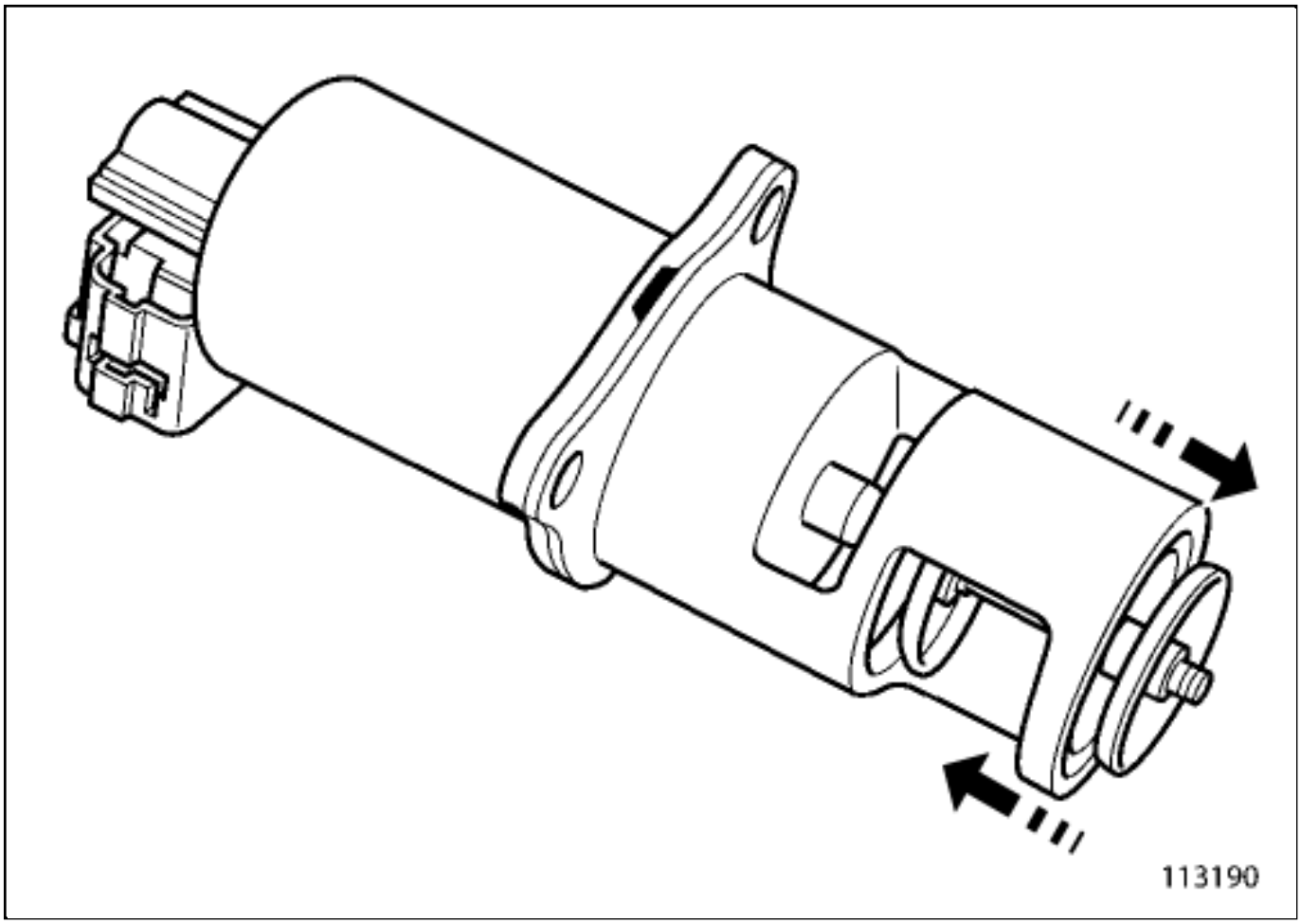
The EGR solenoid valve actuator tool can be used to check the solenoid valve.

An indicator will sound in case of:

- misconnection of the tool to the solenoid valve,
- solenoid valve short circuit,
- break in the solenoid valve circuit.

Connect the adapter(3) for the EGR valve actuator.(**Mot. 1757**) to a current tapping.

2- SOLENOID VALVE CONTROL



- To open or close the EGR solenoid valve, briefly press on the button(1) .

In the open position (with power to the solenoid valve), warning light(2) comes on.

- To start the solenoid valve opening/closing cycle, hold button(1) down for longer:
  - The solenoid valve vibrates for 90 seconds,
  - the indicator light(2) flashes.

Note:

The opening/closing cycle implemented by the tool makes the solenoid valve vibrate approximately twice a second.

- To interrupt a running cycle, press briefly on button(1) .

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ELECTRIC WINDOW: LIST AND LOCATION OF COMPONENTS

1. LIST OF COMPONENTS

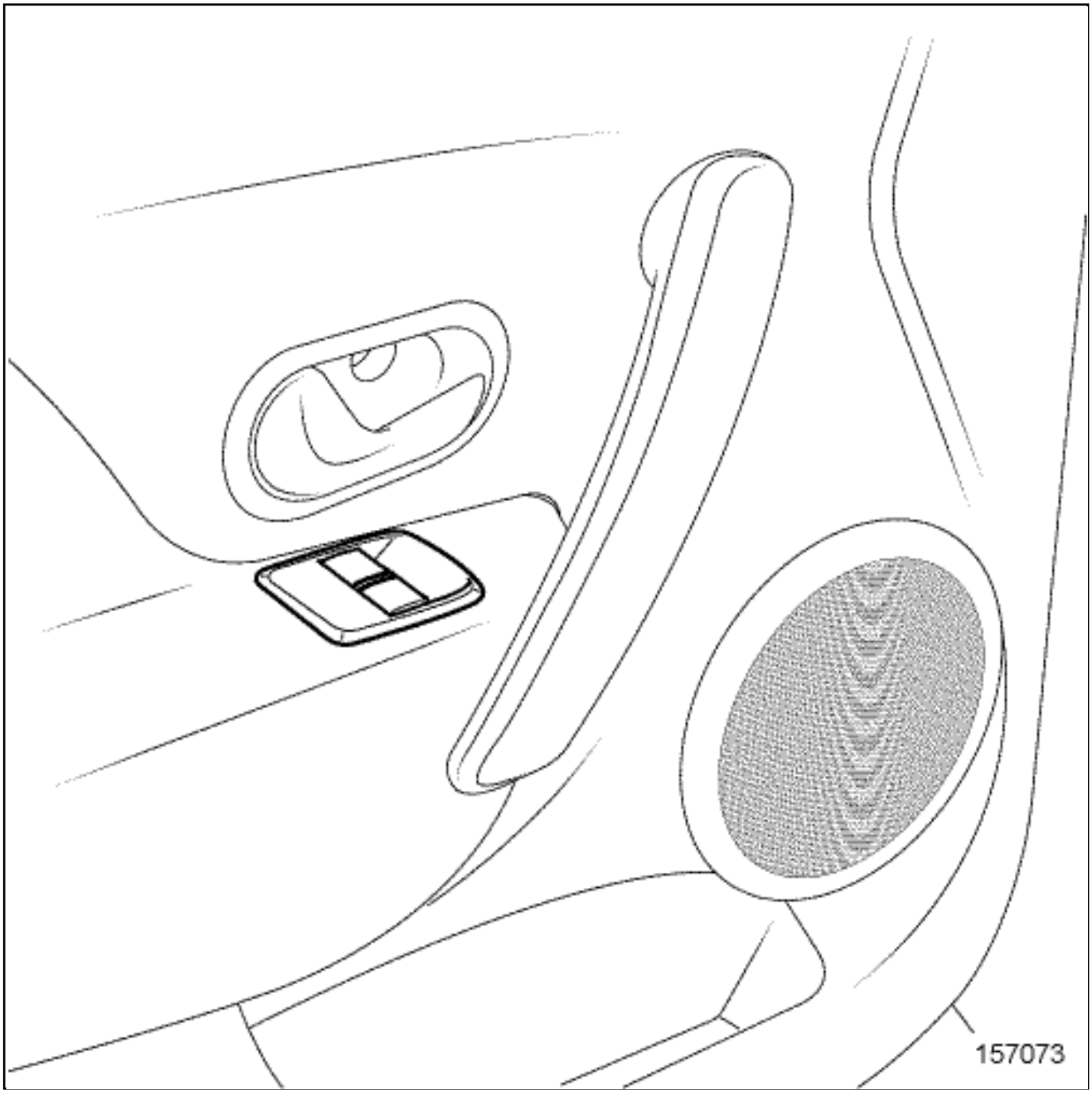
1- THE ELECTRIC WINDOW EQUIPMENT CONSISTS OF:

- a front electric window switches

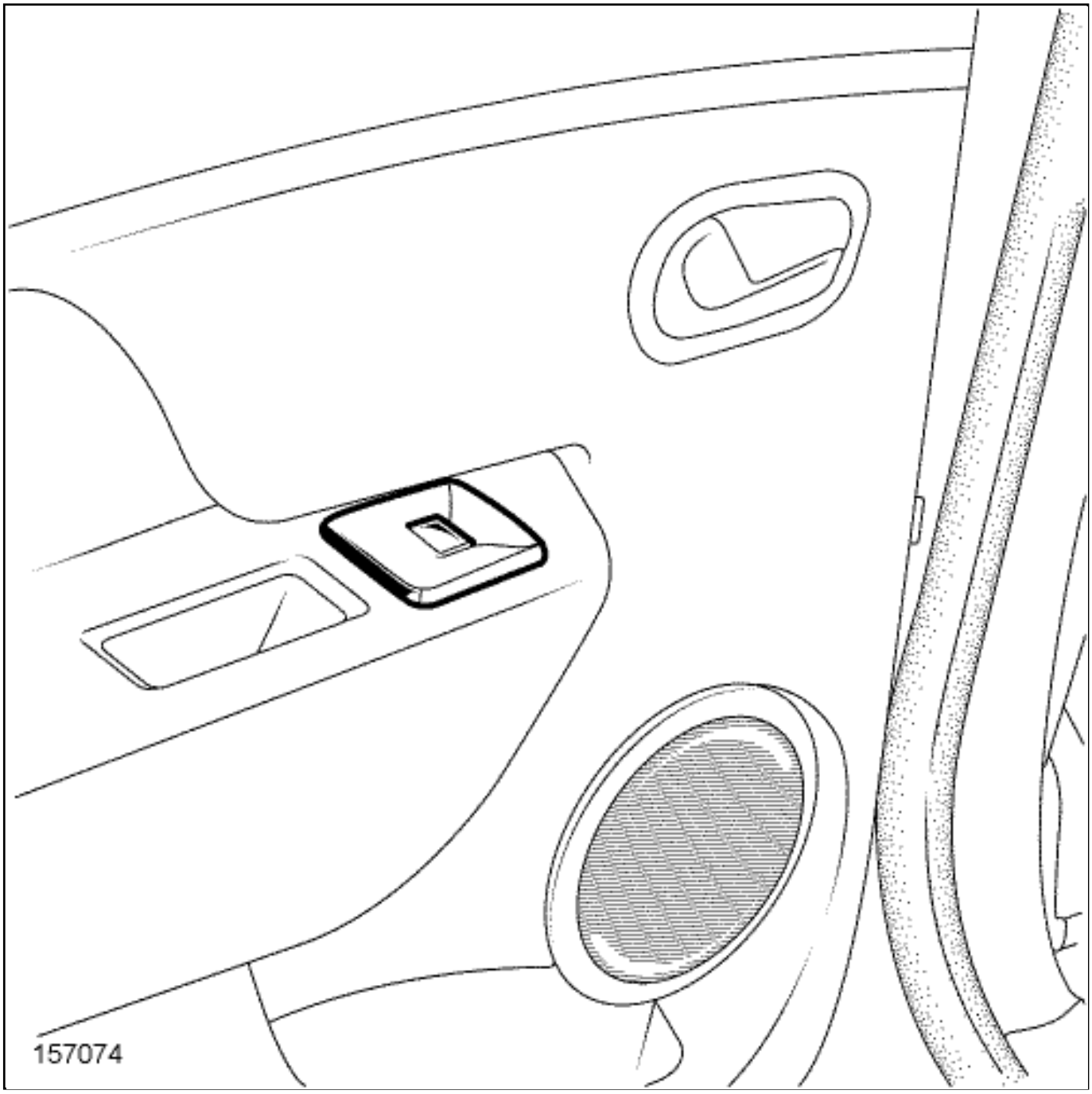
- a rear electric window switches
- a child safety switch

2. LOCATION OF COMPONENTS

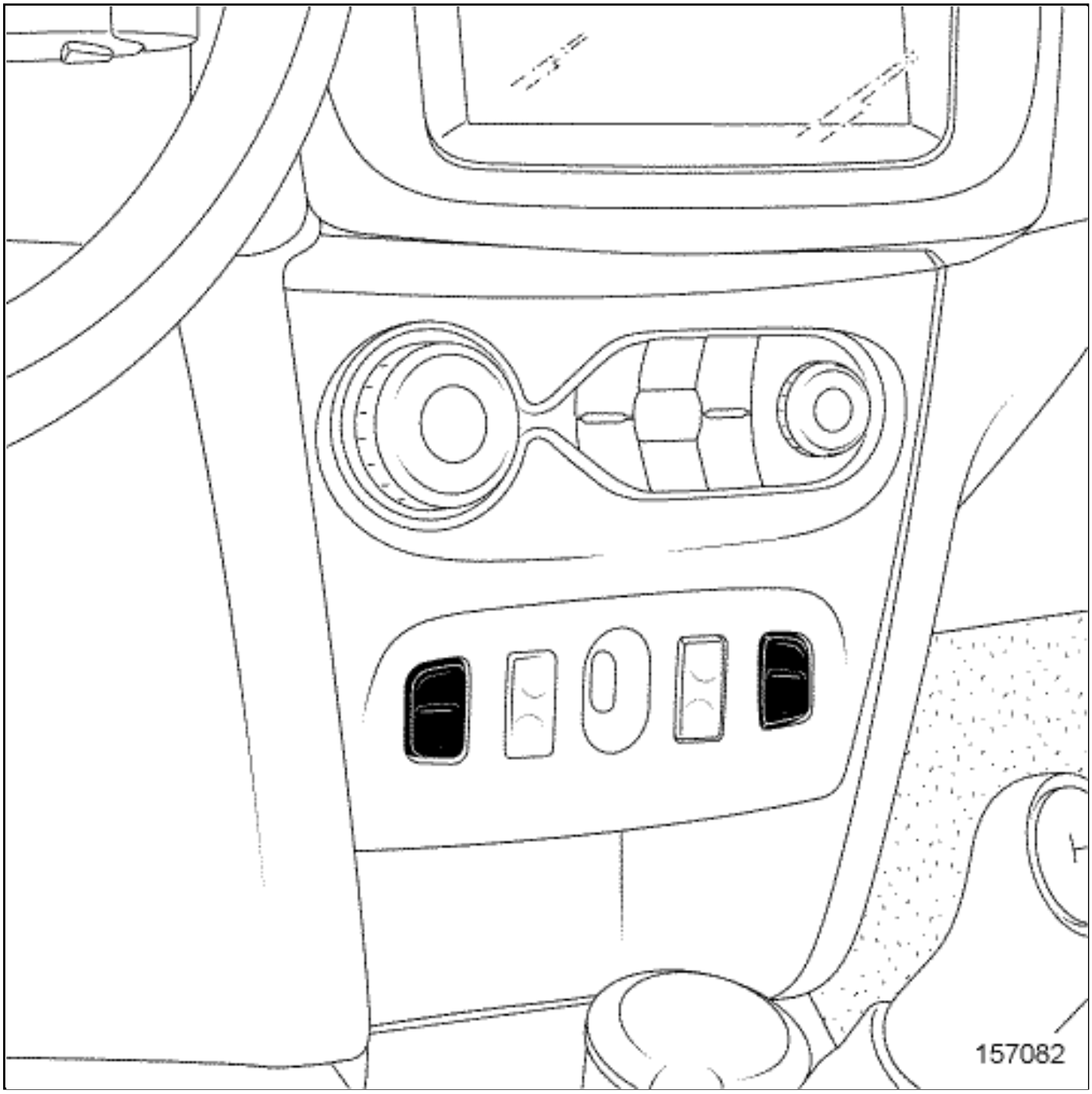
FRONT ELECTRIC WINDOW SWITCHES



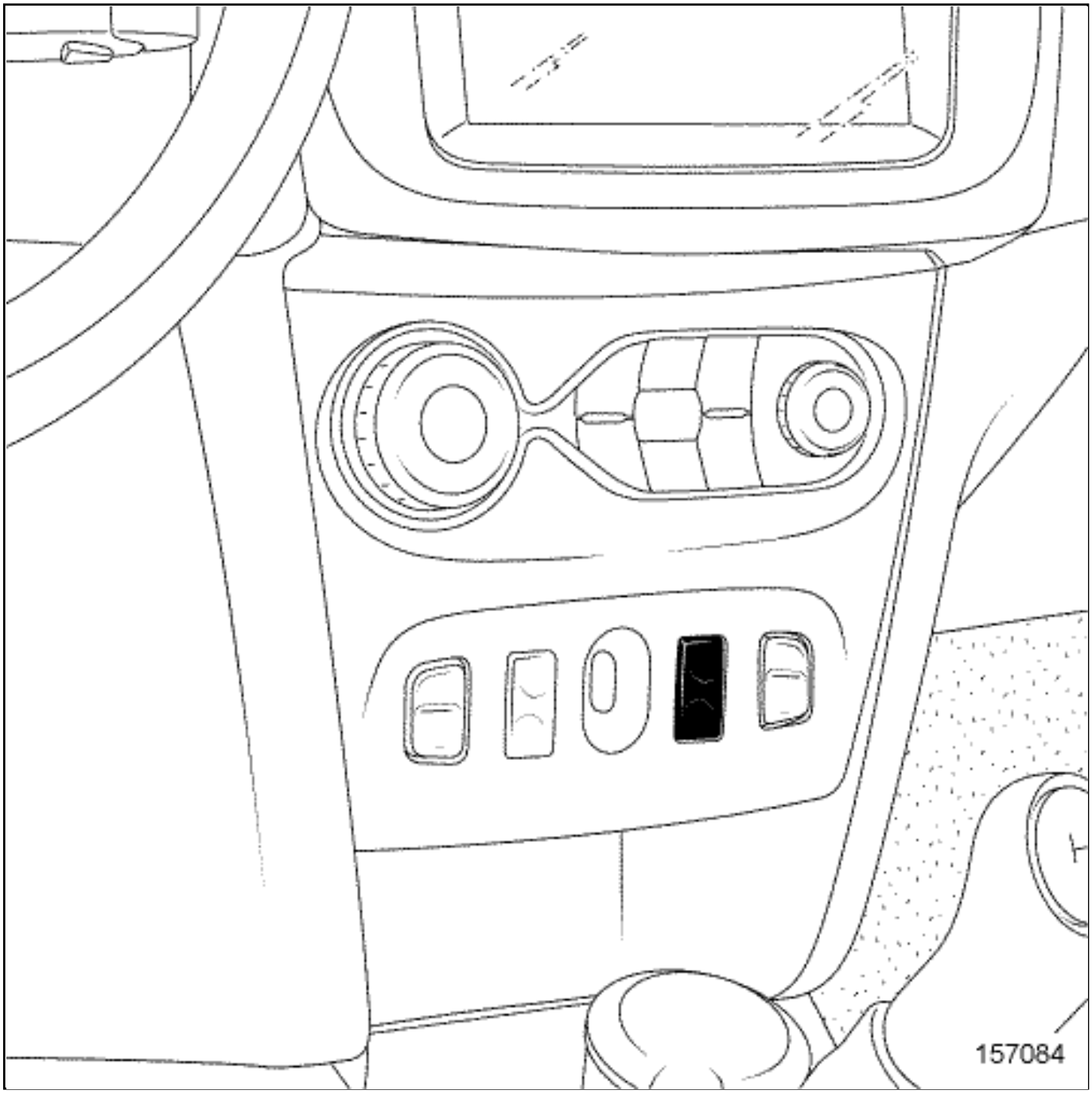
REAR ELECTRIC WINDOW SWITCH ON THE DOOR



REAR ELECTRIC WINDOW SWITCHES ON THE DASHBOARD



CHILD SAFETY SWITCH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ELECTRICAL RESISTANCE SPOT WELDING CONNECTION: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

Special tooling required	
Kit for checking weld seams.	Car. 1779
Set of replacement test pieces for tool Car. 1779	Car. 1800

1. INTRODUCTION

1- PURPOSE

the purpose of this document is to provide the information necessary for making quality resistance spot welds by describing the procedure to apply to define the correct RSW weld parameters. To this end, it includes:

- Weld pre-adjustments adapted according to the thickness and grade of the steel to be welded (mild steel, high elastic limit, very high/ultra high elastic limit).
- Peeling test.

This test alone confirms the weld parameters (Current; Time; effort) and guarantees the result in terms of the quality of the repair.

This is a destructive test from the original assembly tests; it is based on the diameter of the material rivet on pulling.

Note:

This procedure is to be used before every weld according to the stack (grade/thickness).

2- PROCEDURE

- Consult the vehicle MR: section II.
- Consult the charts with the procedure for defining the reference panel (2 and 3 thicknesses): section III.
- Perform the peeling test: sections IV and V.

- Interpret the results: section VI.
- Use the remedial procedures: section VII.
- Use the replacement solutions: section VIII.
- Tests and checks on the vehicle: section IX.

3- DEFINITION CONDITIONS OF THE TABLES

The steel selected is representative of the majority of the stacks found in collision repairs. There are 3 grades: mild steel, high elastic limit, very high/ultra high elastic limit each in two thicknesses, with a G10/10 galvanised treatment.

These pre-adjustments have been defined under certain conditions:

- electrical supply: 32 A time-lag circuit breaker graph D
- air supply: pressure of 6.5 bar

The conditions in addition to the technological performance of the welders are essential to obtain a quality result.

- electrode holder length: 120 mm
- electrode active surface diameter: 8 mm
- using a welder with INVERTERtechnology

2. CONSULT THE VEHICLE'S MR

- consult the Vehicle's MR to find out the grades and thicknesses of the stack.
- define the reference panel:

Two-panel stack : the thinnest in the stack.

Three-panel stack : when repairing, do not weld three panels at a time; assemble two panels, then the third.

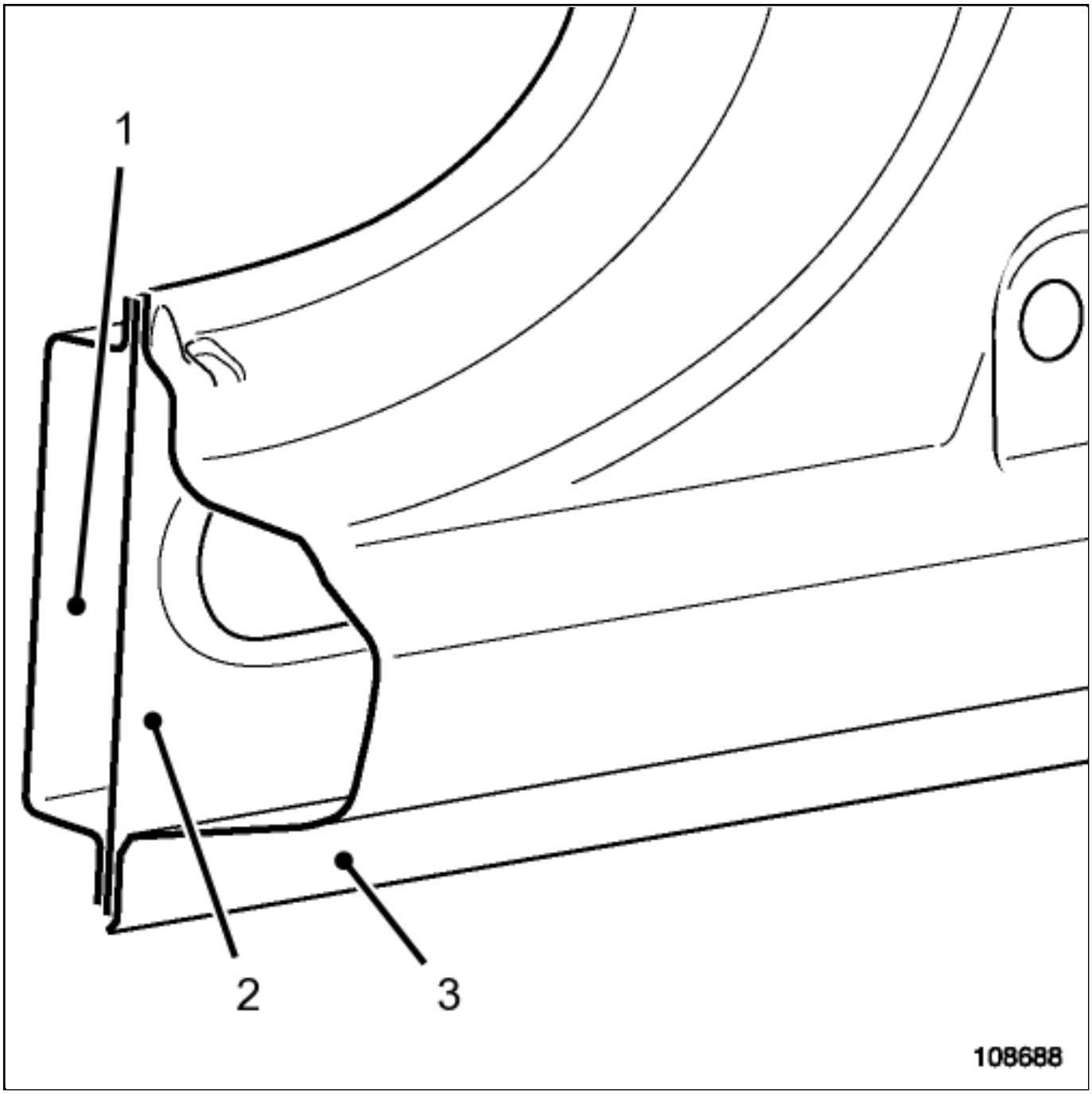
Note:

For the test to be valid, carry out exactly the same operations on the vehicle:

first weld two panels, then the third panel.

Example of three-panel stack:

No.	Description	Type	Thickness (mm)
(1)	inner sill panel	HLE	0.85
(2)	sill panel reinforcement	HLE	1.5
(3)	sill panel	Mild steel	0.75



The thinnest in the stack(1) of the first two panels assembled ((1) and (2)), then the third panel in the

stack (3) .

■ Select the settings that correspond most closely to the grade and thickness of the reference panel, according to the table below.

3. TABLE OF PRE-ADJUSTMENTS

Note:

This chart should always be confirmed by a peeling test on samples according to the procedure explained in section IV.

1- CHART FOR HIGH CURRENT + SHORT TIME

Under optimal conditions short welds (high current; short time) are preferred.

Grades	Thickness of reference panel	Current (A)	Time (ms)	Effort (daN)
Mild steel	0.7 mm	11000	200	450
	1 mm	11500	200	450
HEL steel	0.85 mm	11500	250	450
	1.5 mm	12000	250	450
Very high/ultra high elastic limit steel	1 mm	12000	300	450
	2.5 mm	12500	300	450

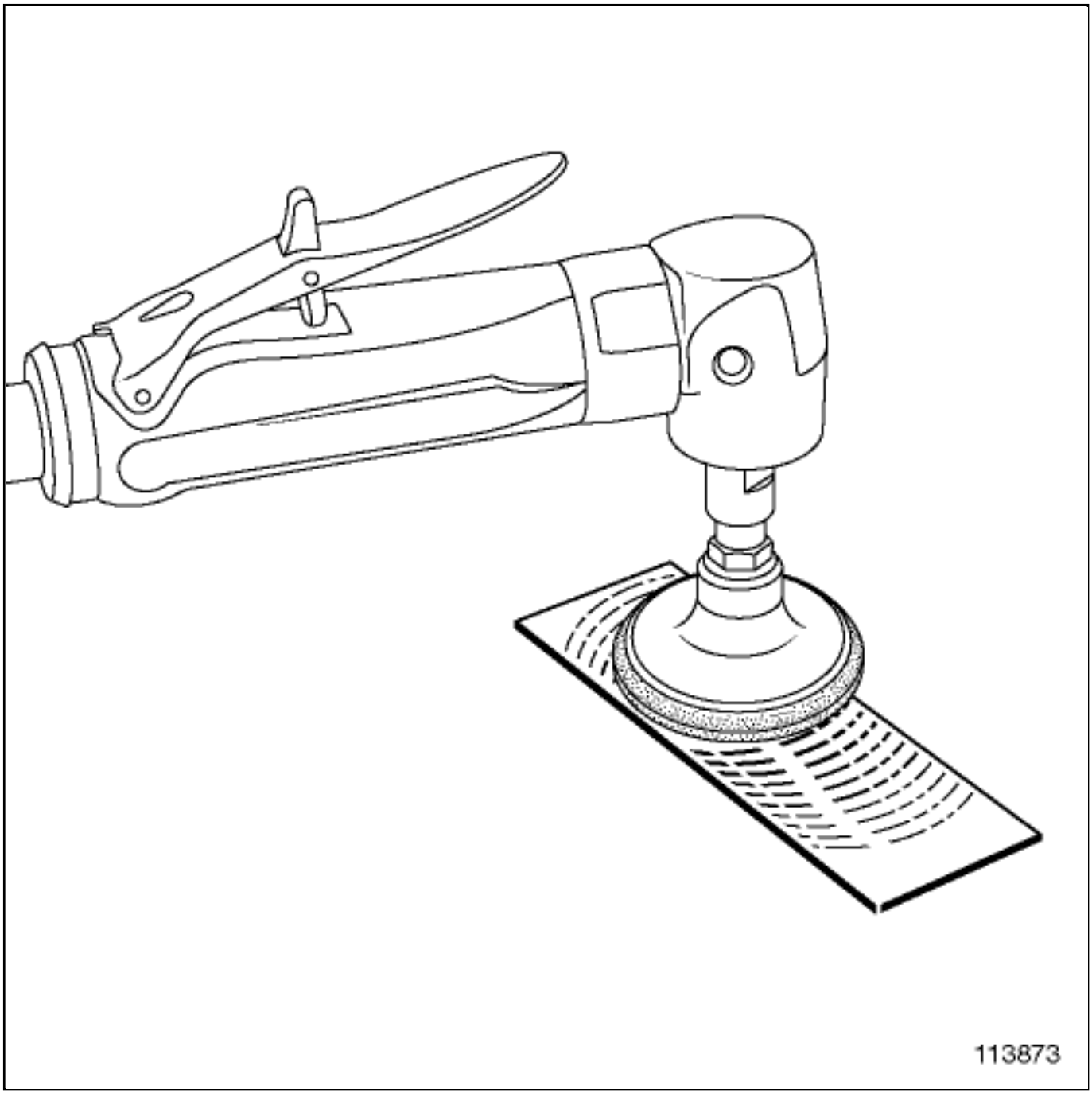
4. PEELING TEST FOR A DOUBLE THICKNESS ASSEMBLY

WARNING

To avoid any accidents:

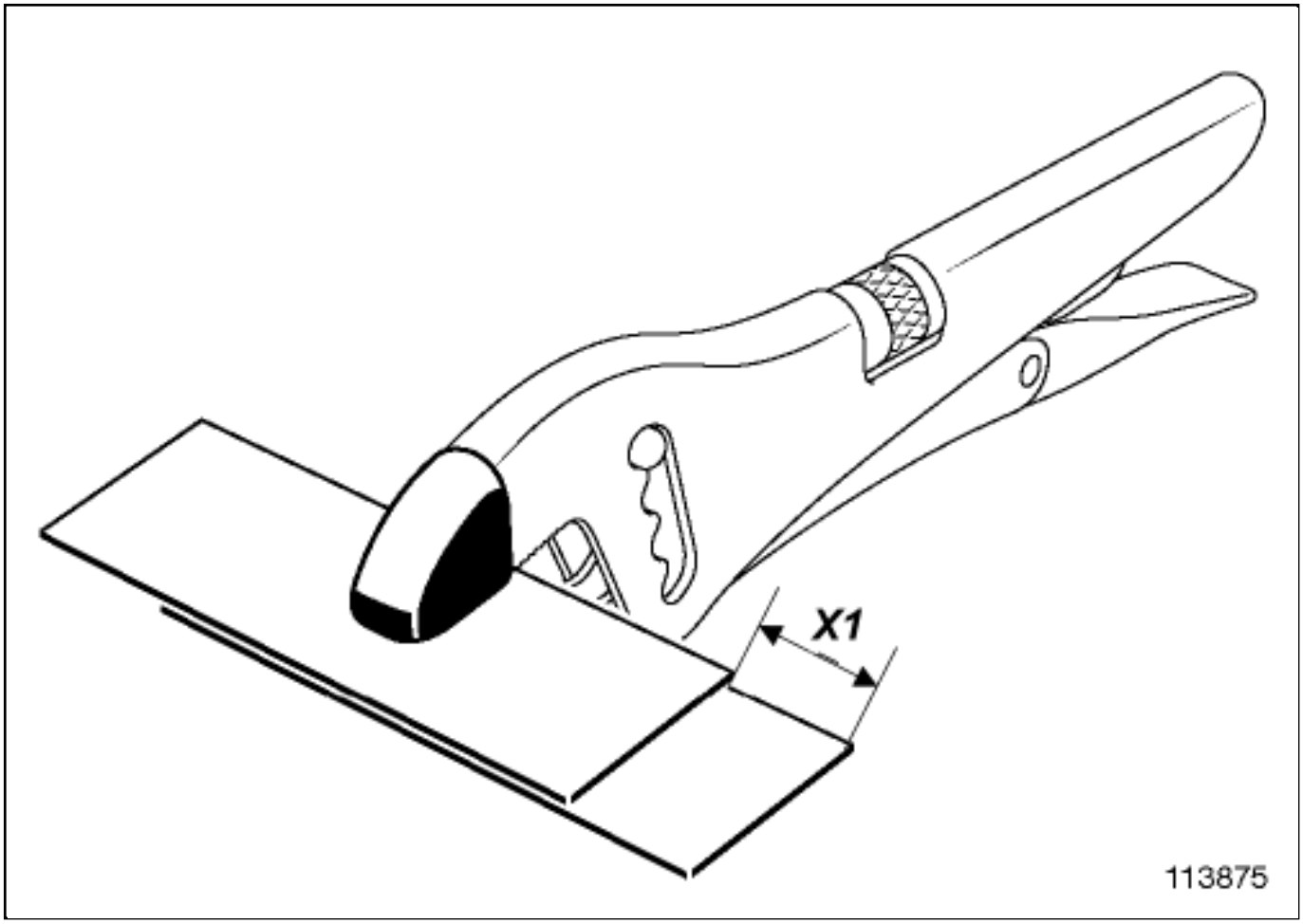
- the vice used for the test should be correctly fixed to the workbench, and the workbench fixed to the floor,
- when carrying out peeling, do not work in front of the tool, as the spot weld may suddenly give, or the jaw of the tool may slip from the test specimen.

Use samples of the same steel grade and thickness as the stacks being tested (see vehicle MR) and the peeling toolKit for checking weld seams.(Car. 1779) or sets of replacement part test specimensSet of replacement test pieces for tool Car. 1779(Car. 1800) .



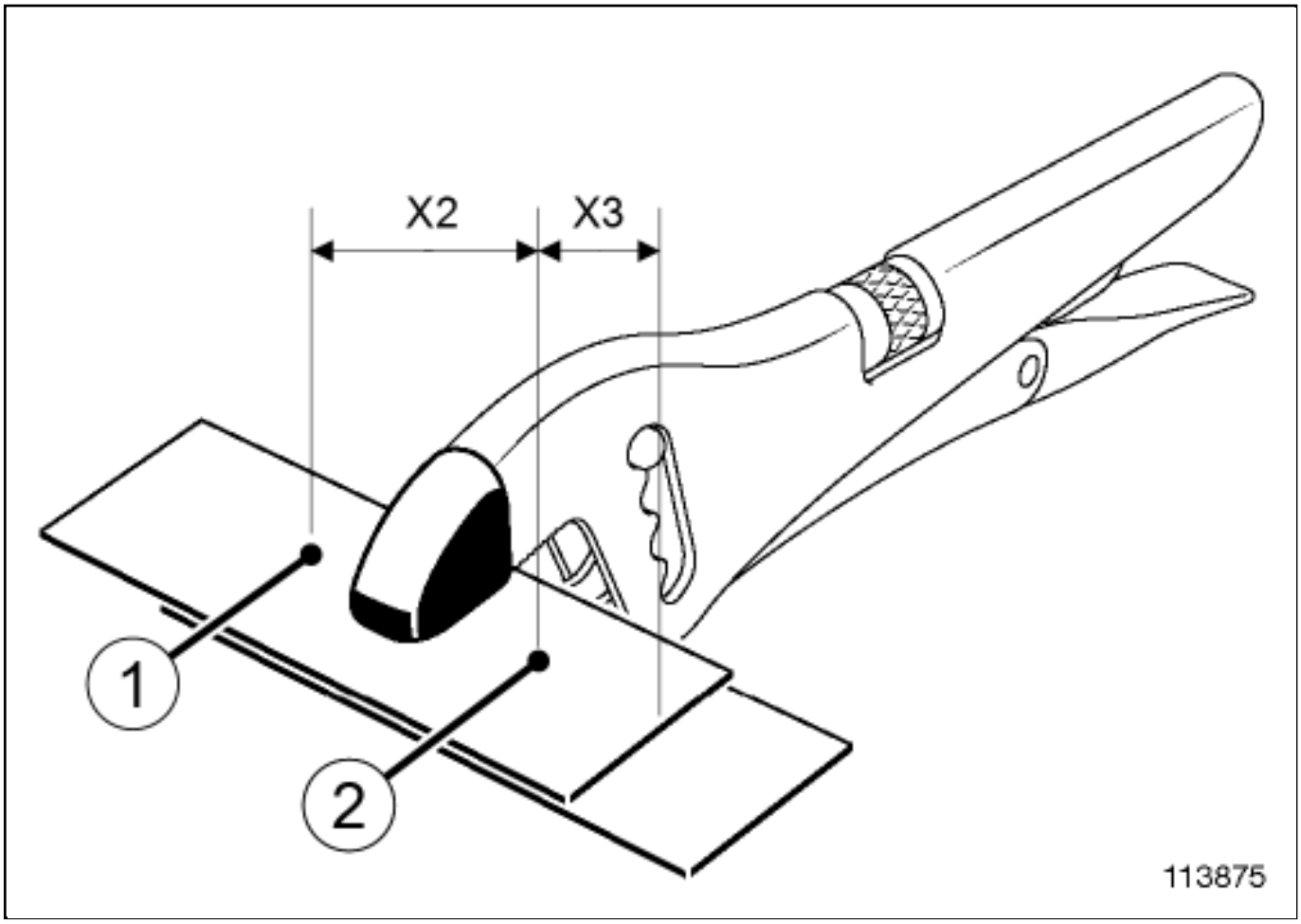
Prepare the test specimens in the same way as the vehicle .

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection with direct access: Description)



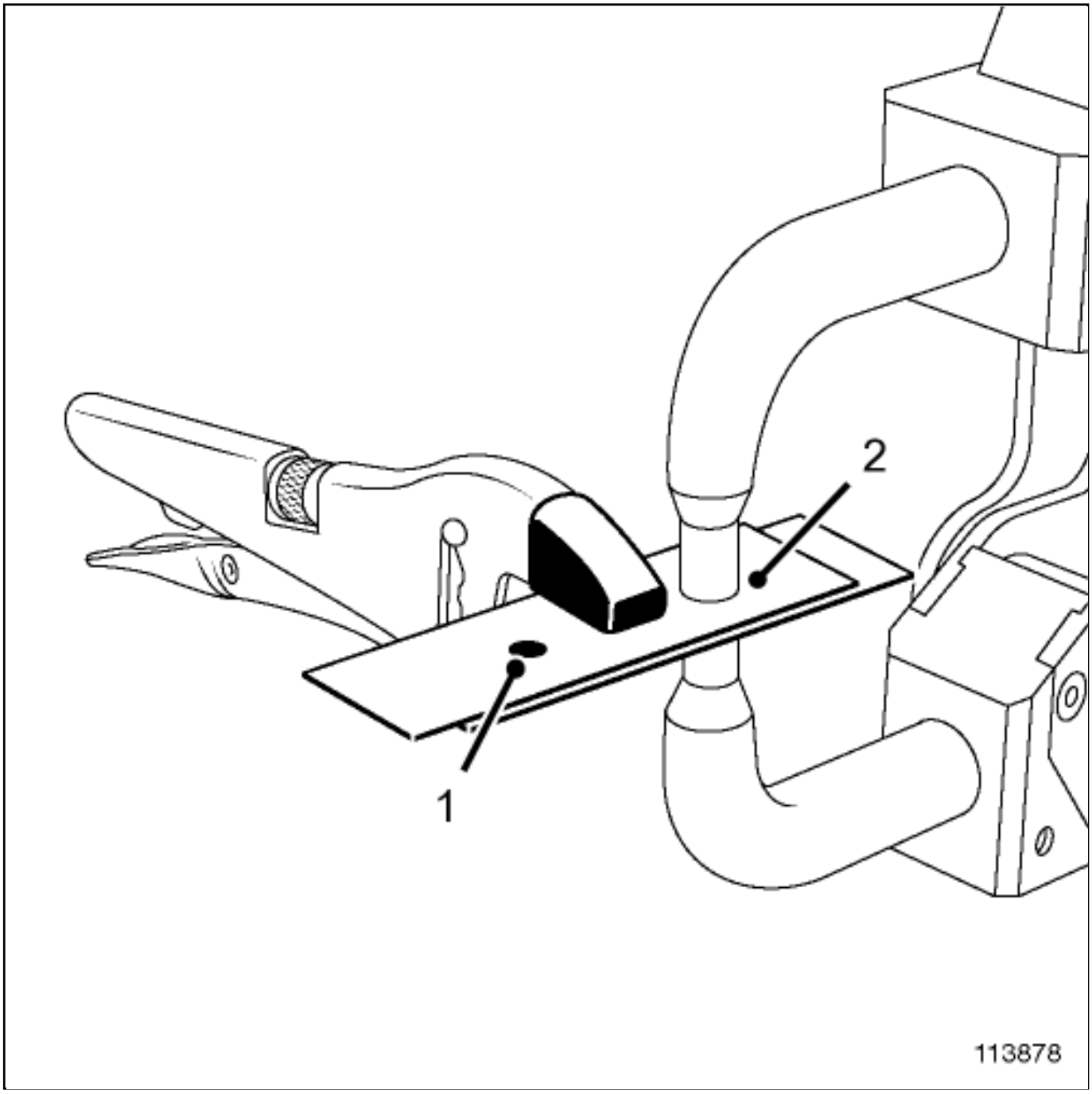
Adjust the panel test specimens by staggering them by(X1) = 20 mm.

Hold the joint in place using locking pliers at the insulated ends.



Mark the position of the two resistance spot welds(1) and (2) on the test specimen according to the following position values:

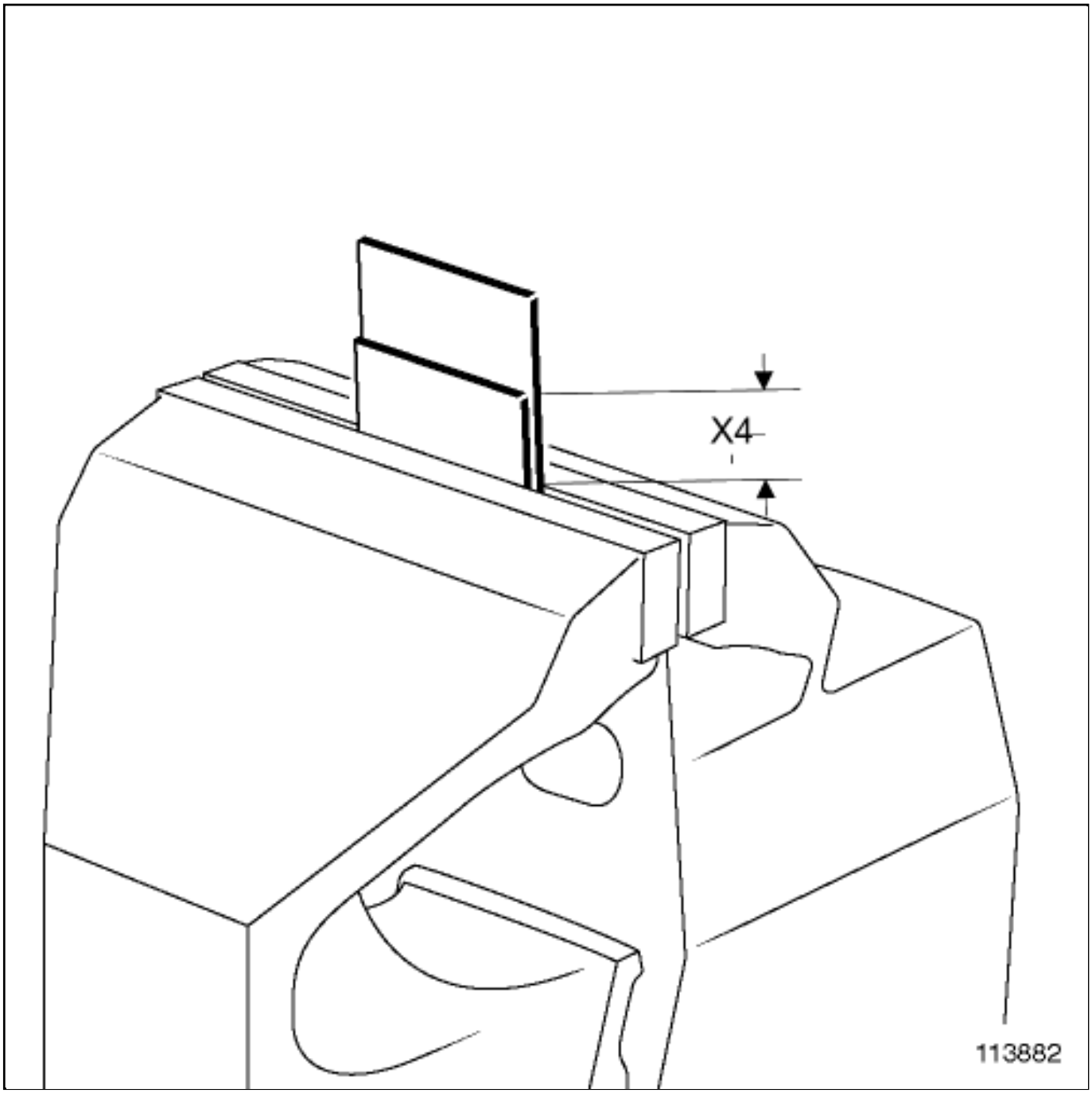
- (X2) = 40 mm
- (X3) = 20 mm



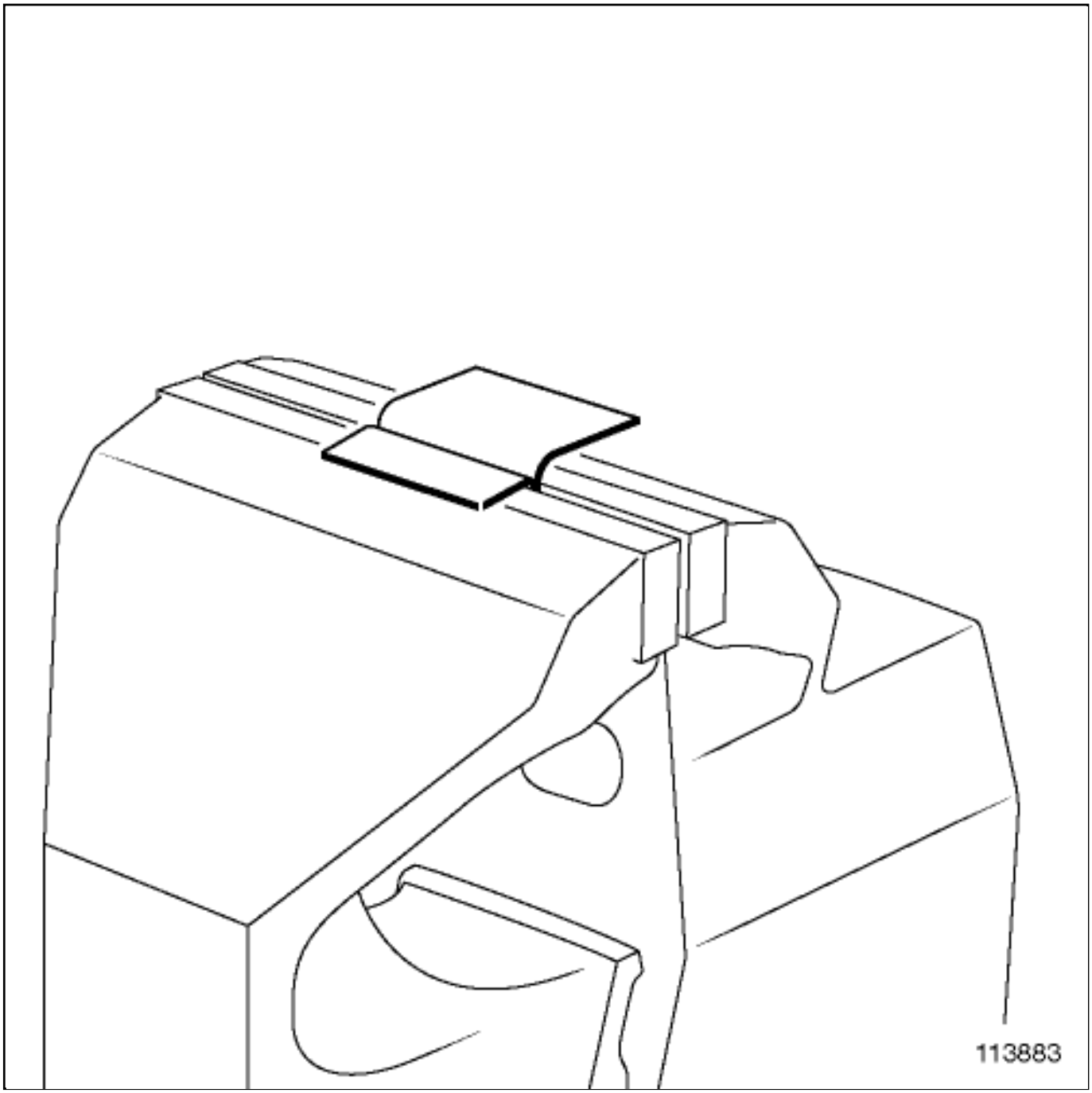
According to the adjustments defined according to the tables in section III.

Make the holding spot(1) ,

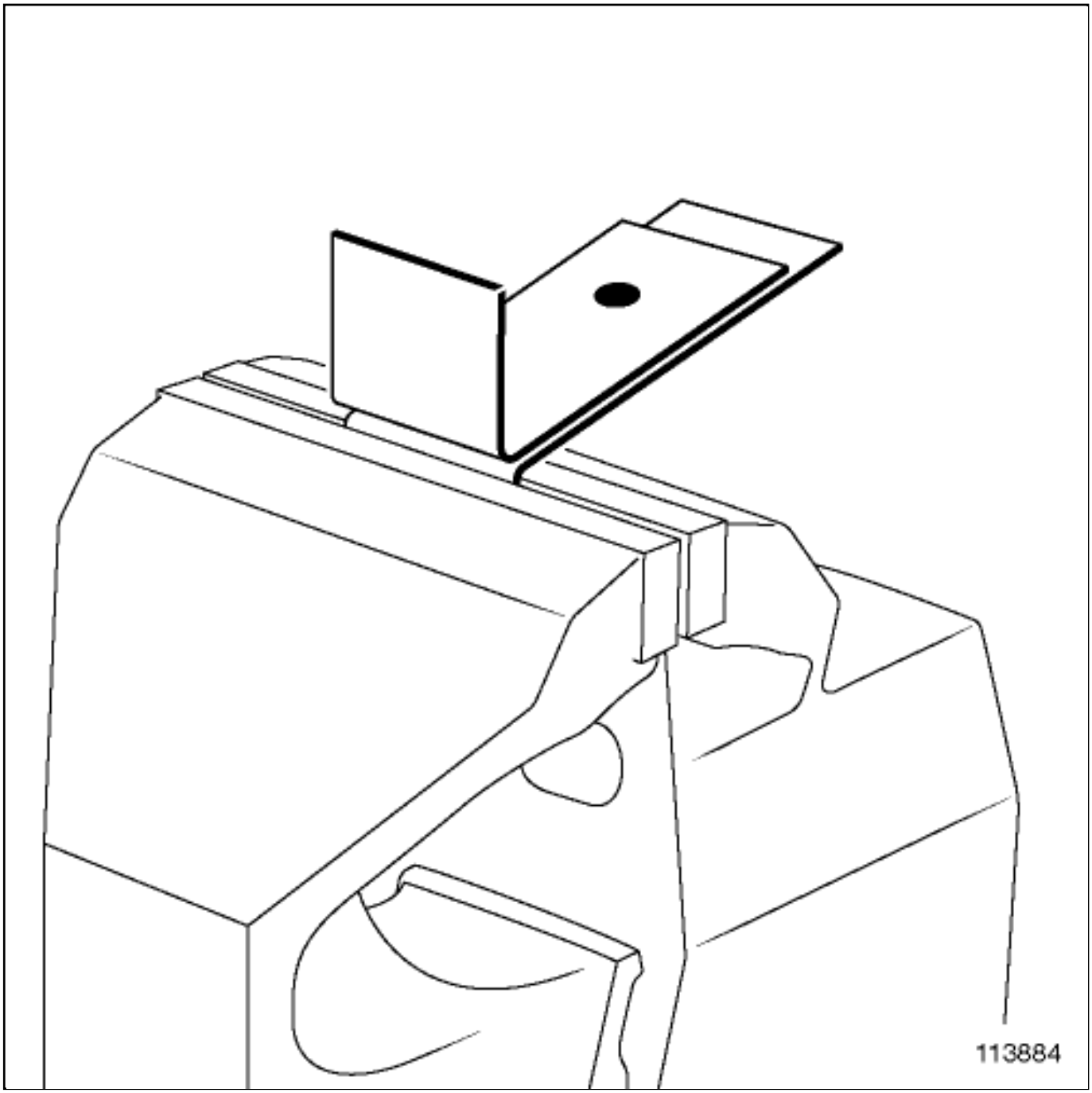
Make the peeling spot(2) .



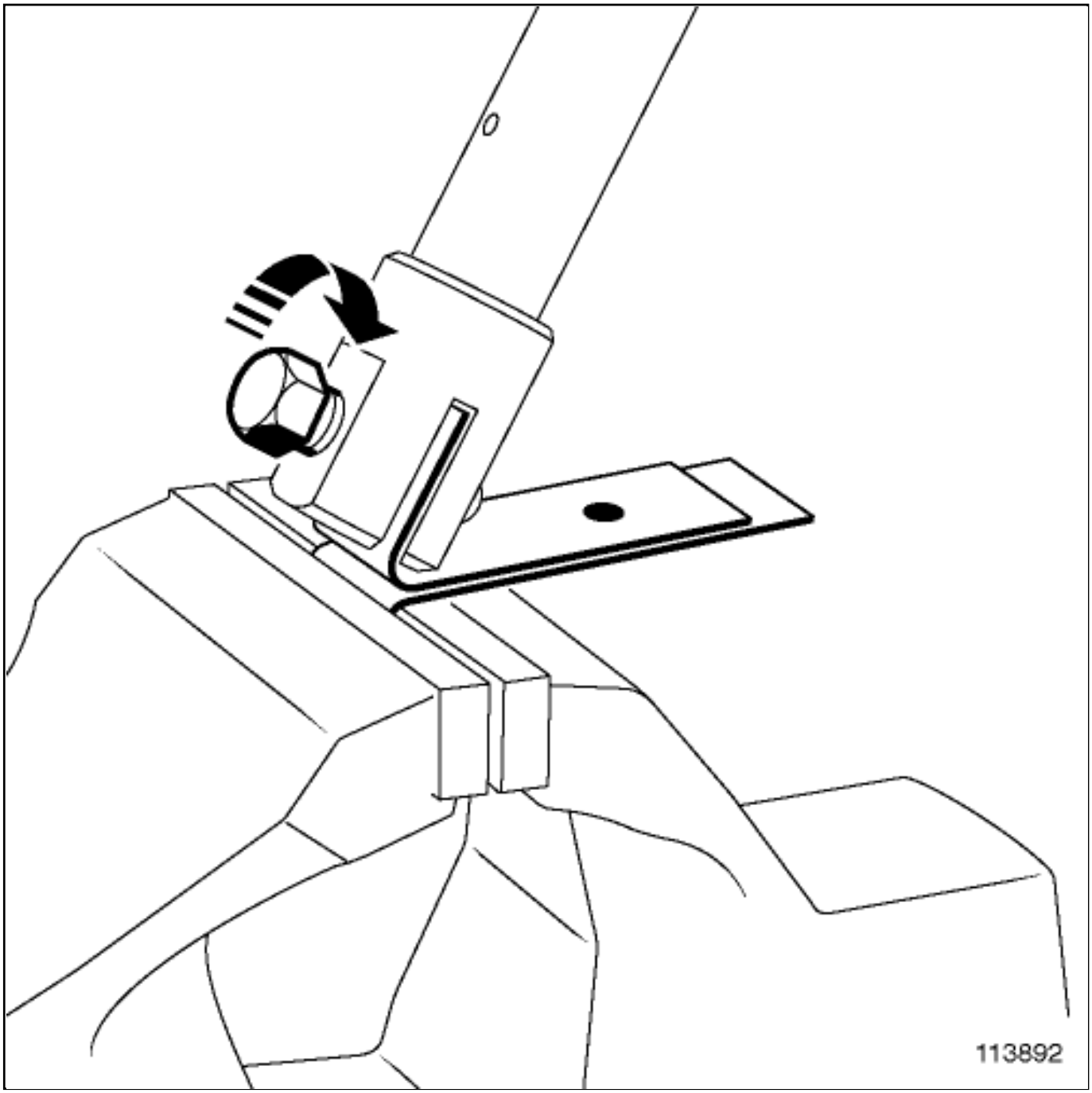
Secure the test specimens in the vice, respecting the value(x_4) = 15 mmshown in the illustration, to avoid damaging the spot weld during the following stage.



Fold down the two panel test specimens.



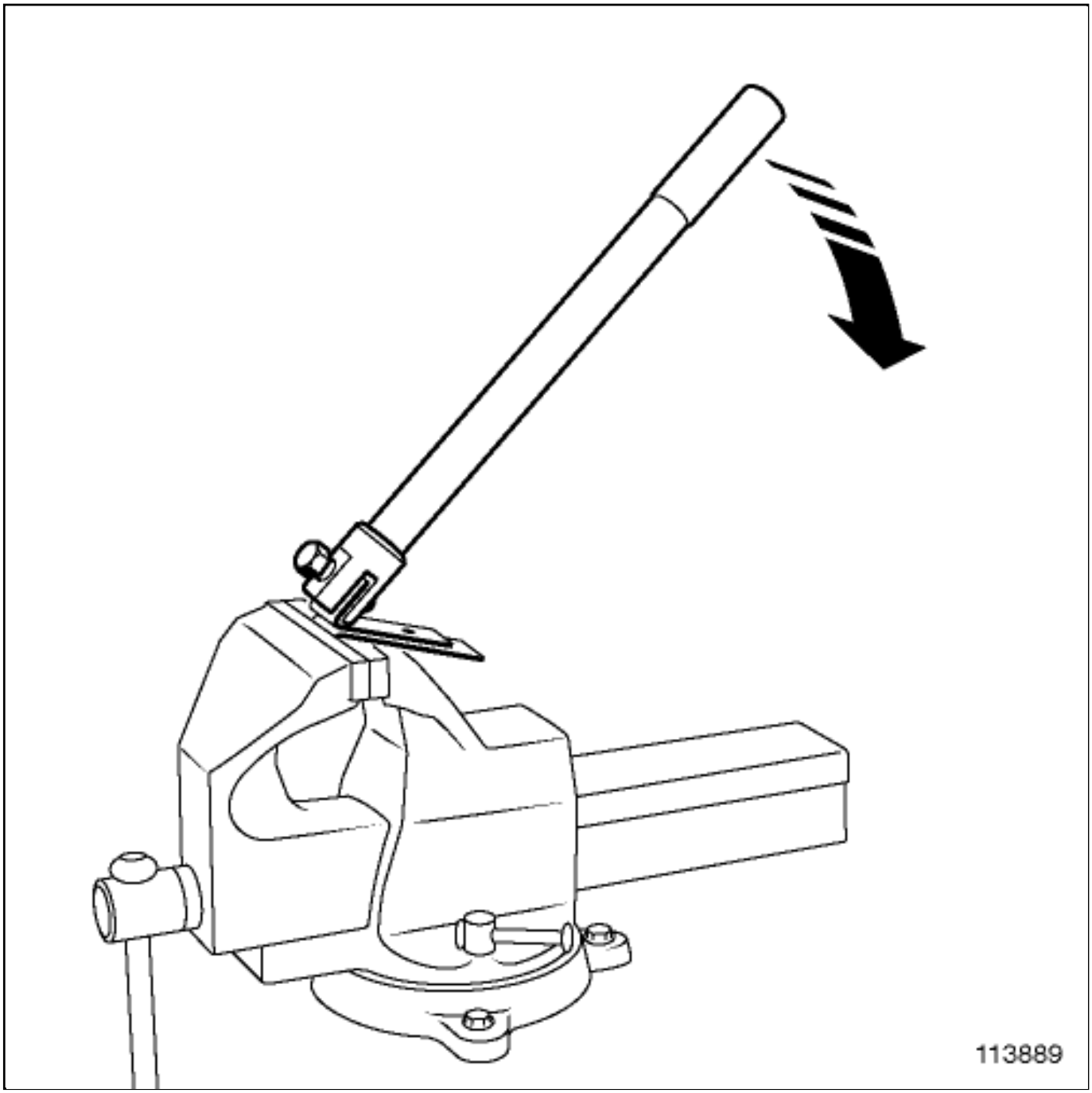
Secure the test specimens in the vice again as shown in the illustration.



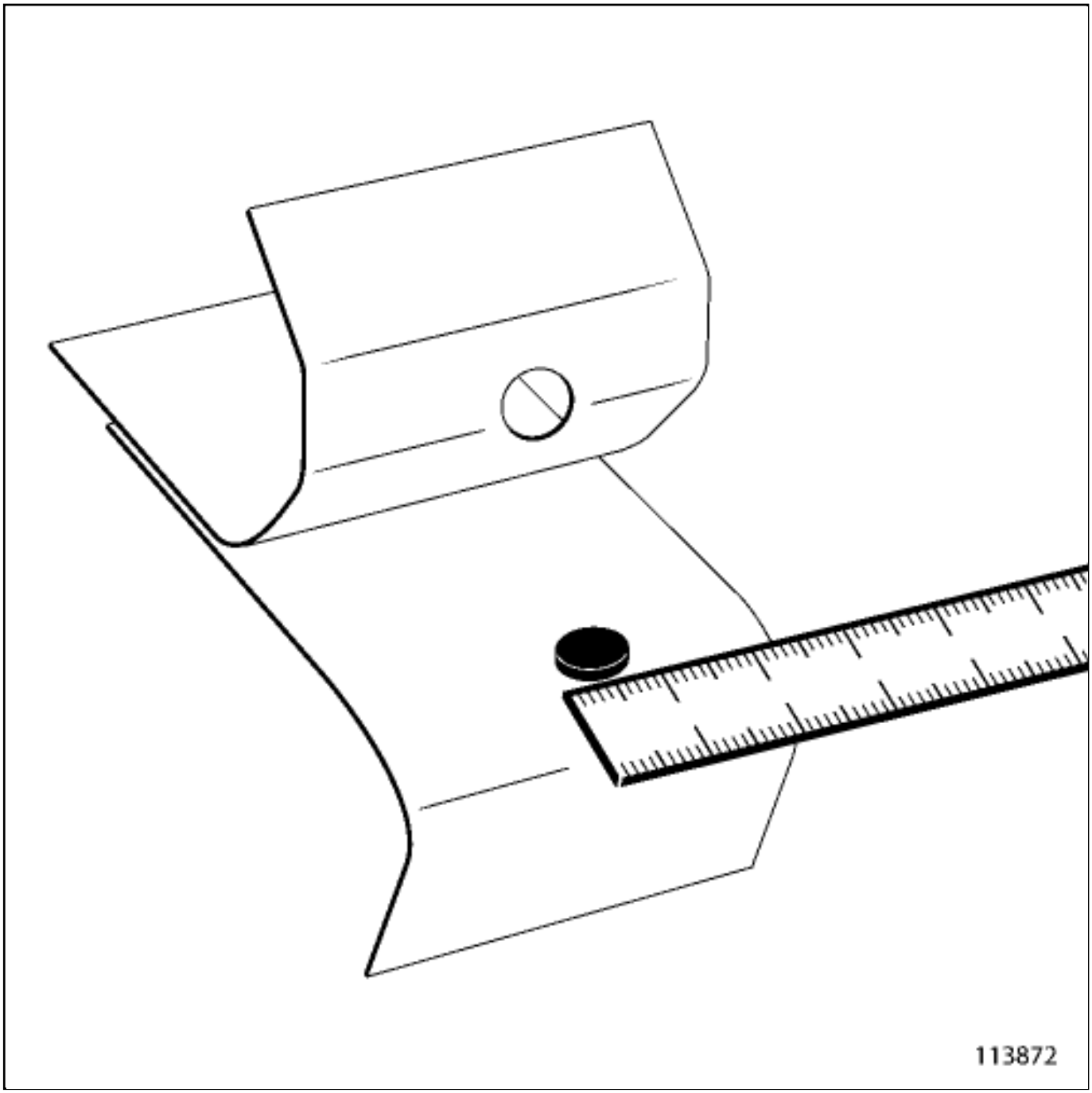
Secure the jaw of the peeling tool.

WARNING

To avoid any accidents, tighten the jaw of the tool to prevent slipping during peeling.



Peel the assembly, applying continuous pressure.



Interpreting the results: section VI.

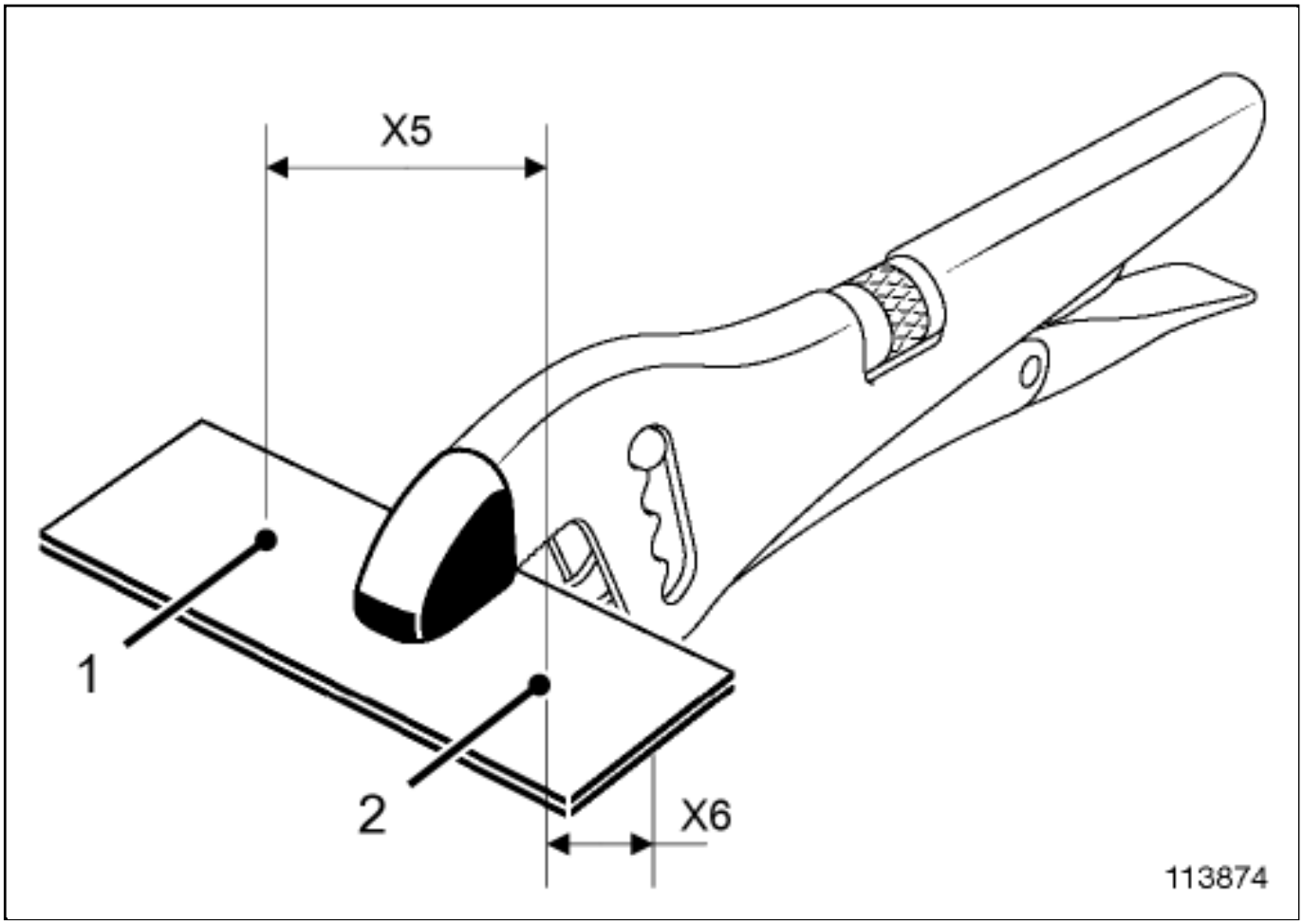
5. PEELING TEST FOR A TRIPLE-THICKNESS ASSEMBLY

Note:

For the test to be valid, carry out exactly the same operations on the vehicle:

first weld two panels, then the third panel.

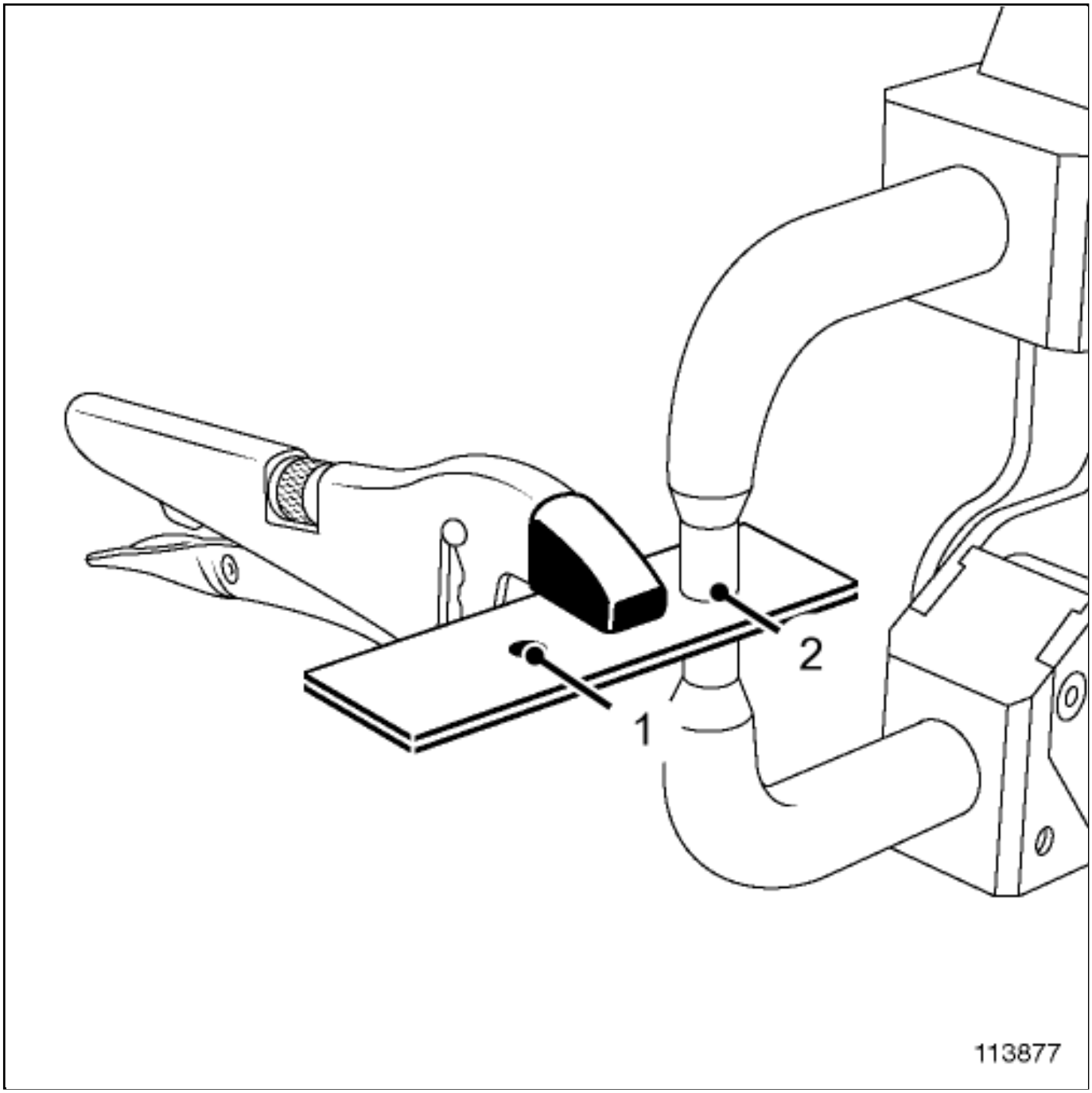
First confirm the adjustments for the first two panels following the procedure for a PEELING TEST FOR A DOUBLE THICKNESS ASSEMBLY.



Prepare two test specimens that correspond to the first two panels, respecting the gaps between the spot welds, and aligning them exactly one on top of the other.

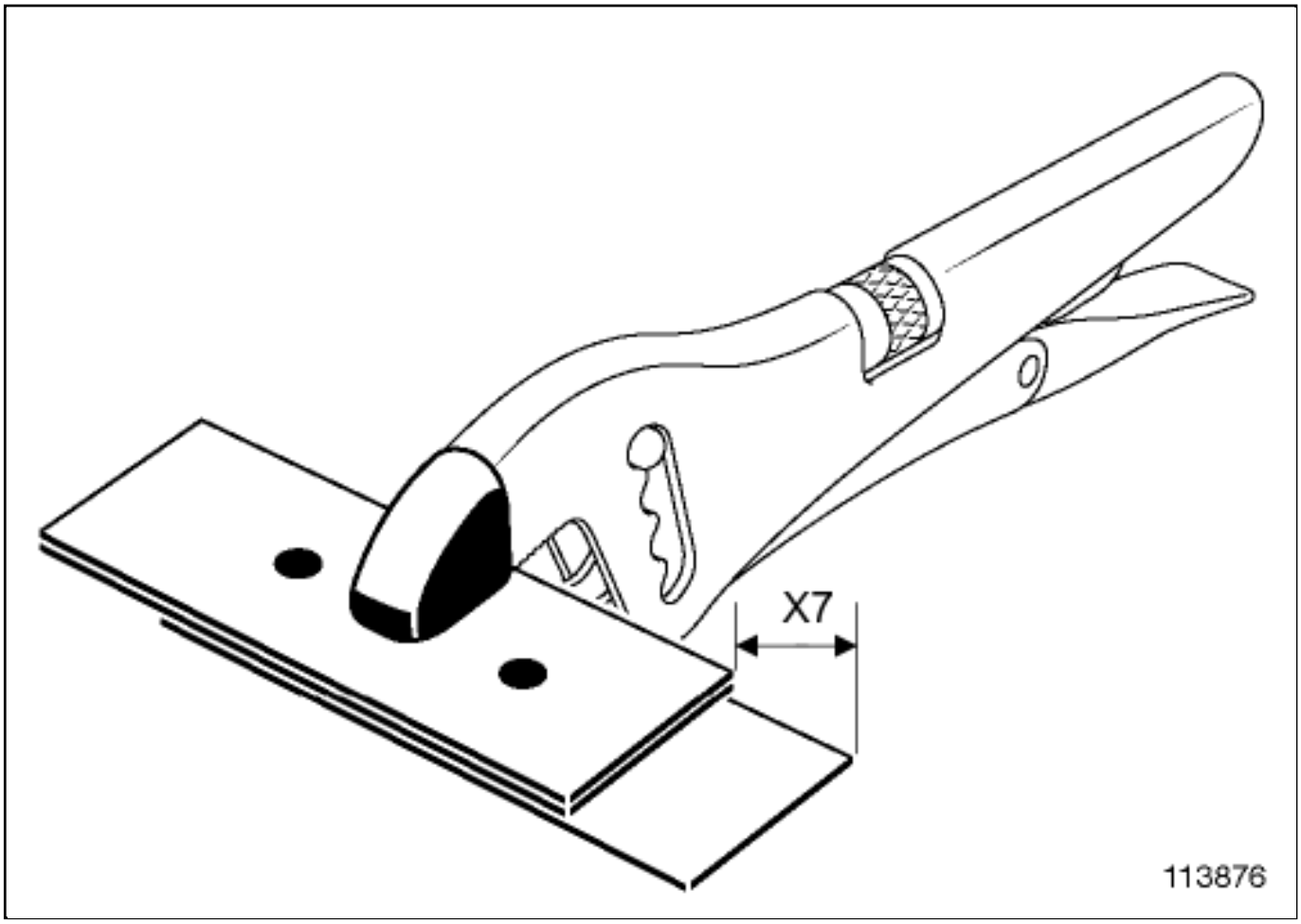
Position values of the spots:

- (X6) = 20 mm,
- (X5) = 40 mm minimum.



Make the holding spot(1) .

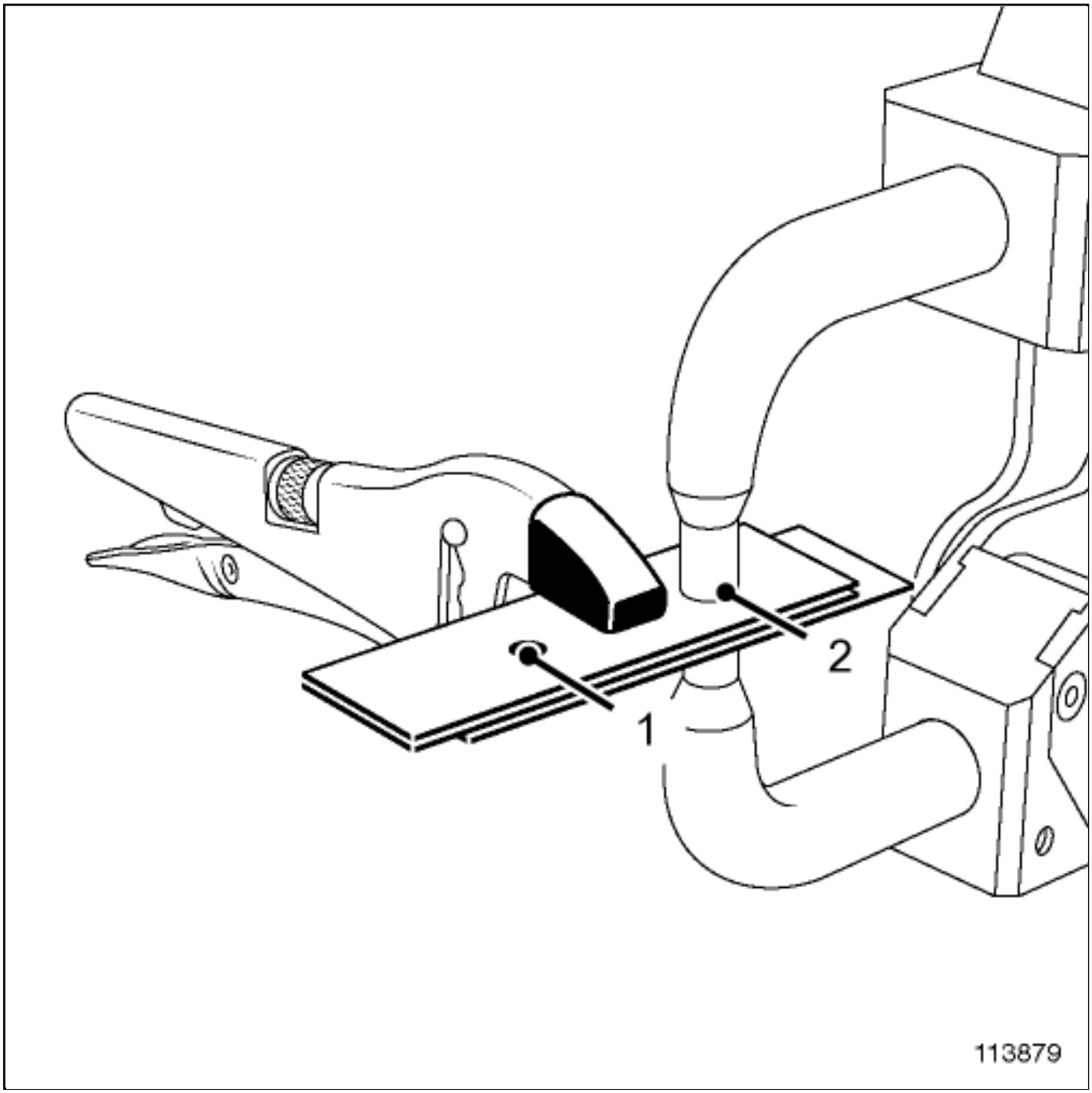
Make the peeling spot(2) , keeping to the predefined adjustments.



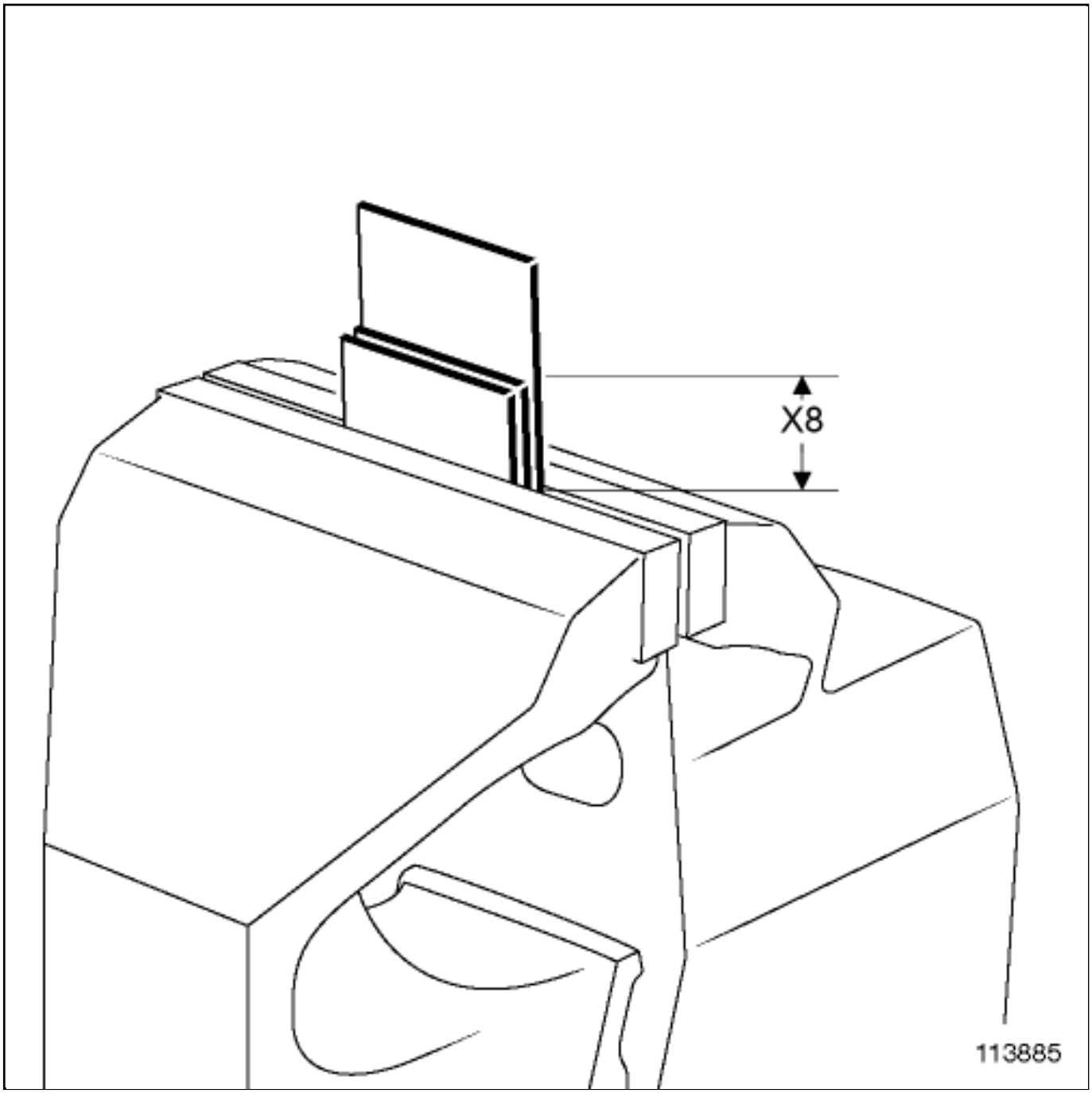
Position the third panel, respecting the stack order (thickness/grade).

Offset the latter by(X7) = 20 mm.

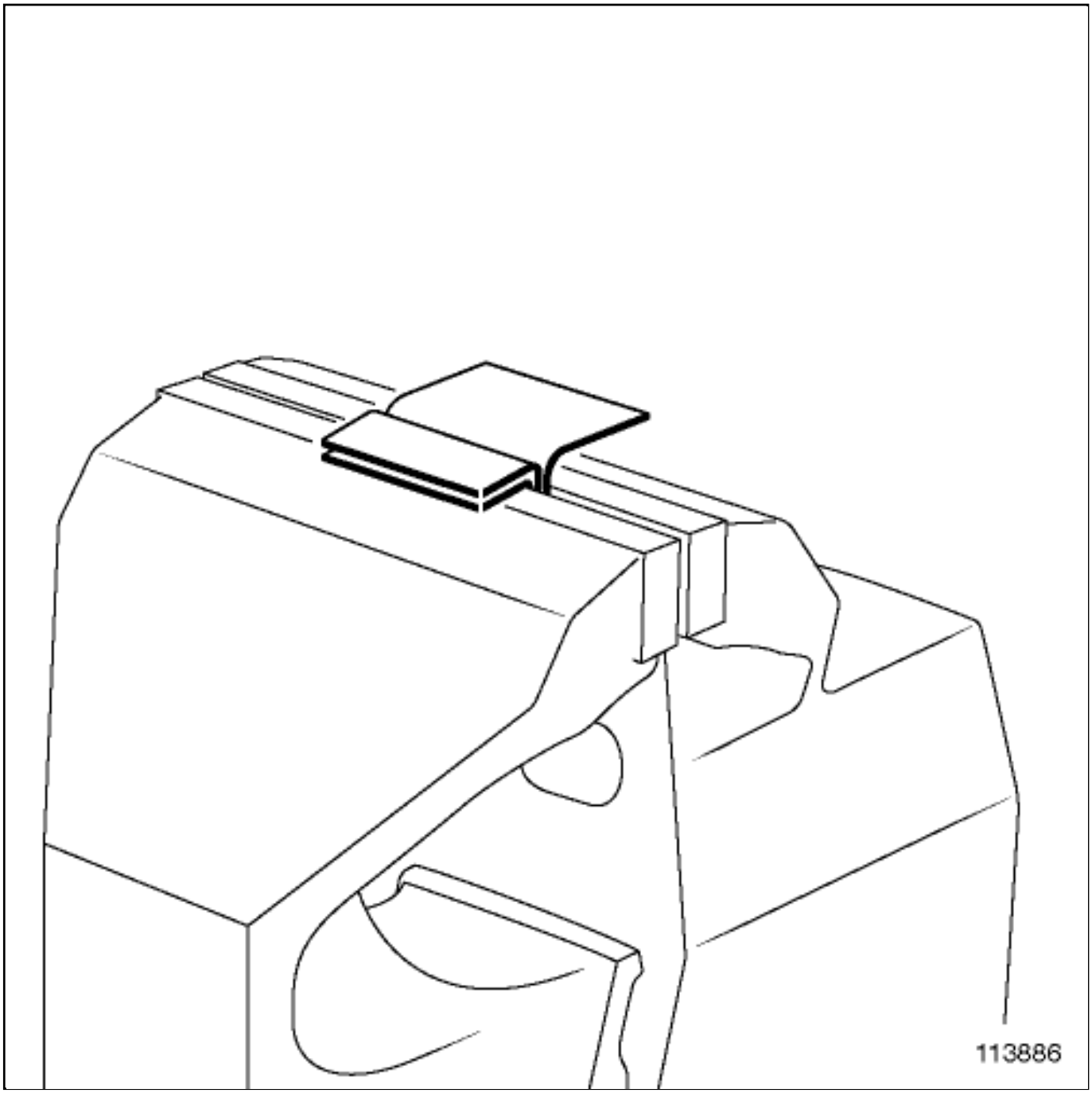
Secure it using separate locking pliers.



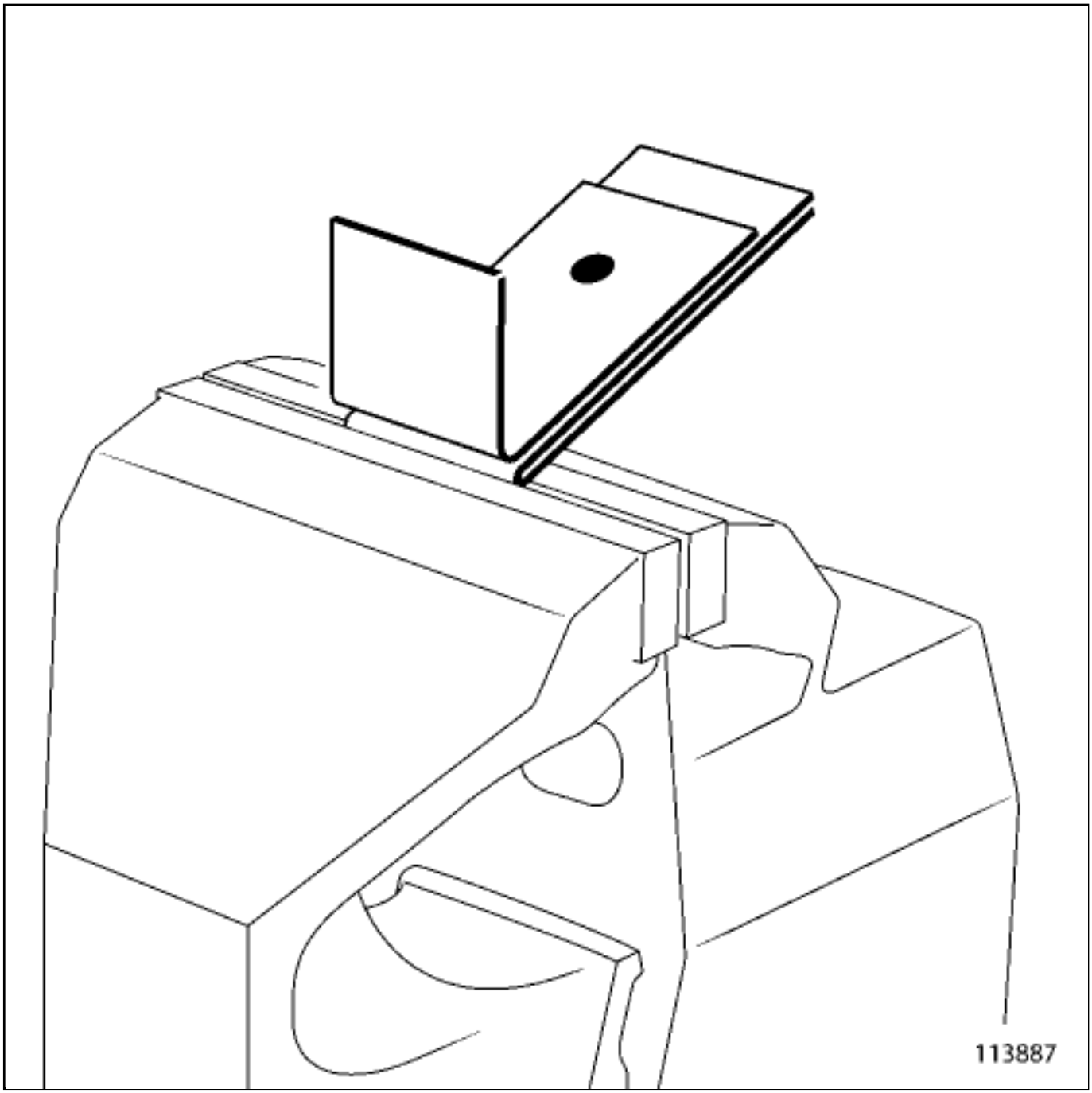
Make the spot welds(1) and (2) over the existing spots on the first two panels.



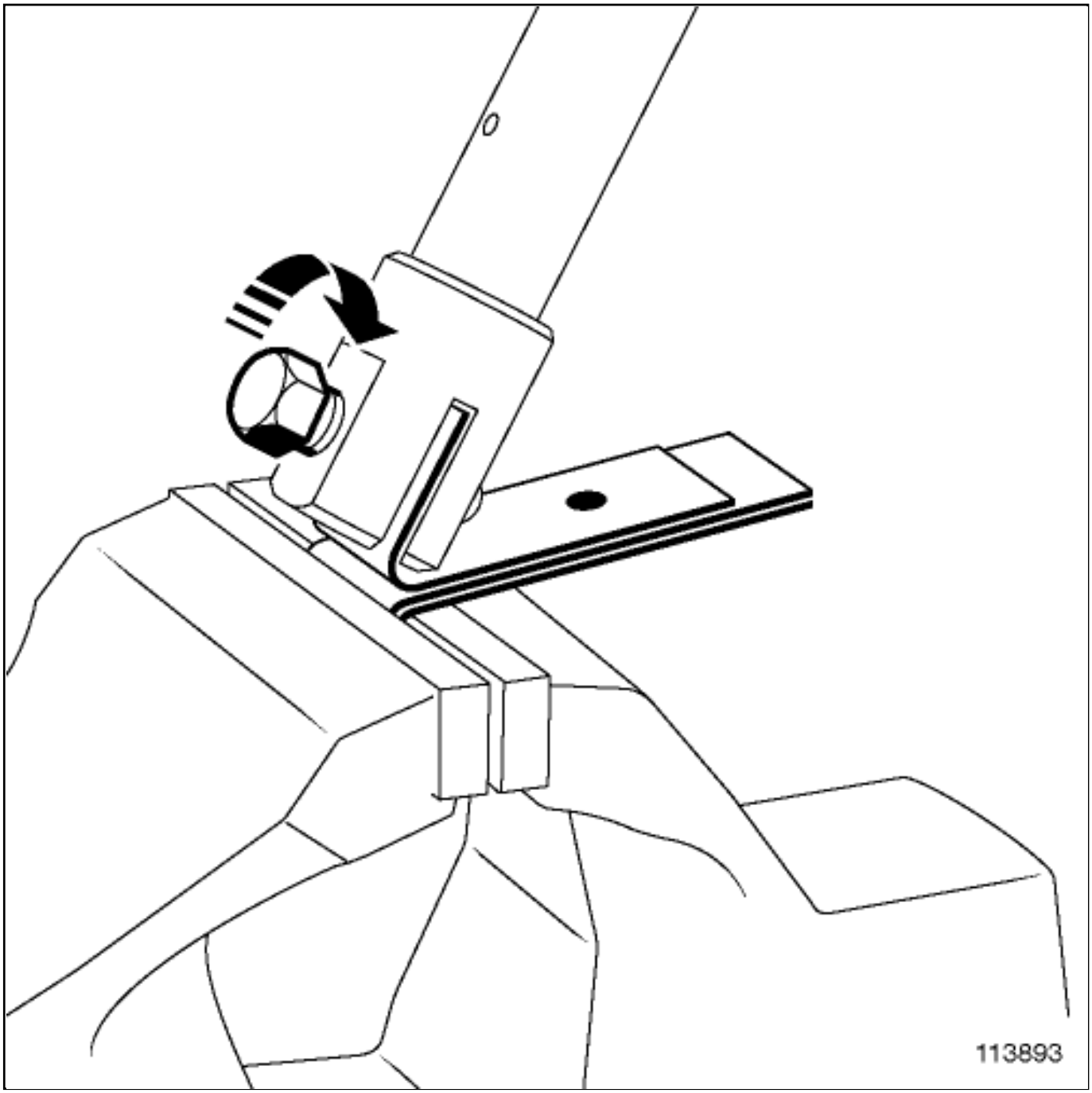
Secure the test specimens in the vice, respecting the dimension(X_8) = 15 mm.



Fold down the test specimens, as shown in the illustration.



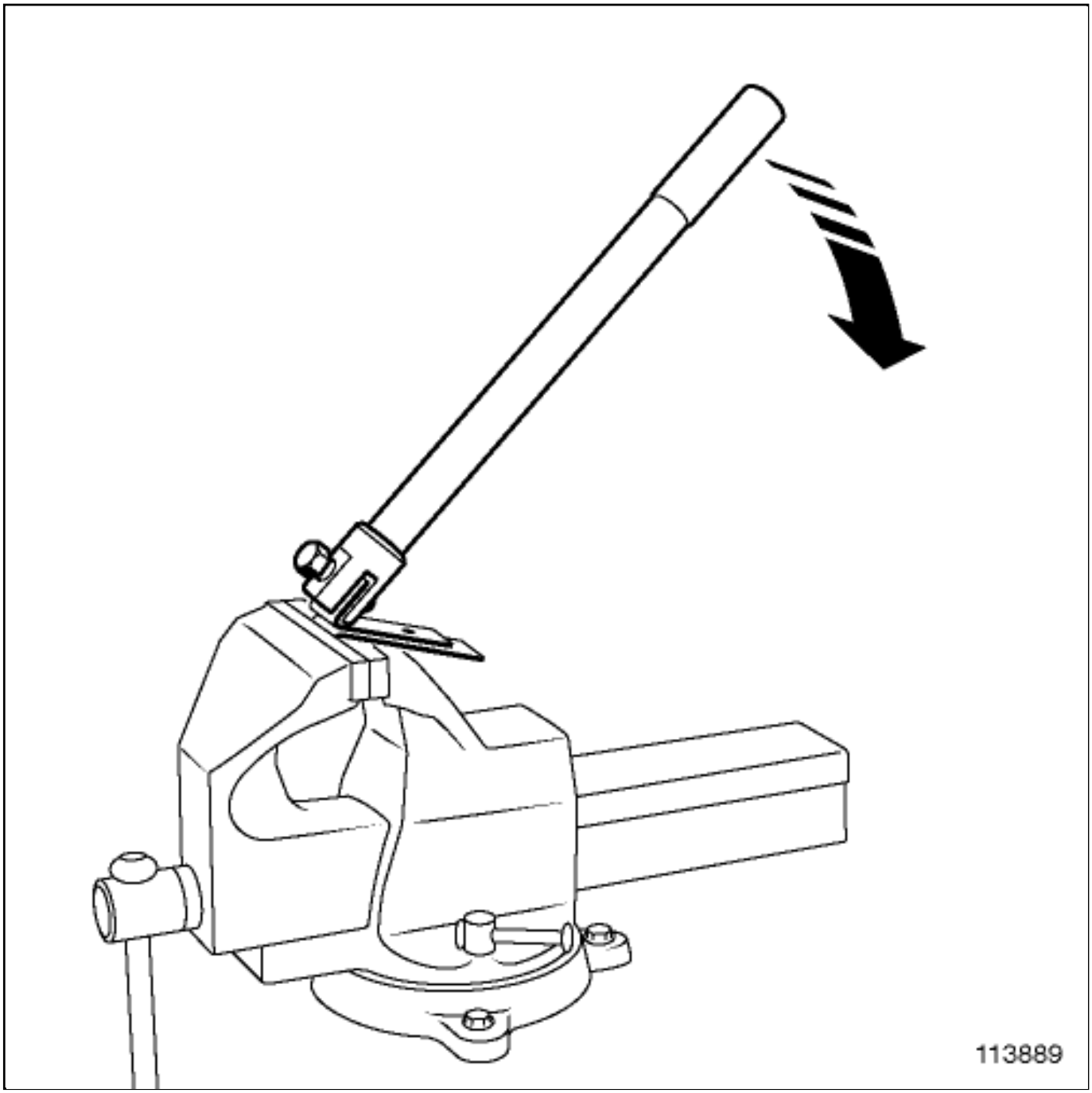
Secure the test specimens in the vice.



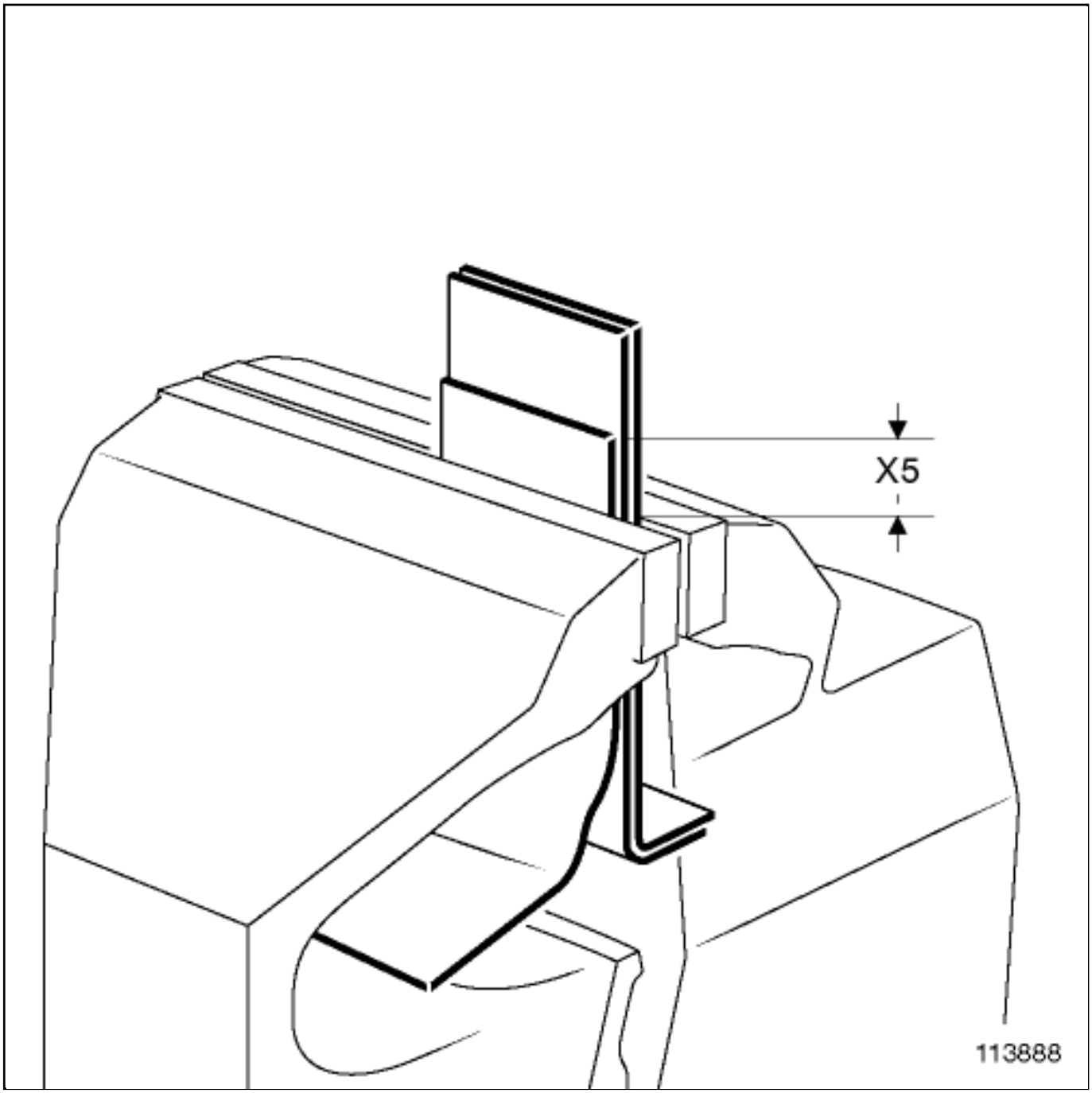
Secure the jaw of the peeling tool.

WARNING

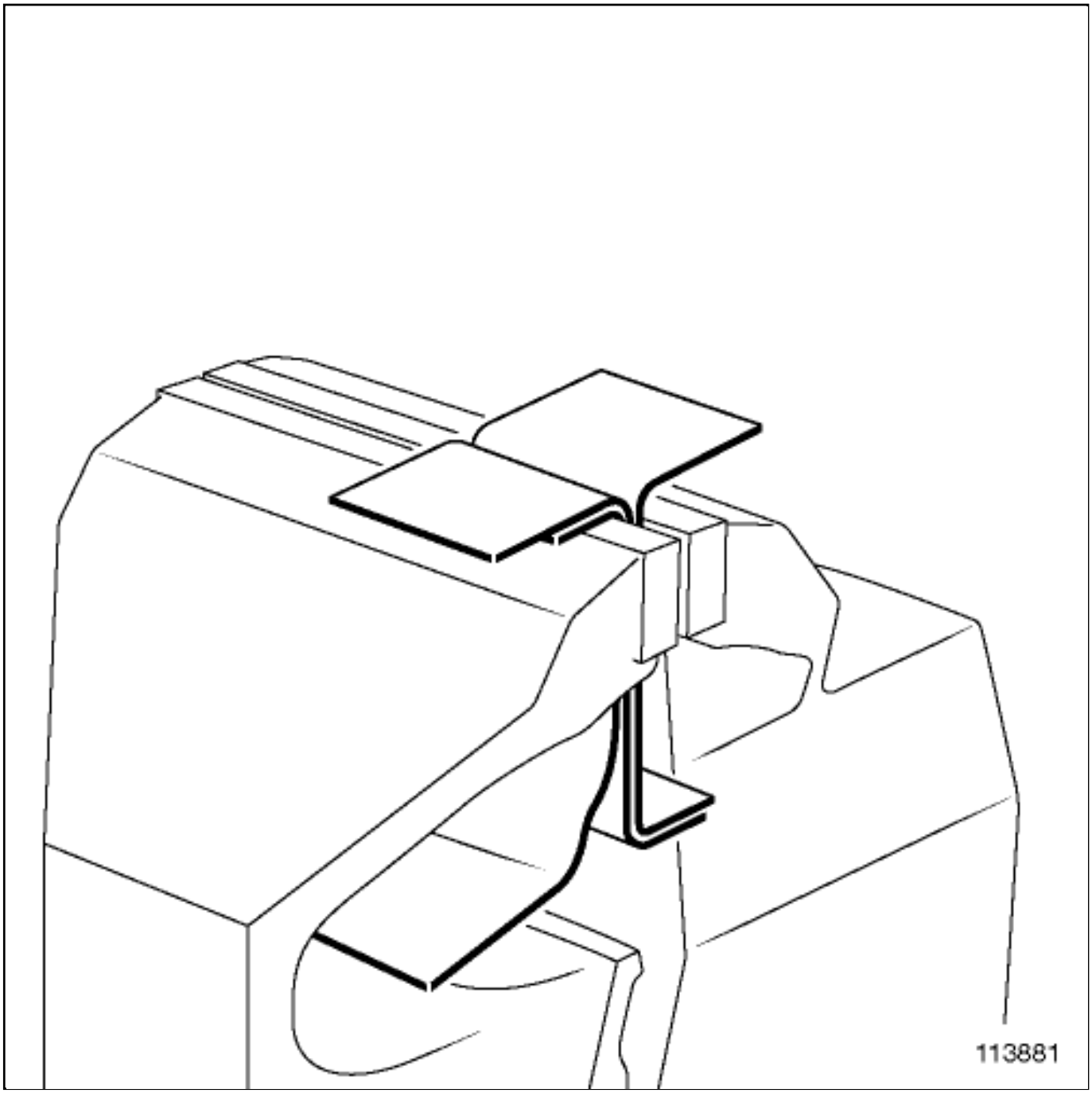
To avoid any accidents, tighten the jaw of the tool to prevent slipping during peeling.



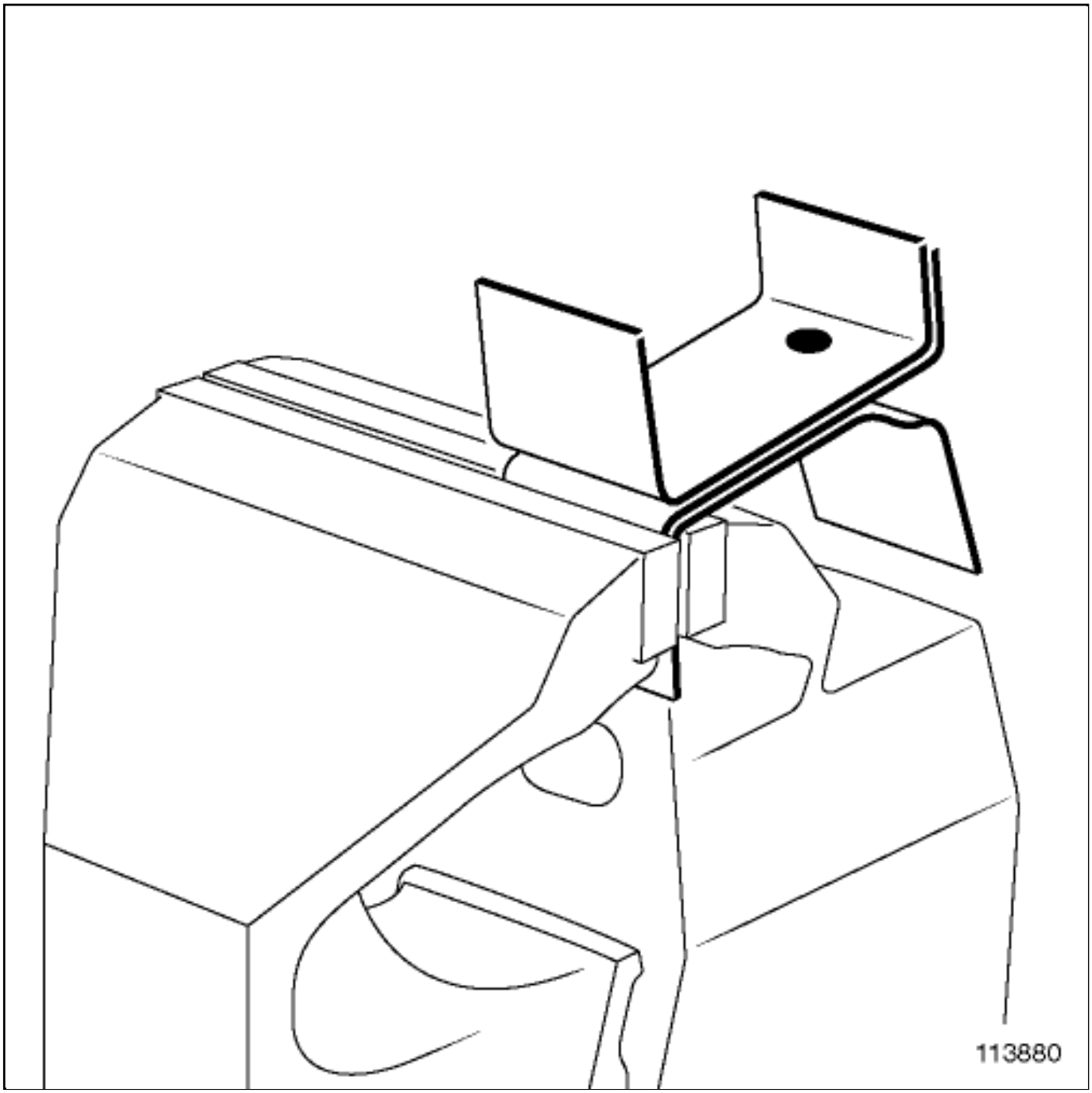
Peel the assembly, applying continuous pressure.



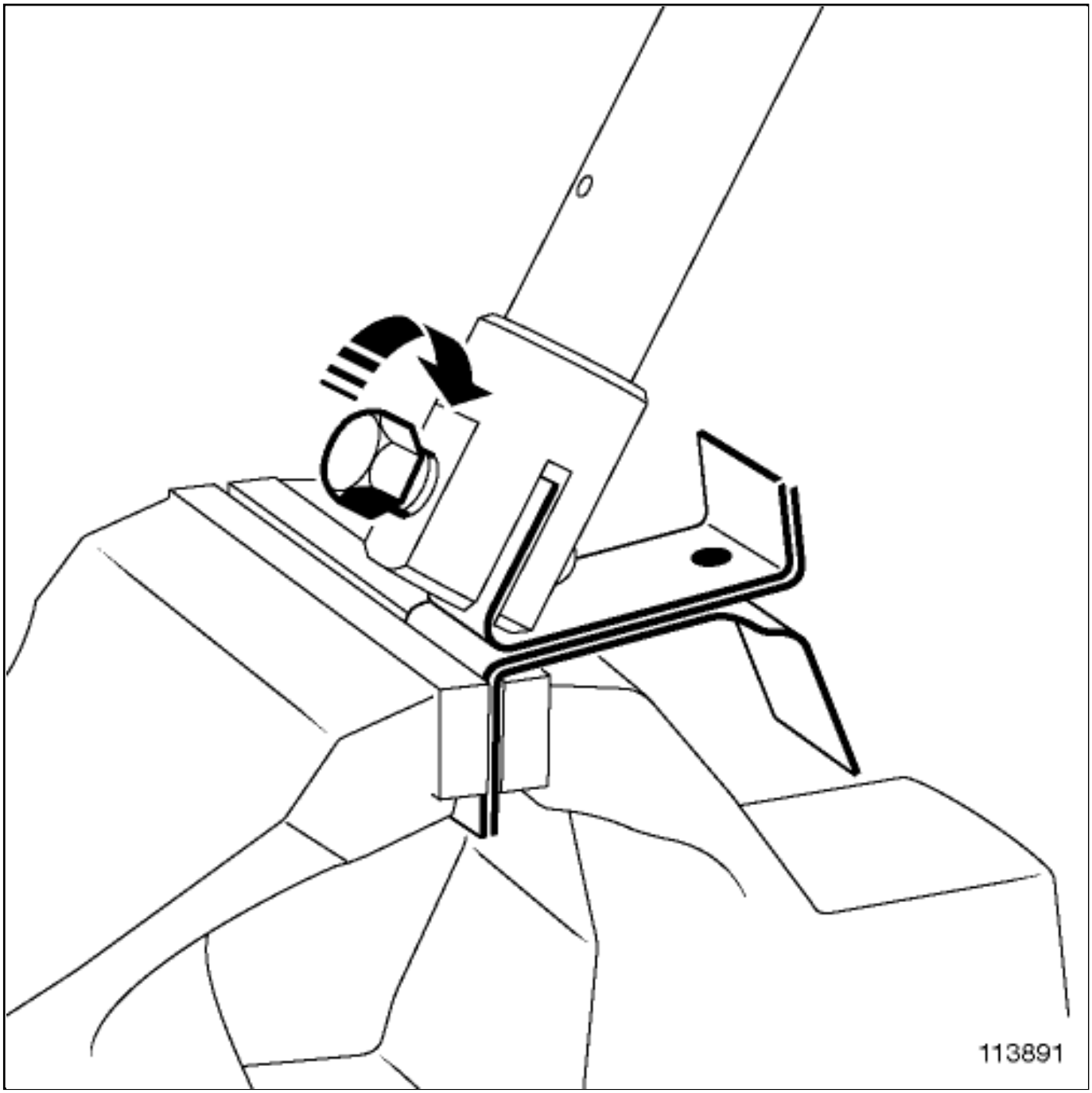
Re-secure the test specimens in the vice(X_5) = 15 mm.



Fold down the test specimens, as shown in the illustration.



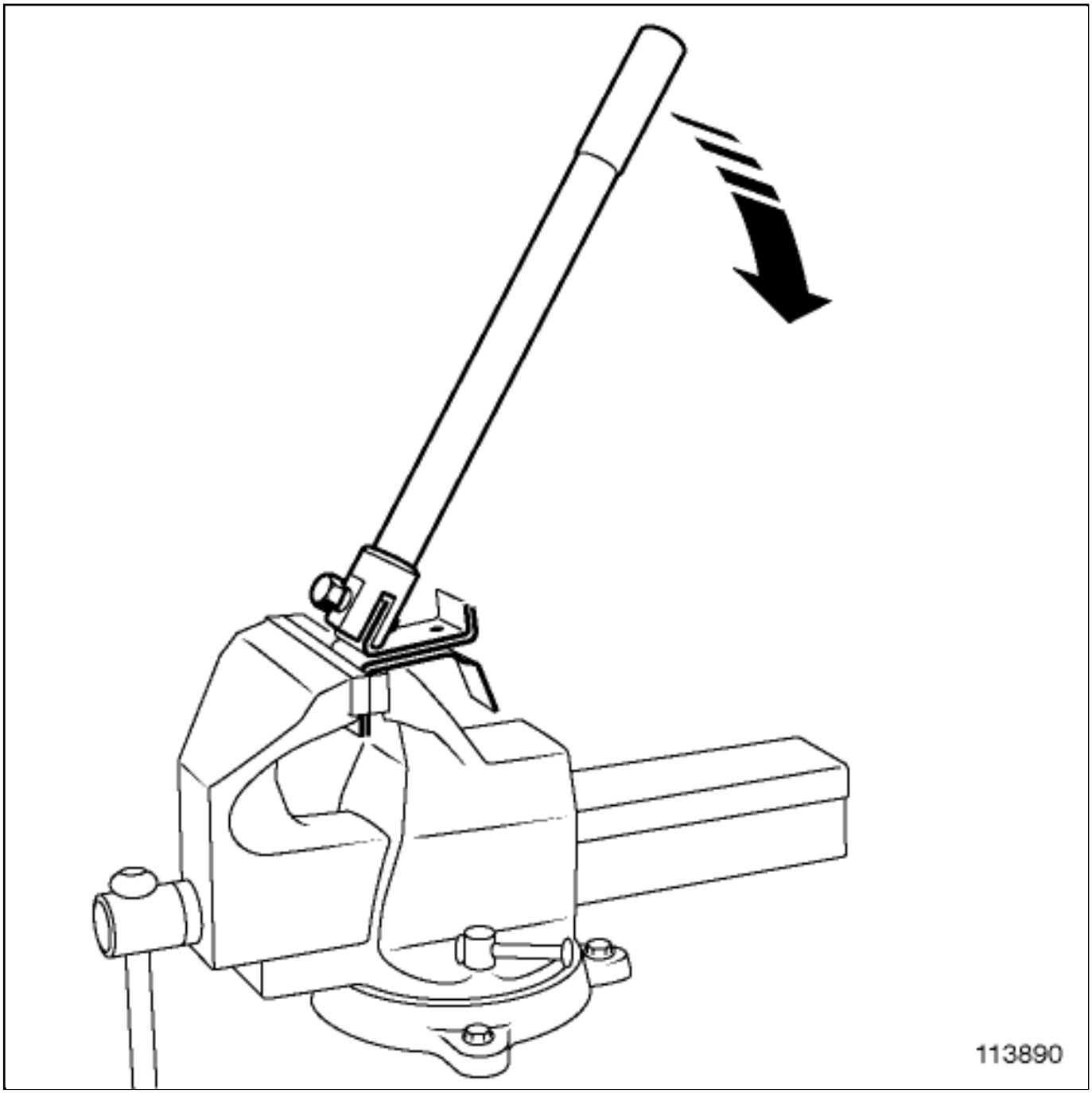
Secure the test specimens in the vice.



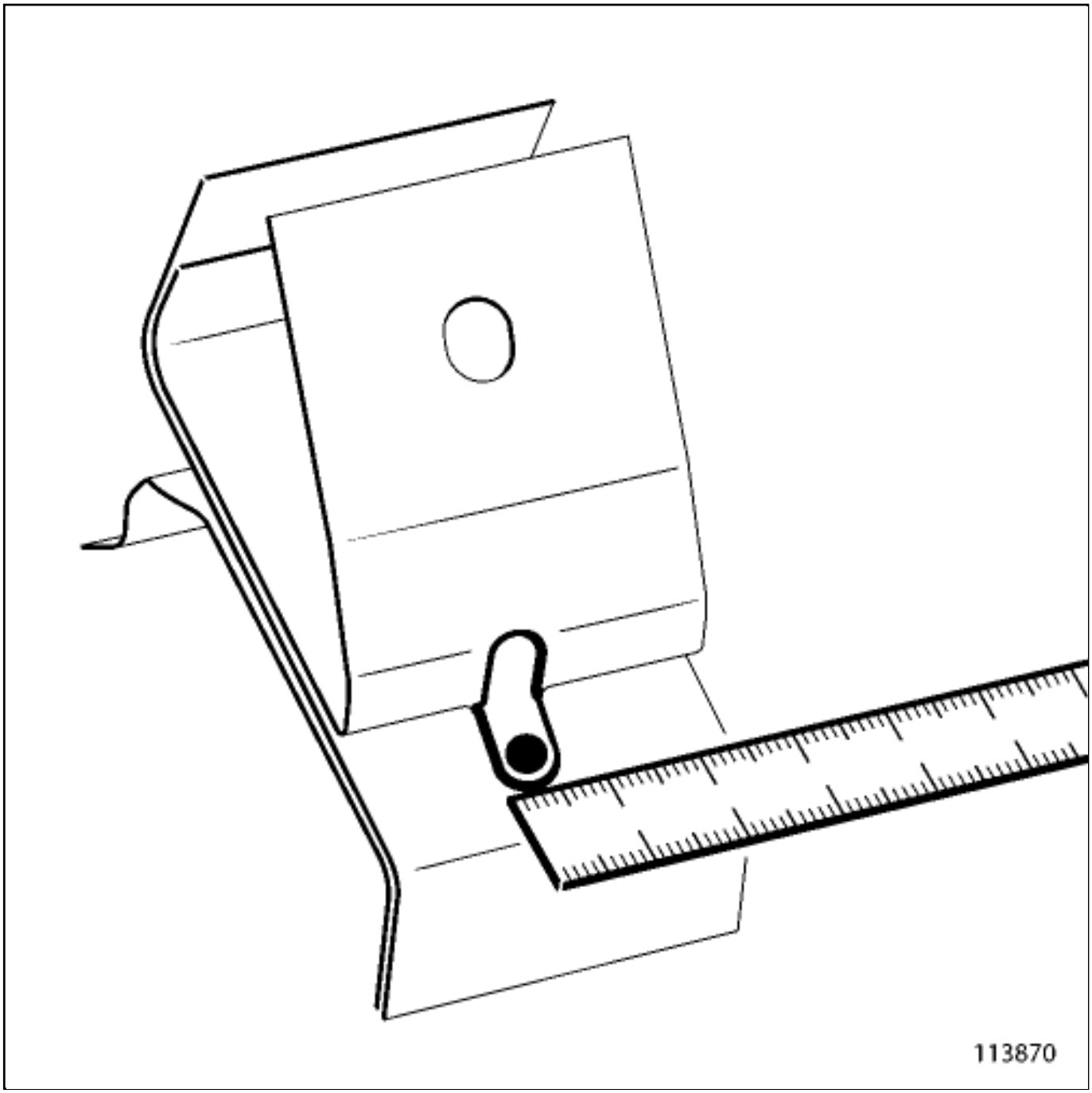
Secure the jaw of the peeling tool.

WARNING

To avoid any accidents, tighten the jaw of the tool to prevent slipping during peeling.



Peel the spot weld of the first joint, applying continuous pressure.



Interpreting the results: section VI.

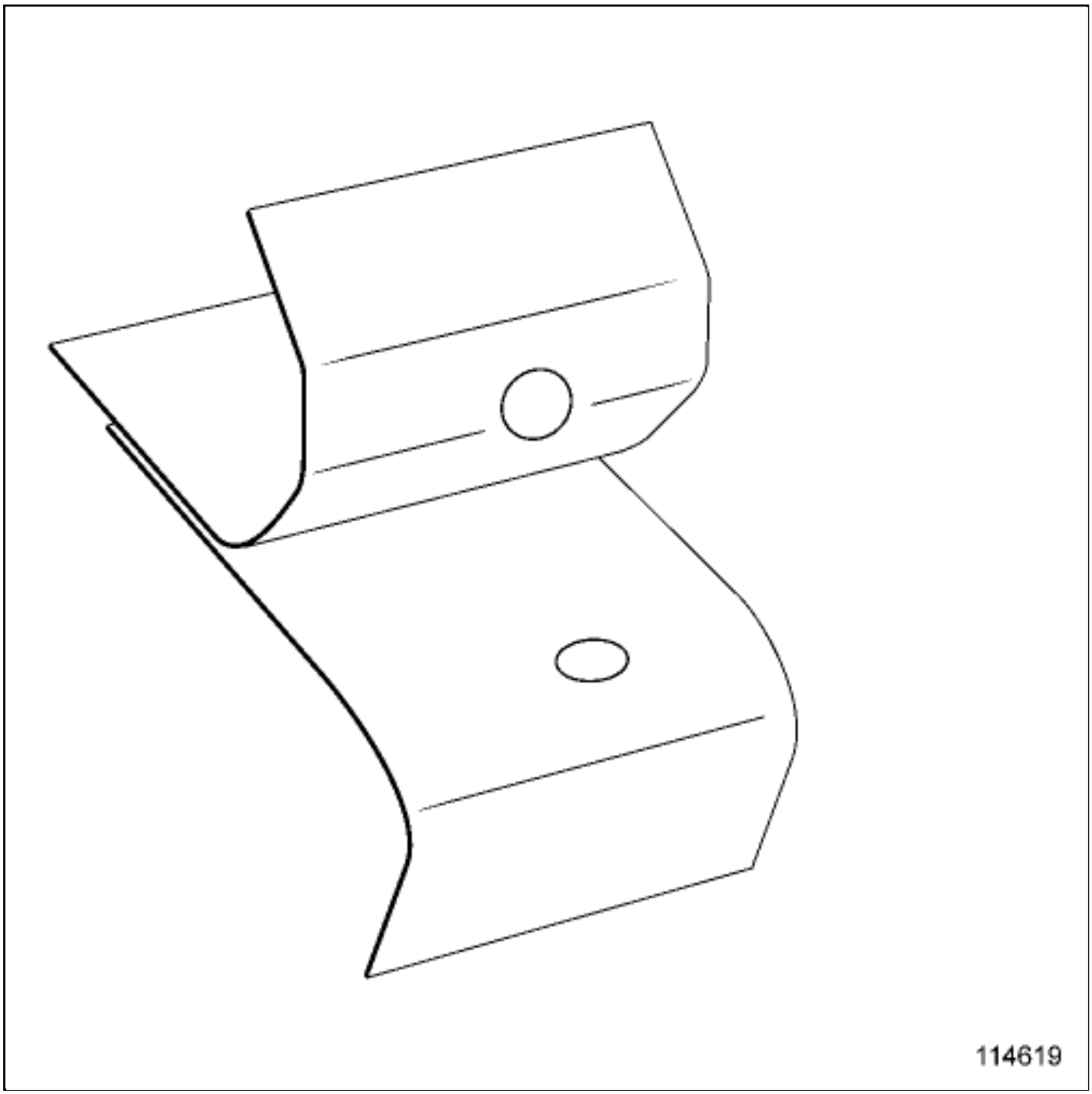
Note:

For triple-thickness assemblies, the thinnest panel on each side of the stack must always be taken into account in order to determine the right material rivet.

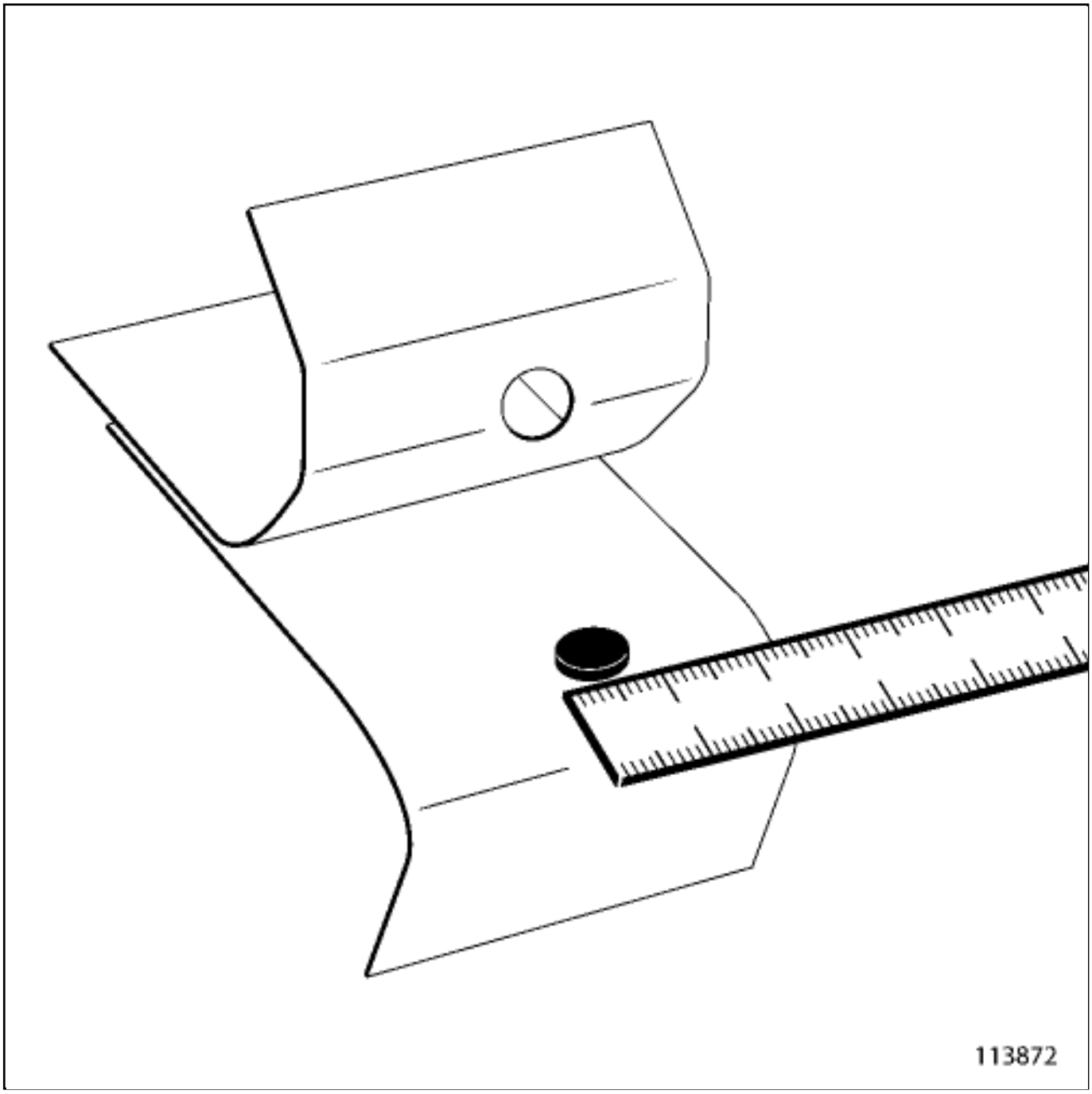
This test is based on the presence or absence of a material rivet after peeling of the spot weld.

1- POSSIBLE RESULTS

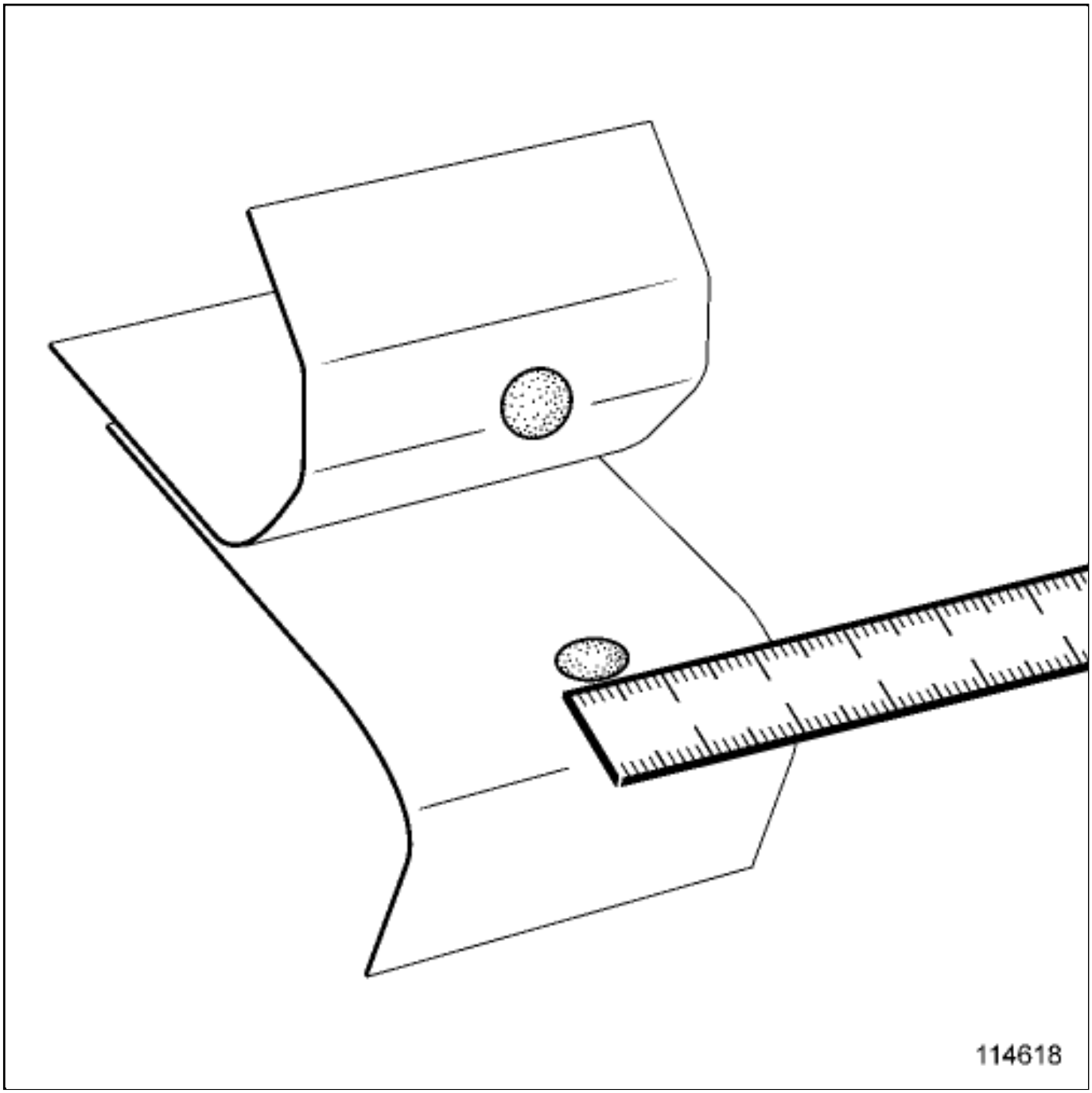
CEMENTED SPOT: UNACCEPTABLE



SPOT WITH MATERIAL RIVET: ACCEPTABLE, IF DIAMETER SUFFICIENT



SPOT WITH MATERIAL PULLING OFF: ACCEPTABLE, IF DIAMETER SUFFICIENT (SEE FOLLOWING TABLE)



Note:

On thick, very high/ultra high elastic limit steels, there may be no material rivet, but material pulled off at the interface; this type of spot weld is acceptable: measure the diameter of the pulled off zone and compare it to the table of values.

Check that the diameter of the material rivet meets the criteria in the following table, with regard to the reference thickness.

Thickness (thinnest panel)	Minimum diameter required
between 0.77 mm and/or equal to 1.2 mm	4 mm
between 1.2 mm and/or equal to 2 mm	6 mm
between 2 mm and/or equal to 3 mm	8 mm

2-

If the result is good:

- Apply the parameters for the joints on the vehicle,
- Carry out the vehicle tests: part IX.

If the result is incorrect (cemented spot, material rivet too small):

- Apply the remedies: part VII

7. REMEDIES

Factors leading to a poor result:

- Poor electrical and pneumatic conditions.
- The machine does not meet the required performance levels.
- Change of electrode holder.

1- ADJUSTING THE SETTINGS

If Effort cannot be guaranteed: increase Time and reduce Current.

If Current cannot be guaranteed: increase Time and reduce effort.

2- CHECKING ADJUSTMENTS

Note:

After any setting adjustments, the resistance spot weld must first be confirmed on a sample using the peeling test in section IV.

- If the result is good:
  - Apply the parameters to the vehicle,
  - Carry out the vehicle tests: part IX.
- If the result is incorrect (cemented spot, material rivet too small):
  - Apply the replacement solutions: section VIII.

8. REPLACEMENT SOLUTIONS

1- LONG TIME TABLE

If adjusting the parameters does not achieve good results, use the following table only on panelwork parts, and selectively on structural parts:

Grades	Thickness of reference panel	Current (A)	Time (ms)	Effort (daN)
Mild steel	0.7 mm	7000	600	250
	1 mm	7400	600	250
HEL steel	0.85 mm	7600	600	250
	1.5 mm	8000	600	250
Very high/ultra high elastic limit steel	1.5 mm	8600	700	250
	2.5 mm	8600	900	250

Note:

This is an exceptional case which cannot be applied generally to the whole of the repair.

In the same way as an RSW spot defined in the first chart, the RSW spot must be confirmed in advance on a sample with the peeling test from section IV.

2- PLUG WELDS

If adjusting the parameters does not achieve good results, or if access is a problem, use electric welding with gas shield selectively and on all thicknesses, making plug welds.

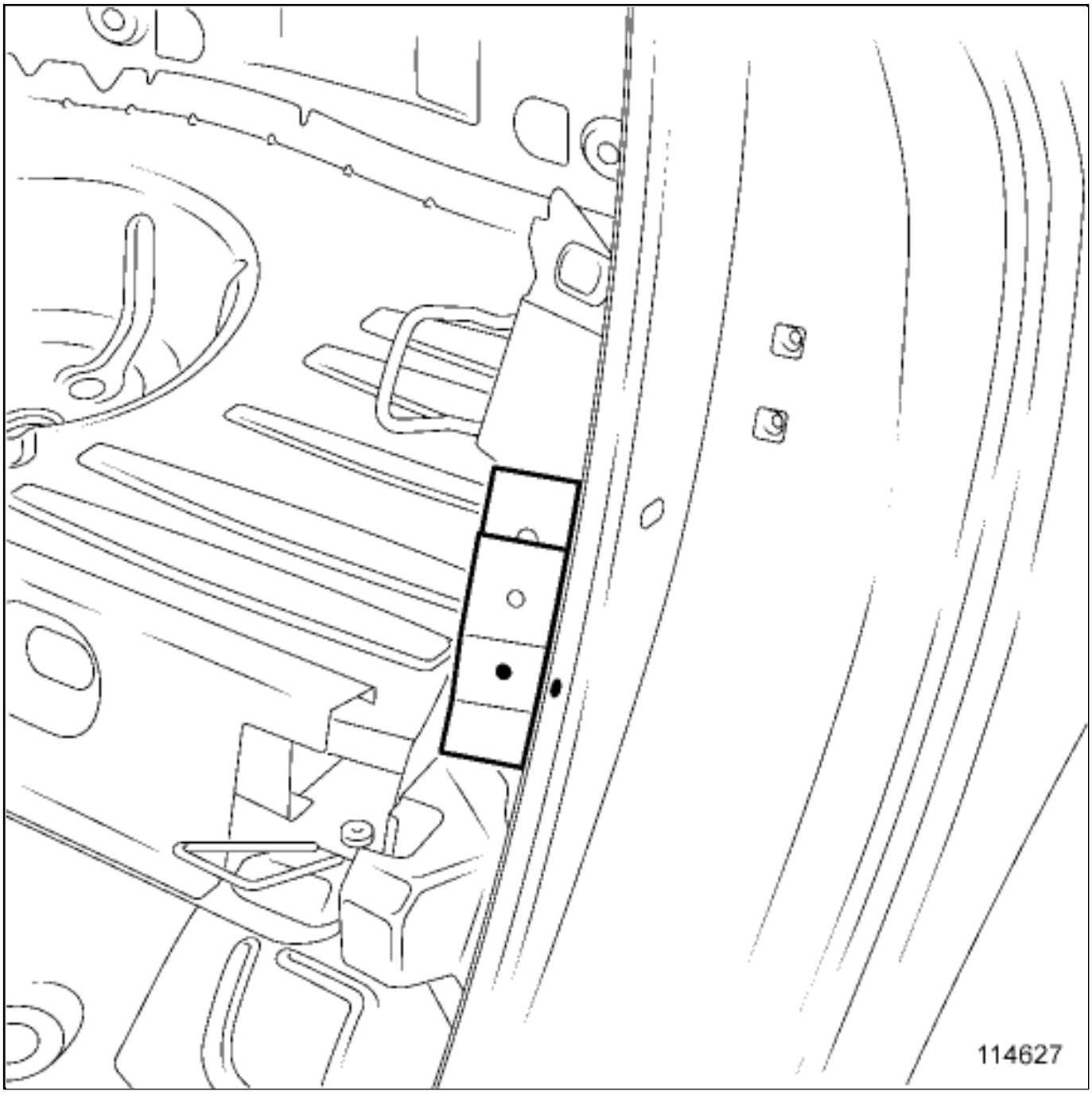
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

Note:

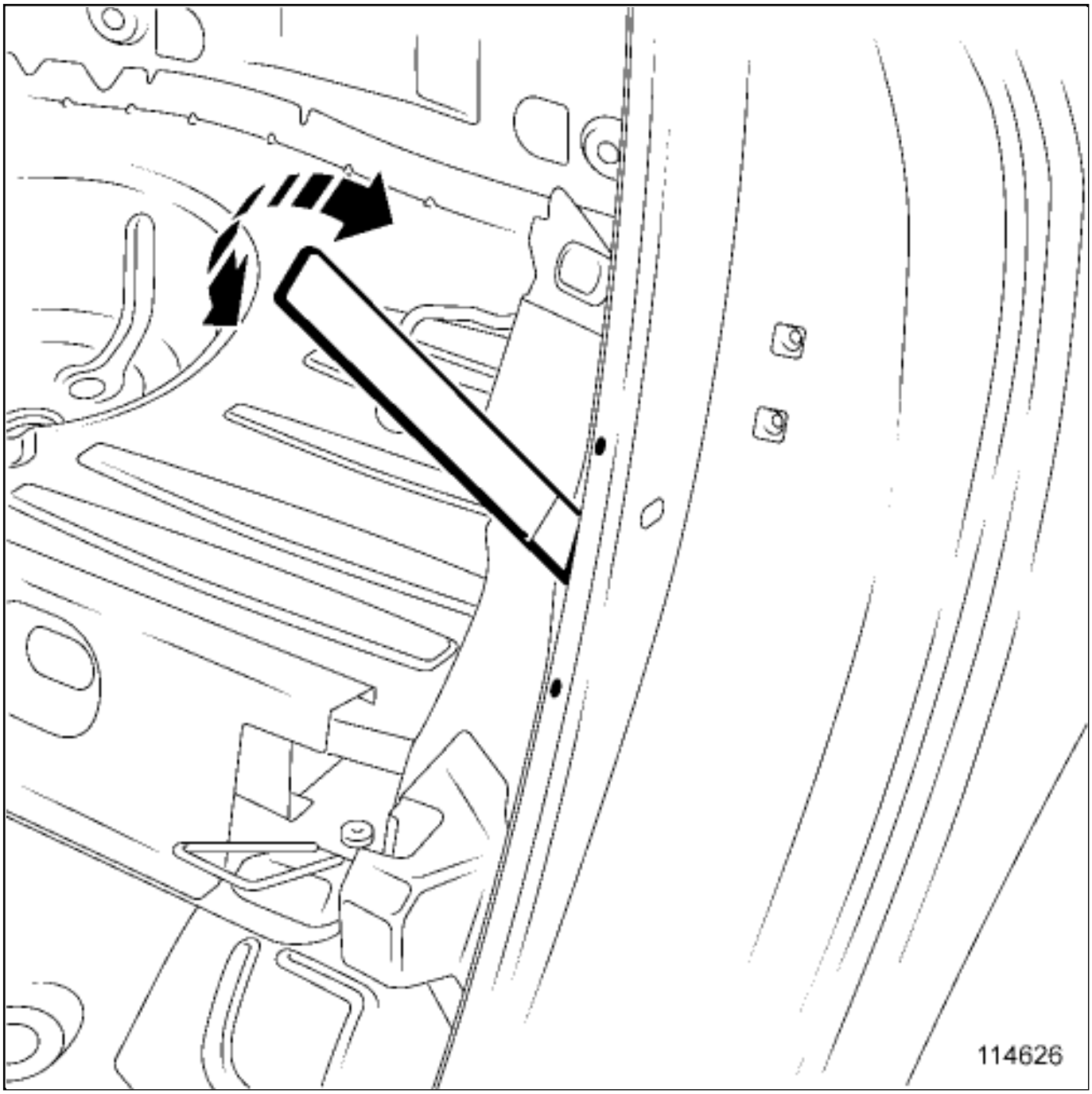
This is an exceptional case which cannot be applied generally to the whole of the repair.

In the same way as an RSW spot, a plug weld spot must be confirmed in advance on a sample with the peeling test from section IV.

9. VEHICLE TESTS



Check the external appearance of the spot on the vehicle to see if it corresponds to that on the test specimen.

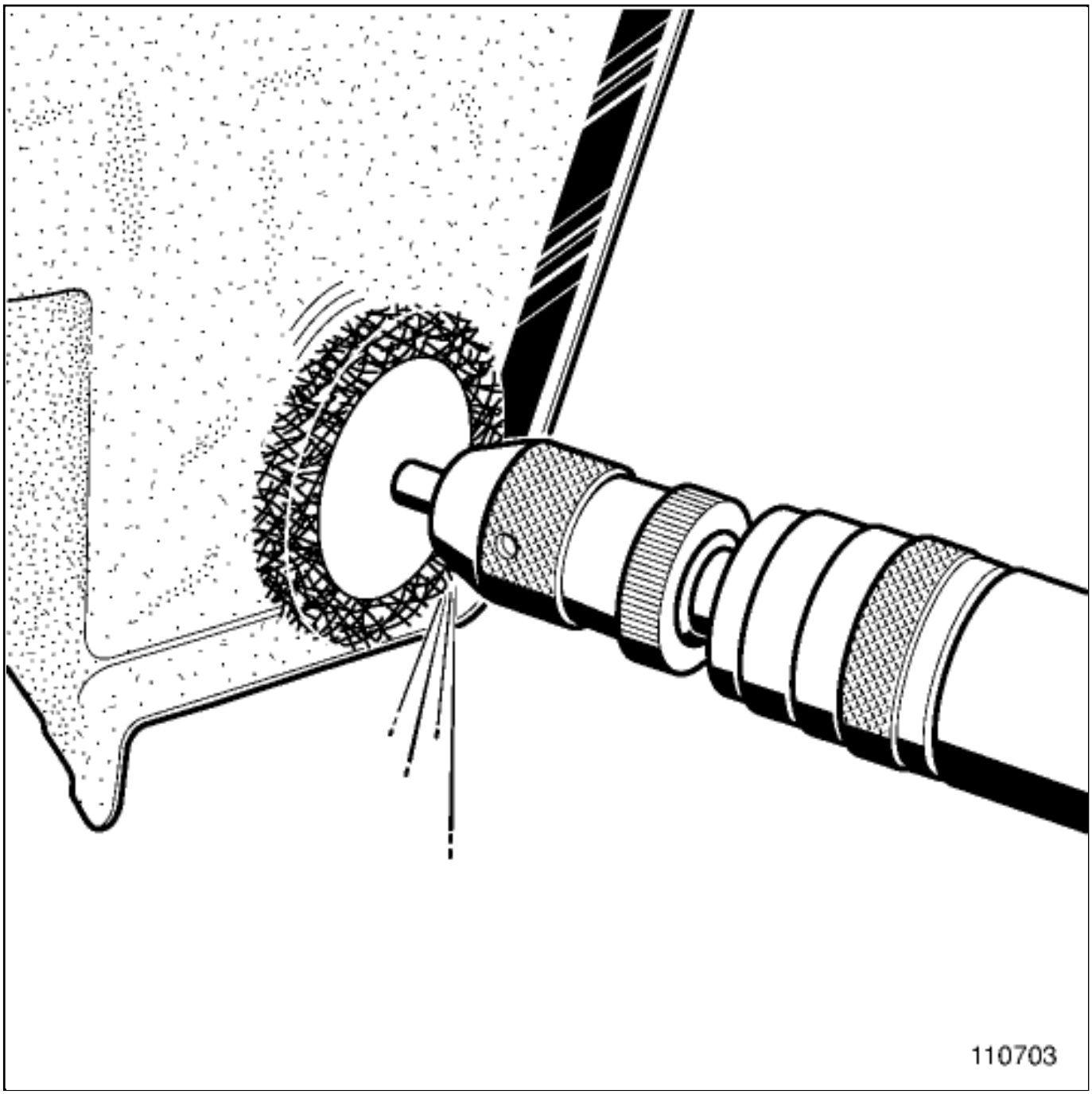


Insert a flat chisel between two spot welds to check the strength of the spots.

ELECTRICAL RESISTANCE SPOT WELDING CONNECTION WITH DIRECT ACCESS

1. DISASSEMBLY

1- SCOURING

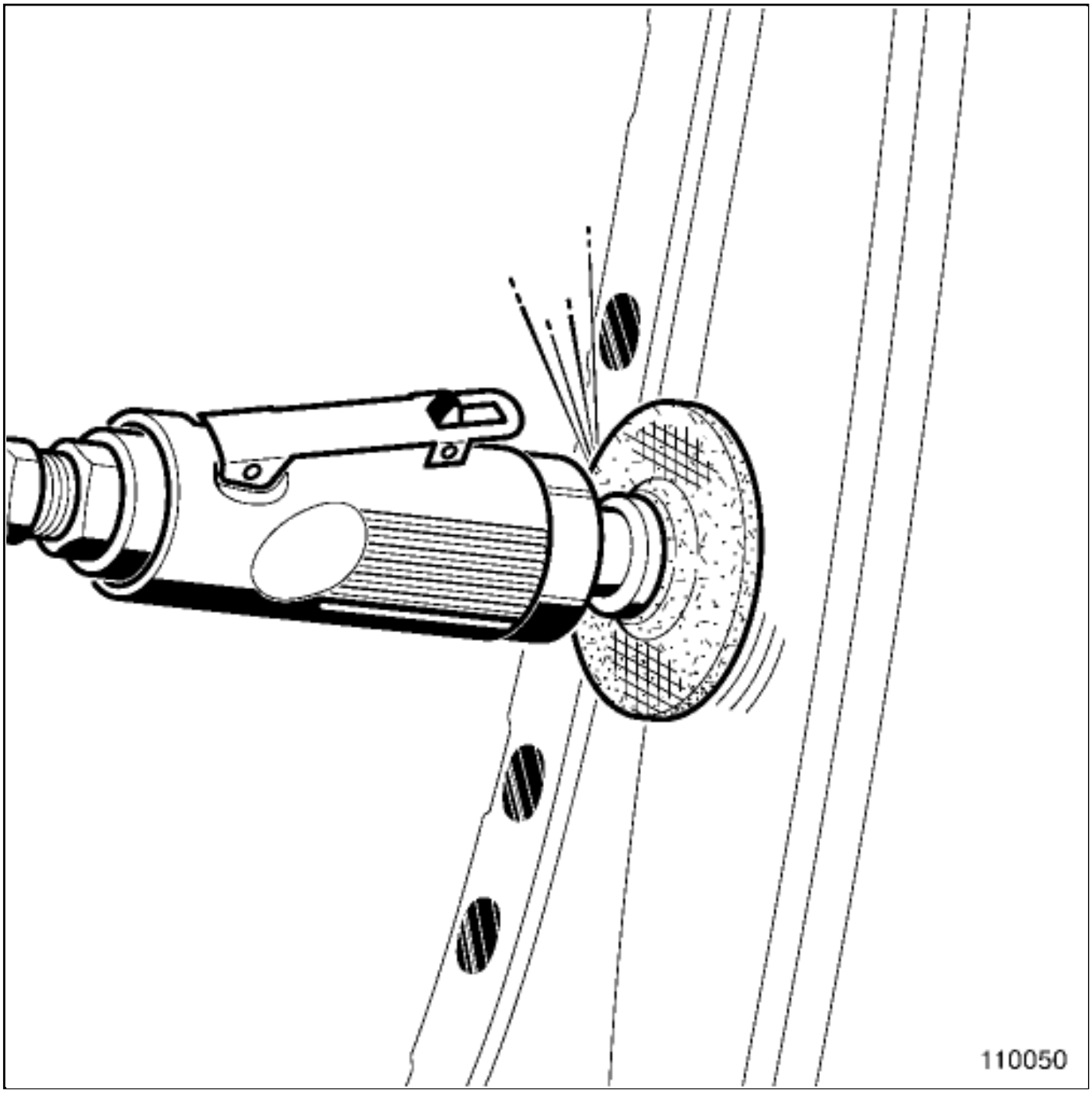


If necessary, scour the joint lines to bring out the spot welds.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- UNPICKING



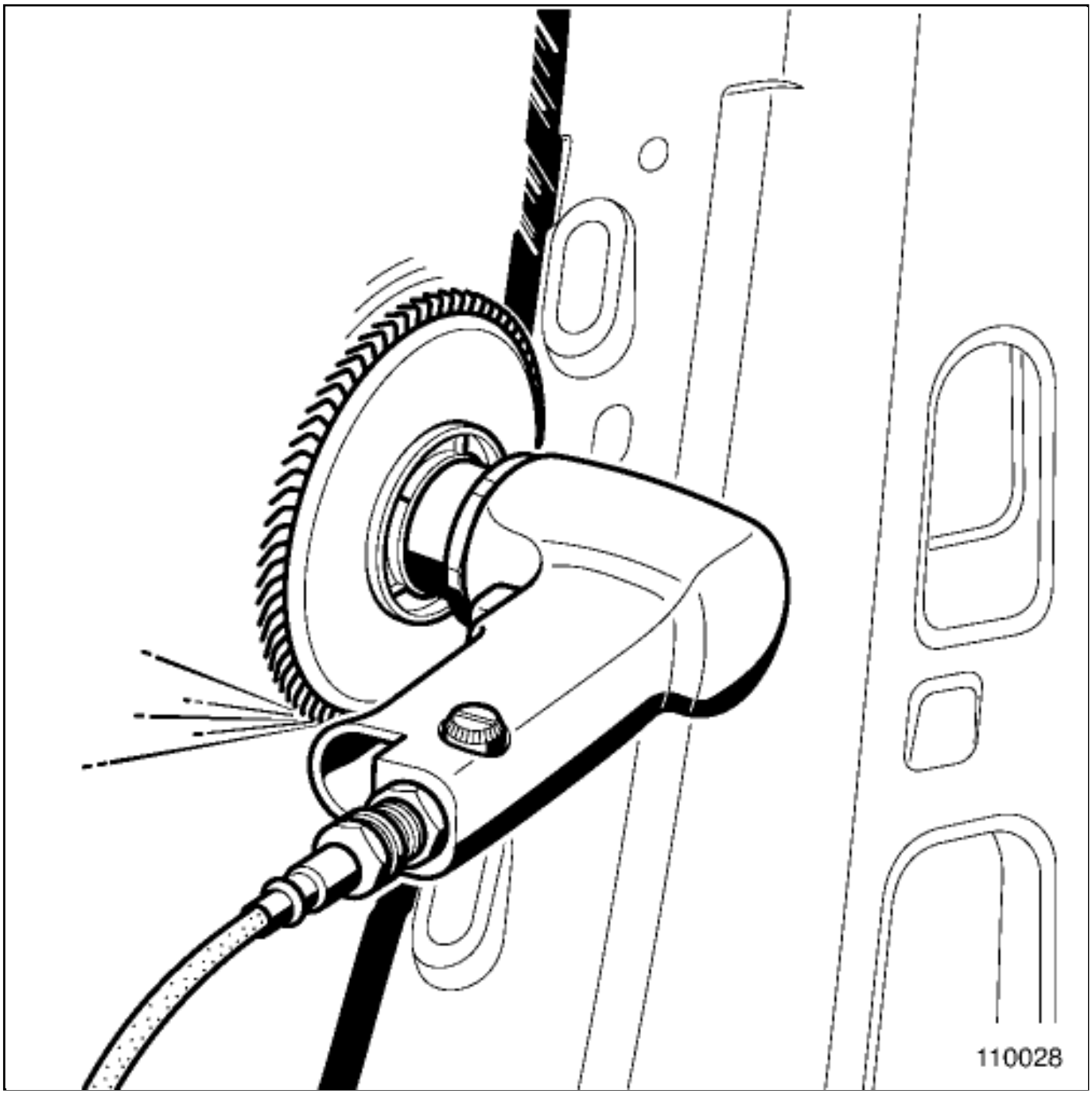
Unpick the spot welds using the most appropriate tool depending on the access(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use) .

Remove the part to be replaced.

Note:

Do not strike or damage the panel.

3- GRINDING



Grind the welding residue.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Put the support face flat so as not to penalise the joint.

2. PREPARATION BEFORE ASSEMBLY

1- POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

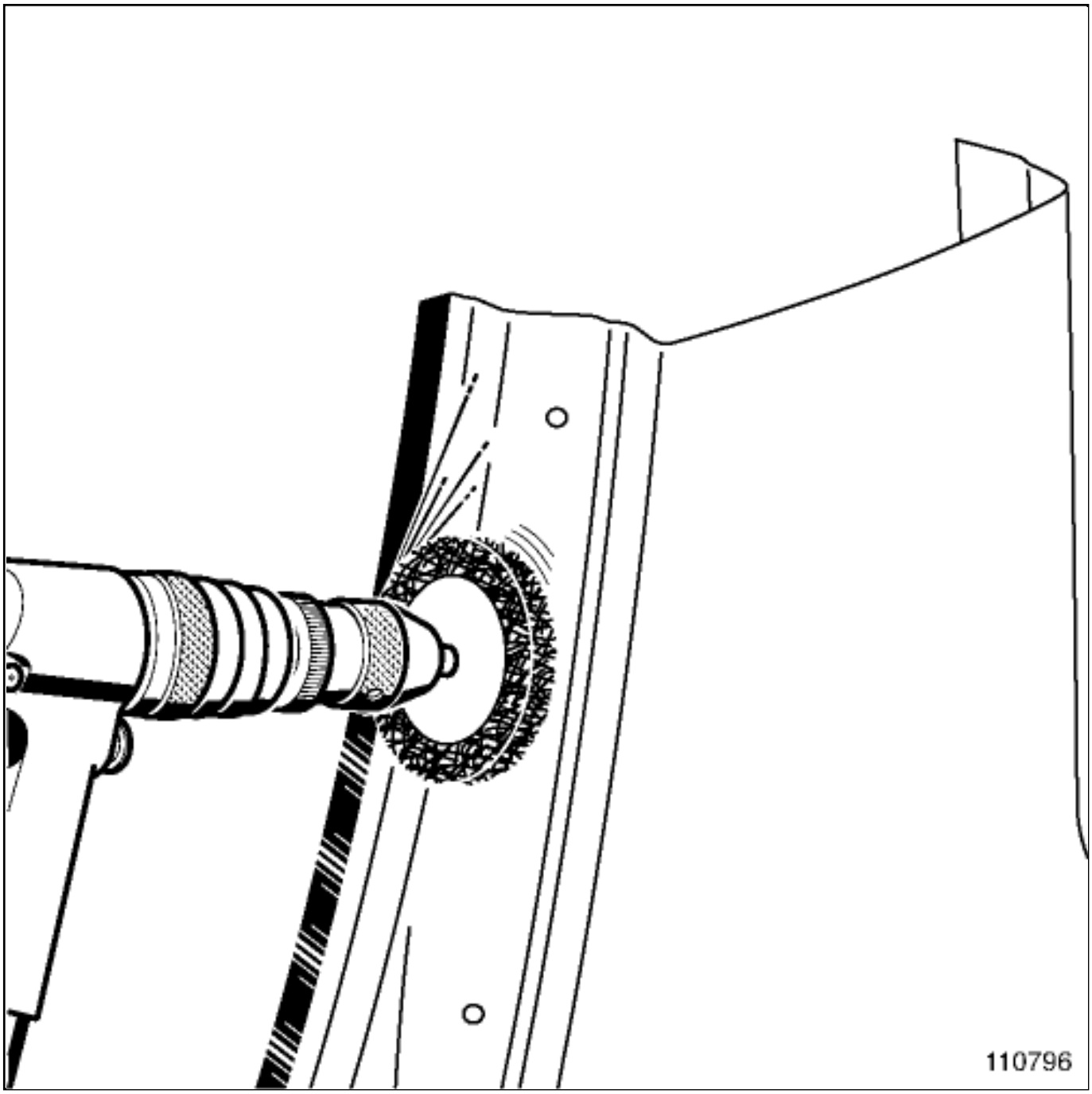
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Remove the replacement part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART



Scour the internal and external faces around the weld zones.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- PREPARATION OF THE JOINTS ON THE VEHICLE

Scour the external mating face around the weld zones.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

5- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld**(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)** .

3. ASSEMBLY

1- FITTING AND ADJUSTING THE REPLACED PARTS

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

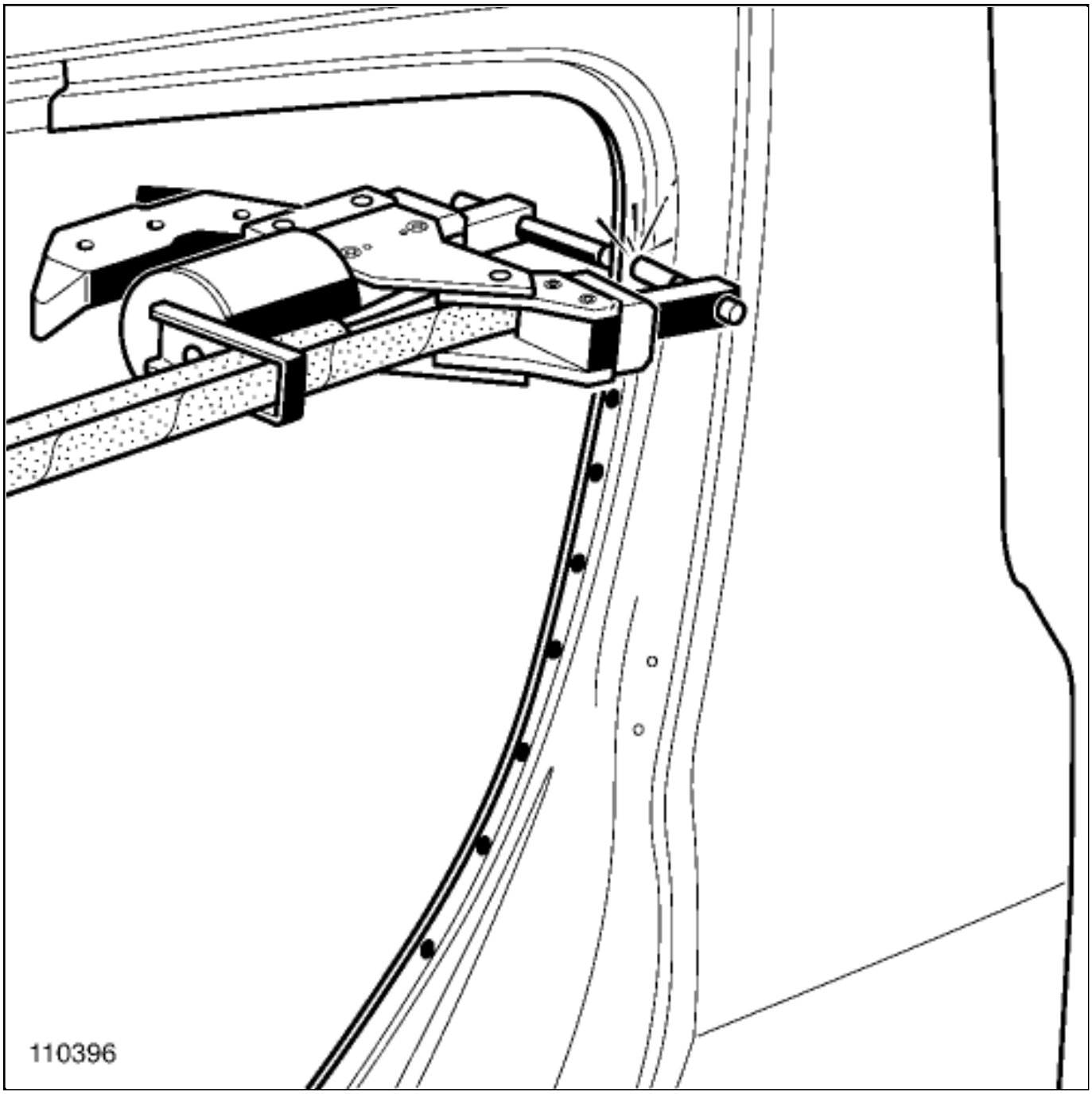
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- ADJUSTING THE WELDER

Before working on the vehicle, follow the procedure below:

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection: Precautions for the repair)

3- CARRYING OUT THE WELDING



Weld the panels, holding the electrodes perpendicular to the joint surface.

4- FINISHING

There is no particular finish to be carried out on this type of weld; it must look the same as the original.

ELECTRICAL RESISTANCE SPOT WELDING CONNECTION WITH FOUR THICKNESSES

Note, one or more warnings are present in this procedure

Note:

Original welding on four thickness types is very rare. When it exists, it is only the consequence of an assembly problem. Often the panels in the stack are welded two by two and the connection between the inner panels is not done.

1. DISASSEMBLY

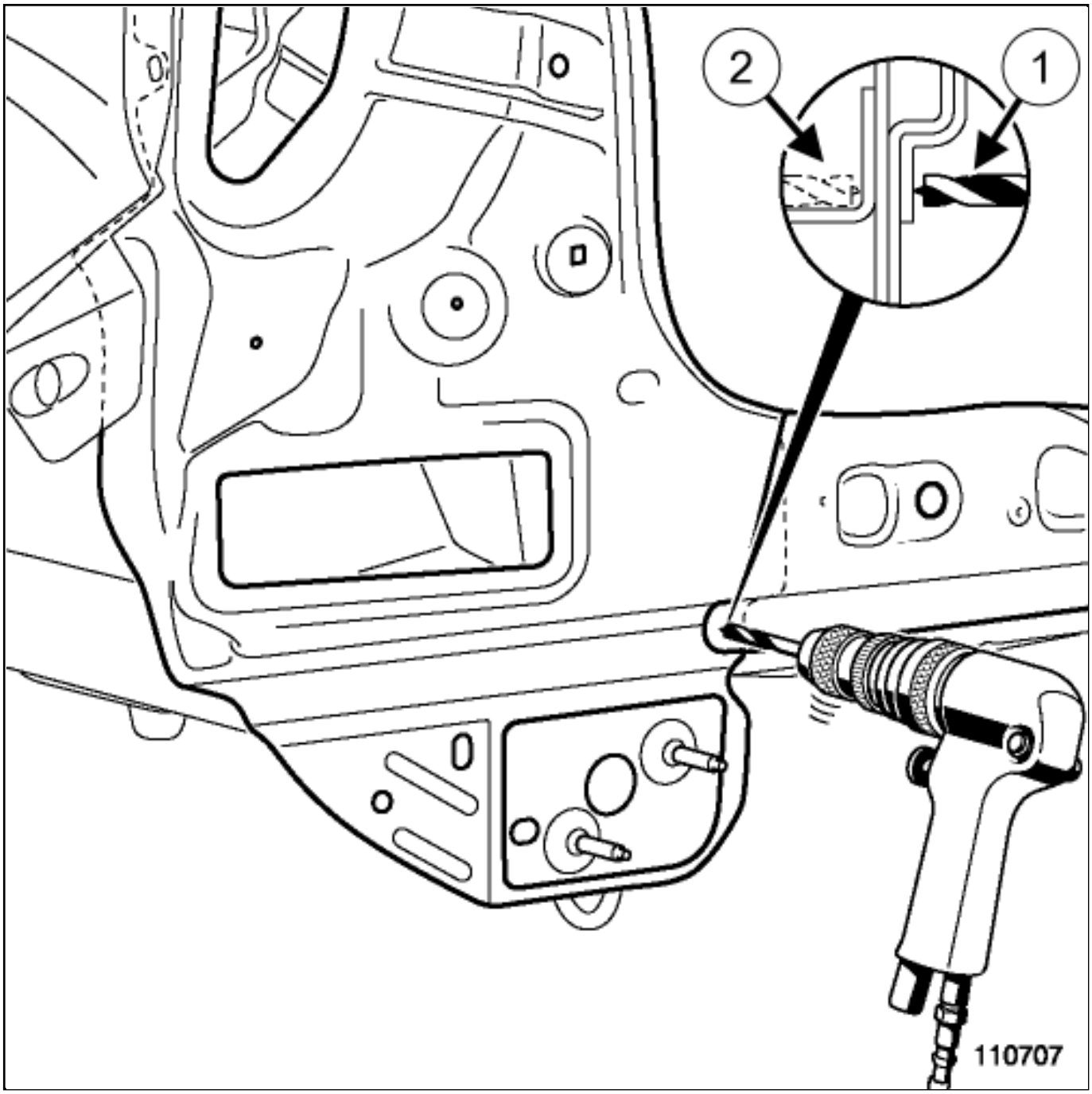
1- SCOURING

If necessary, scour the joint lines to make the spot weld appear on both sides of the joint.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- UNPICKING



Unpick the spot welds on each side(1) and (2) of the assembly.

Remove the damaged part.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Note:

Use a hardened steel bit to preserve the retained panels.

3- GRINDING

Level off the weld residue on the two faces(1) and (2) .

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

2. PRESENTATION BEFORE ASSEMBLY

1- ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

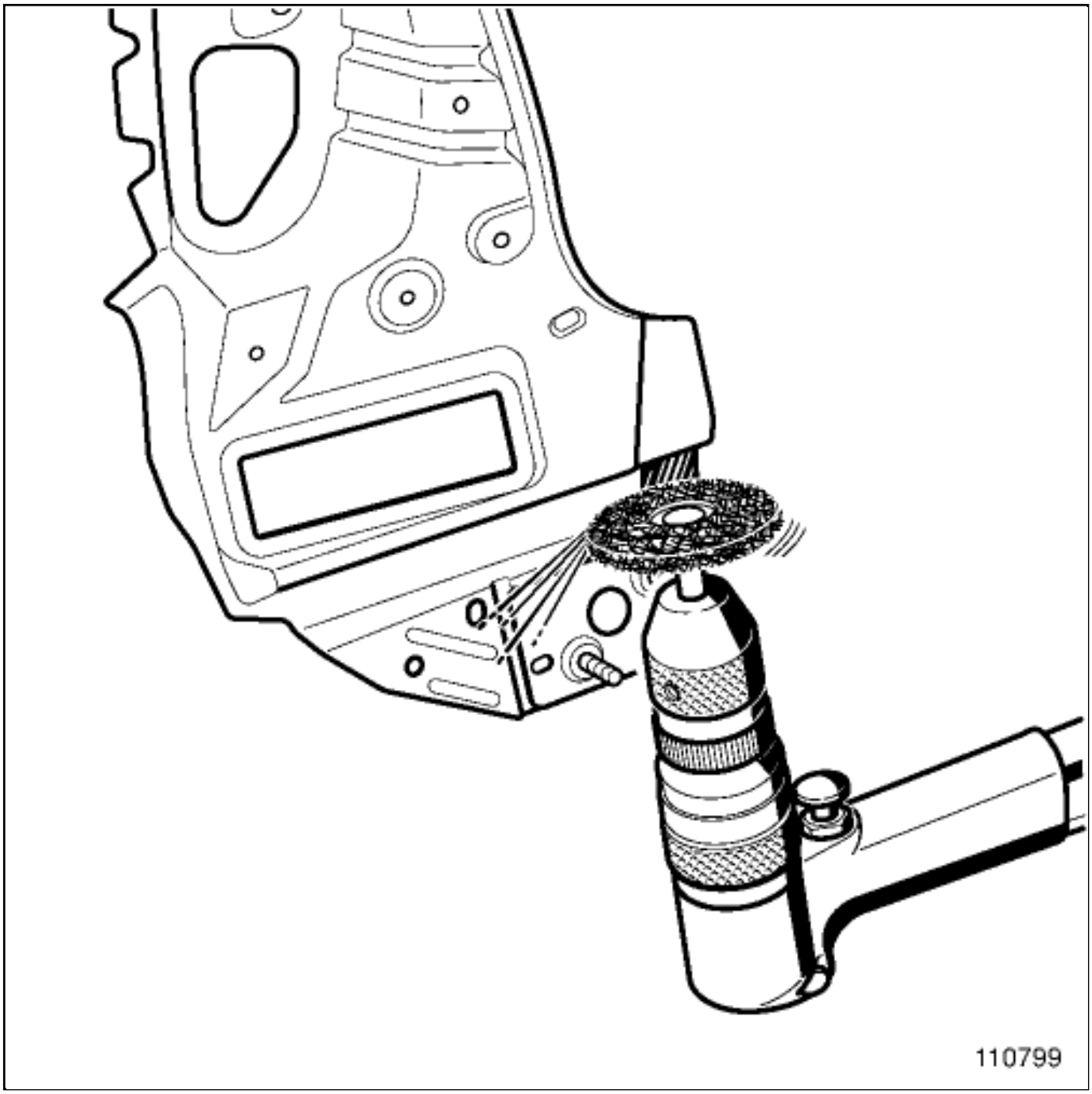
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas, around the drilling holes.

Remove the replacement part.

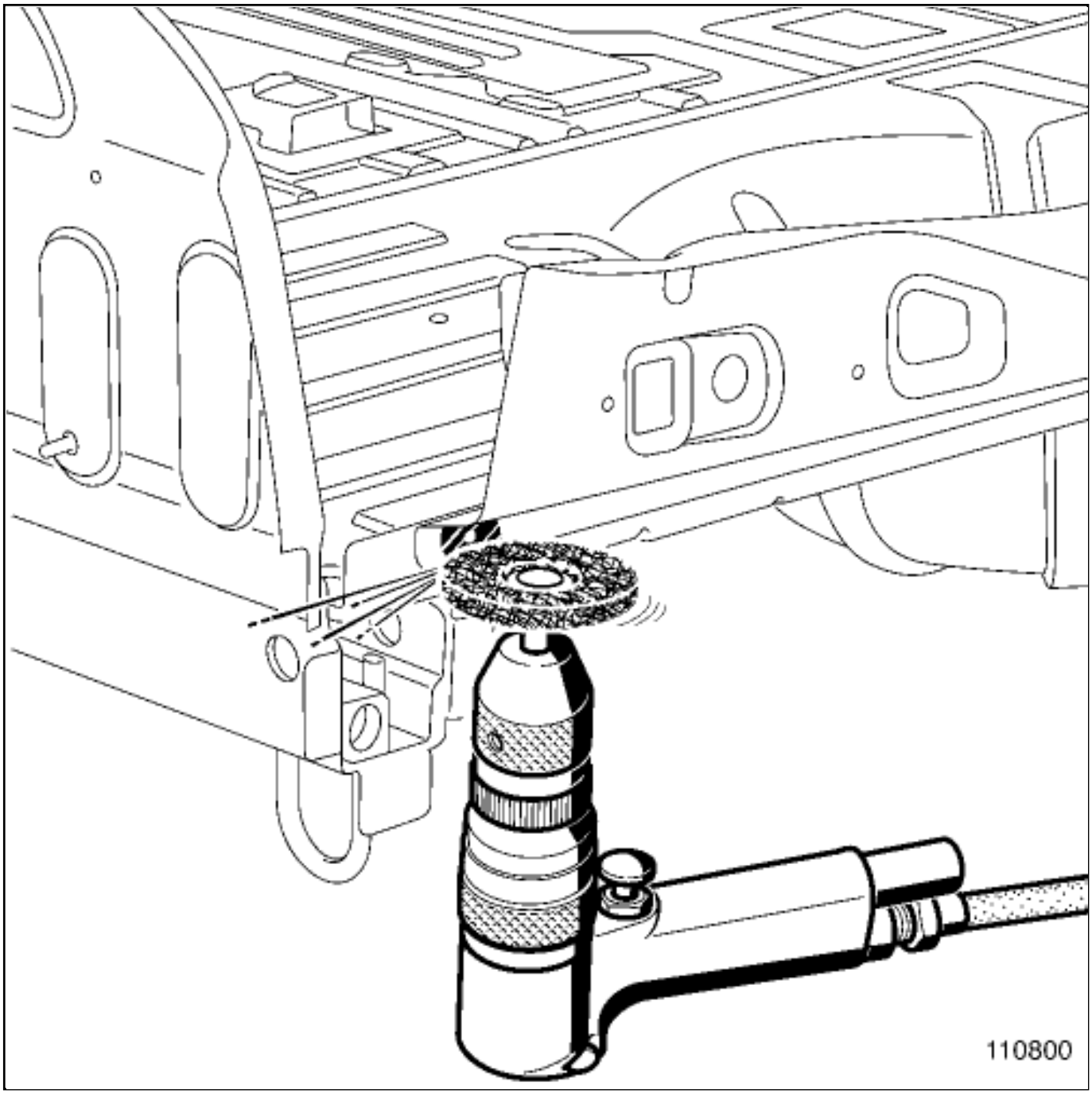
3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART



Scour the two mating faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- PREPARATION OF THE JOINTS ON THE VEHICLE



Scour the two mating faces.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

5- APPLY THE PROTECTION BEFORE ASSEMBLY

Fit the sound insulation inserts into the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3. ASSEMBLY

1- FITTING AND ADJUSTING THE REPLACED PARTS

Reposition the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

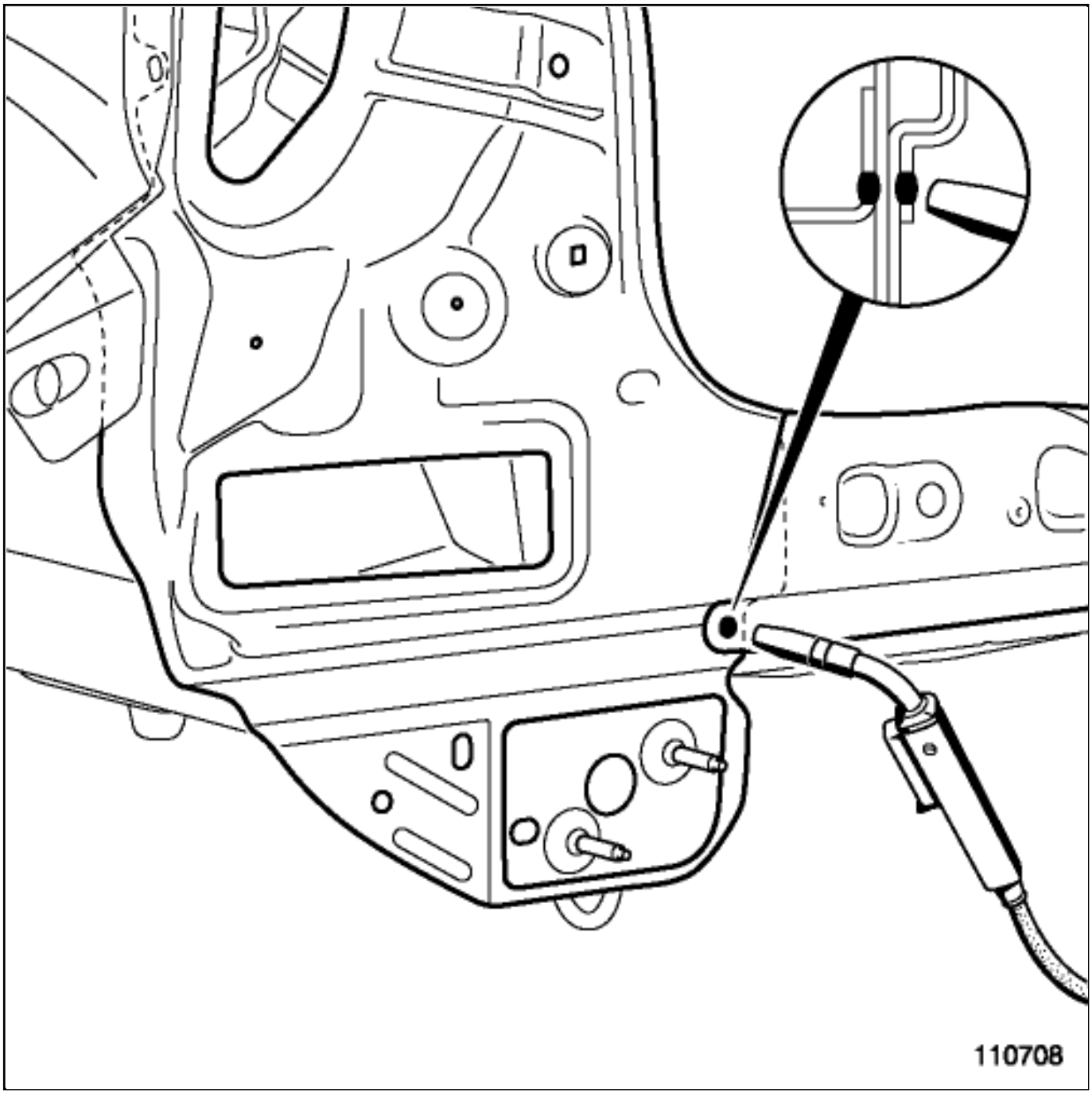
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- ADJUSTING THE WELDER

GMAW joint

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

3- CARRYING OUT THE WELDING



Do the plug welds.

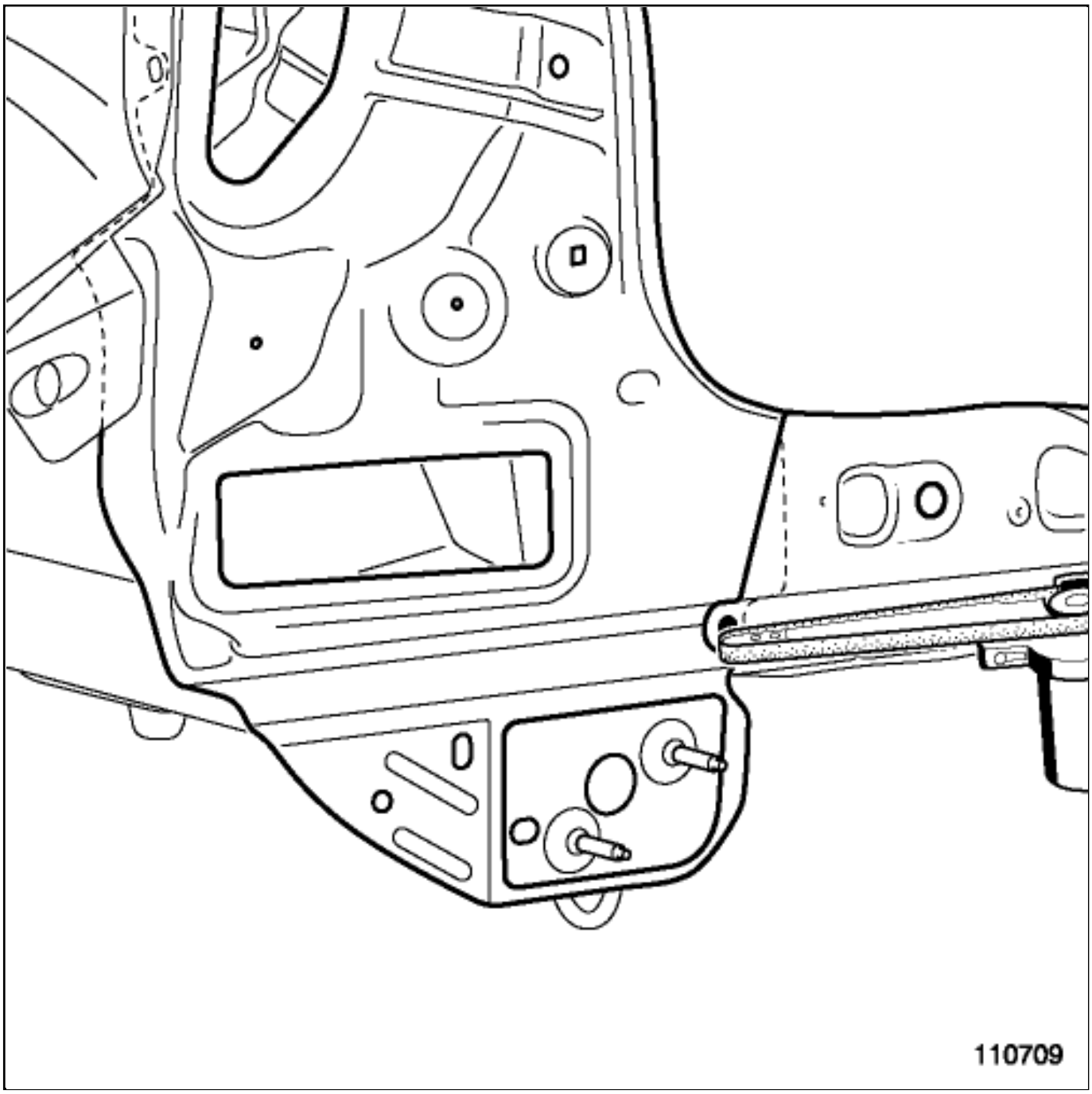
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the welding machine earth as close as possible to the weld zone (see MR 400).

4- FINISHING



Grind the plug welds.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface the shaving residue.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

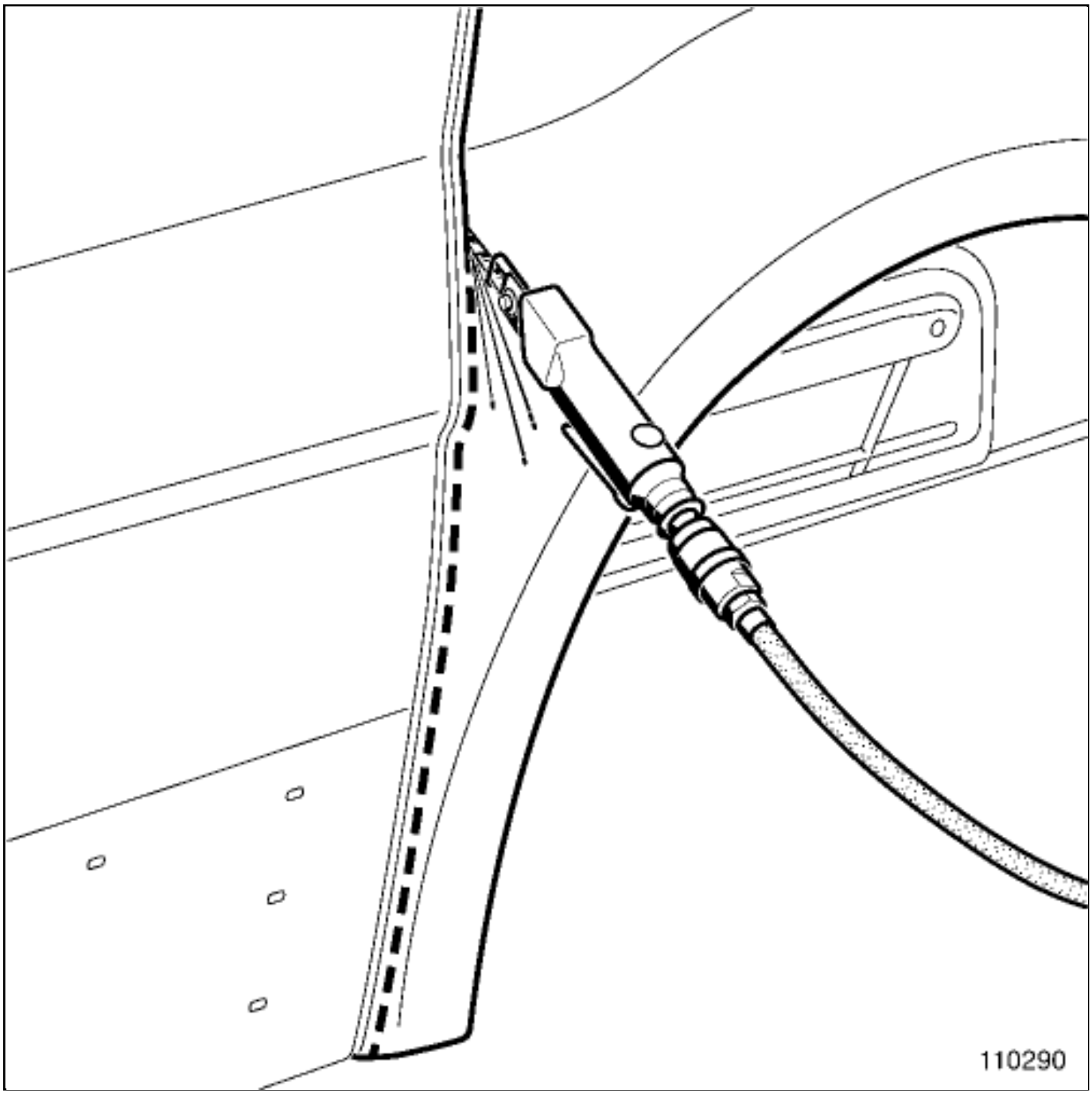
Do not strike or damage the panel.

ELECTRICAL RESISTANCE SPOT WELDING CONNECTION WITH INDIRECT ACCESS

Note, one or more warnings are present in this procedure

1. DISASSEMBLY

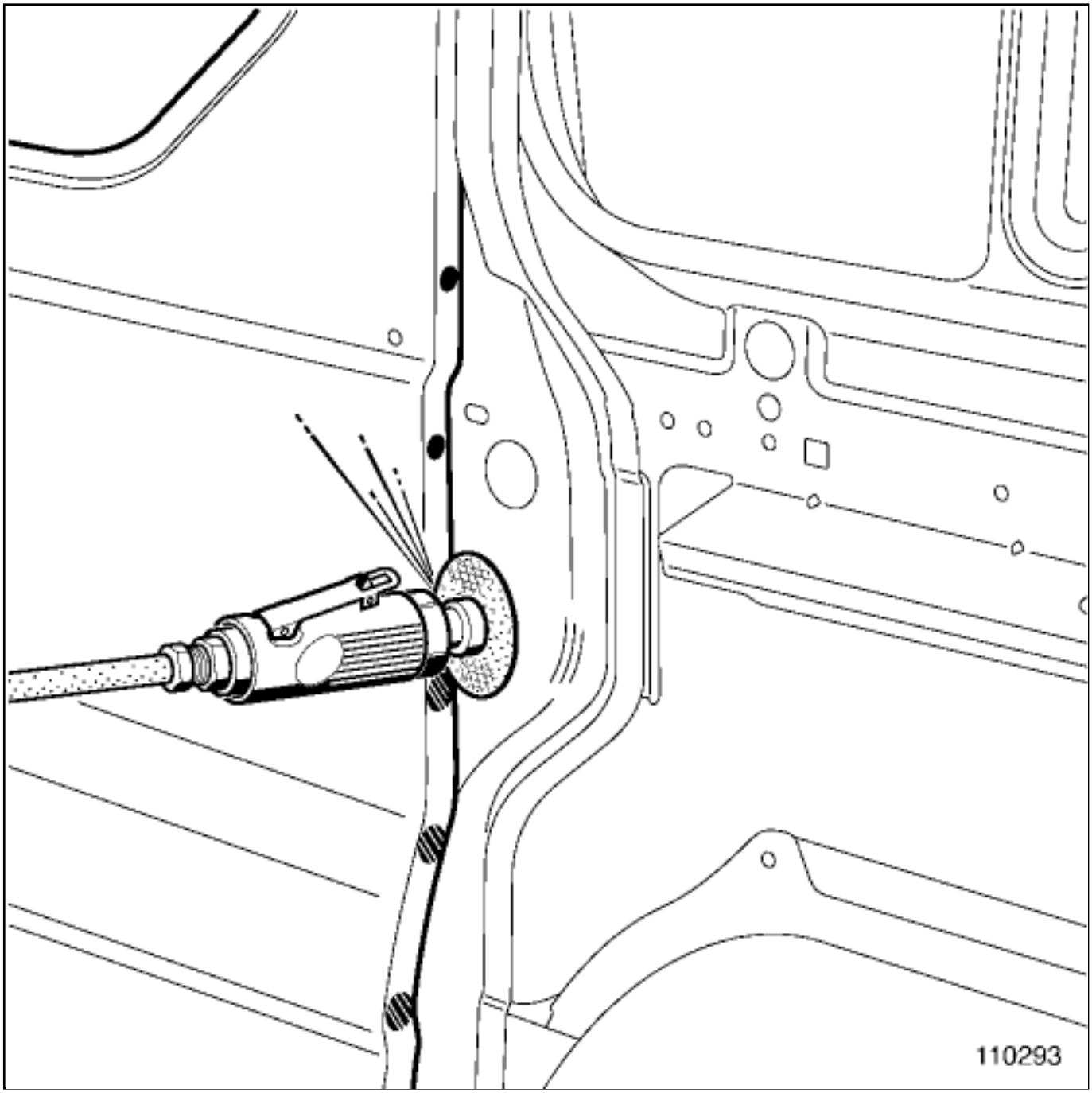
1- CUTTING



Precut the damaged part or remove the part(s) preventing access to the joint.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

2- UNPICKING

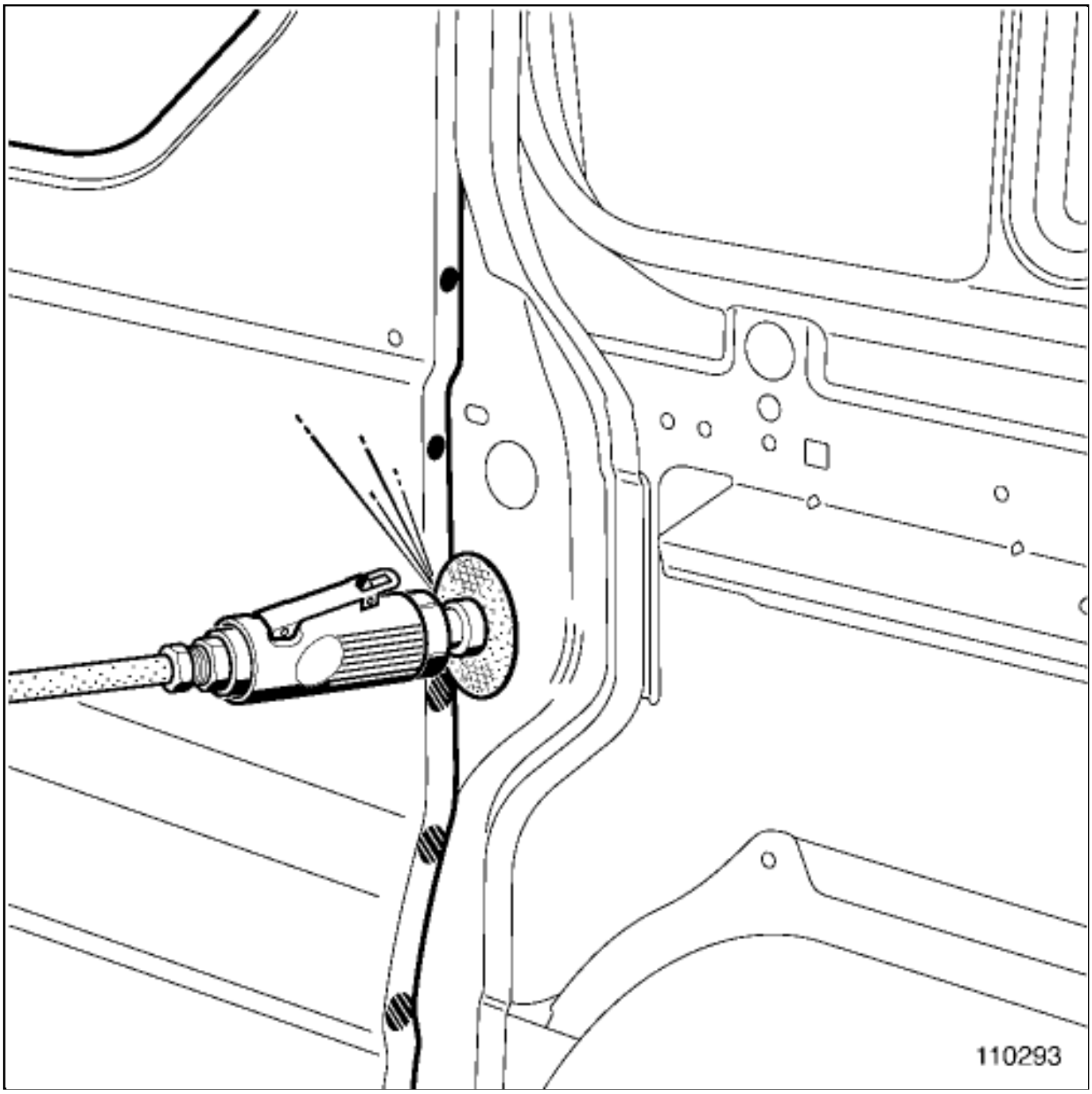


Unpick the spot welds, as in direct access.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the remaining part of the damaged part.

3- GRINDING



Grind the unpicking residue.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface the joint.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

2. TYPES OF JOINT

There are three types of joints to replace an indirect access resistance welded joint:

- Bonded Joint,
- GMAW joint by bead of chain weld,
- GMAW joint by plug welds.

3. BONDED JOINT

1- PREPARATION BEFORE ASSEMBLY

1)POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2)MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

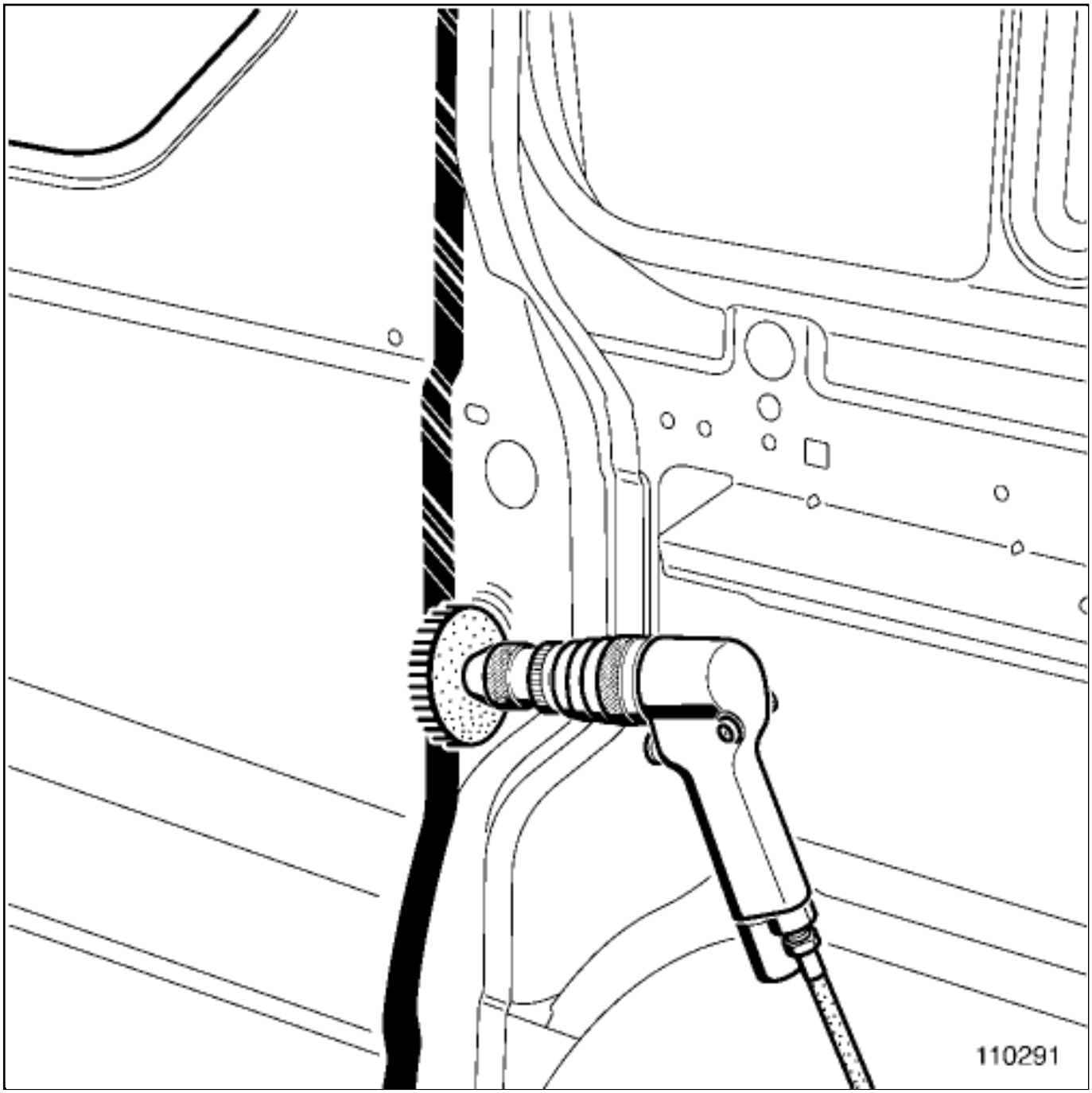
Remove the part.

3)PREPARING THE MATING FACES ON THE REPLACEMENT PART

Sand the internal joint of the areas to be bonded with P320sand paper or using a sanding disc, without damaging the protection.

Clean the joint face with surface cleaner.

4)PREPARING THE MATING FACES ON THE VEHICLE



Scour the internal joint face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

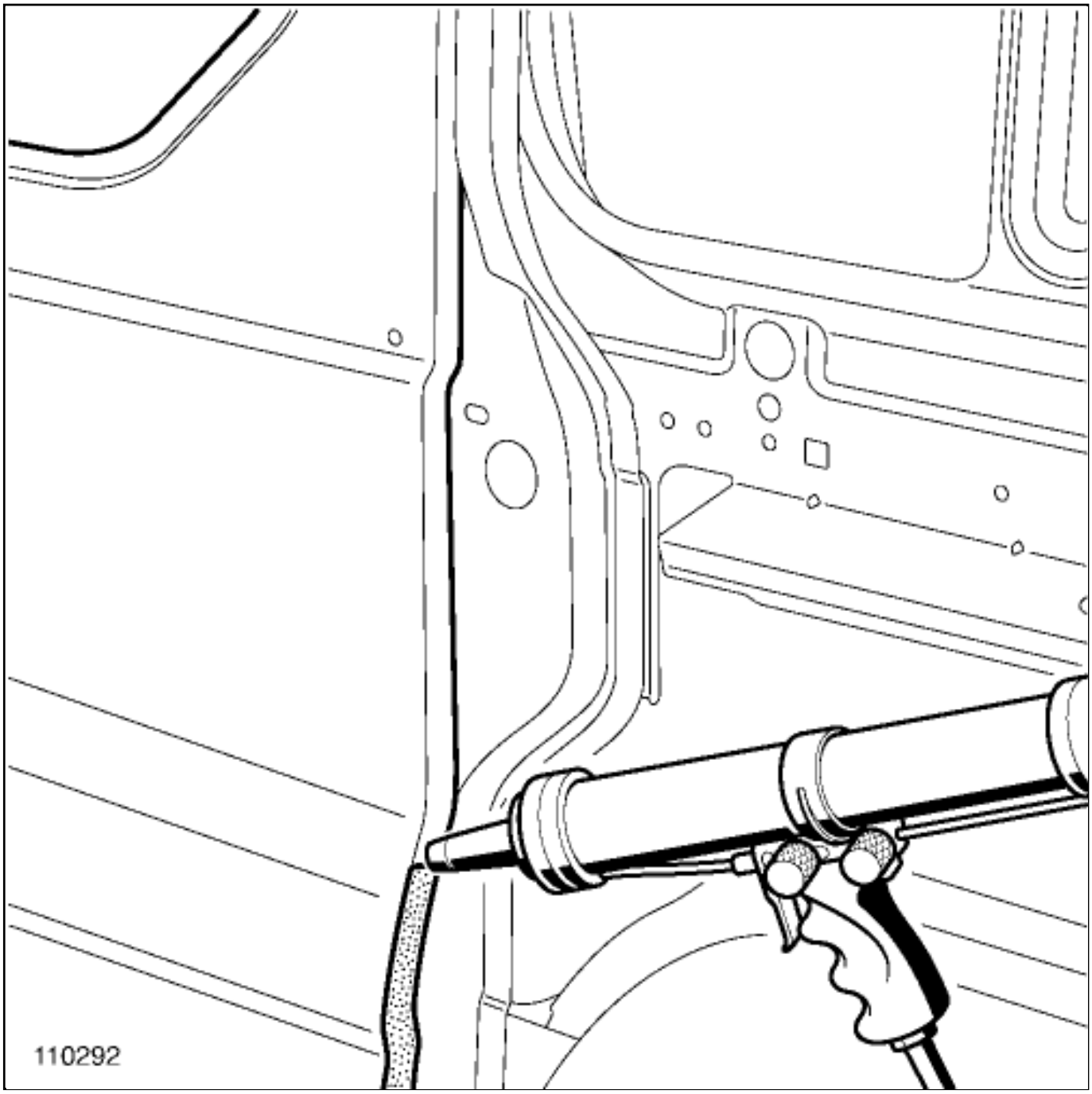
Clean the mating face and the areas to bonded with the surface cleaner.

2- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

3- ASSEMBLY



Apply a structural welding bead over the whole internal joint face of the vehicle.

(see 40F, Bonded connections, Connections by bonding: Precautions for the repair)

4- FITTING AND ADJUSTING THE REPLACED PARTS

Position and adjust the replacement part on the vehicle.

Hold the replacement part to secure it in position.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Get rid of the surplus bonding before it dries.

4. GMAW JOINT BY BEAD OF CHAIN WELD

1- PREPARATION BEFORE ASSEMBLY

1)POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

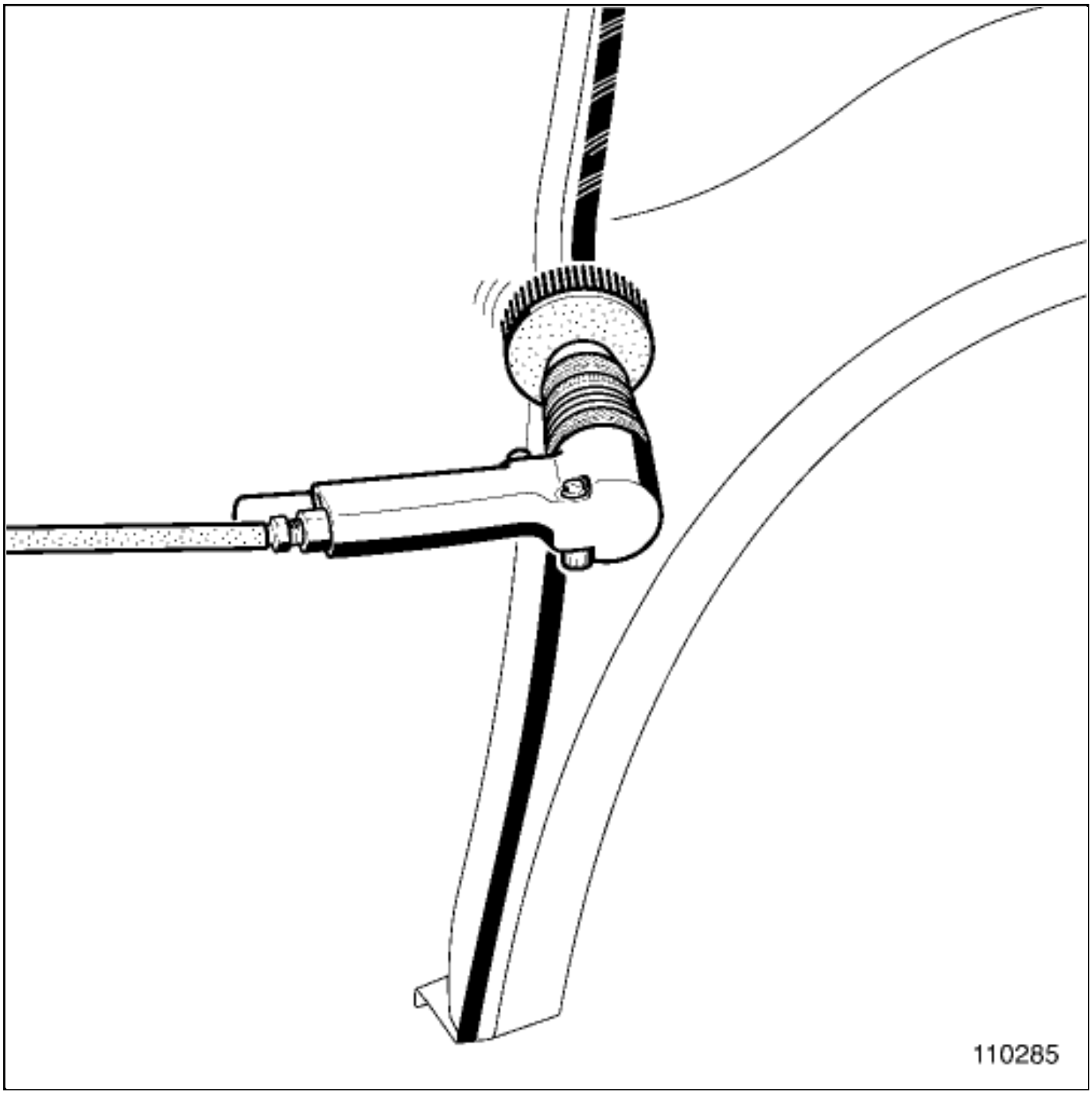
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2)MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Remove the part.

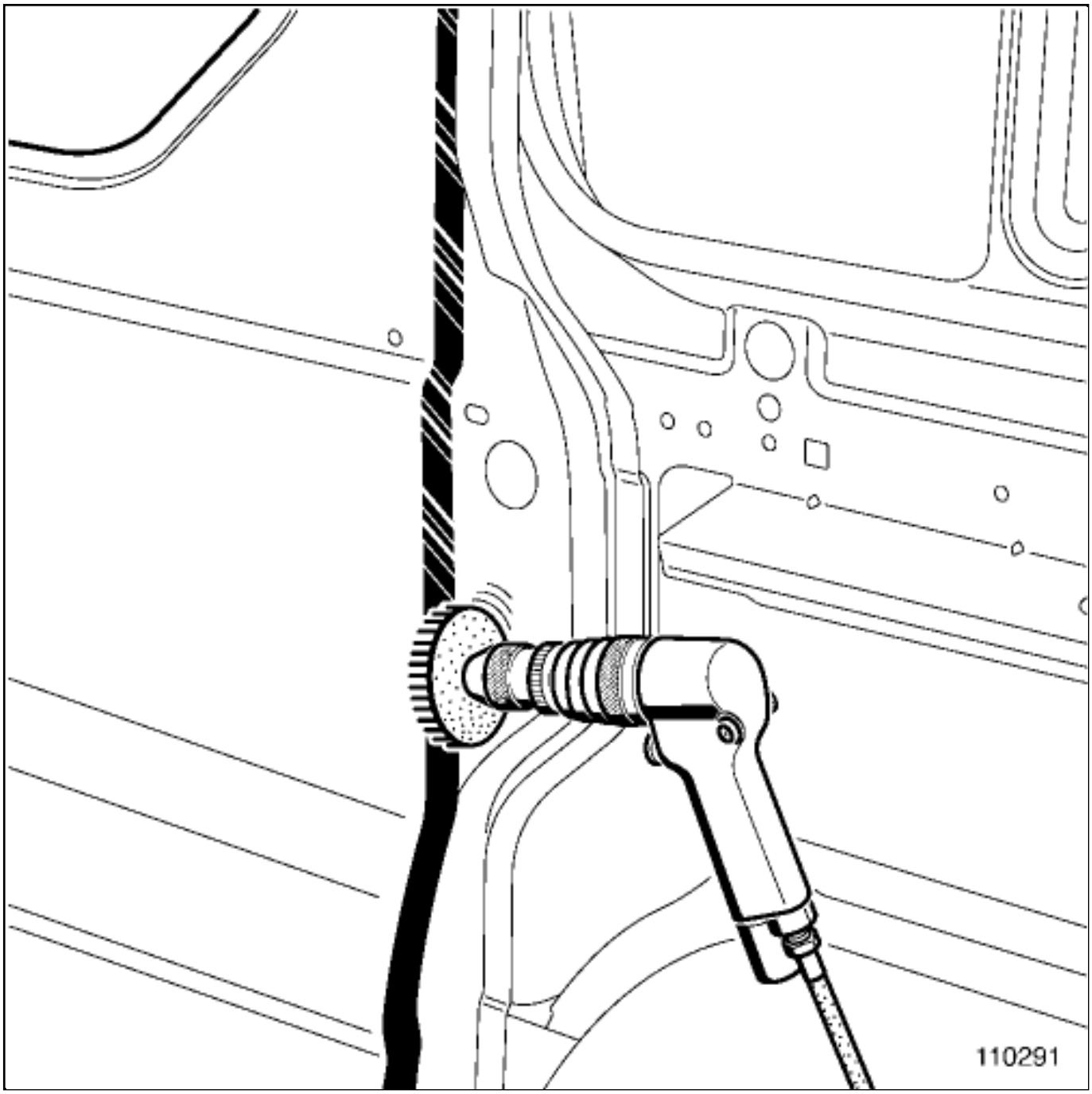
3)PREPARING THE MATING FACES ON THE REPLACEMENT PART



Scour the external mating face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4)PREPARING THE MATING FACES ON THE VEHICLE



Scour the internal joint face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3- ADJUSTING THE WELDER

Joint by GMAW bead of chain weld.

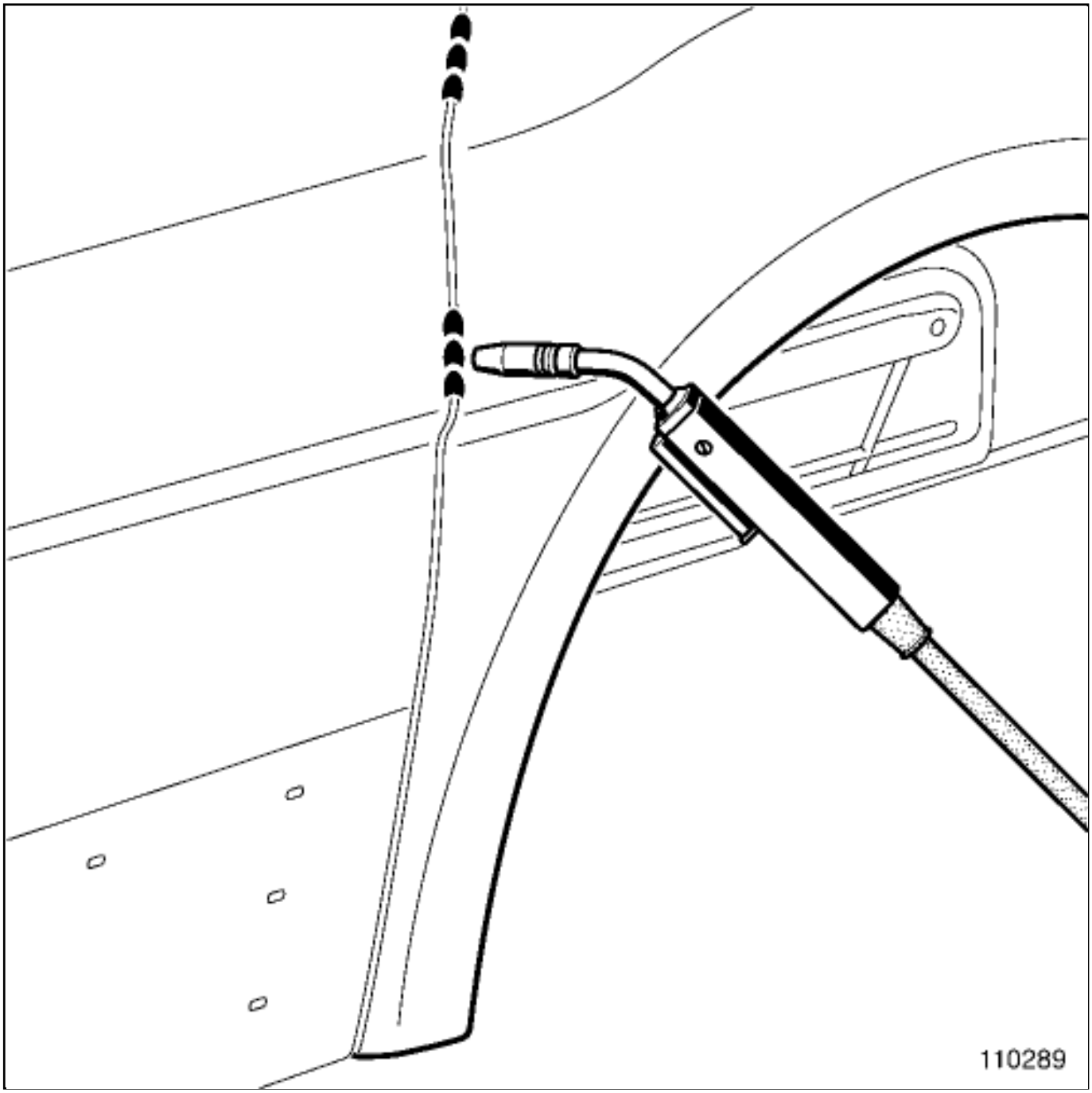
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

4- ASSEMBLY

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

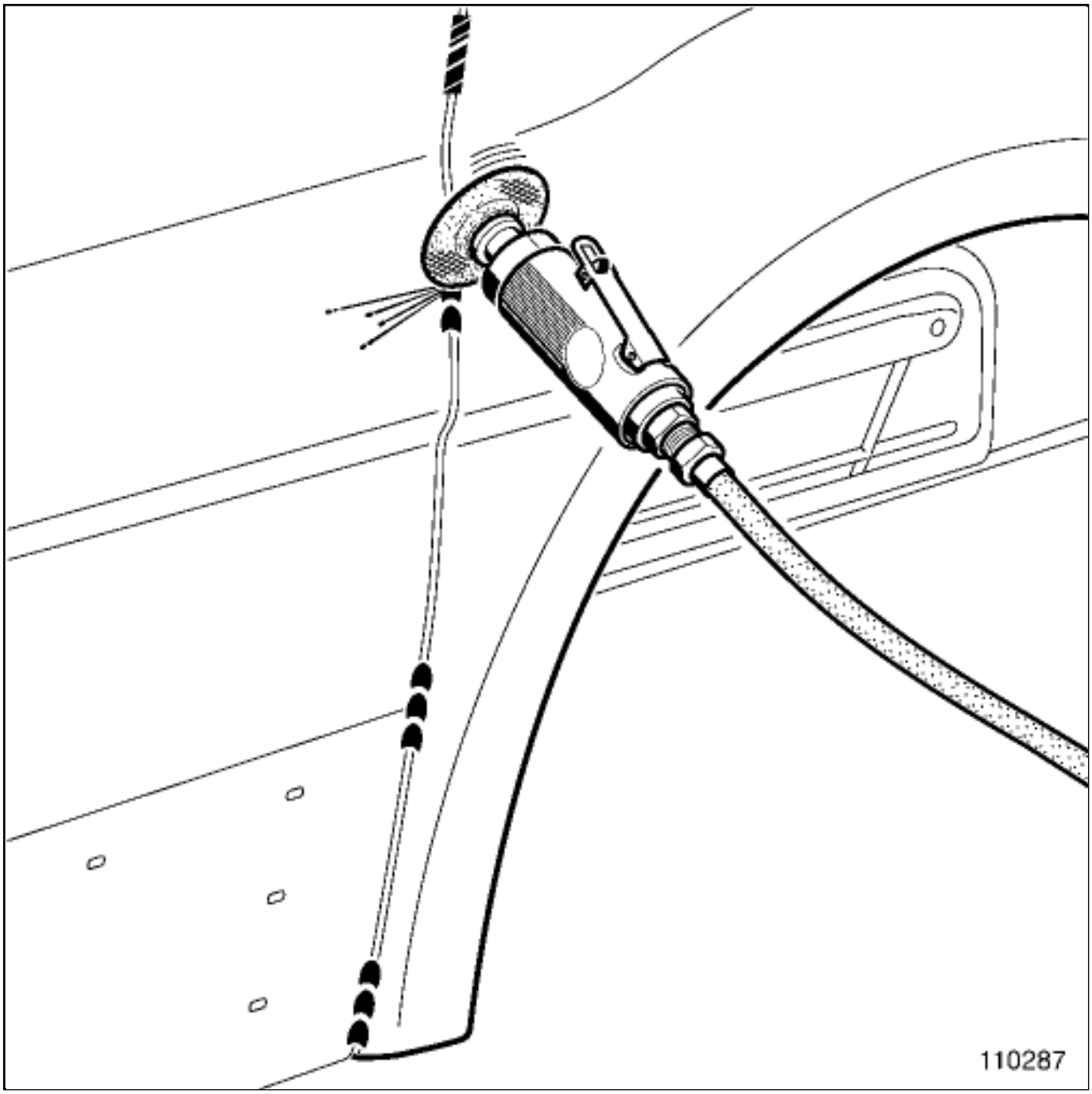
Position the welding machine earth as close as possible to the weld zone (see MR 400).



Carry out the broken continuous welds.

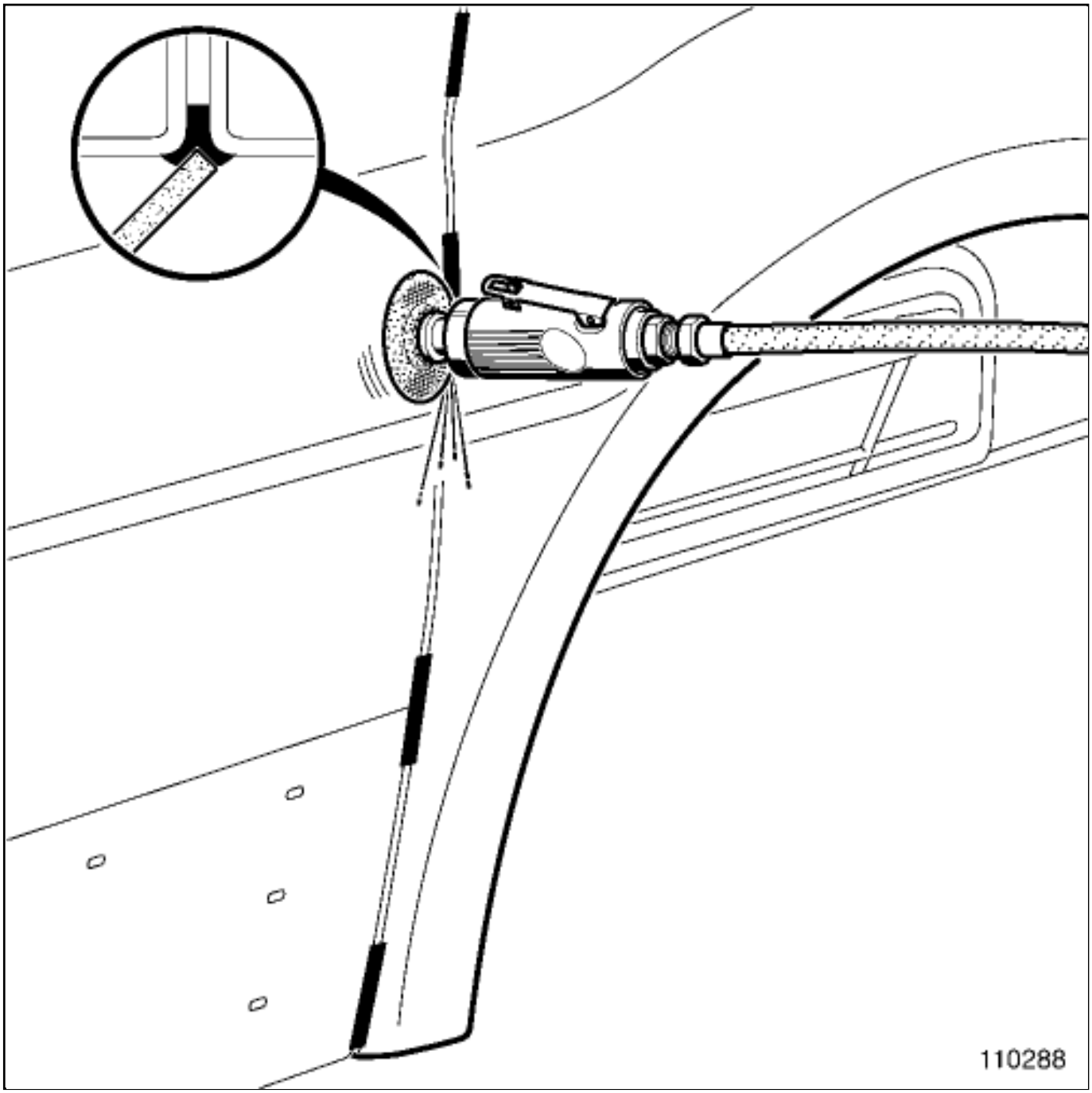
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

5- FINISHING



Grind the beads across their width.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)



Slightly hollow out the beads along their length.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Note:

Do not strike or damage the panel.

6- FITTING PROTECTION AFTER ASSEMBLY

Apply the acoustic protection.

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

Apply the anti-corrosion protection.

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

5. GMAW JOINT BY PLUG WELDS

1- PREPARATION BEFORE ASSEMBLY

1)POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

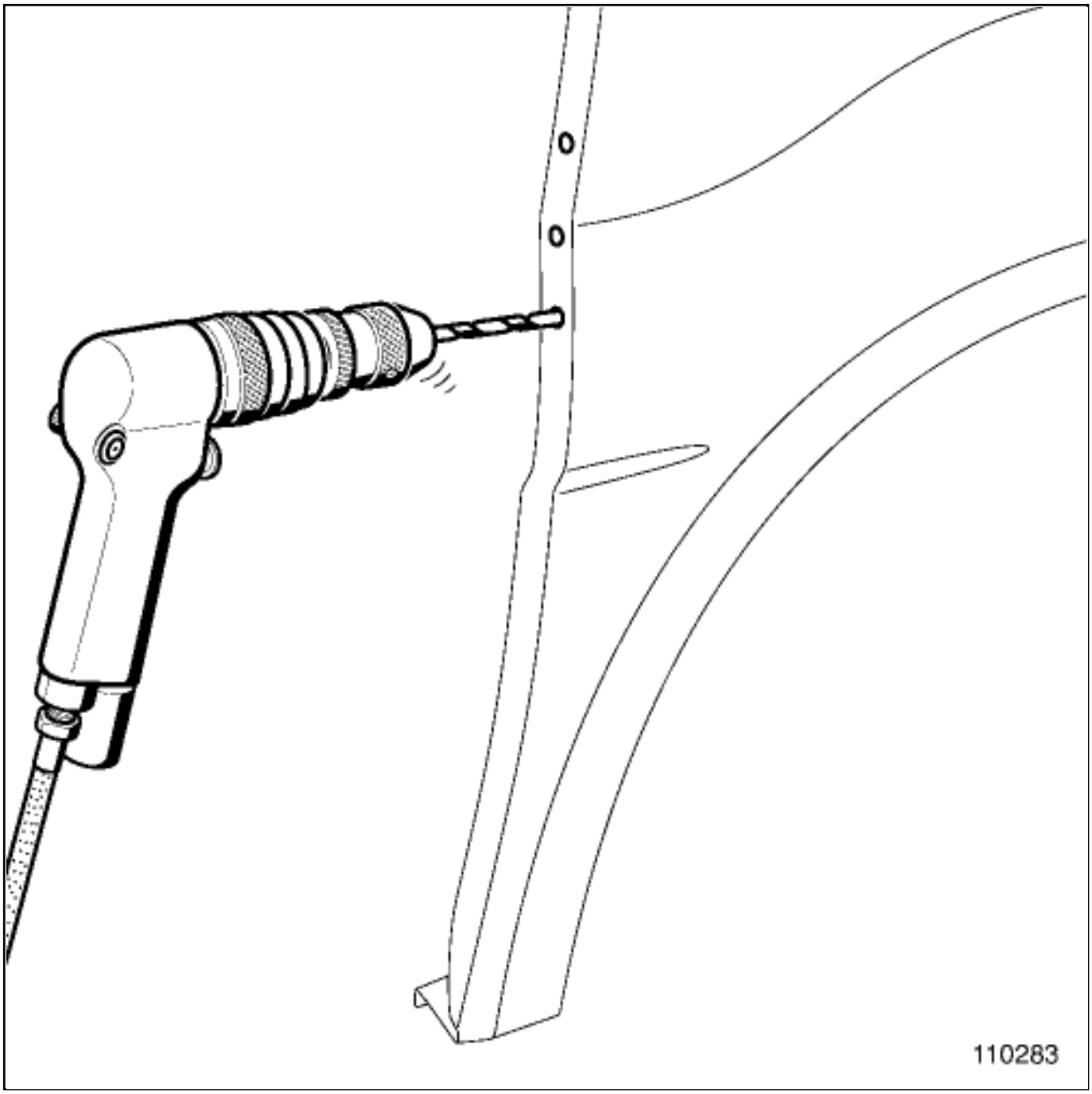
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2)MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

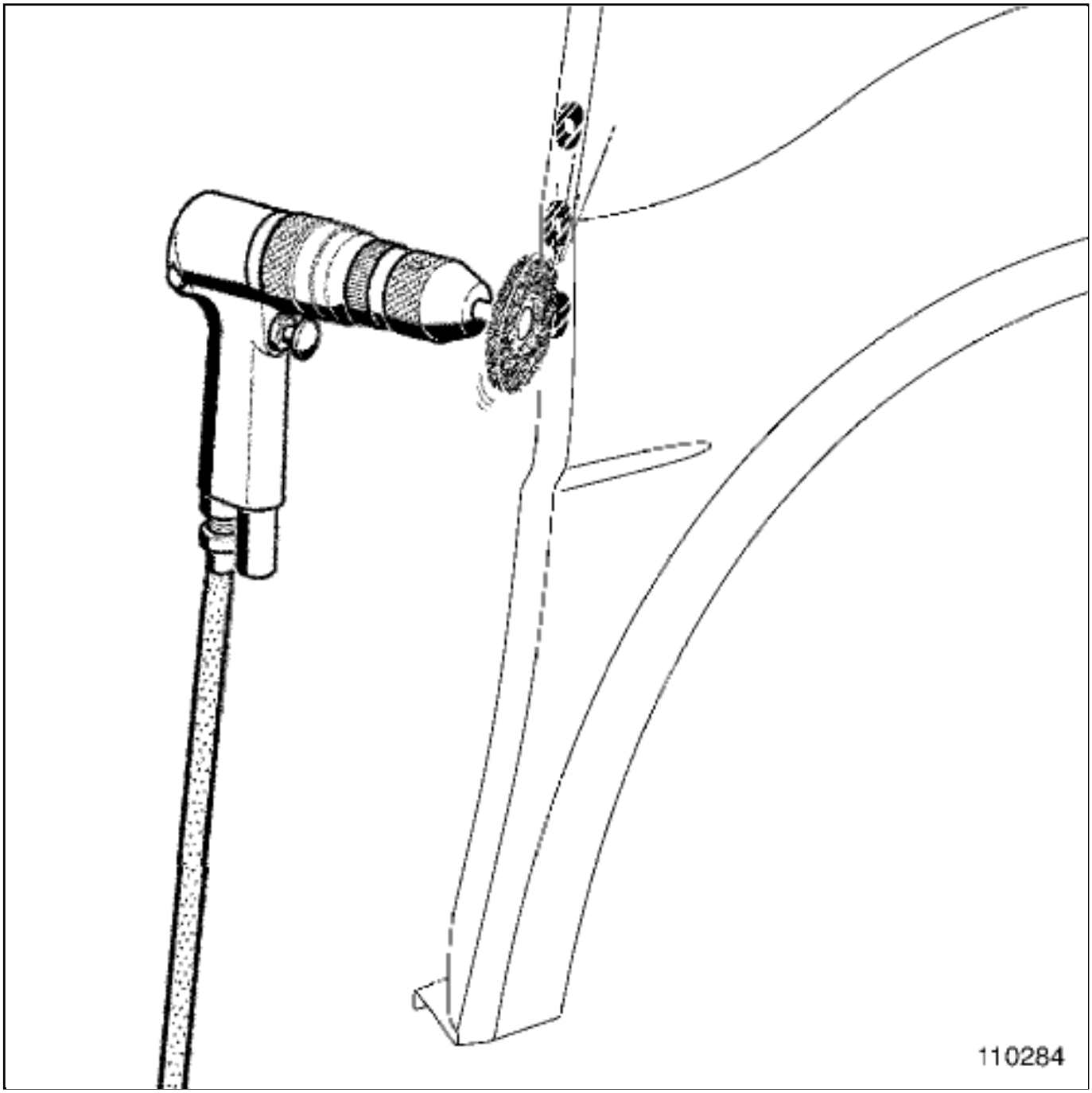
Remove the part.

3)PREPARING THE MATING FACES ON THE REPLACEMENT PART



Drill or pierce the support panel via the internal face of the joint for the plug welds, see table below.

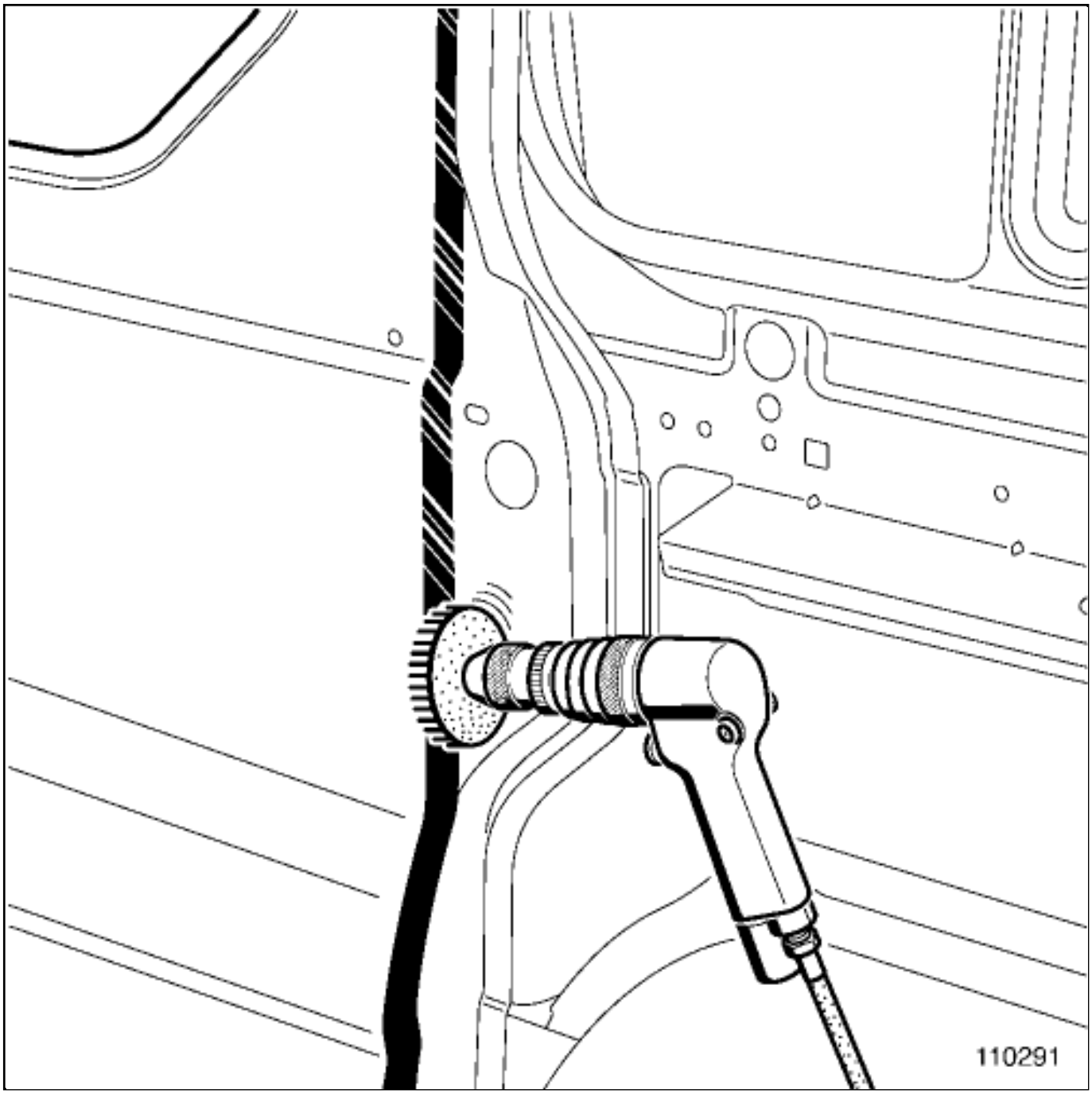
Thickness (mm)	∅ drill bit (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10



Scour the outline of the drilling hole via the external face of the joint.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4)PREPARING THE MATING FACES ON THE VEHICLE



Scour the internal joint face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use) .

3- ADJUSTING THE WELDER

Joint by GMAW plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

4- ASSEMBLY

CAUTION

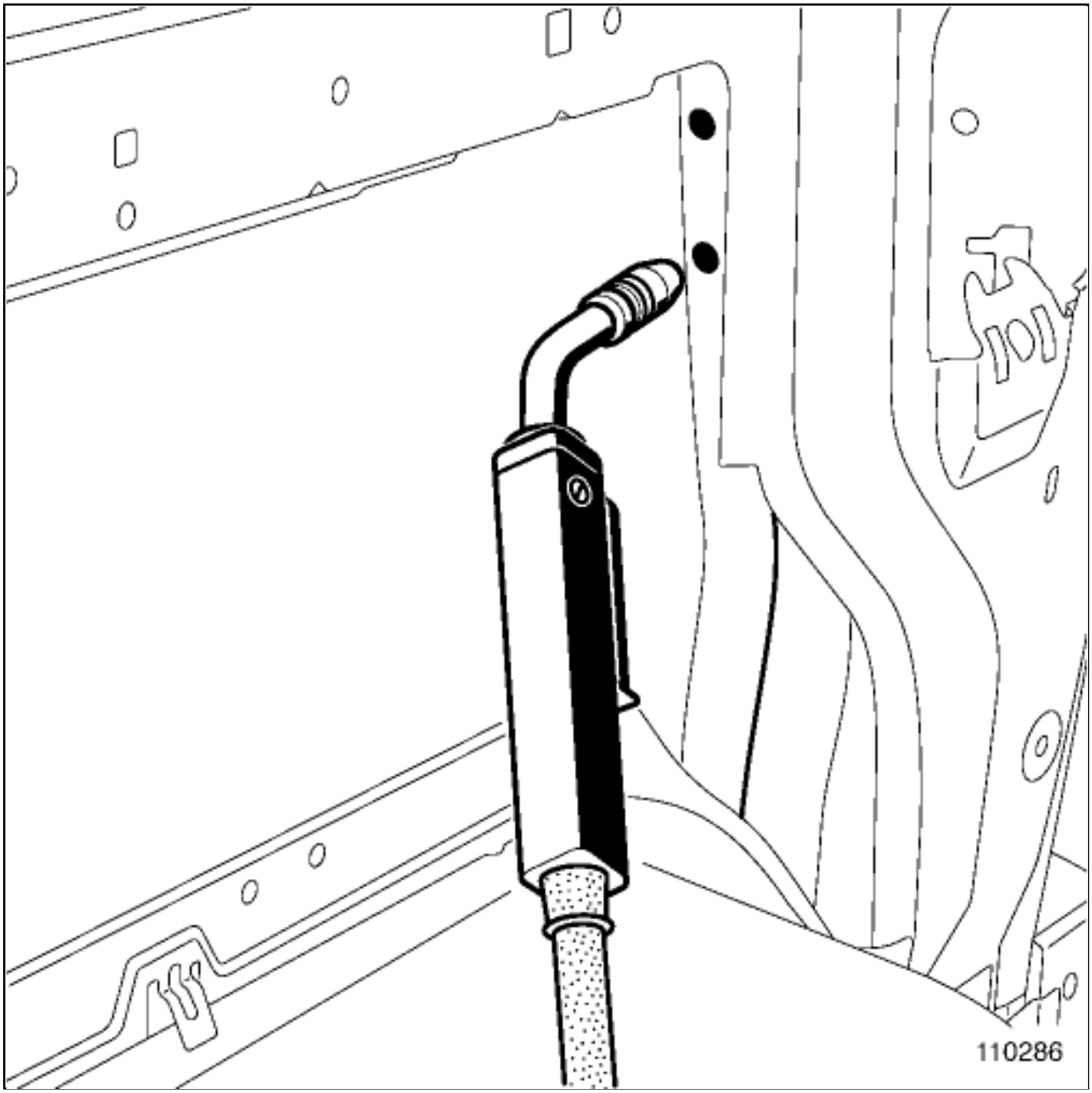
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the welding machine earth as close as possible to the weld zone (see MR 400).

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

5- FITTING PROTECTION AFTER ASSEMBLY

Apply the acoustic protection.

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

Apply the anti-corrosion protection.

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

XSL version : 3.02 du 22/07/11

ELECTRICAL RESISTANCE SPOT WELDING CONNECTION WITH THREE THICKNESSES

Repairing an electric resistance spot welded joint in three thicknesses depends on the panels to be replaced, as well as the stack and access.

Before working on the vehicle, mark exactly the stack of panel(s) to be replaced and the access to the joint in order to use the appropriate method.

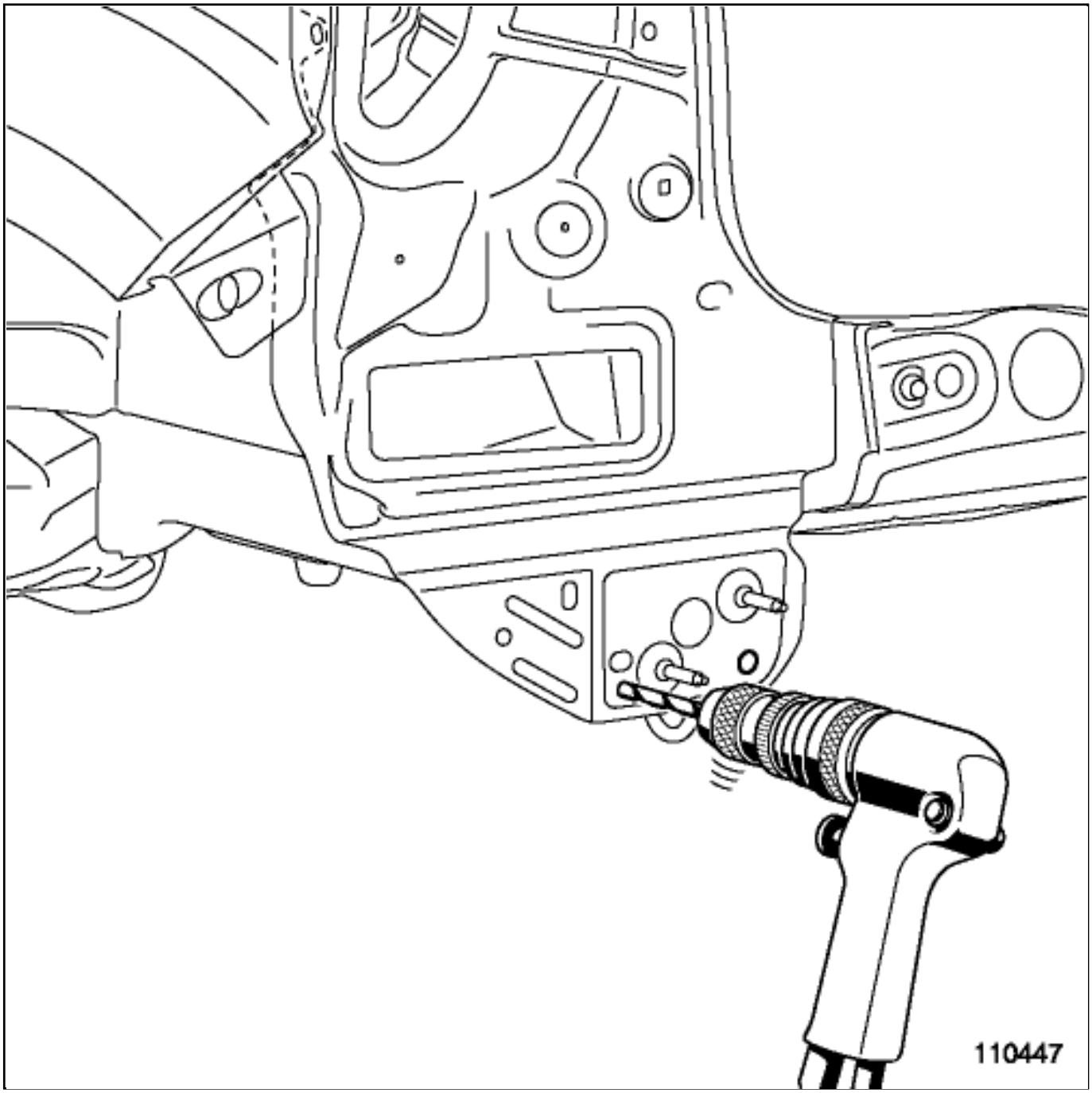
1. TWO FACE ACCESS

1- DISMANTLING

If necessary, scour the joint lines to bring out the spot welds.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)



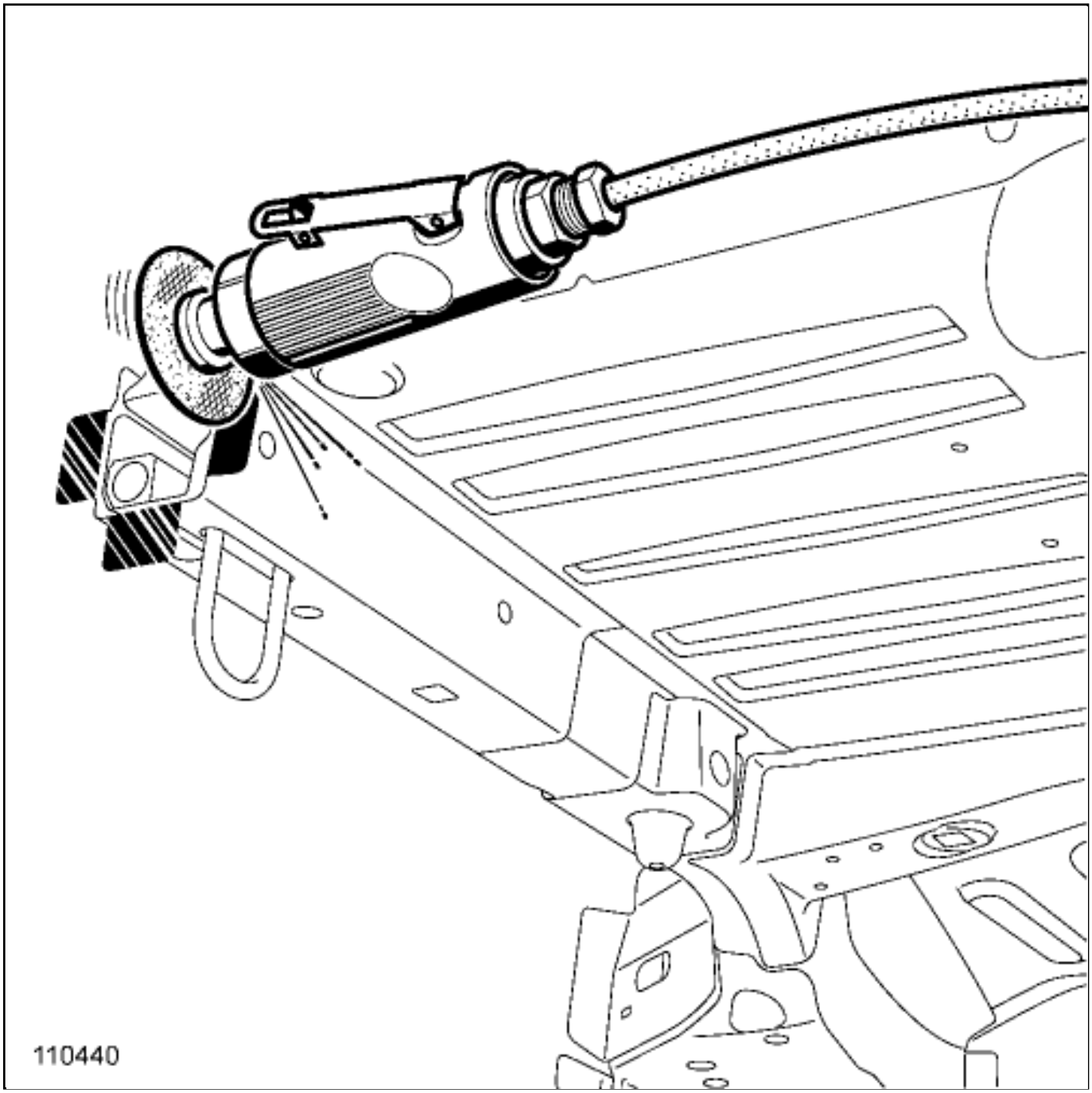
Unpick the spot welds.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the part to be replaced.

Note:

Do not strike or damage the panel.



Grind the welding residue.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

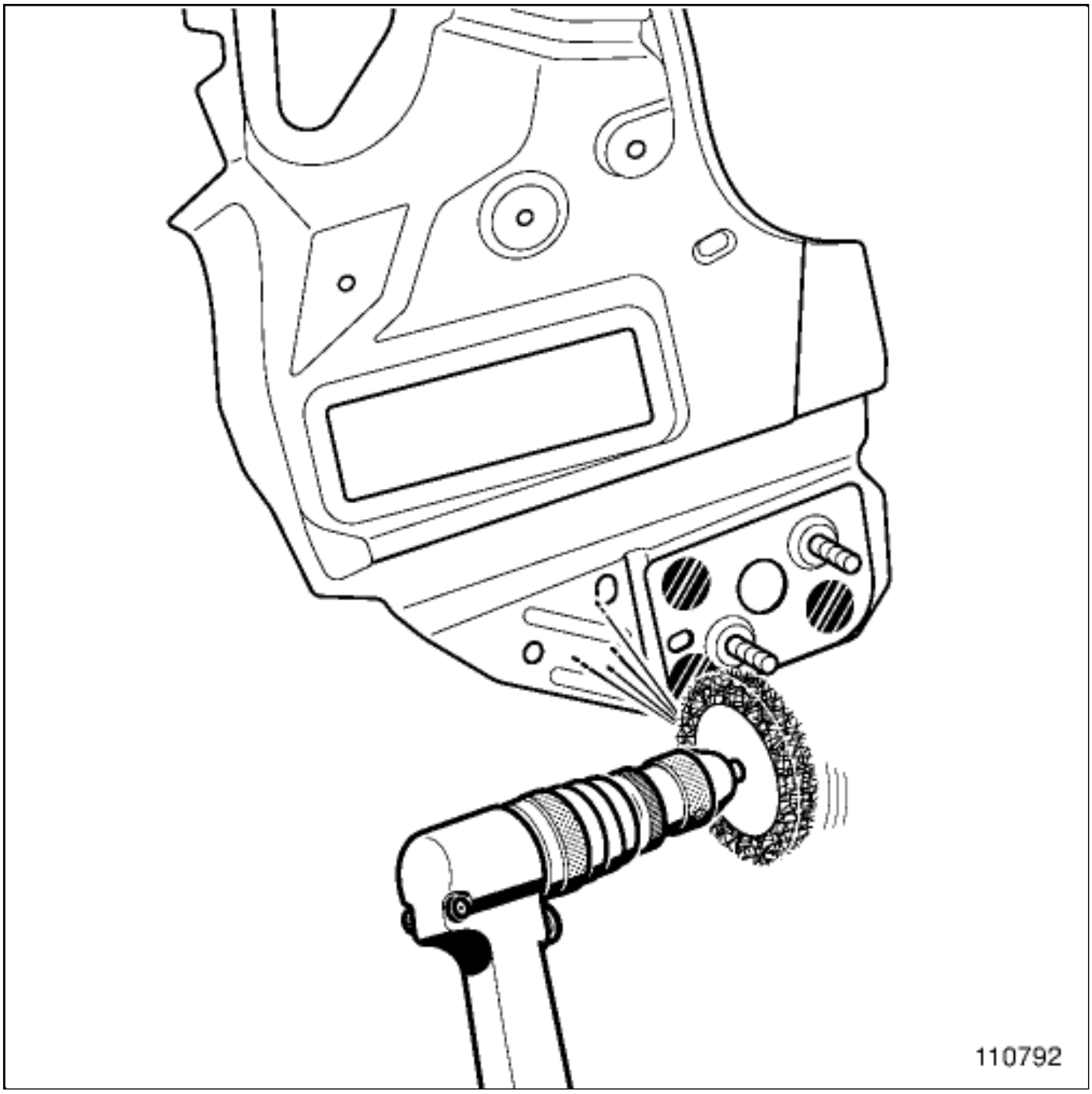
If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE MATING FACES



Scour the internal and external faces at the weld zones on the replacement part and on the vehicle.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3- ASSEMBLY

1)ADJUSTING THE WELDER

Resistance spot welded joints

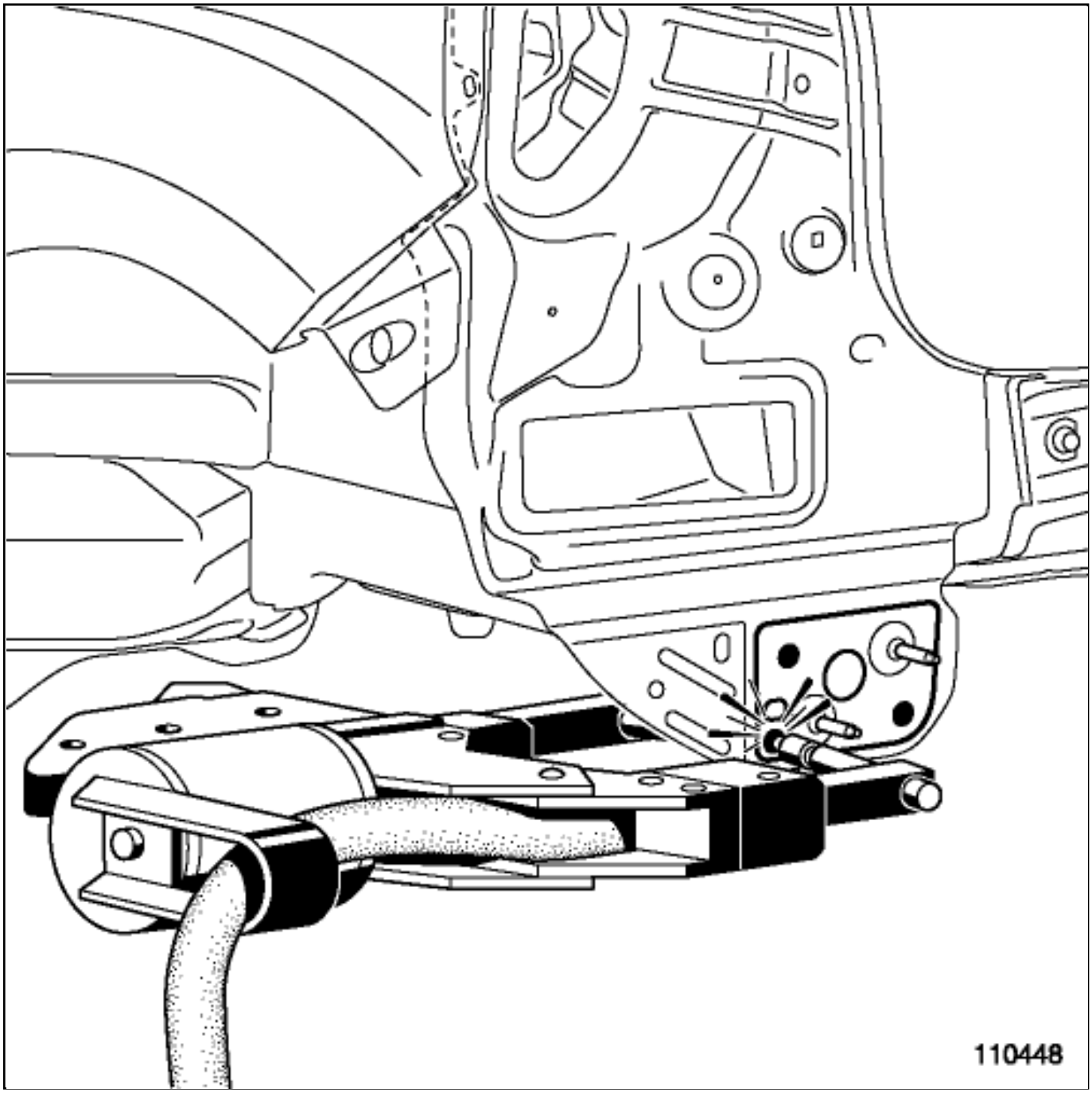
(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection: Precautions for the repair)

2)WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Weld the panels, making the points at the original locations.

There is no particular finish to be carried out on this type of weld; it must look the same as the original.

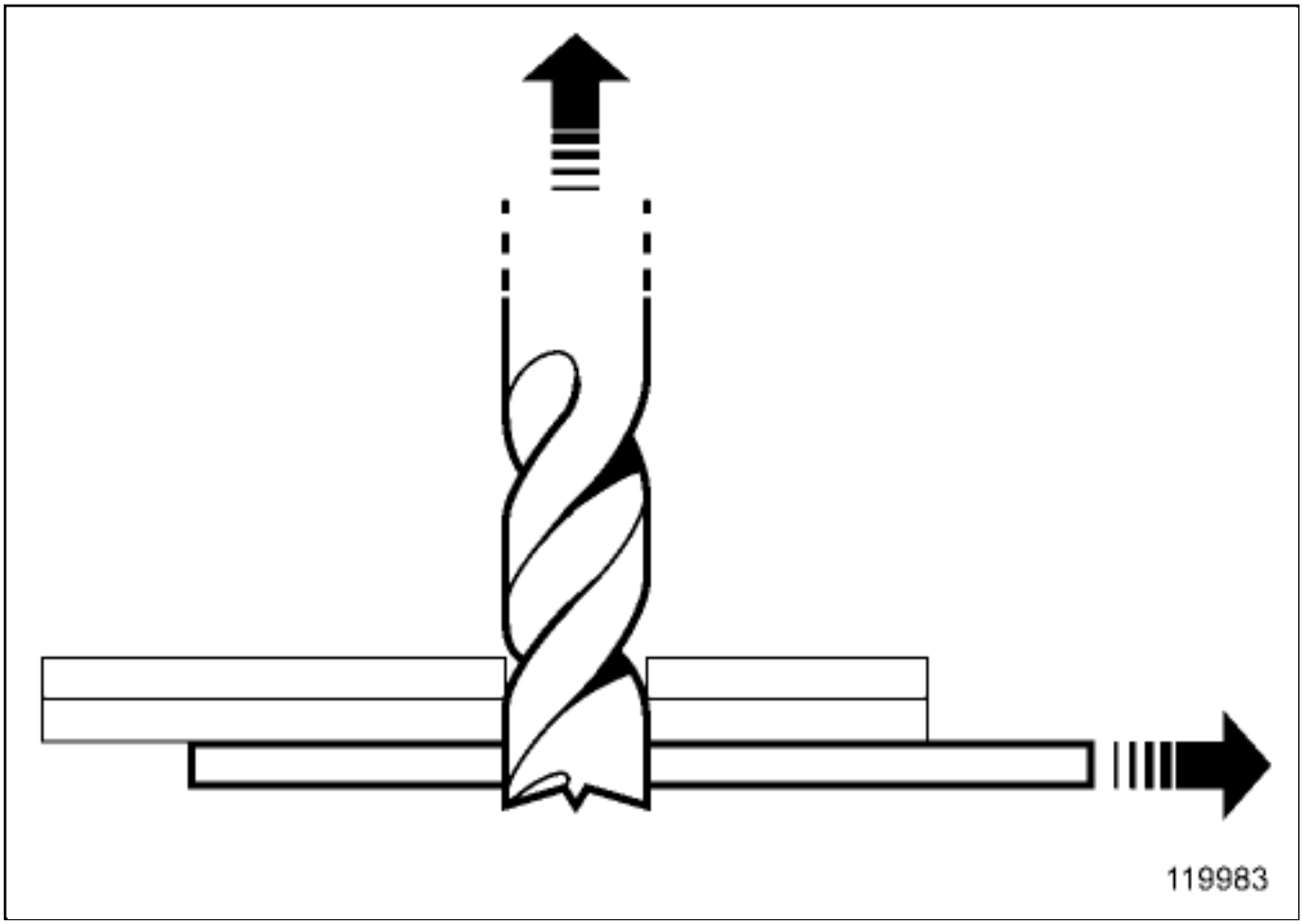
3)SPECIAL NOTE ON THE REPLACEMENT PART

The Parts Departmentprovides replacement parts with a special preparation, the points to be welded into three layers during assembly on the vehicle are pre-welded in two layers on the new part.

During welding of the end points on the vehicle, the operator must perform exactly as the points where the points existing on the part, for correctly stacking during welding.

2. SINGLE FACE ACCESS, THIRD PANEL TO BE REPLACED

1- DISMANTLING



Detach the assembly at the spot weld.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE REPLACEMENT PART

Scour the internal face at the plug welds.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)PREPARATION ON THE VEHICLE

Scour the edges of the drilling holes on the internal and external faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

3- APPLYING PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld**(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)** .

4- ASSEMBLY

1)ADJUSTING THE WELDER

GMAW plug welded joints.

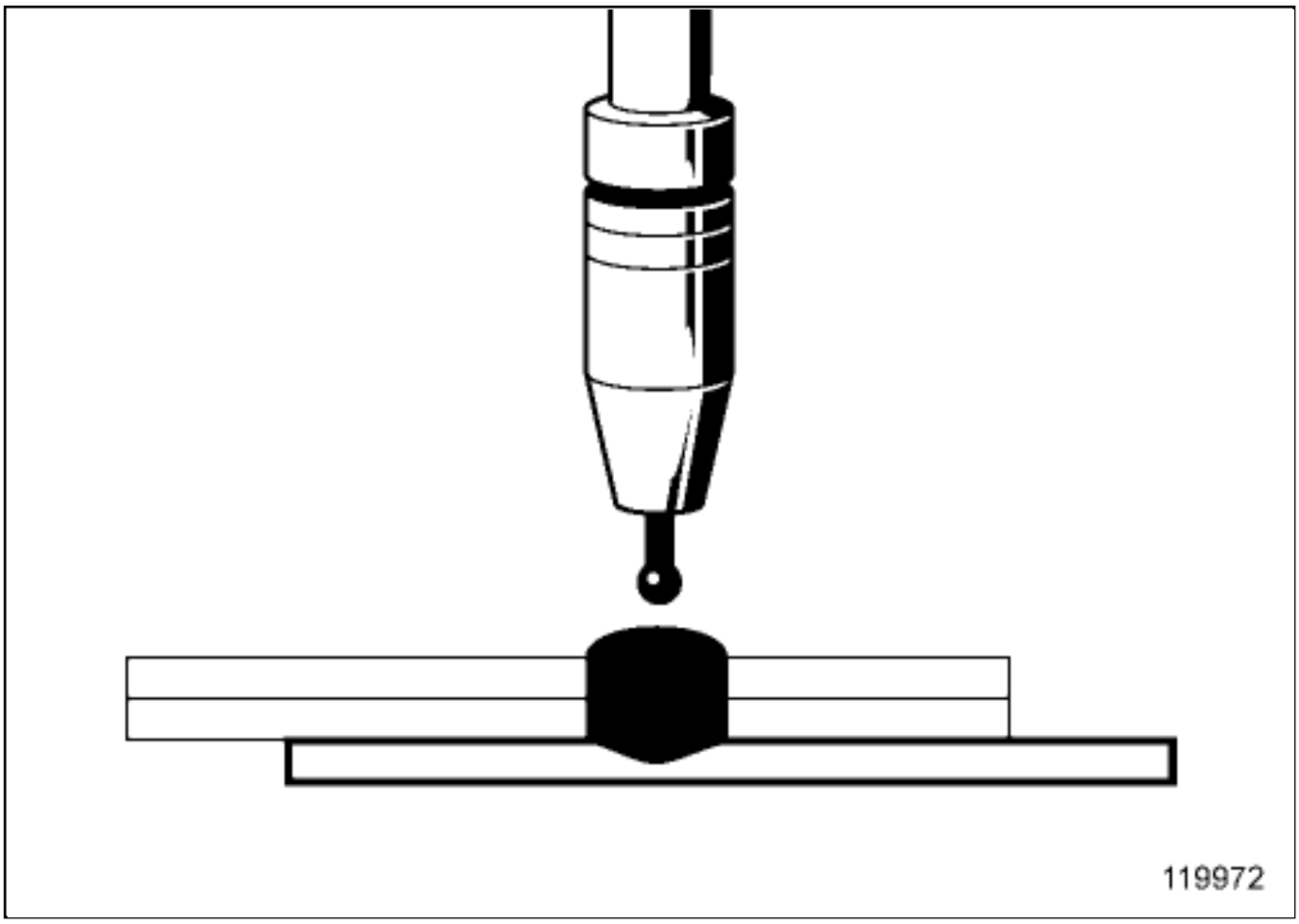
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2)CARRYING OUT THE WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

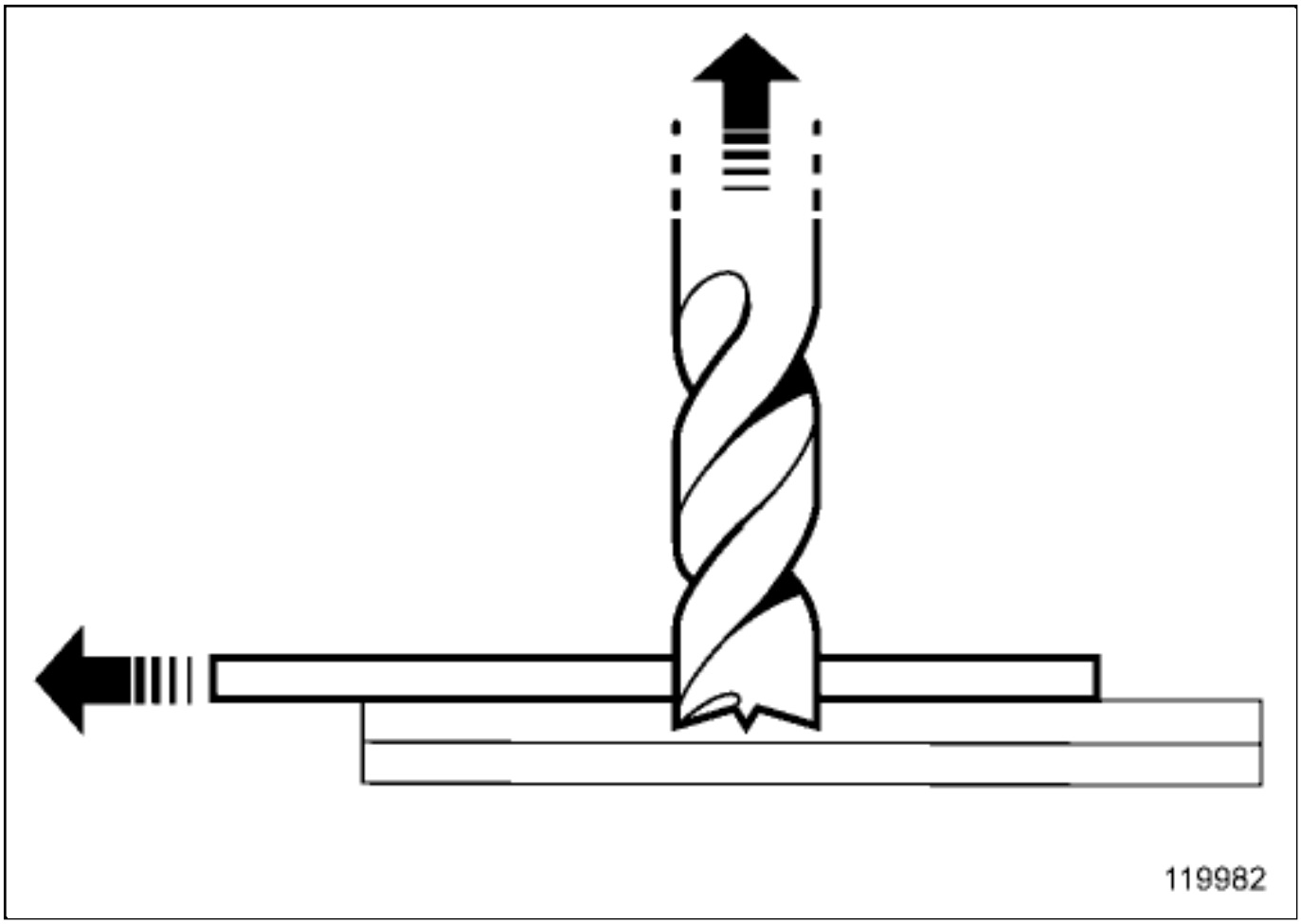
5- FINISHING

Surface finishing the plug welds.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

3. SINGLE FACE ACCESS, FIRST PANEL TO BE REPLACED

1- DISMANTLING



Detach the first panel of the assembly at the spot weld.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE REPLACEMENT PART

Drill the panel via the internal face, respecting the following table:

Panel thickness (mm)	∅ drill bit (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10

Scour the edges of the drilling holes on the internal and external faces

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)PREPARATION ON THE VEHICLE

Scour the internal face at the plug welds.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld**(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)** .

4- ASSEMBLY

1)ADJUSTING THE WELDER

GMAW plug welded joints.

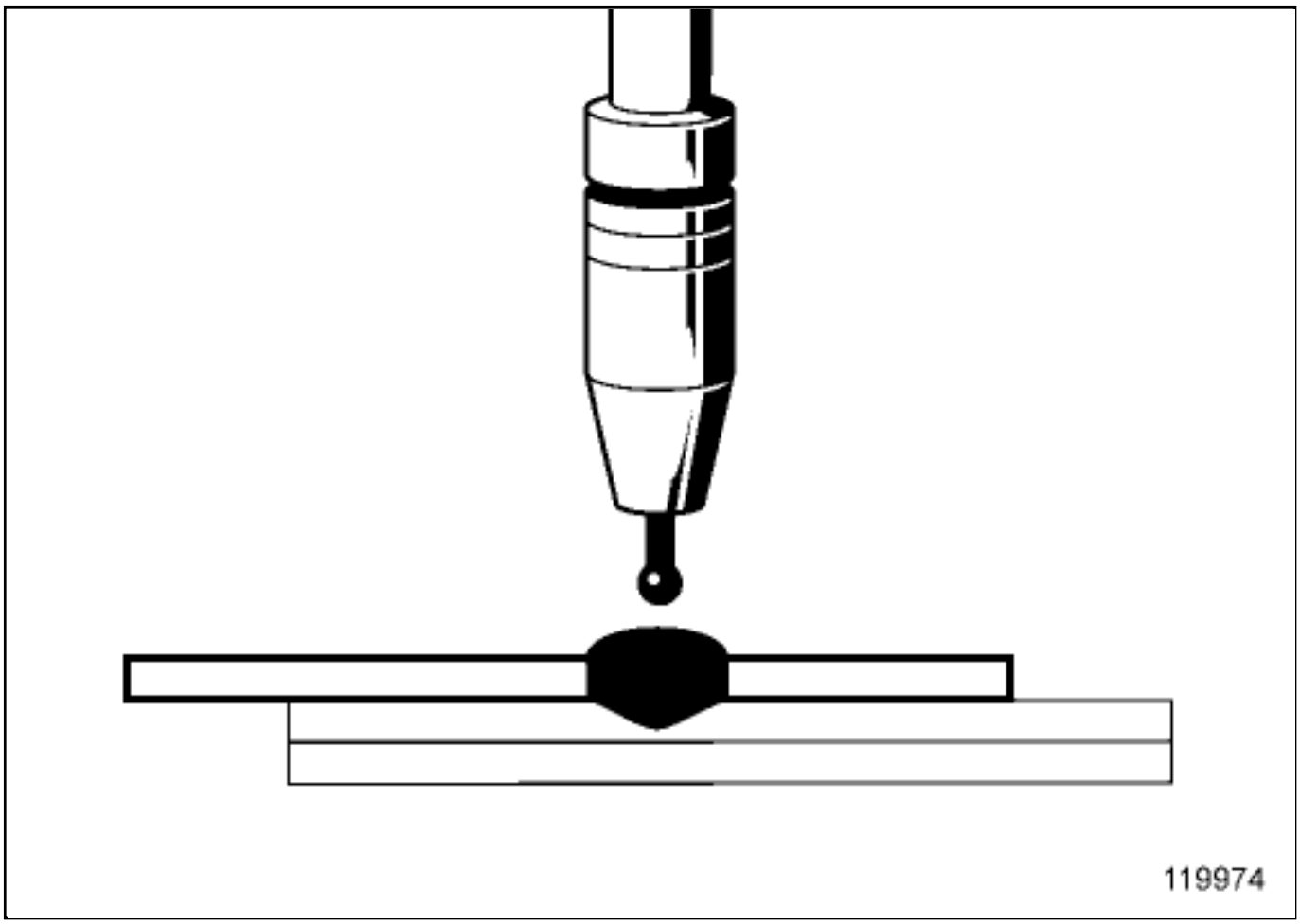
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2)CARRYING OUT THE WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

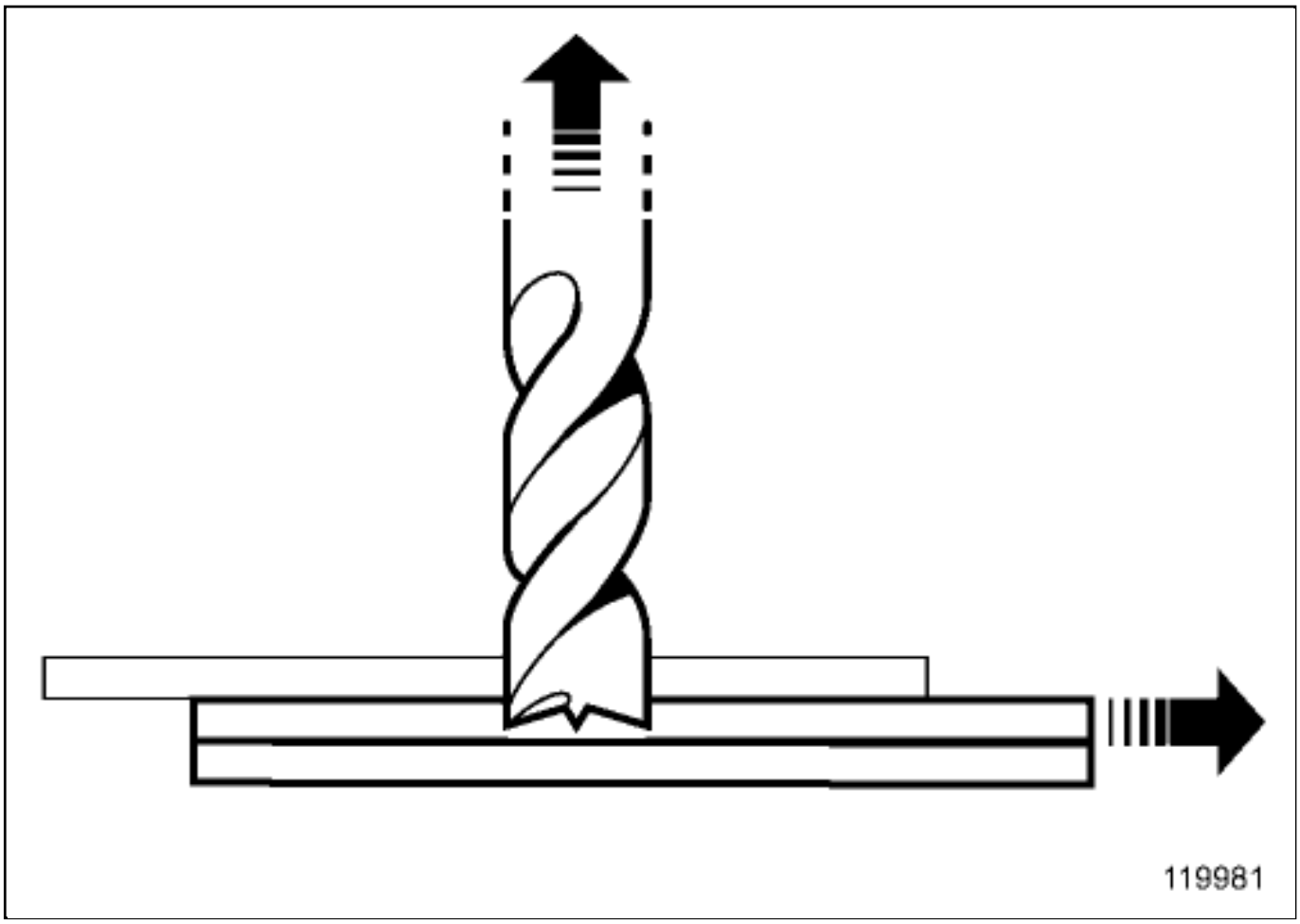
5- FINISHING

Surface finishing the plug welds.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

4. SINGLE FACE ACCESS, SECOND AND THIRD PANELS TO BE REPLACED

1- DISMANTLING



Detach the first panel or the whole assembly at the spot weld.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE REPLACEMENT PART

Scour the internal face at the plug welds.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)PREPARATION ON THE VEHICLE

Scour the edges of the drilling holes on the internal and external faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- APPLYING PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld**(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)** .

4- ASSEMBLY

1)ADJUSTING THE WELDER

GMAW plug welded joints.

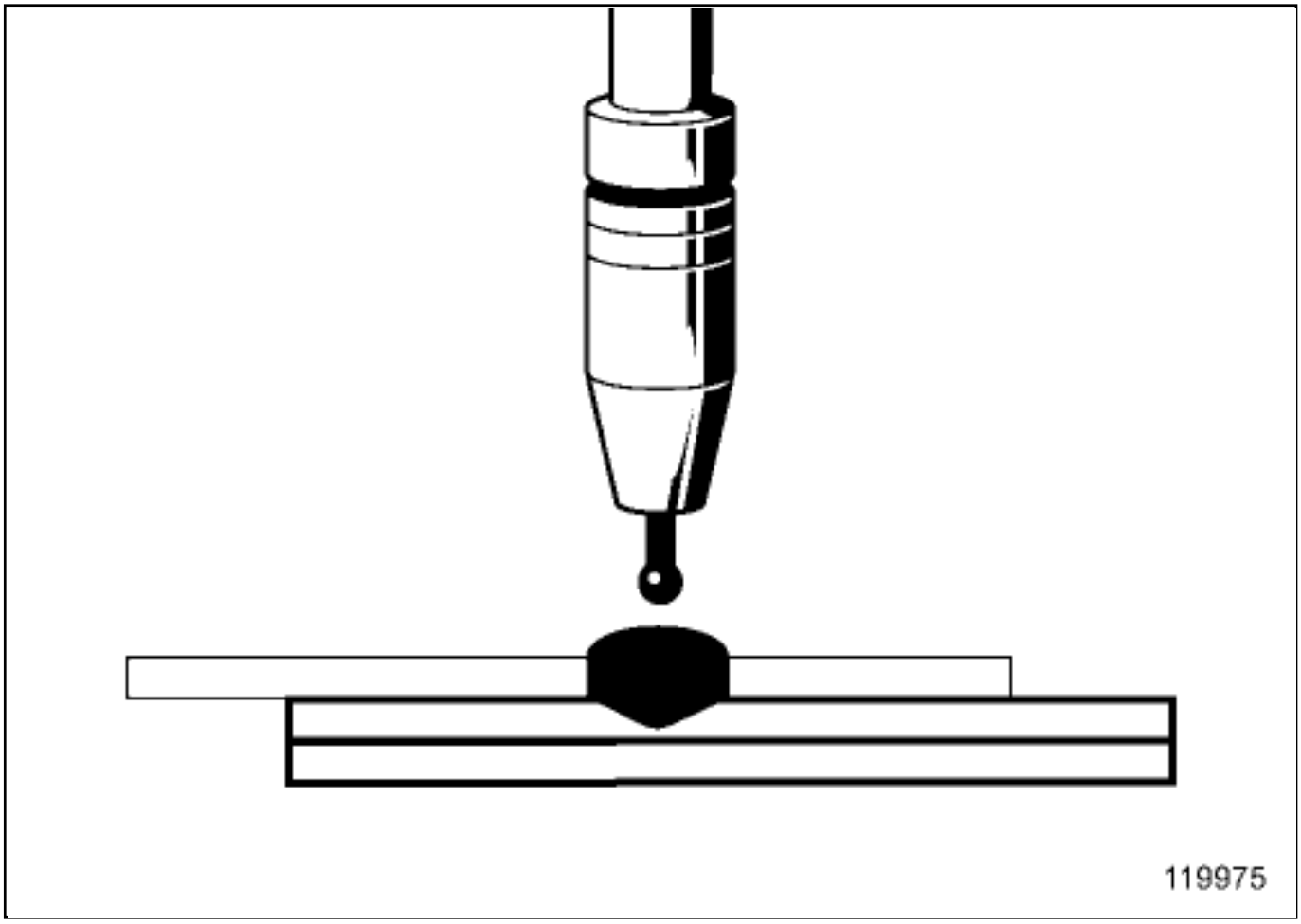
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2)CARRYING OUT THE WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

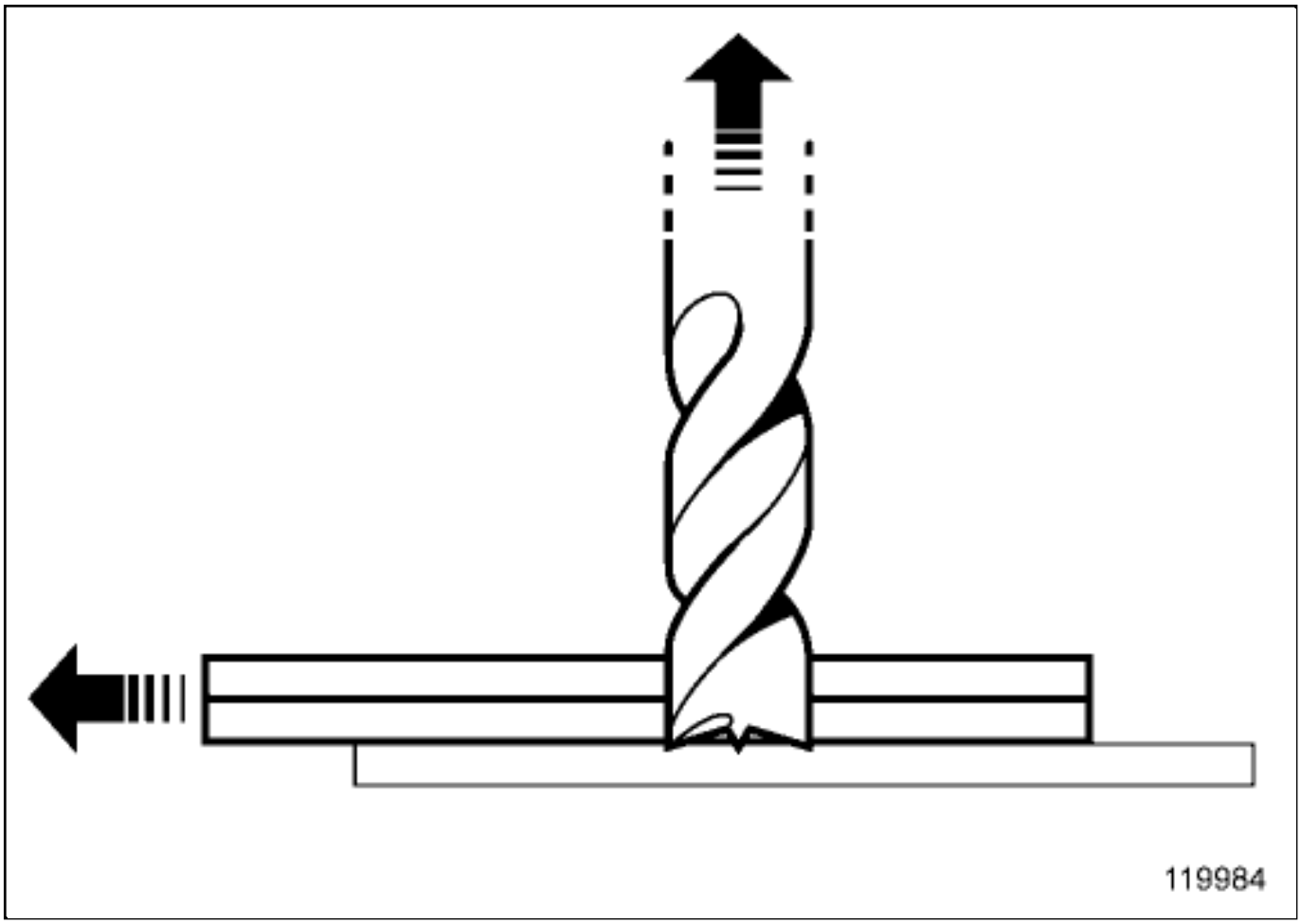
5- FINISHING

Surface finishing the plug welds.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

5. SINGLE FACE ACCESS, FIRST AND SECOND PANELS TO BE REPLACED

1- DISMANTLING



Detach the first two panels of the assembly at the spot weld.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE REPLACEMENT PART

Drill the panels via the internal face at the existing joint

If there is no resistance weld spot in two thicknesses on the replacement part, drill the panels, respecting the following table:

Panel thickness (mm)	∅ drill bit (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10

Scour the edges of the drilling holes on the internal and external faces

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)PREPARATION ON THE VEHICLE

Scour the internal face at the plug welds.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- APPLYING PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld**(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)** .

4- ASSEMBLY

1)ADJUSTING THE WELDER

GMAW plug welded joints.

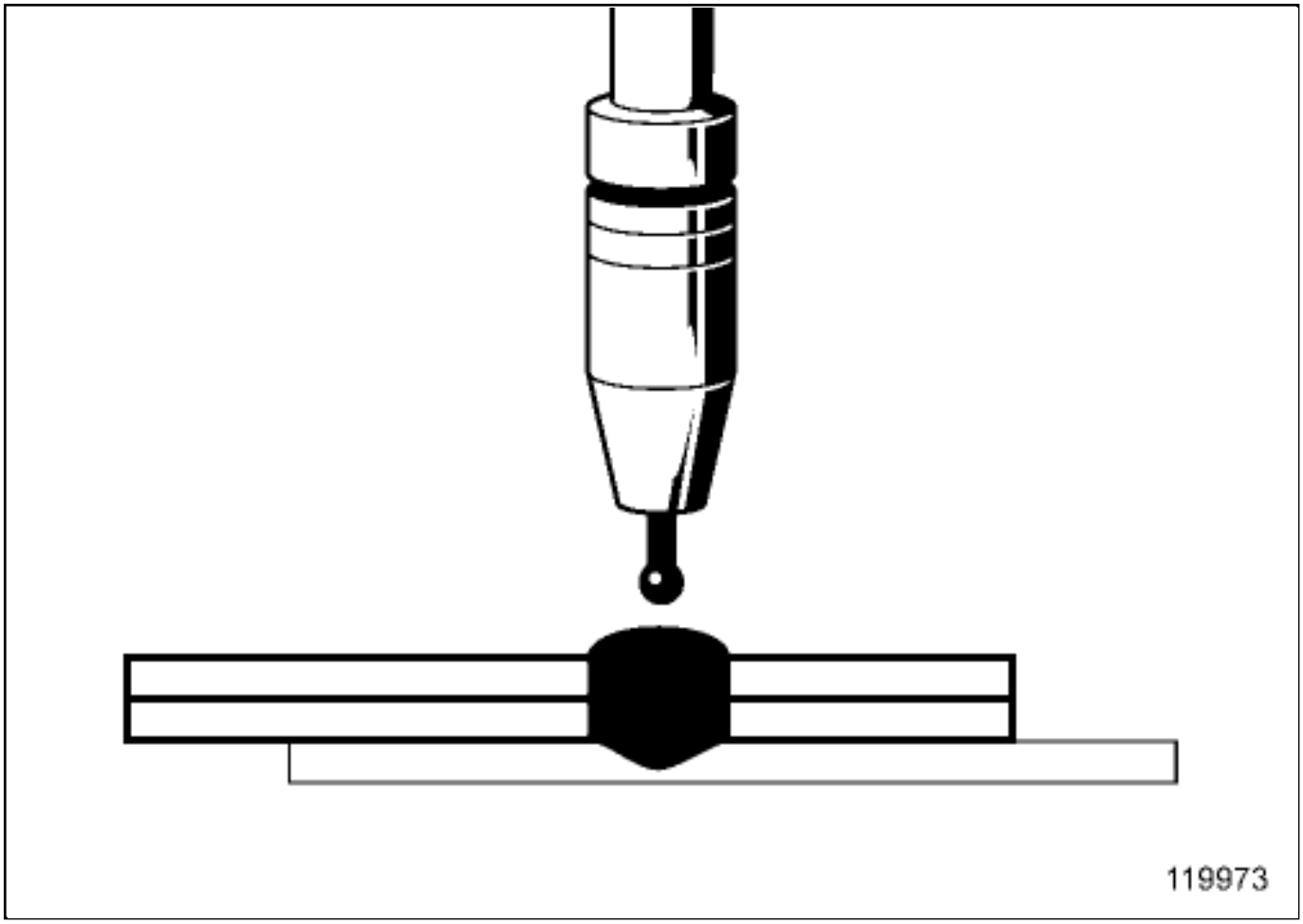
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2)CARRYING OUT THE WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

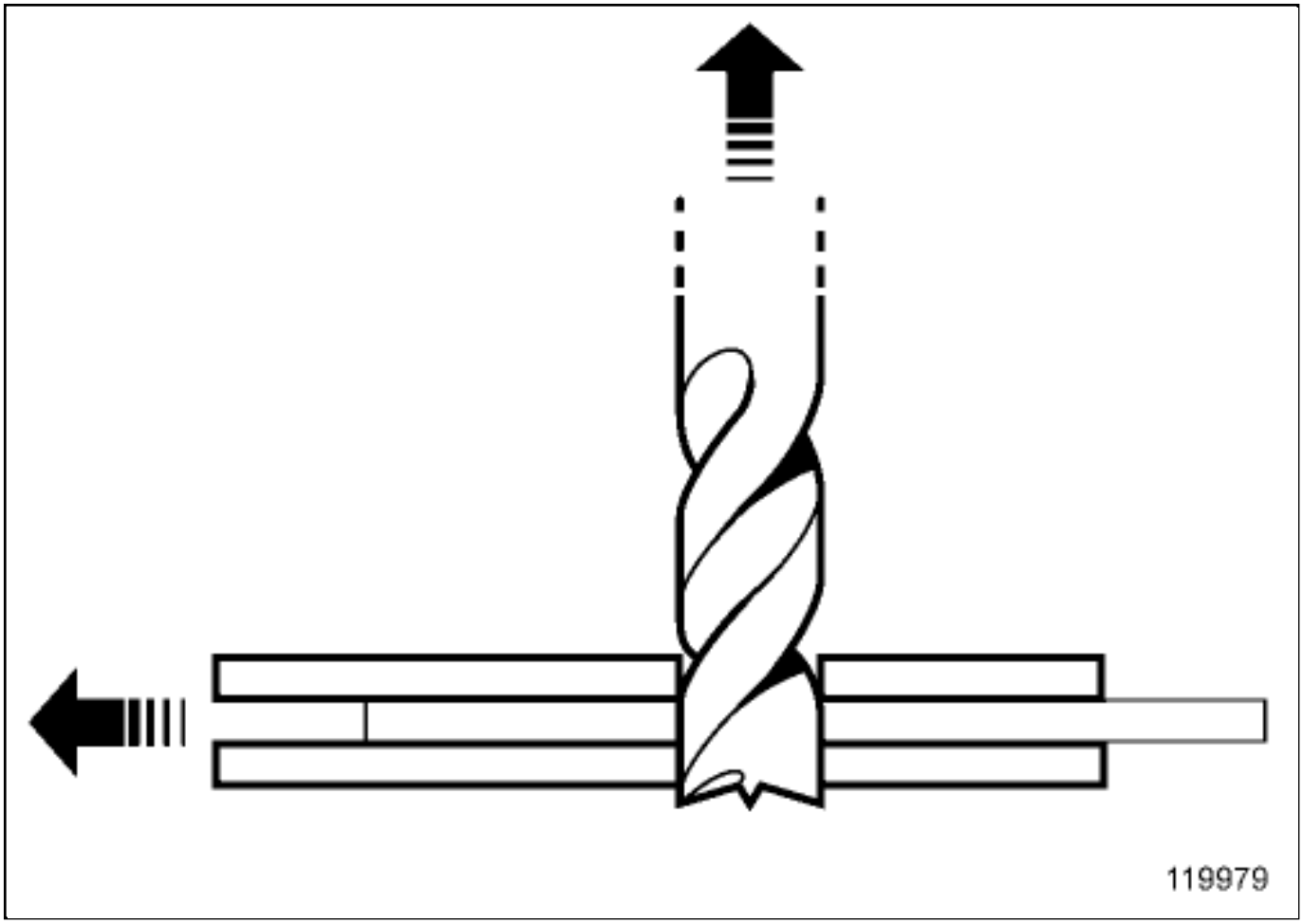
5- FINISHING

Surface finishing the plug welds.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

6. SINGLE FACE ACCESS, FIRST AND THIRD PANELS TO BE REPLACED

1- DISMANTLING



Detach the assembly at the spot weld.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE REPLACEMENT PART

Drill the external panel without touching the second, respecting the following table:

Panel thickness (mm)	∅ drill bit (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10

Scour the edges of the drilling holes on the external faces

If possible, scour the interface between the two panels of the replacement part, without damaging the mating faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)PREPARATION ON THE VEHICLE

Scour the edges of the drilling holes on the internal and external faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use) .

4- ASSEMBLY

1)ADJUSTING THE WELDER

GMAW plug welded joints.

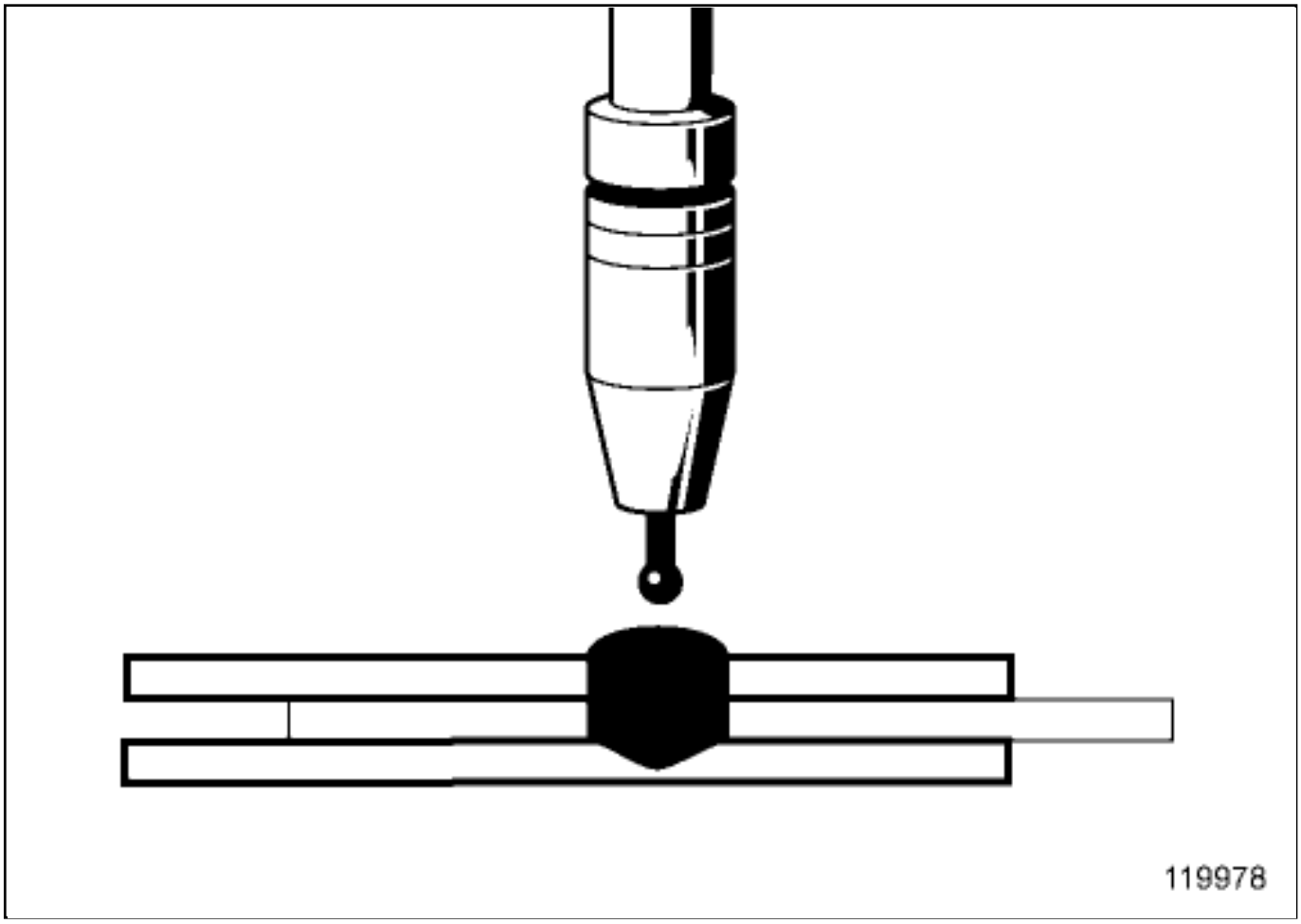
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2)CARRYING OUT THE WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

5- FINISHING

Surface finishing the plug welds.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

RENAULT

Technical Note 6015A

All types

Sub-sections concerned: 88A - 88B - 88C

ELECTRICAL WIRING REPAIR

77 11 332 302 Edition 7 - AUGUST 2011 Edition Anglaise

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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ELECTRICAL WIRING REPAIR

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WARNING
This note authorises the repair of electrical wiring in very specific cases only and under certain conditions.
Check that the repair in question is authorised and that the repair conditions are respected.

1 - Result of the fault finding procedure.

Note:
During repair, check that you have the most recently updated version of the technical note.

A preliminary fault finding procedure has enabled a wiring fault to be identified. Follow the investigation procedure below.

Disconnect the battery (see the **MR corresponding to the vehicle, 80A, Battery, Battery: Removal - Refitting**).

Remove the components necessary to access the area to be worked on. The operation area must allow the pliers and the heat gun to be used, without blocking visibility.

WARNING
If the damaged section is not sufficiently accessible, remove the wiring concerned and repair on the bench.

When the damaged section is sufficiently accessible, detach the wires to be repaired from the main wiring.

WARNING
Check if there is a sensitive line. These cases are listed in the specific procedures reference table in this section.
If there is a sensitive line, replace the defective wiring or apply the specific procedure, if one exists. These procedures are indicated in the specific procedures reference table in this section.

Check that the fault is located more than 10 cm from the connector.

WARNING
If the damaged section is located less than 10 cm from the connector, replace the defective wiring, unless a wiring-connector kit (connector with wires) exists. In this case, use the kit to replace the damaged section and the connector.

This note does not authorise operations directly on the connectors and electrical contacts. Only wiring-connector kits allow the replacement of a connector. These kits can have associated procedures.

Note:
To check whether there is a wiring-connector kit, consult DIALOGYS. These kits are generally linked to specific wiring or function diagrams.

Note:
If the fault is located at the electrical contact (in the connector) and if it is linked to a corrosion or heating fault, replace the wiring or fit the wiring-connector kit. Also check the connector complement.

Note:
In all cases, pay particular attention to supply and earth lines and their tightening (refer to the tightening torques in the MRs concerned).

After having carried out these checks (outlined in the **Summary flowchart of the operating procedure**), if the repair is authorised, and it does not require a specific procedure, carry out the generic procedure (see **Wiring: Repair**).

Note:
If you have been referred to this note by a MR, NT or removal-refitting procedure, apply the repair procedure adapted to the case in question.
Either the generic repair procedure (see **Wiring: Repair**), or a specific procedure listed in the specific procedures reference table in this section.

2 - Specific procedures reference table.

- **Guidelines for reading the tables below:**

  – If not otherwise stated, consider all components or electrical connections to have a link with the functions or equipment listed. For example: For the electric power assisted steering, the function is not specified. It is prohibited to carry out operations on any wire attached to the electric power assisted steering.

  – If one case can be found in both tables, give priority to the **Changing the wiring**, recommendations, and then to those for the specific cases:
    - Example 1: For a 22-track airbag connector where more than 10 wires are damaged, the specific cases refer you back to the airbag and pretensioner repair procedure, and the general cases recommend that the wiring is replaced (as there are more than 10 wires involved). Priority is given to **Changing the wiring**.
    - Example 2: For an operation on a pair of twisted wires (general case) for the airbag function (specific case), the specific case refers back to the repair procedure for Airbags and pretensioners, and the general cases refer back to the repair procedure for multiplex lines. Priority is given to the airbag and pretensioner repair procedure. The recommendations for the specific cases take precedent over the general cases.

● **General cases:**

Functions or equipment	Precisions	Instructions
Wiring harness	Number of damaged wires 10 or fewer	(see **Wiring: Repair**)
	Number of damaged wires more than 10	Change the wiring
Equipment and predispositions specific to commercial vehicles and conversions	/	Change the wiring
Electric vehicles	Wiring and power connectors	Change the wiring
Connections or associated components	/	(see **Connector: Repair**)
Splices	Splice with more than 3 wires	Change the wiring
	3-wire splice which does not need sealing	(see **Wiring: Repair**)
	Splice with 3 wires or more, which needs sealing (engine and underbody areas and damp areas of the doors and boot)	Change the wiring
Wires outside the loom	Sheathed wires	Change the wiring
	Shielded wires	Change the wiring
	Twisted wires	**If the wire cross-sections are 0.5 mm^2:** (see **Multiplex network: Repair**)
	Flat cable	Change the wiring
	Wires with specific thermal protection	Change the wiring
	Copper wires with cross-section less than 0.35 mm^2	Change the wiring
	Copper wires with cross-section greater than 6 mm^2	Change the wiring
	Damaged wires less than 10 cm from the connector	(see **88A, Wiring, Connector: Repair**)

● **Specific cases:**

Lines	Device	Instructions
4-wheel steering	/	Change the wiring
ABS	Other ABS lines	Change the wiring
ABS	ABS sensor	Change the wiring
Airbag	Other airbag lines	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Airbag sensor	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Airbag computer connector	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Pretensioner (squib) connector	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Under seat connector	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Airbag trigger connectors (pyrotechnic lines)	(see **Airbag and pretensioner wiring: Repair**)
Preheating unit (Diesel)	Heater plug	Change the wiring
Injection computer (Petrol)	Petrol vapour absorber	Change the wiring
Injection computer	Variable camshaft	Change the wiring
Injection computer	Variable inlet camshaft	Change the wiring
Injection computer	Variable exhaust camshaft	Change the wiring
Injection computer (Petrol)	Pencil coil	Change the wiring
Injection computer (Petrol and Diesel)	Motorised throttle body	Change the wiring
Injection computer	Camshaft sensor	Change the wiring
Injection computer (Petrol and Diesel)	Inlet camshaft sensor	Change the wiring
Injection computer (Petrol and Diesel)	Exhaust camshaft sensor	Change the wiring
Injection computer	Camshaft sensor, row A, B	Change the wiring
Injection computer	Variable exhaust camshaft sensor	Change the wiring
Injection computer (Petrol and Diesel)	Pinking sensor	Change the wiring
Injection computer (Diesel)	Turbine upstream pressure sensor	Change the wiring

● **Specific cases (cont. 1):**

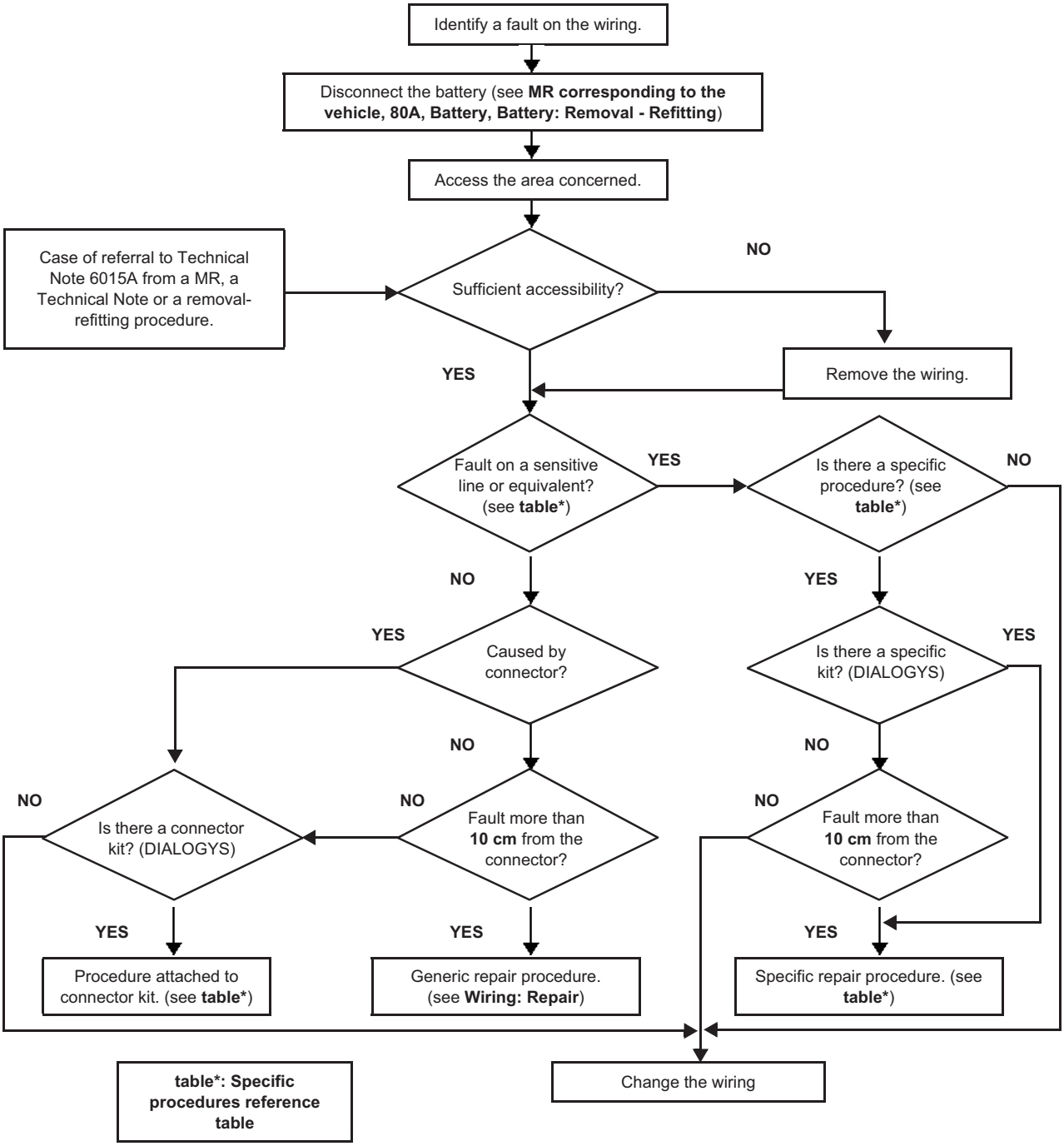
Lines	Device	Instructions
Injection computer (Petrol)	Manifold pressure sensor	Change the wiring
Injection computer (Diesel)	Particle filter differential pressure sensor	Change the wiring
Injection computer (Diesel)	Rail pressure sensor	Change the wiring
Injection computer (Petrol and Diesel)	Turbocharging pressure sensor	Change the wiring
Injection computer	Accelerator pedal sensor	Change the wiring, except for the connector on KANGOO (see **Connector: Repair**)
Injection computer (Petrol and Diesel)	TDC sensor	**See OTS***
Injection computer (Diesel)	Particle filter (downstream) output sensor	Change the wiring
Injection computer (Petrol and Diesel)	Air temperature sensor	Change the wiring
Injection computer (Petrol)	Turbine upstream temperature sensor	Change the wiring
Injection computer (Diesel)	Fuel temperature sensor	Change the wiring
Injection computer (Petrol and Diesel)	Coolant temperature sensor	Change the wiring
Injection computer (Diesel)	Particle filter inlet temperature sensor (upstream)	Change the wiring
Injection computer (Diesel)	Injection air flowmeter	Change the wiring
Injection computer	Camshaft shift, row A, B	Change the wiring
Injection computer (Diesel)	Turbocharger control solenoid valve	Change the wiring
Injection computer (Diesel)	Damper solenoid valve	Change the wiring
Injection computer (Petrol and Diesel)	Injectors	Change the wiring
Injection computer (Diesel)	Diesel heater	Change the wiring
Injection computer (Diesel)	Water in diesel sensor	Change the wiring

*OTS: Special Technical Operation

● **Specific cases (cont. 2):**

Lines	Device	Instructions
Injection computer (Diesel/particle filter)	Oil level and temperature sensor	Change the wiring
Injection computer (Diesel)	Nitrogen oxide (Nox)	Change the wiring
Injection computer (Petrol and Diesel)	Upstream oxygen sensor	Change the wiring
Injection computer (Petrol and Diesel)	Downstream oxygen sensor	Change the wiring
Injection computer (Diesel)	Proportional oxygen sensor	Change the wiring
Injection computer (Diesel)	EGR valve	Change the wiring
Injection computer (Diesel)	Heater plug	Change the wiring
EPAS	/	Change the wiring
ETC (4x4 torque distributor)	/	Change the wiring
GMV	GMV	Change the wiring
Multiplex network	CAN	(See Multiplex network: Repair)
UPC (Petrol and diesel)	Air conditioning compressor	Change the wiring
UPC (Petrol)	Oil level sensor	Change the wiring

3 - Summary flowchart of the operating procedure defined in this section.



1 - Purpose and applications.

Description of the content of the Wiring repair kit case as well as the procedure and the field of application.

The kit enables wiring which is damaged or has cut electrical wires to be repaired whilst ensuring that it will be fully functional.

It also allows wiring-connector kits to be used.

All electrical cables and wires with cross-sections between **0.35 mm^2** and **6 mm^2** except "sensitive lines" (defined in this document), are affected.

WARNING
Repair of sensitive lines is prohibited using the generic procedure alone. It can be authorised provided that there is an additional appropriate procedure (see **Wiring: Precautions for repair**).

The technical nature and the sensitivity of this type of operation requires the adapted equipment contained and described in the Wiring repair kit case.

WARNING
Using tools or components which have not been recommended is strictly forbidden when repairing wiring.

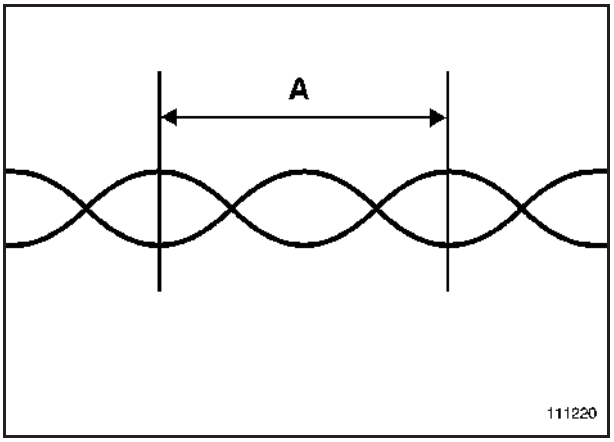
WARNING
For sensitive lines, only automotive electricians, technician agents or cotechs (Level 2 Electricity as a minimum) can carry out the repair described in this note.

2 - Terminology.

● **Wiring-connector kit.**
Kit usually made up of a connector the cells of which are populated with crimped wires along with sleeves for joining.

● **Multiplex lines or connections.**
Principal or secondary CAN network lines link the computers together and are made up of twisted pairs of stranded wires.

● **Turns or twists.**
For twisted pairs:
One turn (twist) = (**A**)



3 - Operation time (TM).

For each vehicle, an average repair time is given in the wiring section of the TM.

The corresponding codes are:
– **0500** for replacing a connector (using a connector kit).
– **0501** for repairing wiring.

This times do not include the time taken to access the area to be repaired. The time taken to remove and refit the wiring must be added.

1 - Case and label.

● **Case (77 11 420 544).**

Part no. 77 11 420 544 corresponds to the new electrical repair case. It replaces case part no. 77 11 229 893.
Both part numbers are authorised for electrical repair.

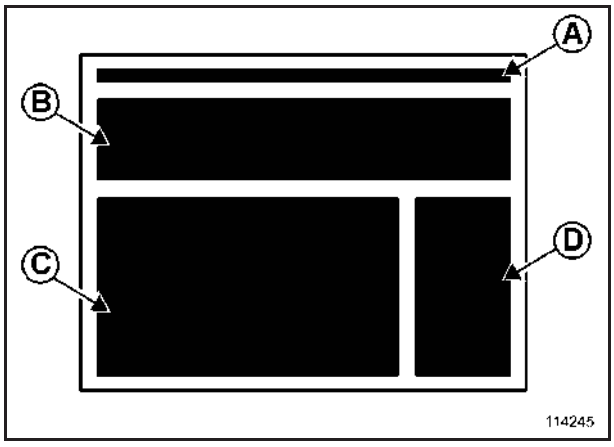
The case contains all the components described in this section. A label lists their part numbers.

● **Label.**

The label affixed inside the case is made up of 4 sections in English and French.

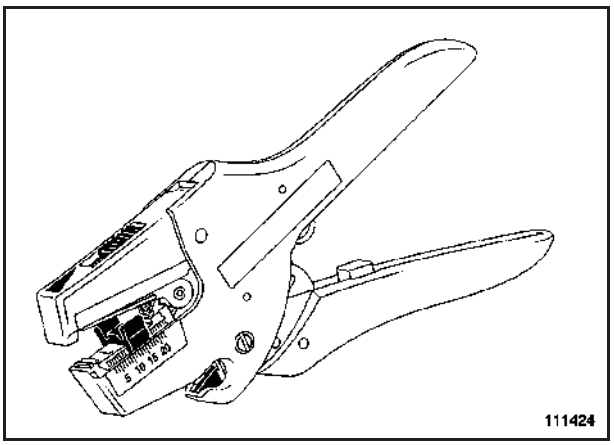
On the upper section, at (**A**) is the title and number of the note. At (**B**) are the After-Sales references (for the network) and MABEC code (for factories) which enables the kit to be restocked with consumables or new tools or a new kit to be ordered.

On the lower section, at (**C**) is a table (not exhaustive) which helps the right sleeve to be chosen, with a summary of the recommendations for each case. And at (**D**) are the recommendations for use.



2 - Tools.

● **Stripping pliers (77 11 230 416).**

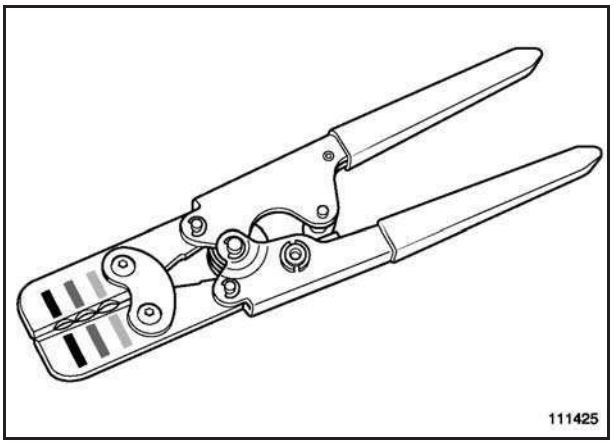


These are automatic stripping pliers which enable an electrical conductor up to a maximum cross-section of **6 mm^2** to be cut or stripped.
The length of the stripped section can be adjusted up to **20 mm**.

The operating instructions for this kit are described in this document (see **Wiring repair kit: Use**).

● **Crimping pliers (77 11 421 296).**

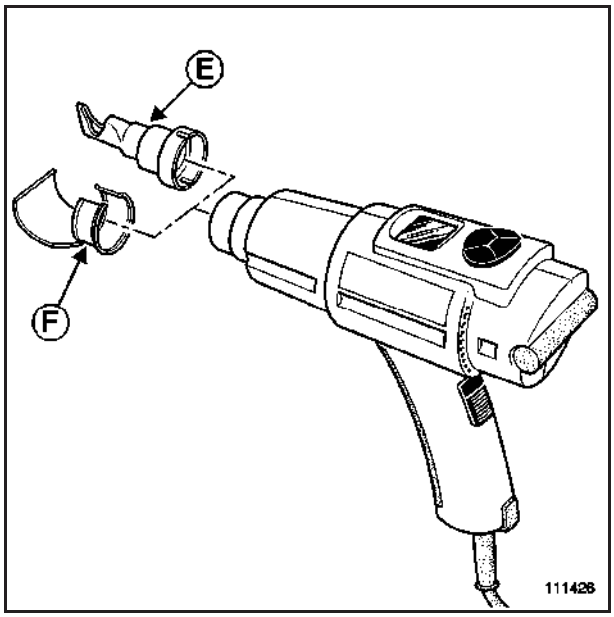
Part no. 77 11 421 296 corresponds to the new crimping pliers in the electrical repair kit. It replaces the crimping pliers with part no. 77 11 230 417.
Both part numbers are authorised for electrical repair.



The crimping pliers have three sizes of jaw (red, blue and yellow) which correspond to the crimping sleeves. These pliers are recommended for the crimping the sleeves provided in the kit.

The operating instructions for this kit are described in this document (see **Wiring repair kit: Use**).

- **Heat gun (77 11 230 415).**



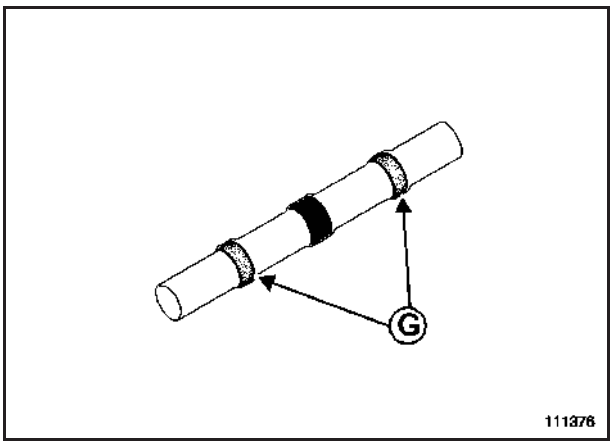
The heat gun is a hot air blower with 2 nozzles which enable it to be adapted for different needs:
- Concentrator nozzle **(E), (77 11 237 778)**.
- Heat shield nozzle **(F), (77 11 237 777)**.

It can be used to solder all self-solder sleeves and to contract the heat-shrinkable parts and sheaths on all sleeves
Its temperature and flow of air are adjustable and are indicated on the screen.
Temperature adjustment from **80°C** to **650°C** in increments of **5°C**.
Air flow adjustment from **200 l/min** to **550 l/min** at 5 levels displayed on the screen.

The operating instructions for this kit are described in this document (see **Wiring repair kit: Use**).

3 - Consumables.

- **Self-solder sleeves.**



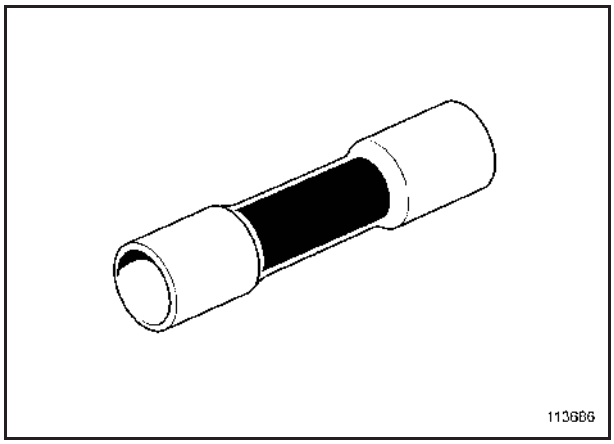
There are three sizes of heat shrinkable self-solder sleeve differentiated by the colour of their rings (**G**):

- **Clear,** for a total copper section (sum of the 2 wires) between **0.3** and **0.8 mm^2** (packet of 20: **77 11 229 418**).
- **Red,** for a total copper section (sum of the 2 wires) between **0.8** and **2.0 mm^2** (packet of 20: **77 11 229 419**).
- **Blue,** for a total copper section (sum of the 2 wires) between **2.0** and **4.0 mm^2**(packet of 20: **77 11 229 420**).

These are sealing sleeves. The seal is formed when the rings are tightened around the wire when heated.

These sleeves are only to be used for connecting one wire with another wire (1-to-1).

● **Crimping sleeve.**



There are three sizes of heat shrinkable crimp sleeve differentiated by the colour of their rings:

– **Red,** for a copper section between **0.5** and **1.5 mm^2** (Packet of 20: **77 11 229 410**).

– **Blue,** for a copper section between **1.5** and **2.5 mm^2** (Packet of 20: **77 11 229 416**).

– **Yellow,** for a copper section between **3.0** and **6.0 mm^2** (Packet of 20: **77 11 229 417**).

These are sealing sleeves. The seal is formed by the inner wall which becomes adhesive when heated.

These sleeves can be used to join one wire with another wire (1-to-1) or two wires with another wire (2-to-1).

In the case where two wires are joined to one wire (2-to-1), the seal is no longer guaranteed. Do not use when a seal is required.

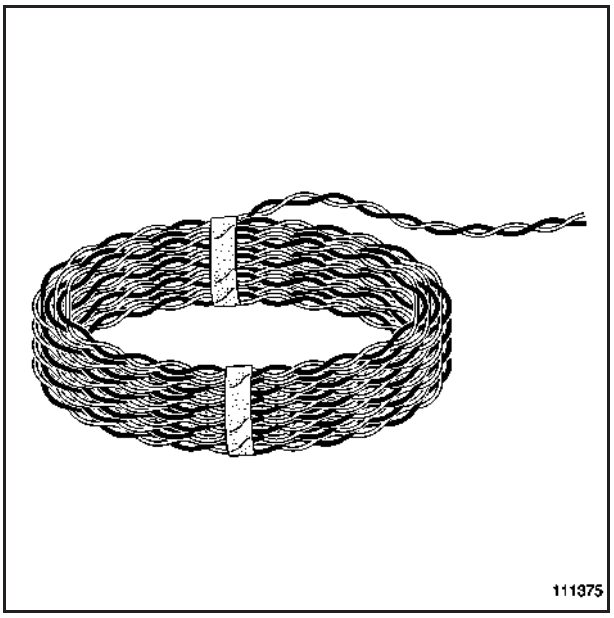
● **Thermal protection (77 11 229 424).**

The protective heat shield is a **250 mm** by **250 mm** square. It is intended to protect the surrounding area from the flow of hot air from the heat gun.

● **Adhesive PVC tape (77 11 170 331).**

Use the adhesive PVC tape for taping the wires. Do not use it to protect or insulate electrical parts.
It is a contact-adhesive high temperature tape.

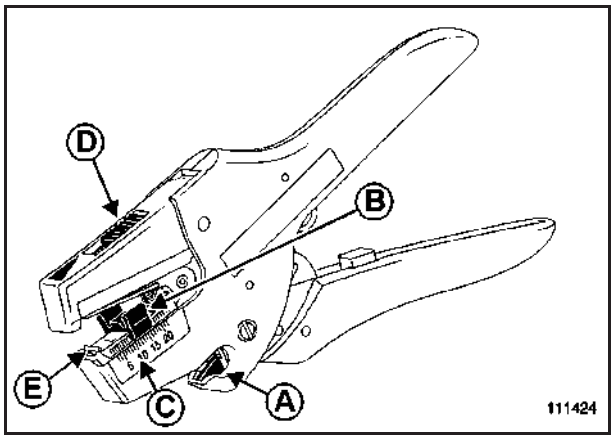
● **Coil of twisted wires (77 11 229 425).**



This is a coil of a pair of twisted wires (40 turns/linear m). Ensure these wires remain twisted. The 2 wires have a **0.5 mm^2** cross-section and are of temperature class T3. It is possible to fit them in all areas of the vehicle during repairs to twisted wires of the same cross-section.

Note:
This section is an abridged version of the instructions for use of the tools in the kit.

1 - Stripping pliers.



● **Description of the stripping pliers:**

(**A**) = Wire cutter.
(**B**) = Stop for adjusting the length to be stripped.
(**C**) = Scale (millimetre divisions).
(**D**) = Pressure adjustment.
(**E**) = Stripping jaws and cutting edges.

● **Cutting a wire:**

To cut electrical wires up to **6 mm^2**, insert the wire into slot **(A)** and press the handle.

● **Stripping a wire:**

This pair of stripping pliers is automatic. It does not need adjusting to the cross-section of wire to be stripped **(6 mm^2** maximum).

To strip a wire, adjust the length to be stripped by moving the stop (**B**). Press lightly on the ends to make it slide. The length to be stripped is read on the scale (**C**) in millimetres (mm).

Adjust the stripping pressure by moving the cursor (**D**). Press on the cursor to make it slide. The further forward the cursor is, the greater the force.

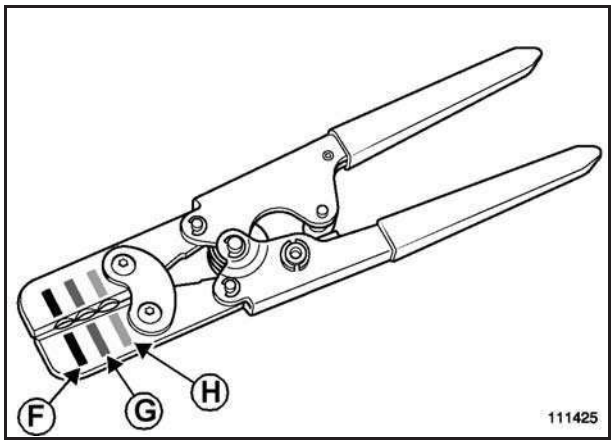
WARNING
If the pressure is too weak, the cutting edges will not grip the wire's insulation. If the pressure is too strong, the cutting edges can cut through the copper strands. Start with a medium setting and then adjust according to results.

Place the end of the wire against the stop (**B**) and bring it out through the jaws (**E**).

Press the handle. The jaws will grip the wire. The cutting edges will automatically adjust their position in relation to the section of wire and strip it.

WARNING
Check the quality of the stripped wire (insulation cleanly removed and no cut copper strands). Start again if necessary.

2 - Crimping pliers.



The crimping pliers are the only pliers recommended for crimping the crimp sleeves in the kit.

They are used on the 3 sizes of crimp sleeve:
- At (**F**) for crimping the **red** crimp sleeve.
- At (**G**) for crimping the **blue** crimp sleeve.
- At (**H**) for crimping the **yellow** crimp sleeve.

Before crimping a sleeve:
- choose the sleeve suitable for the cross-section of the wire (see **Wiring: Repair**),
- strip the recommended length of wire.

● **Crimping operation:**

Squeeze the handles fully together to unlock the pliers and open the jaws.

On the pliers, find the crimping jaws which correspond to the sleeve being used.

Insert the wire(s) into one end of the sleeve.

Position the pliers' jaws in the middle of the half of the metal shaft where the wire(s) are.

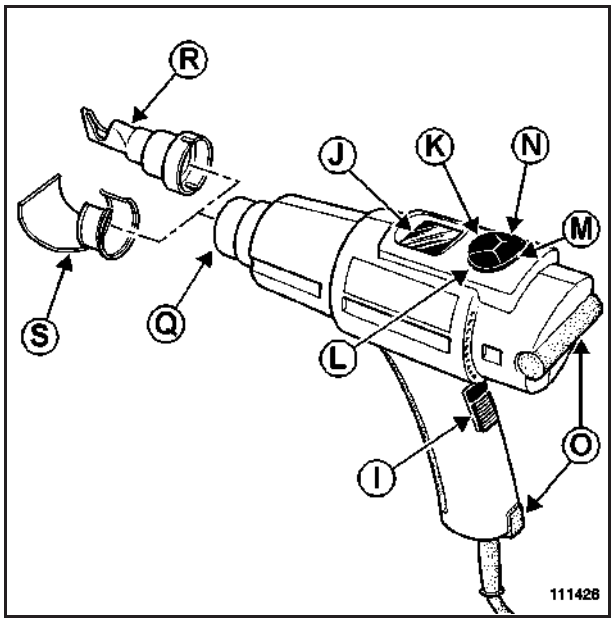
Squeeze the handles fully together to crimp the sleeve onto the wire(s). Crimping is complete once the pliers are opened again.

Check that the copper of the wire is correctly crimped and that the plastic part of the sleeve has not been cut.

Repeat the crimping operation on the other end of the sleeve.

Note:
If the wire is not correctly crimped, cut the wire at the sleeve and start the operation again with a new sleeve.

3 - Heat gun.



WARNING
Before using the gun, the user must familiarise themselves with the safety advice in the user's manual provided by the manufacturer.

● **Introduction to the gun:**

The heat gun is recommended for contracting heat shrinkable sleeves.
For other applications, the user must take the precautions and advice in the user's manual into account.

● **Description of the heat gun:**

(**I**) = On (1)/off (0) switch.
(**J**) = Display screen.
(**K**) = SELECT MENU button.
(**L**) = + button for setting parameters.
(**M**) = STANDBY button (pause/cooling).
(**N**) = - button for setting parameters.
(**O**) = Supports for resting the tool on a bench.
(**P**) = Tool air inlet.
(**Q**) = Tool air outlet.

● **Accessories:**

(**R**) = Concentrator nozzle.
(**S**) = Deflector nozzle.

Note:
The concentrator nozzle (**R**) is recommended when using the heat gun on the crimp or self-solder sleeves in the kit.

WARNING
The heat shield nozzle (S) can be used for contracting single heat shrinkable sheaths. Do not use it for contracting the crimp or self-solder sleeves in the kit.

● **General information on the setting parameters:**

When contracting the sleeves in the kit, use the FREE program and change the settings as recommended. A memory function recalls the program and settings from the last time the gun was used.

● **Switching on the gun:**

Connect the appliance to the mains electricity supply (**230 Vac** - **50 Hz** or **60 Hz**), respecting all precautions.
Push the switch (**I**) on (1).
The appliance will come on using the programs and settings most recently used.

WARNING
The gun starts heating immediately.

WARNING
Before putting the gun away in its case or anywhere else, leave it to cool down to ambient temperature.

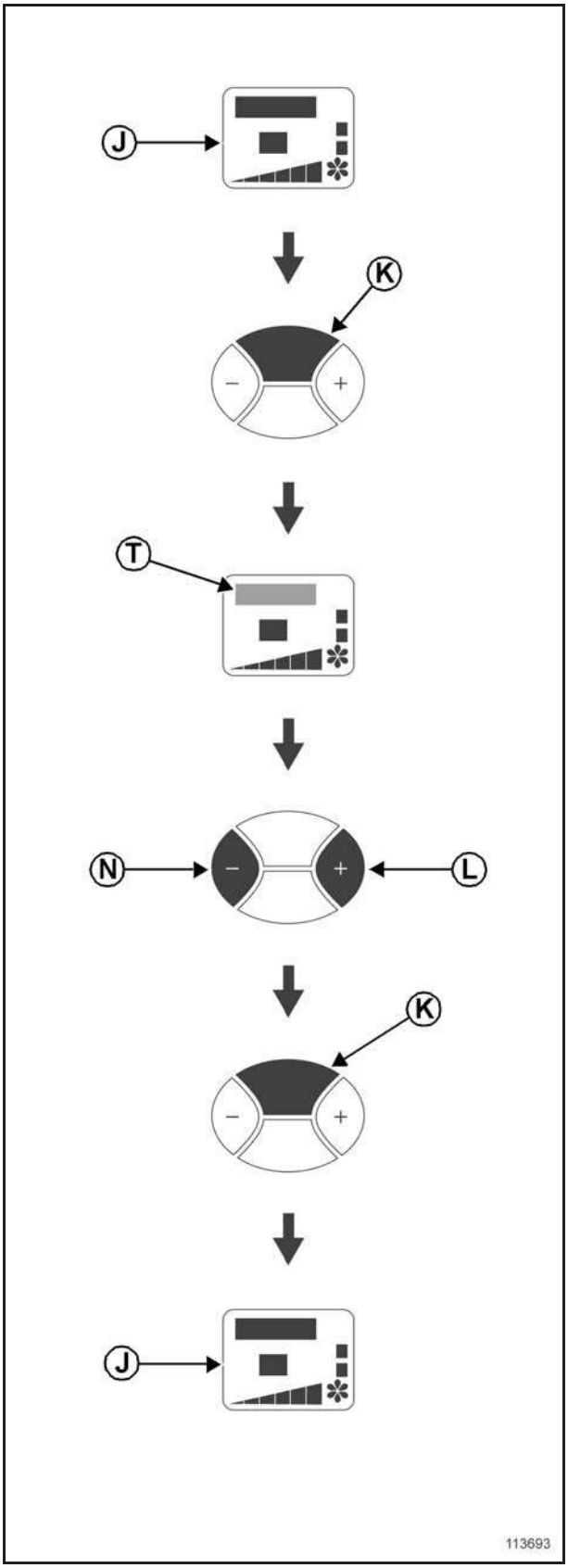
● **Operating instructions:**

The heat gun is used in two ways. It can either be held in the hand and used directly. Or it can be set down on its supports (**O**) on a clean and tidy bench. The latter has the advantage of leaving the user with both hands free.

● **Programs:**

Always work with the FREE program shown on the screen (**J**) at (**T**). If it is not shown, perform the following operation:

– press menu selection button (**K**) once,
– program field (**T**) on display field (**J**) flashes,
– select the free program using the + (**L**) or - (**N**) buttons,
– press the menu selection button (**K**) once, so that field (**T**) on display screen (**J**) stops flashing.

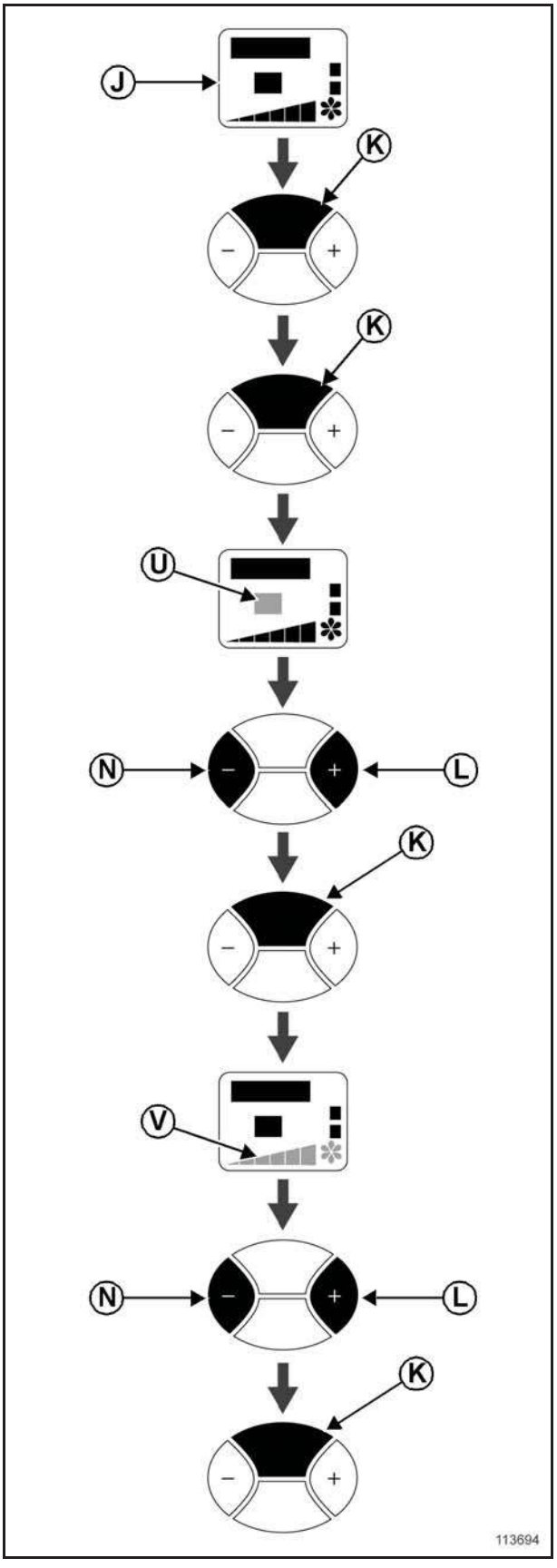


● **Temperature and air flow settings:**

To change the program settings (the FREE program is recommended), carry out the following operation:

– press menu selection button (**K**) twice,
– temperature field (**U**) on display field (**J**) flashes,
– adjust the temperature using the + (**L**) or - (**N**) buttons,
– press menu selection button (**K**) once,
– air flow field (**V**) on display field (**J**) flashes,
– adjust the air flow using the + (**L**) or - (**N**) buttons,
– press menu selection button (**K**) once, so that the fields on display screen (**J**) stop flashing.

Note:
When using the heat gun on crimp or self-solder sleeves, the air flow is always on the maximum setting, only the temperature varies.



● **Special modes (COOL/PAUSE):**

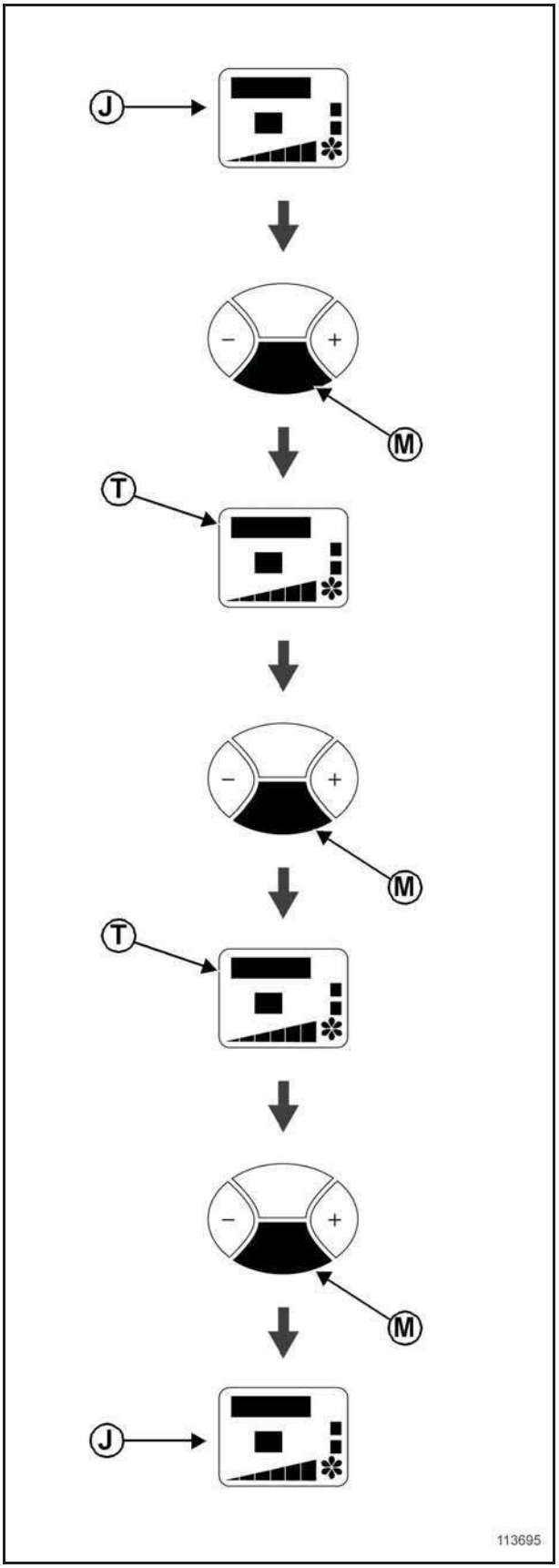
After use and before pushing switch (**A**) off (0), cool the gun. Similarly, during brief pauses or for lower power consumption, switch the gun to PAUSE mode by carrying out the following operation.

Before switching off the heat gun:

– press STANDBY button (**M**) once,
– program field (**T**) on display field (**J**) shows COOL,
– wait until the temperature goes down to **150°C** and push switch (**A**) off (0).

To switch to economy mode:

– press STANDBY button (**M**) once,
– program field (**T**) on display field (**J**) shows COOL,
– press STANDBY button (**M**) once,
– program field (**T**) on display field (**J**) shows WAIT,
– the gun is in economy mode,
– press STANDBY button (**M**) once to recover the previous settings and start heating again.



Note:
This relates to **the generic repair procedure**.

1 - Choosing the sleeve.

The are two possible techniques available:
- self-solder sleeves,
- crimp sleeves.

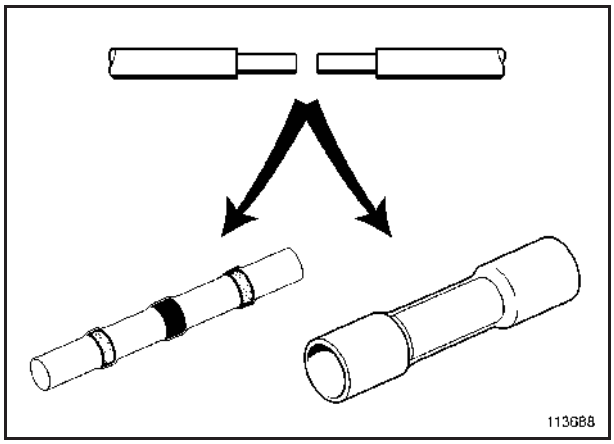
For each technique there are 3 sizes of sleeve.

The choice of sleeve depends on the following criteria:

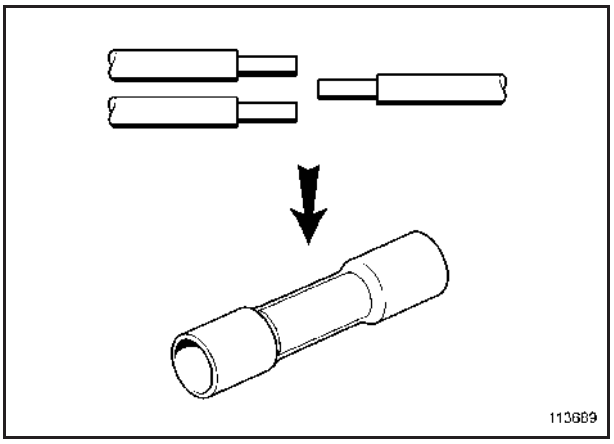
- **Type of operation.**

Note:
This is **stage 1** when using the label.

If wire to wire (1-to-1), use crimp sleeves or self-solder sleeves.



If 2 wires and 1 wire (2-to-1), **only** use crimp sleeves. In this case, the seal can no longer be guaranteed. Do not use this solution when a tight seal is needed (engine and underbody areas and damp areas of the doors and boot).



- **Wire cross-sections.**

Note:
This is **stage 2** when using the label.

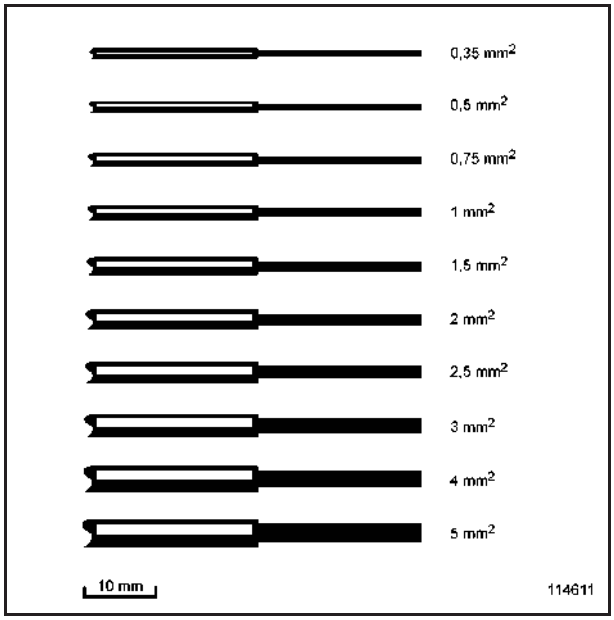
See the sleeve choice table taken from the label.

Note:
The columns corresponding to the wire cross-sections give a representative overview of the different cases.

Identify the cross-section of the wire which is the subject of the operation. Use the diagram which shows pictures of wires which correspond to the wire cross-sections.

Check that the diagram is at scale 1.

Find the stripped section of wire.



Refer to the columns of wire cross-sections to find your case.

Note:
If the case in question is not present, refer to the special cases.

Example 1.
Joining together 2 wires, each **0.5 mm²** (1-to-1 type operation). Look at the upper section of the columns (1-to-1).
Each wire (A and C) has a **0.5 mm²** cross-section.
Refer to the line where:

- column A shows **1 x 0.5 mm²**,
- and column C shows **1 x 0.5 mm²**.

Example 2.
Joining 3 wires together (2-to-1 type operation). Look at the lower section of the columns (2-to-1).
On one side, the 2 wires (A and B) both have a **1 mm²** cross-section. On the other side, wire C has a **2 mm²** cross-section. Refer to the line where:

- columns A & B show **2 x 1 mm²**,
- and column C shows **1 x 2 mm²**.

- **Identifying the settings.**

Note:
This is **stage 3** when using the label.

After having found your case in question, follow the corresponding line to find the setting parameters.
The settings correspond to the lengths to be stripped and the temperature of the heat gun.

The column corresponding to these parameters gives the recommended sleeve.

Note:
If several sleeves are possible for the same operation, choose the one best adapted for the number of wires to be repaired, the wiring layout and the vehicle layout (thickness of the harness, available room etc.).

As relates to the previous examples.

Example 1.
2 possible sleeves:
- Either the red self-solder sleeve.
- Or the red crimp sleeve.

Example 2.
- Only the blue crimp sleeve is possible.

- **Special cases.**

If the case in question is not shown in the selection table, apply the following rules to select a sleeve.

In all cases, identify the cross-section of each wire (copper strands).

● **Case of a wire joint between 1 wire and 1 wire (most common situation).**

Conditions for self-solder sleeves:

Add together the 2 wire cross-sections (copper strands):

If **0.3 mm²** ≤ (section 1 + section 2) ≤ **0.8 mm²**, use the self-solder sleeve with **clear rings**.
Strip **10 mm** from each wire.
The temperature setting is **300°C**.

If **0.8 mm²** ≤ (section 1 + section 2) ≤ **2 mm²**, use the self-solder sleeve with **red rings**.
Strip **12 mm** from each wire.
The temperature setting is **340°C**.

If **2 mm²** ≤ (section 1 + section 2) ≤ **3 mm²**, use the self-solder sleeve with **blue rings**.
Strip **15 mm** from each wire.
The temperature setting is **400°C**.

Conditions for crimp sleeves:

Consider the section of each wire separately.

If **0.5 mm²** ≤ each section ≤ **1.5 mm²**, use the **red** crimp sleeve.
Strip **7 mm** from each wire.
The temperature setting is **280°C**.

If **1.5 mm²** ≤ each section ≤ **2.5 mm²**, use the **blue** crimp sleeve.
Strip **7 mm** from each wire.
The temperature setting is **300°C**.

If **3 mm²** ≤ each section ≤ **6 mm²**, use the **yellow** crimp sleeve.
Strip **8 mm** from each wire.
The temperature setting is **320°C**.

● **Case of a wire joint between 2 wires and 1 wire (less common situation).**

Conditions for crimp sleeves:

Add together the 2 wire cross-sections (copper strands) found on one side of the sleeve to find ***Sum side 1***.

If **0.5 mm²** ≤ ***Sum sections side 1*** ≤ **1.5 mm²**.
And if **0.5 mm²** ≤ wire cross-section side 2 only ≤ **1.5 mm²**, use the **red crimp sleeve**.
The temperature setting is **280°C**.

If **1.5 mm²** ≤ ***Sum sections side 1*** ≤ **2.5 mm²**.
And if **1.5 mm²** ≤ wire cross-section only side 2 ≤ **2.5 mm²**, use the **blue crimp sleeve**.
The temperature setting is **300°C**.

If **3 mm²** ≤ ***Sum sections side 1*** ≤ **6 mm²**.
And if **3 mm²** ≤ wire cross-section only side 2 ≤ **6 mm²**, use the **yellow crimp sleeve**.
The temperature setting is **320°C**.

For stripping the wires:

7 mm is stripped from the single wire (side 2) for red and blue crimp sleeves and **8 mm** for the yellow sleeve.

If the two wires (side 1) have the same cross-section, strip **10 mm** from them for red and blue crimp sleeves and **11 mm** for the yellow sleeve.

If the 2 wires (side 1) have different cross-sections, then:
For red and blue crimp sleeves, strip **10 mm** from the smaller cross-section and **7 mm** from the larger cross-section.
For the yellow sleeve, strip **11 mm** from the smaller cross-section and **8 mm** from the larger cross-section.

WARNING
If no sleeve corresponds to the case in question, the operator cannot repair the wiring. Replace the wiring harness.

- **Settings table (taken from the label).**

	Sleeves / Wire cross-sections		Self-solder									Crimp								
			clear			red			blue			red			blue			yellow		
			$0.3^2 \leq A+C \leq 0.8^2$			$0.8^2 \leq A+C \leq 2^2$			$2^2 \leq A+C \leq 3^2$			$0.5^2 \leq A+B \leq 1.5^2$ & $0.5^2 \leq C \leq 1.5^2$			$1.5^2 \leq A+B \leq 2.5^2$ & $1.5^2 \leq C \leq 2.5^2$			$3^2 \leq A+B \leq 6^2$ & $3^2 \leq C \leq 6^2$		
	A	C	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)
			A	C		A	C		A	C		A	C		A	C		A	C	
1→1	1x0.35 mm²	1x0.35 mm²	10	10	300															
	1x0.35 mm²	1x0.5 mm²	10	10	300	12	12	340												
	1x0.5 mm²	1x0.5 mm²				12	12	340				7	7	280						
	1x0.5 mm²	1x1 mm²				12	12	340				7	7	280						
	1x0.75 mm²	1x0.75 mm²				12	12	340				7	7	280						
	1x0.75 mm²	1x1 mm²				12	12	340				7	7	280						
	1x1 mm²	1x1 mm²				12	12	340	15	15	400	7	7	280						
	1x1 mm²	1x1.5 mm²							15	15	400	7	7	280						
	1x1.5 mm²	1x1.5 mm²							15	15	400	7	7	280	7	7	300			
	1x1.5 mm²	1x2 mm²													7	7	300			
	1x2 mm²	1x2 mm²													7	7	300			
	1x2 mm²	1x2.5 mm²													7	7	300			
	1x2.5 mm²	1x2.5 mm²													7	7	300			
	1x3 mm²	1x3 mm²																8	8	320
	1x3 mm²	1x4 mm²																8	8	320
	1x6 mm²	1x6 mm²																8	8	320

	A & B	C	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)
			A	B	C		A	B	C		A	B	C		A	B	C		A	B	C		A	B	C	
2→1	2x0.5 mm²	1x1 mm²													10	10	7	280								
	1x0.5 mm² + 1x1 mm²	1x1.5 mm²													10	7	7	280	10	7	7	300				
	2x1 mm²	1x2 mm²																	10	10	7	300				
	1x0.5 mm² + 1x 1.5 mm²	1x2 mm²																	10	7	7	300				
	1x0.5 mm² + 1x3 mm²	1x3 mm²																					11	8	8	320
	2x2 mm²	1x6 mm²																					11	11	8	320
Stripping/Temperature			mm			°C	mm			°C	mm			°C	mm			°C	mm			°C	mm			°C

In the case of a 1-to-1 type operation, wires **A** and **C** denote the wires which are found at either side of the sleeve.

In the case of an operation where 2 wires are joined to 1 (2 to 1), wires **A** and **B** denote the 2 wires which are found at the same side of the sleeve (**A** is the smaller section). **C** denotes the single wire on the other side.

2 - Preparation.

To start the preparatory stage, check that the wiring is sufficiently accessible and that the sleeves have been chosen.

– Detach the wires from the wiring.

– Check that the operating area is sufficiently spacious and that the sleeves can be fitted staggered (if there is a number of wires).

– Mark the wires to be cut, particularly if there is a number of wires the same colour.

– Cut the damaged wire(s). Stagger the cuts if a lot of wires are marked so that the sleeves are not all on top of each other. The cut must be made at a distance of no less than **50 mm** from the damaged section and in an area where the sleeve will remain straight.

– Cut the replacement wire to length(s) identical to those removed from the harness. If the self-solder sleeves are being used, add **30 mm** for the wire joints.

WARNING
The cross-section of replacement wire must not be less than the original cross-section of wire.

WARNING
Use a 0.5 mm^2 wire to repair a 0.35 mm^2wire.

WARNING
The temperature class of the replacement wire must be greater than or equal to class T3. For the repair, use the wires recommended by the parts department network, checking that they are suitable for your requirements.

– Strip the ends by the lengths indicated in relation to the sleeve chosen, using the stripping pliers (see **Wiring repair kit: Use**).

– Protect sensitive areas close to the wiring with the heat shield.

3 - Self-solder sleeves.

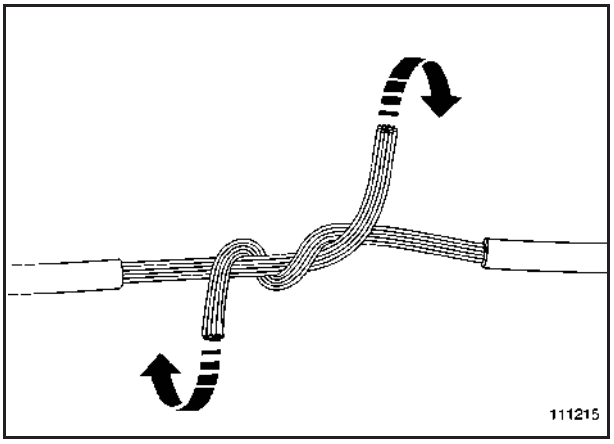
Note:
Fit the self-solder sleeves (connection and heating) line by line, sleeve by sleeve.

● **Connection.**

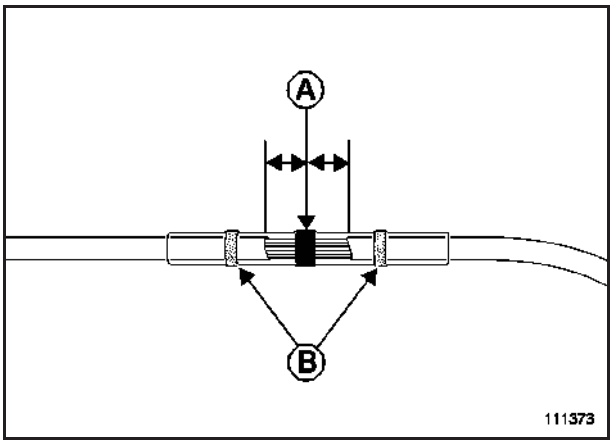
The equipment necessary and the wires are ready for the operation:

– Slip the self-solder sleeve onto one of the wires.

– Connect the wires by twisting the stripped sections around each other.



– Slide the sleeve over the stripped section. The ring of solder should end up in the centre of the stripped and twisted wires (**A**). The stripped and twisted section of the wires must be located between the 2 sealing rings (**B**).



WARNING
When twisting the wires, make sure that your hands are not greasy so that the solder adheres.

WARNING
When the sleeve is positioned, check that all the copper strands remain flat and subsequently are not at risk of perforating the sleeve. Start the operation to join the wires again if necessary.

WARNING
The sealing rings must be clearly located on the insulated section of the wires (B) and not on the copper or where the copper and the insulated section meet. Start the operation to join the wires again if necessary.

Once the wires are joined, start the heating operation.

- **Heating the self-solder sleeve.**

  – Switch on the heat gun fitted with the concentrator nozzle after familiarising yourself with the precautions for use (see **Wiring repair kit: Use**).

  – Adjust the temperature and the air flow to the values indicated (see **Wiring repair kit: Use**).

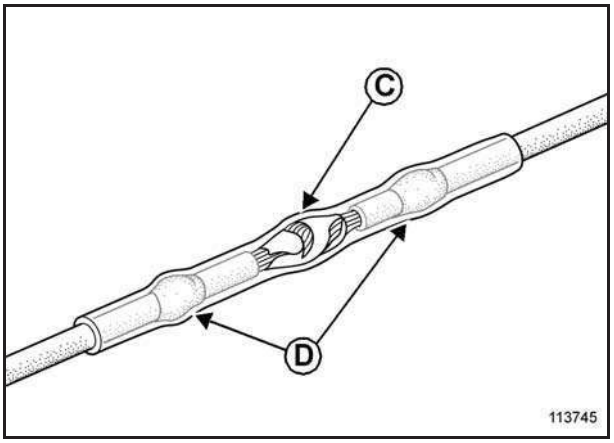
  – Check that the sensitive areas close to the sleeve and the other electrical wires are not at risk of damage.

  – Heat the sleeve starting at the centre, concentrating the heat on the ring of solder and the stripped section of the wires.

  – When the copper and the ring of solder become hot enough, the ring of solder melts and runs in between the copper strands (**C**).

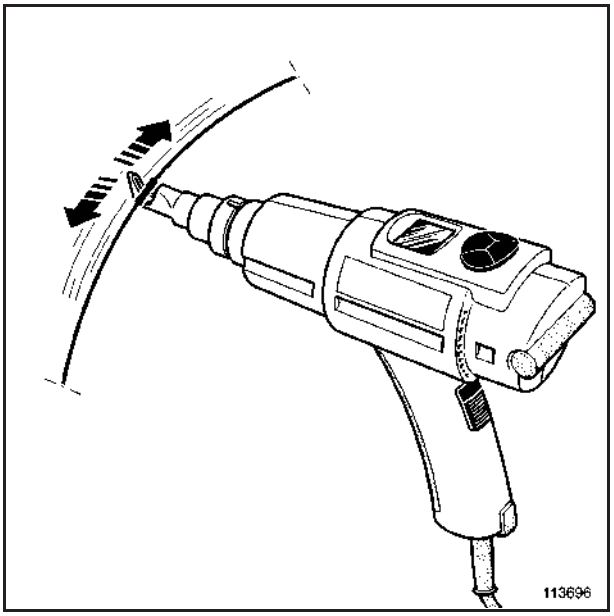
  – When the solder has completely melted, move the nozzle to the ends of the sleeve to finish shrinking the sheath.

  – The sealing rings of the sleeve tighten around the insulation of the wires (**D**).



Note:
Spend the majority of the recommended time on the ring of solder and the rest of the time on the ends of the sleeve.
The heating operation takes **30 s** ± **10**. This time is a guide only. It can be reduced or increased depending on how efficient the heating is.

WARNING
Do not try to heat the sheath too quickly, use a backwards and forwards motion to ensure it does not burn.
Do not direct the flow of hot air onto the insulation of the wires so as not to burn it.



WARNING
Wait for the sleeve to cool before manipulating it to maintain the quality of the solder (minimum waiting period: 1 minute).
Do not bend the sleeve (even when cool) so as to not damage the quality of the solder or the sealing properties of the sleeve.

Note:
– Do not move during installation.
– Do not overheat the sleeve.
– Do not move the sleeve or wires until they have cooled.

If several self-solder sleeves must be positioned, repeat the operation sleeve by sleeve.

When the heating operations have finished, move on to the checking operation (see **Wiring: Check**).

4 - Crimp sleeves.

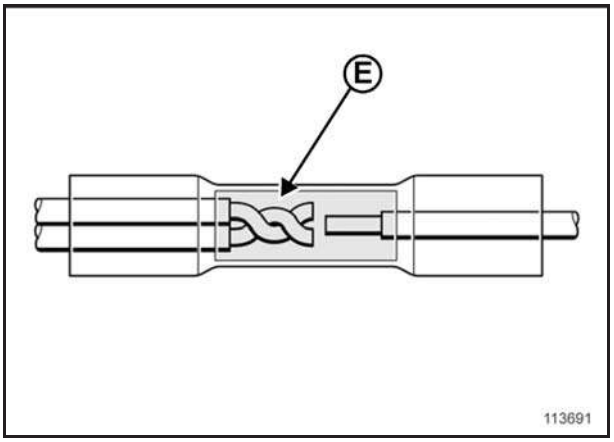
Note:
For a wire-to-wire join, go straight to the crimping operation.

● **Special notes for joining 2 wires to 1 wire.**

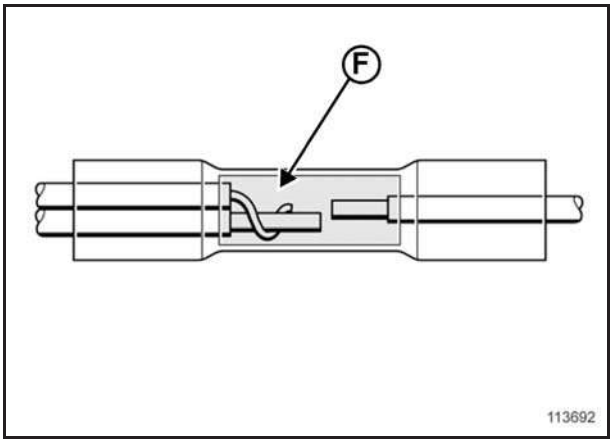
WARNING
Do not use if a tight seal is needed (engine and underbody areas and damp areas of the doors and boot).

When joining 2 wires to 1 wire, first connect the 2 wires from the same end in the following way:

– If the 2 wires have identical diameters, twist together the stripped section of the 2 wires (**E**), before putting them into the sleeve.



– If the 2 wires have different diameters, wind the stripped section of the smaller wire around that of the larger wire (**F**) before inserting them in the sleeve.



● **Crimping.**

The equipment necessary and the wires are ready for the crimping operation:

– Take the crimping pliers. Squeeze the handles fully together to unlock the pliers and open the jaws (see **Wiring repair kit: Use**).

– On the pliers, find the crimping jaws which correspond to the sleeve chosen.

– Insert the wire(s) into one end of the sleeve up to the stop located inside the metal barrel of the sleeve.

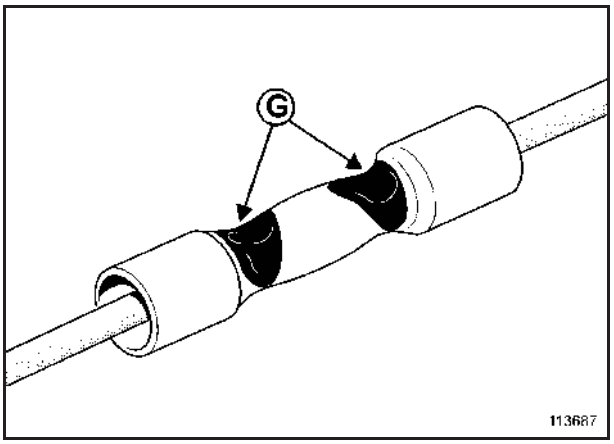
– Position the pliers' jaws around the middle of the section of the metal barrel where the wire(s) are.

– Squeeze the handles fully together to crimp the sleeve onto the wire(s). Crimping is complete once the pliers are opened again.

WARNING
Check that the copper of the wire is correctly crimped and that the plastic part of the sleeve has not been cut. If the wire has been stripped by the correct length and correctly inserted in the metal barrel, then the copper of the wire should barely jut out from the shaft.

Note:
If the wire is not correctly crimped, cut the wire before the sleeve and start the operation again with a new sleeve.

Repeat the crimping operation on the other end of the sleeve to obtain the result below.



The pliers have correctly crimped each wire on the halves of the metal barrel at (**G**) without damaging the plastic.

● **Heating the crimping sleeve.**

– Switch on the heat gun fitted with the concentrator nozzle after familiarising yourself with the precautions for use (see **Wiring repair kit: Use**).

– Set the temperature and the air flow to the values indicated, following the procedure in this note (see **Wiring repair kit: Use**).

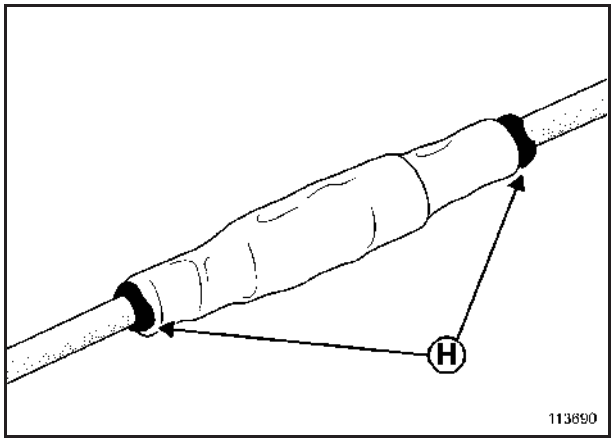
– Check that the sensitive areas close to the sleeve and the other electrical wires are not at risk of damage.

– Heat the sleeve starting at the centre.

– When the sheath starts to contract, move the nozzle to one of the ends.

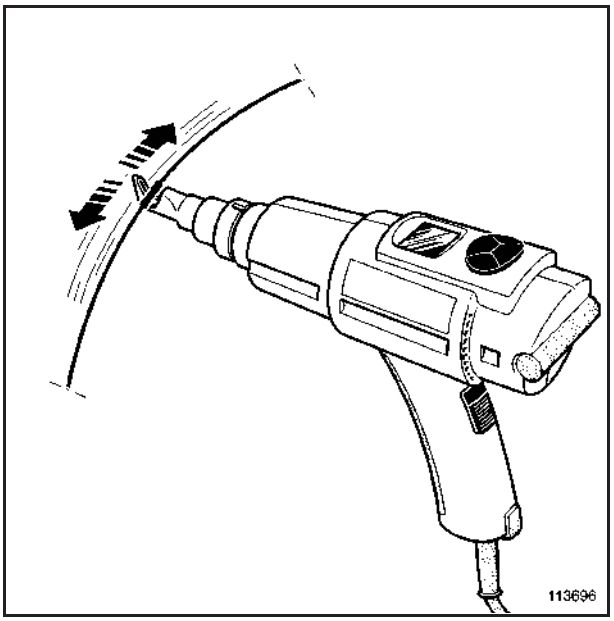
– The sheath continues to contract and produces a glue.

– When the end of the sleeve has completely contracted and the glue has correctly covered the opening of the sleeve, repeat the operation on the other end to obtain the result shown at (**H**).



Note:
Spend the majority of the recommended time on the metal barrel and the rest of the time on the ends of the sleeve.
The heating operation takes **30 s** ± **10**. This time is a guide only. It can be reduced or increased depending on how efficient the heating is.

WARNING
Do not try to heat the sheath too quickly, use a backwards and forwards motion to ensure it does not burn.
Do not direct the flow of hot air onto the insulation of the wires so as not to burn it.



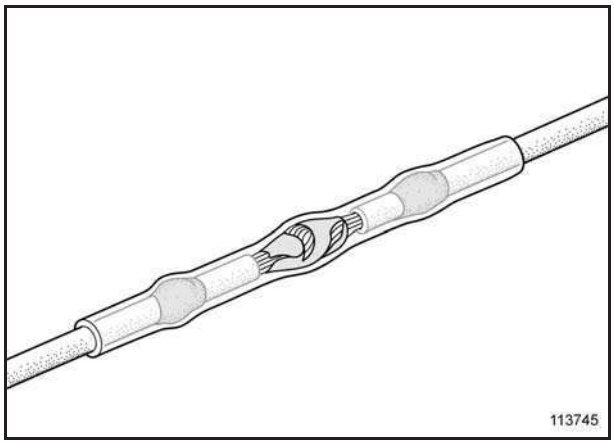
WARNING
Wait for the sleeve to cool before manipulating it to ensure that the sealing properties of the sleeve are not affected (minimum waiting period: 1 minute).
Do not bend the sleeve (even when cool) so as to not damage the sealing properties of the sleeve.

When the heating operations have finished, move on to the checking operation (see **Wiring: Check**).

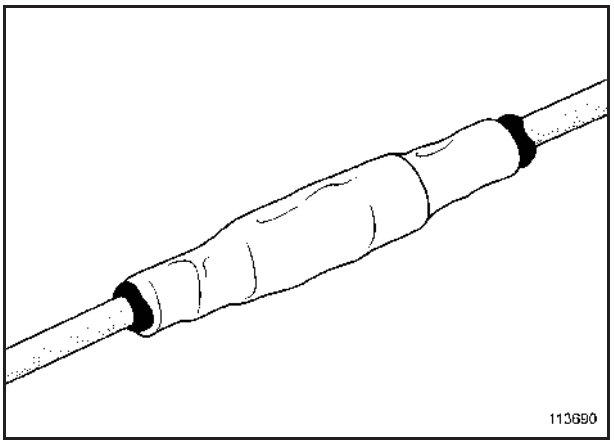
1 - Visual checks.

- The insulation of the wires is within the sleeve.
- (Self-solder sleeves) The sealing rings must be clearly located on the insulated section of the wires.
- (Self-solder sleeves) The solder has completely melted.
- (Crimp sleeves) The adhesive of the crimp sleeves forms a barrier at the ends of the sleeves.
- The sleeves has completely contracted around the insulation of the wires.
- The sleeve is not cut, slit, discoloured or pierced by a copper strand.
- The insulation of the wires does not show any sign of damage caused by overheating.
- The wiring and the area surrounding it have not been damaged by the heating operation.

Result of a correctly applied self-solder sleeve.

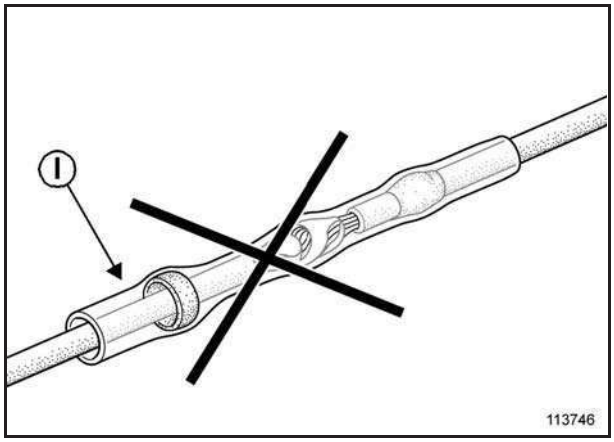


Result of a correctly applied crimp sleeve.

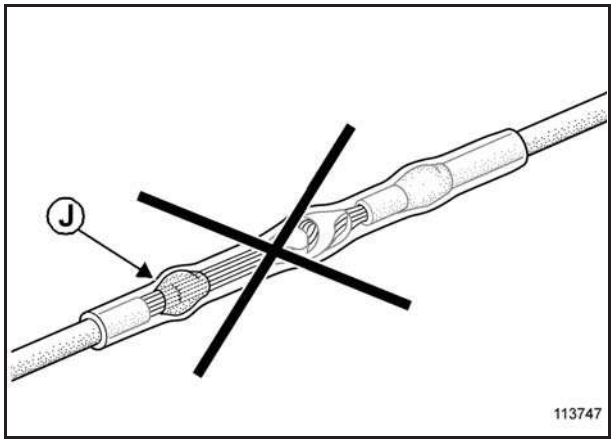


WARNING
The various struck-through cases are strictly forbidden.

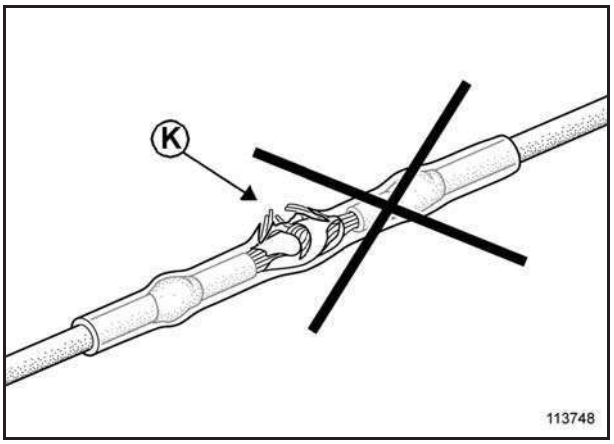
The self-solder sleeve has not been correctly shrunk. At (**I**), the sealing ring has not contracted around the insulation of the wire.



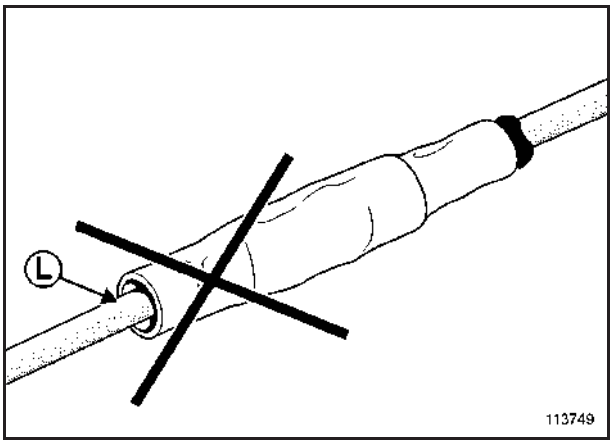
The sealing ring of the self-solder sleeve is directly on the copper of the wire at (**J**).



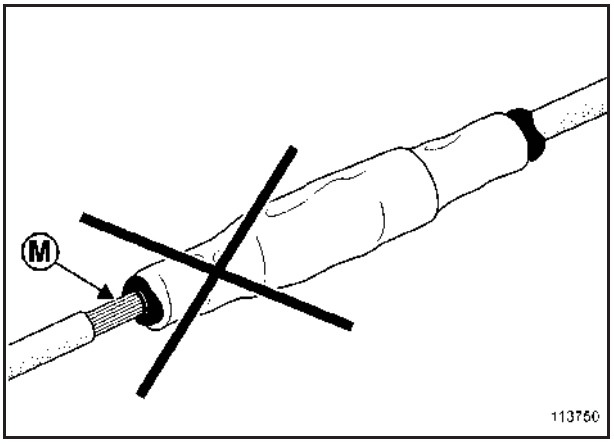
The protruding strands of the wire have pierced the self-solder sleeve at (**K**) during contraction.



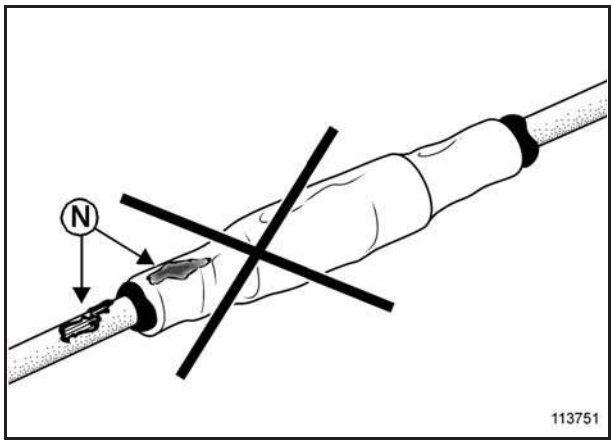
The crimp sleeve has not been correctly shrunk. At (**L**), the adhesive does not form a barrier at the end of the sleeve.



The adhesive of the crimp sleeve is directly on the copper of the wire at (**M**).



The sleeve and the insulation of the wire show signs of damage at (**N**) cause by overheating.



Note:
Reconnect the battery (see the **MR corresponding to the vehicle, 80A, Battery, Battery: Removal - Refitting**).

2 - Check with the diagnostic tool.

When a repaired line can be tested with the diagnostic tool, run this check.

3 - Function check.

Check that the component or the function of the repaired line is working correctly. If the case in question requires it, carry out a test drive.

Note:
Always check for faults after repair.

Refer to the fault finding procedure for the function concerned.

4 - Fitting and protections.

After the operation:

- reposition the wires concerned in the main harness,
- tape up the main harness using adhesive tape,
- protect the harness as it is was originally using equivalent (noise or anti-damage) or superior protection with the protections recommended by the Parts Store network.

The part numbers for the protections are as follows:
– **77 11 237 838** - Protective sheath for wiring, diameter **7 mm** (mechanical)
– **77 11 237 839 -** Protective sheath for wiring, diameter **18 mm** (mechanical)
– **77 11 237 840 -** Protective sheath for wiring, diameter **31 mm** (mechanical)
– **77 11 237 841** - Velour tape for wiring harness (sound insulation)

WARNING
Any repair which requires a specific heat shield for the wiring are forbidden. Replace the wiring harness.

WARNING
Check that the wiring is correctly maintained and protected to avoid any wear by rubbing and any noise disturbance.

5 - Final check.

After any operation on the wiring, check that there are no faults using the diagnostic tools (Clip).

Refer to the corresponding fault finding procedure.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

WARNING
Apply this procedure when there is a connector - wiring kit or wire kit. Unless the kit is linked to one of the sensitive lines listed in the specific procedures reference table (see Wiring: Precautions for repair). In this case, apply the specific procedure for the sensitive line concerned.

1 - Wiring-Connector kit.

A wiring-connector kit enables repair to be carried out when the connector is faulty or when the fault is located less than **10 cm** from the connector.

A wiring-connector kit is generally made up of:

- at least 1 connector,
- crimped wires with corresponding contacts,
- sealing components if the connector is sealed,
- the self-solder or crimp sleeves necessary for the repair,
- other components specific to the function concerned (e.g. fuses).

Note:
if there is no kit, it is possible to create a wiring - connector kit if the following rules are respected:
– The connector affected by the repair must be taken from the **new wiring** provided as a spare part and intended for this repair.
– The function affected by the repair must not by covered by a special procedure.
– The connector should not be made up of more than **10 wires**.
– The wires are cut more than **10 cm** away from the connector.
– For each opening, the wires of the connector taken from the new wiring have a cross-section which is equal to or greater than that of the original connector.
– For each opening, the metal contacts of the connector taken from the new wiring are the same material (gilded or tinplated) as those of the original connector.
– The precautions set out in this note are respected (see **Wiring: Precautions for repair**).

2 - Using a wiring-connector kit.

Except in the specific outlined cases, use the wiring-connector kits as follows:

- check that the kit is complete,
- check that the conductor configuration (position of wires in the cells of the connector) corresponds to your needs,
- check that the wire cross-sections of the wiring-connector kit are equal to or larger than the cross-section of wires to be repaired,
- mark the wires to ensure that the tracks are not reversed,

WARNING
The colour of the wires cannot serve as a marker. In certain cases, wiring-connector kits can have different colours to those of the wiring to be repaired.

- Cut the connector wires to be replaced to a length greater than **100 mm** and stagger the cut wires,
- shorten the wiring-connector kit wires so as to provide wires the same lengths as those cut from the wiring to be repaired. For self-solder sleeves, add **30 mm** for the wire joints,
- apply the generic repair procedure for the joint (see **Wiring: Repair**).

3 - Wire kit.

A wire kit is used to perform a repair when the connector is not damaged.

A wire kit is generally comprised of:

- 3 crimp wires
- protection on the metal contacts.

4 - Applying a wire kit.

NOTE
Access the electric documentation for the vehicle on Infotech to obtain the part number of the wire kit required and the removal procedure for the connector.

Except in the specific outlined cases, use the wire kits as follows:

- check that the kit is complete,
- check for the presence of protection on the metal contacts,
- check that the wire cross-sections of the wire kit are equal to or larger than the cross-section of wires to be repaired,
- mark the wires to ensure that the tracks are not reversed,

WARNING
The colour of the wires cannot serve as a marker. Wiring-connector kits may be different colours to those of the wiring to be repaired.

- cut the connector wires to be replaced to a length greater than 100 mm and stagger the cut wires,
- shorten the kit wires so as to provide wires with the same lengths as those cut from the wiring to be repaired. For self-solder sleeves, add 30 mm for the splices,

Apply the generic repair procedure for the joint (see **Wiring: Repair**).

5 - Checking and fitting the repair with wiring-connector kits.

- Carry out the generic repair procedure check (see Wiring: Check) or that for the specific procedures if it is a specific case (see Wiring: Precautions for repair).
- Apply the recommendations from the generic repair procedure concerning the fitting and protection (see Wiring: Check).

6 - Final check.

After any operation on wiring, check for the absence of faults using the diagnostic tools (Clip, etc.).

Refer to the corresponding fault finding procedure.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

This section deals with an electrical contact fault on the connector between the dashboard wiring and the pedal wiring on KANGOO.

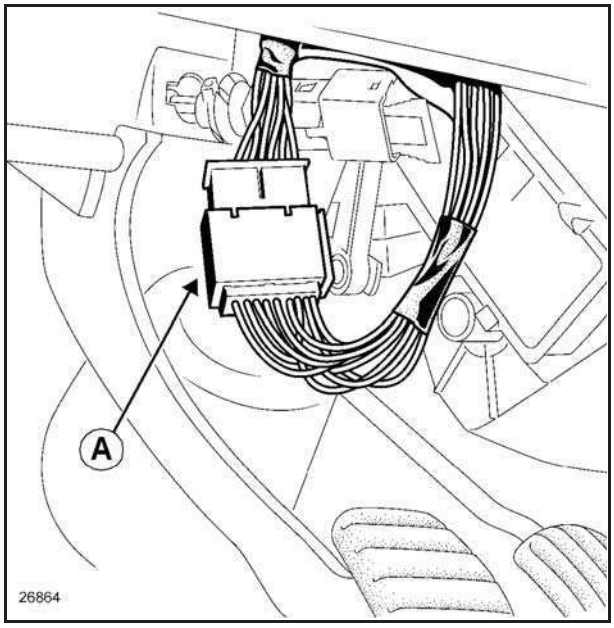
1 - Context.

Customer complaint:
Loss of engine power when driving, with the injection warning light illuminated on Kangoo vehicles with K4M, F9Q, D4F, D7F and K9K engines.

Possible cause:
Loss of contact on the 16-track **R181** connector (dashboard wiring harness and pedal connection).

2 - Description of the repair procedure.

Make the **R181** connector accessible and unclip it from its mounting (**A**).



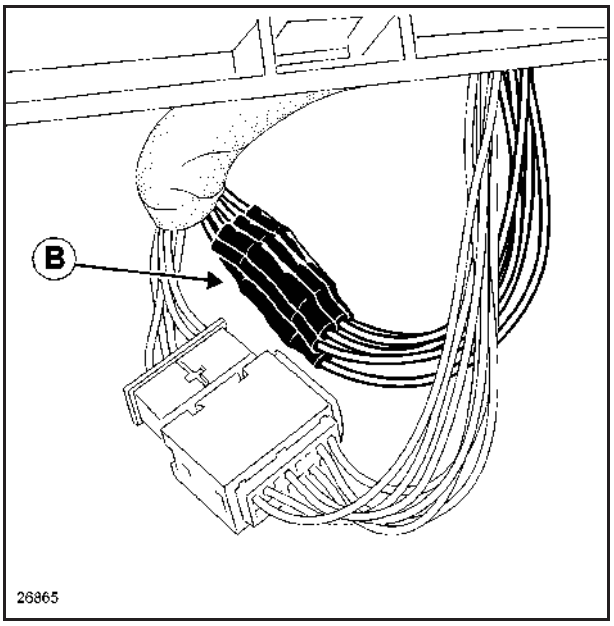
On the **R181** connector and using the Wiring Diagrams Technical Note corresponding to the vehicle, mark the gangs related to the accelerator potentiometer.

Note:
Using the Wiring Diagrams Technical Note or applying a continuity check, check that it concerns gangs B1, B2, B3, B4, B5 and B6.

WARNING
The colour of the wires is not same on either side of the R181 connector.

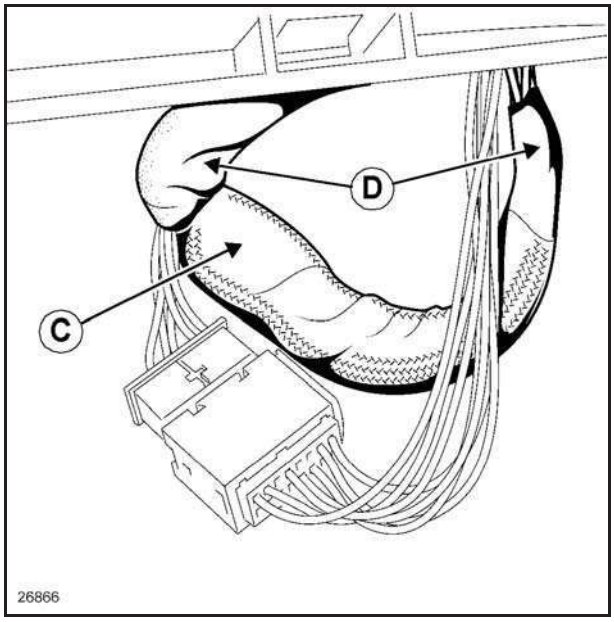
For each gang, proceed in the following manner:

- Cut the electrical wire either side of the connector.
- Make a wire joint with a **red self-solder sleeve** from the **wiring repair kit**, between the pedal electrical wire and the passenger compartment wiring electrical wire (**B**) (see **Wiring: Repair**).



After having shunted all of the wires concerned:

- Protect the shunted electrical wires (**C**) with wiring protective sheath with a diameter of **18 mm (77 11 237 839)**.
- Cover the ends of the protective sheath with **Adhesive PVC tape (D)**.
- Refit the **R181** connector on the mounting.
- Secure the shunted lines to the wiring using **Adhesive PVC Tape**.



3 - Repair check.

Continuity:

- Check the continuity of each of the shunted lines.

Function check:

- Clear the faults.
- Check the conformity of the pedal sensor parameters:
  - If it is a DDCR computer, see **Technical Note 3845A, Injection fault finding: DDCR VDIAG 04 - 08 - 10 - 0C - 14 - 18 - 20, Conformity check**.
  - If it is a DCM 1.2 computer, see **Technical Note 6500A, Fault finding - DCM 1.2 Injection Program 4C Vdiag 08, Conformity check**.
  - If it is a SIM 32 computer, see **Technical Note 3878A, Injection fault finding: SIM 32 SOFT D4 - Vdiag 04, Conformity check**.
  - If it is an EDC15 computer, see **Technical Note 3929A, Injection fault finding: DIESEL BOSCH EDC15C3 Vdiag 10 - 14 - 18, Conformity check** or **Technical Note 3930A, Injection fault finding: DIESEL BOSCH EDC15C3 Vdiag 0C, Conformity check** depending on the case.
  - If it is a SIRIUS 34 computer, see **Technical Note 3834A, Injection fault finding: SIRIUS 34-E932 - Vdiag 08, Conformity check**.
- Perform a road test.
- Check the status of the faults (present and stored).

Final check:

- Carry out a complete check with the **CLIP** tool and check that there are no faults.

This section explains how to insulate and immobilise an unused connector when changing the wiring.

2 cases are dealt with:
- Waterproof wiring in damp areas
- Non-waterproof wiring

Refer to the relevant section.

1 - For waterproof wiring in damp areas.

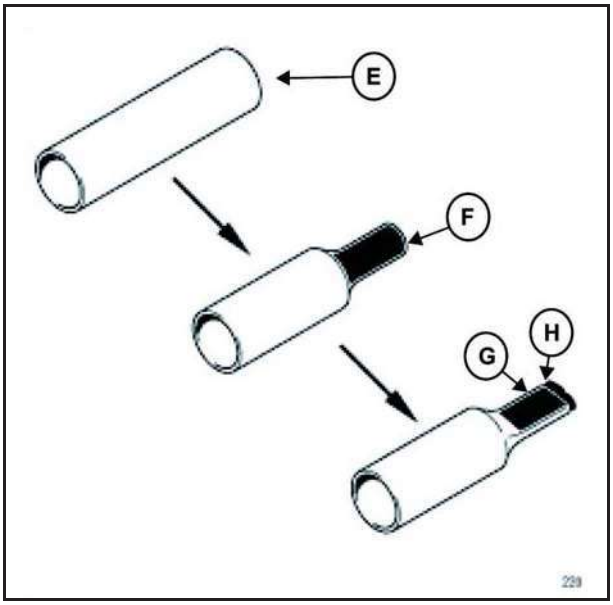
WARNING
This operation is compulsory for any wiring which is located in damp areas which needs to be waterproof (engine and underbody areas, and damp areas of the opening elements).
It applies to all of the unused connectors located on the wiring.

- **Equipment required.**

– Heat shrinkable waterproof sheath:

Part number of heat shrinkable waterproof sheath	Internal diameter (E) before contraction (mm)	Internal diameter (F) after contraction (mm)
7701 069 915	4 mm	1 mm
7701 033 055	8 mm	2 mm
7701 033 056	19 mm	4 mm

(E) < Diameter of electrical wire with insulation < **(F)**



– Adhesive **7703 397 035** (cracked cylinder of solid adhesive).
– Wiring repair kit (see **Wiring Repair Kit: Description**).

- **Description of the operation.**

Plug preparation:

– Mark the unused connector.
– Count the number of wires to be insulated and note their total diameter (copper and insulation).

Note:
The coupling of wires must be preserved.
If several wires are connected together in a connector opening, always preserve this connection.
The electric wires in the same opening will be connected together using self-solder sleeves or crimp sleeves from the wiring repair kit (See **Wiring repair kit: Description**).

– For every wire, remove **50 mm** of heat shrinkable sheath adapted to each wire diameter. The diameter of the wire must be less than the internal diameter of the sheath before contraction **(E)** and greater than the internal diameter of the sheath after contraction **(F)**.

– Heat the end **(G)** of the pre-cut sheath using the heat gun included in the wiring repair kit (See **Wiring Repair Kit: Description**) and contract it approximately 15 mm **(F)**.
The heat gun is equipped with the retraction nozzle and its temperature is adjusted to **120ºC**, with maximum air flow (See **Wiring Repair Kit: Description**).

WARNING
To avoid burns, always wear gloves during the following operation .

– When the end has been contracted, flatten it in order to bond the surfaces using the internal adhesive of the sheath **(G)**.
– Allow the sheath to cool for **1 min**.
– Check the prepared plug. The contracted length should not exceed **15 mm** and the adhesive should completely block the end at **(H)**.
Do not remove the surplus adhesive at **(H)**.

Fitting the plugs:

Note: When replacing the wiring, preferably carry out the operation before refitting the new wiring.

– Mark the unused connector.

– Mark the wire couplings on this connector (wires connected together in the same connector opening). Electric wires in the same opening will be connected together using the self-solder sleeves or crimp sleeves from the wiring repair kit (See **Wiring: Repair**).

– Cut the other wires of the connector equally.

– Fit a plug on each wire **(I)** and contract it using the heat gun included in the wiring repair kit (See **Wiring repair kit: Description**).
The heat gun is equipped with the deflector nozzle and its temperature is adjusted to **120°C**, with maximum air flow (See **Wiring repair kit: Use**).

WARNING
It is forbidden to place 2 wires of different connection codes in a single plug. There is a risk of a short circuit if the wires are live.

– Allow the assembly to cool down for **1 min**.

– Check that the sheath is sufficiently contracted on the wire **(J)**. Repeat the operation with a heat shrinkable sheath with a smaller diameter if necessary.

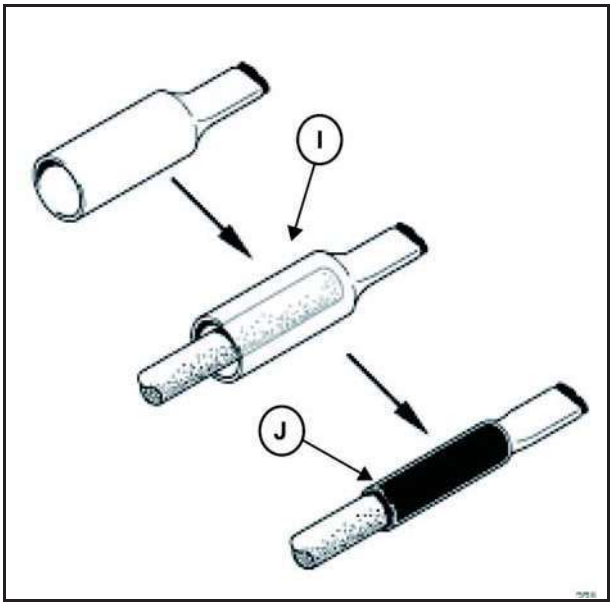
Note:
Do not remove the surplus adhesive.

WARNING
If there is not enough adhesive released by the heat shrinkable sheath, repeat the operation and add some adhesive (see Equipment required) inside the sheath.

– Tape all of the wires and sheaths using adhesive tape included in the wiring repair kit (See **Wiring repair kit: Description**).

– Fit a wiring protector which is equivalent or better than the original (See **Wiring: Check**).

– Secure the assembly to the main wiring using a Colson-type clip which will be fitted level with the sleeves. Use several clips if necessary.



2 - For non-waterproof wiring.

For non-waterproof wiring, only apply the immobilisation procedure.

– Mark the unused connector.

– Secure the connector on the main wiring using a Colson-type clip. Use several clips if necessary.

– Check that the assembly does not produce any interference noises, with the engine running and the vehicle moving. Fit an audible protector if necessary (See **Wiring: Check**).

This section describes how to visually inspect a connector.

Note:
Carry out each requested check visually. Do not remove a connector if it is not required.

Note:
Repeated connections and disconnections alter the functionality of the connectors and increase the risk of poor electrical contact. Limit the number of connections/disconnections as much as possible.

The check is carried out on the 2 parts of the connection. There may be two types of connections:
– Connector / Connector
– Connector / Device

1 - Visual inspection of the connection:

- Check that the connector is connected correctly and that the male and female parts of the connection are correctly coupled.

2 - Visual inspection of the area around the connection:

- Check the condition of the mounting (pin, strap, adhesive tape, etc.) if the connectors are attached to the vehicle.
- Check that there is no damage to the wiring trim (sheath, foam, adhesive tape, etc.) near the wiring.
- Check that there is no damage to the electrical wires at the connector outputs, in particular on the insulating material (wear, cuts, burns, etc.).

Disconnect the connector to continue the checks.

3 - Visual inspection of the plastic casing:

- Check that there is no mechanical damage (casing crushed, cracked, broken, etc.), in particular to the fragile components (lever, lock, openings, etc.).
- Check that there is no heat damage (casing melted, darker, deformed, etc.).
- Check that there are no stains (grease, mud, liquid, etc.).

4 - Visual inspection of the metal contacts:

- Check that there are no bent contacts (the contact is not inserted correctly and can come out of the back of the connector). If the wire is slightly stressed, the contact will come out.
- Check that there is no damage (folded tabs, clips open too wide, blackened or melted contact, etc.).
- Check that there is no oxidation on the metal contacts.

5 - Visual inspection of the sealing:
(Only for watertight connectors)

- Check for the seal on the connection (between the 2 parts of the connection).
- Check the seal at the back of the connectors:
  – For *unit* joints (1 for each wire), check that the unit joints are present on each electrical wire and that they are correctly positioned in the opening (level with the housing). Check that plugs are present on openings which are not used.
  – For a *grommet* seal (one seal which covers the entire internal surface of the connector), check that the seal is present.
  – For gel seals, check for gel in all of the openings without removing the excess or any protruding sections (it does not matter if there is gel on the contacts).
  – For *hotmelt* sealing (heat-shrink sheath with glue), check that the sheath has contracted correctly on the rear of the connectors and electrical wires, and that the hardened glue comes out of the side of the wire.
- Check that there is no damage to any of the seals (cuts, burns, significant deformation, etc.).

WARNING
This procedure is relates to the repair of the multiplex network alone (twisted wires).

1 - Locating the fault.

Use the diagnostic tool (clip) to test the multiplex network (see the fault finding procedure corresponding to the vehicle).

The diagnostic tool can detect the following short circuits on the multiplex network:

- short circuit between CAN L and **+ 12 V**,
- short circuit between CAN H and **+ 12 V**,
- short circuit between CAN H and earth,
- short circuit between CAN L and earth,
- short circuit between CAN L and CAN H,
- open circuits.

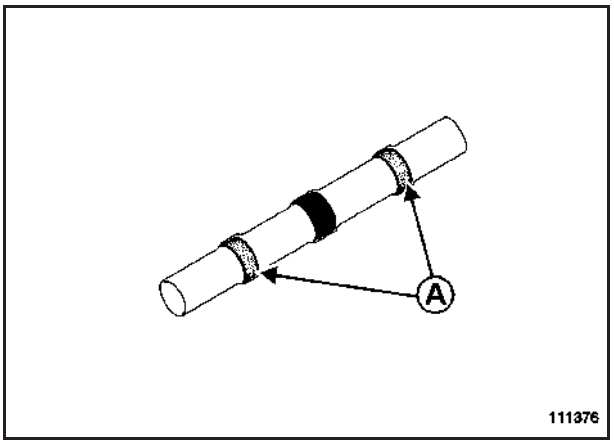
Note:
In the case of a short circuit between CAN-L and earth, communication between the different computers which make up the multiplex network is not interrupted. However, the multiplex network becomes sensitive to interference and can be the cause of an intermittent fault.

After having located the multiplex line fault, it is possible to repair it whilst applying all the necessary precautions outlined in this document.

2 - Necessary equipment.

For repairing the multiplex network, use the components of the wiring repair kit (see **Wiring repair kit: Description**).

Use the self-solder sleeves with red rings (**A**) for making the joints.



3 - Repairing the multiplex line.

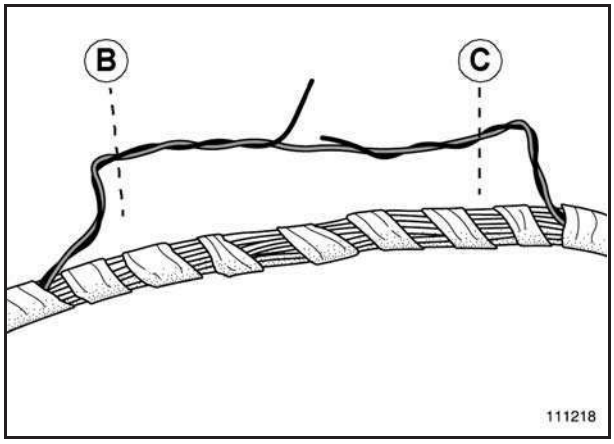
WARNING
Before starting to repair a multiplex line, it is necessary that you familiarise yourself with the use of the tools relating to this repair (see **Wiring repair kit: Use**).

Disconnect the battery (see the **MR corresponding to the vehicle, 80A, Battery, Battery: Removal - Refitting**).

Remove the components necessary to enable access to the wiring.

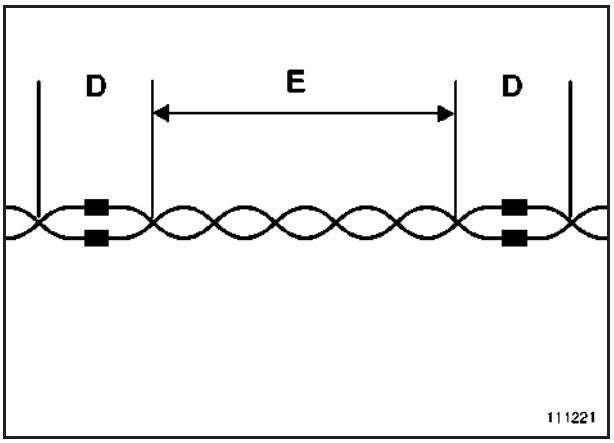
Detach the section of wire to be repaired from the main wiring.

Cut the wires at (**B**) and (**C**), **50 mm** on each side of the damage.

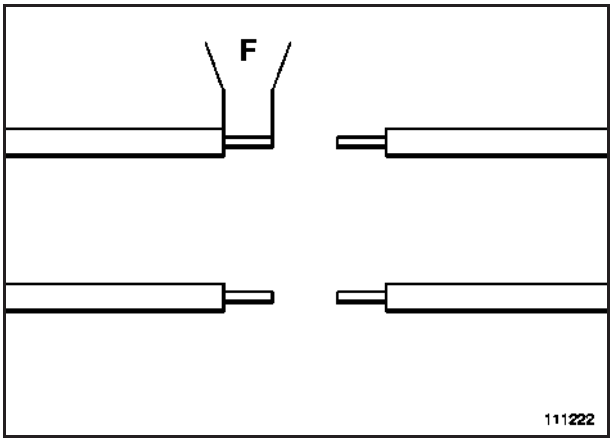


Take from the coil of twisted wires **(0.5 mm^2**, specific number of turns) to be used to repair the multiplexing, a length of wire the same as that removed from the harness, **plus 30 mm** for the wire joints (See **Wiring repair kit: Description**).

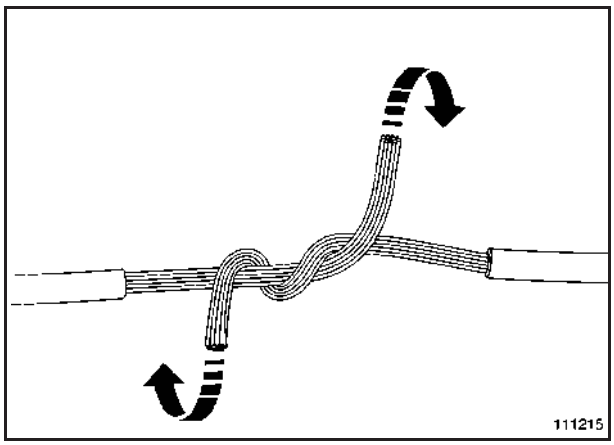
WARNING
Do not untwist the harness to be repaired more than 100 mm (D). The wires at (E) must be twisted uniformly along the repaired length.



Strip each end of the wires by **10 mm (F)** at each side.

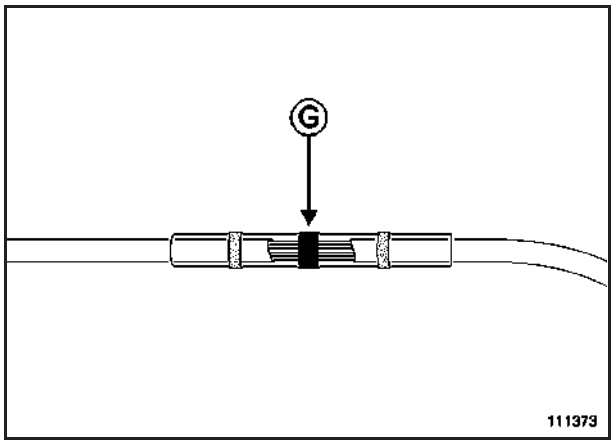


To join the wires, working wire by wire:
- slip the self-solder sleeve onto the wire,
- twist the end of the wires together.



WARNING
The colour of the wires (CAN H et CAN L) must be respected when they are being joined.

- Position the sleeve with its solder ring in the centre of the wire joint.



- Switch on the heat gun.
- Adjust the temperature of the tool to **340°C** with a ventilation speed set to maximum (See **Wiring repair kit: Use**).
- Heat the sleeve so that the solder ring melts (**G**) onto the wires until the heat shrinkable sheath contracts.

Refer to the precautions for use which relate to using self-solder sleeves (see **Wiring: Repair**).

WARNING
Do not try to heat the sheath too quickly, use a backwards and forwards motion to ensure that it does not burn.
Do not direct the flow of hot air onto the insulation of the wires so as not to burn it.

Note:
For the soldering to be complete and for the sheath to contract, the heating operation should last approximately **30 s ± 10**.
Spend the majority of the recommended time on the ring of solder and the rest of the time on the ends of the sleeve.
The recommended time is given as a guide. It can be reduced or increased depending on how efficient the heating is.

WARNING
Wait for the sleeve to cool before manipulating it to maintain the quality of the solder (minimum waiting period: 1 minute).
Do not bend the sleeve (even when cool) so as to not damage the quality of the solder or the sealing properties of the sleeve.

4 - Checking the multiplex line.

WARNING
After repairing the multiplex line, always check the multiplex network using the diagnostic tool.

Note:
During the check with the diagnostic tool, move the lines forwards and backwards slightly. If a fault is recorded, start the operation again for the faulty line.

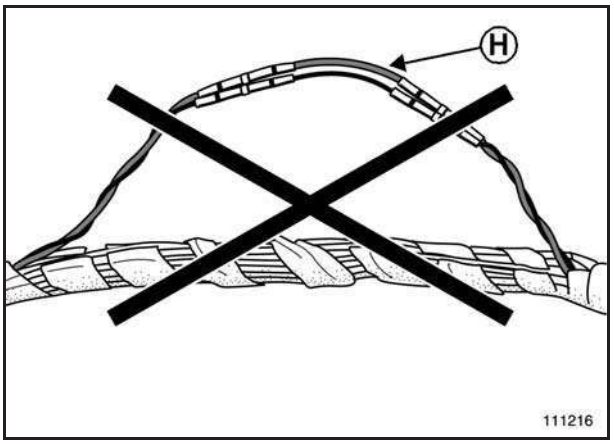
Refer to the fault finding procedure for the function concerned.

WARNING
After having checked the multiplex line:
- **refit it in the main harness,**
- **tape it up with adhesive tape.**

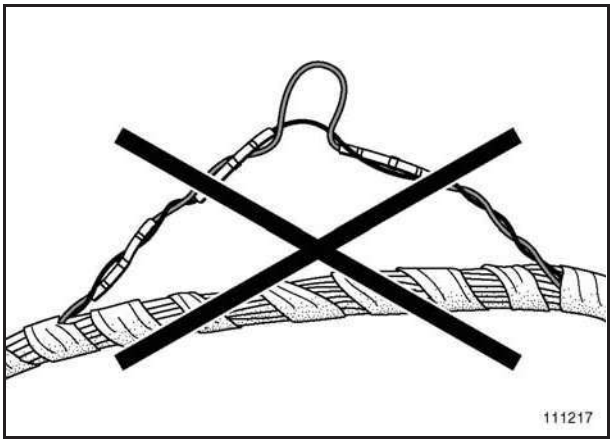
Apply the recommendations from the generic repair procedure concerning the fitting and fuses (see **Wiring: Check**).

WARNING
The various struck-through cases are strictly forbidden.

No turns (twists) at (**H**).



The two wires added are of a different length.



5 - Final check.

After any operation on the wiring, check that there are no faults using the diagnostic tools (Clip).

Refer to the corresponding fault finding procedure.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

WARNING
This procedure relates repairing airbag and pretensioner wiring only.

Note: Apply all the precautions and recommendations shown in the MR.

WARNING
All work on airbag and pretensioner systems must be carried out by qualified trained personnel.

WARNING
The pyrotechnic systems (pretensioners or airbags) must not be handled near to a heat source or flame; there is a risk that they may be triggered.

WARNING
Before removing an electronic control unit (ECU) or before any operation on the safety systems or around them, the airbag computer must be locked using the diagnostic tool. When this function is activated all the trigger lines are inhibited, and the airbag warning light on the instrument panel is lit continuously.

WARNING
Before any operation on a pyrotechnic component connection (connector or wiring) found faulty during fault finding, disconnect the pyrotechnic component.

1 - Identify the solution.
The case in question must figure in the table below. Otherwise, replace the wiring.

Airbag and pretensioner components	Solutions
Under seat connector (Airbag warning light on)	● If the connector has more than 10 wires, no operation can be carried out. Replace the wiring unless there is a specific procedure (OTS*). ● If not, shunt the connector. See **Under seat connector** in this section.
Connector on seat runner	No operation. Replace the wiring unless there is a specific procedure (OTS*).
Pyrotechnic component connectors (squib) (airbag triggers, pretensioner, etc.)	Replace the connector using the airbag connectors kit. See **Pyrotechnic component connectors** in this section.
Airbag computer connector	No operation. Change the wiring harness except in the following cases: ● If there is a specific procedure (OTS*), its application is authorised. ● If the connector lock is broken, replacing the lock authorised.
Airbag and pretensioner harness damage	No operation except in specific conditions. See **Airbag and Pretensioner harness damage** in this section.

*OTS: Special Technical Operation

WARNING
Any repair linked to the airbag function necessitates a specific check using the network's diagnostic tools.

2 - Under seat connector.

Note:
For a connector on a seat runner, the wiring must be replaced.

When fault finding identifies a under seat connector fault, shunt the under seat connector following the procedure below:

Cut the electrical wires either side of the connector.

Apply the specific procedure for repairing multiplex lines (see **Multiplex network: Repair**), except the part on locating the fault, to shunt the connector.

Note:
Check that the length of replacement wire is the same as that removed from the harness, **plus 30 mm** for the wire joints.

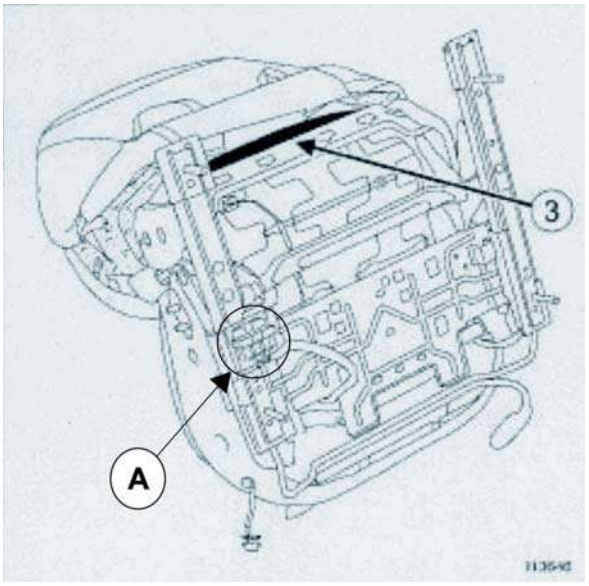
After the operation, check that the wire is not too taut or too long when the seat is furthest forward or back.

Protect the wires so that they are not damaged and this new branch is correctly maintained. Hanging loops are not allowed, regardless of the wires involved in the repair.

Carry out the specific airbag and pretensioner line repair checks. See **Airbag line repair check** and **Final check** in this section.

Note:
Check that the harness is correctly repositioned after the operation and that it is does not obstruct the seat adjusting mechanisms.

Example of a connector on a seat runner (A):



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3 - Pyrotechnic component connectors.

These are airbag and pretensioner trigger connectors.

Identify the connector concerned on the vehicle.

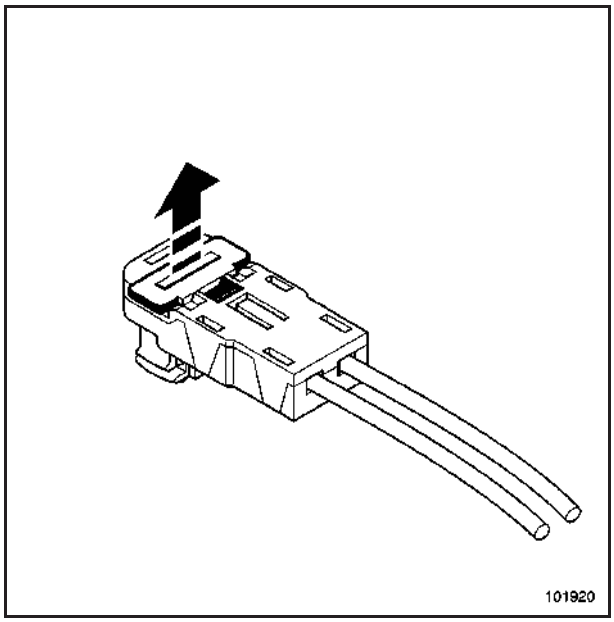
Repair is possible if it is a SQUIB connector.

Find the colour of the connector: Blue, green or orange.

Find the shape of the connector: Straight or angled.

Select the same connector (colour and shape) from the airbag connectors kit (see under DIALOGYS).

Example of an angled SQUIB connector.



Apply the specific procedure for repairing multiplex lines (see **Multiplex network: Repair**), except the section on locating the fault, to replace the connector.

Carry out the specific airbag and pretensioner line repair checks. See **Airbag line repair check** and **Final check** in this section.

4 - Airbag and Pretensioner harness damage.

WARNING
No operation is authorised unless it is possible to check the repair using the diagnostic tool.

Where the repair can be checked with the diagnostic tool:

- if it is a case of twisted wires with a cross-section less than or equal to **0.5 mm^2**, apply the specific procedure for repairing multiplex lines (see **Multiplex network: Repair**), except for the section on locating the fault, for the repair of the lines;

- if it does not concern twisted wires, apply the generic procedure for repairing the harness (see **Wiring: Check**).

Carry out the specific airbag and pretensioner line repair checks. See **Airbag line repair check** and **Final check** in this section.

5 - Airbag lines repair check.

Confirm the airbag line repair to ensure that the repair is correct:

- Check the quality of the operation by reading the impedance reading produced by the computer using the diagnostic tool.
- Unlock the airbag computer using the diagnostic tools.
- The warning light should no longer be on.

Note:
During the check with the diagnostic tool, move the lines forwards and backwards slightly.
The resistance measure should remain stable, if variations in resistance are noticed, start the repair operation again for the defective line.

Refer to the airbag and pretensioner function fault finding procedure for the vehicle concerned.

Apply the recommendations from the generic repair procedure concerning the fitting and fuses (see **Wiring: Check**).

6 - Final check.

After any operation on the wiring, check that there are no faults using the diagnostic tools (Clip).

Refer to the fault finding procedure for the airbag and pretensioner function concerned.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

ENGINE - GEARBOX ASSEMBLY: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Support for removal - refitting of engine - gearbox assembly	Mot. 1390

Equipment required
refrigerant charging station

WARNING

To avoid any risk of cut, wear protective gloves during the operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

WARNING

DANGER :

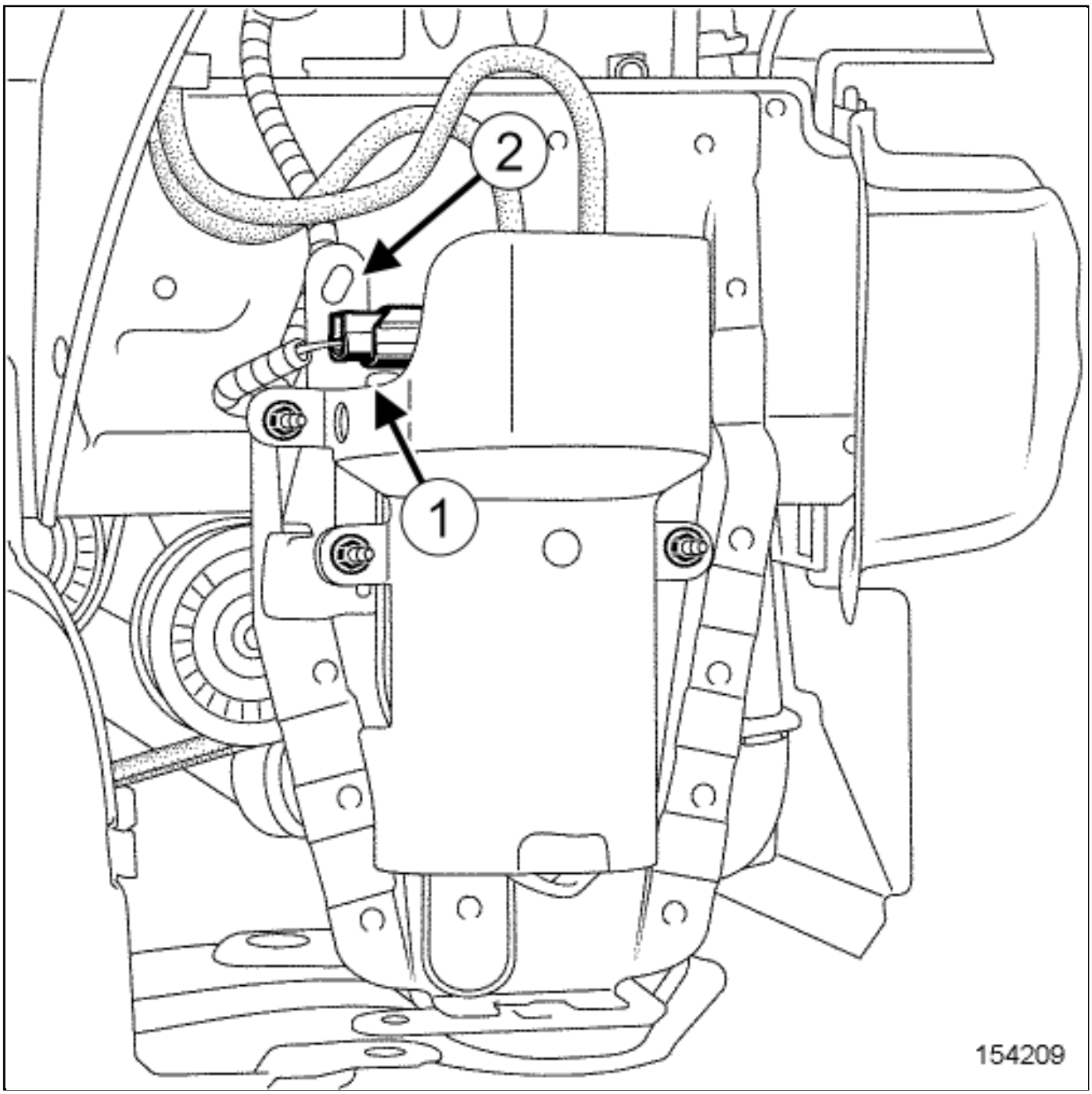
To avoid any risk of serious injury due to the vehicle failover from the lift, lash the vehicle to the lift using straps.

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .

- Remove:
  - the battery Battery: Removal - Refitting ,
  - the front wheels Wheel: Removal - Refitting ,
  - the engine undertray bolts,
  - the engine undertray,
  - the front bumper Front bumper assembly: Exploded view ,
  - the front section of the front wheel arch liners partially Exterior body front trim assembly: Exploded view .

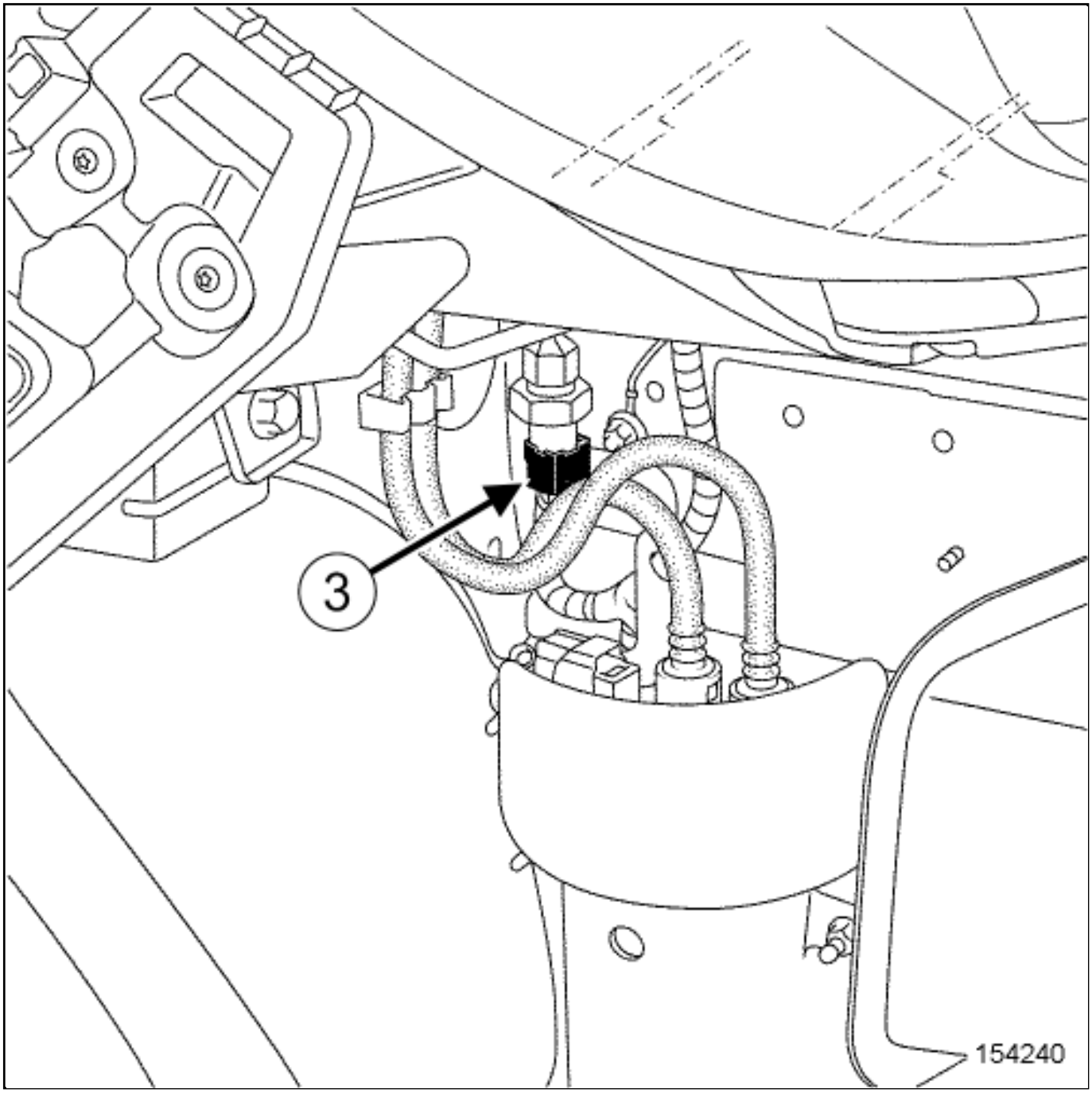
Drain:

- the engine oil if necessary(see **Engine oil: Draining - Refilling**) ,
- the gearbox oil**Manual gearbox oils: Draining - Filling** ,
- the cooling system**Cooling system: Draining - Refilling** .



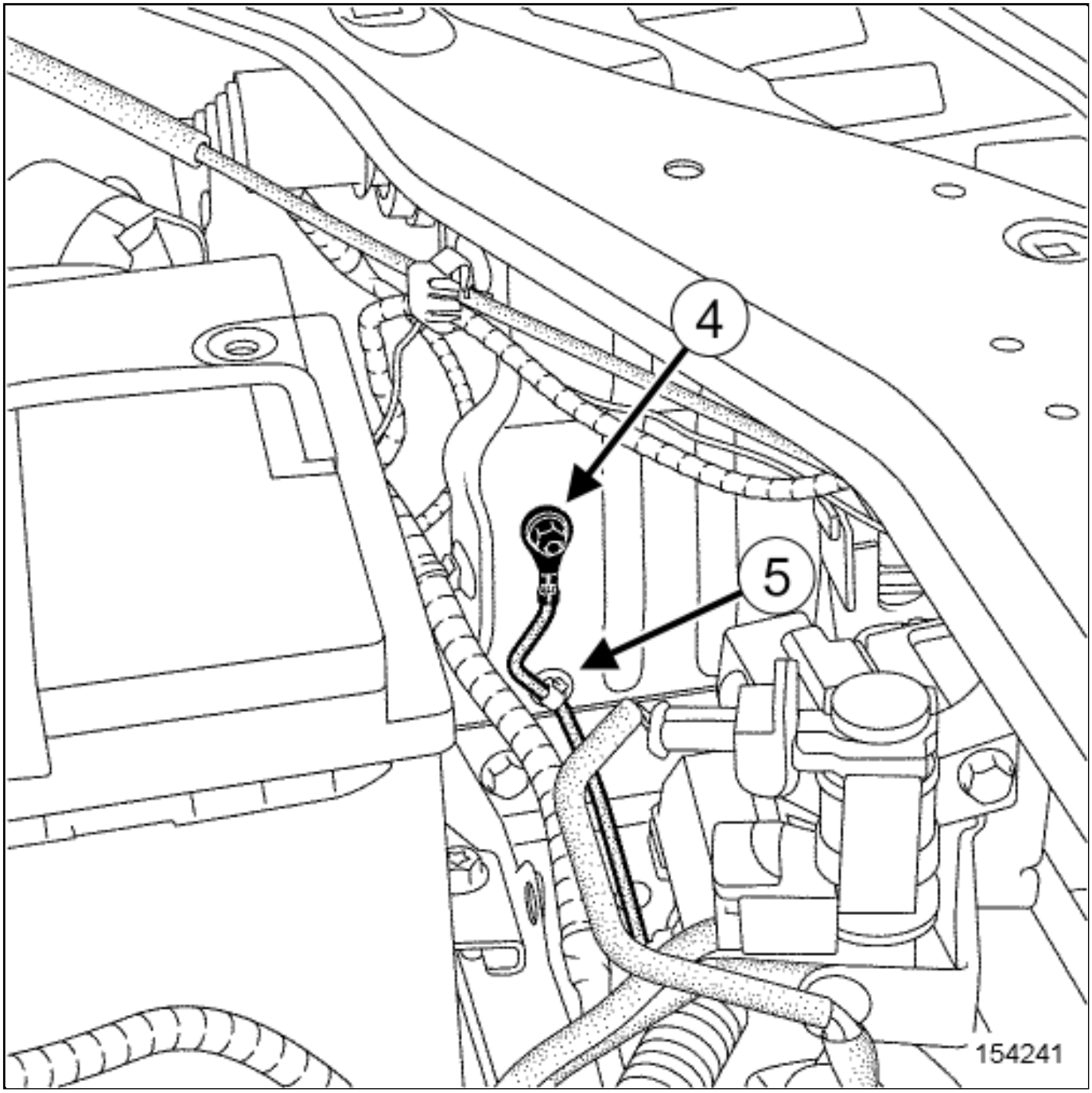
Disconnect the connector(1) from the diesel filter.

Unclip the wiring at(2) .

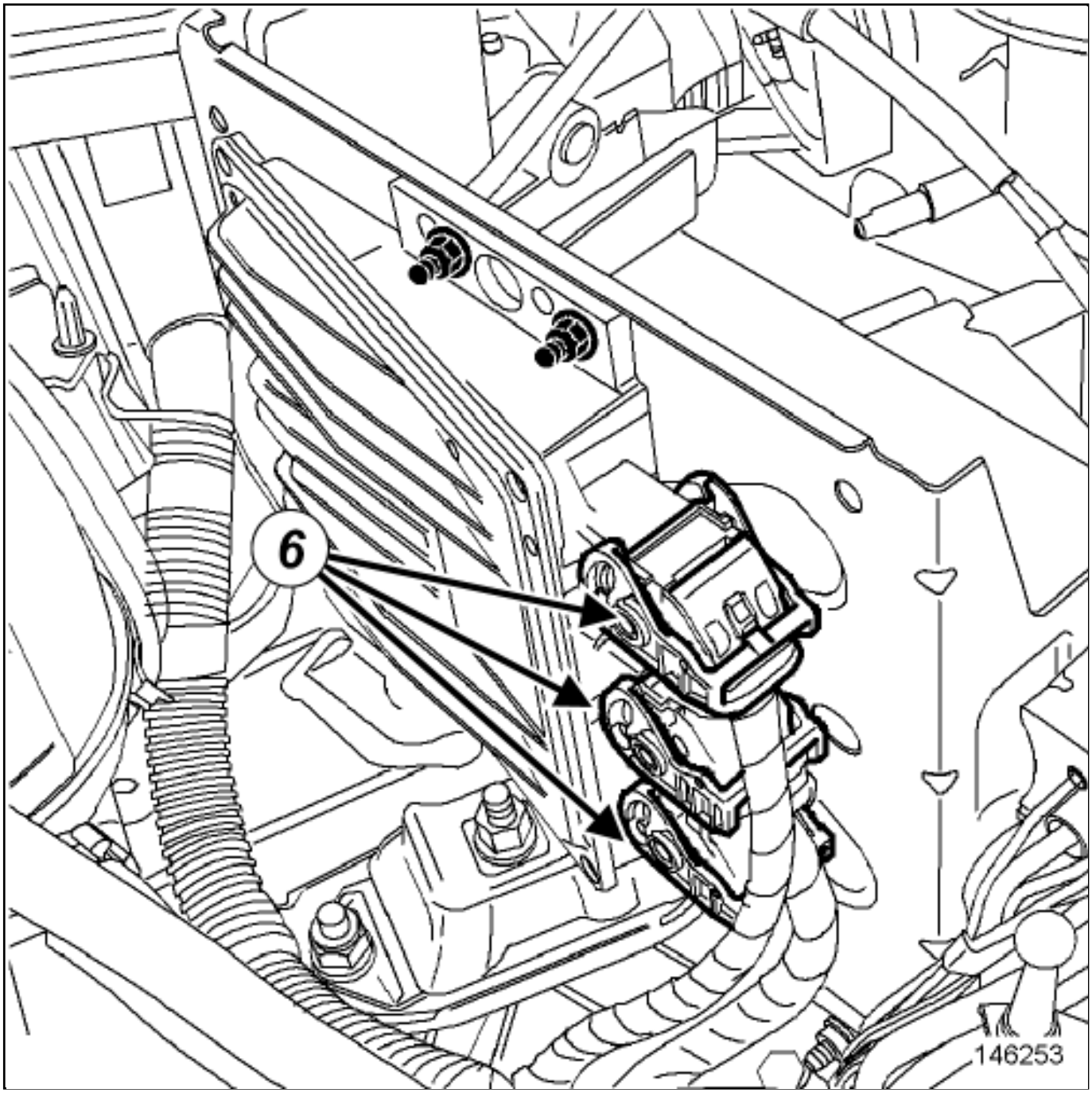


- Disconnect the air conditioning pressure sensor connector(3) .

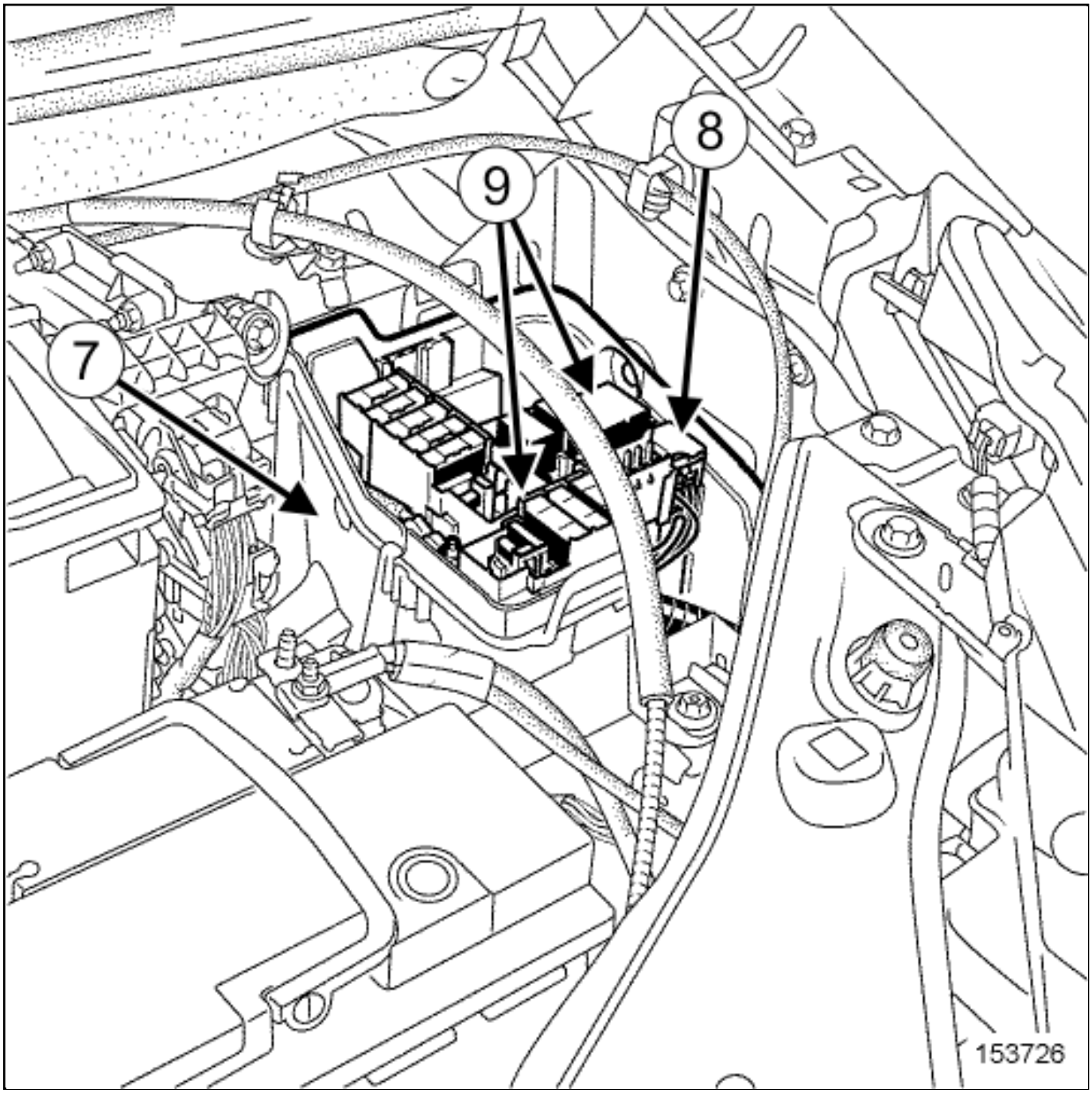
- Remove:
  - the air inlet sleeve,
  - the air filter unit**Air filter unit: Removal - Refitting** .



- Remove the earth strap mounting nut(4) .
- Unclip the wiring at(5) .



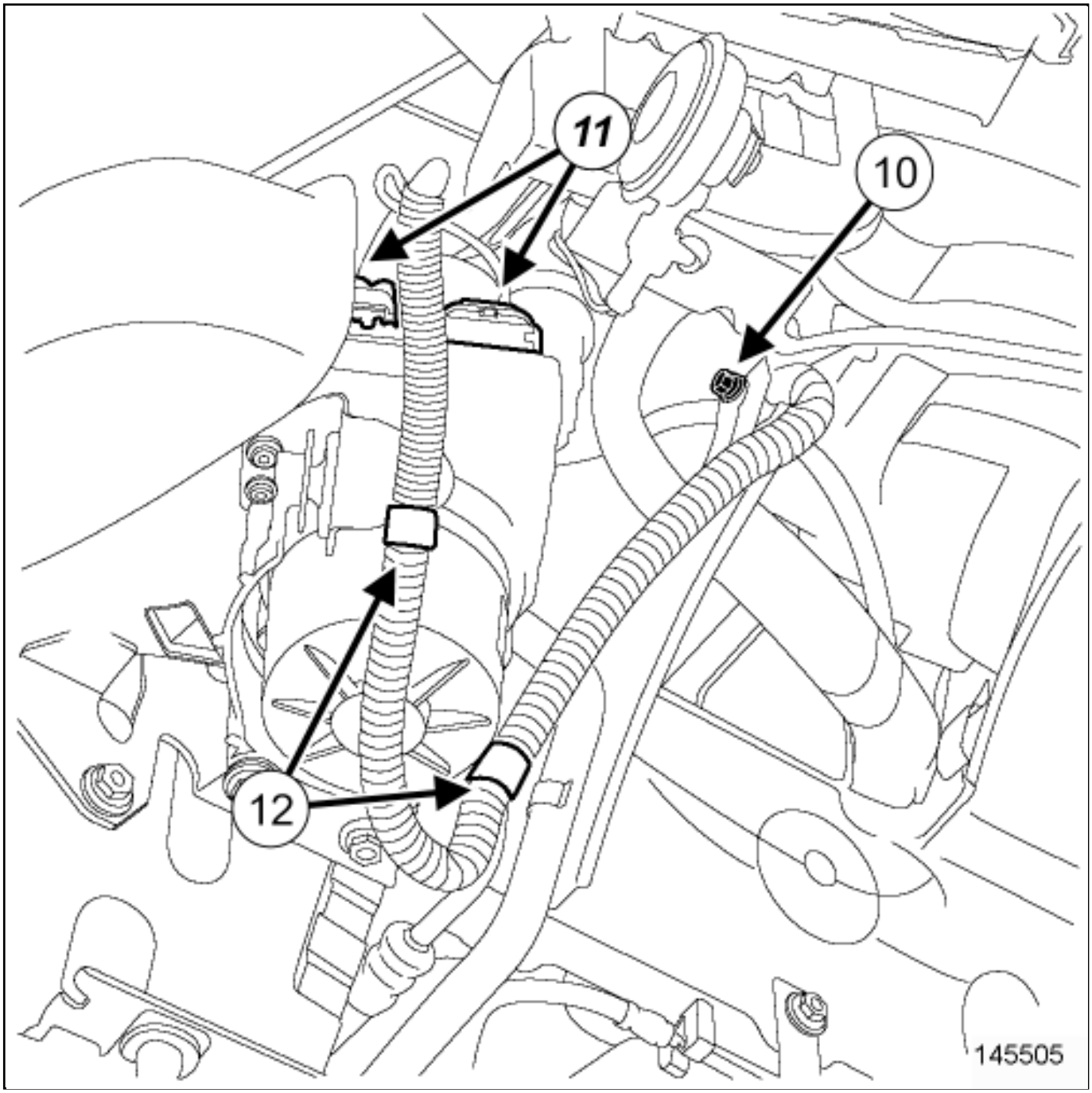
- Disconnect the injection computer connectors(6) .



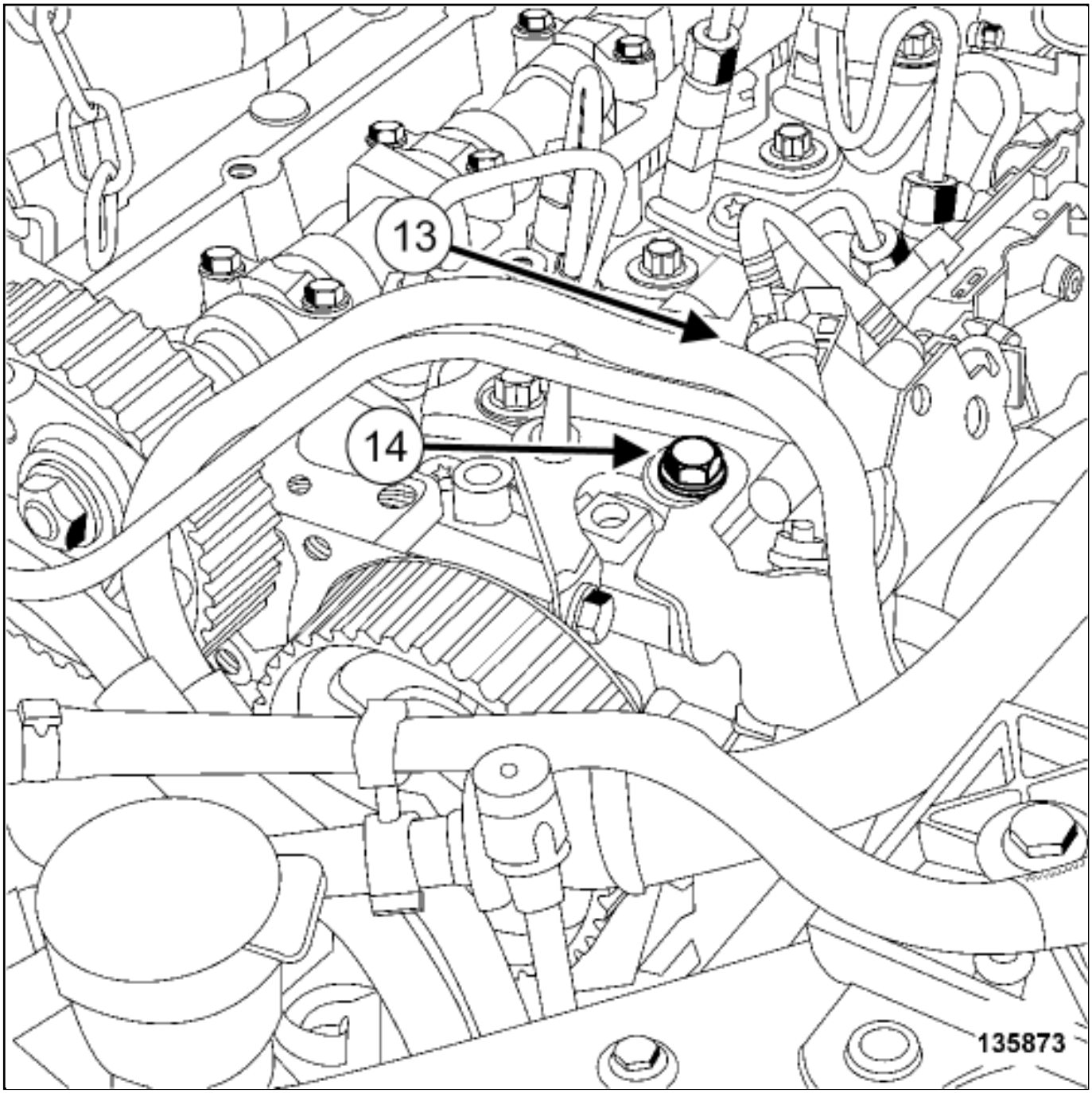
- Remove:
  - the fuse and relay cover,
  - the side protector(7) of the fuse and relay box.

- Disconnect the engine harness - front wiring connector(8) .

- Unclip the fuse holders and relays(9) from their mountings on the fuse and relay box in the engine compartment.



- Remove the earth strap bolt(10) on the body.
- Disconnect the pump assembly connectors(11) .
- Unclip the pump assembly wiring at(12) .
- Position the engine harness, fuses and relays on the engine.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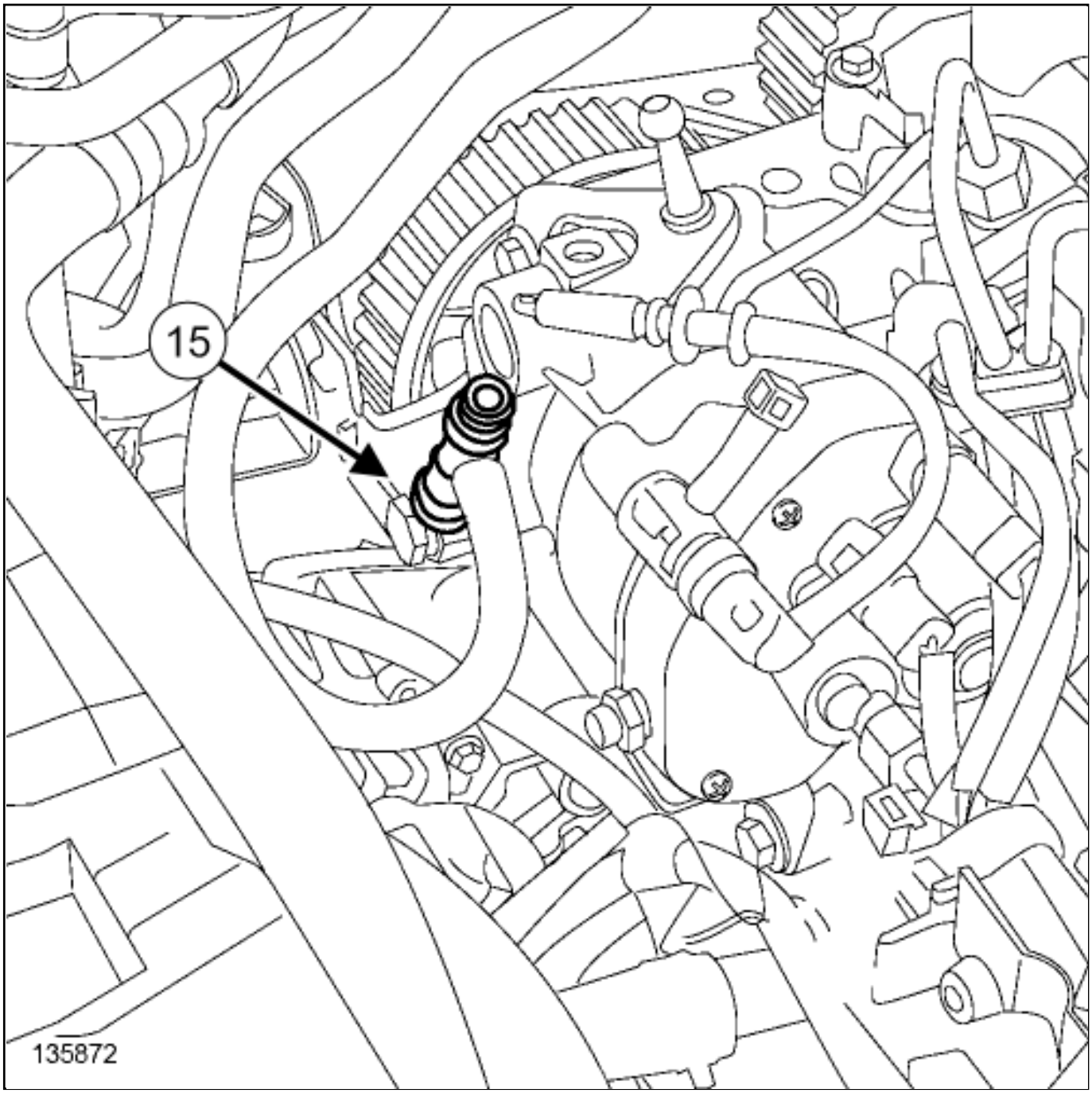


- Unclip the fuel return union(13) of the high pressure pump from the high pressure pump protector.

- Remove:
  - the bolt(14) of the high pressure pump protector,
  - the high pressure pump protector.

- Unclip the fuel supply pipe from the rubber-pad cover assembly of the rigid-hand suspended engine mounting.

- Disconnect the fuel supply pipe from the high pressure pump(15) .

- Fit suitable blanking plugs on:
  - on the fuel supply pipe union opening,

- on the high pressure pump opening.

Unclip the diesel return pipe from the « rubber pad-cover » assembly of the right-hand suspended engine mounting.

Disconnect the diesel return pipe from the fuel return pipe union of the high pressurepump.

Fit suitable blanking plugs on:

- on the opening of the fuel return pipe union,
- on the opening of the diesel return pipe union of the high pressure pump.

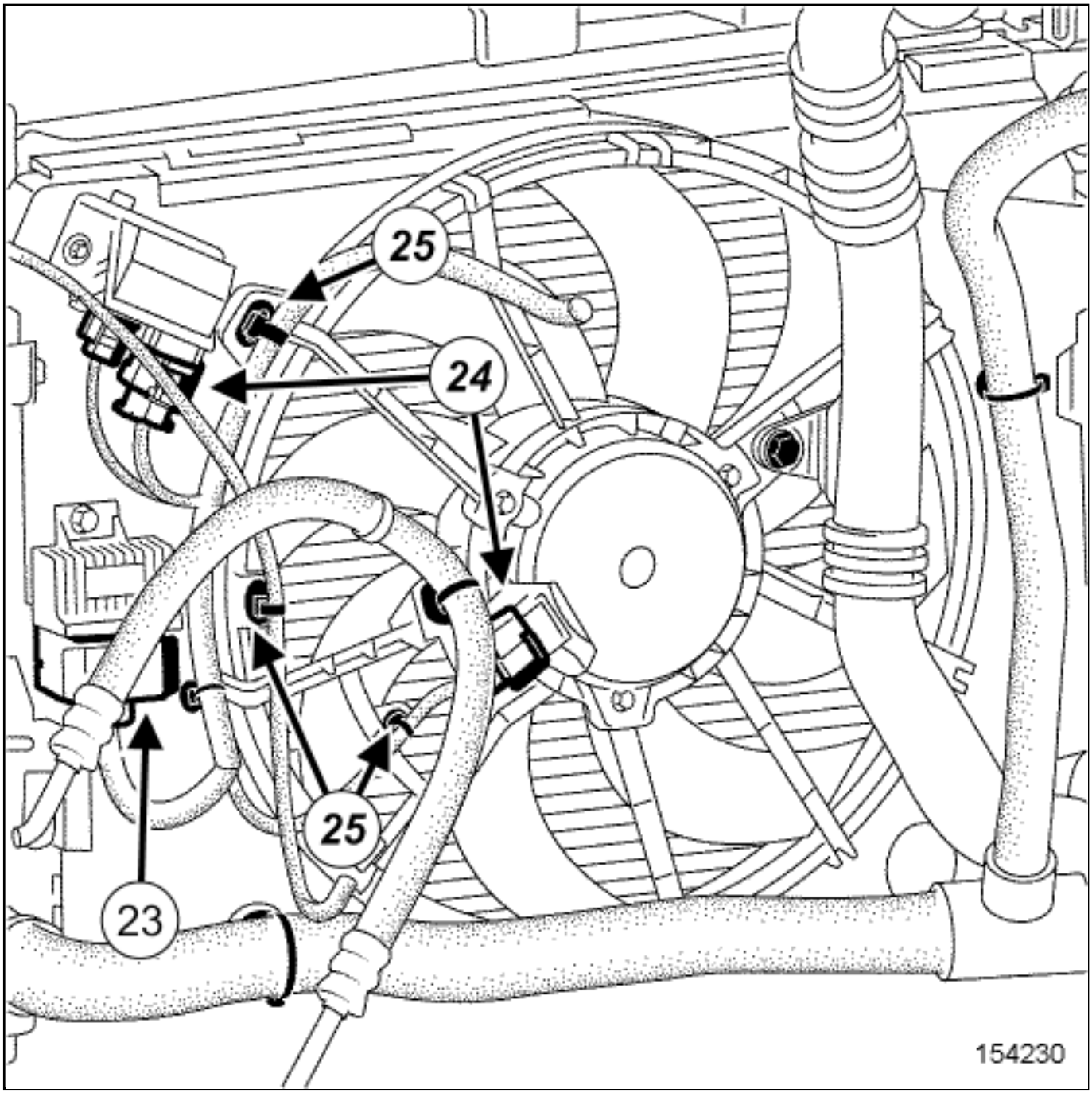
Fit blanking plugs on the fuel pipe openings.

Unclip the fuel supply pipes at(19) .

Remove **Power-assisted steering assembly: Exploded view** :

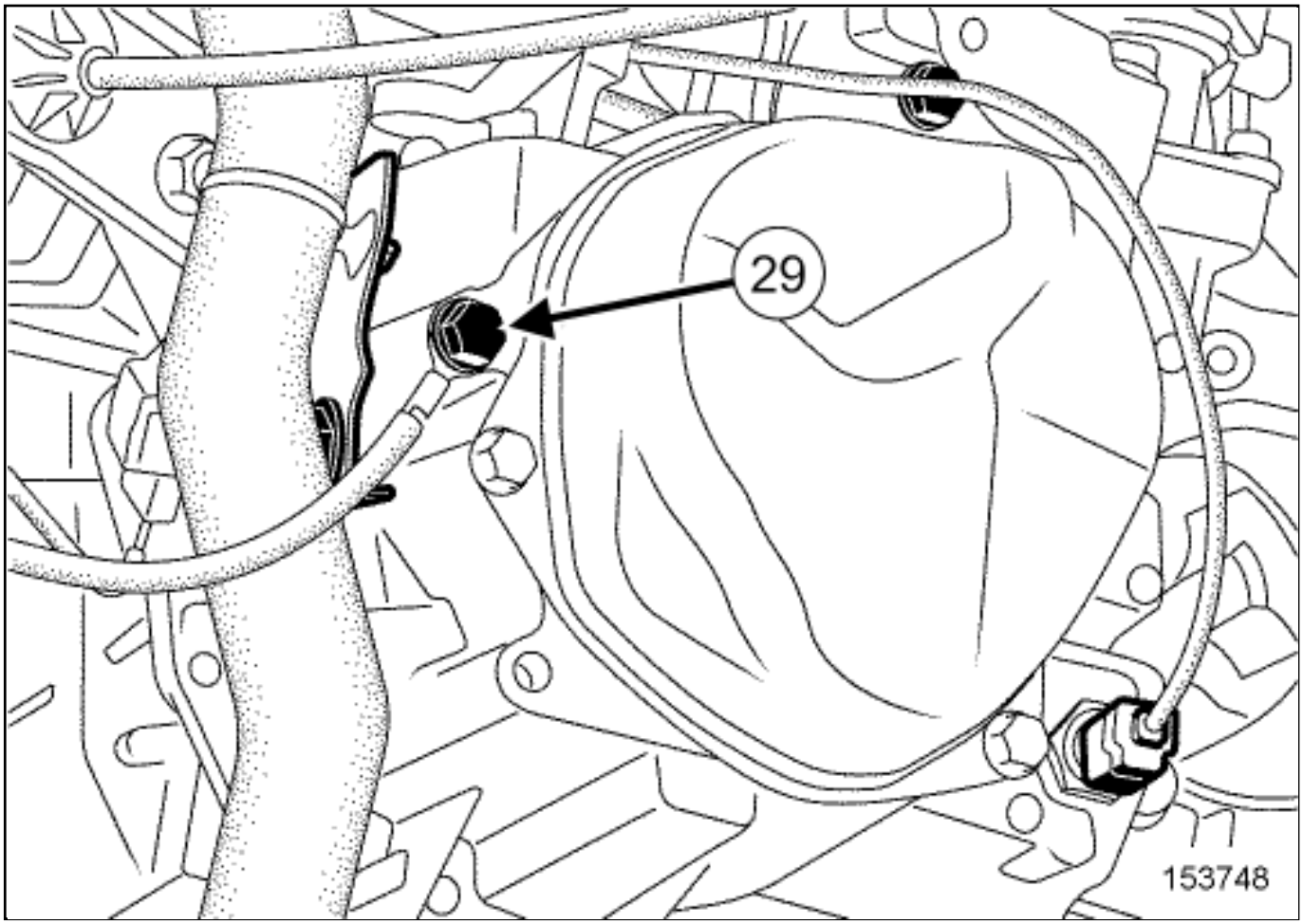
- the power-assisted steering low pressure hose on the power-assisted steering pump assembly using the toolRemote operation pliers for hose clips.(**Mot. 1448**) and drain the circuit,
- the power-assisted steering high pressure pipe on the power-assisted steering pump assembly,

Fit blanking plugs in the pipe openings.



- Disconnect:
  - the pre-postheating unit connector(23) ,
  - the connectors(24) from the motor-driven fan assembly.

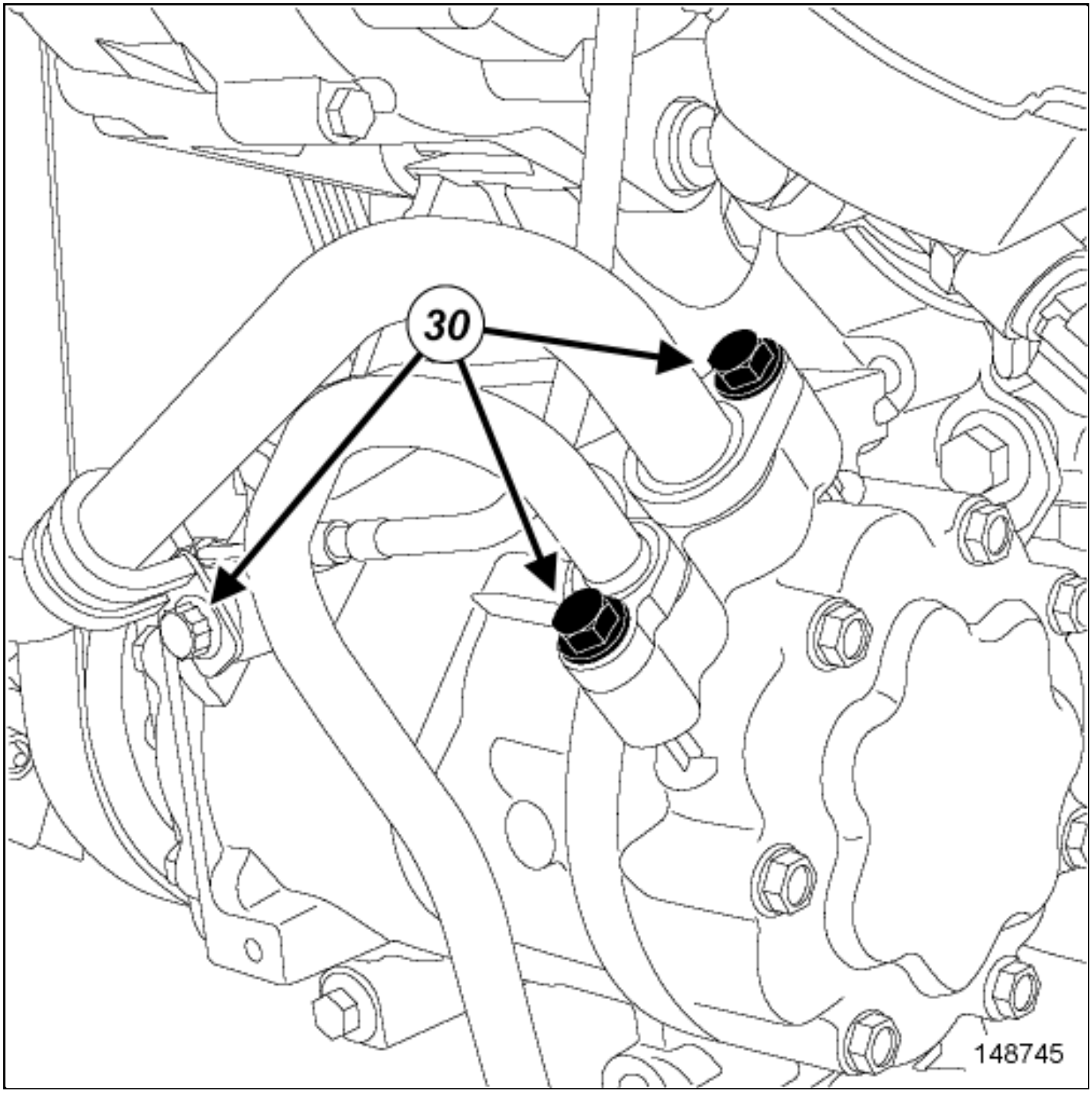
- Unclip the fan assembly wiring at(25) .



- Remove the earth strap bolt(29) on the gearbox.

- Remove:
  - the intercooler air outlet pipe**Intercooler air outlet pipe: Removal - Refitting** ,
  - the intercooler air inlet pipe**Intercooler air inlet pipe: Removal - Refitting** .

- Remove the intercooler**Intercooler : Removal - Refitting** .

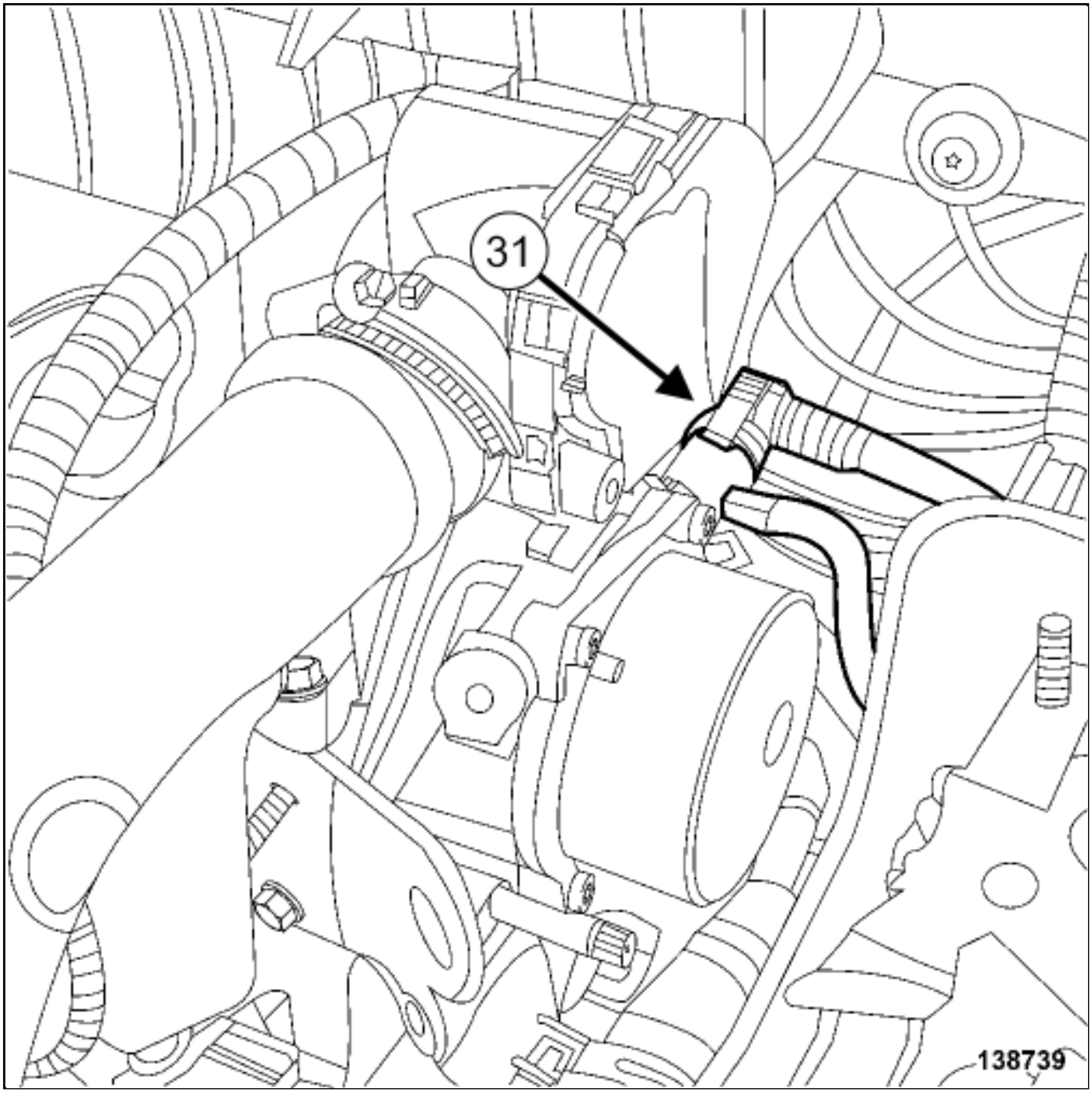


- Remove the bolts(30) from the pipe unions on the compressor.
- Disconnect the compressor pipes.

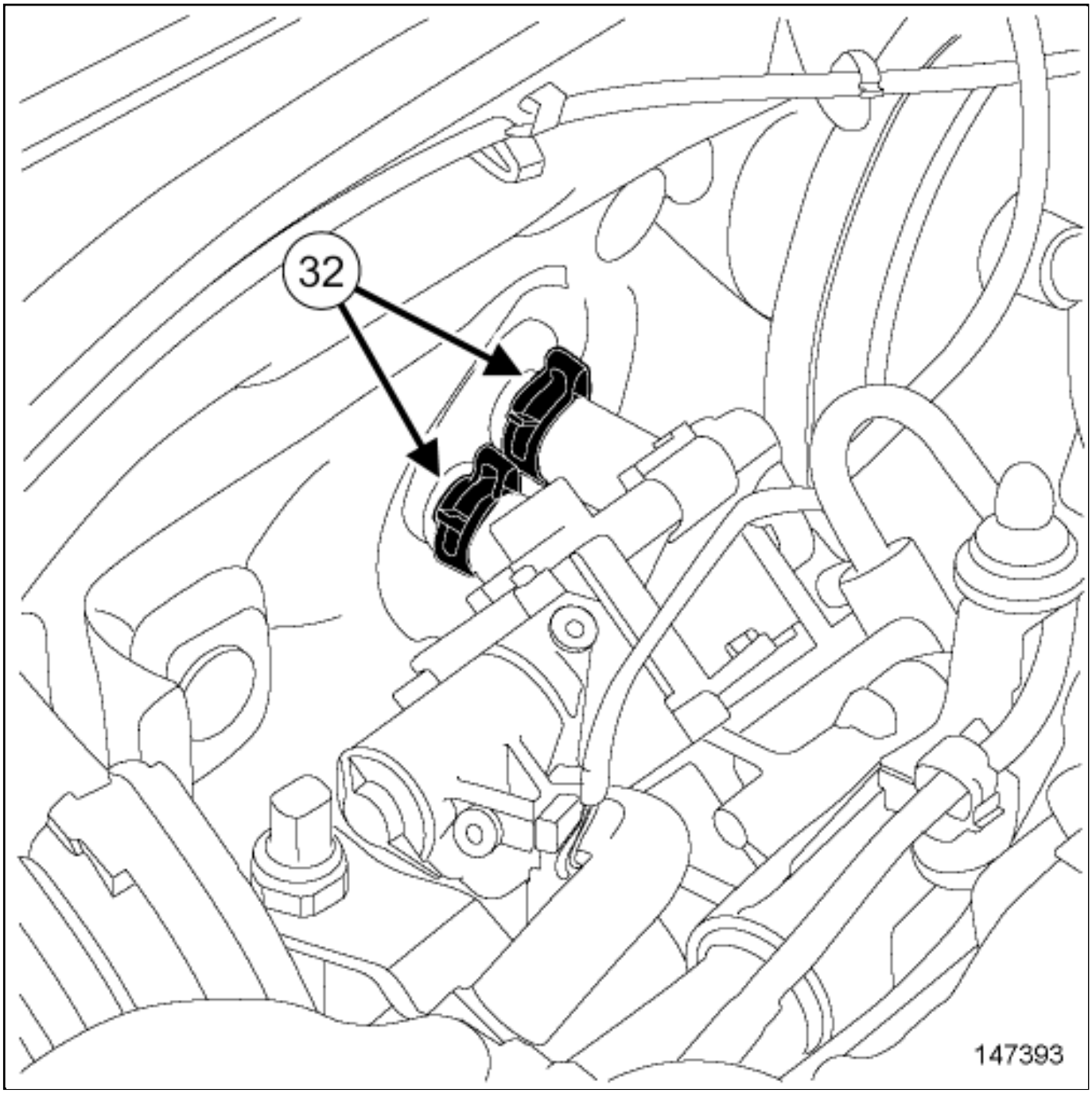
Note:

Plugs must be fitted on the hoses to prevent moisture from entering the system.

- Fit blanking plugs in the pipe openings.



Disconnect the brake servo pipe union(31) from the vacuum pump.



Separate the cooling hose clips(32) on the heating radiator using the toolRemote operation pliers for hose clips.(Mot. 1448) .

Disconnect the cooling hoses on the heating radiator.

Remove the cooling hoses from their mountings.

Disconnect **Coolant circuit assembly: Exploded view** :

- the top hose on the water chamber,
- the coolant pump inlet pipe hose.

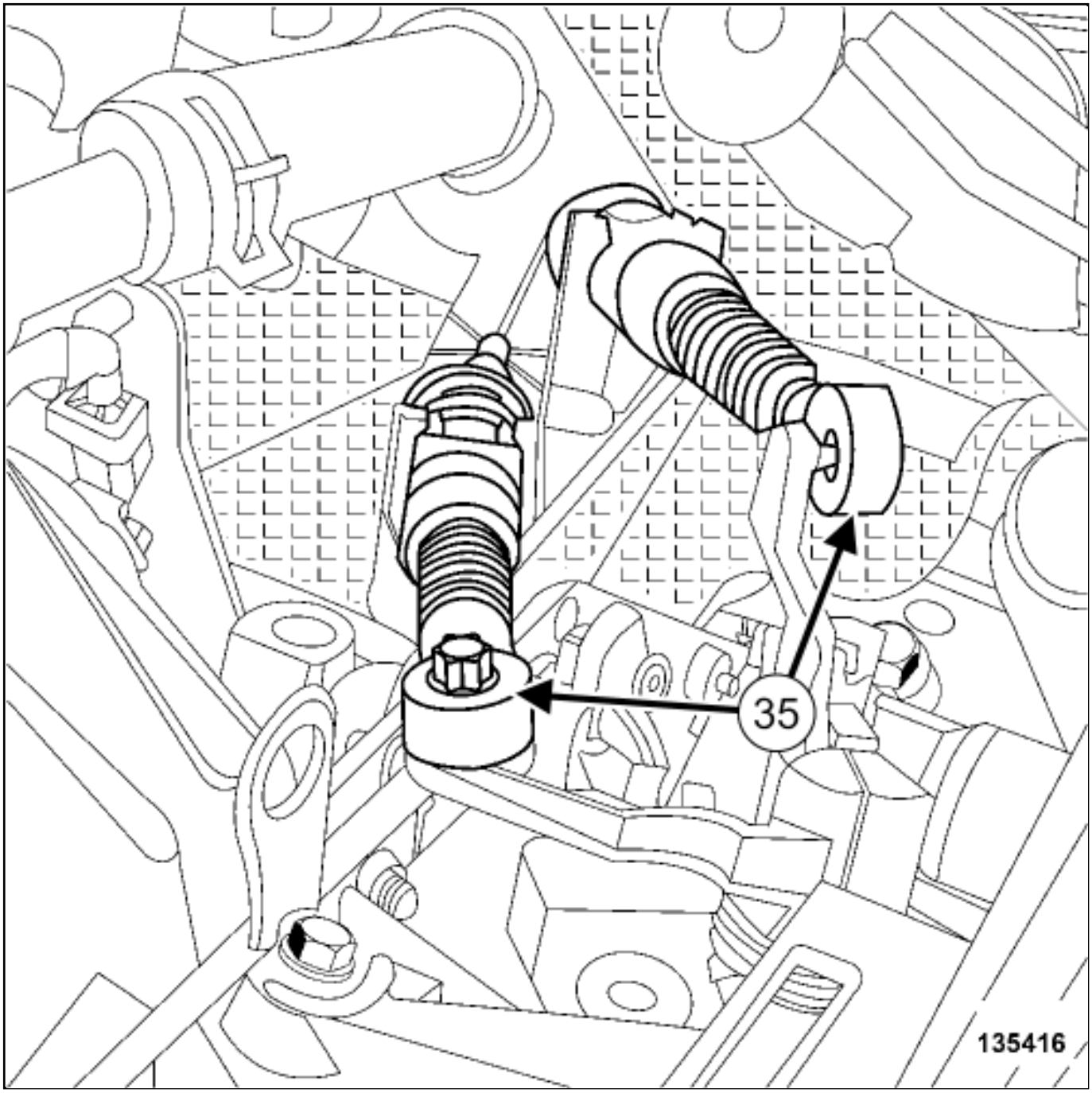
Remove **Steering assembly: Exploded view** :

- the heat shield bolts on the steering box,
- the steering box heat shield,
- the steering box bolts on the front axle subframe.

Attach the steering box to the body.

Remove:

- the front right-hand wheel driveshaft**Front right-hand driveshaft: Removal - Refitting** ,
- the front left-hand wheel driveshaft**Front left-hand driveshaft: Removal - Refitting** .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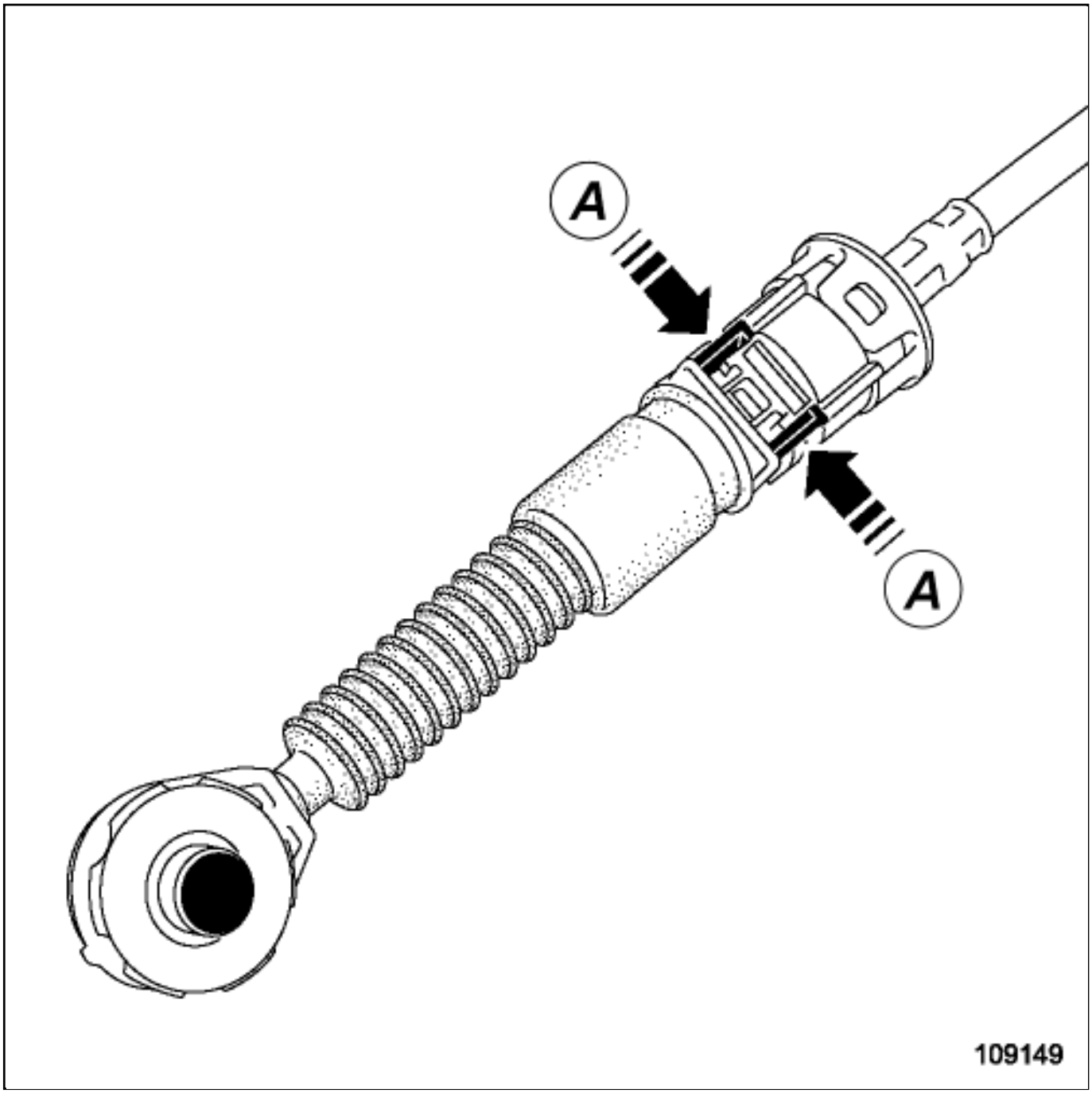


Unclip:

- the gear control cables on the gearbox at(35) using a screwdriver,
- the gear control cables from the sleeve stops by pressing at(A) .

Move the gear control cables away from the gearbox.

Disconnect the clutch control pipe on the clutch master cylinder**Clutch circuit: Removal - Refitting** .

Recover the brake fluid in a container.

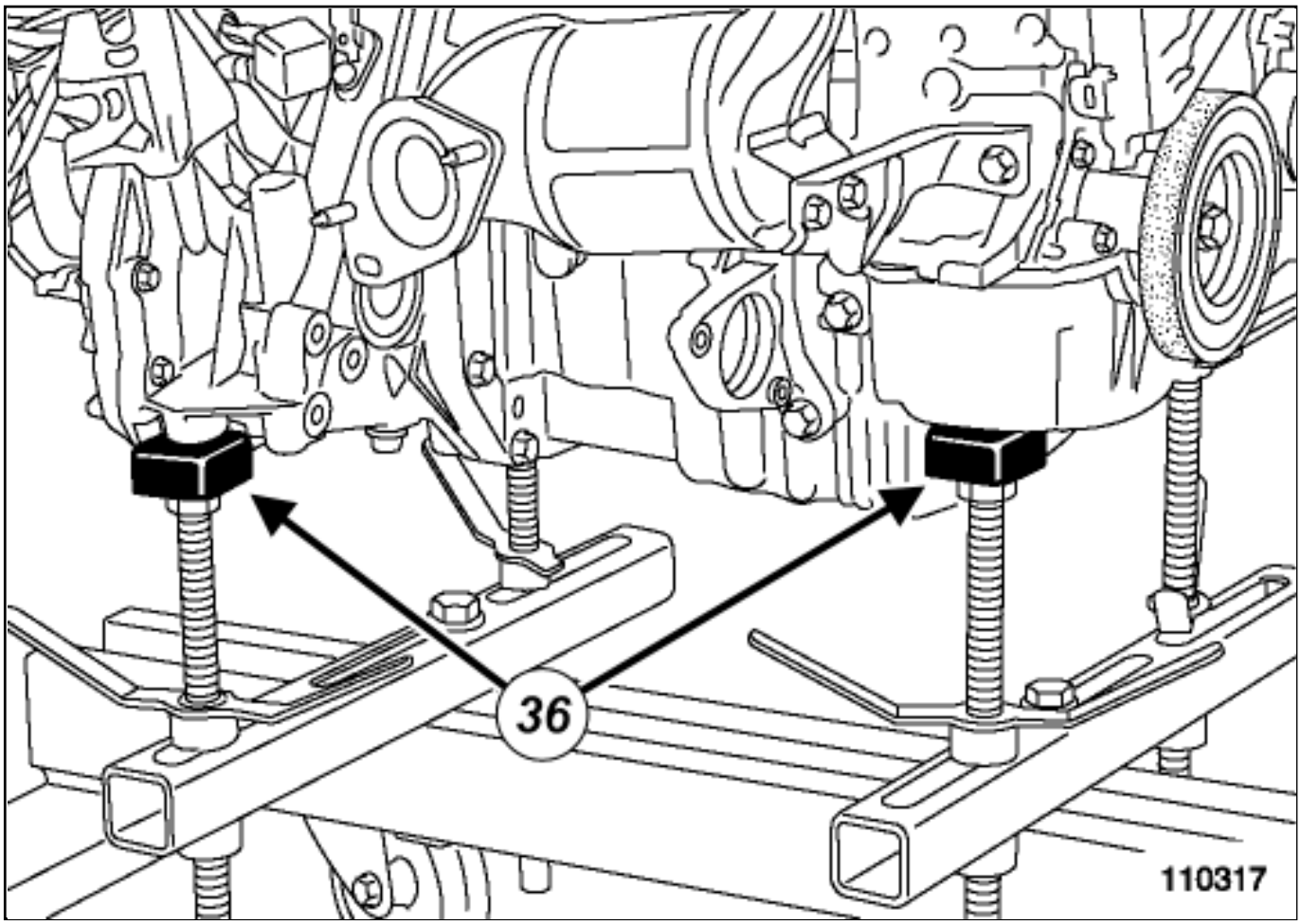
Fit blanking plugs in the pipe openings.

Remove:

- the lower engine tie-bar**Engine-gearbox unit support assembly: Exploded view** ,
- the front axle subframe**Front axle assembly: Exploded view** ,
- the nuts(see **Exhaust assembly in engine compartment: Exploded view**) of the exhaust flange.

Move aside the exhaust pipe.

2. REMOVAL OPERATION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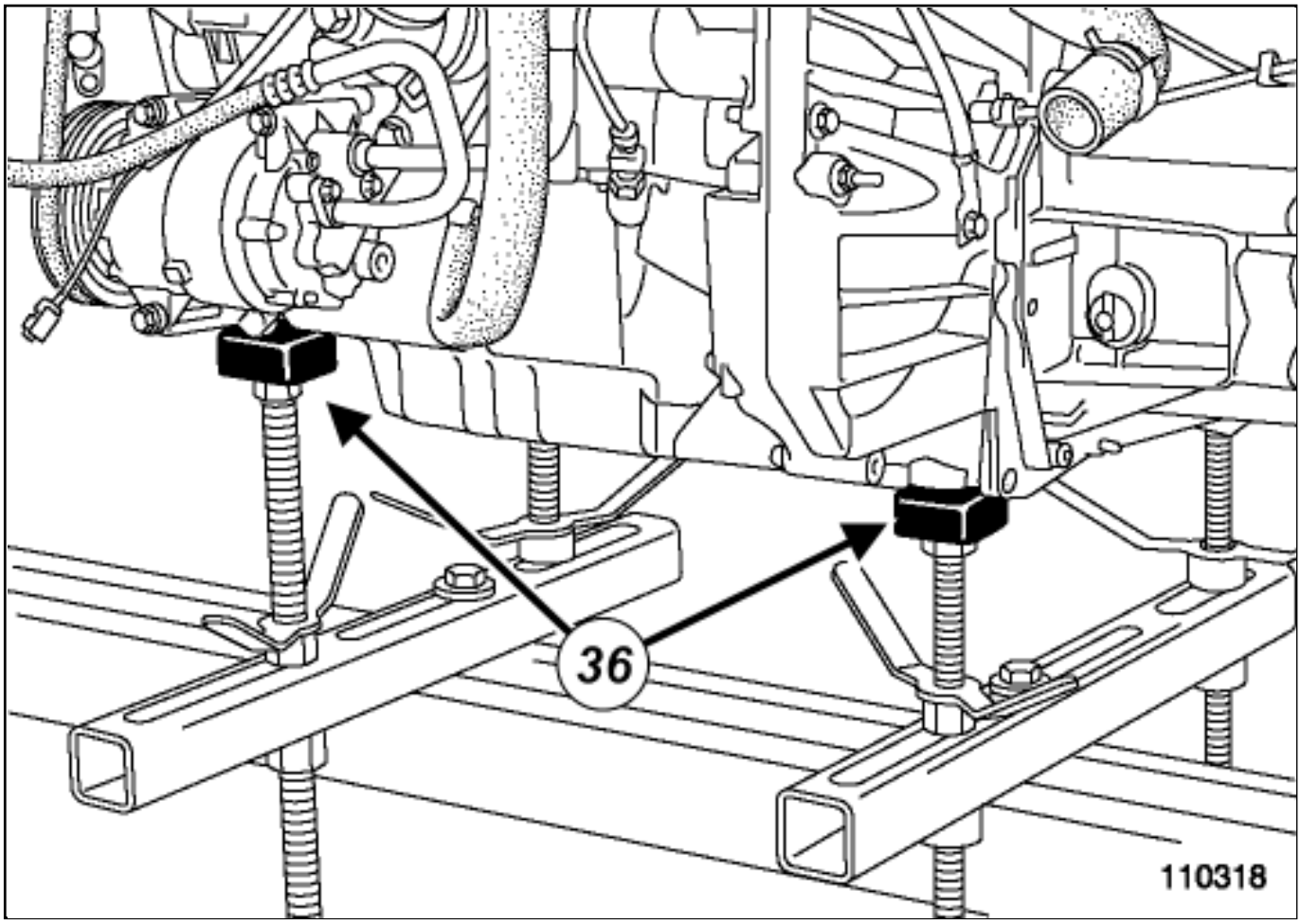


Note:

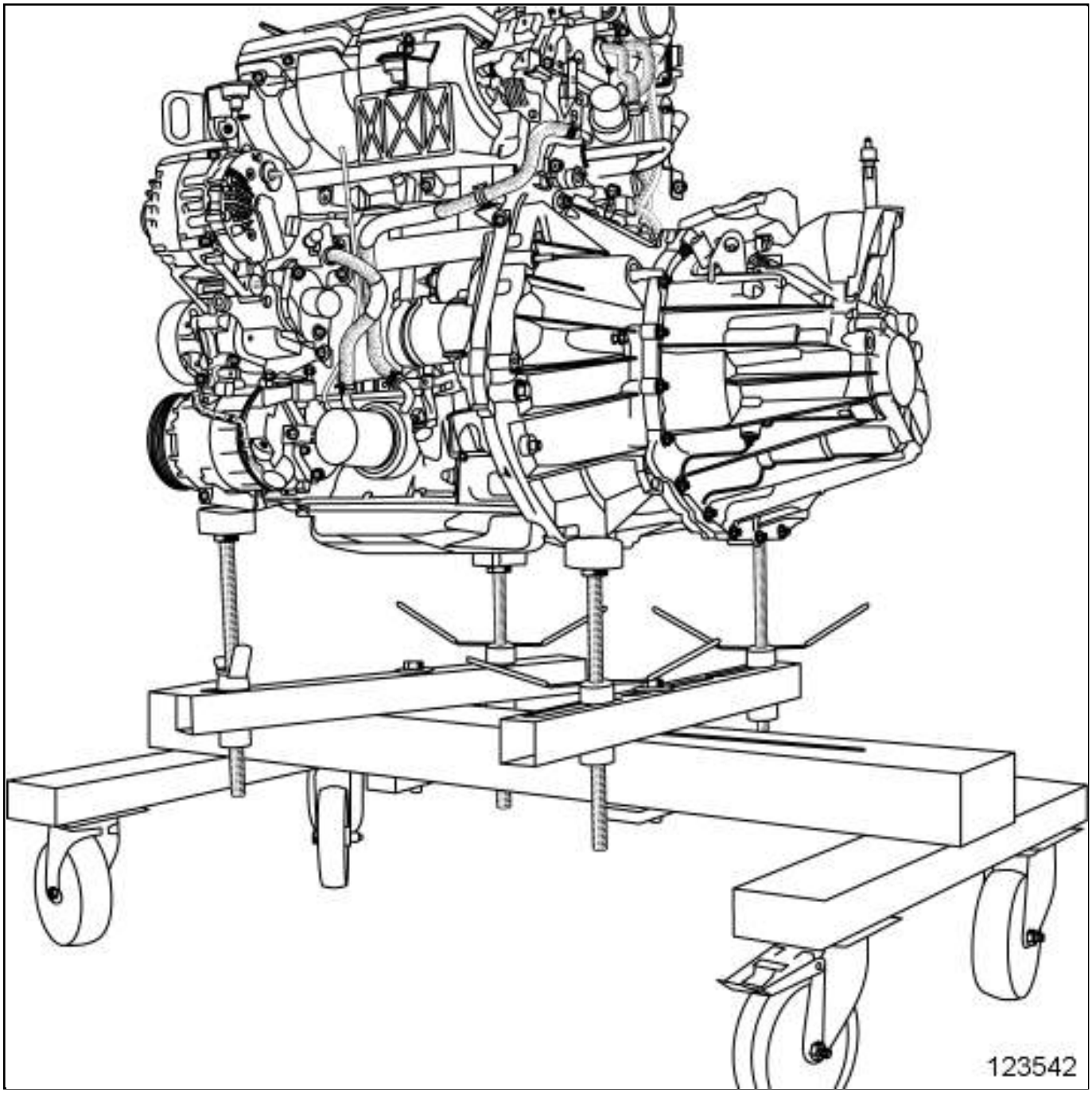
Ensure that theSupport for removal - refitting of engine - gearbox assembly(Mot. 1390) is correctly positioned on the multifunction support at(36) .

Position the Support for removal - refitting of engine - gearbox assembly(Mot. 1390) under the engine - gearbox assembly.

Remove the right-hand suspended engine mountingEngine-gearbox unit support assembly: Exploded view .

Remove the nutEngine-gearbox unit support assembly: Exploded view on the rubber pad support of the left-hand suspended engine mounting.

Strike the gearbox stud with a copper hammer to separate the engine - gearbox assembly from the body.



Lift the vehicle to remove the engine - gearbox assembly.

Note:

Ensure that no component obstructs the movement of the body around the engine - gearbox assembly.

Remove the engine - gearbox assembly.

REFITTING

1. REFITTING PREPARATION OPERATION

For standard engine replacement Engine: Standard replacement .

2. REFITTING OPERATION

Fit the engine - gearbox assembly.

Refit:

- the nut Engine-gearbox unit support assembly: Exploded view of the rubber pad of the left-hand suspended engine mounting,
- the right-hand suspended engine mounting Engine-gearbox unit support assembly: Exploded view .

Remove the Support for removal - refitting of engine - gearbox assembly(Mot. 1390) from the engine - gearbox assembly.

3. FINAL OPERATION

Proceed in the reverse order to removal.

Torque tighten the earth strap bolt on the gearbox21 N.m.

Perform the following operations:

- top up the engine oil(see **Engine oil: Draining - Refilling**) ,
- fill up the gearbox oil**Manual gearbox oils: Draining - Filling** ,
- fill and bleed the cooling circuit**Cooling system: Draining - Refilling** ,
- bleed the clutch circuit**Clutch circuit: Bleed** .

Fill the refrigerant circuit using the tool refrigerant charging station.

Fill up the power-assisted steering circuit.

First, bleed the power-assisted steering circuit by turning the steering wheel fully from left to right with the engine off.

Bleed the power-assisted steering circuit by turning the steering wheel fully from lock to lock with the engine running.

Top up the oil in the power-assisted steering oil reservoir.

Check that there are no leaks.

XSL version : 3.02 du 22/07/11

ENGINE COOLING FAN ASSEMBLY: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

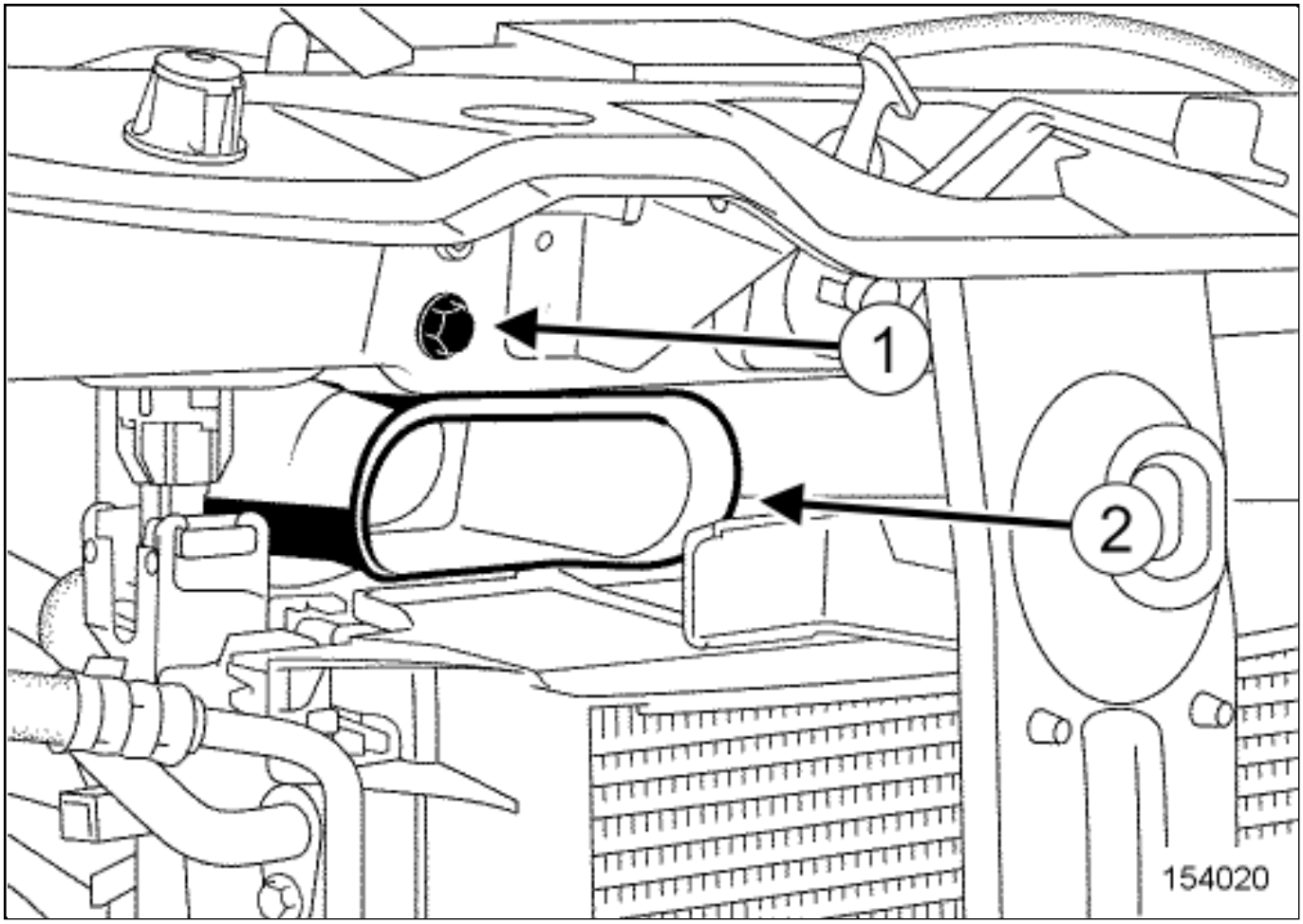
Disconnect the batteryBattery: Removal - Refitting .

Remove :

- the engine undertray bolts,
- the engine undertray,
- intercooler air outlet pipeIntercooler air outlet pipe: Removal - Refitting .

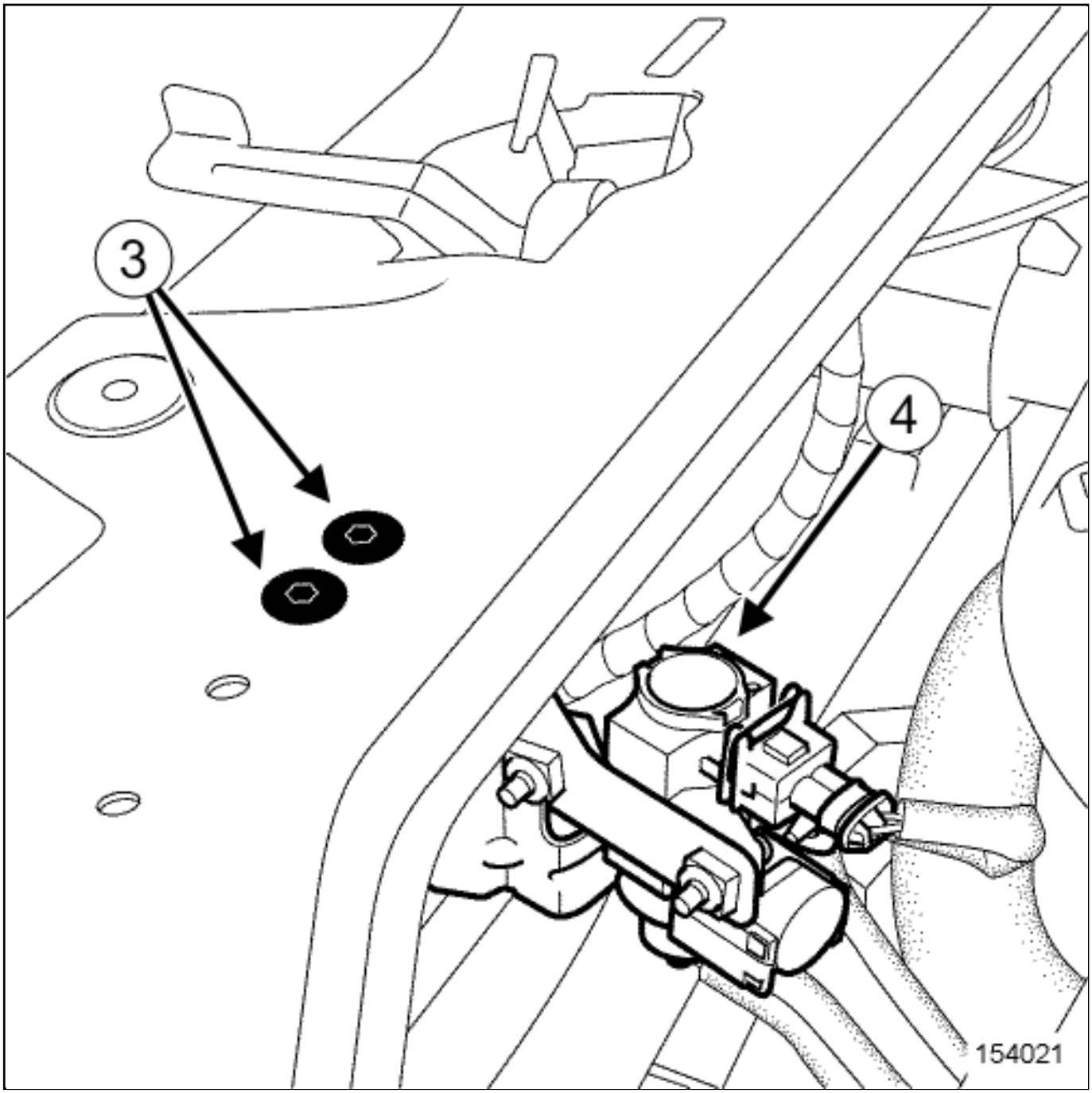
Remove :

- the front bumperFront bumper assembly: Exploded view ,
- the pre/postheating unitPre-postheating unit: Removal - Refitting .



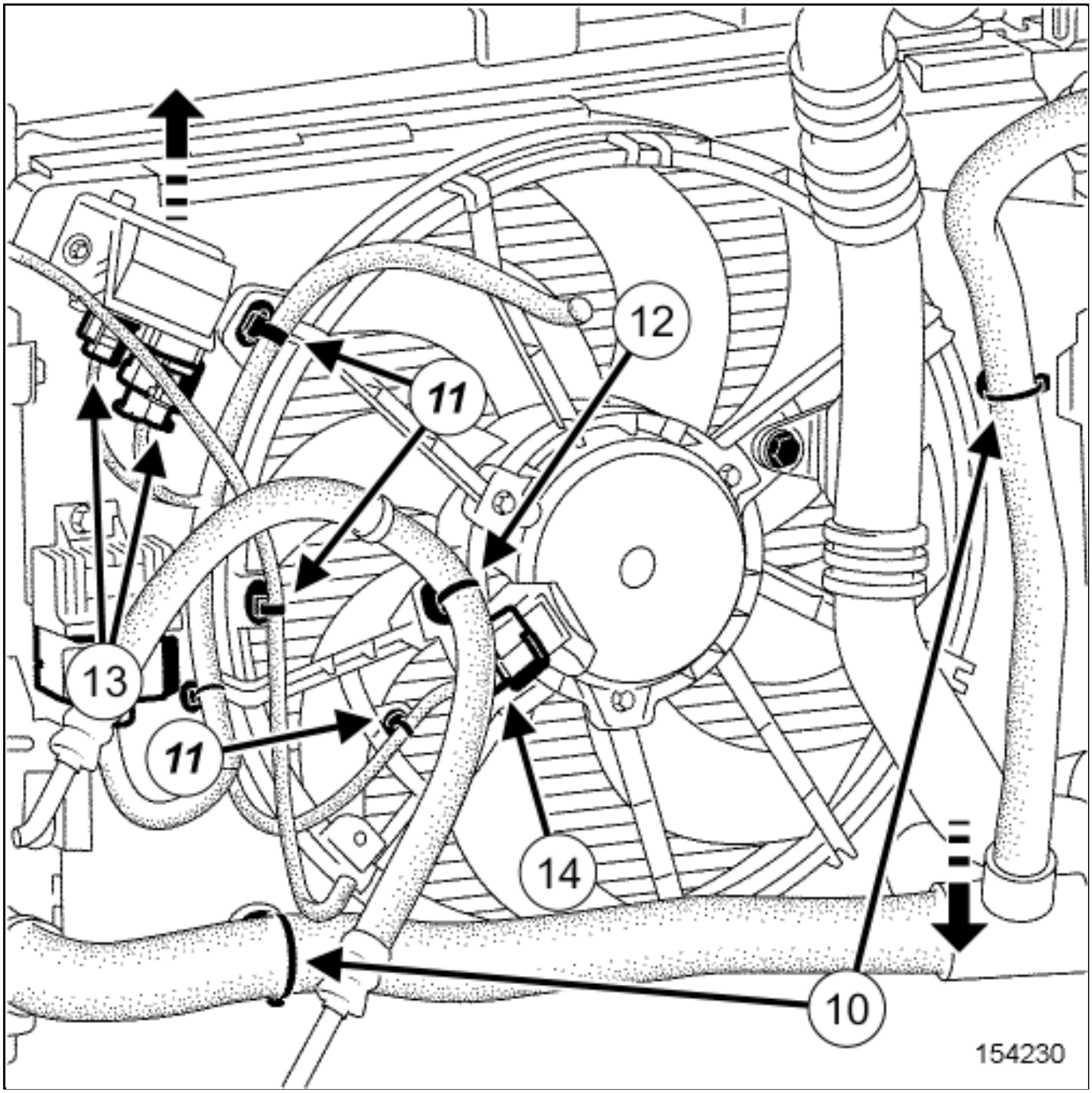
Remove :

- the air scoop bolt(1) ,
- the air scoop(2) .



- Remove the turbocharger control solenoid valve bolt(3) .
- Move the turbocharger control solenoid valve aside(4) .

2. REMOVAL OPERATION



- Unclip :
  - the cooling pipe(**10**) ,
  - the wiring at(**11**) ,
  - the power assisted steering pipe(**12**) .

- Disconnect :
  - the cooling fan assembly resistor connector(**13**) ,
  - the cooling fan assembly connector(**14**) .

- Press on the clips of the centring pins on the engine cooling radiator using a screwdriver and pull them out **(see 19A, Cooling, Coolant circuit assembly: Exploded view)** .

- Remove the motor-driven fan assembly in the direction of the arrows.

1- IN THE EVENT OF REPLACEMENT:

- Remove the cooling fan assembly resistor(see 19A, Cooling, Cooling fan assembly resistor : Removal - Refitting) .

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.
- Connect the batteryBattery: Removal - Refitting .

2. CHECKING THE OPERATION OF THE FAN UNIT

- Start the engine.
- Disconnect the coolant temperature sensor connector.
- Check the operation of the fan assembly.
- Connect the coolant temperature sensor connector.
- Switch off the engine.

ENGINE COOLING SYSTEM: CHECK

Note, one or more warnings are present in this procedure

Special tooling required	
Instrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06	Ms. 554-07
Fault finding and filling - bleeding the cooling circuit.	Mot. 1700

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair** .

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

- To avoid any risk of serious burns when the engine is hot:
  - do not open the expansion bottle cap,
  - do not drain the cooling system,
  - do not open the bleed screw(s).

Note:

- There are two procedures for checking the cooling system:
  - the procedure using theFault finding and filling - bleeding the cooling circuit.(**Mot. 1700**) ,
  - the procedure using theInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(**Ms. 554-07**) .

EXPANSION BOTTLE CAP VALVE RATING:

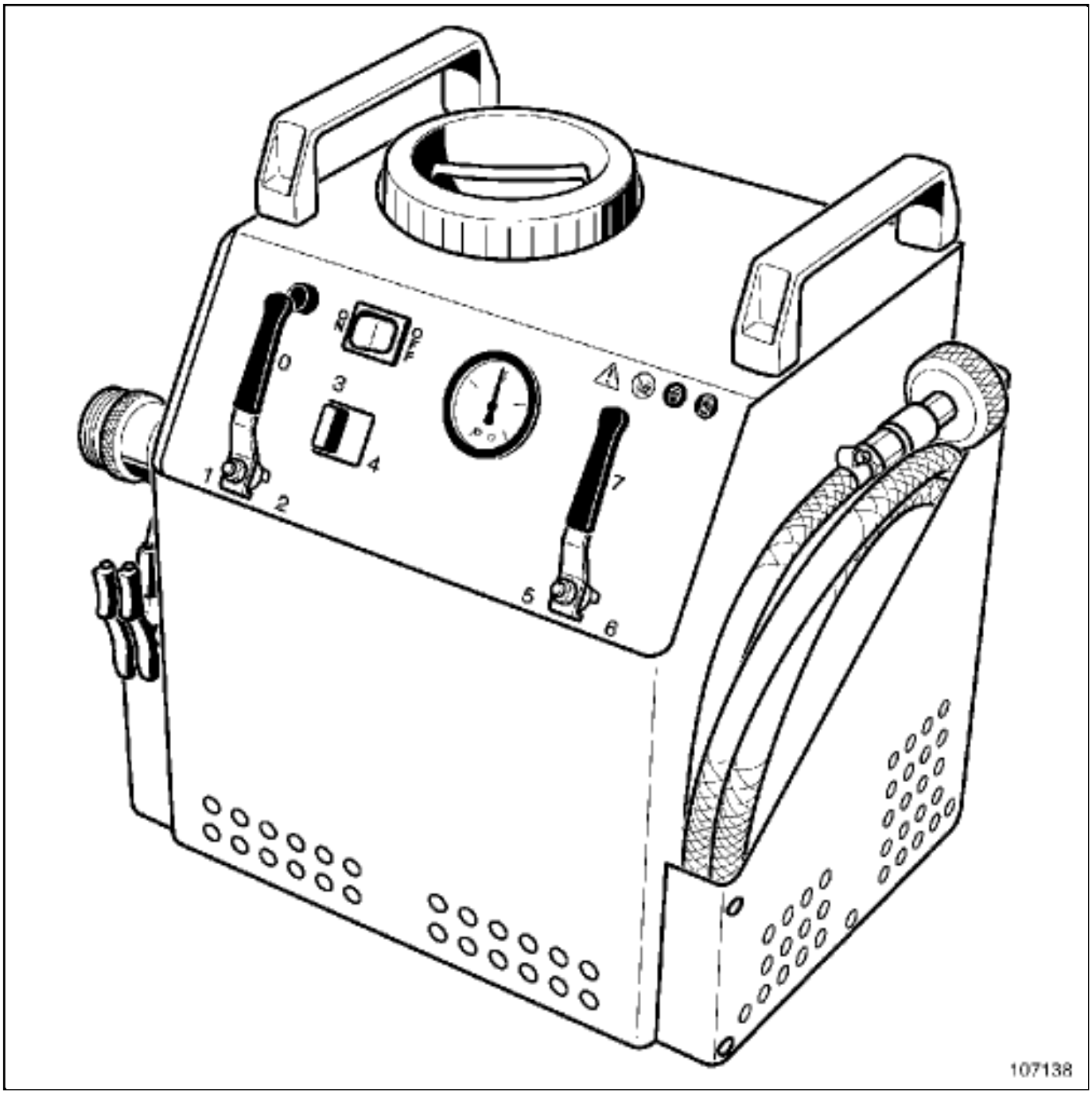
Expansion bottle cap with ...	Valve rating
... a brown circle	1.2 bar
... a yellow marking	1.4 bar
... a white marking	1.6 bar
... a grey marking	1.8 bar

1. CHECKING THE COOLING SYSTEM USING THE TOOL (MOT. 1700)

CAUTION

If the coolant is leaking from the expansion bottle cap, replace the valve.

1- CHECKING THE EXPANSION BOTTLE CAP VALVE



Use the cooling system filling and diagnostic toolFault finding and filling - bleeding the cooling circuit. (Mot. 1700) . Consult the user's manual for this tool(see 19A, Cooling, Cooling system filling and diagnostic tool: Use) (Technical Note 3857A, 19A, Cooling).

2- CHECKING THE SEALING OF THE COOLING CIRCUIT

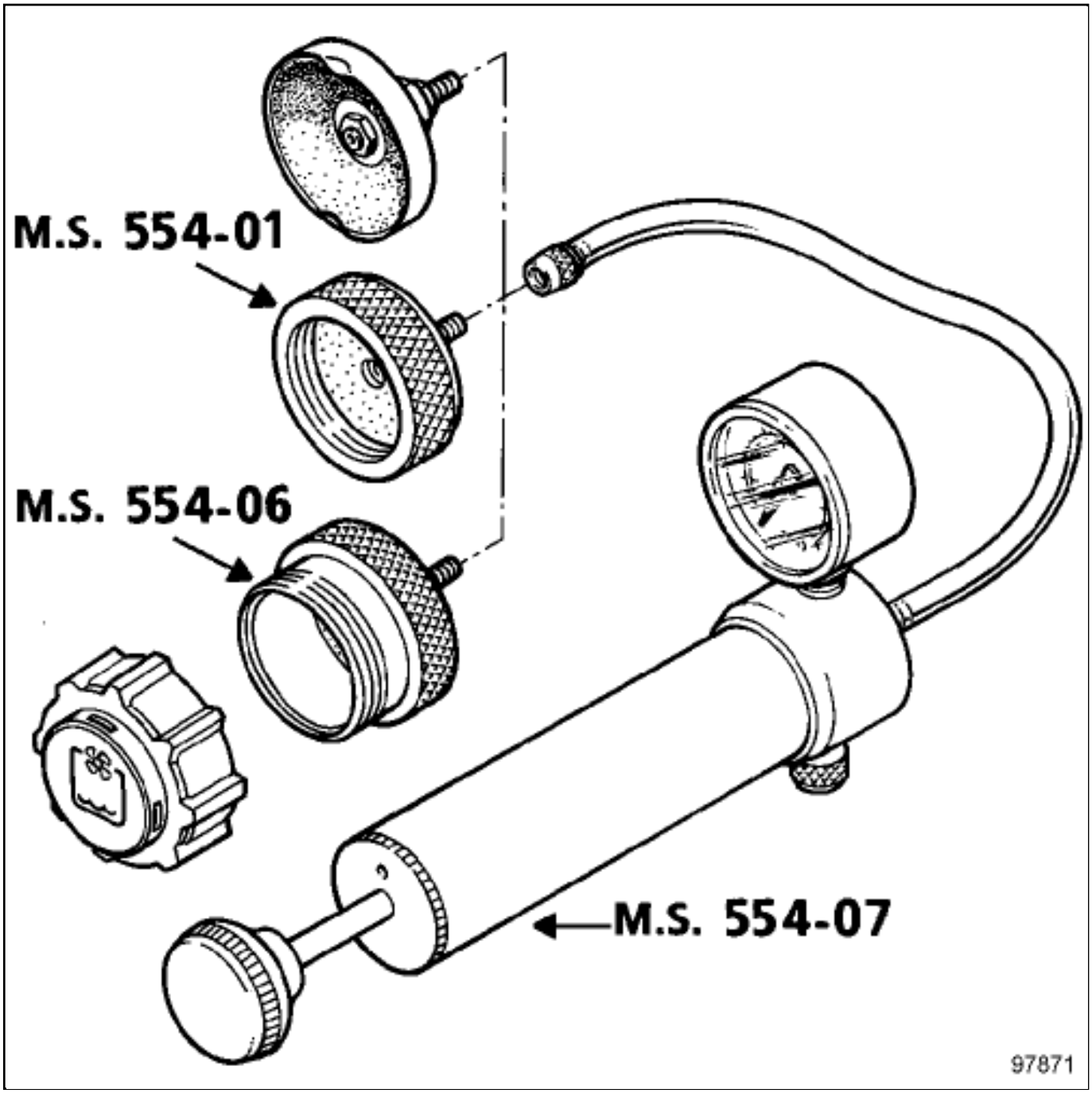
Use the cooling system filling and diagnostic toolFault finding and filling - bleeding the cooling circuit. (Mot. 1700) . Consult the user's manual for this tool(see 19A, Cooling, Cooling system filling and diagnostic tool: Use) (Technical Note 3857A, 19A, Cooling).

2. CHECKING THE COOLING SYSTEM USING THE TOOL (MS. 554-07)

CAUTION

If the coolant is leaking from the expansion bottle cap, replace the valve.

1- CHECKING THE EXPANSION BOTTLE CAP VALVE



- Fit onto the testerInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(Ms. 554-07) , the adapter (Ms. 554-06).

Fit the expansion bottle cap to the adapter (Ms. 554-06).

Note:

The pressure should not drop; if it does, look for the leak.

Pump with theInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(**Ms. 554-07**) , the pressure should stabilise at the expansion bottle cap valve rating with a test tolerance of ± 0.1 bar.

2- CHECKING THE SEALING OF THE COOLING CIRCUIT

Replace the expansion bottle cap with the adapter (Ms. 554-01).

Connect on the adapter (Ms. 554-01)the toolInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(**Ms. 554-07**) .

Pump with theInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(**Ms. 554-07**) to put the cooling circuit under pressure.

Stop pumping at 0.1 barbelow the valve rating for the expansion bottle cap valve.

Note:

The pressure should not drop; if it does, look for the leak.

Gradually unscrew the union of theInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(**Ms. 554-07**) to decompress the cooling system then remove the adapter (Ms. 554-01)and refit the expansion bottle cap.

COOLING SYSTEM: DRAINING - REFILLING

Note, one or more warnings are present in this procedure

Special tooling required	
Clip pliers for hose clips (large size).	Mot. 1202-01
Clip pliers for hose clips (small size)	Mot. 1202-02
Remote operation pliers for hose clips.	Mot. 1448
Instrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06	Ms. 554-07
Set of trim removal levers.	Car. 1363
Fault finding and filling - bleeding the cooling circuit.	Mot. 1700

Equipment required
compressed air nozzle
coolant recovery tray

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

- To avoid any risk of serious burns when the engine is hot:
  - do not open the expansion bottle cap,
  - do not drain the cooling system,
  - do not open the bleed screw(s).

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

CAUTION

The coolant helps to keep the engine running properly (heat exchange).

The system does not operate using pure water.

CAUTION

If the coolant is leaking from the expansion bottle cap, replace the valve.

1. DRAINING

- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).

- Remove:
  - the expansion bottle cap,
  - the engine undertray bolts,
  - the engine undertray,
  - the front bumper Front bumper assembly: Exploded view (55A, Exterior protection).

- Position the coolant recovery tray under the vehicle.

- Remove the cooling radiator bottom hose clip using the Clip pliers for hose clips (large size).(Mot. 1202-01) or Clip pliers for hose clips (small size)(Mot. 1202-02) or Remote operation pliers for hose clips.(Mot. 1448) (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

- Open the cooling system by removing the cooling radiator bottom hose using the tool Set of trim removal levers.(Car. 1363) (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

- Use a compressed air nozzle to blow air into the system through the expansion bottle opening to remove as much coolant as possible.

2. CLEANING

- Fill the cooling system with water through the expansion bottle.

- Let the water run until the water collected from the cooling radiator bottom hose becomes clear.

- Use a compressed air nozzle to blow air into the system through the expansion bottle opening to remove as much coolant as possible.

Refit the cooling radiator bottom hose(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

3. FILLING

Note:

There are two procedures for filling the cooling system:

- the method using the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) , is recommended by Renault. It saves a considerable amount of time because it does not require the cooling system bleed screws to be opened,
- the procedure without a special tool.

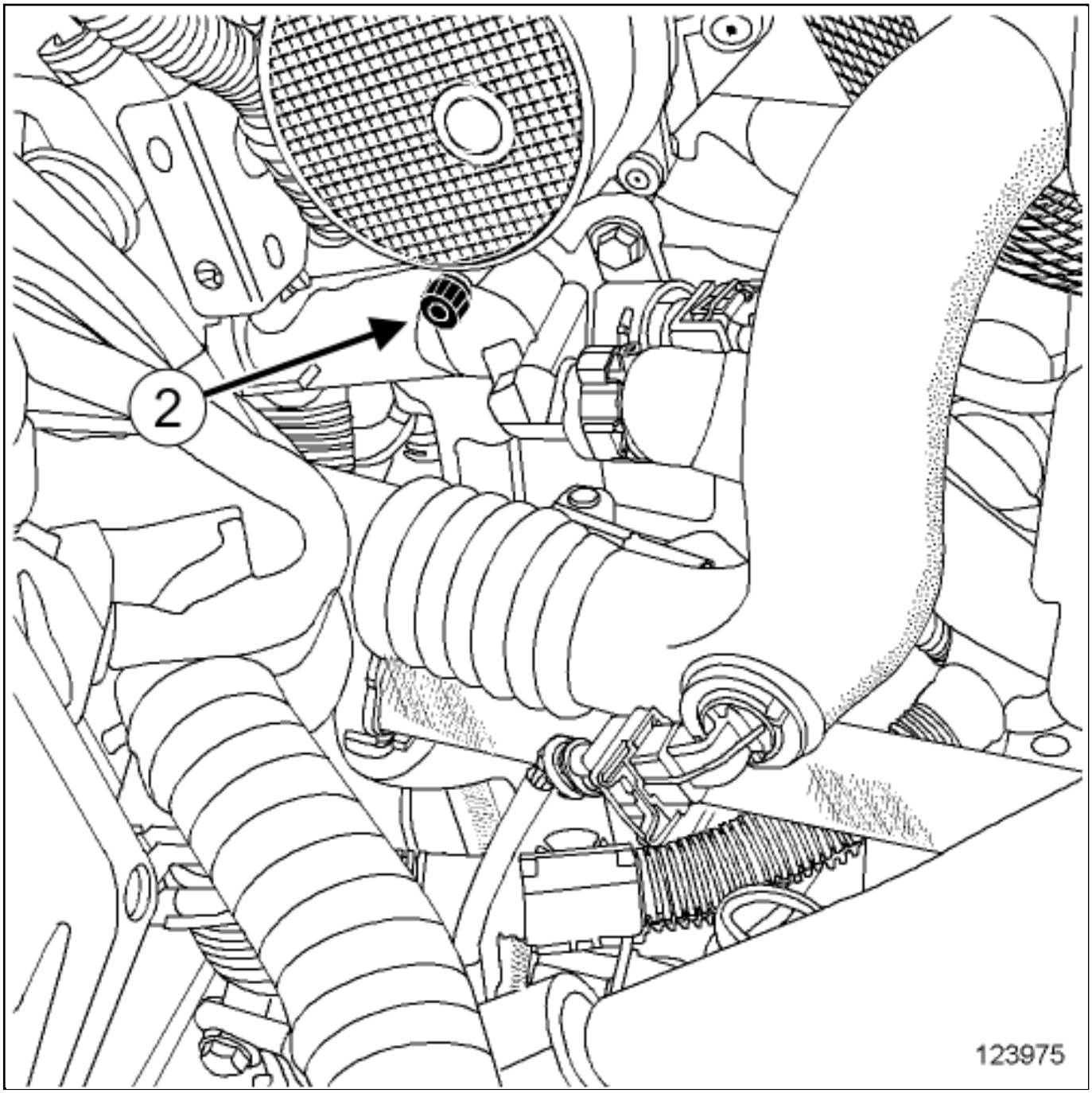
1- FILLING PROCEDURE WITH THE TOOL (MOT. 1700)

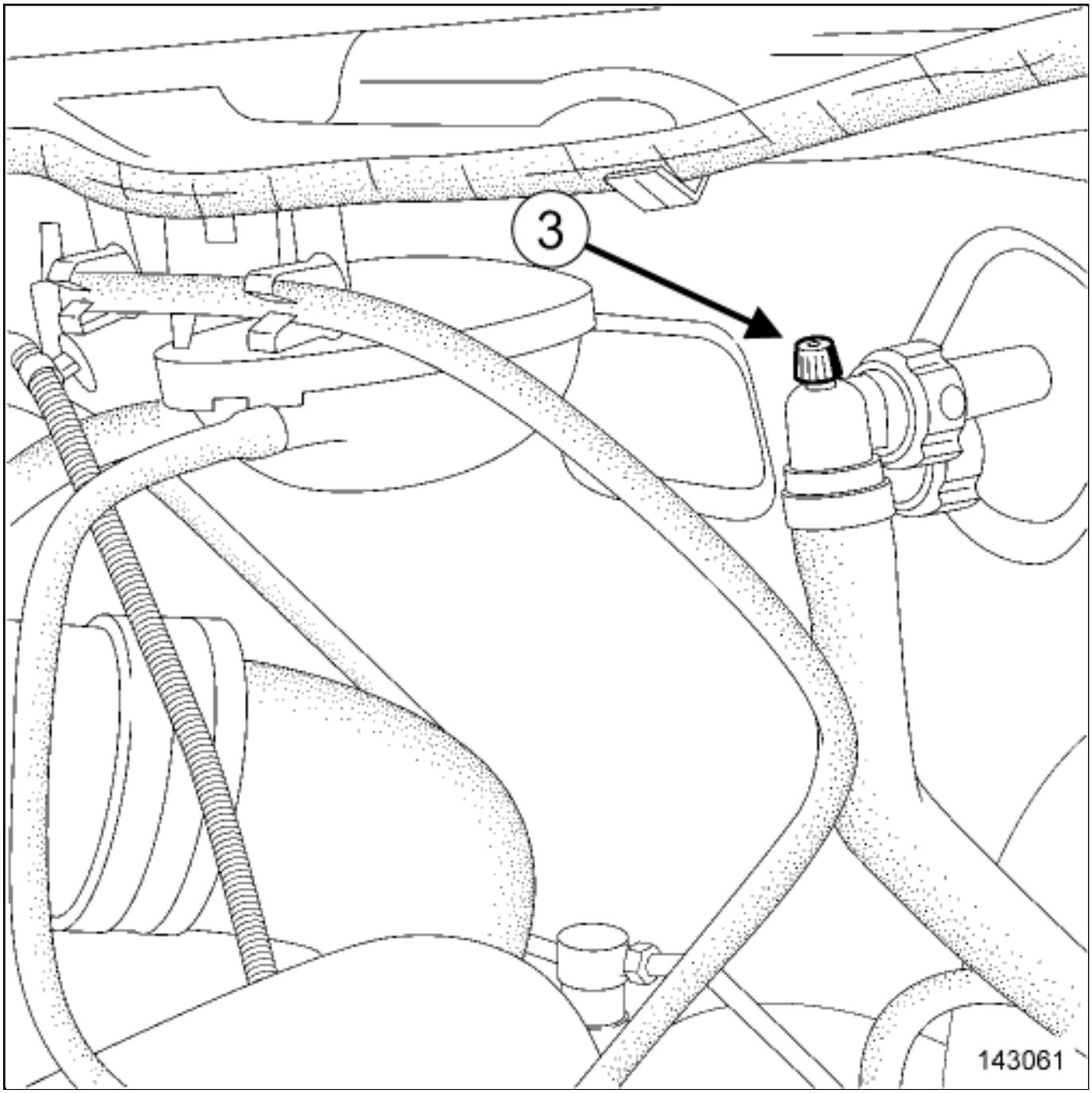
Fill the cooling system with engine coolant recommended by the manufacturerVehicle: Parts and consumables for the repair (04B, Consumables - Products) using the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) . Consult the user's manual for this tool(see **Cooling system: Filling**) (Technical Note 3857A, 19A, Cooling).

2- FILLING METHOD WITHOUT SPECIAL TOOLS

CAUTION

It is essential to open all of the bleed screws to remove as much as air as possible in the cooling system. Failure to perform this procedure may prevent the cooling system from filling properly and may damage the engine.


2
123975



- Open the bleed screws(2) and (3) .

- Fill the cooling system with engine coolant recommended by the manufacturer Vehicle: Parts and consumables for the repair (04B, Consumables - Products) via the expansion bottle until it overflows.

- Close all the bleed screws as soon as the coolant starts to flow in a continuous stream.

- Pressurise the system using the toolInstrument for testing the cooling circuit and the expansion

bottle valve. Contains caps 554-01, 554-04, 554-06(Ms. 554-07) to check that there are no leaks(see 19A, Cooling, Engine cooling system: Check) .

- Refit the expansion bottle cap.
- Clean any surfaces soiled by the coolant.

4. BLEEDING

CAUTION

Do not open the bleed screw whilst the engine is running; this would damage the engine.

- Start the engine.
- Maintain the engine speed at 1500 rpmvarying the engine speed rapidly (until the maximum engine speed is reached) 2 to 3 times approximately every 2 minutesuntil the engine cooling fan starts for the second time.
- Check that the heating is operating correctly.
- Let the engine cool until it reaches a coolant temperature below 50˚C.
- Make sure the coolant fluid level is at the "Maximum" mark.
- Refit the expansion bottle cap.

5. FINAL OPERATION

- Remove the coolant recovery tray.
- Refit:
  - the front bumperFront bumper assembly: Exploded view (55A, Exterior protection),
  - the engine undertray.

ENGINECOOLINGSYSTEM:SPECIFICATIONS

Vehicles in the current range have cooling systems with the following basic specifications:

- hermetically-sealed pressurised circuit (expansion chamber valve),
- circuit using a type "D" coolant,
- passenger compartment heating system via a "heater matrix" type radiator under the dashboard.

1. GRADE AND QUANTITY OF COOLANT

Engine	Quantity (litres)	Grade
D4D	Approximately 4.5 (version with or without AC)	GLACEOL RX (type D) Use coolant only.
D4F		
H4B		
K4M		
K7M		
K9K		

ENGINE OIL - OIL FILTER : DRAINING - FILLING

Note, one or more warnings are present in this procedure

Special tooling required	
Oil filter removing tool (76 mm diameter)	Mot. 1329
Oil filter removing tool (66 mm diameter).	Mot. 1330
8 mm square engine drain plug spanner.	Mot. 1018

Equipment required
oil change wrench
oil recovery tray

parts always to be replaced:
Oil filter cover seal
Oil filter

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When filling up the engine oil, always leave at least 10 minutesfor the oil to drain down before checking the level with a dipstick.

When removing the oil filter, check that the oil filter seal is not still stuck to the cylinder block or the oil filter support.

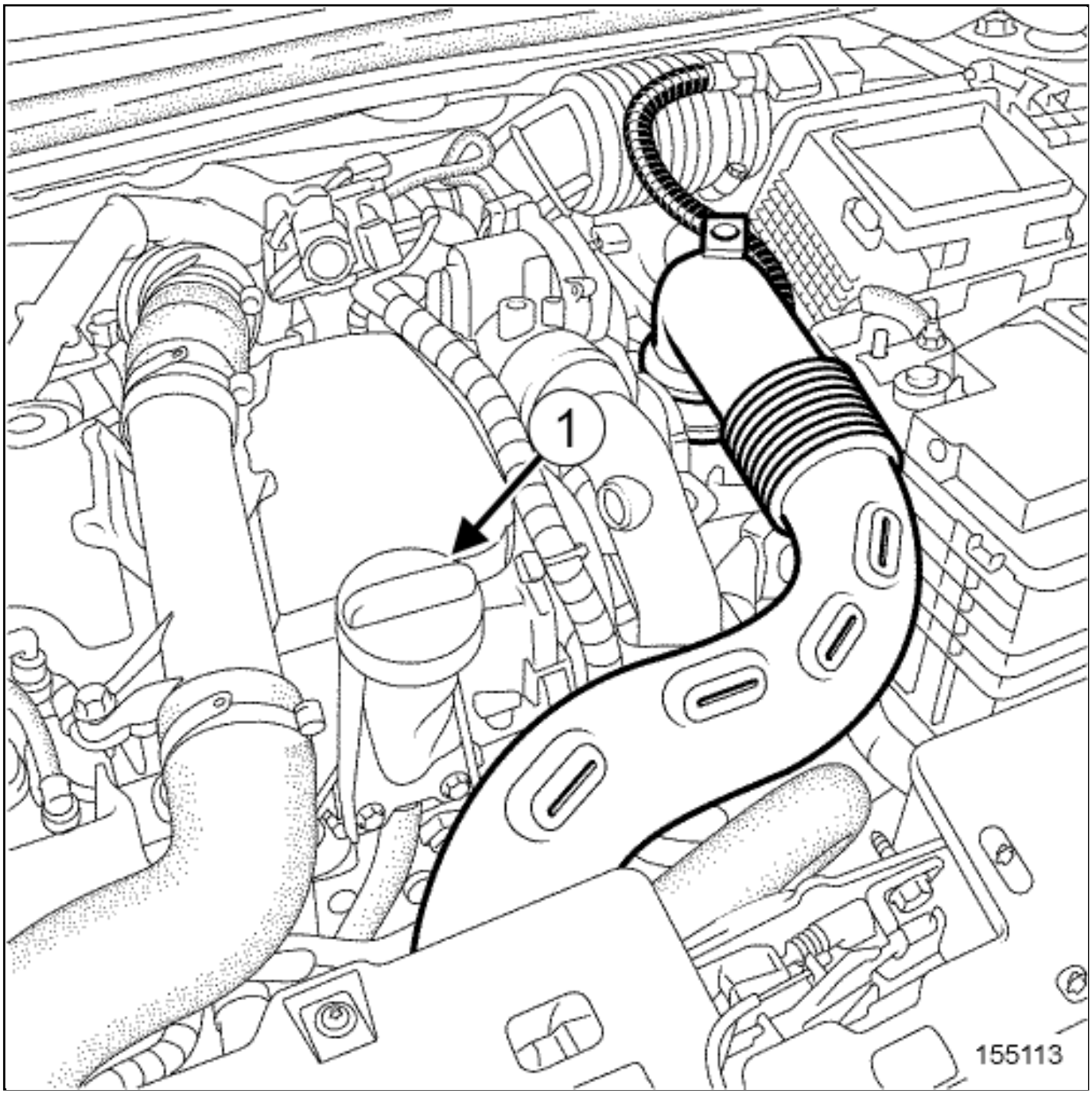
DRAINING

1. ENGINE OIL DRAINING PREPARATION OPERATION

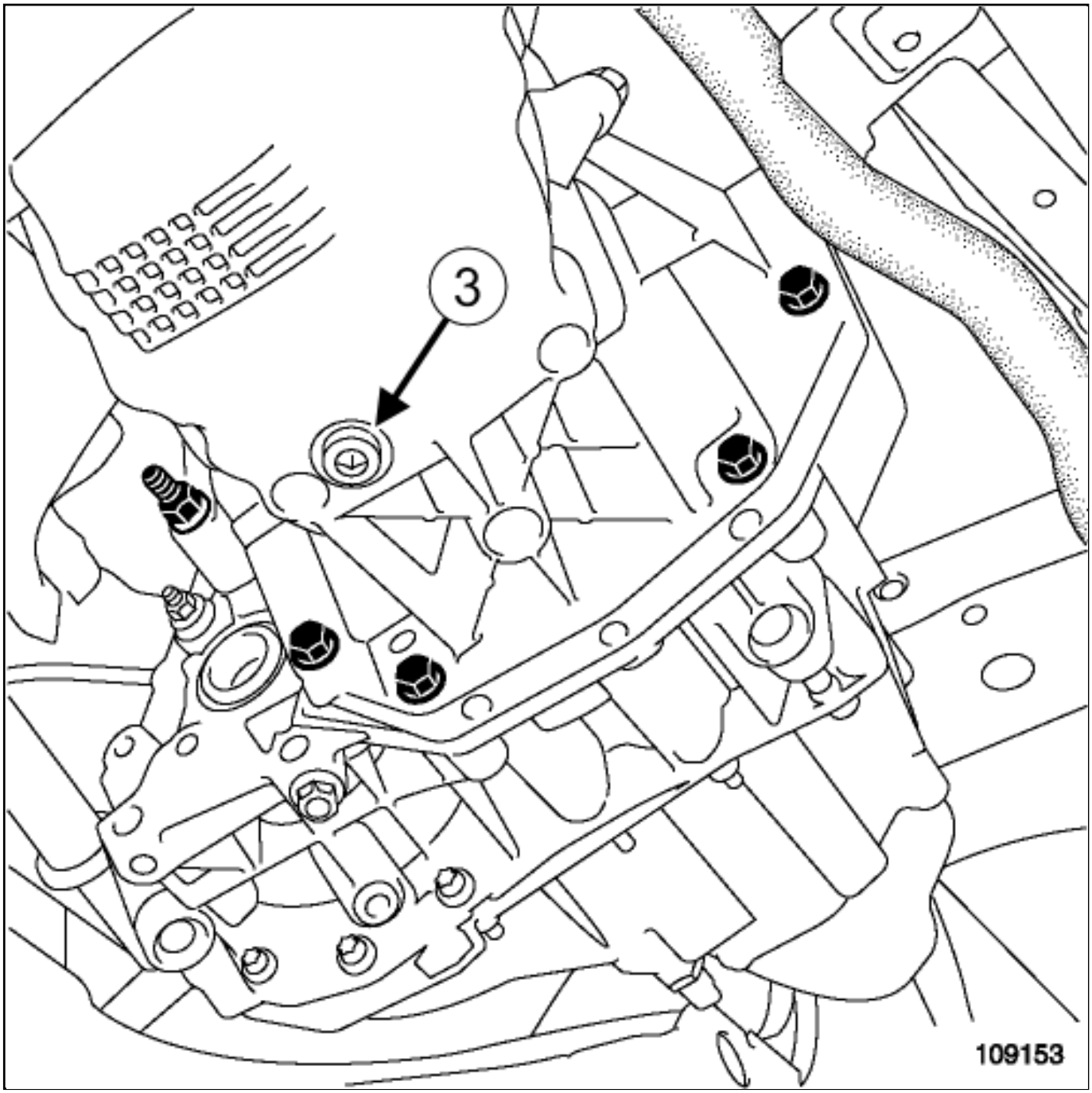
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .

- Remove :
  - the engine undertray bolts,
  - the engine undertray.

2. ENGINE OIL DRAINING OPERATION



- Remove the dipstick(1) .



- Remove the drain plug(3) from the engine oil sump a oil change wrench.

- Let the engine oil run into a oil recovery tray.

REMOVAL

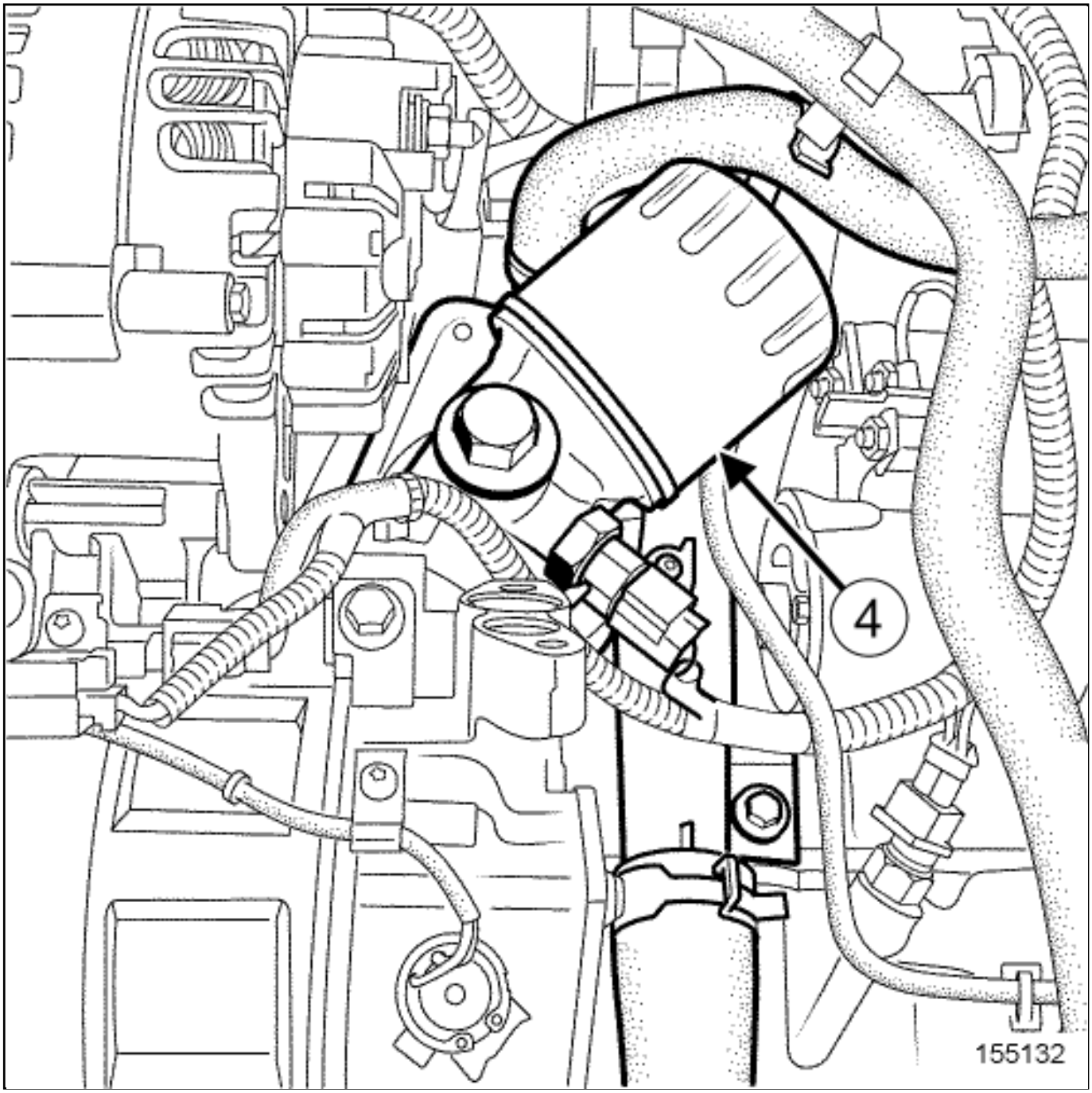
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift **Vehicle: Towing and lifting** .

- Remove :
  - the engine undertray bolts,
  - the engine undertray.

- Fit a oil recovery trayunder the engine.

2. REMOVAL OPERATION



- Remove the oil filter(4) using the toolOil filter removing tool (76 mm diameter)(Mot. 1329) .

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: Oil filter .

- Use surface cleaner Vehicle: Parts and consumables for the repair to clean and degrease the oil filter joint face.

- Lubricate the oil filter seal with new engine oil.

2. REFITTING OPERATION

- Refit a new oil filter.

- Tighten:
  - the oil filter until it makes contact,
  - the oil filter using the toolOil filter removing tool (76 mm diameter)(Mot. 1329) .

3. FINAL OPERATION

- Remove the oil recovery tray.

- Wipe any oil run-off with a cloth.

- Top up with engine oil recommended by the manufacturer Engine oil: Specifications (Technical Note 6013A, 04A, Lubricants).

- Start the engine and wait until the oil pressure warning light goes out on the instrument panel.

- Check for leaks from the oil filter.

- Wait for at least 10 minutes.

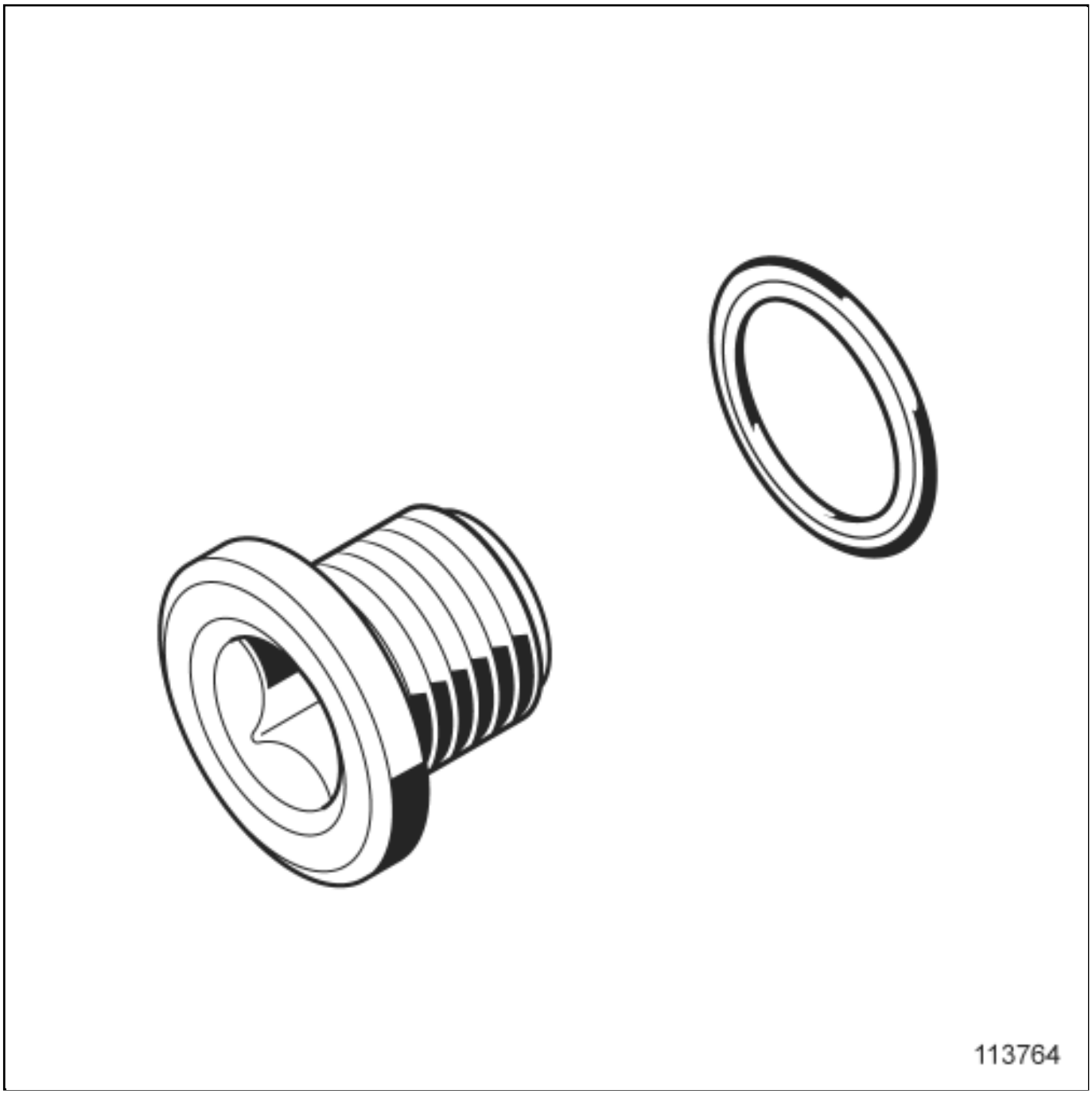
- Check the oil level using the dipstick.

- Adjust the engine oil level if necessary.

- Proceed in the reverse order to removal.

FILLING

1. ENGINE OIL FILLING OPERATION



- Refit:
  - a new seal on the plug, positioning the groove towards the plug,
  - the drain plug.

- Position the vehicle back on the ground.

- Fill with engine oil, observing the quantity and type of engine oil recommended by the manufacturer **Engine oil: Specifications** (Technical Note 6013A, 04A, Lubricants).

- Wait for at least 10 minutes.

- Refit the engine oil dipstick.

- Check the oil level using the dipstick.

- Adjust the engine oil level if necessary.

2. FINAL OPERATION

- Proceed in the reverse order to removal.

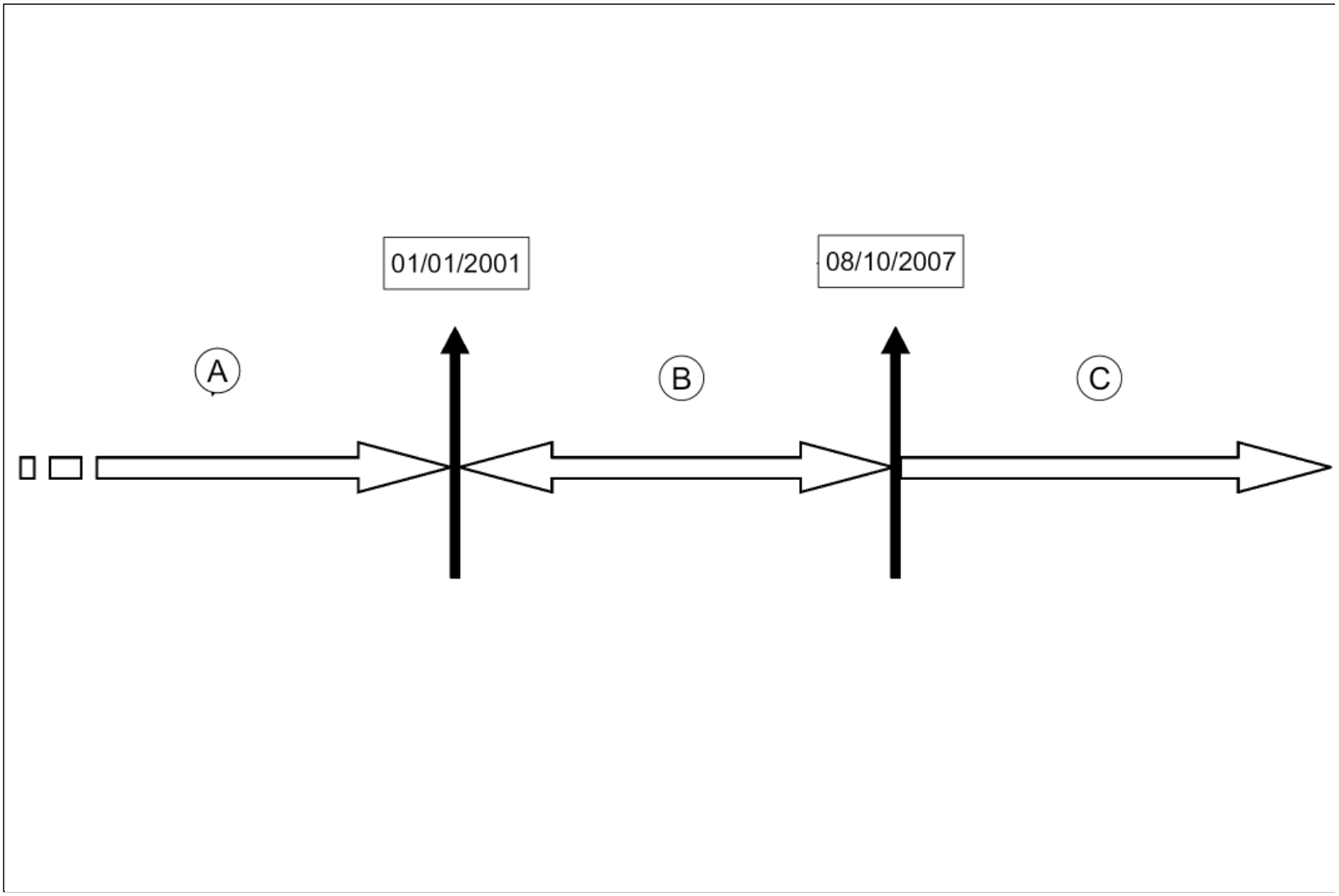
ENGINEOIL:SPECIFICATIONS

Note, one or more warnings are present in this procedure

Note:

A Engine oil quality is always a oil grade and a oil specification (for example : 5W40 RN0710).

INSTRUCTIONS FOR USING THE TECHNICAL NOTE :



(A) Section 3 concerns RENAULT vehicles manufactured before 01/01/2001

(B) Section 2 concerns RENAULT vehicles manufactured between 01/01/2001 and 08/10/2007

(C) Section 1 concerns RENAULT vehicles manufactured after 08/10/2007

For DACIA vehicles, see directly section 4

For optimum usage of this note, it is essential to follow the instructions below scrupulously step by step:

- Select the section according to the manufacturing date of the vehicle (see above).
- Select the country.
- Select the engine type and / or the vehicle type depending on the case.
- Select the oil quality according to the information indicated in the tables.

RENAULT recommends ELF.

GENERAL CONTENTS

Section 1	Oil quality for RENAULT vehicles manufactured after 08/10/2007
Section 2	Oil quality for RENAULT vehicles manufactured between 01/01/2001 and 08/10/2007 (not inclusive):
Section 3	Oil quality for RENAULT vehicles manufactured before 01/01/2001
Section 4	Oil quality for DACIA vehicles
Section 5	Tables of oil interchangeability

1. OIL QUALITY FOR RENAULT VEHICLES MANUFACTURED AFTER 08/10/2007

CONTENTS OF SECTION 1	
1	For Andorra, Austria, Belgium, Croatia, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Iceland, Israel, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Norway, Netherlands, Poland, Portugal, Czech Republic, Slovakia, Slovenia, Spain, Sweden, Switzerland
a	General (excluding special cases)
b	Special cases
2	For French overseas territories (French Guiana, Guadeloupe, Martinique, Réunion)
3	For Bulgaria, Romania and vehicles manufactured after 01/06/08
a	vehicles manufactured after 01/06/08 and delivered before 01/01/11
b	vehicles manufactured after 01/06/08 and delivered since 01/01/11
4	For Russia, Ukraine and vehicles manufactured after 01/06/08
5	For Turkey and vehicles manufactured after 01/06/08
a	vehicles manufactured after 01/06/08 and delivered before 01/01/11
b	vehicles manufactured after 01/06/08 and delivered since 01/01/11
6	For Algeria, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates, and vehicles manufactured after 01/06/08
7	For Morocco and vehicles manufactured after 01/02/09
8	For Albania, Argentina, Bermuda, Bosnia-Herzegovina, Chile, Greek Cyprus, Kosovo, Mauritius, Japan, Lesotho, Macedonia, Malta, Montenegro, Mexico, New Caledonia, New Zealand, Serbia, Singapore, South Korea, Swaziland, Taiwan, Thailand, Turkish Cyprus and vehicles manufactured after 01/06/08
9	For South Africa and vehicles manufactured after 01/01/08
10	For other countries and other vehicles manufactured after 08/10/07 which are not listed above.

1- FOR ANDORRA, AUSTRIA, BELGIUM, CROATIA, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ISRAEL, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, SWITZERLAND :

RENAULT recommends, for both filling and changing, using engine oil which follows the recommendations below for general cases or special cases.

1)GENERAL (EXCLUDING SPECIAL CASES) :

<table>
<tr><th rowspan="2"></th><th rowspan="2">specifications</th><th colspan="3">Grades to use according to the external temperature (T)</th></tr>
<tr><th>if T > -20˚C</th><th>if T > -25˚C</th><th>if T > -30˚C</th></tr>
<tr><td colspan="5">PETROL engine</td></tr>
<tr><td>Naturally aspirated petrol (except Renault Sport petrol engine)
Naturally aspirated E85</td><td>RN0700</td><td>10W40
5W30
5W40
0W30
0W40</td><td>5W30
5W40
0W30
0W40</td><td>0W30
0W40</td></tr>
<tr><td>Renault Sport Petrol
Turbocharged petrol</td><td>RN0710</td><td colspan="2">5W40
0W40</td><td>0W40</td></tr>
<tr><td colspan="5">DIESEL engine</td></tr>
<tr><td>Diesel without particle filter</td><td>RN0710</td><td colspan="2">5W40
0W40</td><td>0W40</td></tr>
<tr><td>Diesel equipped with particle filter</td><td>RN0720</td><td colspan="3">5W30
5W40</td></tr>
</table>

2)SPECIAL CASES :

	specifications	Grades to use according to the external temperature (T)		
		if T > -20˚C	if T > -25˚C	if T > -30˚C
PETROL engine				
CLIO III K4M with power greater than 120 hp (88 kW)	RN0710	5W40 0W40		0W40
DIESEL engine				
G9T engine with particle filter	RN0710	5W40 0W40		0W40
K9K engine without particle filter with RENAULT service interval every 12,000 miles (20,000 km) or 1 year	RN0700	10W40 5W40 0W40	5W40 0W40	0W40
KANGOO II K9K without particle filter with power greater than 100 hp (73 kW) manufactured before 08/09/2008 and Laguna III K9K manufactured before 28/05/2008	ACEAC3 RN0720	5W30 0W30		0W30
MASTER II PROPULSION	ACEA E7	10W30	5W30	NC

2- FOR FRENCH OVERSEAS TERRITORIES (FRENCH GUIANA, GUADELOUPE, MARTINIQUE, RÉUNION) :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15˚C	**if T > -20˚C**	**if T > -25˚C**	**if T > -30˚C**
PETROL engine					
Naturally aspirated petrol engine (except Renault Sport petrol engine)	RN0700	10W40		5W30 5W40	0W30 0W40
	ACEA A3/B4 ACEA A5/B5				5W30 5W40
Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)	RN0710	5W40			0W40
	ACEA A3				
Turbocharged D4F and H4J	RN0710	5W40			0W40
	ACEA A3/B4				
	ACEA A5/B5	5W30			0W30
DIESEL engine					
Diesel engine without particle filter (except Espace IV Diesel without particle filter and P9X engine)	RN0710	5W40			0W40
	ACEA A3/B4	10W40 10W50		5W40 5W50	0W30 0W40
Espace IV Diesel without particle filter P9X engine	RN0710	5W40			0W40
	ACEA A3/B4	5W40			0W30 0W40
Diesel engine with particle filter (except G9T)	RN0720	5W30 5W40			
G9T with particle filter	ACEA B4	5W40			0W40

3- FOR BULGARIA, ROMANIA AND VEHICLES MANUFACTURED AFTER 01/06/08 :

1)FOR BULGARIA, ROMANIA AND VEHICLES MANUFACTURED AFTER 01/06/08 AND DELIVERED BEFORE 01/01/11 :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15˚C	if T > -20˚C	if T > -25˚C	if T > -30˚C
PETROL engine					
MEGANE III K4M manufactured after 01/01/2010 FLUENCE K4M manufactured after 01/01/2010	RN0700	10W40		5W30 5W40	0W30 0W40
Other naturally aspirated petrol engines (except Renault Sport petrol engine)	RN0700	10W40		5W30 5W40	0W30 0W40
	ACEA A3/B4 ACEA A5/B5	10W40			5W30 5W40
Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)	RN0710 ACEA A3	5W40			0W40
Turbocharged D4F and H4J	RN0710 ACEA A3/B4	5W40			0W40
	ACEA A5/B5	5W30			0W30 0W40
DIESEL engine					
Diesel engine without particle filter (except as below)	RN0710	5W40			0W40
	ACEA B2 ACEA B3 ACEA B4	15W40 15W50	10W40 10W50	5W40 5W50	
Espace IV Diesel without particle filter P9X engine	RN0710 ACEA A3/B4	5W40			0W40
Trafic F9Q without particle filter	ACEA A3/B4	5W30 5W40			
MEGANE III K9K with service interval every 12,000 miles (20,000 km) or 1 year, FLUENCE K9K with service interval every 12,000 miles (20,000 km) or 1 year Trafic without particle filter, M9R, G9T, G9U Master without particle filter	RN0710	5W40			0W40
Diesel engine with particle filter (except G9T)	RN0720	5W30 5W40			
G9T with particle filter	ACEA B4	5W40			0W40

2)FOR BULGARIA, ROMANIA AND VEHICLES MANUFACTURED AFTER 01/06/08 AND DELIVERED SINCE 01/01/11 :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15˚C	**if T > -20˚C**	**if T > -25˚C**	**if T > -30˚C**
PETROL engine					
Other naturally aspirated petrol engines (except Renault Sport petrol engine)	RN0700	10W40		5W30 5W40	0W30 0W40
Turbocharged or Renault Sport petrol engine	RN0710	5W40			0W40
DIESEL engine					
Diesel engine without particle filter	RN0710	5W40			0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

4- FOR RUSSIA, UKRAINE AND VEHICLES MANUFACTURED AFTER 01/06/08 :

<table>
<tr><th rowspan="2"></th><th rowspan="2">specifications</th><th colspan="4">Grades to use according to the external temperature (T)</th></tr>
<tr><th>if T > -15˚C</th><th>if T > -20˚C</th><th>if T > -25˚C</th><th>if T > -30˚C</th></tr>
<tr><td colspan="6">PETROL engine</td></tr>
<tr><td rowspan="3">Naturally aspirated petrol engine (except Renault Sport petrol engine)</td><td>RN0700</td><td colspan="2">10W40</td><td>5W30
5W40</td><td rowspan="3">0W30
0W40</td></tr>
<tr><td>ACEA A1
ACEA A2
ACEA A3
ACEA A5</td><td rowspan="2">15W40
15W50</td><td rowspan="2">10W30
10W40
10W50</td><td rowspan="2">5W30
5W40
5W50</td></tr>
<tr><td>API SL/API SM</td></tr>
<tr><td>Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)</td><td>RN0710
ACEA A3</td><td>5W40</td><td>5W40</td><td>5W40</td><td>0W40</td></tr>
<tr><td rowspan="3">Turbocharged D4F
and H4J</td><td>RN0710</td><td colspan="3">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3/B4</td><td colspan="3">5W40</td></tr>
<tr><td>ACEA A5/B5</td><td colspan="3">5W30</td><td>0W30</td></tr>
<tr><td colspan="6">DIESEL engine</td></tr>
<tr><td rowspan="3">Diesel engine without particle filter (except Espace IV Diesel without particle filter, P9X engine, Trafic and Master without particle filter)</td><td>RN0710</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>ACEA B2
ACEA B3
ACEA B4</td><td rowspan="2">15W40
15W50</td><td rowspan="2">10W40
10W50</td><td rowspan="2">5W40
5W50</td><td>0W30
0W40</td></tr>
<tr><td>API CF</td><td>0W40</td></tr>
<tr><td>Espace IV Diesel without particle filter
P9X engine</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>Trafic and Master without particle filter</td><td>RN0710</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>Diesel engine with particle filter (except G9T)</td><td>RN0720</td><td colspan="4">5W30
5W40</td></tr>
<tr><td>G9T with particle filter</td><td>ACEA B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
</table>

5- FOR TURKEY AND VEHICLES MANUFACTURED AFTER 01/06/08 :

1)FOR TURKEY AND VEHICLES MANUFACTURED AFTER 01/06/08 AND DELIVERED BEFORE 01/01/2011 :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15 ˚C	if T > -20 ˚C	if T > -25 ˚C	if T > -30 ˚C
PETROL engine					
MEGANE III K4M with service interval every 12,000 miles (20,000 km) or 1 year. FLUENCE K4M with service interval every 12,000 miles (20,000 km) or 1 year.	RN0700	10W40		5W30 5W40	0W30 0W40
Other naturally aspirated petrol engines (except Renault Sport petrol engine)	RN0700	10W40		5W30 5W40	
	ACEA A1 ACEA A2 ACEA A3 ACEA A5	15W40 15W50	10W30 10W40 10W50	5W30 5W40 5W50	0W30 0W40
	API SL API SM				
Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)	RN0710	5W40			0W40
	ACEA A3				
Turbocharged D4F and H4J	RN0710	5W40			0W40
	ACEA A3/B4				
	ACEA A5/B5	5W30			0W30
DIESEL engine					
Diesel engine without particle filter (except as below)	RN0710	5W40			0W40
K9K engines without particle filter (except Megane III with service interval every 12,000 miles (20,000 km) or 1 year and Fluence with service interval every 12,000 miles (20,000 km) or 1 year), M9R engines without particle filter, M9T engines without particle filter	RN0710	5W40			0W40
	ACEA A5/B5	5W30			
Espace IV Diesel without particle filter P9X engine	RN0710	5W40			0W40
	ACEA A3/B4				
Diesel engine with particle filter (except G9T)	RN0720	5W30 5W40			
G9T with particle filter	ACEA B4	5W40			0W40

2)FOR TURKEY AND VEHICLES MANUFACTURED AFTER 01/06/08 AND DELIVERED SINCE 01/01/2011 :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15˚C	**if T > -20˚C**	**if T > -25˚C**	**if T > -30˚C**
PETROL engine					
Other naturally aspirated petrol engines (except Renault Sport petrol engine)	RN0700	10W40		5W30 5W40	0W30 0W40
Turbocharged or Renault Sport petrol engine	RN0710	5W40			0W40
DIESEL engine					
Diesel engine without particle filter	RN0710	5W40			0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

6- FOR ALGERIA, BAHRAIN, KUWAIT, OMAN, QATAR, SAUDI ARABIA, TUNISIA, UNITED ARAB EMIRATES, AND VEHICLES MANUFACTURED AFTER 01/06/08 :

<table>
<tr><td rowspan="2"></td><td rowspan="2">specifications</td><td colspan="4">Grades to use according to the external temperature (T)</td></tr>
<tr><td>if T > -15˚C</td><td>if T > -20˚C</td><td>if T > -25˚C</td><td>if T > -30˚C</td></tr>
<tr><td colspan="6">PETROL engine</td></tr>
<tr><td rowspan="3">Naturally aspirated petrol engine (except Renault Sport petrol engine)</td><td>RN0700</td><td colspan="2">10W40</td><td>5W30
5W40</td><td rowspan="3">0W30
0W40</td></tr>
<tr><td>ACEA A1
ACEA A2
ACEA A3
ACEA A5</td><td rowspan="2">15W40
15W50</td><td rowspan="2">10W30
10W40
10W50</td><td rowspan="2">5W30
5W40
5W50</td></tr>
<tr><td>API SL
API SM</td></tr>
<tr><td rowspan="2">Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)</td><td>RN0710</td><td colspan="3" rowspan="2">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3</td></tr>
<tr><td rowspan="3">Turbocharged D4F
and H4J</td><td>RN0710</td><td colspan="3" rowspan="2">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3/B4</td></tr>
<tr><td>ACEA A5/B5</td><td colspan="3">5W30</td><td>0W30</td></tr>
<tr><td colspan="6">DIESEL engine</td></tr>
<tr><td rowspan="3">Diesel engine without particle filter (except Espace IV Diesel without particle filter and P9X engine)</td><td>RN0710</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>ACEA B2
ACEA B3
ACEA B4</td><td rowspan="2">15W40
15W50</td><td rowspan="2">10W40
10W50</td><td rowspan="2">5W40
5W50</td><td>0W30
0W40</td></tr>
<tr><td>API CF</td><td>0W40</td></tr>
<tr><td rowspan="2">Espace IV Diesel without particle filter
P9X engine</td><td>RN0710</td><td colspan="3" rowspan="2">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3/B4</td></tr>
<tr><td>Diesel engine with particle filter (except G9T)</td><td>RN0720</td><td colspan="4">5W30
5W40</td></tr>
<tr><td>G9T with particle filter</td><td>ACEA B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
</table>

7- FOR MOROCCO AND VEHICLES MANUFACTURED AFTER 01/02/09 :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15˚C	if T > -20˚C	if T > -25˚C	if T > -30˚C
PETROL engine					
Naturally aspirated petrol engine (except Renault Sport petrol engine)	RN0700	10W40	10W40	5W30 5W40	0W30 0W40
Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)	RN0710	5W40			0W40
	ACEA A3	5W40			
Turbocharged D4F and H4J	RN0710	5W40			0W40
	ACEA A3/B4				
	ACEA A5/B5	5W30			0W30
DIESEL engine					
Diesel engine without particle filter (except Espace IV, Mégane III, Laguna III, Trafic, Master and P9X engine)	RN0710	5W40			0W40
	ACEA A3/B3	10W40 10W50		5W40 5W50	0W30 0W40
	ACEA A3/B4				
	API CF				0W40
Espace IV Diesel without particle filter P9X engine	RN0710	5W40			0W40
	ACEA A3/B4				0W30 0W40
Mégane III Diesel without particle filter, Laguna III Diesel without particle filter, Trafic Diesel without particle filter, Master Diesel without particle filter	RN0710	5W40			0W40
Diesel engine with particle filter (except G9T)	RN0720	5W30 5W40			
G9T with particle filter	ACEA B4	5W40			0W40

8- FOR ALBANIA, ARGENTINA, BERMUDA, BOSNIA-HERZEGOVINA, CHILE, GREEK CYPRUS, KOSOVO, MAURITIUS, JAPAN, LESOTHO, MACEDONIA, MALTA, MONTENEGRO, MEXICO, NEW CALEDONIA, NEW ZEALAND, SERBIA, SINGAPORE, SOUTH KOREA, SWAZILAND, TAIWAN, THAILAND, TURKISH CYPRUS AND VEHICLES MANUFACTURED AFTER 01/06/08 :

<table>
<tr><th rowspan="2"></th><th rowspan="2">specifications</th><th colspan="4">Grades to use according to the external temperature (T)</th></tr>
<tr><th>if T > -15˚C</th><th>if T > -20˚C</th><th>if T > -25˚C</th><th>if T > -30˚C</th></tr>
<tr><td colspan="6">PETROL engine</td></tr>
<tr><td rowspan="3">Naturally aspirated petrol engine (except Renault Sport petrol engine)</td><td>RN0700</td><td colspan="2">10W40</td><td>5W30
5W40</td><td rowspan="3">0W30
0W40</td></tr>
<tr><td>ACEA A1
ACEA A2
ACEA A3
ACEA A5</td><td>15W40
15W50</td><td>10W30
10W40
10W50</td><td>5W30
5W40
5W50</td></tr>
<tr><td>API SL
API SM</td></tr>
<tr><td rowspan="2">Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)</td><td>RN0710</td><td colspan="3" rowspan="2">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3</td></tr>
<tr><td rowspan="3">Turbocharged D4F
and H4J</td><td>RN0710</td><td colspan="3" rowspan="2">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3/B4</td></tr>
<tr><td>ACEA A5/B5</td><td colspan="3">5W30</td><td>0W30</td></tr>
<tr><td colspan="6">DIESEL engine</td></tr>
<tr><td rowspan="4">Diesel engine without particle filter (except Espace IV and P9X engine)</td><td>RN0710</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>ACEA A3/B3
ACEA A3/B4</td><td rowspan="2">15W40
15W50</td><td rowspan="2">10W40
10W50</td><td rowspan="2">5W40
5W50</td><td>0W30
0W40</td></tr>
<tr><td>API CF</td><td>0W40</td></tr>
<tr><td rowspan="2">Espace IV Diesel without particle filter
P9X engine</td><td>RN0710</td><td colspan="3" rowspan="2">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3/B4</td></tr>
<tr><td>Diesel engine with particle filter (except G9T)</td><td>RN0720</td><td colspan="4">5W30
5W40</td></tr>
<tr><td>G9T with particle filter</td><td>ACEA B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
</table>

9- FOR SOUTH AFRICA AND VEHICLES MANUFACTURED AFTER 01/01/08 :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15˚C	**if T > -20˚C**	**if T > -25˚C**	**if T > -30˚C**
PETROL engine					
Naturally aspirated petrol engine (except Renault Sport petrol engine)	RN0700	10 W 40		5 W 30 5 W 40	0 W 30 0 W 40
Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)	RN0710	5 W 40			0 W 40
	ACEA A3/B4	5 W 40			
Turbocharged D4F and H4J	RN0710	5 W 40			0 W 40
	ACEA A3/B4				
	ACEA A5/B5	5 W 30			0 W 30
DIESEL engine					
Diesel engine without particle filter (except Mégane II)	RN0710	5 W 40			0 W 40
Mégane II without particle filter	RN0710	5 W 40			0 W 40
	ACEA A3/B4				
Diesel engine with particle filter (except G9T)	RN0720	5 W 30 5 W 40			
G9T with particle filter	ACEA B4	5 W 40			0 W 40

10- FOR OTHER COUNTRIES AND OTHER VEHICLES WITH A MANUFACTURE DATE AFTER 08/10/2007 WHICH ARE NOT LISTED ABOVE :

<table>
<tr><th rowspan="2"></th><th rowspan="2">specifications</th><th colspan="4">Grades to use according to the external temperature (T)</th></tr>
<tr><th>if T > -15˚C</th><th>if T > -20˚C</th><th>if T > -25˚C</th><th>if T > -30˚C</th></tr>
<tr><td colspan="6">PETROL engine and E100</td></tr>
<tr><td rowspan="3">All models with naturally aspirated (except Renault Sport petrol engine)</td><td>RN0700</td><td colspan="2">10 W 40</td><td>5 W 30
5 W 40</td><td rowspan="3">0 W 30
0 W 40</td></tr>
<tr><td>ACEA A1
ACEA A2
ACEA A3
ACEA A5</td><td rowspan="2">15 W 40
15 W 50</td><td rowspan="2">10 W 30
10 W 40
10 W 50</td><td rowspan="2">5 W 30
5 W 40
5 W 50</td></tr>
<tr><td>API SL
API SM</td></tr>
<tr><td>Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5 W 40</td><td>0 W 40</td></tr>
<tr><td rowspan="3">Turbocharged D4F
and H4J</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5 W 40</td><td>0 W 40</td></tr>
<tr><td>ACEA A5/B5</td><td colspan="3">5 W 30</td><td>0 W 30</td></tr>
<tr><td colspan="6">DIESEL engine</td></tr>
<tr><td rowspan="3">Diesel engine without particle filter (except Espace IV Diesel without particle filter and P9X engine)</td><td>RN0710</td><td colspan="3">5 W 40</td><td>0 W 40</td></tr>
<tr><td>ACEA B3
ACEA B4</td><td rowspan="2">15 W 40
15 W 50</td><td rowspan="2">10 W 40
10 W 50</td><td rowspan="2">5 W 40
5 W 50</td><td>0 W 30
0 W 40</td></tr>
<tr><td>API CF</td><td>0 W 40</td></tr>
<tr><td>Espace IV Diesel without particle filter and P9X engine)</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5 W 40</td><td>0 W 40</td></tr>
<tr><td>Diesel engine with particle filter (except G9T)</td><td>RN0720</td><td colspan="4">5 W 30
5 W 40</td></tr>
<tr><td>G9T with particle filter</td><td>ACEA B4</td><td colspan="3">5 W 40</td><td>0 W 40</td></tr>
</table>

2. OIL QUALITY FOR RENAULT VEHICLES MANUFACTURED BETWEEN 01/01/2001 AND 08/10/2007 (NOT INCLUSIVE)

CONTENTS OF SECTION 2

1	For Andorra, Austria, Belgium, Croatia, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, , Israel, Ireland, Iceland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Norway, Netherlands, Poland, Portugal, Czech Republic, Spain, Slovakia, Slovenia, Sweden, Switzerland and French overseas territories
2	For other countries

1- FOR ANDORRA, AUSTRIA, BELGIUM, CROATIA, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREAT BRITAIN, GREECE, HUNGARY, , ISRAEL, IRELAND, ICELAND, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SPAIN, SLOVAKIA, SLOVENIA, SWEDEN, SWITZERLAND AND FRENCH OVERSEAS TERRITORIES

Note:

The RN specification oils are better quality oils than the ACEA specification. It is thus possible to use an RN specification oil as a substitute for the recommended ACEA specification oil. On the other hand, it is forbidden to replace a recommended RN specification oil with an ACEA specification (see the table of oil interchangeability to know the equivalents).

RENAULT recommends, for both filling and changing, using engine oil which follows the recommendations below.

Instructions for tables:

- when the grades are specified in the table below, only use one of them depending on the external temperature of the country (see graphs under the table to identify the operating temperatures of the grades),
- when the grades are not specified in the table (presence of an "X" in the box), refer to the graphs under the table to find the grade authorised according to the fuel used.

1)SPECIFICATIONS

Vehicle	Engine	ACEA specification				
		A3	A5	B3	B4	C3
TWINGO	C3G	X	X			
	D4D	X	X			
	D4F	X	X			
	D7D	X	X			
	D7F	X	X			
TWINGO II	Naturally aspirated D4F	X	X			
	Turbocharged D4F	Only 5W40 or 0W30 or 0W40	Only 5W30 0W30 0W40			
	K4M	X	X			
	D7F	X	X			
	K9K				X	
CLIO II	D4D	X	X			
	D4F	X	X			
	D7D	X	X			
	D7F	X	X			
	E7J	X	X			
	RENAULT SPORT F4R	Only 5W40 0W40				
	F8Q			X	X	
	F9Q				X	
	K4J	X	X			
	K4M	X	X			
	K7J	X	X			
	K7M	X	X			
	K9K				X	
	Naturally aspirated D4F	X	X			

CLIO III	Turbocharged D4F	Only 5W40 0W30 0W40	Only 5W30 0W30 0W40			
	K4J	X	X			
	K4M	X	X			
	M4R	X	X			
	RENAULT SPORT F4R	Only 5W40 0W40				
	K9K without particle filter with Renault service every 12,000 miles (20,000 km) or 1 year or every 18,000 (30,000 km) or 2 years				X	
	K9K without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	K9K with particle filter					Only 5W30 0W30
CLIO V6	L7X	Only 5W40 0W40				
MODUS	Naturally aspirated D4F	X	X			
	Turbocharged D4F	Only 5W40 0W30 0W40	Only 5W30 0W30 0W40			
	K4J	X	X			
	K4M	X	X			
	K9K without particle filter with Renault service every 12,000 miles (20,000 km) or 1 year or every 18,000 (30,000 km) or 2 years				X	
	K9K without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	

	K9K with particle filter					Only 5W30 0W30
MEGANE/ SCENIC	E7F	X	X			
	F3R	X	X			
	F4P	X	X			
	F4R	X	X			
	F5R	X	X			
	F7R	X				
	F8Q			X	X	
	F9Q				X	
	K4J	X	X			
	K4M	X	X			
	K7M	X	X			
MEGANE II/ SCENIC II	Naturally aspirated F4R	X	X			
	Turbocharged F4R (not RENAULT SPORT)	Only 5W40 0W40				
	RENAULT SPORT turbocharged F4R	Only 5W40 0W40				
	F9Q without particle filter with Renault service every 12,000 miles (20,000 km) or 1 year or every 18,000 miles (30,000 km) or 2 years				X	
	F9Q without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	F9Q with particle filter					Only 5W30 0W30
	K4J	X	X			
	K4M	X	X			
MEGANE II/ SCENIC II	K9K without particle filter with Renault service every 12,000 miles (20,000 km) or 1 year or every 18,000 miles (30,000 km) or 2 years				X	

MEGANE II/ SCENIC II	K9K without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	K9K with particle filter					Only 5W30 0W30
	M9R without particle filter with Renault Service every 12,000 miles (20,000 km) or 1 year				X	
	M9R without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	M9R with particle filter					Only 5W30 0W30
LAGUNA II	F4P	X	X			
	Naturally aspirated F4R	X	X			
	Turbocharged F4R (not GT/CELSIUM)	Only 5W40 0W40				
	GT/CELSIUM turbocharged F4R	Only 5W40 0W40				
	F5R	X	X			
	F9Q without particle filter				Only 5W40 0W40 0W30	
	F9Q with particle filter					Only 5W30 0W30
	G9T without particle filter				X	
	G9T with particle filter				Only 5W40 0W40	

	K4M	X	X			
	L7X	X	X			
	M9R without particle filter				X	
LAGUNA II	M9R with particle filter					Only 5W30 0W30
SAFRANE	G8T			X	X	
	J7R	X	X			
	J7T	X	X			
	J8S			X	X	
	L7X	X	X			
	N7Q	X	X			
	N7U	X	X			
	S8U			X	X	
	Z7X	X	X			
VELSATIS	Turbocharged F4R	Only 5W40 0W40				
	G9T without particle filter				X	
	G9T with particle filter				Only 5W40 0W40	
	P9X				Only 5W40 0W40 0W30	
	V4Y	X	X			
	M9R without particle filter				X	
	M9R with particle filter					Only 5W30 0W30
	F3R	X	X			
	F4R	X	X			
	F9Q				X	

ESPACE (I-III)	G8T			X	X	
	G9T				X	
	J6R	X	X			
	J7R	X	X			
	J7T	X	X			
	J8S			X	X	
	L7X	X	X			
	Z7W	X	X			
	Z7X	X	X			
ESPACE IV	Naturally aspirated F4R	X	X			
	Turbocharged F4R	Only 5W40 0W40				
	F9Q				Only 5W40 0W40 0W30	
	G9T without particle filter				Only 5W40 0W40 0W30	
	G9T with particle filter				Only 5W40 0W40	
	M9R without particle filter with Renault Service every 12,000 miles (20,000 km) or 1 year				X	
	M9R without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	M9R with particle filter					Only 5W30 0W30

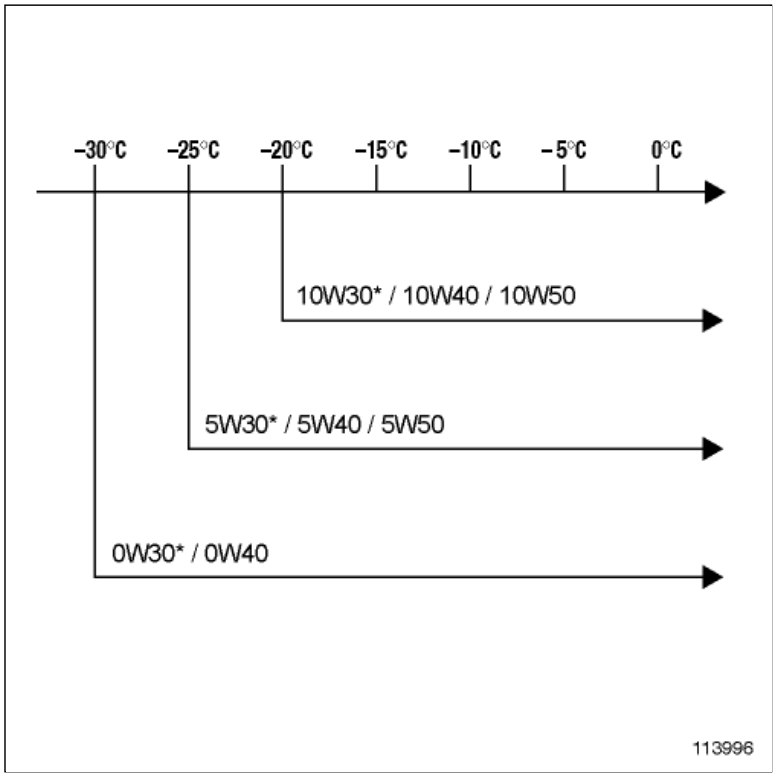
ESPACE IV	P9X				Only 5W40 0W40 0W30	
	V4Y	X	X			
AVANTIME	F3R	X	X			
	Naturally aspirated F4R	X	X			
	Turbocharged F4R	X				
	F9Q				X	
	G8T			X	X	
	G9T				X	
	L7X	X	X			
	Z7X	X	X			
KANGOO	D4D	X	X			
	D4F	X	X			
	D7D	X	X			
	D7F	X	X			
	E7J	X	X			
	F8Q			X	X	
	F9Q				X	
	K4M	X	X			
	K7J	X	X			
	K7M	X	X			
	K9K				X	
	Electric	Only 5W40 0W40				
TRAFIC II	F4R	X	X			
	F9Q				X	
	M9R				Only 5 W 40 5 W 50 0 W 30 0 W 40	

TRAFIC II	G9U without particle filter				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	G9U with particle filter					Only 5W30 0W30
MASTER	F4R	X	X			
	F9Q				X	
	G9T				X	
	G9U without particle filter				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	G9U with particle filter					Only 5W30 0W30
	J5R	X	X			
	J7T	X	X			
	J8S			X	X	
	S8U			X	X	
	S9U				X	
	S9W				X	
	ZD3				X	

Vehicle	Engine	specification			
		RN0710	RN0720	RN0700	ACEA C3 or RN720
LAGUNA III	K9K				Only 5 W 30 0 W 30
	M9R without particle filter	Only 5 W 40 0 W 40			
	M9R with particle filter		Only 5 W 30 5 W 40		
	K4M			Only 10 W 40 5 W 30 5 W 40 0 W 30 0 W 40	
	M4R			Only 10 W 40 5 W 30 5 W 40	
	Turbocharged F4R	Only 5 W 40 0 W 40			

2)PETROL ENGINE AND E85

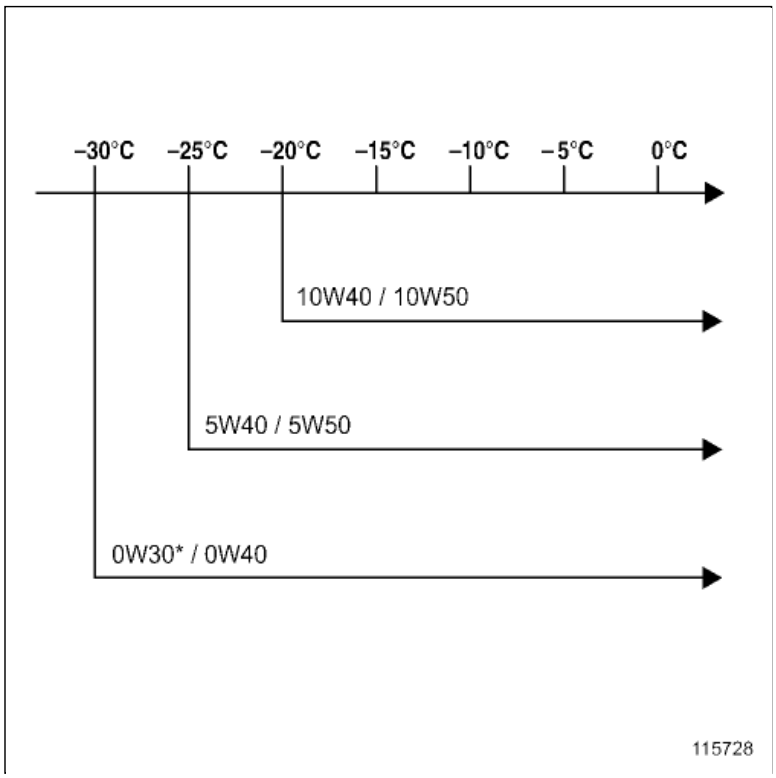
In order to find the oil grade for the external temperature, refer to the graph below.



* Except for turbocharged engines, F7P, F7R, Renault Sport F4R, Renault Sport Turbocharged F4R and Renault Sport L7X.

3)DIESEL ENGINE

In order to find the oil grade for the external temperature, refer to the graph below.



* Only with specifications ACEA B4or ACEA C3.

Note:

If an engine oil grade is not available or has been discontinued, please refer to the "Table of oil interchangeability" section.

Note:

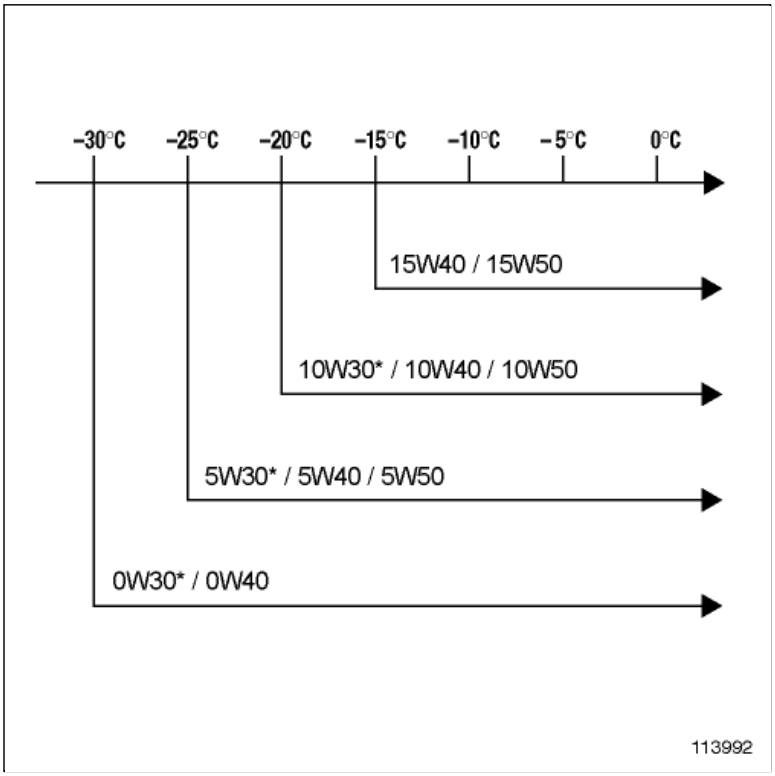
ACEA B1 specification oils should not be used for DIESEL engines under any circumstances.

2- FOR OTHER COUNTRIES

1)PETROL ENGINE AND E100

RENAULT recommends, for both filling and changing the oil, that ACEA A1*, ACEA A3or ACEA A5* specificationengine oil is used, or if this is not available ACEA A2, API SJ, API SLor API SM specification .

To find out which oil grade to choose, please refer to the graph below.



* Except for turbocharged engines, F7P, F7R, Renault Sport F4R, Renault Sport turbocharged F4R and Renault Sport L7X.

-Special cases:

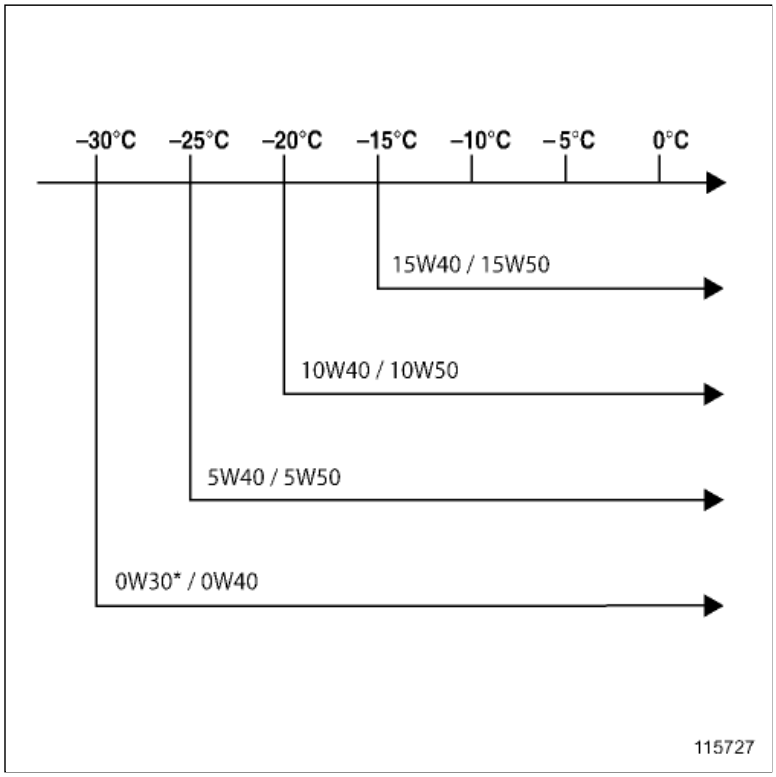
■For RENAULT CLIO SPORT F4R, RENAULT CLIO SPORT L7X, RENAULT MEGANE II SPORT turbocharged F4R, turbocharged F4R engines, LAGUNA GT/CELSIUM turbocharged F4R, and Electric KANGOO, only use ACEA A3 specification of 5W40 grade(or 0W40 gradedepending on the external temperature).■For turbocharged D4F engines, only use oil which is ACEA A3 specificationand 5W40 grade(or 0W40or 0W30 gradedepending on the external temperature), or ACEA A5 specificationand 5W30 grade(or 0W40or 0W30 gradedepending on the external temperature).

2)DIESEL ENGINE

RENAULT recommends, for both filling and changing the oil, that ACEA B3, ACEA B4, ACEA C3* specificationengine oil is used, or if this is not available ACEA B2or API CF specification.

* ACEA C3 specificationengine oils can only be used in the following special cases.

To find out which oil grade to choose, please refer to the graph below.



* Only with ACEAspecification.

-Special cases:

■For G9T engines with particle filters, only use oil which is B4 specificationand 5W40 grade(or 0W40 gradedepending on the external temperature).■For P9X engines, LAGUNA II F9Q, ESPACE IV Diesel without particle filter, only use oil which is B4 specificationand 5W40 grade(or 0W30 gradeor 0W40 gradedepending on the external temperature).■F9Q engines fitted with particle filter, M9R engines fitted with particle filter, K9K engines fitted with particle filter, G9U engines fitted with particle filter, only use oil which is ACEA C3 specificationand 5W30 grade(or 0W30 gradedepending on the external temperature).■For LAGUNA III K9K without particle filter and LAGUNA III M9R without particle filter, use oil which is RN0710 specification and 5W40 grade(or 0W40depending on the external temperature).■LAGUNA III M9R equipped with a particle filter, use only oil which is RN0720 specificationand 5W40or 5W30 grade.

3. OIL QUALITY FOR RENAULT VEHICLES MANUFACTURED BEFORE 01/01/2001

CONTENTS OF SECTION 3	
1	For EUROPE (Andorra, Austria, Belgium, Croatia, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Iceland, Israel, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Norway, Netherlands, Poland, Portugal, Czech Republic, Slovakia, Slovenia, Spain, Sweden, Switzerland)
2	For other countries

Note:

If an engine oil grade is not available or has been discontinued, please refer to the "Table of oil interchangeability" section.

Note:

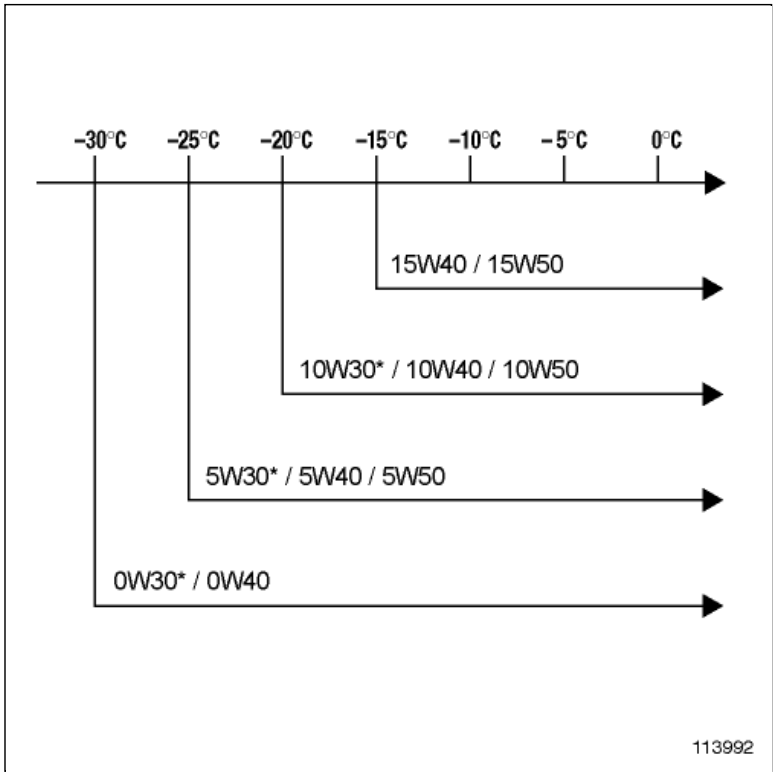
ACEA B1 specification oils should not be used for DIESEL engines under any circumstances.

1- FOR EUROPE (ANDORRA, AUSTRIA, BELGIUM, CROATIA, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ISRAEL, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, SWITZERLAND)

1)PETROL ENGINE

RENAULT recommends, for both filling and changing the oil, that ACEA A2 or ACEA A1* specification oil is used (oil enabling a reduction in fuel consumption).

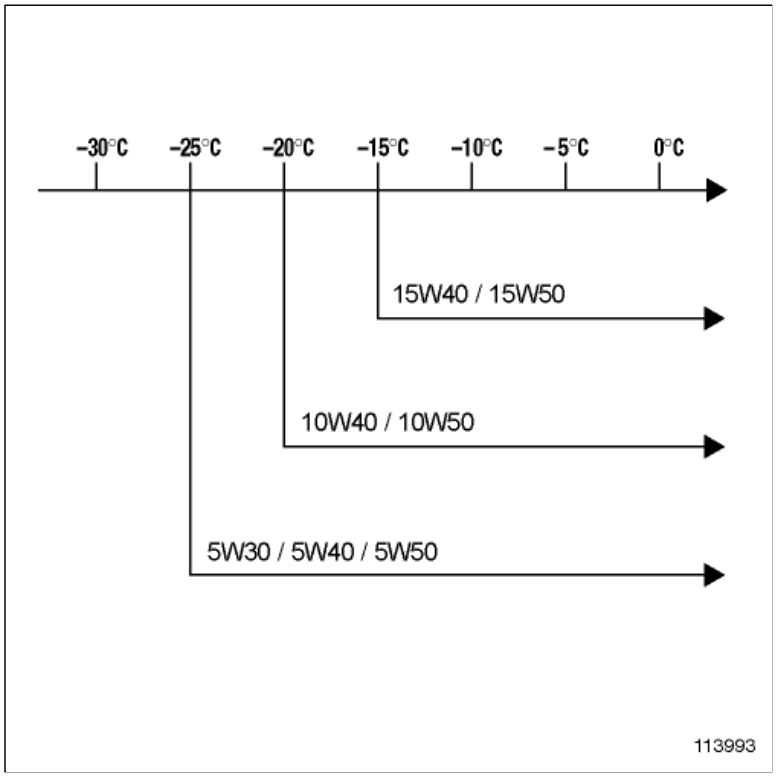
Oil grade depends on the exterior average temperature



* Except turbocharged engines, F7P and F7R.

2)DIESEL ENGINE

RENAULT recommends that ACEA B2 specification oil is used for both filling and changing the oil. The oil grade to use depends on the average external temperature.

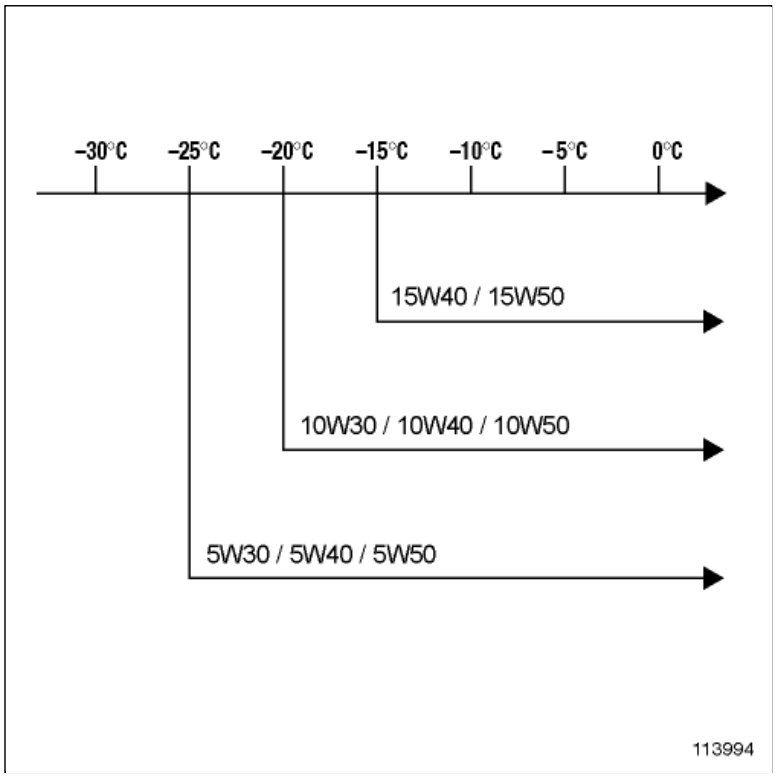


2- FOR OTHER COUNTRIES:

1)PETROL ENGINE AND E100:

RENAULT recommends, for both filling and changing the oil API SHOr API SJ specificationoil.

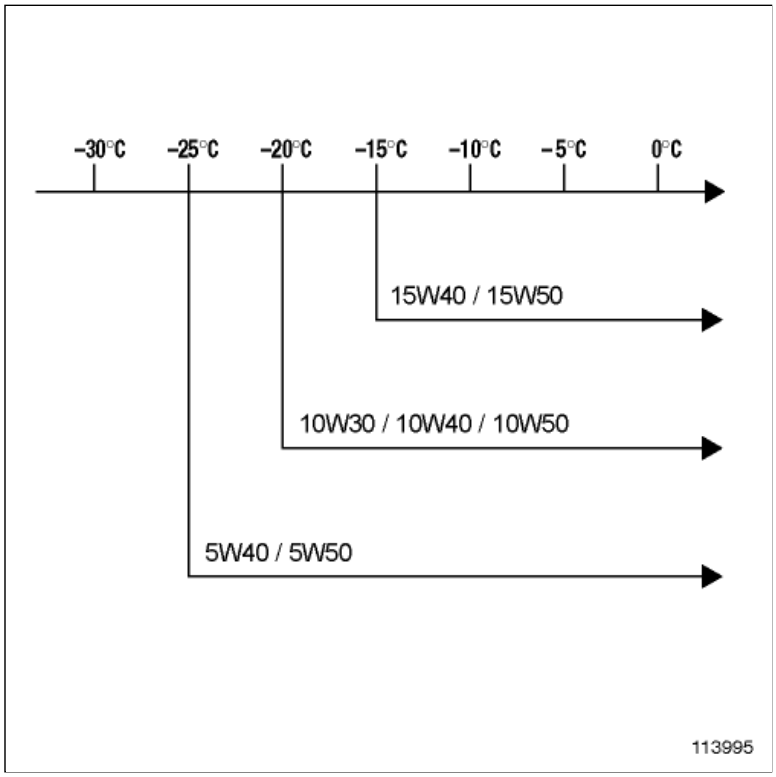
Oil grade depends on the exterior average temperature



2)DIESEL ENGINE:

RENAULT recommends, for both filling and changing the oil API CF specificationoil.

Oil grade depends on the exterior average temperature



4. OIL QUALITY FOR DACIA VEHICLES

CONTENTS OF SECTION 4	
1	For Germany, Andorra, Austria, Belgium, Croatia, Denmark, Estonia, Finland, France, Great Britain, Greece, Hungary, Ireland, Iceland, Israel, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Norway, Netherlands, Poland, Portugal, Czech Republic, Slovakia, Slovenia, , Spain, Sweden, Switzerland
2	For French overseas territories (French Guiana, Guadeloupe, Martinique, Réunion)
3	For Bulgaria, Romania
4	For Turkey
5	For Argentina, Brazil, Colombia, Ecuador, Egypt, Iran, Kuwait, Oman, Qatar, Russia, Ukraine, United Arab Emirates, Venezuela
6	For Morocco
7	For other countries

1- FOR GERMANY, ANDORRA, AUSTRIA, BELGIUM, CROATIA, DENMARK, ESTONIA, FINLAND, FRANCE, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ISRAEL, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, , SPAIN, SWEDEN, SWITZERLAND:

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

VEHICLE MANUFACTURED BEFORE 13/06/2011 :

Engine	**specifications**	**Grades to use according to the external temperature (T)**			
		If T > -15˚C	**If T > -20˚C**	**If T > -25˚C**	**If T > -30˚C**
Petrol and E85 bioethanol engine	ACEA A3/B4 ACEA A5/B5	10W40	10W40	5W30 5W40	0W30 0W40
Diesel engine without particle filter manufactured before 12/01/2009	ACEA A3/B4	15W50	10W40 10W50	5W40 5W50	0W40
Diesel engine without particle filter manufactured from 12/01/2009	RN0710	5W40	5W40	5W40	0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

VEHICLE MANUFACTURED AFTER 14/06/2011 :

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol and E85 bioethanol engine	ACEA A3/B4	10W40	10W40	5W40	0W40
	ACEA A5/B5	5W30	5W30	5W30	0W30
Diesel engine without particle filter	ACEA A3/B4	10W40	10W40	5W40	0W40
Diesel engine with particle filter	ACEA C3	5W30 5W40			

2- FOR FRENCH OVERSEAS TERRITORIES (FRENCH GUIANA, GUADELOUPE, MARTINIQUE, RÉUNION):

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine	ACEA A3/B4	10W40 10W50	10W40 10W50	5W40 5W50	0W40
Diesel engine without particle filter	ACEA B4	10W40 10W50	10W40 10W50	5W40 5W50	0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

3- FOR BULGARIA, ROMANIA:

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine	ACEA A3/B4	10W40	10W40	5W40	5W40
Diesel engine without particle filter	ACEA B2/ ACEA B3/ ACEA B4	15W40 15W50	10W40 10W50	5W40 5W50	0W40
Diesel engine with particle filter manufactured before 13/06/2011	RN0720	5W30 5W40			
Diesel engine with particle filter manufactured after 14/06/2011	ACEA C3	5W30 5W40			

4- FOR TURKEY:

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine	ACEA A1 ACEA A2 ACEA A3	15W40 15W50	10W40 10W50	5W40	0W40
	API SL/SM				
Diesel engine without particle filter	RN0710	5W40	5W40	5W40	0W40
	ACEA A5/B5	5W30			
Diesel engine with particle filter manufactured before 13/06/2011	RN0720	5W30 5W40			
Diesel engine with particle filter manufactured after 14/06/2011	ACEA C3	5W30 5W40			

5- FOR ARGENTINA, BRAZIL, COLOMBIA, ECUADOR, EGYPT, IRAN, KUWAIT, OMAN, QATAR, RUSSIA, UKRAINE, UNITED ARAB EMIRATES, VENEZUELA :

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine and E100	RN0700	10W40	10W40	5W30 5W40	0W30 0W40
	ACEA A1 ACEA A2 ACEA A3 ACEA A5	15W40 15W50	10W30 10W40 10W50	5W30 5W40 5W50	0W30 0W40
	API SL/SM				
Diesel engine without particle filter	RN0710	5W40	5W40	5W40	0W40
	ACEA B3 ACEA B4	15W40 15W50	10W40 10W50	5W40 5W50	0W30 0W40
	API CF				0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

6- FOR MOROCCO:

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine with oil change interval every 6,000 miles (10,000 km) or 1 year	ACEA A1 ACEA A2 ACEA A3 ACEA A5	15W40 15W50	10W30 10W40 10W50	5W30 5W40	0W30 0W40
	API SL/SM				
Petrol engine with oil change interval every 12,000 miles (20,000 km) or 1 year	RN0700	10W40	10W40	5W30 5W40	0W30 0W40
Diesel engine without particle filter	ACEA B2 ACEA B3 ACEA B4	15W40 15W50	10W40 10W50	5W40 5W50	0W30 0W40
	API CF				0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

7- FOR OTHER COUNTRIES:

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine	ACEA A1 ACEA A2 ACEA A3 ACEA A5	15W40 15W50	10W30 10W40 10W50	5W30 5W40	0W30 0W40
	API SL/SM				
Diesel engine without particle filter	ACEA B2 ACEA B3 ACEA B4	15W40 15W50	10W40 10W50	5W40 5W50	0W30 0W40
	API CF				0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

5. TABLES OF OIL INTERCHANGEABILITY

CONTENTS OF SECTION 5	
1	ACEA/RN specification
2	ACEA specification
3	API specification
4	CCMC/ACEA specification

1- TABLE OF OIL INTERCHANGEABILITY

1)ACEA/RN SPECIFICATION

CAUTION
RN specification oils are better quality oils than ACEA specification oils. It is therefore possible to substitute the ACEA specification recommended oil by the RN specifications but it is prohibited to substitute RN specification recommended oil by the ACEA specification

CAUTION
The RN grades to use are the same as those recommended initially in ACEA.

	specification	**RN specification which can replace ACEA specification**
PETROL	ACEA A3 on naturally aspirated engine	RN0700
	ACEA A3 on turbocharged engine	RN0710
	ACEA A5	RN0700
DIESEL	10W40 ACEA B4	10W40 RN0700
	5W40 ACEA B4	5W40 RN0710
	ACEA C3	RN0720

2)ACEA SPECIFICATION :

	specification	Minimum specification with which it can be replaced
PETROL	ACEA A1*	ACEA A3 or ACEA A5*
	ACEA A2	ACEA A3
	ACEA A3	-
	ACEA A5*	ACEA A3
DIESEL	ACEA B1*	ACEA B3 or ACEA B5*
	ACEA B2	ACEA B3
	ACEA B3	ACEA B4
	ACEA B4	-
	ACEA B5*	ACEA B4
	ACEA C3	-

* engine oil enabling a reduction in fuel consumption.

3)API SPECIFICATION :

	specification	Minimum specification with which it can be replaced
PETROL	API SH	API SJ
	API SJ	API SL
	API SL	API SM
	API SM	-
DIESEL	API CF	-

4)CCMC/ACEA SPECIFICATION :

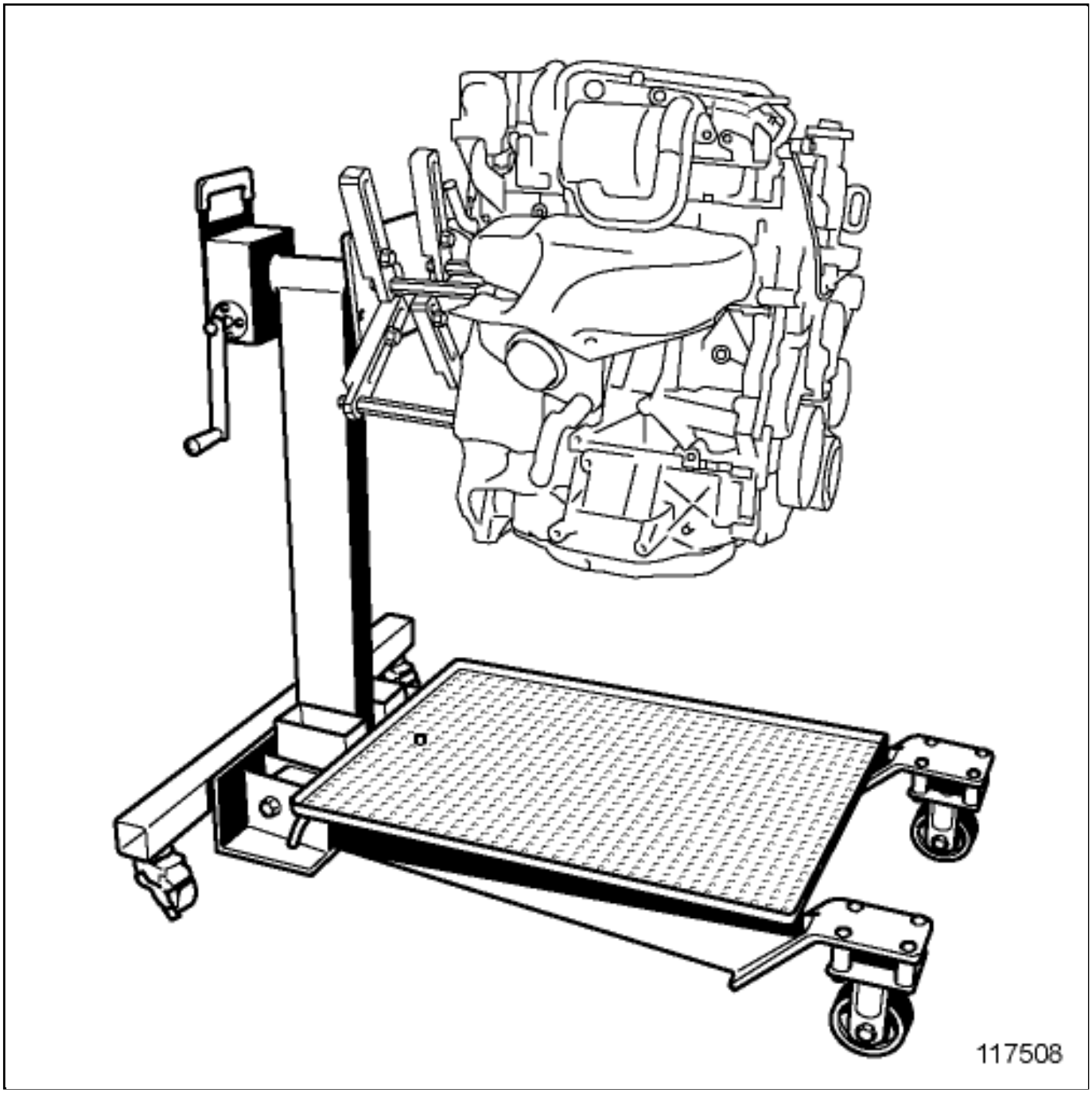
	specification	Minimum specification with which it can be replaced
Petrol	CCMC G4	ACEA A2
	CCMC G5	ACEA A2
DIESEL	CCMC PD2	ACEA A2

ENGINE SUPPORT EQUIPMENT: USE

Note, one or more warnings are present in this procedure

Special tooling required	
Flywheel locking tool.	Mot. 1677
Flywheel locking tool.	Mot. 582-01
Engine support plate for Desvil engine stand	Mot. 792-03
Pins X and Y for use with adapter pin A on DESVIL stand	Mot. 1378
Engine support, can be adapted for Desvil stand.	Mot. 1723

Equipment required
component support
load balancer
workshop hoist



WARNING

To work on the engine in complete safety, it is essential to use a component stand.

CAUTION

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

1. PREPARATION OPERATION FOR FITTING THE ENGINE ON THE COMPONENT SUPPORT

Remove the "engine and gearbox" assembly Engine - gearbox assembly: Removal - Refitting .

Separate the gearbox from the engine Manual gearbox: Removal - Refitting (21A, Manual gearbox).

There are two methods for fitting the engine on the component support:

- by fitting the toolEngine support, can be adapted for Desvil stand.(**Mot. 1723**) or the studs fitted with the retaining struts of the relevant equipment on the cylinder block (flywheel end),
- by positioning the toolEngine support plate for Desvil engine stand(**Mot. 792-03**) on the cylinder block (oil filter side).

1- FITTING THE ENGINE ON THE SUPPORT FITTED WITH MOT. 1723 OR THE STUDS OF THE RELEVANT EQUIPMENT (FLYWHEEL END)

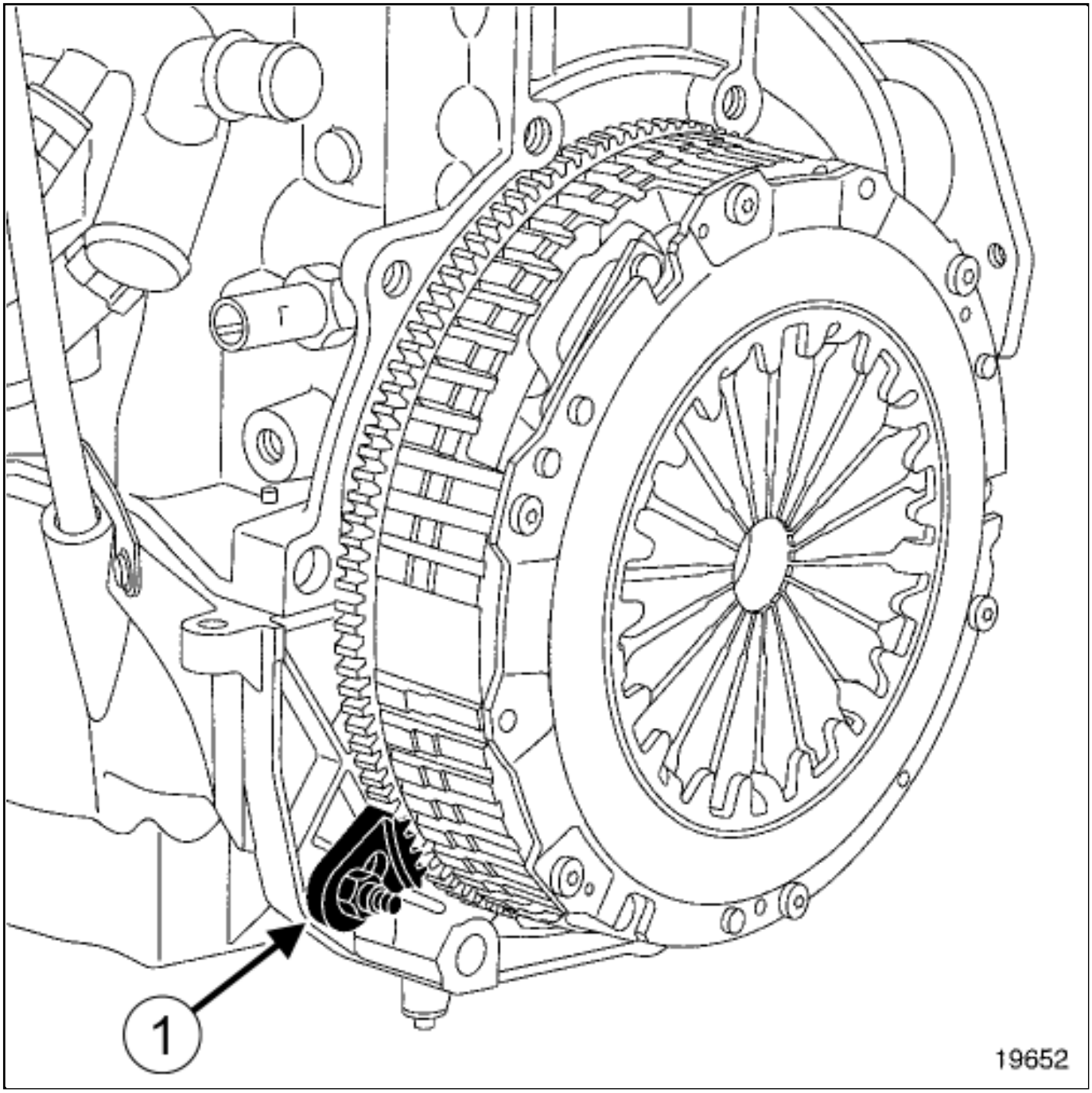
Note:

This fitting relates to all K9K engines.

Note:

The flywheel must be removed on engines with the starter motor at the exhaust end.

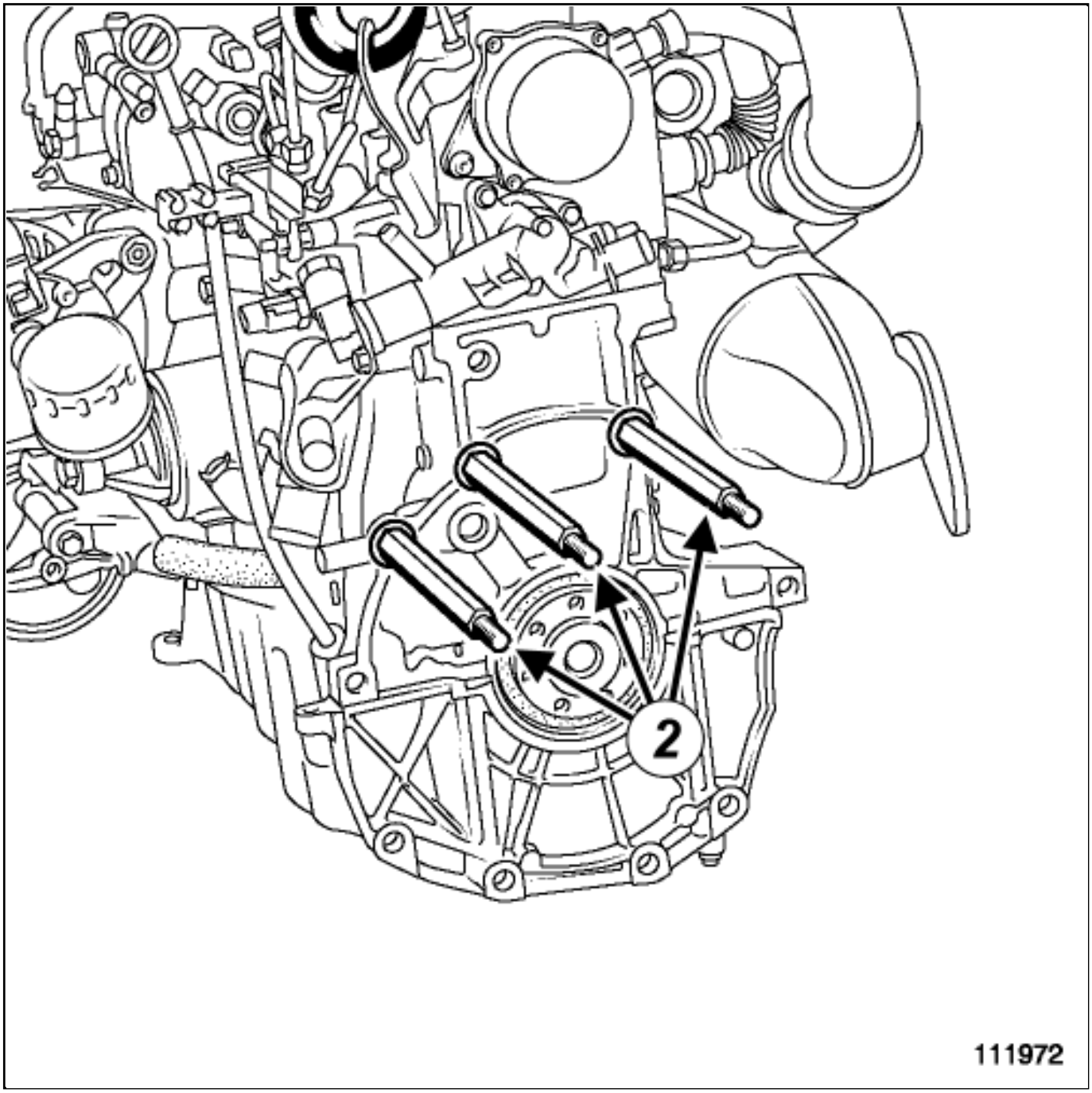
Remove the accessories belt Accessories belt: Removal - Refitting .



Fit the flywheel locking toolFlywheel locking tool.(Mot. 582-01) or Flywheel locking tool.(Mot. 1677) (1) on the sump.

Remove:

- the crankshaft accessories pulleyCrankshaft accessories pulley: Removal - Refitting ,
- the clutch plate and pressure platePressure plate - Disc: Removal - Refitting ,
- the flywheelFlywheel: Removal - Refitting ,
- the flywheel locking toolFlywheel locking tool.(Mot. 582-01) or Flywheel locking tool.(Mot. 1677) .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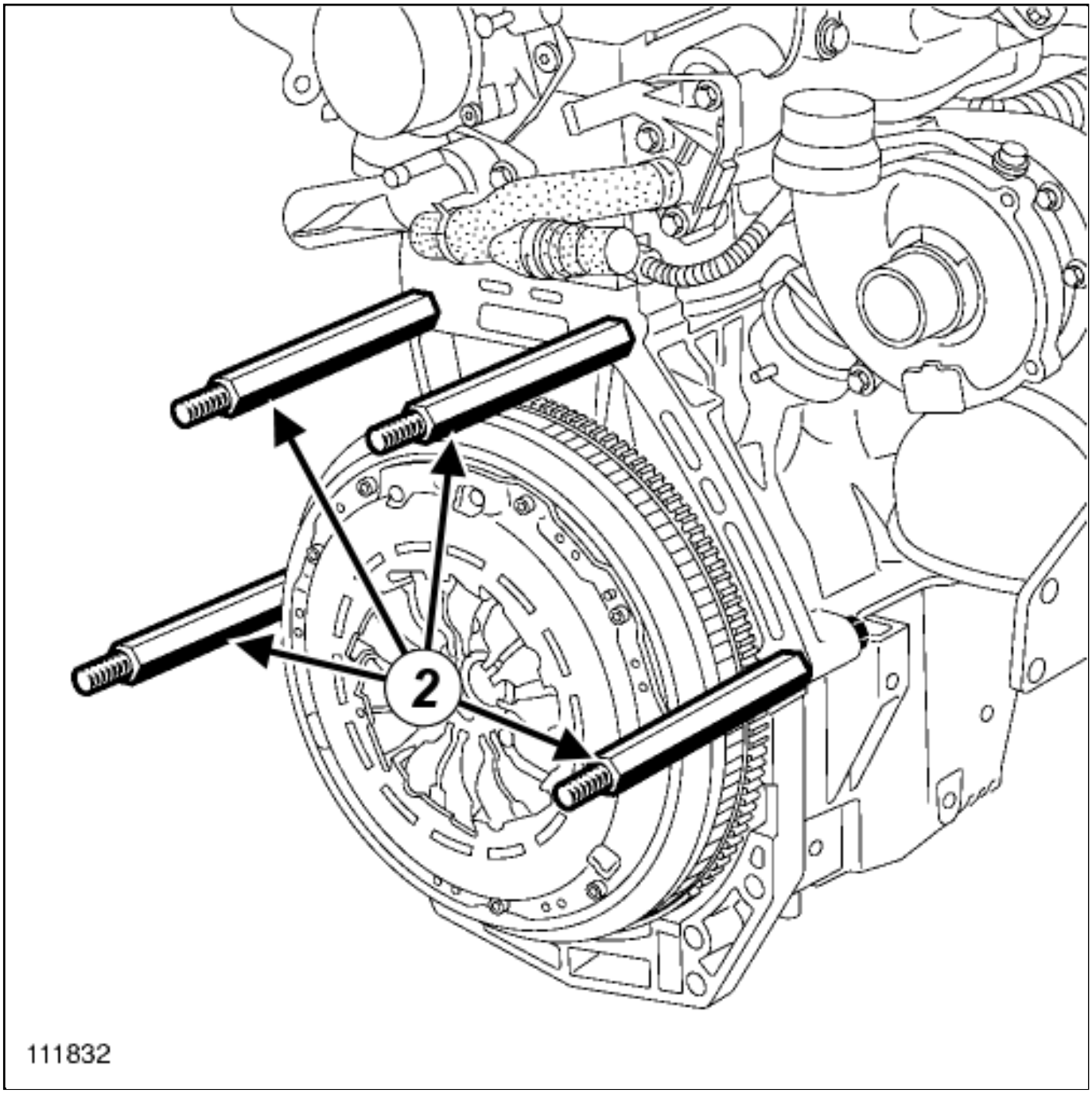
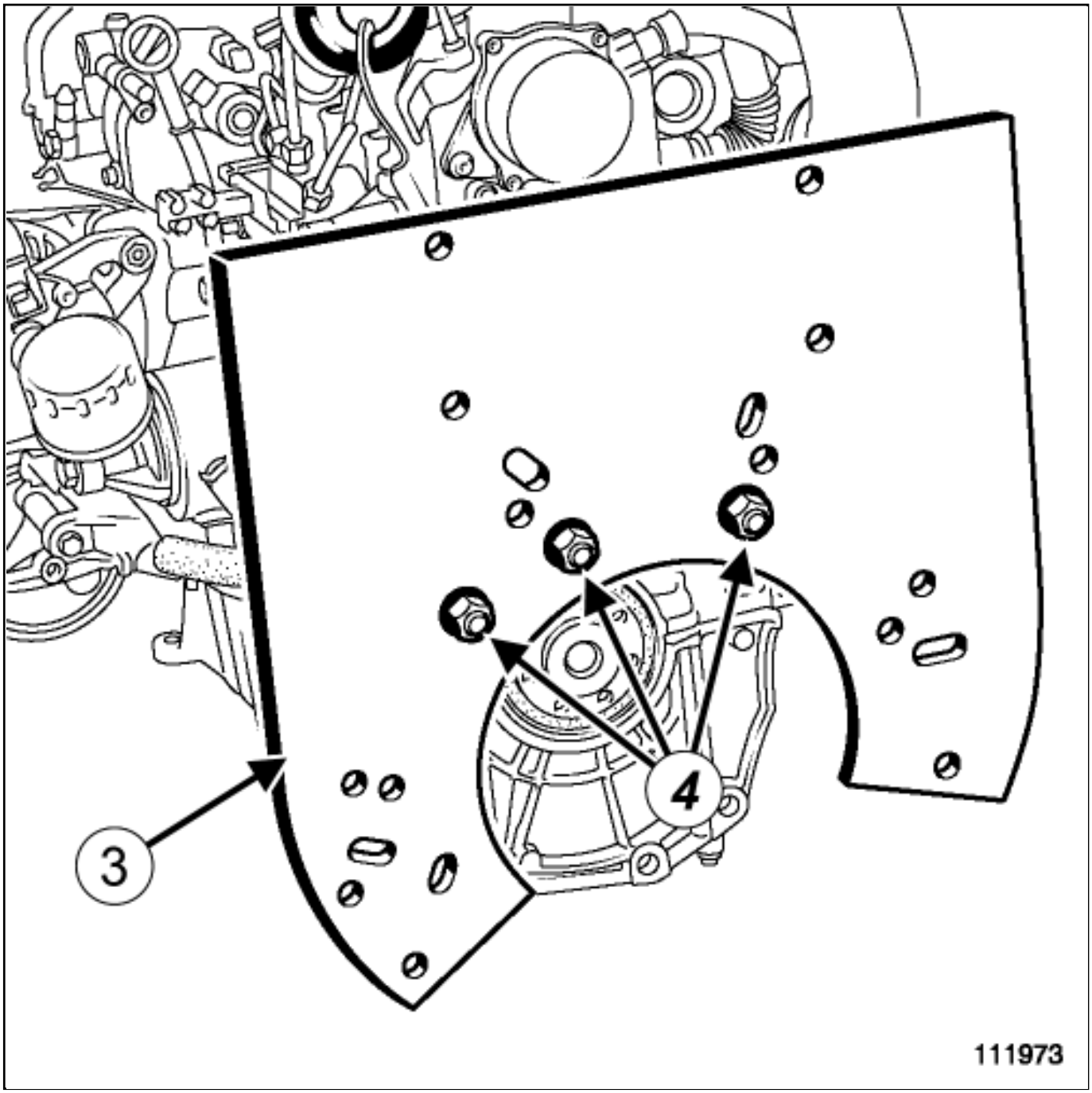


❑ Fit the pins(2) of theEngine support, can be adapted for Desvil stand.(Mot. 1723) to the cylinder block on the flywheel end.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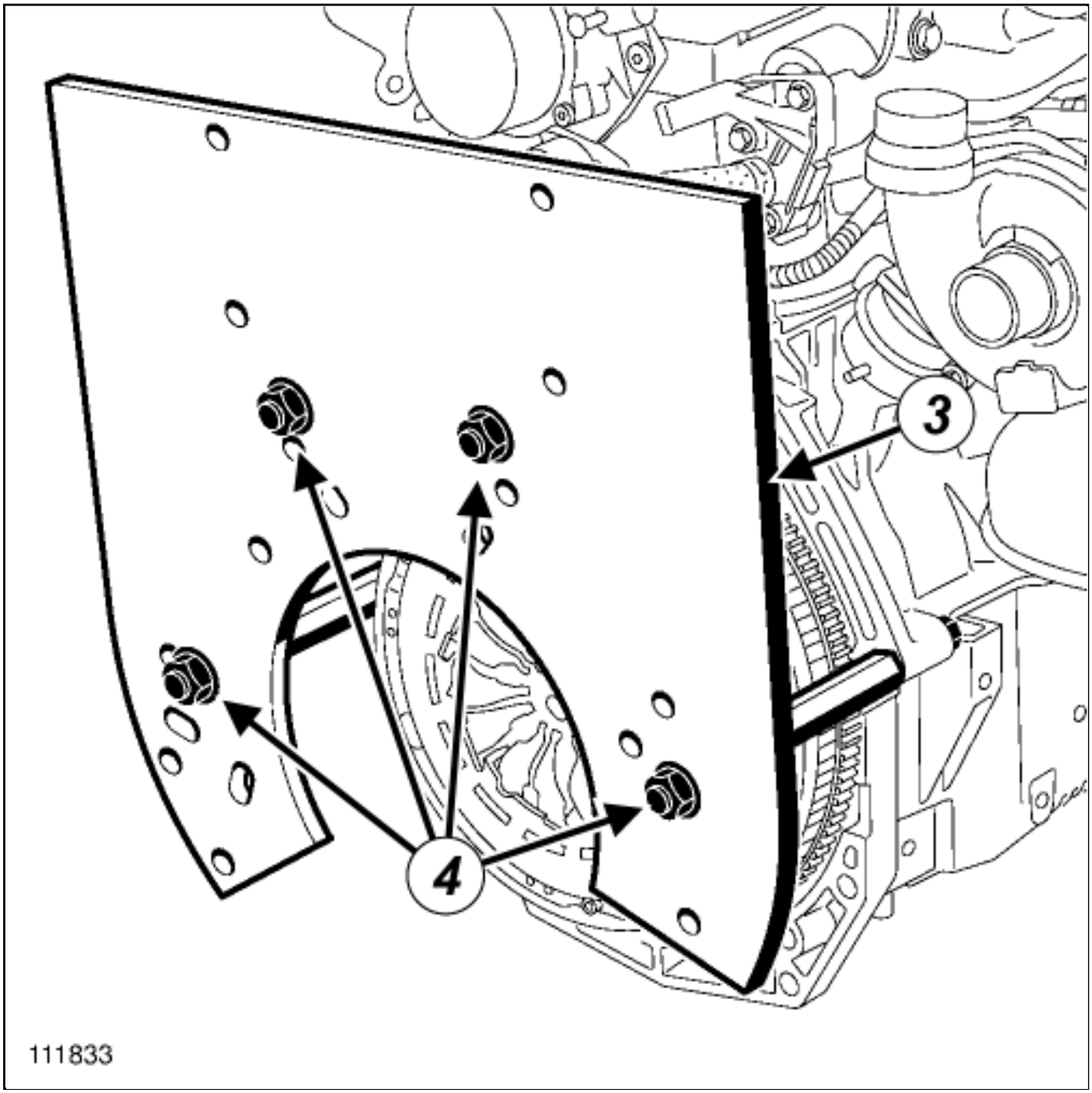
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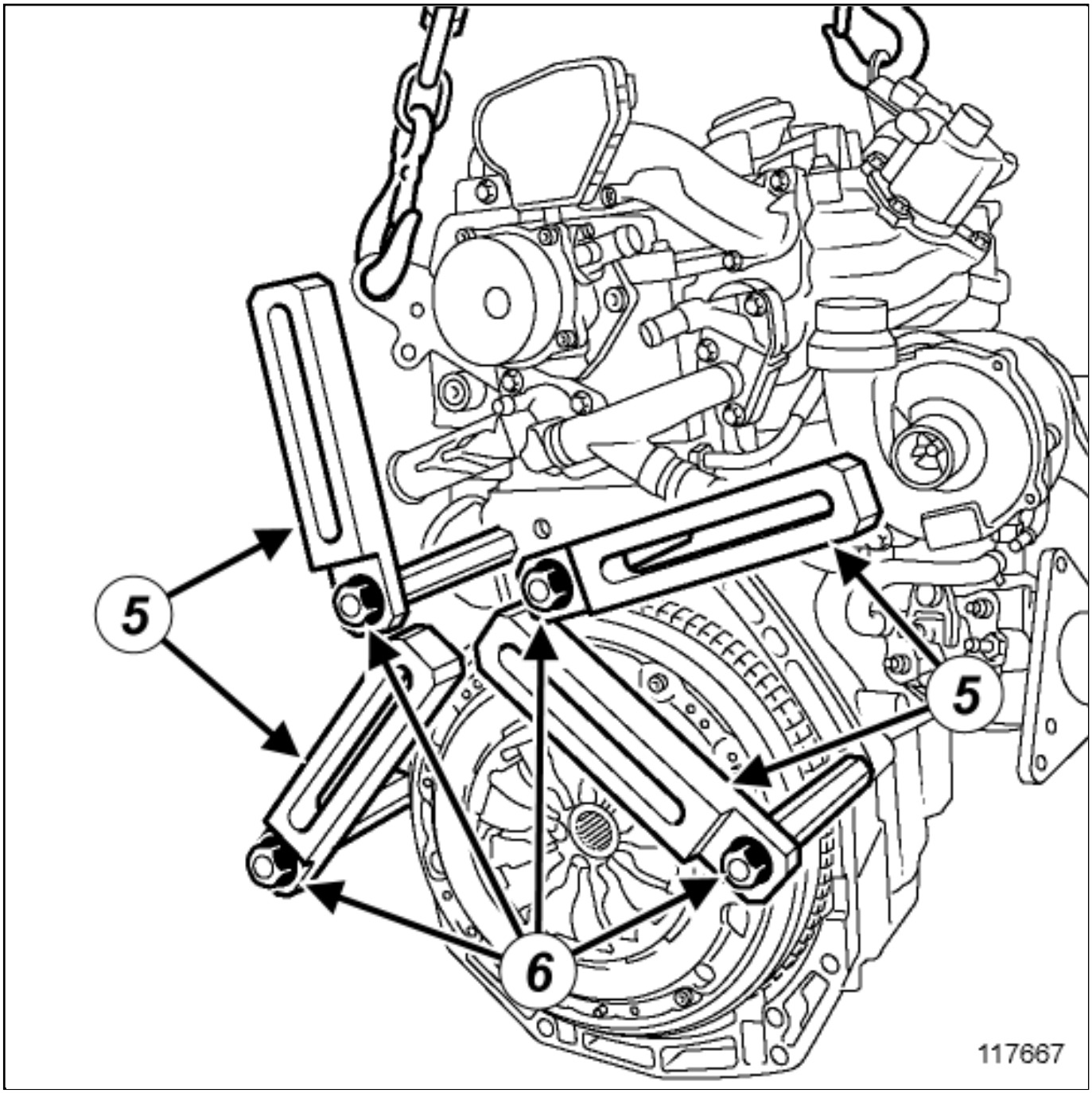


- Fit the support plate(3) of the toolEngine support, can be adapted for Desvil stand.(Mot. 1723) on the pins (holes 5, 6 and 7or 1, 2, 10 and 12) or fit the retaining bars(5) of the component supporton the pins.

- Tighten the pin nuts(4) on the stand plate or fit without tightening the nuts(6) of the retaining bars.

2- FITTING THE ENGINE ON THE SUPPORT FITTED WITH MOT. 792-03 (OIL FILTER END)

Note:

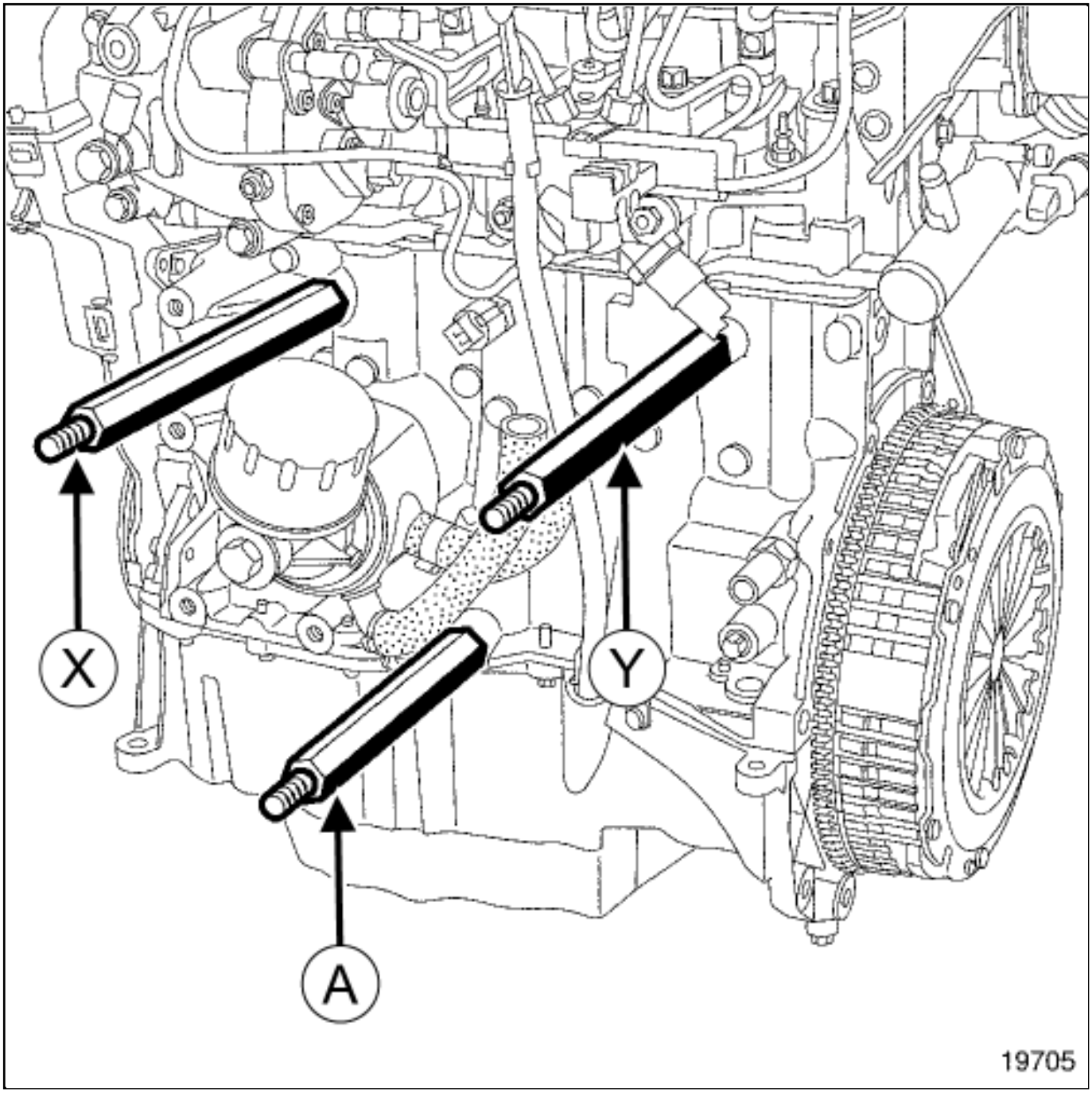
This fitting operation only concerns K9K 260-262-270-272-700-702-704-706-710-722-750-752-790-794 engines.

Remove:

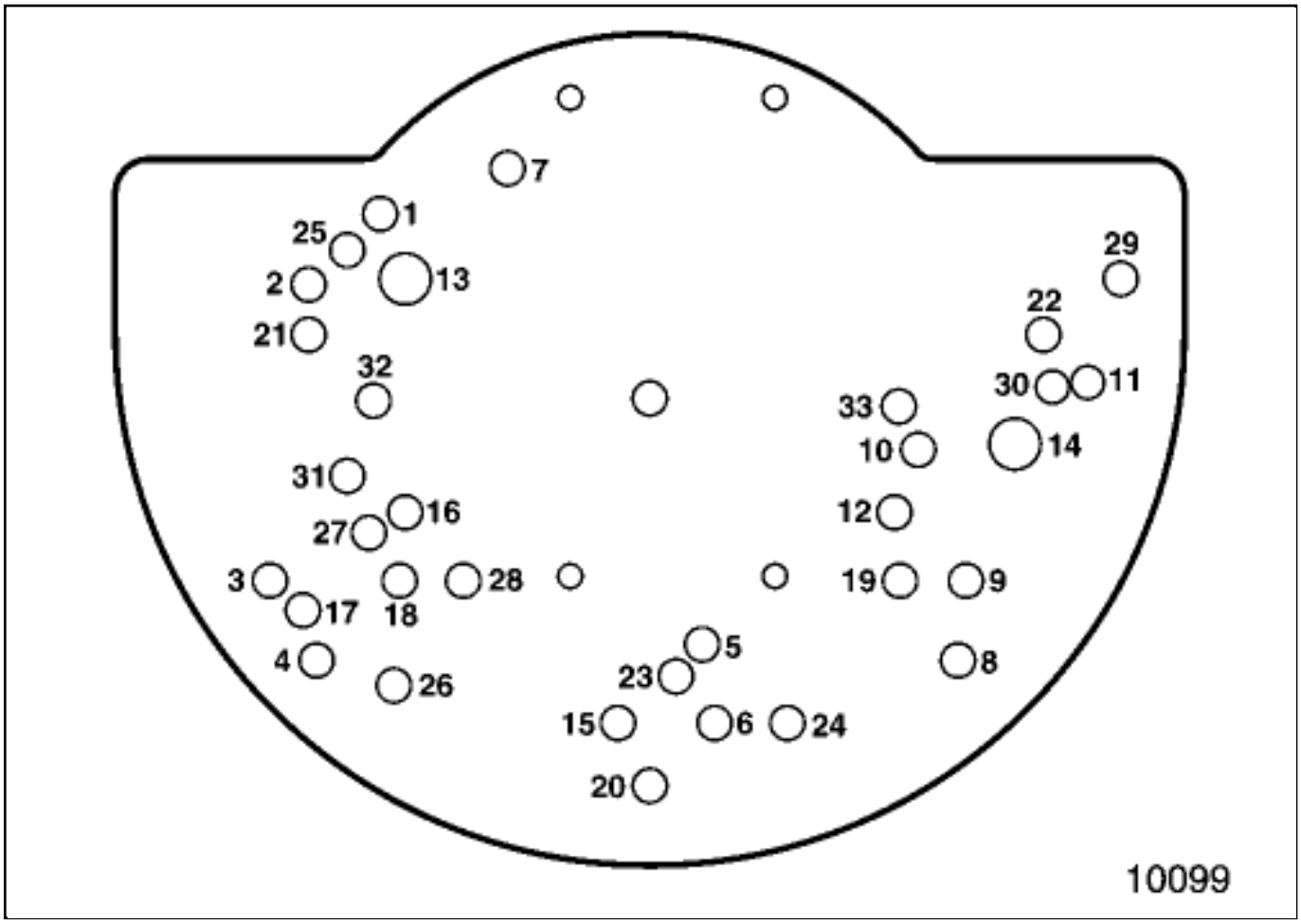
- the accessories belt **Accessories belt: Removal - Refitting** ,
- the alternator **Alternator: Removal - Refitting** .

Remove:

- the multifunction support **Multifunction support: Removal - Refitting** ,
- the coolant pump inlet pipe **Coolant pump inlet pipe: Removal - Refitting** .



- Fit the support studs(X) , (Y) of thePins X and Y for use with adapter pin A on DESVIL stand(Mot. 1378) and the support stud(A) of theEngine support plate for Desvil engine stand(Mot. 792-03) to the cylinder block.

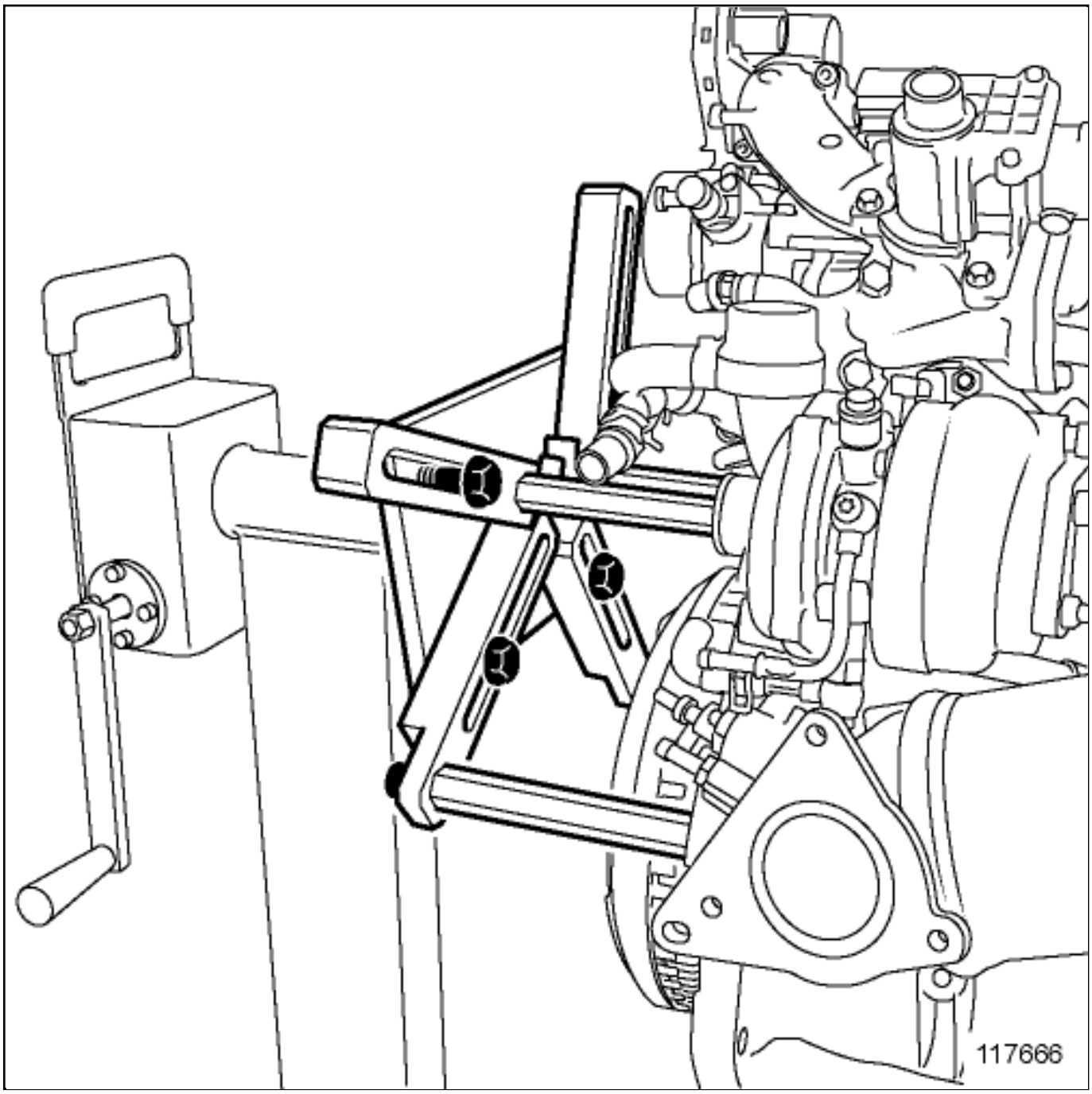


Position the plate ofEngine support plate for Desvil engine stand(**Mot. 792-03**) on the engine fitted with the support studs, aligning:

- support stud(**A**) with hole 20of the plate,
- support stud(**X**) with hole 33of the plate,
- support stud(**Y**) with hole 32of the plate.

Tighten the support stud nuts on the stand plate.

2. FITTING THE ENGINE ON THE COMPONENT SUPPORT



Fit the "engine - pins - stand plate" assembly or the "engine - pins - retaining bars" assembly on the component support using a workshop hoist and a load balancer.

Tighten the studs of the stand plate or of the support bars on the component support.

Set the blocks to ensure that the component support does not move.

Remove the load balancer.

3. OPERATION FOR REMOVING THE ENGINE FROM COMPONENT SUPPORT

Support the "engine - pins - stand plate" assembly or the "engine - pins - retaining bars" assembly on the component supportusing the workshop hoistand the load balancer.

Remove the studs of the mounting plate or of the retaining bars from the component support.

Separate the "engine - pins - stand plate" assembly or the "engine - pins - retaining bars" assembly from the component supportusing the workshop hoistand the load balancer.

4. FINAL OPERATION

Remove:

- the support stud nuts on the stand plate or the retaining bar nuts,
- the stand plate or the retaining bars.

1- ENGINE SECURED ON THE FLYWHEEL END)

Remove the pins of theEngine support, can be adapted for Desvil stand.(**Mot. 1723**) .

Note:

For engines which have a starter located on the exhaust side, the flywheel must only be refitted after the engine has been removed from the engine stand.

Refit (if they have been removed):

- the flywheelFlywheel: Removal - Refitting ,
- the flywheel locking toolFlywheel locking tool.(Mot. 582-01) or Flywheel locking tool.(Mot. 1677) ,
- the clutch plate and pressure platePressure plate - Disc: Removal - Refitting ,
- the crankshaft accessories pulleyCrankshaft accessories pulley: Removal - Refitting .

Remove the flywheel locking toolFlywheel locking tool.(Mot. 582-01) or Flywheel locking tool.(Mot. 1677) on the lower housing.

Refit the accessories beltAccessories belt: Removal - Refitting .

Connect the gearbox to the engineManual gearbox: Removal - Refitting (21A, Manual gearbox).

Refit the "engine and gearbox" assemblyEngine - gearbox assembly: Removal - Refitting .

2- ENGINE SECURED ON OIL FILTER SIDE)

Remove the pins from thePins X and Y for use with adapter pin A on DESVIL stand(Mot. 1378) and the pin from theEngine support plate for Desvil engine stand(Mot. 792-03) .

Refit:

- the coolant pump inlet pipeCoolant pump inlet pipe: Removal - Refitting ,
- the multifunction supportMultifunction support: Removal - Refitting .

Refit:

- the alternator Alternator: Removal - Refitting ,
- the accessories belt Accessories belt: Removal - Refitting .

Connect the gearbox to the engine Manual gearbox: Removal - Refitting (21A, Manual gearbox).

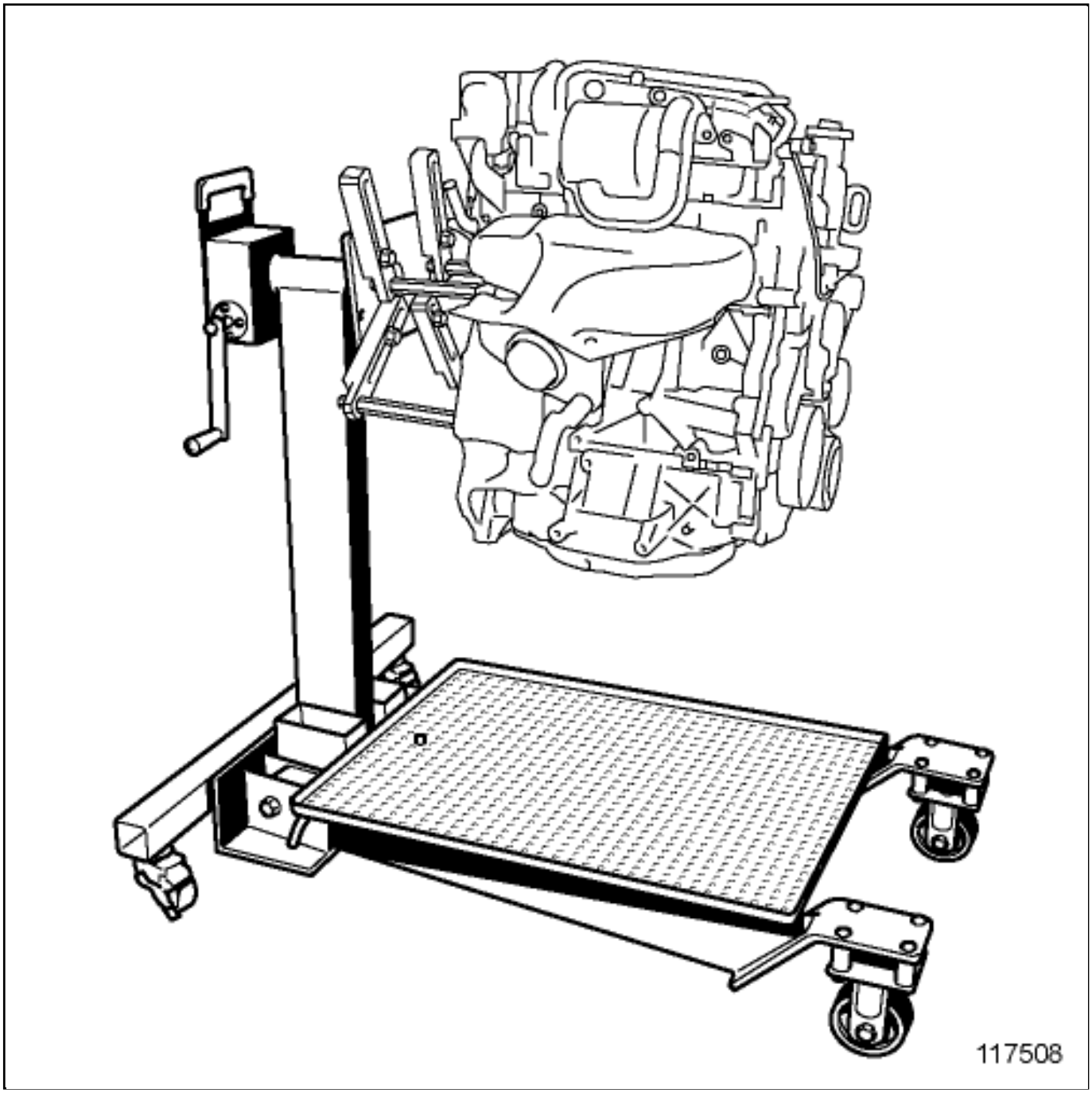
Refit the "engine and gearbox" assembly Engine - gearbox assembly: Removal - Refitting .

ENGINE SUPPORT EQUIPMENT: USE

Note, one or more warnings are present in this procedure

Special tooling required	
Flywheel locking tool.	Mot. 1677
Flywheel locking tool.	Mot. 582-01
Engine support plate for Desvil engine stand	Mot. 792-03
Pins X and Y for use with adapter pin A on DESVIL stand	Mot. 1378
Engine support, can be adapted for Desvil stand.	Mot. 1723

Equipment required
component support
load balancer
workshop hoist



WARNING

To work on the engine in complete safety, it is essential to use a component stand.

CAUTION

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

1. PREPARATION OPERATION FOR FITTING THE ENGINE ON THE COMPONENT SUPPORT

Remove the "engine and gearbox" assembly Engine - gearbox assembly: Removal - Refitting .

Separate the gearbox from the engine Manual gearbox: Removal - Refitting (21A, Manual gearbox).

There are two methods for fitting the engine on the component support:

- by fitting the toolEngine support, can be adapted for Desvil stand.(**Mot. 1723**) or the studs fitted with the retaining struts of the relevant equipment on the cylinder block (flywheel end),
- by positioning the toolEngine support plate for Desvil engine stand(**Mot. 792-03**) on the cylinder block (oil filter side).

1- FITTING THE ENGINE ON THE SUPPORT FITTED WITH MOT. 1723 OR THE STUDS OF THE RELEVANT EQUIPMENT (FLYWHEEL END)

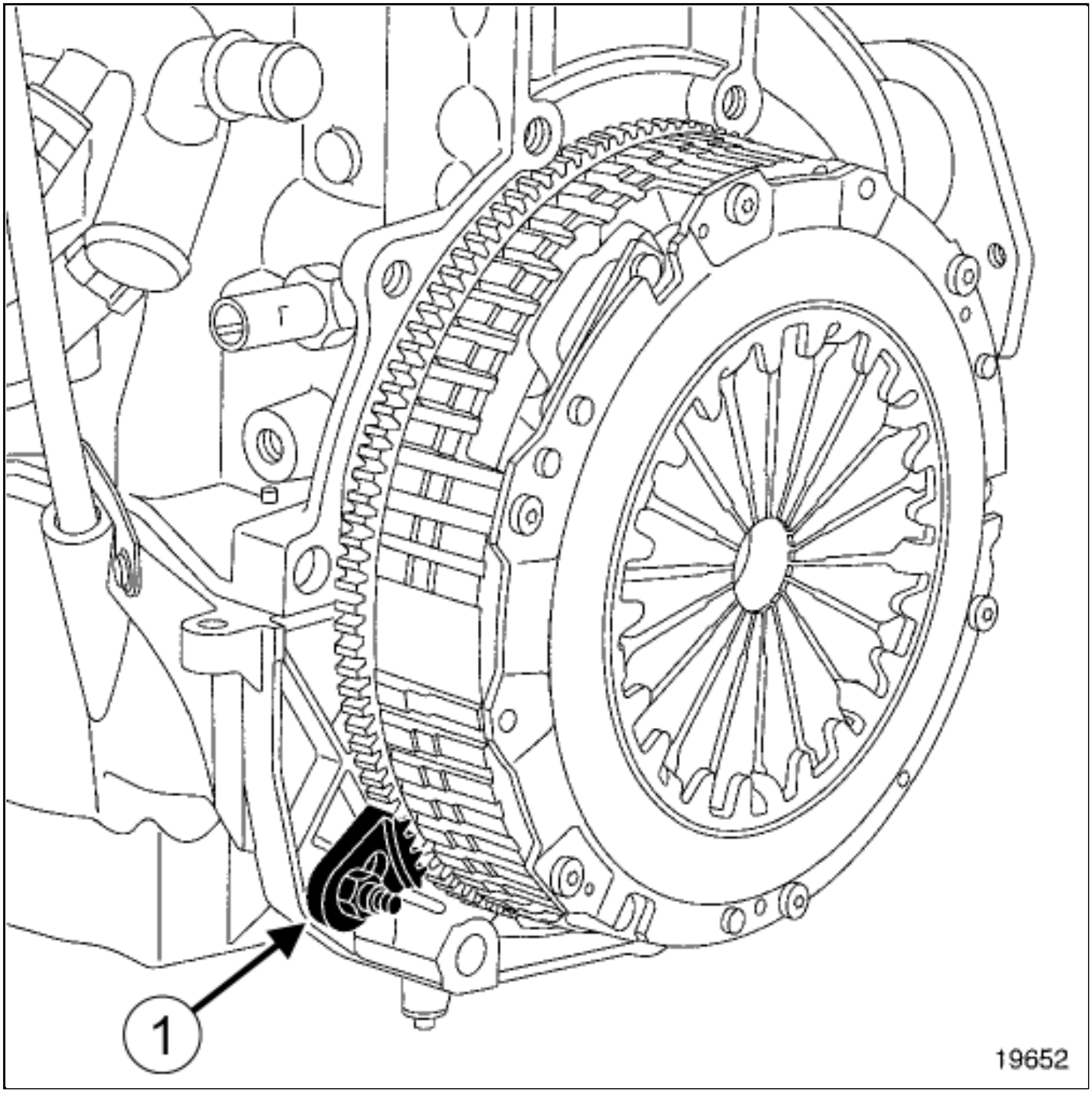
Note:

This fitting relates to all K9K engines.

Note:

The flywheel must be removed on engines with the starter motor at the exhaust end.

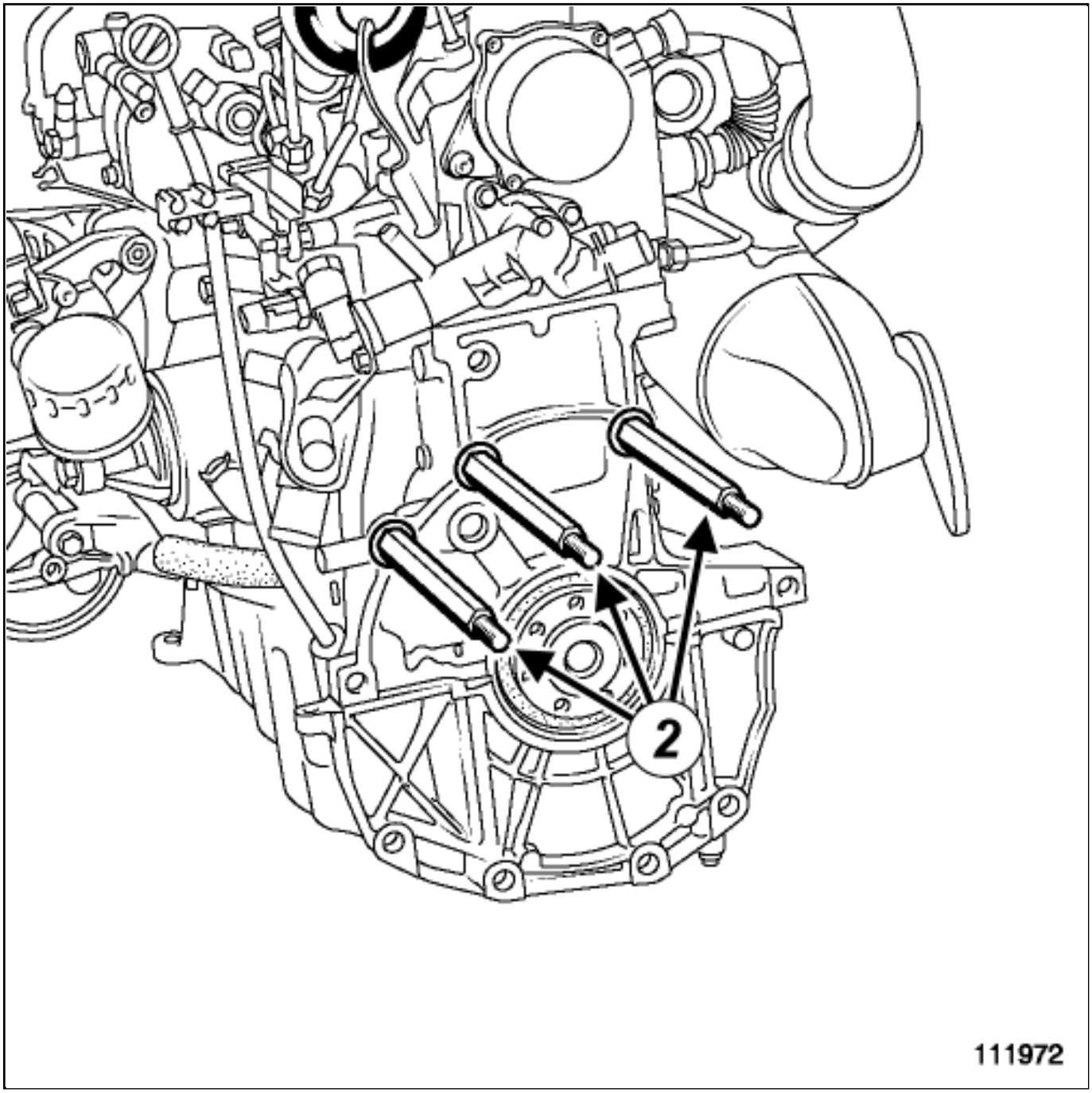
Remove the accessories belt Accessories belt: Removal - Refitting .



Fit the flywheel locking toolFlywheel locking tool.(Mot. 582-01) or Flywheel locking tool.(Mot. 1677) (1) on the sump.

Remove:

- the crankshaft accessories pulleyCrankshaft accessories pulley: Removal - Refitting ,
- the clutch plate and pressure platePressure plate - Disc: Removal - Refitting ,
- the flywheelFlywheel: Removal - Refitting ,
- the flywheel locking toolFlywheel locking tool.(Mot. 582-01) or Flywheel locking tool.(Mot. 1677) .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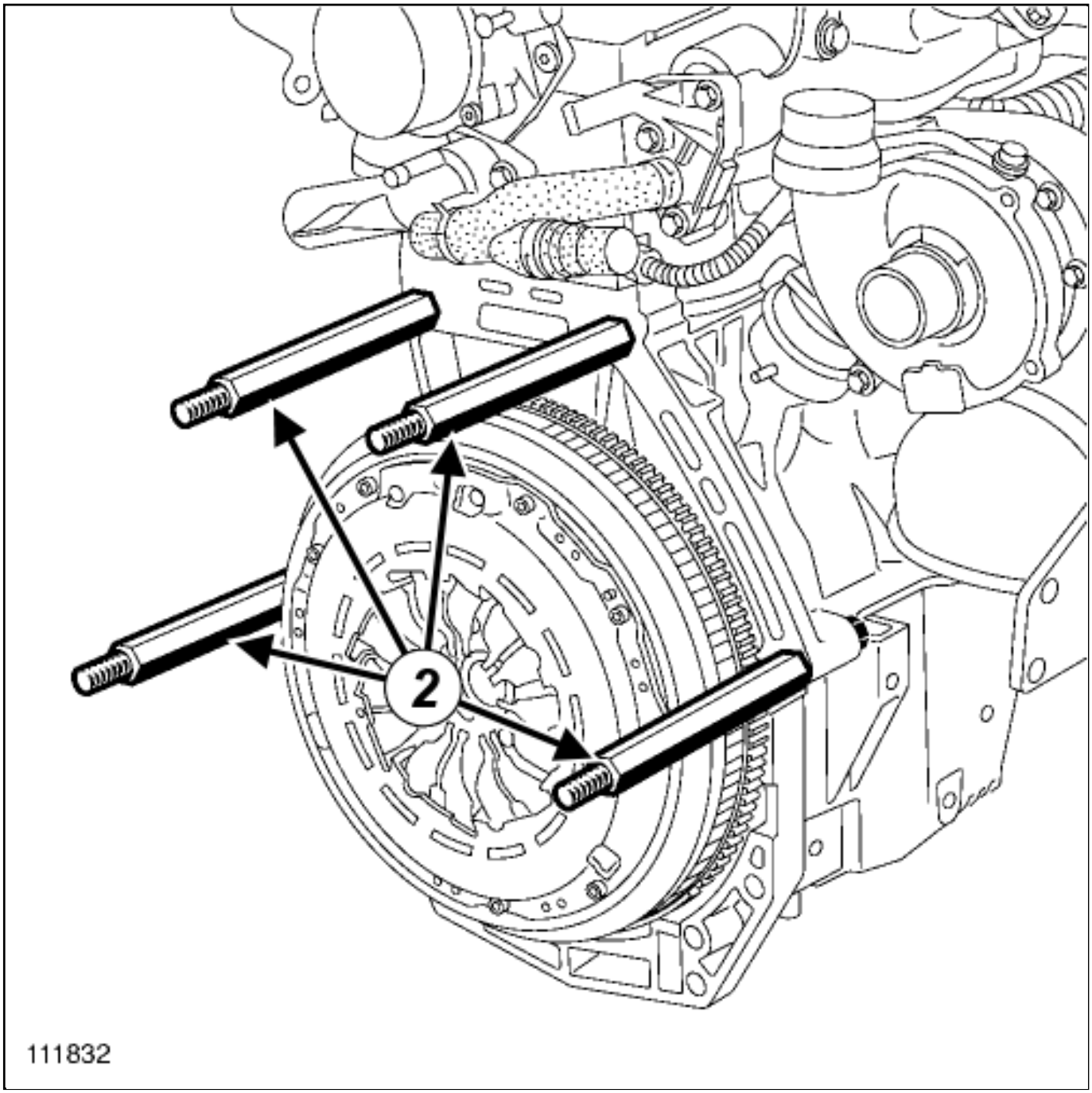
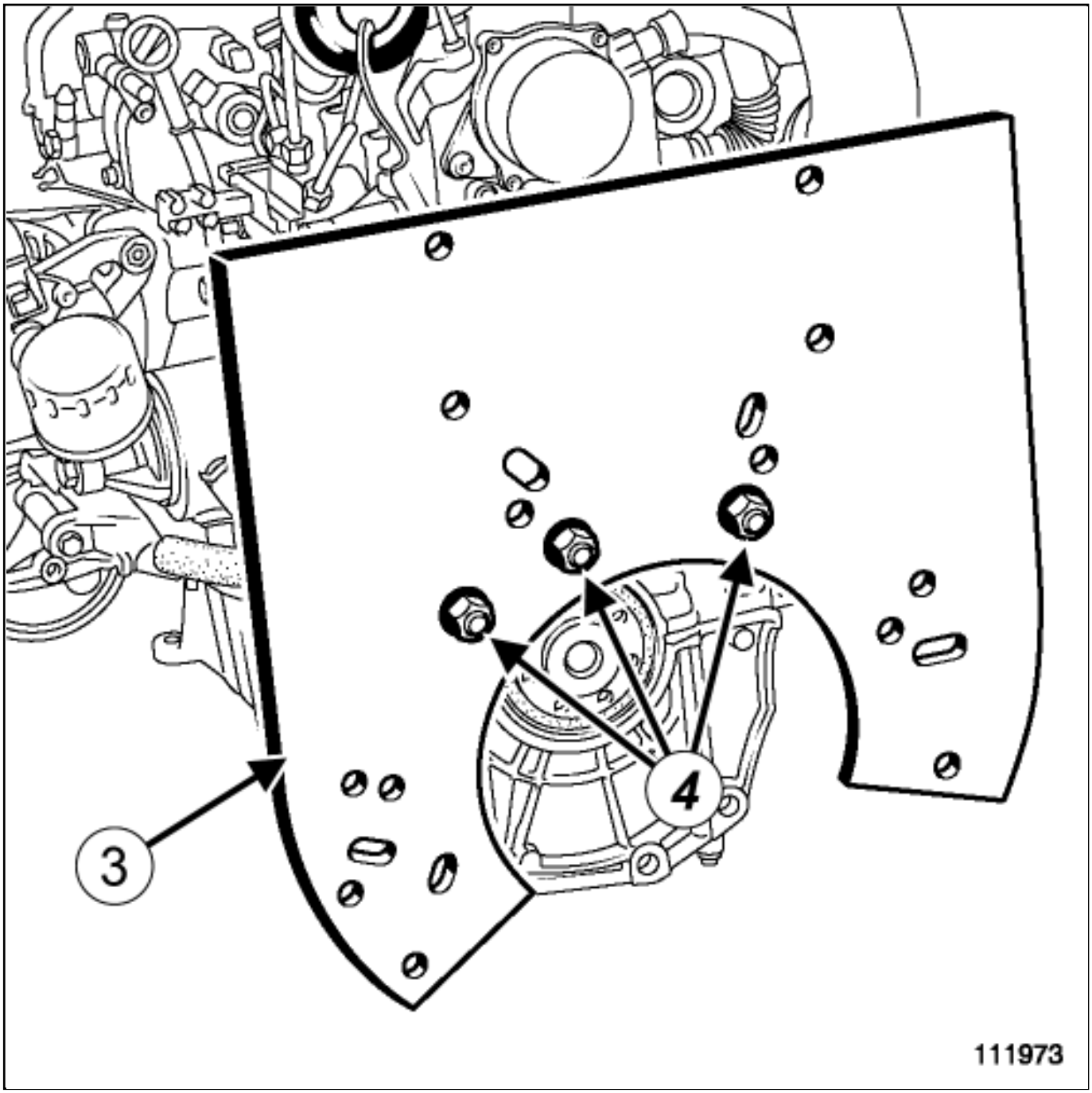


❑ Fit the pins(2) of theEngine support, can be adapted for Desvil stand.(Mot. 1723) to the cylinder block on the flywheel end.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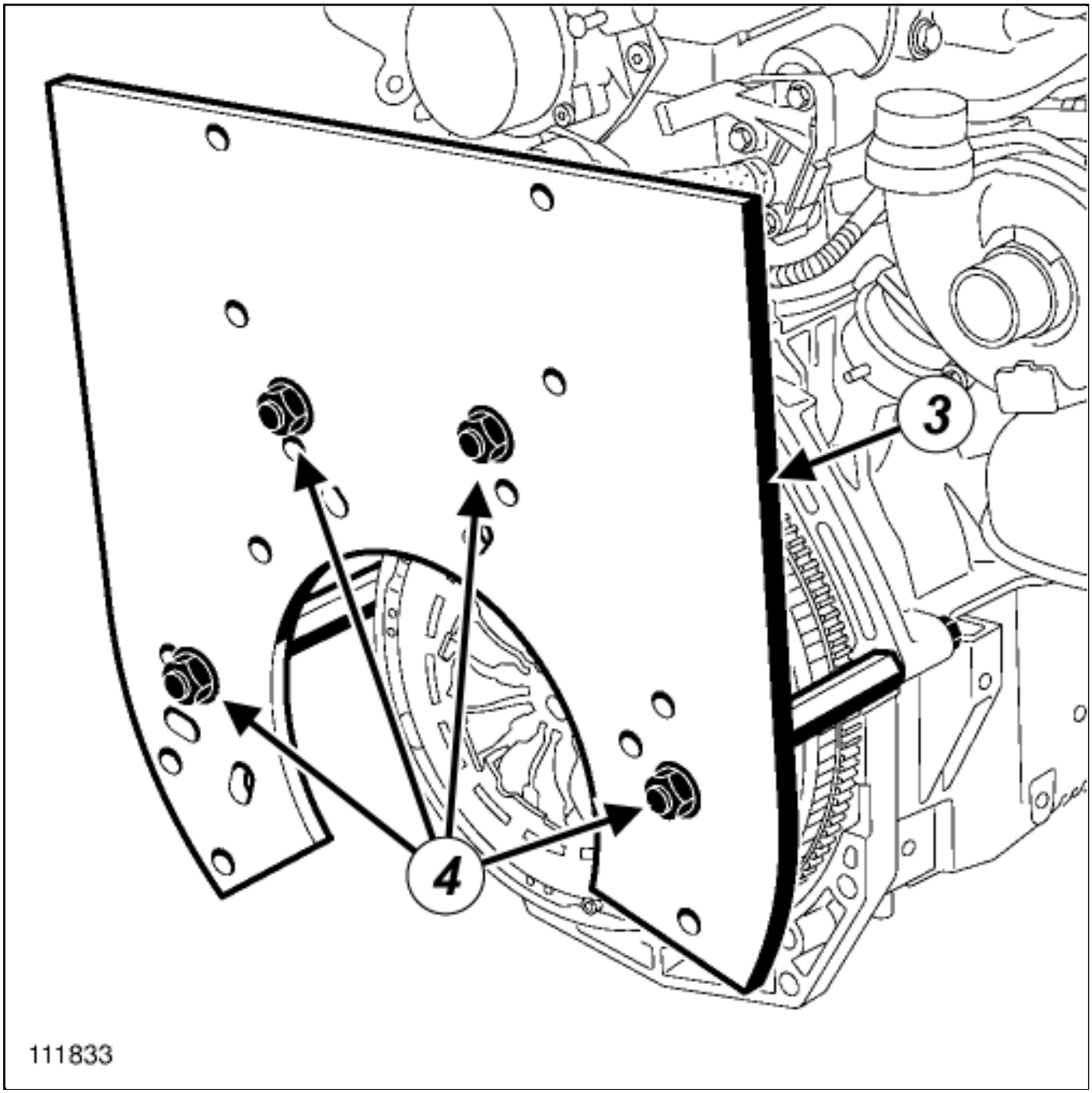
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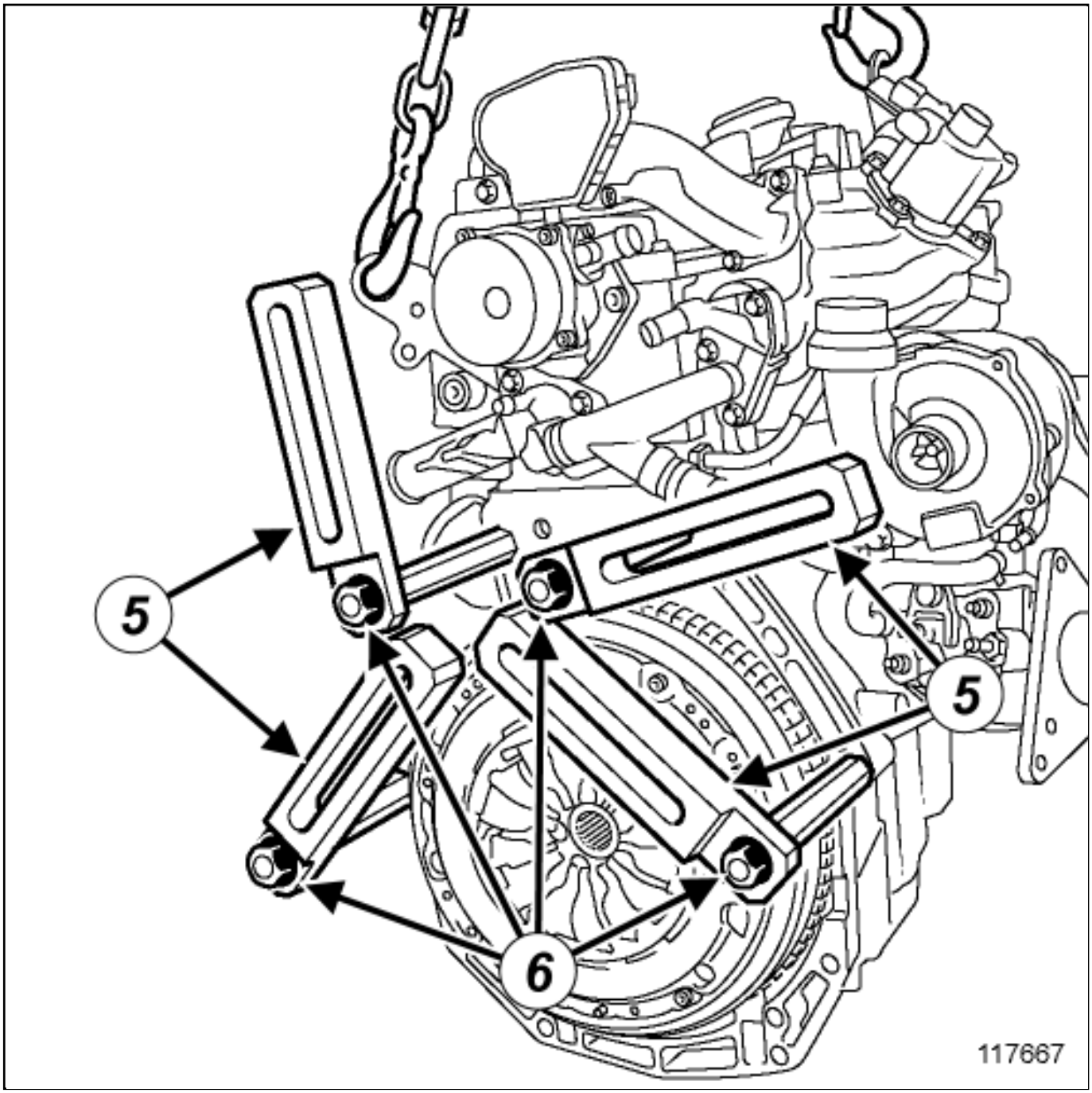


- Fit the support plate(3) of the toolEngine support, can be adapted for Desvil stand.(Mot. 1723) on the pins (holes 5, 6 and 7or 1, 2, 10 and 12) or fit the retaining bars(5) of the component supporton the pins.

- Tighten the pin nuts(4) on the stand plate or fit without tightening the nuts(6) of the retaining bars.

2- FITTING THE ENGINE ON THE SUPPORT FITTED WITH MOT. 792-03 (OIL FILTER END)

Note:

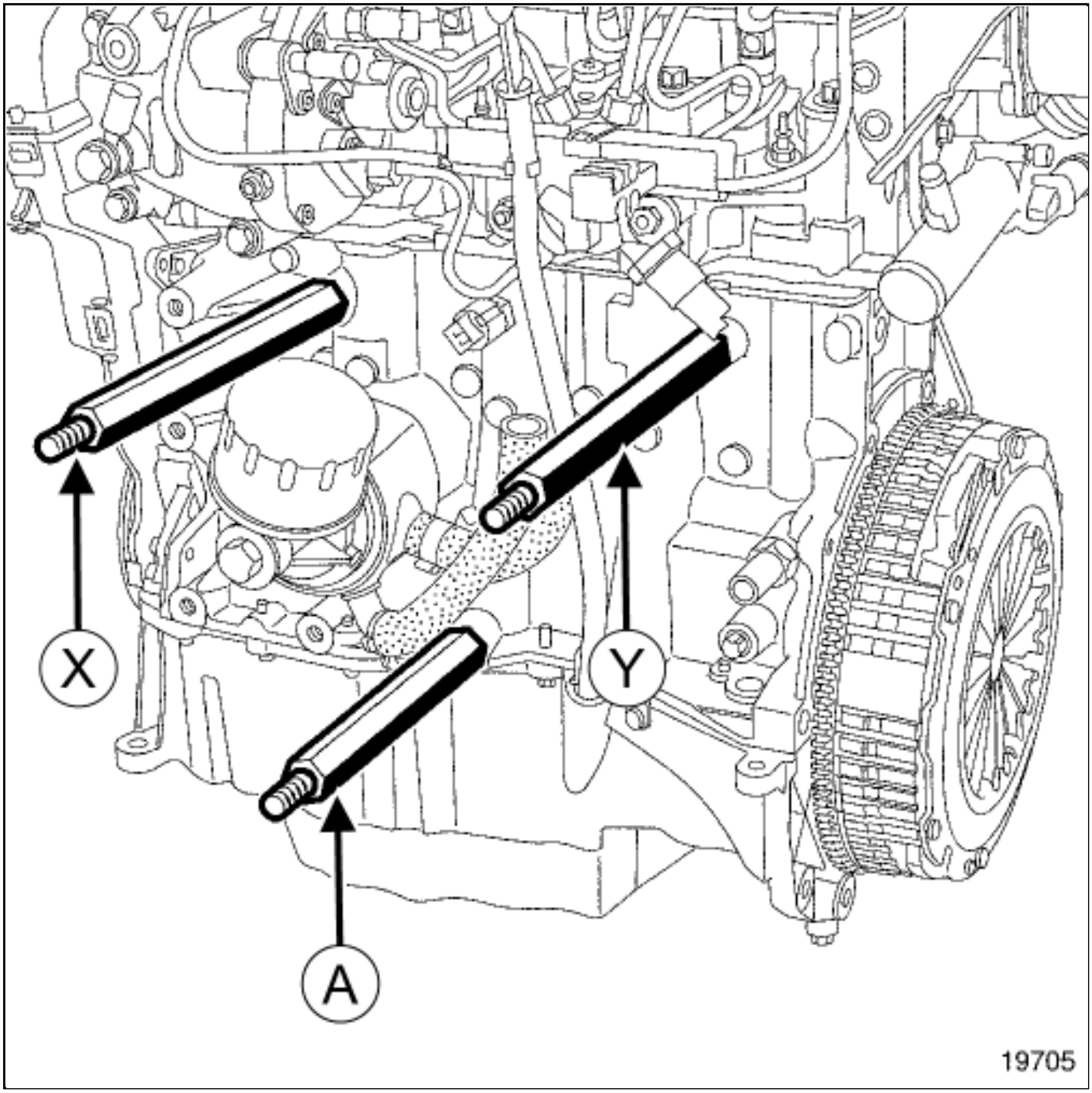
This fitting operation only concerns K9K 260-262-270-272-700-702-704-706-710-722-750-752-790-794 engines.

Remove:

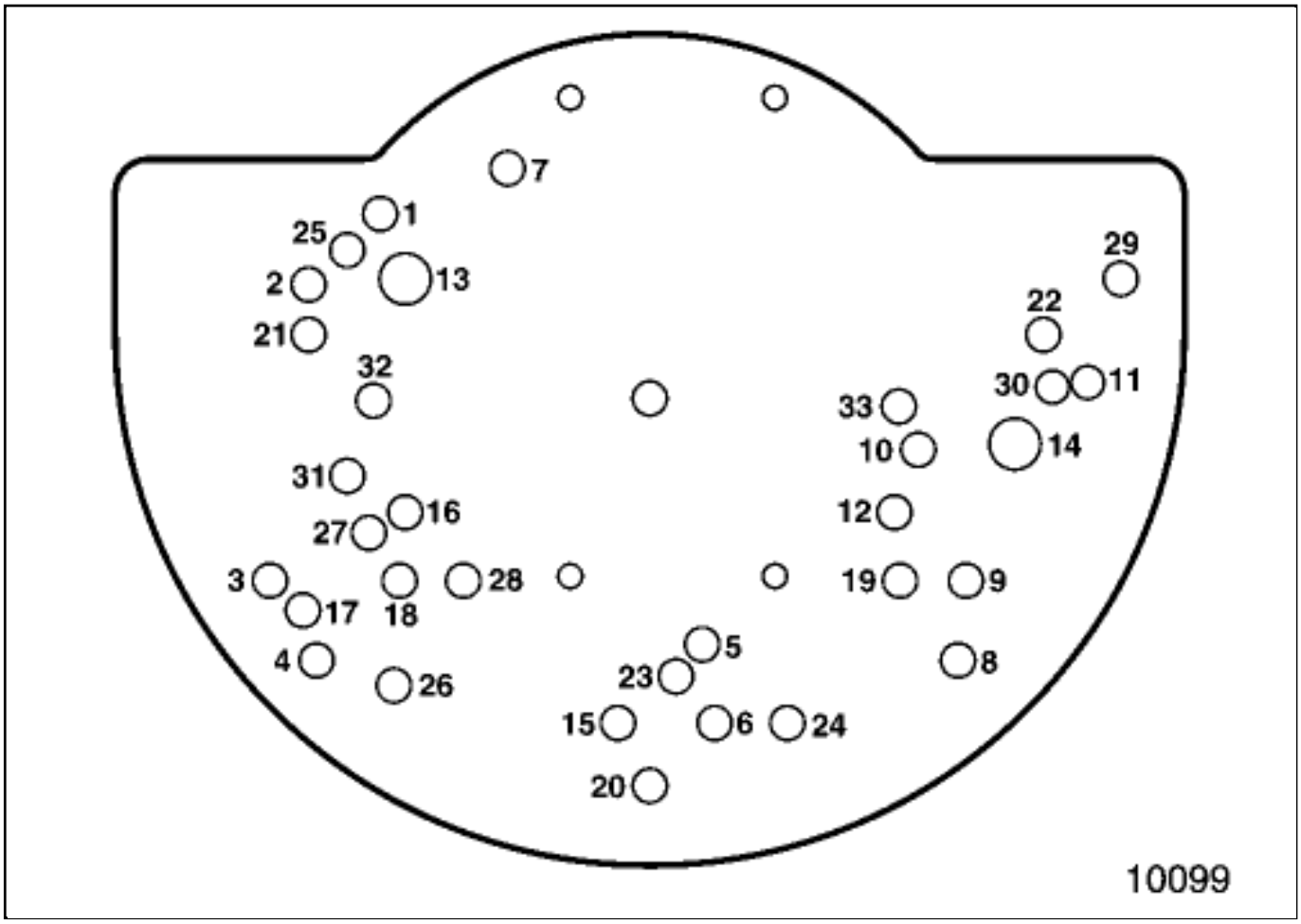
- the accessories belt **Accessories belt: Removal - Refitting** ,
- the alternator **Alternator: Removal - Refitting** .

Remove:

- the multifunction support **Multifunction support: Removal - Refitting** ,
- the coolant pump inlet pipe **Coolant pump inlet pipe: Removal - Refitting** .



- Fit the support studs(X) , (Y) of thePins X and Y for use with adapter pin A on DESVIL stand(Mot. 1378) and the support stud(A) of theEngine support plate for Desvil engine stand(Mot. 792-03) to the cylinder block.

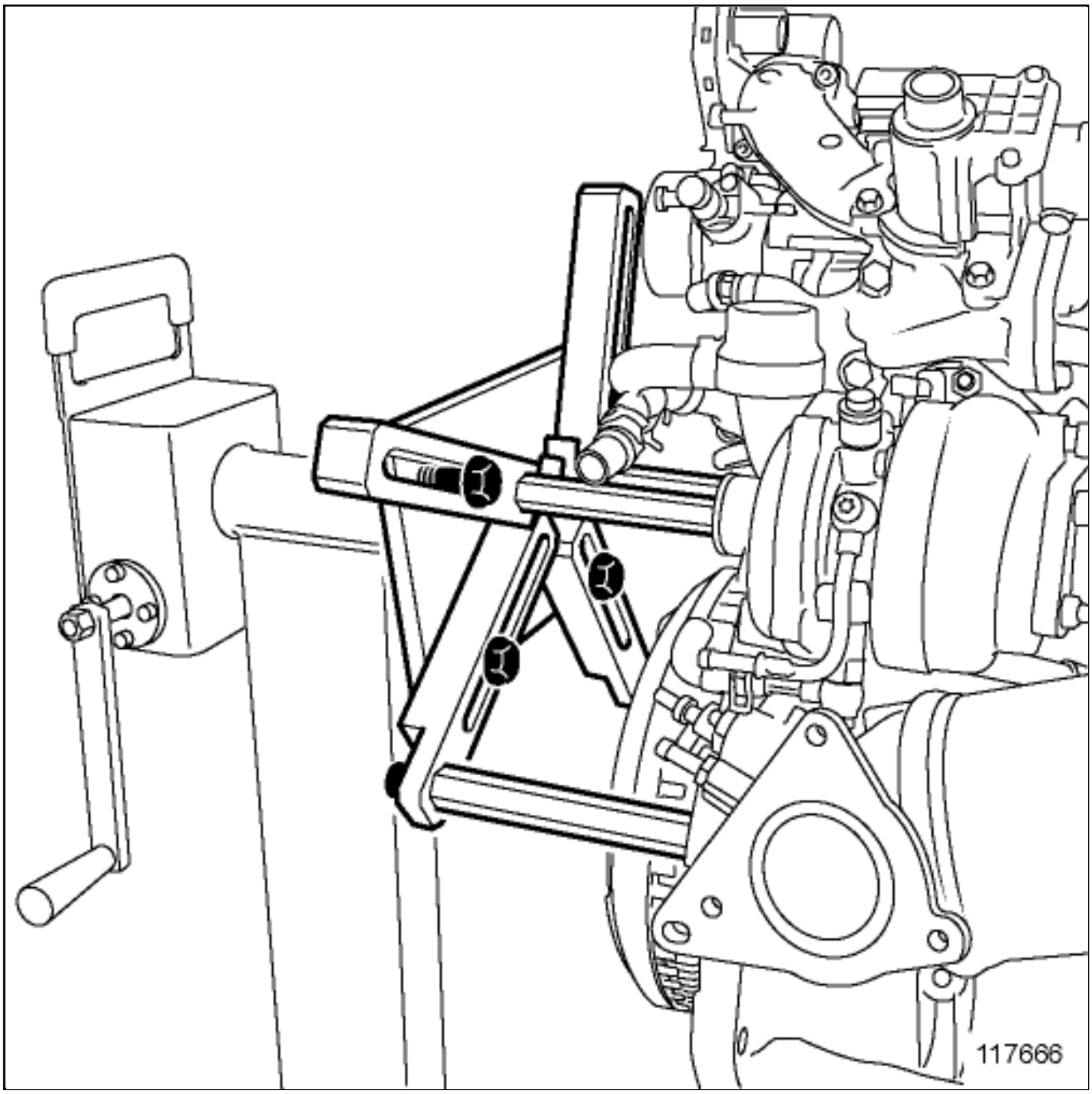


Position the plate ofEngine support plate for Desvil engine stand(**Mot. 792-03**) on the engine fitted with the support studs, aligning:

- support stud(**A**) with hole 20of the plate,
- support stud(**X**) with hole 33of the plate,
- support stud(**Y**) with hole 32of the plate.

Tighten the support stud nuts on the stand plate.

2. FITTING THE ENGINE ON THE COMPONENT SUPPORT



Fit the "engine - pins - stand plate" assembly or the "engine - pins - retaining bars" assembly on the component support using a workshop hoist and a load balancer.

Tighten the studs of the stand plate or of the support bars on the component support.

Set the blocks to ensure that the component support does not move.

Remove the load balancer.

3. OPERATION FOR REMOVING THE ENGINE FROM COMPONENT SUPPORT

Support the "engine - pins - stand plate" assembly or the "engine - pins - retaining bars" assembly on the component supportusing the workshop hoistand the load balancer.

Remove the studs of the mounting plate or of the retaining bars from the component support.

Separate the "engine - pins - stand plate" assembly or the "engine - pins - retaining bars" assembly from the component supportusing the workshop hoistand the load balancer.

4. FINAL OPERATION

Remove:

- the support stud nuts on the stand plate or the retaining bar nuts,
- the stand plate or the retaining bars.

1- ENGINE SECURED ON THE FLYWHEEL END)

Remove the pins of theEngine support, can be adapted for Desvil stand.(**Mot. 1723**) .

Note:

For engines which have a starter located on the exhaust side, the flywheel must only be refitted after the engine has been removed from the engine stand.

Refit (if they have been removed):

- the flywheelFlywheel: Removal - Refitting ,
- the flywheel locking toolFlywheel locking tool.(Mot. 582-01) or Flywheel locking tool.(Mot. 1677) ,
- the clutch plate and pressure platePressure plate - Disc: Removal - Refitting ,
- the crankshaft accessories pulleyCrankshaft accessories pulley: Removal - Refitting .

Remove the flywheel locking toolFlywheel locking tool.(Mot. 582-01) or Flywheel locking tool.(Mot. 1677) on the lower housing.

Refit the accessories beltAccessories belt: Removal - Refitting .

Connect the gearbox to the engineManual gearbox: Removal - Refitting (21A, Manual gearbox).

Refit the "engine and gearbox" assemblyEngine - gearbox assembly: Removal - Refitting .

2- ENGINE SECURED ON OIL FILTER SIDE)

Remove the pins from thePins X and Y for use with adapter pin A on DESVIL stand(Mot. 1378) and the pin from theEngine support plate for Desvil engine stand(Mot. 792-03) .

Refit:

- the coolant pump inlet pipeCoolant pump inlet pipe: Removal - Refitting ,
- the multifunction supportMultifunction support: Removal - Refitting .

Refit:

- the alternator Alternator: Removal - Refitting ,
- the accessories belt Accessories belt: Removal - Refitting .

Connect the gearbox to the engine Manual gearbox: Removal - Refitting (21A, Manual gearbox).

Refit the "engine and gearbox" assembly Engine - gearbox assembly: Removal - Refitting .

ENGINE WIRING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
indelible pencil

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 88A, Wiring harness, Wiring: Precautions for the repair) ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

CAUTION

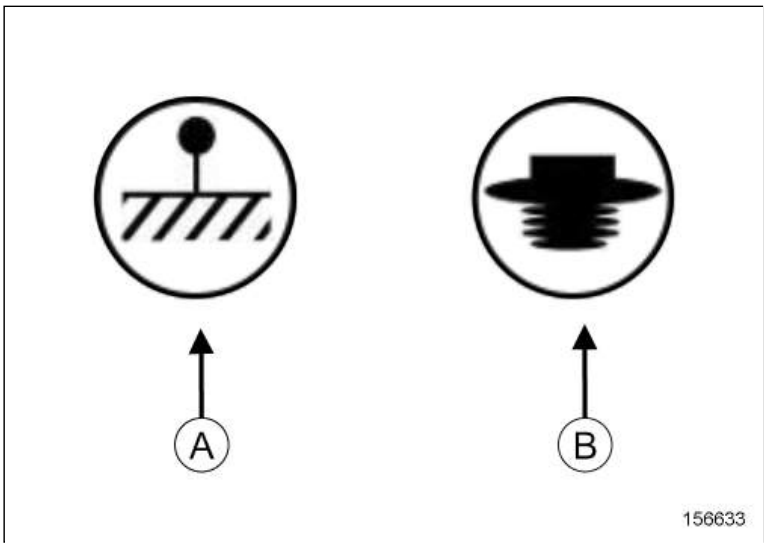
To prevent damage to the wiring harness when refitting, observe the original routing.

CAUTION

Consult the disconnection procedures (see Connectors: Disconnection and reconnection) (Technical Note 6015A, 88A, Wiring) to prevent damaging the connectors.

Note:

For information on instrument connectors (see Visu-Schéma).



(A) Symbol for an earth

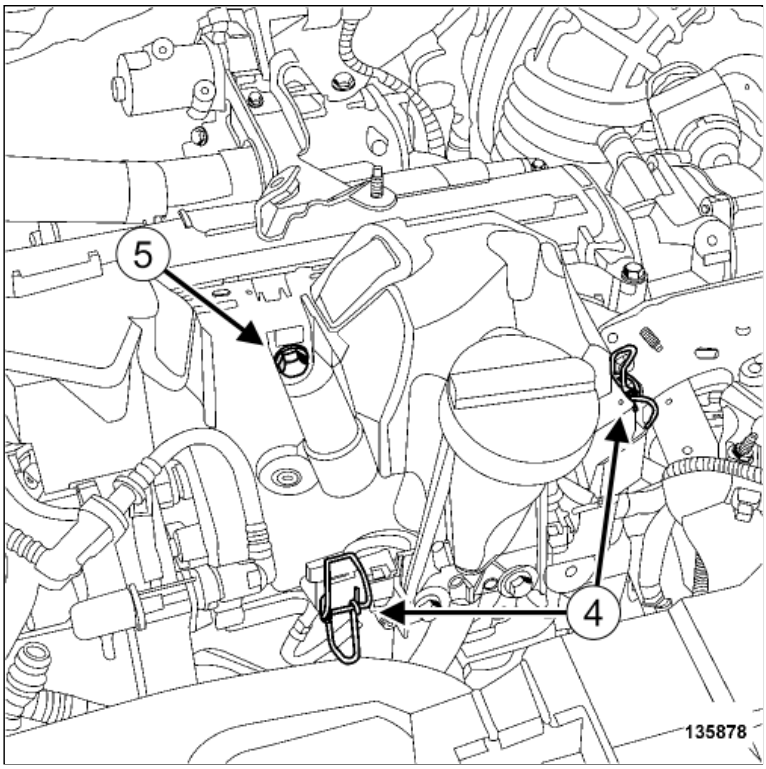
(B) Symbol for a mounting (clip, clamp, etc.)

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Switch off the ignition.
- Remove:
  - the batteryBattery: Removal - Refitting ,
  - the engine undertray bolts,
  - the engine undertray,
  - the front section of the front wheel arch linerExterior body front trim assembly: Exploded view ,
  - the air filter outlet ductAir filter unit: Removal - Refitting ,
  - the intercooler inlet pipeIntercooler air inlet pipe: Removal - Refitting .

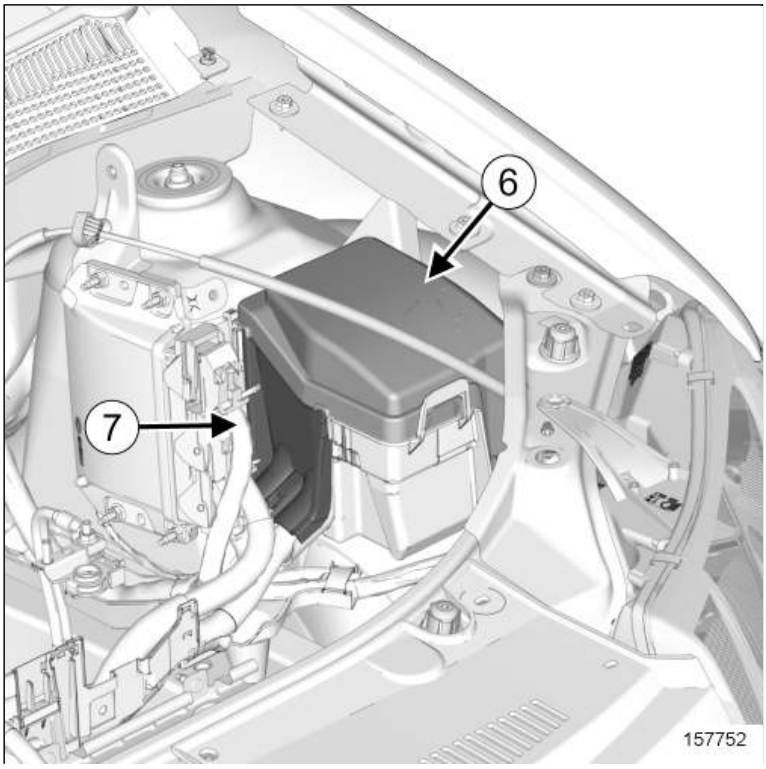
Disconnect the intercooler air outlet pipe from the damper valve Intercooler air outlet pipe: Removal - Refitting .



Unclip the injector rail protector cover at(4) .

Remove:

- the bolt(5) from the injector rail protector cover,
- the injector rail protector cover,



Remove:

- the cover(6) of the engine compartment fuse and relay box,
- the closure panel component(7) of the engine compartment fuse and relay box.

Note:

Mark the position of the fuses and relays before removal.

- Unclip the fuse holders and the engine harness relays from their mountings.

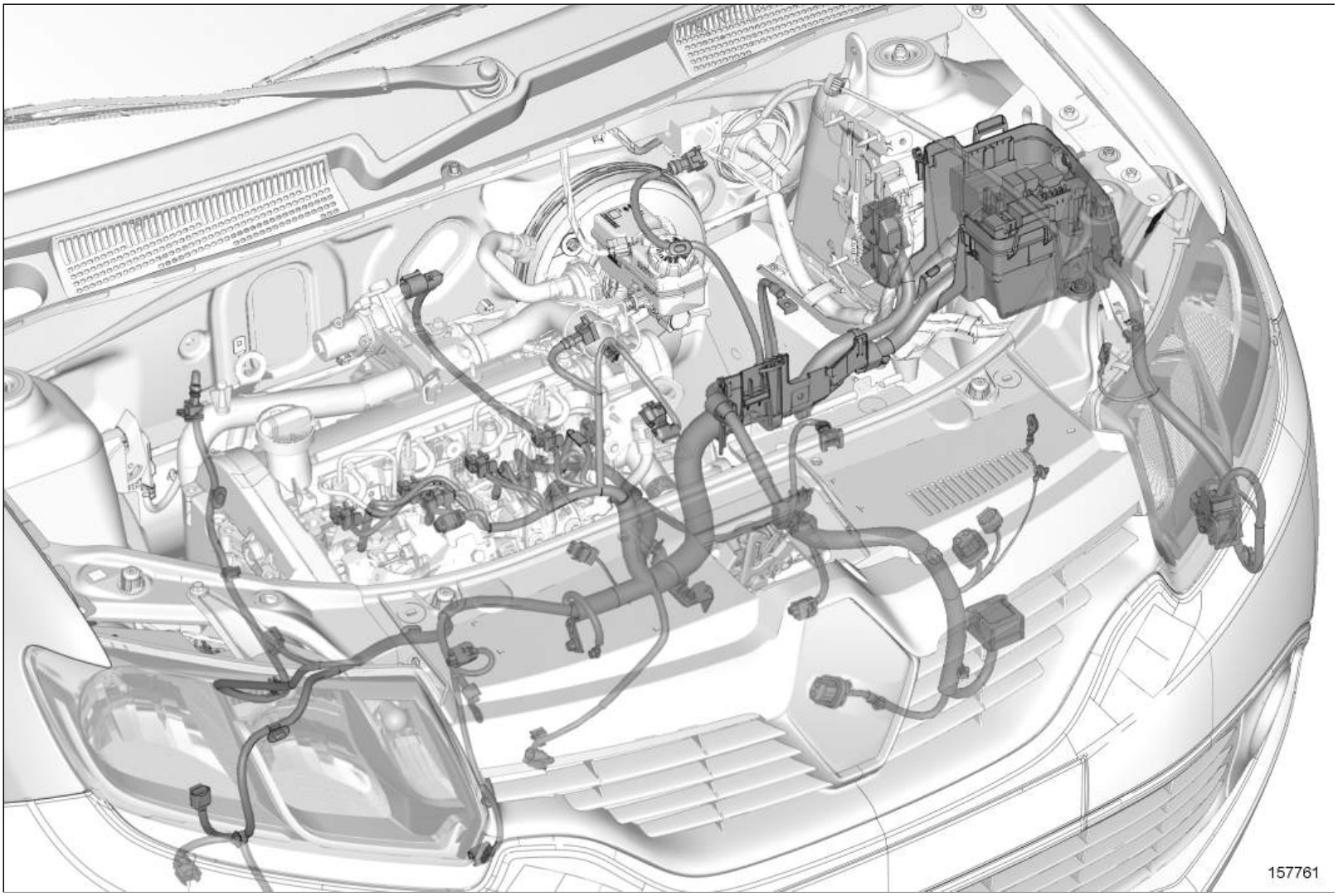
1- IF REPLACING THE ENGINE WIRING

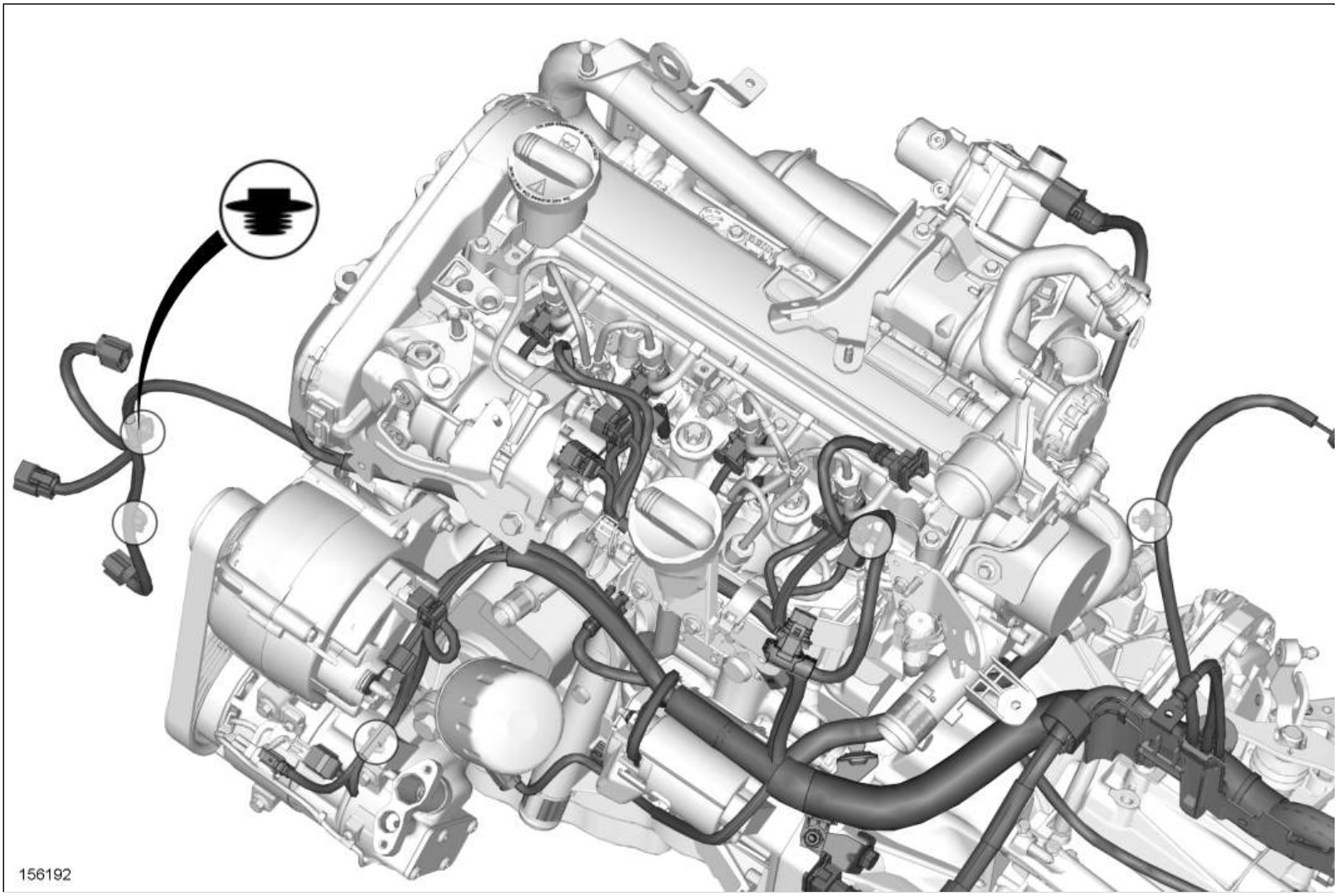
- Remove the fuses.

2. REMOVAL OPERATION

CAUTION

To prevent any risk of noise, premature wear, short circuits, etc. after the refitting operation, mark the wiring routing and how to connect the connectors.

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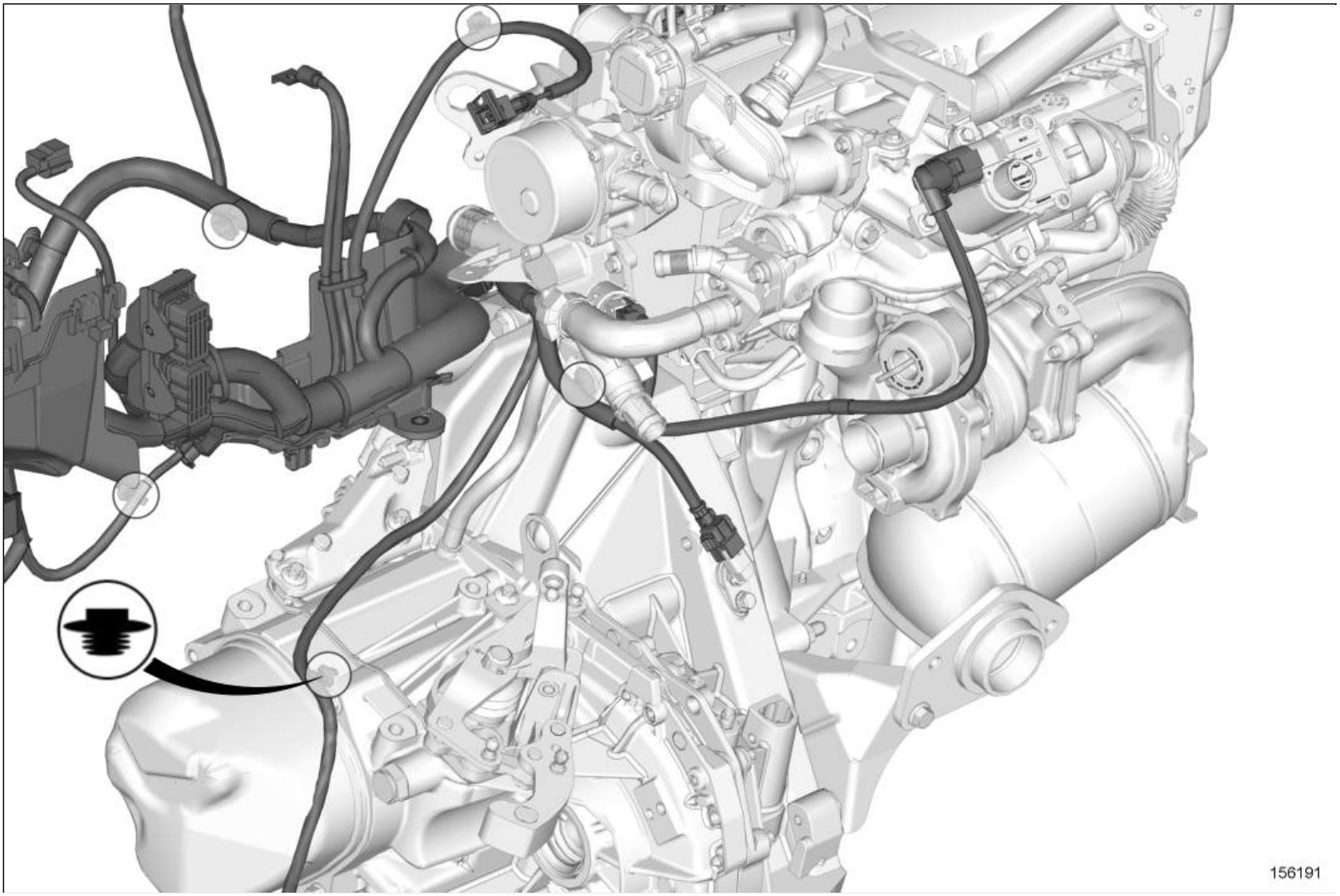
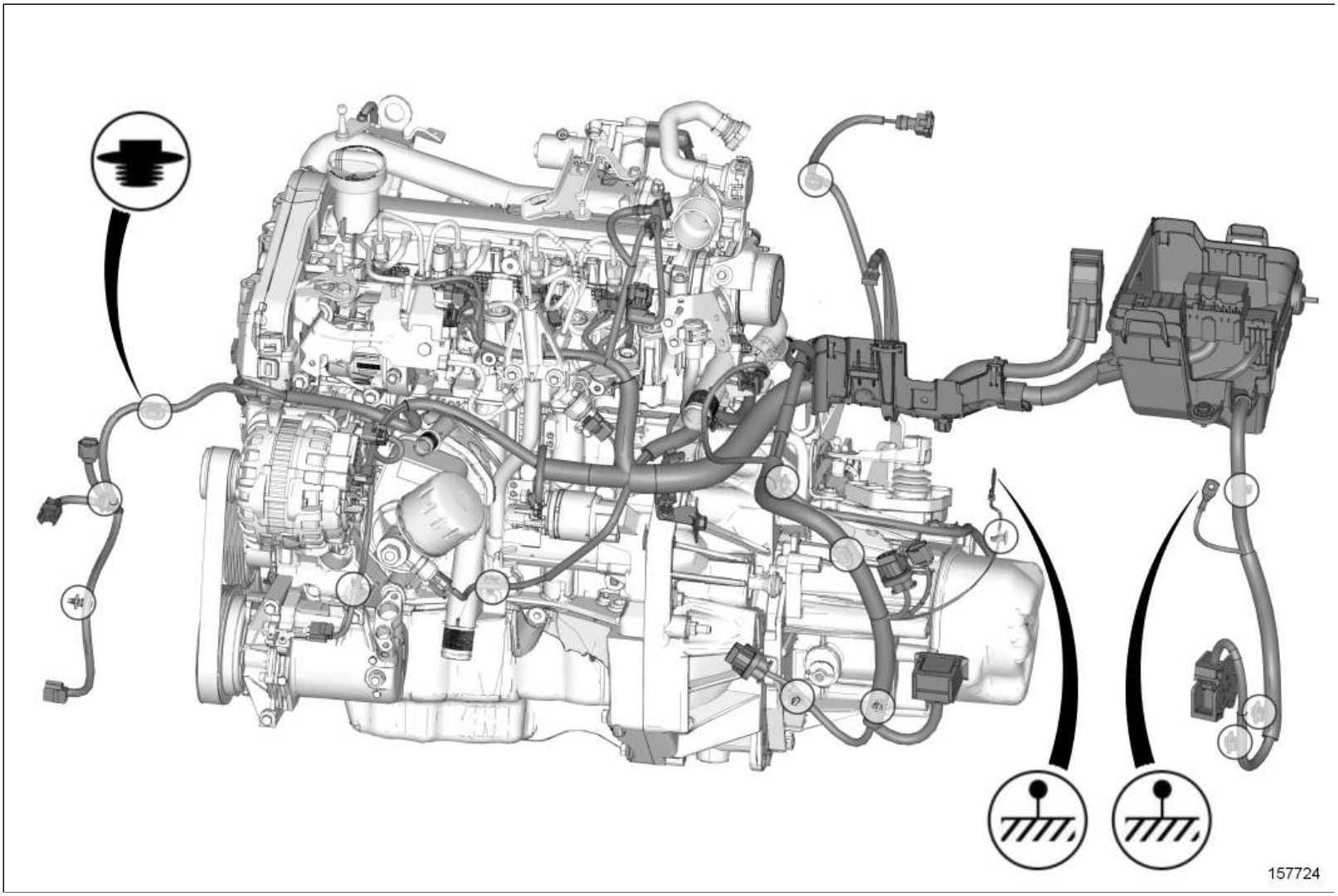


- Disconnect all the connectors.
- Unclip the engine wiring where indicated.

Note:

Before removing the earth terminal, mark its position using an indelible pencil.



- Disconnect all the connectors.
- Unclip the engine wiring where indicated.

Note:

Before removing the earth terminal, mark its position using an indelible pencil.

- Remove the earth terminals.

CAUTION

To prevent any damage during the removal operation, check that the wiring is free from its mountings (retaining clip, plastic clip, adhesive tape, connector, etc.).

- Remove the engine wiring.

REFITTING

1. REFITTING PREPARATION OPERATION

1- IF REPLACING THE ENGINE WIRING

Refit the fuses.

If replacing with a complete wiring harness, lock the unused connectors (see Connectors: Sealing and locking) (Technical Note 6015A, 88A, Wiring).

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Note:

Refit the earth terminal, aligning the indelible marks.

When reassembling, improper positioning of the earth terminal casing could result in damage to the earth terminal or earth wiring.

Torque tighten the earth cable nuts8 N.m.

Connect the battery**Battery: Removal - Refitting** .

Switch on the ignition.

Connect the Diagnostic tool.

Check that there are no faults.

ENGINE-GEARBOX UNIT SUPPORT ASSEMBLY: EXPLODED VIEW

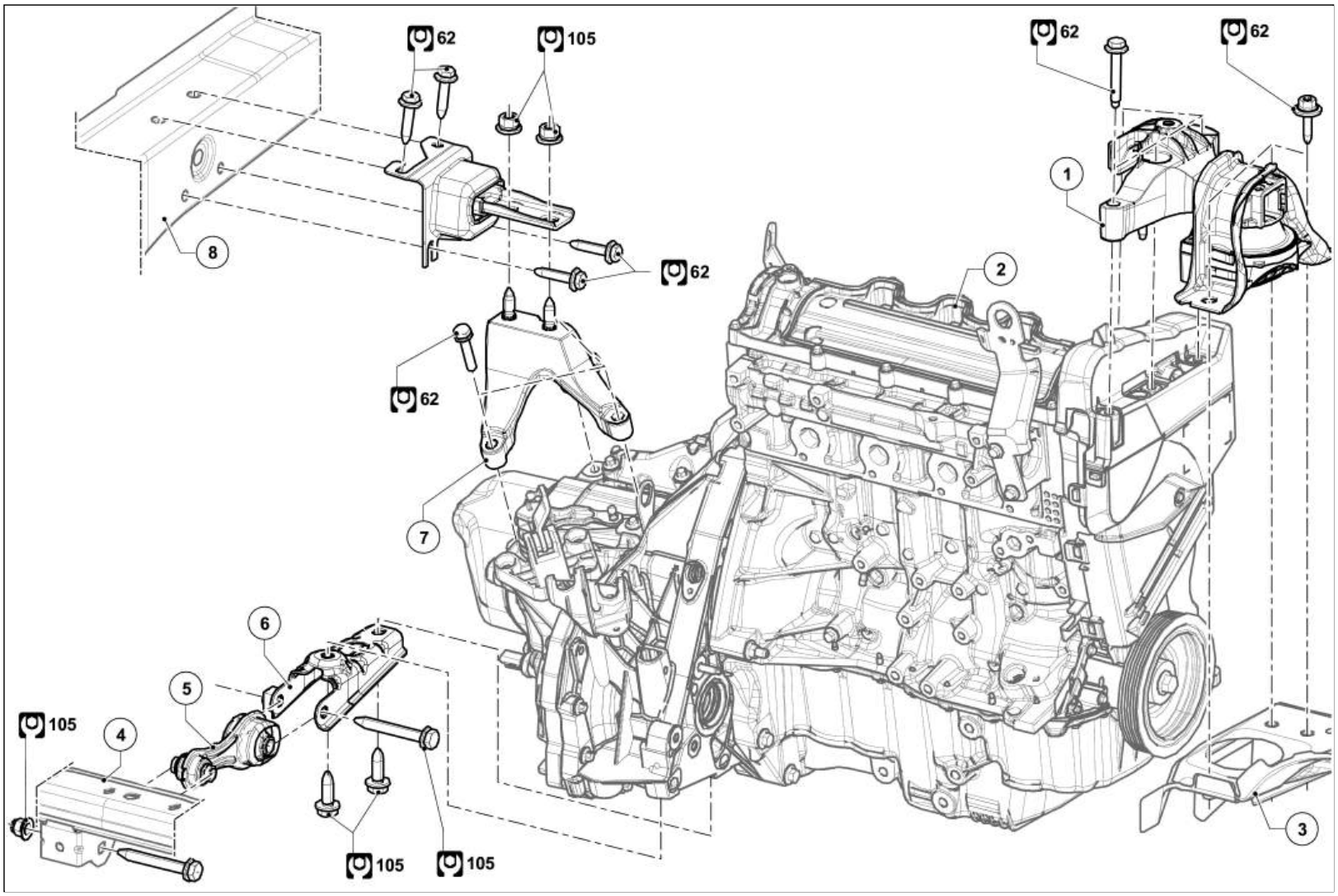


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

1	Cylinder head suspended mounting	(see 19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting)
2	Engine - gearbox assembly	(see **Engine - gearbox assembly: Removal - Refitting**)
3	Front side member	
4	Front axle subframe	Front axle assembly: Exploded view
5	Rear rubber pad	(see 19D, Engine mounting, Engine-gearbox unit support assembly: Exploded view)
6	Engine tie-bar mounting	(see 19D, Engine mounting, Lower engine tie-bar: Removal - Refitting)
7	Gearbox support	(see 19D, Engine mounting, Left-hand suspended engine mounting: Removal - Refitting)
8	Front side member	

XSL version : 3.02 du 22/07/11

EVAPORATOR: CLEANING

Note, one or more warnings are present in this procedure

CAUTION

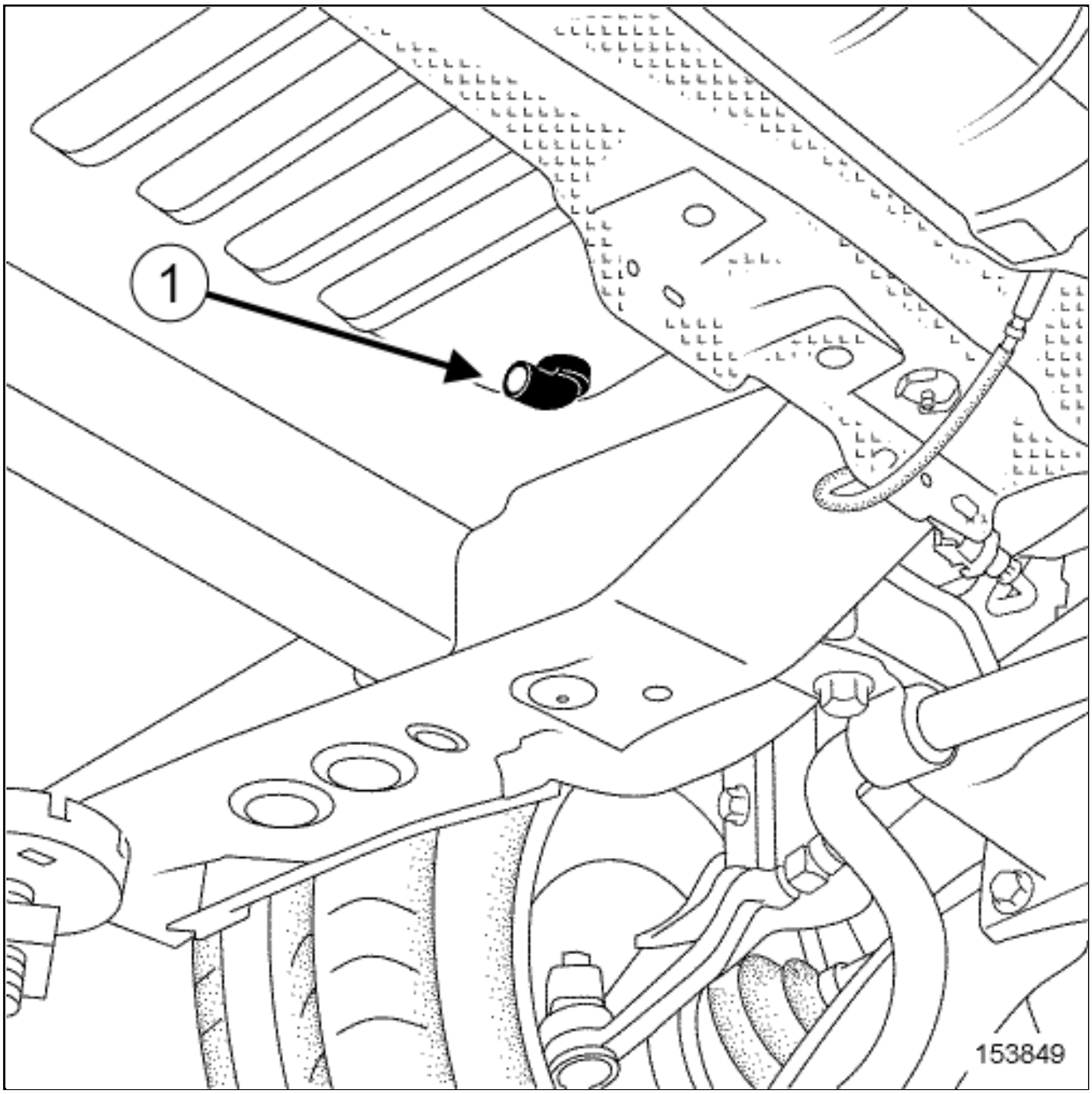
Do not spray the cleaner via the air inlet, as this could damage the fan assembly.

CLEANING

1. CLEANING PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove the cabin filter Passenger compartment heating and ventilation assembly: Exploded view .

2. CLEANING OPERATION



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Apply the air conditioning cleaner Vehicle: Parts and consumables for the repair through the condensation evacuation hole(1) located under the vehicle, using an extension piece.

- Leave the product to work for 15 minutes.

-

Activate the low speed motor-driven fan assembly for 5 min.

3. FINAL OPERATION

Refit the cabin filter **Passenger compartment heating and ventilation assembly: Exploded view** .

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XSL version : 3.02 du 22/07/11

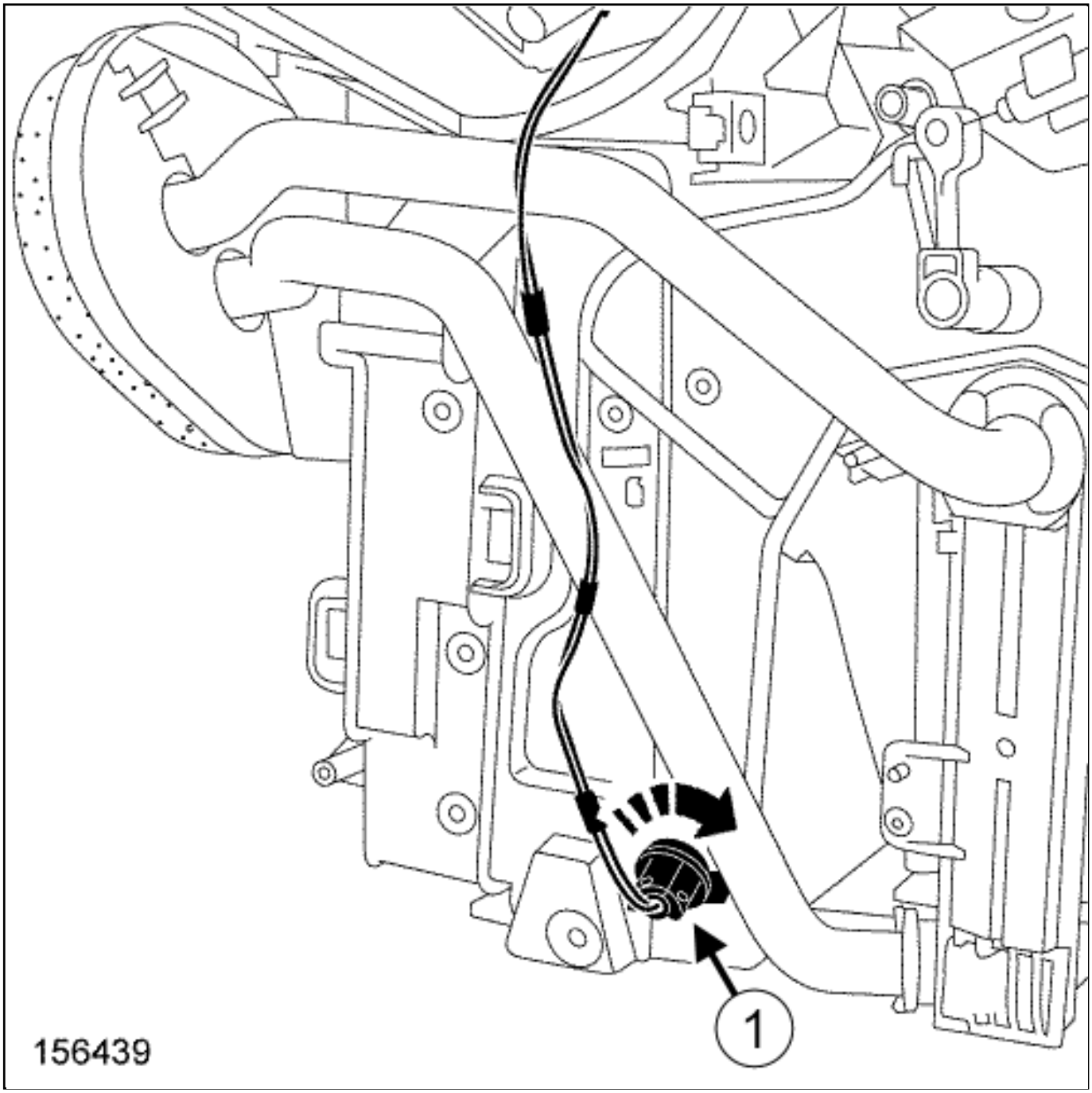
EVAPORATOR SENSOR: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)Passenger compartment heating and ventilation assembly: Exploded view .

REMOVAL

1. REMOVAL OPERATION

- Move aside the soundproofing.



- Remove the evaporator sensor(1) by turning it a quarter of a turn clockwise.

- Cut the wires of the evaporator sensor (see Wiring: Repair) (Technical Note 6015A, 88A, Wiring).

REFITTING

1. REFITTING OPERATION

- Solder the wires of the evaporator sensor (see Wiring: Repair) (Technical Note 6015A, 88A, Wiring).

- Fit the evaporator sensor in its housing.

- Clip on the evaporator sensor by turning it a quarter of a turn anti-clockwise.

2. FINAL OPERATION

- Proceed in the reverse order to removal.

EXHAUST ASSEMBLY UNDER BODY: EXPLODED VIEW

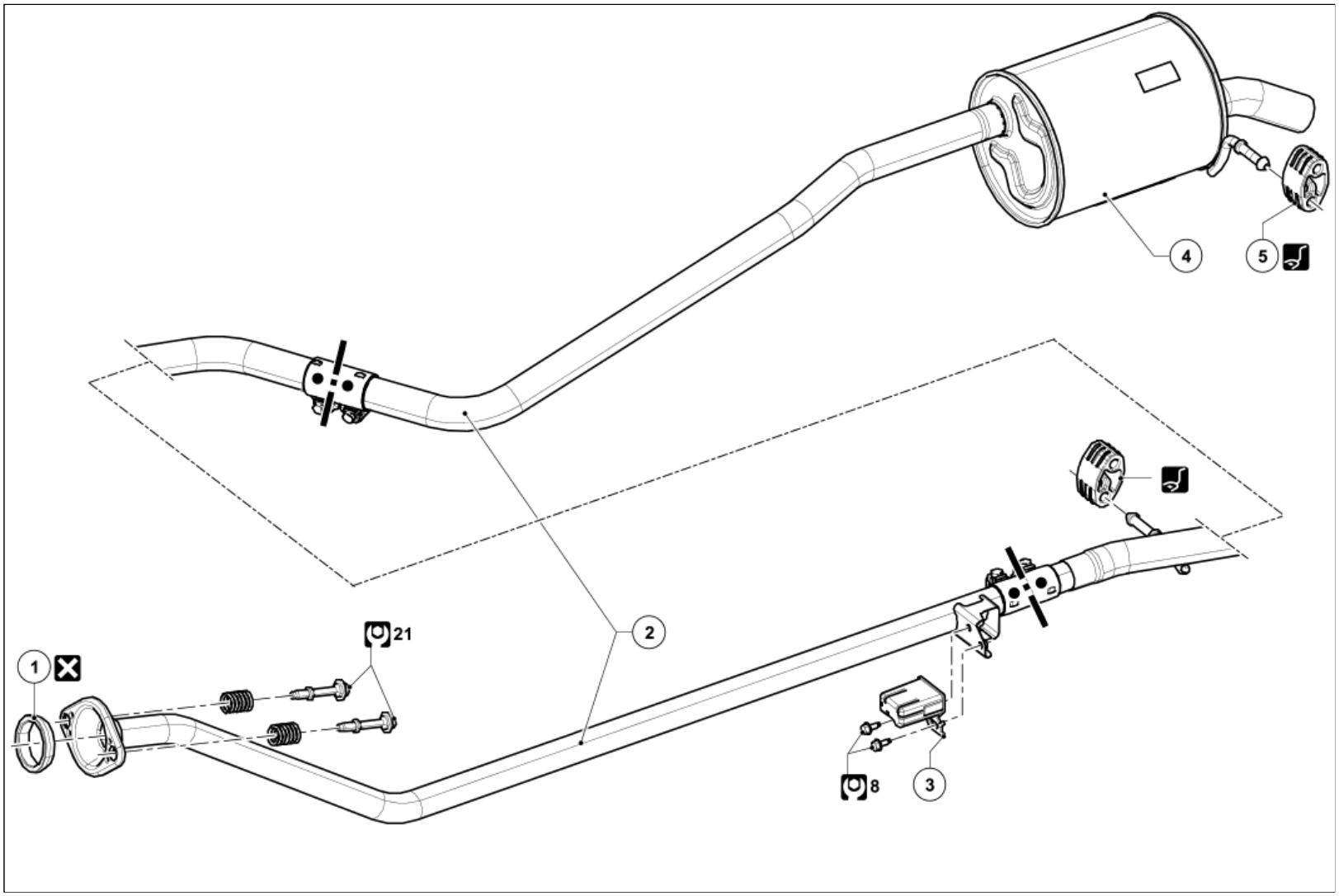


Illustration key: Description Legend .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Outlet seal of turbocharger outlet exhaust gas duct	
2	Intermediate pipe	(see **Intermediate pipe: Removal - Refitting**)
3	Damper	
4	Silencer	(see **Silencer: Removal - Refitting**)
5	Rubber mounting bush of silencer	(Mot. 1857)

EXHAUST GAS COOLER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:
exhaust gas cooler seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

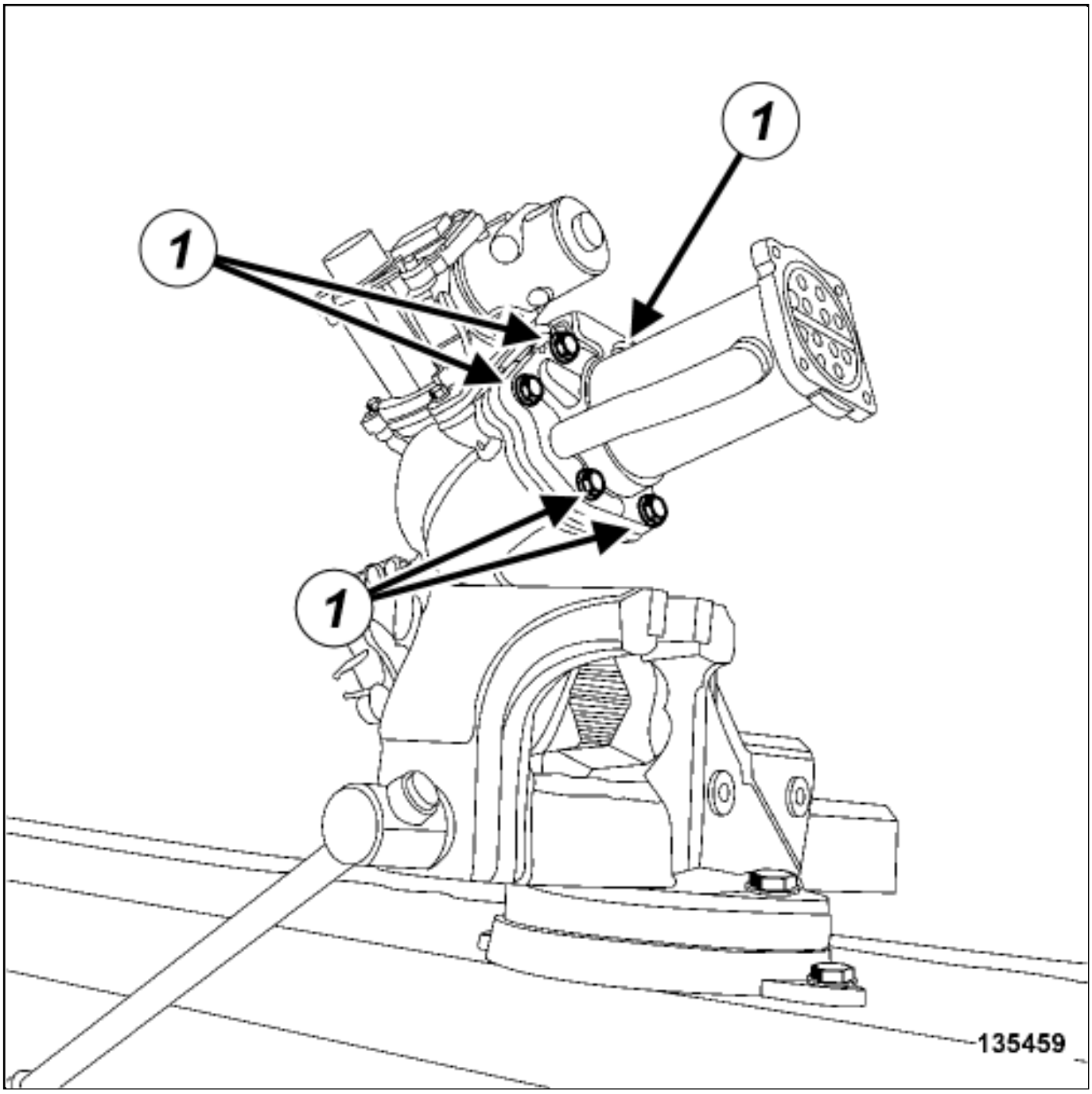
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .
- Disconnect the battery**Battery: Removal - Refitting** .
- Remove:
  - the engine cover,
  - the engine undertray bolts,
  - the engine undertray.
- Remove:
  - the catalytic converter**Catalytic converter: Removal - Refitting** ,
  - the turbocharger air outlet pipe**Intercooler air inlet pipe: Removal - Refitting** .
- Remove:
  - the exhaust gas recirculation rigid pipe**(see 14A, Antipollution, Exhaust gas recirculation rigid pipe: Removal - Refitting)** ,
  - the exhaust gas recirculation assembly**(see 14A, Antipollution, Exhaust gas recirculation assembly: Removal - Refitting)** .

2. REMOVAL OPERATION

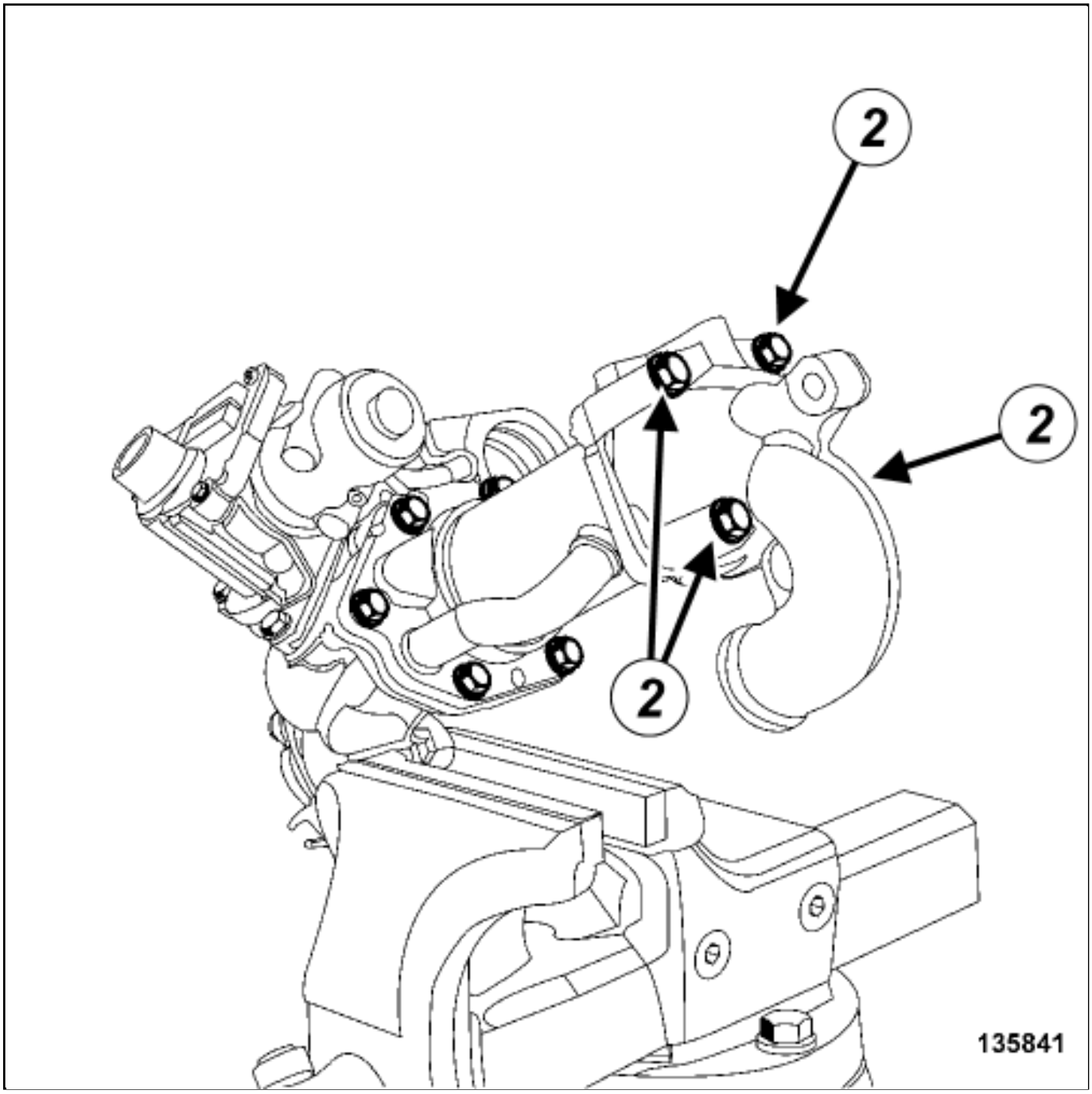
FIRST FITTING



Remove the following on the workbench:

- the exhaust gas cooler bolts(1) from the exhaust gas cooler mounting at the gearbox end,
- the exhaust gas cooler from the exhaust gas cooler mounting at the gearbox end,
- the exhaust gas cooler seal at the gearbox end.

SECOND FITTING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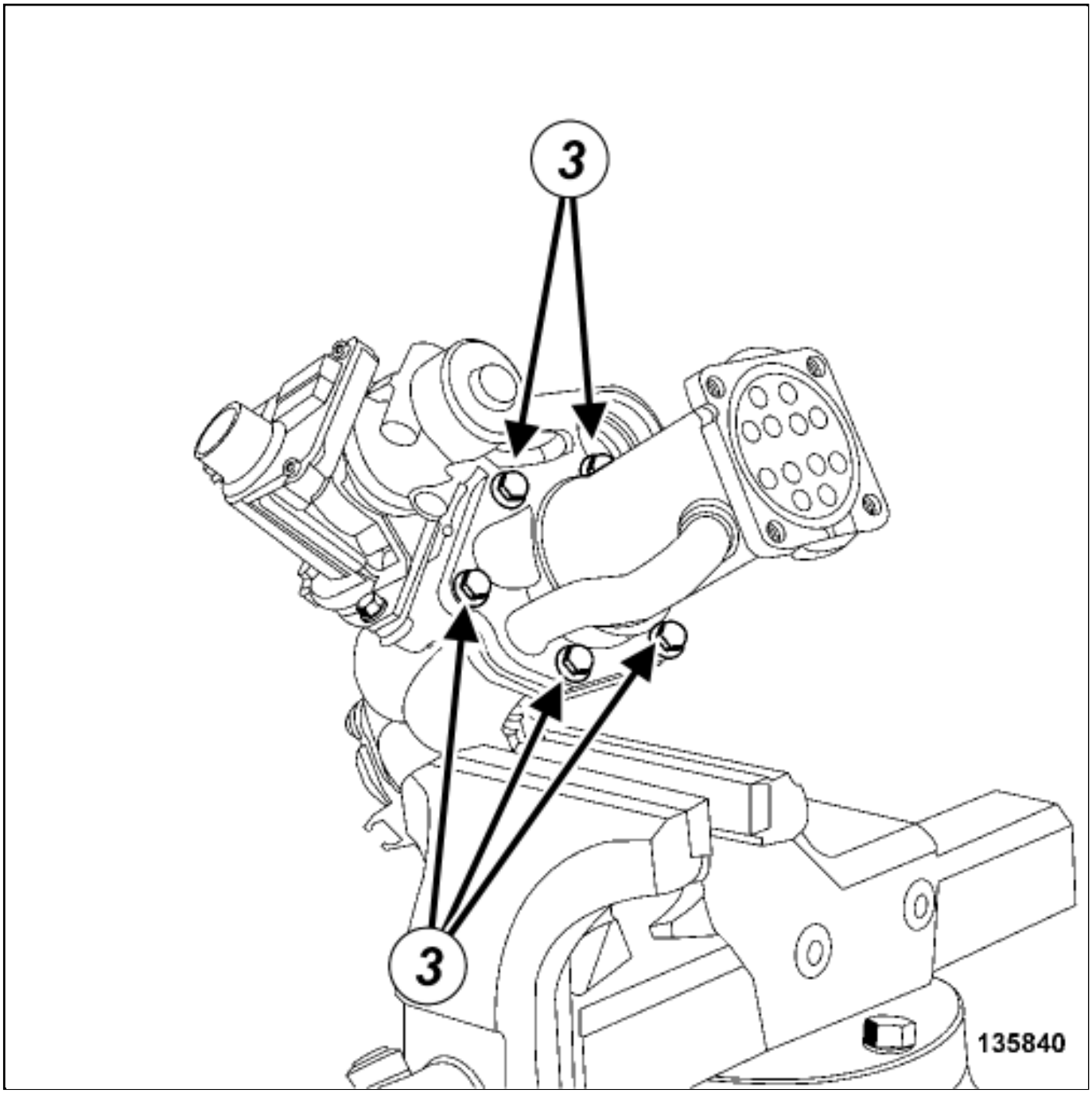
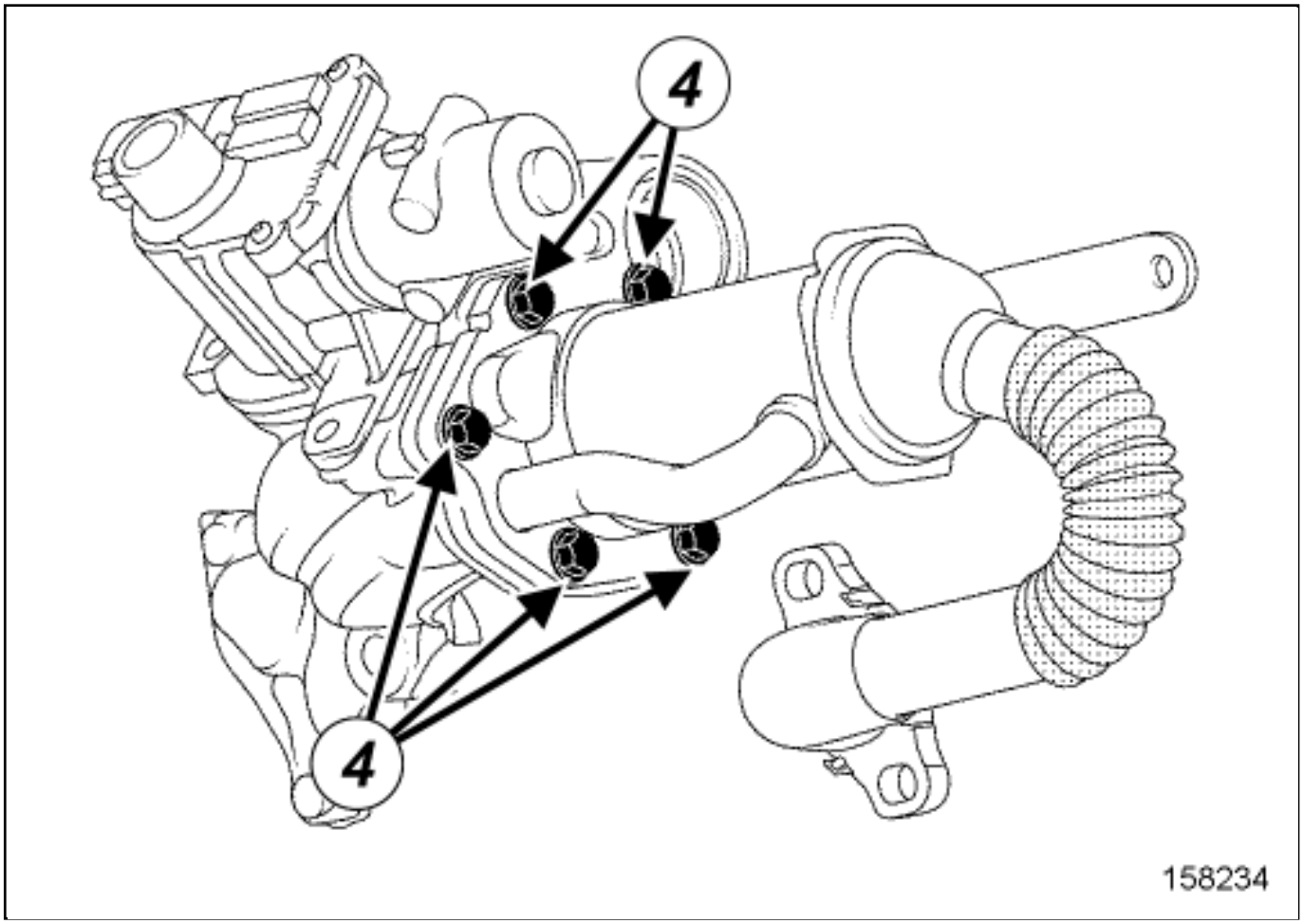


Remove:

- the exhaust gas cooler mounting bolts(2) at the timing end from the exhaust gas recirculation assembly,
- the exhaust gas cooler mounting at the timing end from the exhaust gas recirculation assembly,
- the exhaust gas cooler mounting seal at the timing end,
- the exhaust gas cooler bolts(3) from the exhaust gas cooler mounting at the gearbox end,
- the exhaust gas cooler from the exhaust gas cooler mounting at the gearbox end,
- the exhaust gas cooler seal at the gearbox end.

THIRD FITTING



- Remove the following on the workbench:
  - the exhaust gas cooler bolts(4) from the exhaust gas cooler mounting,
  - the exhaust gas cooler from the exhaust gas cooler mounting,
  - the exhaust gas cooler seal.

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: **exhaust gas cooler seal**.

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

Use grey abrasive pads Vehicle: Parts and consumables for the repair to clean:

- the exhaust gas cooler joint faces, if they are being reused,
- the joint face of the exhaust gas cooler mounting on the gearbox end.

Note:

Take care not to damage the joint faces of the exhaust gas cooler on its mounting to prevent any coolant leaks.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

Use surface cleaner Vehicle: Parts and consumables for the repair and clean clothsto degrease:

- the exhaust gas cooler joint faces, if they are being reused,
- the joint face of the exhaust gas cooler mounting on the gearbox end.

2. REFITTING OPERATION

On the workbench, refit:

- the exhaust gas cooler fitted with a new seal on the exhaust gas cooler mounting at the gearbox end,
- fit without tightening the exhaust gas cooler bolts on the exhaust gas cooler mounting at the gearbox end,
- the exhaust gas cooler mounting at the timing end on the exhaust gas recirculation assembly,
- fit without tightening the bolts of the exhaust gas cooler mounting at the timing end on the exhaust gas recirculation assembly.

Note:

The exhaust gas cooler must be able to move in relation to the exhaust gas recirculation mounting and the exhaust gas recirculation rigid pipe so that it can be adjusted correctly.

Fit the exhaust gas recirculation assembly on the cylinder head equipped with the exhaust gas recirculation assembly mounting.

Tighten:

- the bolts of the exhaust gas recirculation assembly on the cylinder head,
- the exhaust gas cooler bolts on the exhaust gas cooler mounting at the gearbox end,

- the exhaust gas cooler mounting bolts at the timing end on the exhaust gas recirculation assembly.

Remove:

- the bolts of the exhaust gas recirculation assembly on the cylinder head,
- the exhaust gas recirculation assembly.

On the workbench, torque tighten:

- the exhaust gas cooler bolts on the exhaust gas cooler mounting at the gearbox end 12 N.m,
- the exhaust gas cooler mounting bolts at the timing end on the exhaust gas recirculation assembly 12 N.m.

3. FINAL OPERATION

Refit:

- the exhaust gas recirculation assembly (see 14A, Antipollution, Exhaust gas recirculation assembly: Removal - Refitting),
- the exhaust gas recirculation rigid pipe (see 14A, Antipollution, Exhaust gas recirculation rigid pipe: Removal - Refitting).

Refit:

- the turbocharger air outlet pipe Intercooler air inlet pipe: Removal - Refitting,
- the oil vapour rebreathing pipe.

Refit the catalytic converter Catalytic converter: Removal - Refitting.

Refit:

- the engine undertray,
- the engine cover.

Connect the battery **Battery: Removal - Refitting** .

Bleed the cooling system **Cooling system: Draining - Refilling** .

EXHAUST GAS PRESSURE SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

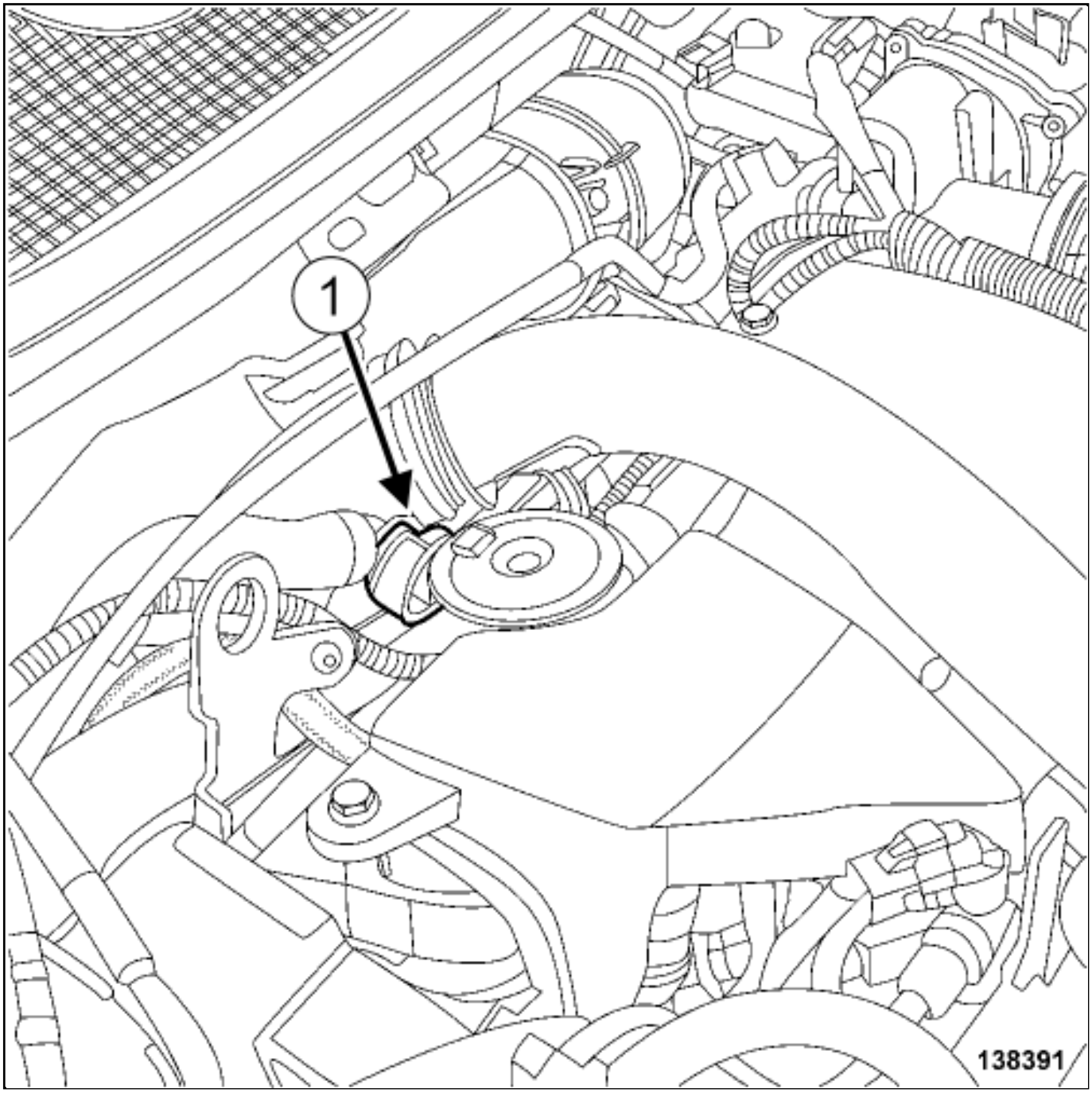
Wear cut-resistant gloves during the operation.

REMOVAL

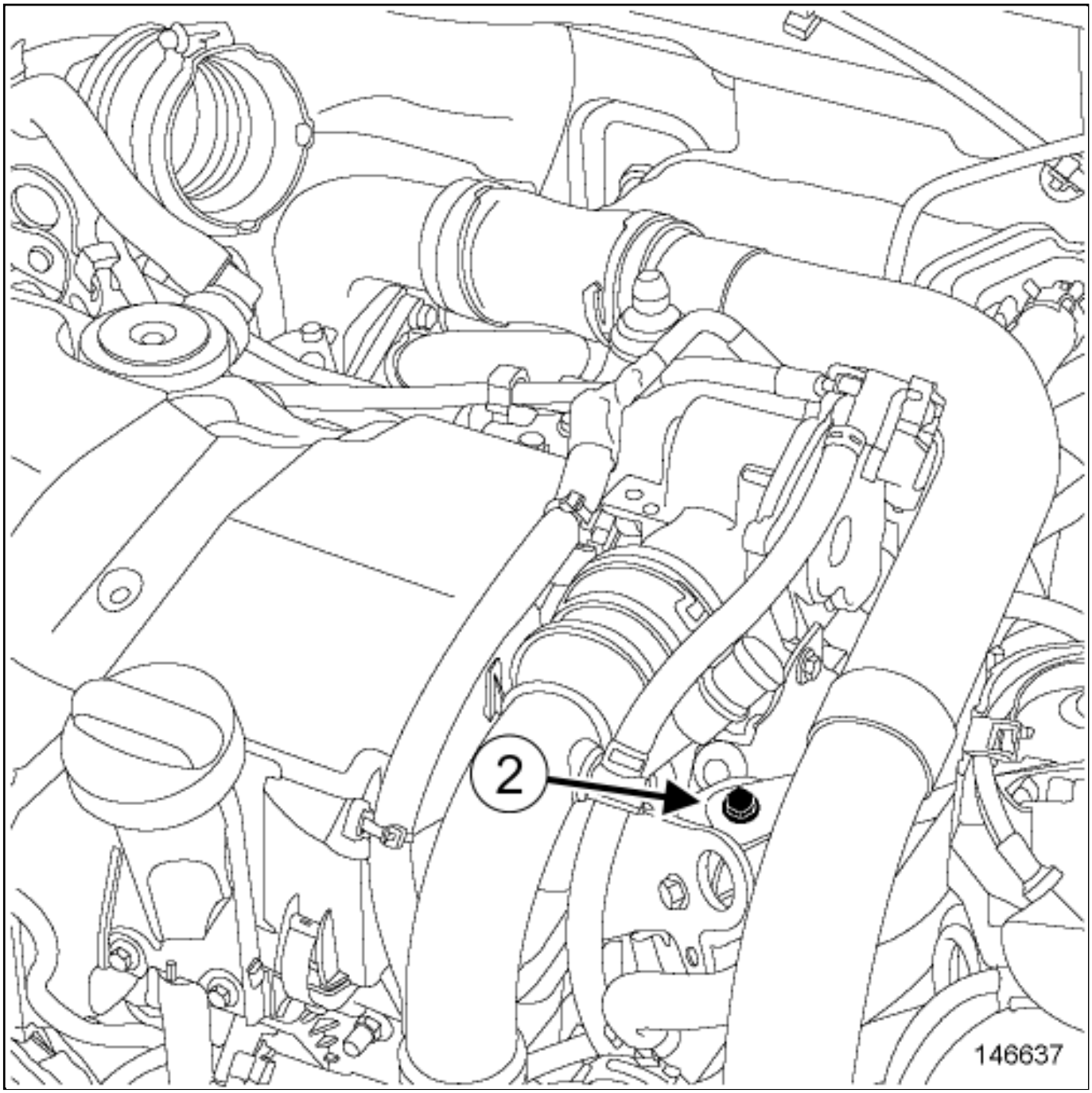
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).

- Remove:
  - the air filter unit Air filter unit: Removal - Refitting ,
  - the engine undertray bolts,
  - the engine undertray.



- Disconnect the oil vapour rebreathing pipe union from the rocker cover(1) .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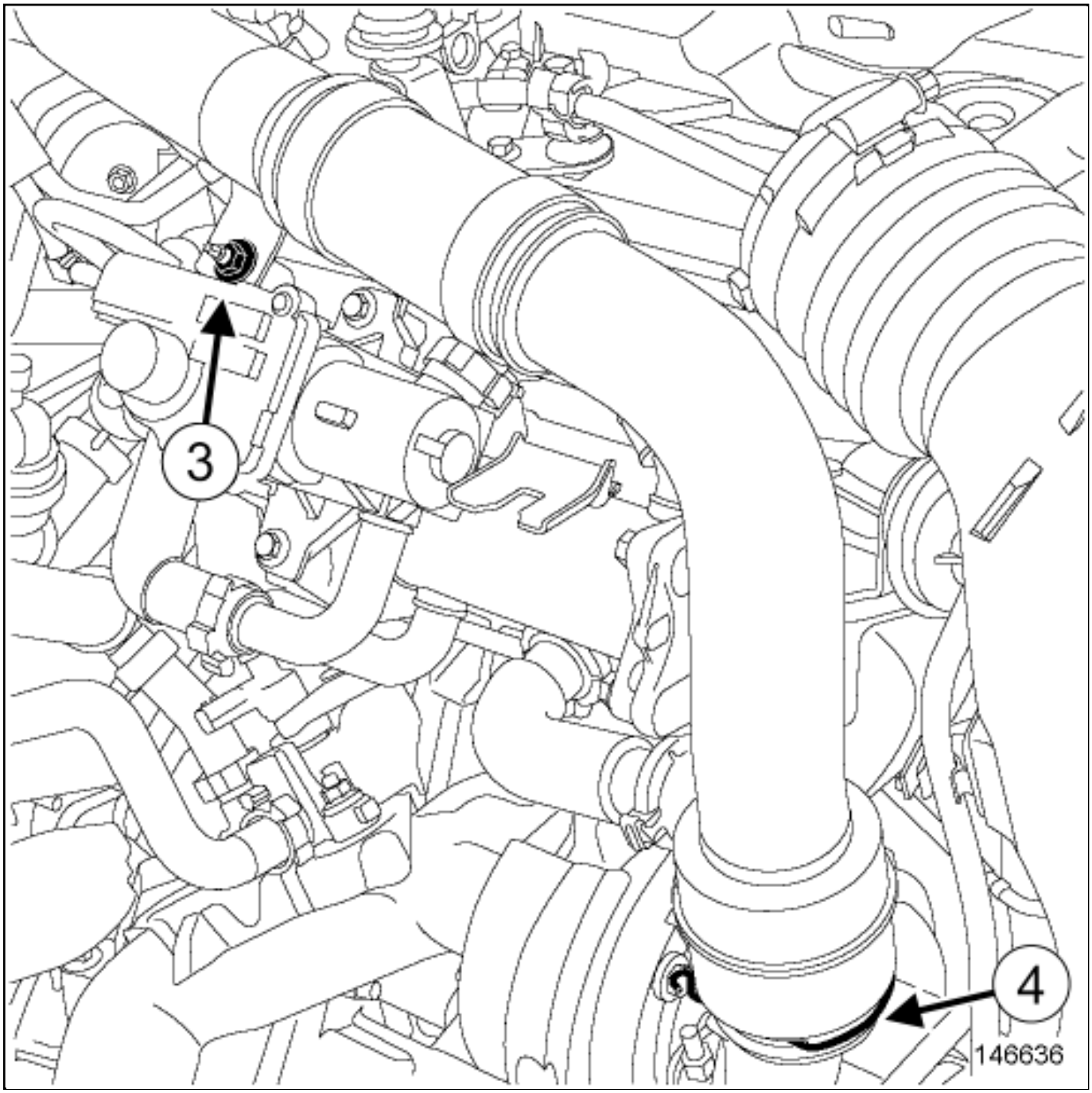
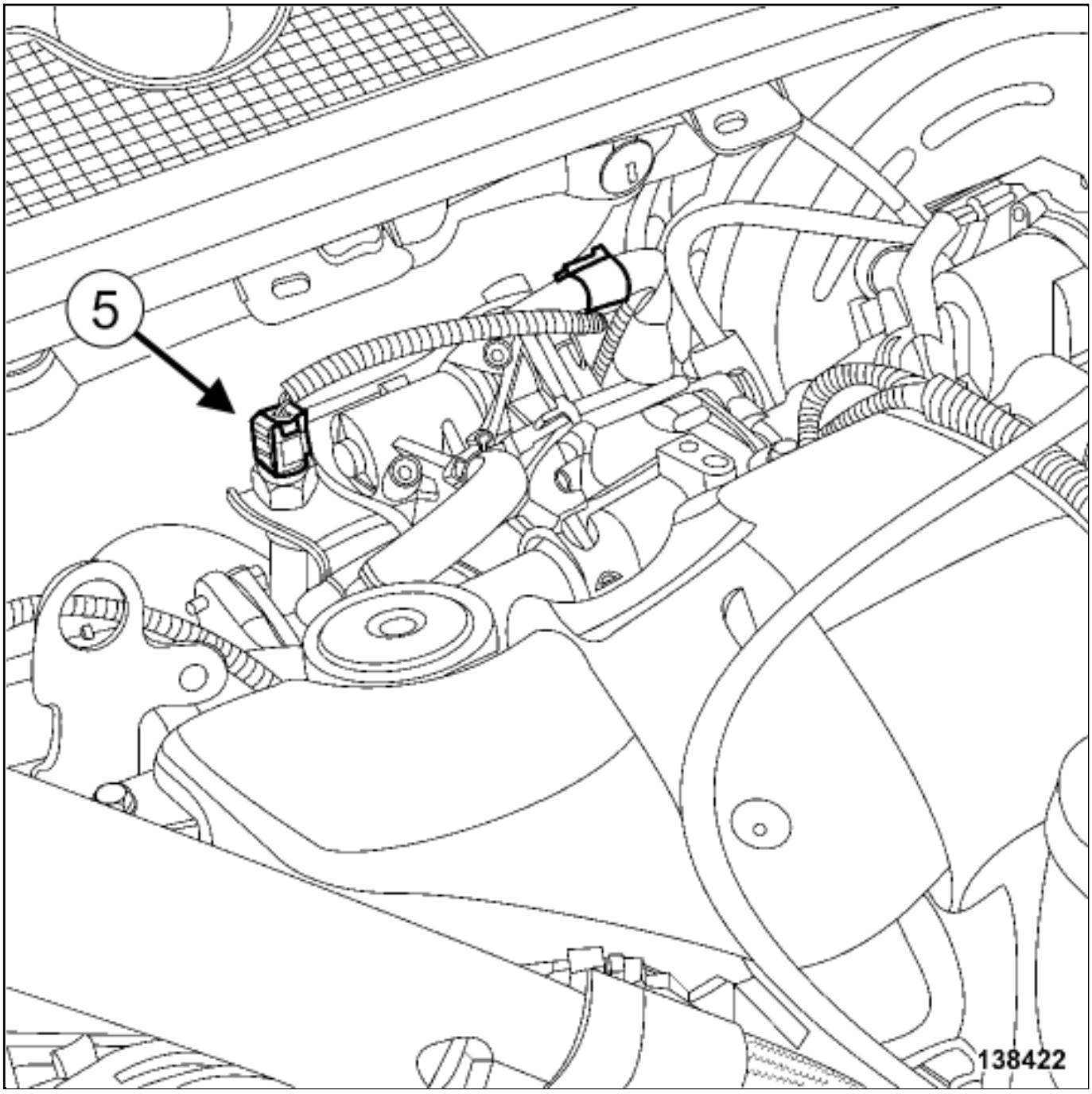


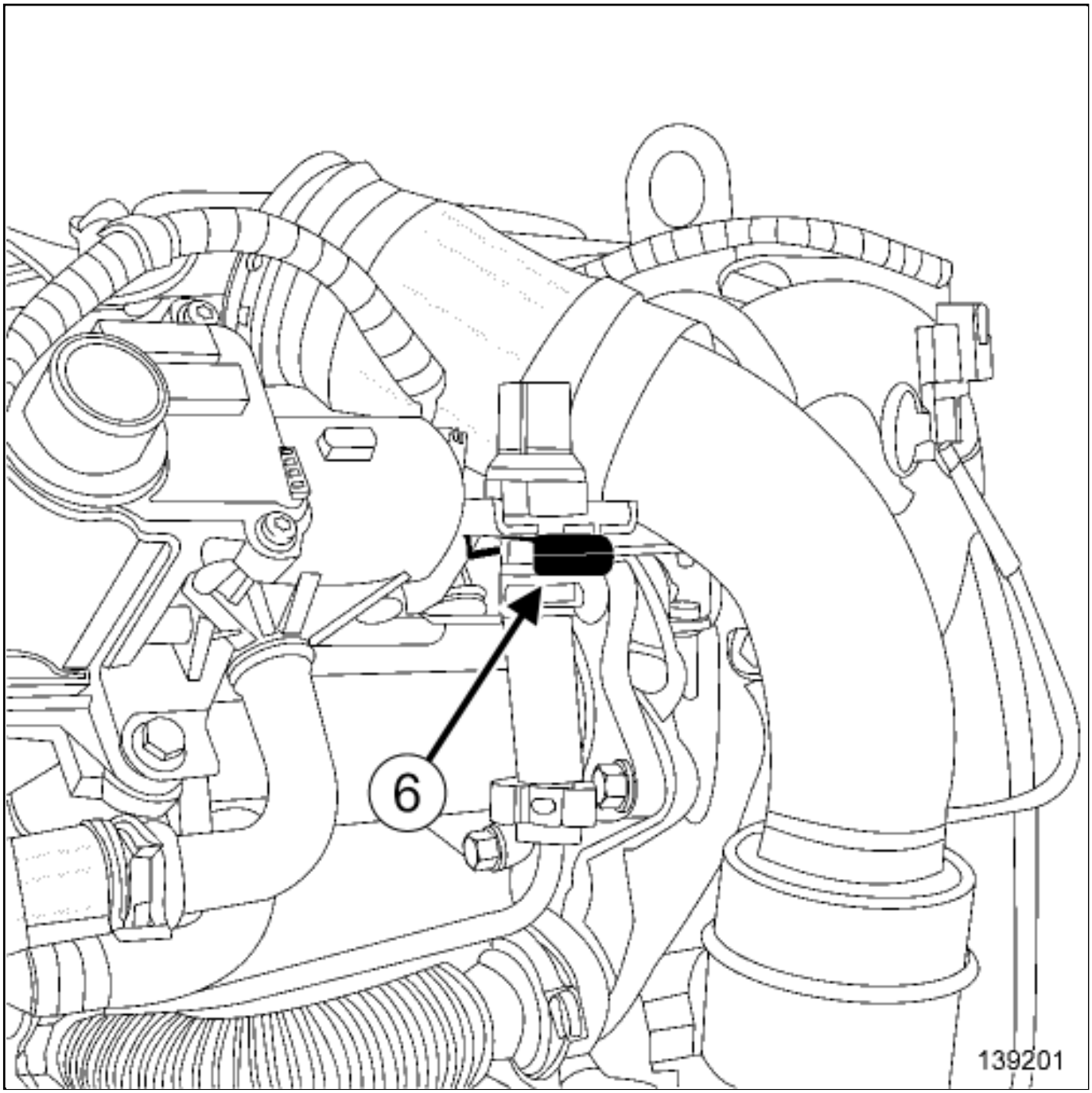
- Remove:
  - the bolt(2) from the turbocharger air outlet duct on the lifting eye,
  - the nut(3) from the turbocharger air outlet duct on the EGR,
  - the clip(4) on the turbocharger air outlet duct.
- Disconnect the turbocharger air outlet duct from the turbocharger.
-

  Separate the air outlet duct from the turbocharger.

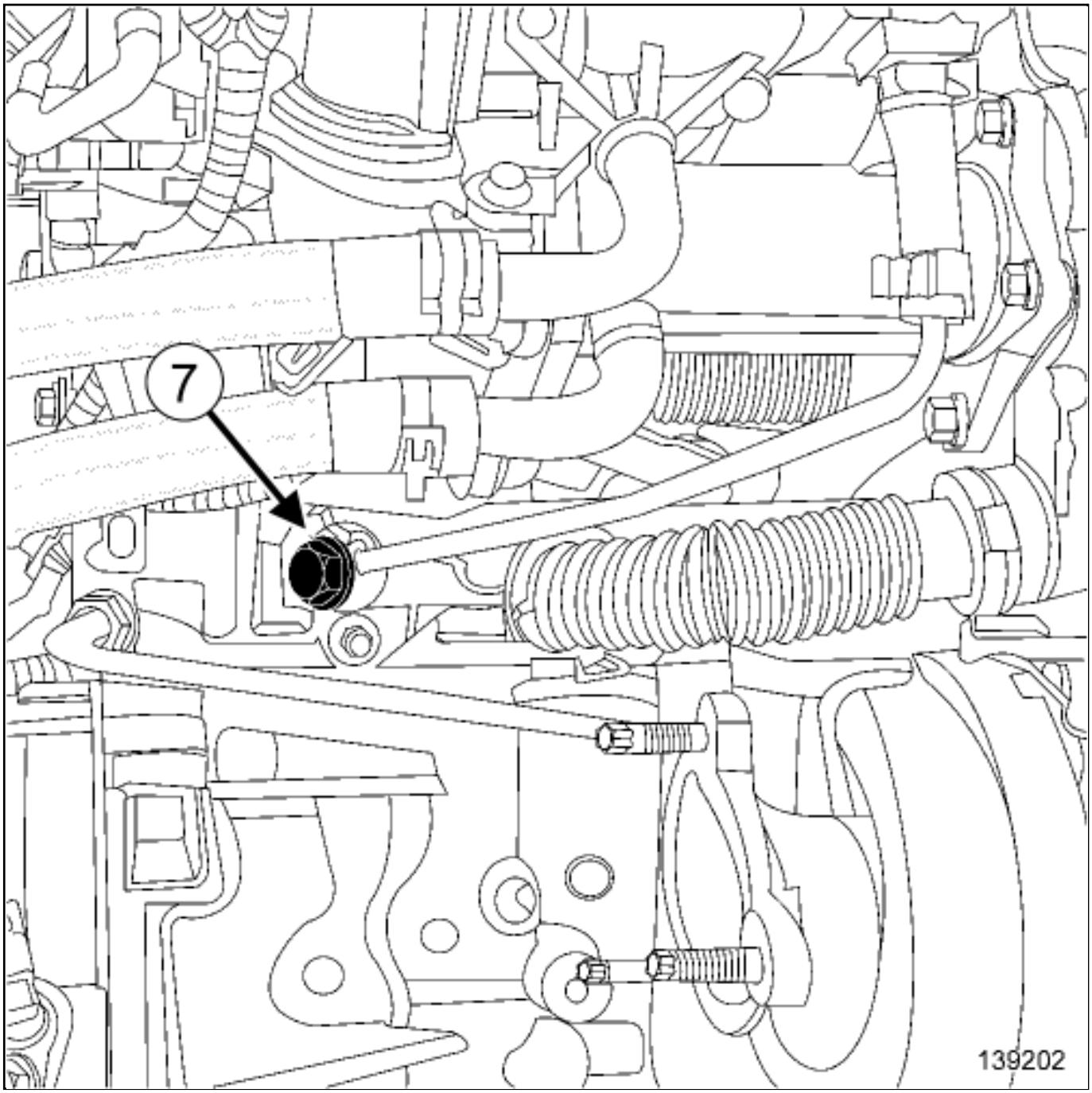
2. REMOVAL OPERATION



Disconnect the exhaust gas pressure sensor connector(5) .



Remove the exhaust gas pressure sensor clip(6) .



Remove:

- the exhaust gas pressure sensor hollow bolt(7) from the exhaust manifold,
- the exhaust gas sensor.

REFITTING

1. REFITTING PREPARATION OPERATION

Always replace the exhaust gas pressure sensor clip.

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Torque tighten the exhaust gas pressure sensor hollow bolt on the exhaust manifold32 N.m.

EXHAUST GAS RECIRCULATION ASSEMBLY: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Pipe clamps.	Ms. 583

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

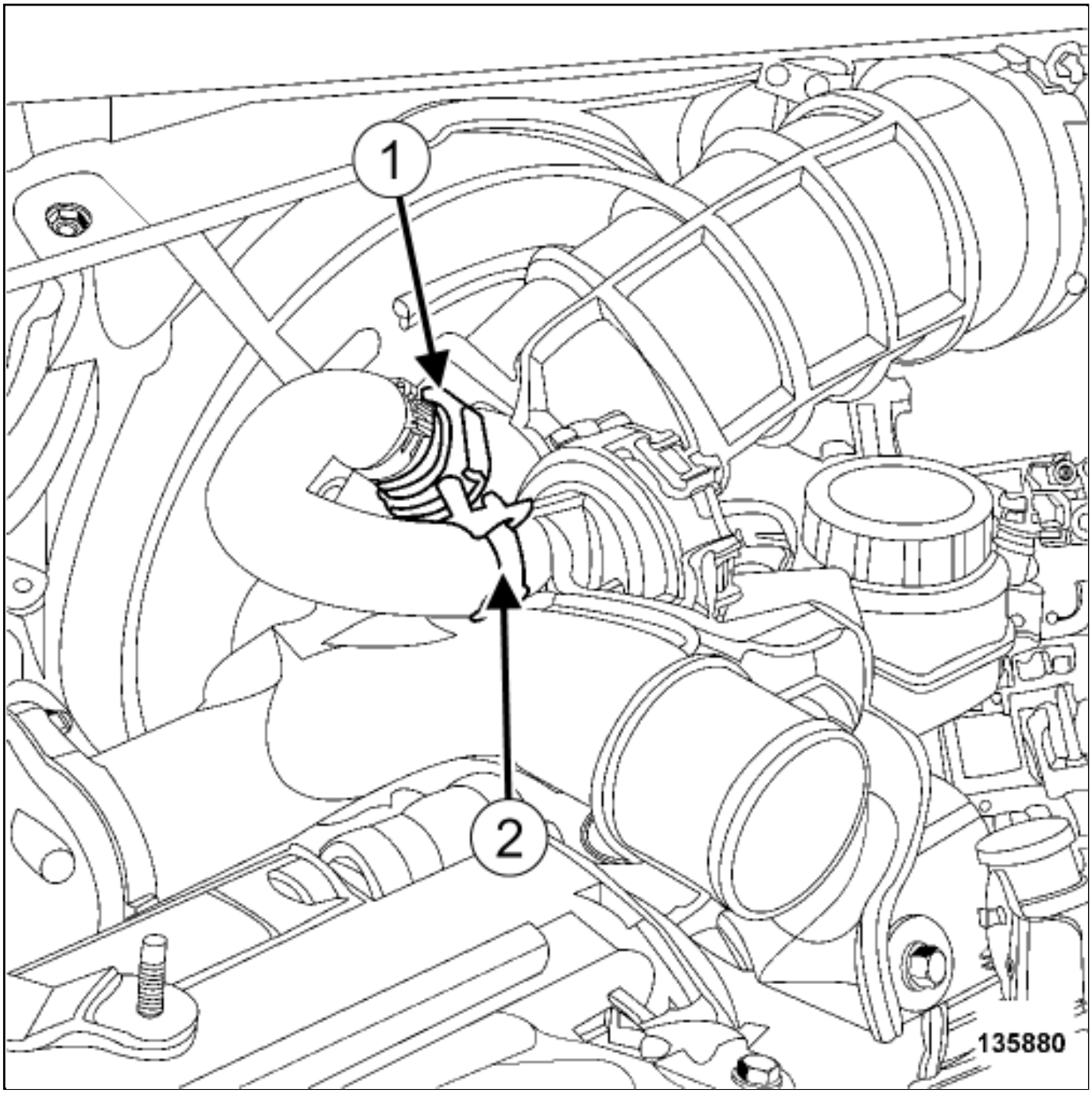
WARNING

Wear protective gloves during the operation.

REMOVAL

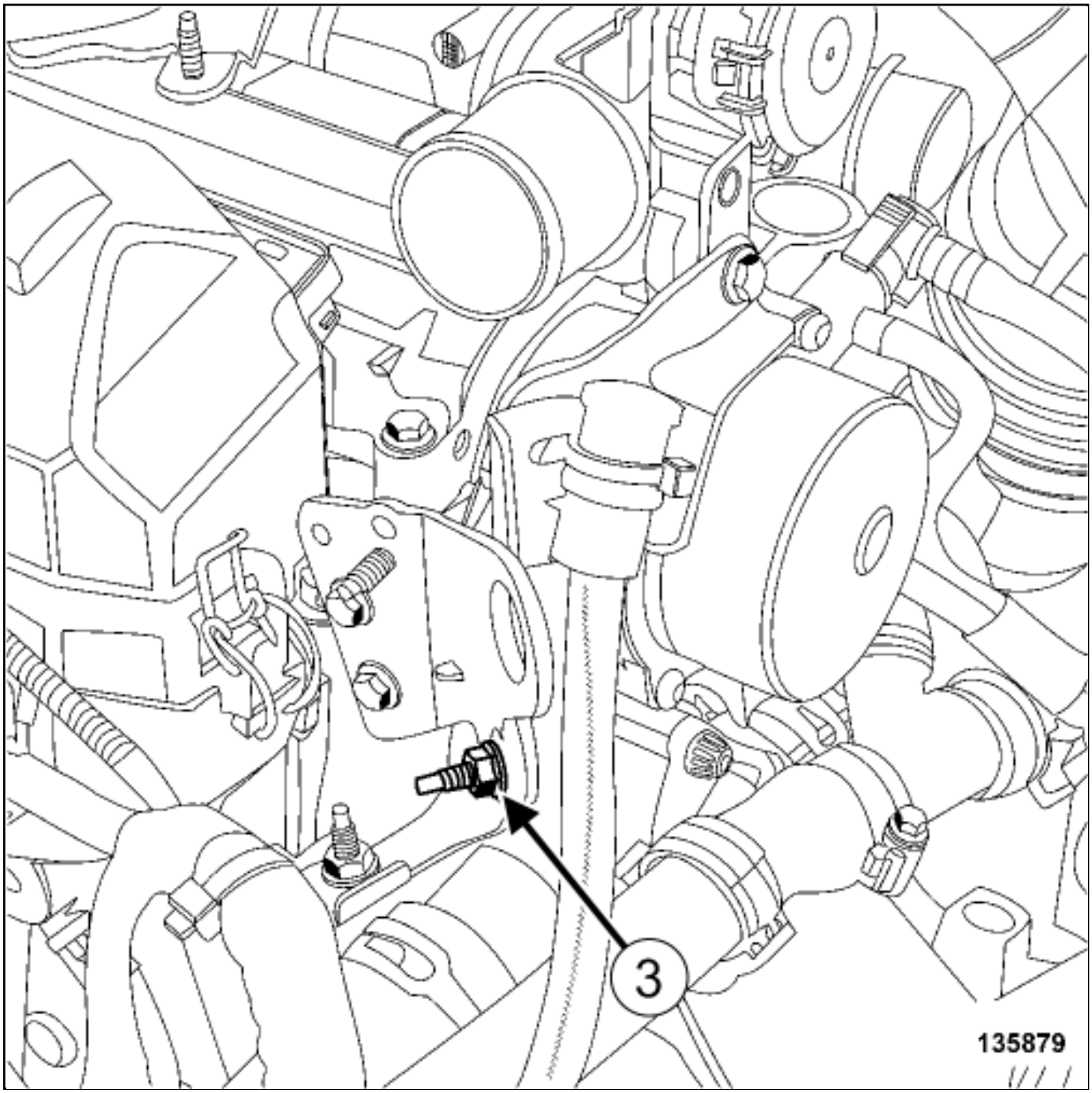
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift**Vehicle: Towing and lifting** (02A, Lifting equipment).
- Disconnect the battery**Battery: Removal - Refitting** (80A, Battery).
- Remove:
  - the engine cover,
  - the engine undertray bolts,
  - the engine undertray.
- Remove the catalytic converter**Catalytic converter: Removal - Refitting** .



- Disconnect the oil vapour rebreathing pipe union from the air filter unit air outlet pipe(1) .
- Separate the clip (2) of the oil vapour rebreathing pipe away on the oil vapour rebreathing valve.
- Disconnect the oil vapour rebreathing pipe from the oil vapour rebreathing valve.
- Remove the oil vapour rebreathing pipe.

- Remove the turbocharger outlet air pipe**Intercooler air inlet pipe: Removal - Refitting** .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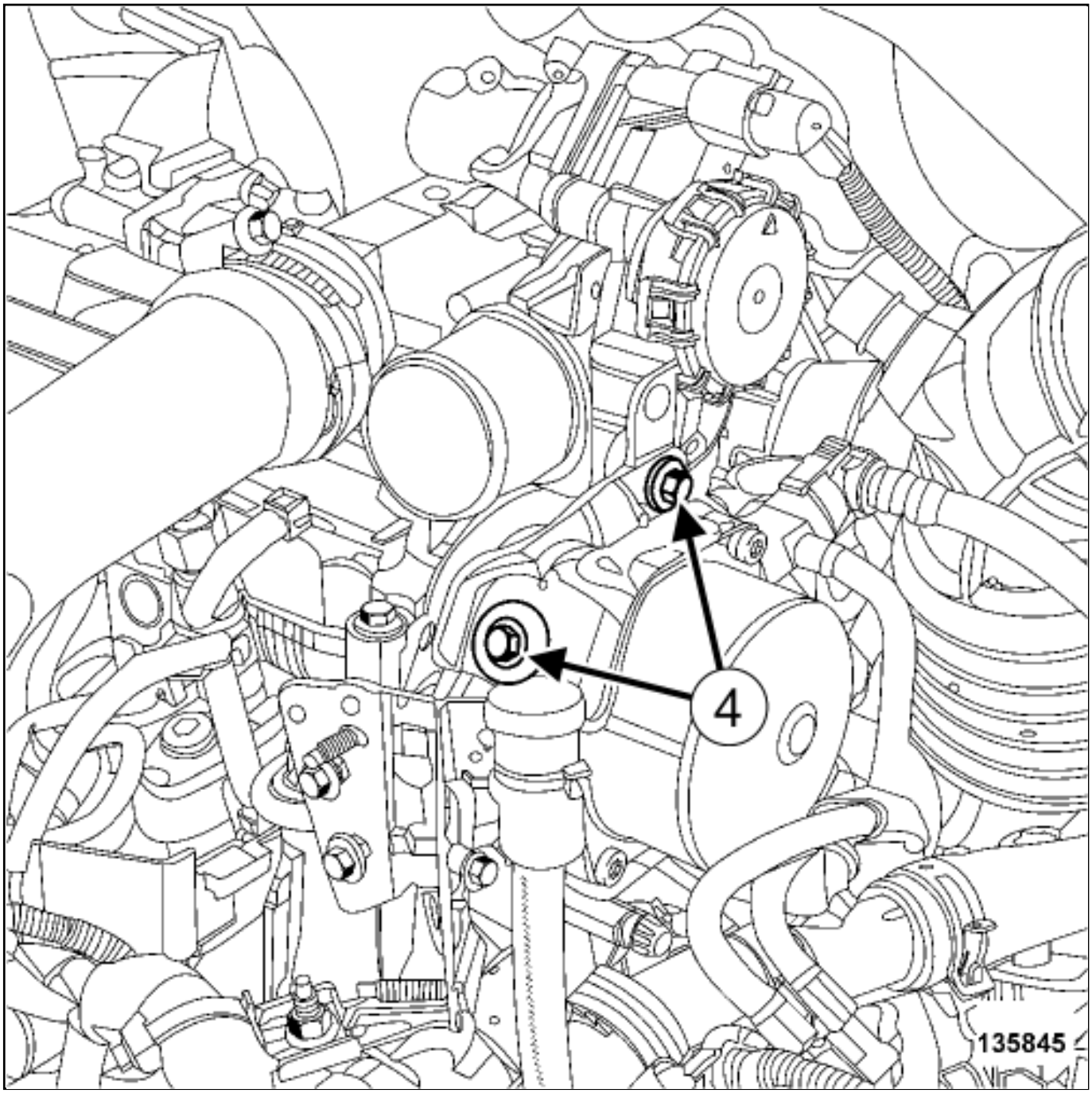
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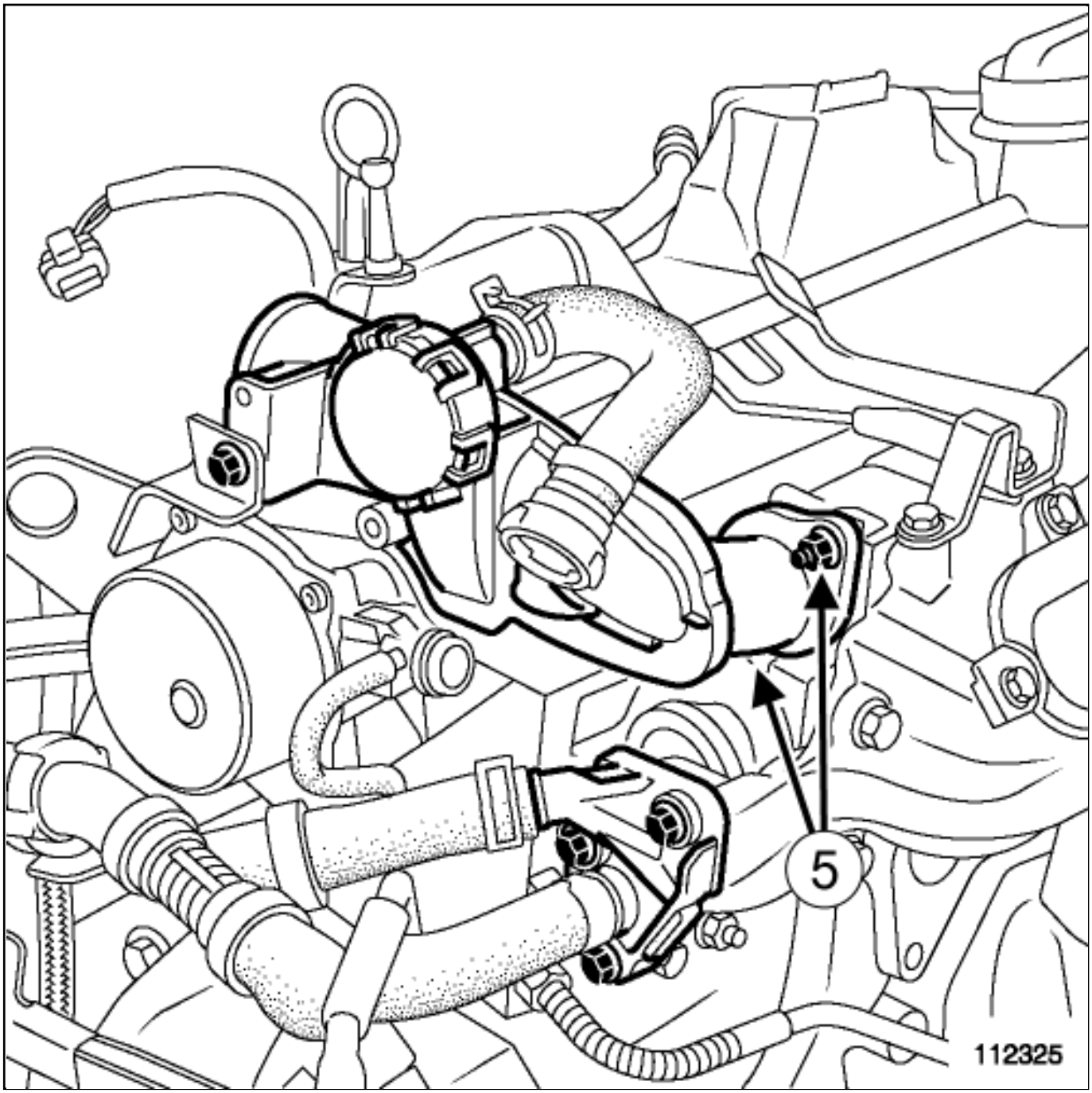
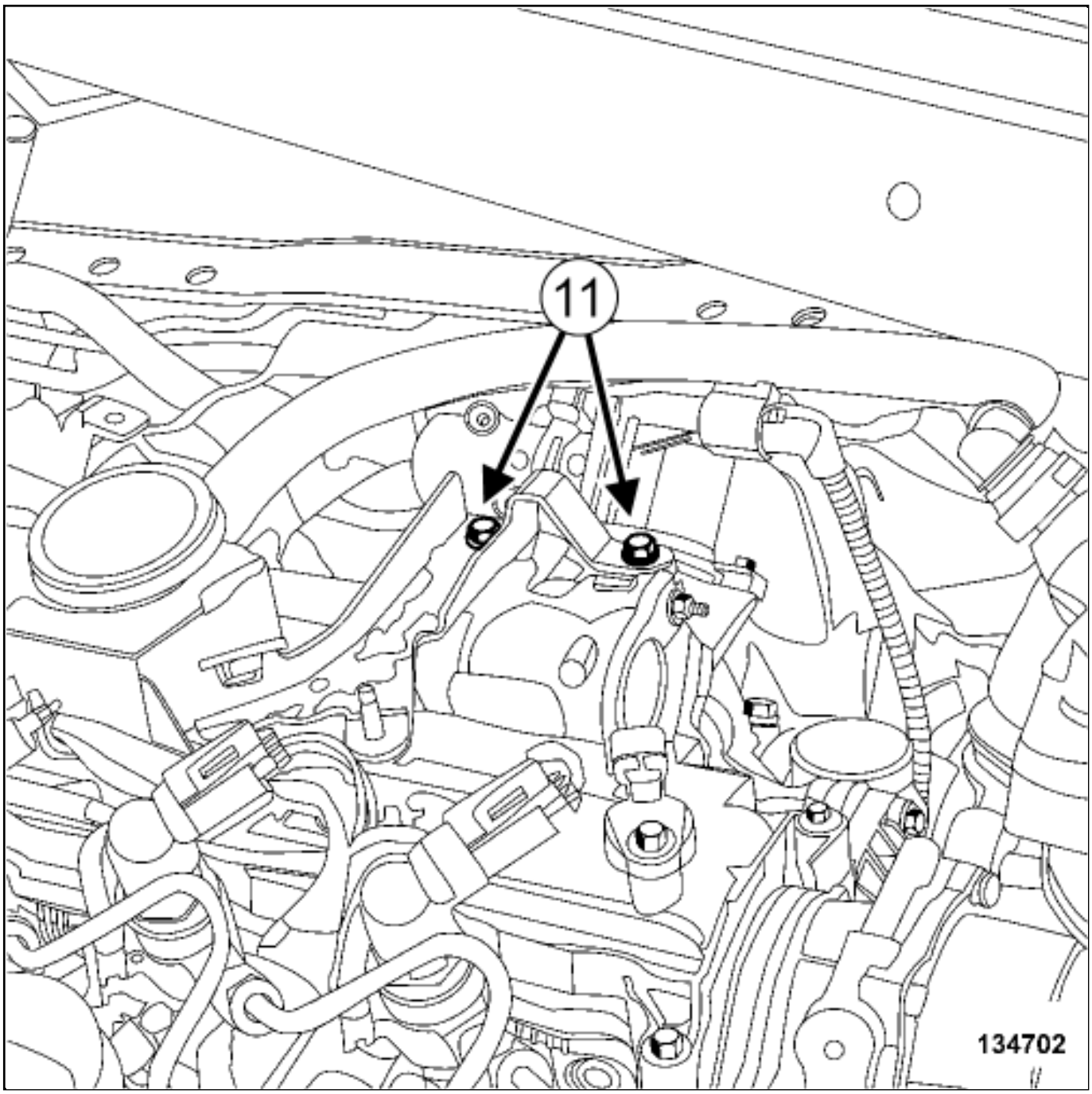
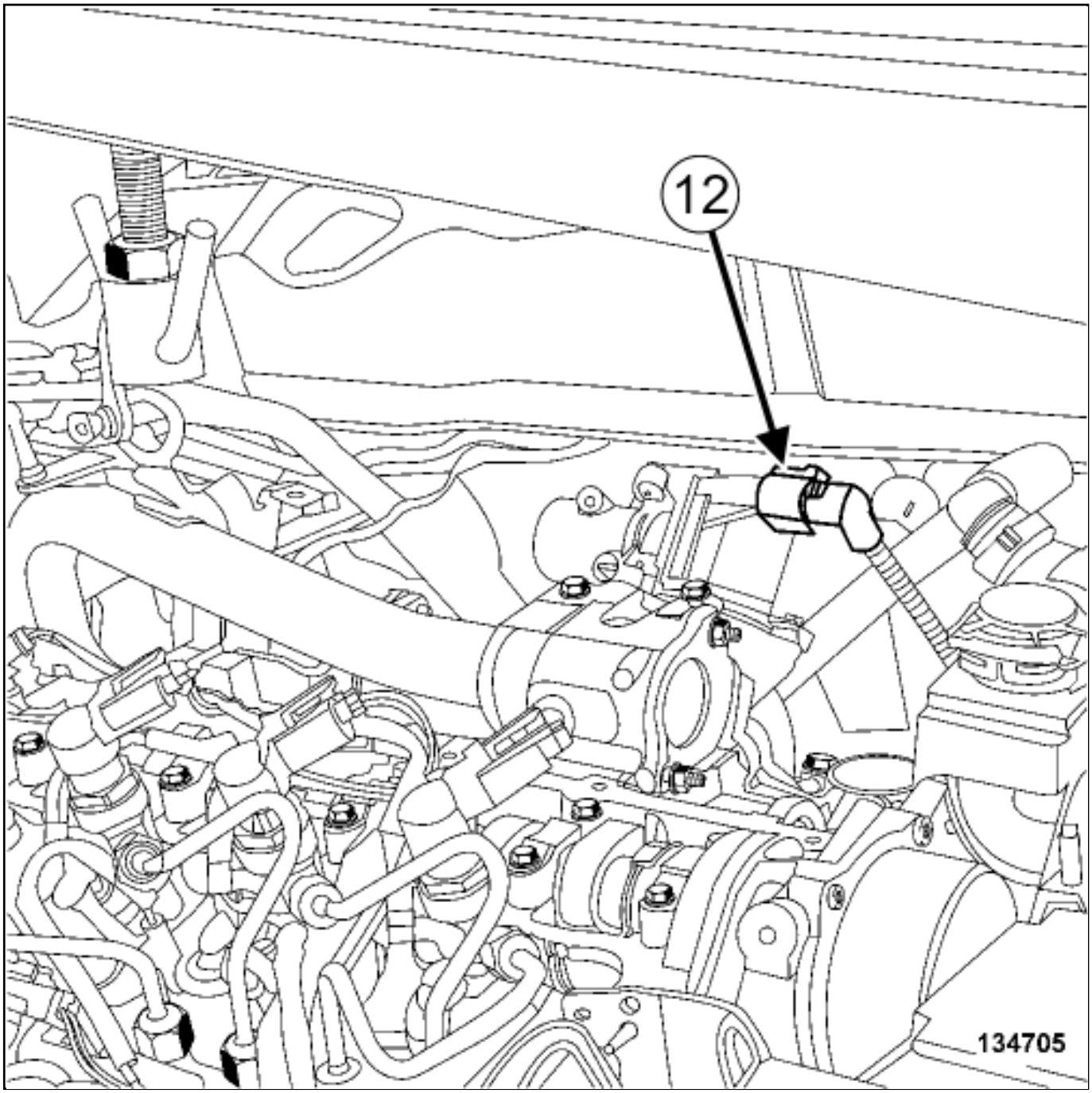


- Remove the nut(3) from the breather mounting on the gearbox.
- Move the breather mounting away from the gearbox.
- Remove:
  - the bolts(4) of the oil vapour rebreathing valve bracket,
  - the oil vapour rebreathing valve bracket.
- Disconnect the brake servo pipe union from the vacuum pump.
- Remove:
  - the nuts(5) of the oil vapour rebreathing valve,
  - the oil vapour rebreathing valve.

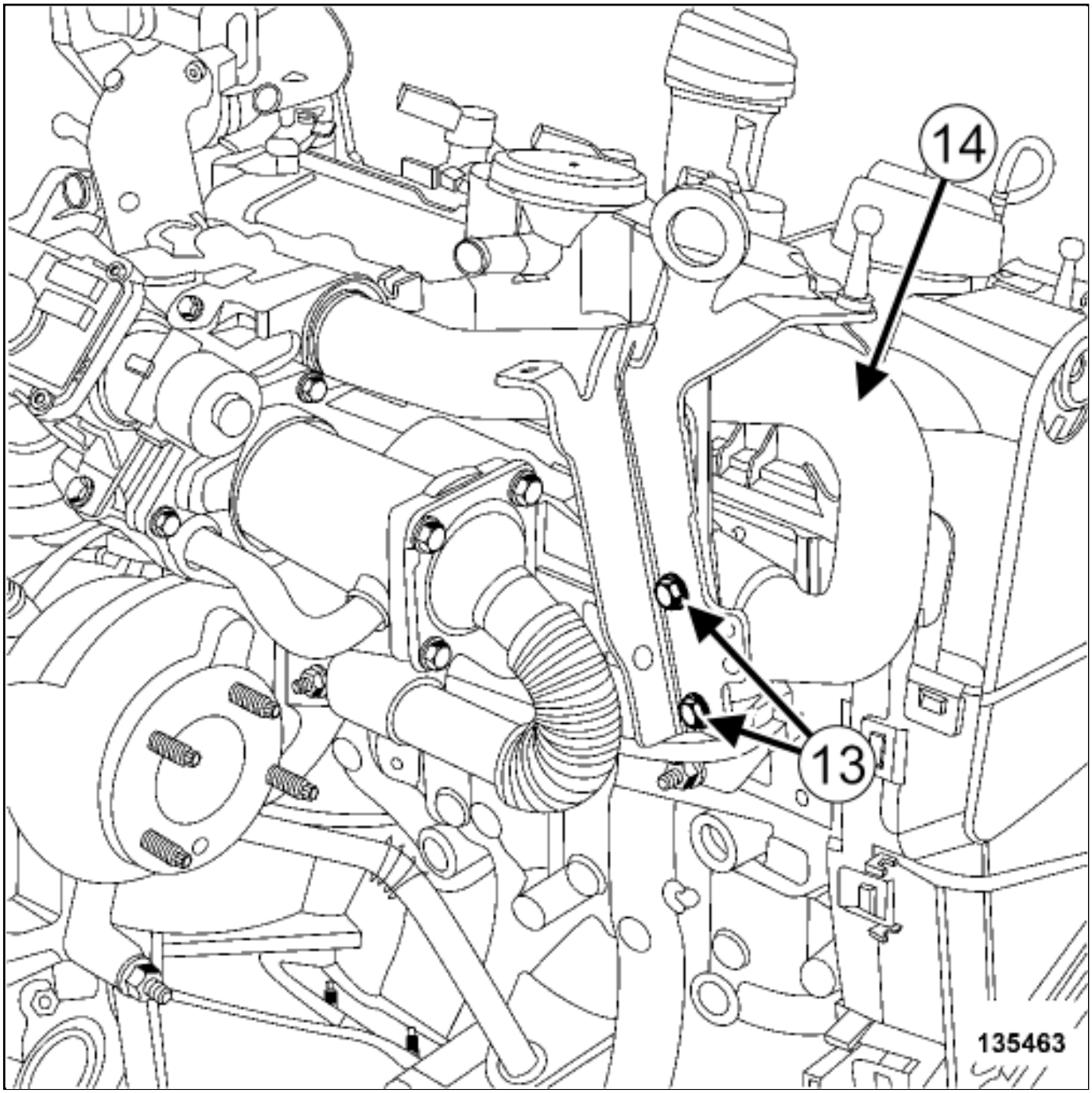


Remove:

- the injector rail protector cover mounting bolts(**11**) ,
- the injector rail protector cover mounting.

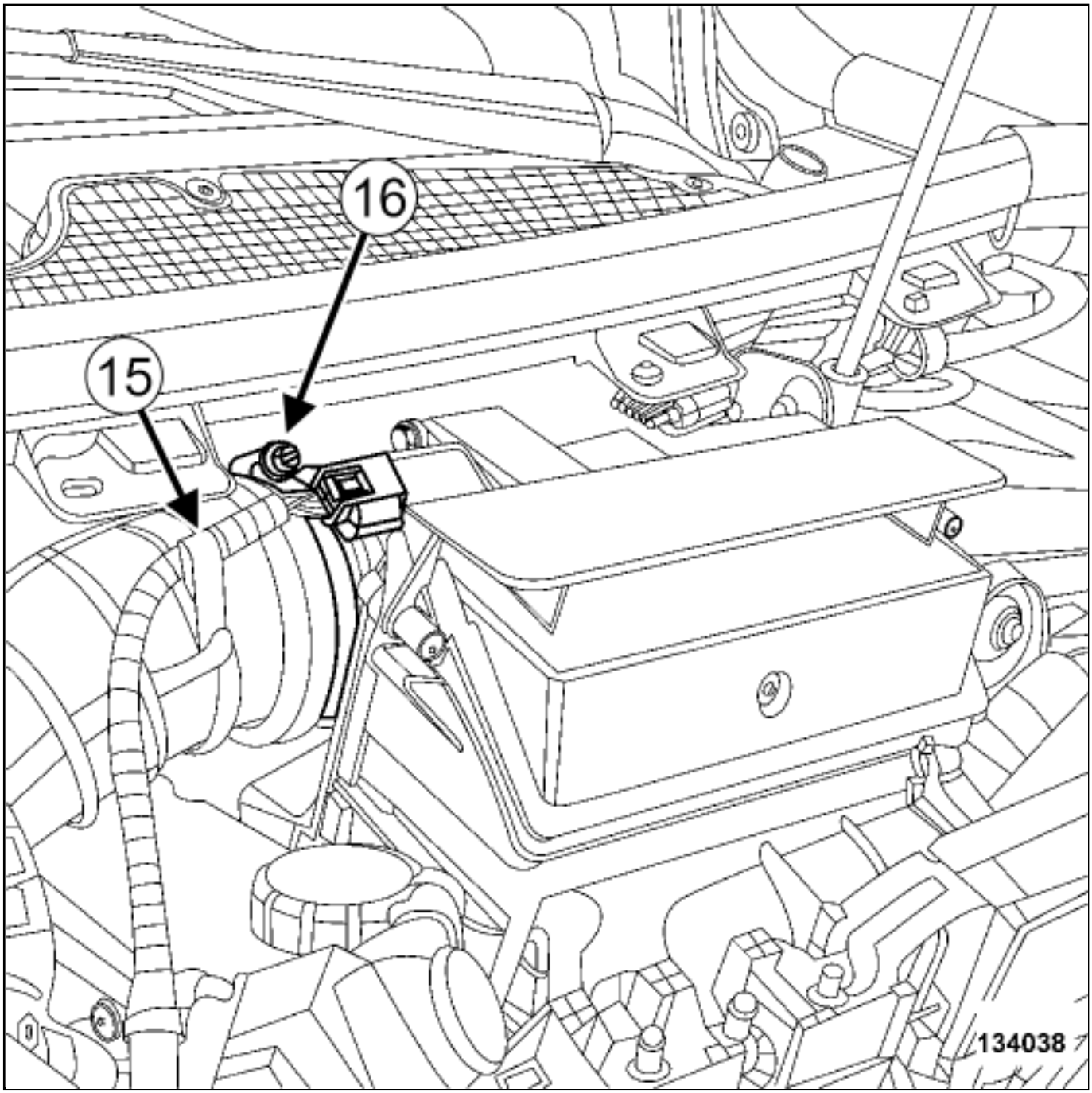


- Disconnect the connector(12) from the exhaust gas recirculation solenoid valve.

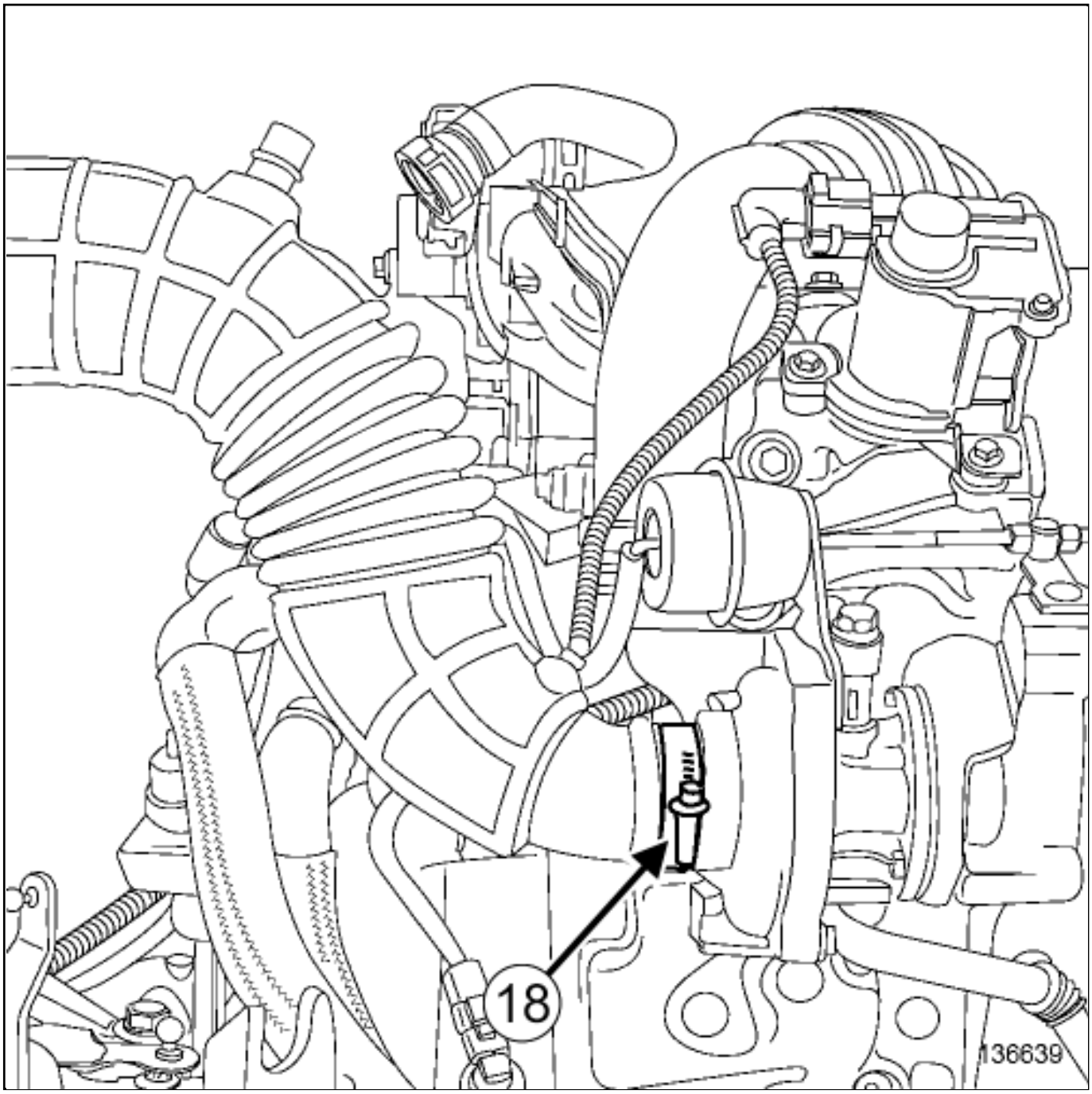


Remove:

- the bolts(13) from the lifting eye at the timing end,
- the lifting eye on the timing end,
- the air inlet metal tube(14) ,
- the air inlet metal tube seals,
- the rigid exhaust gas recirculation pipe(see 14A, Antipollution, Exhaust gas recirculation rigid pipe: Removal - Refitting) .



- Unclip the air flowmeter wiring from the air filter unit air outlet pipe at(15) .
- Loosen the clip(16) of the air filter unit air outlet pipe from the air filter unit.
- Disconnect the air filter unit air outlet pipe from the air filter unit.



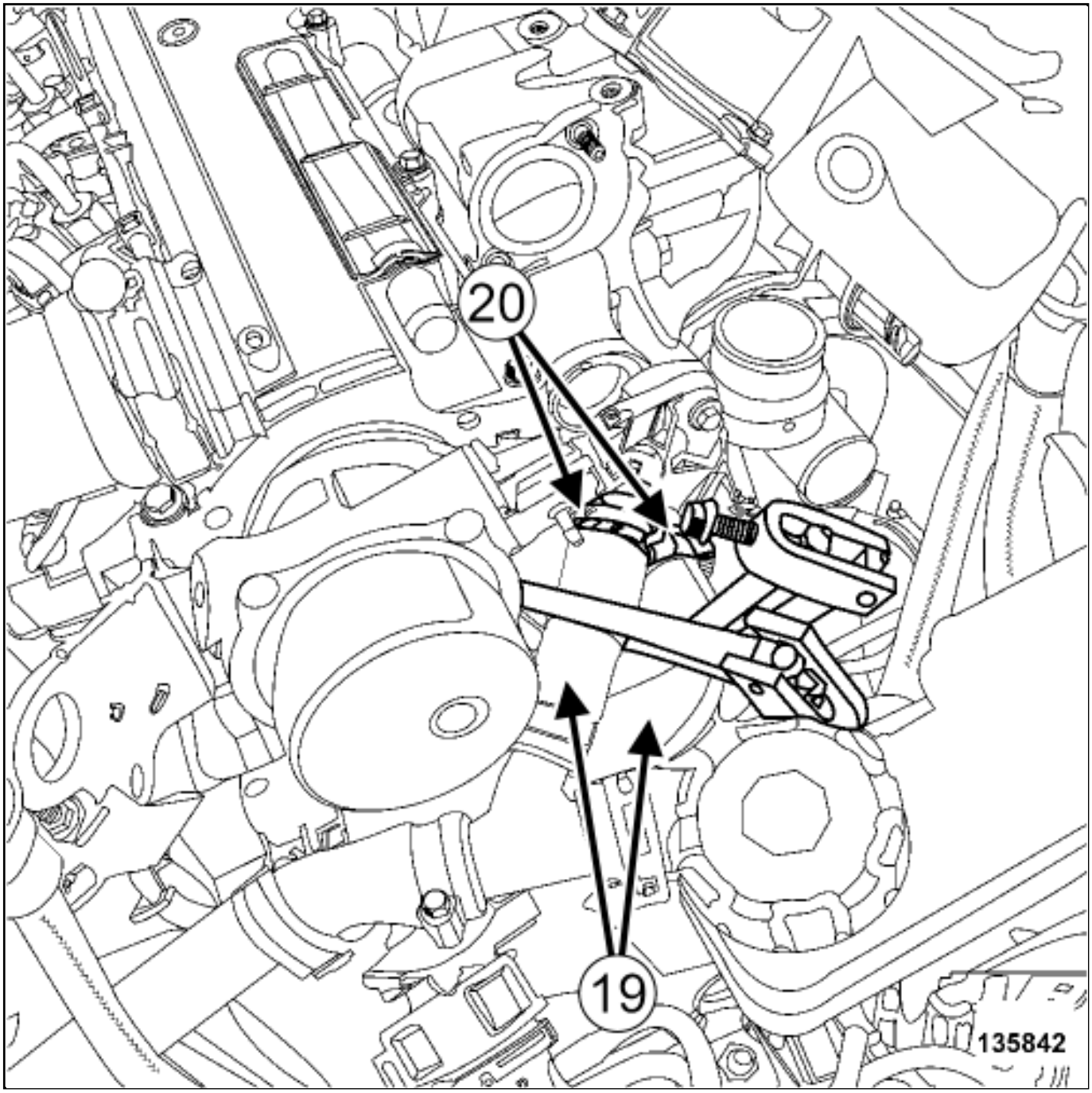
Undo the air filter unit air outlet pipe clip(18) from the turbocharger.

Disconnect the air filter unit air outlet pipe from the turbocharger.

Remove the air outlet pipe from the air filter box.

Unclip the hose of the turbocharging pressure regulation solenoid valve from the exhaust gas

cooler cover.



Fit the toolPipe clamps.(Ms. 583) on each cooling hose(19) of the exhaust gas cooler cover.

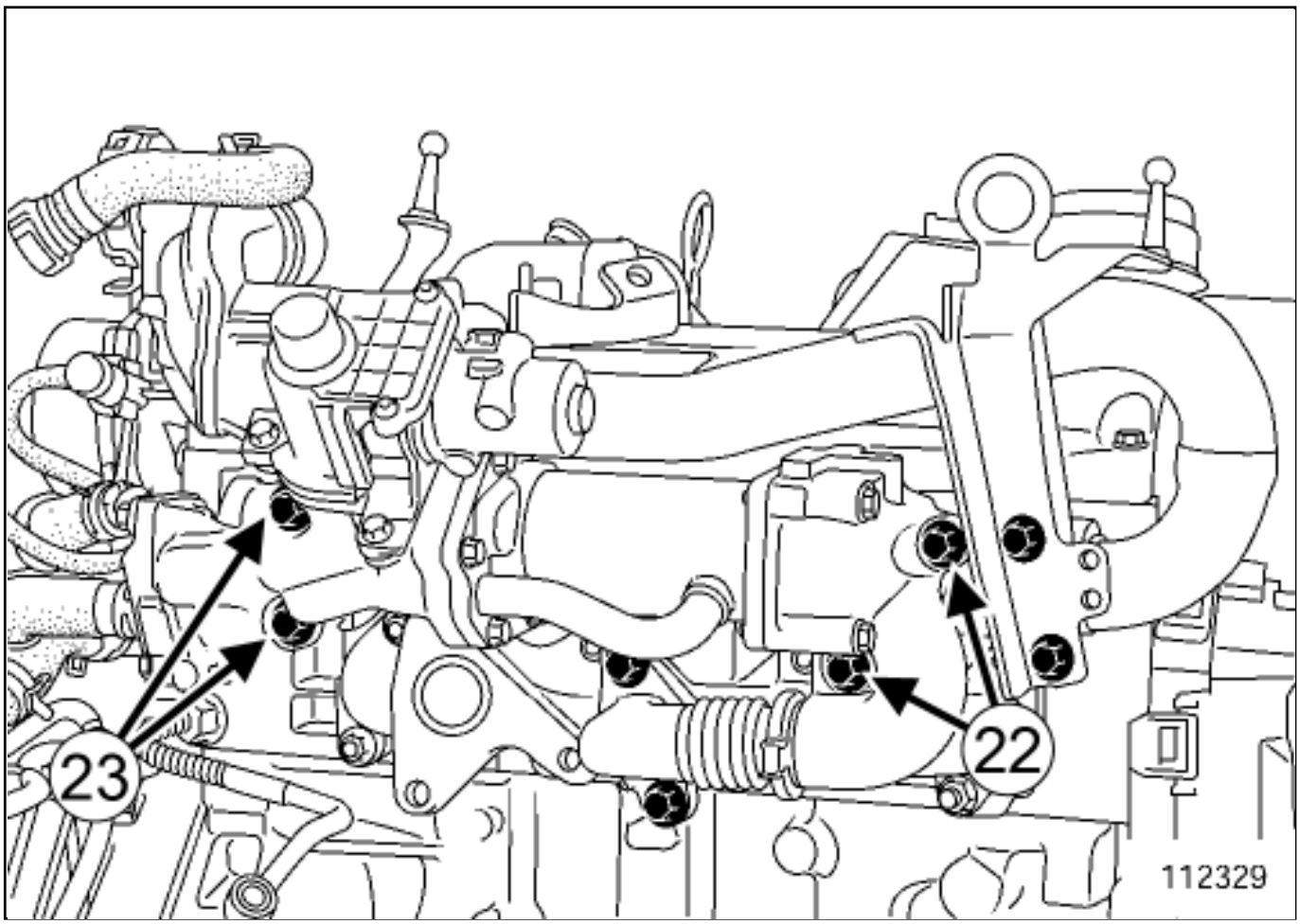
Separate the clip (20) of each cooling hose of the exhaust gas cooler cover(19) on the exhaust gas cooler cover using the toolRemote operation pliers for hose clips.(Mot. 1448) .

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Disconnect the cooling hoses of the exhaust gas cooler cover(20) from the exhaust gas cooler cover.

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove:

- the bolts(22) of the exhaust gas recirculation assembly mounting,

- the bolts(23) from the exhaust gas recirculation assembly,

- the exhaust gas recirculation assembly.

REFITTING

1. REFITTING PREPARATION OPERATION

Always replace the seals on the air inlet metal tube.

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

Use grey abrasive pads Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean the joint faces of the exhaust gas cooler mounting at the gearbox end.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

Use surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean and degrease:

- the housing of each air inlet metal tube seal,

- the housing of the air inlet metal tube in the cylinder head,

- the housing of the air inlet metal tube in the exhaust gas cooler mounting on the gearbox end.

2. REFITTING OPERATION FOR PART CONCERNED

- Refit the exhaust gas recirculation assembly.
- Torque tighten:
  - the bolts of the exhaust gas recirculation assembly25 N.m,
  - the bolts of the exhaust gas recirculation assembly mounting25 N.m.

3. FINAL OPERATION

- Connect the cooling hoses of the exhaust gas cooler cover.
- Fit the clip on each cooling hose of the exhaust gas cooler cover using the toolRemote operation pliers for hose clips.(Mot. 1448) .
- Remove the toolPipe clamps.(Ms. 583) on each cooling hose of the exhaust gas cooler cover.
- Clip the hose of the turbocharging pressure regulation solenoid valve onto the exhaust gas cooler cover.
- Refit the air outlet pipe onto the air filter unit.
- Connect the air filter unit air outlet pipe to the turbocharger.
- Torque tighten the air filter unit air outlet pipe clip on the turbocharger5.5 N.m .

Connect the air filter unit air outlet pipe to the air filter unit.

Torque tighten the clip of the air filter unit air outlet pipe on the air filter unit5.5 N.m .

Clip the air flowmeter wiring onto the air filter unit air outlet pipe.

Refit the rigid exhaust gas recirculation pipe(see 14A, Antipollution, Exhaust gas recirculation rigid pipe: Removal - Refitting) .

Refit:

- the air inlet metal tube fitted with new seals,
- the lifting eye on the timing end.

Connect the exhaust gas recirculation solenoid valve connector.

Refit:

- the injector rail protector cover mounting,
- the injector rail protector cover,

Clip the injector rail protector cover into place.

Refit the oil vapour rebreathing valve.

Connect the brake servo pipe union to the vacuum pump.

Refit the oil vapour rebreathing valve bracket.

Fit the breather mounting on the gearbox.

Refit the nut of the breather mounting on the gearbox.

Refit:

- the turbocharger air outlet pipe **Intercooler air inlet pipe: Removal - Refitting** ,
- the oil vapour rebreathing pipe .

Connect the oil vapour rebreathing pipe to the oil vapour rebreathing valve.

Fit the clip of the oil vapour rebreathing pipe on the oil vapour rebreathing valve.

Connect the oil vapour rebreathing pipe union to the air filter unit air outlet pipe.

Refit the catalytic converter **Catalytic converter: Removal - Refitting** .

Refit:

- the engine undertray,
- the engine cover.

Connect the battery Battery: Removal - Refitting (80A, Battery).

Fill and bleed the cooling system Cooling system: Draining - Refilling .

EXHAUST GAS RECIRCULATION RIGID PIPE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote pliers for exhaust gas recirculation pipe clamps.	

parts always to be replaced:
Exhaust gas recirculation rigid pipe
Exhaust gas recirculation pipe clip
exhaust gas recirculation pipe bolt
Exhaust gas recirculation rigid pipe
exhaust gas cooler seal
exhaust gas recirculation pipe bolt

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

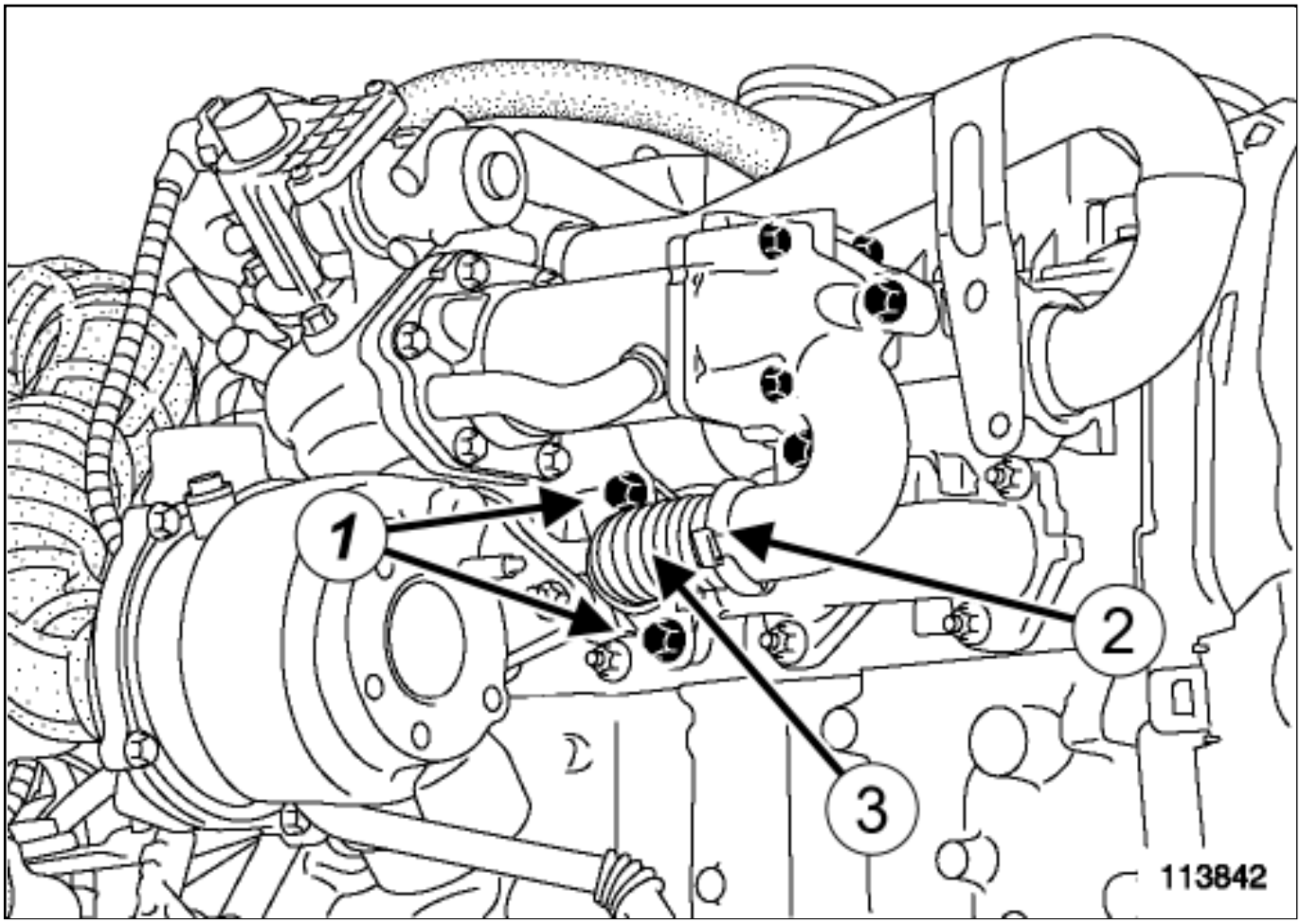
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .
- Remove the engine covers.
- Disconnect the battery**Battery: Removal - Refitting** .
- Remove:
  - the engine undertray bolts,
  - the engine undertray.

2. OPERATION FOR REMOVAL OF PART CONCERNED

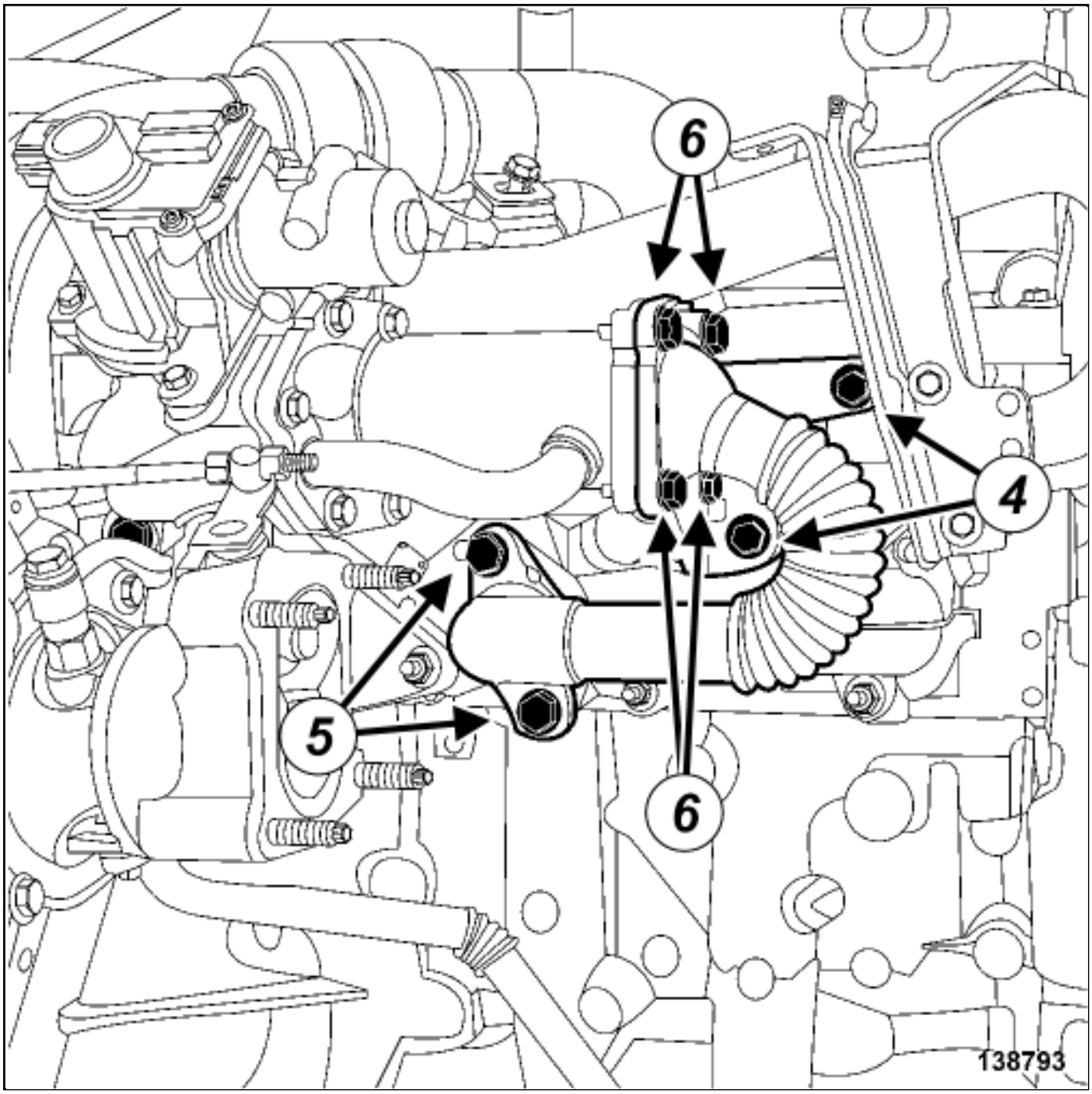
1- FIRST FITTING



Remove:

- the exhaust gas recirculation rigid pipe bolts(1) ,
- the snap-on clip(2) of the exhaust gas recirculation rigid pipe using the toolRemote pliers for exhaust gas recirculation pipe clamps. ,
- the EGR rigid pipe.

2- SECOND FITTING



Remove:

- the bolts(4) of the exhaust gas recirculation rigid pipe bracket from the cylinder head,
- the bolts(5) of the exhaust gas recirculation rigid pipe from the exhaust manifold,
- the bolts(6) of the exhaust gas recirculation rigid pipe from the exhaust gas recirculation assembly,
- the exhaust gas recirculation rigid pipe,
- the exhaust gas recirculation pipe rigid seal.

3- THIRD FITTING

For removing the exhaust gas recirculation rigid pipe(see 14A, Antipollution, Exhaust gas cooler: Removal - Refitting) .

- The exhaust gas recirculation rigid pipe cannot be separated from exhaust gas cooler.

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

- Clean using abrasive pads:
  - the joint face of the exhaust gas recirculation assembly,
  - the exhaust manifold seal face.

- Use surface cleaner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and clean clothsto degrease:
  - the exhaust manifold joint face,
  - the joint face of the exhaust gas recirculation assembly.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

1- FIRST FITTING

- parts always to be replaced: Exhaust gas recirculation rigid pipe
- parts always to be replaced: Exhaust gas recirculation pipe clip
- parts always to be replaced: exhaust gas recirculation pipe bolt

2- SECOND FITTING

parts always to be replaced: Exhaust gas recirculation rigid pipe

parts always to be replaced: **exhaust gas cooler seal**

parts always to be replaced: exhaust gas recirculation pipe bolt

2. REFITTING OPERATION FOR PART CONCERNED

1- FIRST FITTING

Refit the new exhaust gas recirculation rigid pipe with a new seal and a new clip.

Torque tighten:

- the EGR rigid pipe bolts 36 N.m,
- the exhaust gas recirculation rigid pipe clip 5 N.m.

2- SECOND FITTING

Fit the new exhaust gas recirculation rigid pipe with a new seal.

Fit without tightening:

- the bolts of the exhaust gas recirculation rigid pipe on the exhaust gas recirculation assembly,
- the bolts to the exhaust gas recirculation rigid pipe on the exhaust manifold,
- the bolts to the exhaust gas recirculation rigid pipe bracket on the cylinder head.

Torque tighten:

- the bolts of the exhaust gas recirculation rigid pipe bracket on the cylinder head 25 N.m,
- the bolts of the exhaust gas recirculation rigid pipe on the exhaust manifold 36 N.m,
- the bolts of the exhaust gas recirculation rigid pipe on the exhaust gas recirculation assembly 12 N.m.

3. FINAL OPERATION

Refit the engine undertray.

- Connect the battery **Battery: Removal - Refitting** .

- Refit the engine covers.

EXHAUST GAS RECIRCULATION SOLENOID VALVE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

parts always to be replaced:
exhaust gas recirculation solenoid valve seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair** .

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

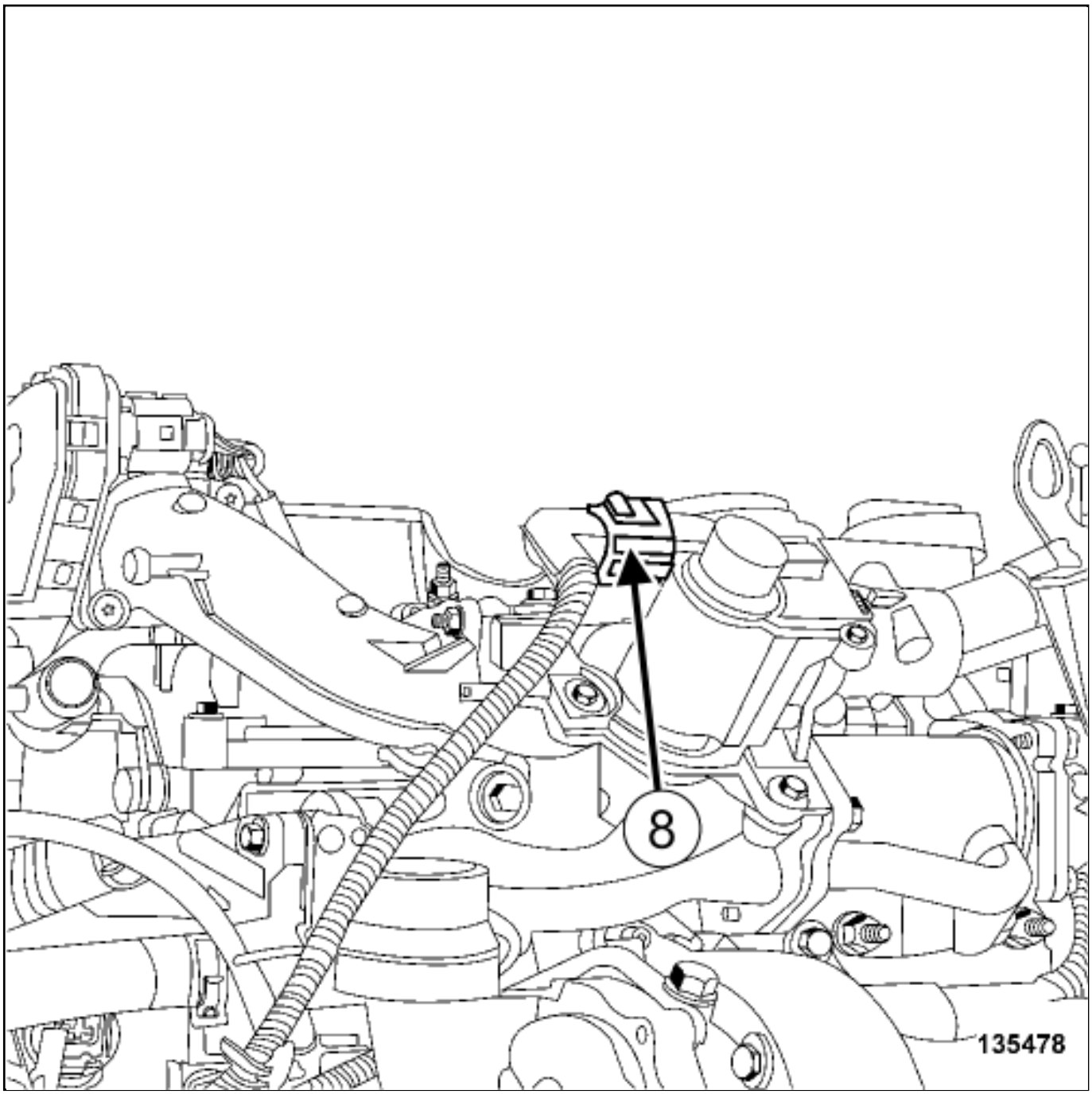
Wear cut-resistant gloves during the operation.

REMOVAL

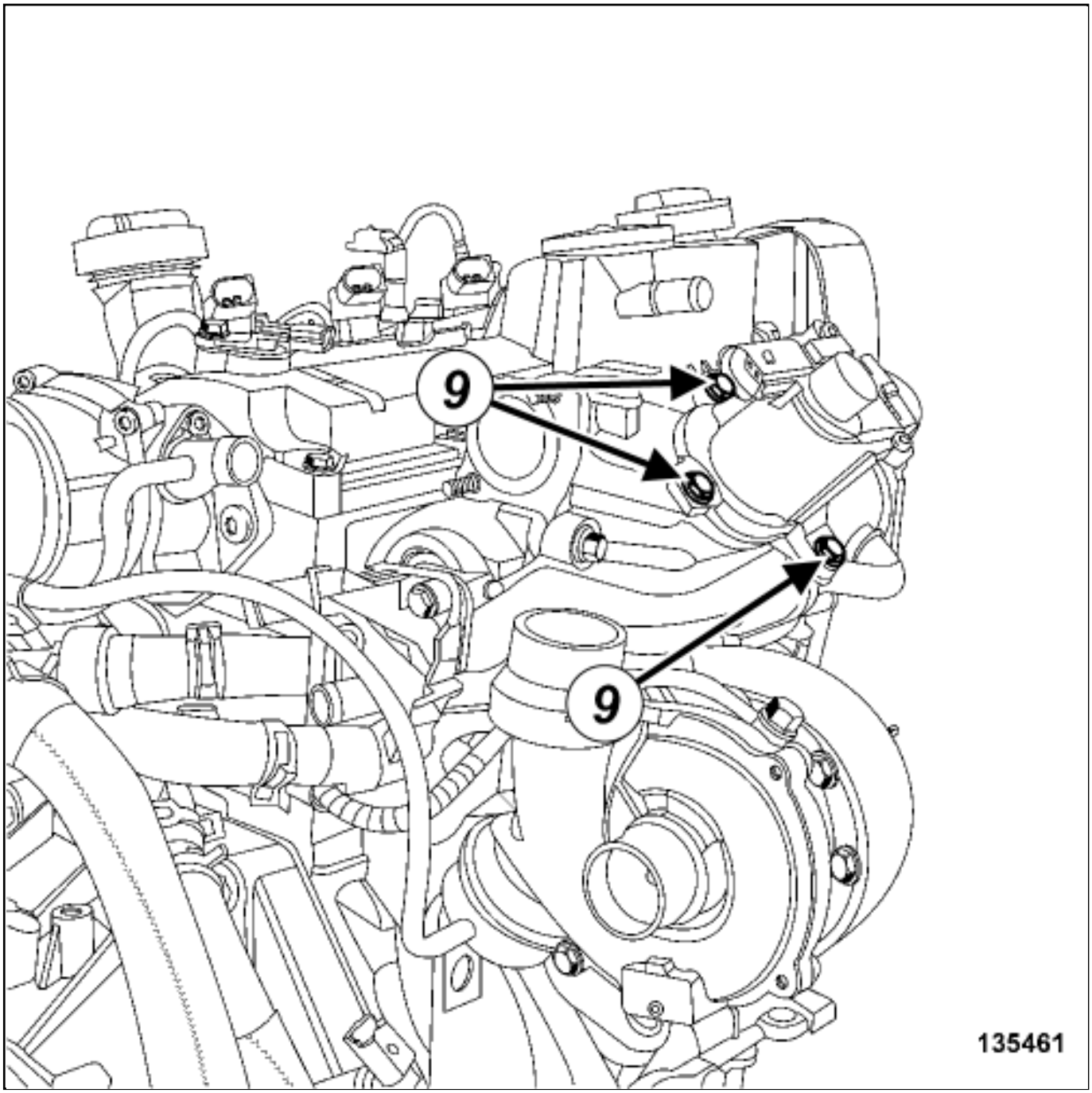
1. REMOVAL PREPARATION OPERATION

- Remove the front engine cover.

2. OPERATION FOR REMOVAL OF PART CONCERNED



- Disconnect the connector(8) from the exhaust gas recirculation solenoid valve.



Remove:

- the bolts(9) from the exhaust gas recirculation solenoid valve,
- the exhaust gas recirculation solenoid valve,
- the exhaust gas recirculation solenoid valve seal.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: exhaust gas recirculation solenoid valve seal.

- Always replace the clip on the cooling hose between the exhaust gas cooler and the exhaust gas recirculation solenoid valve.

- Use surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean and degrease the joint faces:
  - of the exhaust gas recirculation solenoid valve if it is being reused,
  - of the exhaust gas recirculation mounting on the gearbox side.

2. REFITTING OPERATION FOR PART CONCERNED

- Refit:
  - a new seal on the exhaust gas recirculation solenoid valve,
  - the exhaust gas recirculation solenoid valve.

- Torque tighten the exhaust gas recirculation solenoid valve bolts 10 N.m.

- Connect the exhaust gas recirculation solenoid valve connector.

3. FINAL OPERATION

- Refit the engine cover.

- Apply the after repair procedure using the Diagnostic tool:

- connect the Diagnostic tool,
- select "Injection computer",
- go to repair mode,
- display the "Before/after repair procedure" for the computer selected,
- select "Exhaust gas recirculation solenoid valve" in the "List of components controlled by this computer" section,
- carry out the operations described in the "After repair procedure" section.

EXHAUST MANIFOLD: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:
exhaust manifold seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

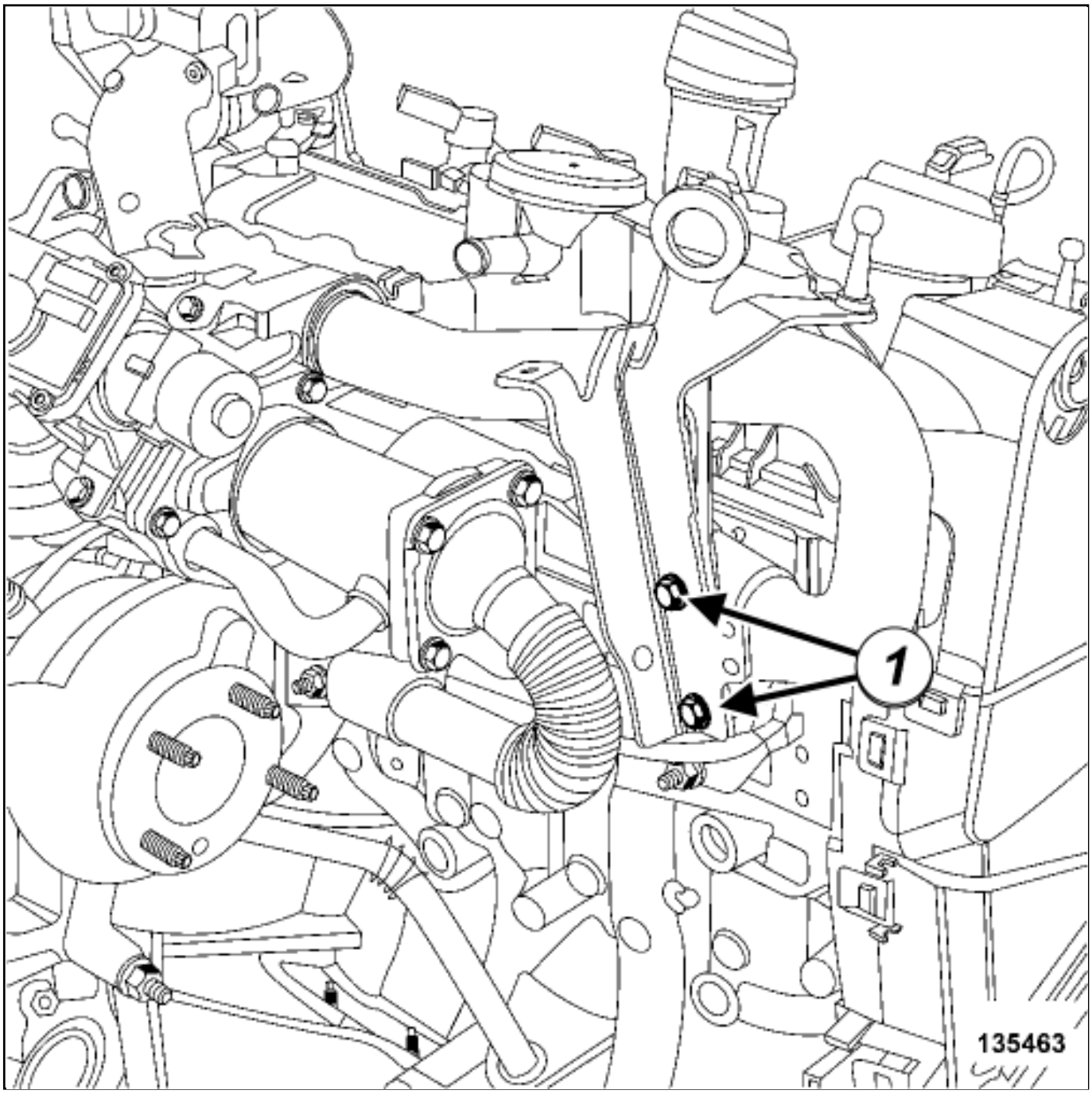
WARNING

Wear protective gloves during the operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

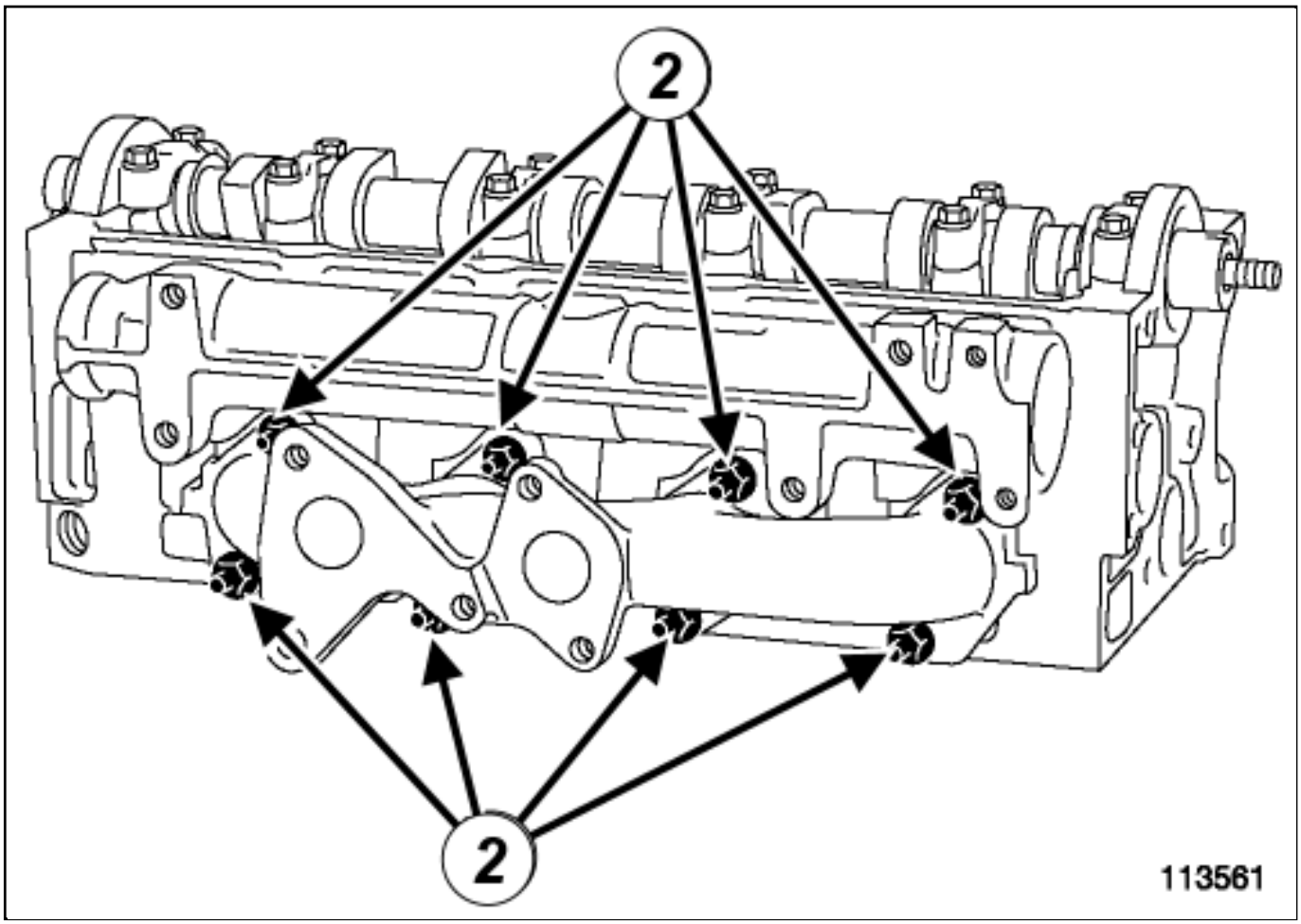
- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).
- Disconnect the battery Battery: Removal - Refitting (80A, Battery).
- Remove:
  - the engine undertray bolts,
  - the engine undertray,
- Remove:
  - the catalytic converter Catalytic converter: Removal - Refitting ,
  - the turbocharger oil return pipe Turbocharger oil pipe: Removal - Refitting ,
  - the turbocharger air outlet pipe Intercooler air inlet pipe: Removal - Refitting ,
  - the turbocharger oil supply pipe Turbocharger oil pipe: Removal - Refitting ,
  - the turbocharger Turbocharger: Removal - Refitting .



Remove:

- the bolts(1) from the lifting eye at the timing end,
- the lifting eye on the timing end,
- the rigid exhaust gas recirculation pipeExhaust gas recirculation rigid pipe: Removal - Refitting .

2. OPERATION FOR REMOVAL OF PART CONCERNED



- Remove:
  - the nuts(2) from the exhaust manifold,
  - the exhaust manifold.

- Mark the position of the exhaust manifold gasket.

- Remove the exhaust manifold gasket.

REFITTING

1. REFITTING PREPARATION OPERATION

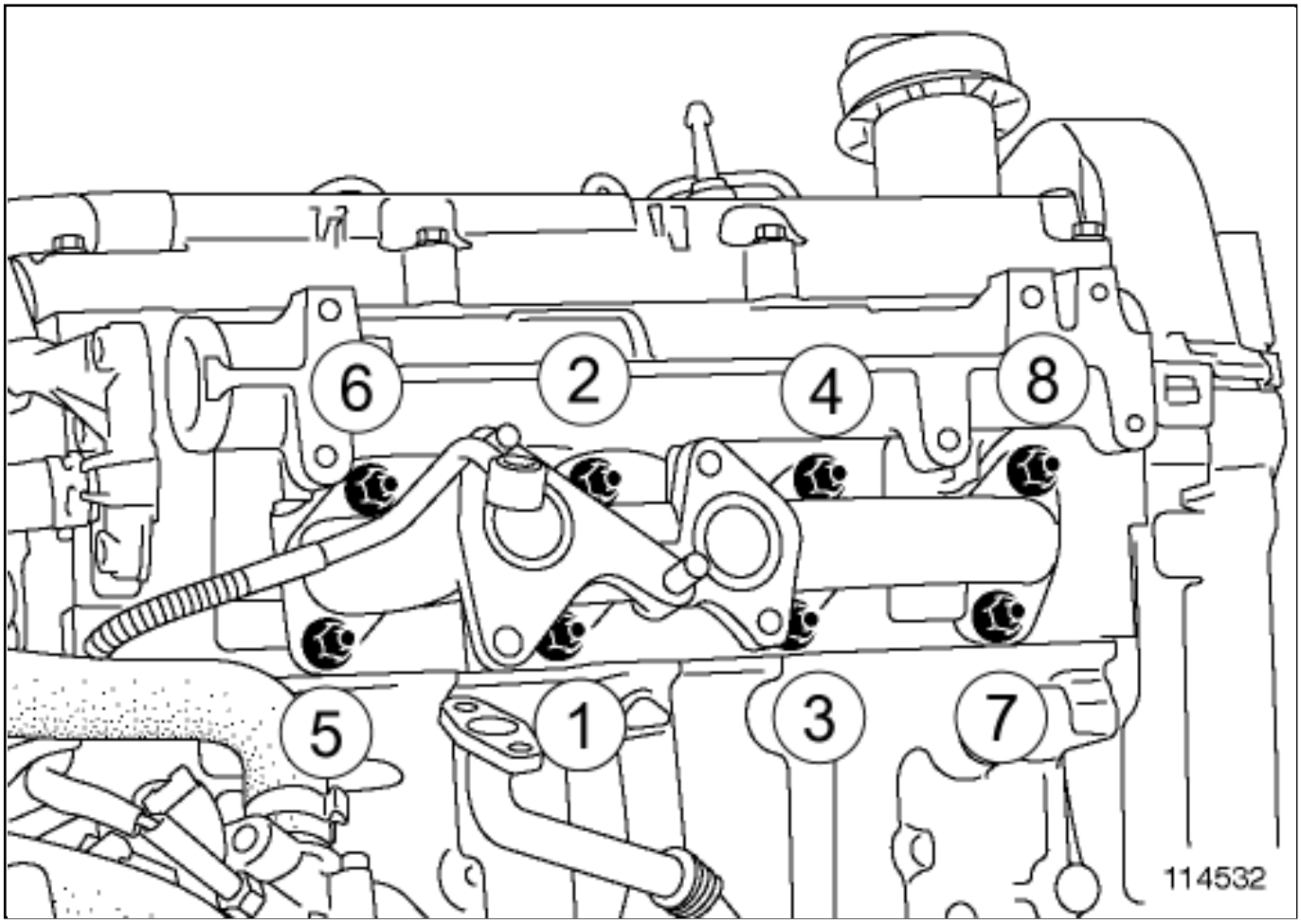
- parts always to be replaced: exhaust manifold seal.

- Use grey abrasive pads Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean the joint face:
  - the cylinder head,
  - of the exhaust manifold, if it is to be reused.

Use surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products) and clean clothsto clean and degrease the joint faces:

- the cylinder head,
- of the exhaust manifold, if it is to be reused.

2. REFITTING OPERATION FOR PART CONCERNED



Refit:

- a new exhaust manifold gasket in the position marked during removal,
- the exhaust manifold.

Torque tighten in order the exhaust manifold nuts26 N.m.

3. FINAL OPERATION

Refit:

- the exhaust gas recirculation rigid pipeExhaust gas recirculation rigid pipe: Removal - Refitting ,

- the lifting eye on the timing end,
- the turbocharger Turbocharger: Removal - Refitting .
- the turbocharger oil supply pipe Turbocharger oil pipe: Removal - Refitting ,
- the turbocharger air outlet pipe Intercooler air inlet pipe: Removal - Refitting ,
- the turbocharger oil return pipe Turbocharger oil pipe: Removal - Refitting ,
- the catalytic converter Catalytic converter: Removal - Refitting .

Refit the engine undertray.

Connect the battery Battery: Removal - Refitting (80A, Battery).

EXHAUST: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

Special tooling required	
Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.	Mot. 1199-01

Equipment required
component jack

1. PARTS AND CONSUMABLES FOR THE REPAIR

1- PARTS ALWAYS TO BE REPLACED:

- the exhaust sleeve (if fitted)

- the seal or sealing ring on the connection between the catalytic converter or catalytic pre-converter and the rest of the exhaust system

- the exhaust clip(s) (if fitted)

2- CONSUMABLES (SEE PART NUMBER IN TECHNICAL NOTE 5068, 04B, CONSUMABLES - PRODUCTS):

- exhaust mastic

- surface cleaner

- grey abrasive pads

2. ADVICE TO OBSERVE

WARNING

Do not park and run the engine in a place where combustible substances and materials such as grass or leaves can come into contact with the hot exhaust system.

WARNING

Catalytic converters contain ceramic fibres, these are contained within a closed unit, and cannot disperse. Drilling or cutting catalytic converters is prohibited.

1 - During removal and refitting, the catalytic converter or catalytic pre-converter must not receive any knocks or impacts as this could damage it.

2 - The whole exhaust pipe is made of stainless steel.

3 - After working on the bracket between the catalytic converter or catalytic pre-converter and the rest of the exhaust system, ensure that the connection is perfectly sealed.

To do this:

- clean the bearing faces of the connection using grey abrasive pads,
- degrease the bearing faces of the connection using surface cleanerand clean cloths,
- always replace the seal or sealing ring on the connection.

3. SPECIAL NOTES ON THE SINGLE UNIT EXHAUST PIPE

1- CUTTING THE SINGLE UNIT EXHAUST PIPE

The exhaust pipe is a "single unit type" .

To replace different parts of the exhaust system it must be cut.

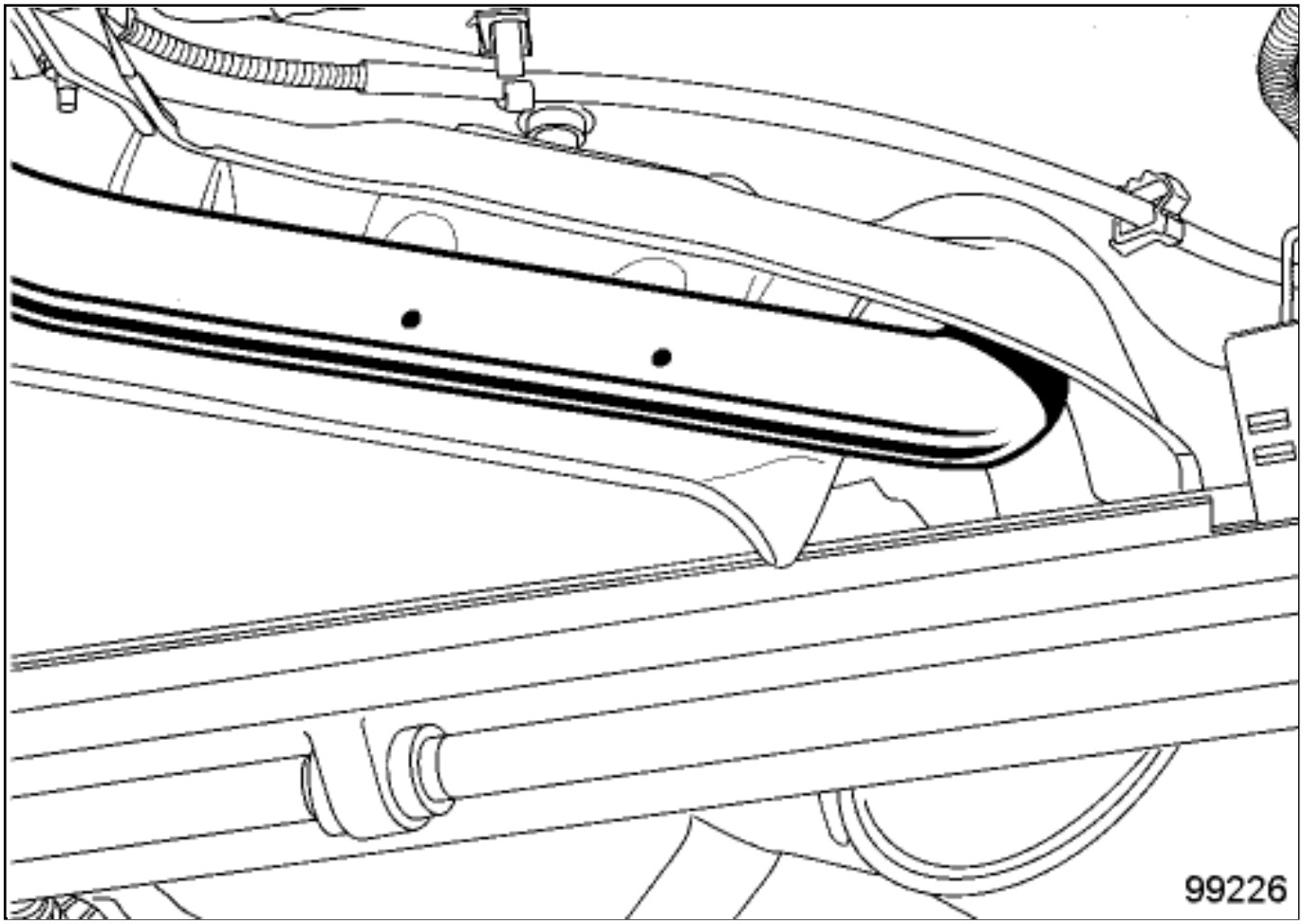
To do this be sure to carry out these precautions in the following order:

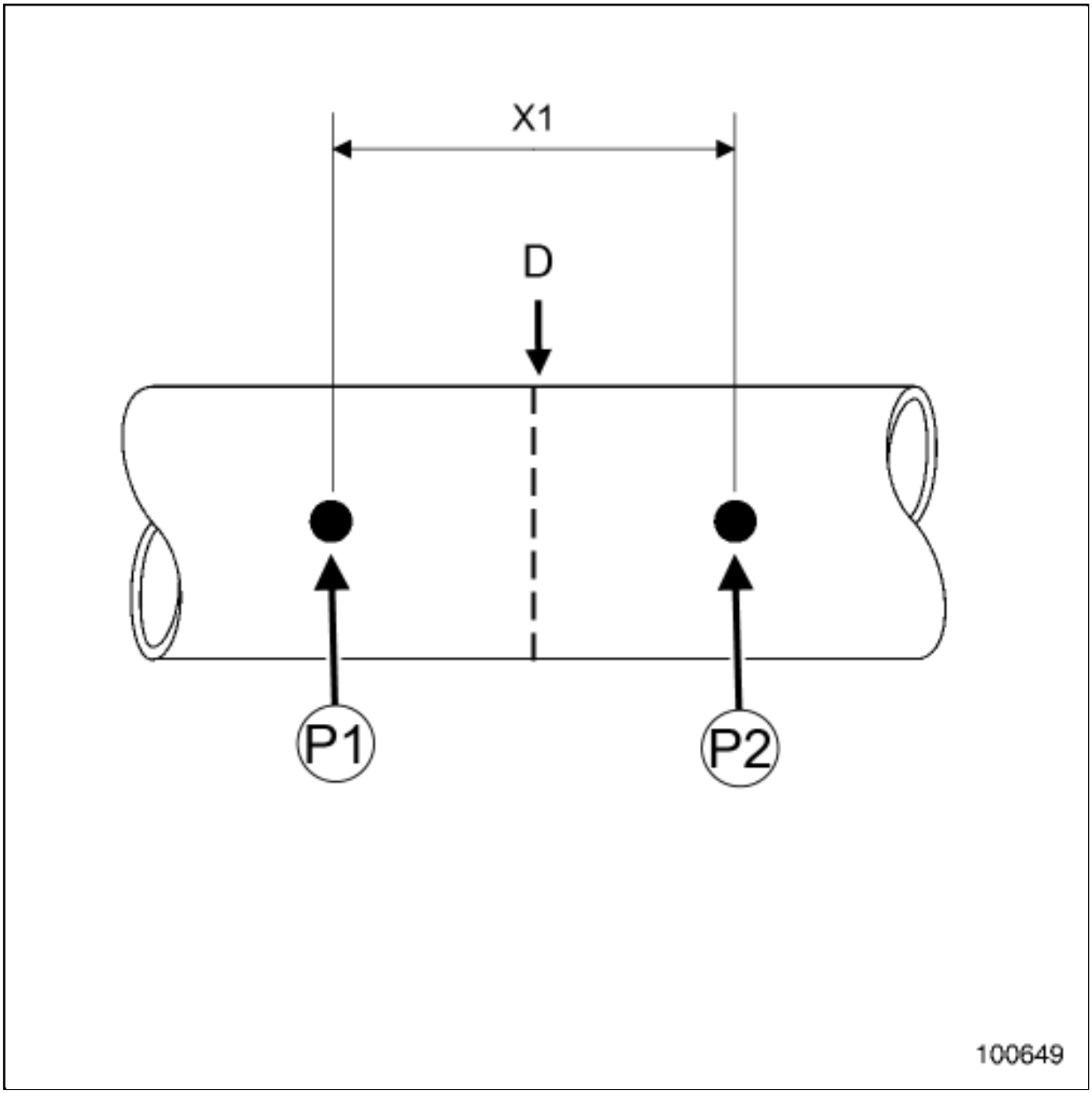
- correctly identify the area to be cut, as explained below,
- use the cutting tool correctlyExhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case. (**Mot. 1199-01**) ,
- position the exhaust sleeve correctly.

2- IDENTIFYING THE AREA OF THE EXHAUST SYSTEM TO BE CUT

Two marks made on the exhaust system define the area to be cut**(see 19B, Exhaust, Exhaust assembly under body: Exploded view)** (see MR for vehicle concerned, 19B, Exhaust).

EXAMPLE OF CUTTING AREA

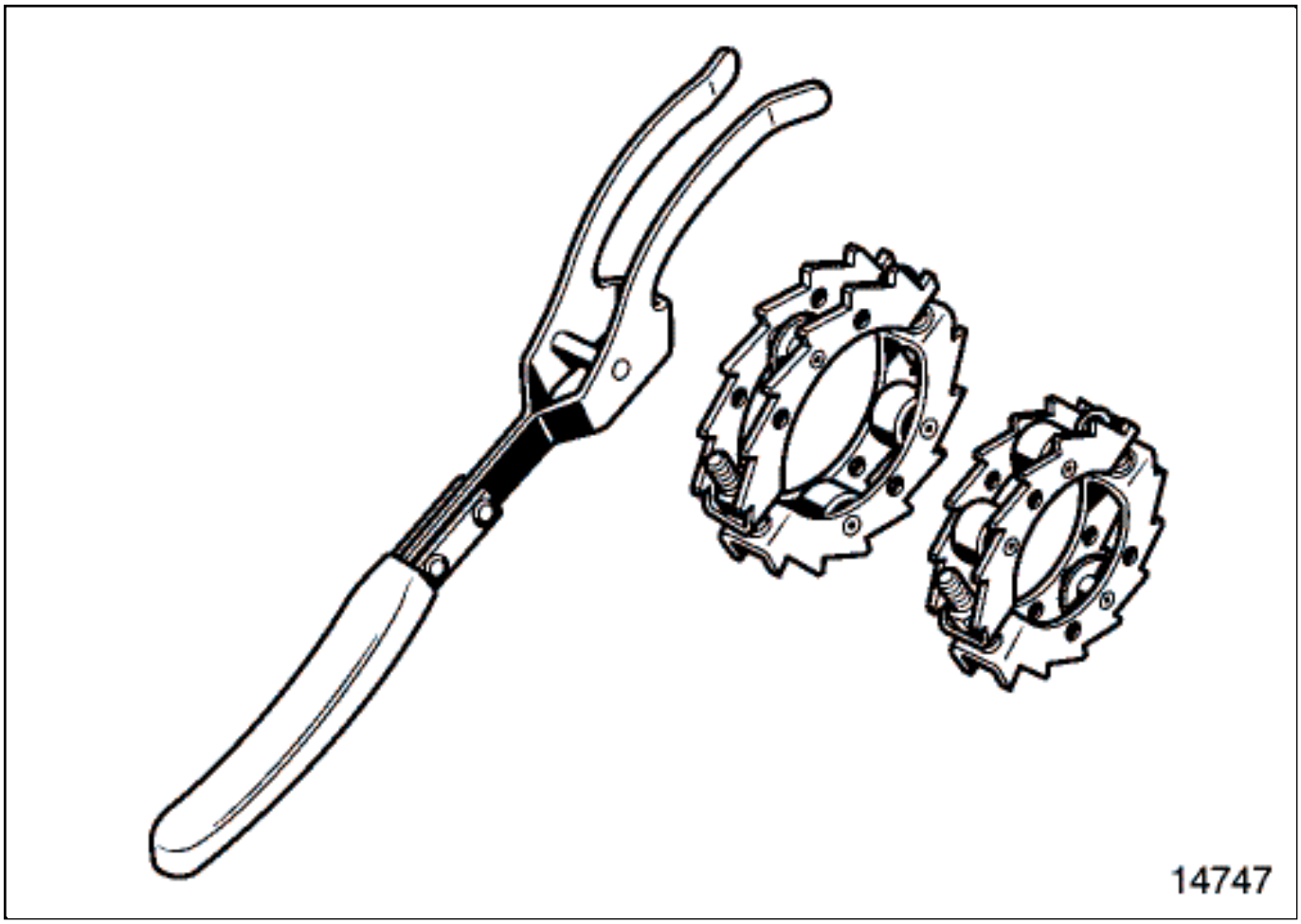

99226



Before cutting the exhaust system, draw a line(D) between the two marks(P1) and (P2) .

The distance between the two marks on the exhaust pipe is(X1) : 80 mm .

3- OPERATE TOOL MOT. 1199-01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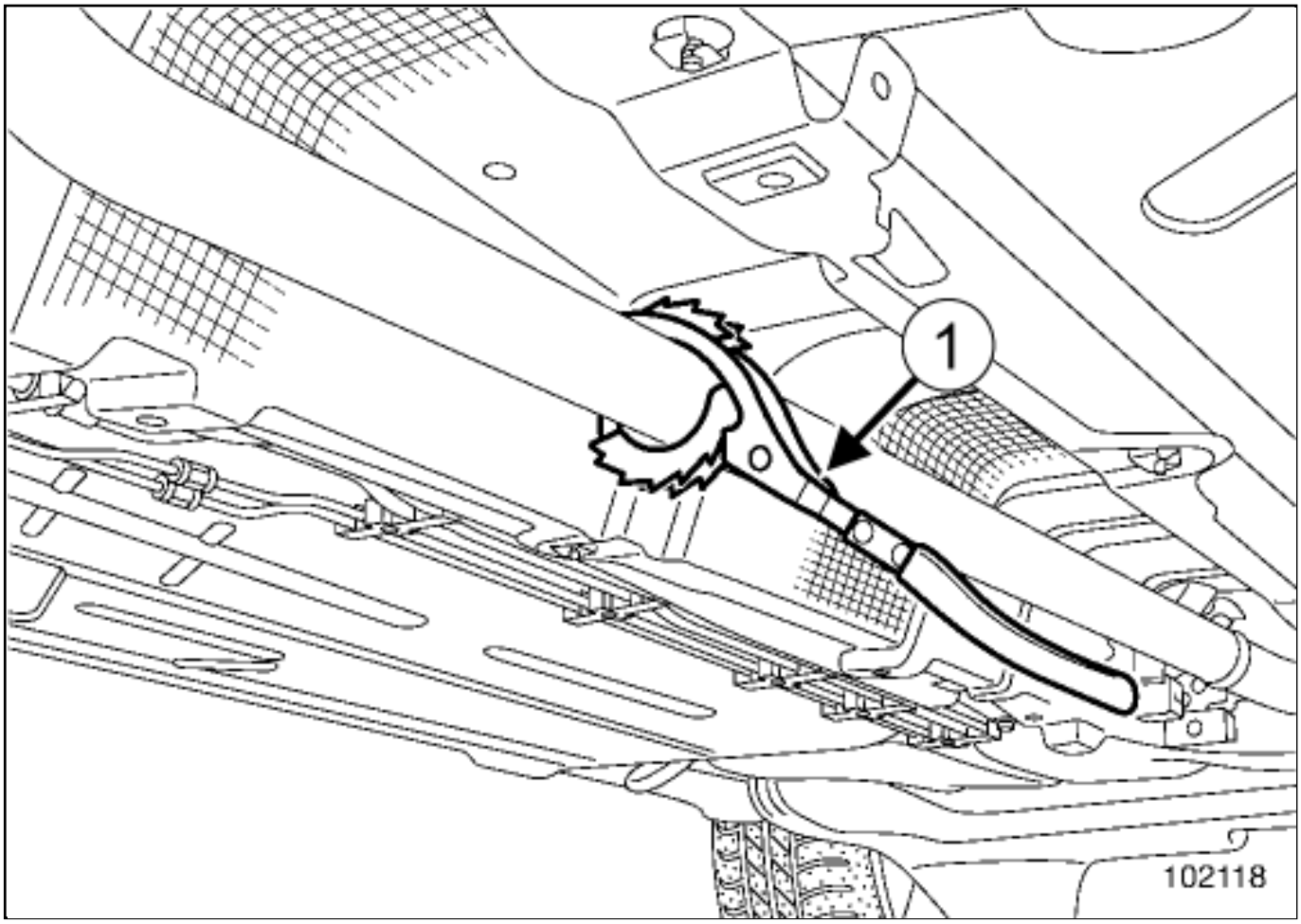


Fit the Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.(Mot. 1199-01) (1) on the exhaust pipe.

Tighten the two bolts on the tool until they touch the pipe in order to clamp the tool onto the pipe.

Turn the cutting tool using the handle and pressing it against the pipe (as indicated in the diagram above).

Tighten the two bolts on the tool whilst cutting, until the pipe is completely cut.

Note:

Do not over-tighten the tool onto the pipe to avoid deforming it.

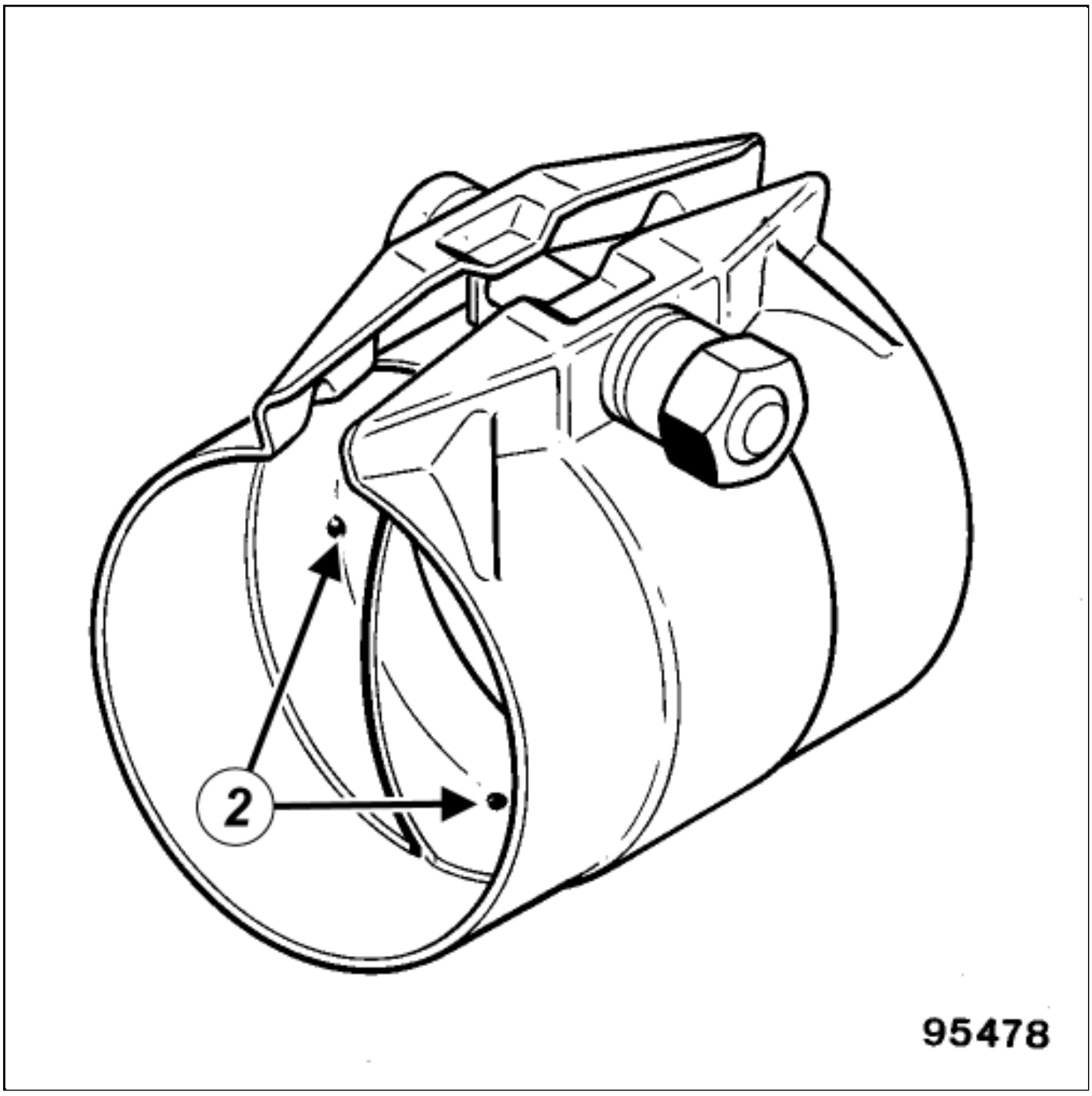
Once the pipe is cut, file and deburr the end of the pipe to be used on the vehicle again.

4- POSITIONING THE EXHAUST SLEEVE

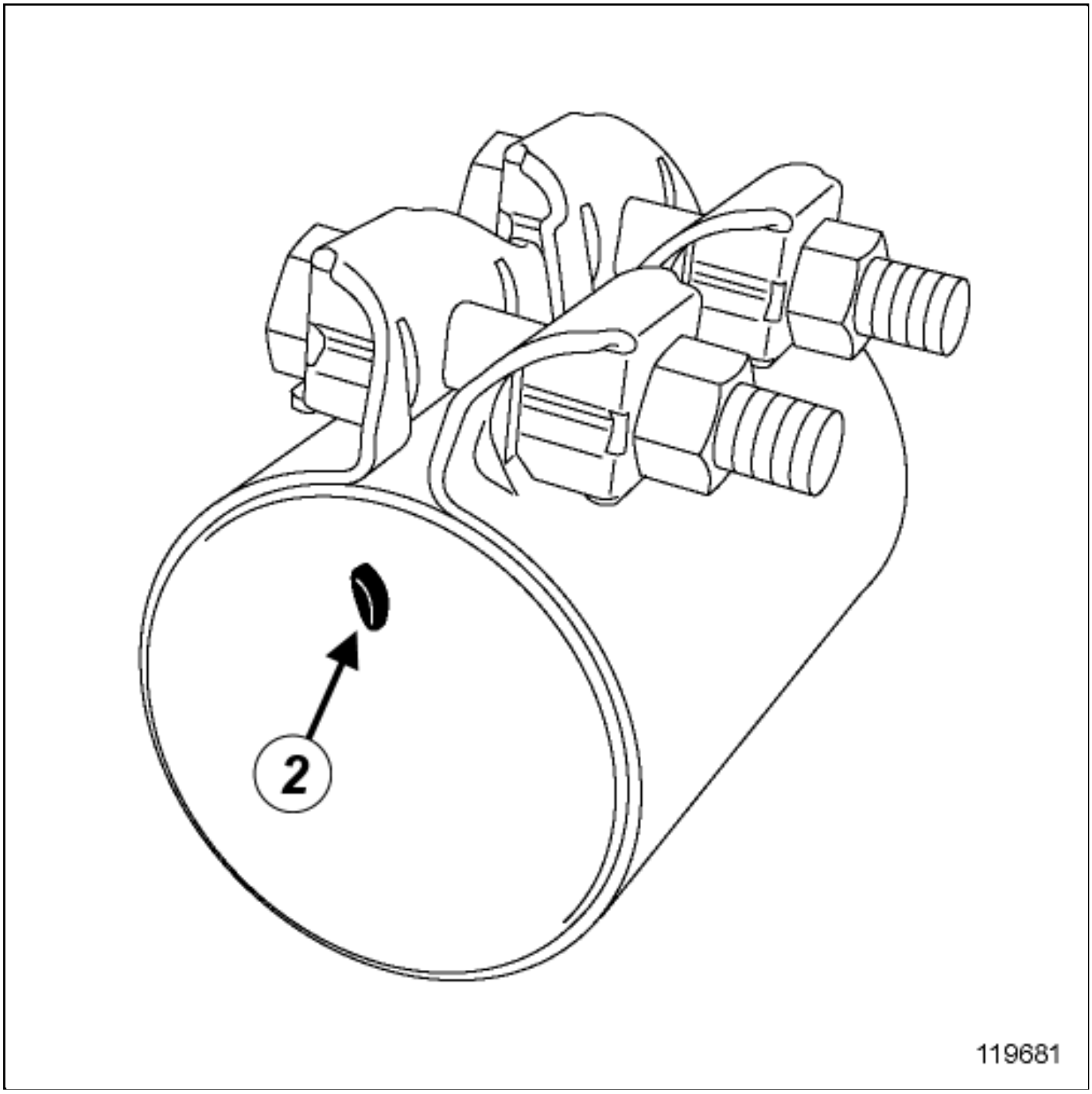
CAUTION

Do not reuse an old exhaust sleeve.

EXHAUST SLEEVE WITH 1 BOLT



EXHAUST SLEEVE WITH 2 BOLTS



Fit the exhaust sleeve onto the part of the exhaust system fitted to the vehicle.

Position the pipe onto the lugs(2) inside the exhaust sleeve.

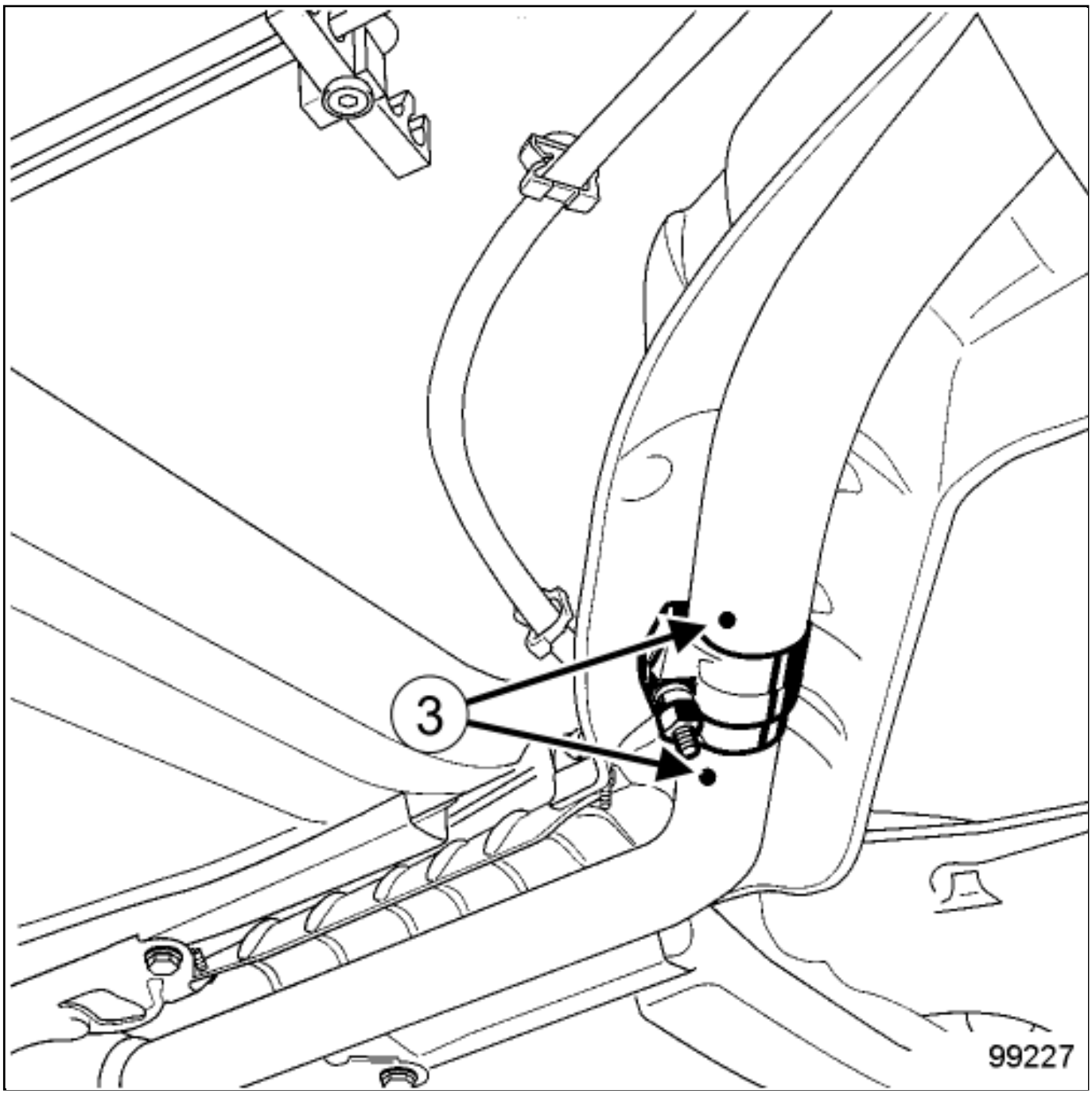
Tighten the exhaust sleeve bolt(s) slightly (depending on the version).

Position the second part of the exhaust system under the vehicle, fitting it in the exhaust sleeve.

Note:

If necessary, use a component jackto lift and hold the heavy and bulky components of the exhaust system.

Position the second exhaust pipe onto the lugs inside the exhaust sleeve.



Check that the two cut marks(3) are aligned (if applicable).

Position the sleeve so that there is no risk of contact between its bolt or bolts and the heat shields.

Torque tighten:

- the exhaust sleeve nut with 1 bolt25 N.m(if fitted),
- the exhaust sleeve nuts with 2 bolts18 N.m(if fitted).

Check the following and deal with if necessary:

- no underbody contact between the exhaust system and the heat shields,
- all of the heat shields are present and secure.

Note:

Any damaged heat shields must be replaced.

Start the engine.

Check that there are no leaks: deal with any leaks.

Note:

If there are leaks from the exhaust sleeves with 1 bolt, apply exhaust masticto the sleeve (see part no. in Technical Note 5068, 04B, Consumables - Products).

If the application of exhaust mastic does not fix the leak:

- remove and replace the used exhaust sleeve,
- check the condition of the exhaust pipes (condition of the pipe surface, deburring of the area cut, damage to the pipes).
- fit the new sleeve in accordance with the instructions given before.

EXPANSION VALVE - INTERMEDIATE PIPE CONNECTING PIPE AT EXPANSION VALVE INLET: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
refrigerant charging station

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair(see 62A, Air conditioning, Air conditioning: Precautions for the repair) .

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857to plug any openings exposed to the open air. They must be clean. Do not use any which have already been used to plug a fuel circuit.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Disconnect the battery Battery: Removal - Refitting .
- Remove the front bumper Front bumper assembly: Exploded view .
- Disconnect the pressure sensor connector.
- Drain the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .
- Move aside the engine compartment bulkhead soundproofing.

2. REMOVAL OPERATION

- Remove (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :
  - the bolt from the retaining bracket of the "expansion valve - expansion valve inlet intermediate pipe" connecting pipe from the expansion valve,
  - the bolt from the retaining bracket of the "expansion valve - expansion valve inlet intermediate pipe" connecting pipe from the "condenser - intermediate pipe" connecting pipe.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

- Disconnect (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :
  - the "expansion valve - expansion valve inlet intermediate pipe" connecting pipe from the expansion valve,
  - the "expansion valve - expansion valve inlet intermediate pipe" connecting pipe from the "condenser - intermediate pipe" connecting pipe.
- Insert the blanking plugs.
- Remove the "expansion valve - expansion valve inlet intermediate pipe" connecting pipe (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

- Clean the seals of the refrigerant circuit pipes(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Consult the refrigerant and oil quantity values before filling the circuit(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

- Perform the following operations:
  - fill the refrigerant circuit using the refrigerant charging station(see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
  - check for leaks(see 62A, Air conditioning, Refrigerant circuit: Check) .

- Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

EXPANSION VALVE - INTERMEDIATE PIPE CONNECTING PIPE AT THE EXPANSION VALVE OUTLET: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
refrigerant charging station

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair(see 62A, Air conditioning, Air conditioning: Precautions for the repair) .

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857to plug any openings exposed to the open air. They must be clean. Do not use any which have already been used to plug a fuel circuit.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the batteryBattery: Removal - Refitting .

Drain the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .

Move aside the engine compartment bulkhead soundproofing.

2. REMOVAL OPERATION

Remove (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :

- the bolt from the retaining bracket of the "expansion valve - expansion valve outlet intermediate pipe" connecting pipe from the expansion valve.
- the bolt from the retaining bracket of the "expansion valve - expansion valve outlet intermediate pipe" connecting pipe from the "compressor - intermediate pipe" connecting pipe.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

Disconnect (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :

- the "expansion valve - expansion valve outlet intermediate pipe" connecting pipe from the expansion valve,
- the "expansion valve - expansion valve outlet intermediate pipe" connecting pipe from the "compressor - intermediate pipe" connecting pipe.

Insert the blanking plugs.

Remove the "expansion valve - expansion valve outlet intermediate pipe" connecting pipe (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

- Clean the seals of the refrigerant circuit pipes (see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Consult the refrigerant and oil quantity values before filling the circuit (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

- Perform the following operations:
  - fill the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
  - check for leaks (see 62A, Air conditioning, Refrigerant circuit: Check) .

- Check that the air conditioning system is operating correctly (see 62A, Air conditioning, Air conditioning: Check) .

EXPANSION VALVE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
refrigerant charging station

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair(see 62A, Air conditioning, Air conditioning: Precautions for the repair) .

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857to plug any openings exposed to the open air. They must be clean. Do not use any which have already been used to plug a fuel circuit.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the batteryBattery: Removal - Refitting .
- Drain the refrigerant circuit using the refrigerant charging station(see 62A, Air conditioning, Refrigerant circuit:

Draining - Filling) .

2. REMOVAL OPERATION

- Remove (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :
  - the bolt from the retaining bracket of the "expansion valve - expansion valve inlet intermediate pipe" connecting pipe from the expansion valve,
  - the bolt from the retaining bracket of the "expansion valve - expansion valve outlet intermediate pipe" connecting pipe from the expansion valve.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

- Disconnect (see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) :
  - the "expansion valve - expansion valve inlet intermediate pipe" connecting pipe from the expansion valve,
  - the "expansion valve - expansion valve outlet intermediate pipe" connecting pipe from the expansion valve.

- Insert the blanking plugs.

- Remove the expansion valve(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

Clean the seals of the refrigerant circuit pipes(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Consult the refrigerant and oil quantity values before filling the circuit(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

Perform the following operations:

- fill the refrigerant circuit using the refrigerant charging station(see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
- check for leaks(see 62A, Air conditioning, Refrigerant circuit: Check) .

Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

EXTERIOR BODY FRONT TRIM ASSEMBLY: EXPLODED VIEW

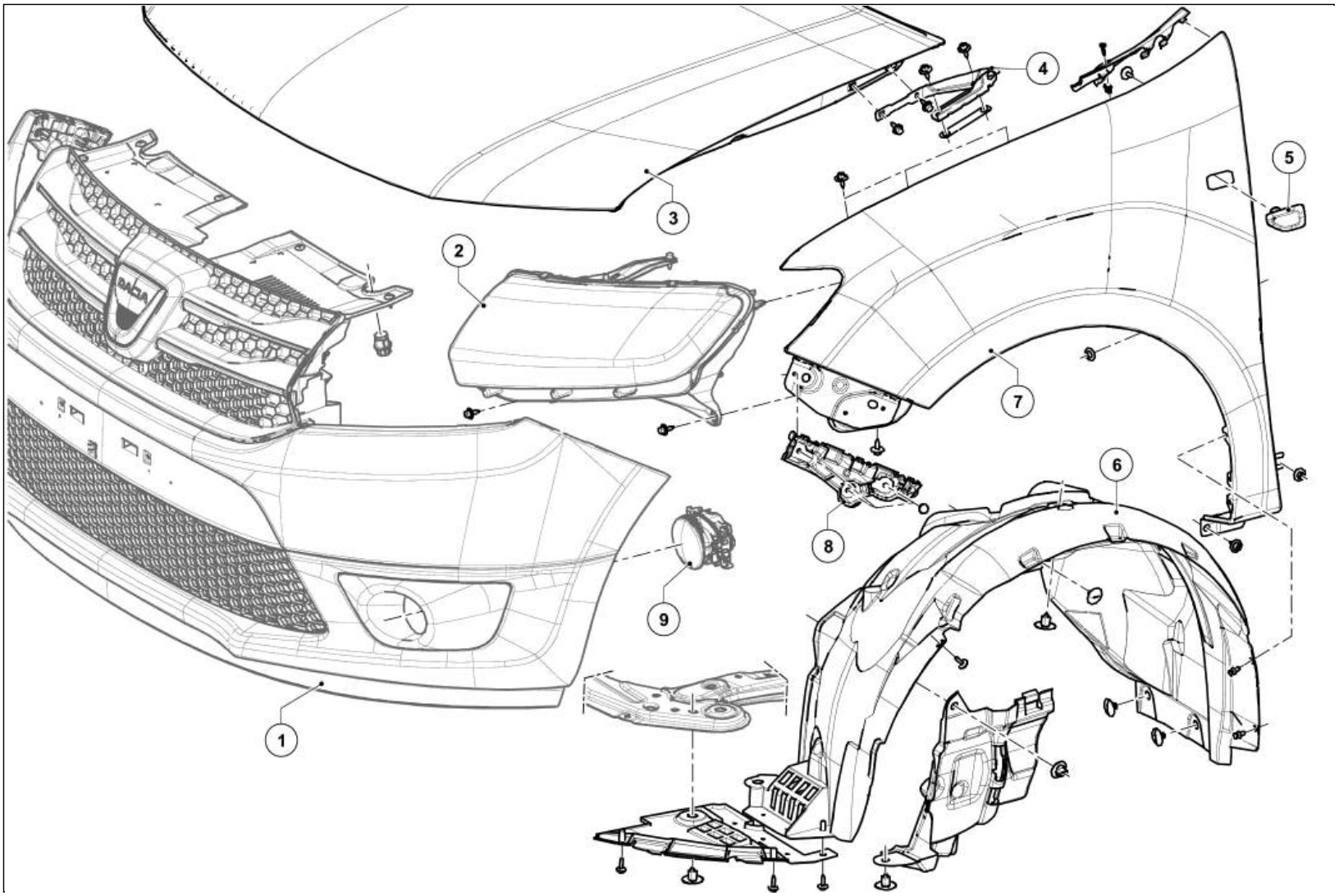


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front bumper assembly	(see 55A, Exterior protection, Front bumper assembly: Exploded view)
2	Headlight	Front signals - lighting assembly: Exploded view
3	Bonnet	
4	Bonnet hinge	
5	Side indicator	(Car. 1363)
6	Front wheel arch liner	
7	Front wing	Front wing: Removal - Refitting
8	Side pressure piece of front bumper	
9	Fog light	Front signals - lighting assembly: Exploded view

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EXTERIOR BODY REAR TRIM ASSEMBLY : EXPLODED VIEW

B52 K52(B52 OR K52)

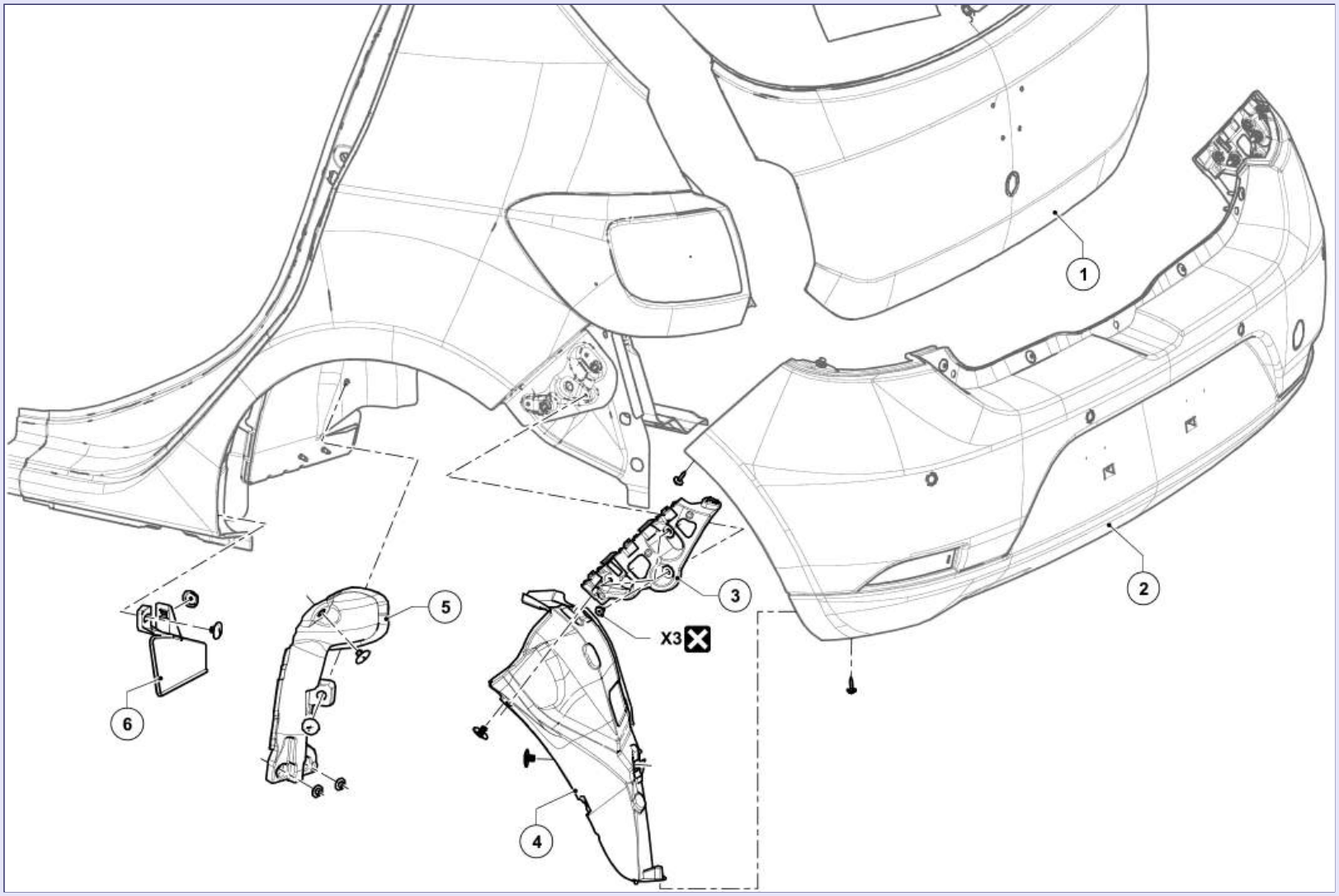


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Rear opening element	
2	Rear bumper	(see 55A, Exterior protection, Rear bumper assembly: Exploded view)
3	Bumper mounting	
4	Rear wheel arch liner	
5	ABS sensor cover	
6	Rear flap	

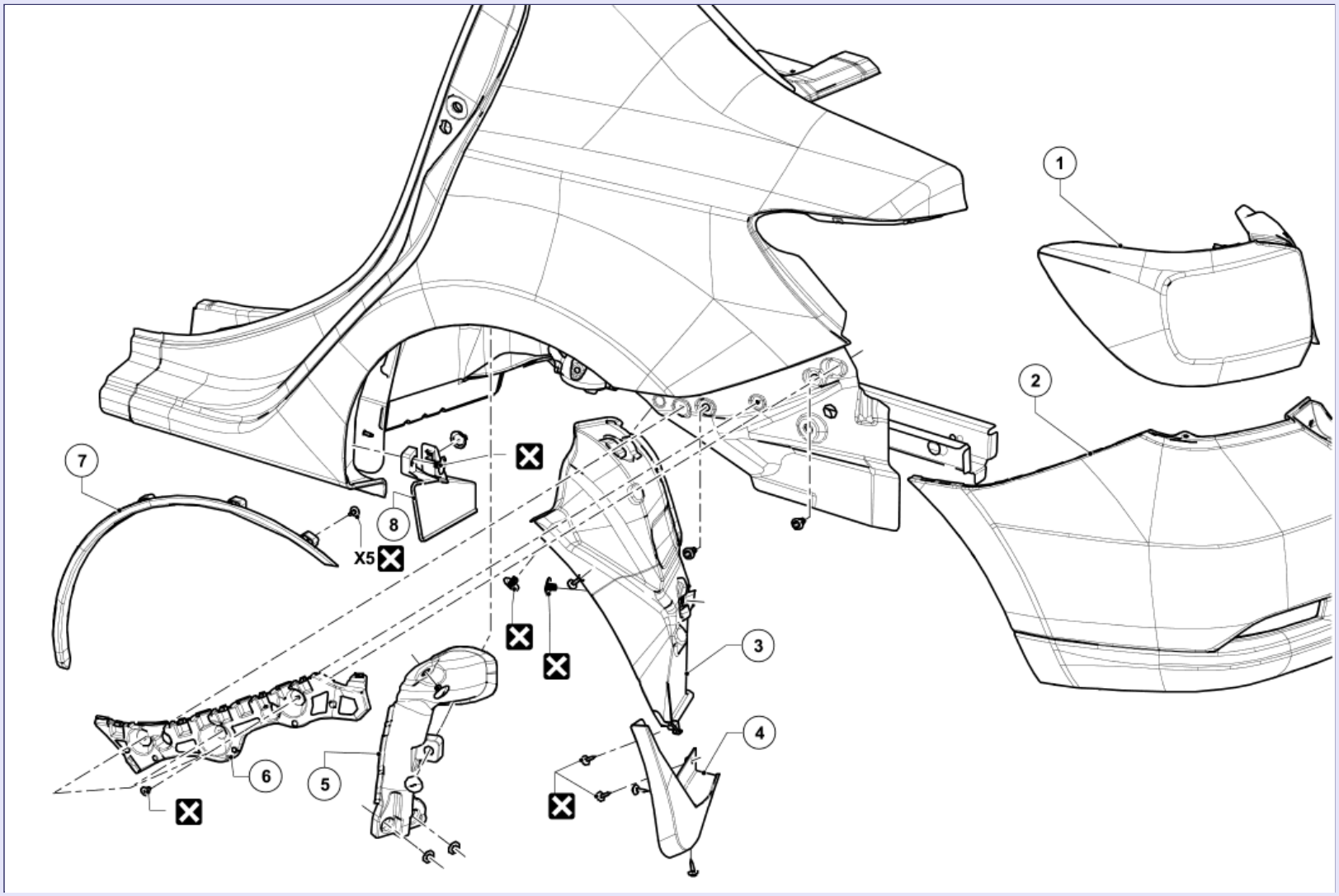


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Rear light	
2	Rear bumper	(see 55A, Exterior protection, Rear bumper assembly: Exploded view)
3	Rear wheel arch liner	
4	Rear mud flap	
5	ABS sensor cover	
6	Rear bumper support	
7	Rear wing protective strip	
8	Rear mud flap	

EXTERIOR BODY SIDE TRIM ASSEMBLY: EXPLODED VIEW

B52, ADDITIONAL SUV VERSION(B52)

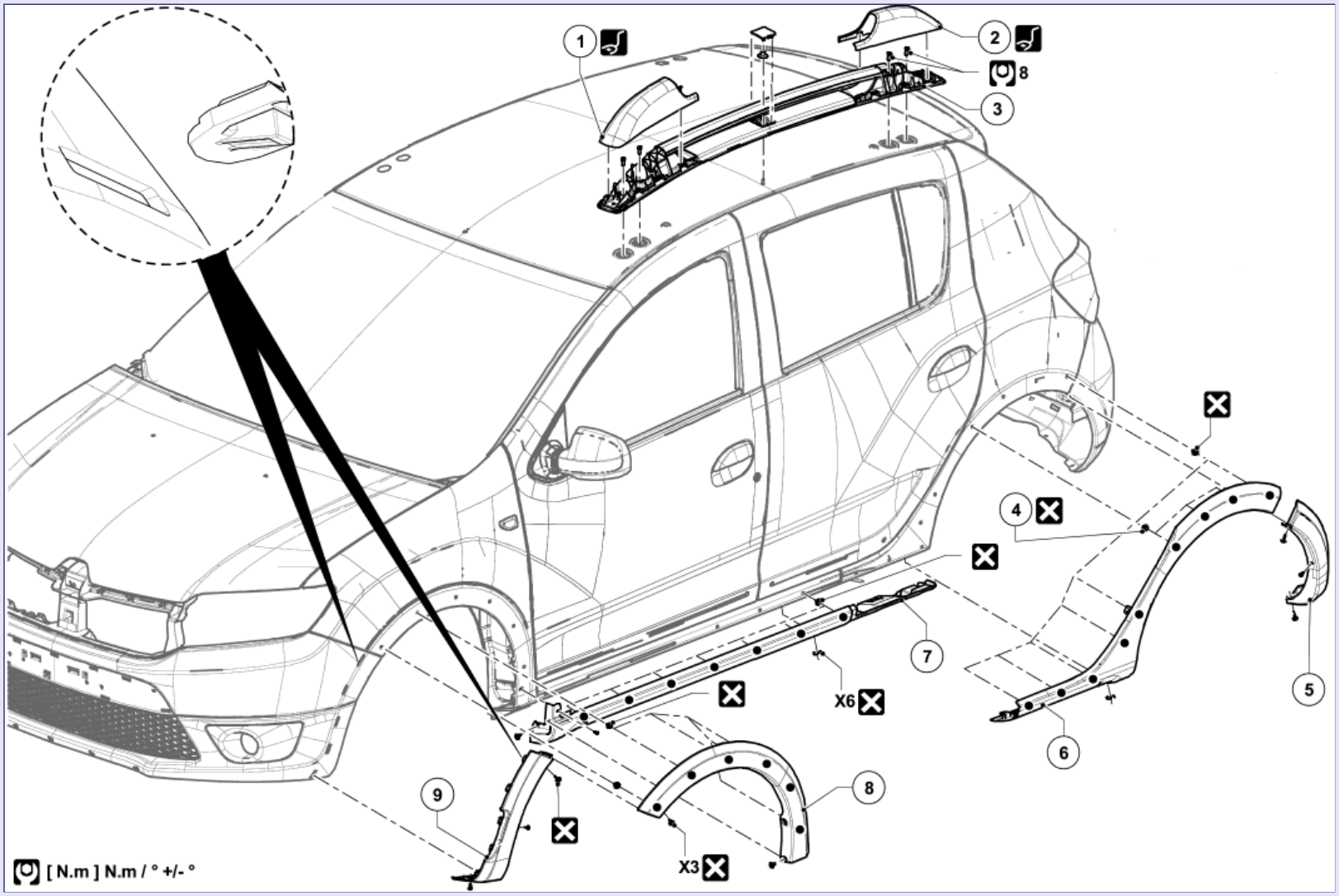


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Roof bar front trim	(Car. 1363)
2	Roof bar rear trim	(Car. 1363)
3	Roof bar	(see 56A, Exterior equipment , Roof bar: Removal - Refitting)
4	Rivet of rear wing extender	
5	Rear bumper extender	
6	Rear wing extender	
7	Sill panel extender	
8	Front wing upper extender	
9	Front wing lower extender	

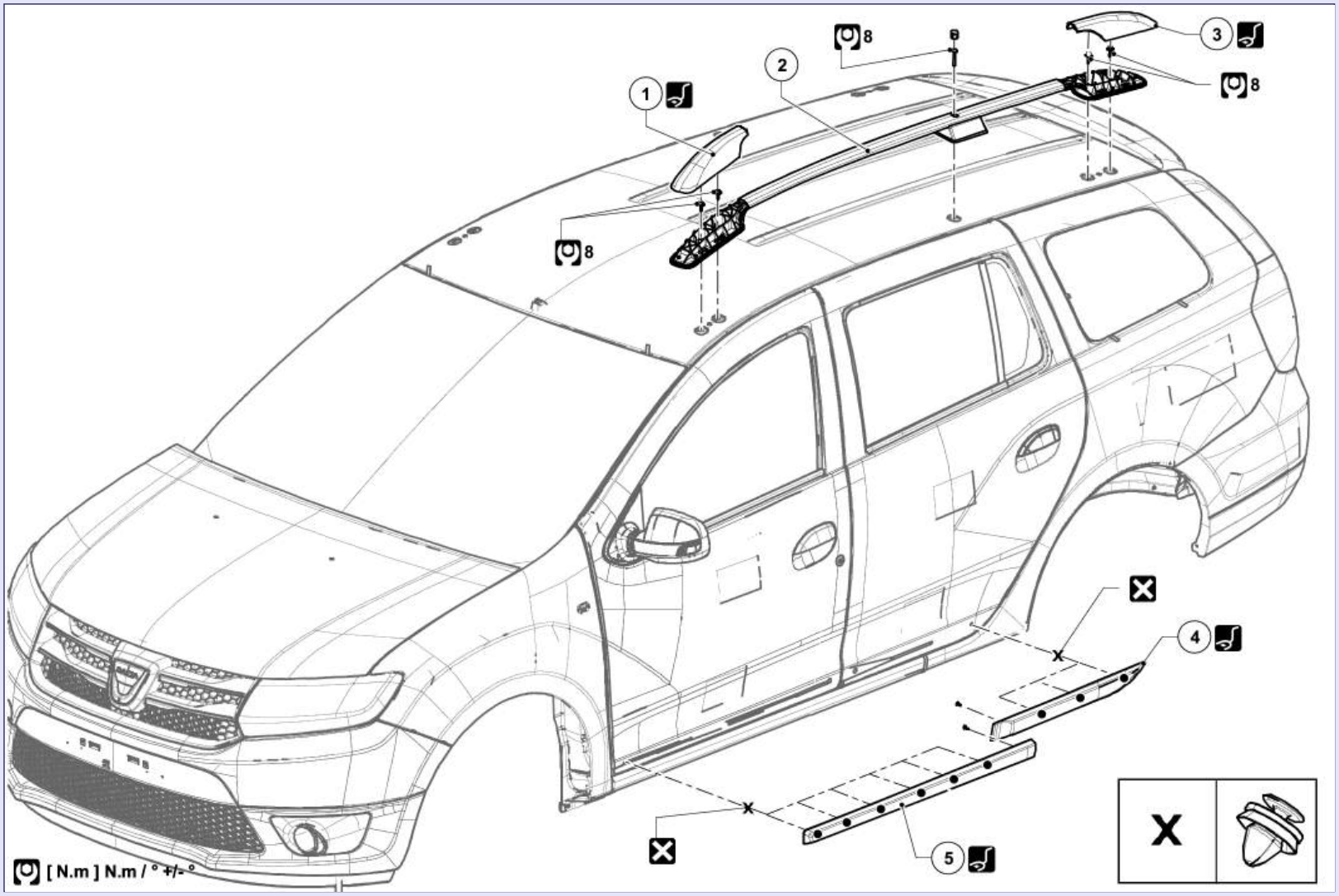


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Roof bar front trim	(Car. 1363)
2	Roof bar	(see 56A, Exterior equipment , Roof bar: Removal - Refitting)
3	Roof bar rear trim	(Car. 1363)
4	Rear side door protective strip	(Car. 1363)
5	Front side door protective strip	(Car. 1363)

EXTERIOR FRONT SIDE OPENING ELEMENT ASSEMBLY: EXPLODED VIEW

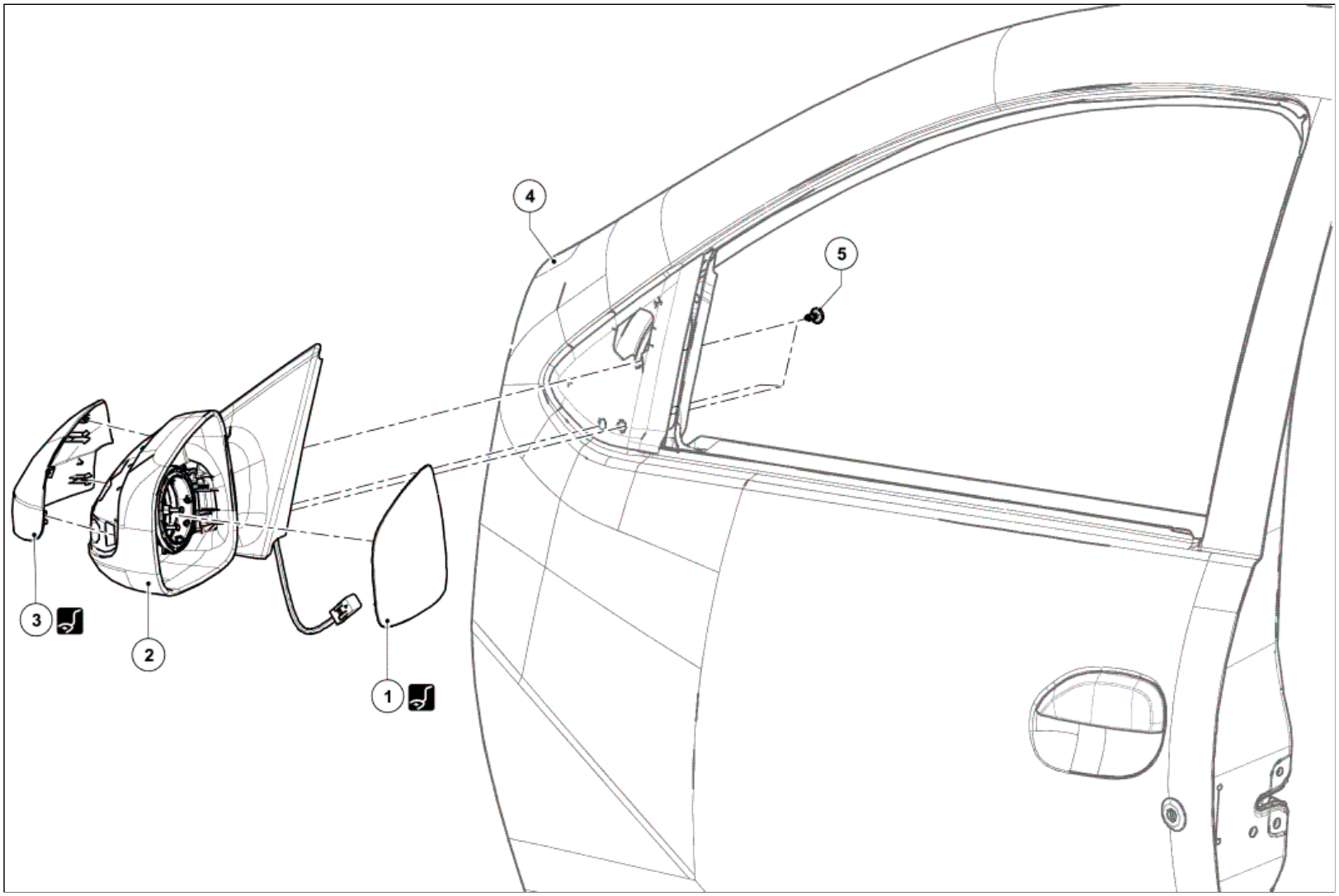


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Door mirror glass	(Car. 1363)
2	Door mirror	Door mirror: Removal - Refitting
3	Door mirror trim	(Car. 1363)
4	Front side opening element	(see **Front side door: Removal - Refitting**)
5	Door mirror mounting bolts	

EXTERIOR REAR OPENING ELEMENT ASSEMBLY: EXPLODED VIEW

B52, DACIA BRAND(B52)

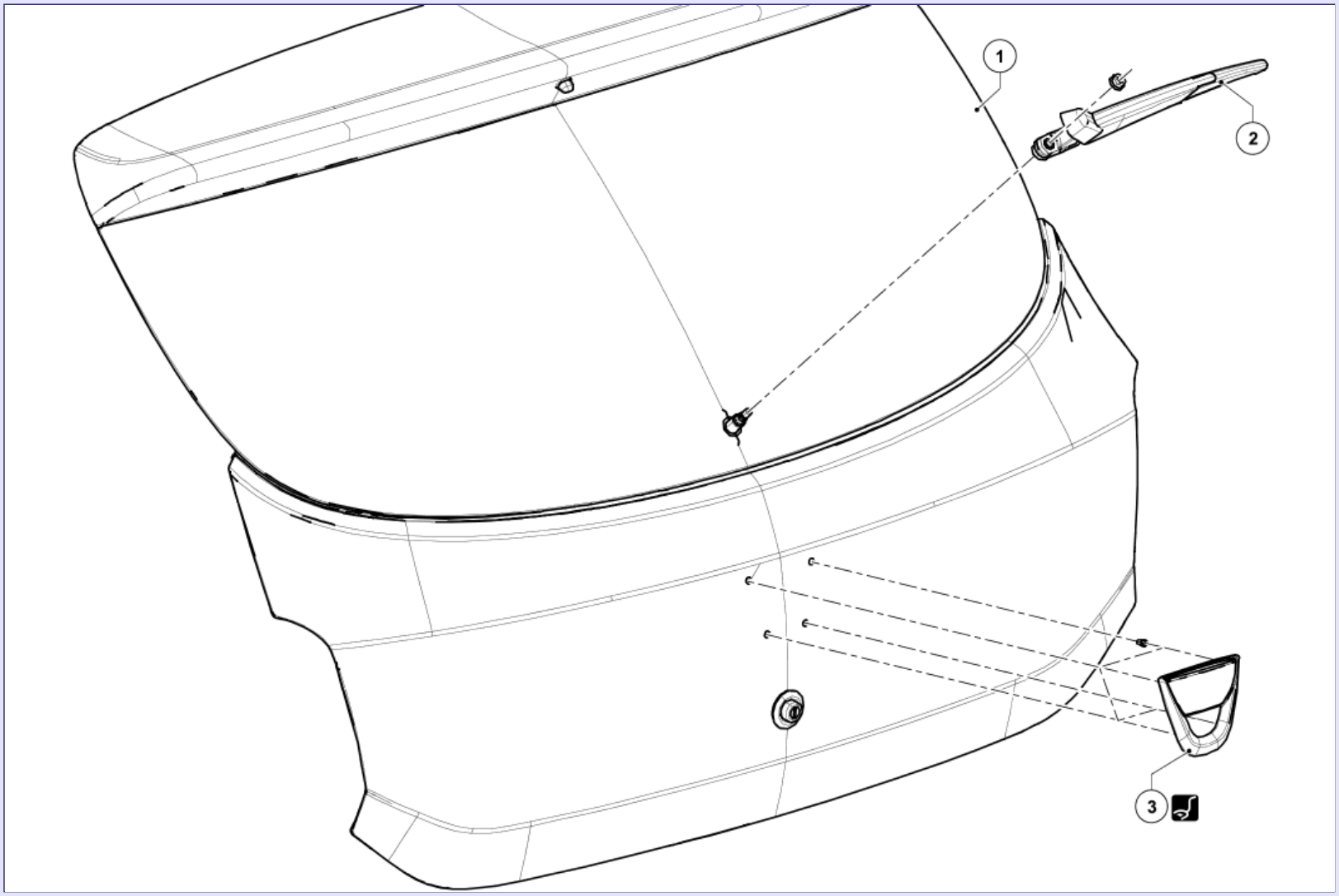


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Tailgate	Rear opening element: Removal - Refitting
2	Rear screen wiper	
3	Badge	(Car. 1363)

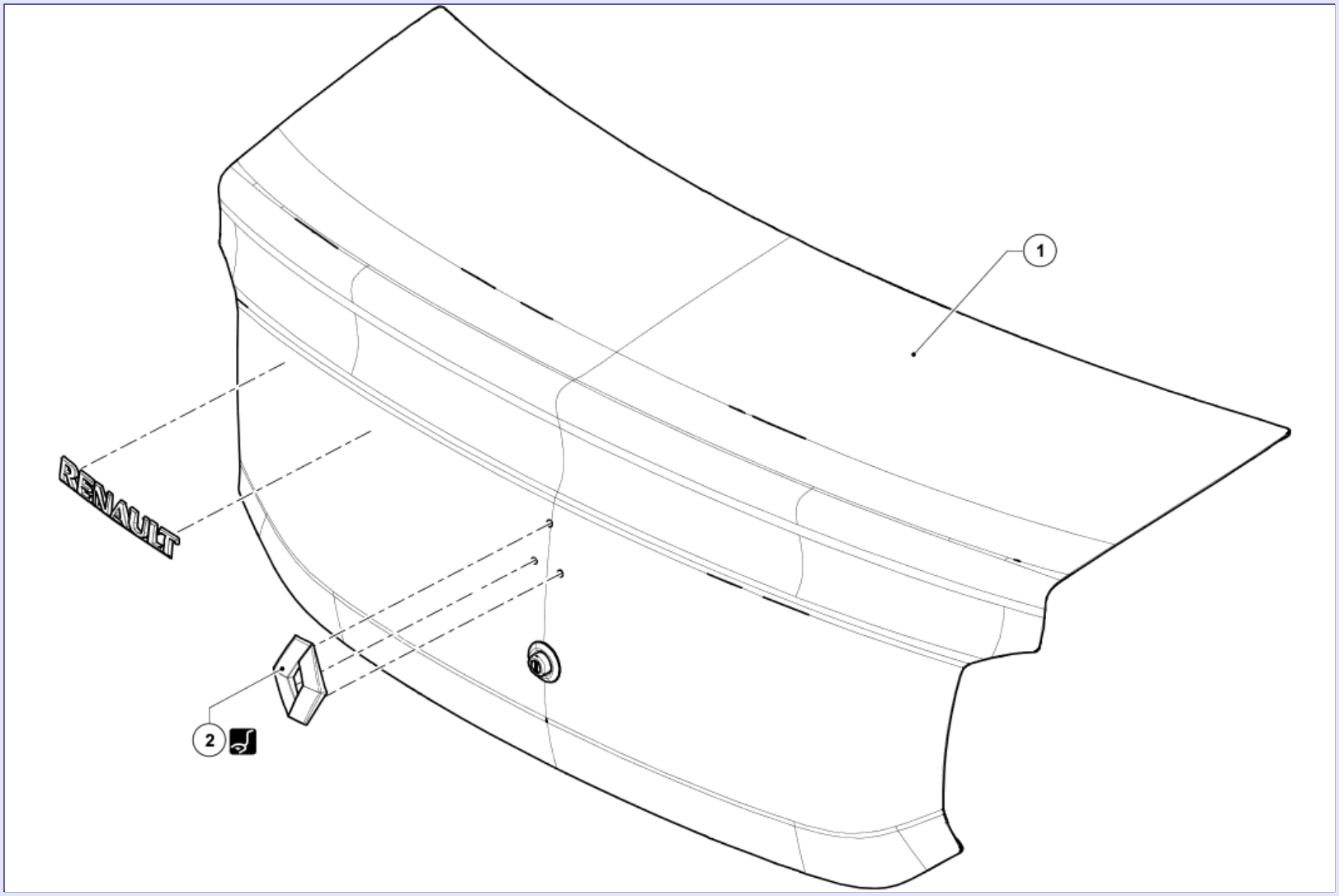


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Rear opening element	Rear opening element: Removal - Refitting
2	Badge	(Car. 1363)

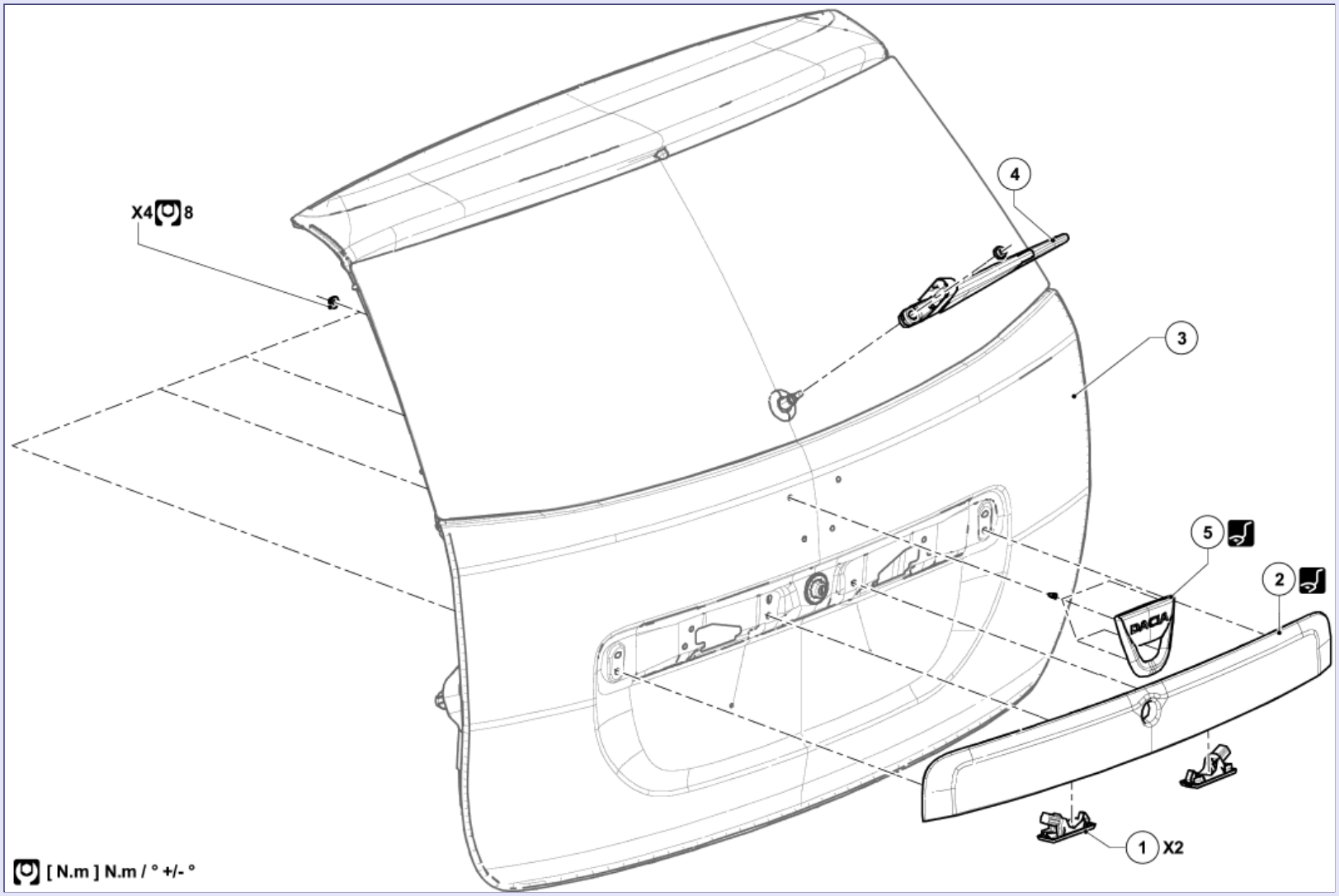


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Number plate light	
2	Tailgate strip	(Car.1363)
3	Tailgate	
4	Rear screen wiper arm	
5	Badge	(Car.1363)

FANASSEMBLY:CLEANING

CLEANING

1. CLEANING PREPARATION OPERATION

- Remove the fan assembly(see 61A, Heating, Fan assembly: Removal - Refitting) .

2. CLEANING

- Aspirate foreign matter in the passenger compartment blower unit.

3. FINAL OPERATION.

- Refit the fan assembly(see 61A, Heating, Fan assembly: Removal - Refitting) .

FAN ASSEMBLY: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Airbag and pretensioners: Precautions for the repair ,
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

WARNING

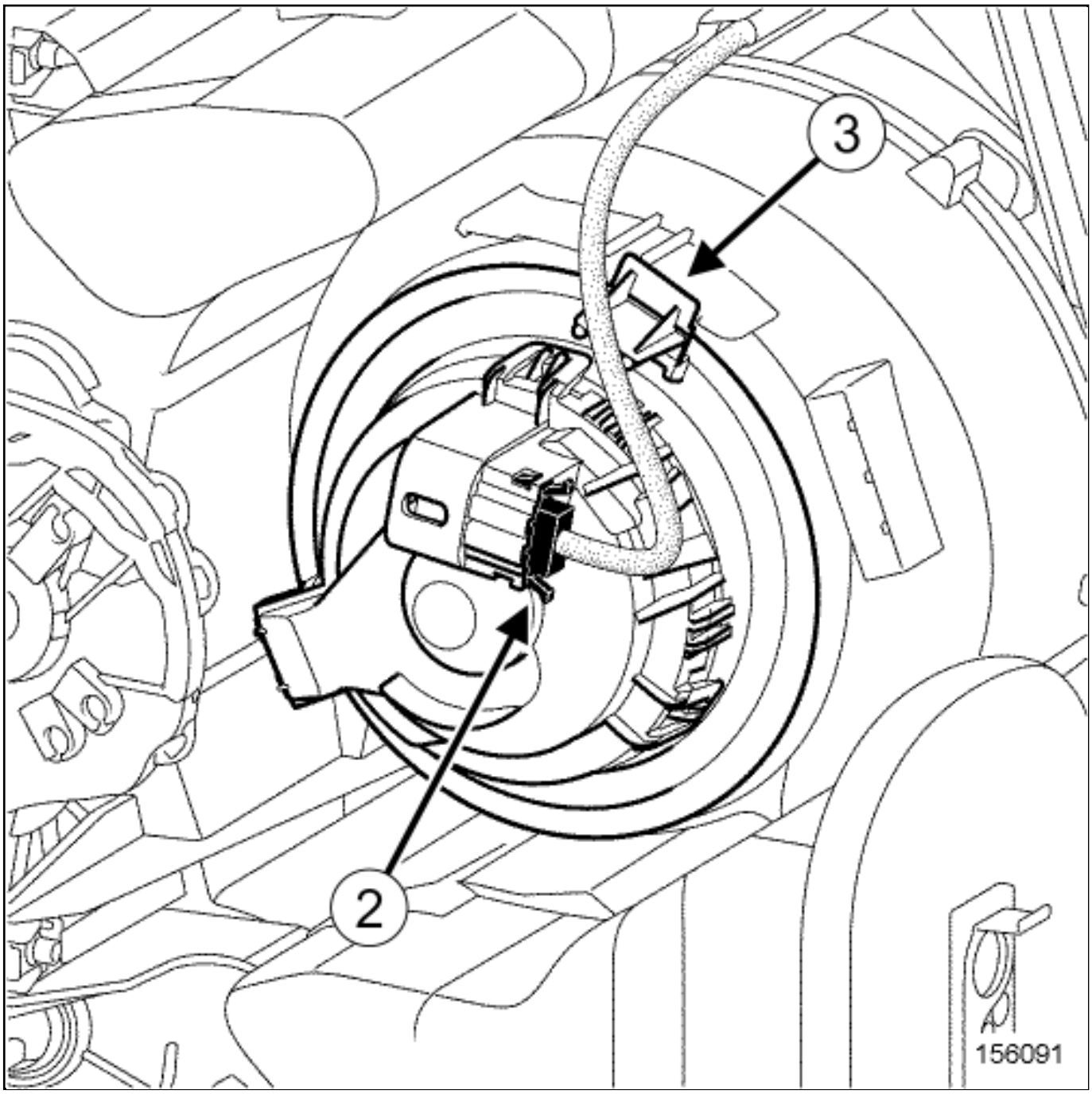
Never handle the pyrotechnic systems (pretensioners or airbags) near to a source of heat or naked flame - they may be triggered.

Lock the airbag computer Airbag and pretensioners: Precautions for the repair .

Disconnect the battery Battery: Removal - Refitting .

Remove the dashboard Dashboard: Removal - Refitting .

2. REMOVAL OPERATION



- Disconnect the fan assembly connector(2) .
- Press the tab(3) , and turn the fan assembly a quarter of a turn anti-clockwise.
- Remove the fan assembly.

REFITTING

- Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

RENAULT

Technical Note 3700A

XXXX

FAULT FINDING LOG

Content: Fault Finding Log

Edition 12 - February 2010 **EDITION ANGLAISE**

"The repair procedures given by the manufacturer in this document are based on the technical specifications current
when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which its
vehicles are constructed".

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IMPORTANT!

WARNING
All problems involving a system must be subject to thorough diagnostics with the appropriate tools.
The FAULT FINDING LOG is an aid in the fault finding process. It allows you to have and keep a record of the fault finding carried out, and is an essential aspect in communication with the manufacturer.

IT IS THEREFORE MANDATORY TO FILL OUT A FAULT FINDING LOG EACH TIME FAULT FINDING IS CARRIED OUT, AND FROM THE START OF THE OPERATION.

This log may be requested:

- when requesting technical assistance from Techline,
- for approval requests when replacing parts for which approval is mandatory,
- which must be attached to monitored parts for which reimbursement is requested. It is therefore used to decide whether a reimbursement will be made under warranty and leads to improved analysis of the removed parts.

FAULT FINDING PROCEDURE

Repair Order:

CUSTOMER COMPLAINT	
IDENTIFICATION	

I C M	(Technical and administrative edition)
Message for the vehicle: ❑ Yes ❑ No	Vehicle under warranty or service contract: ❑ Yes ❑ No
History relating to the customer complaint: ❑ Yes❑ No	OTS to be carried out:❑ Yes❑ No

Code	Symptom	Actis fault code	RC	Warnings: Actis solution, Guided fault finding, Recurrence	Normal operation	Context

1. CUSTOMER COMPLAINT CONFIRMED	❑ Yes ❑ No Symptom code confirmed ❑ Yes ❑ No

2. PRIOR TO FAULT FINDING (Visual and audible inspection, battery voltage, fuel level, determine what operates and what does not operate, etc.)	

3. ACTIS CONSULTATION AND CONSULTATION OF TECHLINE INFORMATION BEGIN BY RECORDING THE FAULTS IN THE COMPUTERS IF THE FUNCTION HAS FAULT FINDING.

– If a fault is stored in a computer: apply the occurrence conditions described in the technical documentation. On the CLIP tool, also consult the fault occurrence context and the fault occurrence counter.

Computer number	DEF	Fault designation	STATUS	Present	Stored

OBSERVE THE SAFETY INSTRUCTIONS DESCRIBED IN DIALOGYS FOR THE OPERATIONS YOU ARE PERFORMING.

4. APPLY THE ACTIS SOLUTION OR THE OTS (If an operation concerns the fault)

5. Fault finding without CLIP with Dialogys (*1)	**5. Visu Schéma fault finding (*2)**	**5. Clip Bornéo 2 / ASDE** (See following page)	**5. Bornéo 3 fault finding** (See following page)

(*1): Consult Dialogys, except with Bornéo 3. Examples: Technical Note 6511A for manual gearboxes, Technical Note 3701A for radios, Technical Note 5164A for noises, etc.

(*2): Except with Bornéo 3, for systems not having any fault finding procedure, perform a fault search using Visu Schéma. Examples: the instrument panel lighting dimmer, beam adjustment of headlights other than discharge bulb types, etc.

Workshop Repair Manual		Fault Finding Manual		Technical Notes		Wiring Diagram Note	
Clip Version		Vdiag		Program No.		Software version	

5. BORNEO 2 / ASDE (Without guided fault finding)	
INTERPRETATION OF FAULTS (If no fault, carry out a conformity check)	
CONFORMITY CHECK (Statuses / parameters / command modes)	
SEARCH BY CUSTOMER COMPLAINT	

5. BORNEO 3 (With guided fault finding) If the fault is not resolved after dealing with the symptom code, carry out fault finding by dealing with the other DTCs present.	
SYMPTOM CODES USED	
FAULT FINDING ASSOCIATED WITH THE FAULT	
UNGUIDED FAULT FINDING ❑	**FAULT FINDING BY FUNCTION ❑**

IF THE FAULT FINDING LASTS 2 HOURS, PLEASE SEND A CIR TO THE TECHLINE.

6. IDENTIFY THE ORIGIN OF THE FAULT (Check everything that could have generated the fault. Example: An oxidised terminal causes an electric malfunction, but the oxidation is due to moisture, which must be eliminated.)

7. BEFORE REPAIR (With guided fault finding: Apply the before repair procedure / Without guided fault finding: consult the repair procedures to determine the computer configurations to record, the measurements to be made on the part before dismantling, etc.)
8. REPAIR (Perform the repairs, applying the manufacturer's procedures, the tightening torques. etc.)
9. AFTER REPAIR (With guided fault finding: Apply the after repair procedure / without guided fault finding: Configure the computers, carry out system programming procedures, etc.)

10. CONFIRM THE REPAIR	❑ The system is working properly	❑ No warning light illuminated
❑ No fault in the computers	❑ Radio operational	❑ Windows and sunroof initialised
❑ Customer notified	❑ Test certificate completed	❑ 'Alert CIR' for fault investigation or for the improvement of fault finding procedures

WARRANTY (information to be submitted)		
❑ Describe the cause of the fault	❑ Associated symptom code	❑ Approval granted
❑ Approval of fault search time		

Notes:

FIXED WINDOW OF REAR SIDE OPENING ELEMENT: REMOVAL - REFITTING

parts always to be replaced:
Pin of rear side opening element sliding window

Location and specifications (tightening torques, parts always to be replaced, etc.)Rear side window mechanism assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

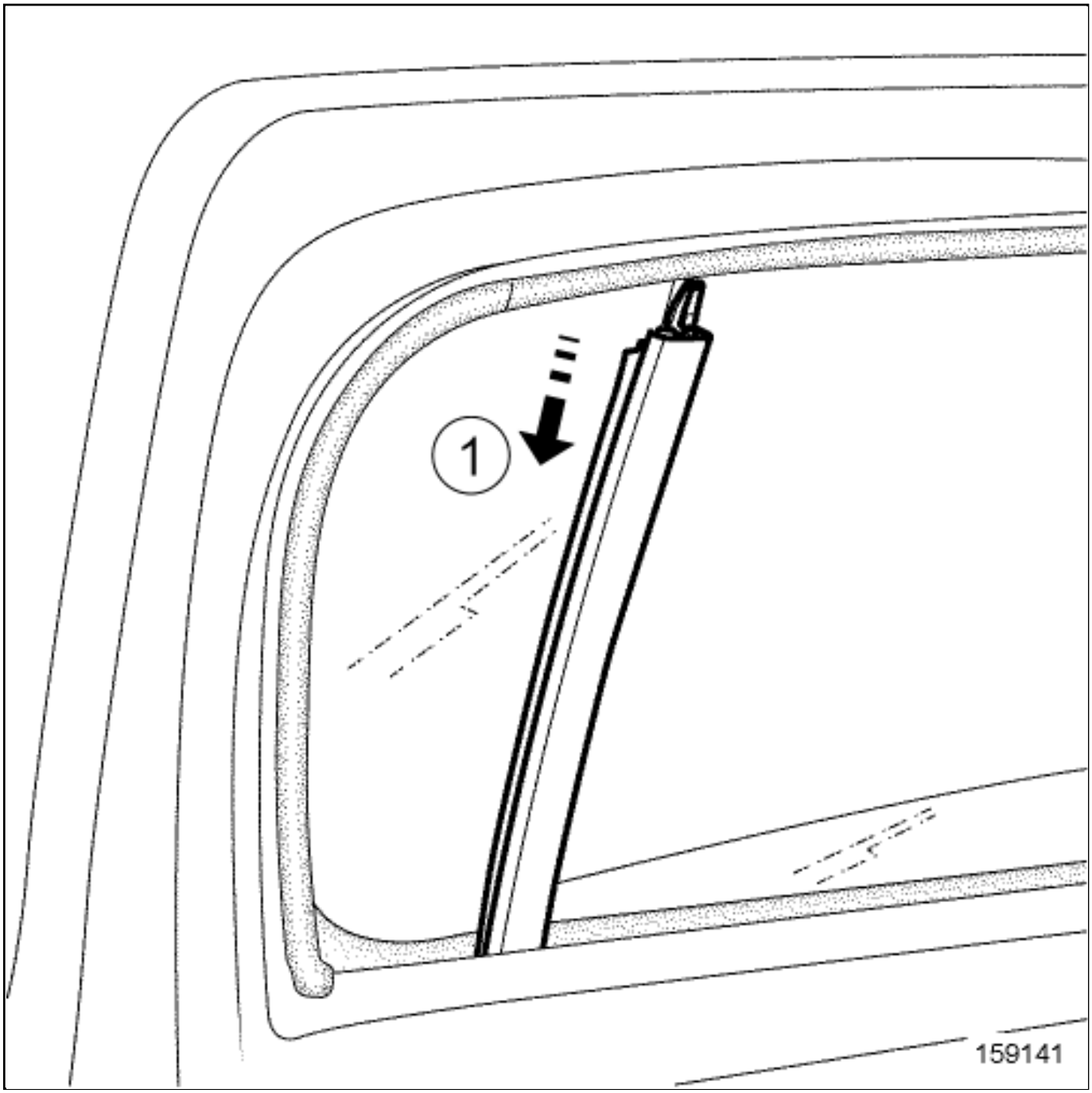
- Remove:
  - the rear side opening element trimRear side opening element trim: Removal - Refitting ,
  - the side opening element sealing filmSide opening element sealing film: Removal - Refitting ,
  - the interior weatherstrip of rear side opening element windowRear side window mechanism assembly: Exploded view .

- Lower the window in order to access the bolts of the rear side door sliding windowRear side window mechanism assembly: Exploded view .

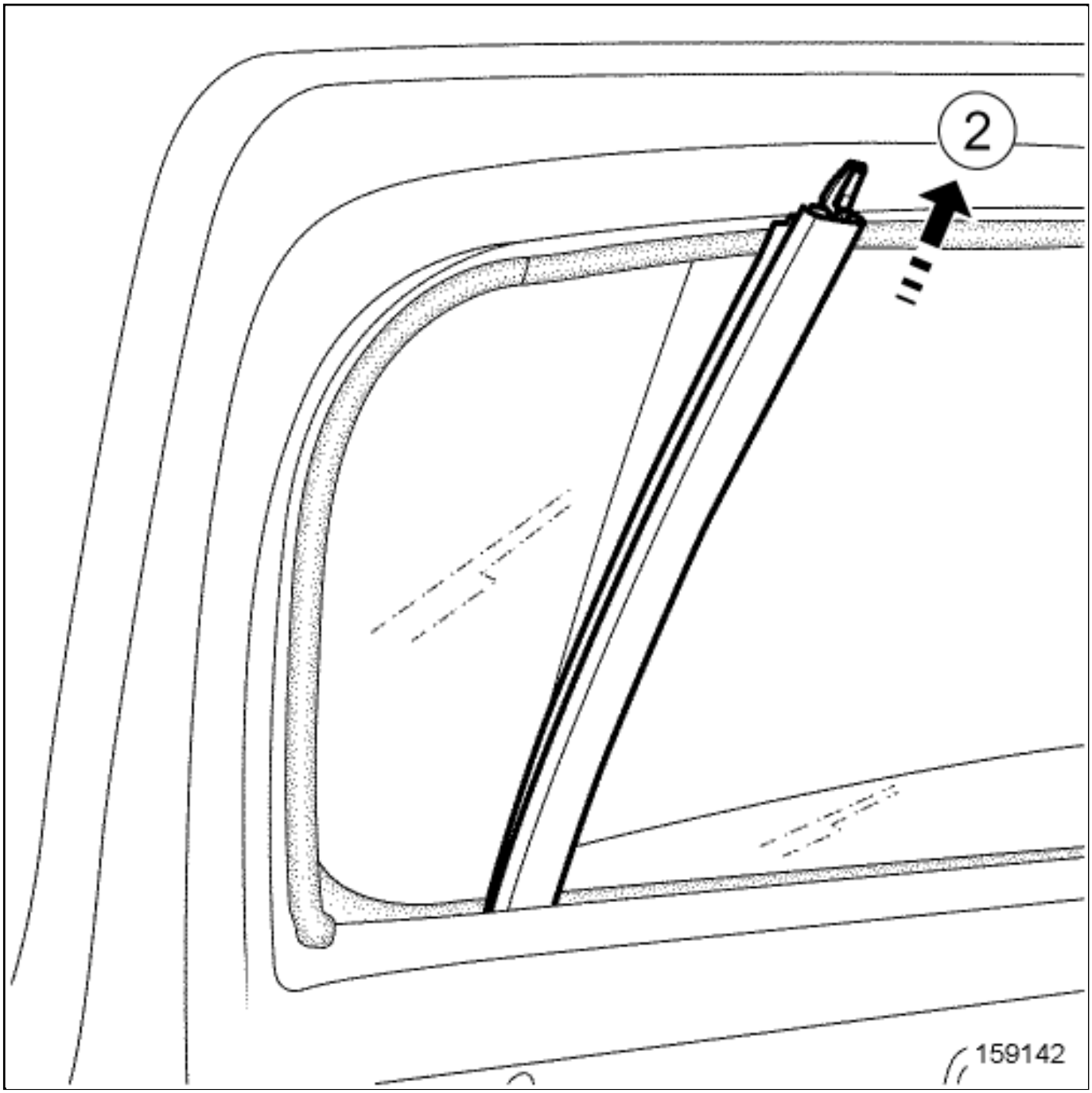
- Remove:
  - the bolts on the sliding windowRear side window mechanism assembly: Exploded view ,
  - the sliding window from the operating mechanism shaft.

- Fit the sliding window at the bottom of the door box section.

- Remove the inner bolt from the fixed uprightRear side window mechanism assembly: Exploded view .



- Unclip the fixed upright at(1) .



- Remove the fixed upright(2) .
- Remove the sliding windowRear side window mechanism assembly: Exploded view .

2. REMOVAL OPERATION

- Remove the fixed windowRear side window mechanism assembly: Exploded view .

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: **Pin of rear side opening element sliding window**

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

FLOOR TRIM ASSEMBLY: EXPLODED VIEW

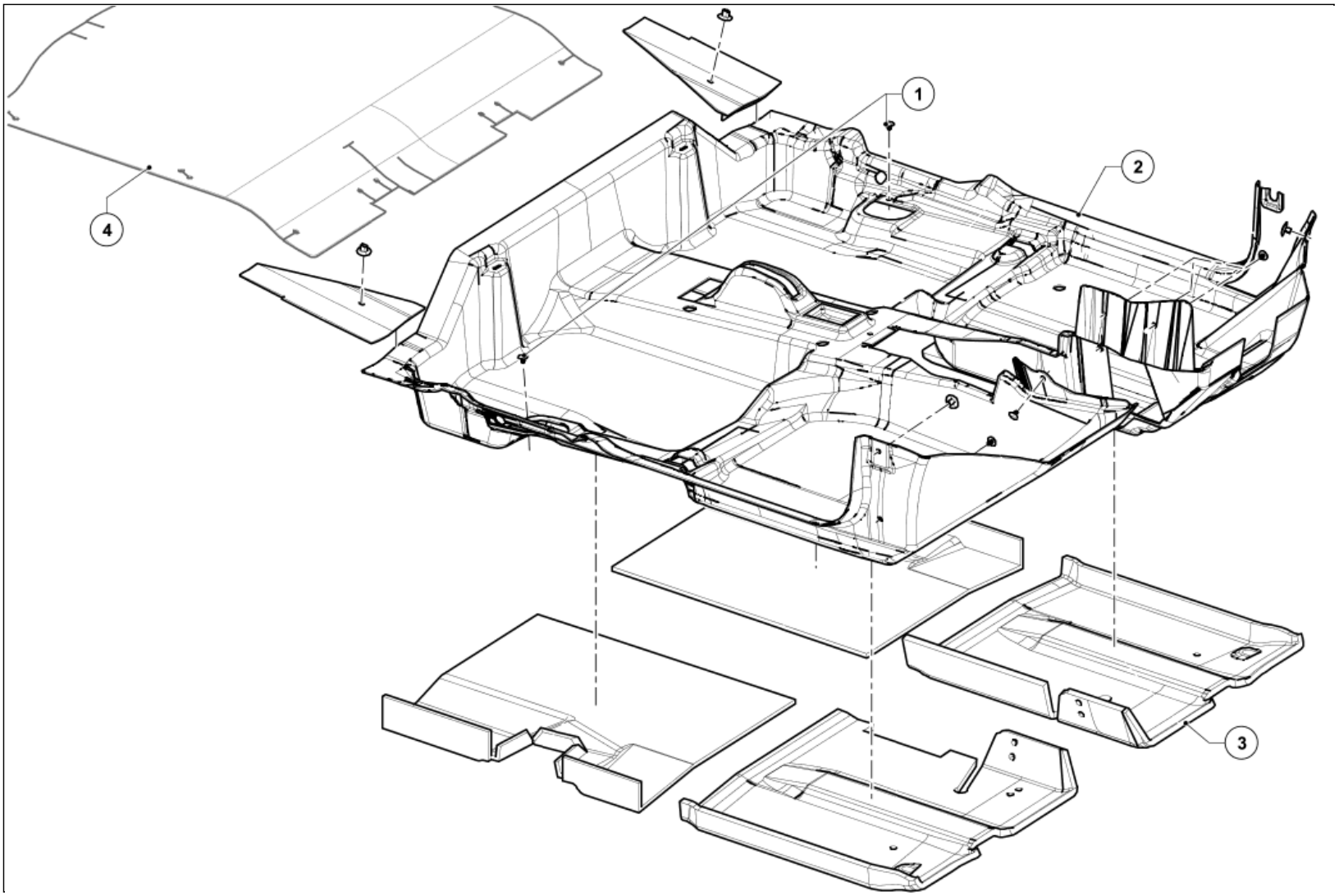


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Floor carpet clip	
2	Floor carpet	(see 71A, Body internal trim, Centre floor front carpet: Removal - Refitting)
3	Floorsoundproofing	
4	Luggage compartment carpet	

FLOW ACTUATOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

parts always to be replaced:
Fuel flow regulator seal on injection pump

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair** .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 13B, Diesel injection, Diesel injection: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

Note:

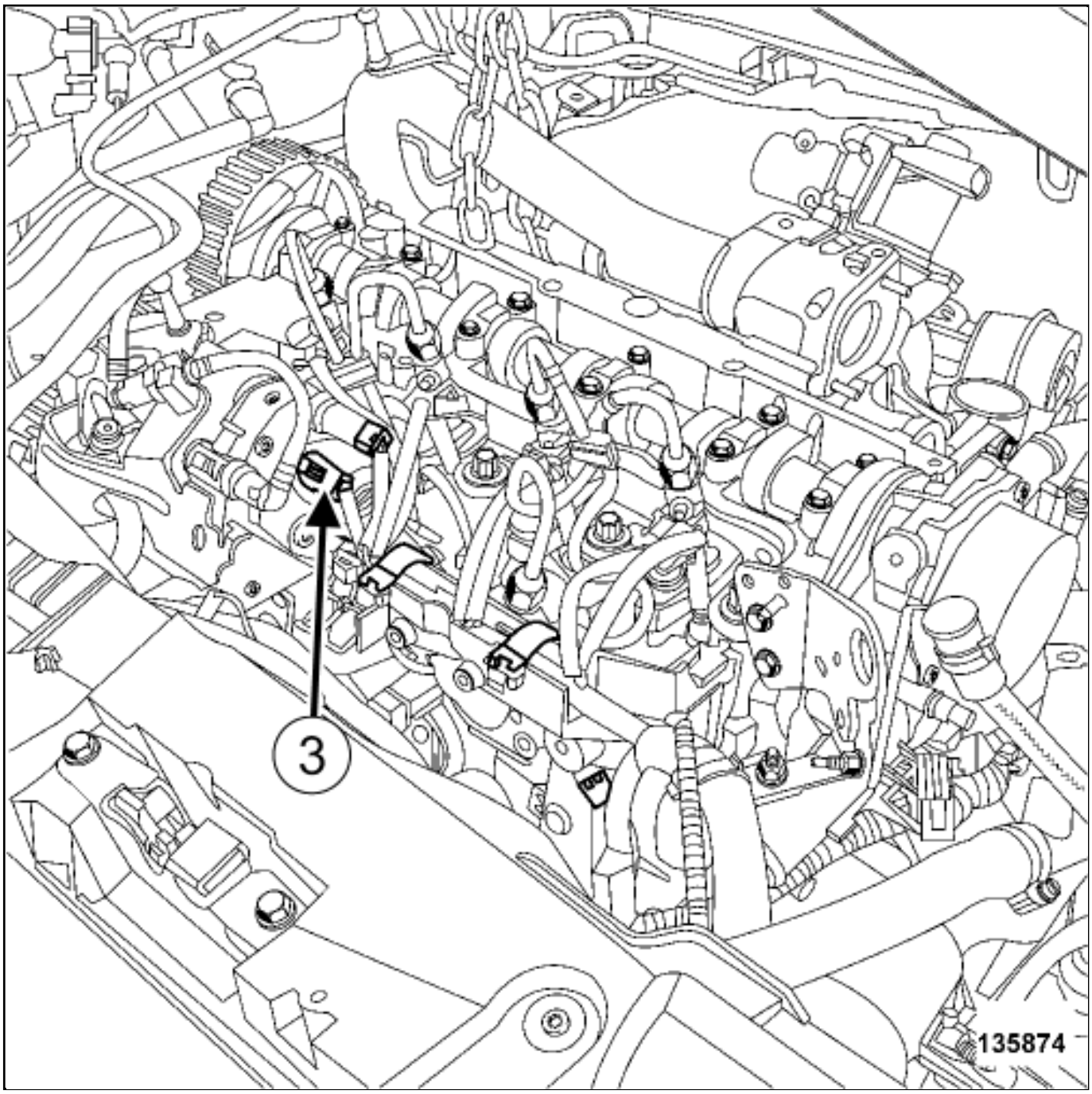
Ensure that you have a new flow actuator before opening up the fuel circuit.

REMOVAL

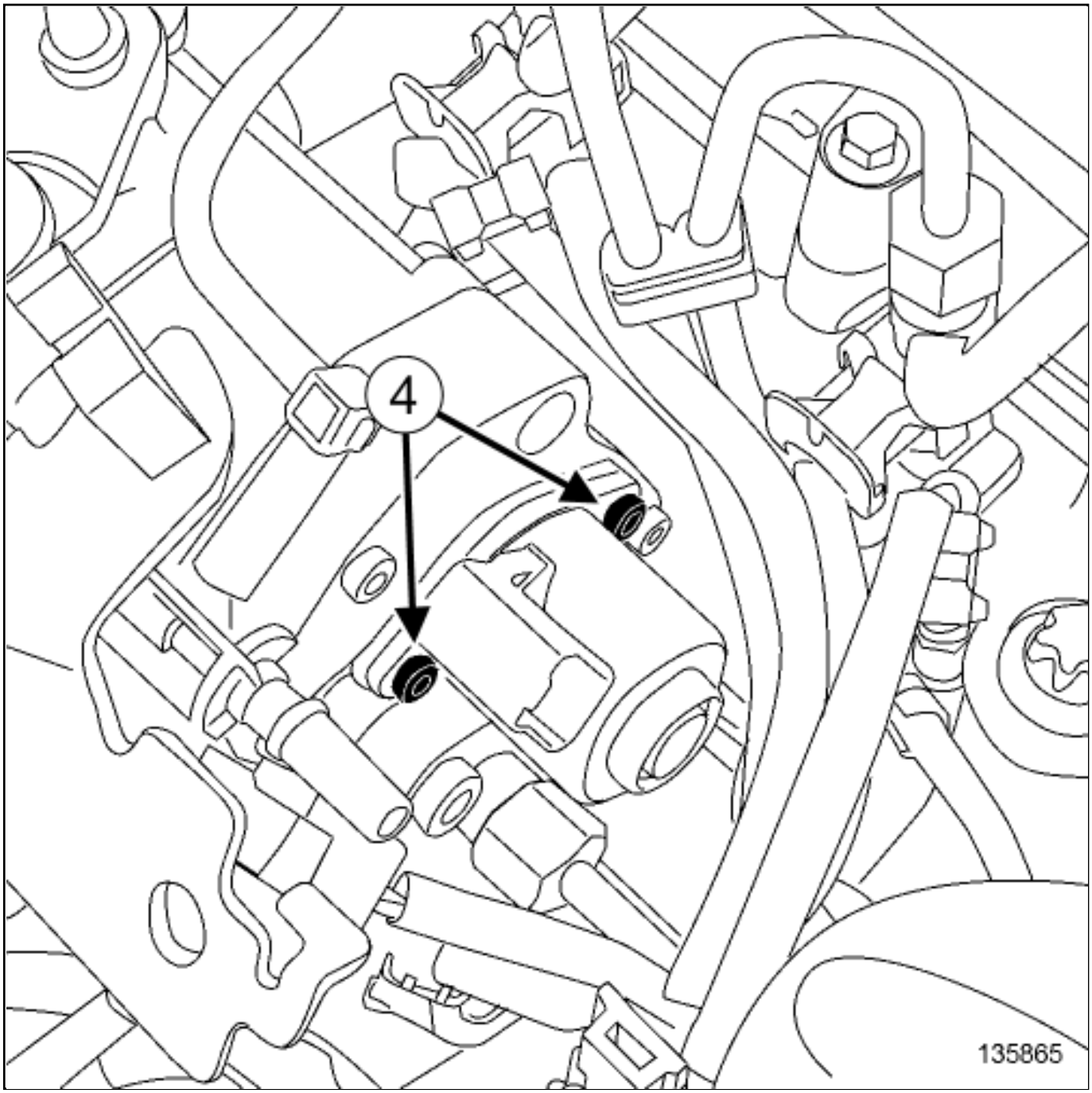
1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .
- Remove the turbocharger outlet air pipe Intercooler air inlet pipe: Removal - Refitting .
- Remove the injector rail protector (see 13B, Diesel injection, Injector rail protector: Removal - Refitting) .

2. REMOVAL OPERATION



- Disconnect the flow actuator connector(3) .



- Remove:
  - the flow actuator bolts(4) ,
  - the fuel flow actuator

- Make sure that no impurities enter the high pressure pump when the fuel flow actuator is removed.

CAUTION

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Only use cleaning cloths.

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: Fuel flow regulator seal on injection pump.

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

2. REFITTING OPERATION

- Refit the flow actuator to the high pressure pump.
- Connect the flow actuator connector.

3. FINAL OPERATION

- Prime the fuel circuit using the manual priming pump.
- Refit the injector rail protector (see 13B, Diesel injection, Injector rail protector: Removal - Refitting) .
- Refit the turbocharger air outlet pipe Intercooler air inlet pipe: Removal - Refitting .
- Connect the battery Battery: Removal - Refitting .

- Start the engine.

- Check that there are no fuel leaks.

- Apply the after repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

■"Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

■"Fuel flow regulator on the injection pump" .

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FLYWHEEL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Tightening torques	
flywheel bolts	55 N.m

Special tooling required	
Flywheel locking tool.	Mot. 582-01

parts always to be replaced:
Flywheel bolts

CAUTION

The part removed is subject to customer safety controls, the safety instructions detailed in this procedure must be observed when removing and refitting.

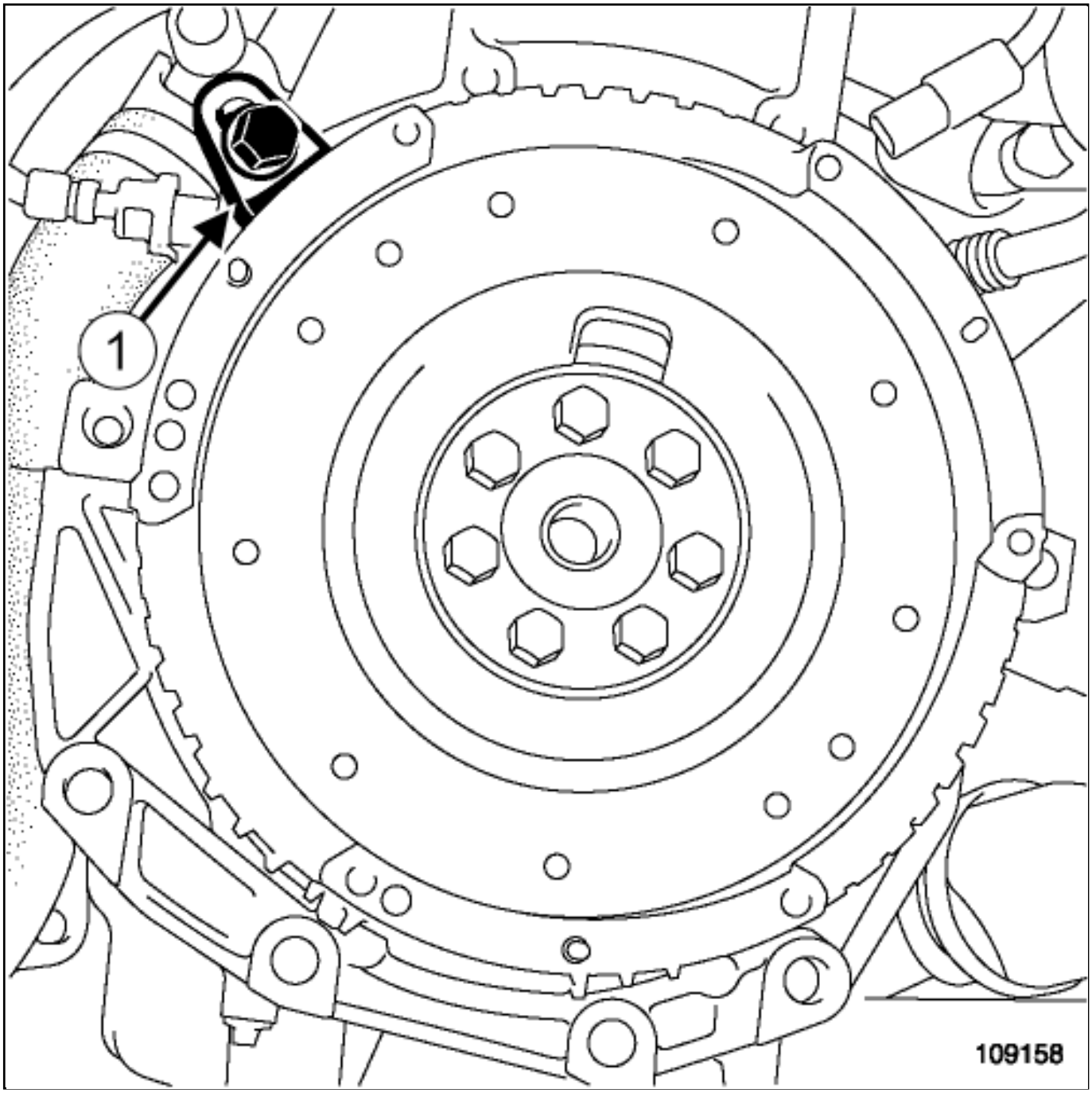
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Drain the manual gearbox Manual gearbox oils: Draining - Filling .

- Remove:
  - the manual gearbox Manual gearbox: Removal - Refitting ,
  - the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) .

2. REMOVAL OPERATION



- Lock the flywheel with theFlywheel locking tool.(Mot. 582-01) (1) .
- Remove the flywheel bolts.

- Remove:
  - the flywheel,
  - theFlywheel locking tool.(Mot. 582-01) .

REFITTING

1. REFITTING PREPARATION OPERATION

- Check the condition of the flywheel.

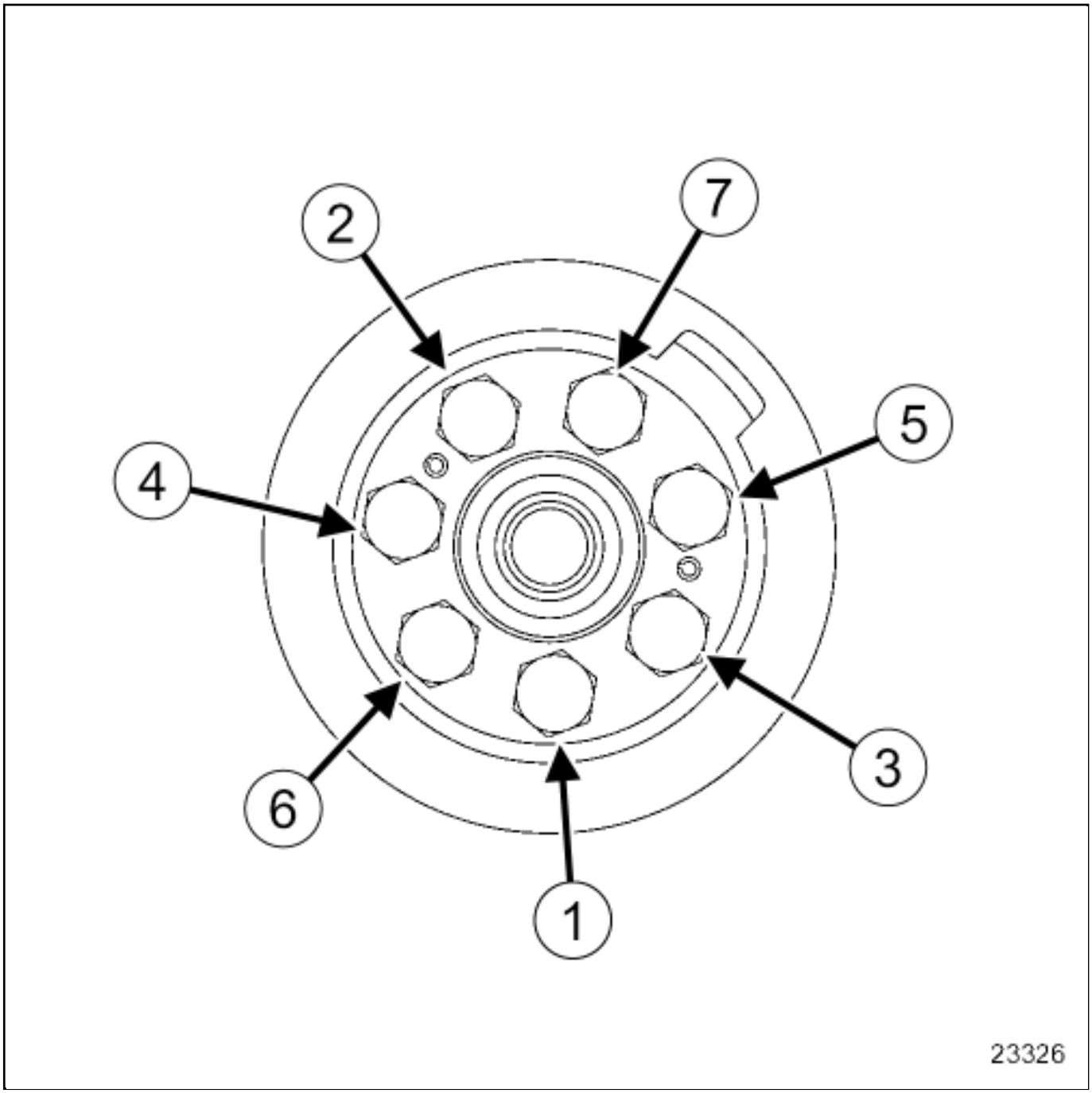
- parts always to be replaced: Flywheel bolts.

- Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean and degrease:
  - the crankshaft bearing face on the flywheel if reused,
  - the flywheel pressure face on the crankshaft,
  - the flywheel threading.

2. REFITTING OPERATION

- Refit the flywheel.

- Coat the new flywheel bolts with FRENETANCH Vehicle: Parts and consumables for the repair .



- Lock the flywheel using toolFlywheel locking tool.(Mot. 582-01) .

- Tighten to torque and in order the flywheel bolts55 N.m.

3. FINAL OPERATION

- Refit:
  - the clutch pressure plate(see **Pressure plate - Disc: Removal - Refitting**) ,
  - the manual gearboxManual gearbox: Removal - Refitting .

- Fill the manual gearbox**Manual gearbox oils: Draining - Filling** .

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FRONT AIR INLET DUCT: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove :
  - the dashboardDashboard assembly: Exploded view ,
  - the front left-hand side air duct(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

- Unclip the cable sleeve stop from the distribution unit(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

- Extract the end of the air recirculation control cable.

2. REMOVAL OPERATION

- Disconnect the modulate variation of speed of fan assembly for passenger compartment connector (see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

- Remove the front air inlet duct(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

- In the event of replacement remove the modulate variation of speed of fan assembly for passenger compartment Coolant circuit assembly: Exploded view .

REFITTING

- Proceed in the reverse order to removal.

FRONT AXLE ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 31A, Front axle components, Front axle components: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

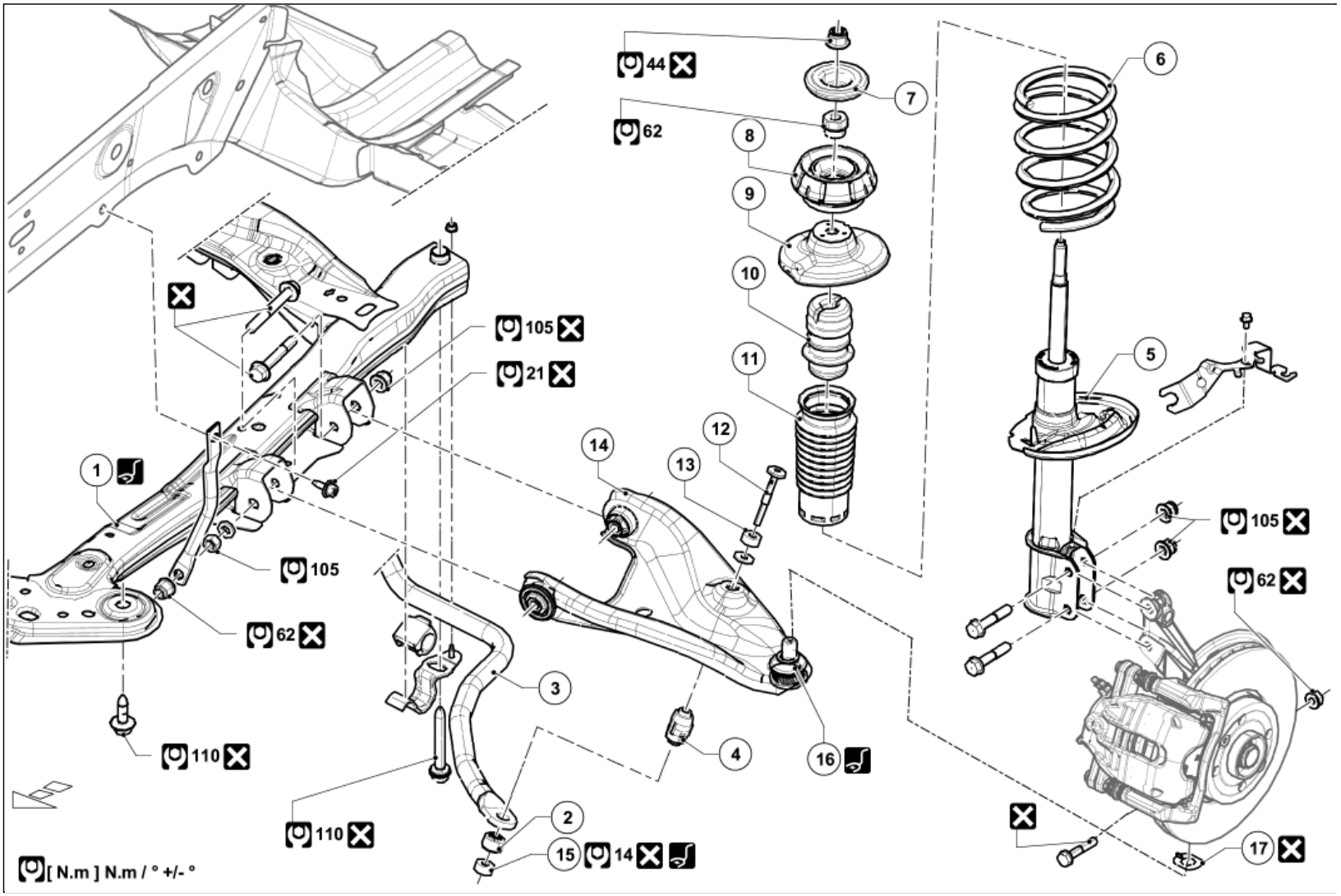


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front axle subframe	(see **Front axle subframe: Removal - Refitting**) (Tav. 1747, Mot. 1390)
2	Front anti-roll bar rubber pad	Position the vehicle on a two-post liftVehicle: Towing and lifting .
3	Front anti-roll bar	Position the vehicle on a two-post liftVehicle: Towing and lifting
4	Front anti-roll bar rubber pad	Position the vehicle on a two-post liftVehicle: Towing and lifting
5	Support cap	(see 31A, Front axle components, Front shock absorber and spring: Removal - Refitting)
6	Spring	(see 31A, Front axle components, Front shock absorber and spring: Removal - Refitting)
7	Filter unit	(see 31A, Front axle components, Front shock absorber and spring: Removal - Refitting)
8	Rotating stop	(see 31A, Front axle components, Front shock absorber and spring: Removal - Refitting)
9	Upper spring support	(see 31A, Front axle components, Front shock absorber and spring: Removal - Refitting)
10	Impact stop	(see 31A, Front axle components, Front shock absorber and spring: Removal - Refitting)
11	Gaiter	(see 31A, Front axle components, Front shock absorber and spring: Removal - Refitting)
12	Front anti-roll bar rubber pad	Position the vehicle on a two-post liftVehicle: Towing and lifting
13	Front anti-roll bar tie-rod	Position the vehicle on a two-post liftVehicle: Towing and lifting
14	Front driveshaft lower arm	Position the vehicle on a two-post liftVehicle: Towing and lifting Ball-joint uncoupling tool : Use
15	Front anti-roll bar tie-rod nut	(Sus. 1413, Sus. 1734)
16	Lower ball joint	Ball-joint uncoupling tool : Use
17	Lower ball joint protector	Ball-joint uncoupling tool : Use

FRONT AXLE COMPONENTS: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Do not press on the brake pedal during work on the brake system.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

In case of incorrect handling, the brake fluid can cause serious injury and damage. Follow the manufacturer's instructions for brake fluid.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Clean around the braking system with brake cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

3. GENERAL RECOMMENDATIONS

1- BEARING, HUB CARRIER

CAUTION

- In order to prevent irreversible damage to the front hub bearing:
  - Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
  - Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

CAUTION

To ensure that the wheel speed sensor works properly, do not mark the sensor target on the bearing.

When removing a hub, it is essential to replace the bearing with a new one.

CAUTION

Do not press the bearing's internal bush so as to avoid damaging the bearing (very high shrink-fitting force).

It is essential to check the condition of the hub and bearing surface and the hub carrier bore before refitting the bearing.

- Use surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean:
  - the new bearing's internal and external surfaces which are in contact with the hub carrier and the hub,
  - the hub carrier surfaces in contact with the new bearing,
  - the hub surfaces in contact with the new bearing.

Always check the surface condition of the hub carrier before refitting the "hub - bearing" assembly.

Clean the surfaces of the hub carrier that are in contact with the "hub - bearing" assembly using surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products)

Replace any component whose contact surfaces have deep scratches or cracks.

2- SUSPENSION SPRING

When replacing the spring, ensure that the positioning and orientation of the spring and the tool cups are correct.

When replacing a spring, always replace the spring on the opposite side.

If a shock absorber is replaced, the shock absorber on the opposite side must also be replaced.

Check that the spring compressor tool is operating correctly.

In the interests of safety, do not leave a spring compressed in the spring compressor tool.

During assembly and removing operations, the surface and the protection paint must not be damaged.

There must be no impacts during operations. Any handling hooks and tightening or positioning clamps should be equipped with rubber or plastic in order to avoid damage on the springs.

- It is recommended to replace springs if:
  - the paint is damaged,
  - there are dents on the spring.

They are not usually symmetrical in shape and care should be taken to assemble them the right way round. This can be done using the position of the coloured markings.

CAUTION

To prevent the suspension spring from prematurely breaking, do not damage the anti-corrosion protection.

3- ANTI-ROLL BAR

During assembly and removing operations, the surface and the protection paint must not be damaged.

There must be no impacts during operations. Any handling hooks, tightening or positioning clamps should be equipped with rubber or plastic parts so as to avoid damaging the anti roll bar.

- It is recommended to replace the anti-roll bar if:
  - the paint is damaged,
  - the anti-roll bar has dents in it.

Note:

the most critical and sensitive zones are in the elbows.

4- FRONT AXLE

CAUTION

To prevent any damage, do not use the lower arm as support for the lifting system.

Check the condition of all the gaiters before refitting. Always replace any damaged components with new ones.

FRONT AXLE SUBFRAME: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Support for removal - refitting of engine - gearbox assembly	Mot. 1390
Threaded rods for carrying out subframe operations.	Tav. 1747

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 31A, Front axle components, Front axle assembly: Exploded view) andSteering assembly: Exploded view .

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 31A, Front axle components, Front axle components: Precautions for the repair) ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

CAUTION

To prevent any damage, do not use the lower arm as support for the lifting system.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Disconnect the batteryBattery: Removal - Refitting .
- Remove the steering box universal joint boltSteering assembly: Exploded view .
- Remove:
  - the front wheelsWheel: Removal - Refitting ,
  - the engine undertray,
  - the wheel arch linersExterior body front trim assembly: Exploded view .

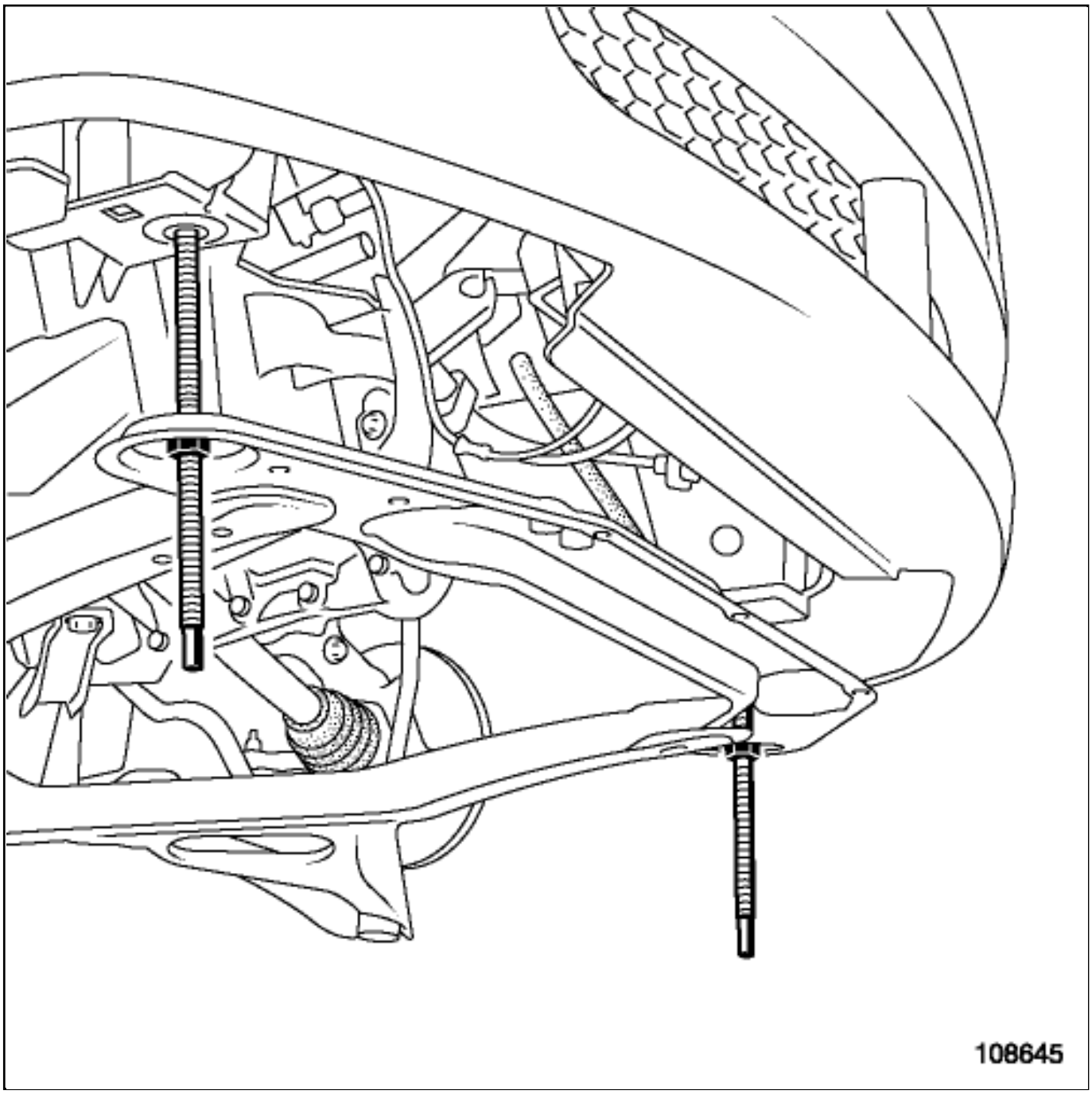
- Remove the front bumper lower bolts on the subframe **Front bumper assembly: Exploded view** .

- Strap the cooling radiator on the front upper cross member.

- Remove **(see 31A, Front axle components, Front axle assembly: Exploded view)** :
  - the subframe tie rod upper bolts,
  - the lower arm ball joints from the hub carrier.

- Remove:
  - the power-assisted steering pipe bolts on the subframe **Power-assisted steering assembly: Exploded view** ,
  - the engine tie-bar bolts on the gearbox **Engine-gearbox unit support assembly: Exploded view** .

2. REMOVAL OPERATION

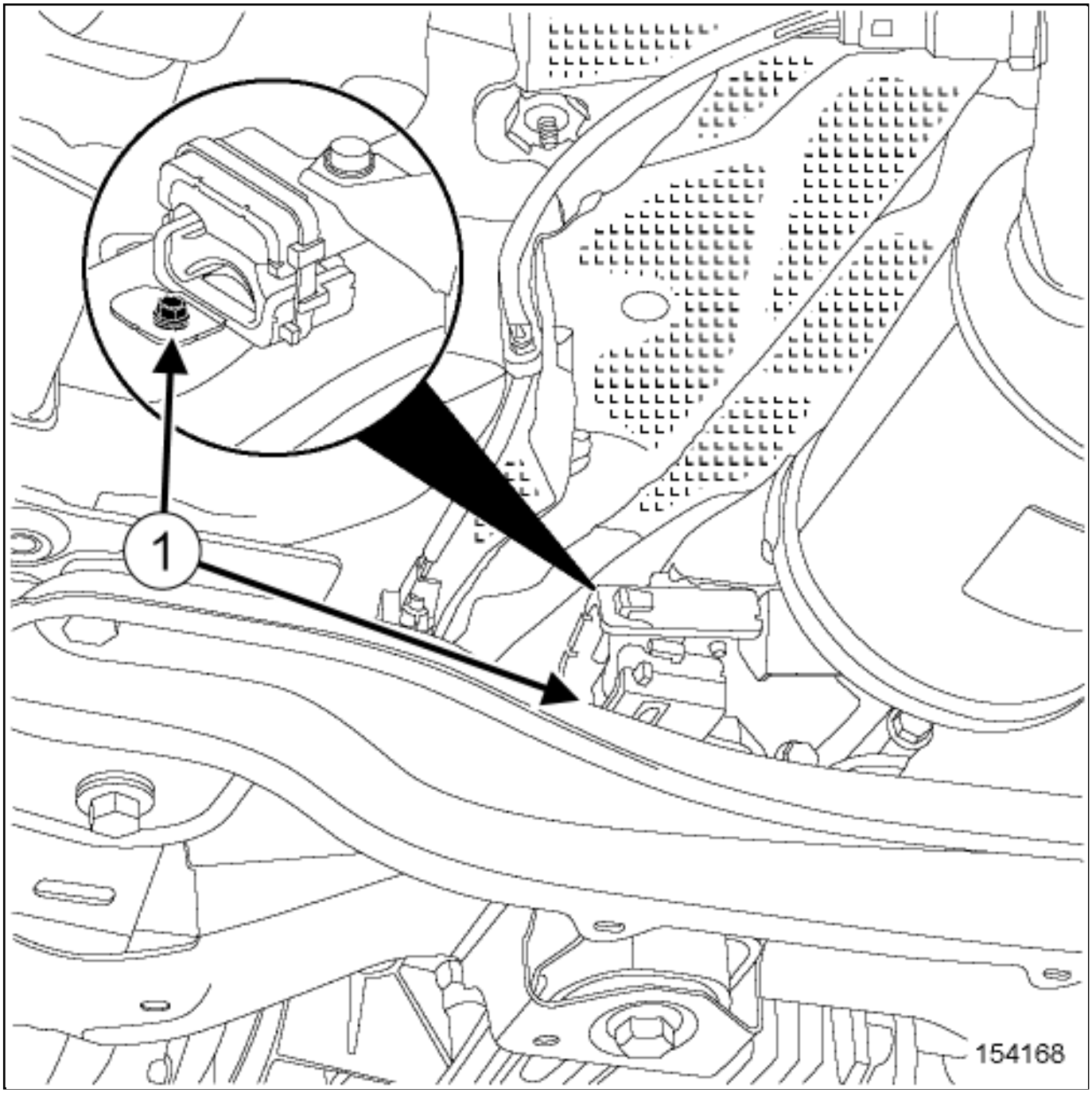


- Replace one by one the subframe mounting bolts by the threaded rods of the toolThreaded rods for carrying out subframe operations.(Tav. 1747) .

- Lower the subframe by 20 cm.

- Remove the particle filter pressure sensor mounting.

- Disconnect the particle filter temperature sensor connector.



- Remove the bolt(1) of the exhaust rubber mounting bush.

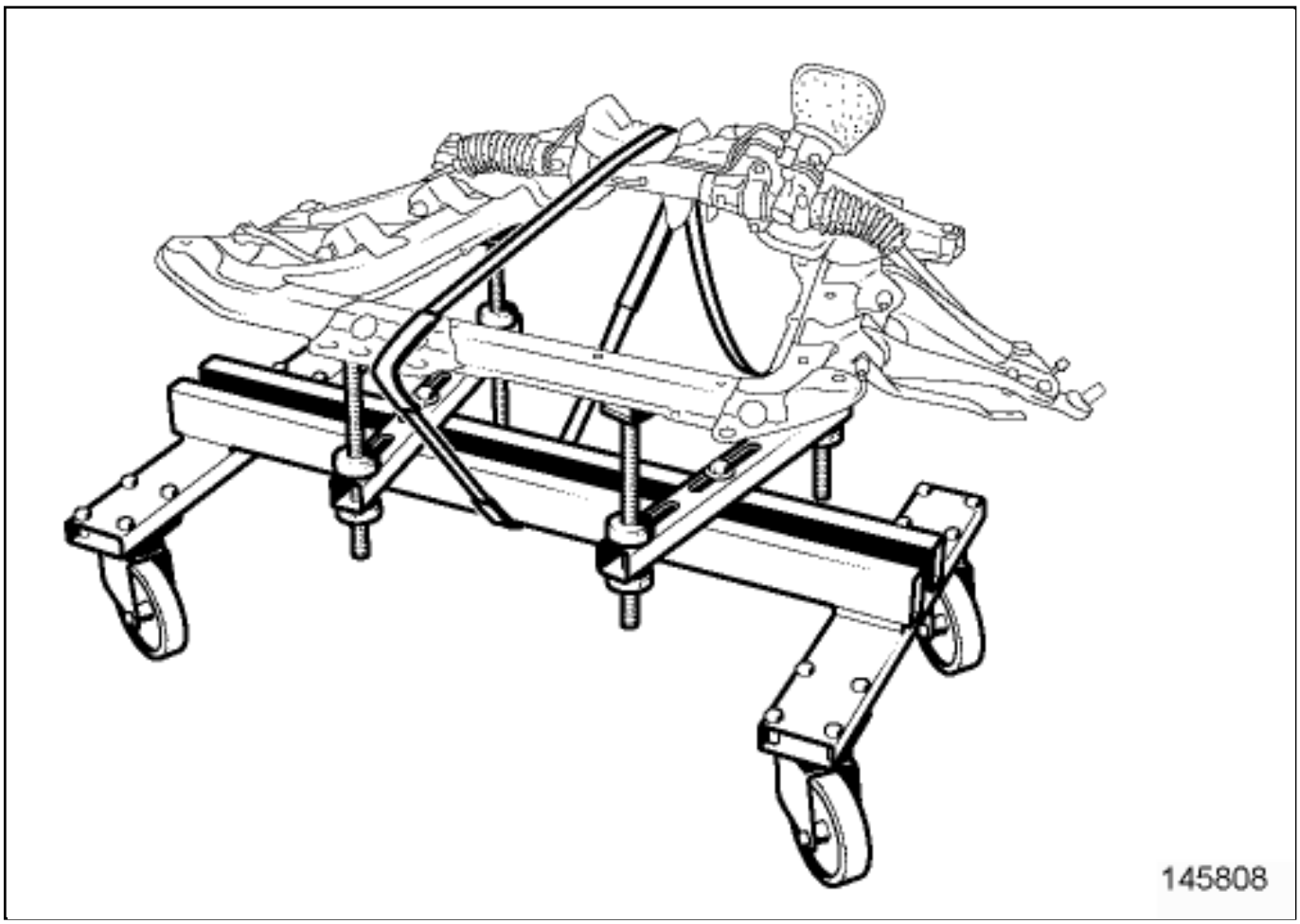
- Remove the steering box bolts on the subframe.

- Attach the steering box to the body.

- Position the Support for removal - refitting of engine - gearbox assembly(Mot. 1390) under the sub-frame.

- Lower the lift and adjust the pads to ensure that the subframe is secure on the tool.

- Lower the subframe on the threaded rods.



- Strap the subframe toSupport for removal - refitting of engine - gearbox assembly(Mot. 1390) .

- Raise the lift to separate the subframe from the body.

- Remove the subframe fittings.

REFITTING

1. REFITTING PREPARATION OPERATION

- Degrease the contact surface areas of the sub-frame and the body using surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products).

CAUTION

To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

3. FINAL OPERATION

- Check the axle geometry **Axle assemblies: Check** .
- Adjust the front axle, if necessary **Front axle system: Adjustment** .

FRONT AXLE SYSTEM: ADJUSTMENT

Equipment required
Diagnostic tool
flywheel immobiliser

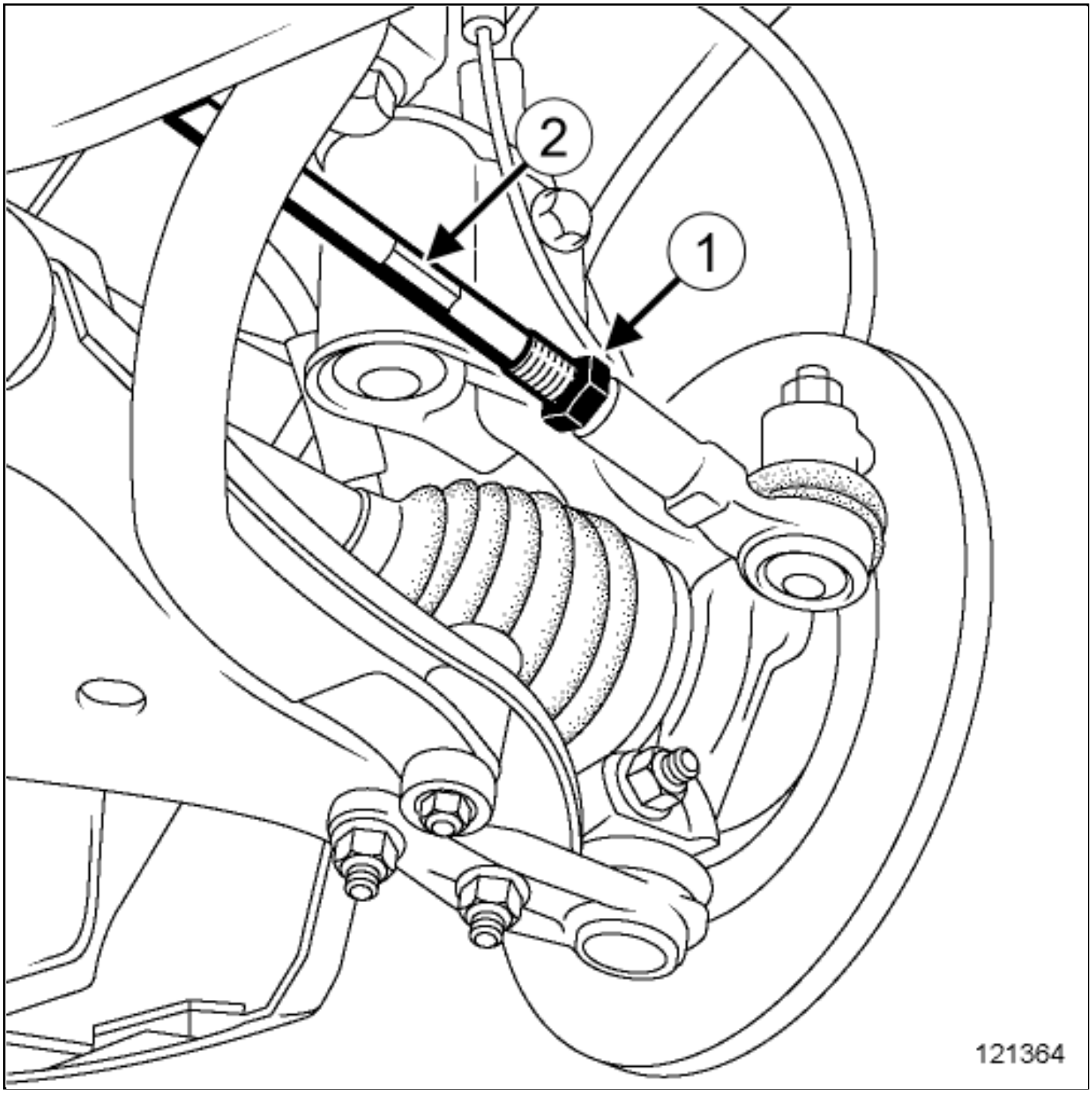
1. PREPARATION FOR ADJUSTMENT

- Check the geometry (see 30A, General information, Axle assemblies: Check) .

2. ADJUSTMENT OPERATION

1- WHEEL ALIGNMENT

- Set the wheels straight ahead.
- Lock the steering wheel using a flywheel immobiliser.



- Loosen the wheel alignment adjustment lock nut(1) .
- Turn the track rod sleeve(2) to the required value.
- After adjustment, torque tighten the wheel alignment adjustment lock nuts Steering assembly: Exploded view .

2- CASTOR ANGLE

- Not adjustable.

3- CAMBER

- Not adjustable.

4- PIVOT

- Not adjustable.

- Calibrate the steering wheel angle sensor.

- Apply the after repair procedure:
  - connect the Diagnostic tool,
  - select "Braking computer",
  - go to repair mode,
  - display the "Before/after repair procedure" for the computer selected,
  - select "Steering wheel angle sensor" in the "List of components controlled by this computer" section,
  - carry out the operations described in the "After repair procedure" section.

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FRONT AXLE

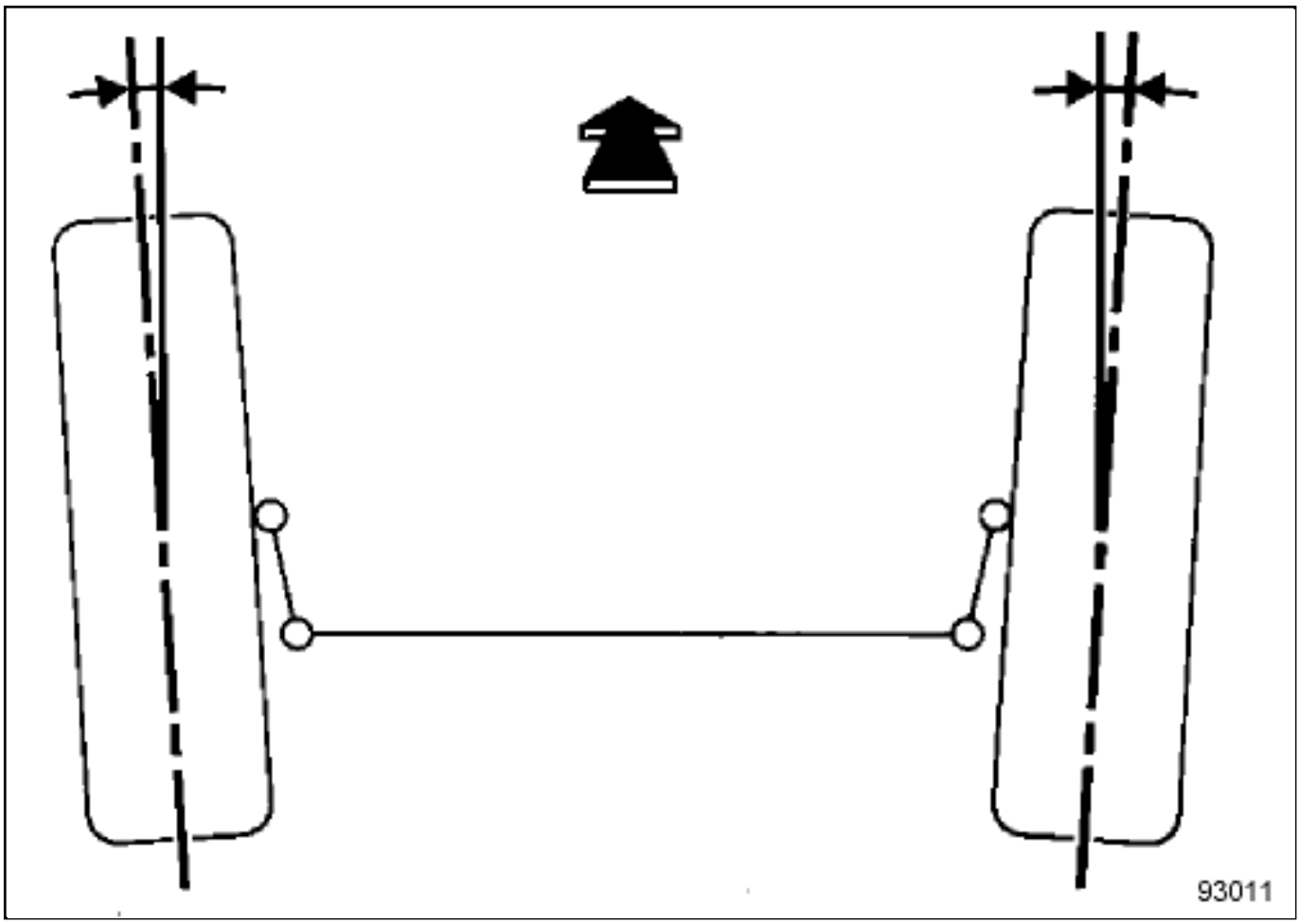
Note, one or more warnings are present in this procedure

1. WHEEL ALIGNMENT: MEANING OF SYMBOLS

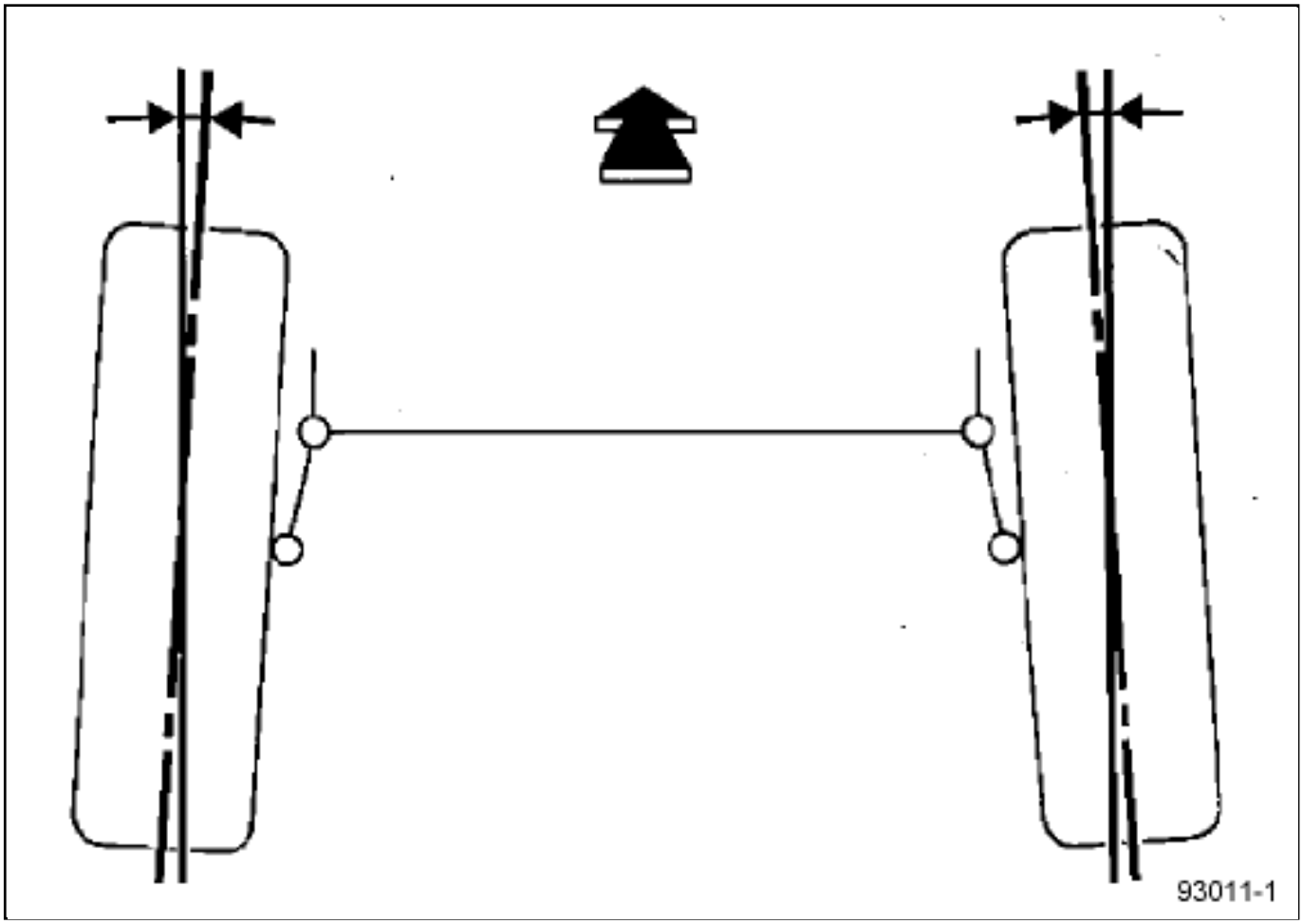
CAUTION

- Symbols used by RENAULT:
  - toe-out: -,
  - toe-in: +.

TOE-OUT: MINUS SIGN

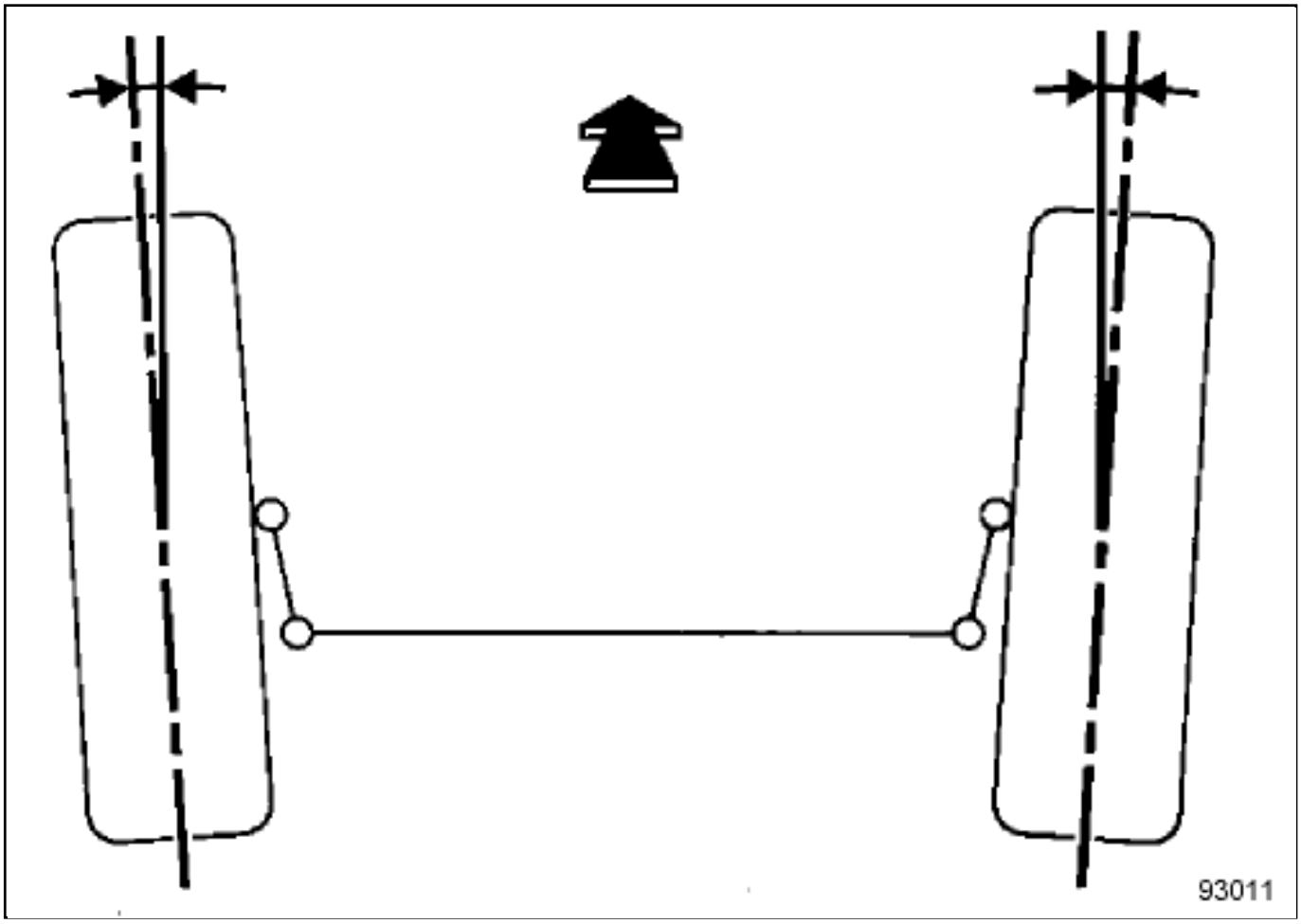


TOE-IN: PLUS SIGN



2. WHEEL ALIGNMENT

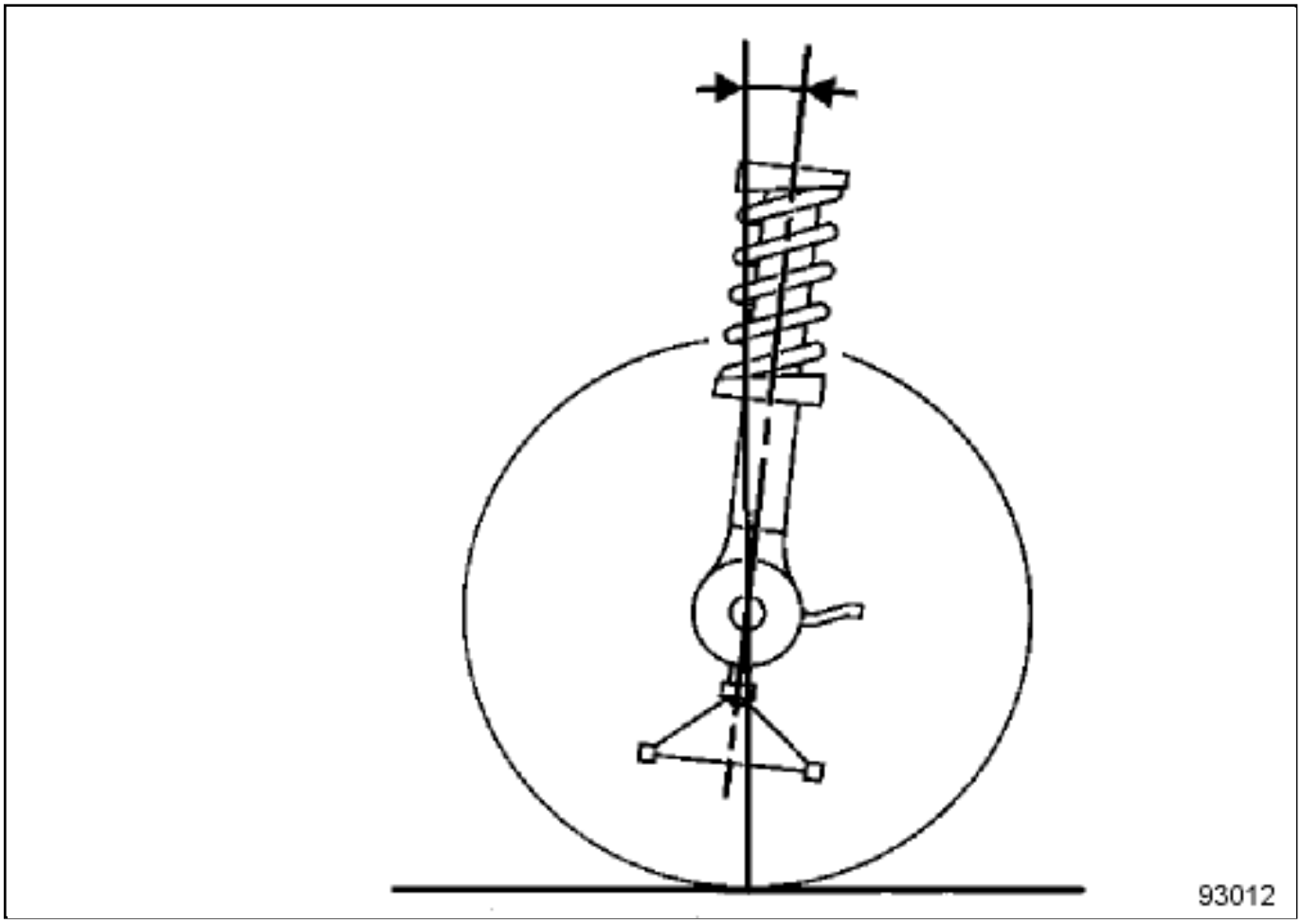
Adjustable by rotating the track rod sleeves(see 30A, General information, Front axle system: Adjustment) .



Value (for two wheels)	Tolerance	Position of vehicle
-0º10'	+10'	Vehicle in running order
	-10'	

3. CASTOR ANGLE

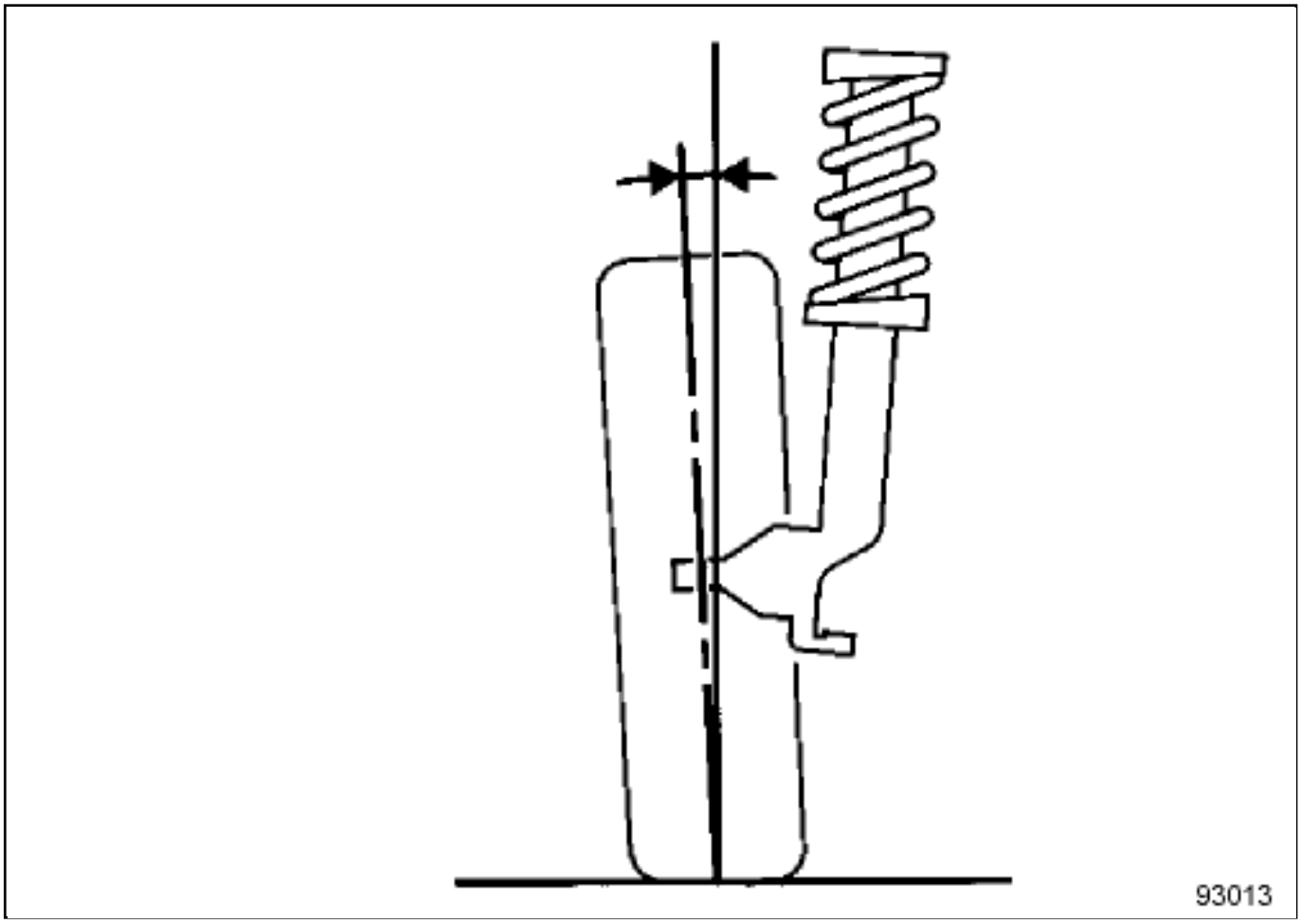
Not adjustable.



Value	Tolerance	Position of vehicle
+2˚45'	+1˚30'	Vehicle in running order
	-1˚30'	

4. CAMBER

Not adjustable.

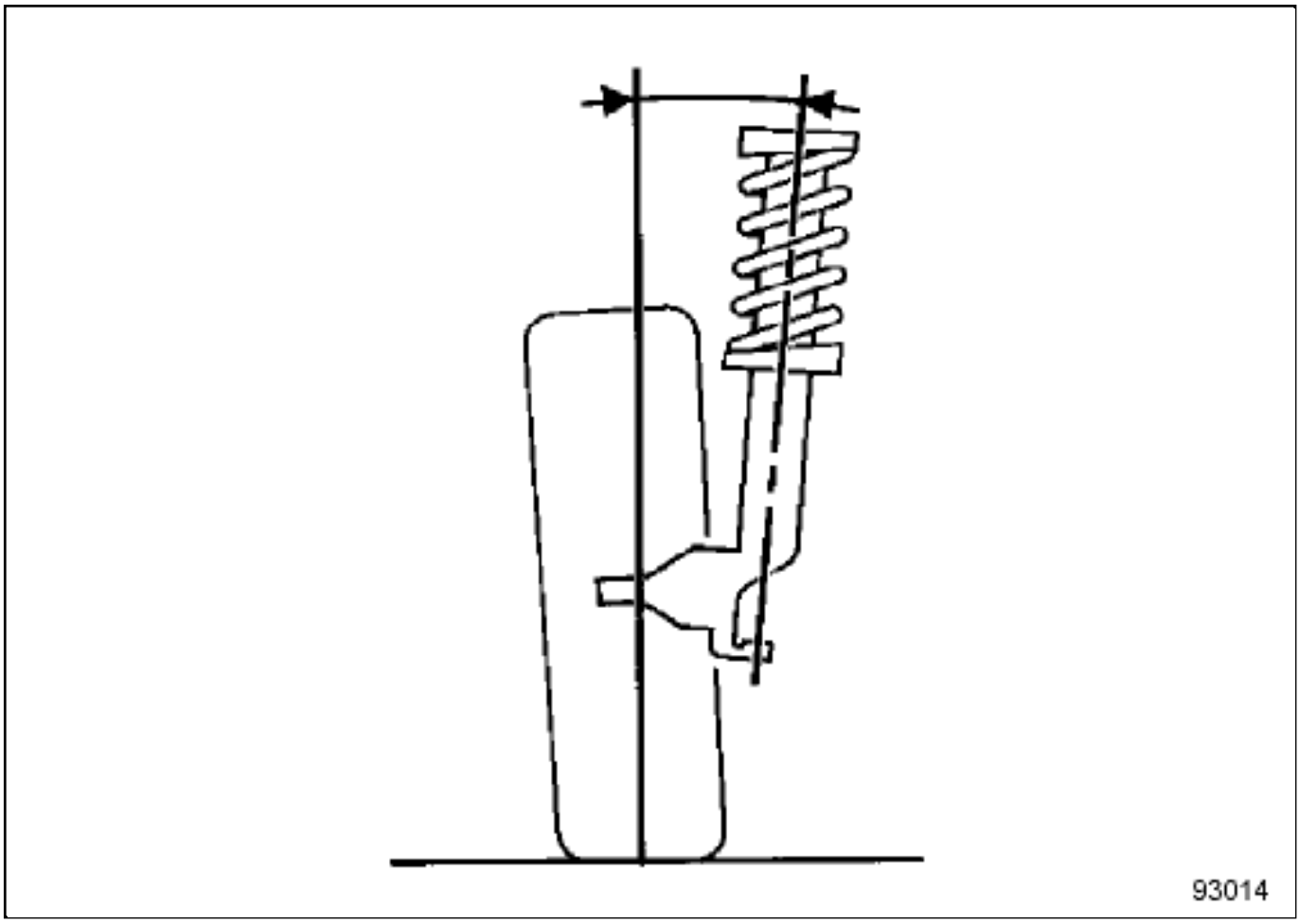


For vehicles made in Europe		
Value	**Tolerance**	**Position of vehicle**
+0˚11'	+35'	Vehicle in running order
	-35'	

For vehicles made in Mercosur and Russia		
Value	**Tolerance**	**Position of vehicle**
+0˚21'	+35'	Vehicle in running order
	-35'	

5. PIVOT

Not adjustable.



For vehicles made in Europe		
Value	**Tolerance**	**Position of vehicle**
+9˚45'	+1˚30'	Vehicle in running order
	-1˚30'	

For vehicles made in Mercosur and Russia		
Value	**Tolerance**	**Position of vehicle**
+9˚21'	+1˚30'	Vehicle in running order
	-1˚30'	

FRONT BRAKE CALLIPER ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Brake circuit: Precautions for the repair ,
- Vehicle: Precautions for the repair .

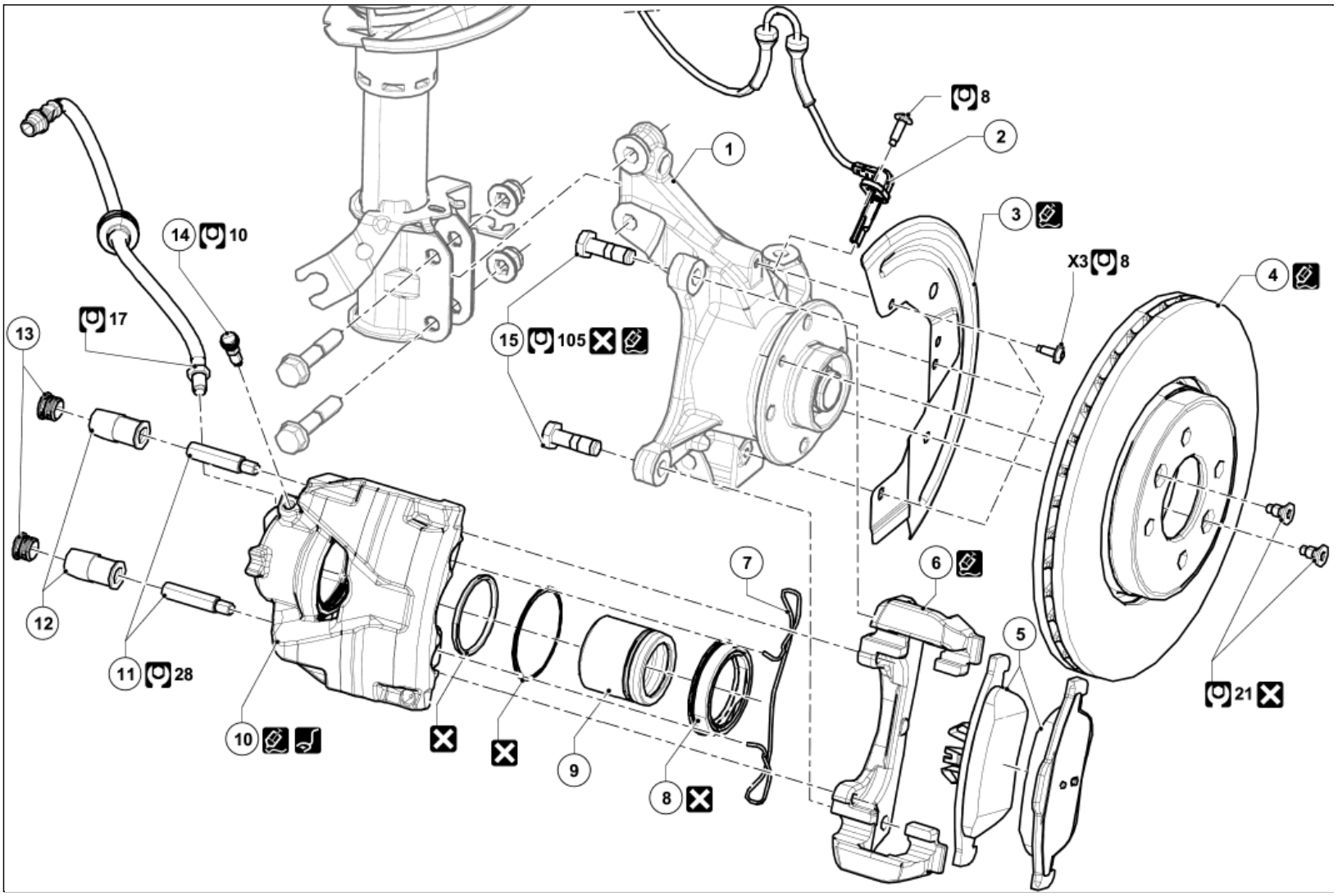


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front hub carrier assembly	(see 31A, Front axle components, Front hub carrier assembly: Exploded view)
2	Wheel speed sensor	Front wheel speed sensor: Removal - Refitting
3	Brake disc protector	SURFACE CLEANER Vehicle: Parts and consumables for the repair
4	Front brake disc	(see 31A, Front axle components, Front brake disc: Removal - Refitting) BRAKE CLEANERVehicle: Parts and consumables for the repair
5	Brake pad	(see 31A, Front axle components, Front brake pads: Removal - Refitting)
6	Brake calliper mounting	(see 31A, Front axle components, Front brake calliper mounting: Removal - Refitting) BRAKE CLEANERVehicle: Parts and consumables for the repair
7	Spring	(see 31A, Front axle components, Front brake pads: Removal - Refitting)
8	Dust seal of brake calliper piston	
9	Brake calliper piston	
10	Brake calliper	(see 31A, Front axle components, Front brake calliper: Removal - Refitting) BRAKE CLEANERVehicle: Parts and consumables for the repair (Fre. 1842)
11	Brake calliper guide pin	
12	Brake calliper guide pin gaiter	
13	Brake calliper guide pin gaiter	
14	Brake calliper bleed screw	
15	Brake calliper mounting bolt	HIGH STRENGTH THREAD LOCKVehicle: Parts and consumables for the repair

FRONT BRAKE CALLIPER MOUNTING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
indelible pencil

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - Brake circuit: Precautions for the repair ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

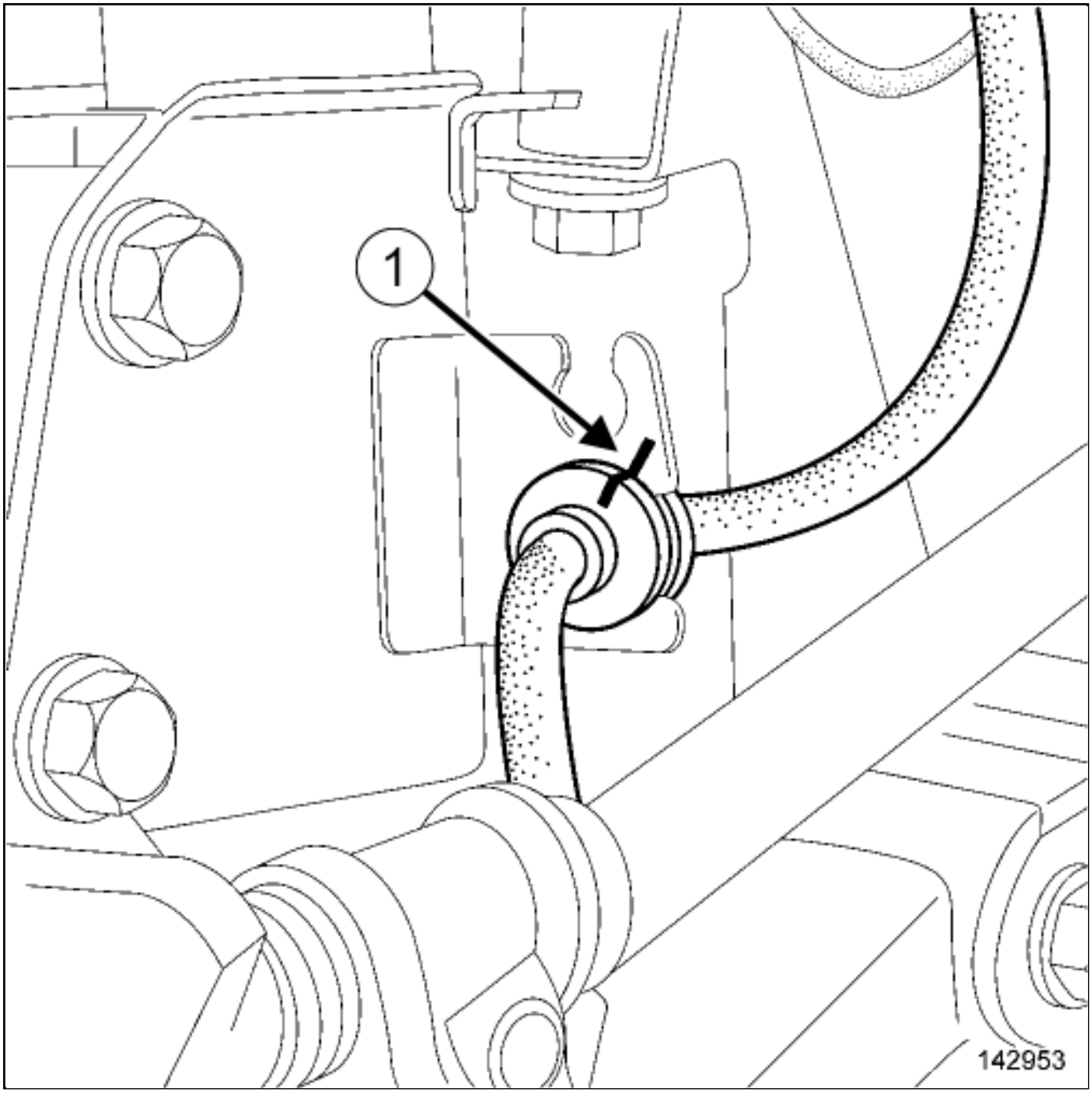
CAUTION

- In order not to damage the brake hose:
  - do not tension the hose,
  - do not twist the hose,
  - check that there is no contact with the surrounding components.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Unlock the steering column.
- Remove the front wheelWheel: Removal - Refitting



- Set the wheels straight ahead.

- Mark the position of the front brake hose cap(1) on the base of the shock absorber using a indelible pencil .

- Unclip the front brake hose cap(1) from the shock absorber base.

- Remove the front brake pads(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

2. REMOVAL OPERATION

Remove the front brake calliper mounting(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

Clean using a wire brush and brake cleanerVehicle: Parts and consumables for the repair :

- the front brake calliper mounting,
- the front brake calliper,
- the hub carrier.

Coat the calliper mounting bolts with High strength thread lockVehicle: Parts and consumables for the repair (04B, Consumables - Products) before fitting them.

2. REFITTING OPERATION

Proceed in the reverse order to removal.

WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

FRONT BRAKE CALLIPER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Front brake calliper piston return tool	Fre. 1842

Equipment required
pedal press
indelible pencil

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Brake circuit: Precautions for the repair ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

CAUTION

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

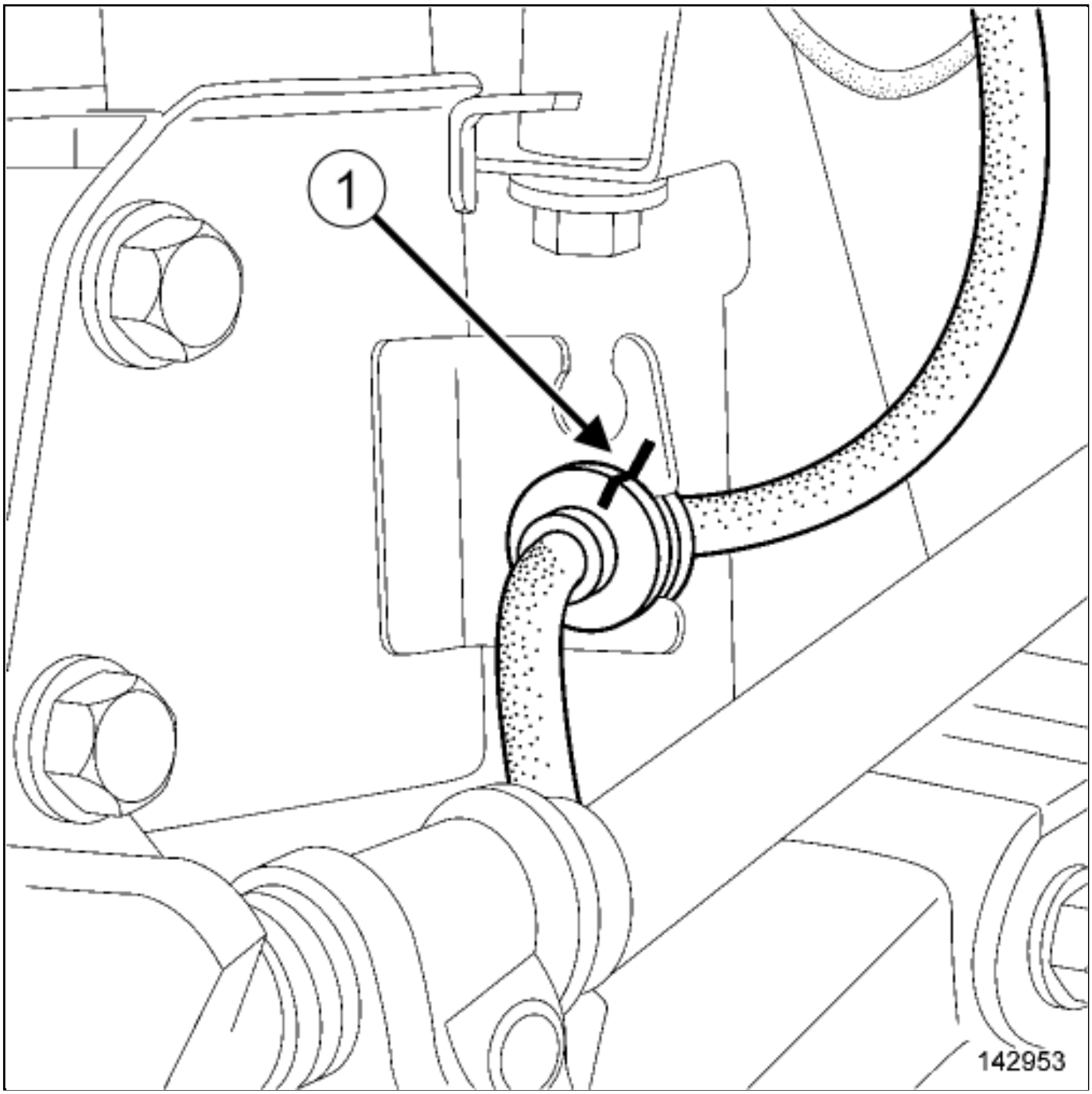
CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Fit the pedal press to the brake pedal to limit the outflow of brake fluid.
- Unlock the steering column.
- Remove the front wheel Wheel: Removal - Refitting .



- Set the wheels straight ahead.
- Mark the position of the front brake hose cap(1) on the shock absorber base using an indelible pencil.

- Unclip the front brake hose cap(1) from the shock absorber base.

2. REMOVAL OPERATION

- Release the brake hose from the brake calliper(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

- Remove the retaining spring(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

- Remove (see 31A, Front axle components, Front brake calliper assembly: Exploded view) :
  - the guide pin bolts,
  - the front brake calliper from the hose,
  - the front brake calliper.

REFITTING

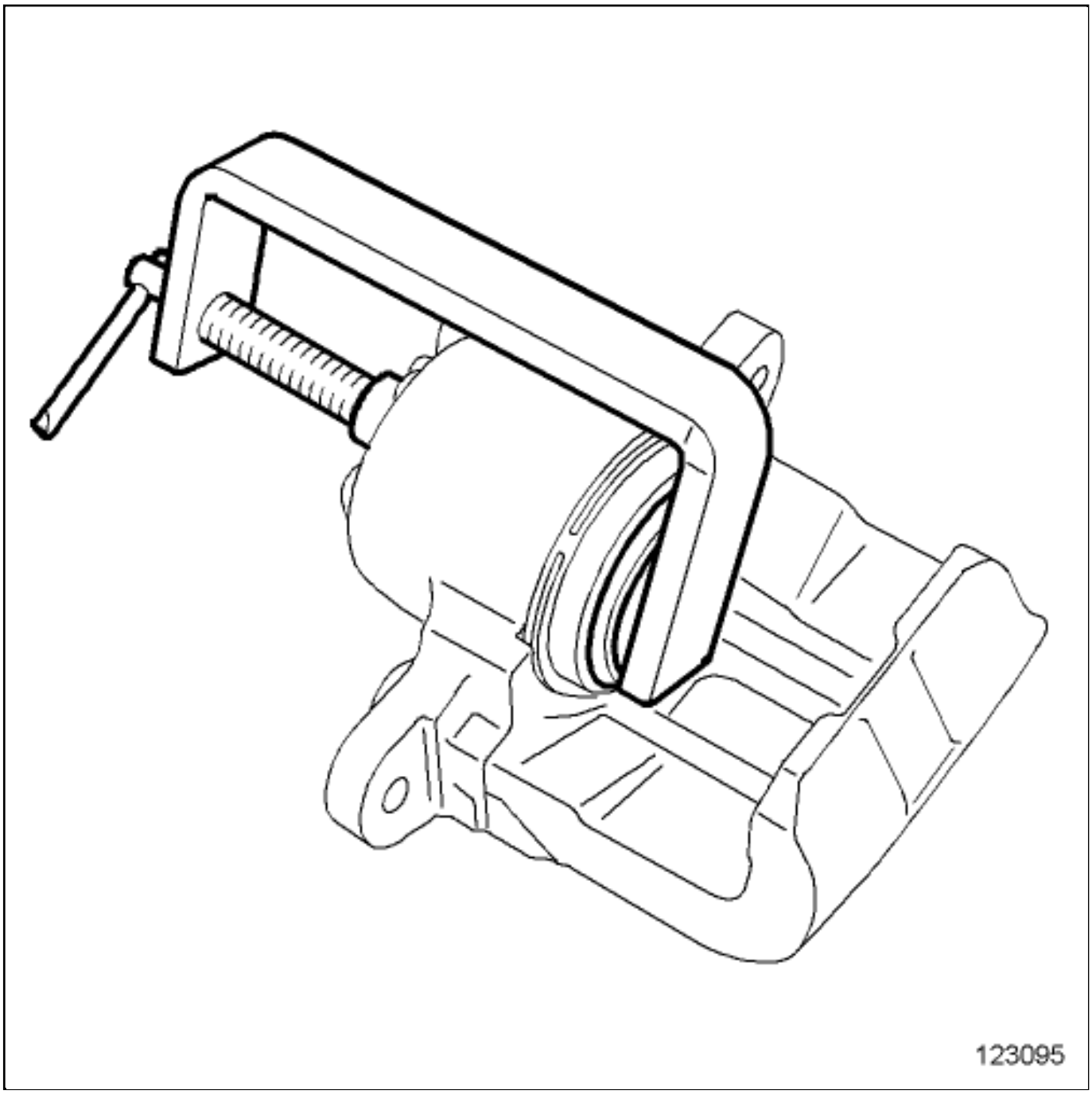
1. REFITTING PREPARATION OPERATION

- Check the condition of the gaiter and the calliper piston.

- Replace any faulty parts(see 31A, Front axle components, Front brake calliper: Repair) .

- Clean using a wire brush and brake cleanerVehicle: Parts and consumables for the repair :
  - the front brake calliper mounting,
  - the front brake calliper.

2. REFITTING OPERATION



- Push back the front brake calliper pistons to the bottom of their housings using the toolFront brake calliper piston return tool(Fre. 1842) .

- Without using a tool, screw the calliper to the brake hose as tightly as possible.

- Refit the front brake calliper(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

3. FINAL OPERATION

- Clip the front brake hose cap on to the base of the shock absorber, aligning the marks made using a indelible pencil .

- Remove the tool pedal press.
- Bleed the brake circuit Braking circuit: Bleed .
- Refit the front wheel Wheel: Removal - Refitting .

WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

FRONT BRAKE CALLIPER: REPAIR

Note, one or more warnings are present in this procedure

Special tooling required	
Front brake calliper piston return tool	Fre. 1842

Equipment required
pedal press

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Brake circuit: Precautions for the repair ,
- Vehicle: Precautions for the repair .

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

1. REMOVAL PREPARATION OPERATION

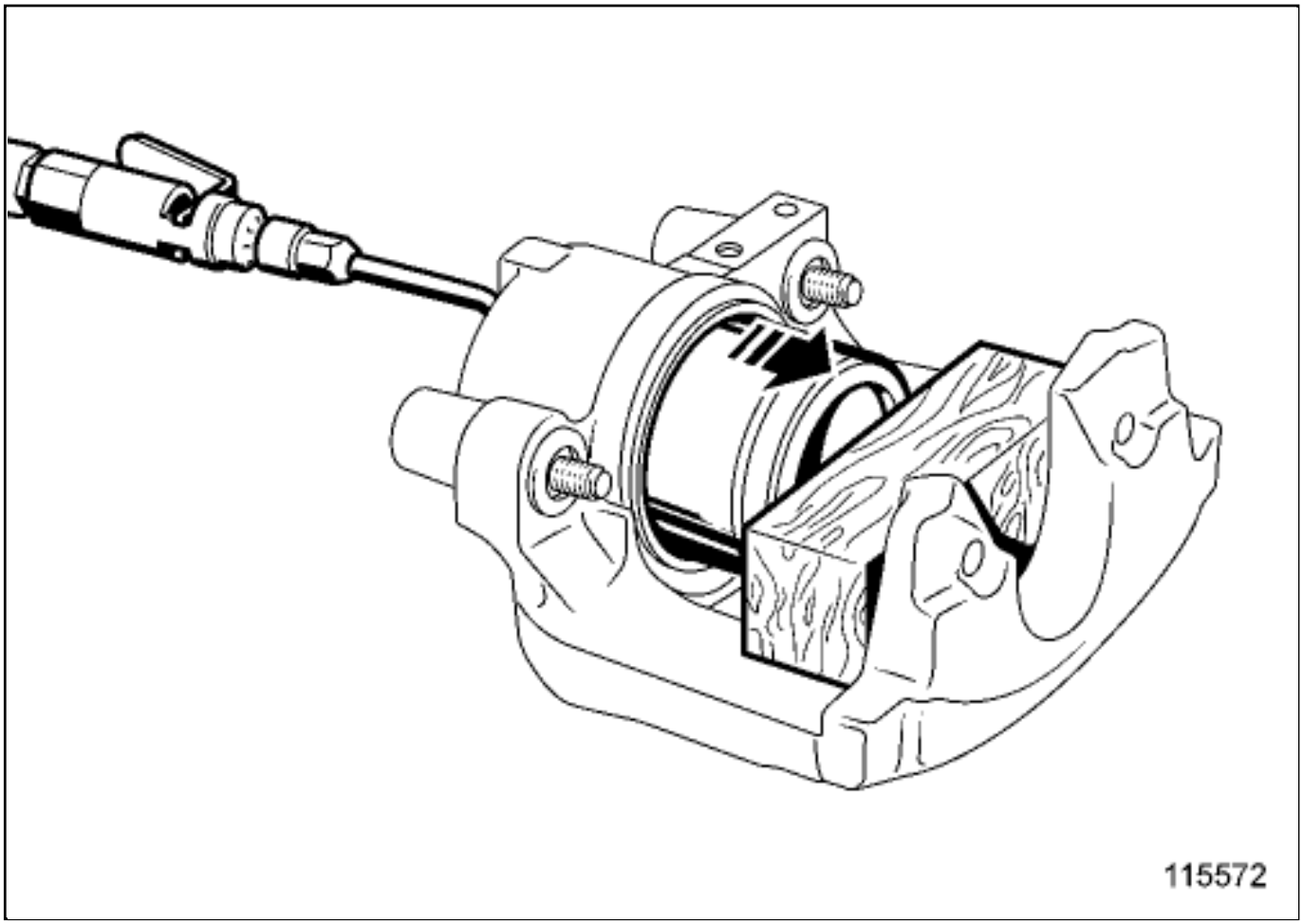
Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Position the pedal press on the brake pedal to limit the outflow of brake fluid.

Remove:

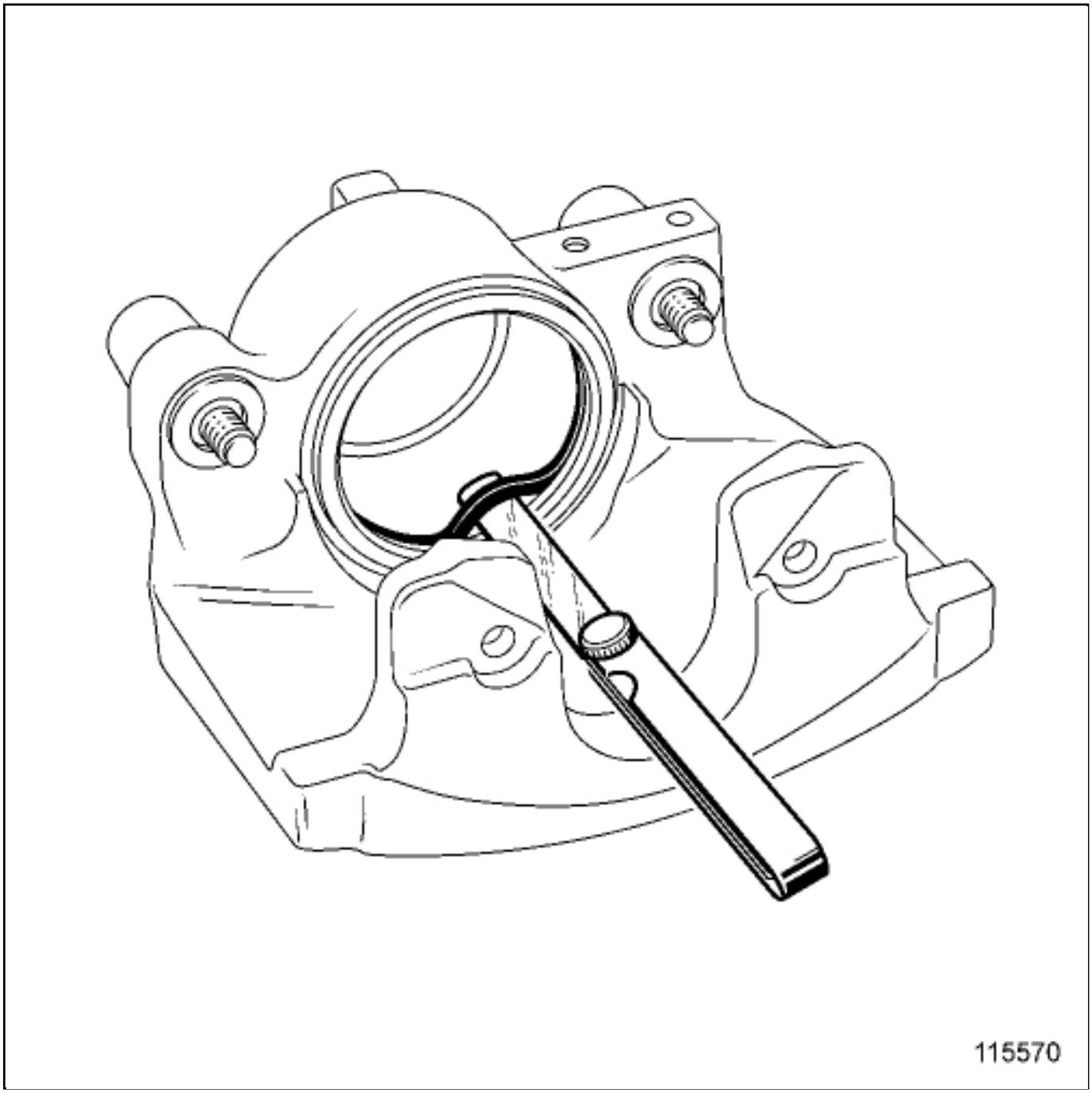
- the front wheel Wheel: Removal - Refitting ,
- the front brake calliper (see 31A, Front axle components, Front brake calliper: Removal - Refitting) .

2. OPERATION FOR REMOVAL OF PART CONCERNED



- Remove the piston using compressed air, making sure to insert a wooden block between the calliper and the piston to avoid damaging it. Any trace of impact on the end panel will render the piston unfit for use.

- Remove the dust seal.



- Remove the rectangular section seal from the calliper groove with a round edged spring blade (feeler gauge).

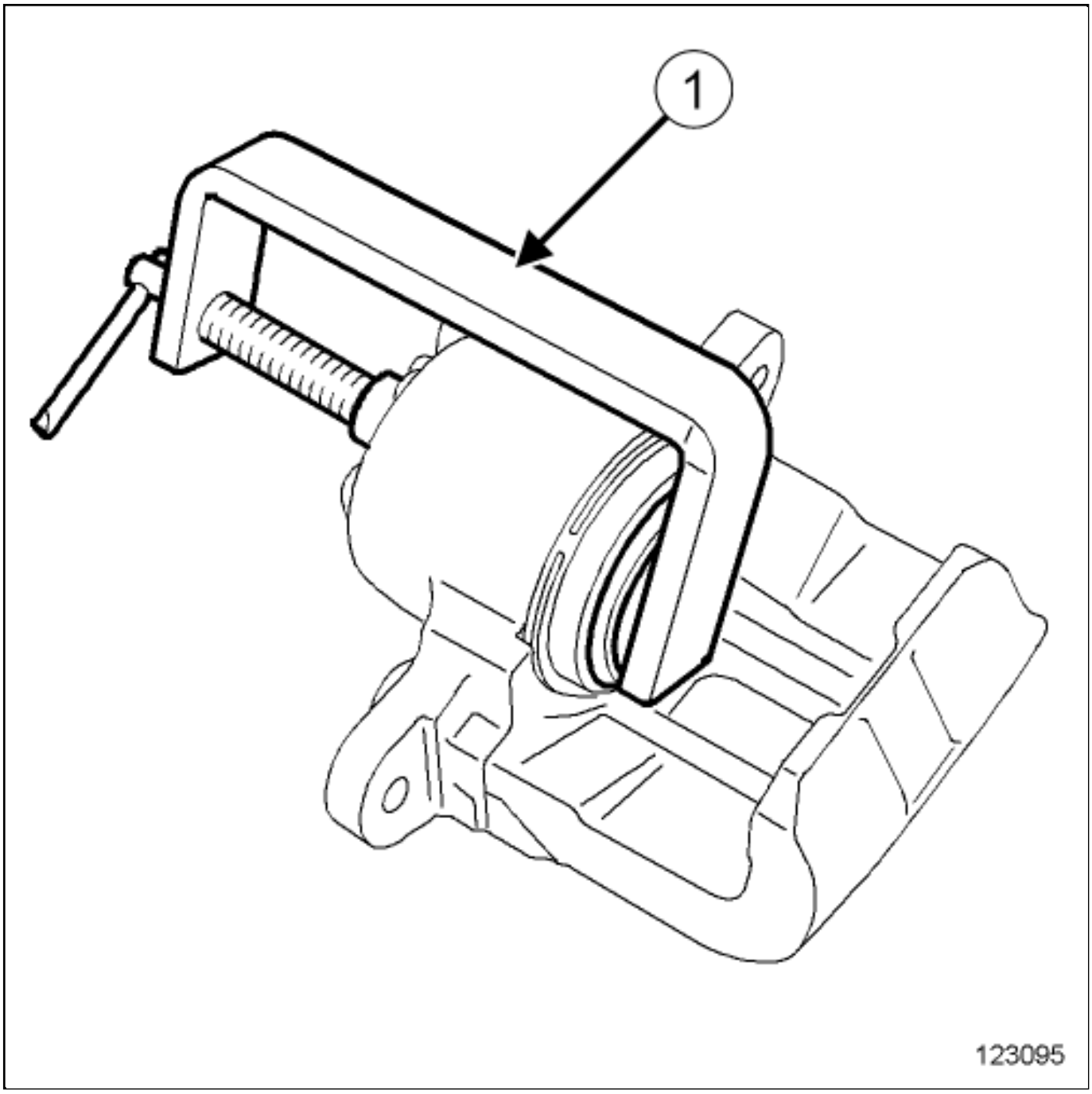
- Replace the complete calliper if the bore is scratched.

- Clean the parts using methylated spirit.

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

- Refit the new rectangular section seal into the calliper groove.



- Push the piston (after coating it with grease from the repair kit) using theFront brake calliper piston return tool (Fre. 1842) (1) until it is at the end of its bore.

- Refit the dust seal.

2. FINAL OPERATION

Refit:

- the brake calliper (see 31A, Front axle components, Front brake calliper: Removal - Refitting) ,
- the front wheel Wheel: Removal - Refitting .

Remove the pedal press.

Bleed the brake circuit Braking circuit: Bleed .

FRONT BRAKE DISC: DESCRIPTION

1. PREPARATION OPERATION FOR CHECK

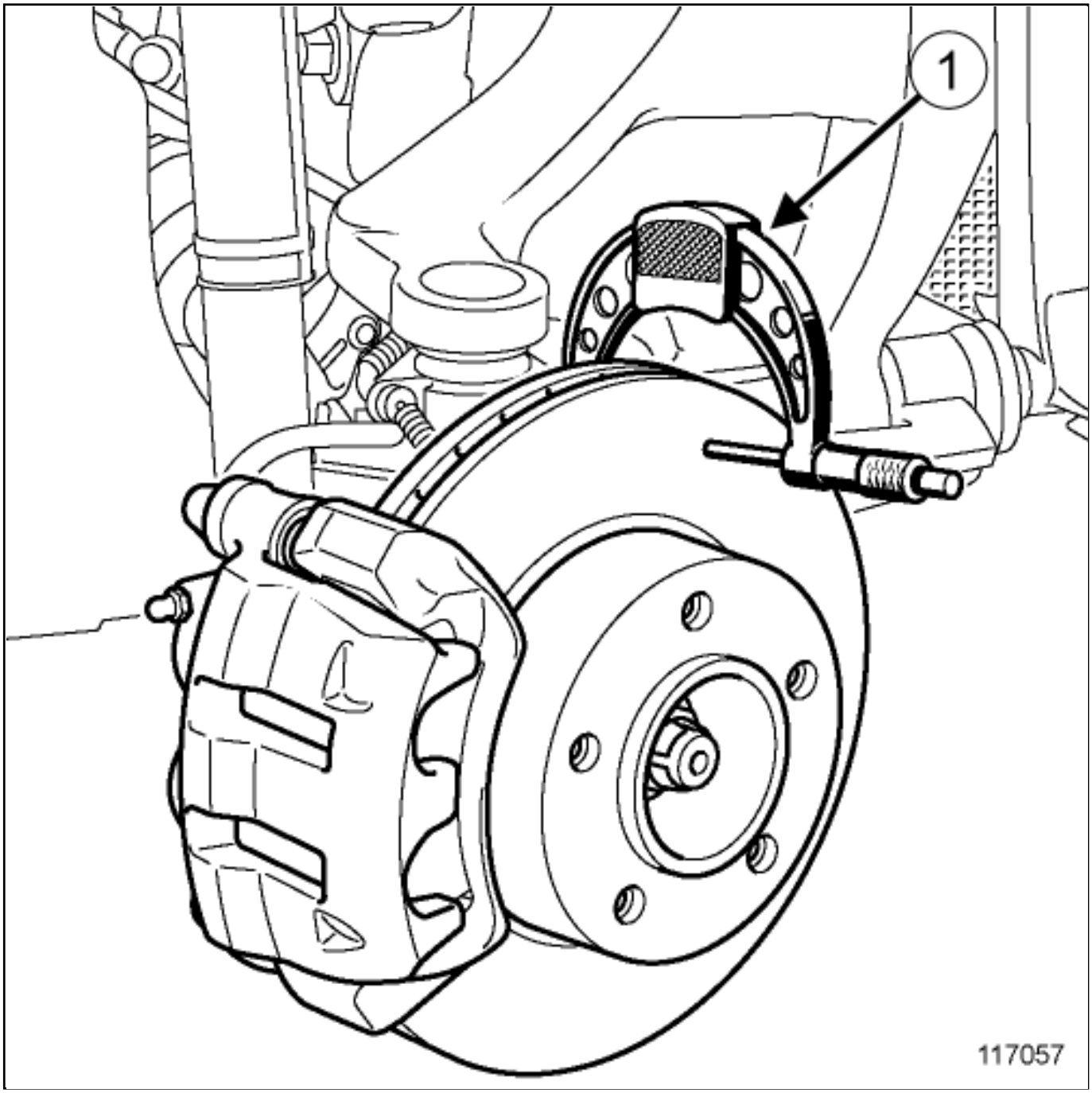
Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .

Remove the wheel in question**Wheel: Removal - Refitting** .

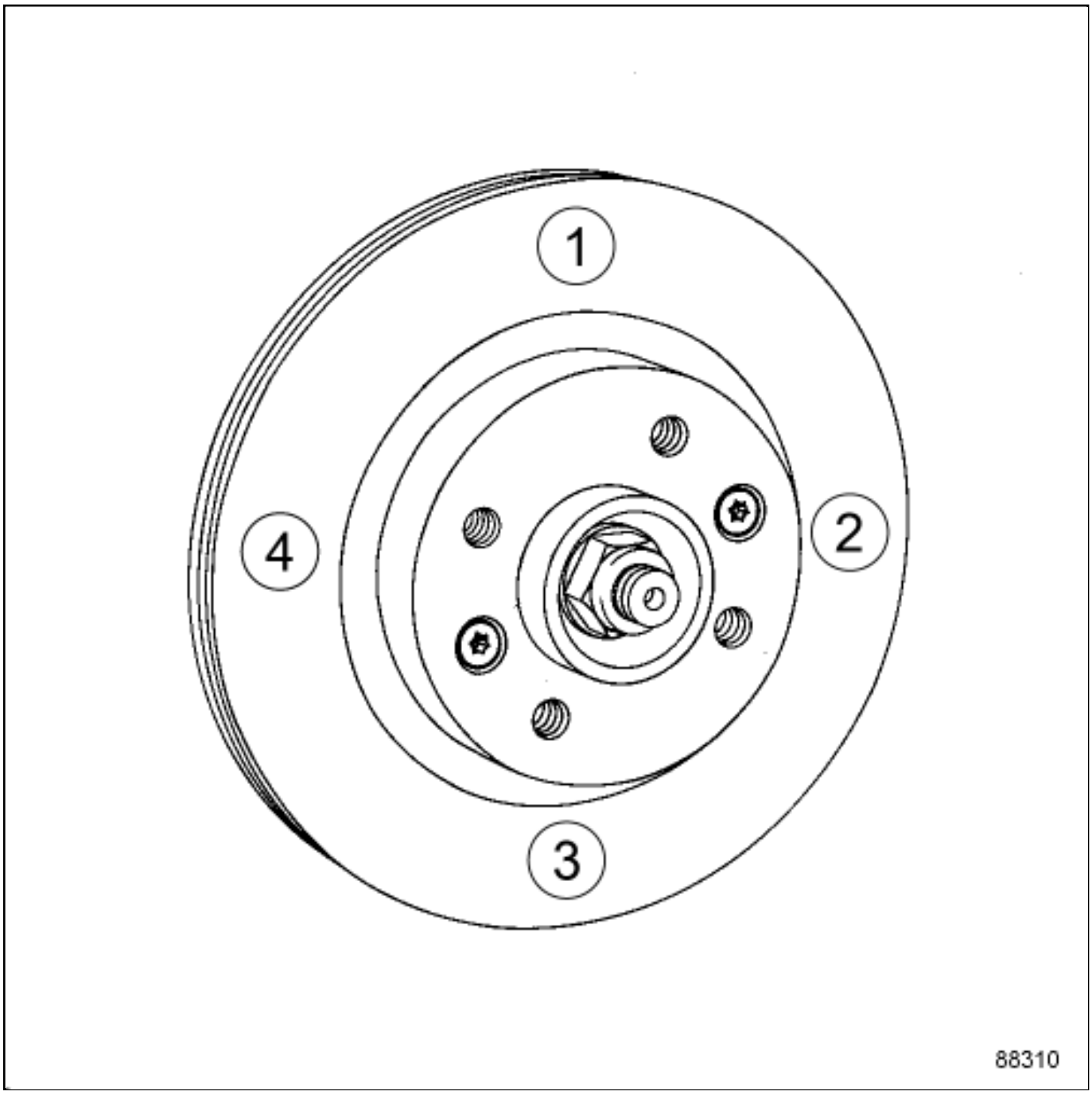
2. CHECKING OPERATION FOR PART CONCERNED

Note:

Use a Palmer type tool to check the thickness of the disc.



Position the Palmer tool(1) to measure the disc thickness.



Measure the thickness of the disc at 4 points in order (90˚ apart).

Compare the values with those recommended by the manufacturer**Brake: Specifications** .

3. FINAL OPERATION

Replace the discs if necessary**(see 31A, Front axle components, Front brake disc: Removal - Refitting)** .

Refit the wheel in question**Wheel: Removal - Refitting** .

XSL version : 3.02 du 22/07/11

FRONT BRAKE DISC: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
parts washer
indelible pencil

parts always to be replaced:
Front brake disc bolt

Brake discs cannot be reground. If there is excessive scoring or wear, they will need to be replaced Brake: Specifications .

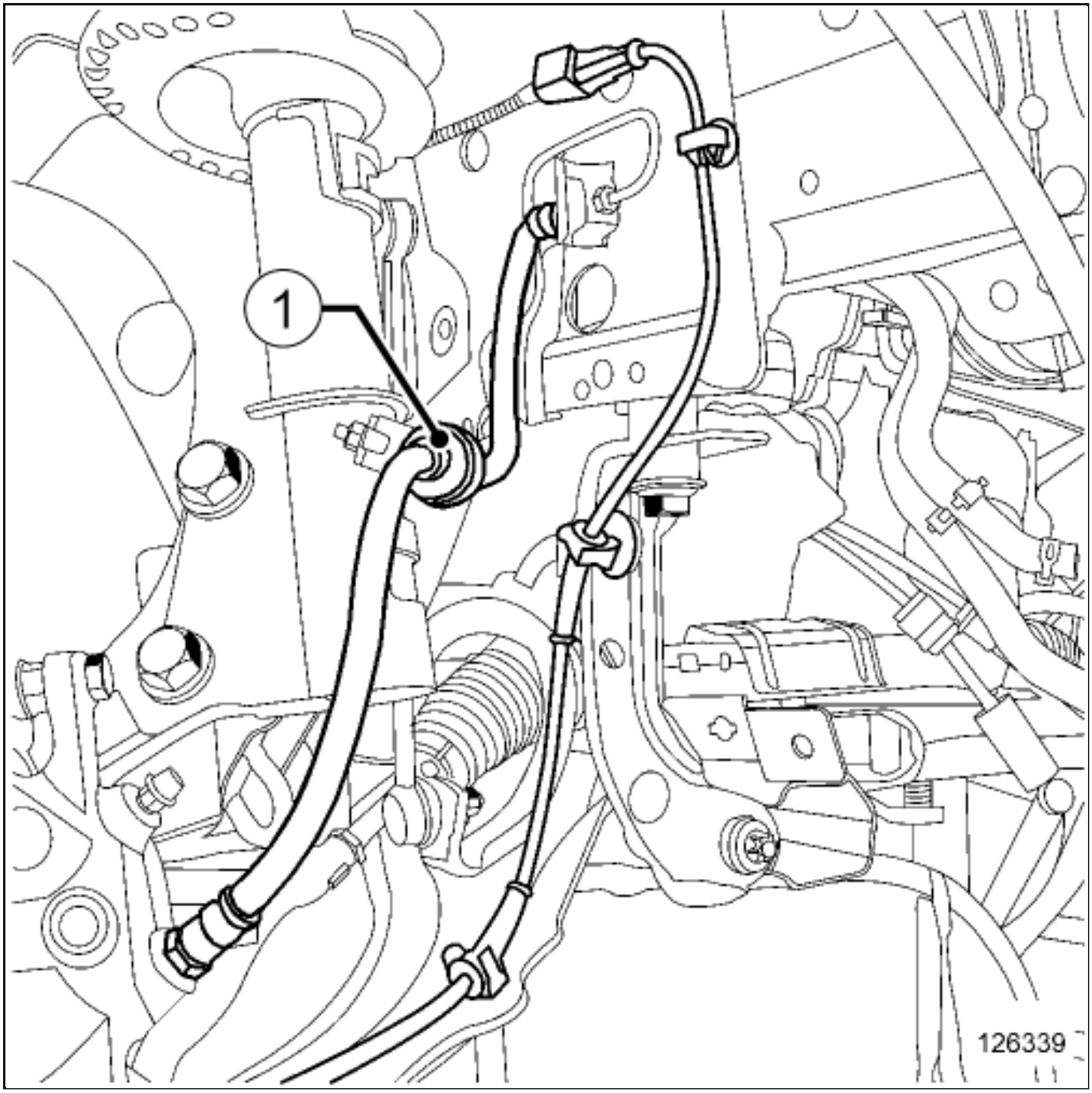
WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - Brake circuit: Precautions for the repair ,
  - Vehicle: Precautions for the repair .

REMOVAL

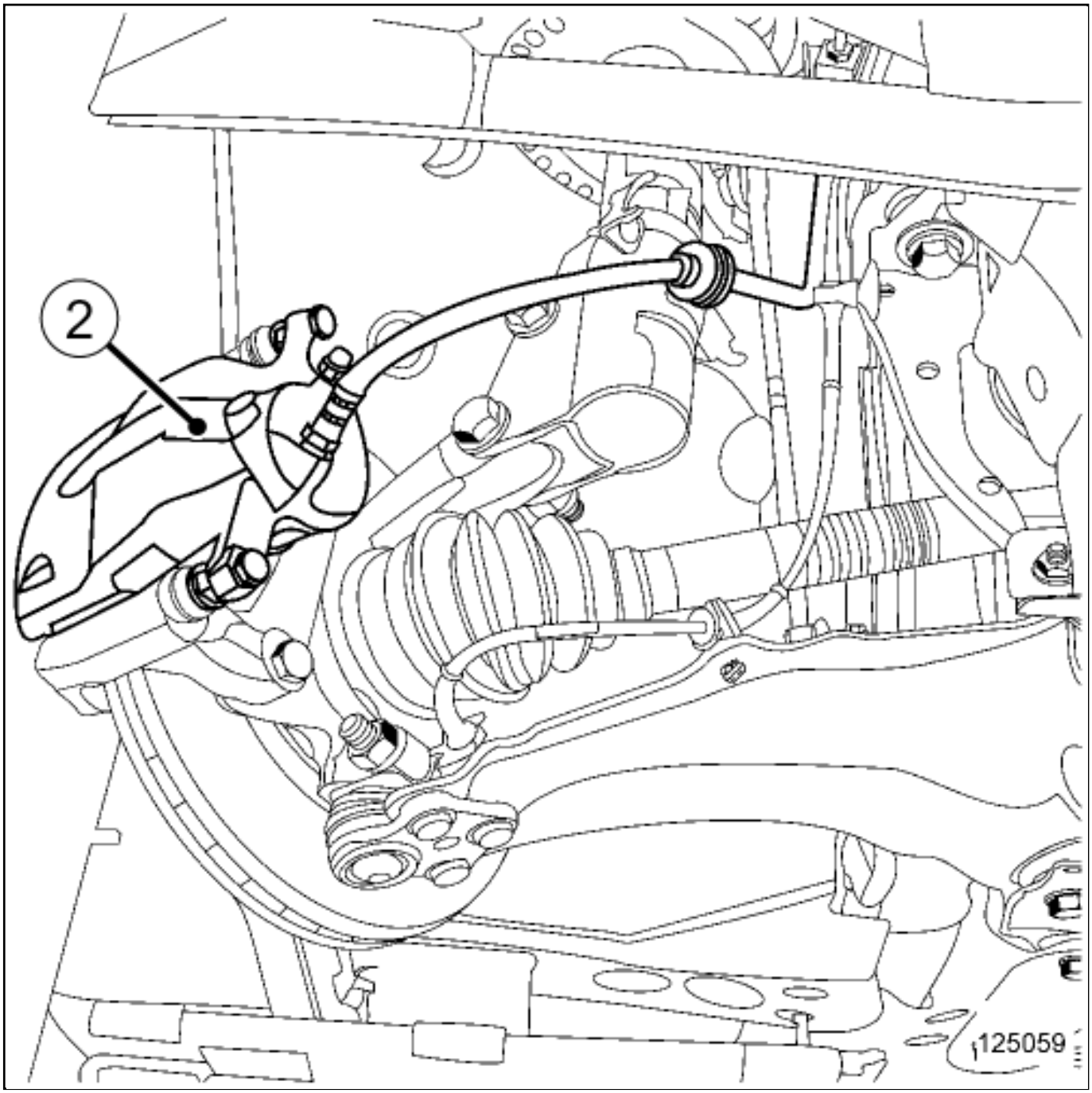
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Set the wheels straight ahead.
- Remove the front wheel Wheel: Removal - Refitting .



If the vehicle is equipped:

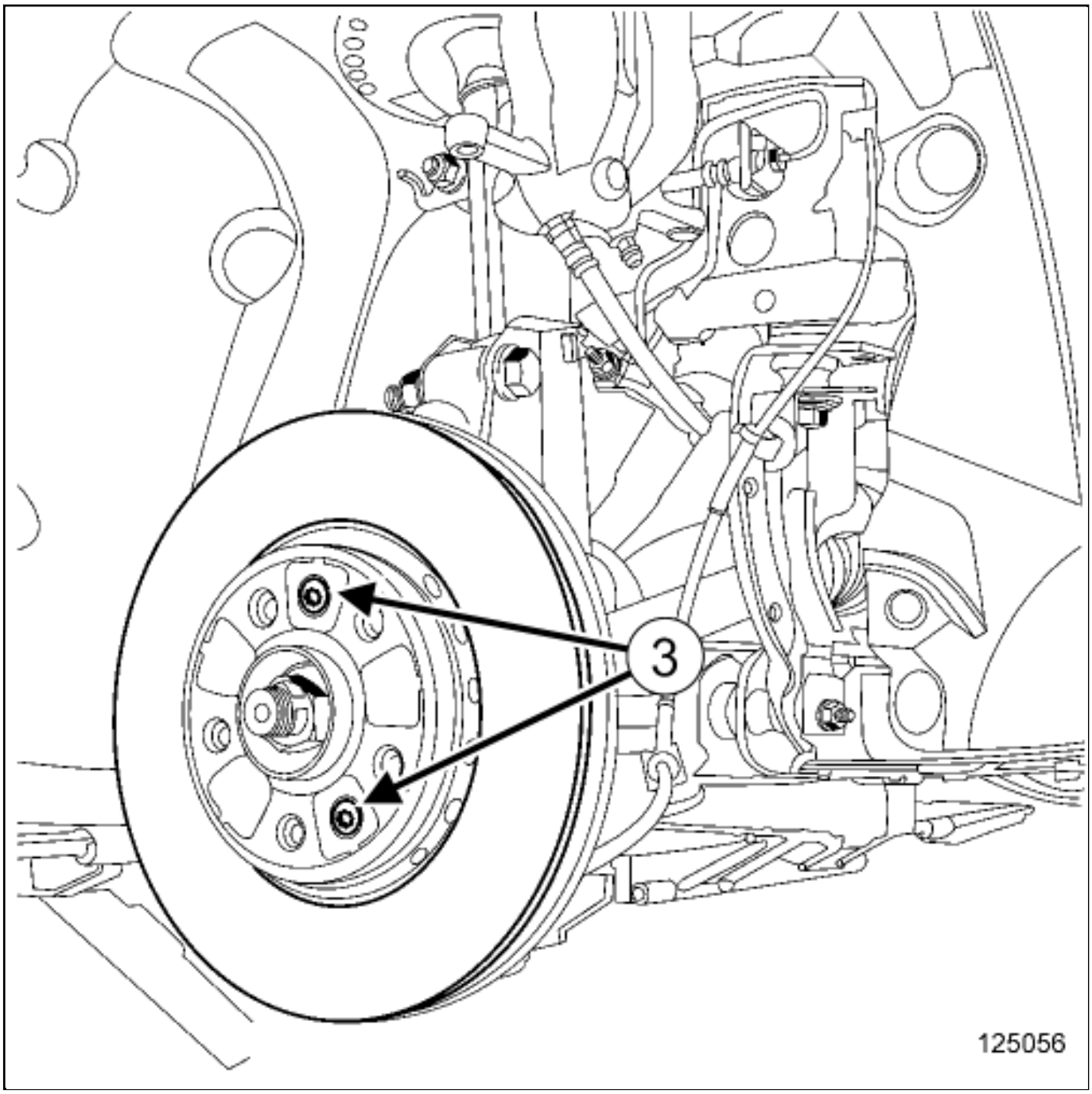
- mark the position of the cap(1) on the base of the shock absorber using an indelible pencil,
- unclip the cap(1) from the base of the shock absorber.



- Remove:
  - the brake pads (see 31A, Front axle components, Front brake pads: Removal - Refitting) ,
  - the"brake calliper mounting - brake calliper" assembly(2) (see 31A, Front axle components, Front brake calliper mounting: Removal - Refitting) .

- Hang the "brake calliper mounting - brake calliper" assembly(2) on the suspension spring.

2. REMOVAL OPERATION



Remove:

- the brake disc bolt or bolts(3) ,
- the brake disc.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the brake discs using a parts washer.

- Dry the surface of the discs.

- Clean the mating faces of the disc on the hub using a wire brush and brake cleaner Vehicle: Parts and consumables for the repair .

- parts always to be replaced: **Front brake disc bolt** .

2. REFITTING OPERATION

- Refit the brake disc with new bolts.

- Torque tighten the new disc mounting bolts Brake circuit: Tightening torque .

3. FINAL OPERATION

- Refit:
  - the "brake calliper mounting - brake calliper" assembly(2) (see 31A, Front axle components, Front brake calliper mounting: Removal - Refitting) ,
  - the brake pads (see 31A, Front axle components, Front brake pads: Removal - Refitting) .

- Set the wheels straight ahead.

- If the vehicle is equipped, clip the cap onto the base of the shock absorber by aligning the marks made at (1) .

CAUTION

- In order not to damage the brake hose:
  - do not tension the hose,
  - do not twist the hose,
  - check that there is no contact with the surrounding components.

- Refit the front wheel Wheel: Removal - Refitting .

WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

- Advise the customer to run-in the brake pads (no harsh braking).

FRONT BRAKE HOSE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
pedal press

WARNING

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair**(see 31A, Front axle components, Front axle components: Precautions for the repair)** .

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Location and specifications (tightening torques, parts always to be replaced, etc.)**(see 31A, Front axle components, Front brake calliper assembly: Exploded view)** .

REMOVAL

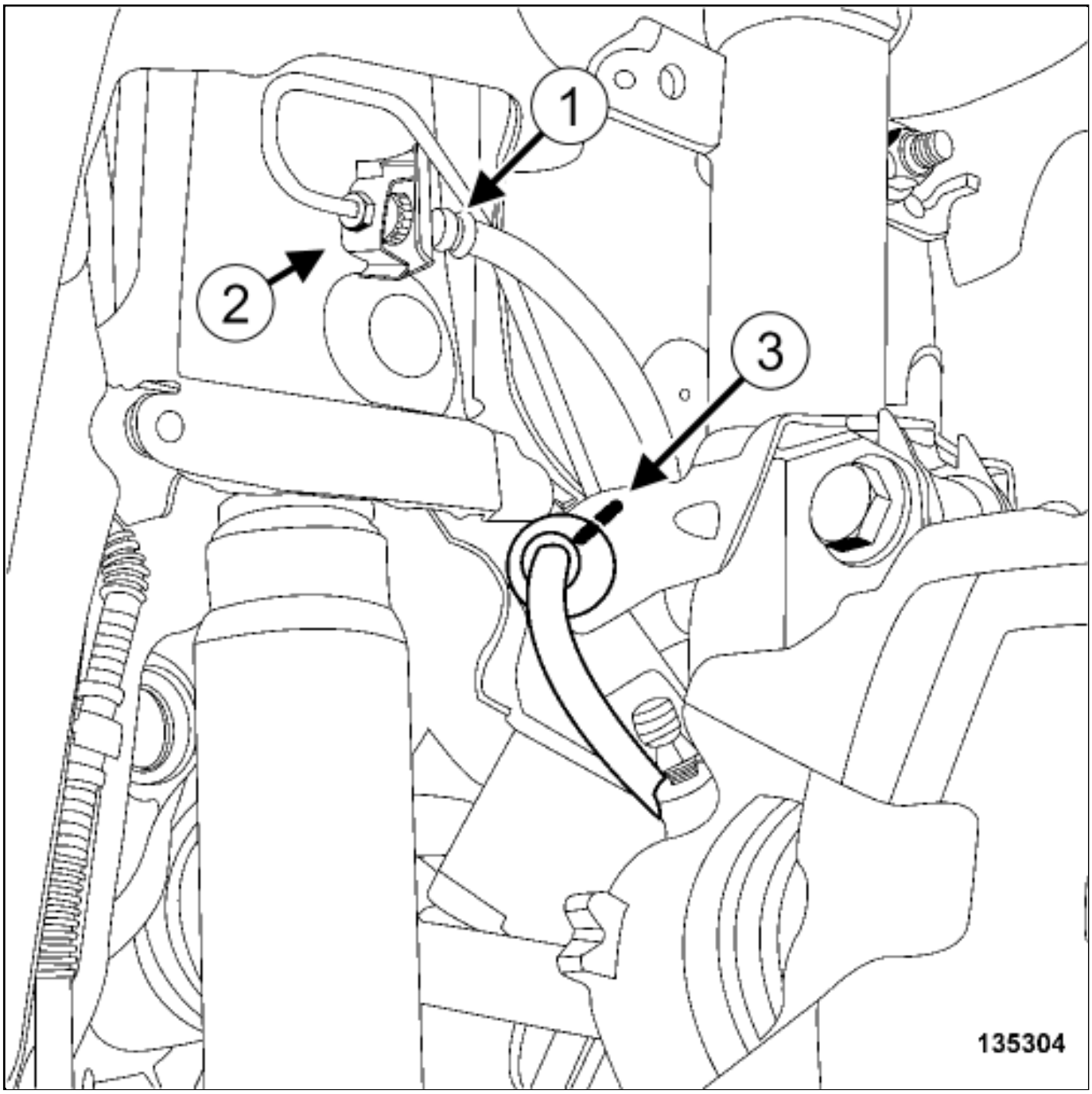
1. REMOVAL PREPARATION OPERATION

Place:

- the vehicle on a two-post lift**Vehicle: Towing and lifting** ,
- the wheels straight-ahead,
- a pedal presson the brake pedal to limit the outflow of brake fluid.

Remove the front wheel**Wheel: Removal - Refitting** .

2. OPERATION FOR REMOVAL OF PART CONCERNED



- Loosen the hose union(1) on the rigid pipe union.
- Remove the retaining(2) fork from the hose.
- To avoid the premature damage of the brake hose by friction, observe the following procedure before unclipping the hose:
- Set the wheels straight ahead.
- If the vehicle is equipped:
  - mark the position of the cap on the base of the shock absorber using a permanent marker,
  - unclip the brake hose cap(3) from the shock absorber base.

- Loosen the hose union on the brake calliper.
- Remove the brake hose.

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

CAUTION

- In order not to damage the brake hose:
  - do not tension the hose,
  - do not twist the hose,
  - check that there is no contact with the surrounding components.

- Set the wheels straight ahead.
- Refit the brake hose at the calliper end.
- Torque tighten the brake hose union on the calliper(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .
- Clip the brake hose cap onto the base of the shock absorber by aligning the marks made with the indelible marker pen (if the vehicle is equipped).
- Refit:
  - the brake hose on the rigid pipe union,
  - the hose retaining fork.
- Torque tighten the brake hose union on the rigid pipe unionBrake circuit: Tightening torque .

2. FINAL OPERATION

- Refit the front wheelWheel: Removal - Refitting .
- Remove the pedal press from the brake pedal.
- Bleed the brake circuitBraking circuit: Bleed .

FRONT BRAKE PADS: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Front brake calliper piston return tool	Fre. 1842

Equipment required
indelible pencil

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Brake circuit: Precautions for the repair ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

CAUTION

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

REMOVAL

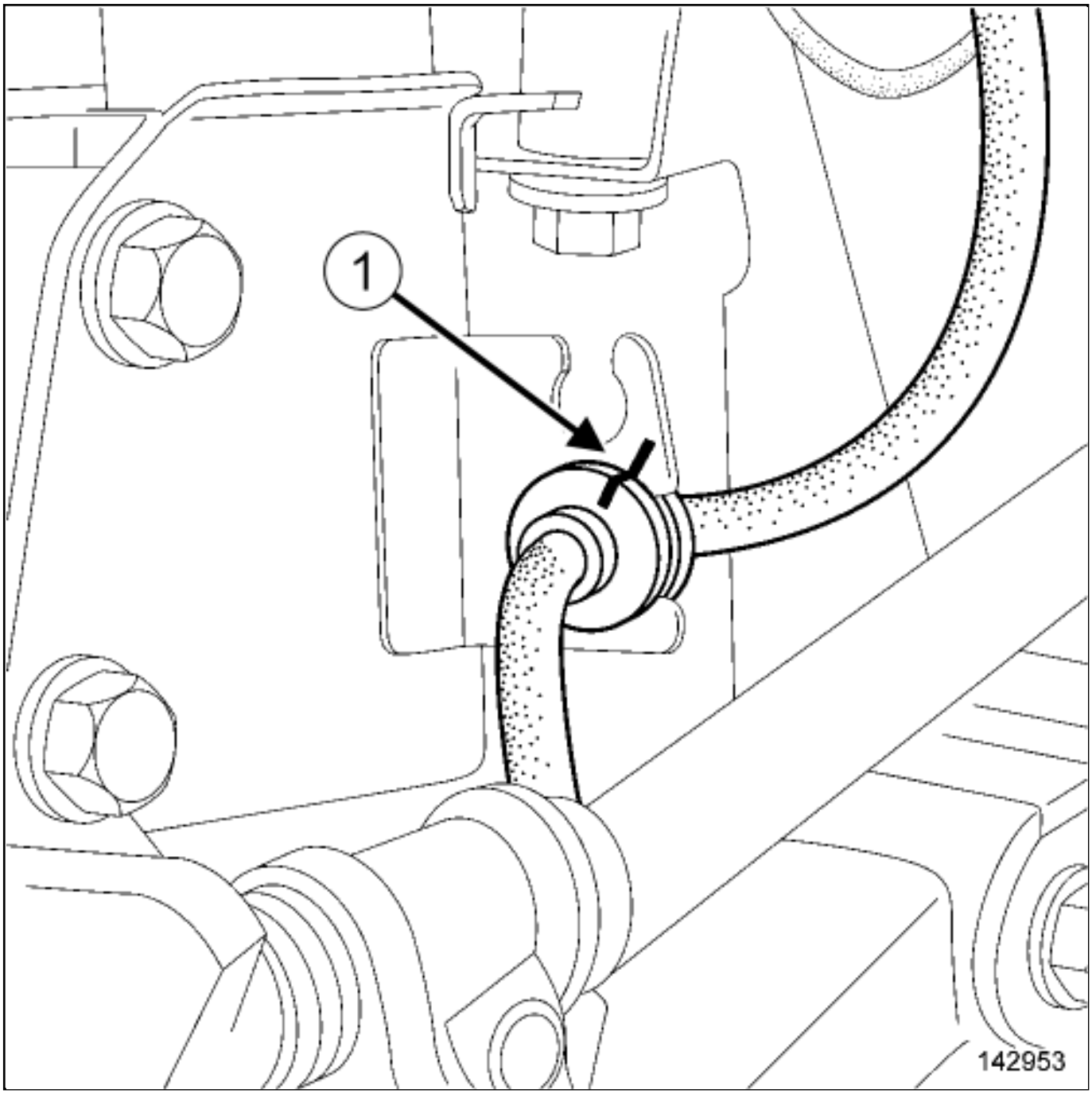
1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Unlock the steering column.

Remove the front wheelsWheel: Removal - Refitting .

2. REMOVAL OPERATION



- Set the wheels straight ahead.

- Mark the position of the front brake hose cap(1) on the base of the shock absorber using a indelible pencil .

- Unclip the front brake hose cap(1) from the shock absorber base.

- Remove (see 31A, Front axle components, Front brake calliper assembly: Exploded view) :

- the calliper retaining spring.
- the caps from the guide pin protectors,
- the guide pins using a male Allen key.
- the front brake calliper.

Suspend the front brake calliper from the suspension spring.

Remove the brake pads(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

REFITTING

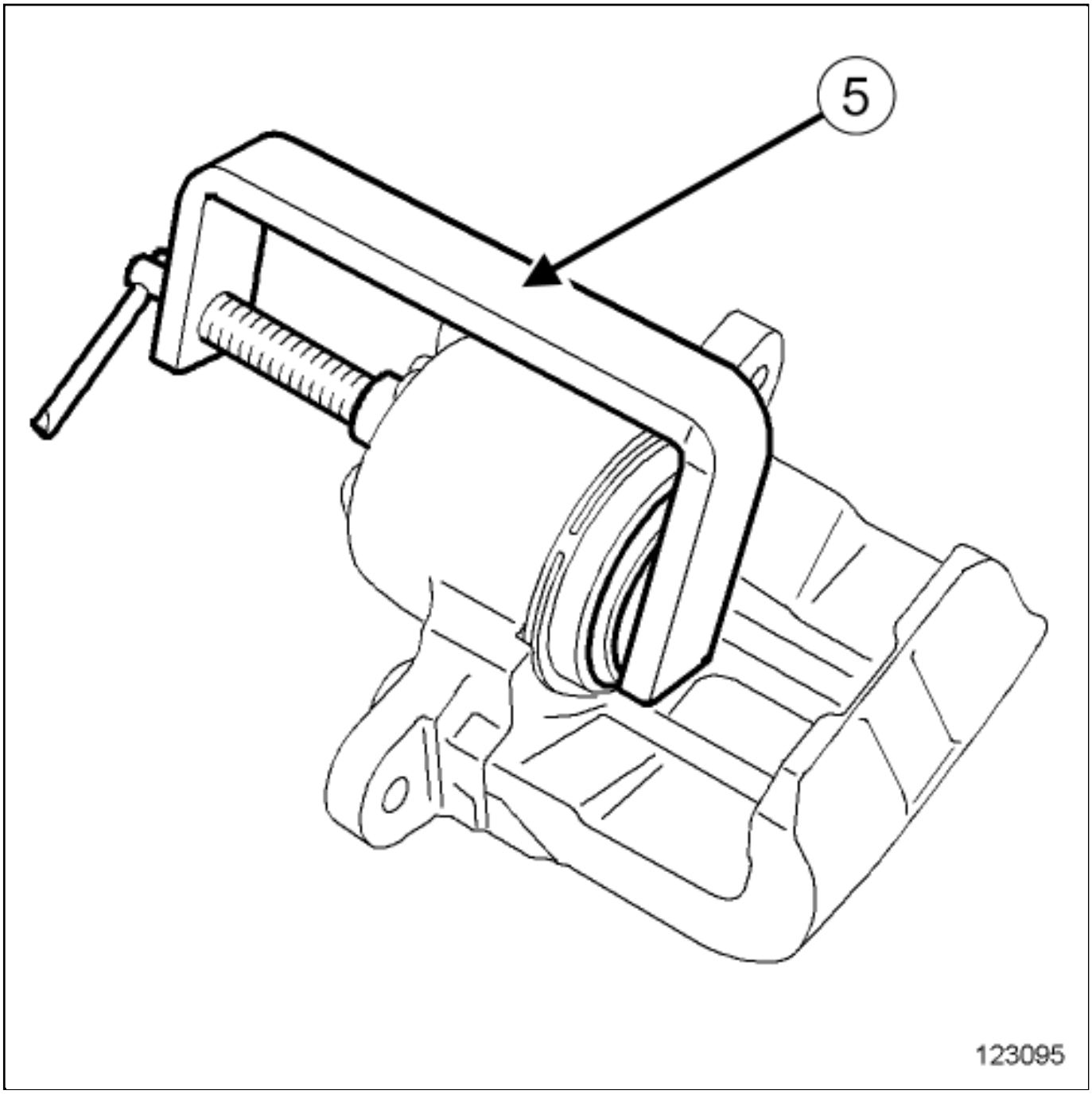
1. REFITTING PREPARATION OPERATION

Check the thickness of the front brake padsBrake: Specifications .

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

Clean using a wire brush and brake cleanerVehicle: Parts and consumables for the repair :

- the front brake calliper mountings,
- the front brake callipers,
- the brake discs.



- Push the piston (after coating it with grease from the repair kit) using theFront brake calliper piston return tool (Fre. 1842) (5) until it is at the end of its bore.

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

FRONT BUMPER ASSEMBLY: EXPLODED VIEW

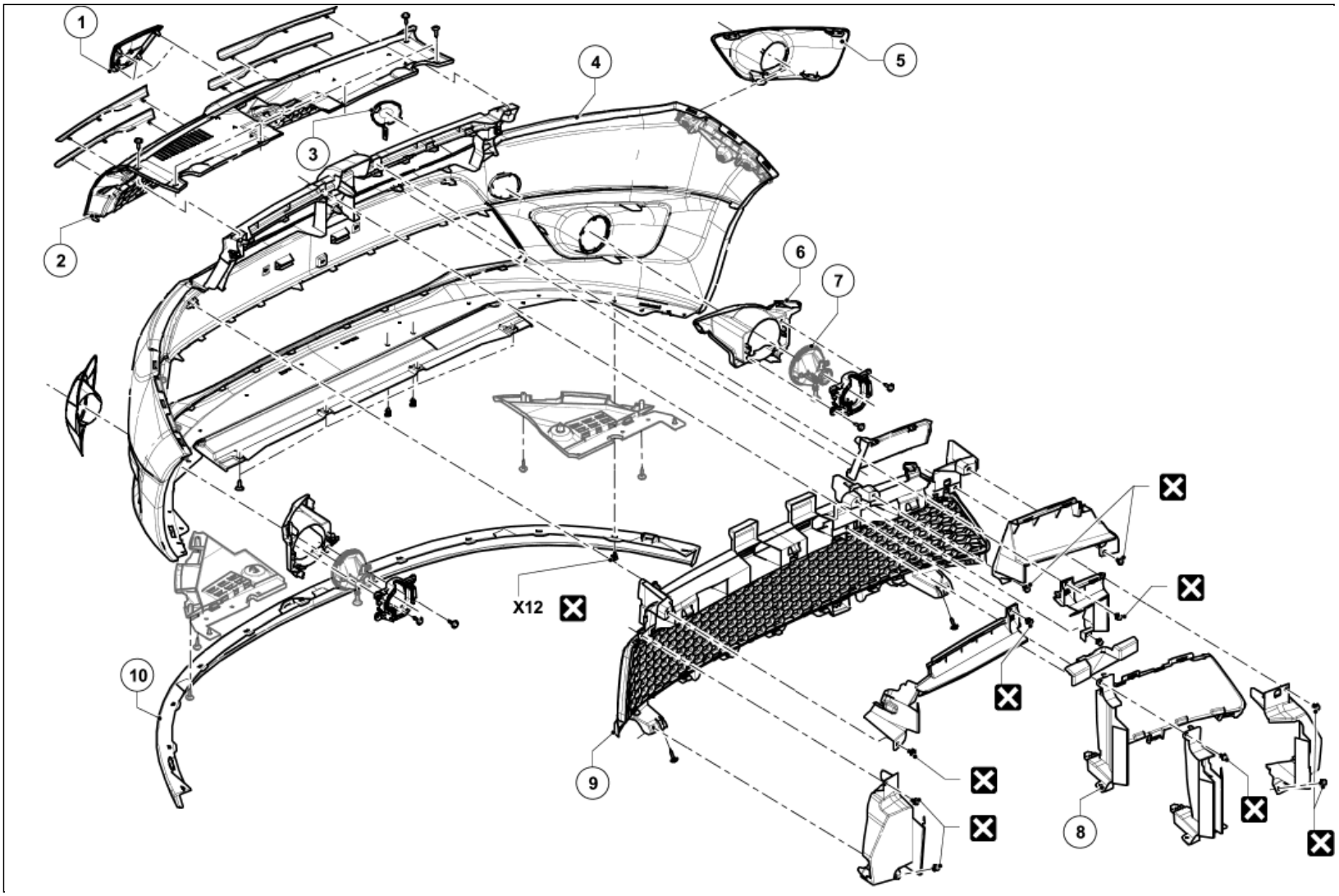


Illustration key: Description

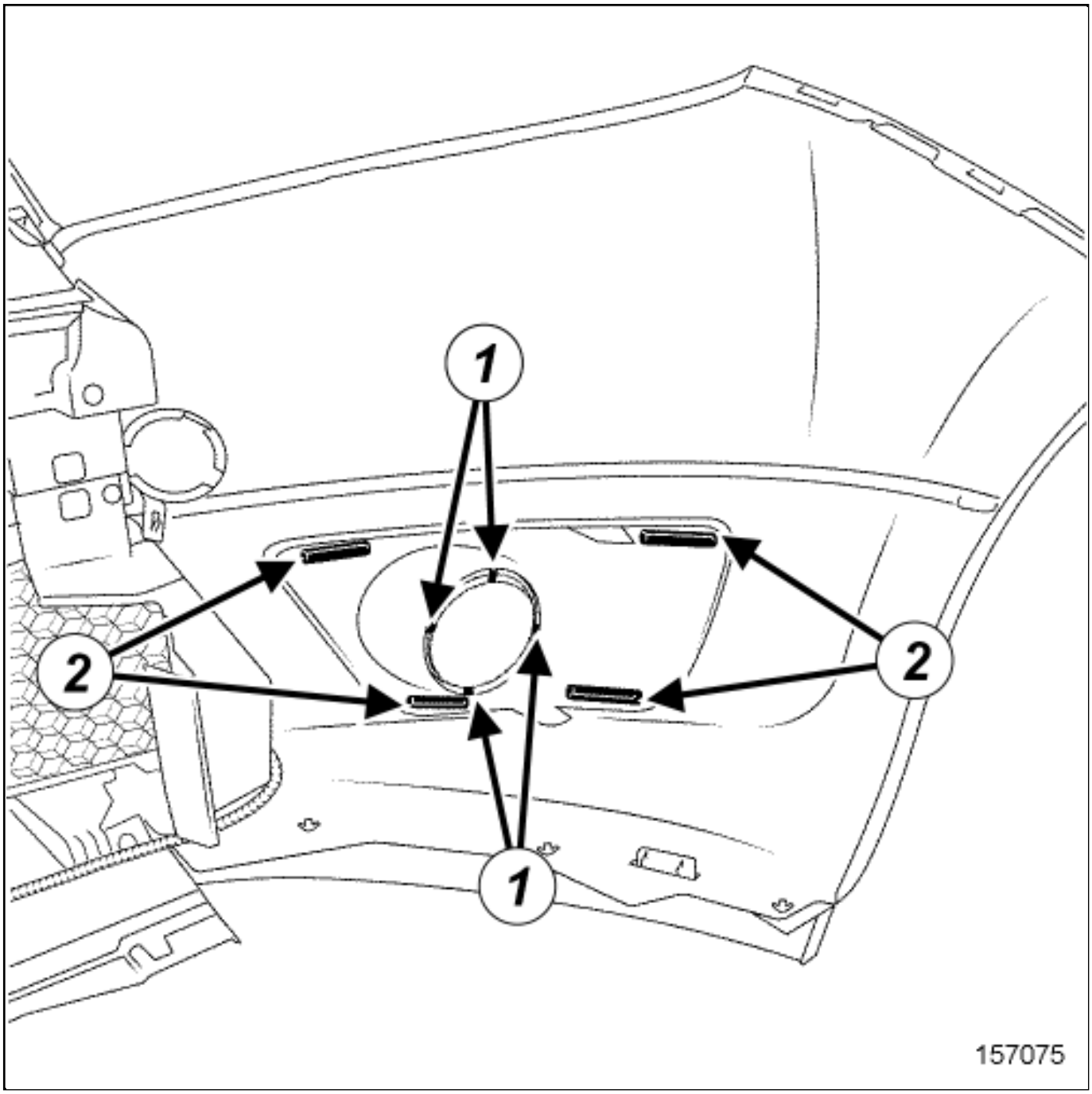
For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front badge	(Car. 1363)
2	Radiator grille	
3	Trap ring towing	
4	Front bumper	(see 55A, Exterior protection, Front bumper: Removal - Refitting) Material : P/E EPDM T12Plastic material bodywork component: Repair andPolypropylene / polyethylene bodywork component: Preparation and paint range
5	Headlight cover	(see 55A, Exterior protection, Front bumper: Stripping - Rebuilding)
6	Fog light mounting	
7	Fog light	
8	Guide upper air of shield front bumper	
9	Front bumper lower grille	(see 55A, Exterior protection, Front bumper: Stripping - Rebuilding)
10	Element aerodynamics	(see 55A, Exterior protection, Front bumper: Stripping - Rebuilding)

FRONT BUMPER: CONVERSION

Note:

When a front bumper is replaced, the replacement part must be modified before it is painted so that the fog lights can be fitted.



- Cut the clips(1) using a cutting tool.

- Drill the front bumper using a drill bit around the inside edge of the marking(2) .
- Finish off using a small file.

FRONT BUMPER: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 55A, Exterior protection, Front bumper assembly: Exploded view) and(see 55A, Exterior protection, Exterior body front trim assembly: Exploded view) .

REMOVAL

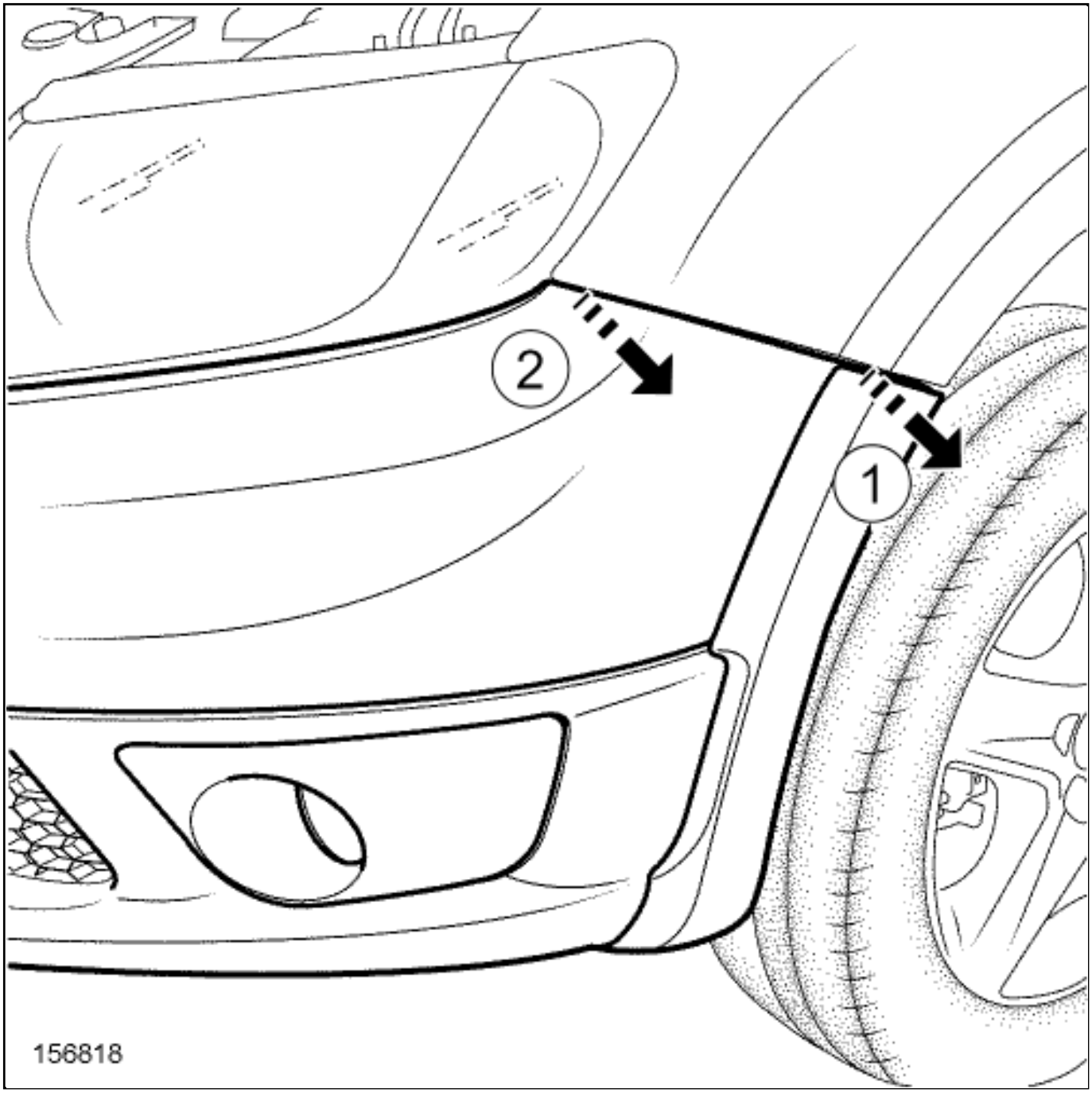
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

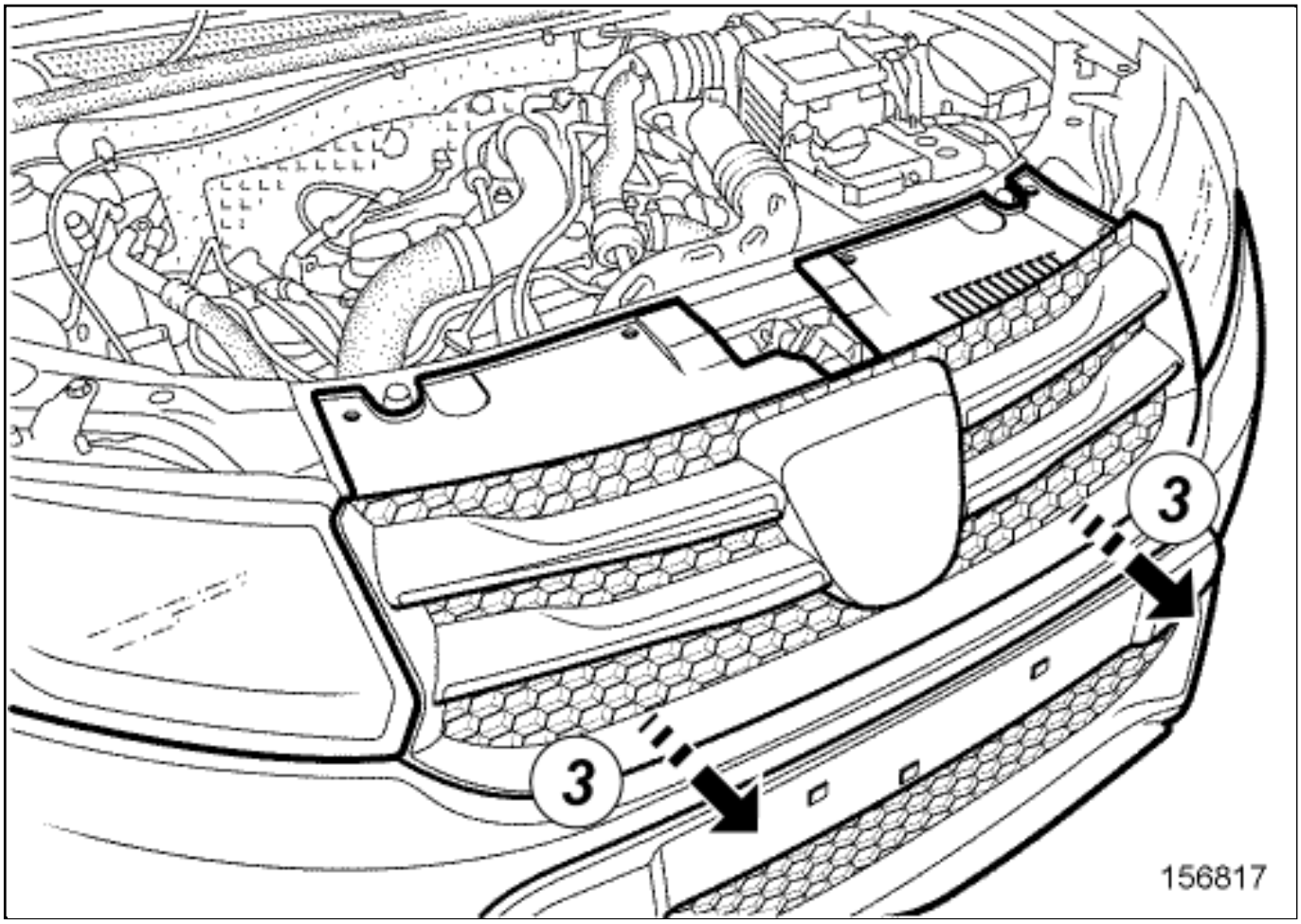
2. REMOVAL OPERATION

- Remove (see 55A, Exterior protection, Exterior body front trim assembly: Exploded view) :
  - the front wheel arch liner bolts on the front bumper on each side of the vehicle,
  - the bolts from the closure panel components.

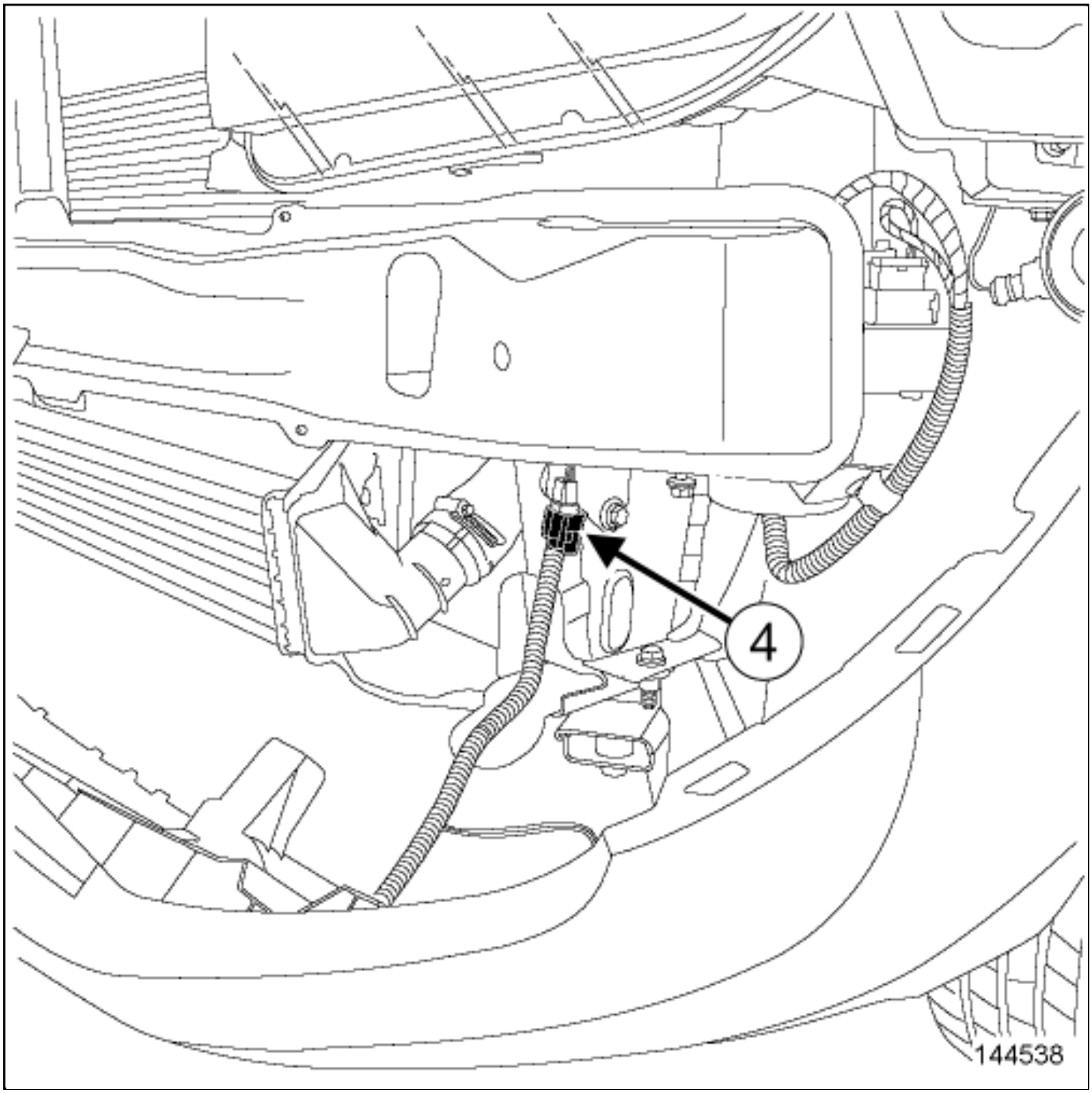
- Remove (see 55A, Exterior protection, Front bumper assembly: Exploded view) :
  - the lower bolts of the front bumper,
  - the upper bolts of the front bumper.



- Unclip the side sections of the front bumper at(1) and (2) .



- Partially remove the front bumper at(3) (this operation requires two people).



- Unclip the fog lights connector(4) .
- Disconnect the fog lights connector.

- Remove the front bumper (this operation requires two people).

REFITTING

- Proceed in the reverse order to removal.

FRONT BUMPER: STRIPPING - REBUILDING

parts always to be replaced:
front bumper rivet

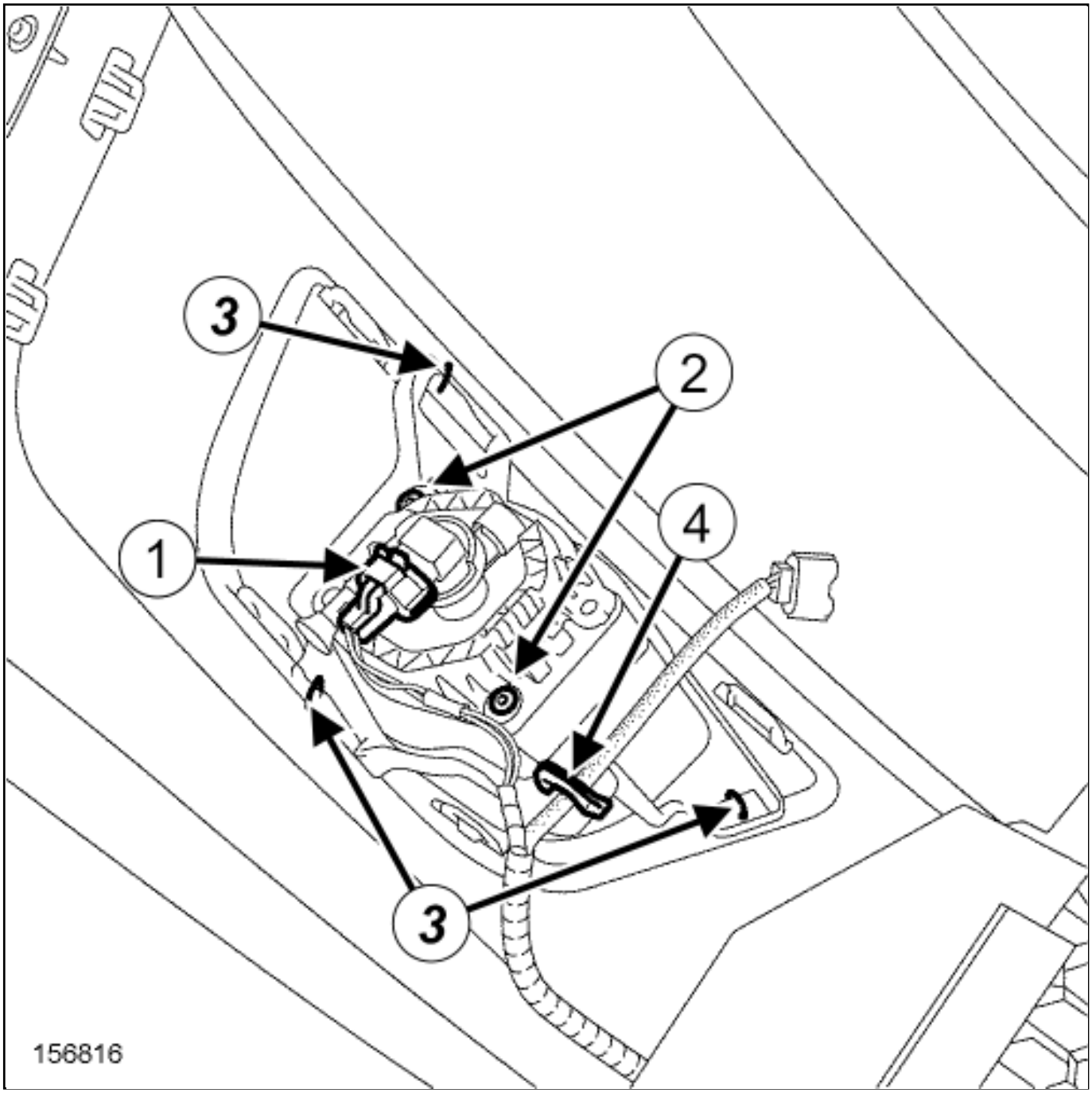
Location and specification (tightening torques, parts always to be replaced, etc.)(see 55A, Exterior protection, Front bumper assembly: Exploded view) .

STRIPPING

1. STRIPPING PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the front bumper(see 55A, Exterior protection, Front bumper: Removal - Refitting) .

2. STRIPPING OPERATION



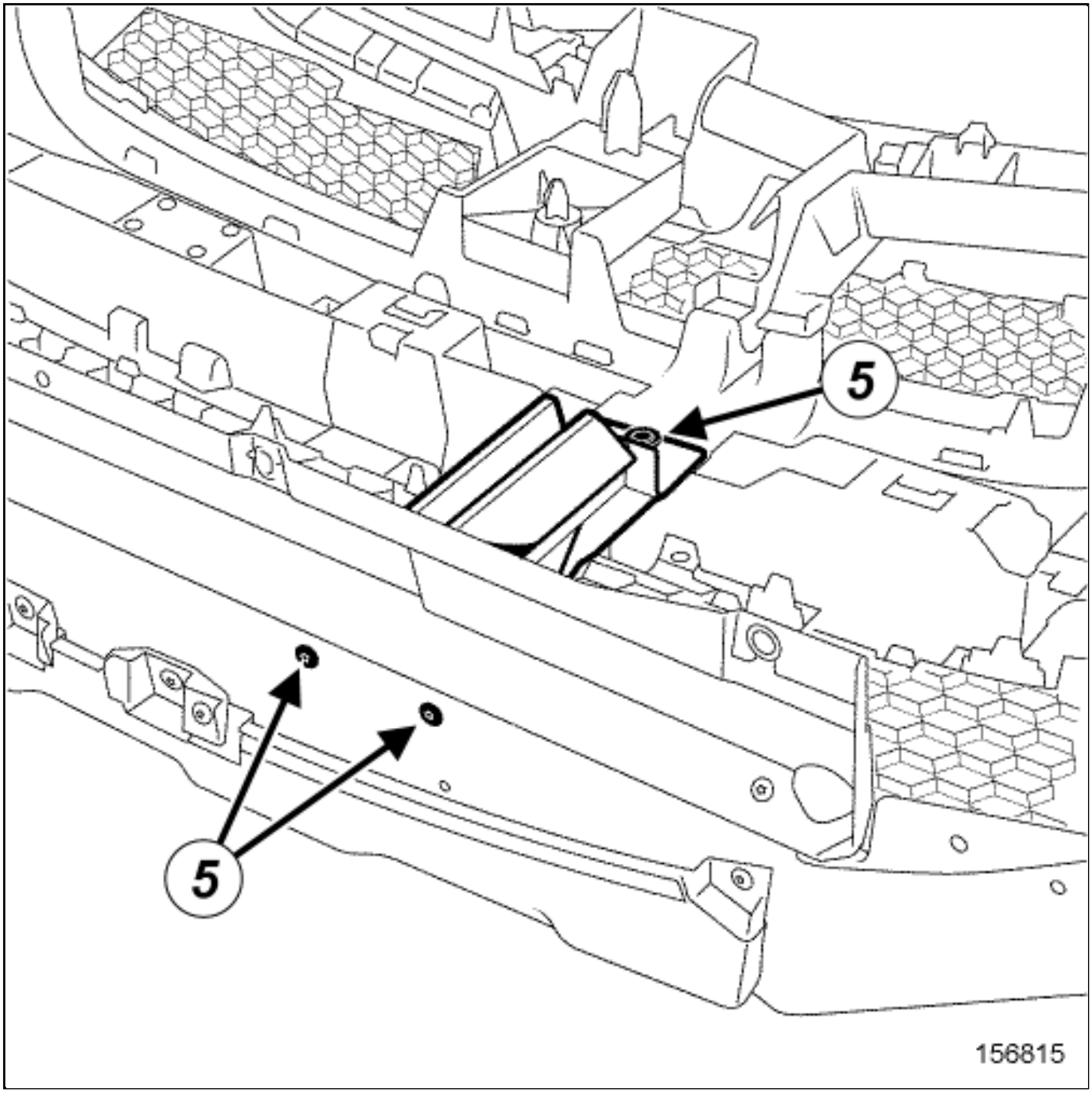
- Disconnect the fog light connector(1) .
- Remove:
  - the fog light bolts(2) ,
  - the fog light.
- Cut the clips(3) of the fog light mounting.
- Unclip the wiring on the fog light mounting at(4) .
- Remove the fog light mounting.

- Unclip the fog light trim piece (see 55A, Exterior protection, Front bumper assembly: Exploded view) .

B52, WITHOUT ADDITIONAL VERSION(B52) AND (K52 OR L52)

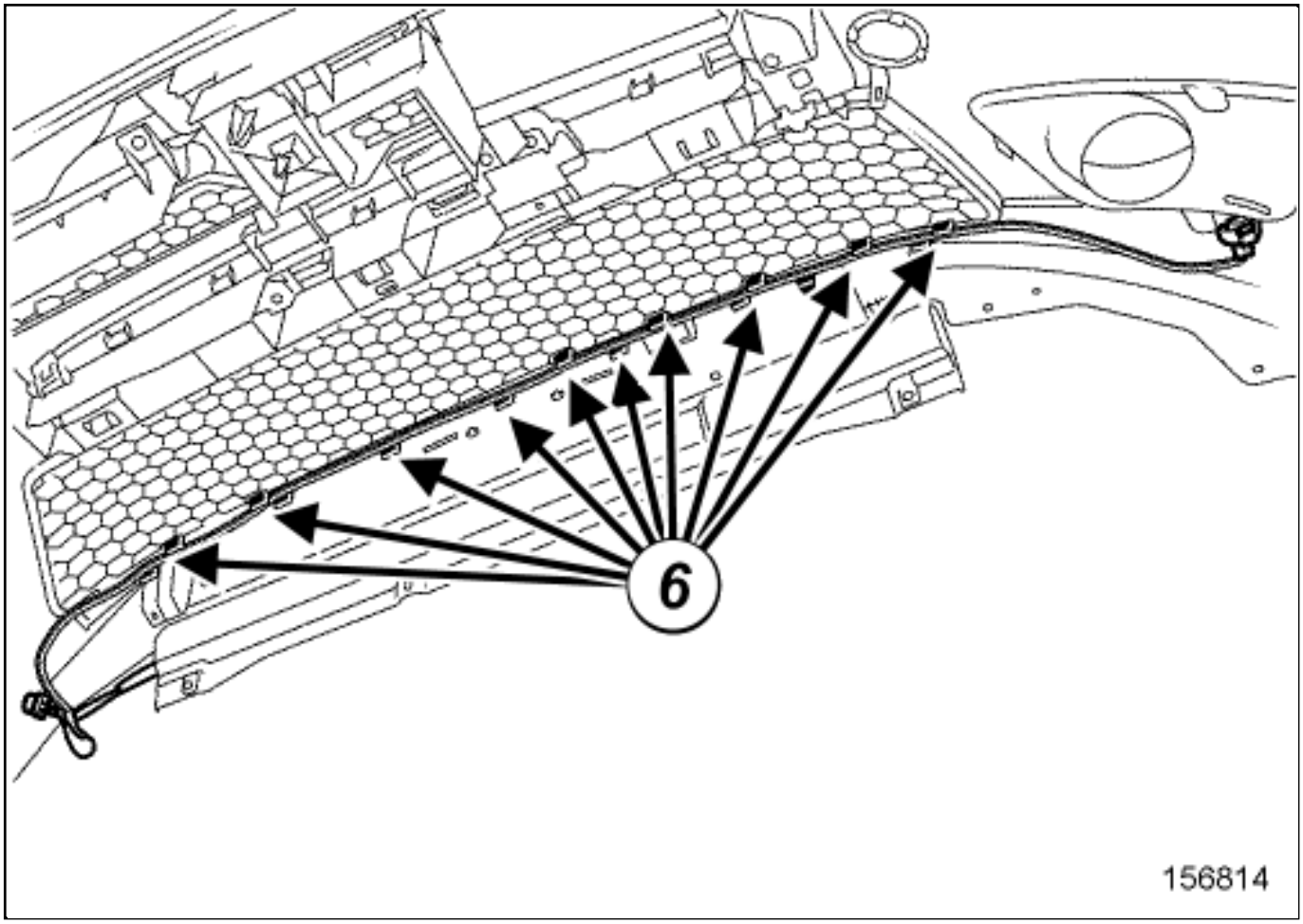
- Remove (see 55A, Exterior protection, Front bumper assembly: Exploded view) :
  - the aerodynamic component rivets,
  - the aerodynamic component.

- Remove (see 55A, Exterior protection, Front bumper assembly: Exploded view) :
  - the lower left side difusser rivets from the lower air grille,
  - the lower left side difusser from the lower air grille,
  - the lower right side difusser rivets from the lower air grille,
  - the lower right side difusser from the lower air grille.

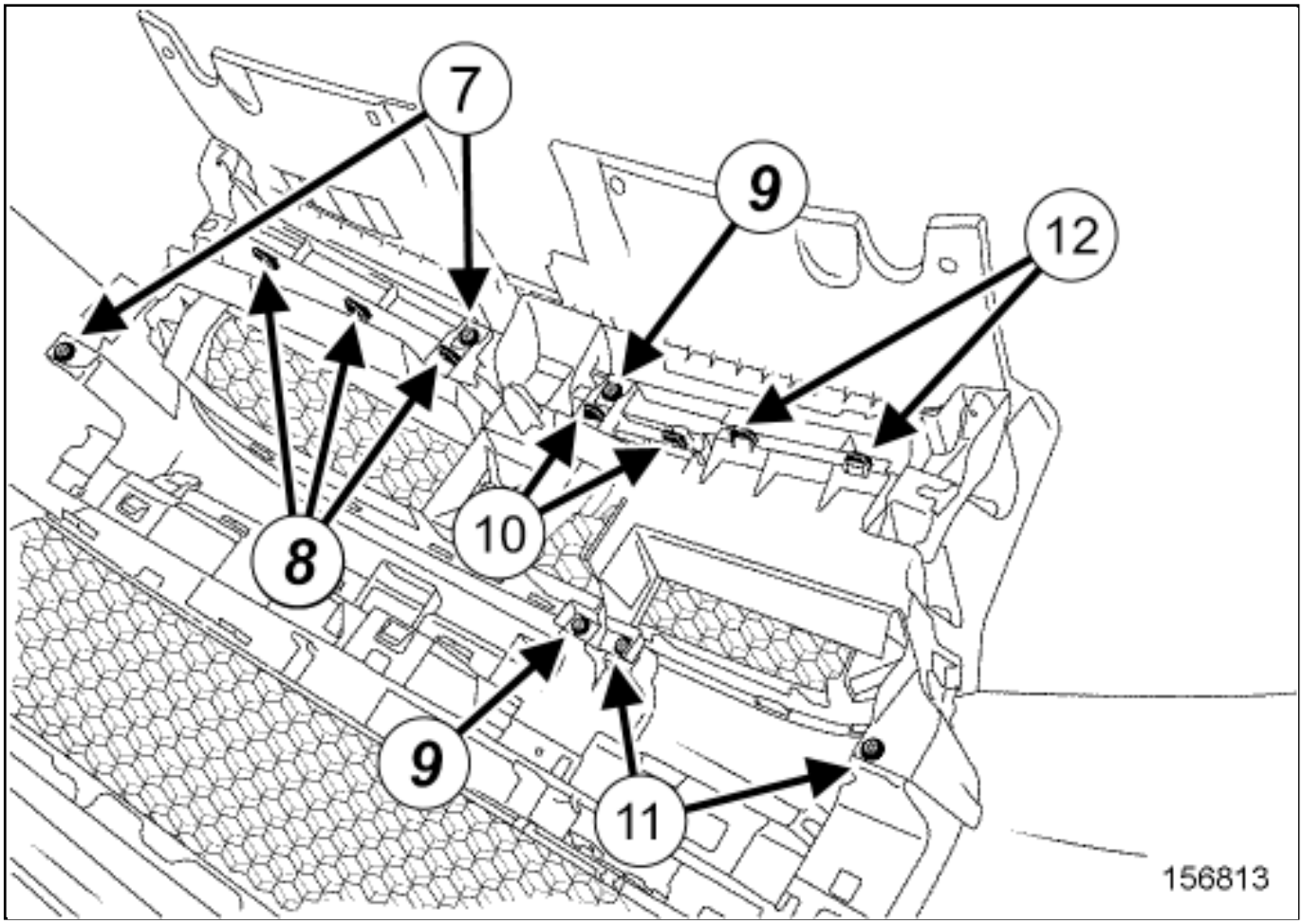


Remove:

- the lower central difusser rivets(**5**) from the lower air grille,
- the lower central difusser from the lower air grille.

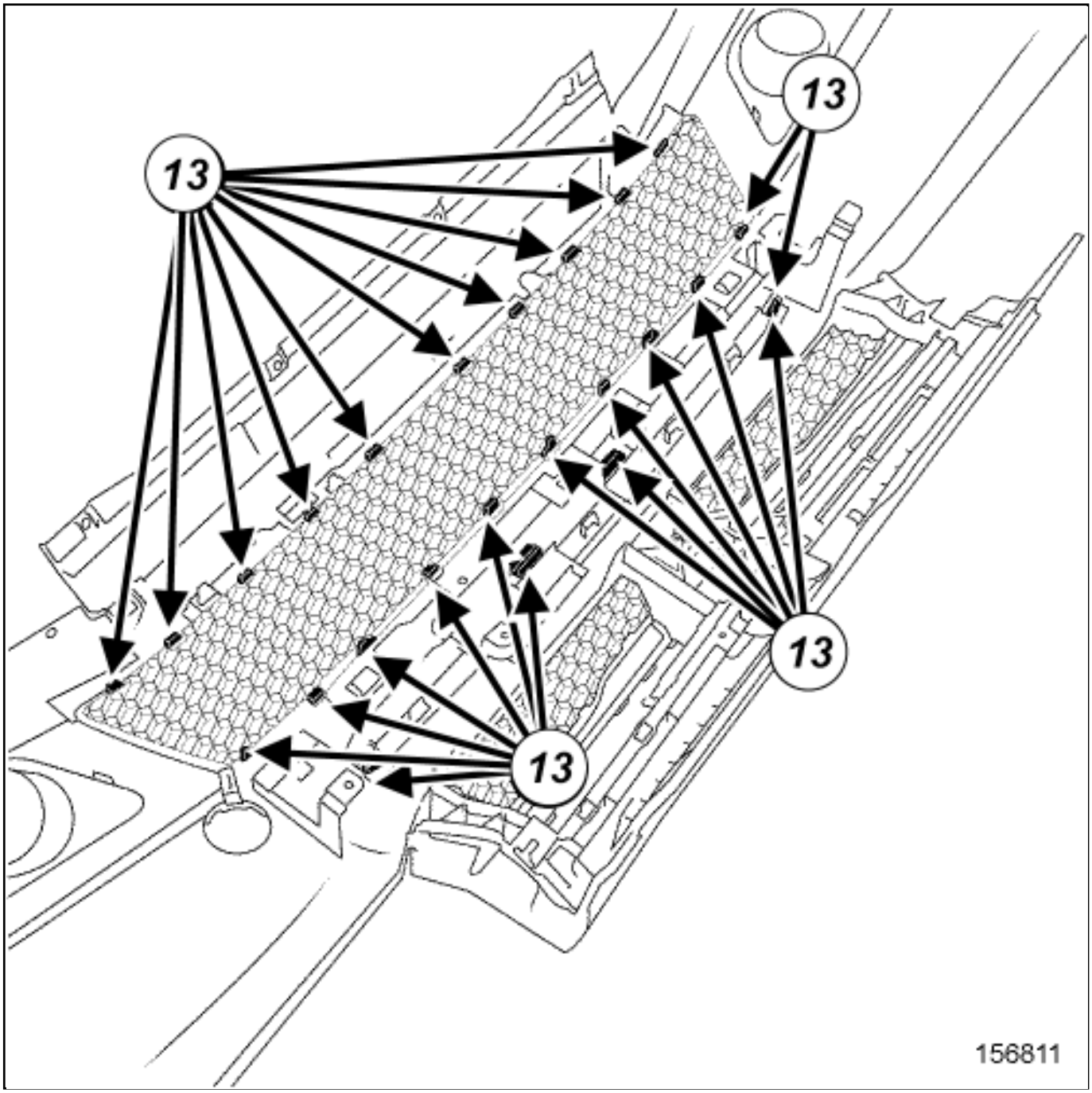


- Remove the electric wiring of the fog lights(6) .

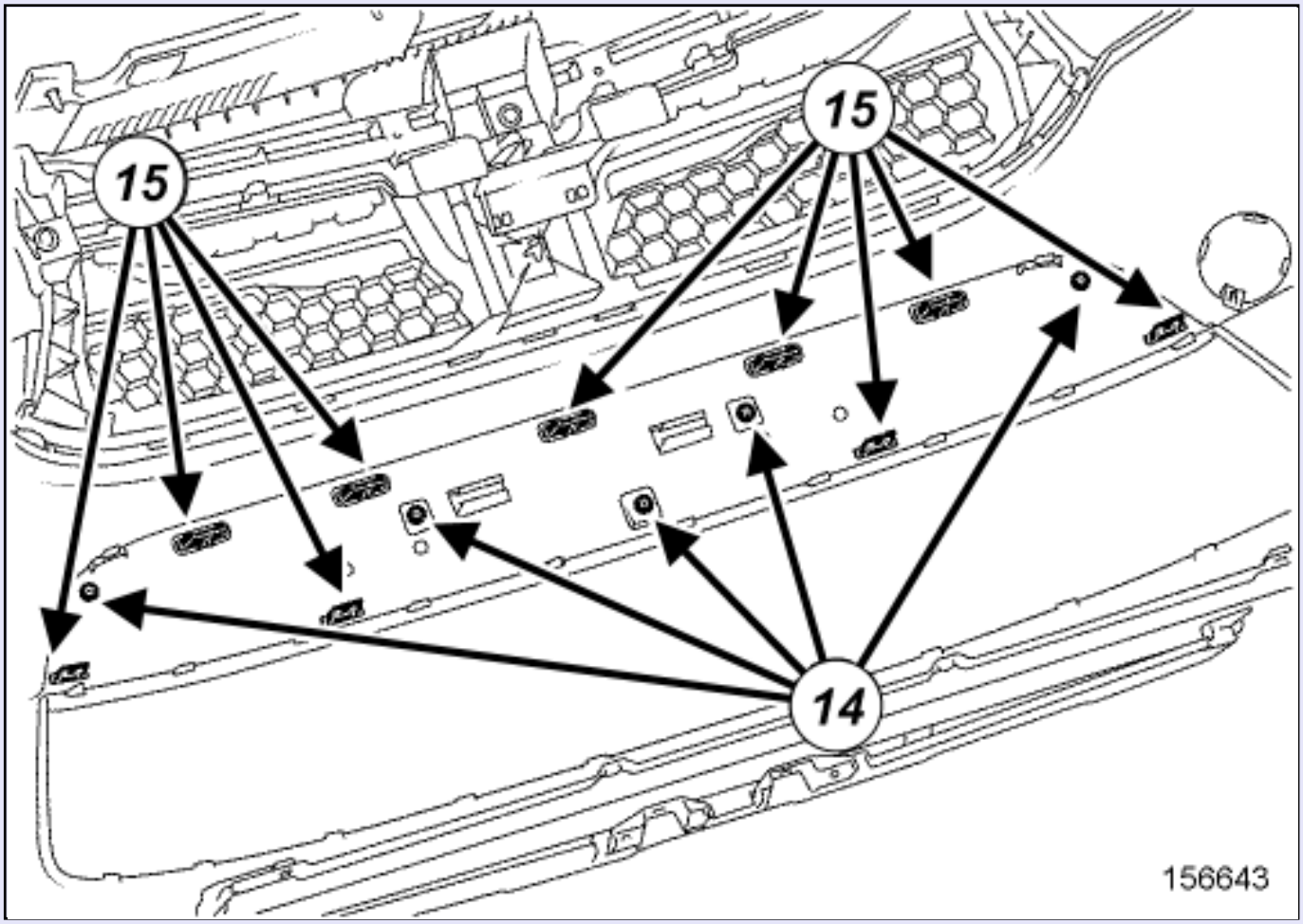


- Remove the upper left difusser rivets at(7) from the radiator grille.
- Unclip the upper left difusser from the radiator grille at(8) .
- Remove the upper central difusser rivets at(9) from the radiator grille.
- Unclip the upper central difusser from the radiator grille at(10) .
- Remove the upper right difusser rivets at(11) from the radiator grille.
- Unclip the upper right difusser from the radiator grille at(12) .

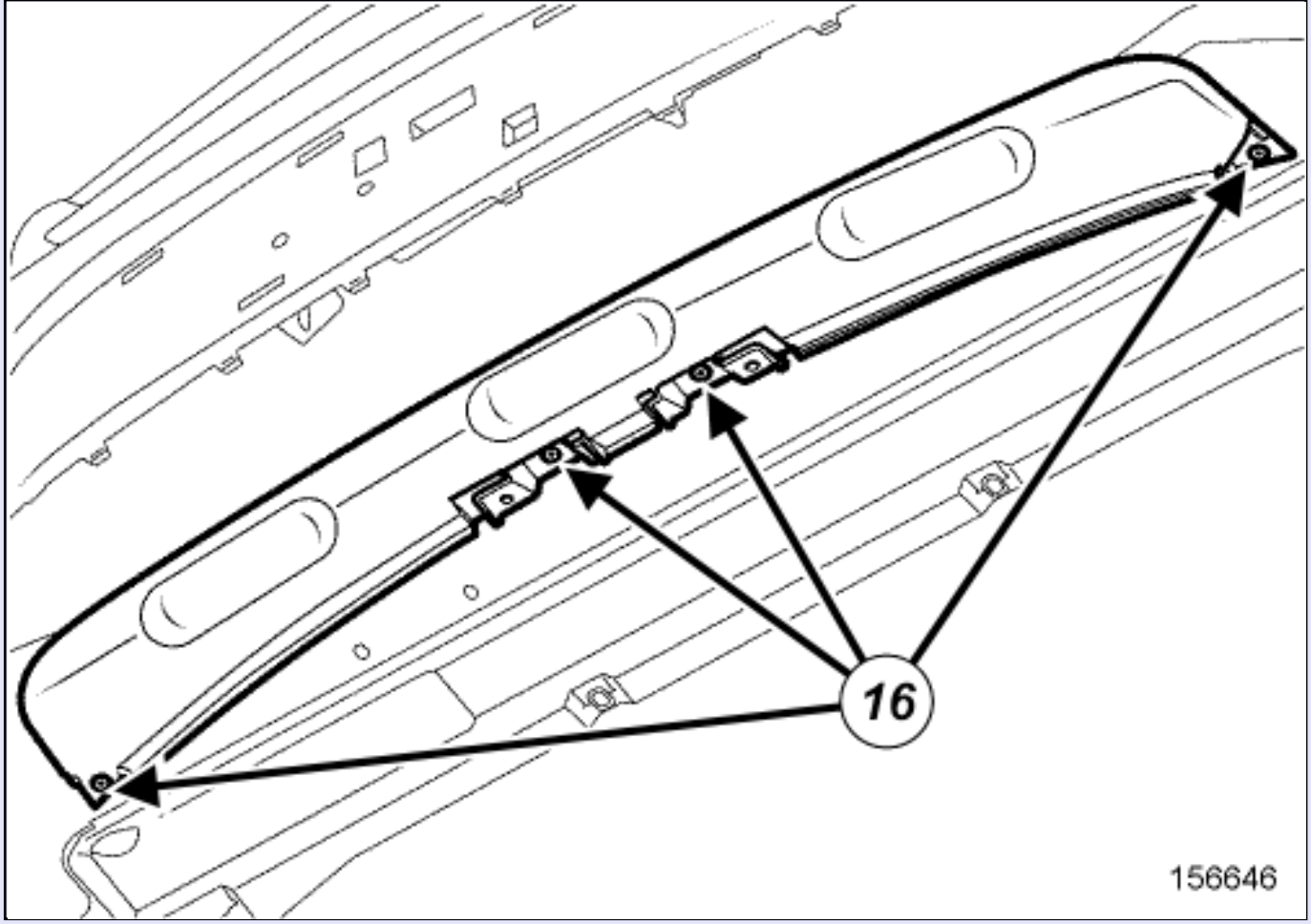
- Remove the lower air grille bolts(see 55A, Exterior protection, Front bumper assembly: Exploded view) .



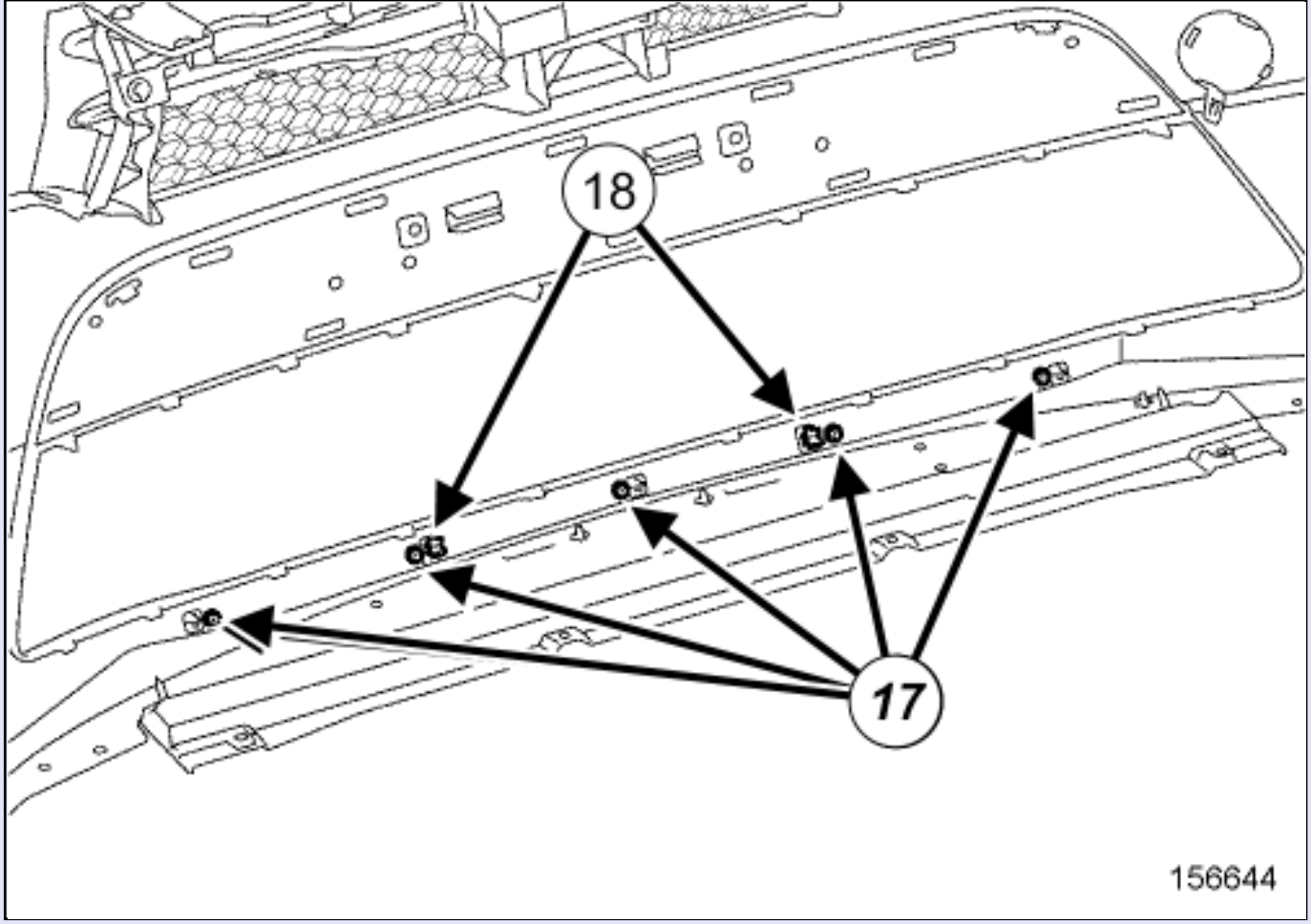
- Unclip the lower air grille at(13) .



- Remove the upper central trim bolts(14) .
- Unclip the upper central trim at(15) .
- Remove the upper central trim.

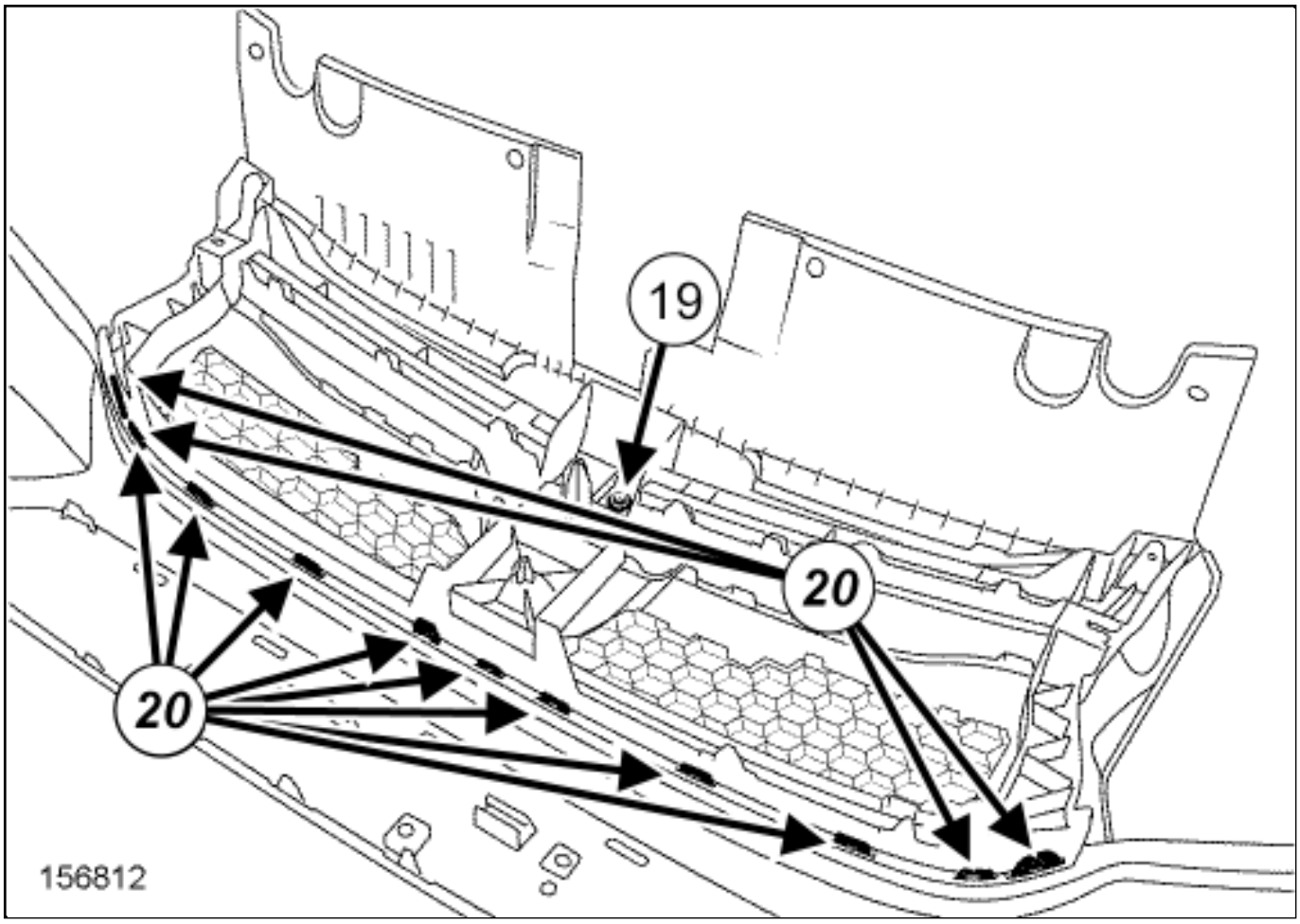


- Remove the lower central trim rivets(16) .



- Remove the lower central trim bolts(17) .
- Unclip the lower central trim at(18) .
- Remove the lower central trim.
- Remove the front side bumper trim bolt Exterior body side trim assembly: Exploded view .
- Unclip the front side bumper trim Exterior body side trim assembly: Exploded view .
- Remove the front side bumper trim Exterior body side trim assembly: Exploded view .

Remove the radiator grille bolts(see 55A, Exterior protection, Front bumper assembly: Exploded view) .

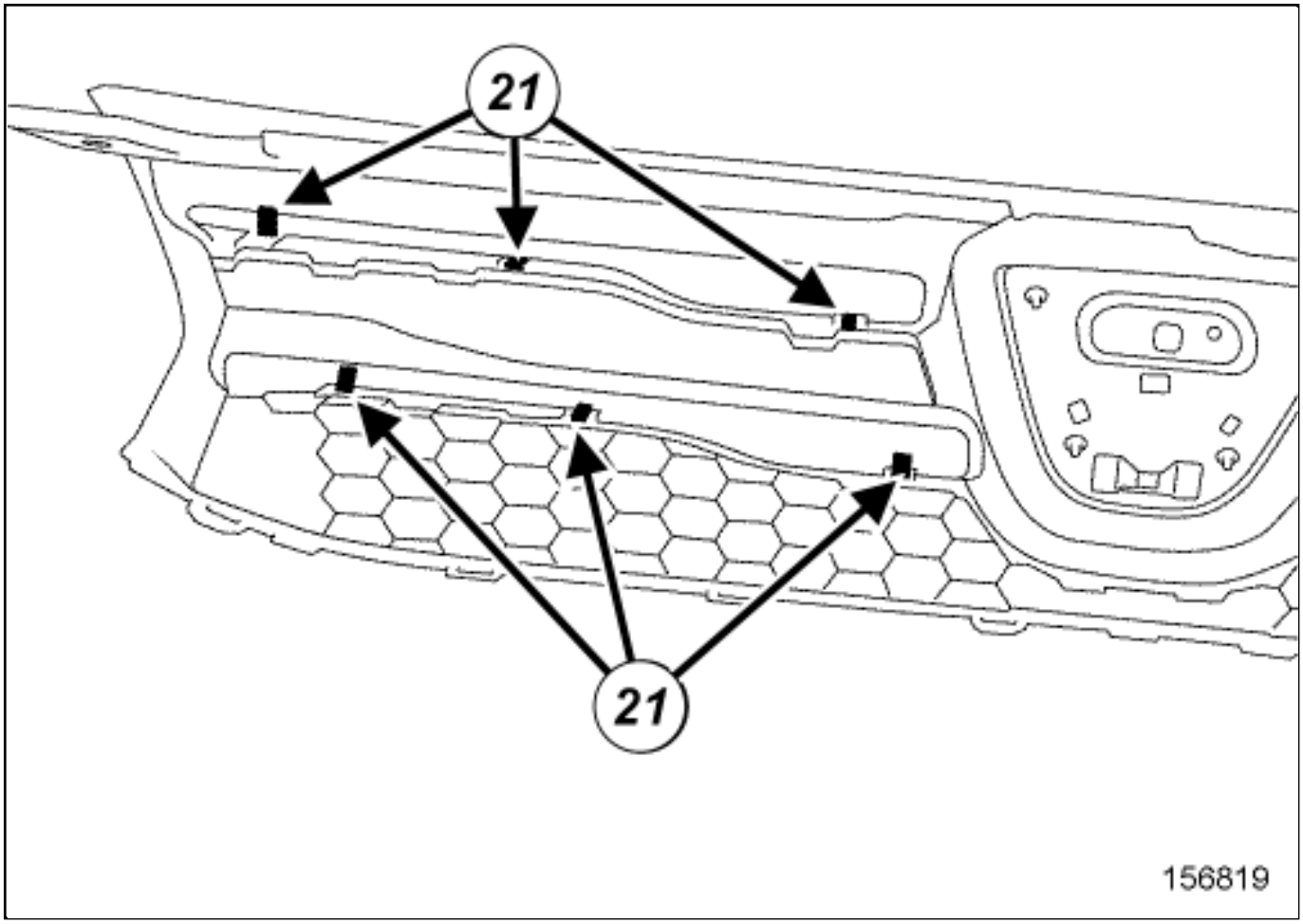


Remove the radiator grille bolt(19) .

Unclip the radiator grille at(20) .

Remove:

- the radiator grille,
- the front badge(see 55A, Exterior protection, Front bumper assembly: Exploded view) ,
- the towing ring flap(see 55A, Exterior protection, Front bumper assembly: Exploded view) .

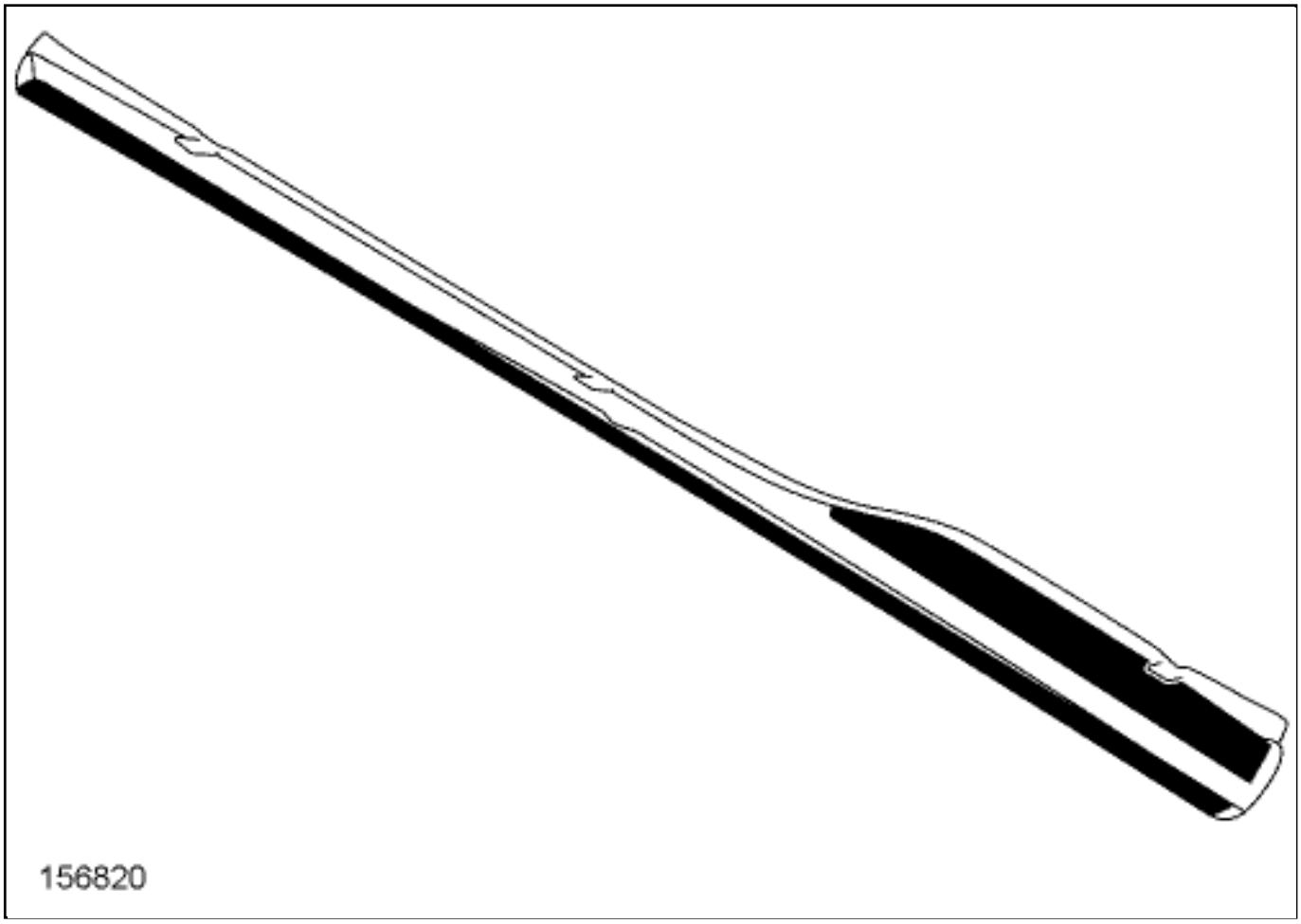


- Unclip the trims clips at(21) .
- Detach the bumper trims.

REBUILDING

1. REBUILDING PREPARATION OPERATION

- parts always to be replaced: front bumper rivet .



- Remove the adhesive residue from the trim.

- Clean the adhesive surface of the film with heptane Vehicle: Parts and consumables for the repair and wipe with a lint-free cloth.

- Always replace the Double-sided adhesive tape Vehicle: Parts and consumables for the repair .

2. REBUILDING OPERATION

- Remove the paper protecting the trim cement bead.

Note:

Do not touch the cement bead.

Position the trim correctly on the radiator grille.

Firmly apply the trim over its entire surface area.

Proceed in the reverse order to stripping.

FRONT BUMPER WIRING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

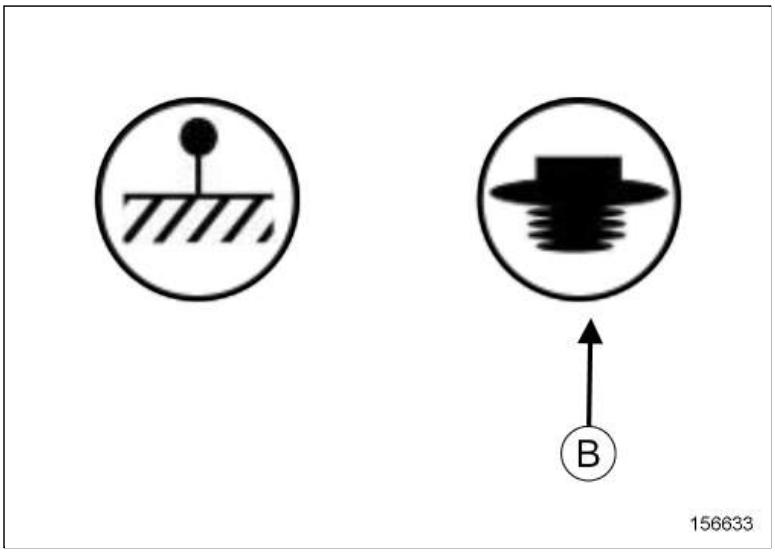
- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 88A, Wiring harness, Wiring: Precautions for the repair) ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

CAUTION

To prevent damage to the wiring harness when refitting, observe the original routing.

CAUTION

Consult the disconnection procedures (see Connectors: Disconnection and reconnection) (Technical Note 6015A, 88A, Wiring) to prevent damaging the connectors.



(B) Symbol for a mounting (clip, clamp, etc.)

REMOVAL

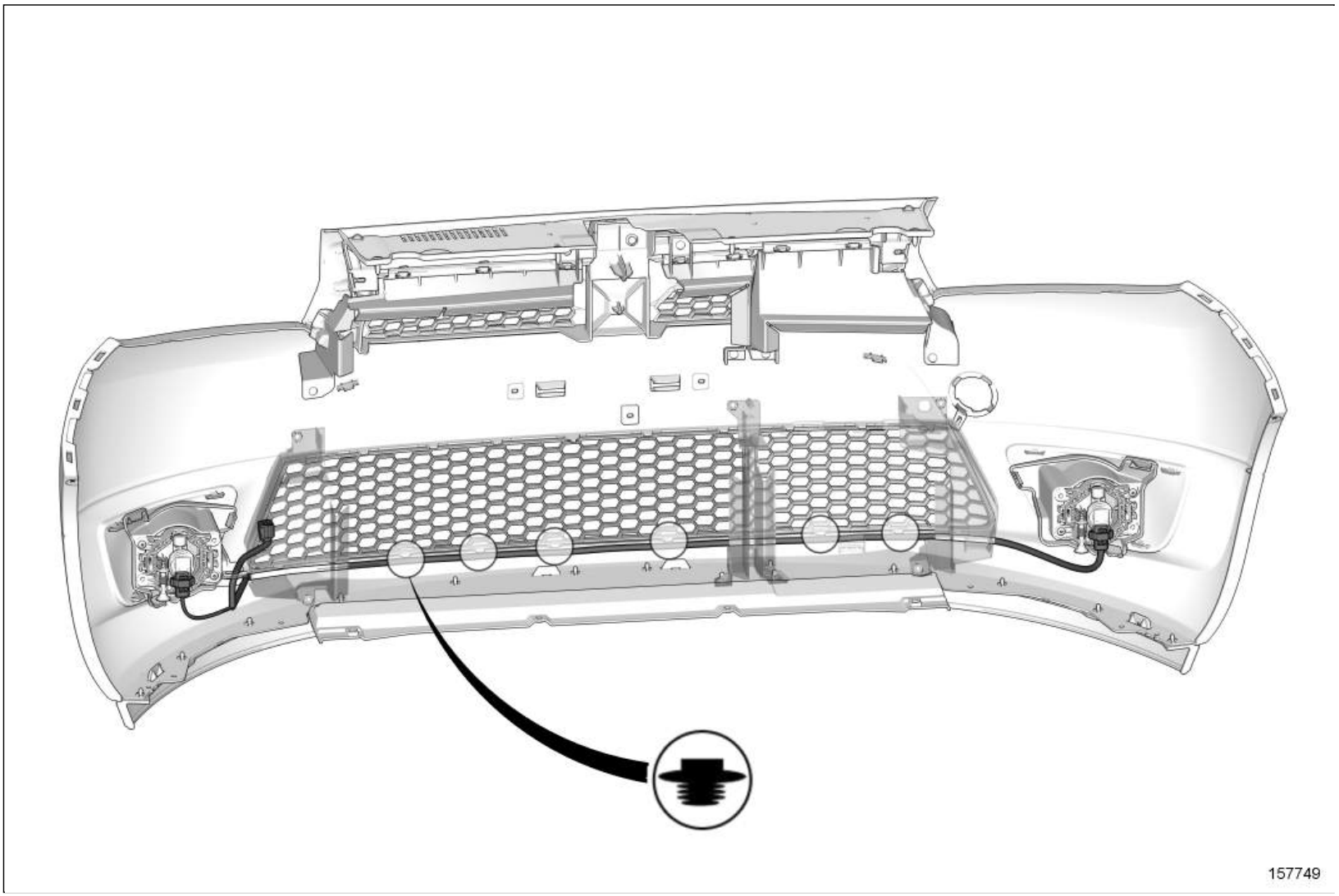
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Switch off the ignition.
- Disconnect the battery Battery: Removal - Refitting .
- Remove Front bumper assembly: Exploded view :
  - the front bumper,
  - the supports.

2. REMOVAL OPERATION

CAUTION

To prevent any risk of noise, premature wear, short circuits, etc. after the refitting operation, mark the wiring routing and how to connect the connectors.



- Disconnect all the connectors.
- Unclip the wiring section where indicated.

CAUTION
To prevent any damage during the removal operation, check that the wiring is free from its mountings (retaining clip, plastic clip, adhesive tape, connector, etc.).

- Remove the front bumper wiring.

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.
- Switch on the ignition.
- Check that there are no faults.

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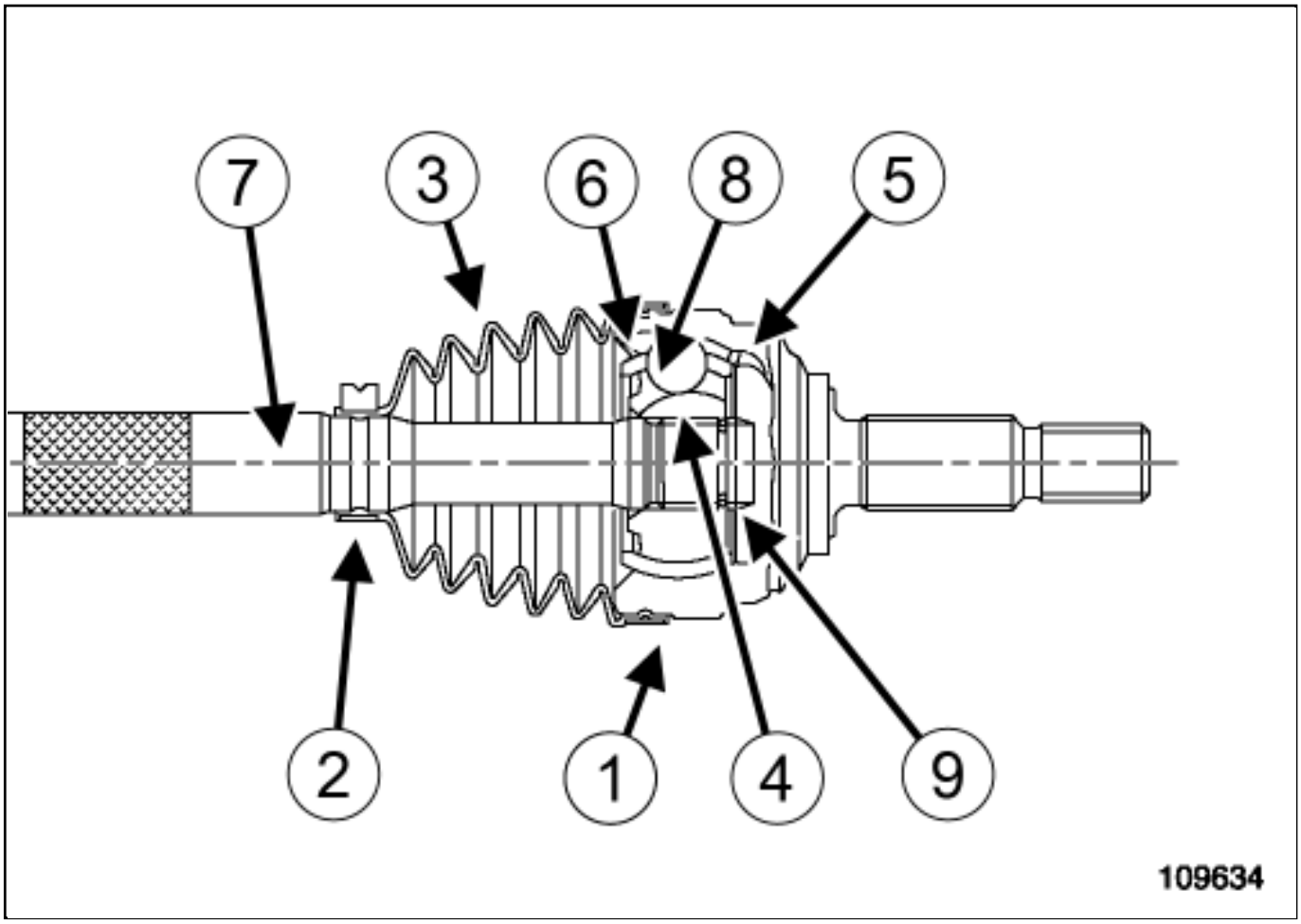
FRONT DRIVESHAFT GAITER, WHEEL SIDE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Type clip pliers for driveshafts with a thermoplastic gaiter.	Tav. 1168
Pliers for the driveshaft gaiter collar.	Tav. 1784

Equipment required
steel inertia hammer
parts washer
roll pin punch

parts always to be replaced:
Front driveshaft gaiter, wheel side
wheel side front driveshaft seal locking ring



(1) Big securing clip

(2) Small securing clip

(3) Driveshaft gaiter

(4) Ball hub

(5) Stub axle bowl

(6) Ball race

(7) Driveshaft

(8) Balls

(9) Lock ring

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .

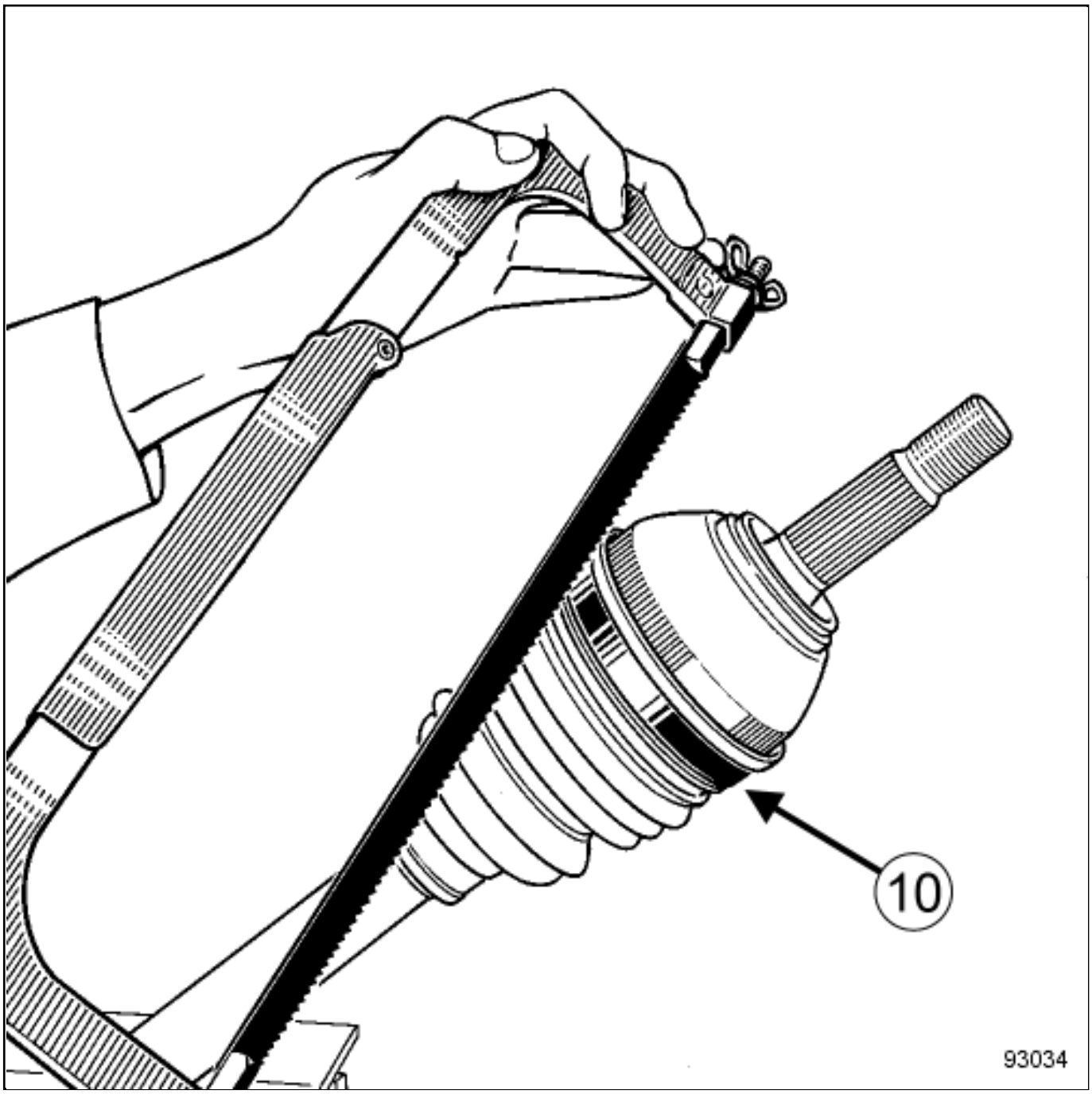
- Remove:
  - the engine undertray bolts,
  - the engine undertray.

- Drain the gearbox Manual gearbox oils: Draining - Filling or Automatic gearbox oil: Draining - Filling .

- Remove:
  - the wheel on the side concerned Wheel: Removal - Refitting ,
  - the wheel driveshaft on the side concerned (see 29A, Driveshafts , Front right-hand driveshaft: Removal - Refitting) or (see 29A, Driveshafts , Front left-hand driveshaft: Removal - Refitting) .

- Remove the differential output seal on the side concerned Differential output seal: Removal - Refitting .

2. REMOVAL OPERATION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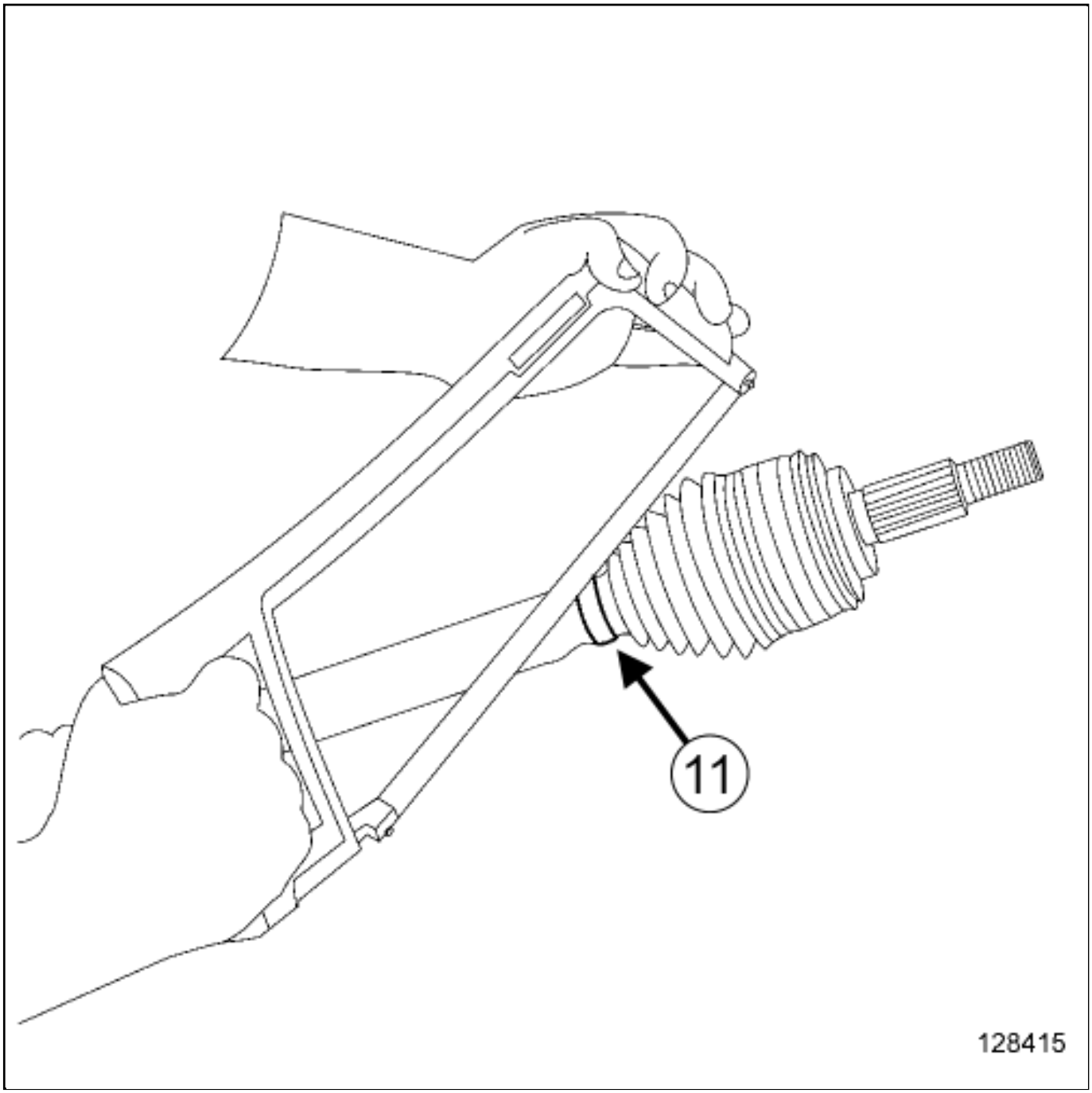
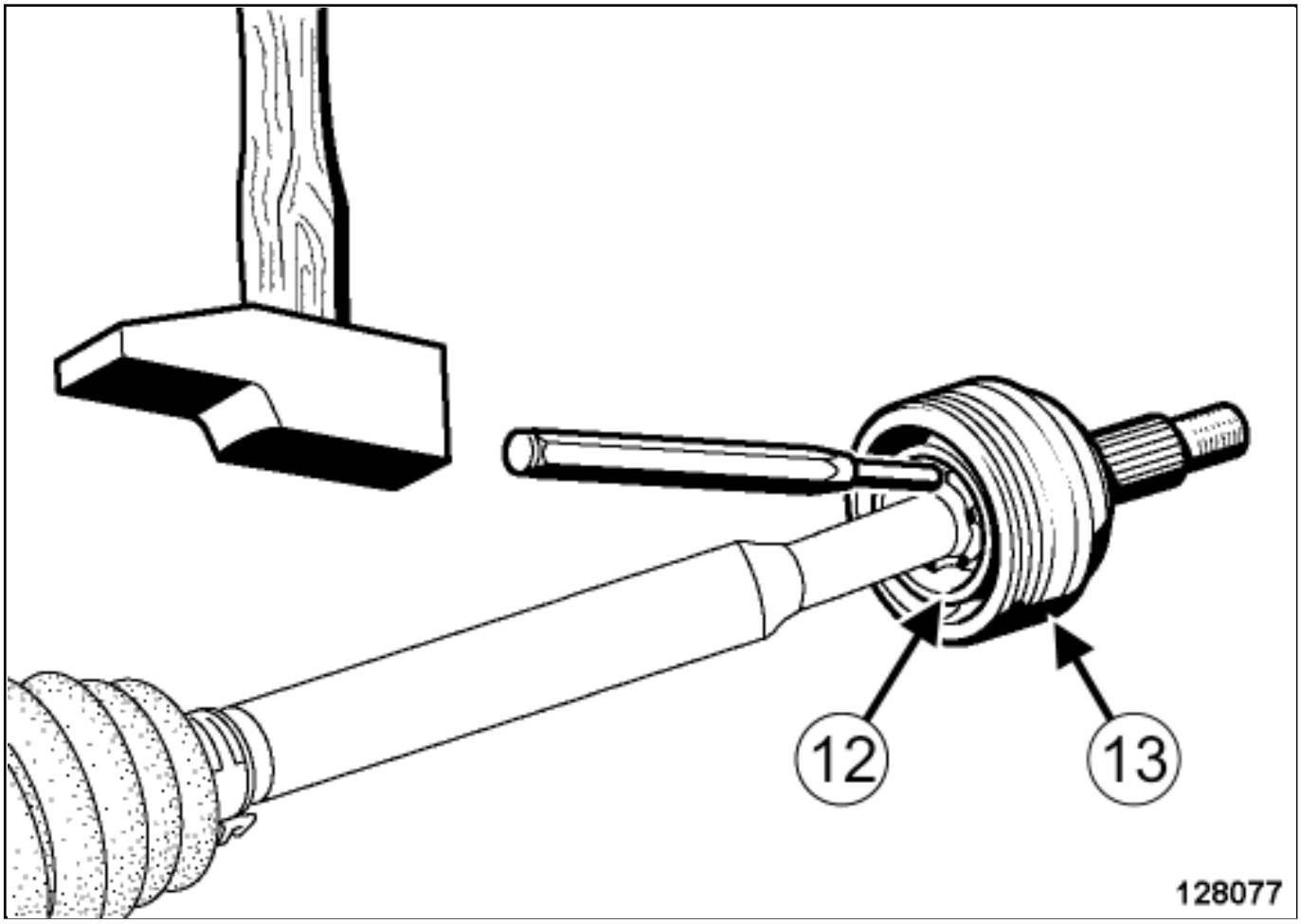


- Cut the big securing clip(10) and the small securing clip(11) using cutting pliers or a metal saw, taking care not to damage the stub axle bowl and the driveshaft.

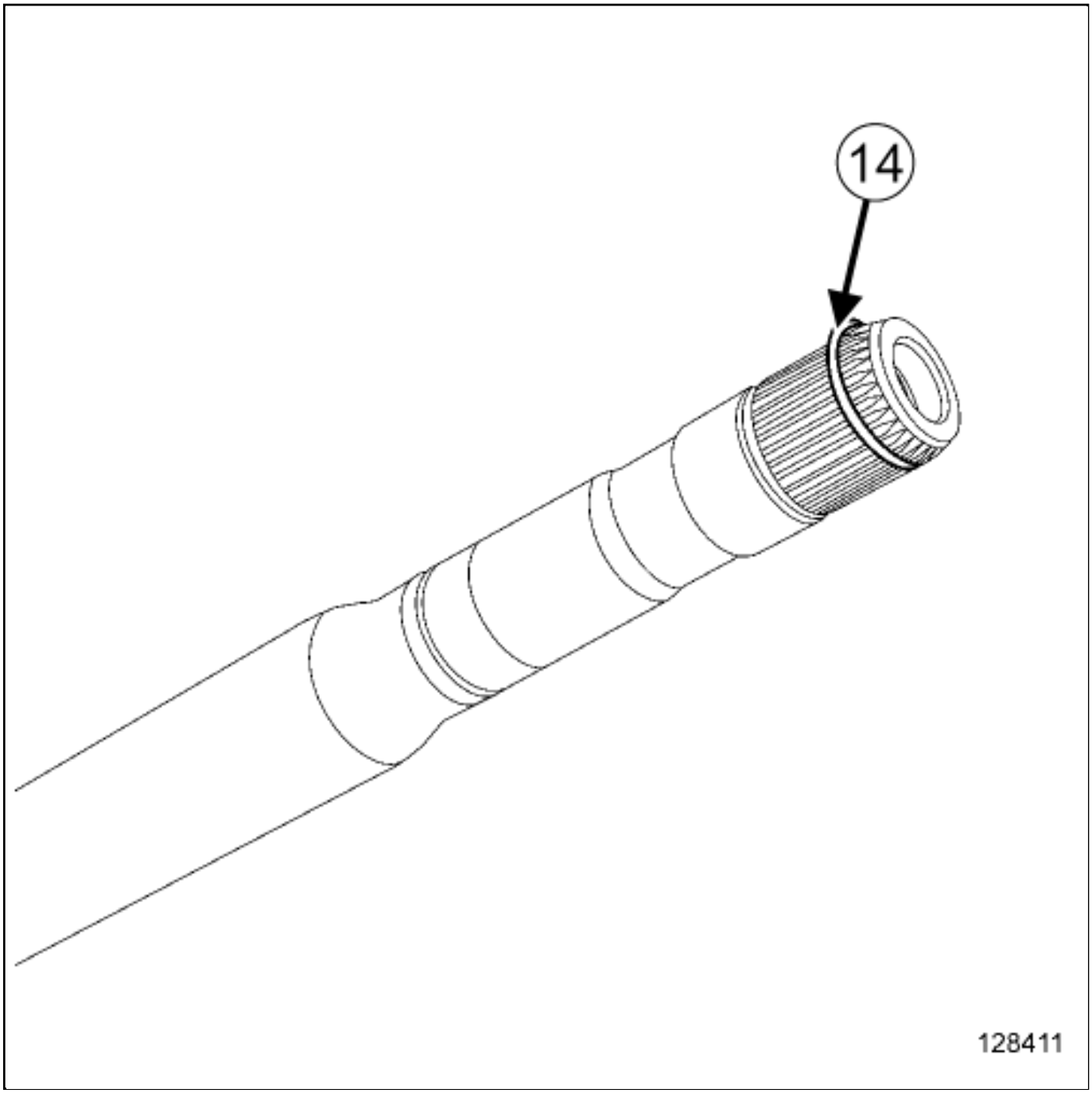
- Push back the gaiter to release the stub axle bowl.

- Cut the driveshaft gaiter.

- Remove as much grease as possible.



❑ Using a steel inertia hammer and a roll pin punch, hit the ball hub(12) a few times to detach the stub axle bowl (13) from the driveshaft.



- Remove the lock ring(14) .

REFITTING

1. REFITTING PREPARATION OPERATION

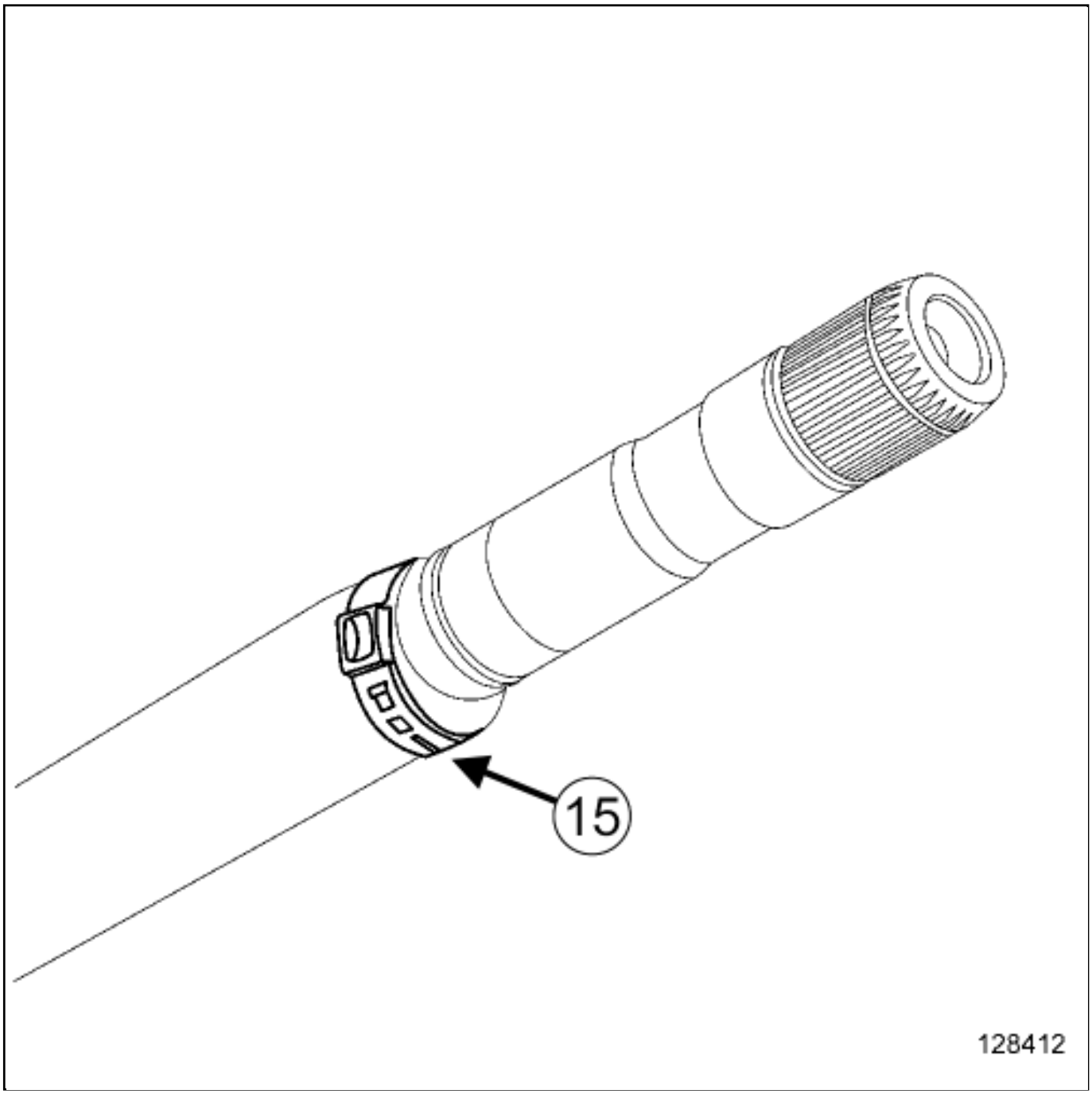
- parts always to be replaced: Front driveshaft gaiter, wheel side.

parts always to be replaced: wheel side front driveshaft seal locking ring.

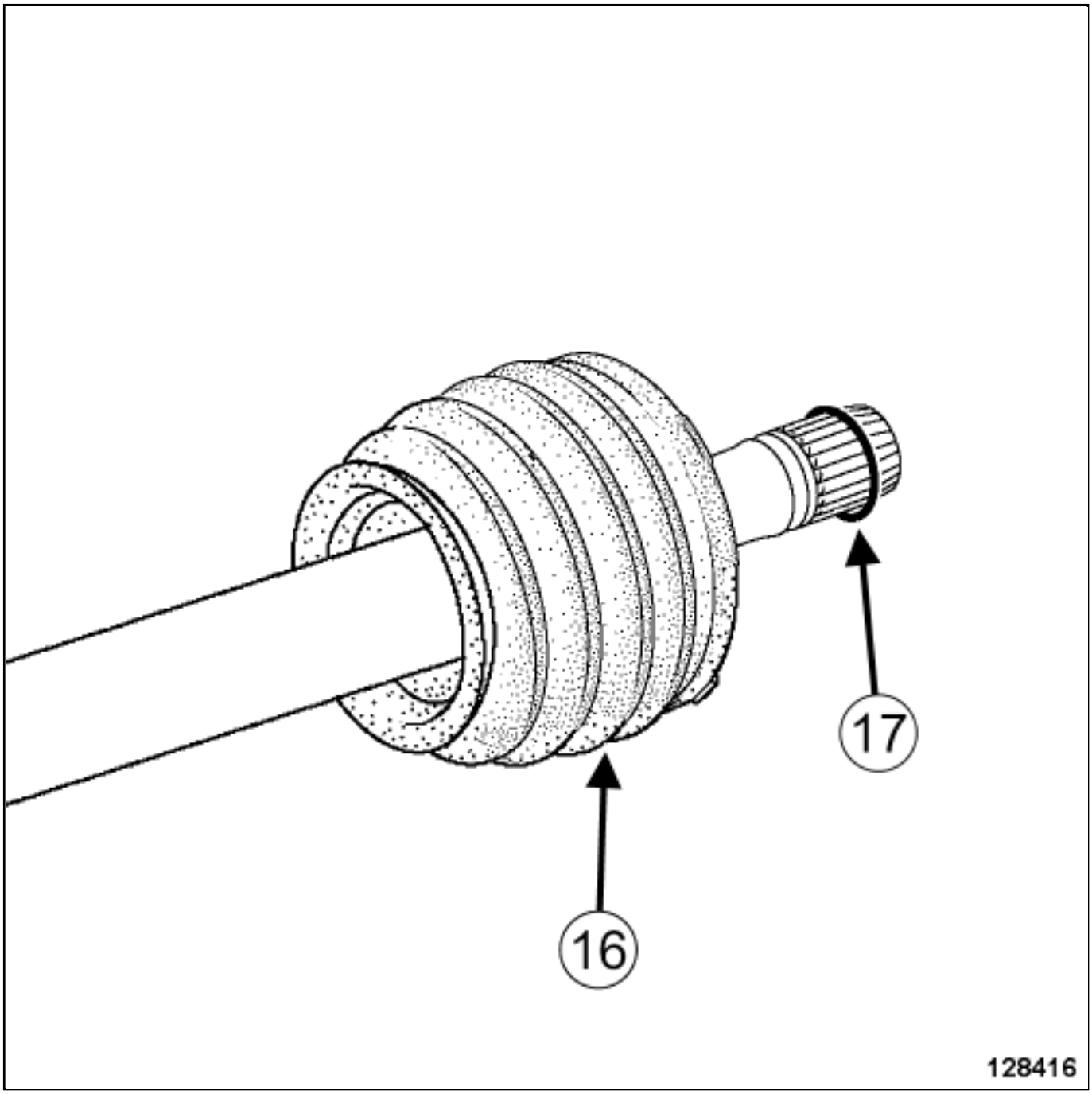
- Always replace:
  - the small securing clip,
  - the big securing clip.

- Using a parts washer, clean the driveshaft and the stub axle bowl.

2. REFITTING OPERATION FOR PART CONCERNED

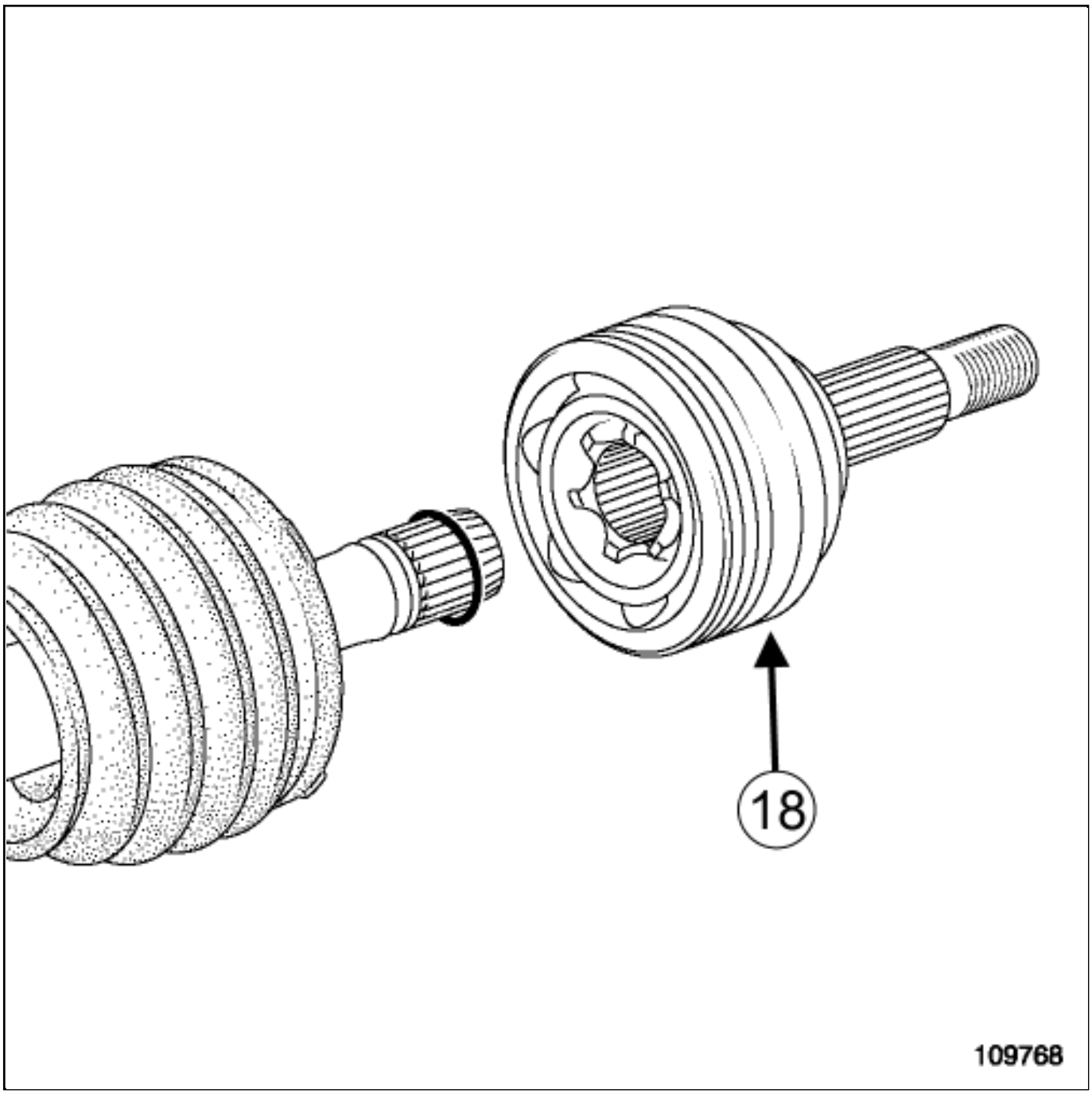


- Fit the small securing clip(15) onto the driveshaft.
- Lightly lubricate the driveshaft using the grease supplied with the gaiter to facilitate its fitting.



- Refit the gaiter(16) onto the driveshaft.
- Insert the gaiter lip into the groove of the driveshaft.
- Refit the lock ring(17) .

- Spread the quantity of grease around the gaiter and the stub axle bowl.



- Refit the stub axle bowl(18) to the driveshaft by tapping the stub axle bowl using a brass drift until the lock ring clicks into place behind the ball hub.

-

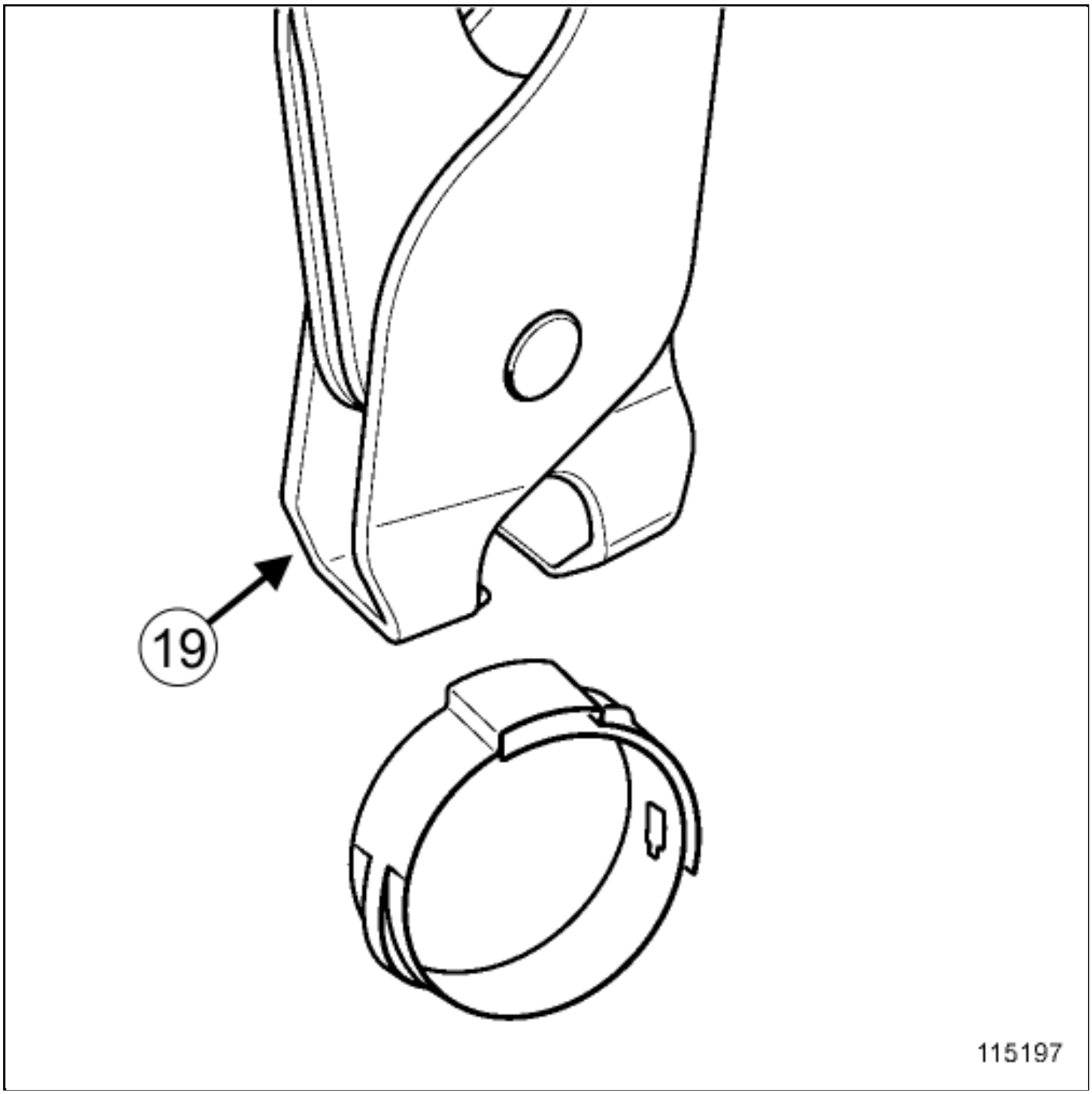
  Fit the lip of the driveshaft gaiter into the groove on the stub axle bowl.

Note:

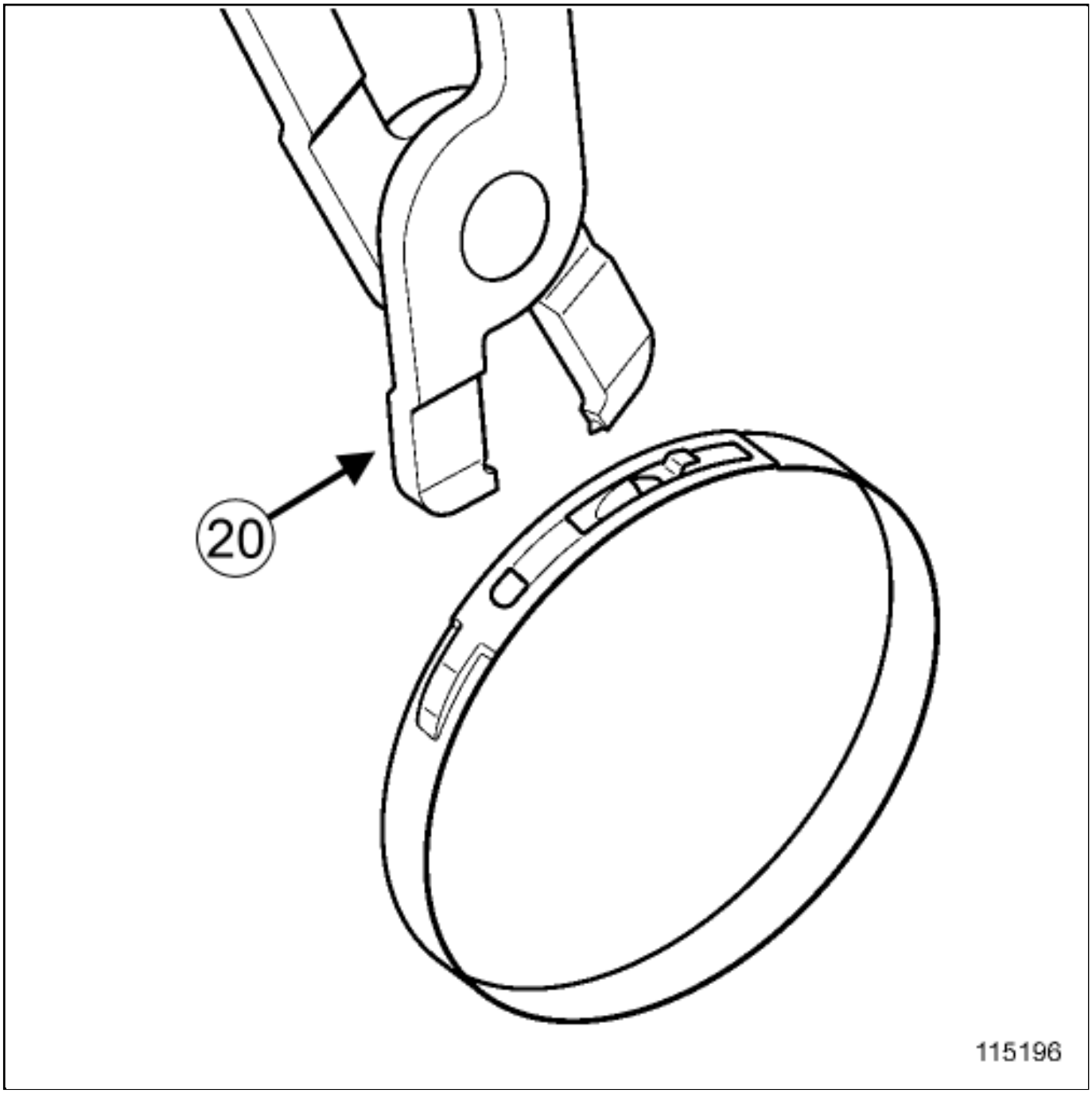
Check that the gaiter lip is correctly positioned in the groove of the driveshaft.

- Fit the small securing clip on the driveshaft gaiter.
- Refit the big securing clip on the driveshaft gaiter.

CLIC CLIP



CLIP WITH PROFILE END



Tighten the clips using the toolType clip pliers for driveshafts with a thermoplastic gaiter.(Tav. 1168) (19) for clic clips or the toolPliers for the driveshaft gaiter collar.(Tav. 1784) (20) for profile end clips.

3. FINAL OPERATION

Refit a new differential output seal on the side concerned Differential output seal: Removal - Refitting .

Refit:

- the wheel driveshaft on the side concerned (see 29A, Driveshafts , Front right-hand driveshaft: Removal - Refitting) or (see 29A, Driveshafts , Front left-hand driveshaft: Removal - Refitting) ,
- the wheel on the side concerned Wheel: Removal - Refitting .

Fill up the gearbox Manual gearbox oils: Draining - Filling or Automatic gearbox oil: Draining - Filling .

Refit the engine undertray.

FRONT END PANEL: REMOVAL - REFITTING

REMOVAL

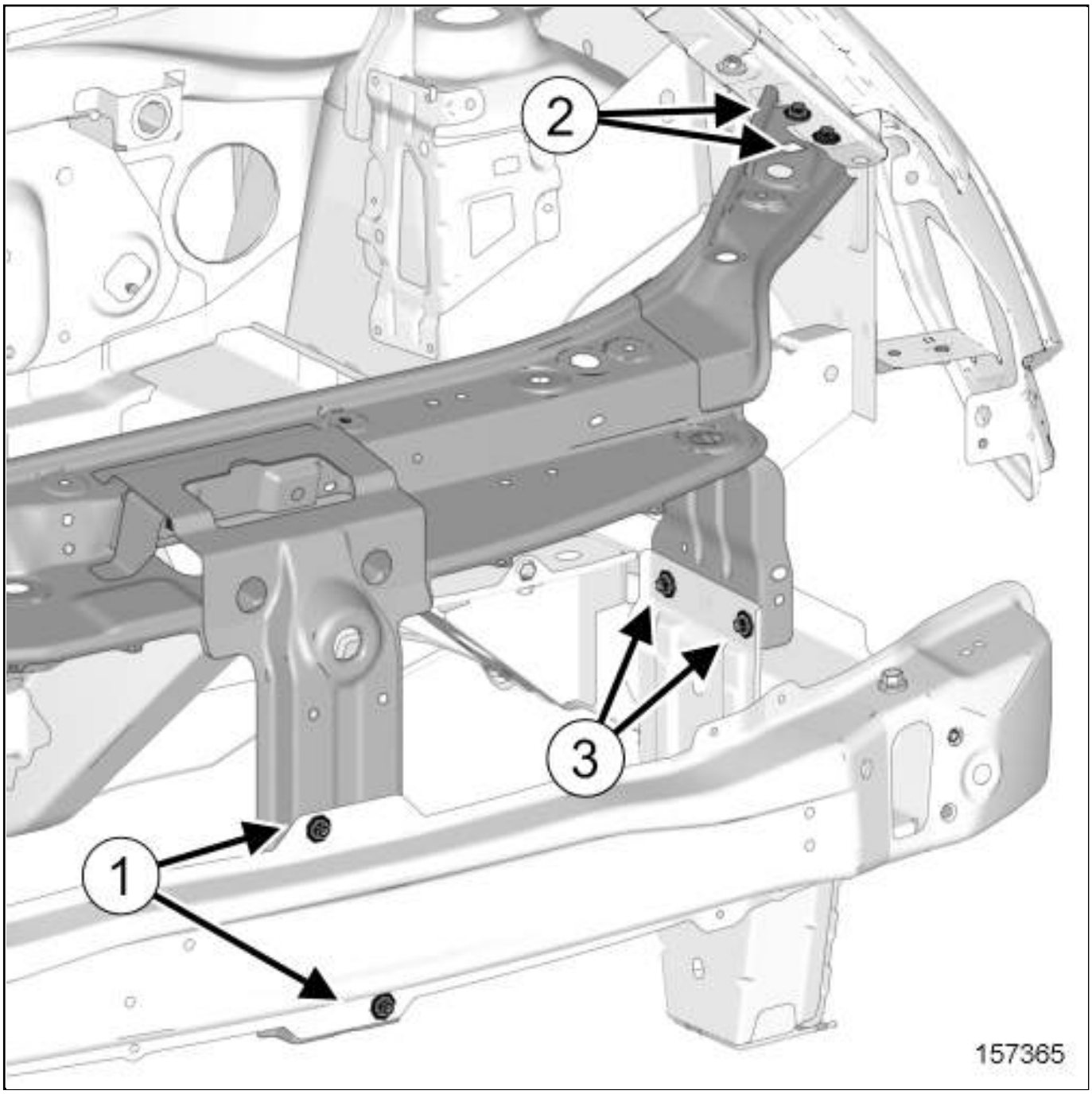
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift **Vehicle: Towing and lifting** .

- Remove:
  - the front wheel arch liners **Exterior body front trim assembly: Exploded view** ,
  - the front bumper **Front bumper assembly: Exploded view** ,
  - the headlights **Front signals - lighting assembly: Exploded view** ,
  - the earth nut from the left-hand headlight carrier panel,
  - the bonnet catch.

- Depending on the equipment level, remove:
  - the power-assisted steering fluid reservoir(see **Power-assisted steering assembly: Exploded view**) ,
  - the air inlet pipe **Air inlet assembly: Exploded view** ,
  - the clips.

2. REMOVAL OPERATION



Remove:

- the bolts(**1**) .
- the bolts(**2**) and (**3**) on each side of the vehicle,
- the front end panel.

REFITTING

Proceed in the reverse order to removal.

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FRONT FOOTWELL AIR DISTRIBUTION DUCT: REMOVAL - REFITTING

Special tooling required	
Pipe clamps.	Ms. 583

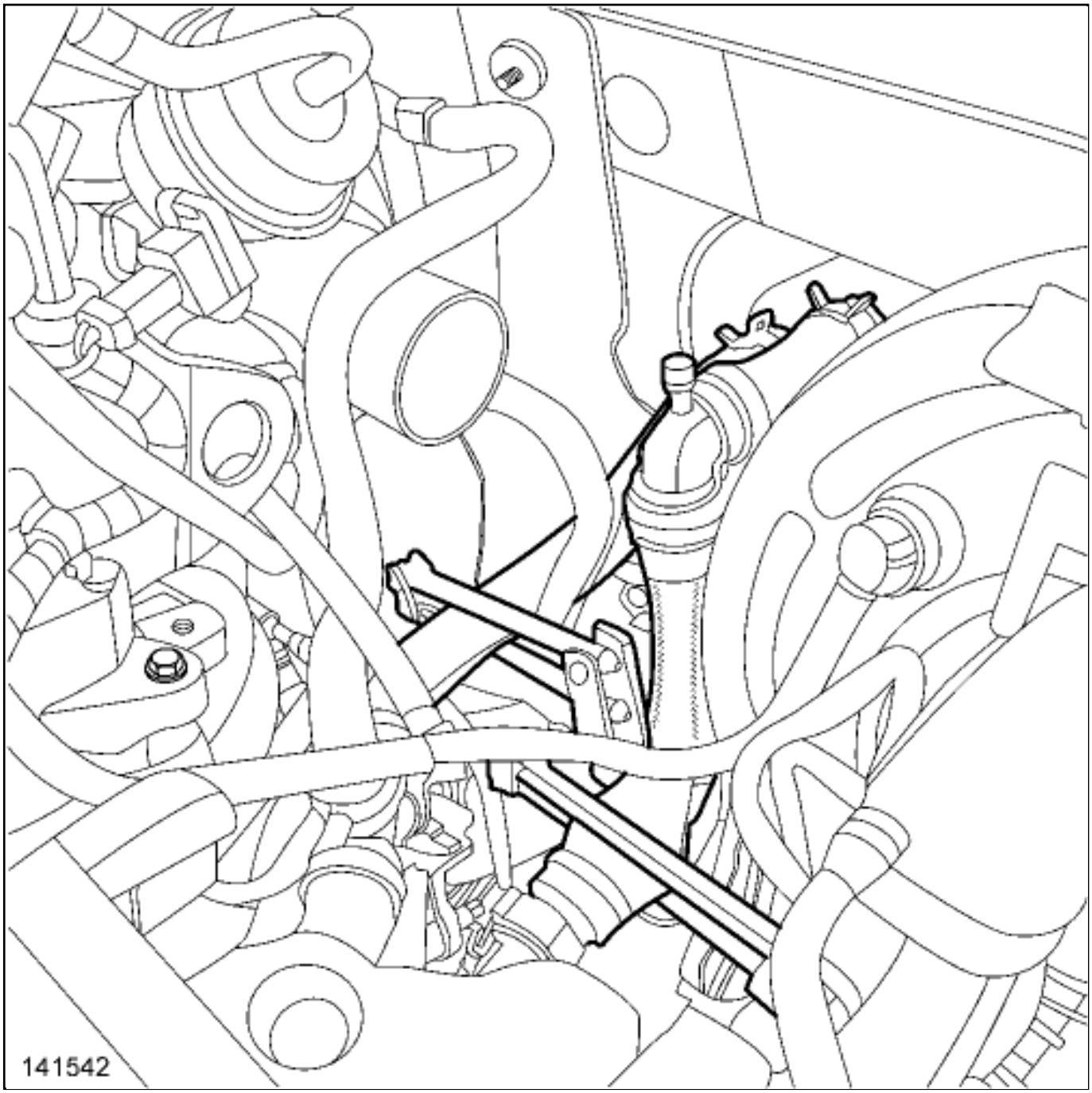
Location and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

1- LEFT-HAND SIDE

- Lock the airbag computer (see Fault finding - Replacement of components) (88C, Airbags and pretensioners).
- Disconnect the batteryBattery: Removal - Refitting (80A, Battery).
- Remove :
  - the driver's front airbagDriver's frontal airbag: Removal - Refitting (88C, Airbags and pretensioners),
  - the steering wheelSteering assembly: Exploded view (36A, Steering assembly),
  - the steering column switch assemblySteering column switch assembly: Removal - Refitting (84A, Control - Signals).
- Move aside the control panelDashboard assembly: Exploded view (57A, Interior equipment).



- Fit the Pipe clamps.(Ms. 583) on the heater matrix hoses.

- Remove (see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :
  - the heater matrix pipe bracket,
  - the heater matrix pipe clips.

- Move the heater matrix pipes aside(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

2- RIGHT-HAND SIDE

- Remove the dashboard Dashboard assembly: Exploded view (57A, Interior equipment).

- Move aside the control panel Dashboard assembly: Exploded view (57A, Interior equipment).

2. REMOVAL OPERATION

- Remove the front footwell air distribution duct (see 61A, Heating, Air distribution circuit assembly: Exploded view) .

REFITTING

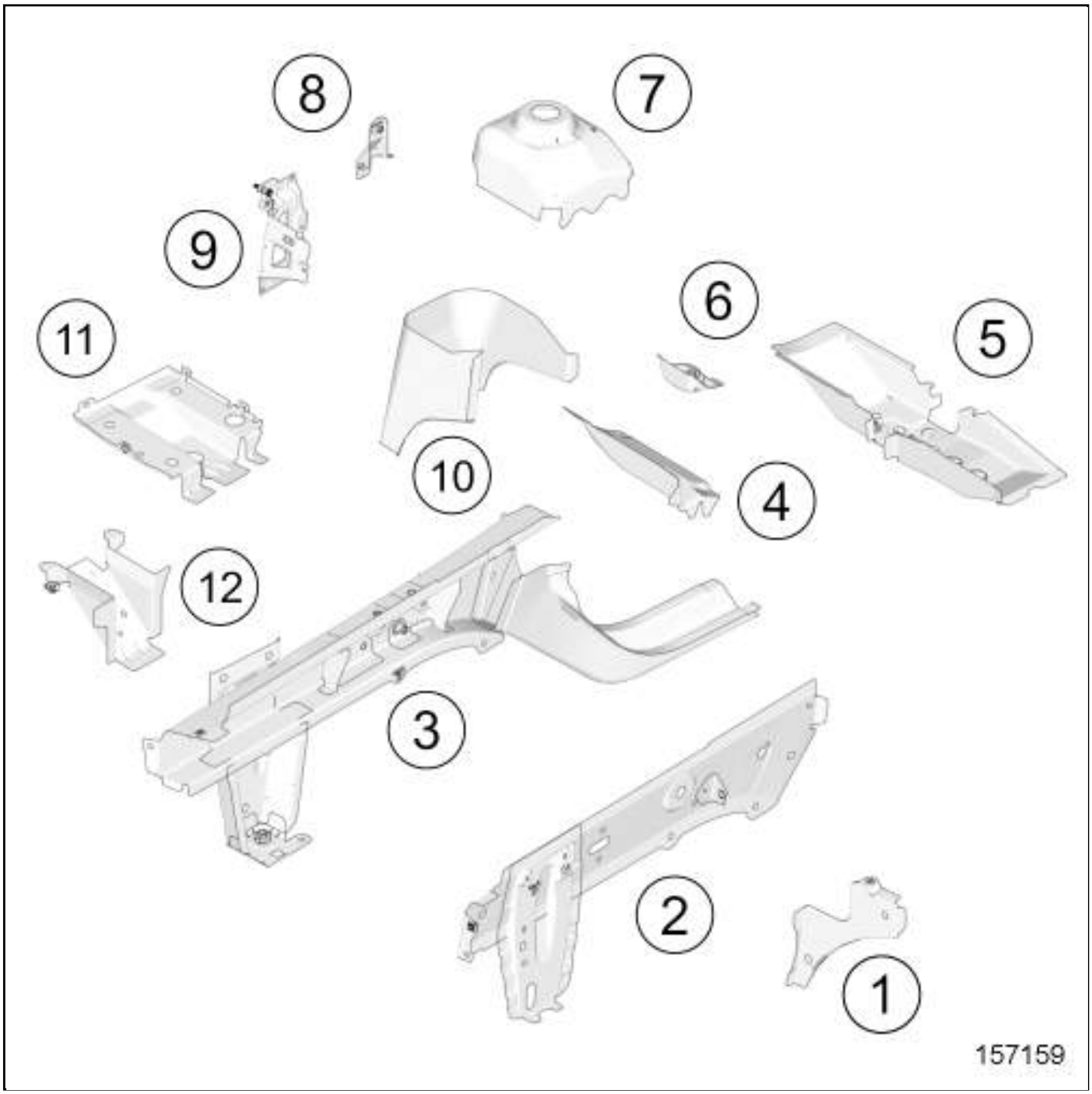
- Proceed in the reverse order to removal.

FRONTHALF-UNIT:REPLACEMENT

Note, one or more warnings are present in this procedure

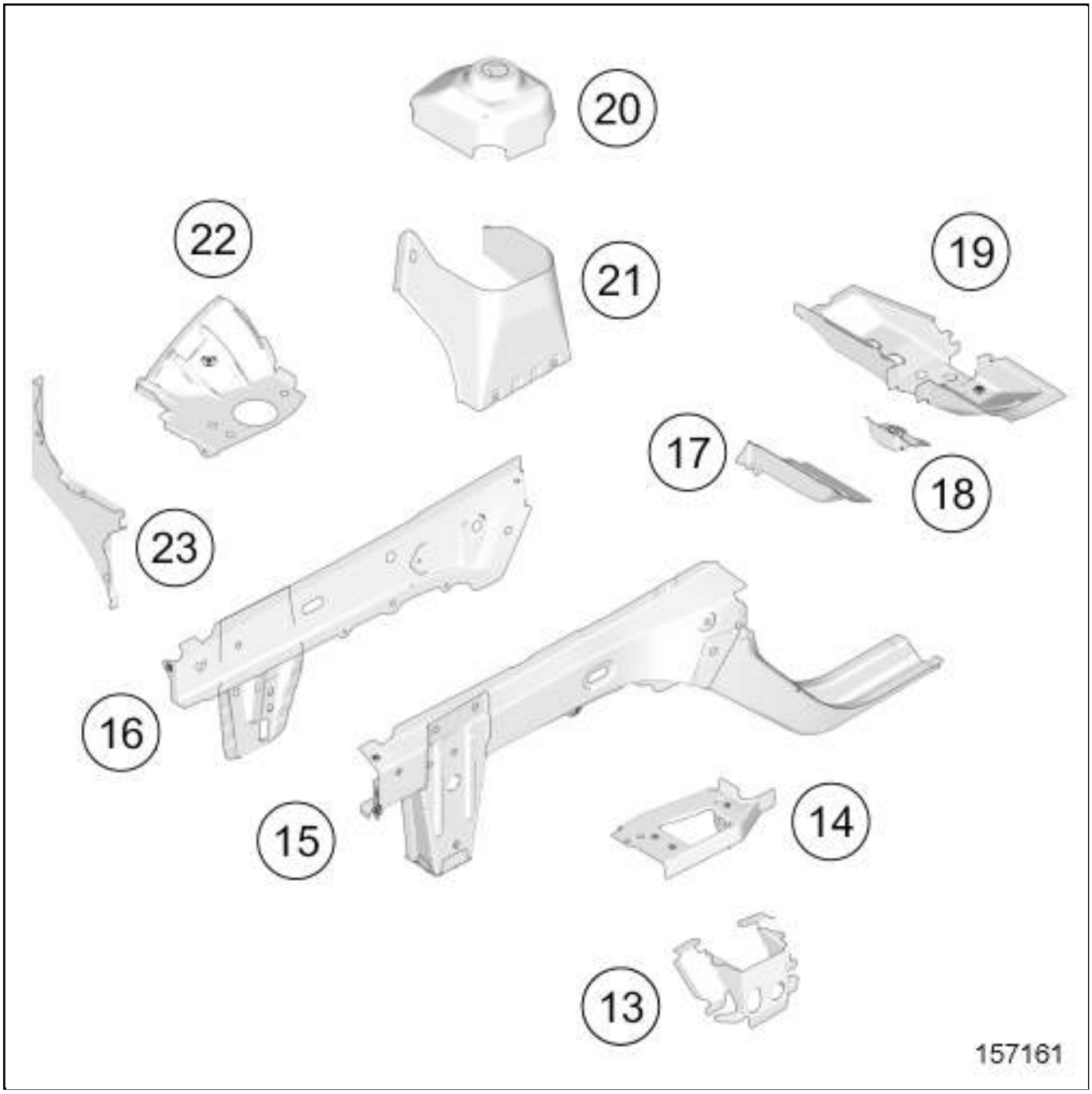
1. COMPOSITION OF THE SPARE PART

LEFT-HAND SIDE



No.	Description	Thickness (mm)
(1)	Front end side cross member	1.2
(2)	Front section of front side member closure panel	1.2/1.25
(3)	Front left-hand side member	1.2/3
(4)	Rear left-hand unit of front subframe mounting	1.95
(5)	Centre floor front left-hand side cross member	0.95
(6)	Front subframe rear mounting reinforcement	1.95
(7)	Front left-hand shock absorber cup	2
(8)	Bonnet strut support	1.8
(9)	Computer mounting	0.95
(10)	Front left-hand shock absorber cup height adjuster	1.2
(11)	Battery tray support upper section	1.4
(12)	Battery tray support lower section	1.4

RIGHT-HAND SIDE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No.	Description	Thickness (mm)
(13)	Right-hand engine - gearbox assembly suspension support on body	2.5
(14)	Right-hand mounting plate for engine - gearbox assembly support on body	2.5
(15)	Front right-hand side member	1.2/3
(16)	Front section of front side member closure panel	1.2/1.25
(17)	Rear right-hand unit of front subframe mounting	1.95
(18)	Front subframe rear mounting reinforcement	1.95
(19)	Centre floor front right-hand side cross member	0.95
(20)	Front right-hand shock absorber cup	2
(21)	Front right-hand shock absorber cup height adjuster	1.2
(22)	Front wheel arch	1.2
(23)	Front end side cross member	1.2

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- partial replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

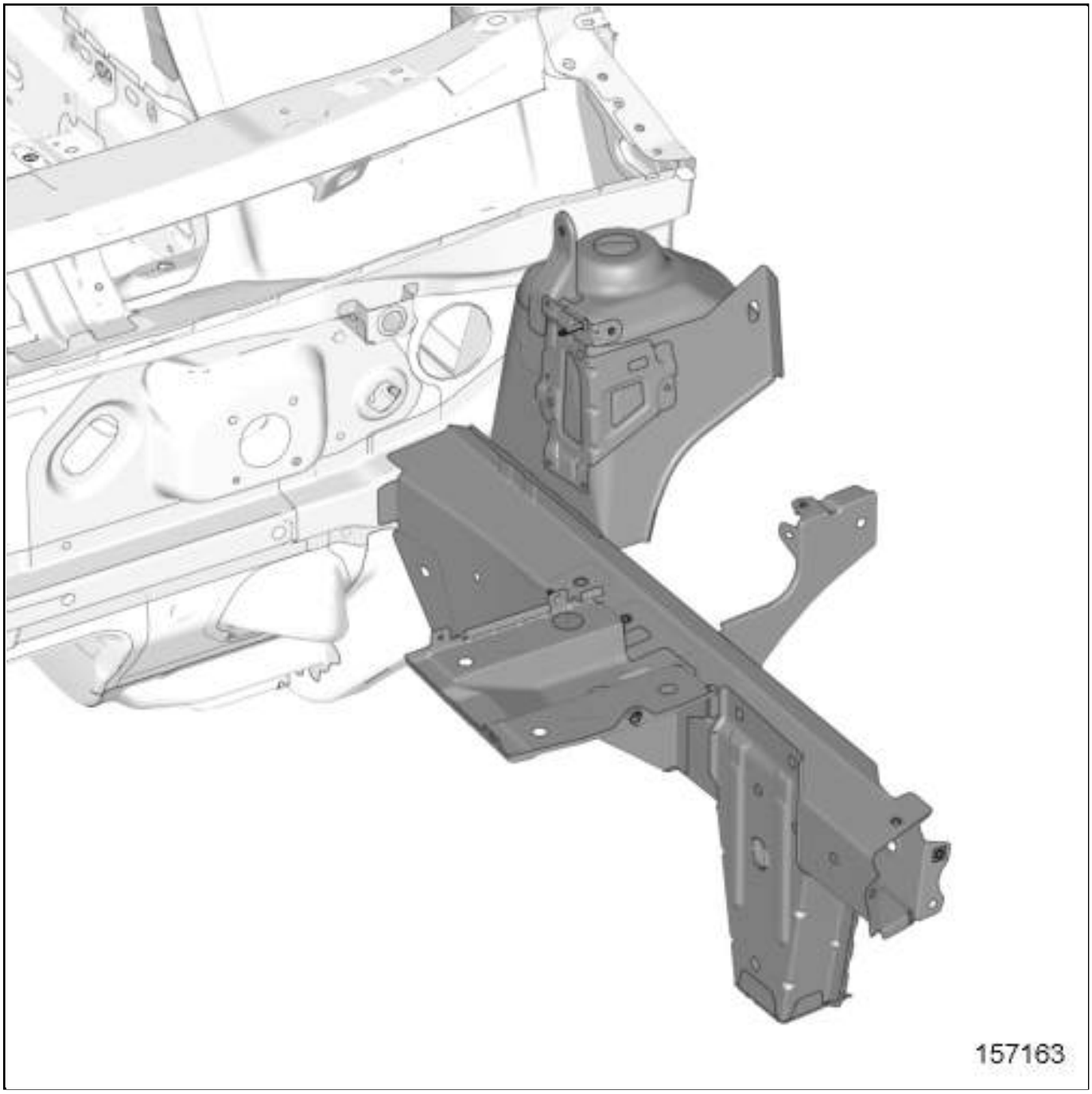
1- PARTIAL REPLACEMENT

WARNING

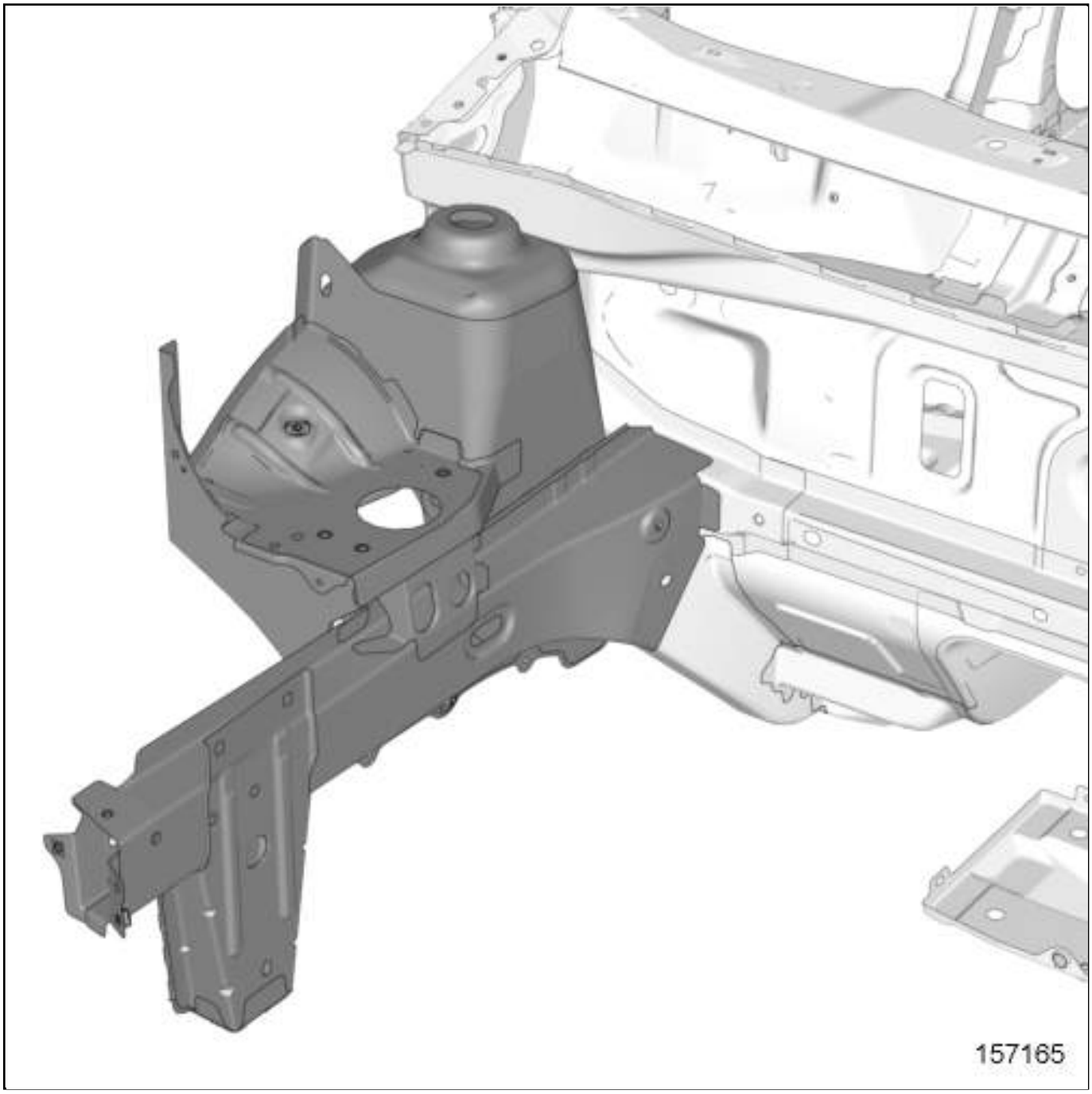
Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1)PART IN POSITION

LEFT-HAND SIDE



RIGHT-HAND SIDE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FRONT HUB CARRIER ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 31A, Front axle components, Front axle components: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

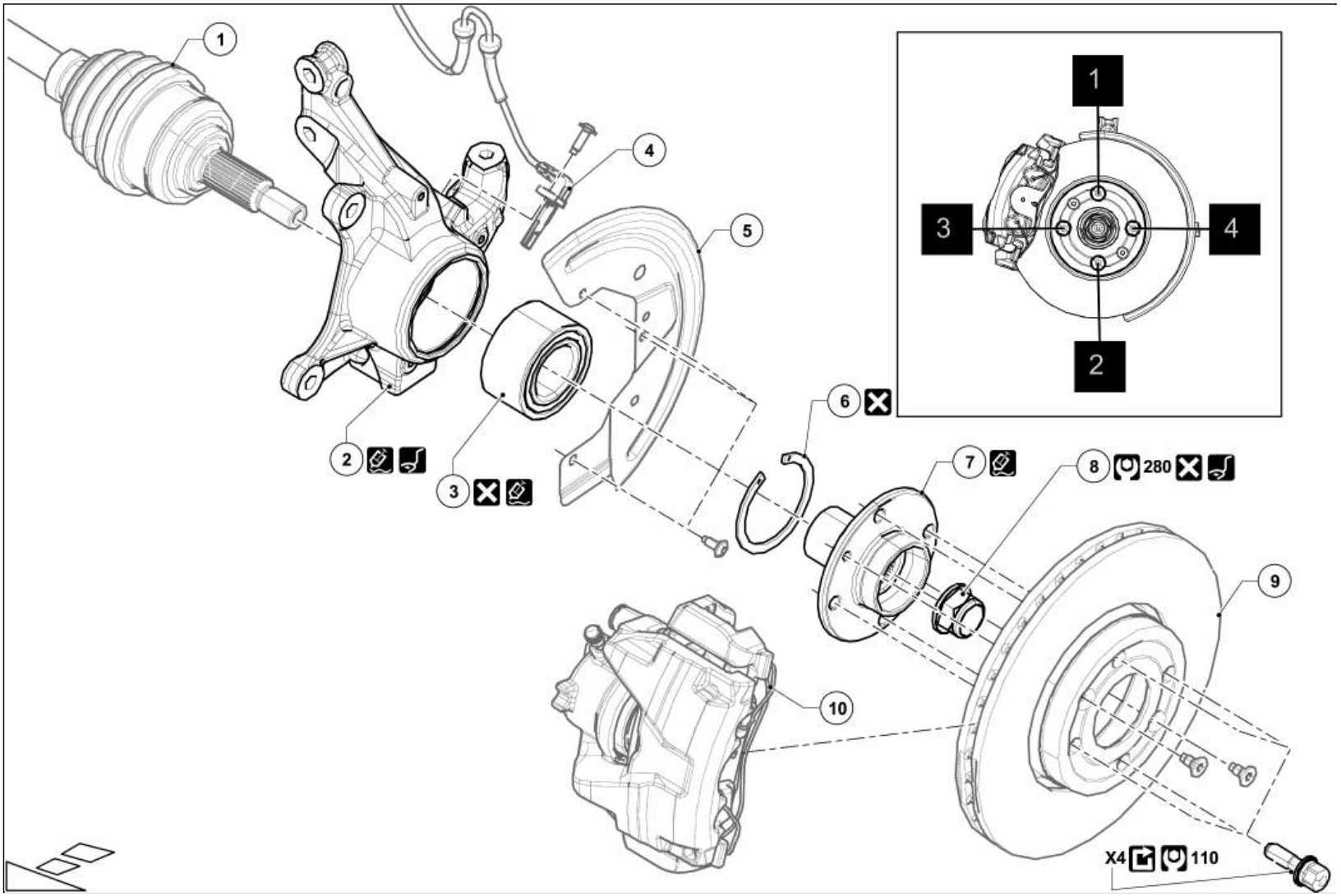


Illustration key: Description

Marks	Designations	Informations
1	Driveshaft	Front right-hand driveshaft: Removal - Refitting and Front left-hand driveshaft: Removal - Refitting
2	Driveshaft hub carrier	(see 31A, Front axle components, Front axle assembly: Exploded view) and Steering assembly: Exploded view (Tav. 1050-04, Tav. 1420-01) SURFACE CLEANER Vehicle: Parts and consumables for the repair ,
3	Hub carrier bearing	(see 31A, Front axle components, Front hub carrier bearing: Removal - Refitting) SURFACE CLEANER Vehicle: Parts and consumables for the repair ,
4	Wheel speed sensor	(see 31A, Front axle components, Front brake calliper assembly: Exploded view)
5	Brake disc protector	(see 31A, Front axle components, Front brake calliper assembly: Exploded view)
6	Hub carrier bearing rubber ring	
7	Wheel hub	SURFACE CLEANER Vehicle: Parts and consumables for the repair ,
8	Driveshaft nut	(Rou. 604-01)
9	Front brake disc	(see 31A, Front axle components, Front brake calliper assembly: Exploded view)
10	Brake calliper	(see 31A, Front axle components, Front brake calliper assembly: Exploded view)

FRONT HUB CARRIER BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 31A, Front axle components, Front axle components: Precautions for the repair) ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

CAUTION

- In order not to damage the brake hose:
  - do not tension the hose,
  - do not twist the hose,
  - check that there is no contact with the surrounding components.

CAUTION

- In order to prevent irreversible damage to the front hub bearing:
  - Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
  - Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

- Location and specifications (tightening torques, parts always to be replaced, etc.)(see 31A, Front axle components, Front hub carrier assembly: Exploded view) and(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

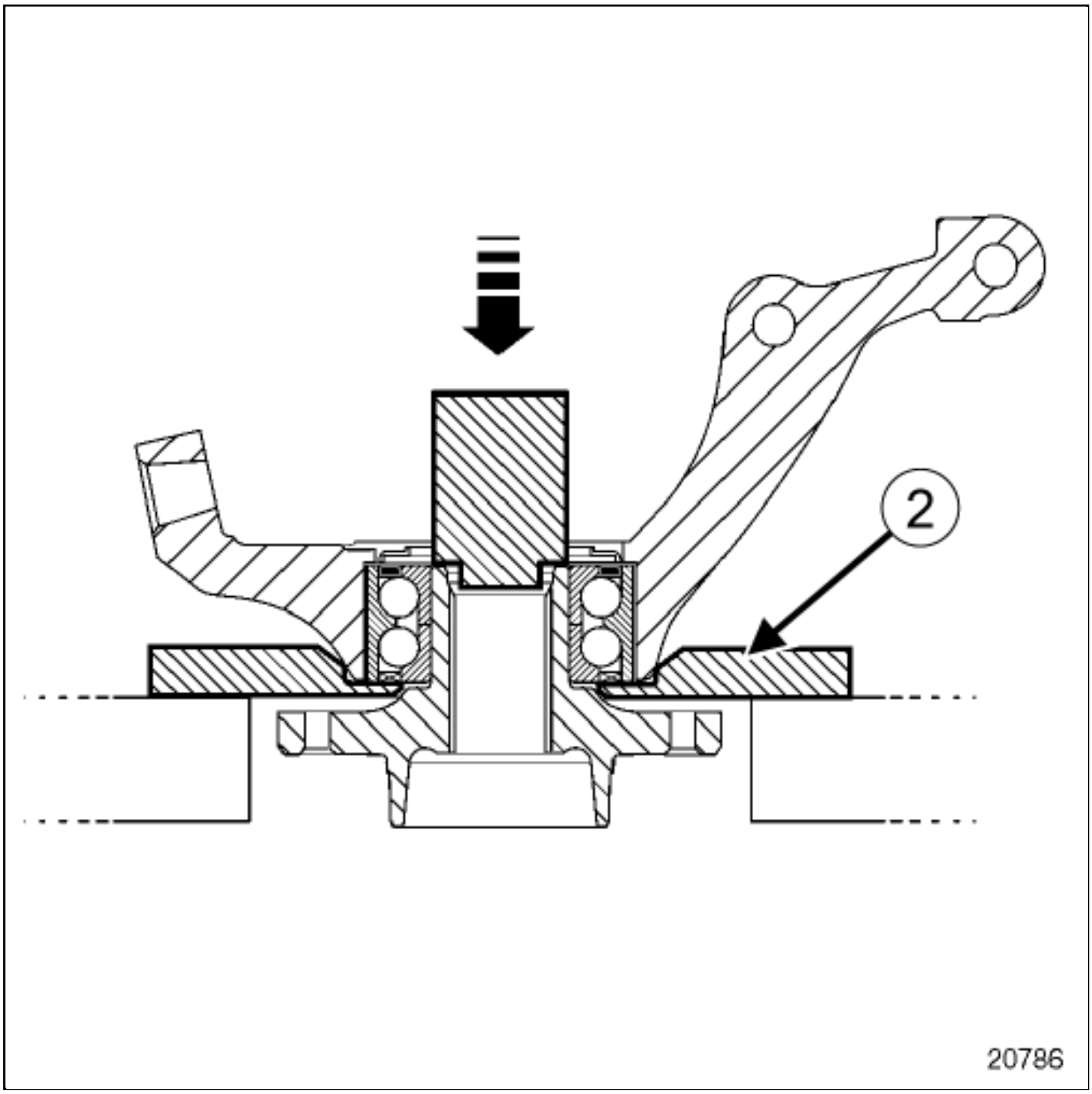
- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove the front wheels Wheel: Removal - Refitting .

- Remove (see 31A, Front axle components, Front brake calliper assembly: Exploded view) :
  - the front wheel speed sensor,
  - the front brake calliper mounting bolts,
  - the calliper/mounting assembly,
  - the front brake disc.

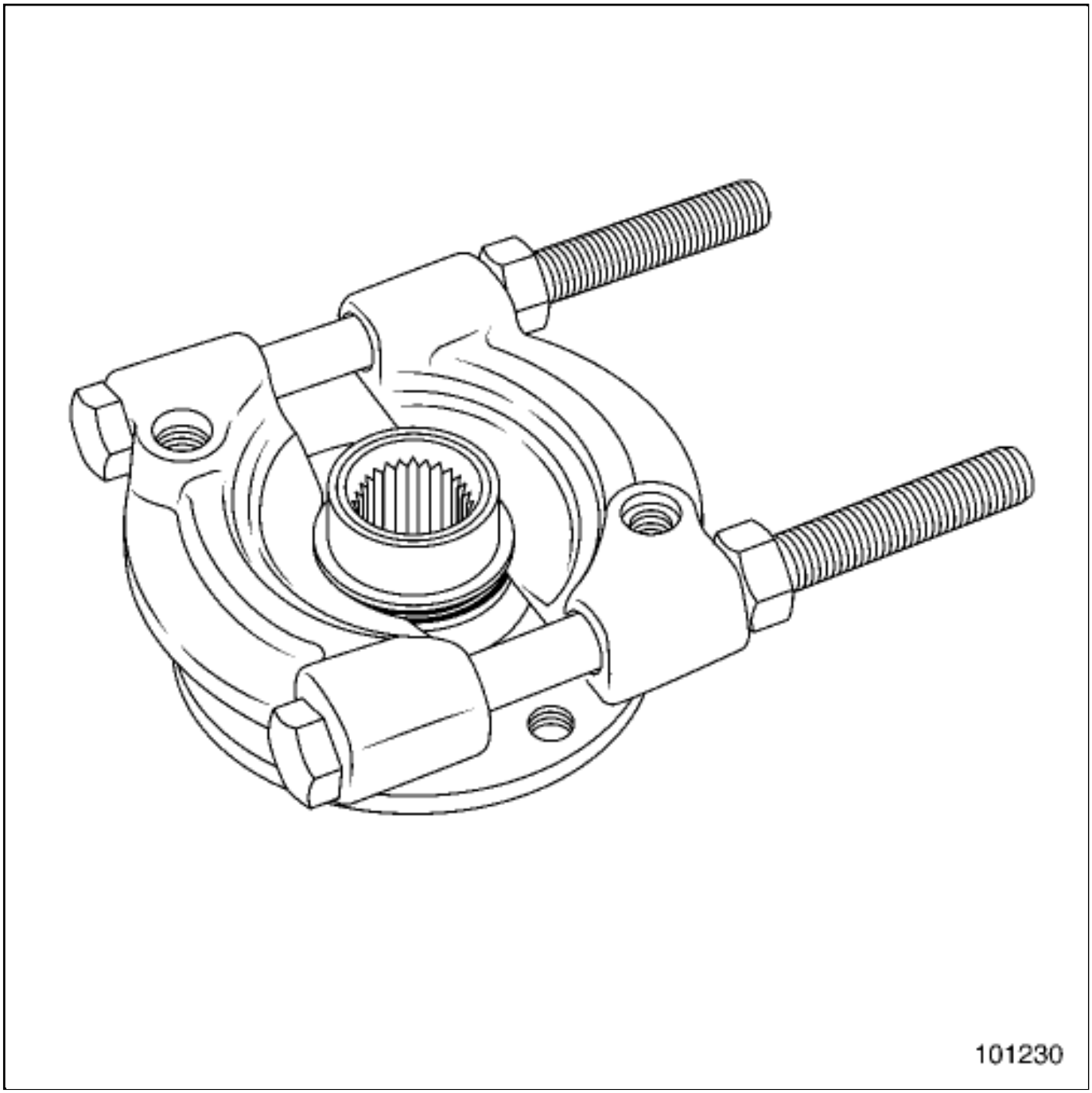
- Remove the front driveshaft hub carrier (see 31A, Front axle components, Front hub carrier assembly: Exploded view) .

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove:

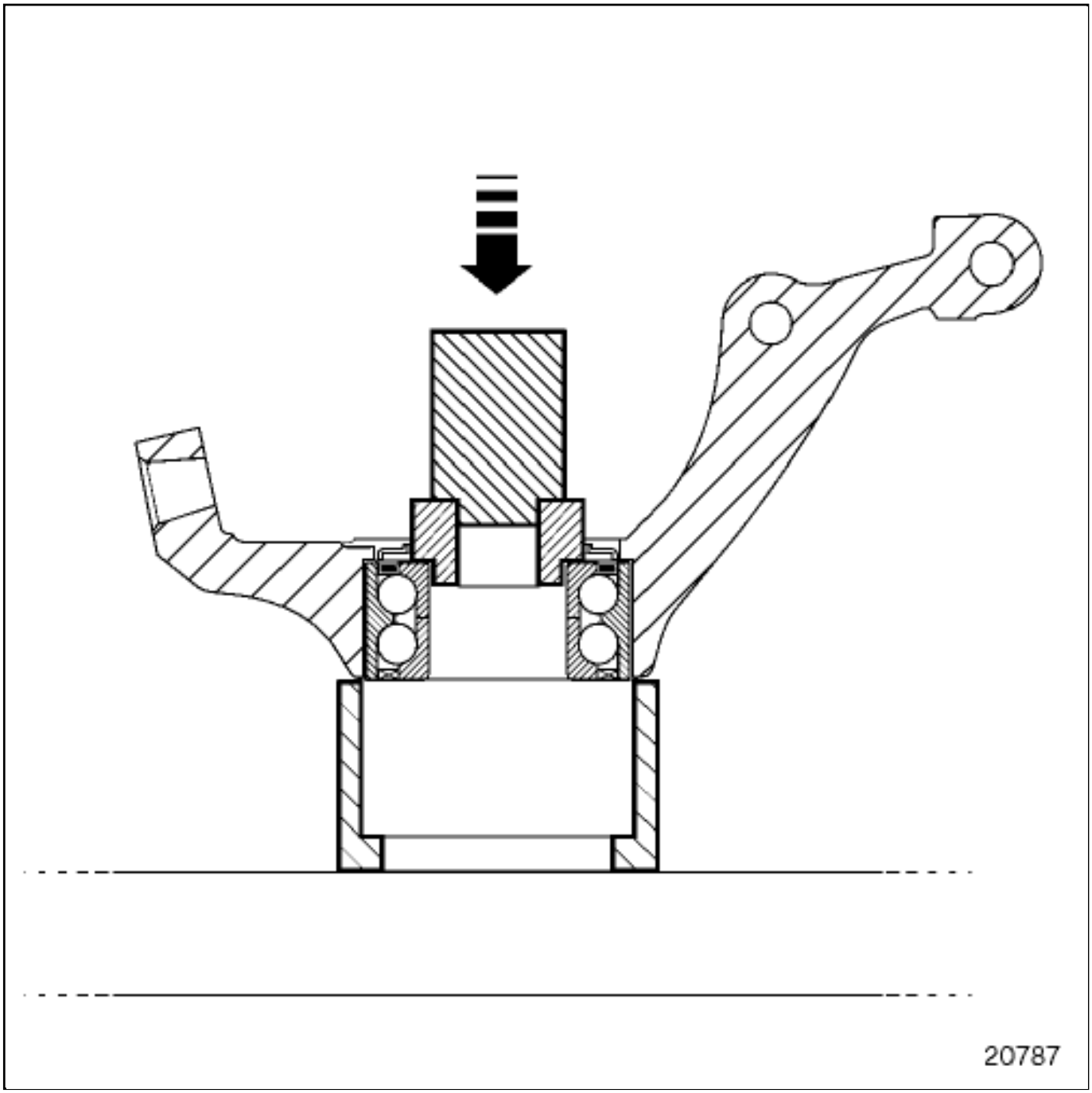
- the hub, with the press, by applying pressure to the hub with a 36.5 mm outer diameter tube using an extractor (2) ,
- the circlip.



- Extract the inner bush from the hub using a jawed extractor.

Note:

Place the extractor jaws in the groove of the internal bush.



- Remove the bearing by applying pressure to the inner bush with a tube with an external diameter of 65 mm .

Note:

Do not press on the sensor carrier (if fitted on the vehicle).

REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean:
  - the internal and external surfaces of the bearing, in contact with the hub carrier and the hub,
  - the hub carrier surfaces in contact with the bearing,
  - the hub surfaces in contact with the bearing.

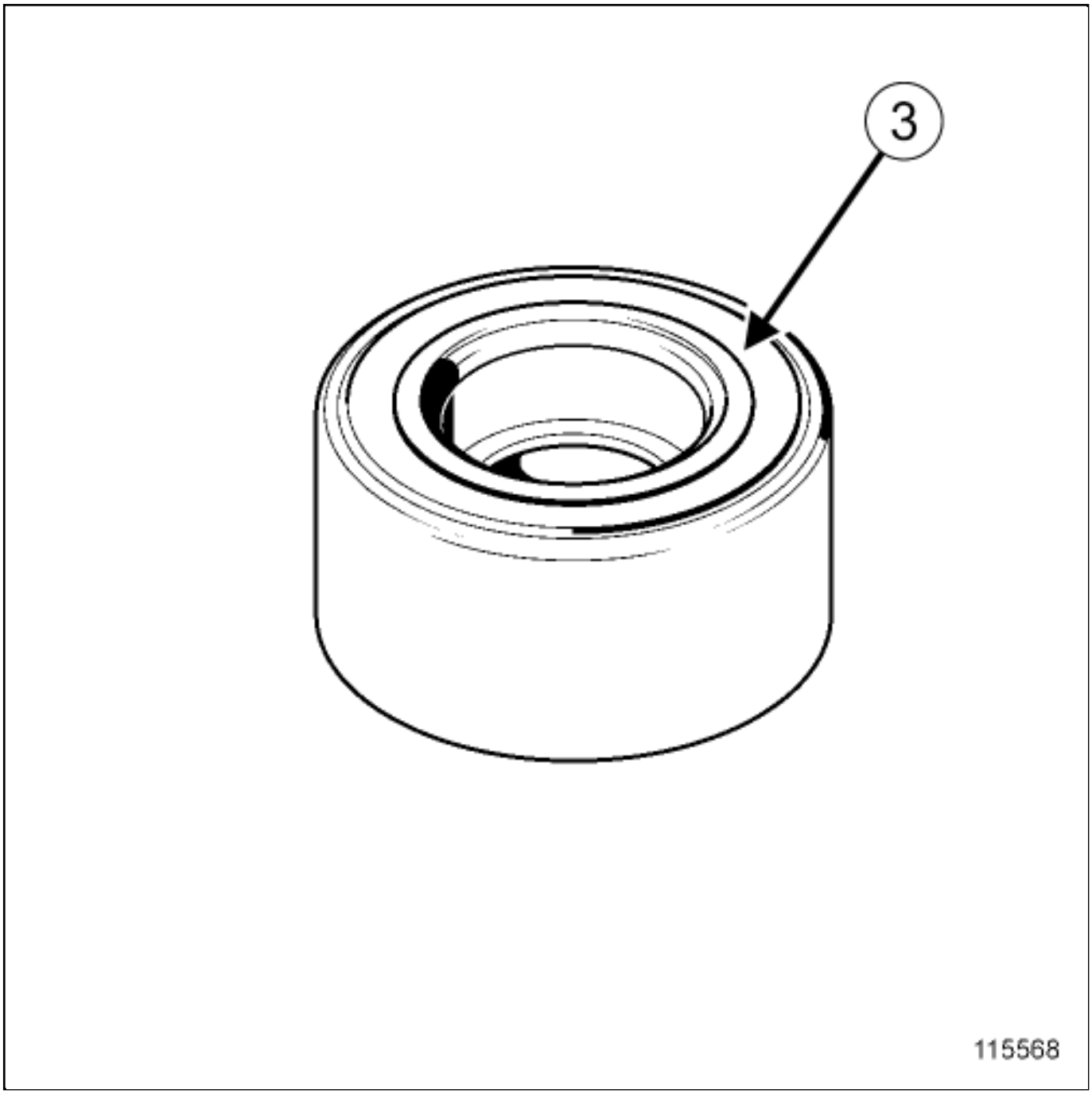
CAUTION

Do not press the bearing's internal bush so as to avoid damaging the bearing (very high shrink-fitting force).

- Check the condition of the hub surface and the bore of the hub carrier in contact with the bearing.

- Replace any component whose contact surfaces have deep scratches or cracks.

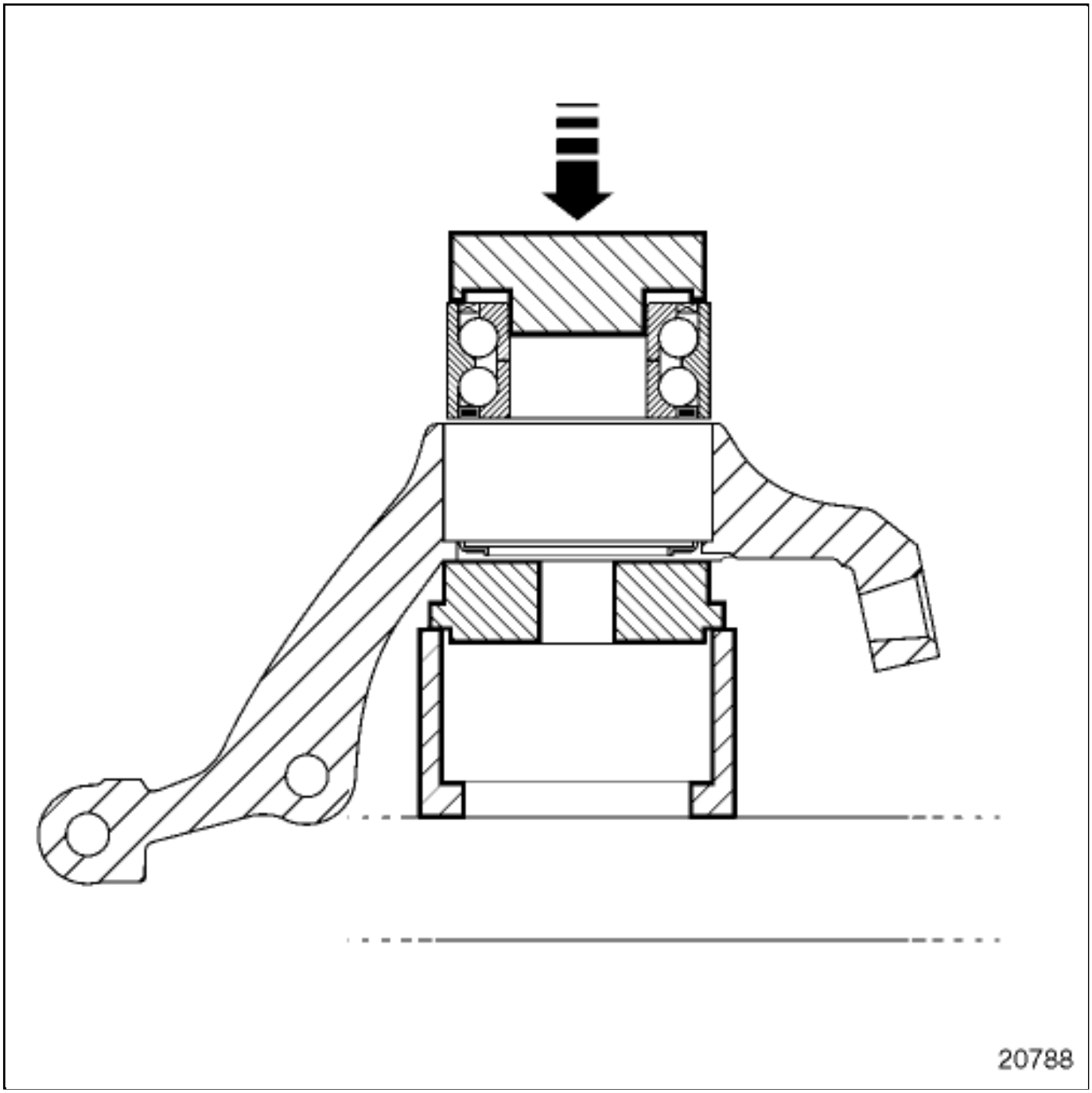
2. REFITTING OPERATION FOR PART CONCERNED



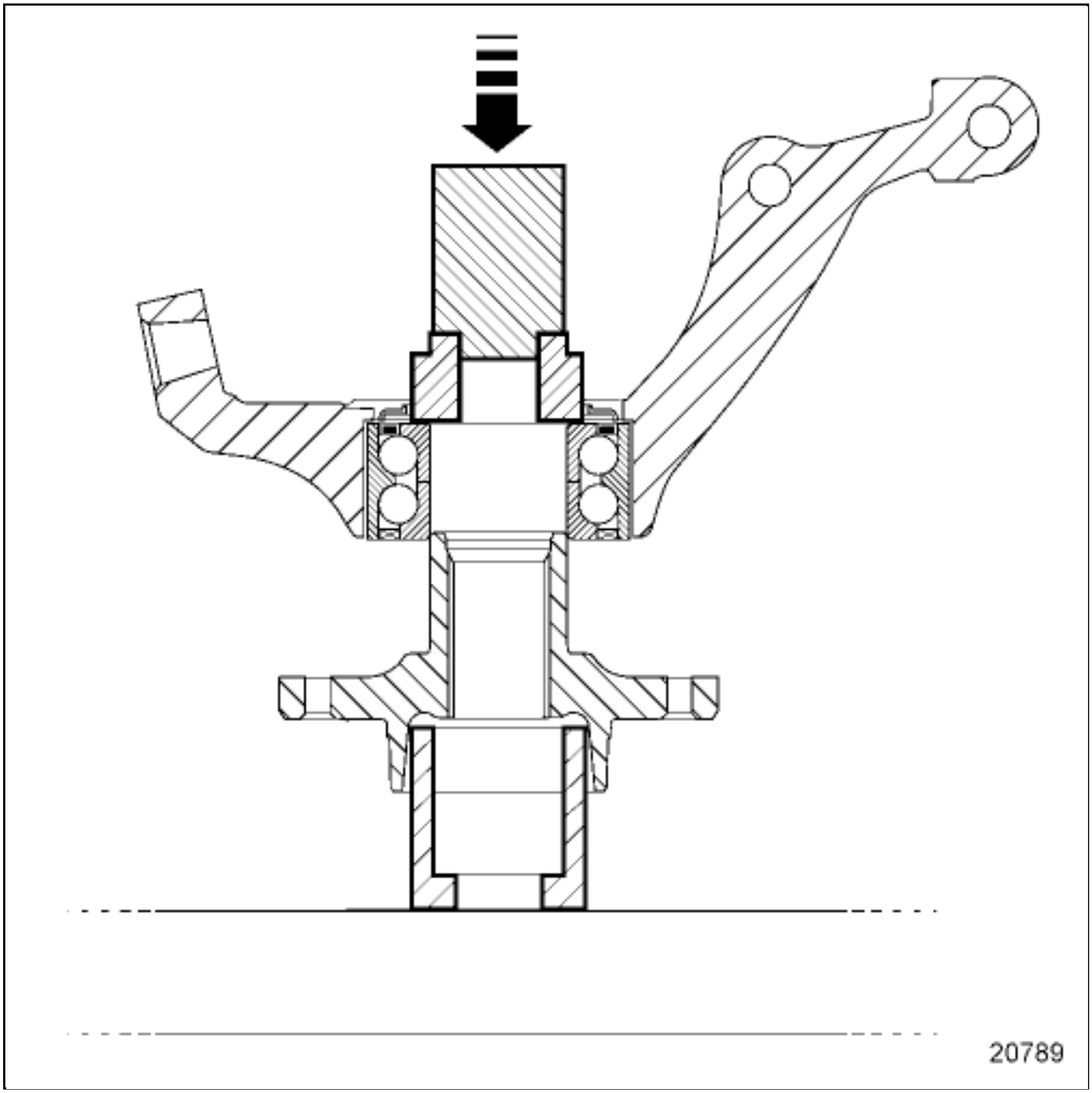
CAUTION

To ensure that the wheel speed sensor works properly, do not mark the sensor targeton the bearing.

- Position the sensor target on the bearing on the vehicle interior side.



- Press on the outer bearing bush with a tube of an external diameter of 70 mm.
- Refit the bearing retaining circlip.



Refit the hub using a tube with an outer diameter of 50 mm.

Apply pressure to the inner bearing bush.

3. FINAL OPERATION

Proceed in the reverse order to removal.

WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

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XSL version : 3.02 du 22/07/11

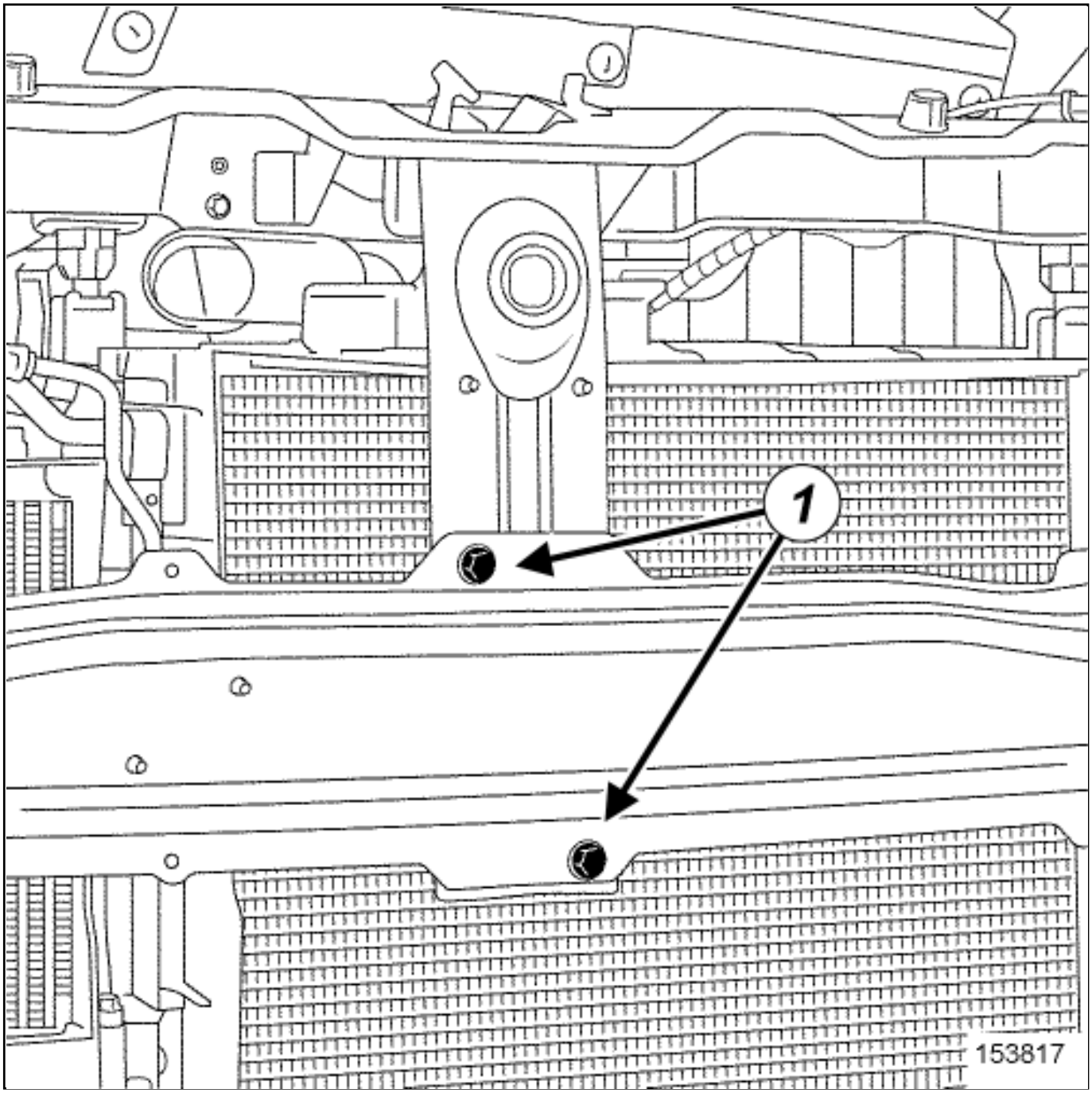
FRONT IMPACT CROSS MEMBER: REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

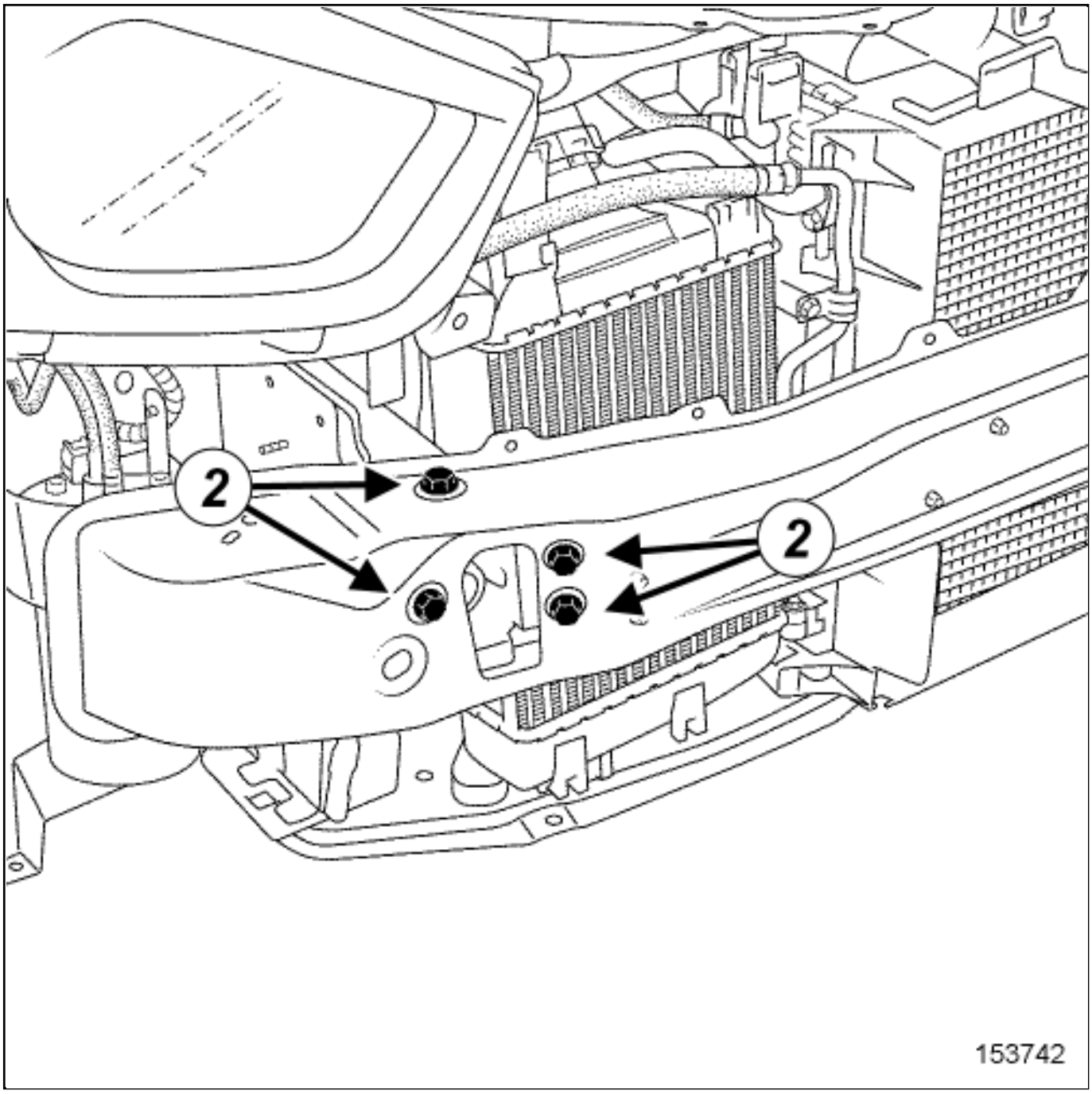
Remove:

- the front bumper Front bumper assembly: Exploded view ,
- the audible warning Front signals - lighting assembly: Exploded view .



Remove the bolts(1) of the front end panel.

2. REMOVAL OPERATION



Remove:

- the bolts(2) ,
- the front impact cross member.

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.
- Torque tighten the front impact cross member bolts21 N.m.

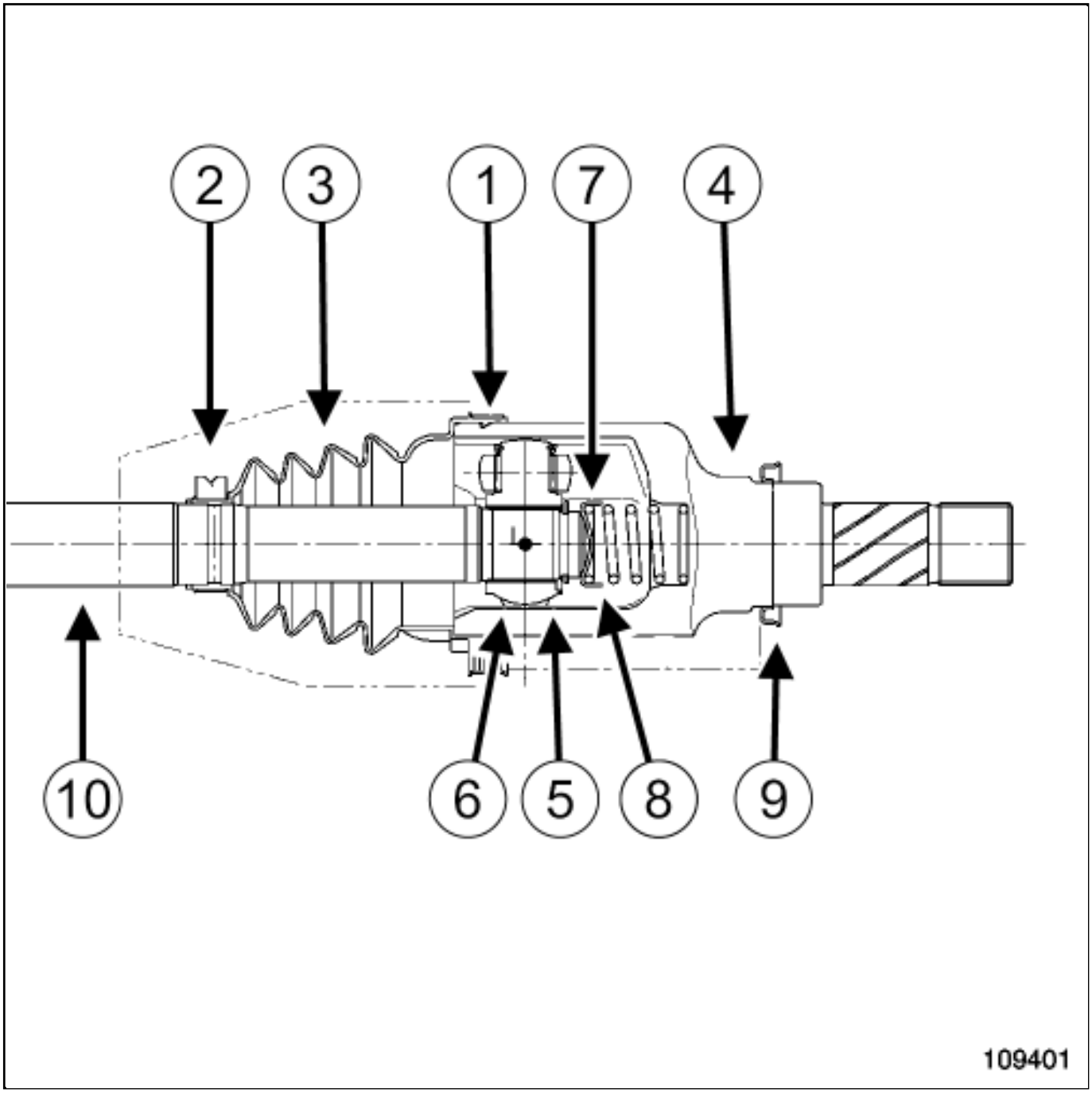
FRONT LEFT-HAND DRIVESHAFT GAITER, GEARBOX SIDE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Type clip pliers for driveshafts with a thermoplastic gaiter.	Tav. 1168
Pliers for the driveshaft gaiter collar.	Tav. 1784

Equipment required
parts washer

parts always to be replaced:
Front left-hand driveshaft gaiter, gearbox side
gearbox side front driveshaft seal locking ring



(1) Big securing clip

(2) Small securing clip

(3) Driveshaft gaiter

(4) Driveshaft yoke sleeve

(5) Lock ring

(6) Spider

(7) Cup

(8) Cup spring

(9) Deflector

(10) Driveshaft

WARNING

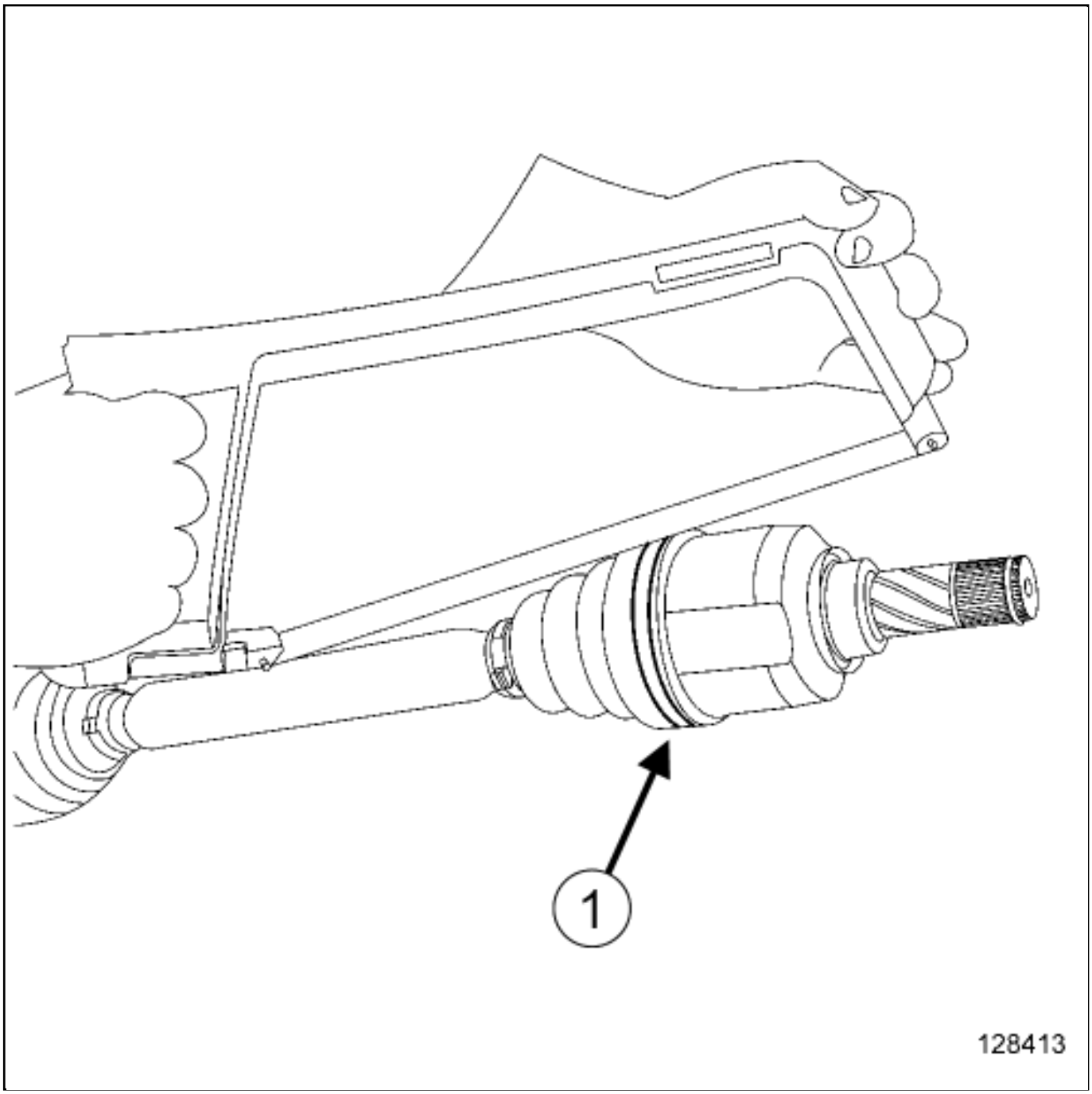
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove:
  - the engine undertray bolts,
  - the engine undertray.
- Drain the gearbox Manual gearbox oils: Draining - Filling or Automatic gearbox oil: Draining - Filling .
- Remove:
  - the front left-hand wheel Wheel: Removal - Refitting ,
  - the front left-hand driveshaft (see 29A, Driveshafts , Front left-hand driveshaft: Removal - Refitting) .
- Remove the left-hand side differential output seal Differential output seal: Removal - Refitting .

2. REMOVAL OPERATION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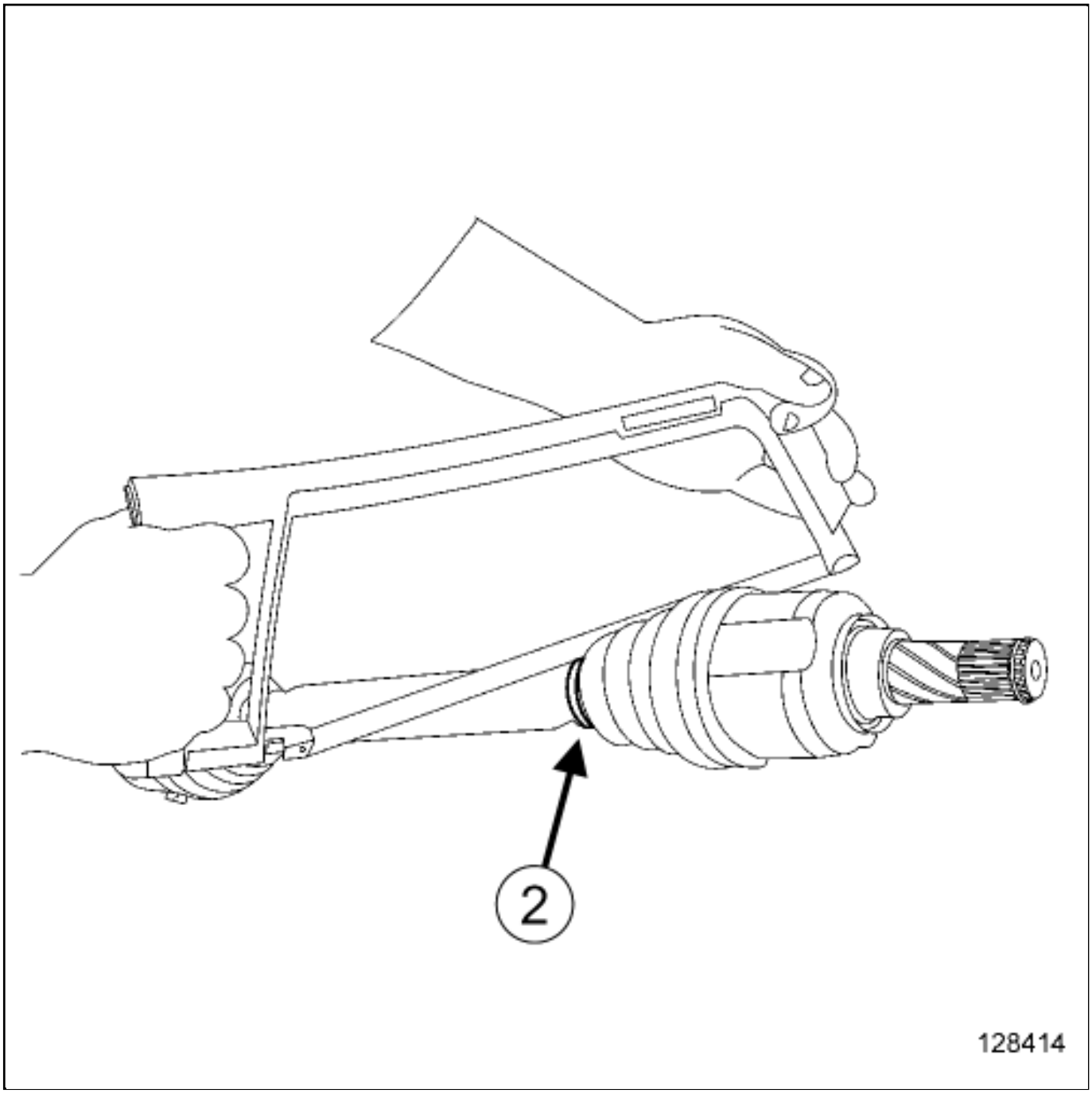
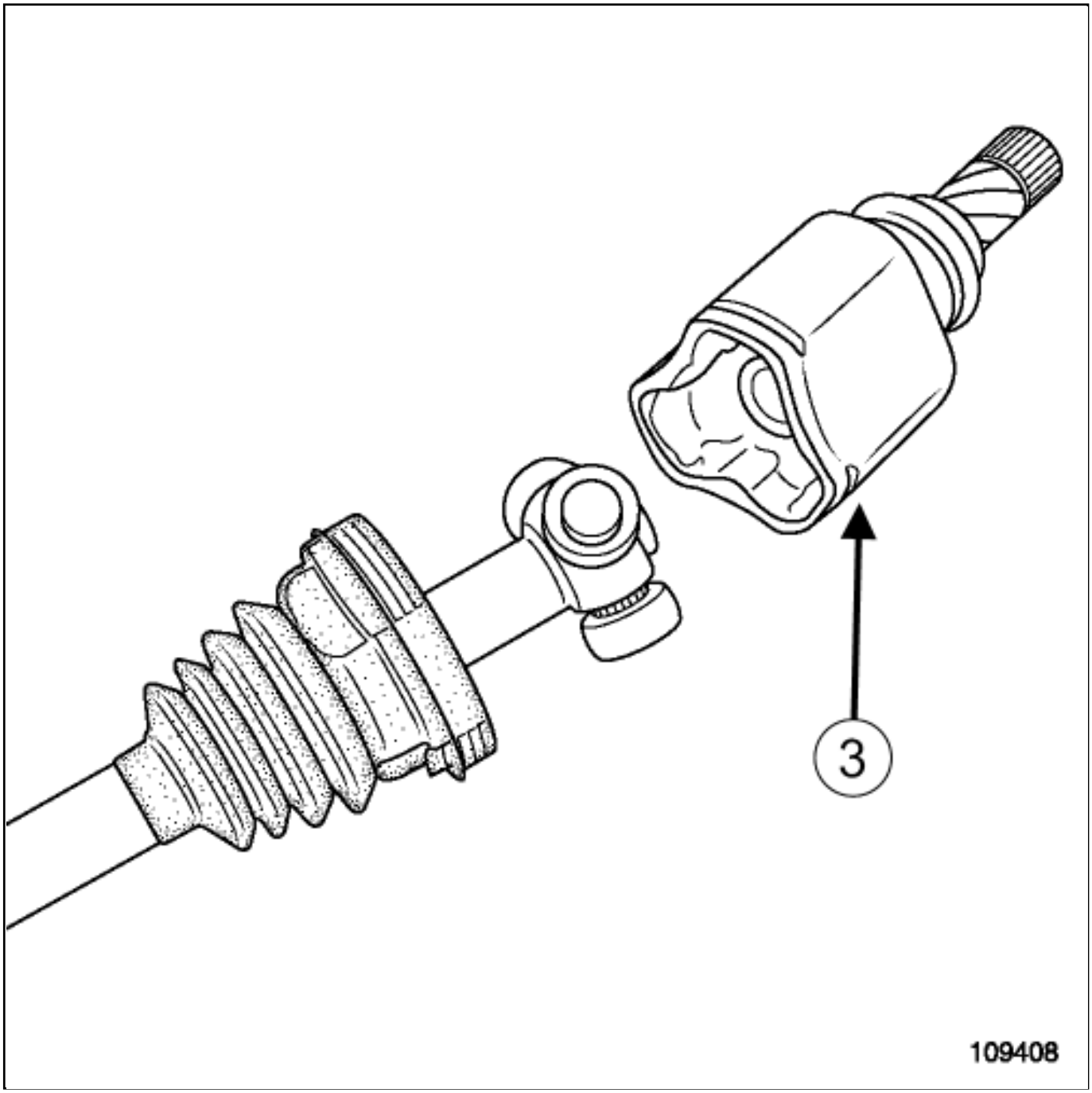


- Cut the big securing clip(1) and the small securing clip(2) using cutting pliers or a metal saw, taking care not to damage the yoke sleeve or the driveshaft.

- Push back the driveshaft gaiter to release the driveshaft yoke sleeve.

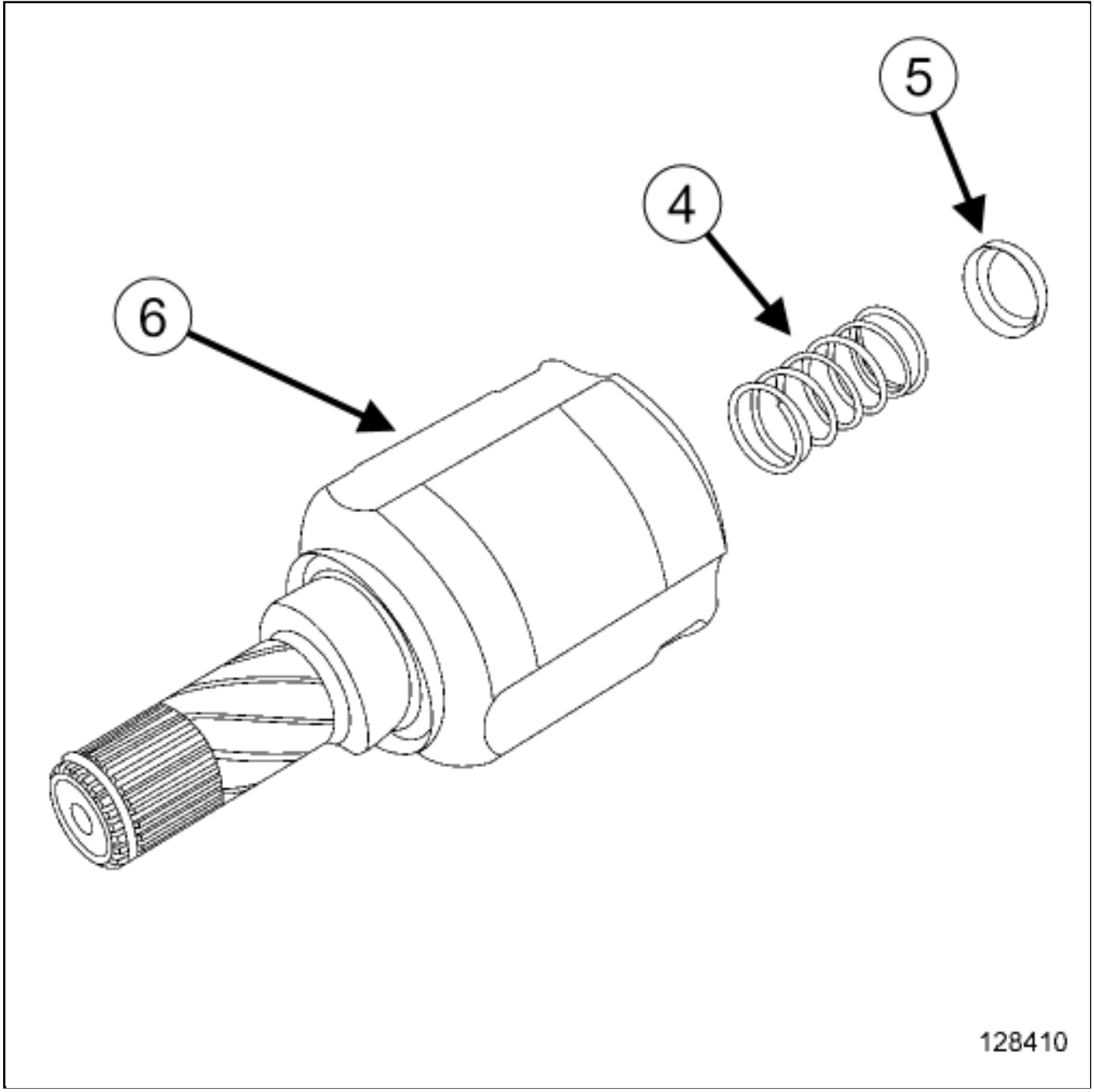


- Remove the driveshaft yoke sleeve(3) .

- Note:

■ since the driveshaft yoke sleeve does not have a stop tab, it can be removed without being forced,

■ do not remove the rollers from their respective bushings as the rollers and needles are matched and should never be interchanged.

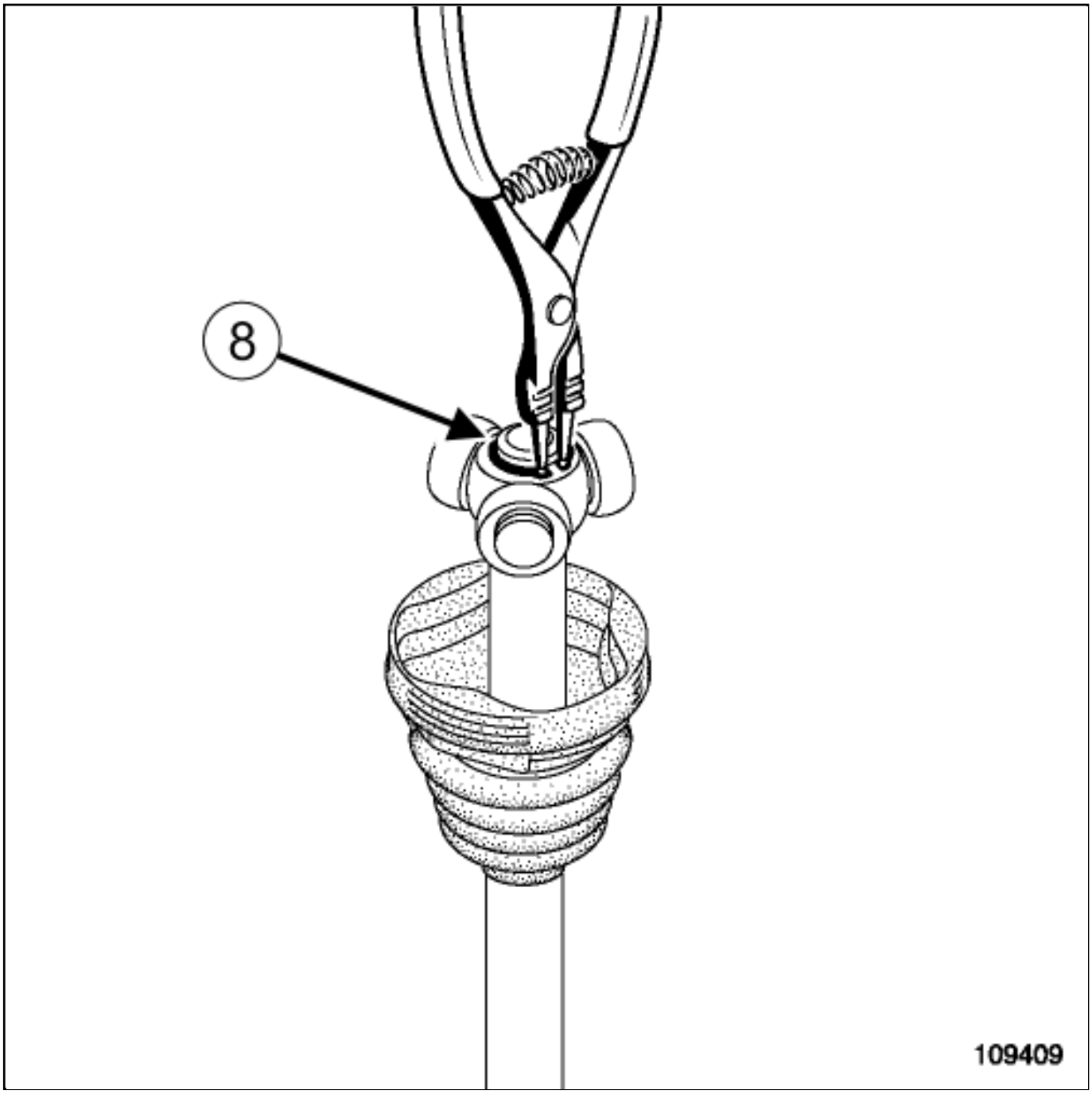


- Remove the cup spring(4) fitted with the cup(5) from the driveshaft yoke sleeve(6) .

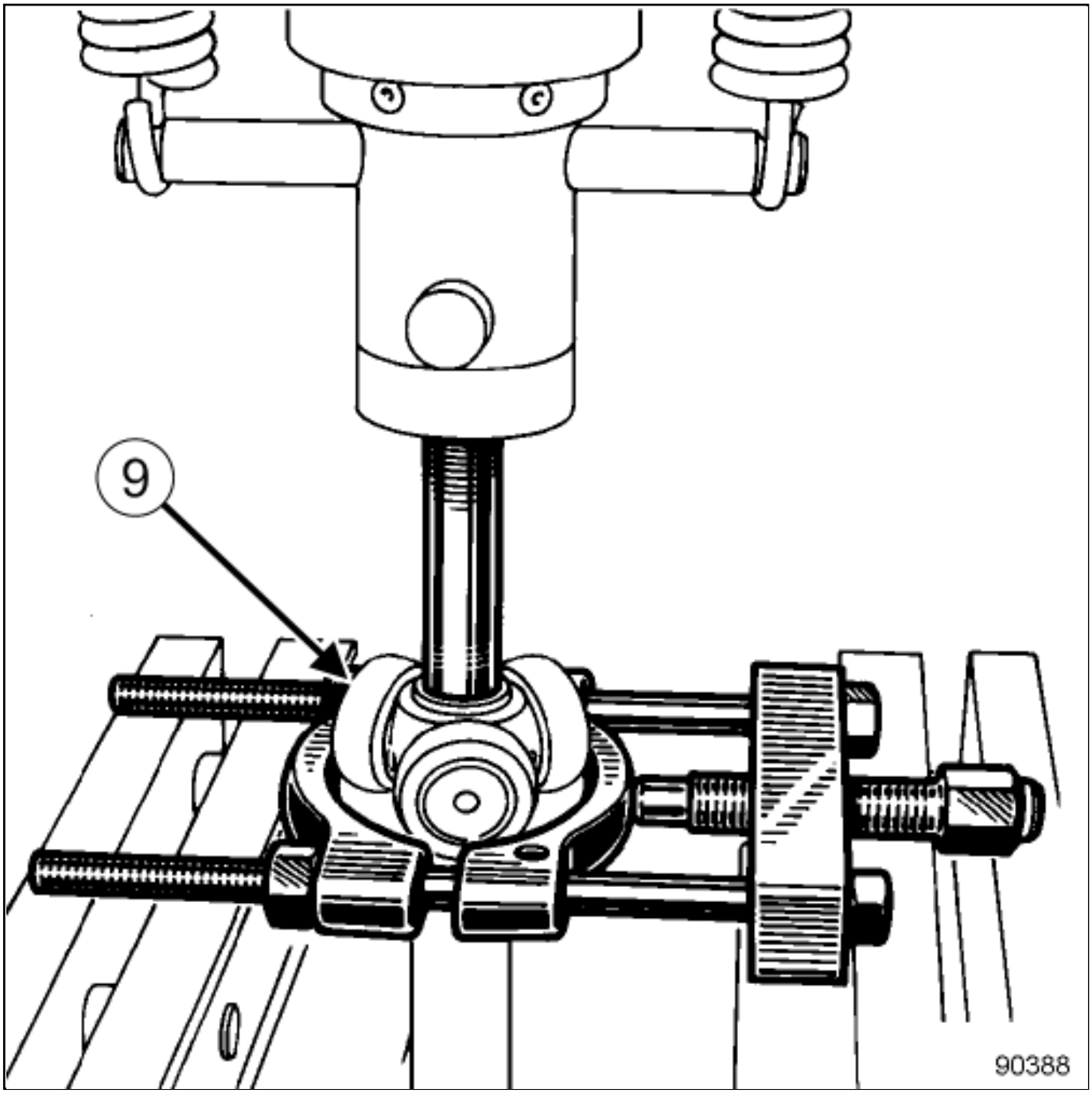
- Remove as much grease as possible from inside the driveshaft yoke sleeve.

Note:

Never use thinner to remove grease.



- Remove the lock ring(8) using circlip pliers.



Note:

Mark the position of the spider before extracting it.

- Remove the spider(9) using a press and a releasing type extractor.

- Remove:
  - the gaiter from the driveshaft,

- the cup equipped with the cup spring.

REFITTING

1. REFITTING PREPARATION OPERATION

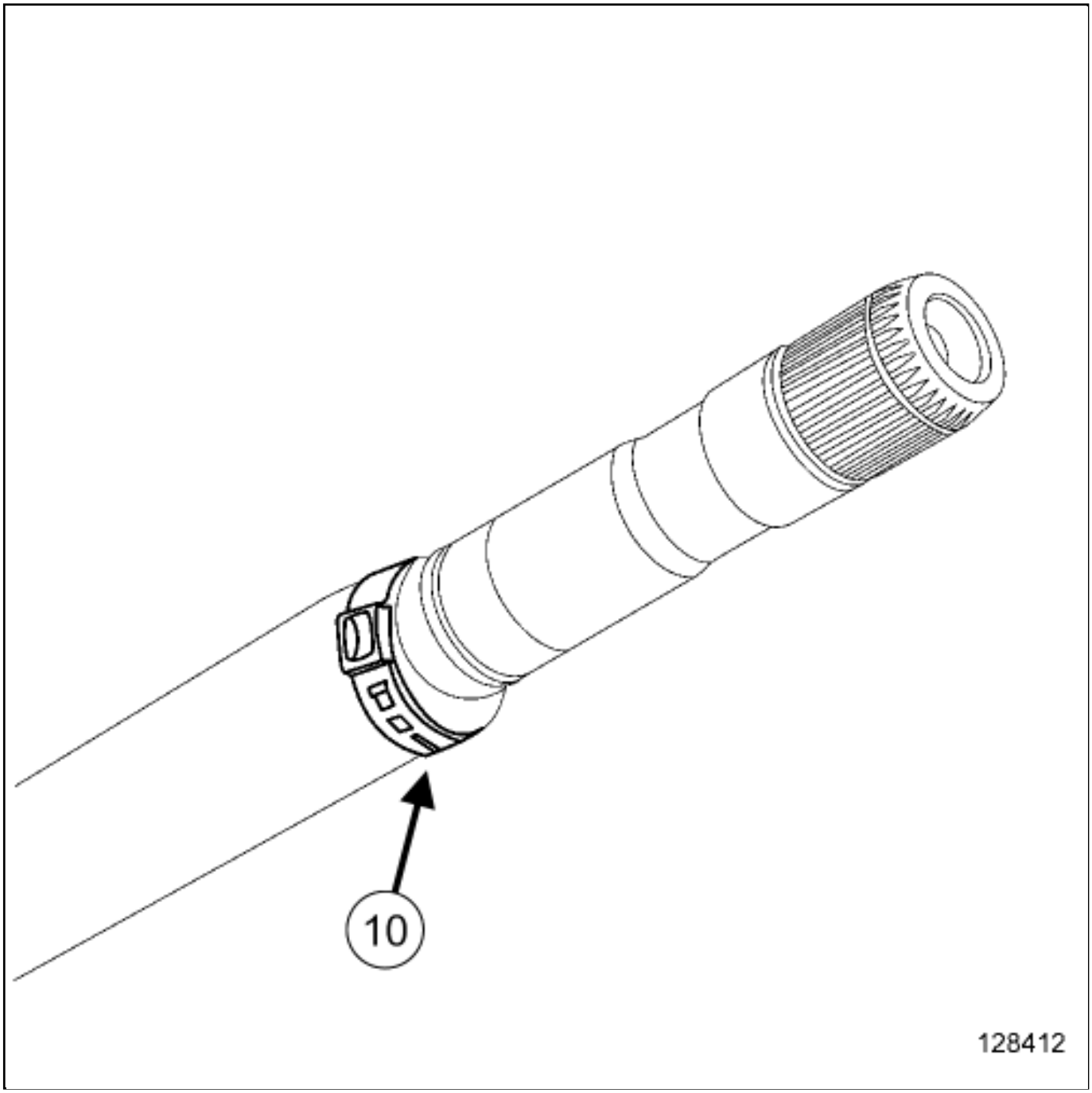
parts always to be replaced: Front left-hand driveshaft gaiter, gearbox side.

parts always to be replaced: gearbox side front driveshaft seal locking ring.

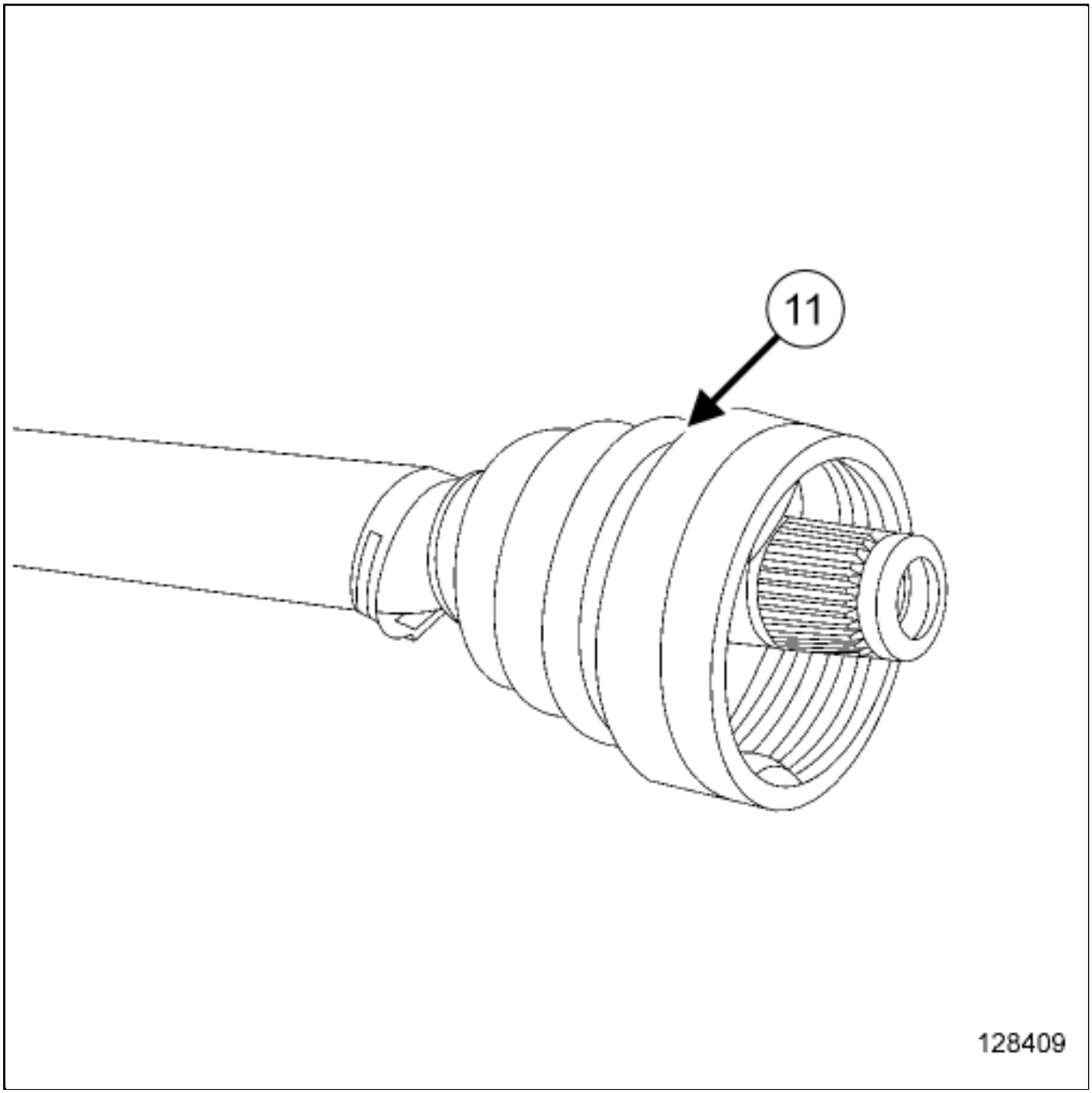
Always replace:
- the cup,
- the cup spring,
- the big securing clip,
- the small securing clip.

Use a parts washerto clean the driveshaft, the spider and the driveshaft yoke sleeve.

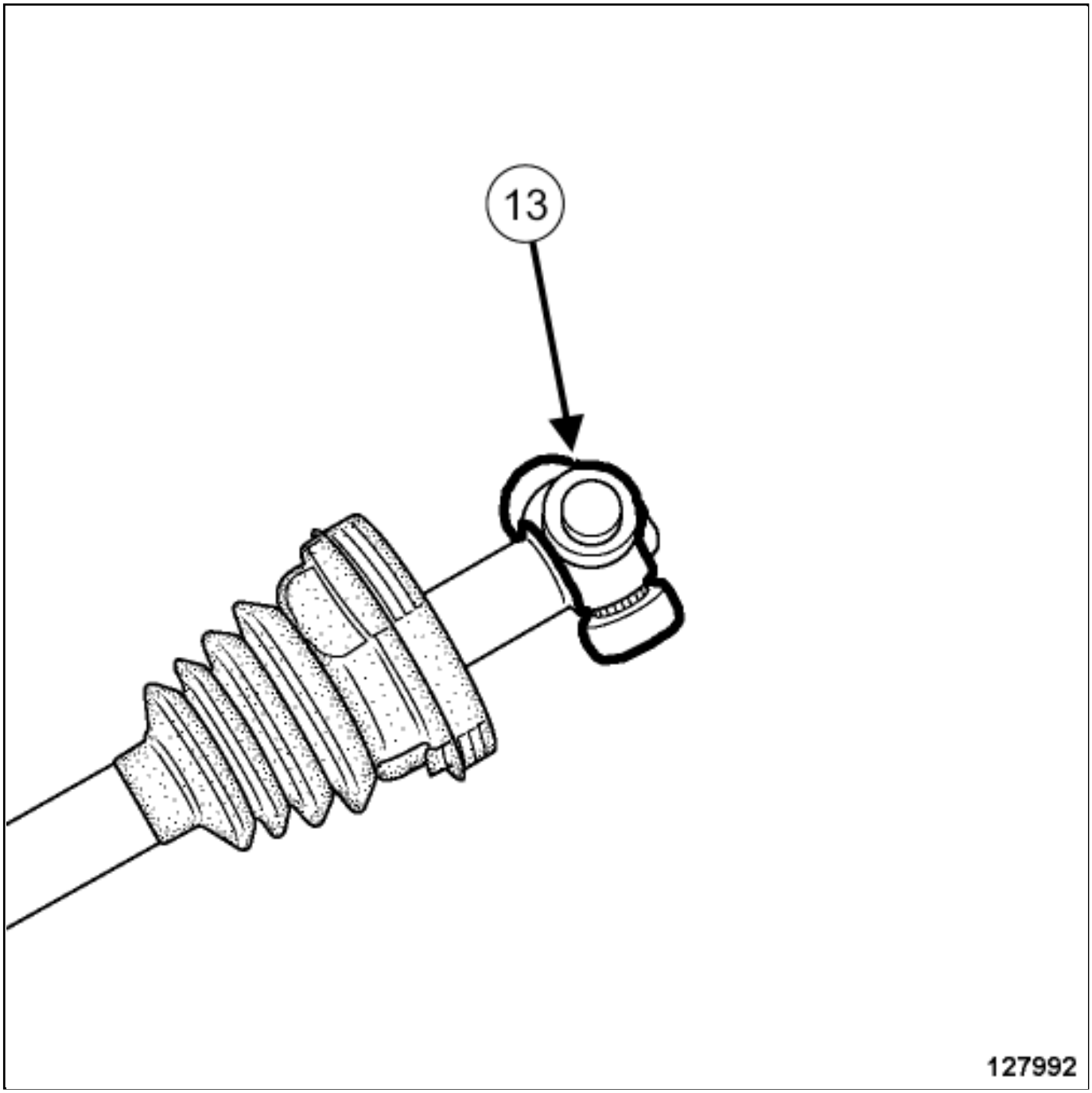
2. REFITTING OPERATION



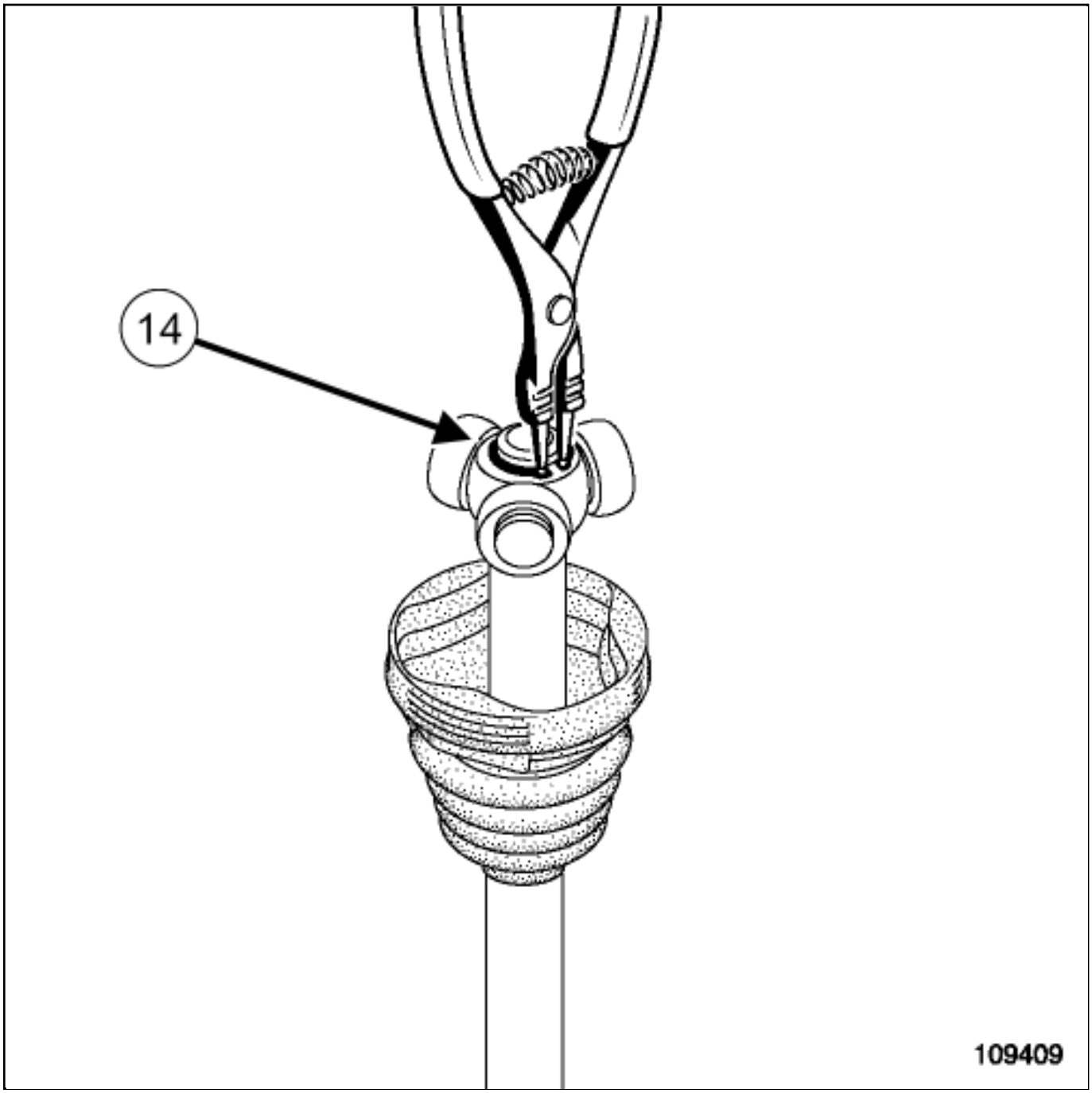
- Fit the small securing clip(10) onto the driveshaft.
- Lightly lubricate the driveshaft using the grease supplied with the gaiter to facilitate its fitting.



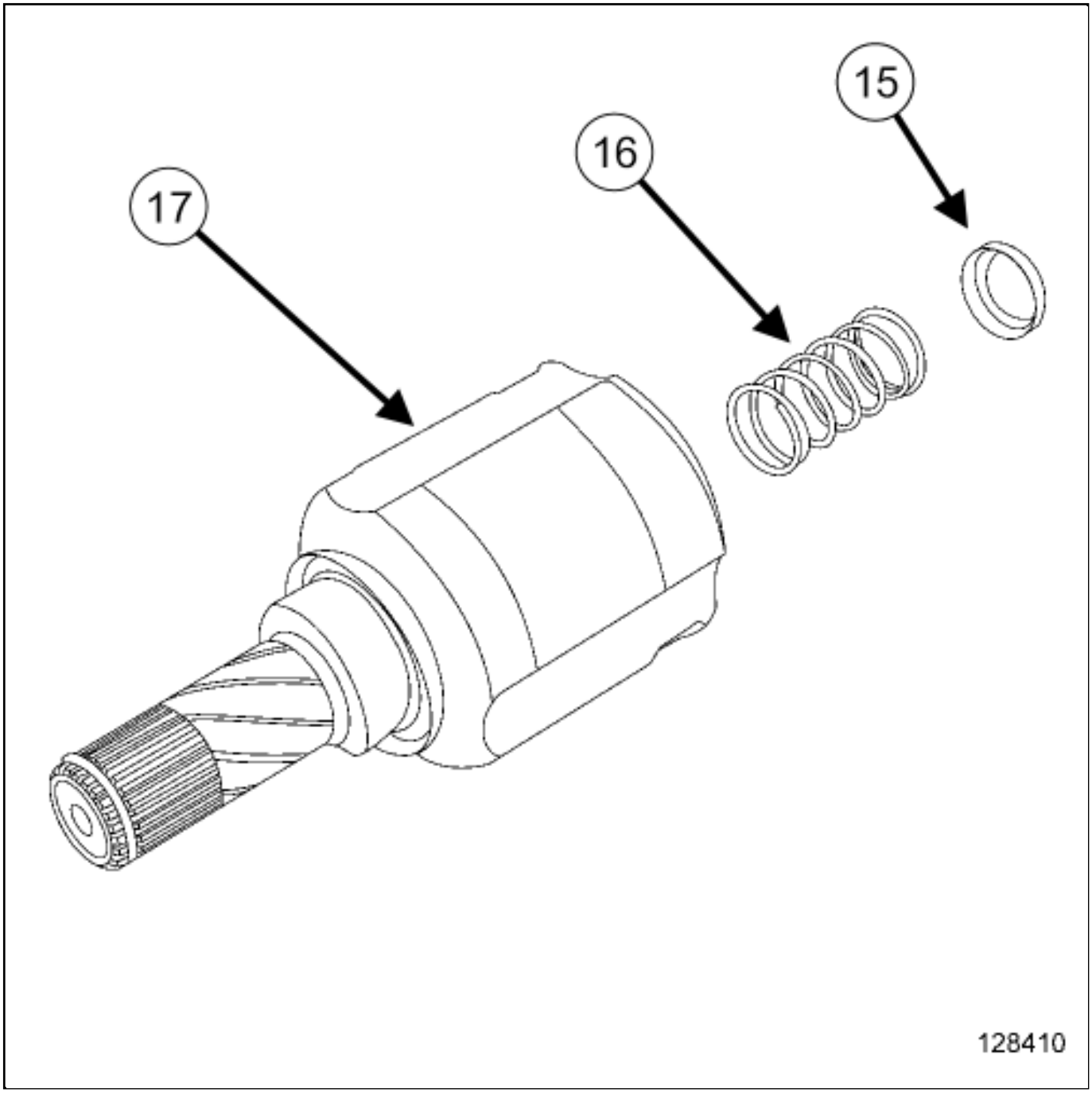
- Refit the gaiter(11) onto the driveshaft.
- Insert the gaiter lip into the groove of the driveshaft.



- Refit the spider(13) in the position marked during removal.

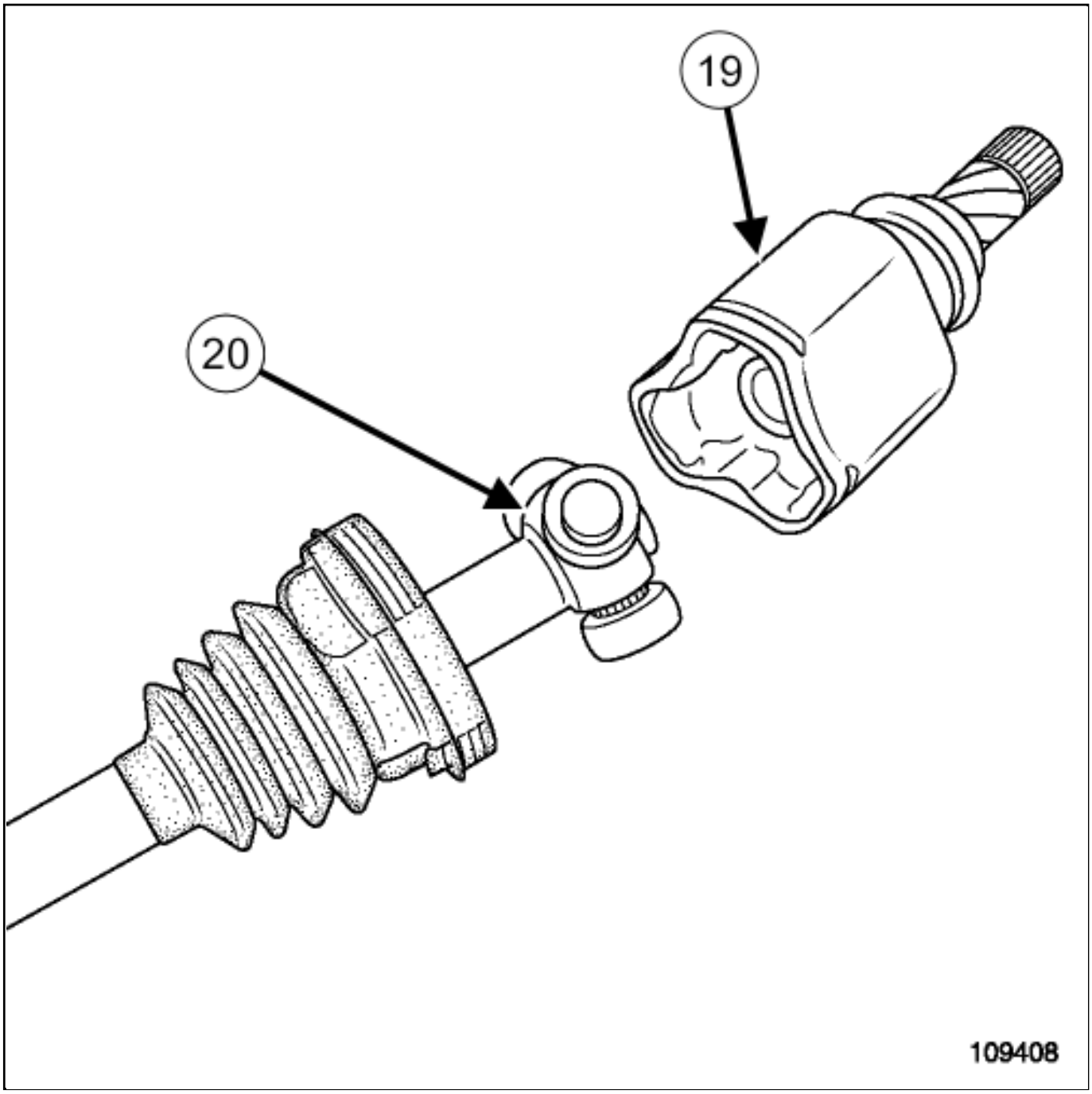


Fit a new lock ring(14) using circlip pliers.



Refit:

- the cup(15) onto the cup spring(16) ,
- the cup spring equipped with the cup into the driveshaft yoke sleeve(17) .



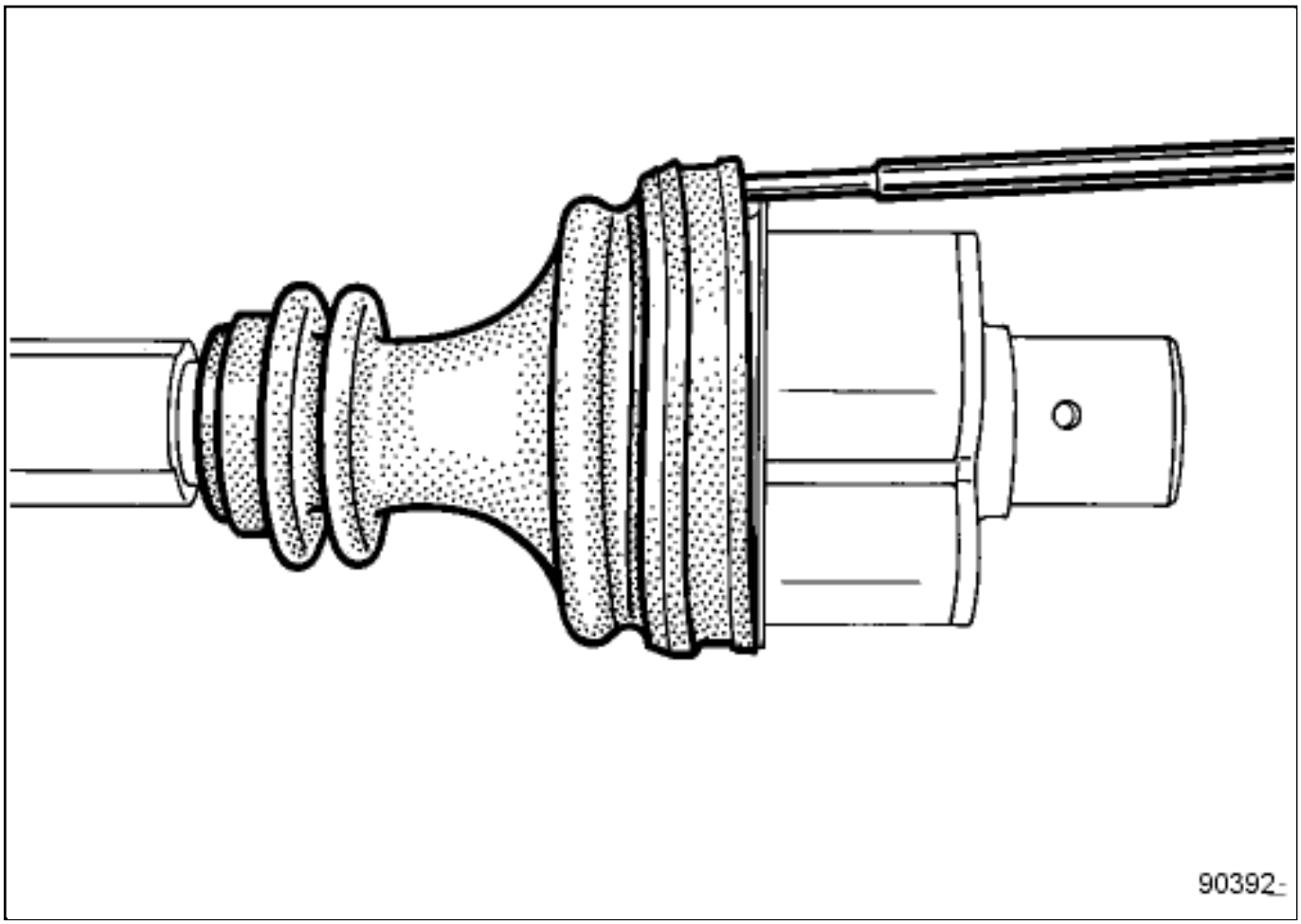
Divide the quantity of grease between the driveshaft gaiter and the yoke sleeve.

Engage the yoke sleeve(19) on the tripod(20).

Insert the gaiter lip into the groove of the yoke sleeve.

Note:

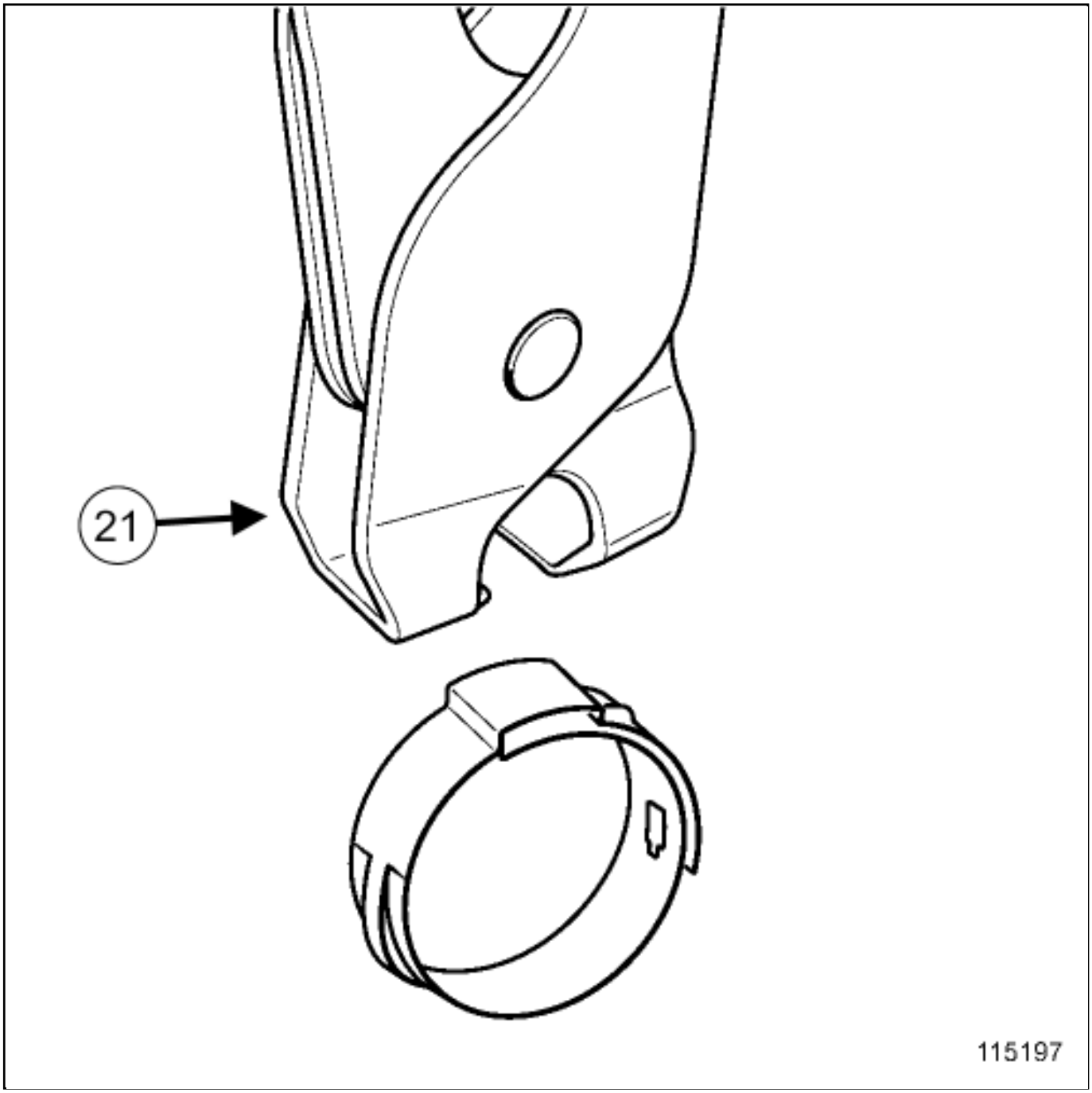
Check that the gaiter lip is correctly positioned in the groove of the driveshaft.



Insert a smooth rod with a rounded end between the driveshaft gaiter and the yoke sleeve to evenly distribute the volume of air contained inside the driveshaft gaiter.

Fit the small securing clip on the driveshaft gaiter.

Refit the big securing clip on the driveshaft gaiter.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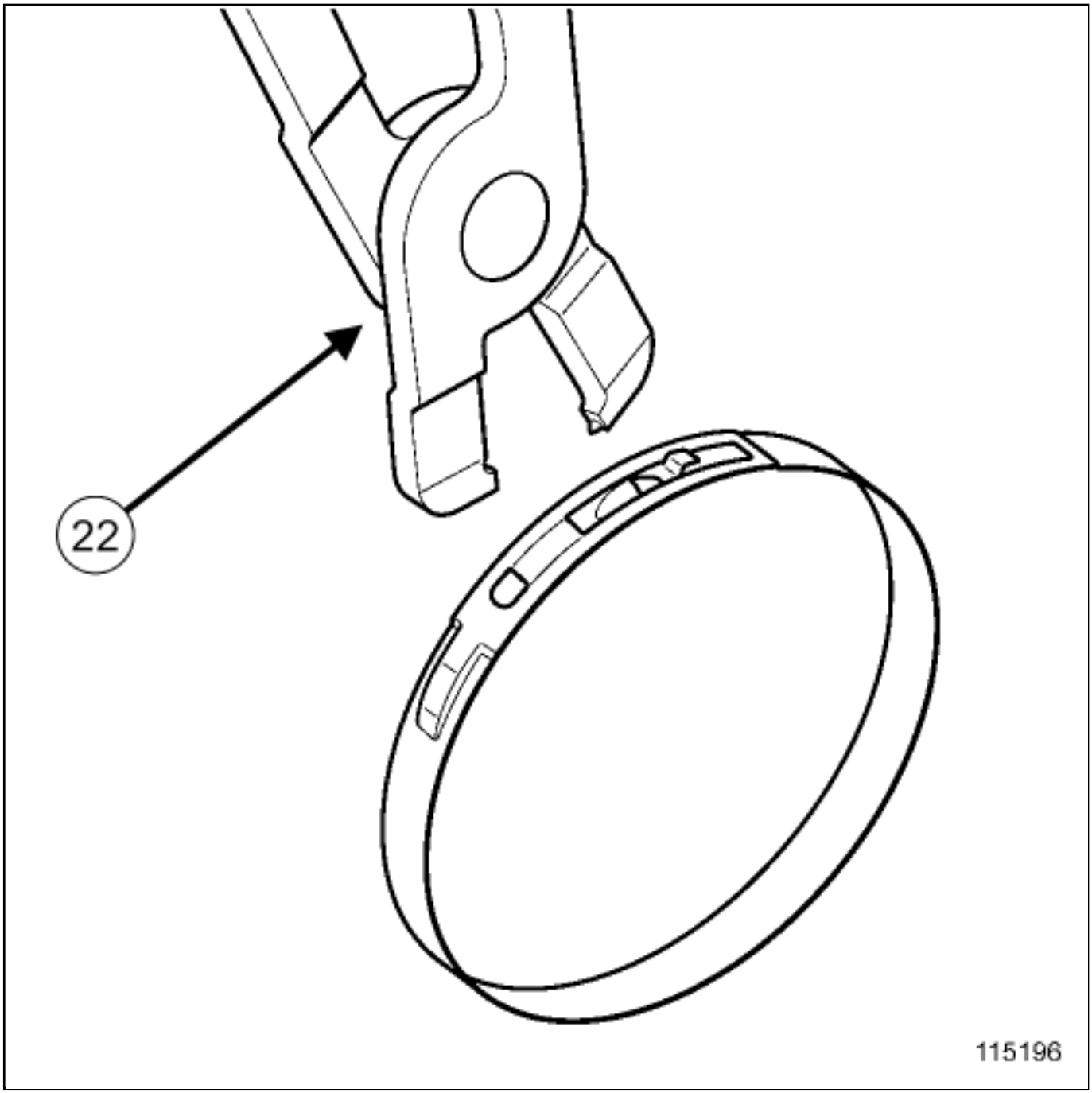


Tighten the clips using the toolType clip pliers for driveshafts with a thermoplastic gaiter.(Tav. 1168) (21) for clic clips or the toolPliers for the driveshaft gaiter collar.(Tav. 1784) (22) for profile end clips.

3. FINAL OPERATION

Refit a new left-hand differential output seal Differential output seal: Removal - Refitting .

Refit:

- the front left-hand driveshaft (see 29A, Driveshafts , Front left-hand driveshaft: Removal - Refitting) ,
- the front left-hand wheel Wheel: Removal - Refitting .

Fill up the gearbox Manual gearbox oils: Draining - Filling or Automatic gearbox oil: Draining - Filling .

Refit the engine undertray.

FRONT LEFT-HAND DRIVESHAFT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Ball joint extractor.	Tav. 476
Pin extractor tool.	Emb. 880
Universal driveshaft push back tool (plate and claws without ram).	Tav. 1050-04
Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.	Tav. 1420-01

parts always to be replaced:
Differential output seal

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 29A, Driveshafts , Driveshaft: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

CAUTION

In order to prevent irreversible damage to the front hub bearing:

- Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
- Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the front left-hand wheel Wheel: Removal - Refitting ,
- the engine undertray bolts,
- the engine undertray.

Drain the gearbox Manual gearbox oils: Draining - Filling or Automatic gearbox oil: Draining - Filling .

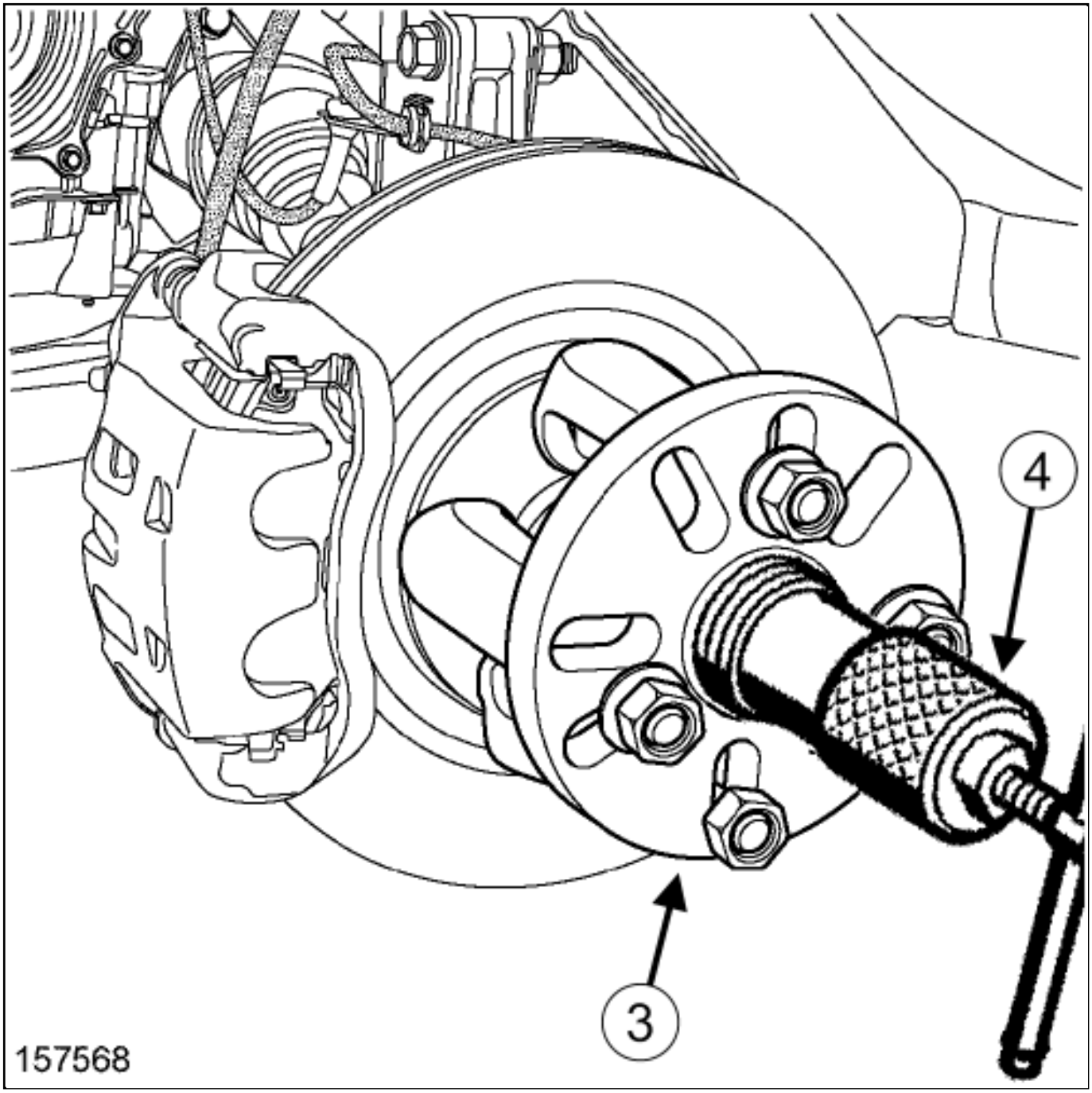
2. REMOVAL OPERATION

Unclip Front brake calliper assembly: Exploded view :

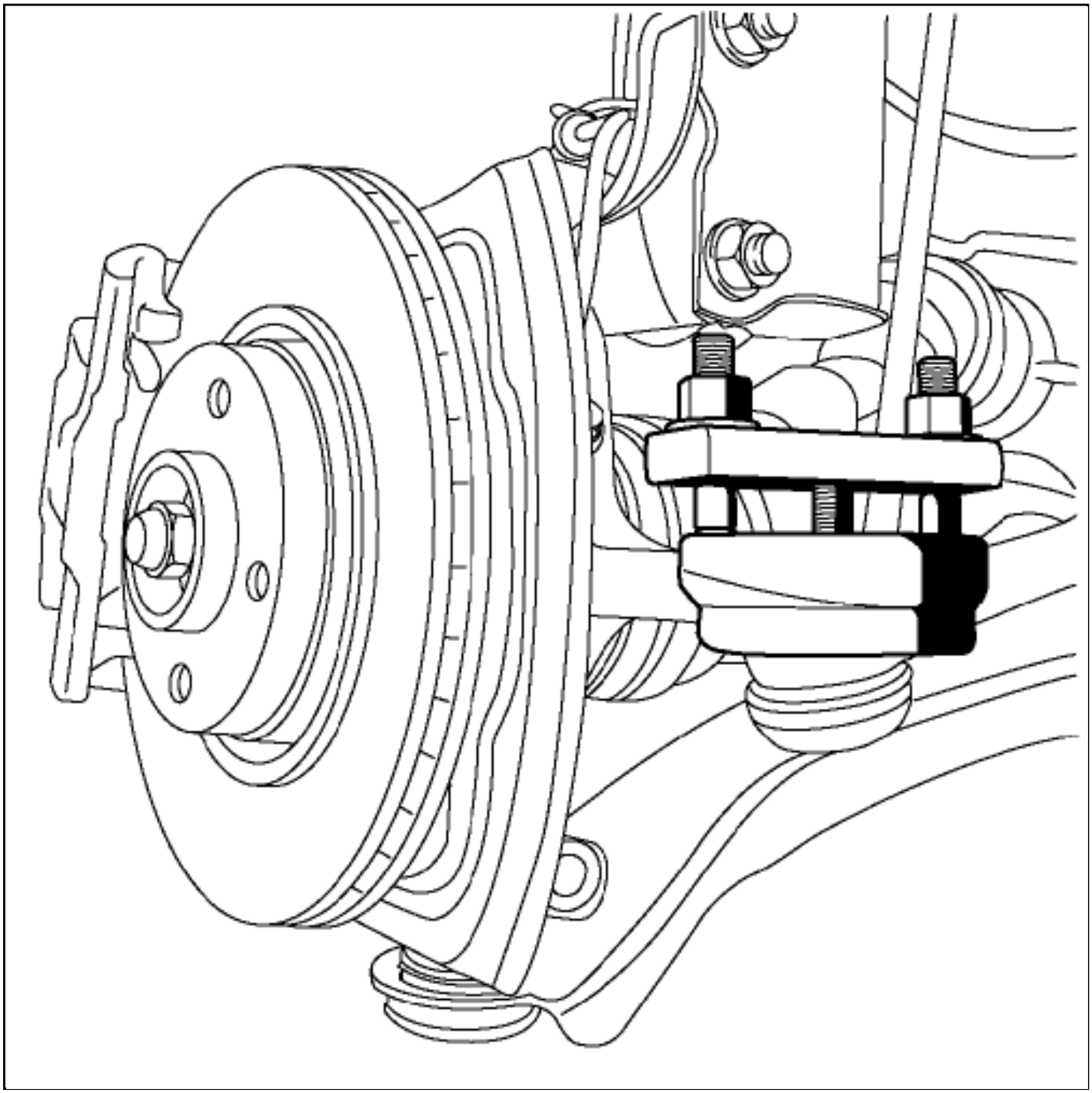
- the front left-hand brake hose on the shock absorber base,
- the wiring of the front left-hand wheel speed sensor.

Remove:

- the driveshaft nut Front hub carrier assembly: Exploded view ,
- the track rod end nut Steering assembly: Exploded view .

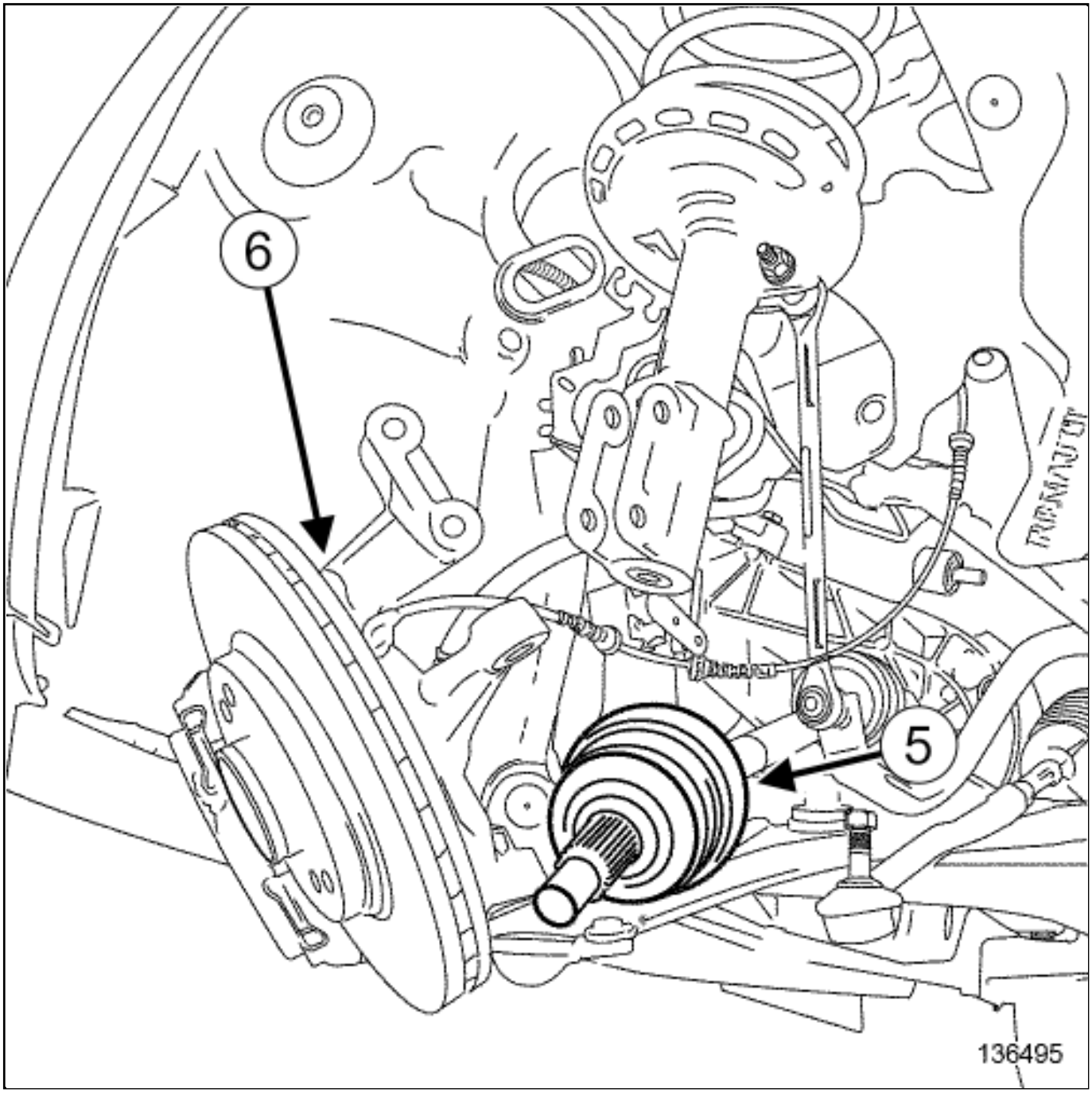


- Push back the front left-hand driveshaft from the stub axle carrier using the toolsUniversal driveshaft push back tool (plate and claws without ram).(Tav. 1050-04) (3) and Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) (4) .

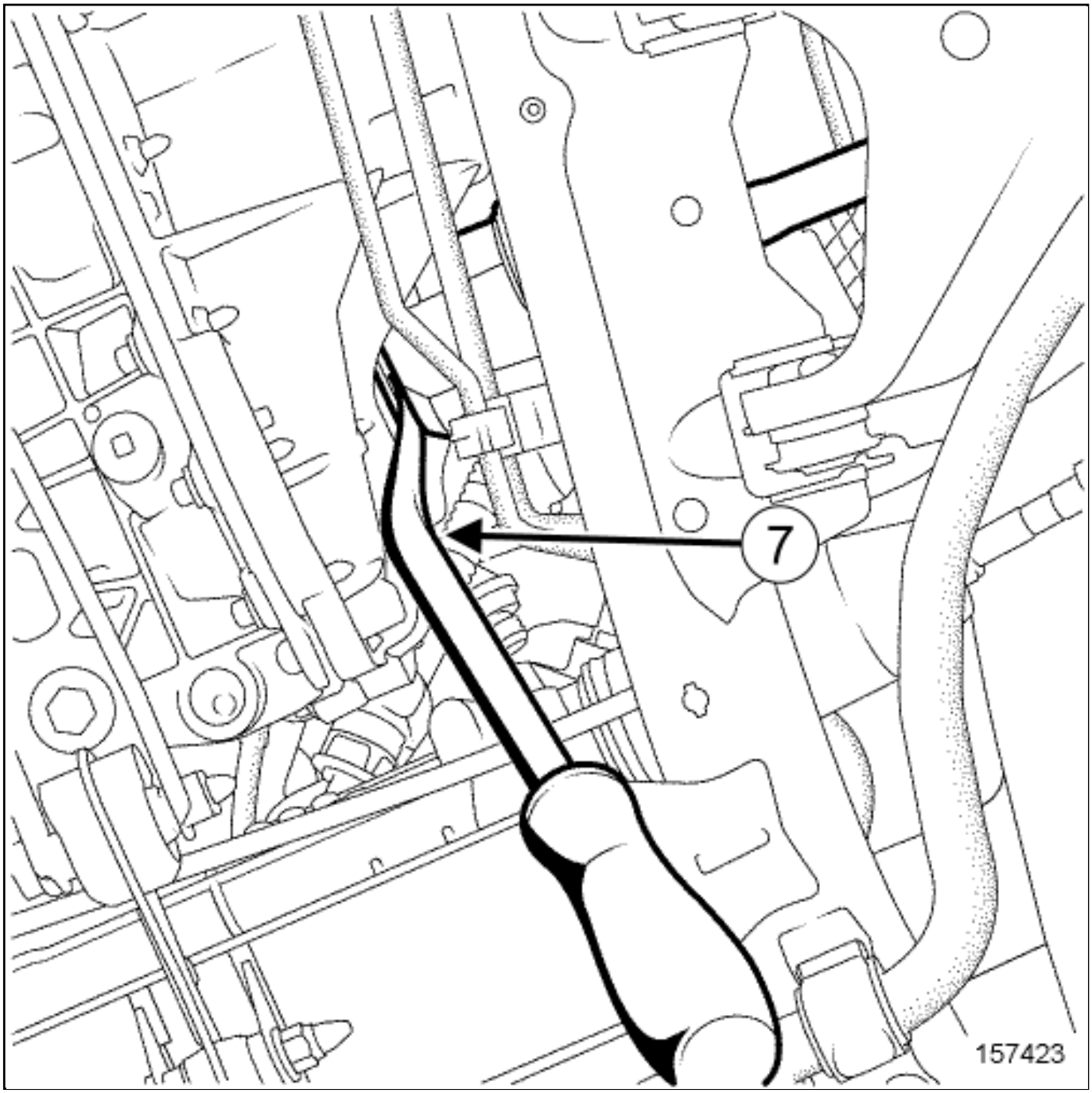


- Detach the track rod end using theBall joint extractor.(Tav. 476) .

- Remove the shock absorber base boltsFront axle assembly: Exploded view .



- Extract the front left-hand driveshaft(5) from the hub carrier(6) by pivoting the hub carrier.



Detach the front left-hand driveshaft from gearbox using a lever(7) .

Remove:

- the front left-hand driveshaft,
- the left-hand differential output seal**Differential output seal: Removal - Refitting** .

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: **Differential output seal** .

2. REFITTING OPERATION

Refit the left-hand differential output seal **Differential output seal: Removal - Refitting** .

Position and fit the front left-hand driveshaft into the gearbox.

Insert the front left-hand driveshaft into the hub carrier.

Refit:

- the shock absorber base bolts **Front axle assembly: Exploded view** ,
- the track rod end nut **Steering assembly: Exploded view** ,
- the driveshaft nut **Front hub carrier assembly: Exploded view** .

Clip **Front brake calliper assembly: Exploded view** :

- the front left-hand brake hose on the shock absorber base,
- the wiring of the front left-hand wheel speed sensor.

Proceed in the reverse order to removal.

Fill up the gearbox **Manual gearbox oils: Draining - Filling** or **Automatic gearbox oil: Draining - Filling** .

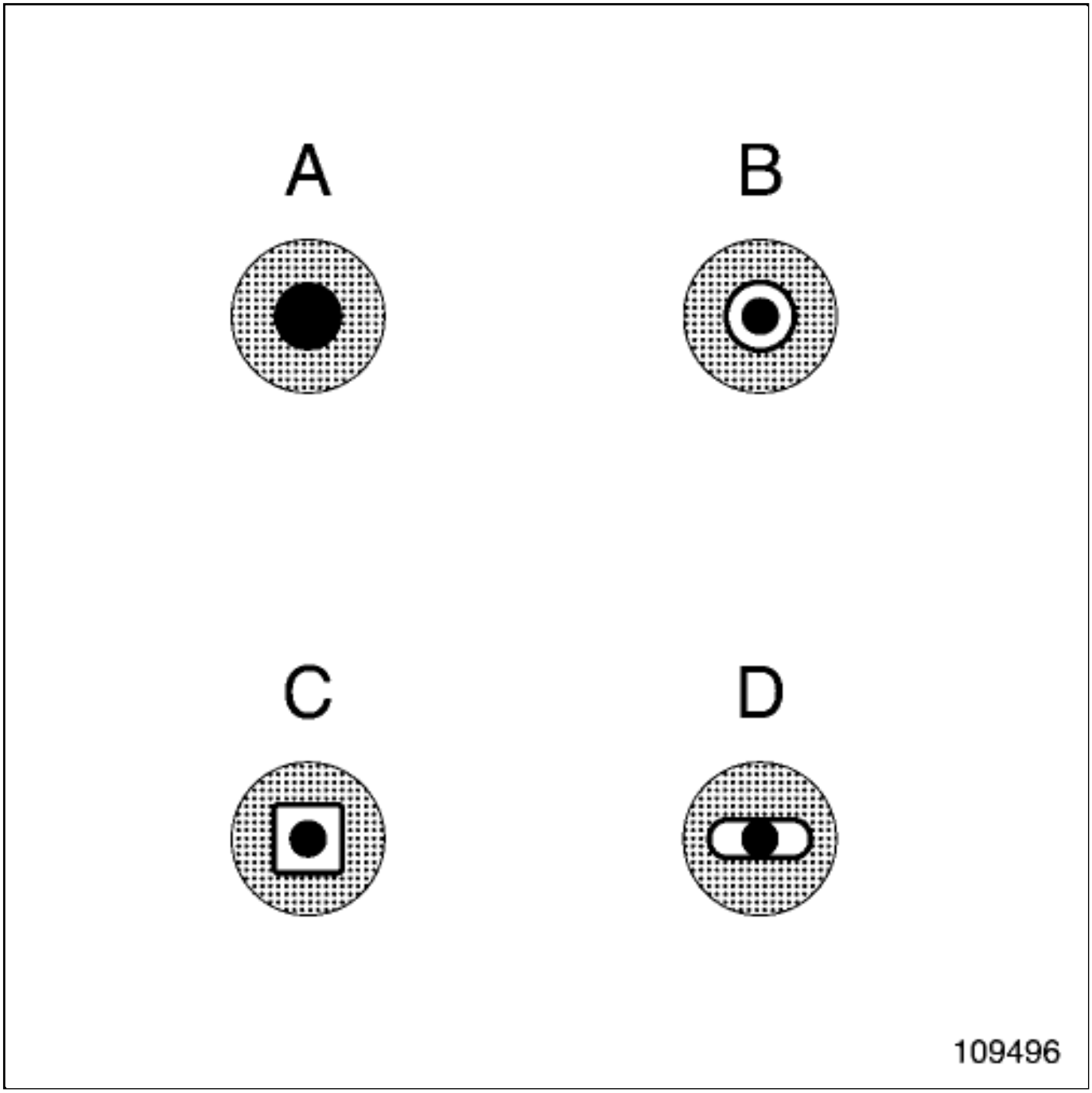
FRONT OPENING ELEMENT: ADJUSTMENT

Location and specifications (tightening torques, parts always to be replaced, etc.)Exterior body front trim assembly: Exploded view .

ADJUSTMENT

- For all information about bonnet adjustment valuesVehicle panel gaps: Adjustment value .

- There are two options for adjusting the bonnet:
  - by means of the bonnet bolts,
  - by means of the bonnet hinge bolts.

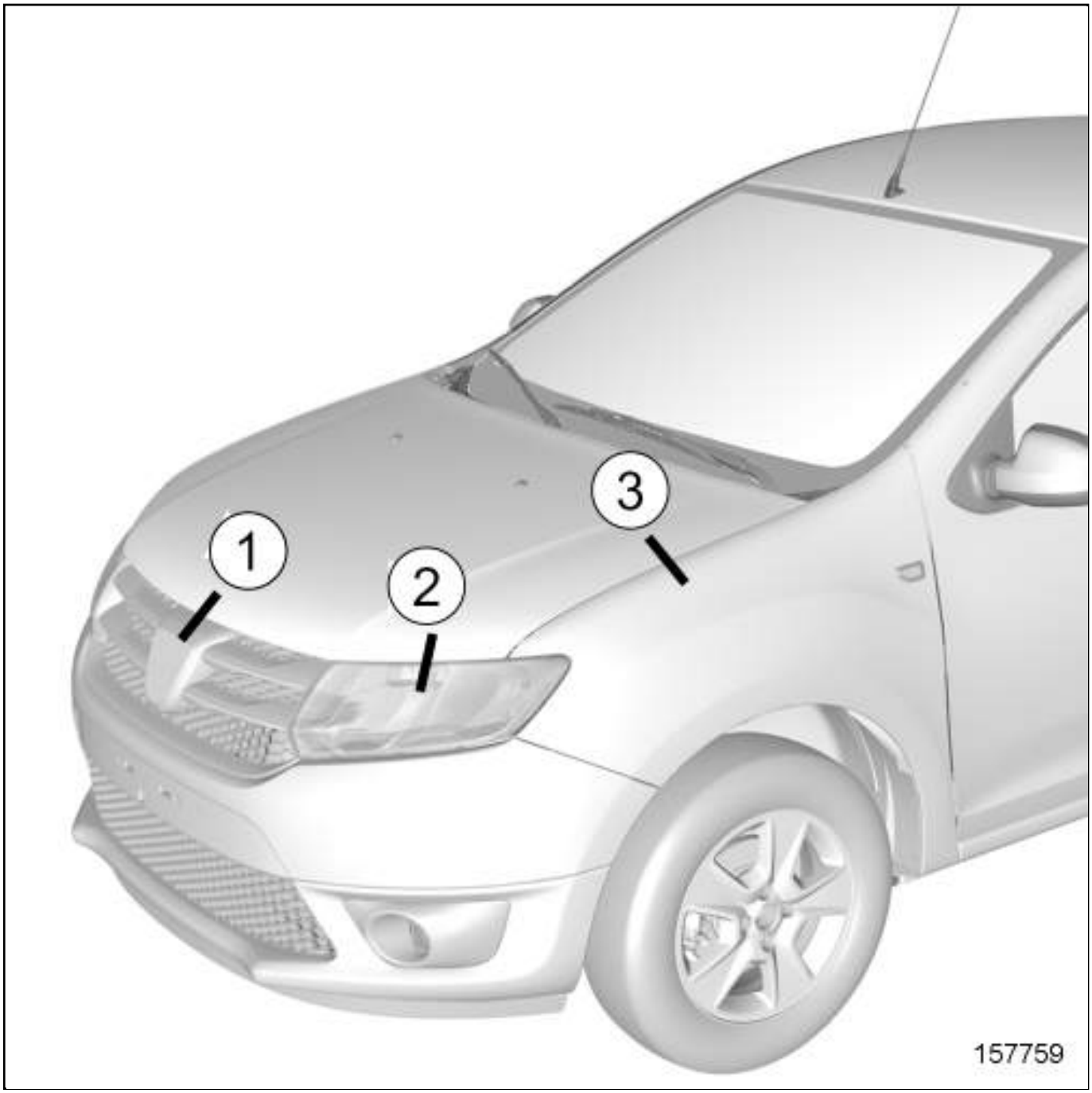


- Symbols A, B, C and D show the adjustment options.

The black dot in the centre represents the body of the bolt.

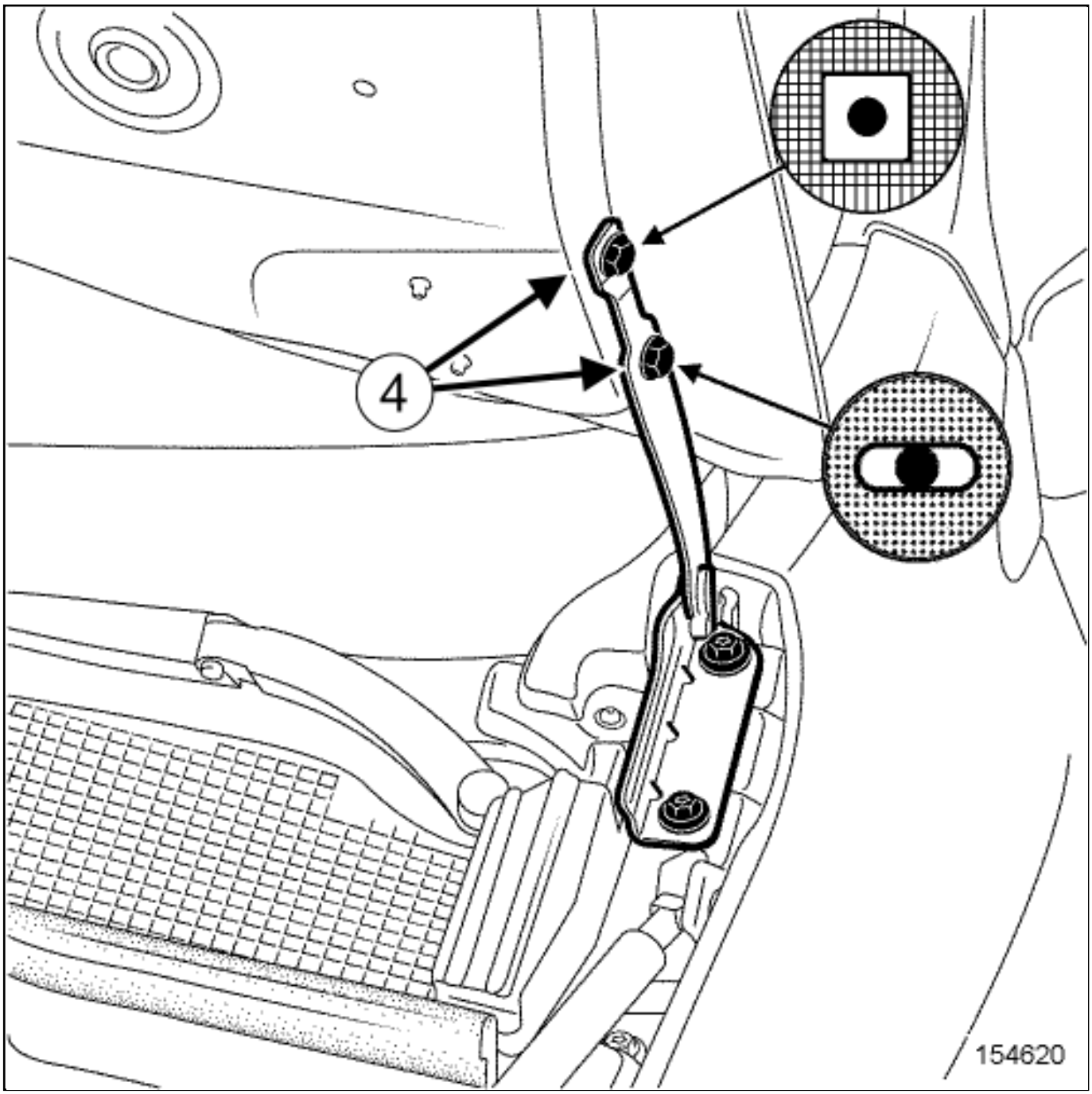
The grey section represents the component to be adjusted.

The white section represents the adjustment area.



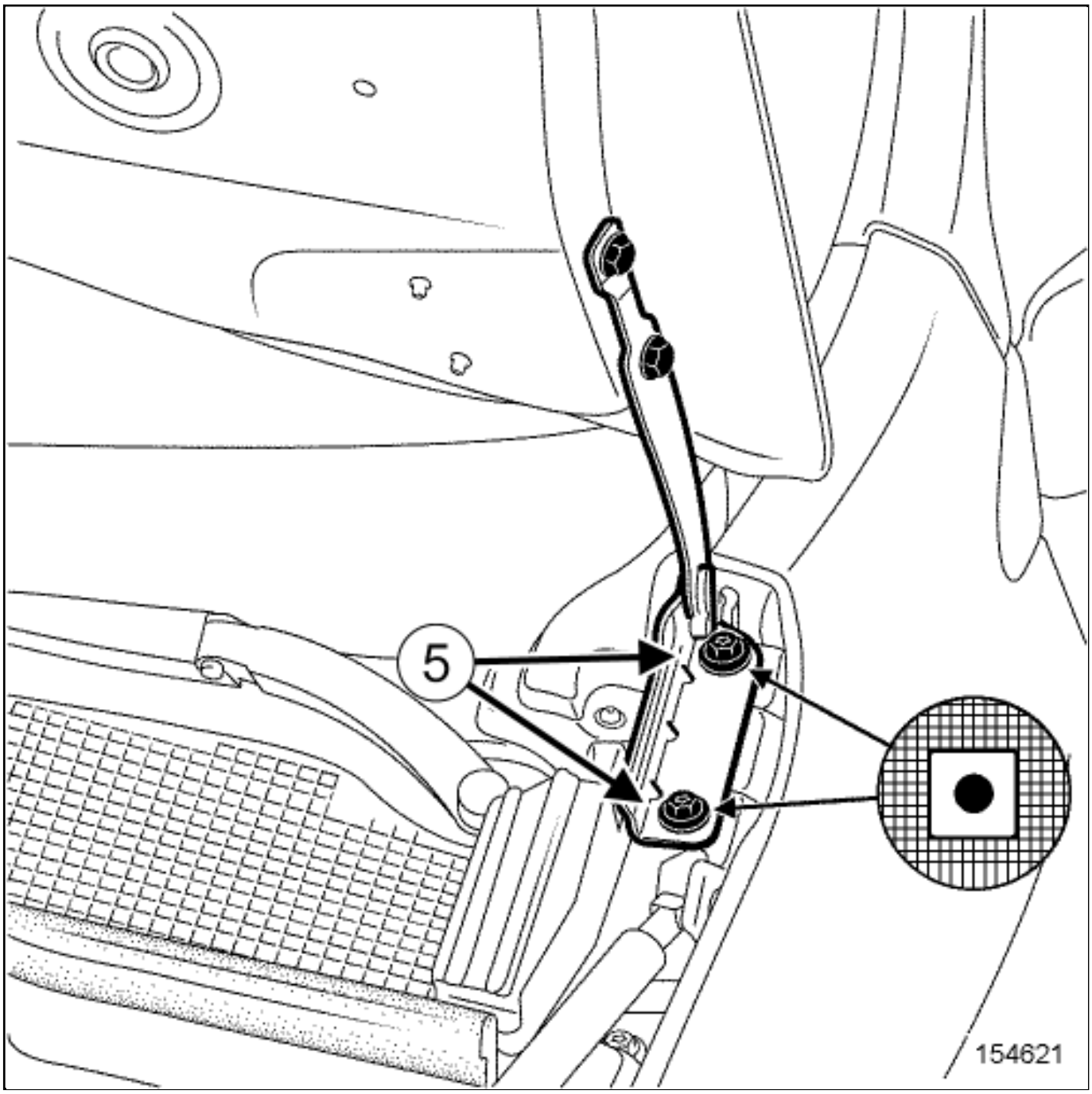
- Observe the adjustment sequence(1) , (2) and (3) .

1. ADJUSTMENT BY MEANS OF THE BONNET BOLTS



- Loosen the bonnet bolts(4) .
- Adjust the gaps and flush fittings of the bonnet.
- Tighten the bonnet bolts.

2. ADJUSTMENT BY MEANS OF THE BONNET HINGE BOLTS



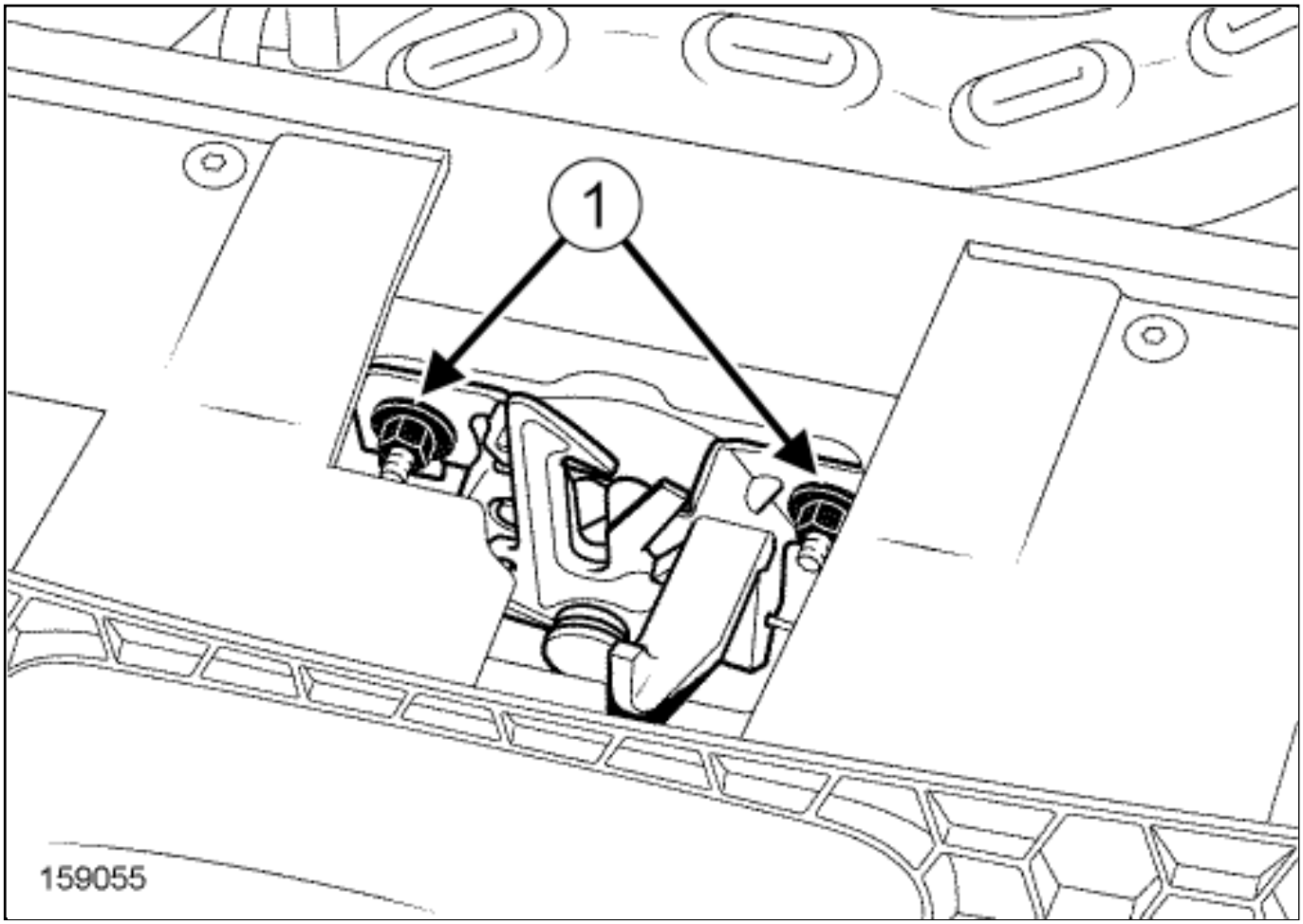
- Loosen the bonnet hinge bolts(5) .
- Adjust the bonnet panel gaps.
- Tighten the bonnet hinge bolts.

XSL version : 3.02 du 22/07/11

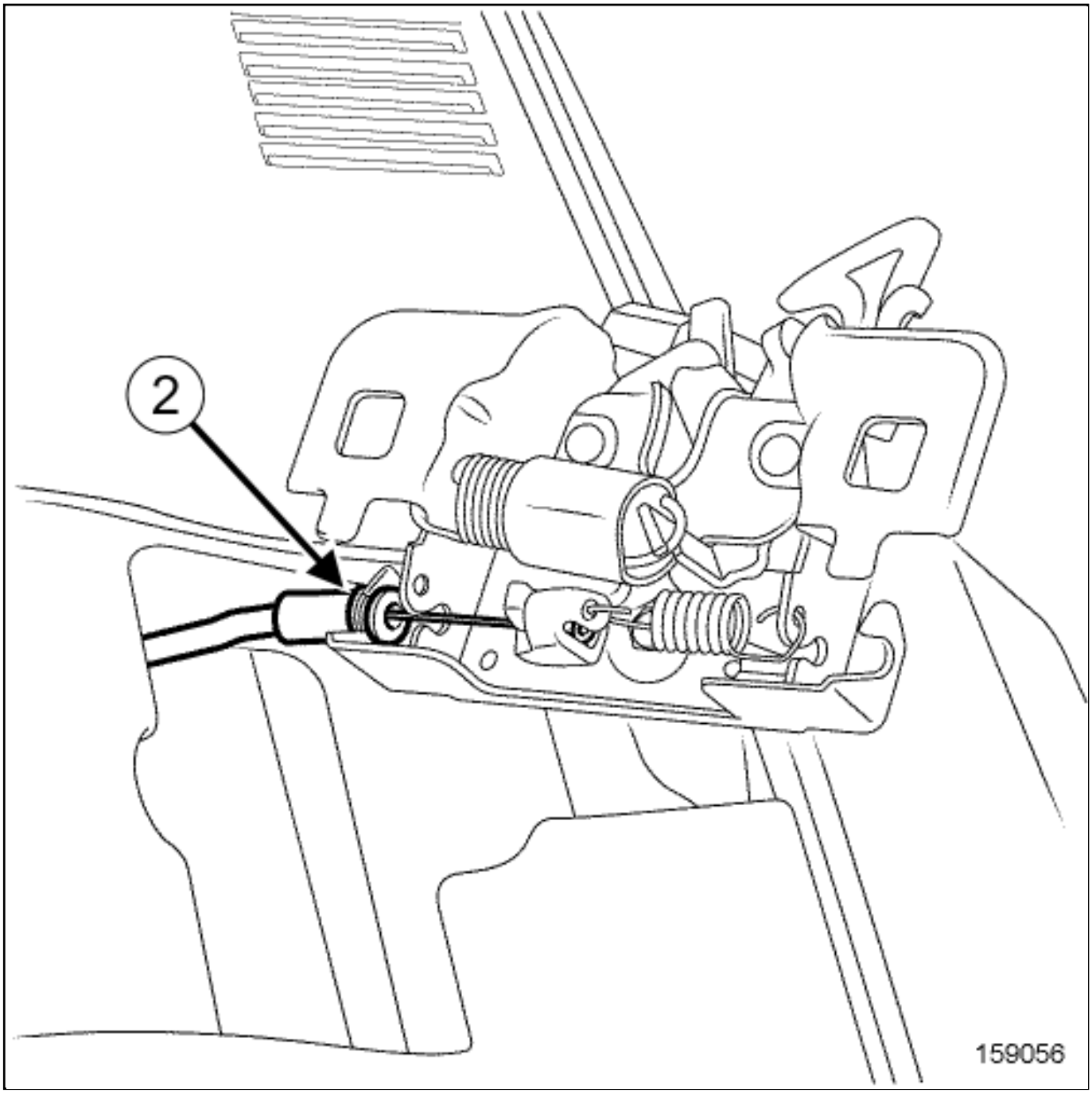
FRONT OPENING ELEMENT LOCK: REMOVAL - REFITTING

REMOVAL

1. REMOVAL OPERATION



- Remove the nuts(1) .



- Remove :
  - the bonnet release cable(**2**) ,
  - the bonnet catch.

REFITTING

- Proceed in the reverse order to removal.
- Torque tighten the bonnet catch nuts21 N.m.

- Carry out a function test.

XSL version : 3.02 du 22/07/11

FRONT OPENING ELEMENT: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced etc.)**Exterior body front trim assembly: Exploded view** .

REMOVAL

1. REMOVAL PREPARATION OPERATION

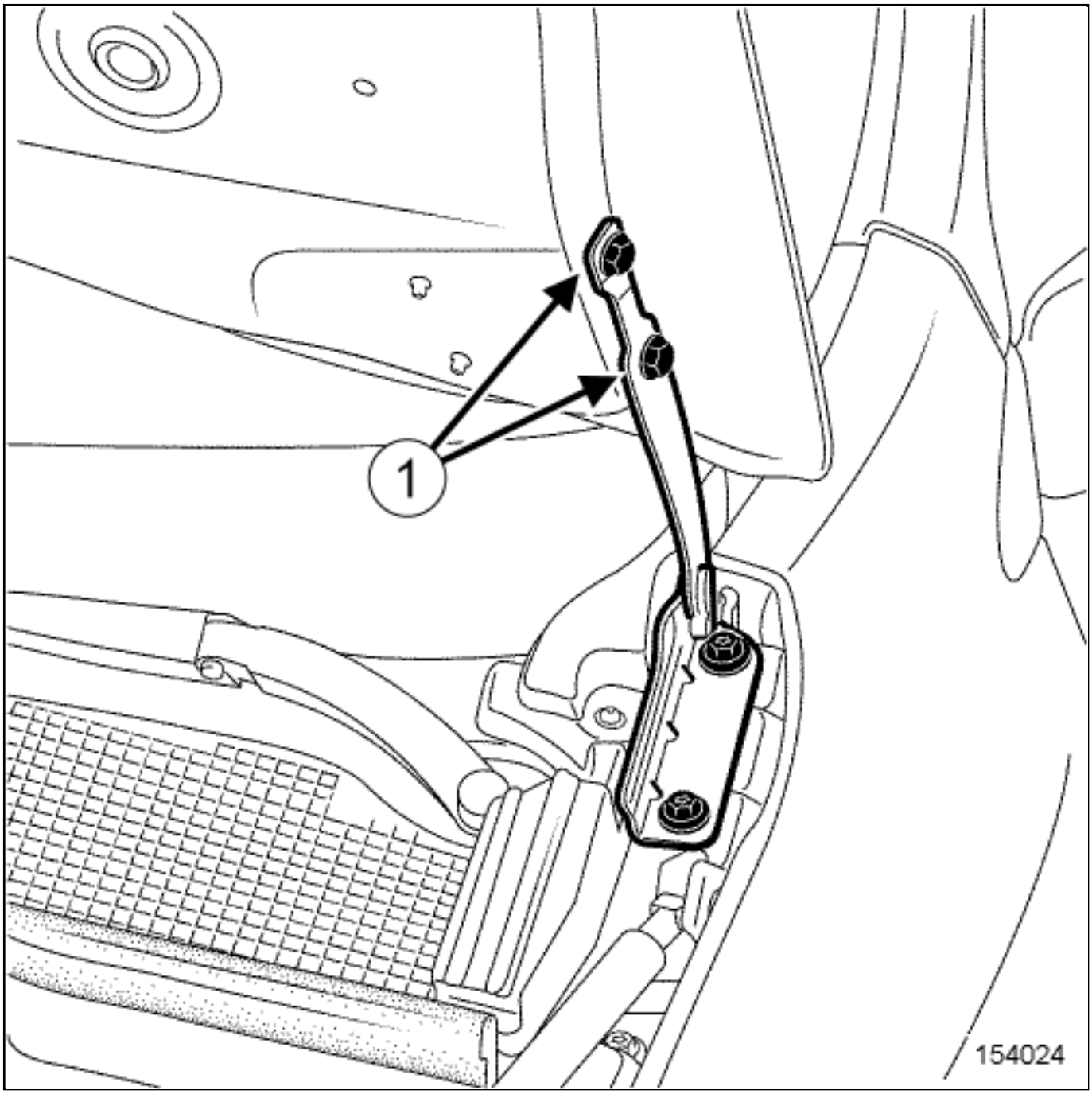
- Remove:
  - the bonnet soundproofing (depending on the equipment level),
  - the bonnet strut(see **Bonnet strut: Removal - Refitting**) .

- Disconnect the screen washer pipes.

- Unclip the screen washer pipes.

2. OPERATION FOR REMOVAL OF PART CONCERNED

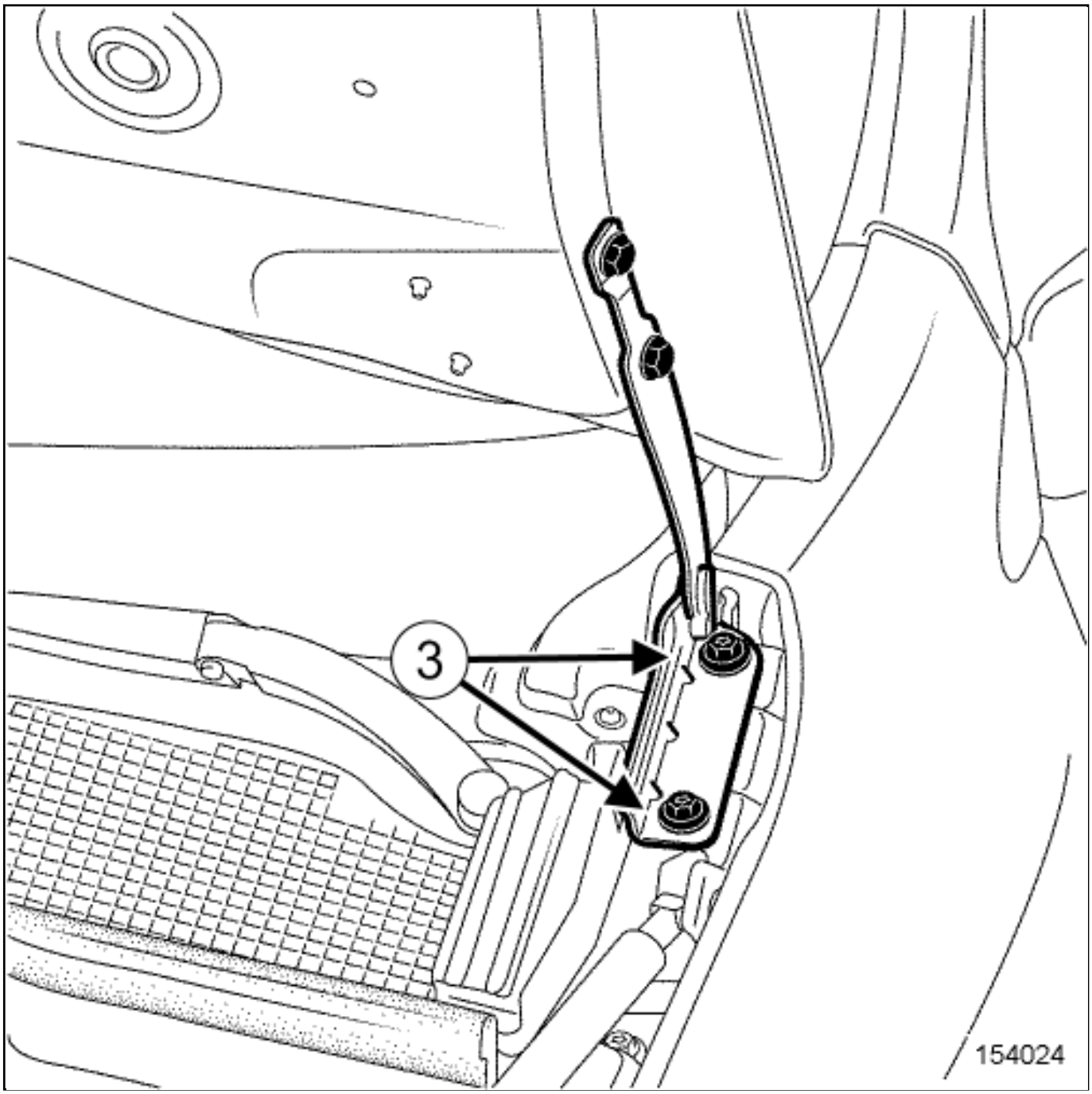
1- REMOVAL BY MEANS OF THE BONNET BOLTS



Remove:

- the bolts(1) ,
- the front opening element (this operation requires two people).

2- REMOVAL BY MEANS OF THE BONNET HINGE BOLTS



- Remove:
  - the bolts(3) ,
  - the front opening element (this operation requires two people).

REFITTING

- Proceed in the reverse order to removal.

- Adjust the opening clearances and flush fitting(see 48A, Non-side opening elements, Front opening element:

Adjustment) .

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XSL version : 3.02 du 22/07/11

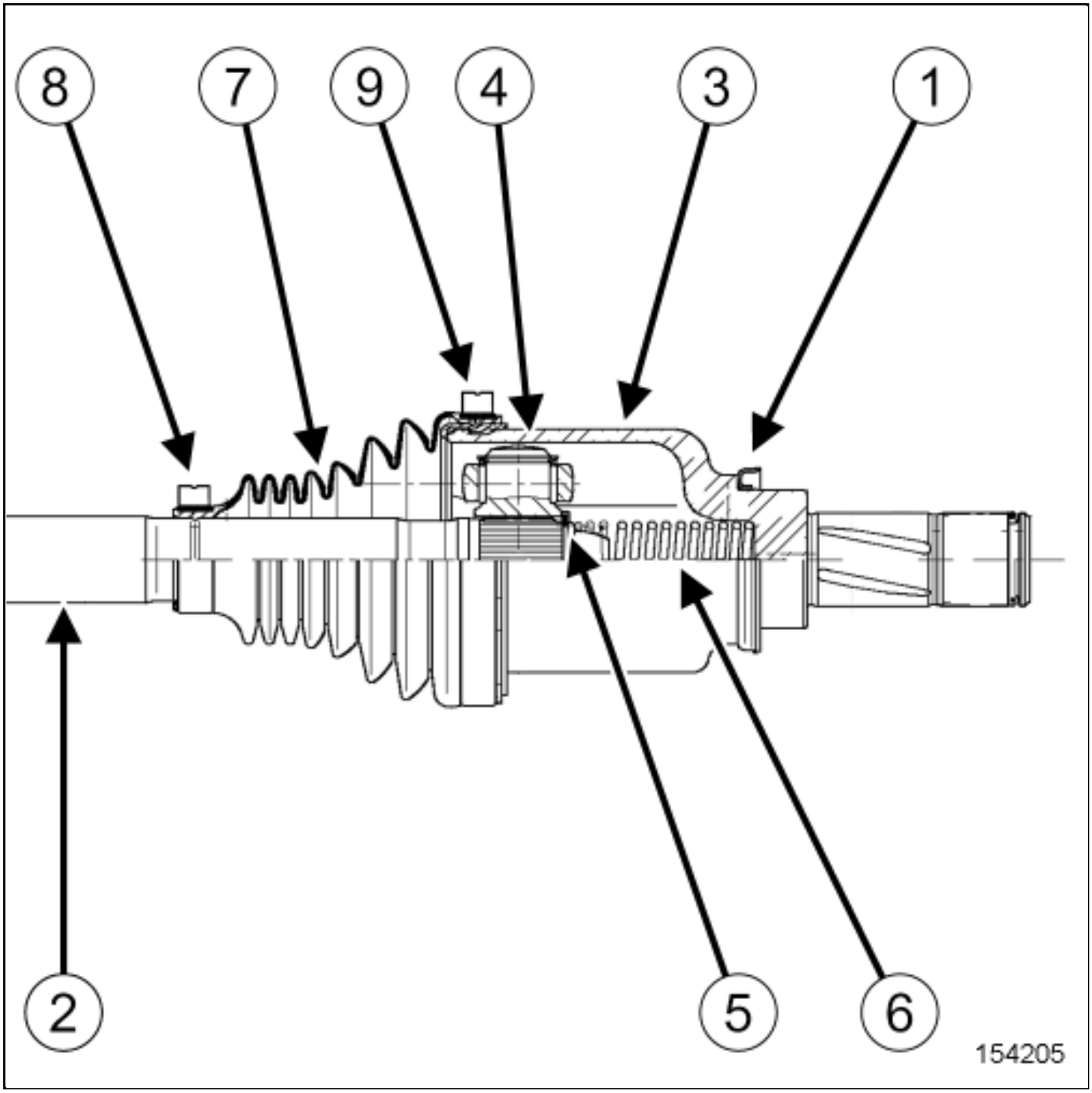
FRONT RIGHT-HAND DRIVESHAFT GAITER, GEARBOX SIDE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Type clip pliers for driveshafts with a thermoplastic gaiter.	Tav. 1168
Pliers for the driveshaft gaiter collar.	Tav. 1784

Equipment required
parts washer

parts always to be replaced:
Front right-hand driveshaft gaiter, gearbox side
gearbox side front driveshaft seal locking ring



(1) Deflector

(2) Driveshaft

(3) Driveshaft yoke sleeve

(4) Spider

(5) Lock ring

(6) Spring

(7) Driveshaft gaiter

(8) Small securing clip

(9) Big securing clip

WARNING

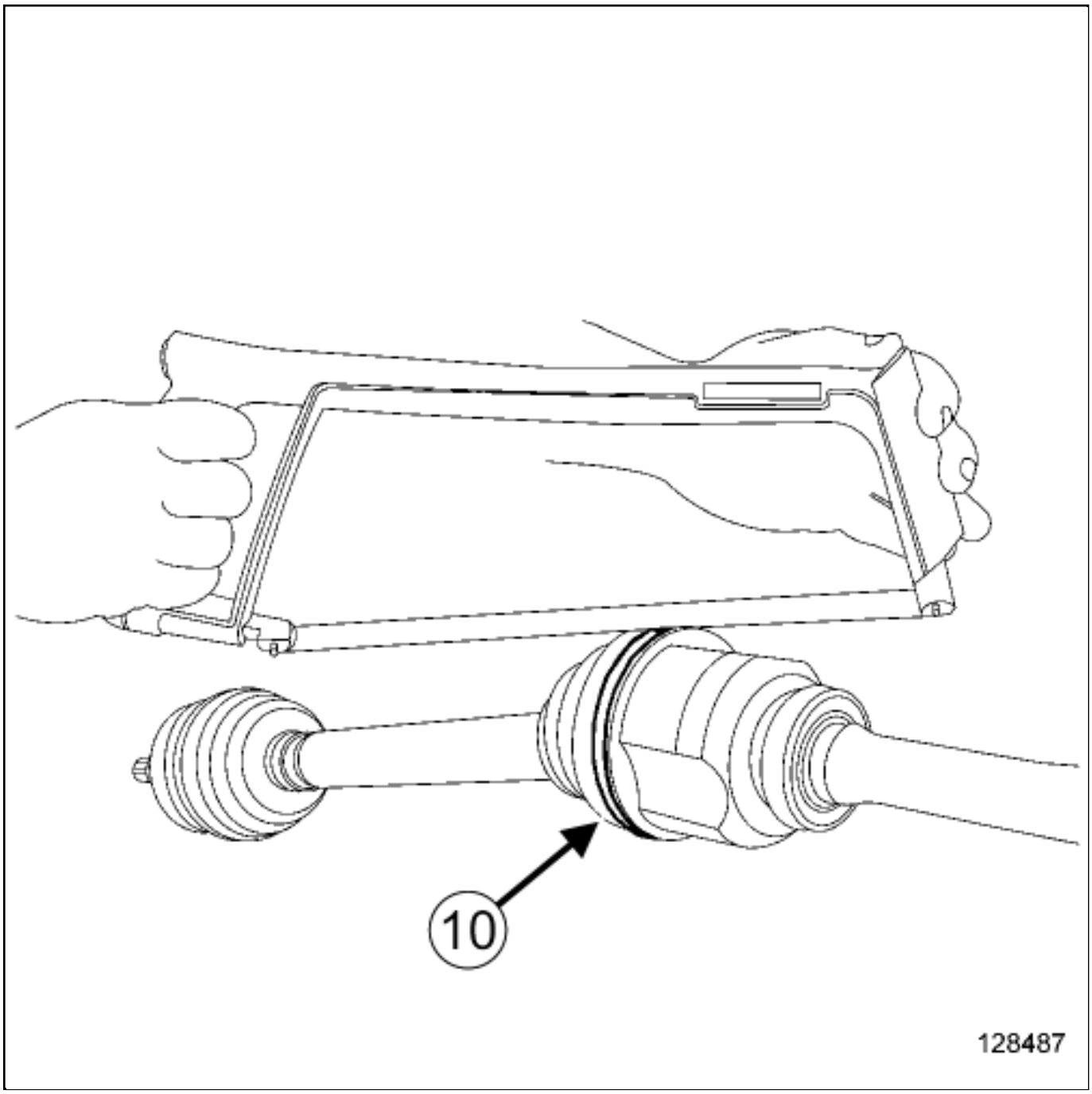
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove
  - the engine undertray bolts,
  - the engine undertray.
- Drain the gearbox Manual gearbox oils: Draining - Filling or Automatic gearbox oil: Draining - Filling .
- Remove:
  - the front right-hand wheel Wheel: Removal - Refitting ,
  - the front right-hand wheel driveshaft (see 29A, Driveshafts , Front right-hand driveshaft: Removal - Refitting) .
- Remove the differential output seal Differential output seal: Removal - Refitting .

2. REMOVAL OPERATION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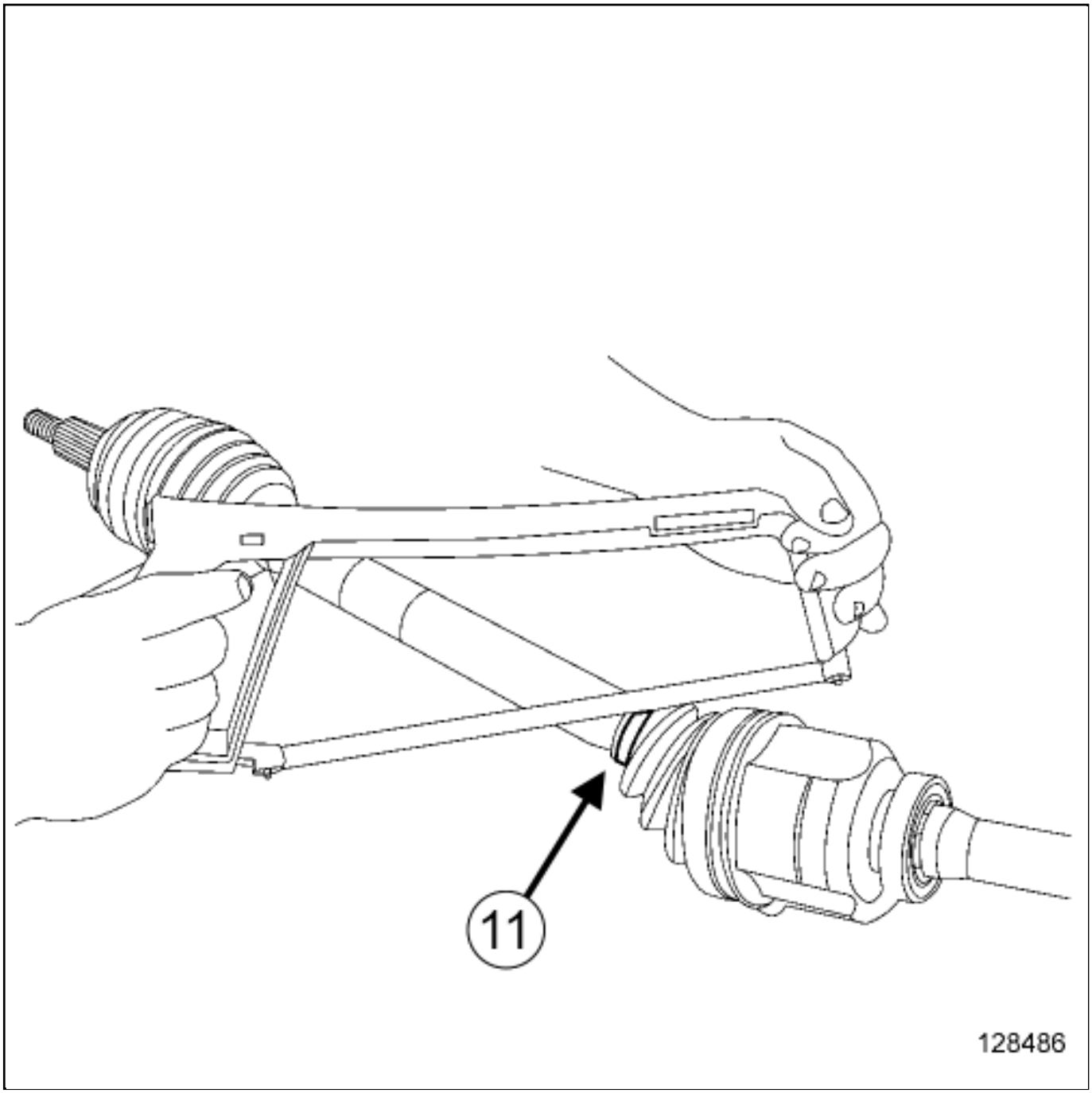
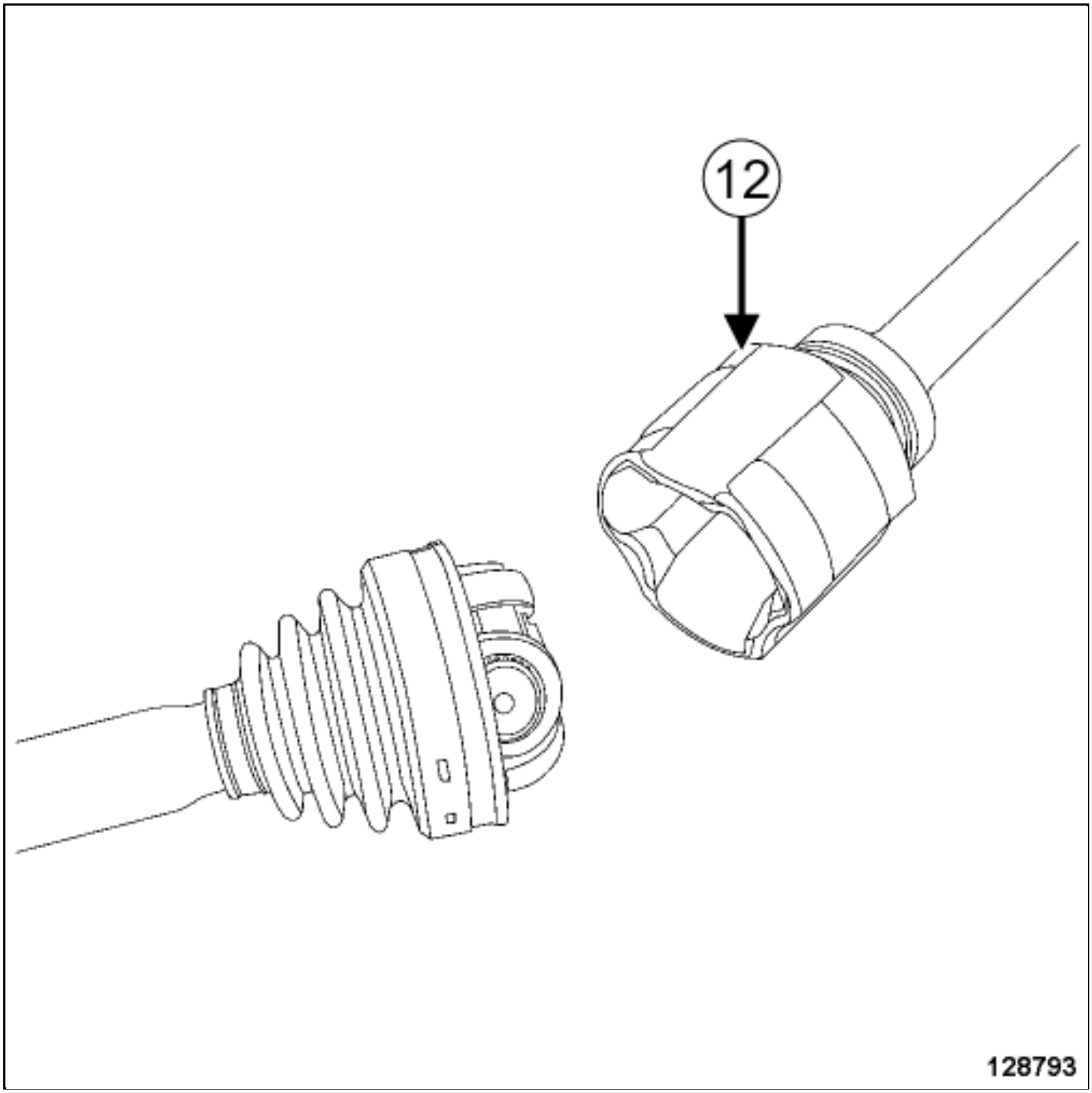


- Cut the big securing clip(10) and the small securing clip(11) using cutting pliers or a metal saw, taking care not to damage the yoke sleeve or the driveshaft.

- Push back the driveshaft gaiter to release the driveshaft yoke sleeve.

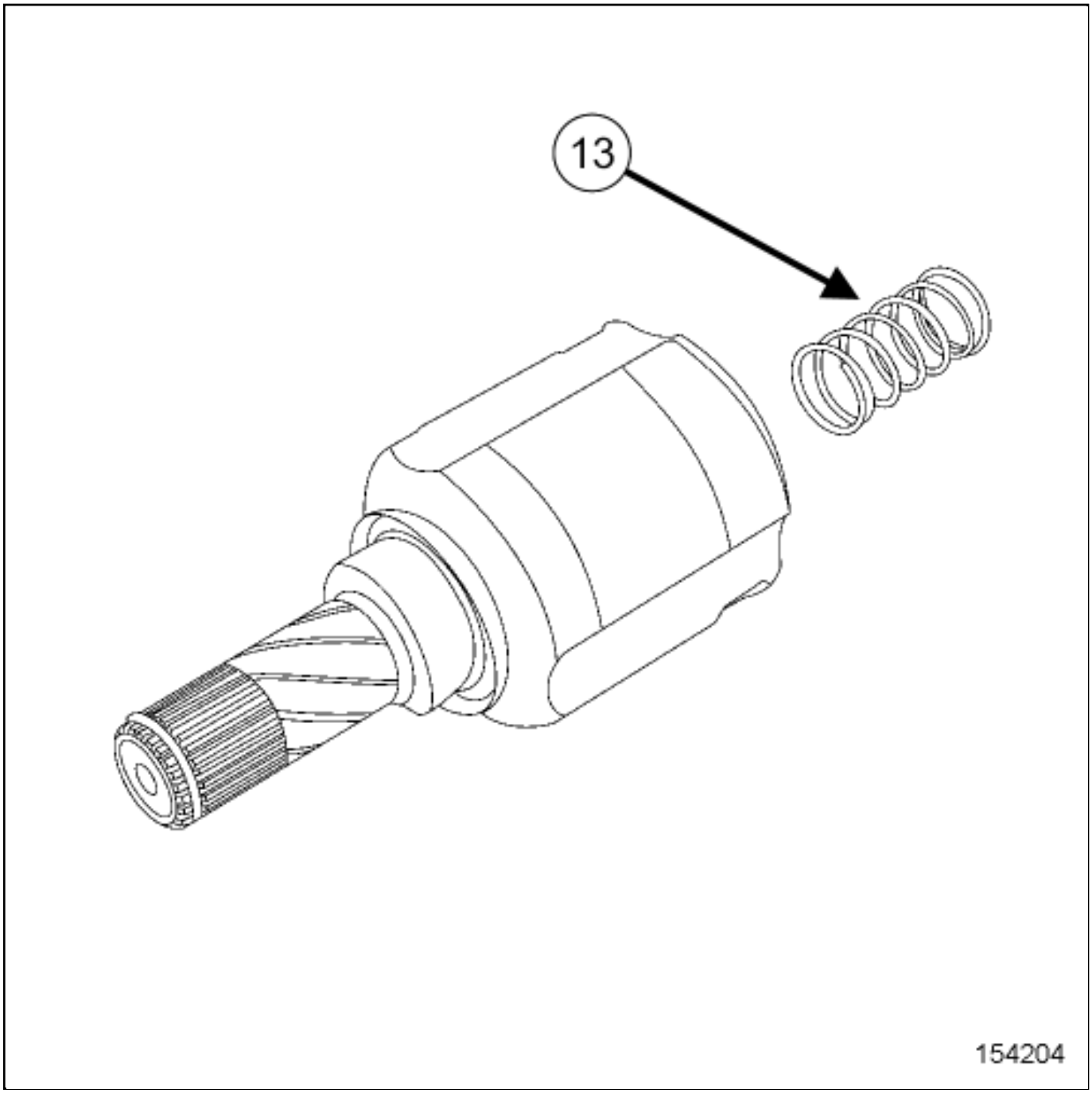


- Remove the driveshaft yoke sleeve(12) .

- Note:

■ since the driveshaft yoke sleeve does not have a stop tab, it can be removed without being forced,

■ do not remove the rollers from their respective bushings as the rollers and needles are matched and should never be interchanged.

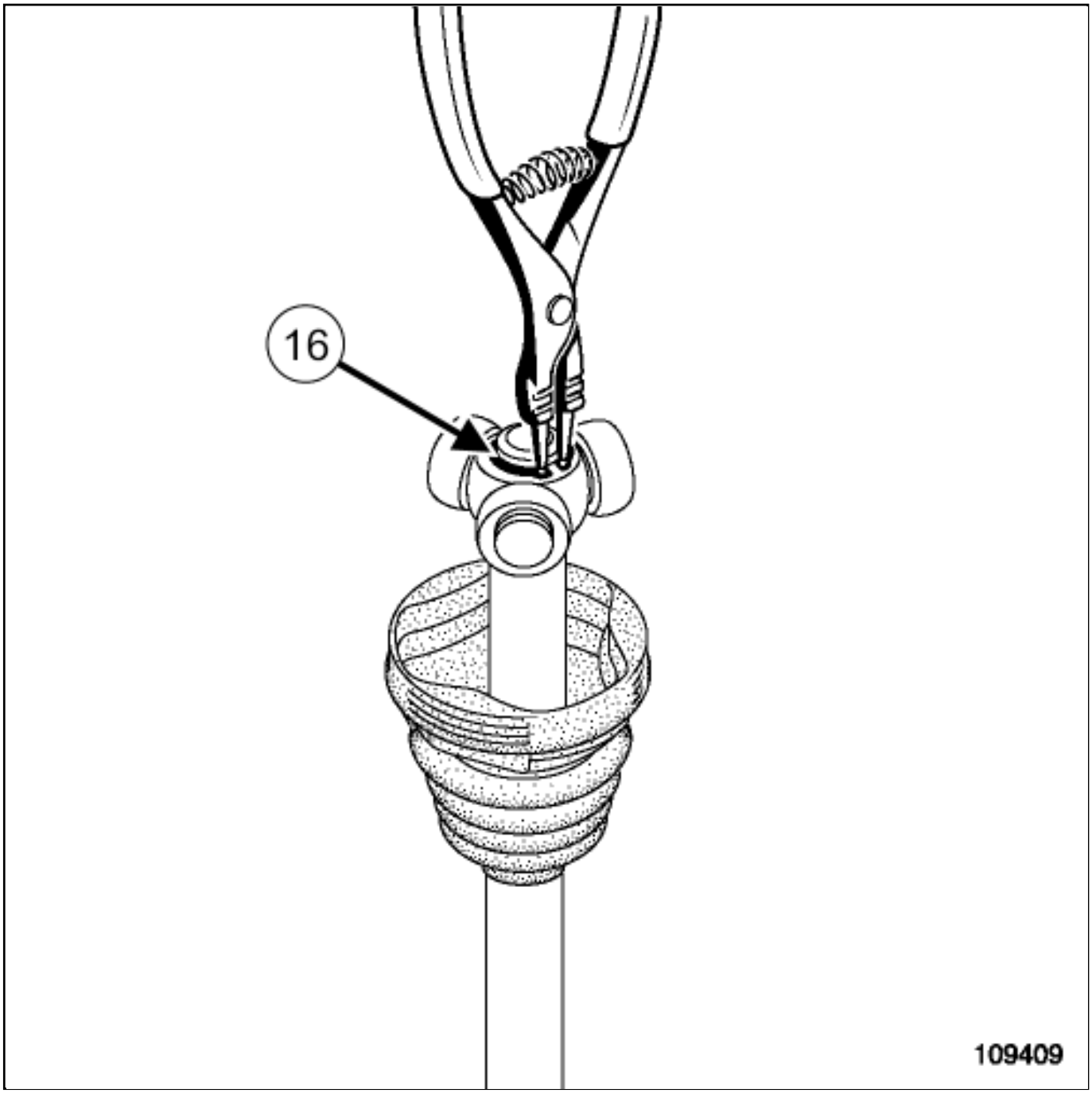


- Remove the spring(13) .

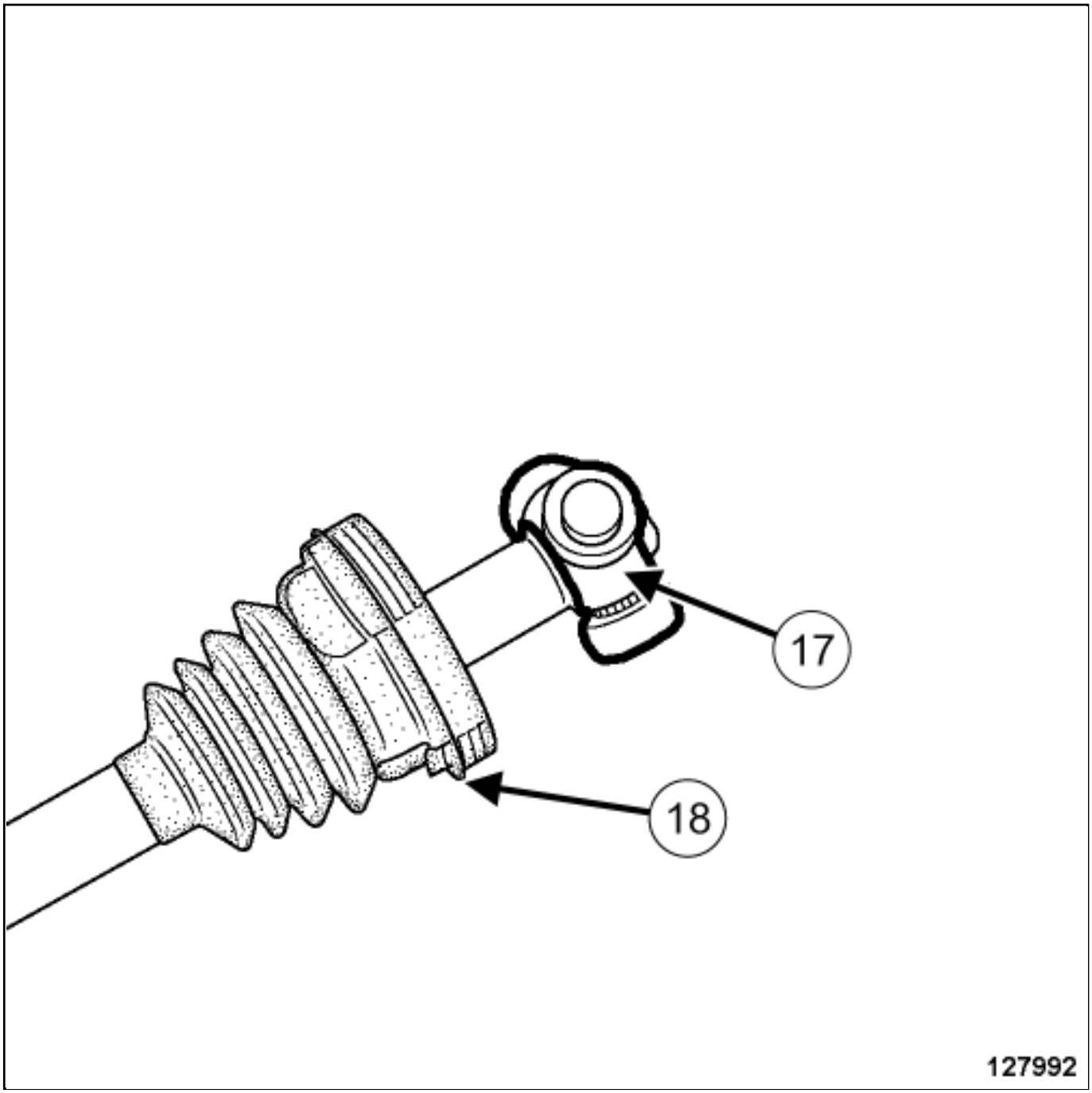
- Remove as much grease as possible from inside the yoke sleeve.

Note:

Never use thinner to remove grease.



- Remove the lock ring(16) using circlip pliers.



Note:

Mark the position of the spider before extracting it.

- Remove the spider(17) using a press and a releasing type extractor.
- Remove the driveshaft gaiter(18) from the driveshaft.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Front right-hand driveshaft gaiter, gearbox side.

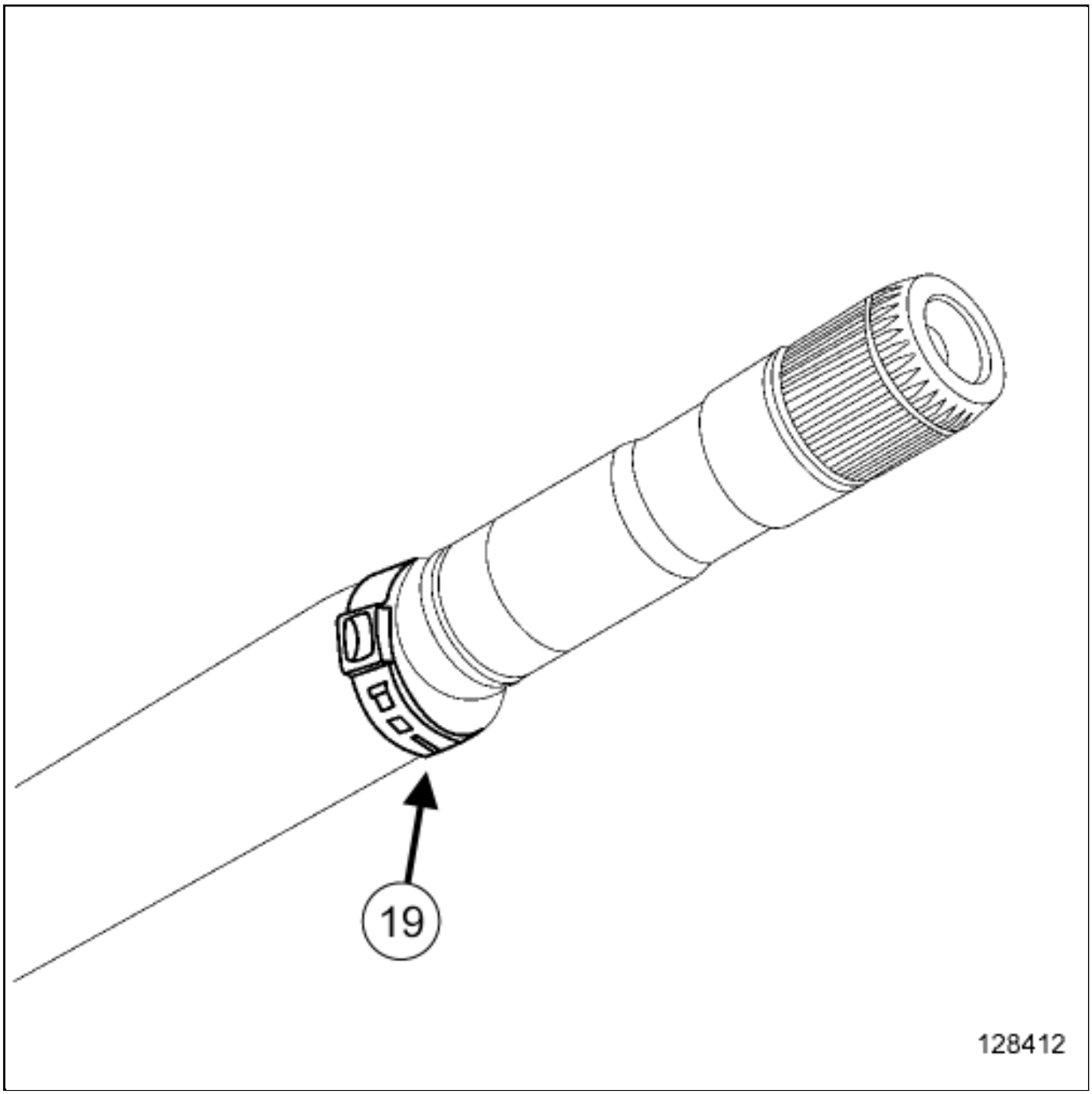
parts always to be replaced: gearbox side front driveshaft seal locking ring.

Always replace:

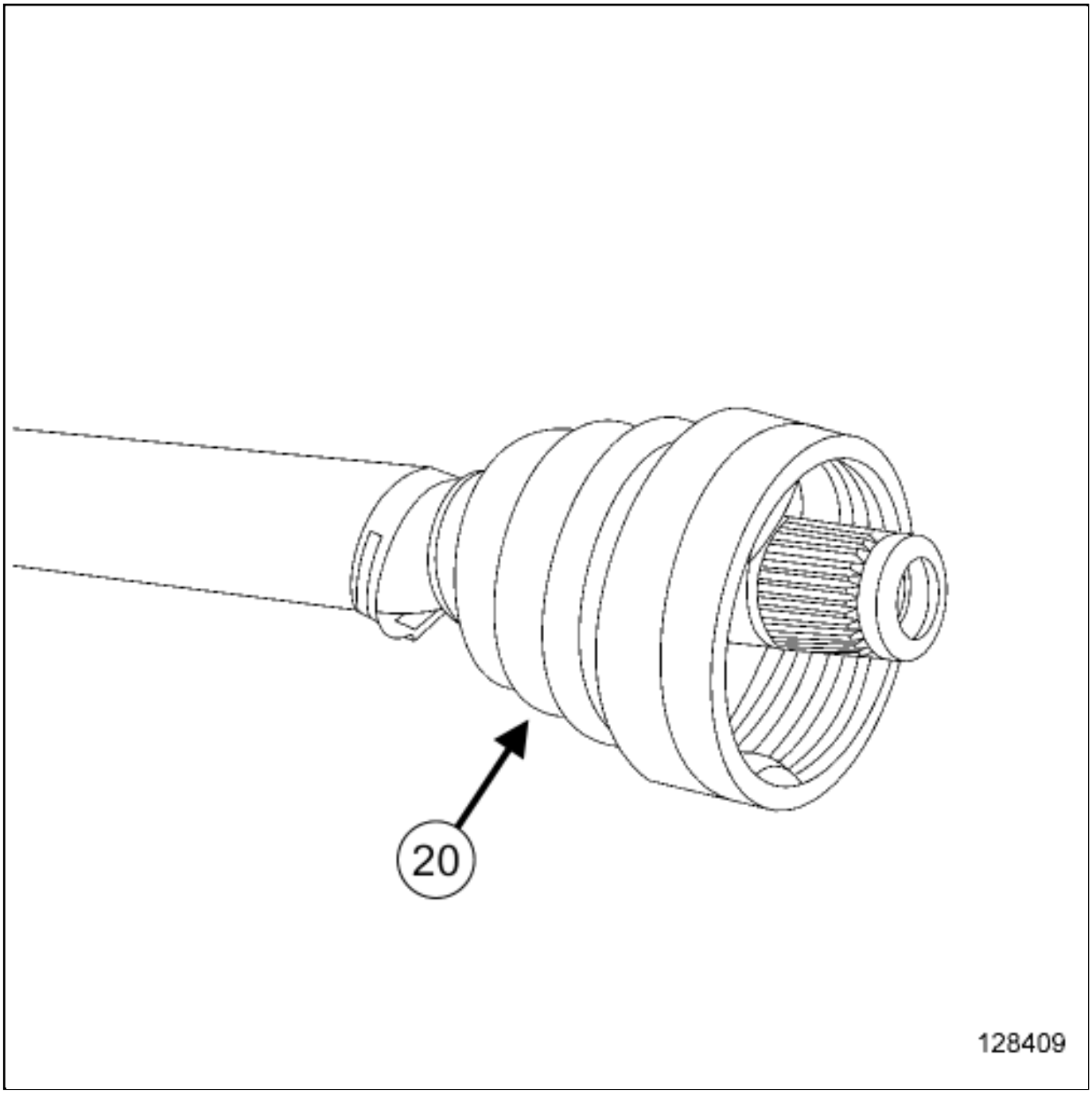
- the big securing clip,
- the small securing clip.

Use a parts washer to clean the driveshaft, the spider and the driveshaft yoke sleeve.

2. REFITTING OPERATION

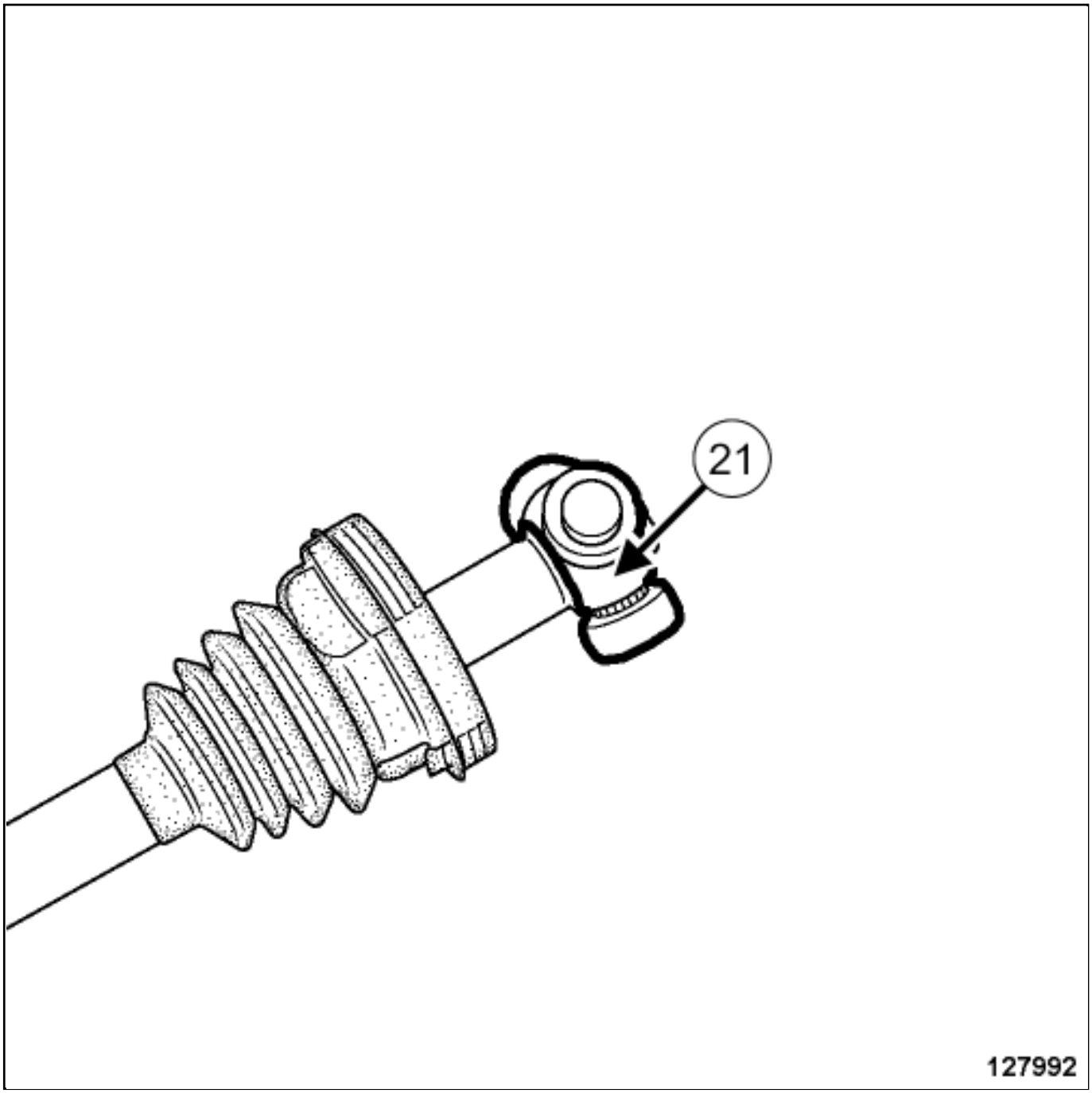


- Fit the small tightening clip(19) to the driveshaft.
- Lightly lubricate the driveshaft using the grease supplied with the gaiter to facilitate its fitting.

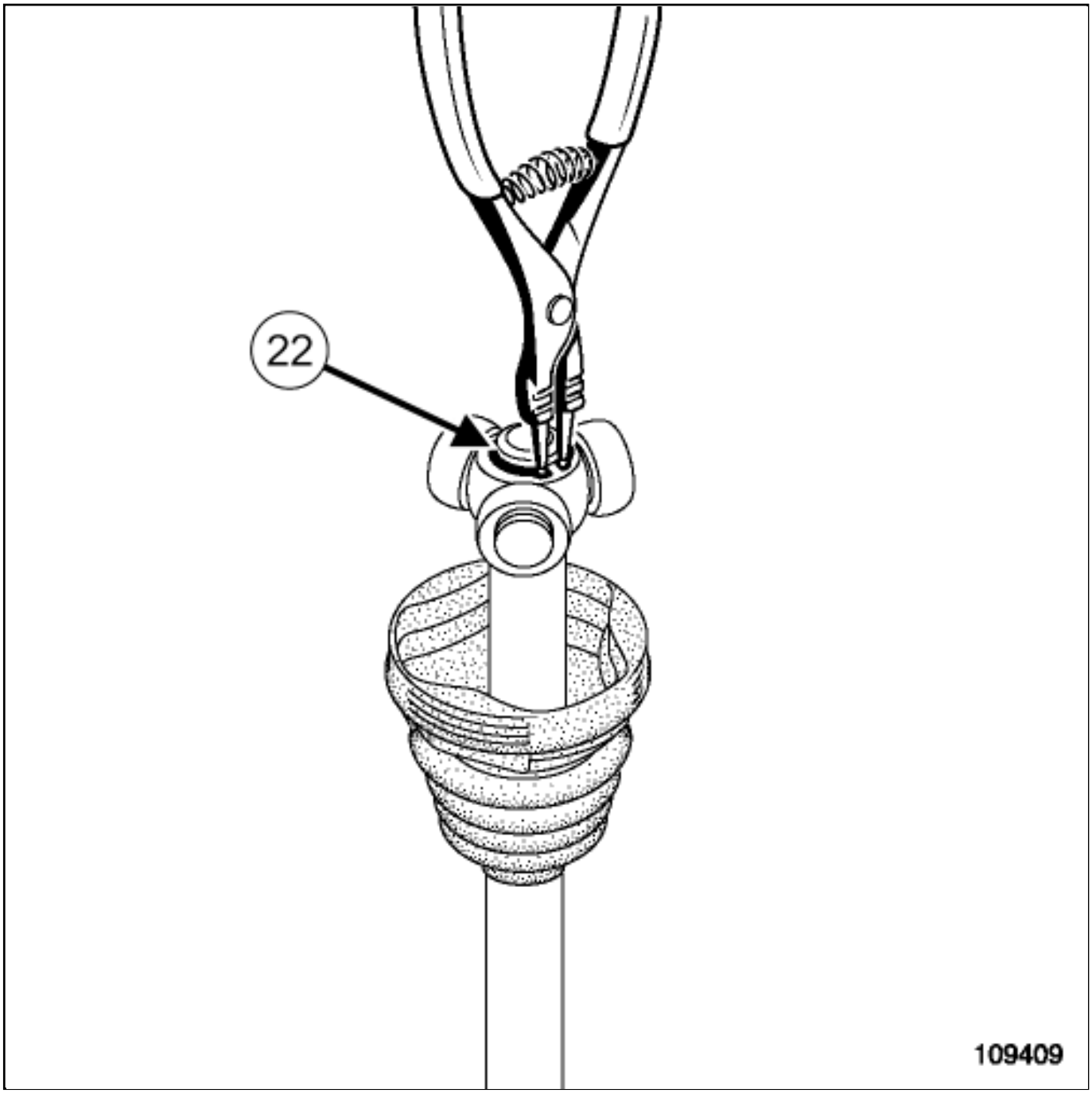


- Refit the gaiter(20) onto the driveshaft.
-

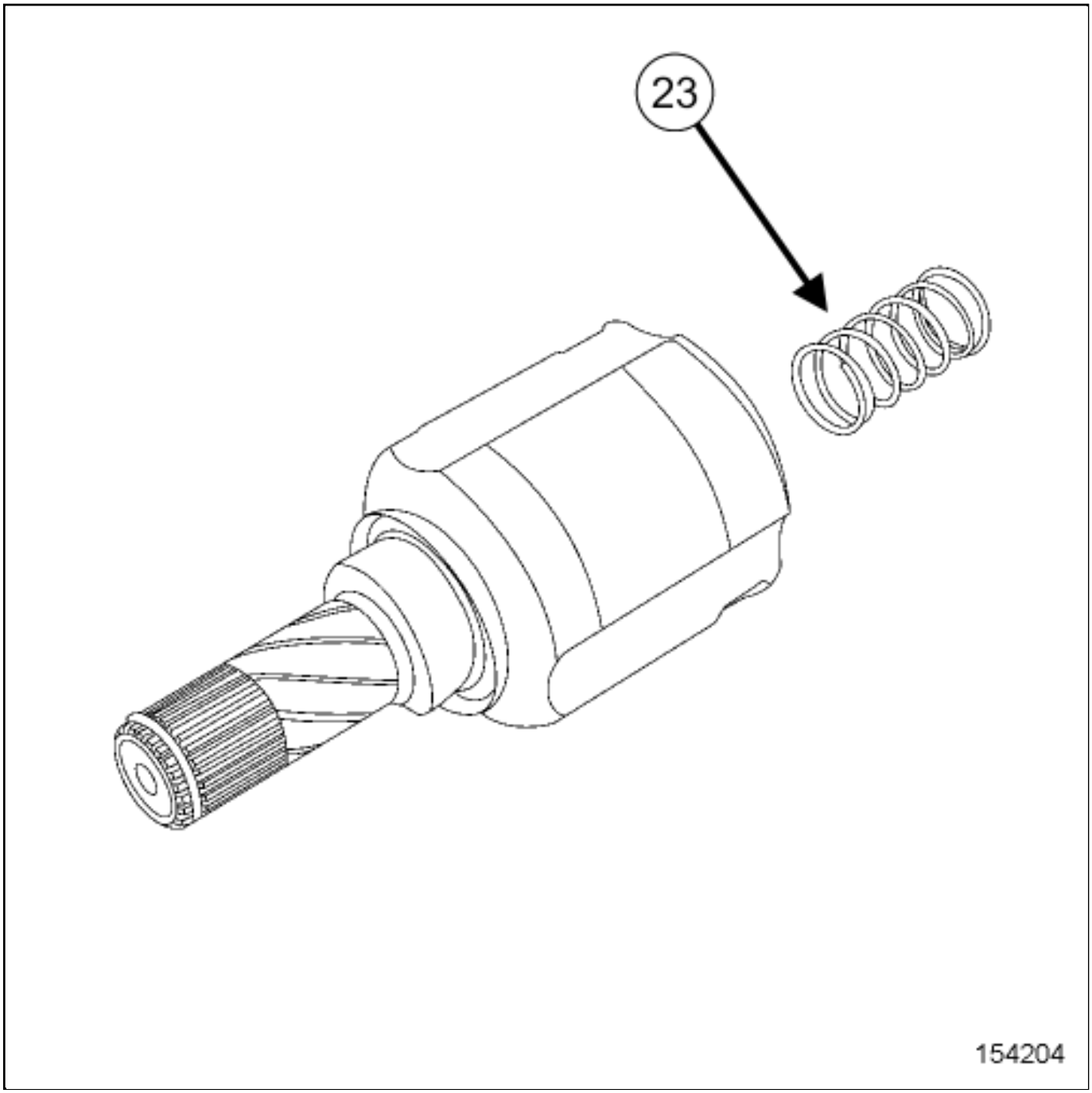
  Insert the gaiter lip into the groove of the driveshaft.



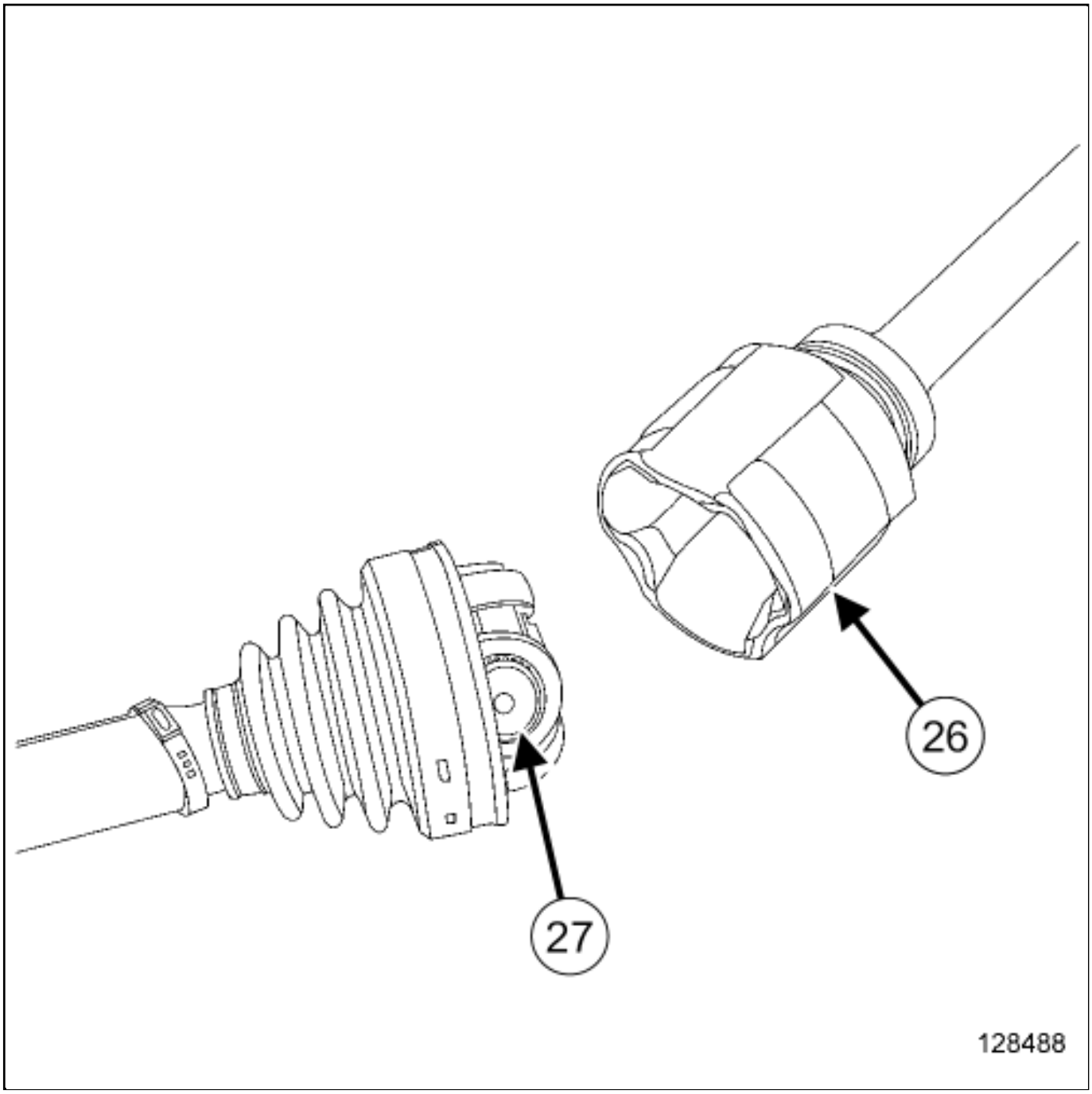
Refit the spider(21) in the position marked during removal.



Fit a new lock ring(22) using circlip pliers.



Refit the spring(23) .



Divide the quantity of grease between the driveshaft gaiter and the yoke sleeve.

Engage the yoke sleeve(26) on the tripod(27) .

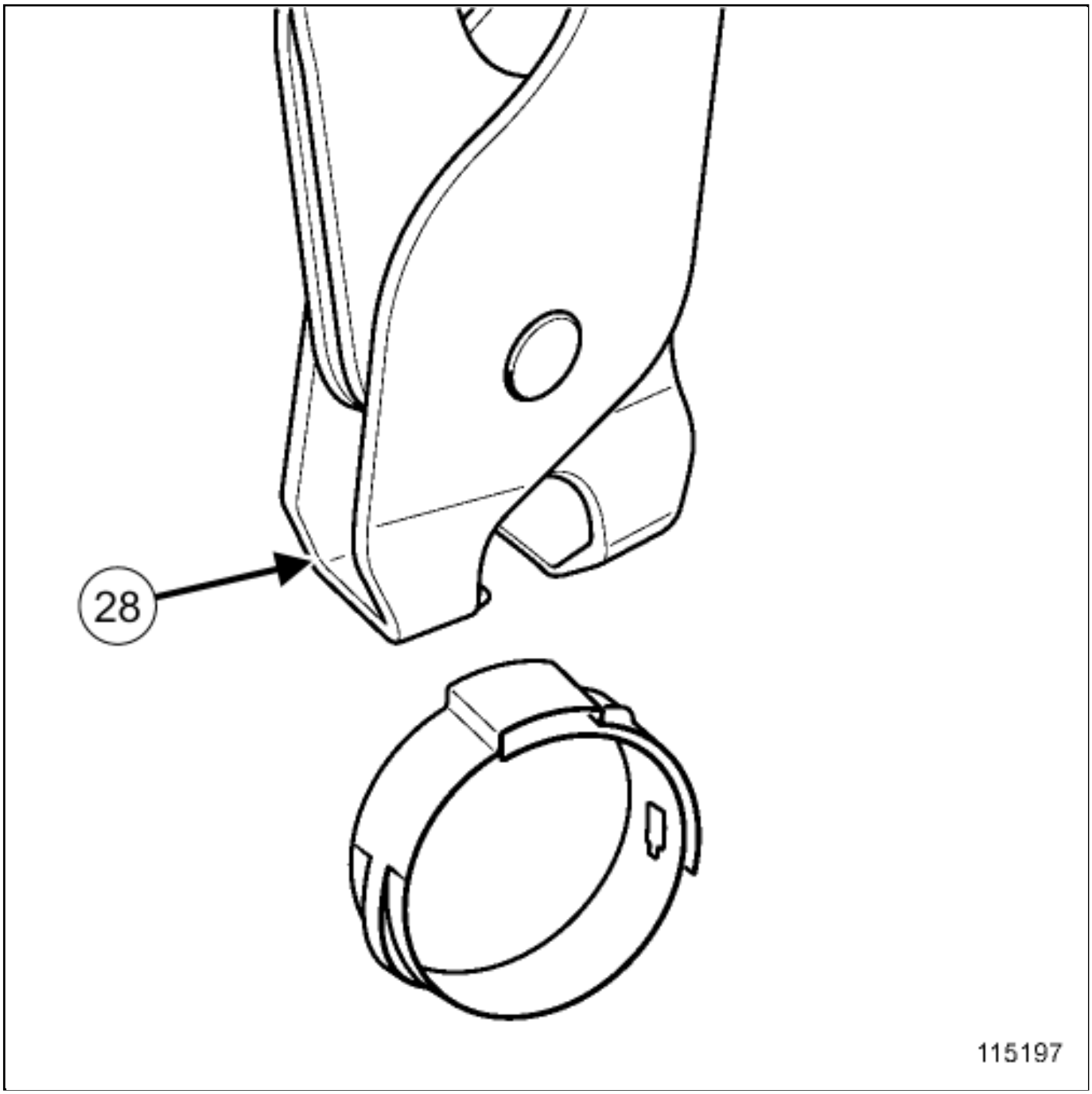
Position the driveshaft gaiter lip into the groove of the yoke sleeve.

Note:

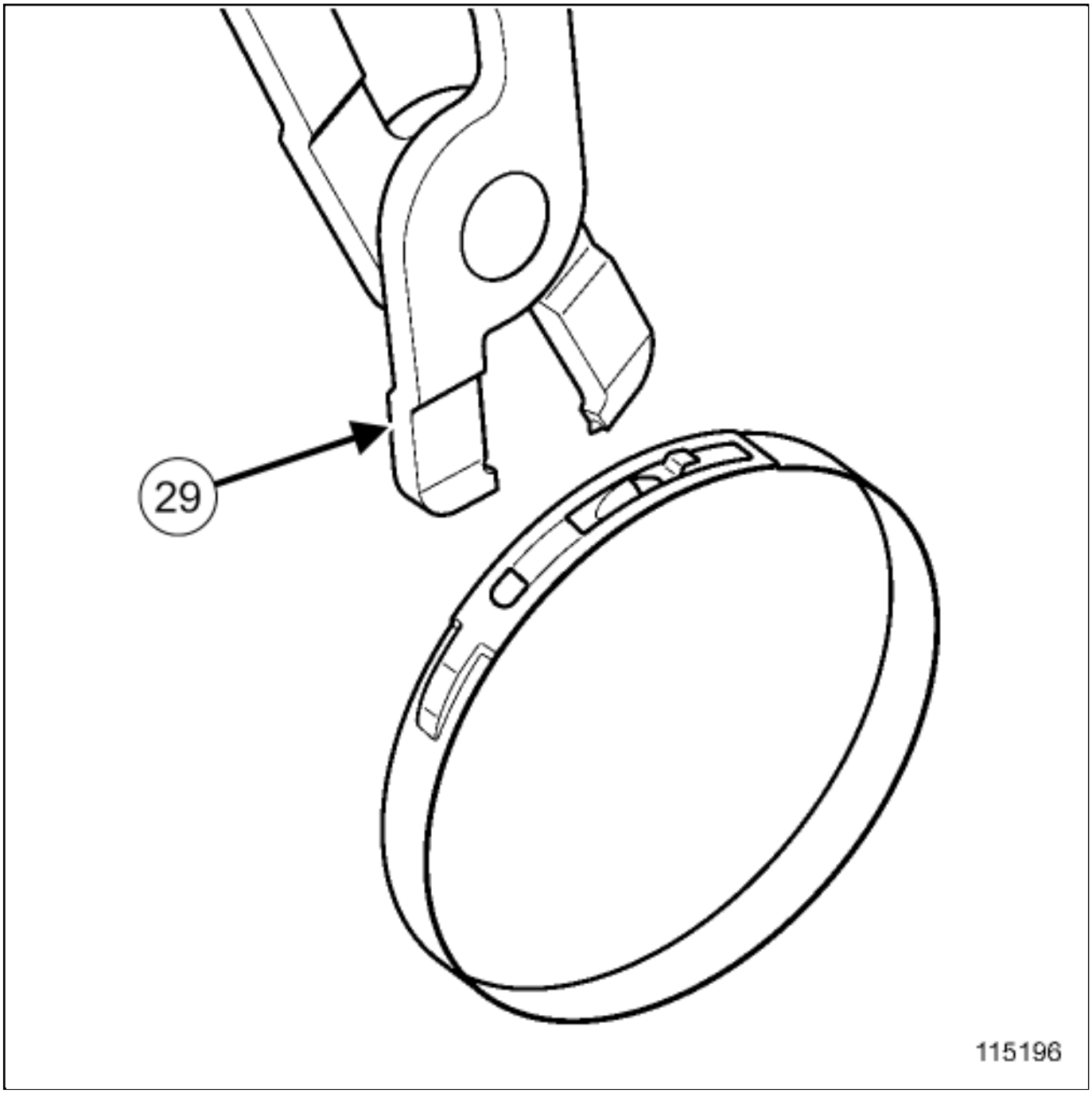
Check that the gaiter lip is correctly positioned in the groove of the driveshaft.

- Fit the small securing clip on the driveshaft gaiter.
- Refit the big securing clip on the driveshaft gaiter.

CLIC CLIP



CLIP WITH PROFILE END



Tighten the clips using the toolType clip pliers for driveshafts with a thermoplastic gaiter.(Tav. 1168) (28) for clic clips or the toolPliers for the driveshaft gaiter collar.(Tav. 1784) (29) for profile end clips.

3. FINAL OPERATION

Refit a new differential output seal Differential output seal: Removal - Refitting .

Refit:

- the front right-hand driveshaft (see 29A, Driveshafts , Front right-hand driveshaft: Removal - Refitting) ,
- the front right-hand wheel Wheel: Removal - Refitting .

Fill up the gearbox Manual gearbox oils: Draining - Filling or Automatic gearbox oil: Draining - Filling .

Refit the engine undertray.

FRONT RIGHT-HAND DRIVESHAFT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Ball joint extractor.	Tav. 476
Universal driveshaft push back tool (plate and claws without ram).	Tav. 1050-04
Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.	Tav. 1420-01

parts always to be replaced:
Differential output seal

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 29A, Driveshafts , Driveshaft: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

CAUTION

In order to prevent irreversible damage to the front hub bearing:

- Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
- Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the front right-hand wheel Wheel: Removal - Refitting ,
- the engine undertray bolts,

- the engine undertray.

Drain the gearbox Manual gearbox oils: Draining - Filling or Automatic gearbox oil: Draining - Filling .

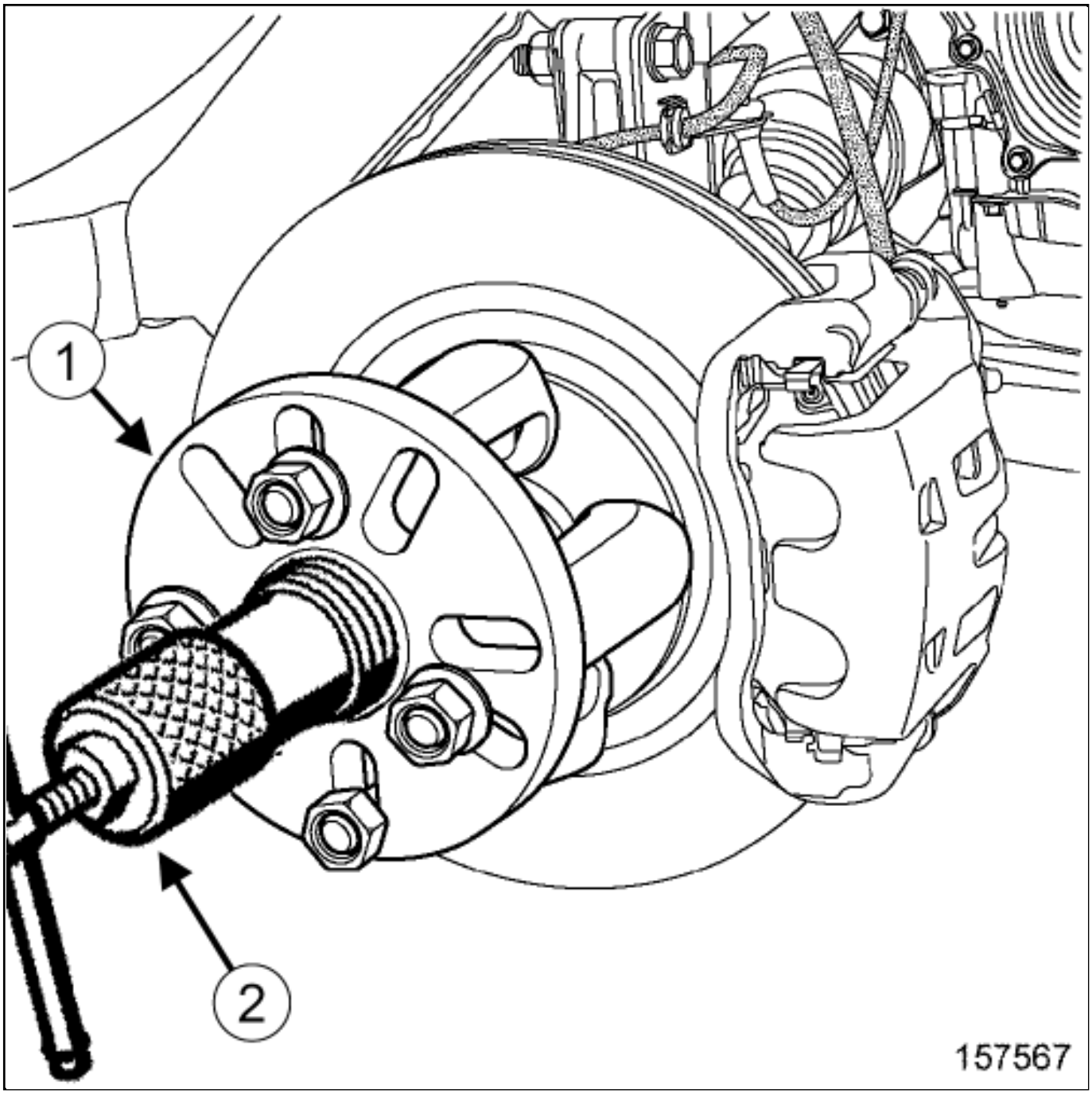
2. REMOVAL OPERATION

Unclip Front brake calliper assembly: Exploded view :

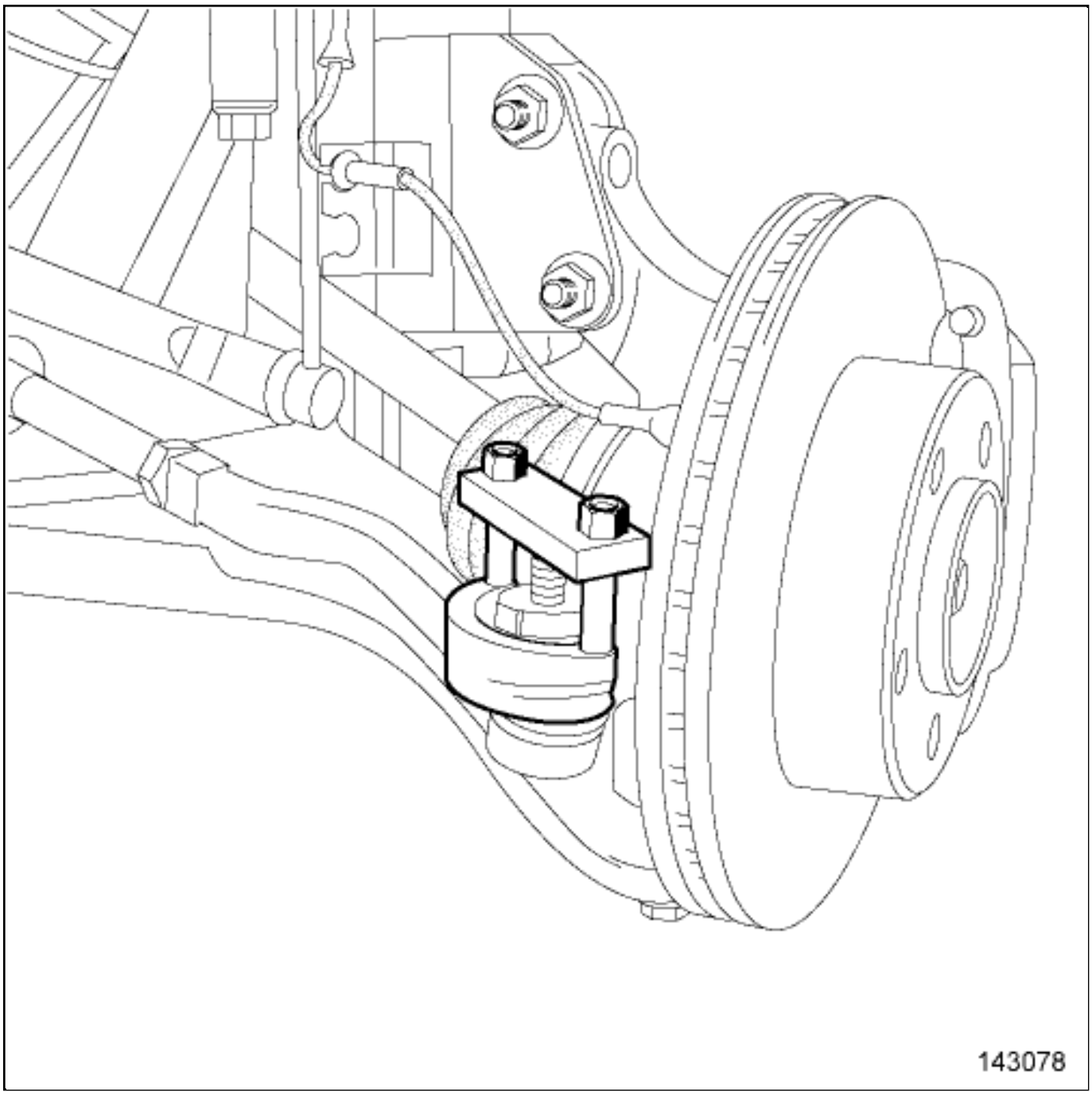
- the front right-hand brake hose on the shock absorber base,
- the wiring of the front right-hand wheel speed sensor.

Remove:

- the driveshaft nut Front hub carrier assembly: Exploded view ,
- the track rod end nut Steering assembly: Exploded view .

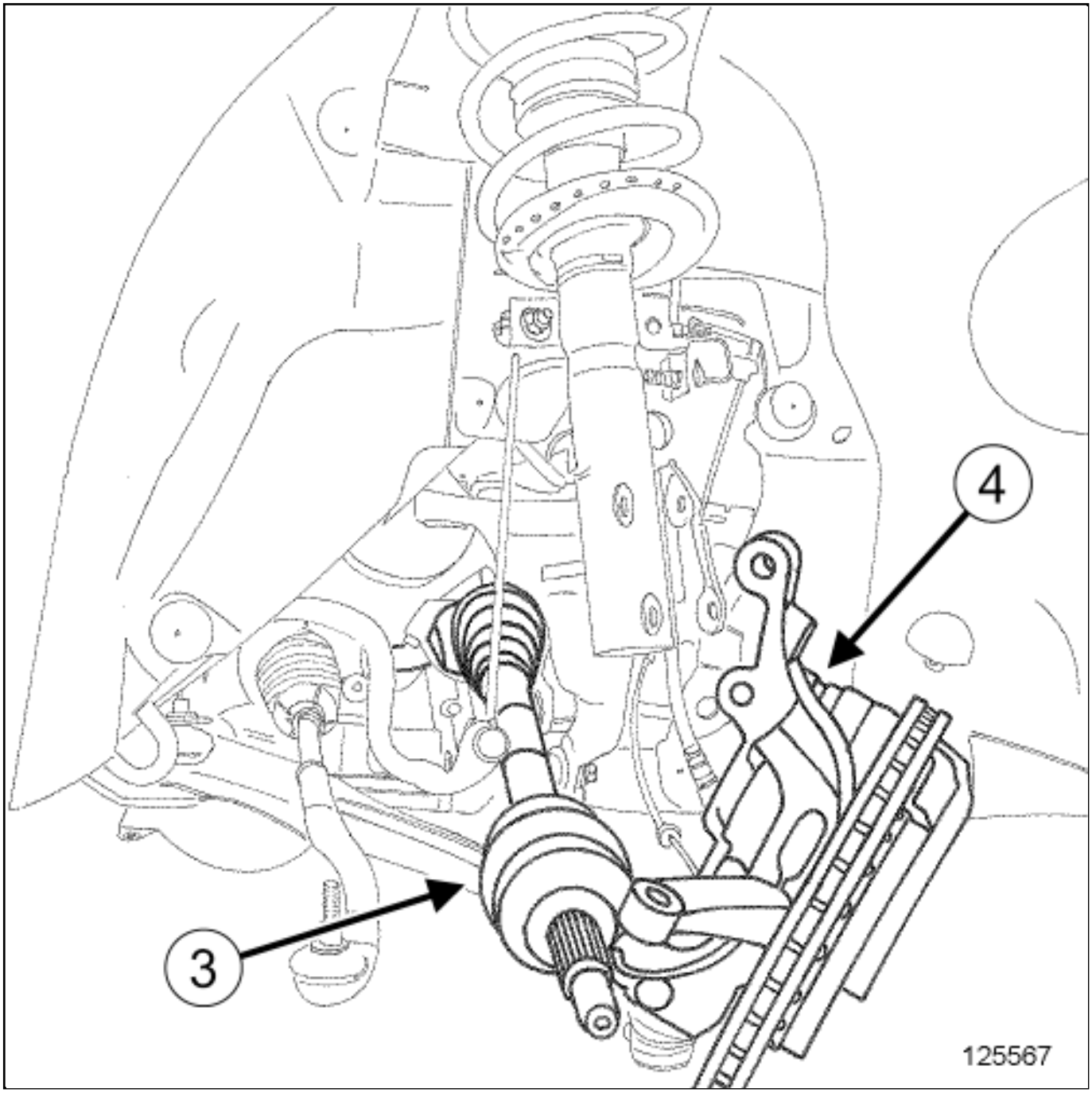


Push back the front right-hand driveshaft from the stub axle carrier using the toolsUniversal driveshaft push back tool (plate and claws without ram).(Tav. 1050-04) (1) and Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) (2) .

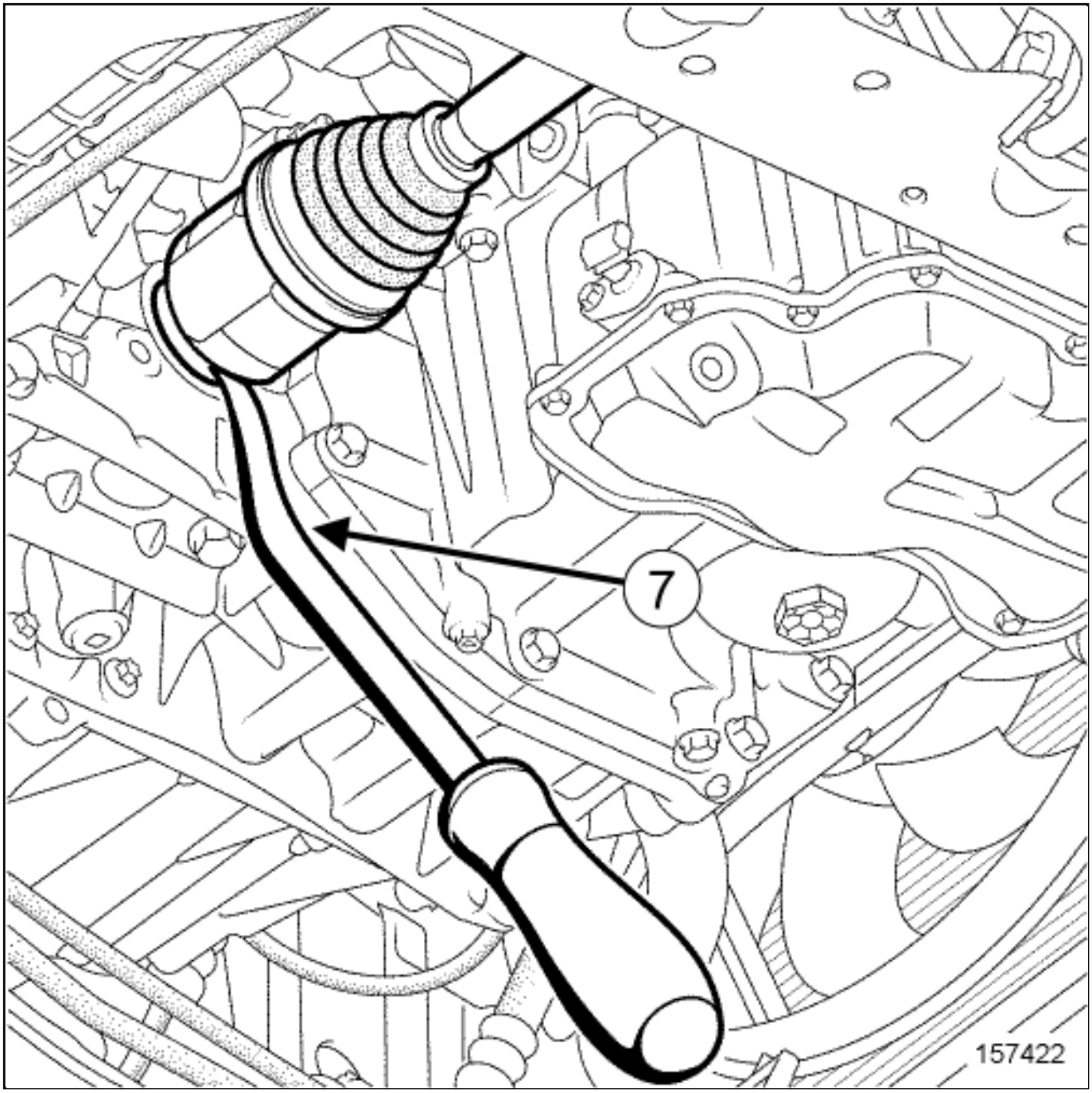


Detach the track rod end using theBall joint extractor.(Tav. 476) .

Remove the shock absorber base boltsFront axle assembly: Exploded view .



- Extract the front right-hand driveshaft(3) from the hub carrier(4) by pivoting the hub carrier.



Detach the front right-hand driveshaft from gearbox using a lever(7) .

Remove the front right-hand driveshaft.

1- CLOSED DIFFERENTIAL GEARBOX

Remove the right-hand differential output seal Differential output seal: Removal - Refitting .

REFITTING

1. REFITTING PREPARATION OPERATION

1- CLOSED DIFFERENTIAL GEARBOX

- parts always to be replaced: Differential output seal .
- Refit the right-hand differential output seal Differential output seal: Removal - Refitting .

2. REFITTING OPERATION

- Position and fit the front right-hand driveshaft into the gearbox.
- Insert the front right-hand driveshaft into the hub carrier.
- Refit:
  - the shock absorber base bolts Front axle assembly: Exploded view ,
  - the track rod end nut Steering assembly: Exploded view ,
  - the driveshaft nut Front hub carrier assembly: Exploded view .
- Clip Front brake calliper assembly: Exploded view :

- the front right-hand brake hose on the shock absorber base,
- the wiring of the front right-hand wheel speed sensor.

Proceed in the reverse order to removal.

Fill up the gearbox **Manual gearbox oils: Draining - Filling** or **Automatic gearbox oil: Draining - Filling** .

FRONT SEAT ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Airbag and pretensioners: Precautions for the repair ,
- Vehicle: Precautions for the repair .

FIRST FITTING

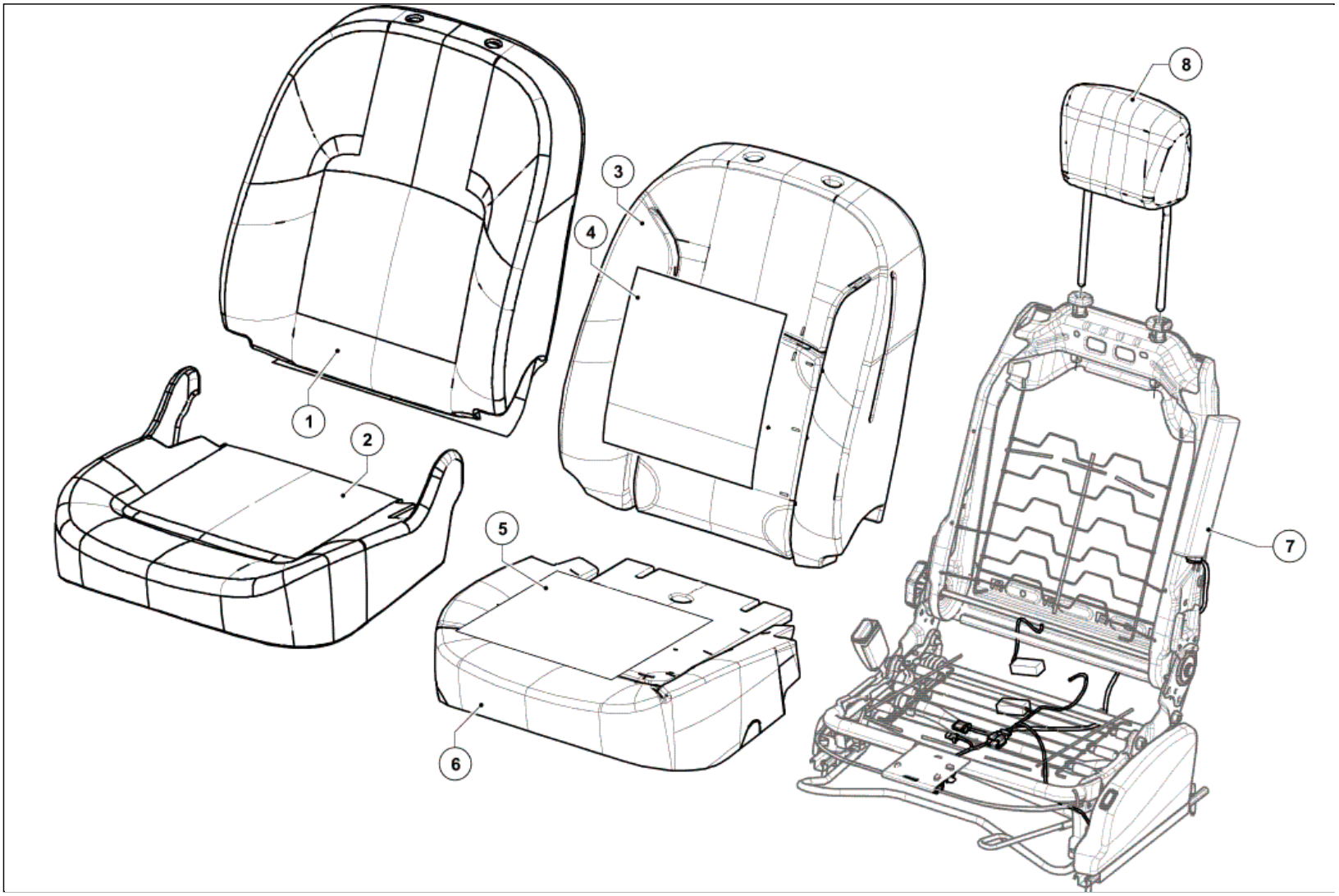


Illustration key: Description

Marks	Designations	Informations
1	Front seatback cover	
2	Front seat base cover	
3	Front seat back foam	
4	Front seatback heated pad	
5	Front seat base heated pad	
6	Front seat base foam	
7	Front seat frame	
8	Front seat headrest	

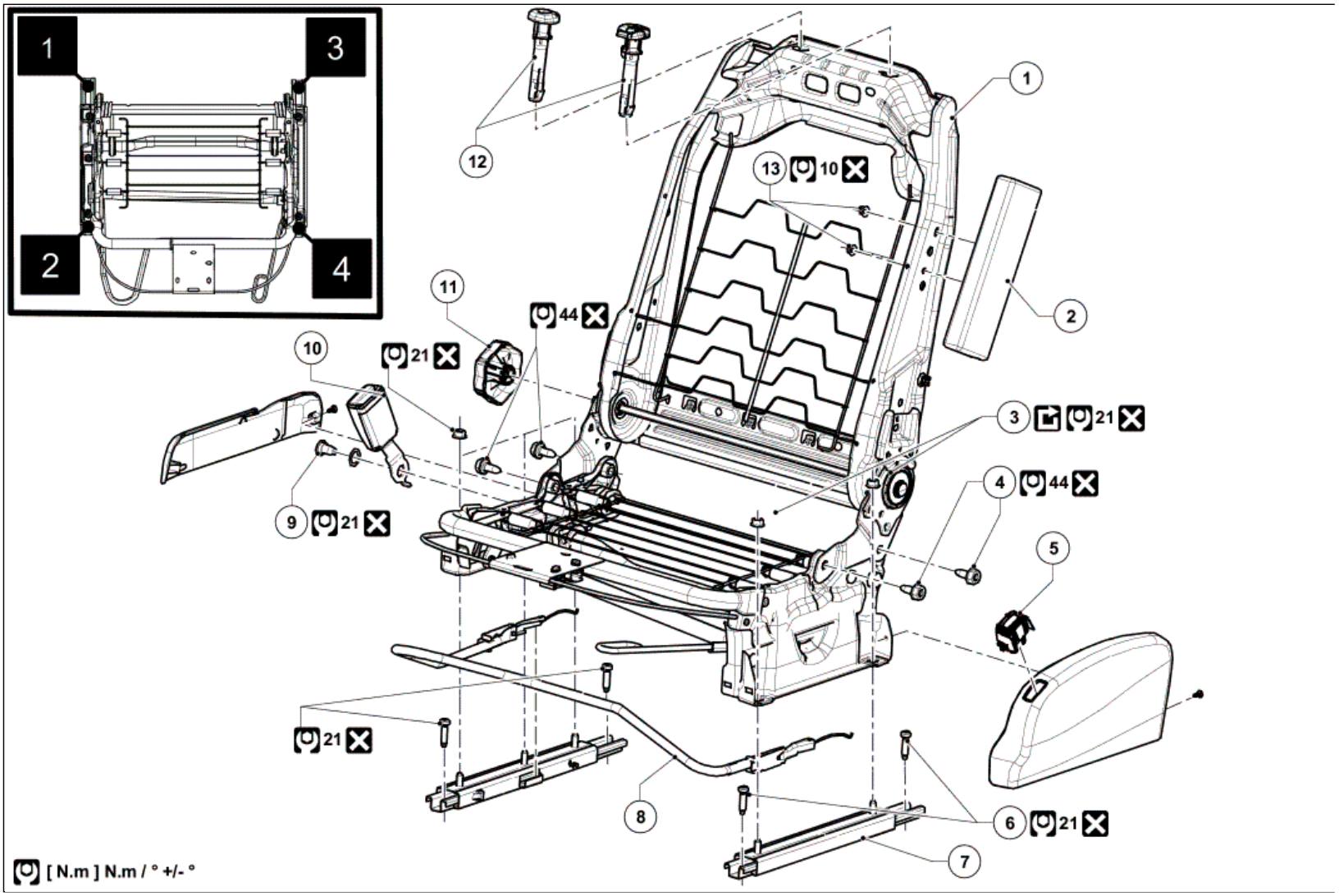


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front seatback frame	
2	Front seat chest-level side airbag	
3	Base frame nut on front seat runner	
4	Bolts of front seat "seatback - seat base" frame	
5	Front seat heated pad switch	
6	Front seat bolts on body	
7	Front seat runner	
8	commands slide of front seat	
9	Front seat belt stalk bolt	
10	Front seat belt buckle	
11	Front seat backrest tilt control	
12	Front seat headrest guide	
13	Nut of front seat chest-level side airbag	

SECOND FITTING

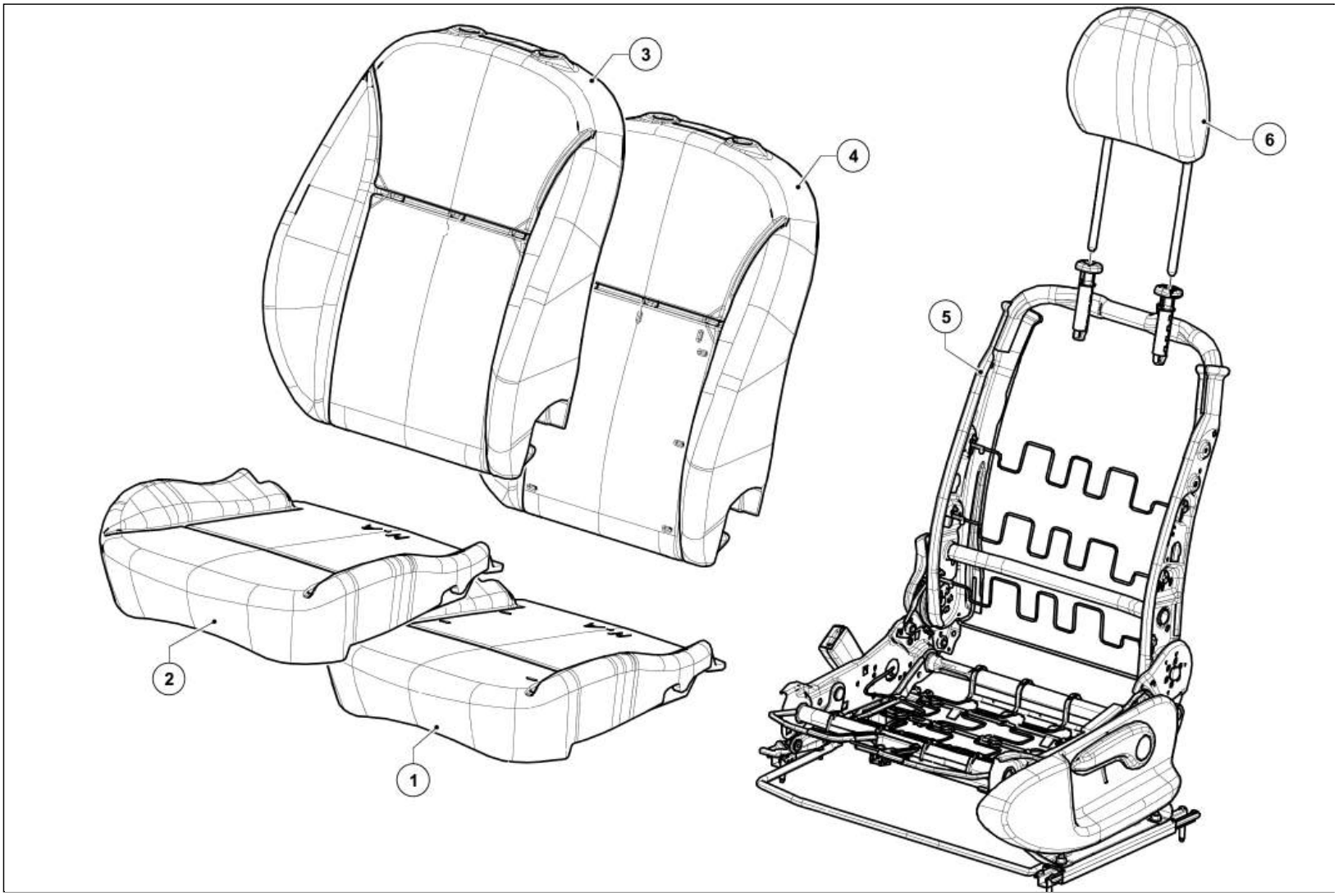


Illustration key: Description

Marks	Designations	Informations
1	Front seat base foam	
2	Front seat base cover	
3	Front seatback cover	
4	Front seat back foam	
5	Front seat frame	
6	Front seat headrest	

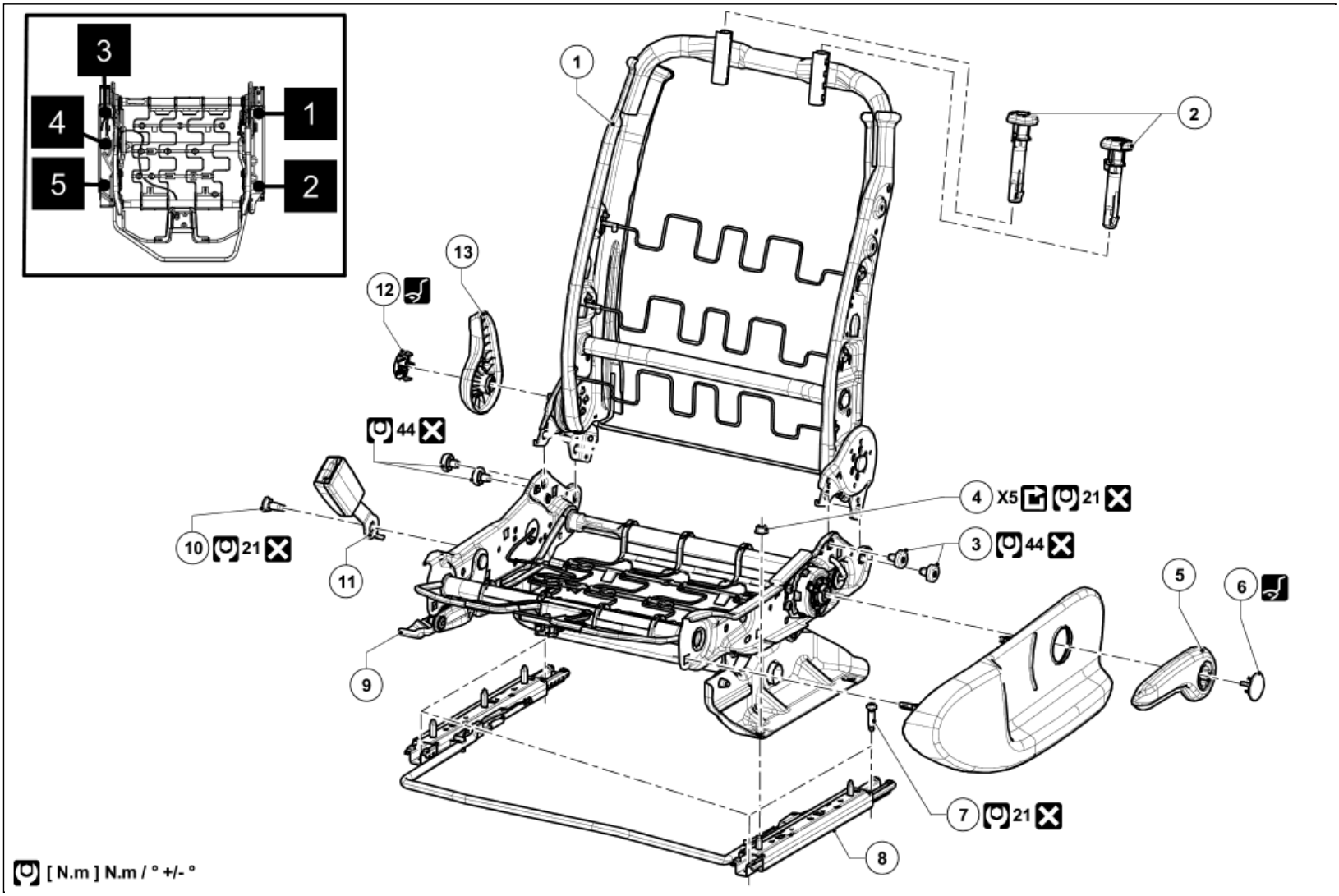


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front seatback frame	
2	Front seat headrest guide	
3	Bolts of front seat "seatback - seat base" frame	
4	Front seat runner bolt on front seat frame	
5	Front seat height adjustment control	
6	Trim of the front seat height adjustment control	Car. 1363
7	Front seat bolts on body	
8	Front seat runner	
9	Front seat base frame	
10	Front seat belt stalk bolt	
11	Front seat belt buckle	
12	Front seatback angle control trim	Car. 1363
13	Front seat backrest tilt control	

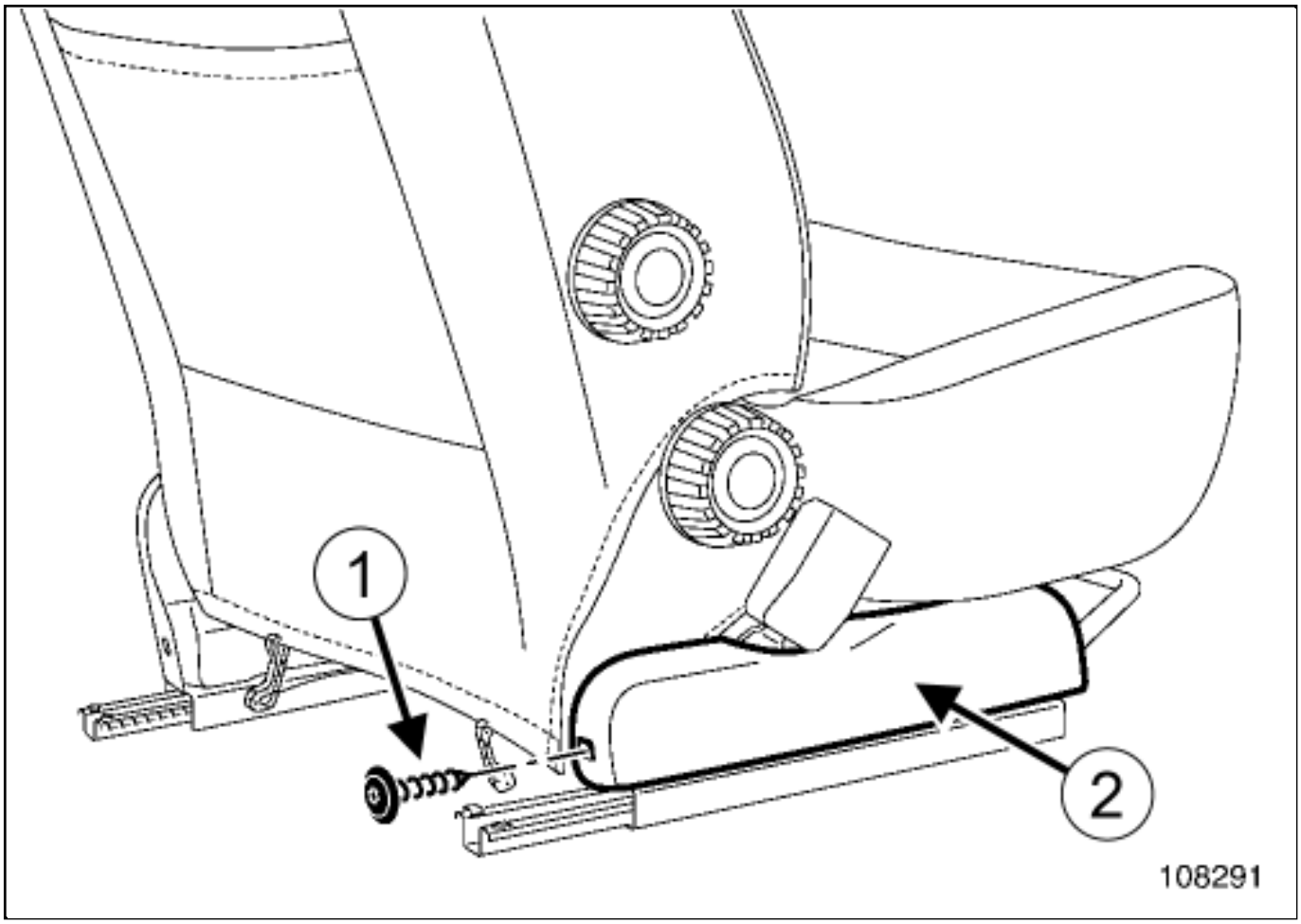
FRONT SEAT BELT BUCKLE: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always replaced, etc.).Front seat assembly: Exploded view

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove the complete front seatFront seat assembly: Exploded view .



Remove (depending on the vehicle equipment):

- the bolt(1) ,
- the casing(2) .

2. REMOVAL OPERATION

- Cut the plastic clips.
- Unclip the front seat belt buckle.
- Remove Front seat assembly: Exploded view :
  - the nut of the front seat belt buckle,
  - the front seat belt buckle.

REFITTING

1. REFITTING PREPARATION OPERATION

- Coat the threads of the front seat belt buckle bolts with HIGH STRENGTH THREAD LOCKVehicle: Parts and consumables for the repair .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

FRONT SECTION OF FRONT SIDE MEMBER CLOSURE PANEL: REPLACEMENT

Note, one or more warnings are present in this procedure

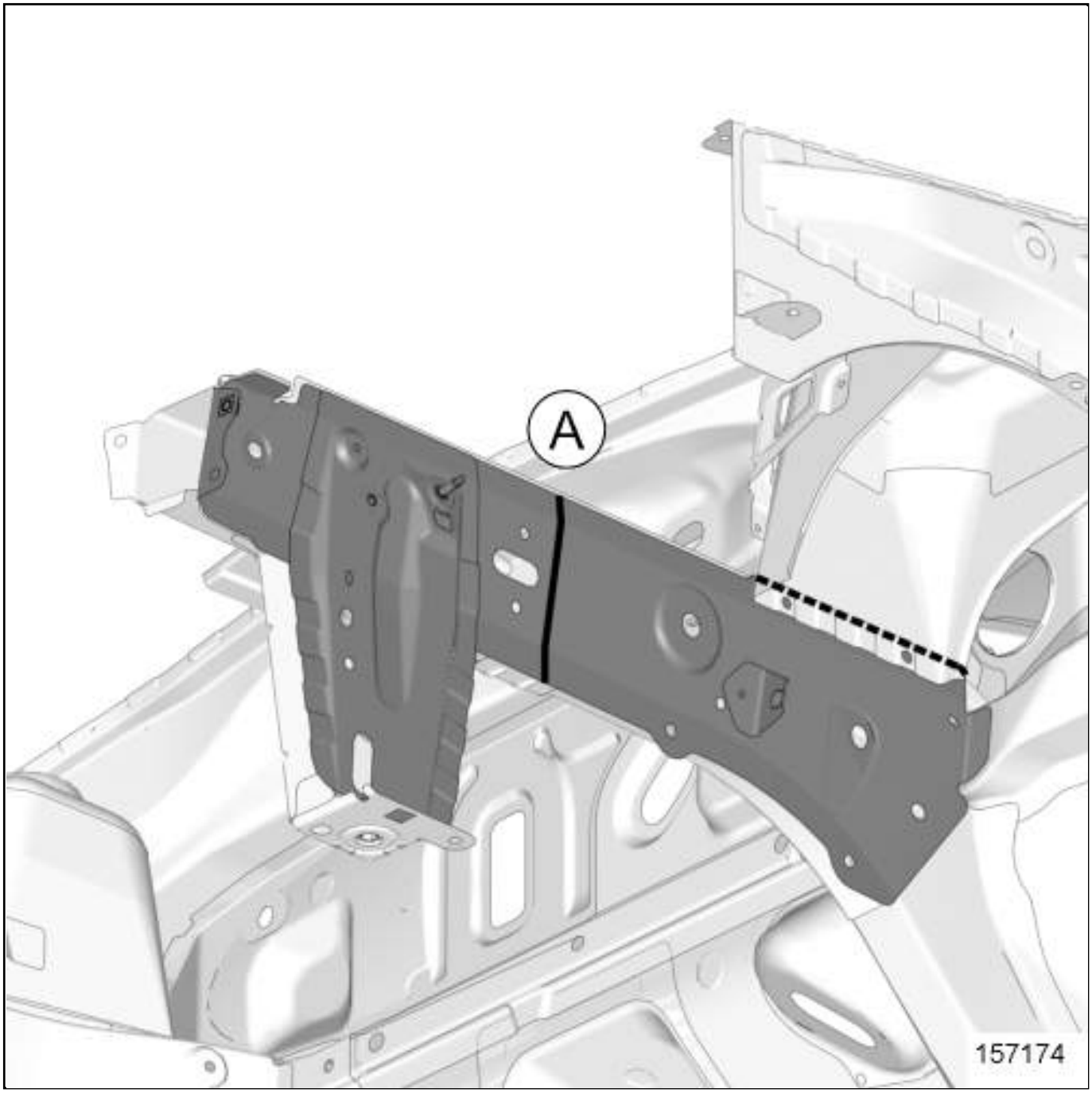
1. COMPOSITION OF THE SPARE PART

No.	Description	Thickness (mm)
(1)	Front closure panel component of front section front side member	1.25
(2)	Front subframe mounting front unit component	1.2
(3)	Front brake hose support	2

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement along cut A.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

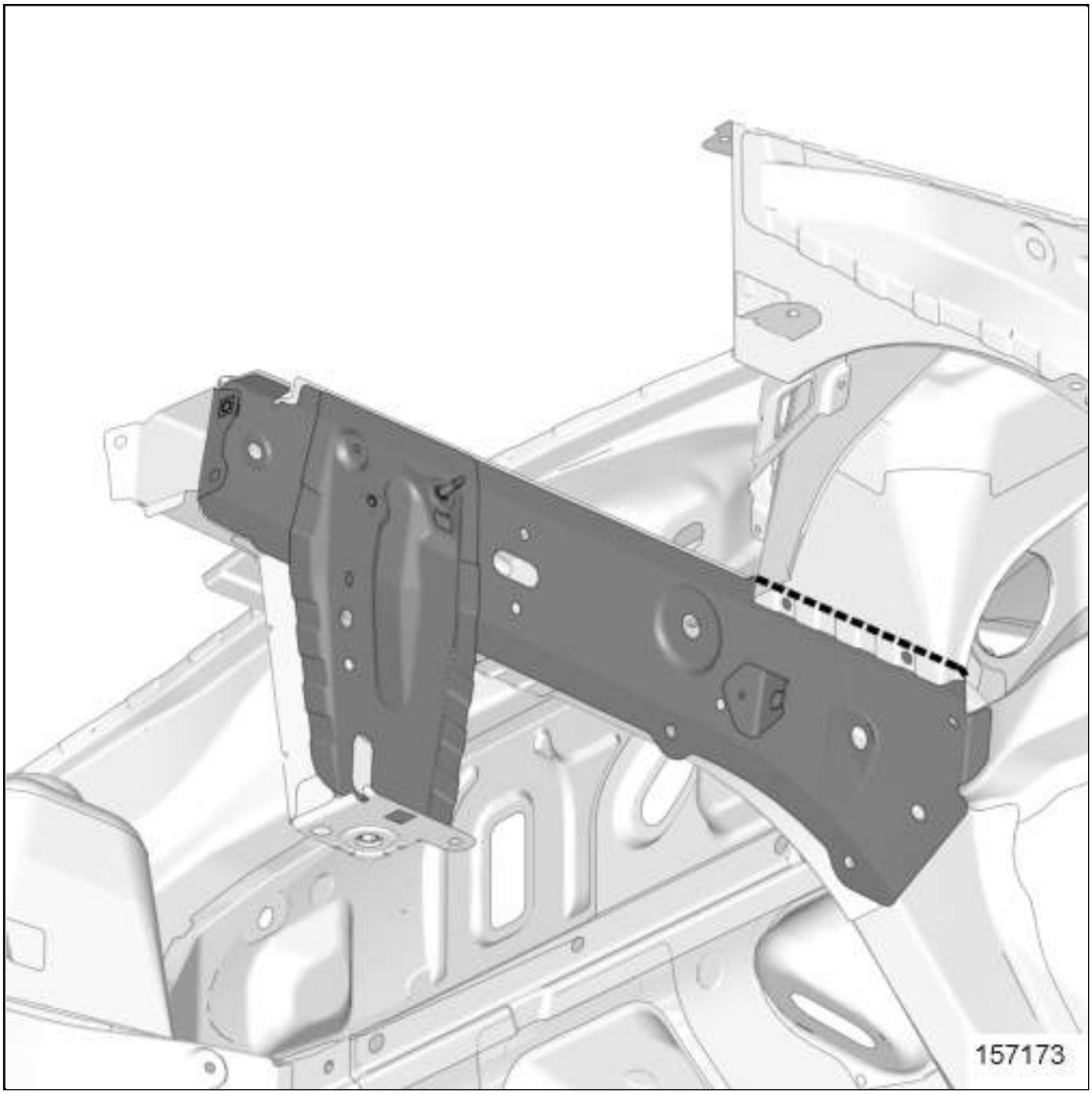
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

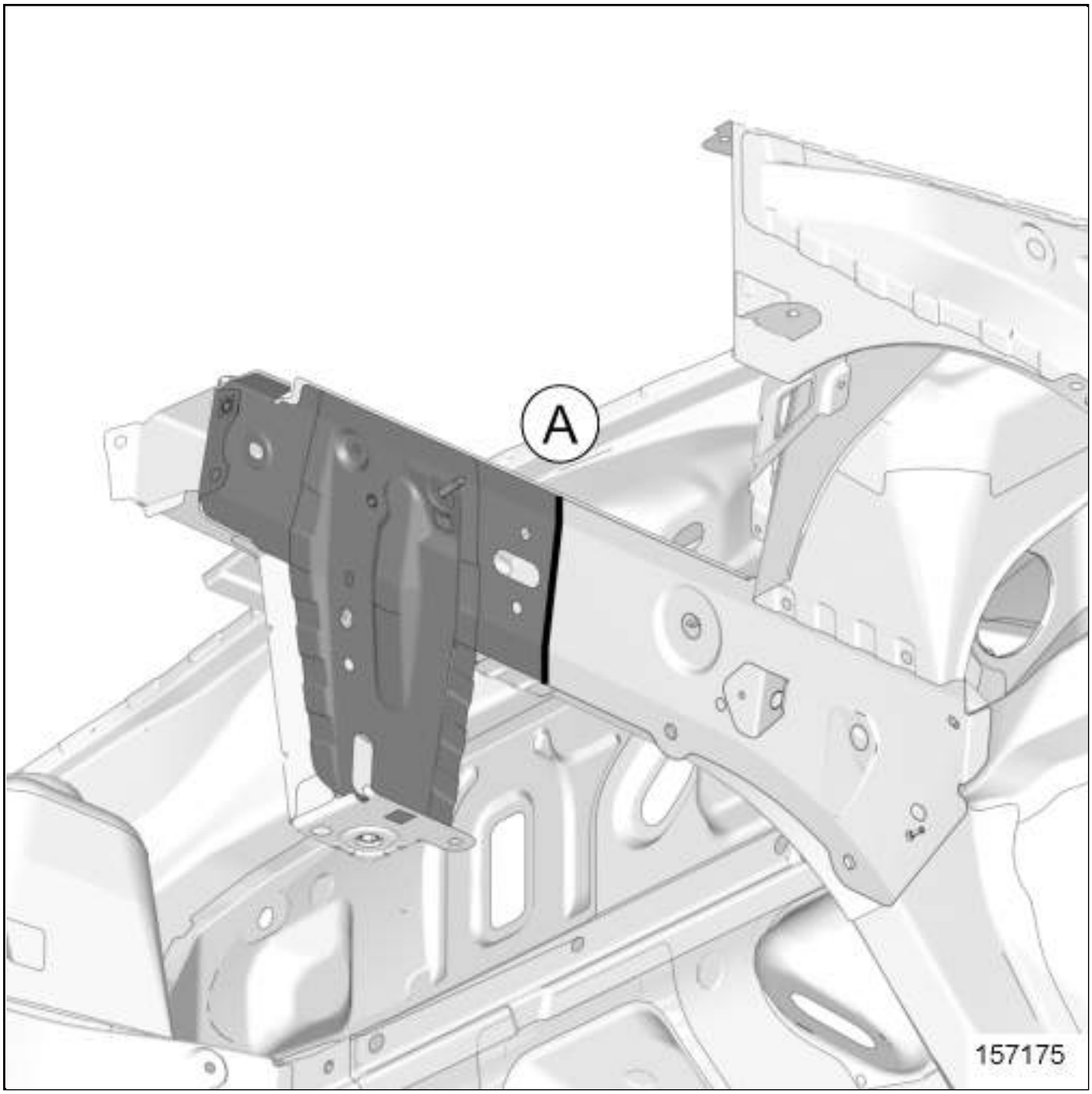
1- COMPLETE REPLACEMENT

1)PART IN POSITION

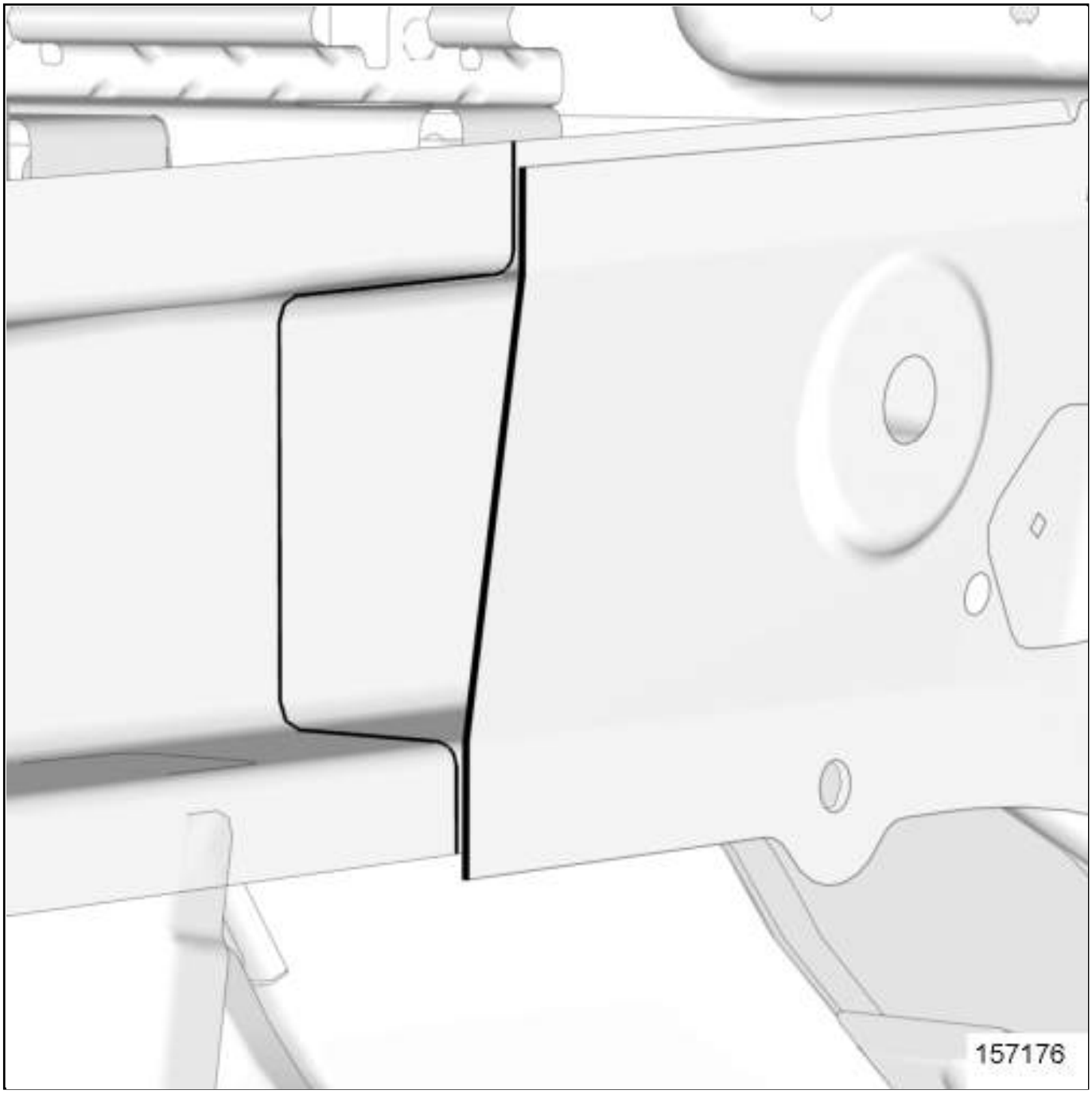


2- PARTIAL REPLACEMENT ALONG CUT A

1)PART IN POSITION



DETAILED VIEW A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FRONT SECTION OF THE VEHICLE: SEALING CHECK

Note:

Before any operation, check the water outlets. If necessary, clean any residues which have accumulated (example: dead leaves, twigs, etc.) and check that the water flows out correctly.

Note:

The list of joint areas dealt with here is general. Additional areas may exist depending on the layout of each vehicle (see MR for the vehicle concerned).

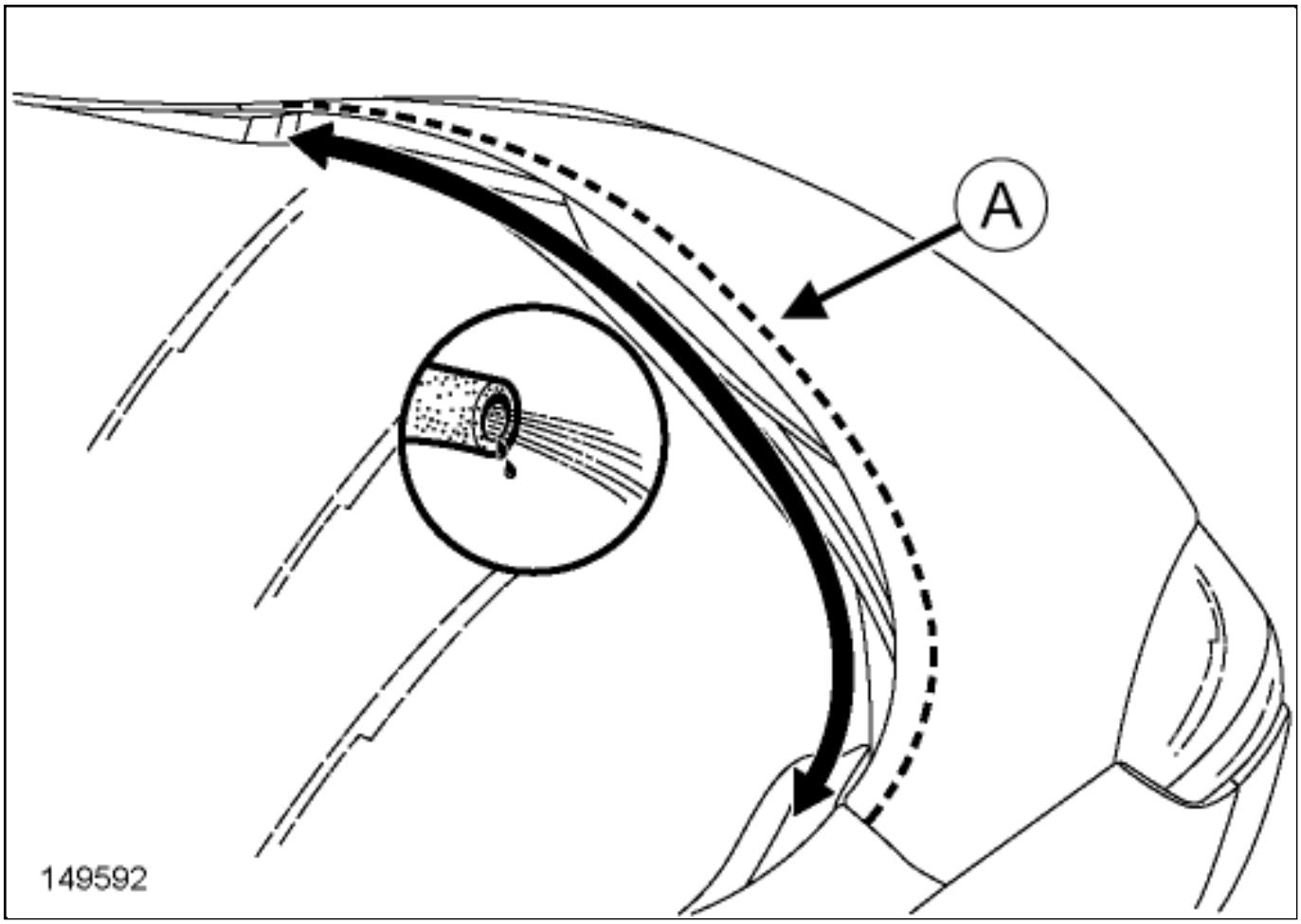
1. PREPARATION OPERATION FOR CHECKING THE SEALING

1- CONDITIONS TO RESPECT BEFORE CHECKING THE SEALING

- Position the vehicle on a level washing area(see 60A, General information, Vehicle sealing: General information) .
- Check that all the opening elements are closed(see 60A, General information, Vehicle sealing: General information) .
- Prepare the equipment to perform the operation(see 60A, General information, Sealing tools: Use) ,(see 60A, General information, Sealing tools: Description) and(see 60A, General information, Vehicle sealing: General information) .
- Adjust the flow of the water jet(see 60A, General information, Sealing tools: Use) .

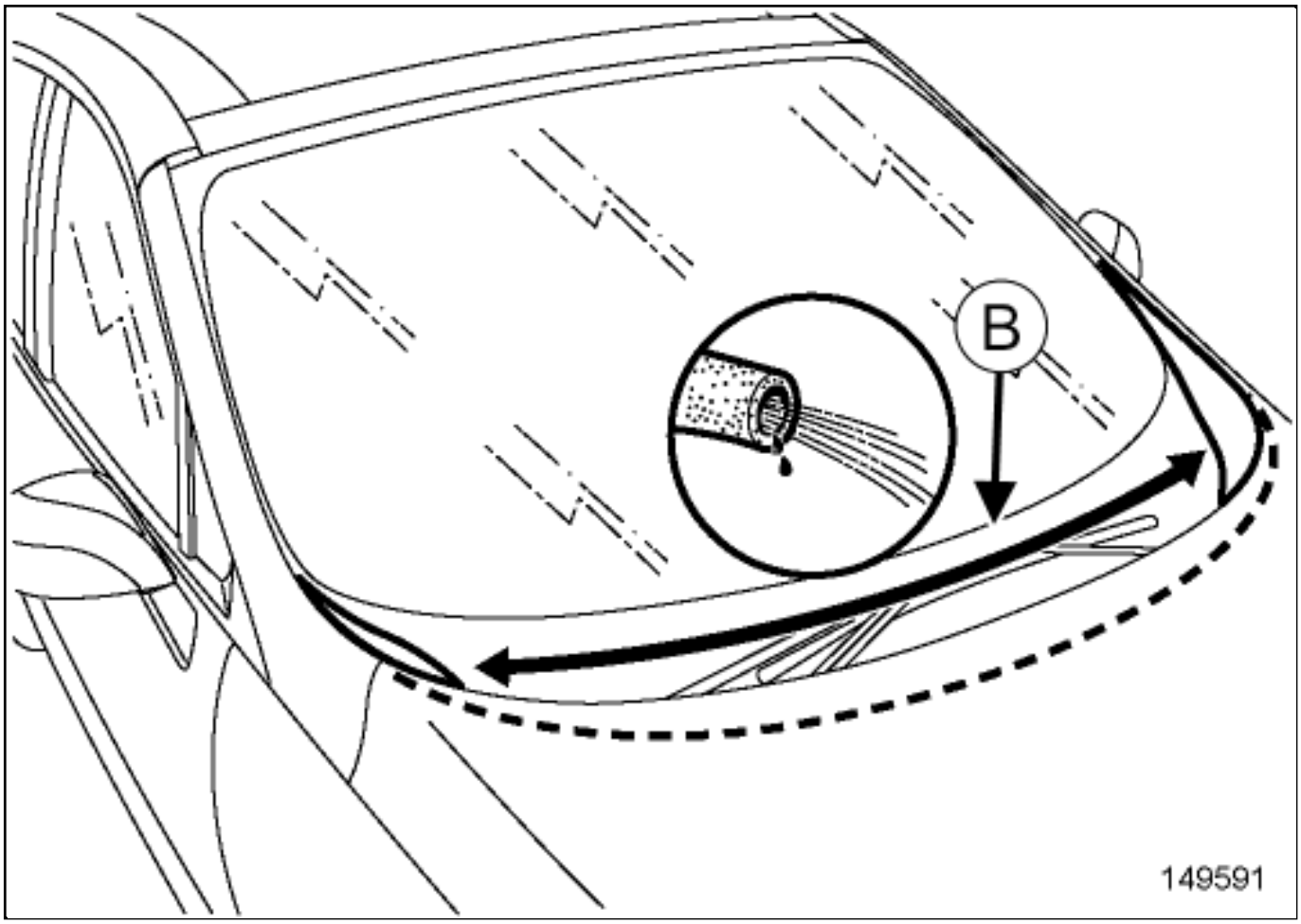
2. OPERATION FOR CHECKING THE SEALING

1- FRONT OPENING ELEMENT SEAL



- Spray the rear section(A) of the front opening element by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the engine compartment(see 60A, General information, Vehicle sealing: General information) .

2- SCUTTLE PANEL GRILLE AND SCOOP UNDER SCUTTLE PANEL GRILLE



- Spray the upper section of the scuttle panel grille by sweeping the zone(B) from right to left.

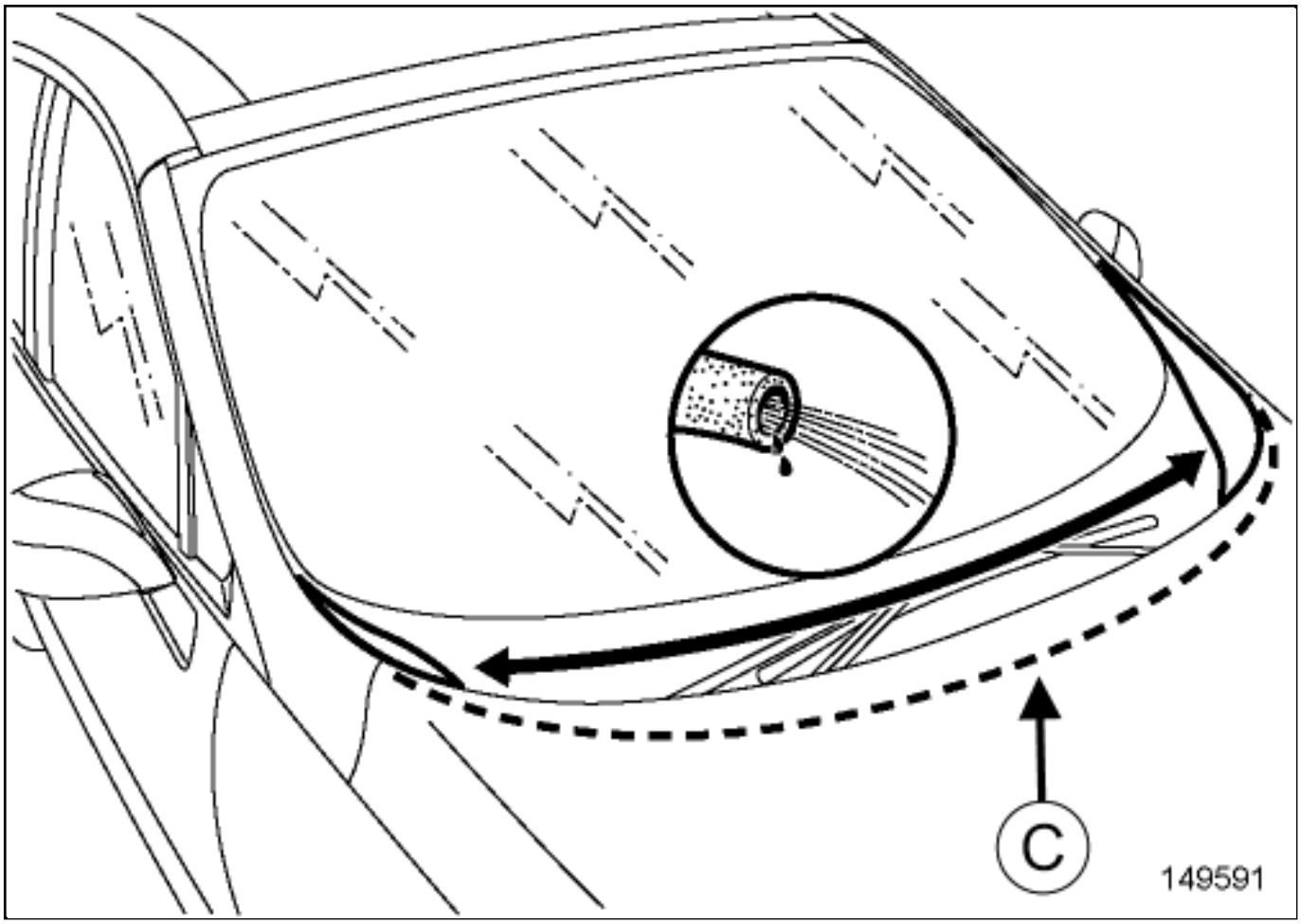
- Visually inspect for the presence of water inside the engine compartment at the lower section of the scoop under the scuttle panel grille(see 60A, General information, Vehicle sealing: General information) .

- Spray the mating surface of the scoop under the scuttle panel grille / bulkhead using the pressurised sprayer.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

3- SEALING THE SCUTTLE PANEL

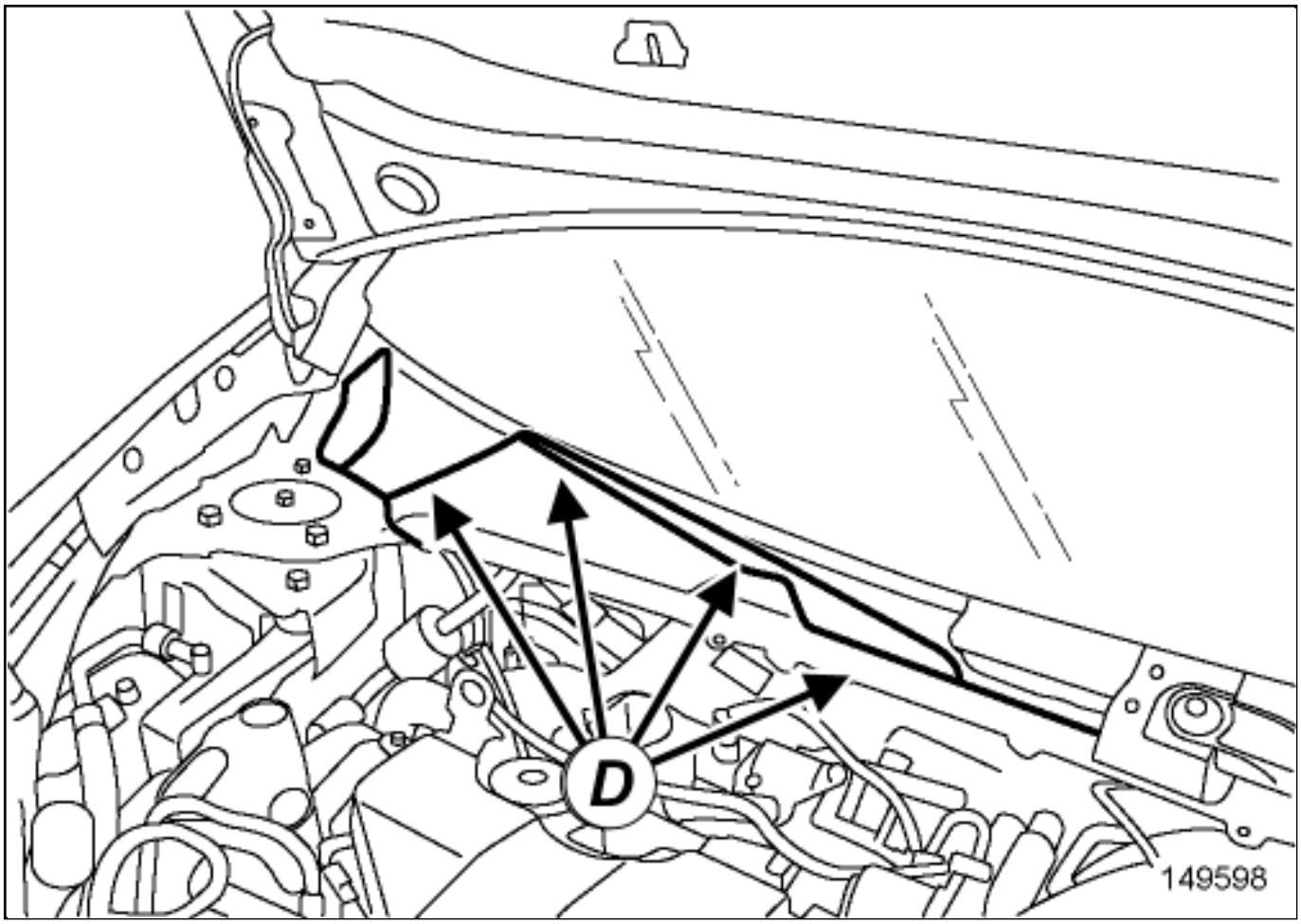
1)FIRST METHOD: SCUTTLE PANEL GRILLE IN PLACE, BONNET CLOSED



- Spray the scuttle panel grille(C) by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

2)SECOND METHOD: SCUTTLE PANEL GRILLE REMOVED, BONNET OPEN



- Spray the mastic(D) locally using the pressurised sprayer.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

4- BULKHEAD GROMMETS AND BLANKING COVERS

- Spray around the edge of the blanking covers and grommets of the bulkhead in a circular manner using the pressurised sprayer.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

5- CHECKING THE SEALING WITH THE TRIM REMOVED

- If the customer complaint could not be reproduced in accordance with the procedure, repeat the sealing check from step 1, then extend the sealing check to the surrounding zones(see 60A, General

information, Vehicle sealing: General information) .

XSL version : 3.02 du 22/07/11

FRONT SECTION OF THE VEHICLE: SEALING REPAIR

Note:

Before repairing the sealing, check the sealing of the zone concerned(see 60A, General information, Vehicle: Sealing check) .

1. PREPARATION OPERATION FOR REPAIRING THE SEALING

1- CHECK THE POSITION AND ADJUST IF NECESSARY:

- the scuttle panel grilleScuttle panel grille: Removal - Refitting (56A, Exterior equipment),
- the scoop under the scuttle panel grilleScoop under the scuttle panel grille: Removal - Refitting (56A, Exterior equipment),
- the front side opening element seal,
- the blanking covers and grommets of the bulkhead.

Note:

If the seals are dirty, clean them in soapy water(see 60A, General information, Vehicle sealing: General information) .

2- WAS ANY ACTION PERFORMED?

- NO: move on to the next step.
- YES: check the sealing of the zone(see 60A, General information, Front section of the vehicle: Sealing check) .

☐ Was water present in the passenger compartment of the vehicle?

- YES: move on to the next step.
- NO: fault resolved.

2. SEALING REPAIR OPERATION

1- FRONT OPENING ELEMENT SEAL

☐ Is water present in the passenger compartment after the front opening element sealing has been checked?

- NO: move on to the next step.
- YES:

- a) if the front opening element seal is deformed, replace the front opening element seal,
- b) if the front opening element seal shows signs of wear, cuts or cracks, replace the front opening element seal.

Check the sealing of the front opening element seal(see 60A, General information, Front section of the vehicle: Sealing check) .

2- SCUTTLE PANEL GRILLE AND SCOOP UNDER THE SCUTTLE PANEL GRILLE

Is water present in the passenger compartment after the sealing of the scuttle panel grille and scoop under the scuttle panel grille has been checked?

- NO: move on to the next step.
- YES:
- a) if the scuttle panel grille is deformed, cracked or split, replace the scuttle panel grille,
- b) if the clips of the scuttle panel grille are deformed or broken, replace the scuttle panel grille clips.

Check the sealing of the scuttle panel grille(see 60A, General information, Front section of the vehicle: Sealing check) .

- c) if the scoop under the scuttle panel grille is deformed, cracked or split, replace the scoop under the scuttle panel grille,
- d) if the sealing foam of the scoop under the scuttle panel grille is detached, cut or compressed, replace the foam of the scoop under the scuttle panel grille.

Check the sealing of the scoop under the scuttle panel grille(see 60A, General information, Front section of the vehicle: Sealing check) .

3- MASTIC FILLING OF THE BULKHEAD / SCUTTLE SIDE PANEL, BULKHEAD / BULKHEAD LOWER CROSS MEMBER, BULKHEAD / WINDSCREEN APERTURE LOWER CROSS MEMBER CLOSURE PANEL

Is water present in the passenger compartment after the sealing of the mastic filling of the bulkhead / scuttle side panel, bulkhead / lower cross member of bulkhead, bulkhead / windscreen aperture lower cross member closure panel has been checked?

- NO: move on to the next step.
- YES:
- a) if the mastic is faulty or incorrectly positioned on the panelwork connections, apply extruded mastic to the panelwork connectionsAnti-corrosion protection products after assembly: Use (04F, Bodywork products and mountings) and (see 60A, General information, Bodywork sealing products: Description) .
- Check the sealing of the mastic filling of the bulkhead / scuttle side panel, bulkhead / bulkhead lower cross member, bulkhead / windscreen aperture lower cross member closure panel(see 60A, General information, Front section of the vehicle: Sealing check) .

4- BLANKING COVERS AND GROMMETS OF THE BULKHEAD

Is water present in the passenger compartment after the sealing of the blanking covers and grommets of the bulkhead has been checked?

- No: fault resolved.

■ Yes:

■ a) if the blanking covers and grommets of the bulkhead are detached, refit the blanking covers and grommets of the bulkhead.

■ b) if the blanking covers and grommets of the bulkhead are deformed or cracked, replace the blanking covers and grommets of the bulkhead.

■ Check the sealing of the blanking covers and grommets of the bulkhead**(see 60A, General information, Front section of the vehicle: Sealing check)** .

FRONT SIDE AIR DISTRIBUTION DUCT: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the dashboardDashboard assembly: Exploded view .

1- FRONT LEFT-HAND AIR DISTRIBUTION DUCT

2. REMOVAL OPERATION

- Remove the front side air distribution duct(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

REFITTING

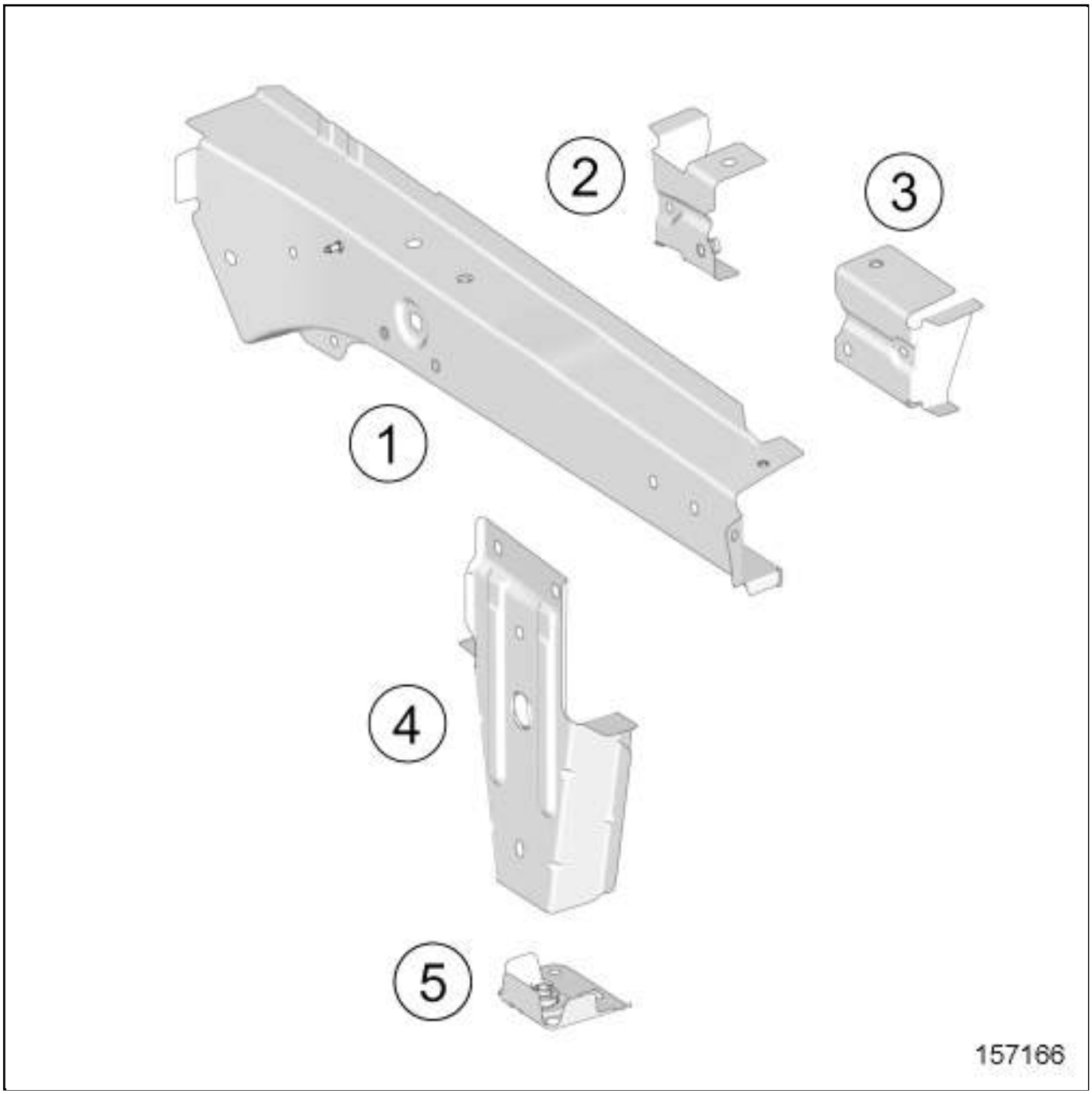
- Proceed in the reverse order to removal.

FRONT SIDE MEMBER, FRONT SECTION: REPLACEMENT

Note, one or more warnings are present in this procedure

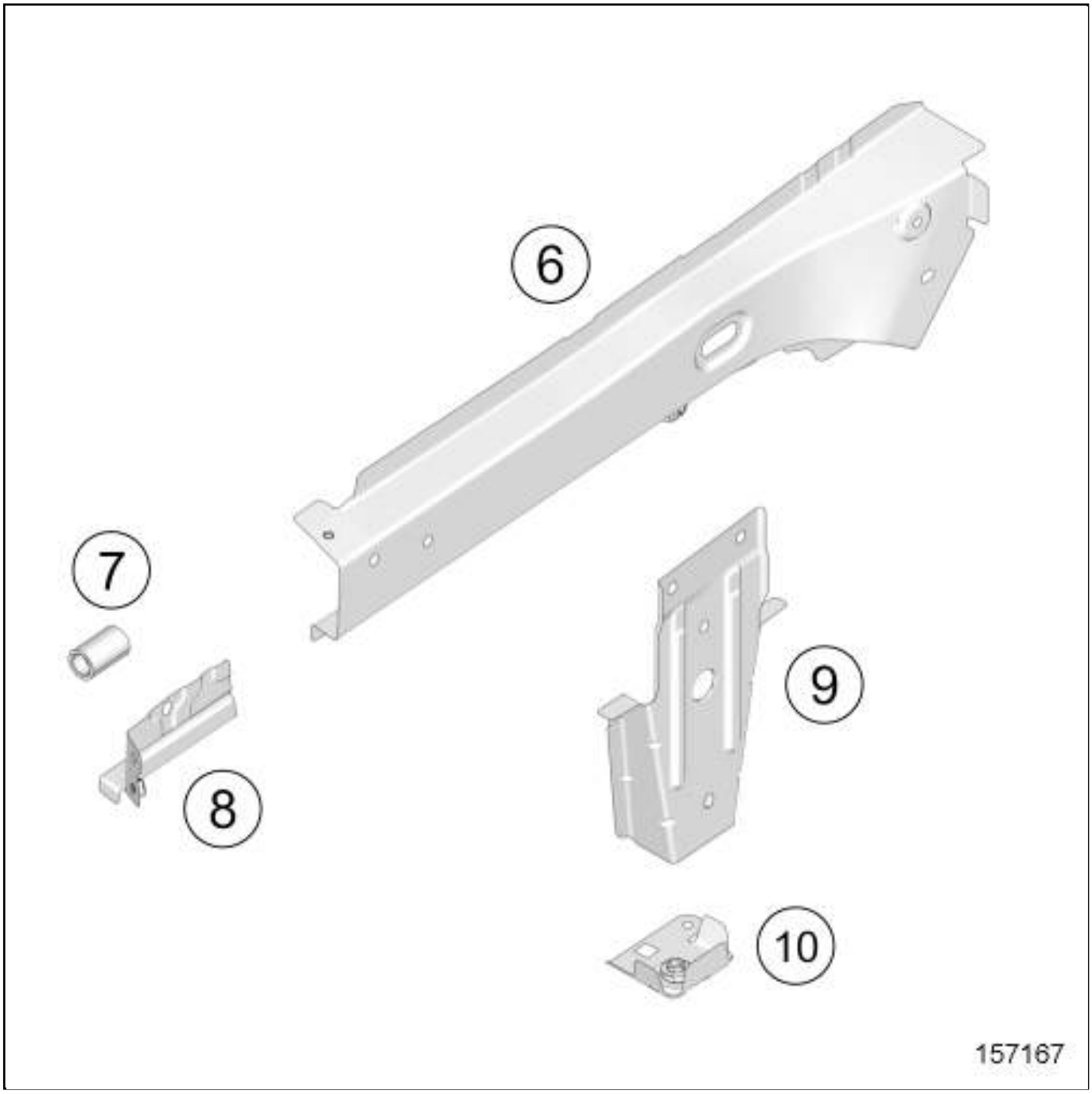
1. COMPOSITION OF THE SPARE PART

LEFT-HAND SIDE



No.	Description	Thickness (mm)
(1)	Front side member front section	1.25
(2)	Engine - gearbox assembly suspension rear reinforcement on body	2.5
(3)	Engine - gearbox assembly suspension front reinforcement on body	2.5
(4)	Front sub-frame front mounting unit	1.2
(5)	Front subframe mounting support plate	3

RIGHT-HAND SIDE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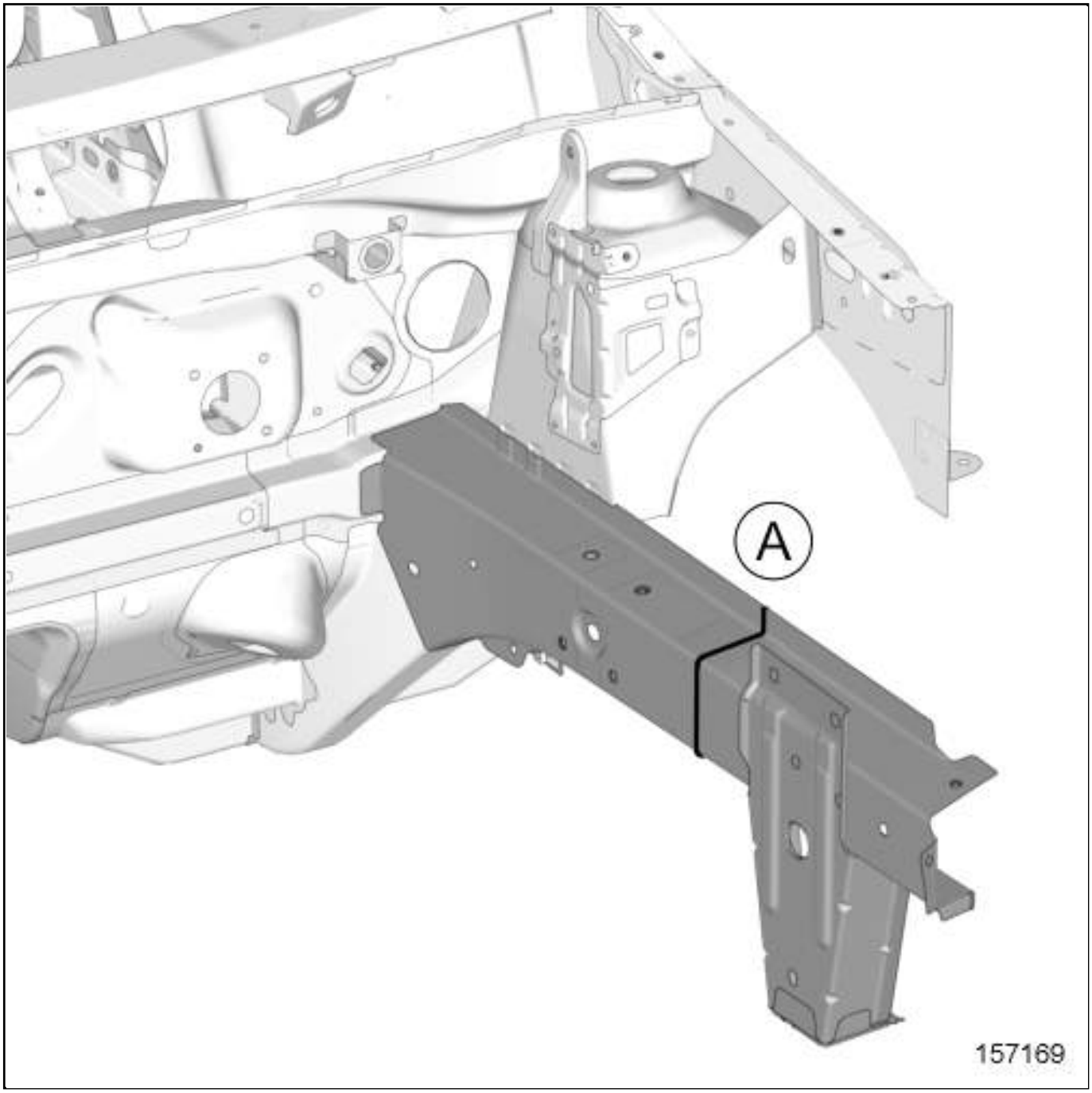
No.	Description	Thickness (mm)
(6)	Front side member front section	1.25
(7)	Tow eye socket	-
(8)	Front tow hitch support	2.5
(9)	Front sub-frame front mounting unit	1.2
(10)	Front subframe mounting support plate	3

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement along cut A.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

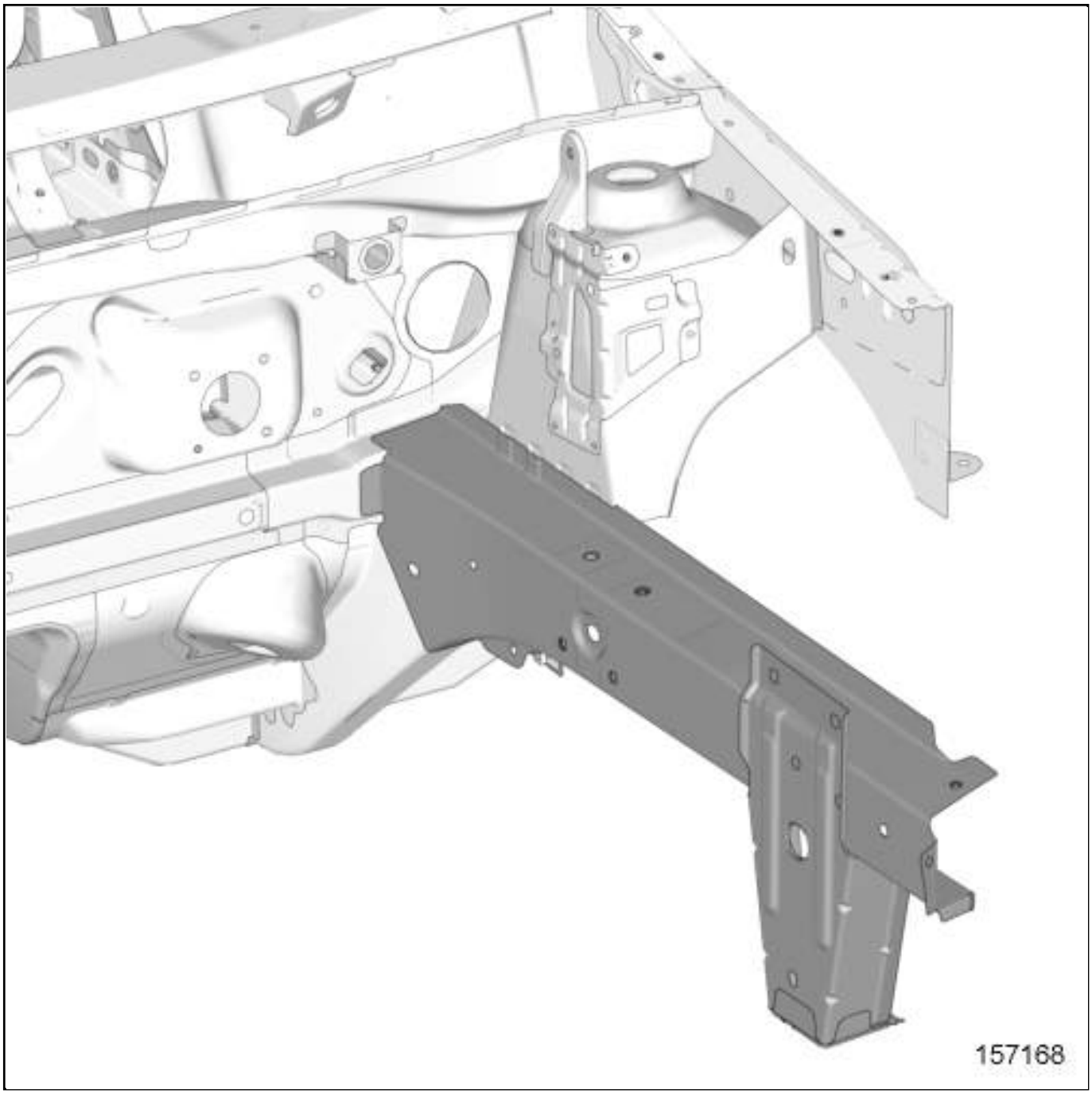
Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT

WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1)PART IN POSITION

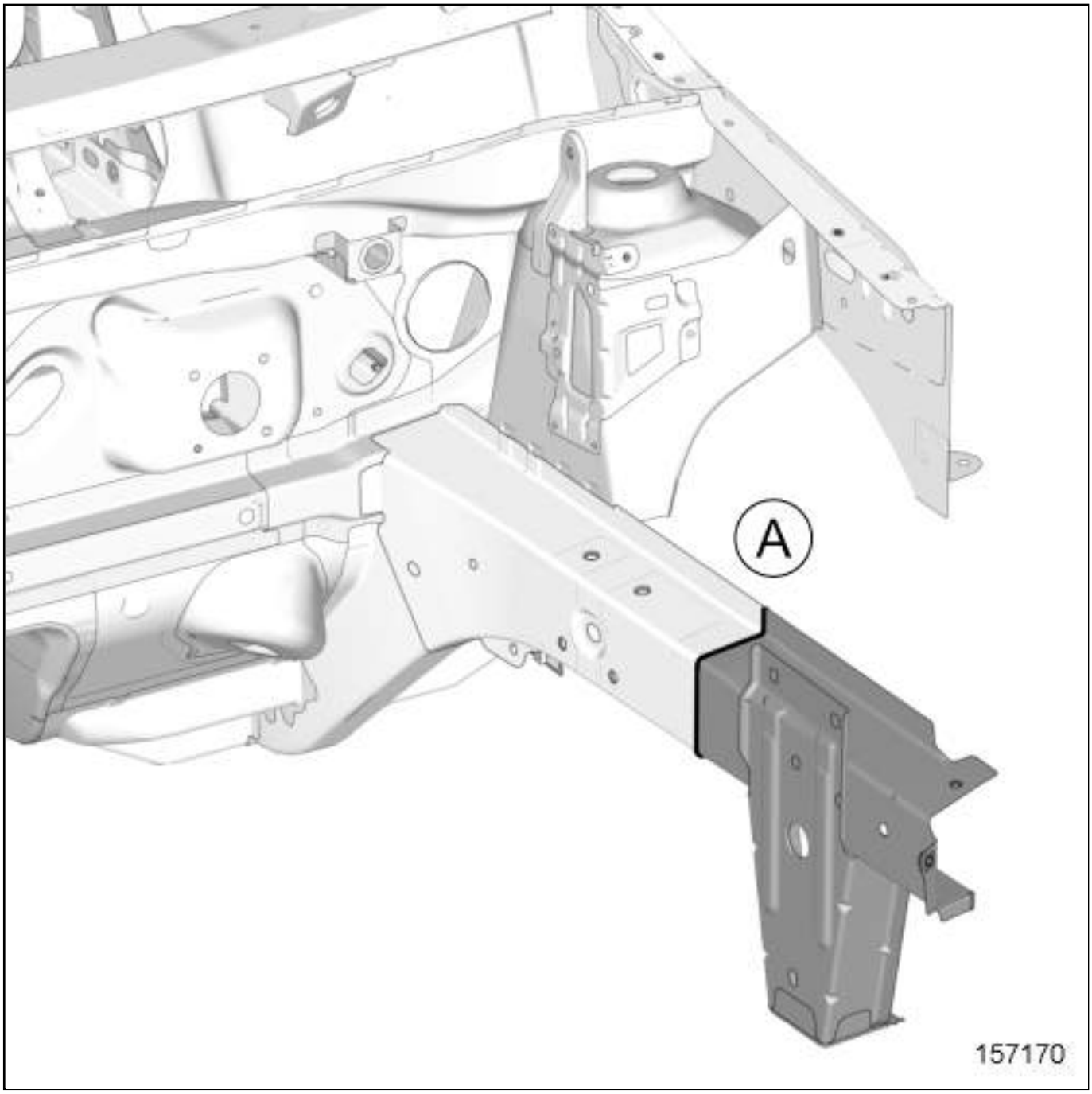


2- PARTIAL REPLACEMENT ALONG CUT A

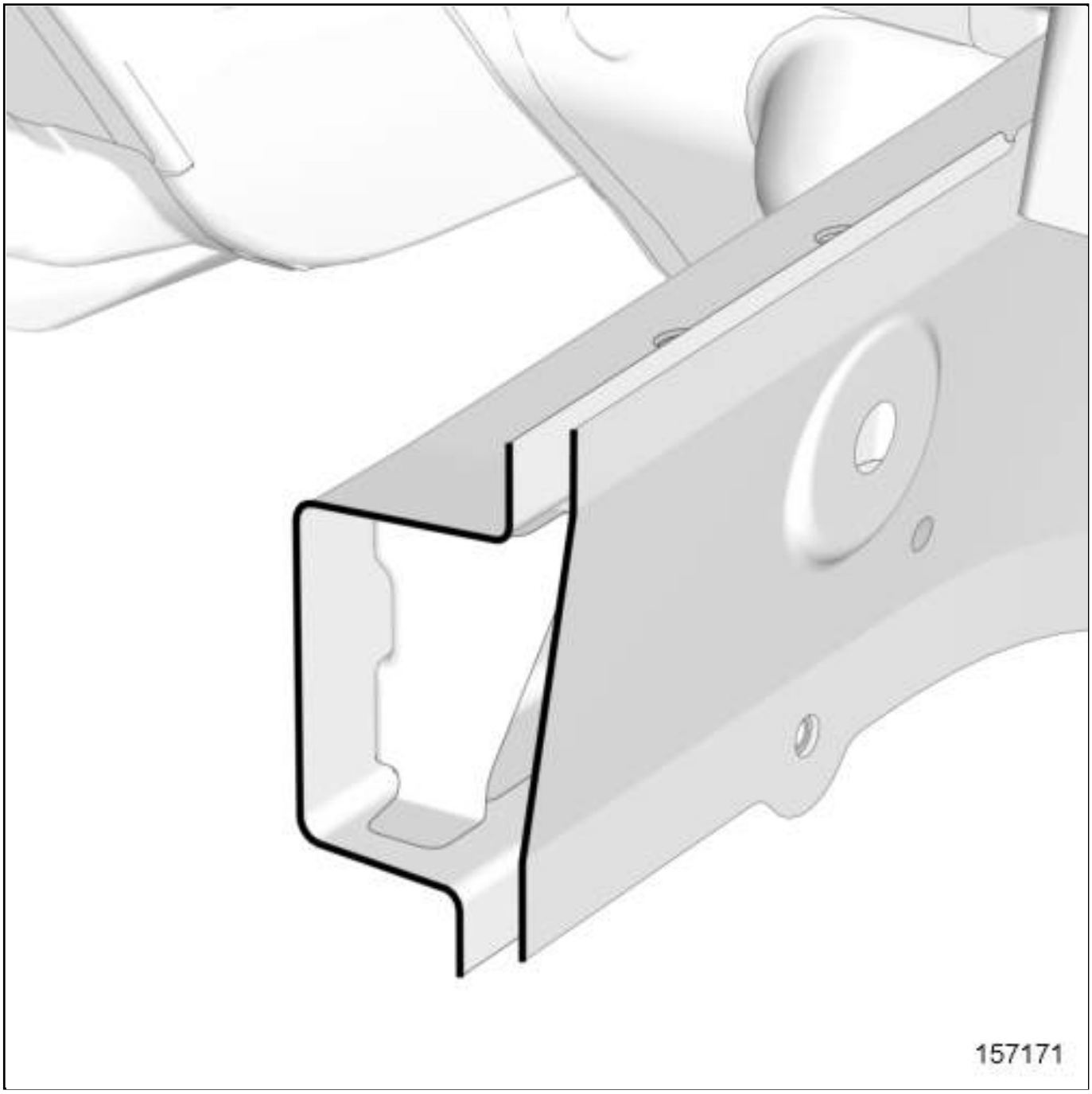
WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1)PART IN POSITION



DETAILED VIEW A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FRONT SIDE OPENING ELEMENT: ADJUSTMENT

Location and specifications (tightening torques, parts always to be replaced, etc.)Front side opening element box section internal assembly: Exploded view .

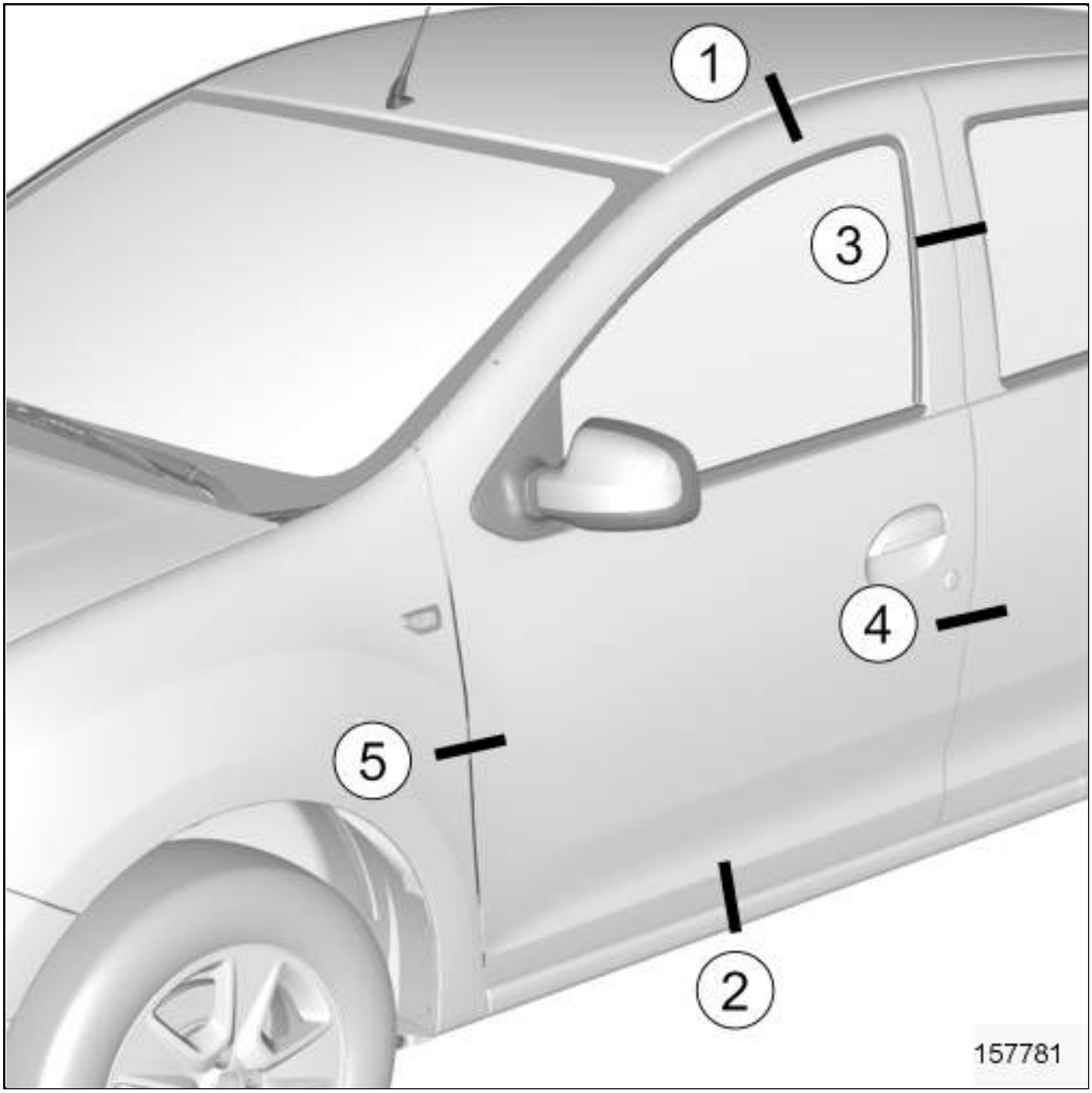
ADJUSTMENT VALUES

For all information on the front side opening element adjustment valuesVehicle panel gaps: Adjustment value .

ADJUSTMENT

There are two options for adjusting the front side door:

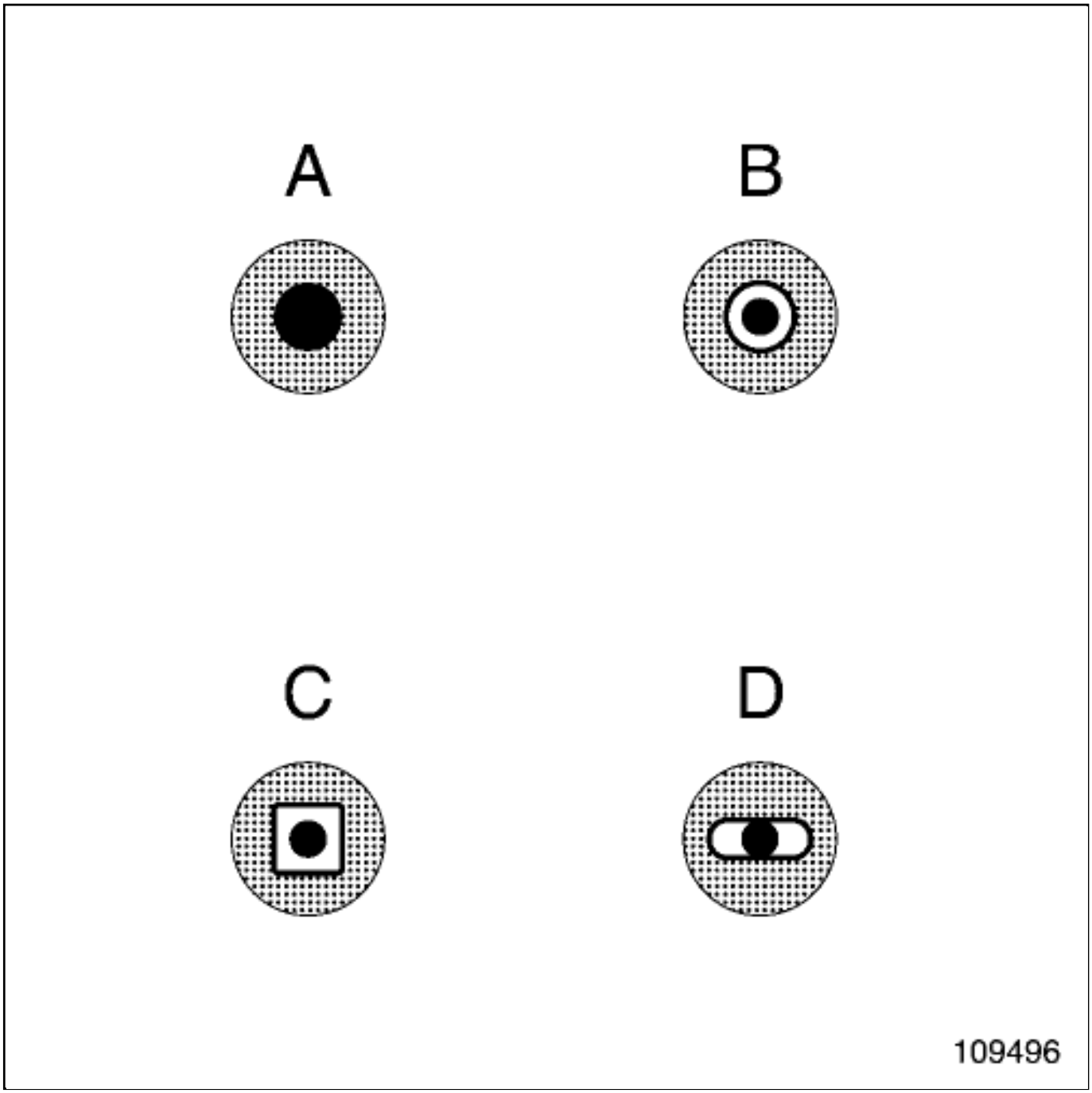
- using the front side door mountings,
- using the front side door striker panel.



- Respect the adjustment order of zones(1) , (2) , (3) , (4) and (5) .

Note:

Adjustment of zones (3) and (4) is only valid if the rear side opening element is correctly adjusted.



- Symbols A, B, C and D show the adjustment options.

The black dot in the centre represents the body of the bolt.

The grey section represents the component to be adjusted.

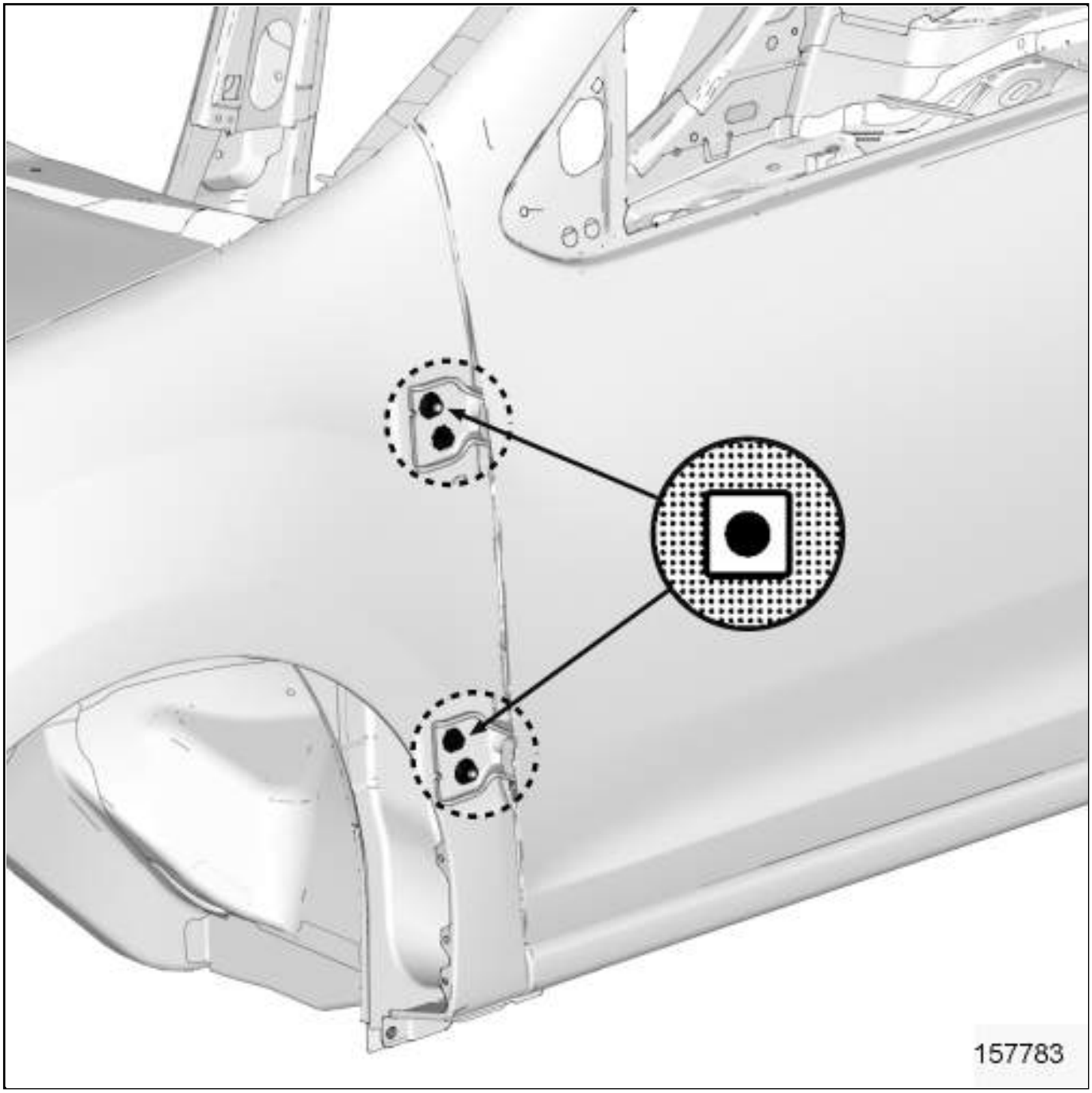
The white section represents the adjustment area.

1. HEIGHT AND LENGTH ADJUSTMENT

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the front wheel Wheel: Removal - Refitting ,
- the front wheel arch liner Exterior body front trim assembly: Exploded view .



Loosen Front side opening element box section internal assembly: Exploded view :

- the front side door hinge bolts,
- the front side door hinge nuts.

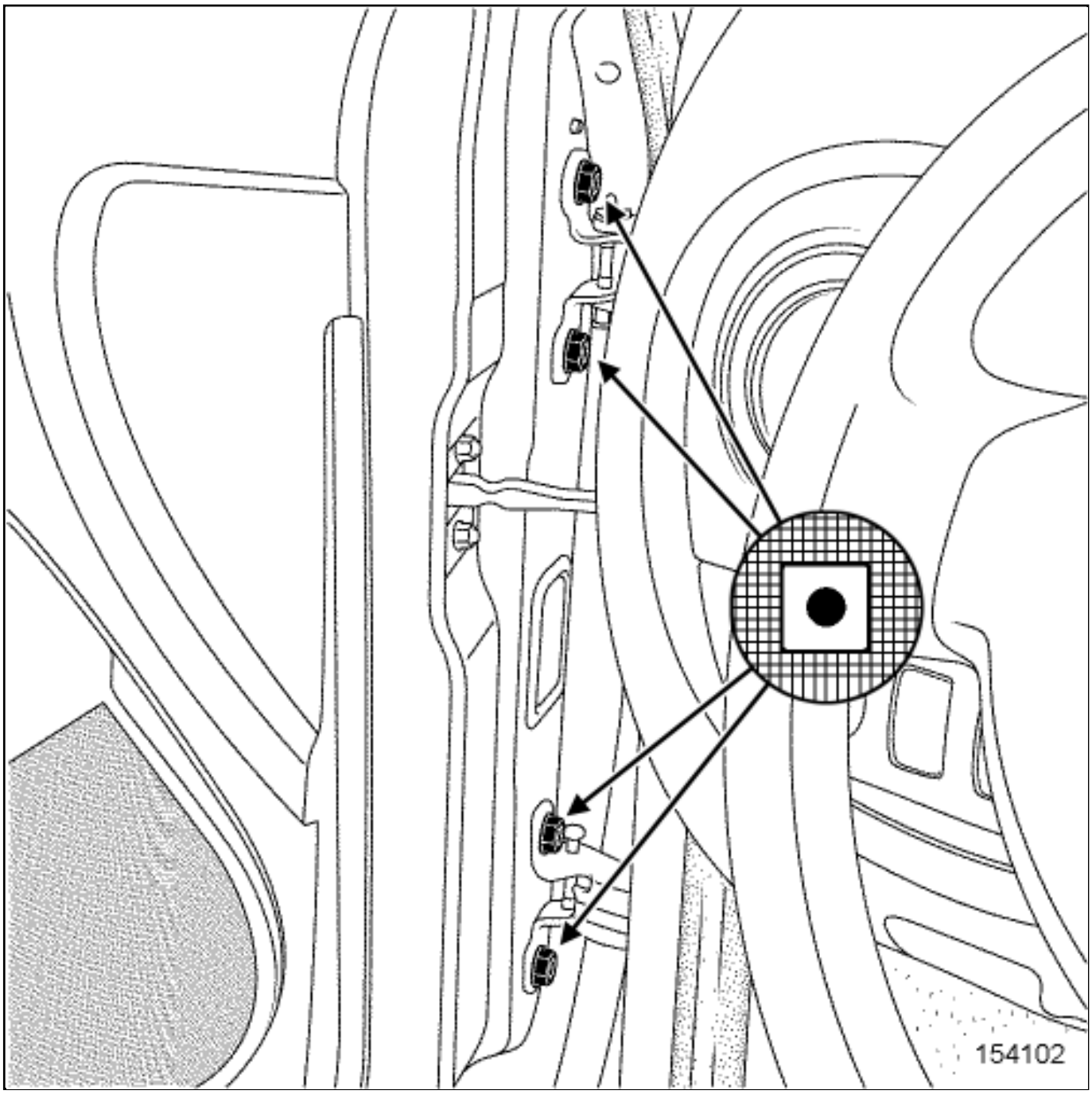
Note:

Adjustment of zones (3) and (4) is dependent on the adjustment of the rear side opening element **(see 47A, Side opening elements, Rear side opening element: Adjustment)** .

- Adjust in the following order:
  - the height of zones(1) and (2) ,
  - the length of zones(3) , (4) and (5) .

- Tighten **Front side opening element box section internal assembly: Exploded view** :
  - the front side door hinge bolts,
  - the front side door hinge nuts.

2. DEPTH ADJUSTMENT



- Loosen the front side door hinge bolts[Front side opening element box section internal assembly: Exploded view] .
-

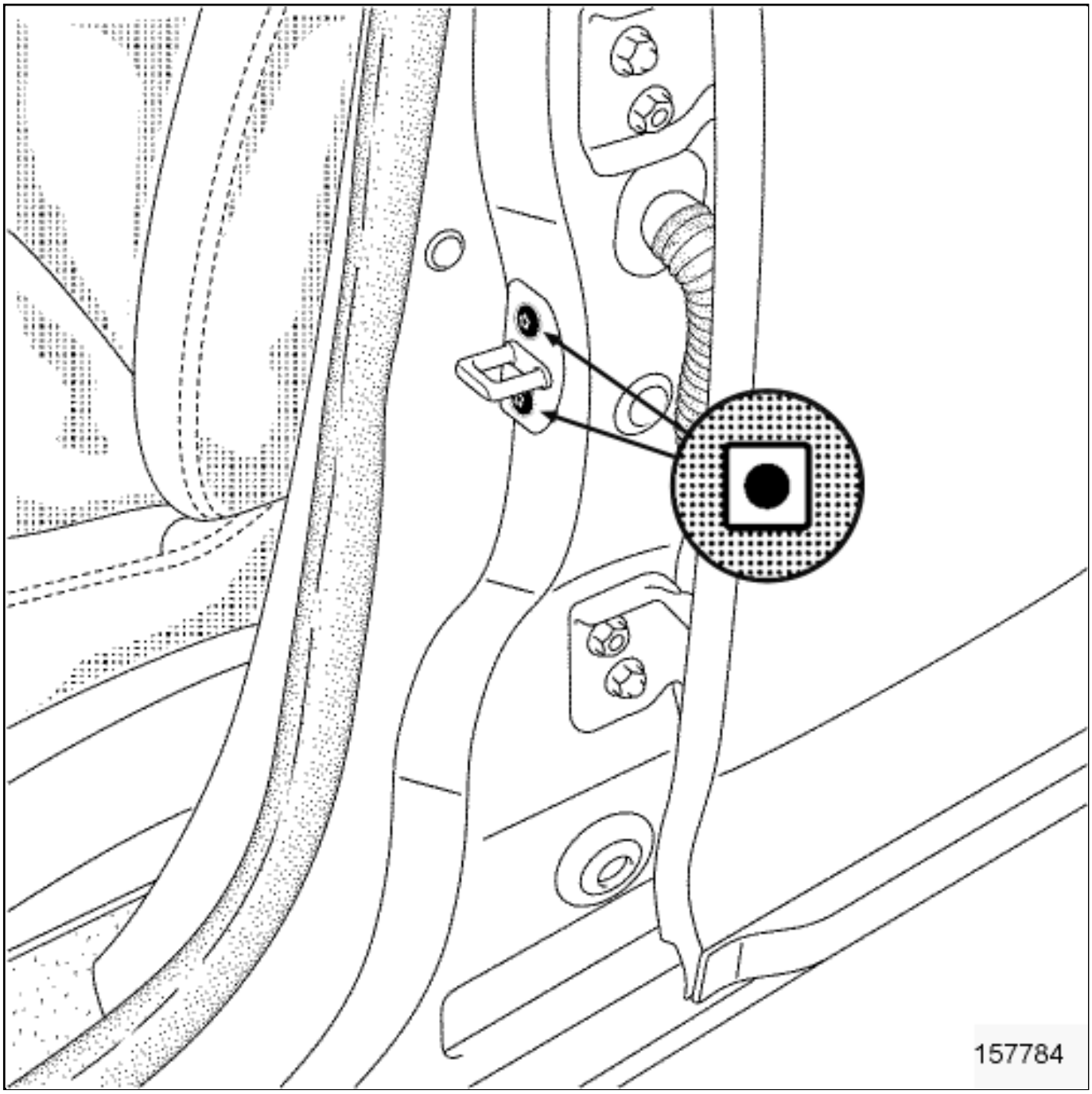
Note:

The original hinge mounting plates are bonded to the door box section.

To carry out the adjustment, it is necessary to remove the plate using a wooden block and a hammer.

Adjust the depth of zones(1) , (2) and (5) .

- Tighten the front side door hinge bolts Front side opening element box section internal assembly: Exploded view .



- Loosen the striker panel bolts Front side opening element box section internal assembly: Exploded view .

Note:

Adjustment of zones (3) and (4) is dependent on the adjustment of the rear side opening element **(see 47A, Side opening elements, Rear side opening element: Adjustment)** .

Adhere to the following adjustment sequence:

- adjust the height of the striker panel in relation to the lock to prevent them touching,
- adjust the depth of zones(3) and (4) .

Tighten the striker panel bolts**Front side opening element box section internal assembly: Exploded view** .

FRONT SIDE OPENING ELEMENT ASSEMBLY ON THE PASSENGER COMPARTMENT SIDE: EXPLODED VIEW

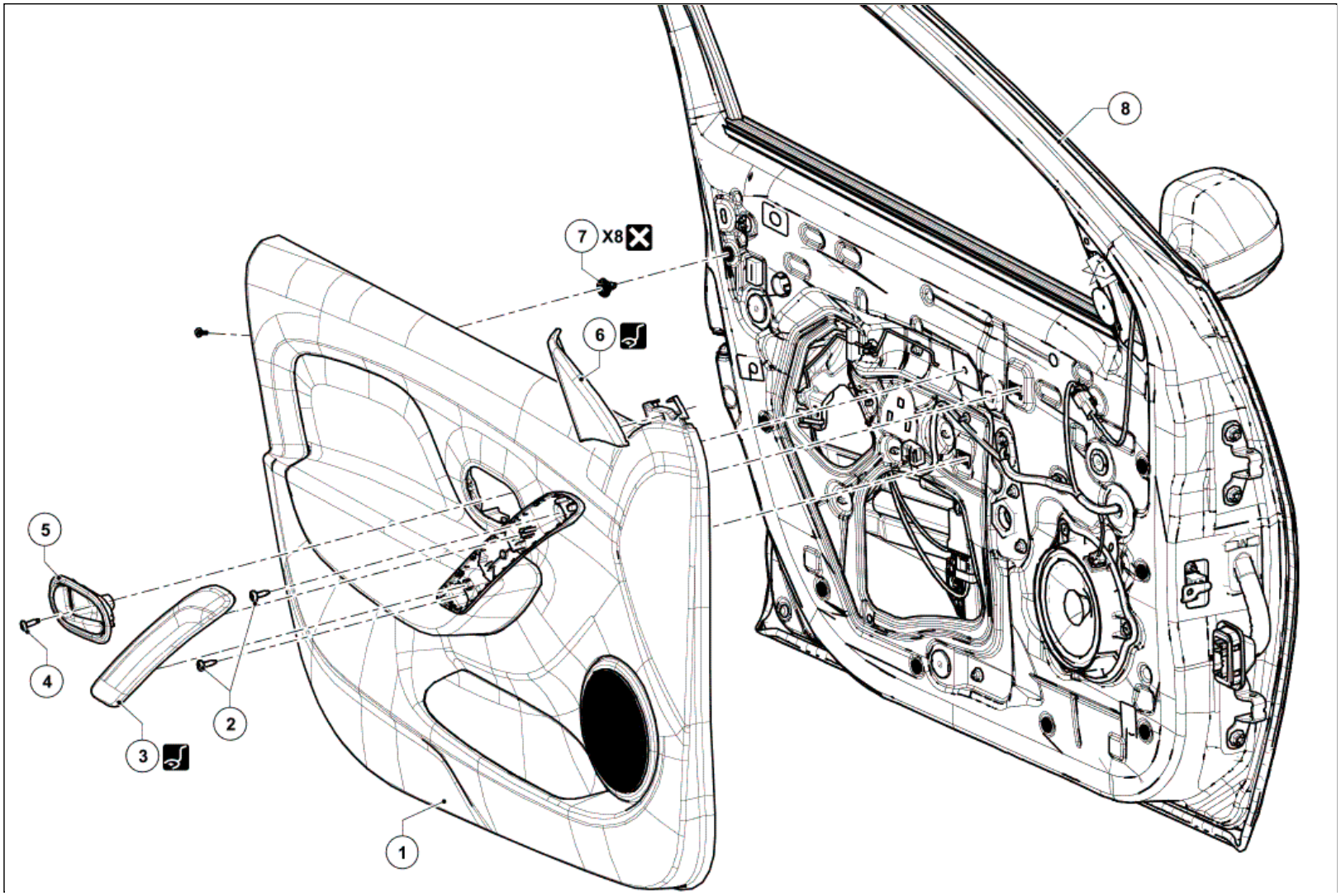


Illustration key: Description

Marks	Designations	Informations
1	Front side opening element trim	
2	Bolt of front side opening element pulling handle	
3	Blanking cover of front side opening element pulling handle	(Car.1363)
4	Bolt of interior opening control of front side opening element	
5	Front side door interior opening control	
6	Door mirror cover	(Car.1363)
7	Rear side opening element trim clip	
8	Rear side opening element	

FRONT SIDE OPENING ELEMENT BOX SECTION INTERNAL ASSEMBLY: EXPLODED VIEW

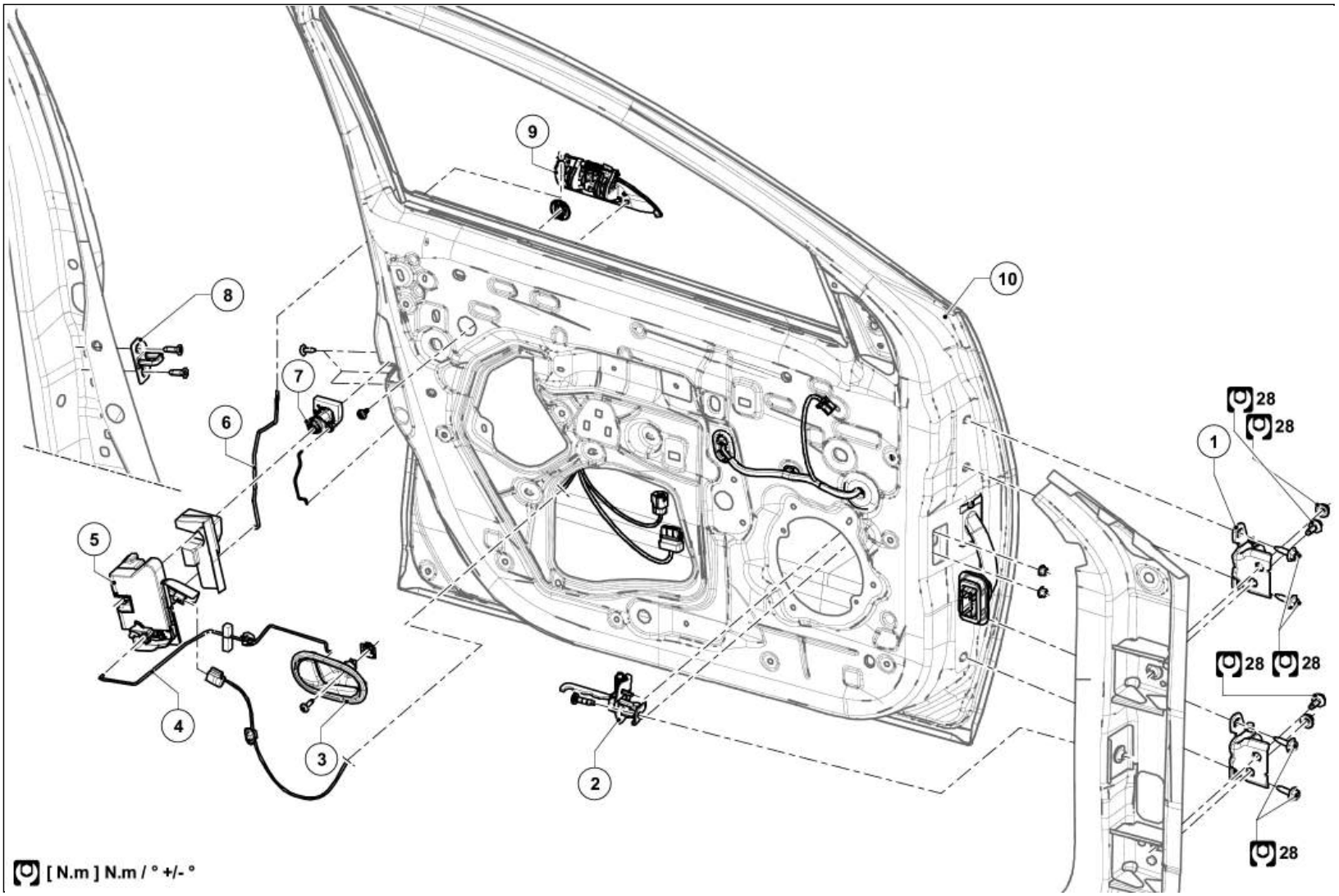


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front opening element hinge	
2	Front side door striker panel	
3	Front side door interior opening control	
4	Linkage of the front side door interior handle	
5	Front side door lock	
6	Linkage of the front side door exterior handle	(see 51A, Side opening element mechanisms, Front side opening element lock: Removal - Refitting)
7	Front side door lock barrel	(see 51A, Side opening element mechanisms, Front side opening element lock barrel: Removal - Refitting)
8	Front side opening element striker panel	
9	Front side door exterior handle	(see 51A, Side opening element mechanisms, Side opening element exterior handle: Removal - Refitting)
10	Front side opening element	Front side opening element: Removal - Refitting

FRONT SIDE OPENING ELEMENT LOCK BARREL: REMOVAL - REFITTING

parts always to be replaced:
front side opening element lock barrel locking ring

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 51A, Side opening element mechanisms, Front side opening element box section internal assembly: Exploded view) .

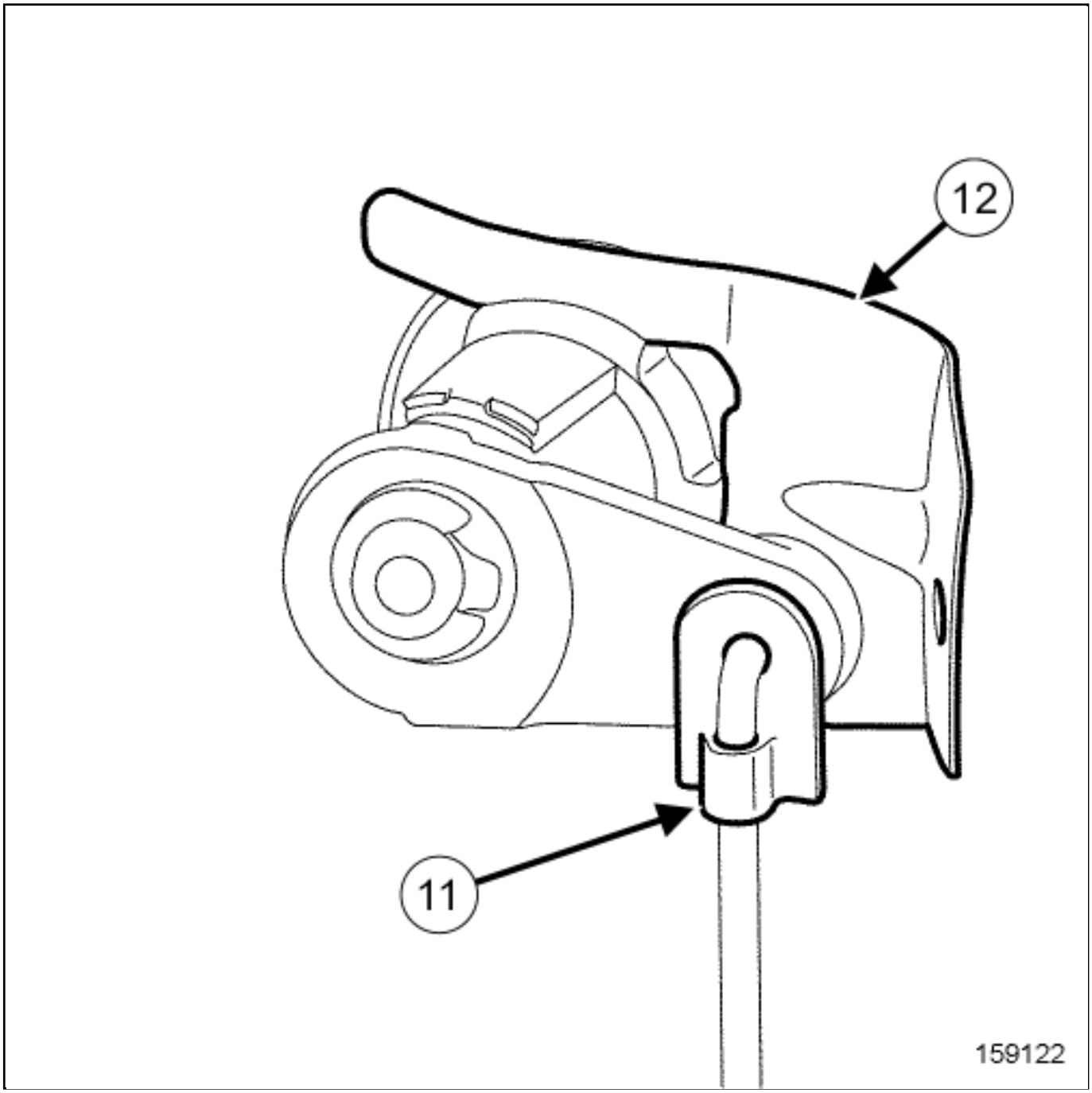
REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

- the front side opening element trimFront side opening element trim: Removal - Refitting ,
- the side opening element sealing filmSide opening element sealing film: Removal - Refitting .

2. REMOVAL OPERATION



- Extract the front side door lock barrel linkage from the clip(11) .

- Remove:
  - the fork(12) ,
  - the front side door lock barrel.

REFITTING

1. REFITTING PREPARATION OPERATION

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Carry out a function test on the front side opening element lock barrel.

FRONT SIDE OPENING ELEMENT LOCK: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 51A, Side opening element mechanisms, Front side opening element box section internal assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove:
  - the front side opening element trimFront side opening element trim: Removal - Refitting ,
  - the side opening element sealing filmSide opening element sealing film: Removal - Refitting .

- Remove the front side door sliding window front run channel(see 51A, Side opening element mechanisms, Front side window mechanism assembly: Exploded view) .

2. REMOVAL OPERATION

- Remove the exterior opening control linkage from the clip on the exterior door handle(see 51A, Side opening element mechanisms, Front side opening element box section internal assembly: Exploded view) .

- Disconnect the connector from the lock motor(see 51A, Side opening element mechanisms, Front side opening element box section internal assembly: Exploded view) .

- Remove the front side opening element lock bolts(see 51A, Side opening element mechanisms, Front side opening element box section internal assembly: Exploded view) .

- Unclip the interior opening control linkage(see 51A, Side opening element mechanisms, Front side opening element box section internal assembly: Exploded view) .

- Remove the front side opening element lock and the interior opening linkage(see 51A, Side opening element mechanisms, Front side opening element box section internal assembly: Exploded view) .

REFITTING

- Proceed in the reverse order to removal.

- Carry out a function test.

FRONT SIDE OPENING ELEMENT: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)Front side opening element box section internal assembly: Exploded view .

- This operation can be carried out in two ways:
  - removal without hinges: used when replacing the door.
  - removal with hinges: allows the initial adjustments to be kept.

Note:

The front side door can be removed without removing the front wing.

REMOVAL

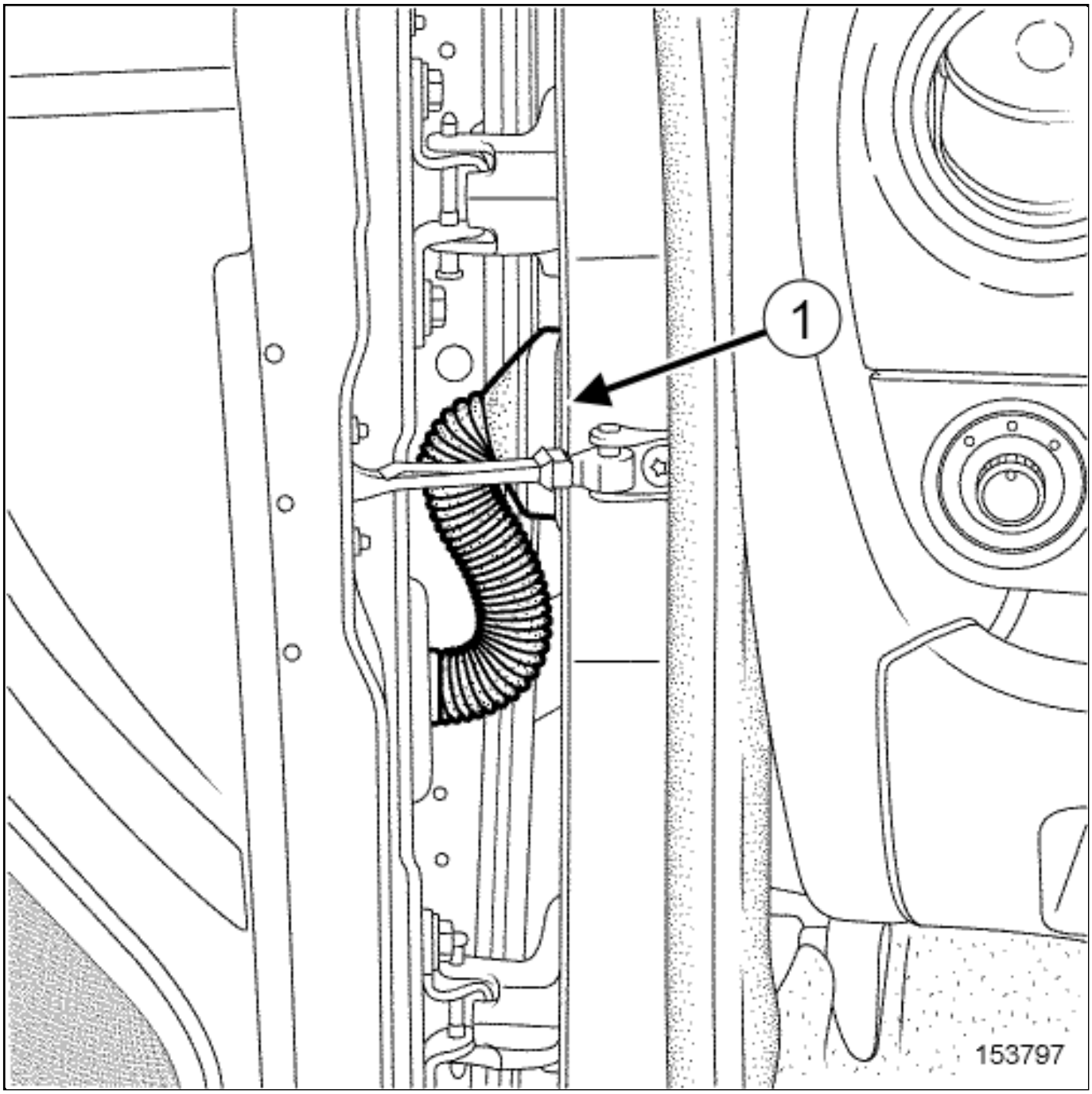
1. REMOVAL PREPARATION OPERATION

1- REMOVAL WITH HINGES

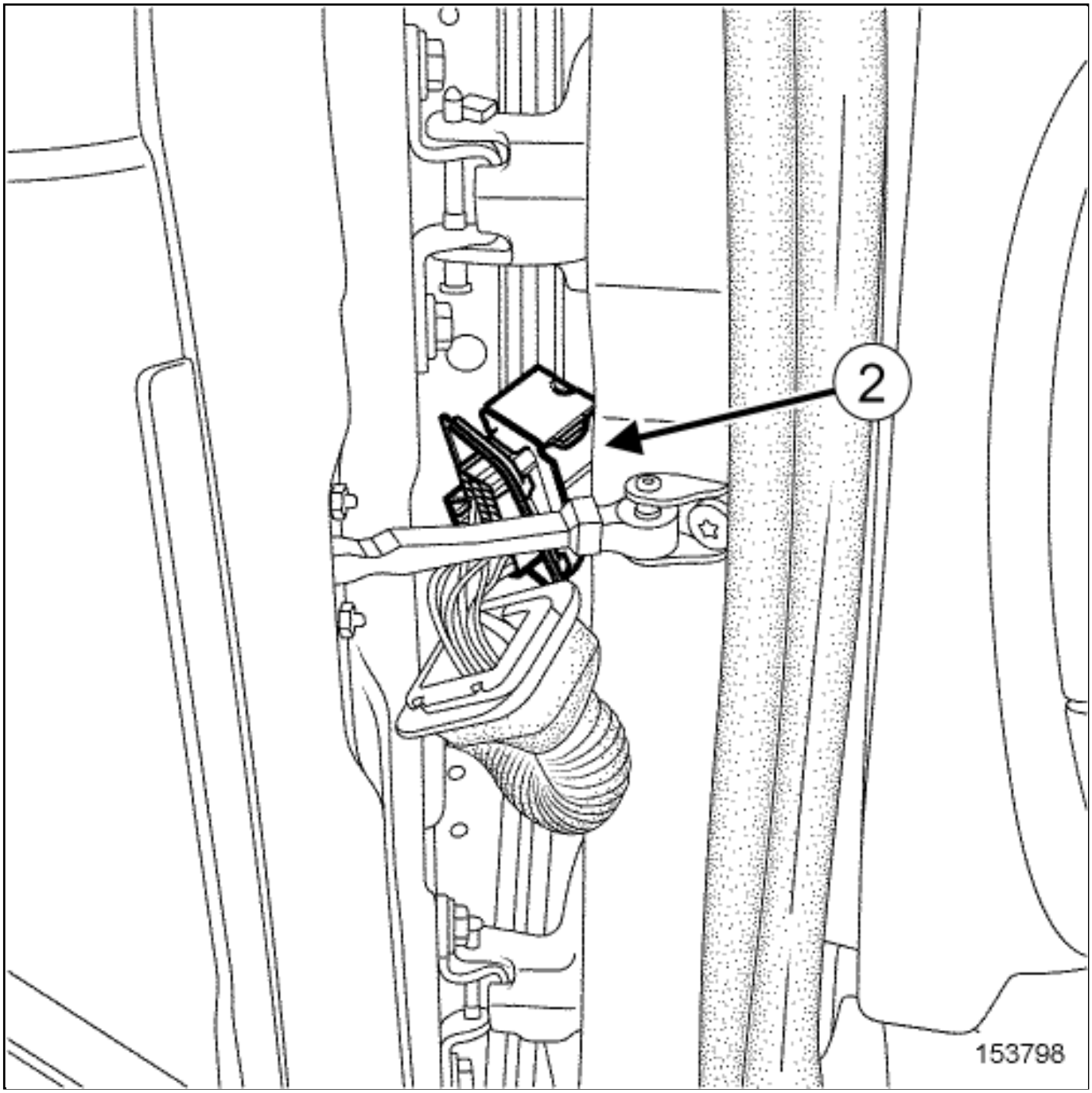
- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the front wheelWheel: Removal - Refitting ,
  - the front wheel arch linerExterior body front trim assembly: Exploded view .

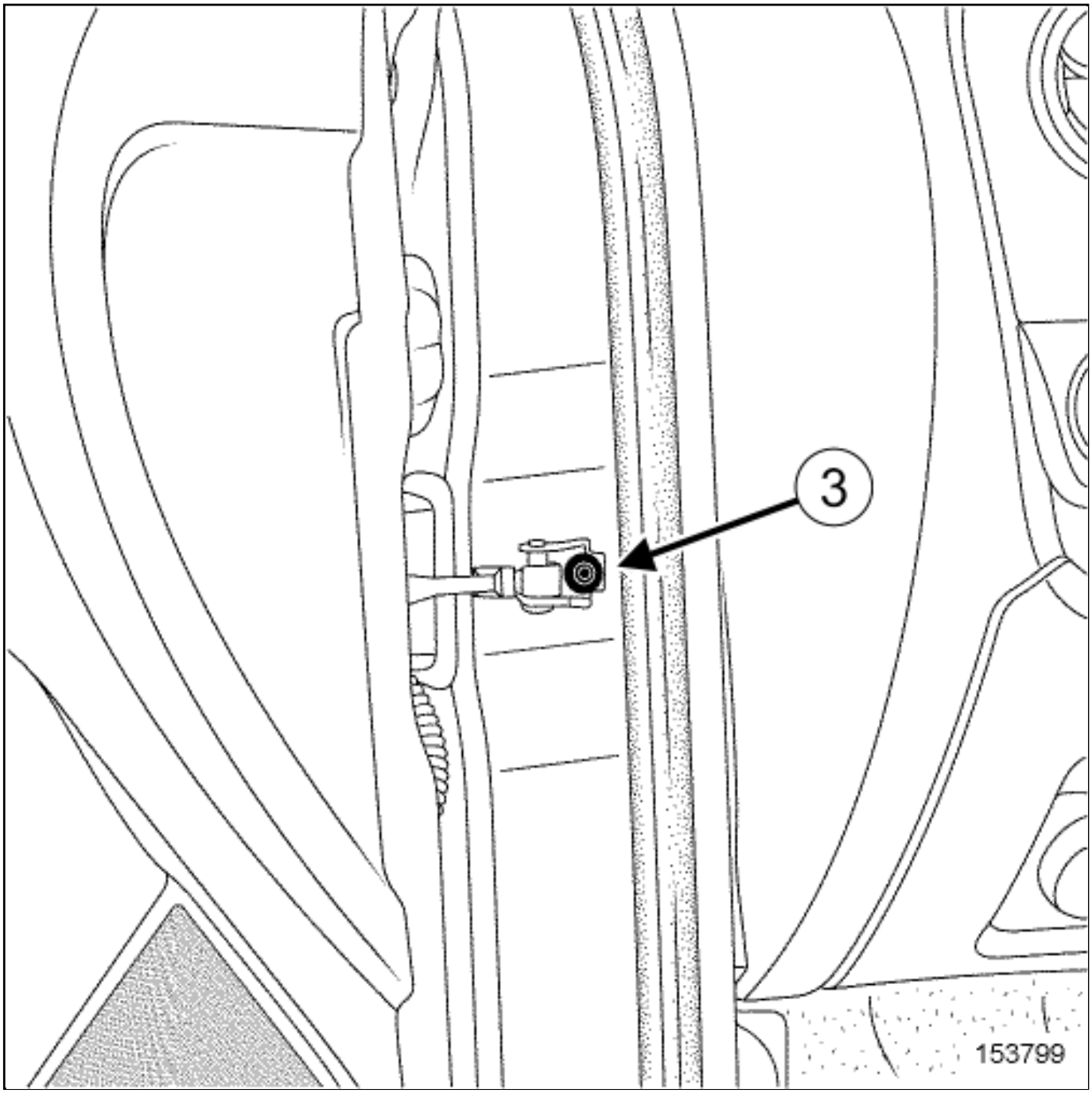
2- SAME PROCEDURE FOR BOTH TYPES



- Extract the protector(1) of the front side door wiring on the A-pillar (depending on the equipment level).



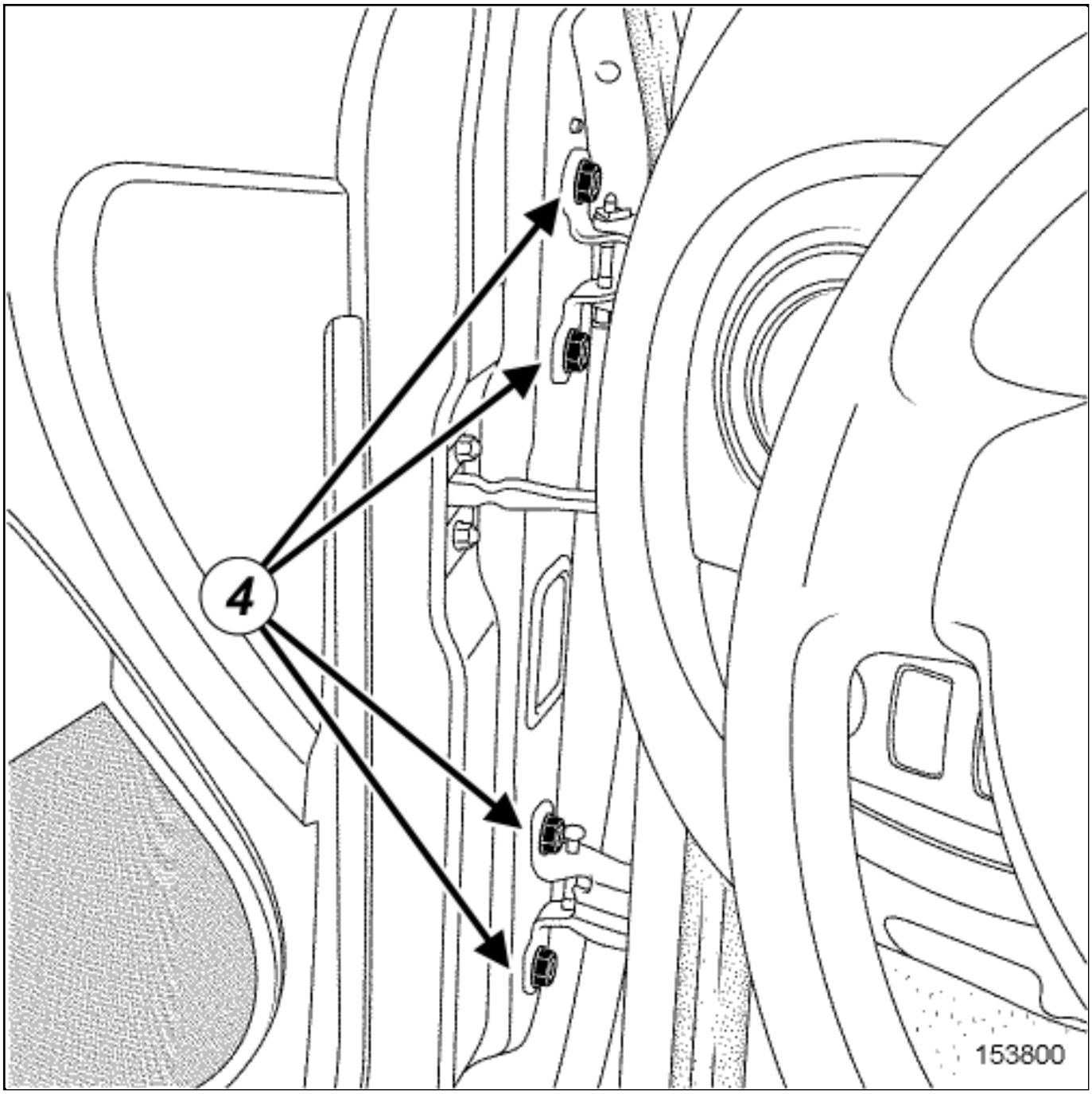
- Disconnect the connector(2) of the front side door wiring (depending on the equipment level).



- Remove the bolt(3) of the front side door check strap on the A-pillar.
- Move aside the front side door check strap.

2. REMOVAL OPERATION

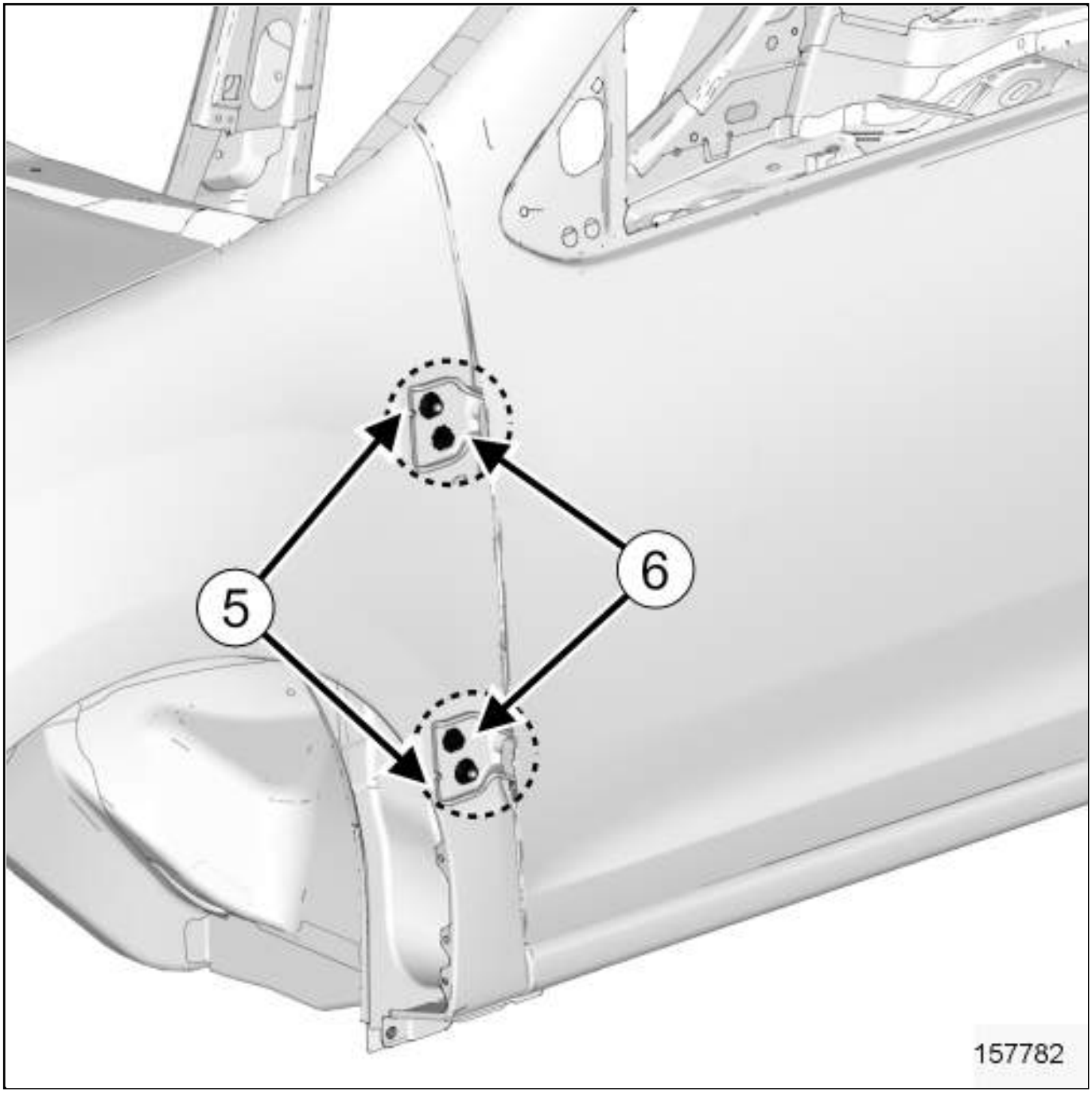
1- REMOVAL WITHOUT HINGES



Remove:

- the front side door bolts(4) ,
- the front side door (this operation requires two people).

2- REMOVAL WITH HINGES



Remove:

- the front side door nuts(**5**) ,
- the front side door bolts(**6**) ,
- the front side door (this operation requires two people).

REFITTING

1. REFITTING OPERATION

1- REFITTING WITHOUT HINGES

- Proceed in the reverse order to removal.
- Adjust the front side door clearances and flush fittings (see 47A, Side opening elements, Front side opening element: Adjustment) .
- Carry out a function test on all functions.

2- REFITTING WITH HINGES

Note:

Apply a bead of sealing mastic Vehicle: Parts and consumables for the repair to the door hinges Anti-corrosion protection product before assembly: Use .

- Proceed in the reverse order to removal.
- Adjust the front side door clearances and flush fittings (see 47A, Side opening elements, Front side opening element: Adjustment) .
- Carry out a function test on all functions.

XSL version : 3.02 du 22/07/11

FRONT SIDE OPENING ELEMENT TRIM: REMOVAL - REFITTING

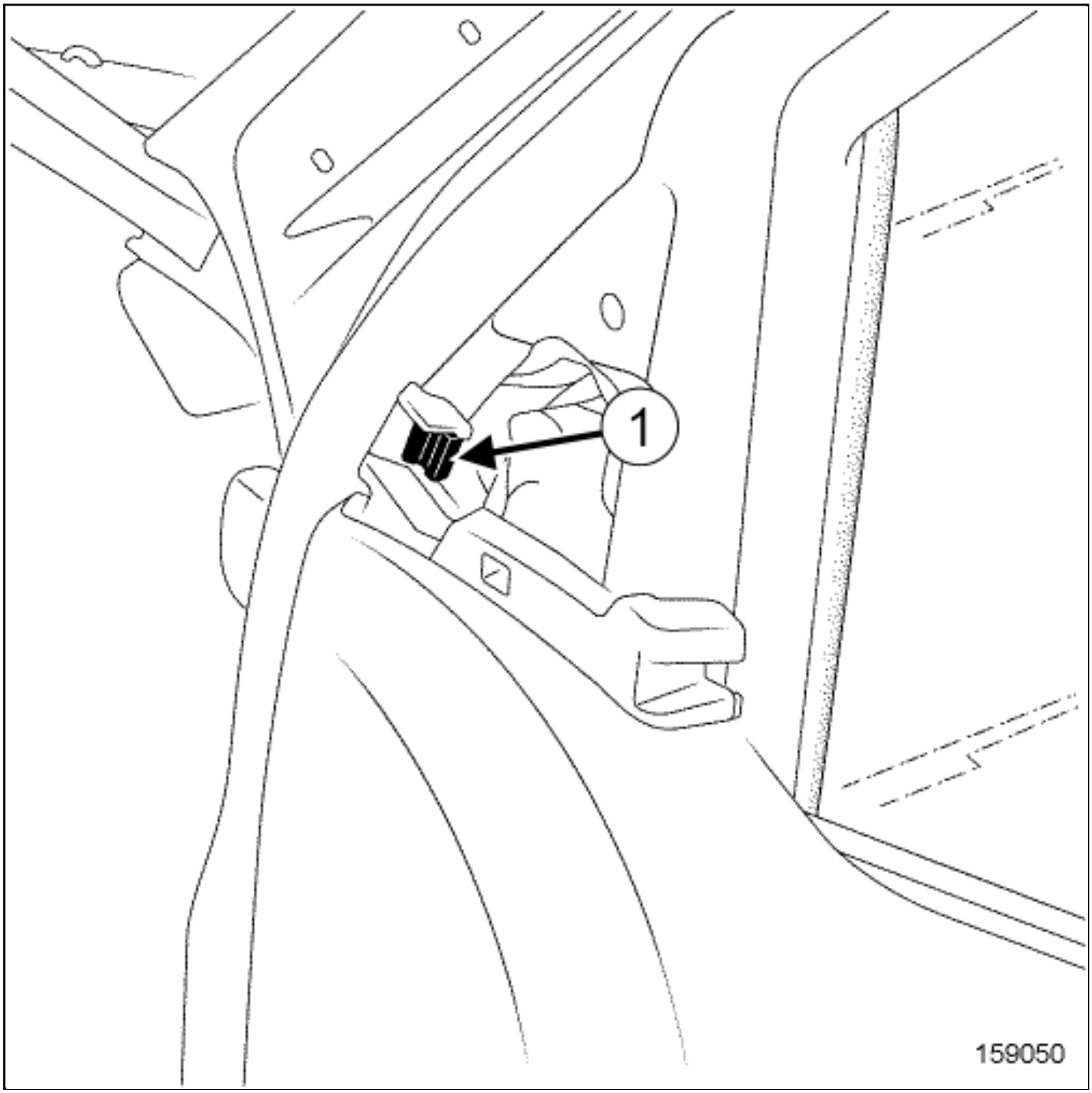
Special tooling required	
Set of trim removal levers.	Car. 1363

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 72A, Side opening element trim, Front side opening element assembly on the passenger compartment side: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the door mirror cover(see 72A, Side opening element trim, Front side opening element assembly on the passenger compartment side: Exploded view) .



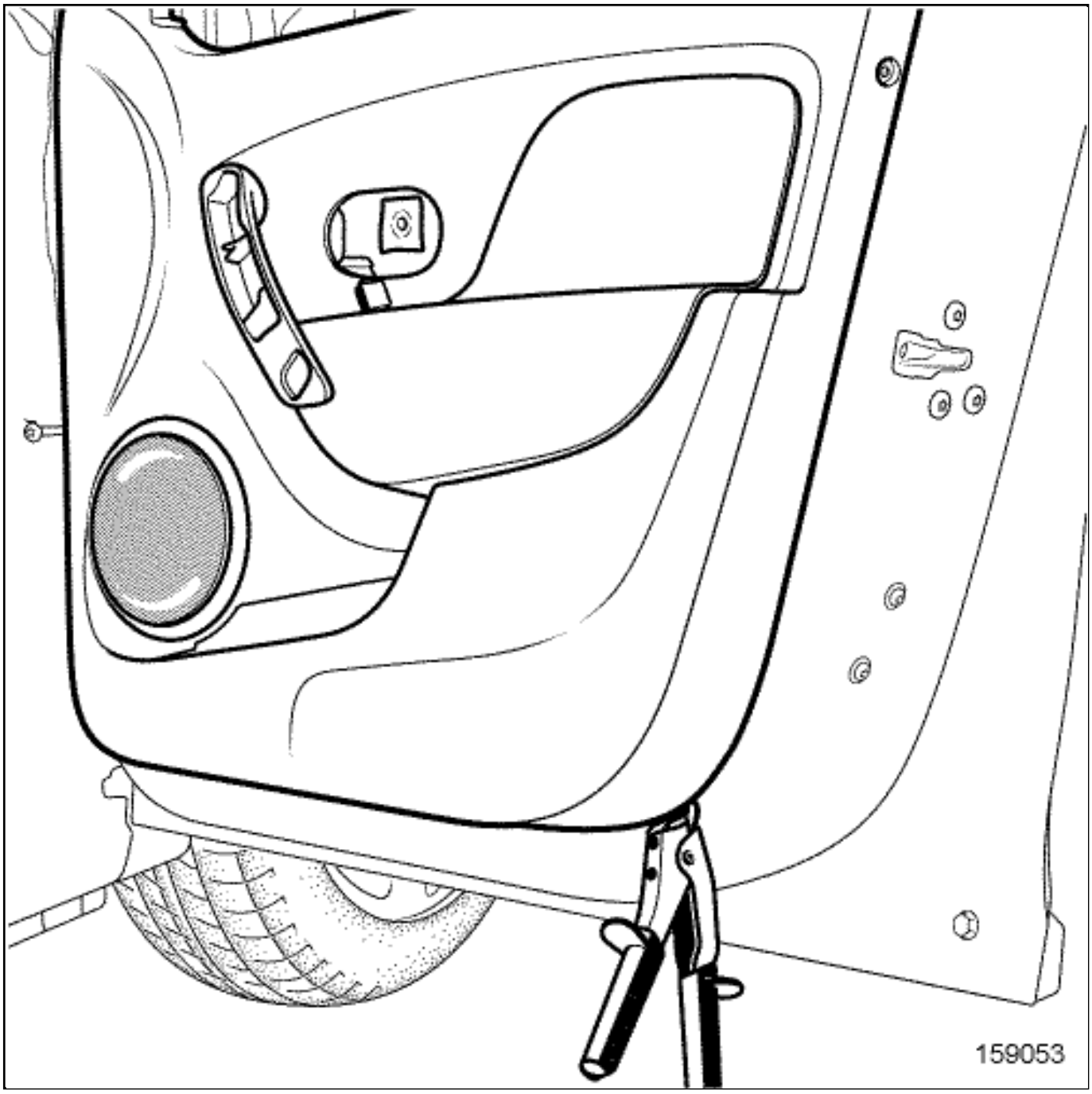
Unclip the clip(1) from the front side opening element trim.

Remove (see 72A, Side opening element trim, Front side opening element assembly on the passenger compartment side: Exploded view) :

- the interior opening control bolt,
- the interior opening control,
- the cover from the interior handle,
- the interior handle bolts.

2. REMOVAL OPERATION

- Remove the front side opening element trim bolt(see 72A, Side opening element trim, Front side opening element assembly on the passenger compartment side: Exploded view) .



- Remove the front side opening element trim using a pair of unclipping pliers.

REFITTING

1. REFITTING PREPARATION OPERATION

- Check the condition of the clips and replace them if necessary.

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

FRONT SIDE SEAT BELT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Front seat belt inertia reel bolt

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair **(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair)** .

WARNING

Never handle the pyrotechnic systems (pretensioners or airbags) near to a source of heat or naked flame - they may be triggered.

WARNING

To eliminate the risk of any accident, do not reuse pyrotechnic components.

It is essential to destroy pretensioners or airbags before scrapping a vehicle or a part only **(see 88C, Airbags and pretensioners, Airbags and pretensioners: Recycling - Destruction)** .

Note:

The seat belt must be handled by the inertia reel mechanism (risk of damaging the strap).

REMOVAL

1. REMOVAL PREPARATION OPERATION

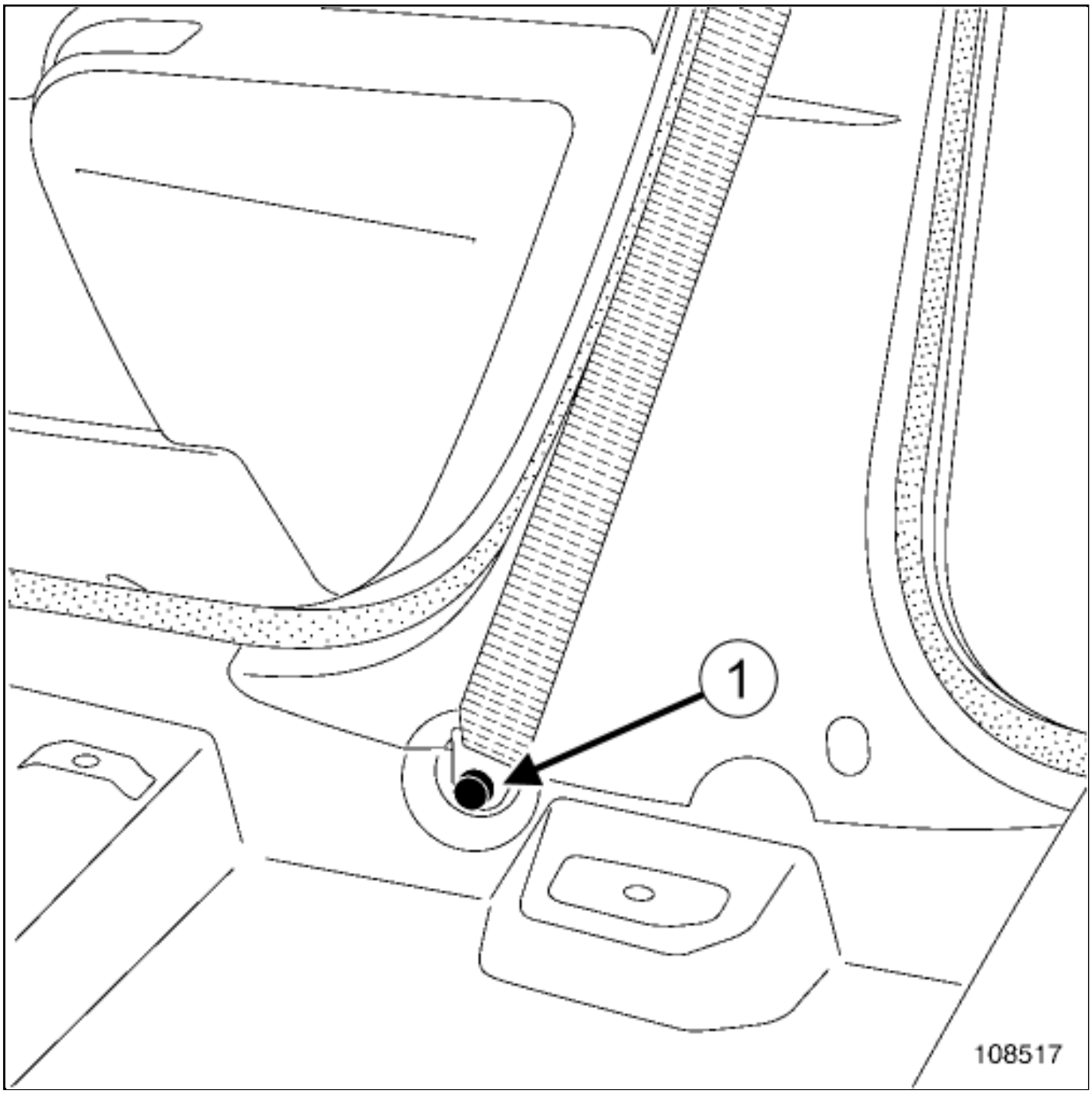
WARNING

To avoid any risk of triggering when working on or near a pyrotechnic component (airbags or pretensioners), lock the airbag computer using the diagnostic tool.

When this function is activated, all the trigger lines are inhibited and the airbag warning light on the instrument panel lights up continuously (ignition on).

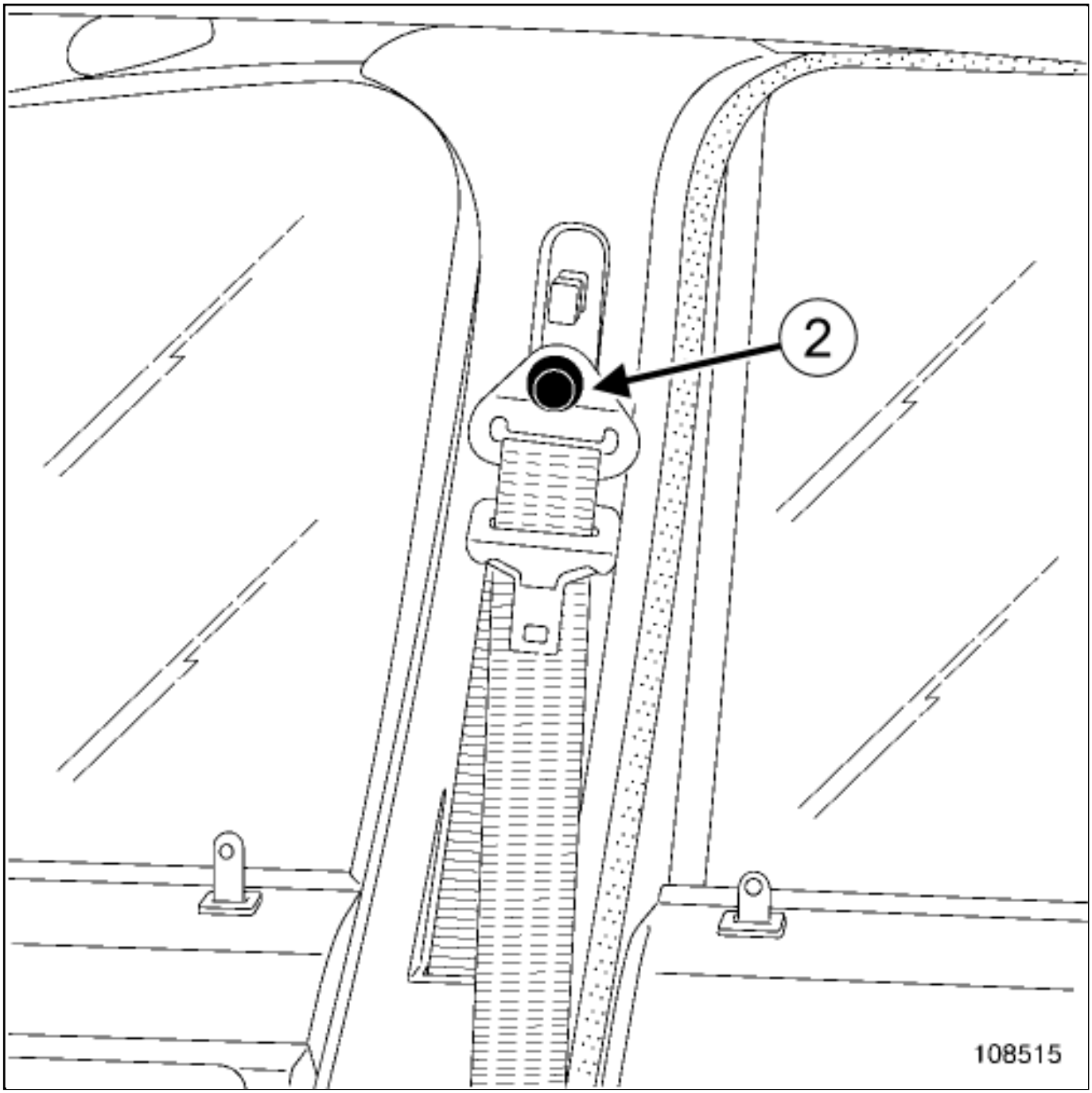
- Lock the airbag computer (see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .
- Switch off the ignition.
- Disconnect the battery Battery: Removal - Refitting .

2. REMOVAL OPERATION



Remove:

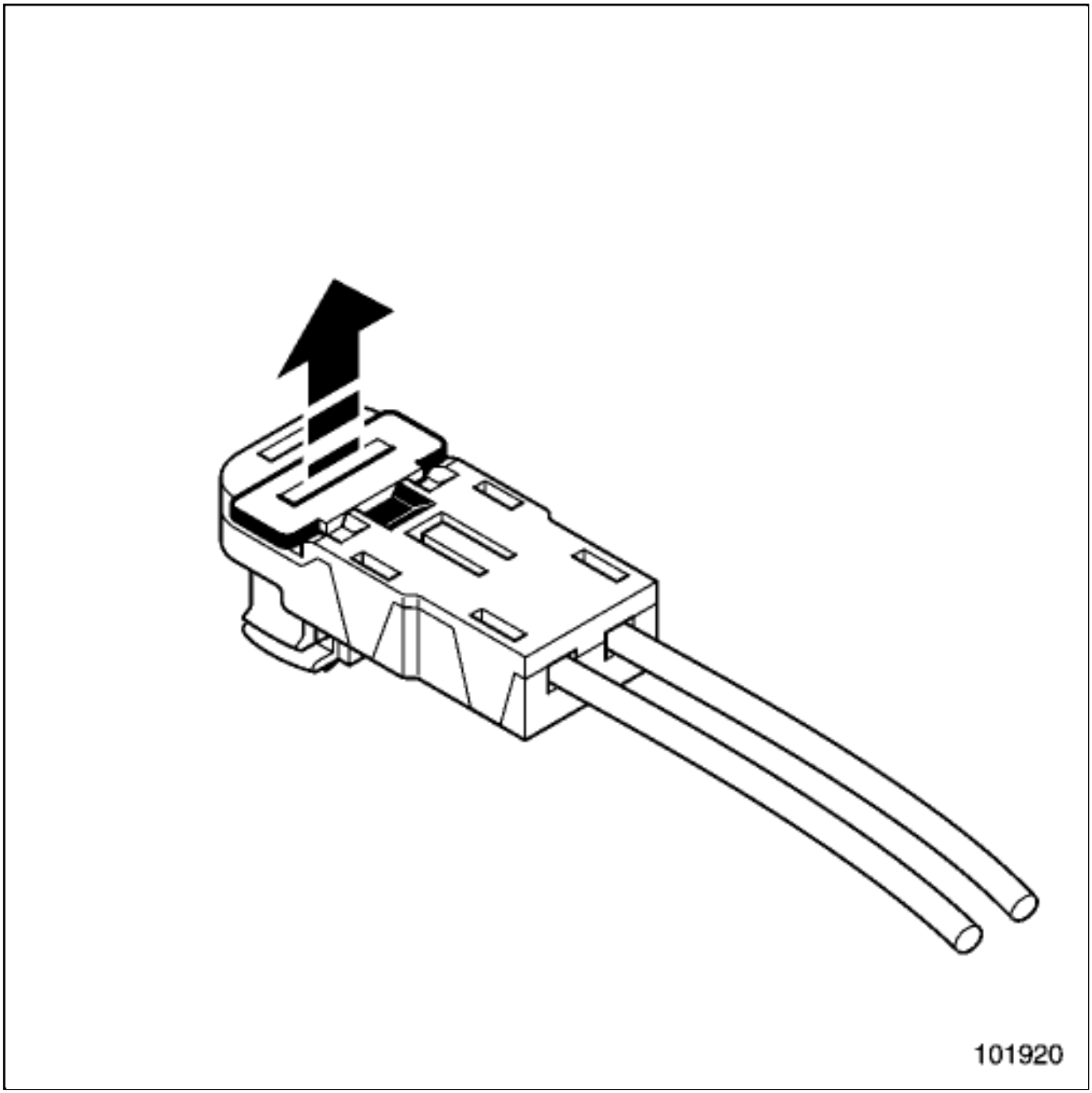
- the cover of the seat belt lower bolt,
- the seat belt lower bolt(**1**) .



Remove:

- the cover of the seat belt upper bolt,
- the seat belt upper bolt(2) .

Remove the lower B-pillar trim[Interior body side trim assembly: Exploded view] .



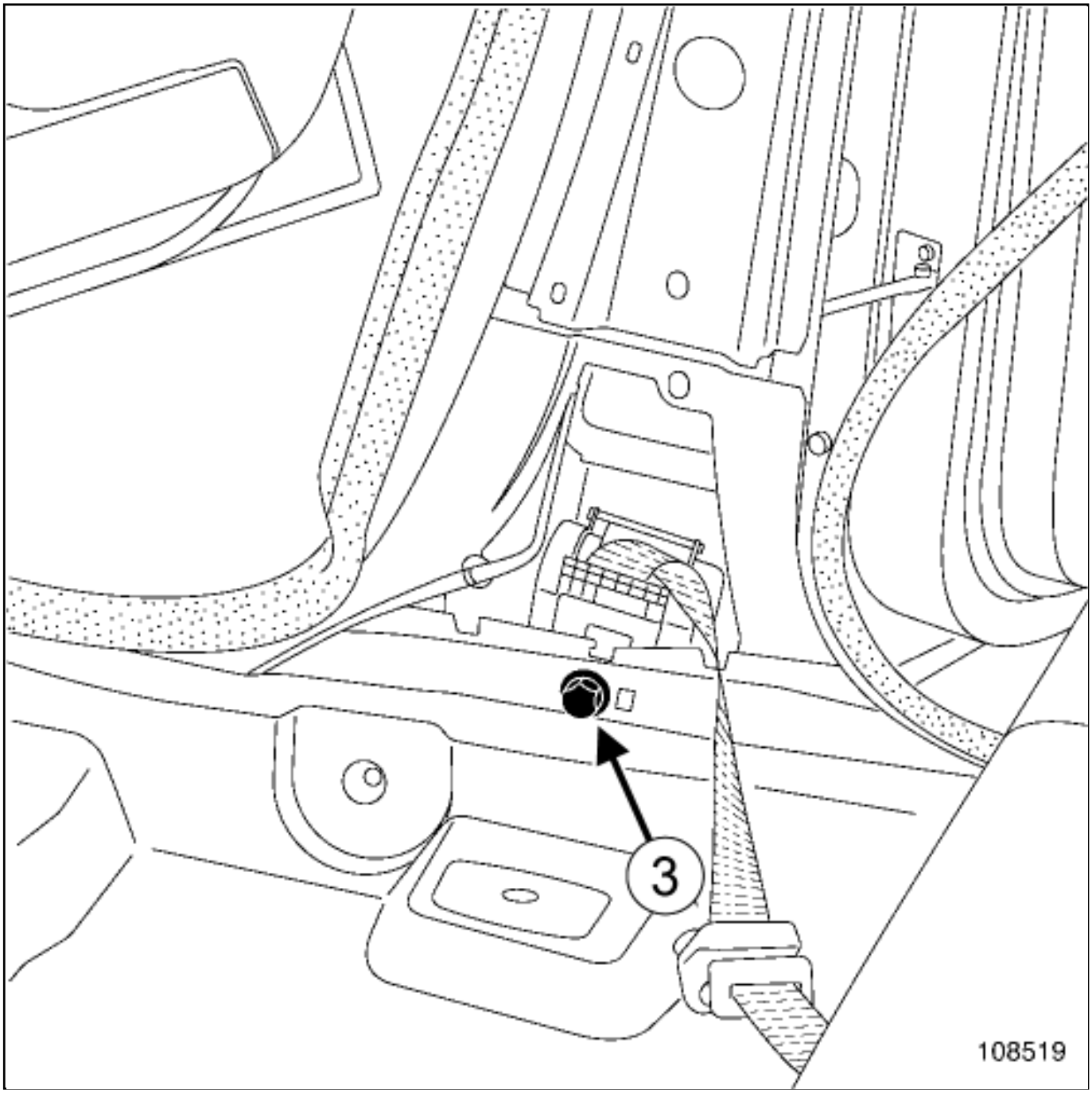
CAUTION

To prevent any risk of noise, premature wear, short circuits, etc. after the refitting operation, mark the wiring routing and how to connect the connectors.

Mark the wiring routing at the front side seat belt inertia reel.

Unclip the inertia reel connector safety clip.

Disconnect the inertia reel connector.



Remove:

- the inertia reel bolt(3) ,
- the inertia reel.

Remove the height adjustment mechanism (depending on the vehicle equipment).

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: **Front seat belt inertia reel bolt**

Always replace the return mechanism bolts and the lower mounting bolts of the front side seat belt.

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Note:

Check that the seat belt is not twisted between the inertia reel and the front side seat belt return mechanism.

Check that the seat belt is not twisted between the front side seat belt return mechanism and the front side seat belt lower mounting.

Torque tighten:

- the seat belt upper bolt 21 N.m,
- the inertia reel bolt 21 N.m,

- the seat belt lower bolt21 N.m,
- the height adjustment mechanism bolts21 N.m.

3. CHECKING AFTER REPAIR

Check the correct operation by unrolling the front side seat belt by 300 mm and letting it return twice.

Check that the front side seat belt locks correctly by pulling the front side seat belt strap with increasing speed 200 to 300 mm maximum until the inertia reel locks.

Switch on the ignition.

Check that there are no faults on the instrument panel.

FRONT SIGNALS - LIGHTING ASSEMBLY: EXPLODED VIEW

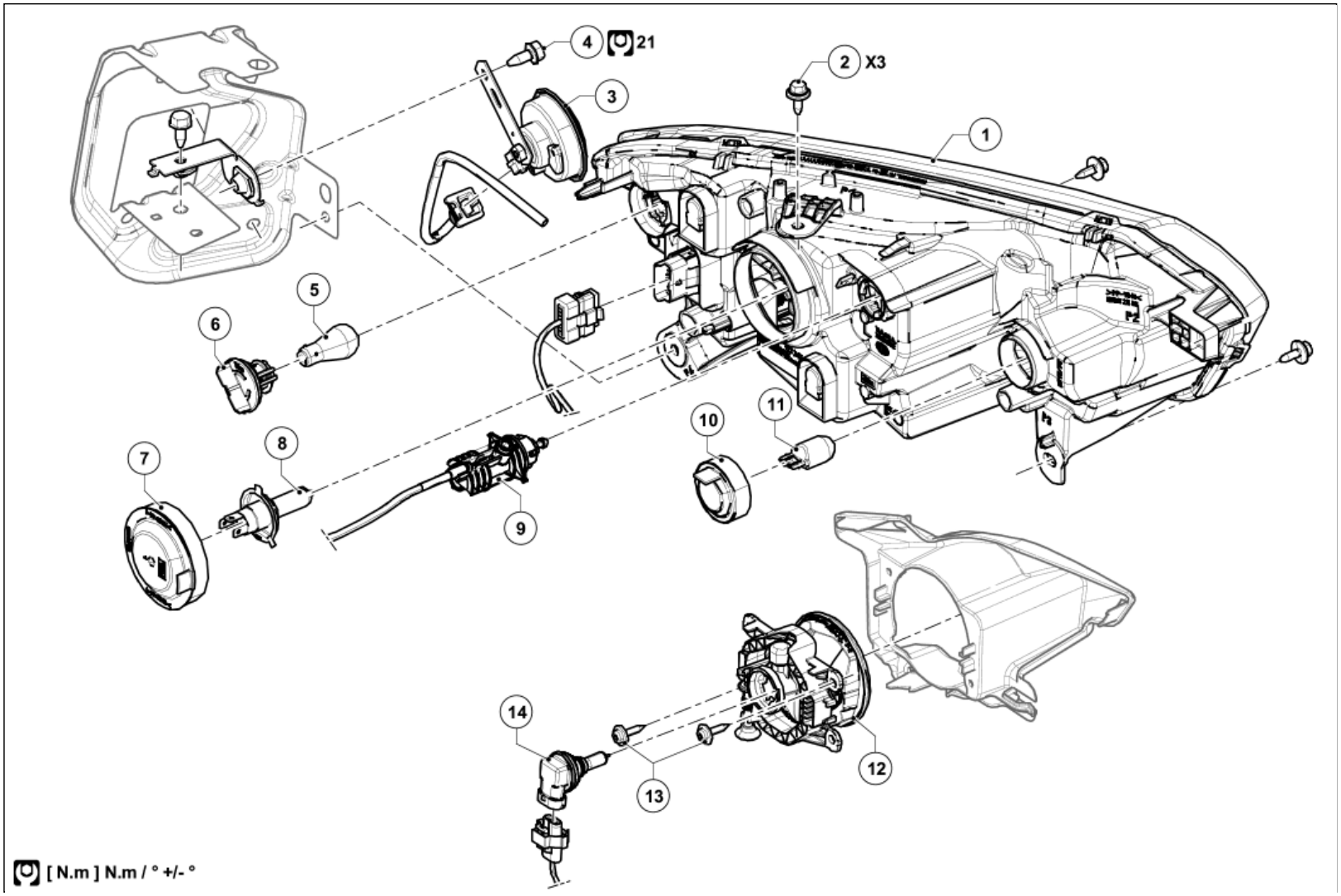


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Headlight	
2	Headlight screw	
3	Audible warning	
4	Bolt	
5	Direction indicator bulb	
6	Holder front turn signal lamp	
7	Tight mask	
8	Main and dipped beam headlight bulbs	
9	Headlight beam adjustment actuator	
10	Tight mask	
11	Day beam headlight bulb	
12	Fog light	
13	Bolt	
14	Fog light bulb	

FRONT WHEEL SPEED SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Location and specifications (tightening torques, parts always to be replaced, etc.)**Front brake calliper assembly: Exploded view** .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 38C, Anti-lock braking system, ABS: Precautions for the repair)** .

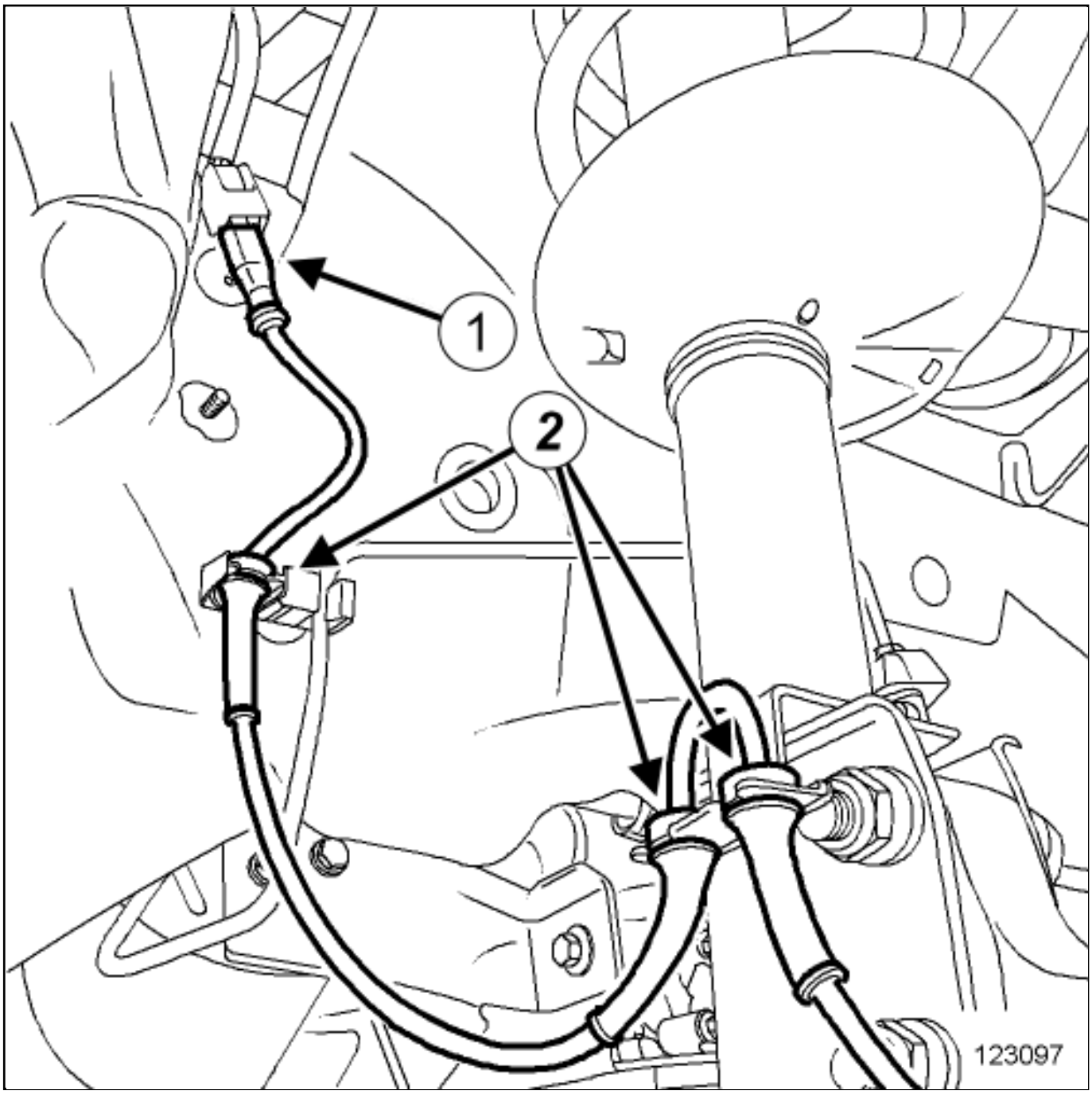
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .

- Remove:
  - the front wheel**Wheel: Removal - Refitting** ,
  - the front wheel arch liner**Exterior body front trim assembly: Exploded view** .

2. REMOVAL OPERATION



- Disconnect the front wheel speed sensor connector(1) .
- Unclip the front wheel speed sensor wiring at(2) .
- Remove the wheel speed sensor Front brake calliper assembly: Exploded view .

REFITTING

- Proceed in the reverse order to removal.

CAUTION

- To avoid damaging the wheel speed sensor cable:
  - Do not tension the cable,
  - Do not twist the cable,
  - Check that there is no contact with the surrounding components,
  - Do not use tools that may damage the cable.

FRONT WING: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)Exterior body front trim assembly: Exploded view .

REMOVAL

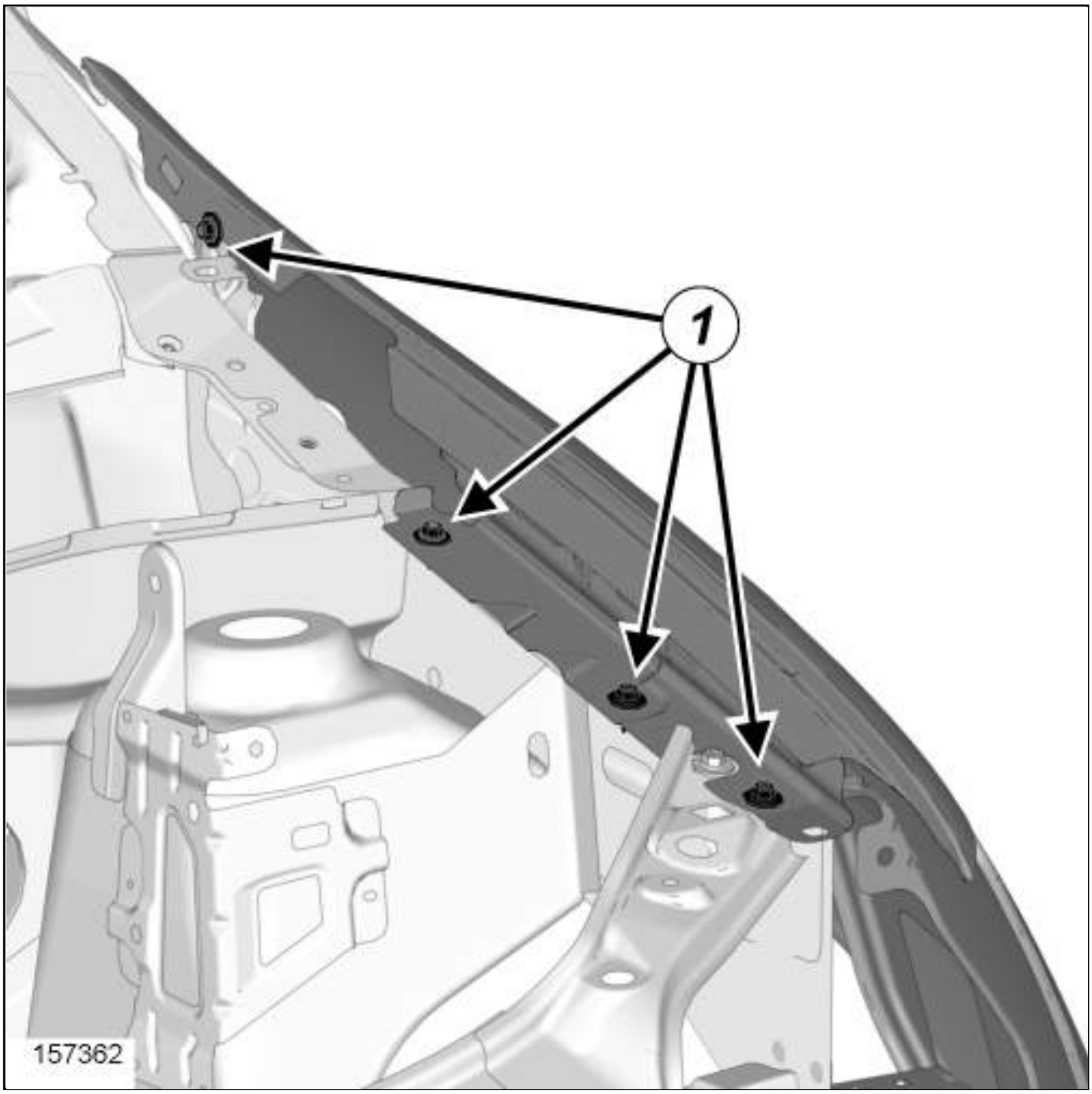
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the front wheel arch linerExterior body front trim assembly: Exploded view ,
  - the front bumperFront bumper assembly: Exploded view ,
  - the headlightFront signals - lighting assembly: Exploded view .

- Remove Exterior body front trim assembly: Exploded view :
  - the windscreen lower trim piece.
  - the side pressure piece of front bumper,
  - the side indicator.

2. REMOVAL OPERATION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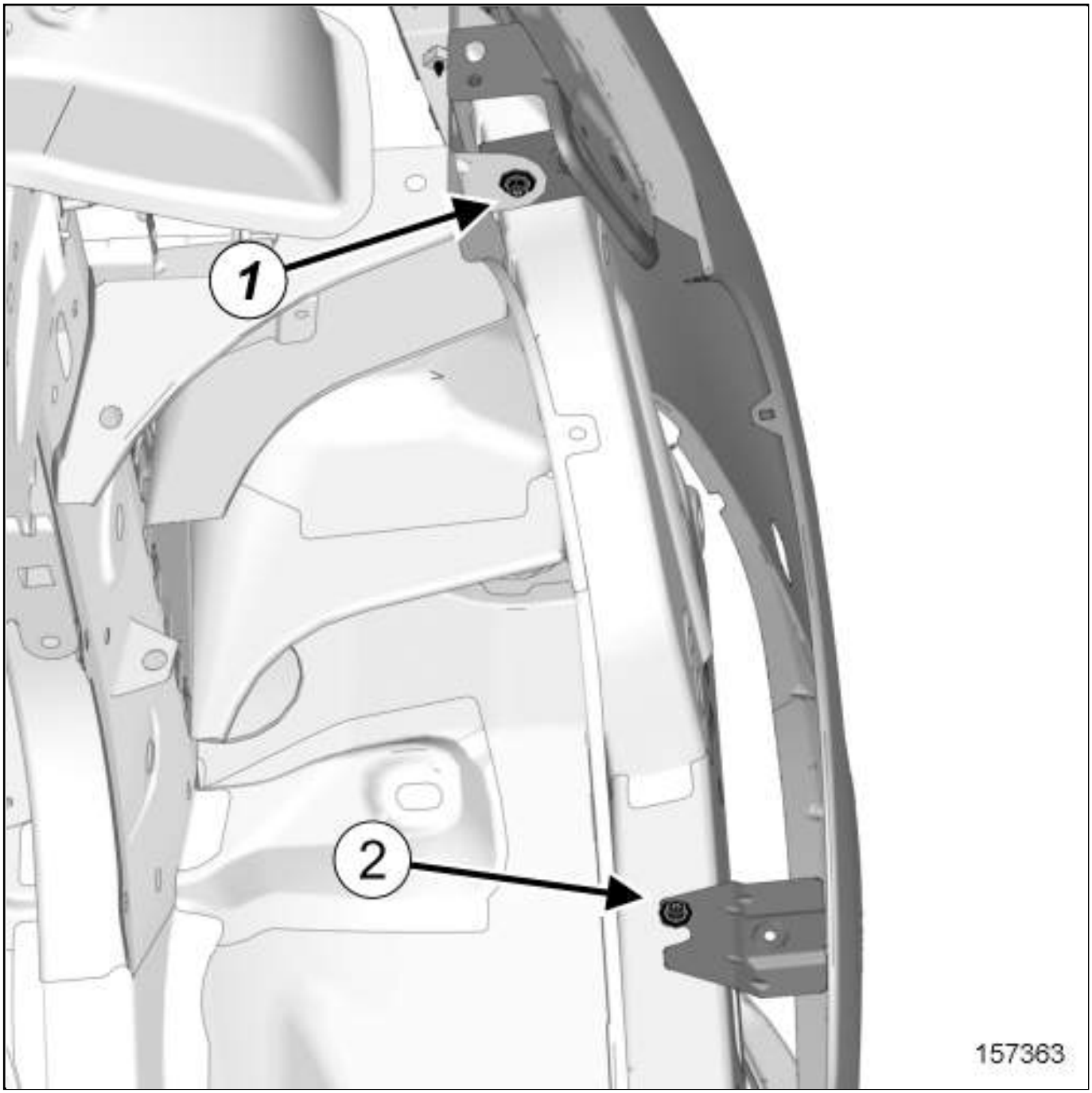
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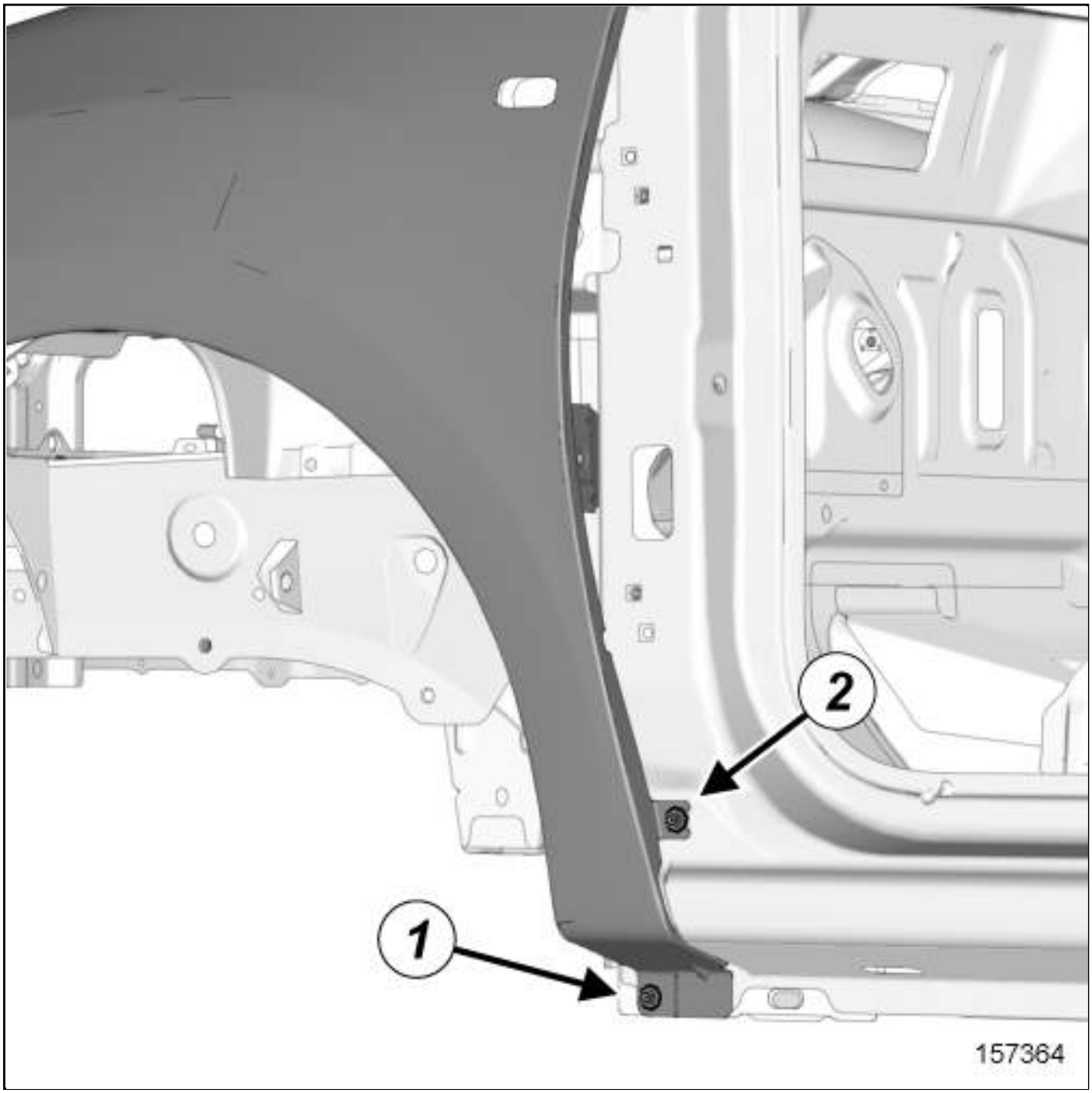


Remove:

- the bolts(1) ,
- the nuts(2) ,
- the front wing.

REFITTING

1.

Proceed in the reverse order to removal.

- Adjust the clearances and flush fitting **Vehicle panel gaps: Adjustment value** .

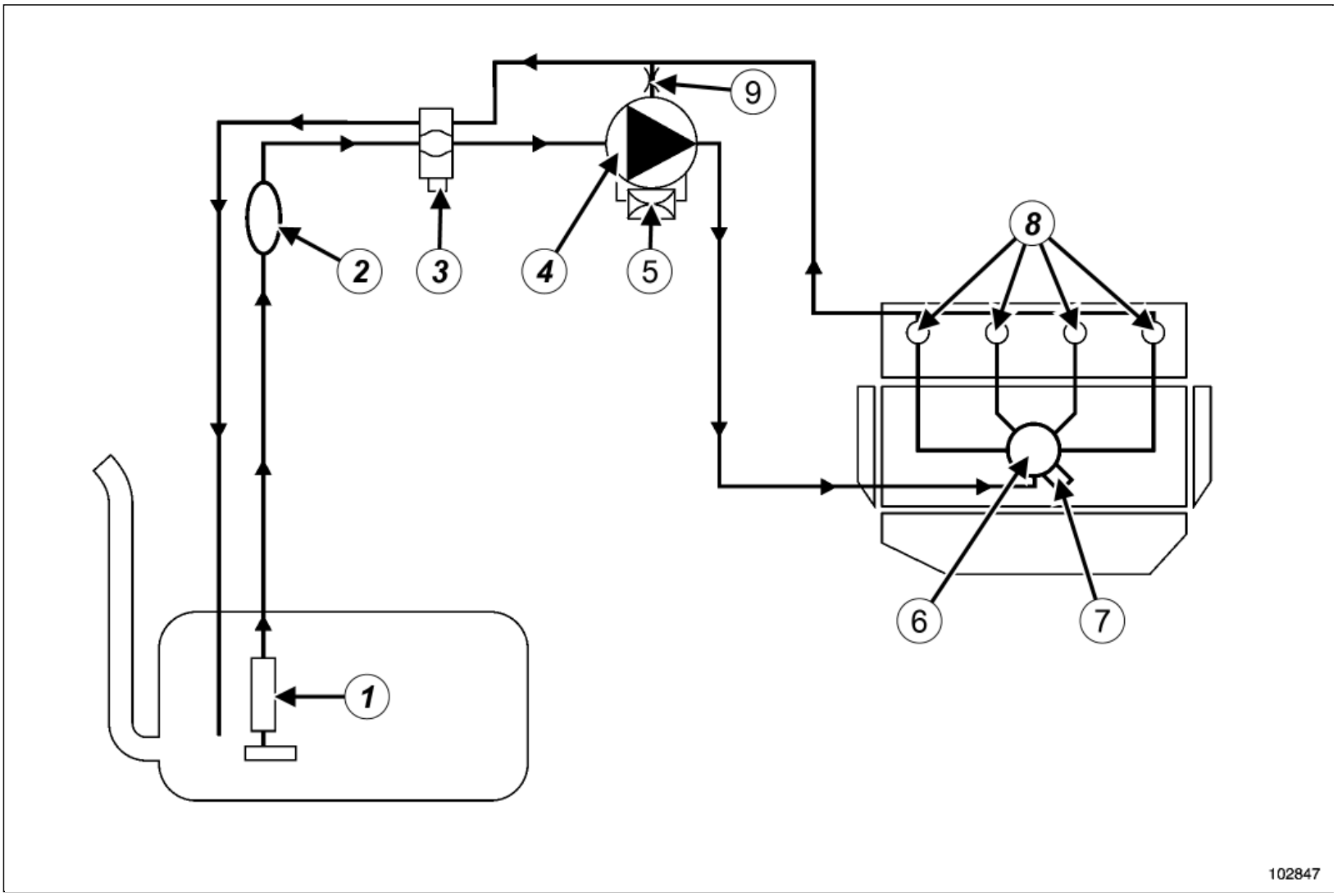
FUEL CIRCUIT: DRAIN

Note, one or more warnings are present in this procedure

Special tooling required	
Union for taking fuel pressure measurements.	
Kit for measuring the injector fuel flow rate.	Mot. 1711

Equipment required
Diagnostic tool
pneumatic transfer pump for fuels

This procedure relates to vehicles fitted with the DELPI DDCR injection system with a Renault card.



(1) fuel sender

(2) manual priming pump

(3) fuel filter

(4) high pressure pump

(5) fuel flow actuator

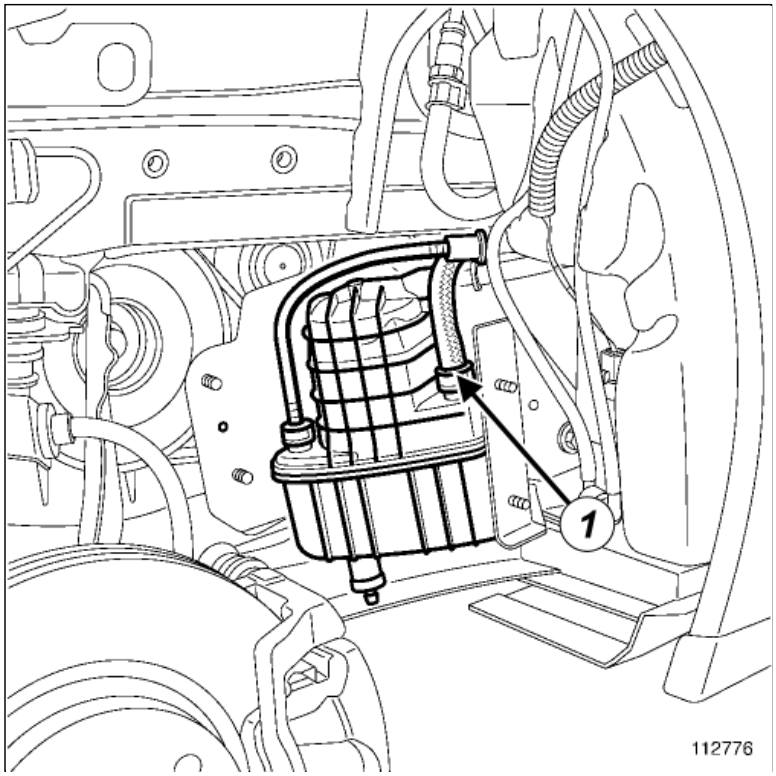
(6) injection rail

(7) pressure sensor

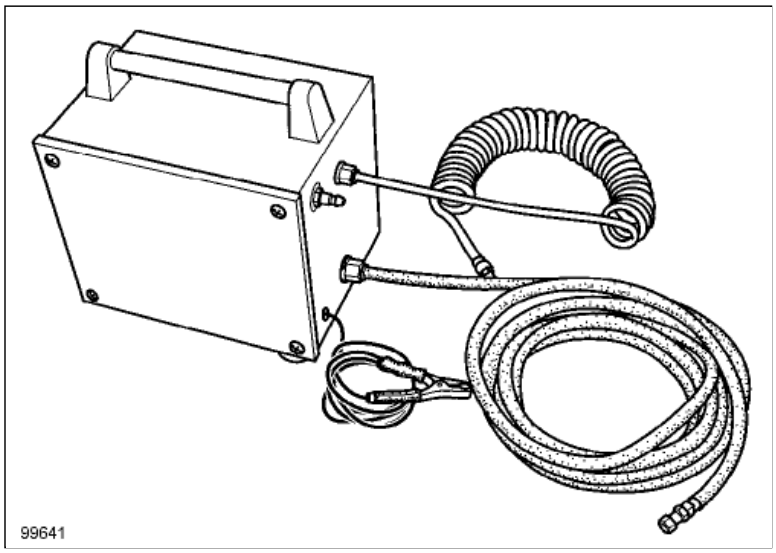
(8) injectors

(9) venturi

1. DRAINING THE LOW PRESSURE CIRCUIT



- Position the unionUnion for taking fuel pressure measurements. between the diesel filter output quick-release union and the high pressure pump supply pipe(1) .



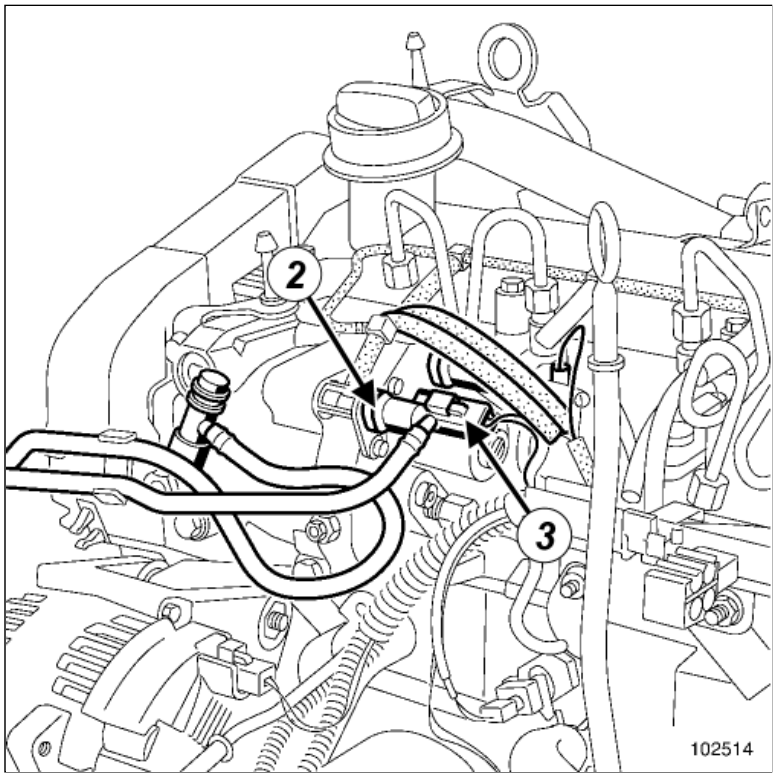
- Connect the pneumatic transfer pump for fuelsto the unionUnion for taking fuel pressure measurements. .
- Remove the fuel filler cap from the tank so that air can enter.
- Run the pneumatic transfer pump for fuels.
- Drain the low pressure circuit completely.
- Remove the diesel filter (see the procedure for the vehicle concerned).
- Replace the diesel filter or the diesel filter cartridge.
- Blow air through the tank-diesel filter pipe.

Note:

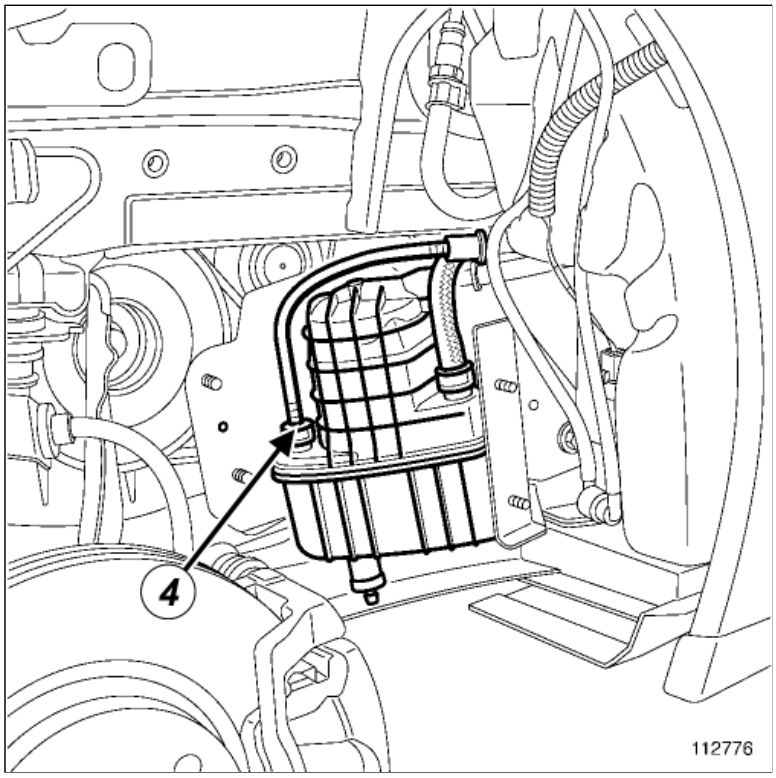
If the pipe has several sections, blow air through all of them.

2. DRAINING THE HIGH PRESSURE CIRCUIT

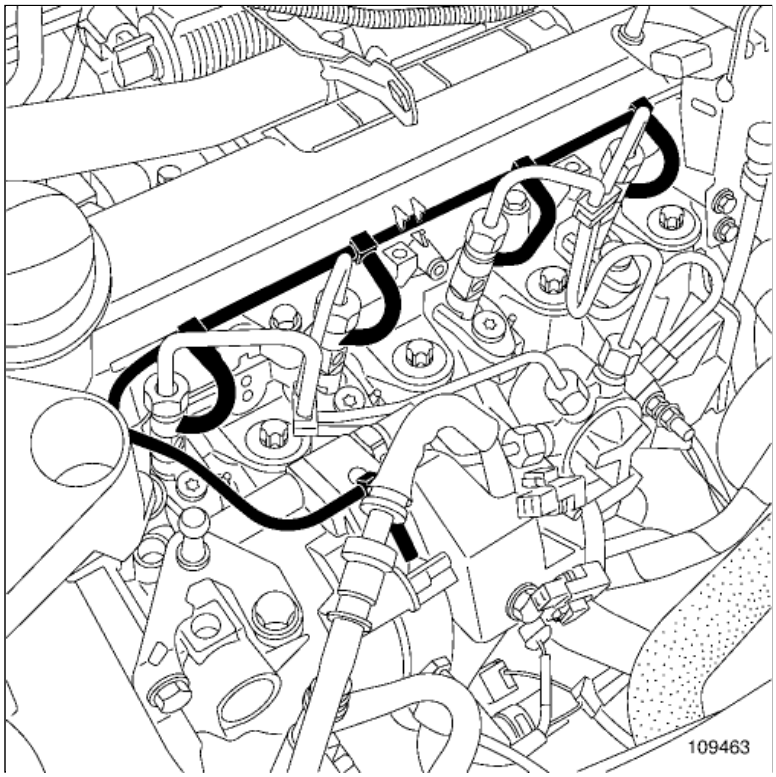
- Switch off the ignition.



- Disconnect the return pipe(2) from the high pressure pump.
- Position a receptacle to collect the fuel outflow.
- Disconnect the fuel flow actuator connector(3) from the high pressure pump.
- Connect a test IMV or the adapter for toolKit for measuring the injector fuel flow rate.(Mot. 1711) .
- Disconnect the injector connectors.
- Start the engine.



- Run through this start procedure 3 times(to recover as much fuel as possible from the high pressure circuit).
- Position the unionUnion for taking fuel pressure measurements. on the diesel filter return pipe(4) .
- Connect the pneumatic transfer pump for fuelsto the unionUnion for taking fuel pressure measurements. .
- Plug the end of the union which is not being used.
- Run the pneumatic transfer pump for fuels.



Disconnect:

- the fuel return pipe from the high pressure pump (pump-filter-tank pipe),
- the return pipes from the injectors.

Blow air through:

- the return circuit,
- the pump venturi.

ATTENTION
protect sensitive areas from fuel outflow.

Fill up the tank.

Reprime the fuel circuit (see the procedure for the vehicle).

Bleed the fuel circuit (see the procedure for the vehicle).

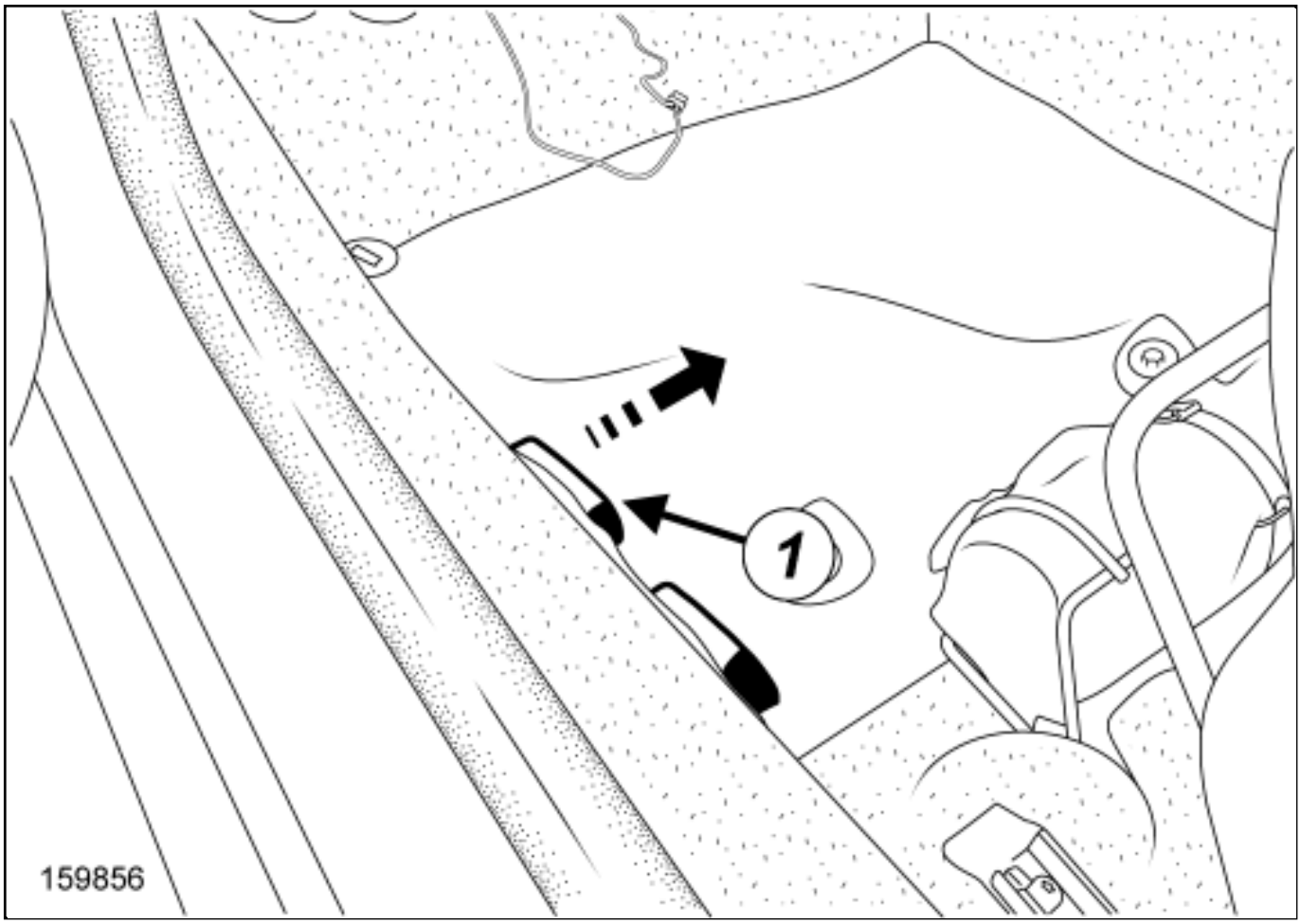
Clear the faults using the Diagnostic tool.

FUEL FILLER FLAP OPENING CONTROL CABLE: REMOVAL - REFITTING

Special tooling required	
Set of trim removal levers.	Car. 1363
Tool for removing the fuel filler flap locking mechanism	Car. 1845

REMOVAL

1. REMOVAL PREPARATION OPERATION



- Remove the fuel flap opening control(1) .

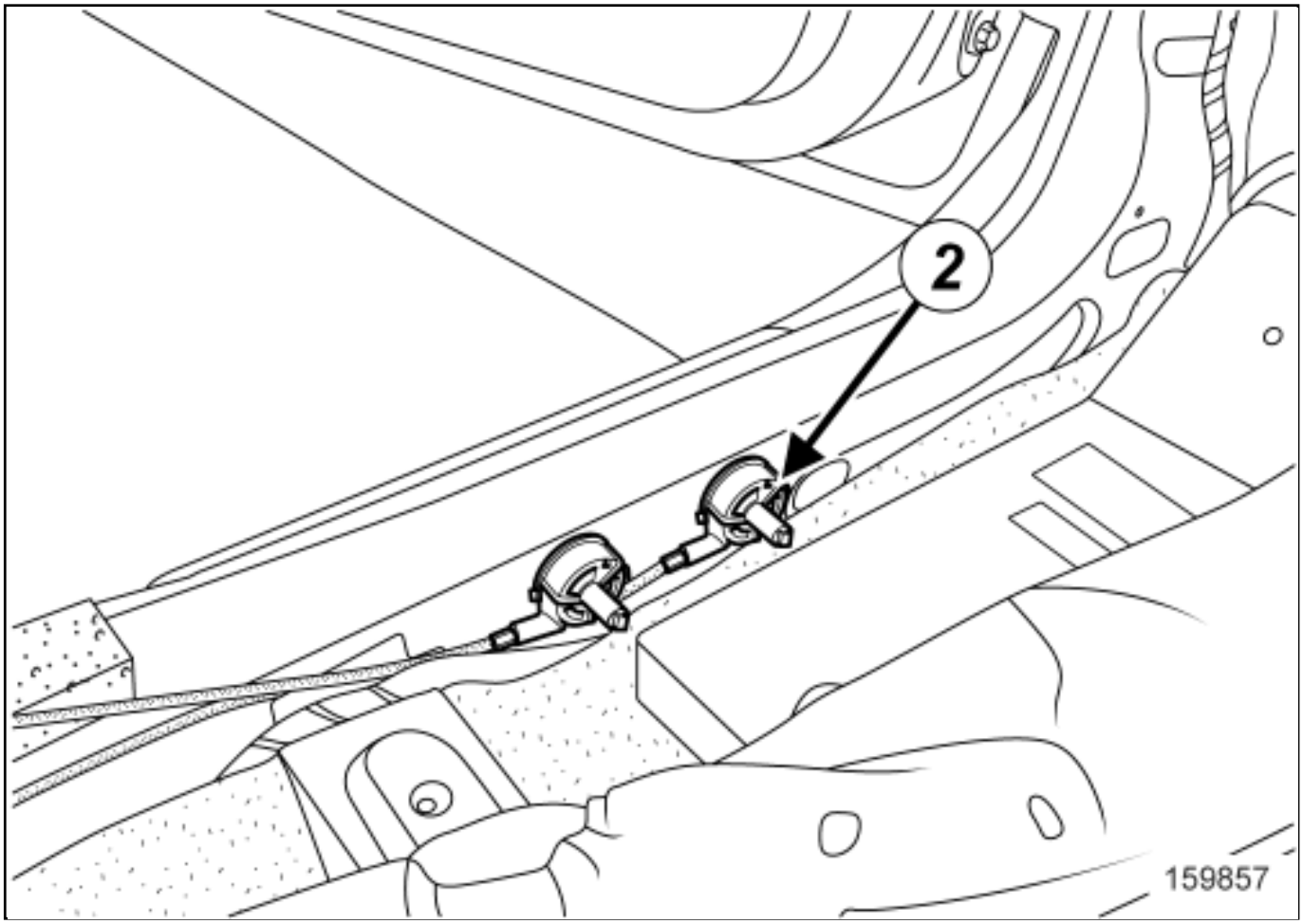
- Remove:
  - the left side doors seals partially.

- Remove:
  - the B-pillar upper trim Interior body side trim assembly: Exploded view ,

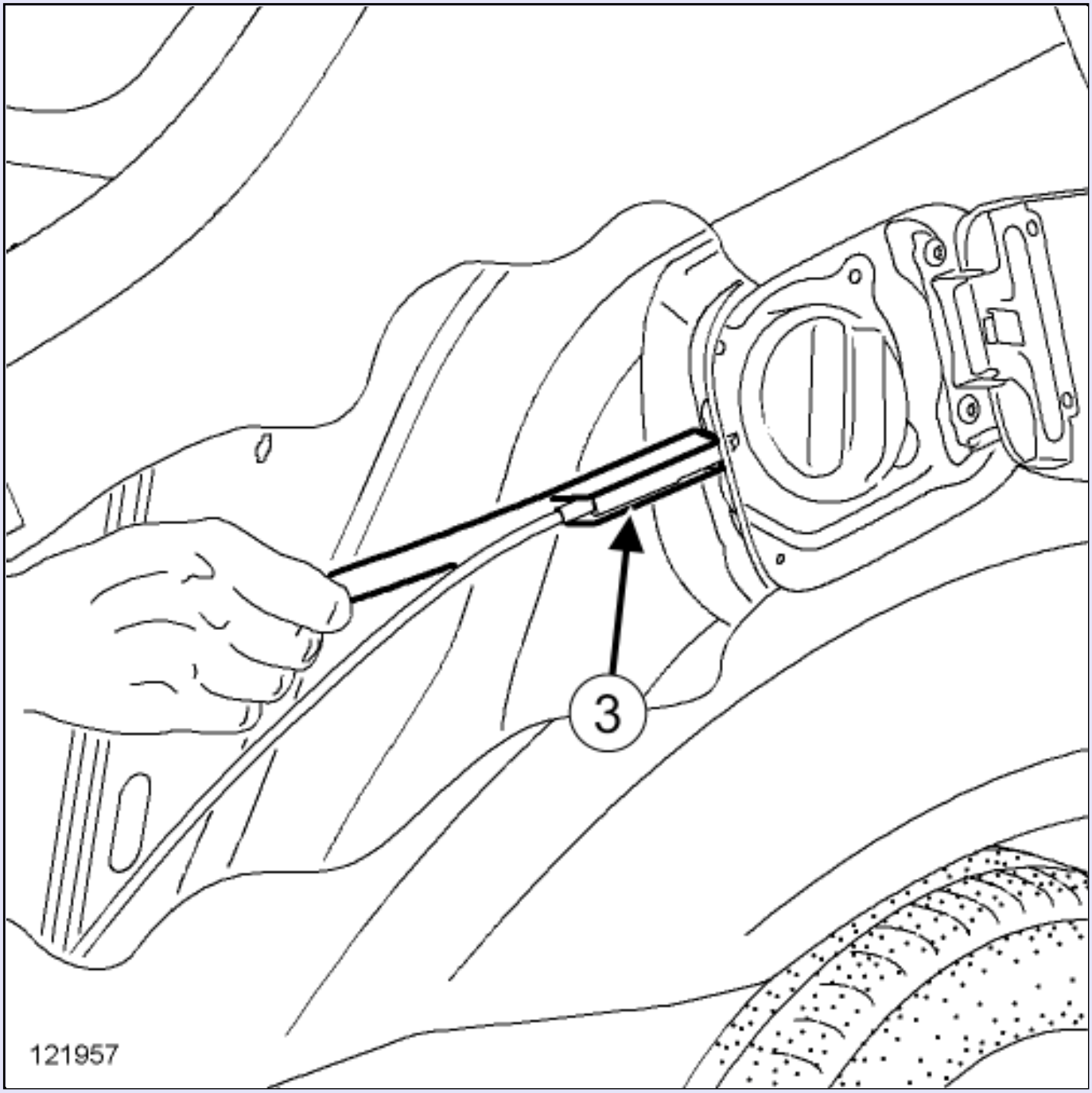
- the B-pillar lower trim Interior body side trim assembly: Exploded view .
- the rear bench seat base Rear bench seat assembly: Exploded view ,
- the luggage compartment carpet.

Remove partially the floor carpet.

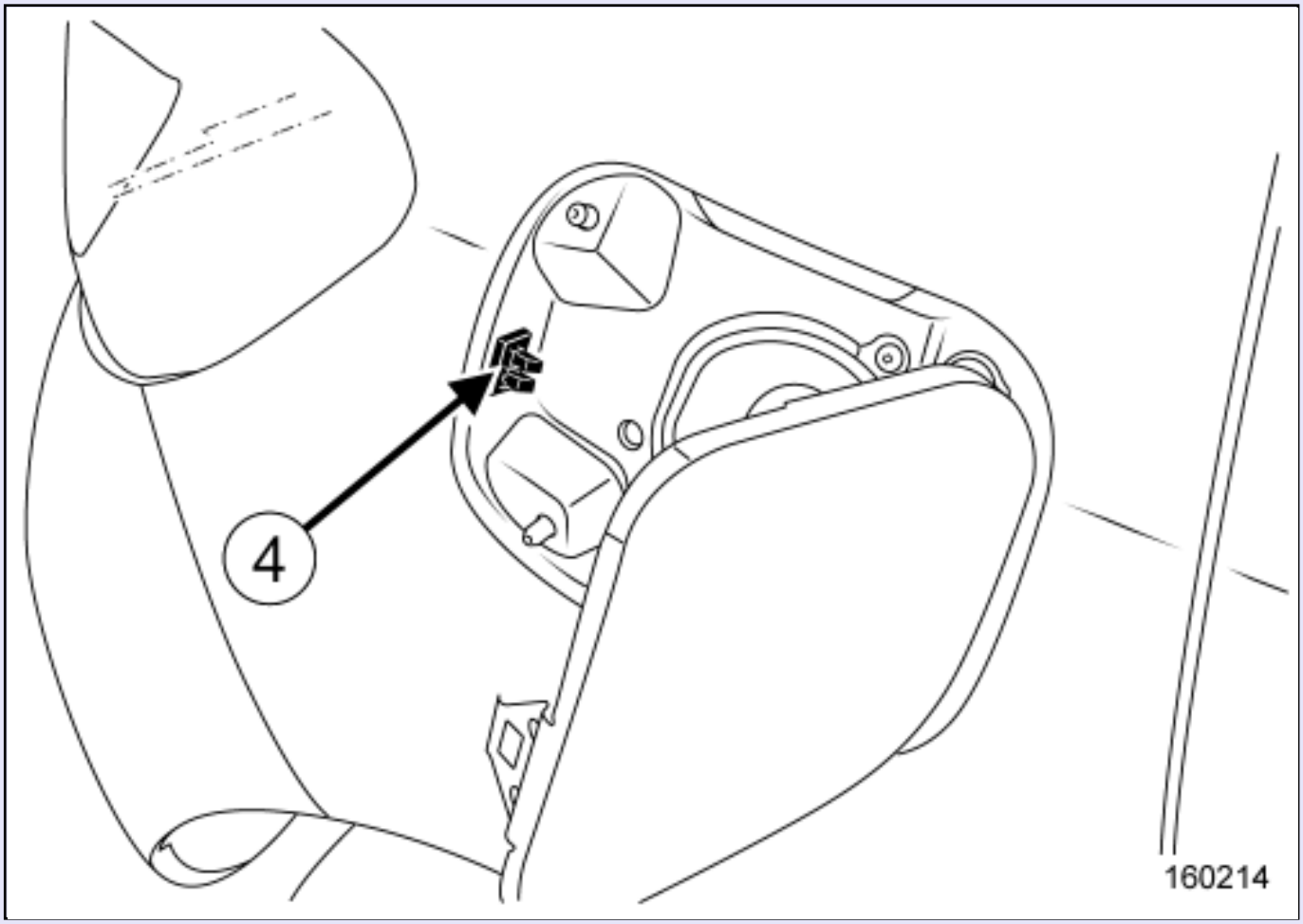
2. REMOVAL OPERATION



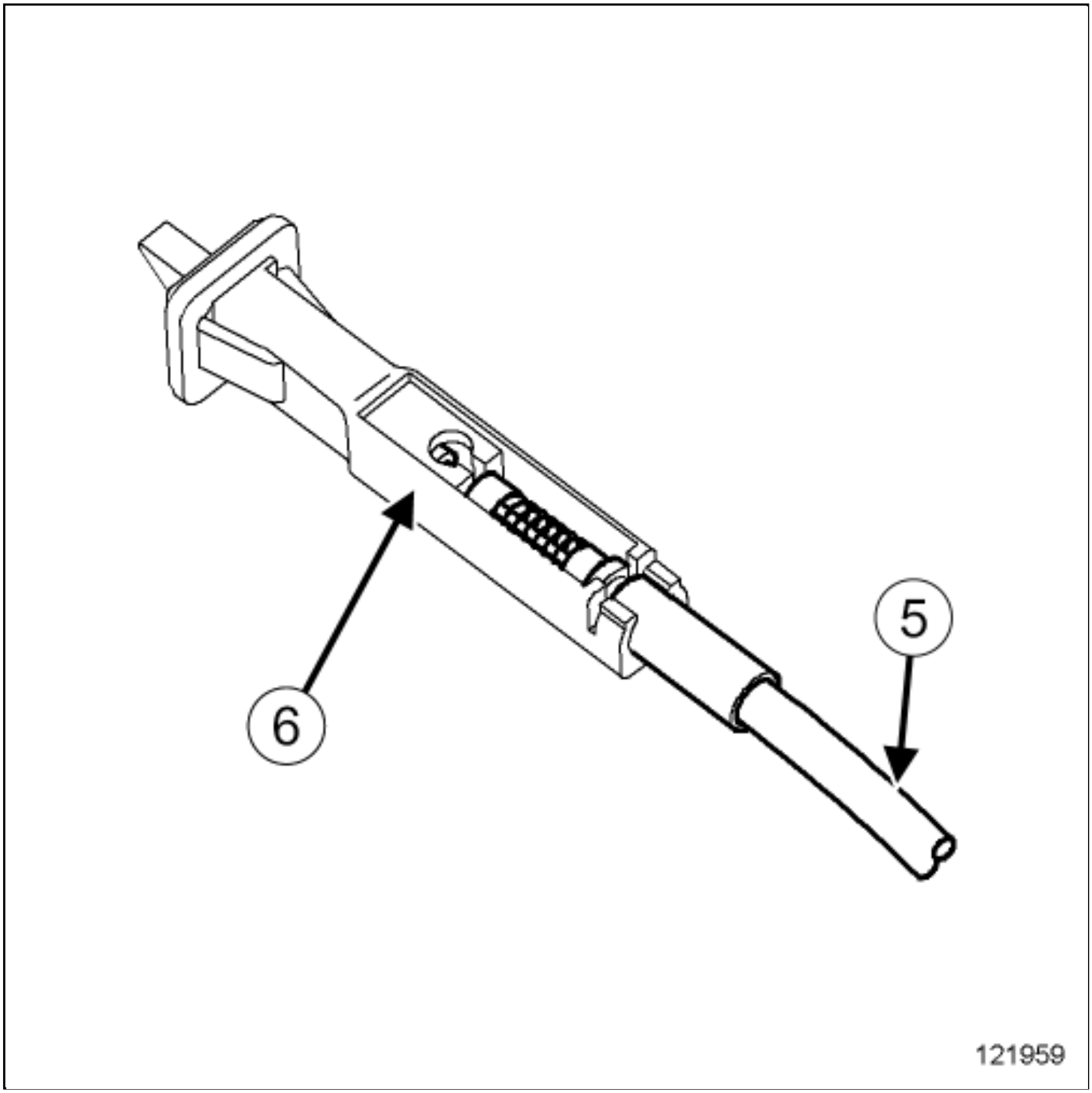
Remove the bolt(2)



❑ Unclip the fuel filler flap locking mechanism(3) using the Tool for removing the fuel filler flap locking mechanism (Car. 1845) .



- Unclip the fuel filler flap locking mechanism(4) using the Set of trim removal levers.(Car. 1363) .



- Extract the locking mechanism cable(5) from the fuel filler flap(6) .
- Note the fuel filler flap opening release cable routing.
- Remove the fuel filler flap opening release cable.

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Carry out a function test.

Repair-50x02x20x06-01x37-1-6-1.xml

XSL version : 3.02 du 22/07/11

FUEL FILTER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Diesel injection: Precautions for the repair ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

CAUTION

The part removed is subject to customer safety controls, the safety instructions detailed in this procedure must be observed when removing and refitting.

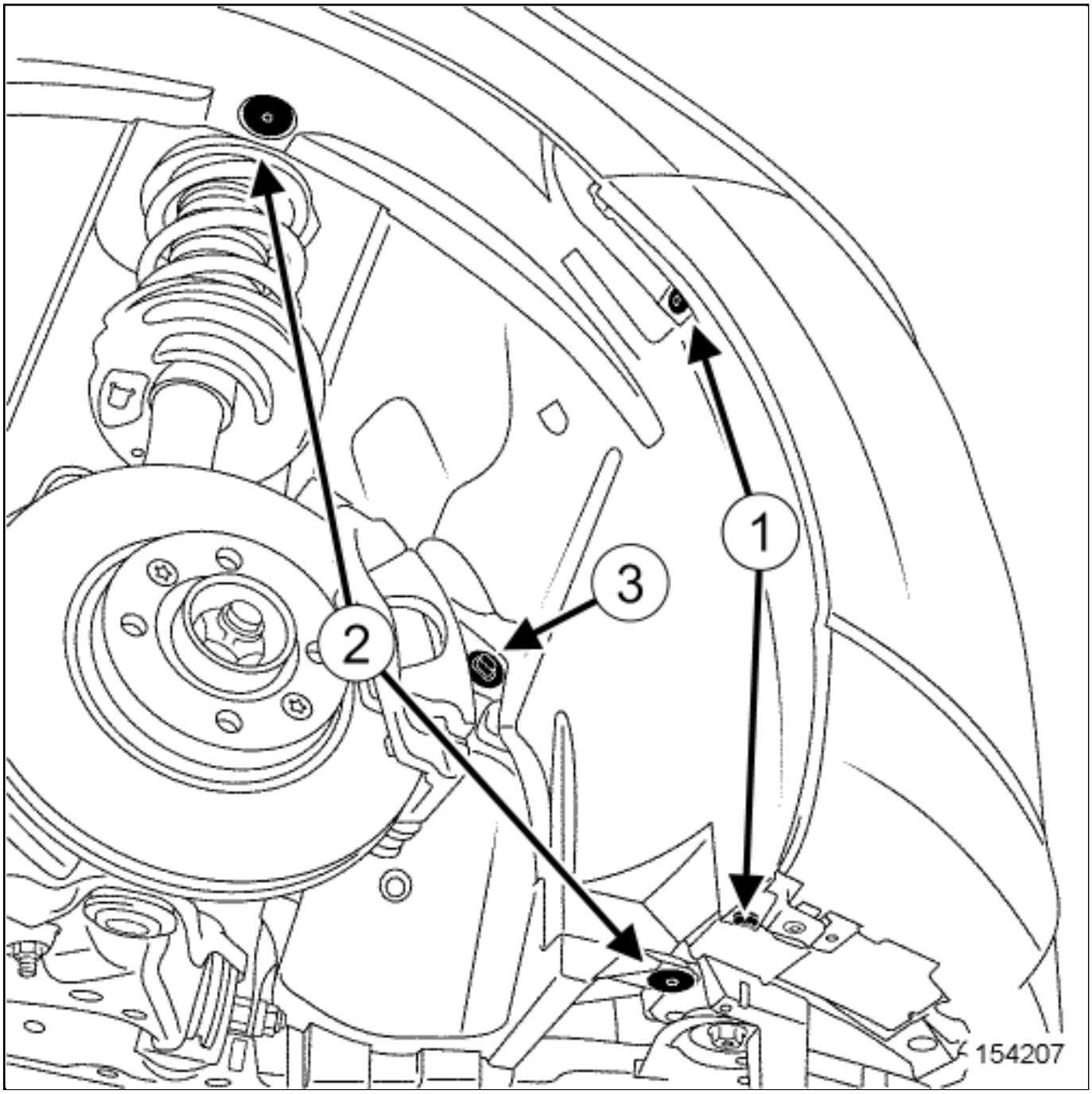
Note:

Make sure you have a new diesel filter before opening the fuel circuit.

REMOVAL

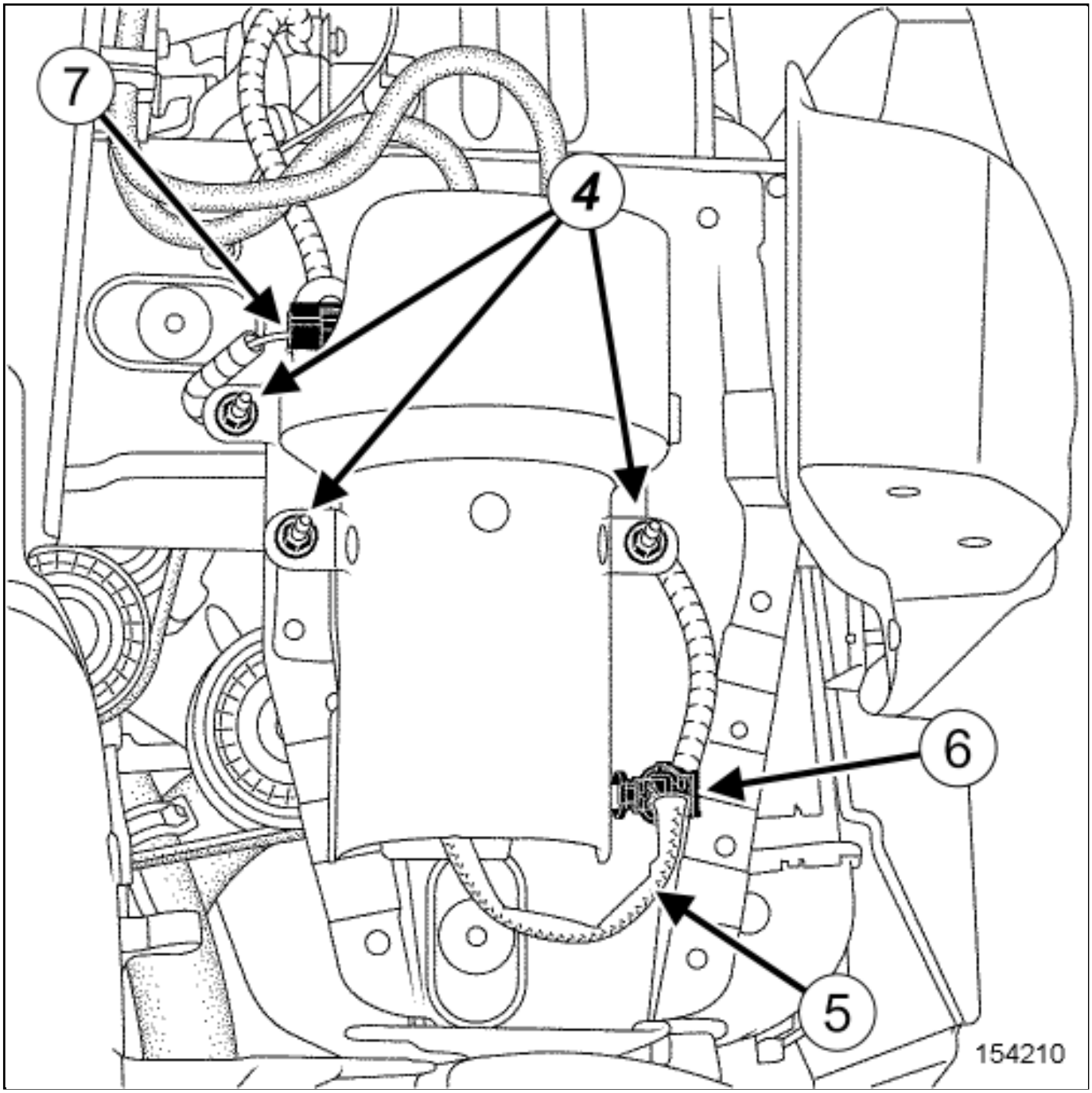
1. REMOVAL OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove the front right hand wheel Wheel: Removal - Refitting .



- Remove:
  - the front right-hand wheel arch liner bolts(1) ,
  - the front right-hand wheel arch liner clips(2) ,
  - the front right-hand wheel arch liner nut(3) .
- Move the front right-hand wheel arch liner slightly to one side.

2. REMOVAL OPERATION



- Remove:
  - the diesel filter protection plate nuts(4) ,
  - the diesel filter protection plate,
  - the water detection sensor wiring(5) (if fitted) from the protection plate.

- Disconnect:
  - the water detection sensor connector(6) (if fitted),
  - the electric diesel heater connector(7) .

Remove the diesel filter from its mounting, noting its original position.

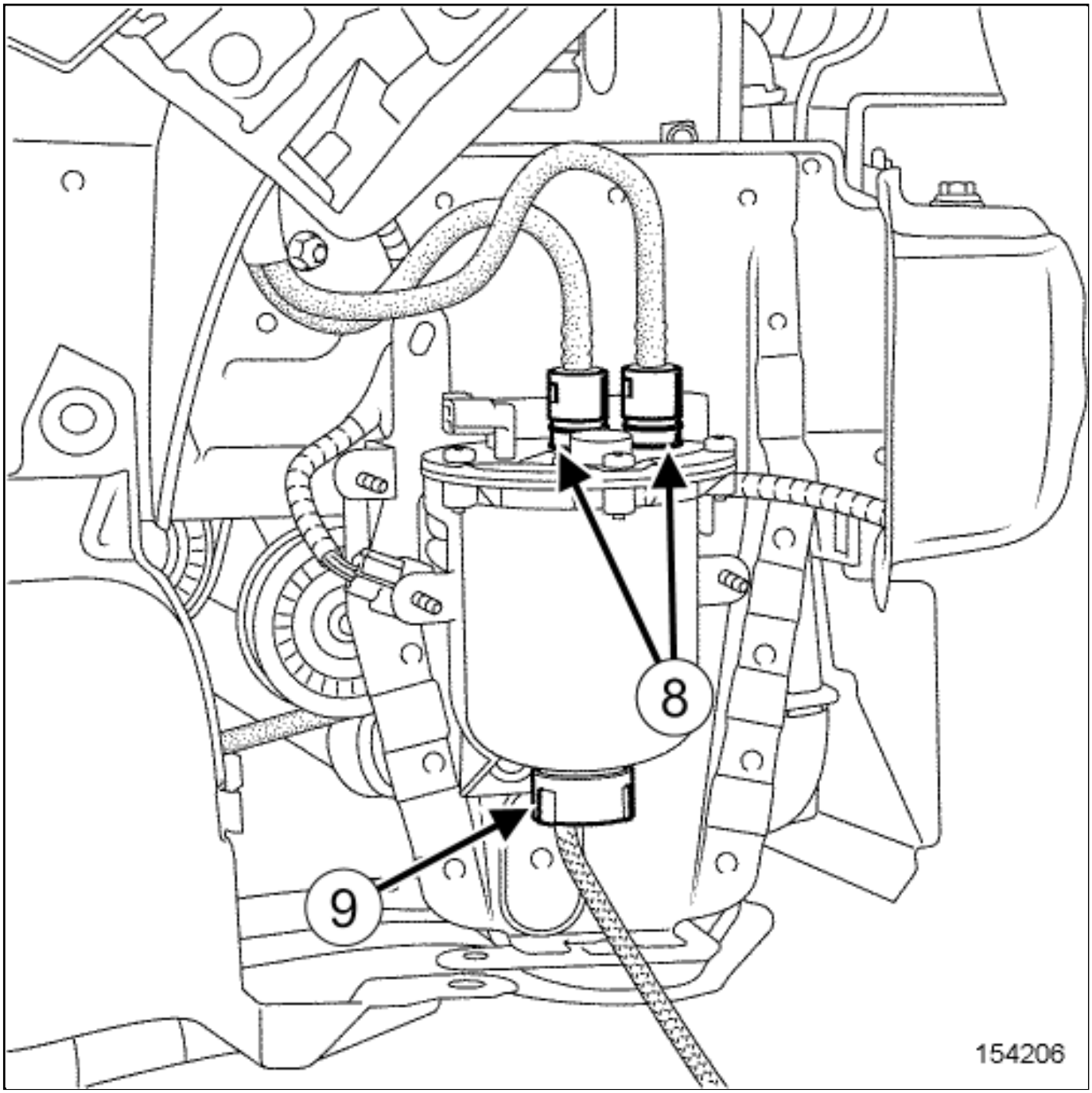
- Place a container under the diesel filter.

CAUTION

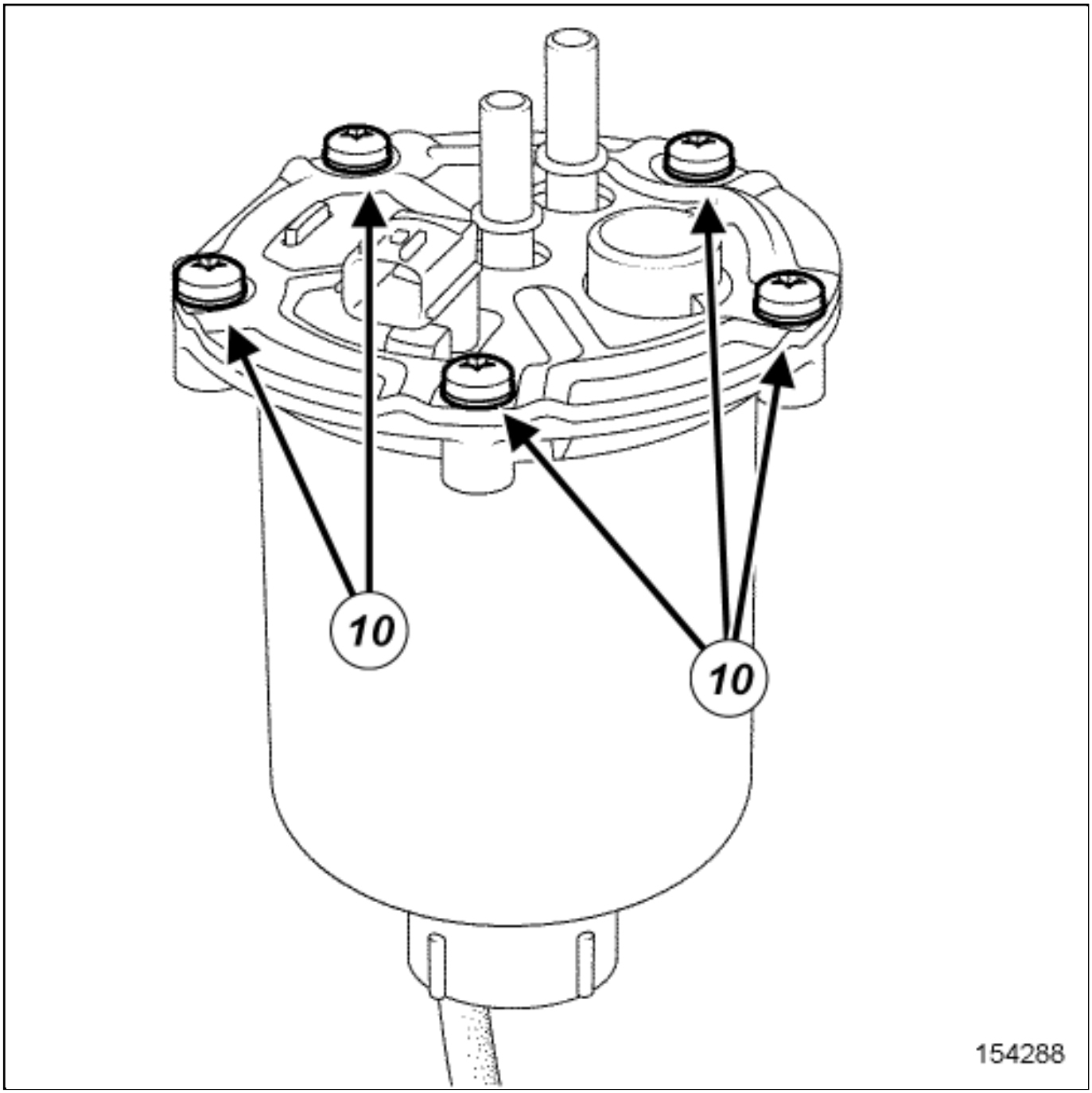
Keep the pipe unions away from contaminated areas.

Note:

Mark the position of the fuel pipe unions in relation to the diesel filter before removing the diesel filter.



- Disconnect the pipe unions(8) on the diesel filter.
- Let the diesel fuel flow out from the various pipes into the container.
- Fit plugs into the openings.
- Remove the water detection sensor(9) , turning it anti-clockwise.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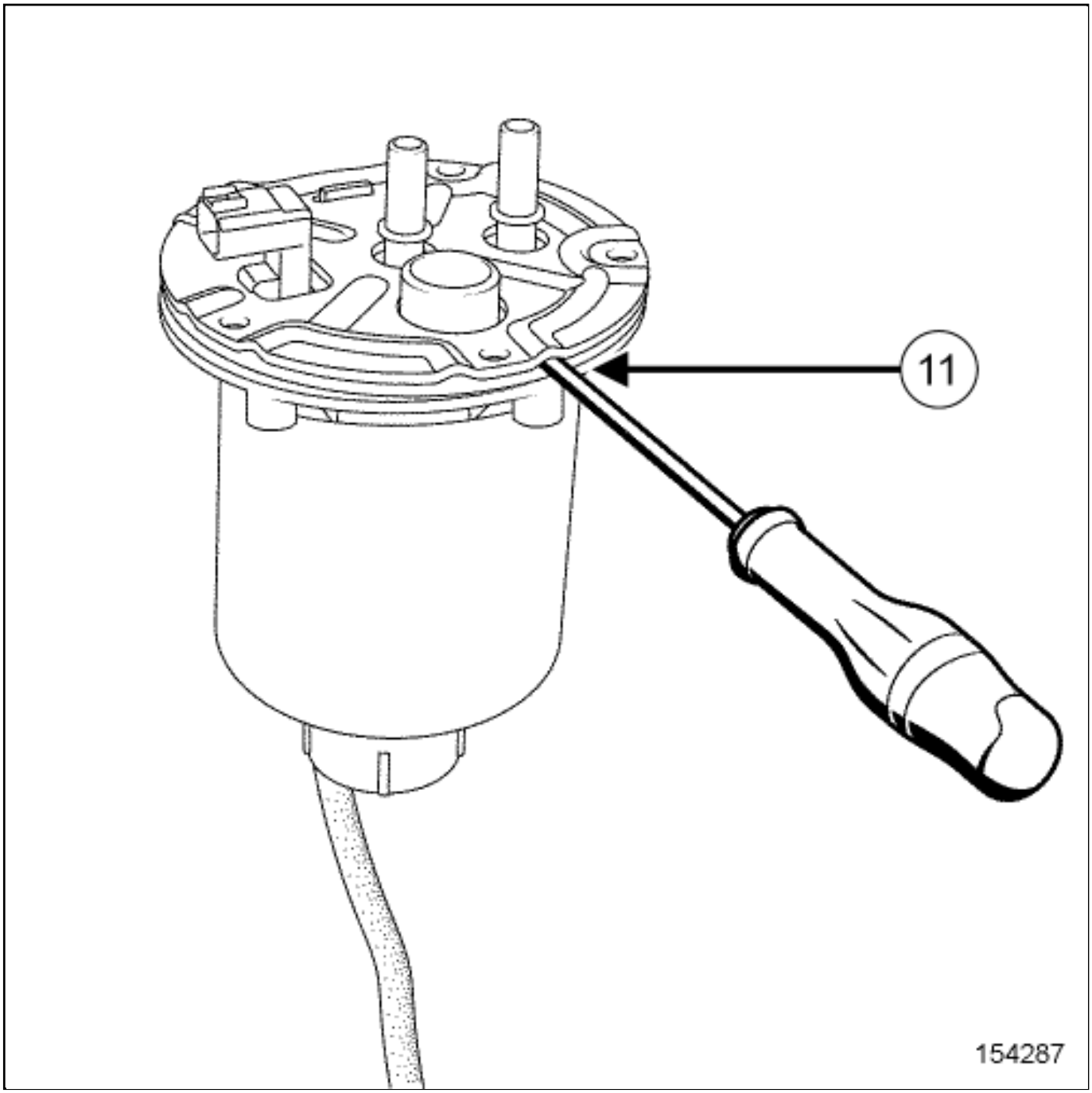


Remove using the workbench:

- the diesel filter cover bolts(**10**) ,
- the diesel filter cover using a screwdriver at(**11**) ,
- the filter element.

REFITTING

1. REFITTING OPERATION

Refit using the workbench:

- the new filter element,
- the diesel filter cover,
- the diesel filter cover bolts,
- the water detection sensor, turning it clockwise.

Connect:

- the pipe unions on the diesel filter,
- the water detection sensor wiring (if fitted) from the protection plate,
- the water detection sensor connector (if fitted).

Refit:

- the diesel filter in its original position,
- the diesel filter protection plate,
- the diesel filter protection plate nuts.

2. DRAINING THE WATER INSIDE THE DIESEL FILTER

Note:

Certain vehicles have a sensor for detecting water in the diesel fuel, located in the diesel filter. If water is detected, the injection fault warning light comes on.

Periodically drain any water contained in the diesel filter.

For filters without a water presence sensor:

- open the drain plug,
- let the water flow out,
- close the plug.

For filters with a water presence sensor:

- disconnect the water presence sensor connector,
- unclip the water presense sensor connector,
- loosen the water presence sensor by one turn,
- let the water flow out,
- tighten the water presence sensor,
- connect the water presence sensor connector.

3. FINAL OPERATION

Refit:

- the front right-hand wheel arch liner,
- the plastic screen under the diesel filter.

1- PRIMING THE SUPPLY CIRCUIT

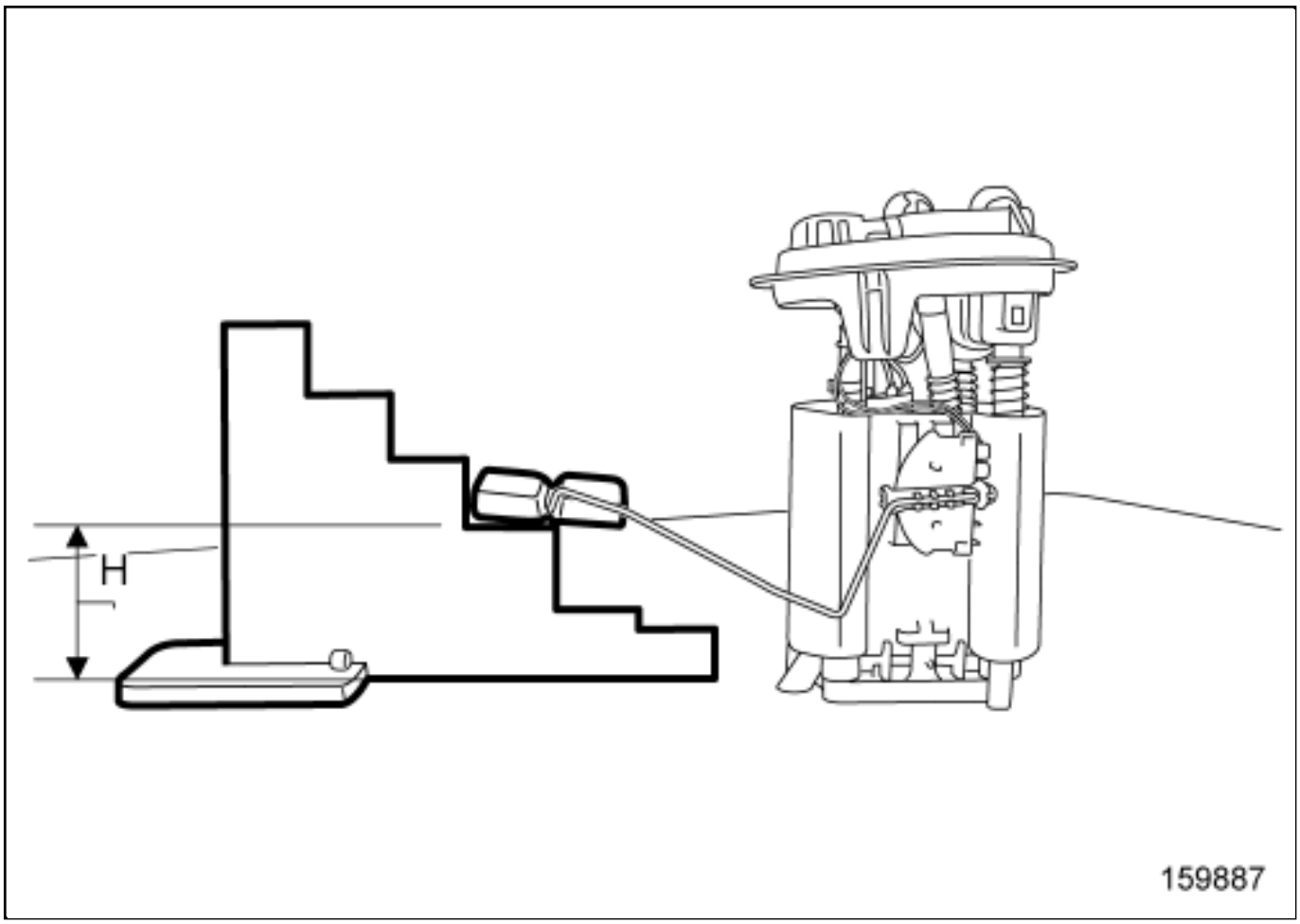
Prime the fuel system with the manual priming pump (automatic degassing).

Repair-11x03x01x05-01x37-1-53-1.xml

XSL version : 3.02 du 22/07/11

FUEL LEVEL SENSOR: CHECK

Ensure that the resistance varies when the float is moved.



TO FLEXFL VEHICLE

Height H (mm) ± 2,0	Resistance (Ohms)	Resistance (Ohms)
140.5	30	36
139.5	30	36
99.3	107	113
72.6	162.5	169.5
44.9	227.5	236.5
16.2	307.5	318.5
12.9	307.5	318.5

TO GAS VEHICLE

Height H (mm) ± 2,0	Resistance (Ohms)	Resistance (Ohms)
142.9	30	36
139.1	30	36
100.6	107	113
74.1	162.5	169.5
46.4	227.5	236.5
16.4	307.5	318.5
13.2	307.5	318.5

- Place the removed gauge sender unit on a flat surface.

H is the height measured under the float and the work surface.

Note:

All these values are given as a guide.

FUEL LEVEL SENSOR MODULE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363
Universal spanner for removing fuel gauge nuts.	Mot. 1397

Equipment required
Diagnostic tool

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19C, Tank, Fuel tank assembly: Exploded view) .

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Wear goggles with side protectors for this operation.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CAUTION

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Apply the before repair procedure using the Diagnostic tool(see Diagnostic tool : Use) :

-Computer concerned by the before repair procedure:

■"Injection computer" ,

-Component concerned by the before repair procedure:

■"Low pressure fuel pump" .

Disconnect the batteryBattery: Removal - Refitting .

Remove:

- the rear bench seat assemblyRear bench seat assembly: Exploded view ,
- the rear side door seal (partially)(see **Rear side door seal: Removal - Refitting**) ,
- the rear centre floor carpet(see **Centre floor rear carpet: Removal - Refitting**) .

2. REMOVAL OPERATION

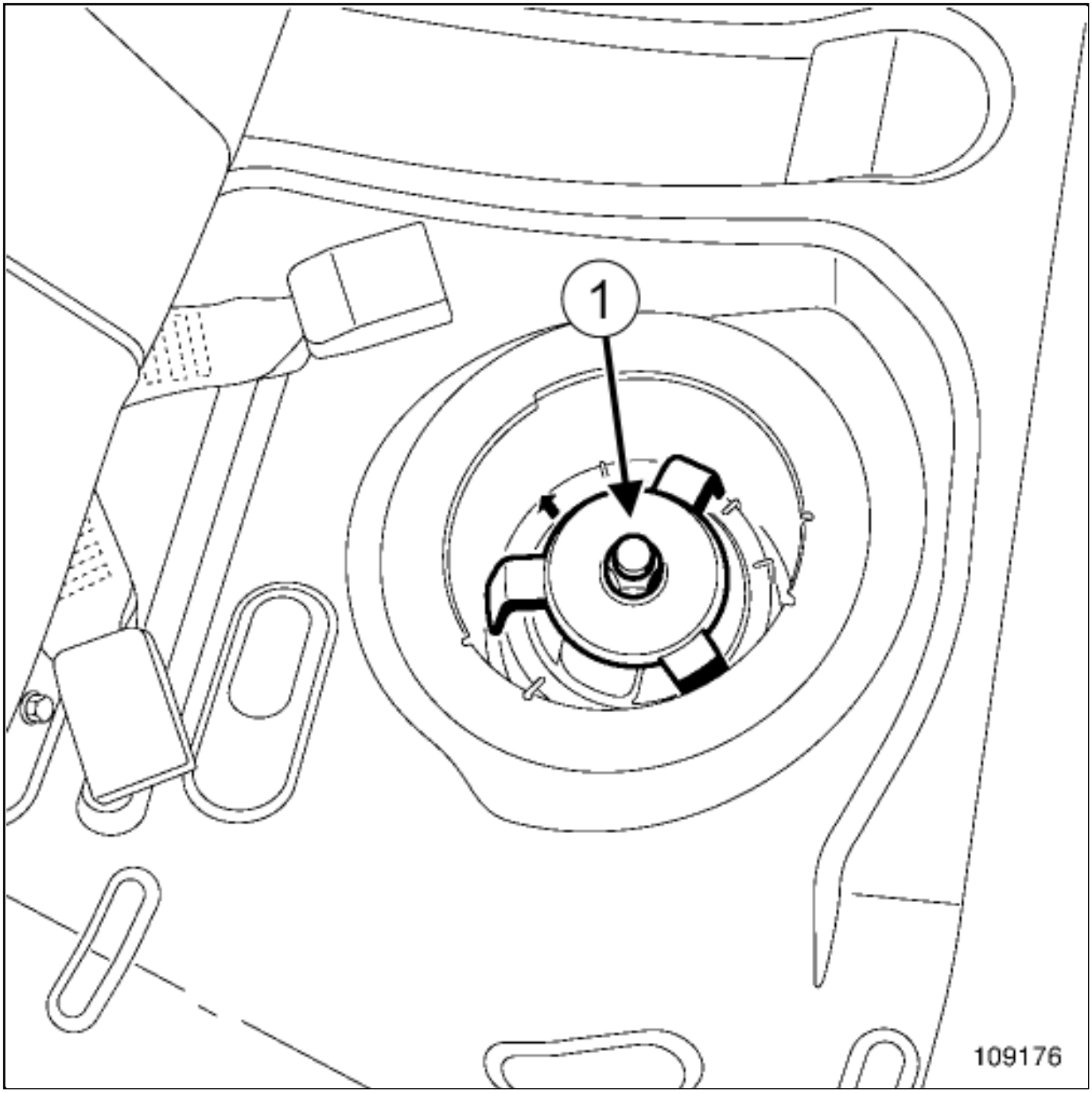
Remove the blanking cover from the inspection flap using the toolSet of trim removal levers.(Car. 1363) .

Note:

Make provisions for the flow of fuel from the fuel supply and return pipes.

Disconnect (see 19C, Tank, Fuel tank assembly: Exploded view) :

- the connector from the fuel level sensor module,
- the union(s).



Remove:

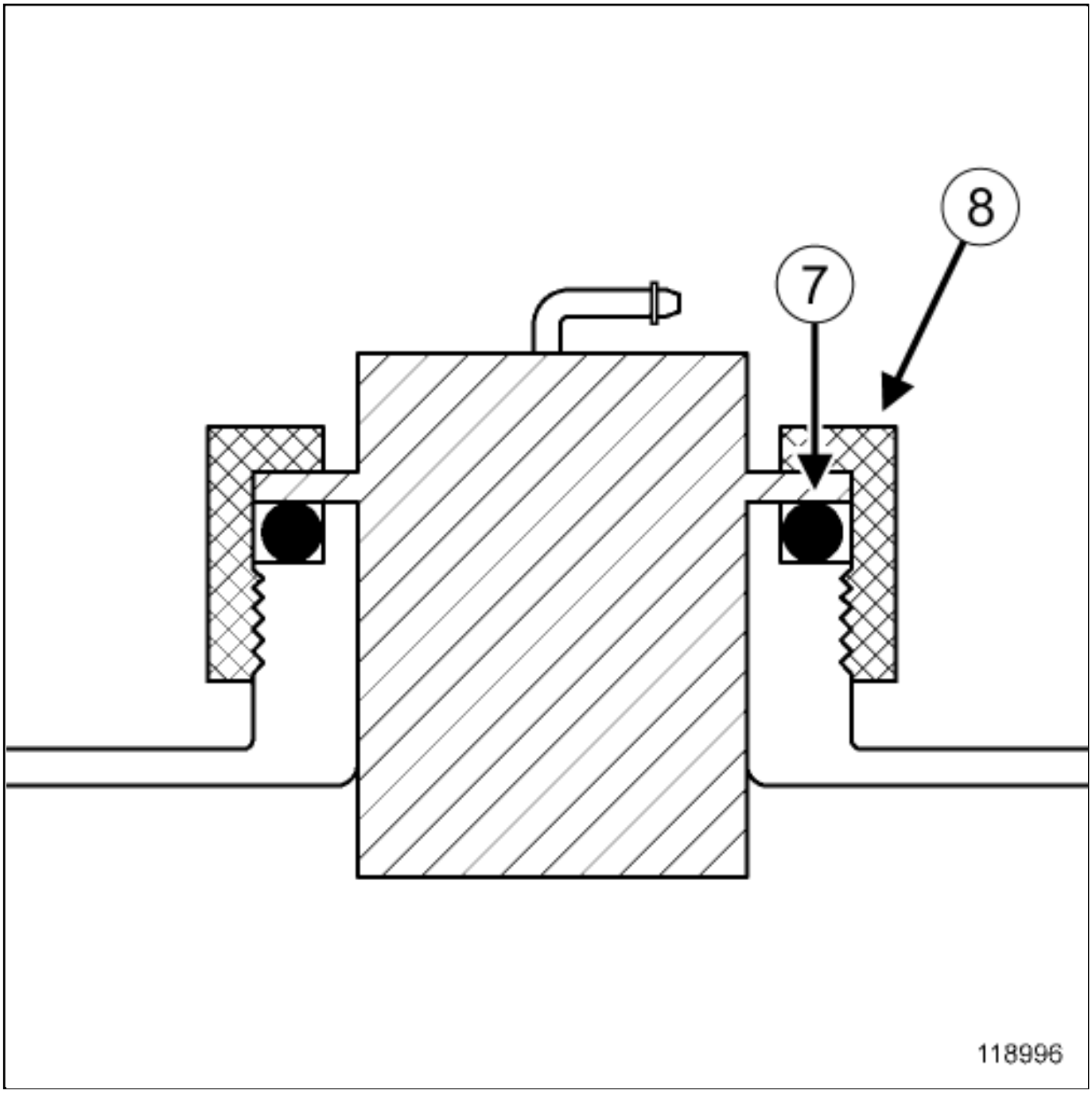
- the nut from the fuel level sensor module using the toolUniversal spanner for removing fuel gauge nuts.(**Mot. 1397**) (1) ,
- the fuel level sensor module, taking care not to damage the float.

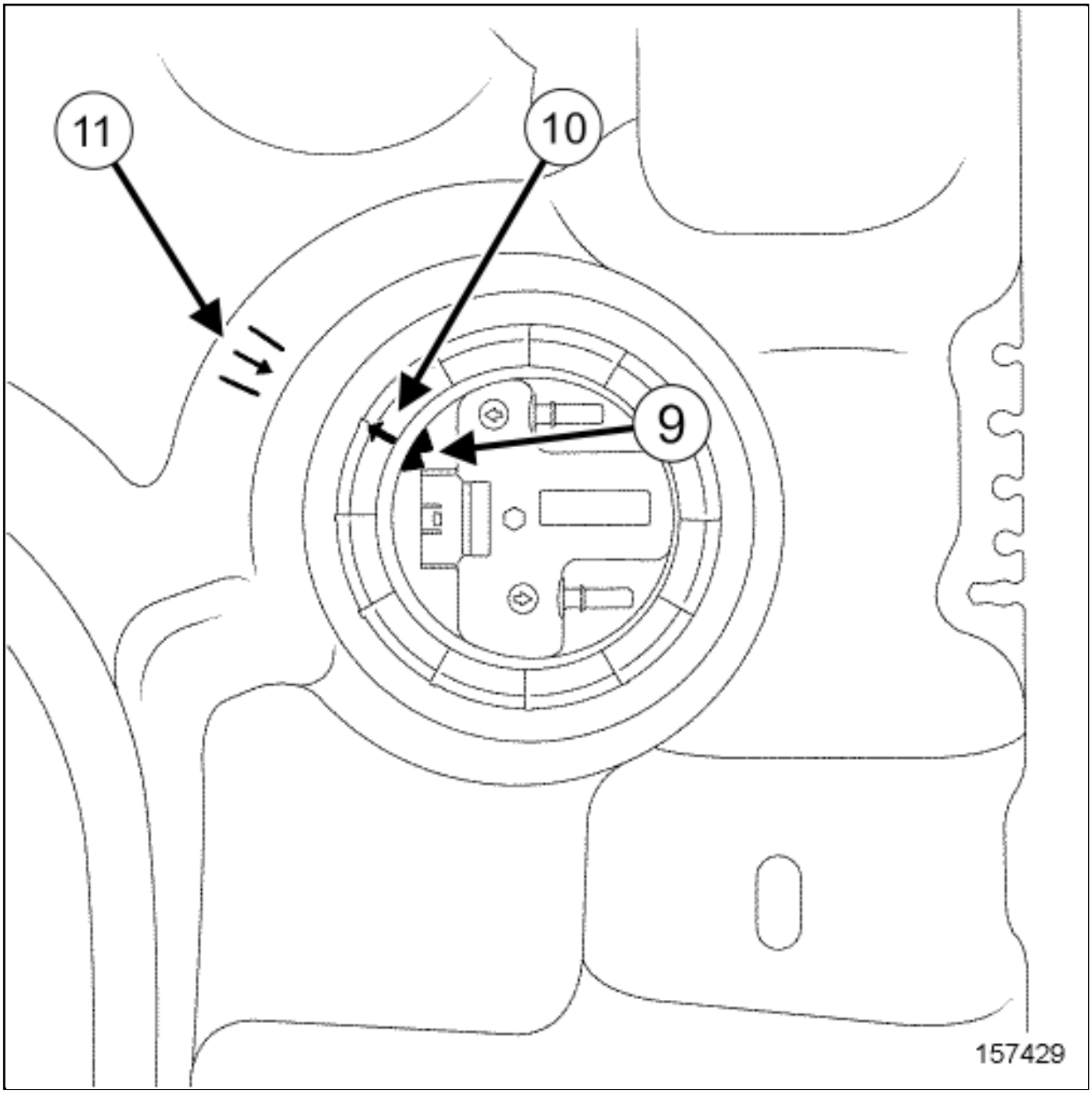
CAUTION

To prevent the tank from deforming, refit the fuel level sensor module nut to the tank well immediately.

REFITTING

1. REFITTING OPERATION





- Position:
  - the seal(7) correctly in the neck,
  - the fuel level sensor module on the tank. There is a tab on the module and a recess in the tank for a single possible position; the mark (9) of the fuel level sensor must be opposite the fuel tank mark(11) .

- Press the fuel level sensor module by hand (to prevent the seal from moving) and fit the nut by hand to the tank.

- Next use theUniversal spanner for removing fuel gauge nuts.(Mot. 1397) , tighten nut(8) until the mark (10) of the nut is opposite the mark(11) of the tank.

Connect:

- the pipes to the fuel level sensor module connector,
- the fuel level sensor module connector.

Refit the access flap for the fuel level sensor module.

2. FINAL OPERATION

Refit:

- the rear centre floor carpet(see **Centre floor rear carpet: Removal - Refitting**) ,
- the rear side door seal(see **Rear side door seal: Removal - Refitting**) ,
- the rear bench seat assembly**Rear bench seat assembly: Exploded view** .

Connect the battery**Battery: Removal - Refitting** .

FUEL PIPES: REPAIR

Note, one or more warnings are present in this procedure

Special tooling required	
Pliers for disconnecting fuel snap-fit connections, diameter 8 mm (Legris et Raymond).	Mot. 1265
Pipe-cutter, semi-rigid fuel pipes.	Mot. 1352
Pliers for disconnecting fuel snap-fit connections, diameter 10 mm (Legris et Raymond).	Mot. 1265-01

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

- During this operation, be sure to:
  - refrain from smoking or bringing red hot objects close to the working area,
  - be careful of fuel splashes when disconnecting the union.

WARNING

Wear goggles with side protectors for this operation.

WARNING

Wear leaktight gloves (nitrile type) for this operation.

CAUTION

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

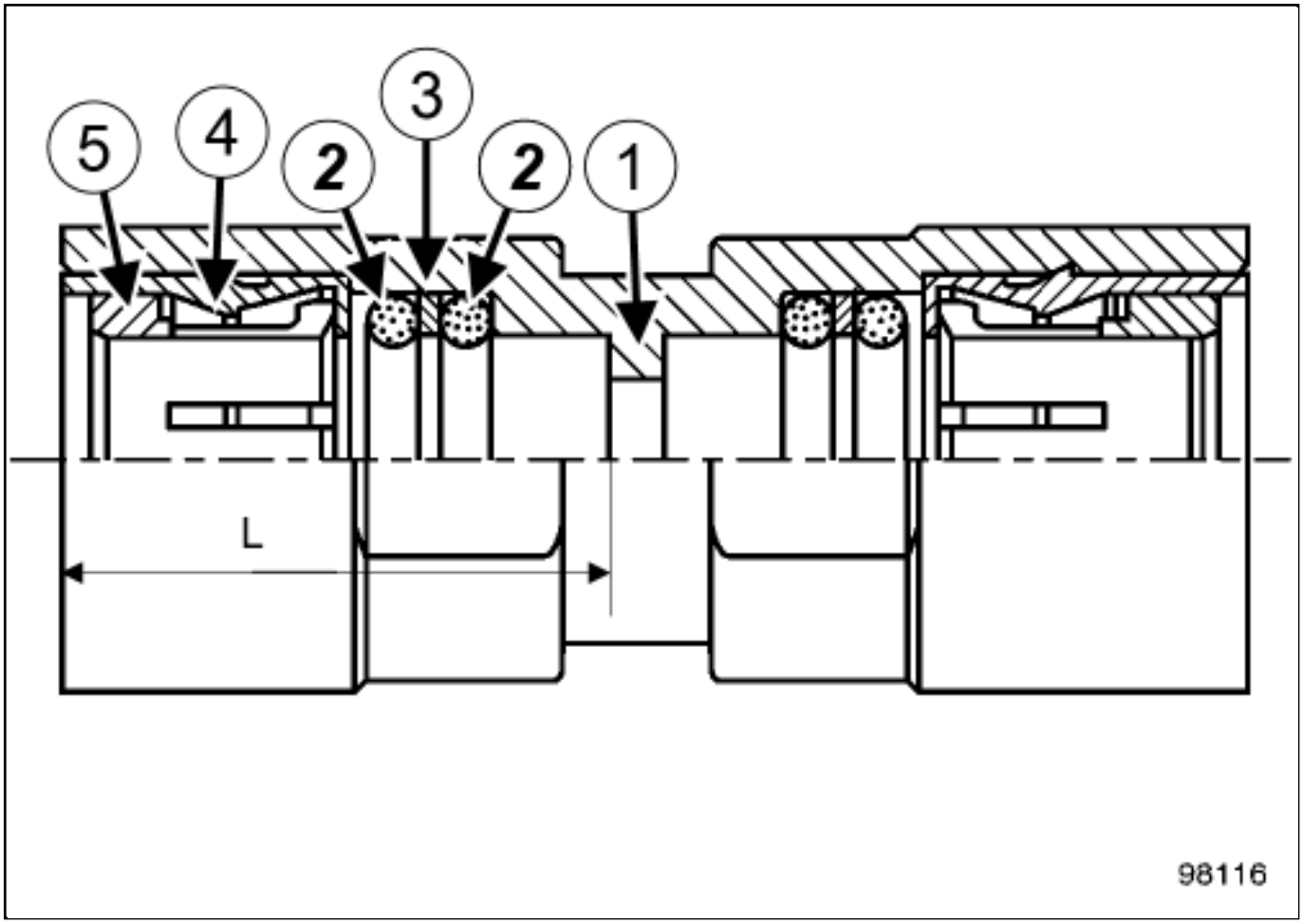
CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

1. PRESENTATION

It is possible to replace parts of the plastic pipes for petrol (fuel supply pipe going from the tank to the injection rail) and diesel fuel (supply pipe going from the tank to the fuel filter) without replacing them completely, the tools and parts required are:

- : Pliers for disconnecting fuel snap-fit connections, diameter 8 mm (Legris et Raymond).(**Mot. 1265**) pliers to disconnect the quick release unions of the fuel pipe diameter 8 mm(Legris and Raymond),
- : Pliers for disconnecting fuel snap-fit connections, diameter 10 mm (Legris et Raymond).(**Mot. 1265-01**) pliers to disconnect the quick release unions of the fuel pipe diameter 10 mm(Legris and Raymond),
- : Pipe-cutter, semi-rigid fuel pipes.(**Mot. 1352**) tube cutter, semi-rigid fuel pipes,
- double union sold as a spare part diameter 8 mmor 10 mm,
- tube with length 1.5 mand angled at 90°, diameter 8 mmor 10 mm,
- the complete piping of the vehicle that will have to be cut according to requirements.



- (1) : Body

(2) : O-rings x2

(3) : Washer

(4) : Dowel

(5) : Clip

(L) : Length of insertion (L = 18.5 mm)

2. REPLACING PART OF THE PIPE

1- PIPE CUTTING

1)PREPARATION BEFORE CUTTING:

- Carry out the repairs cold, after the engine has been stopped for an hour.

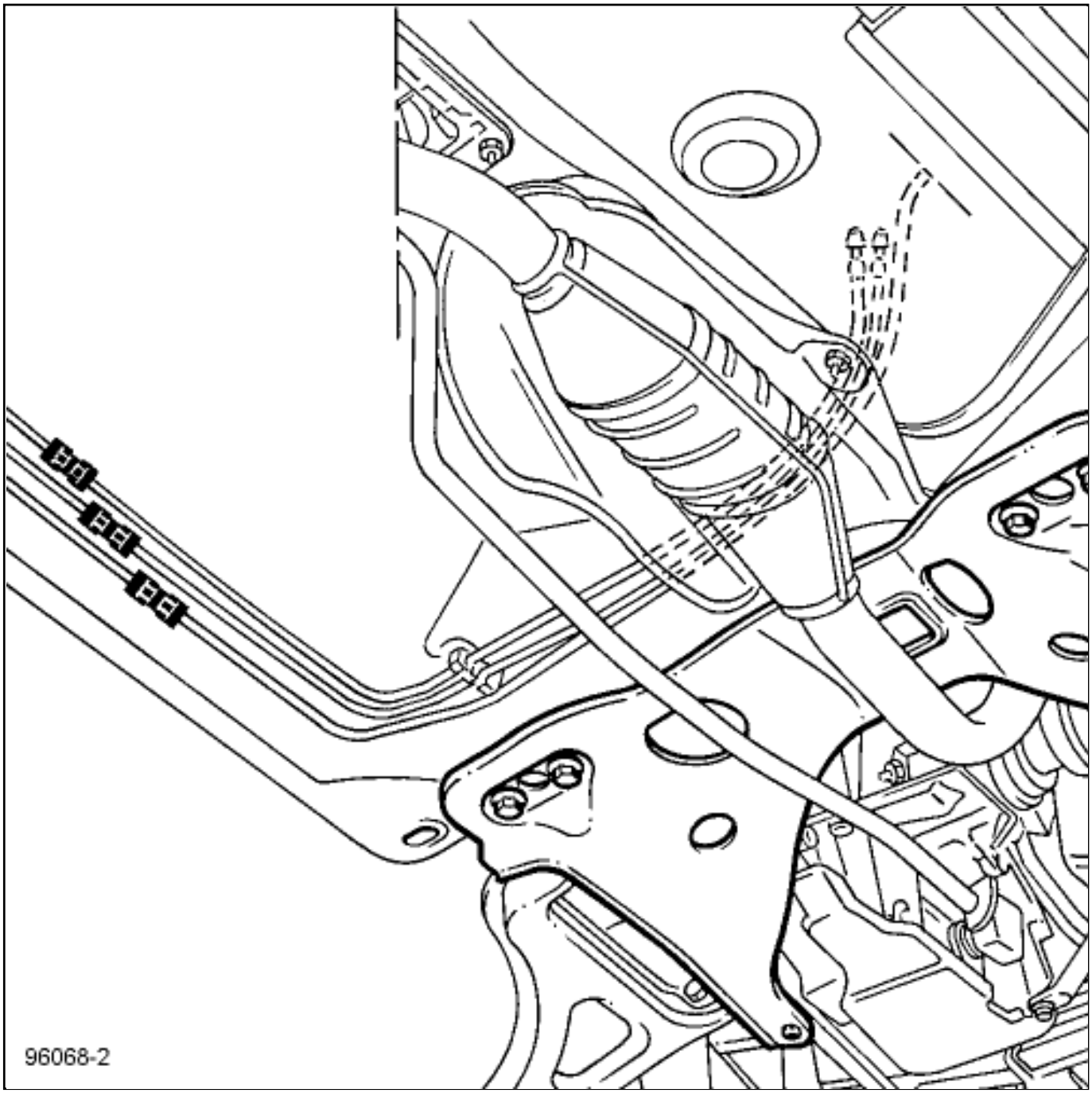
Disconnect the battery(see **Battery: Removal - Refitting**) (80A, Battery).

Measure the fuel pipe diameter for selecting the correct diameter for the parts and tools.

If the cutting is done under body, to avoid siphoning the tank, for diesel pipes in particular, either they should be disconnected at the gauge module level or the oil in the tank should be emptied.

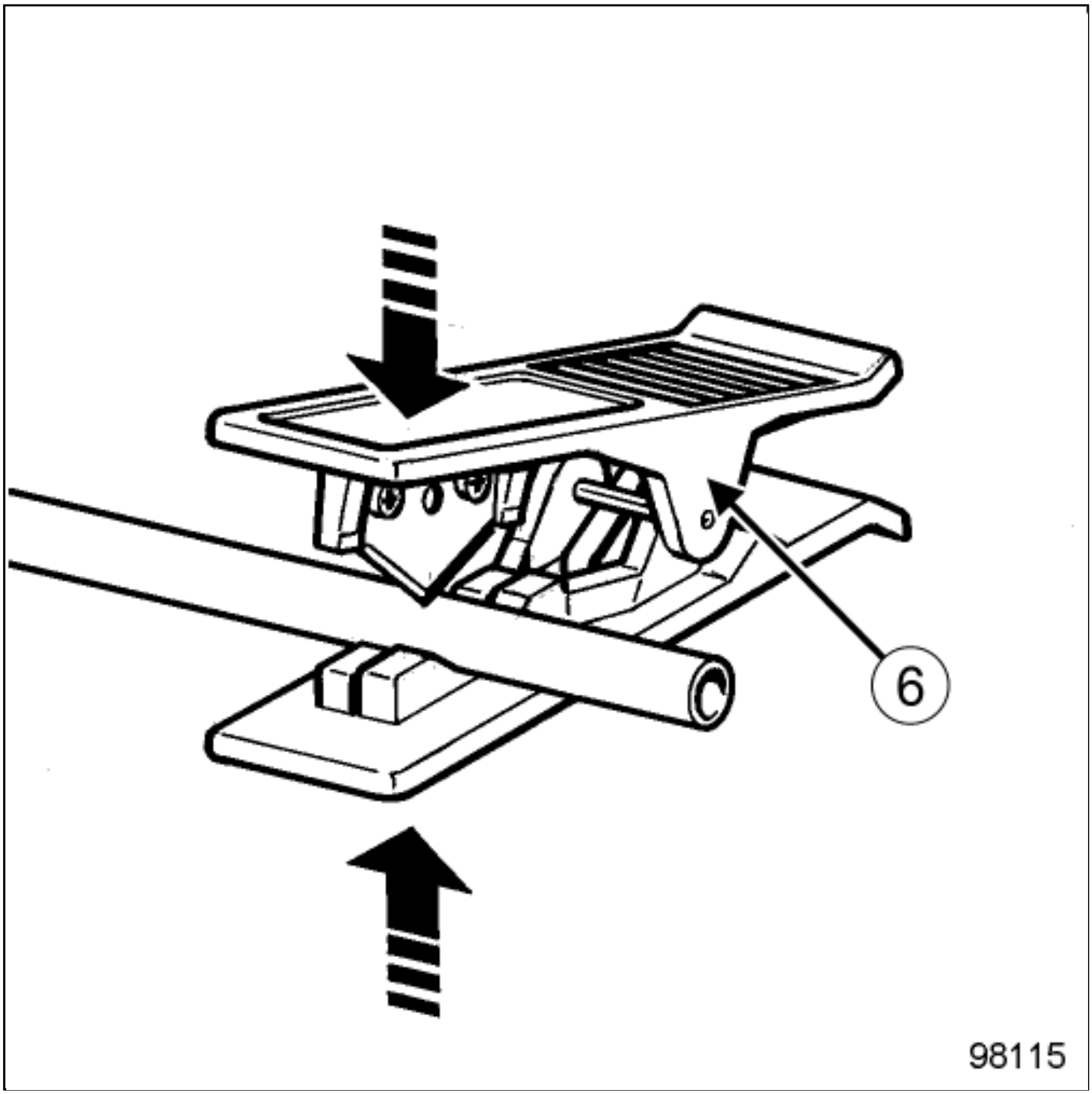
The cut will determine the location of the union. The following rules should therefore be complied with in order to determine the location of the cut:

- the unions must always be in a straight line,
- only cut the pipes in straight lines,
- do not install unions within 50 cm of the catalytic converter, above very hot zones or electrical connections, on pipes in clearance between engine and body, in the zone between the engine and the catalytic converter.



When installing the unions on parallel piping, make sure to cut off-set so that the unions are positioned off-set.

2)CUTTING OPERATION FOR THE PIPE TO BE REPLACED



In order to avoid damaging the two union O-rings and to provide a perfect seal when fitting, perform the cutting operation using toolPipe-cutter, semi-rigid fuel pipes.(Mot. 1352) (6) .

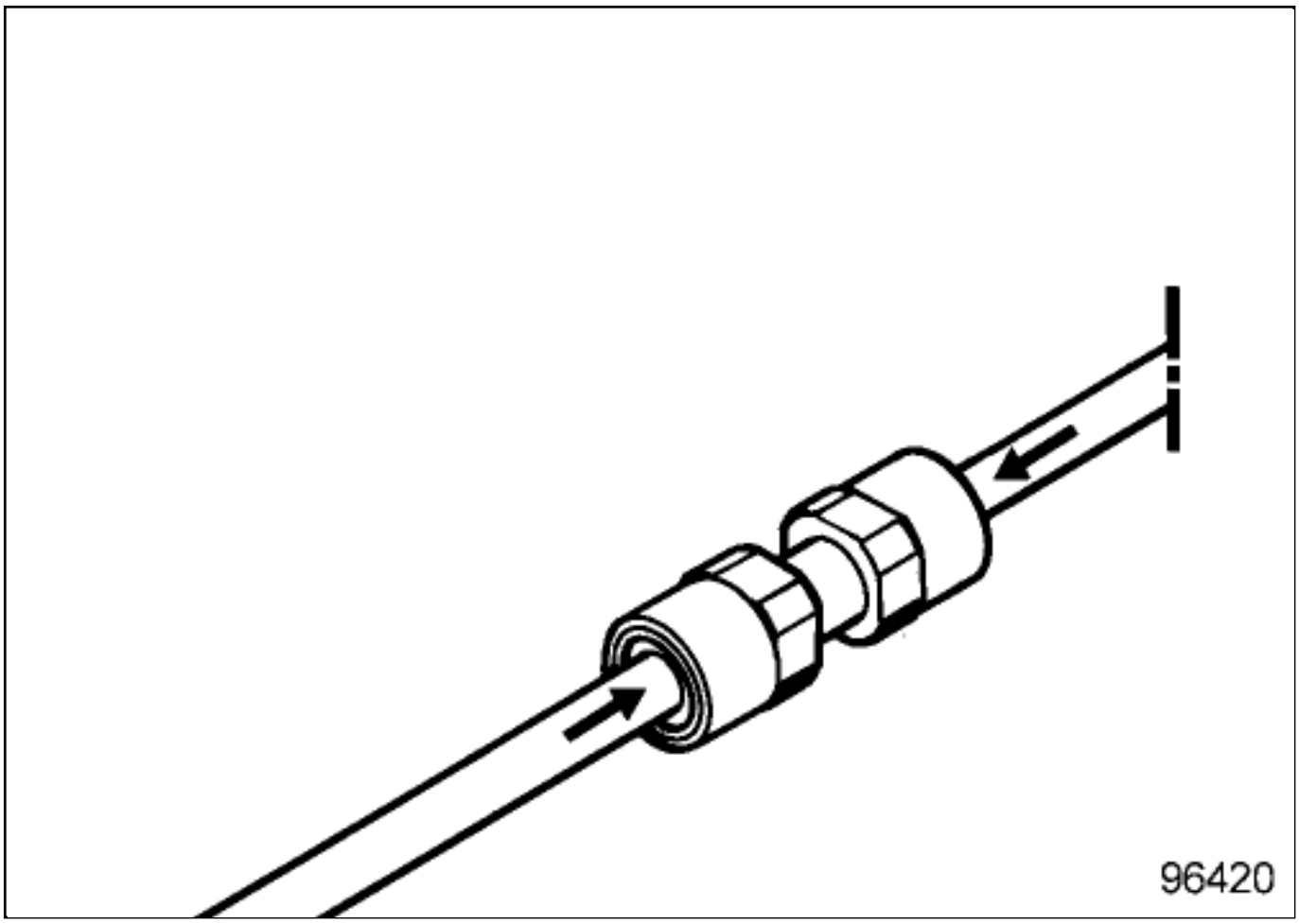
2- NEW PIPE CUTTING

- If the part to be replaced does not have any specific union and has a straight path, you can use the tube of length 1.5 msold as a spare part. If the path is complex, use the standard pipe and cut it according to the part to be replaced.

- For a correct cut, place the pipe that you wish to replace onto the new pipe and mark the cut location.

- Cut the pipe using toolPipe-cutter, semi-rigid fuel pipes.(Mot. 1352) .

3- FITTING THE UNION



- Fit directly on the corresponding piping and press the piping down well.

- Connect the battery(see **Battery: Removal - Refitting**) (80A, Battery).

- After every union installation, check the seal:

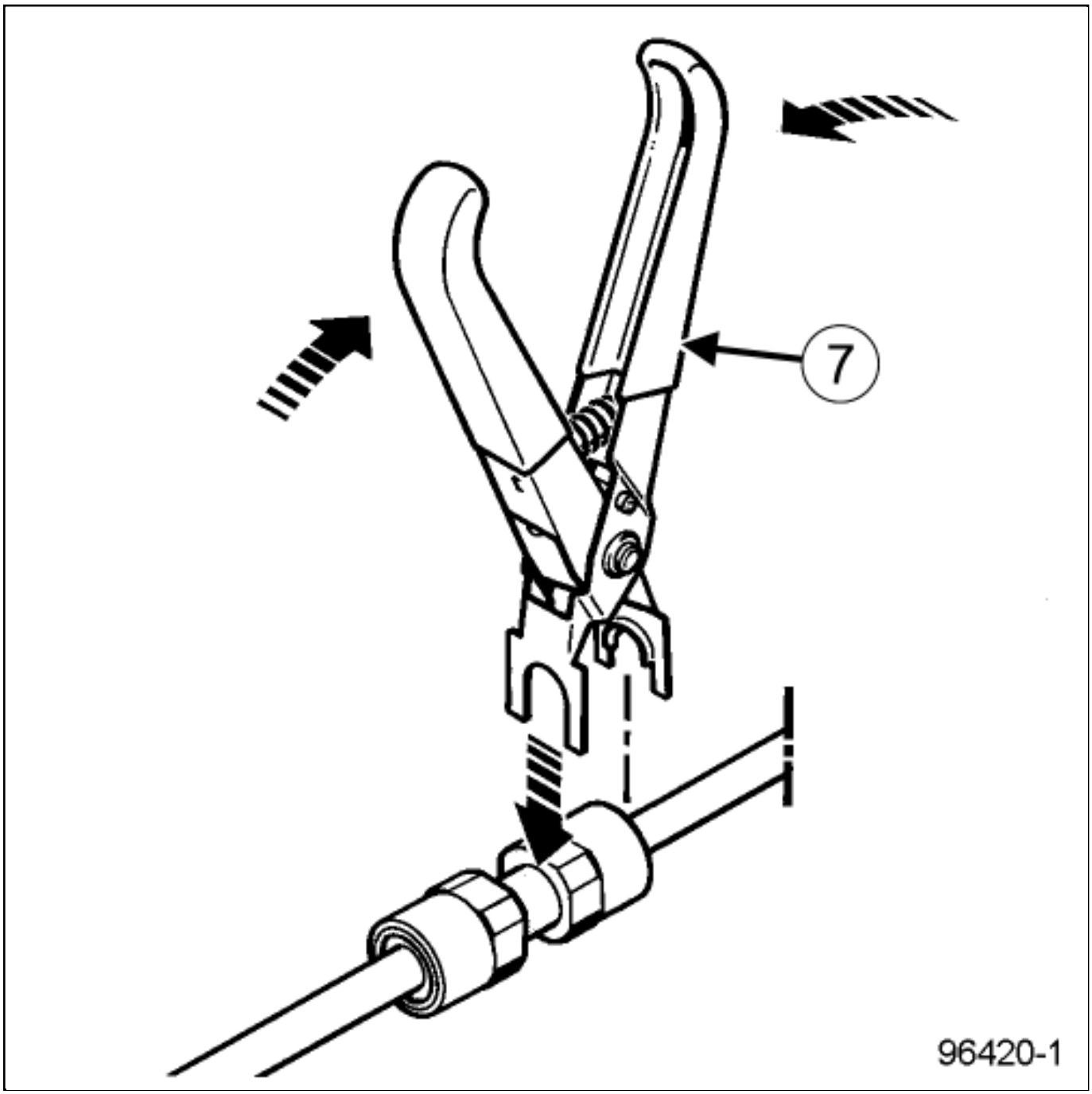
  - for pressure pipes (petrol supply), run the engine and observe for 5 min. to check that there are no drips around the repaired connections.
  - for vacuum pipes (Diesel supply), run the engine and observe for 5 minto check that no air bubbles appear at the high pressure pump outlet, through the transparent pipes.

3. REMOVAL OF THE UNIONS

- Carry out the repairs cold, after the engine has been stopped for an hour.

- Disconnect the battery(see **Battery: Removal - Refitting**) (80A, Battery).

- If the cutting is done under body, to avoid siphoning the tank, for fuel pipes in particular, either they should be disconnected at the gauge module level or the oil in the tank should be emptied.



- Remove the union using pliersPliers for disconnecting fuel snap-fit connections, diameter 8 mm

(Legris et Raymond).(Mot. 1265) and Pliers for disconnecting fuel snap-fit connections, diameter 10 mm (Legris et Raymond).(Mot. 1265-01) (7) which fit the pipe diameters.

FUEL TANK ASSEMBLY: EXPLODED VIEW

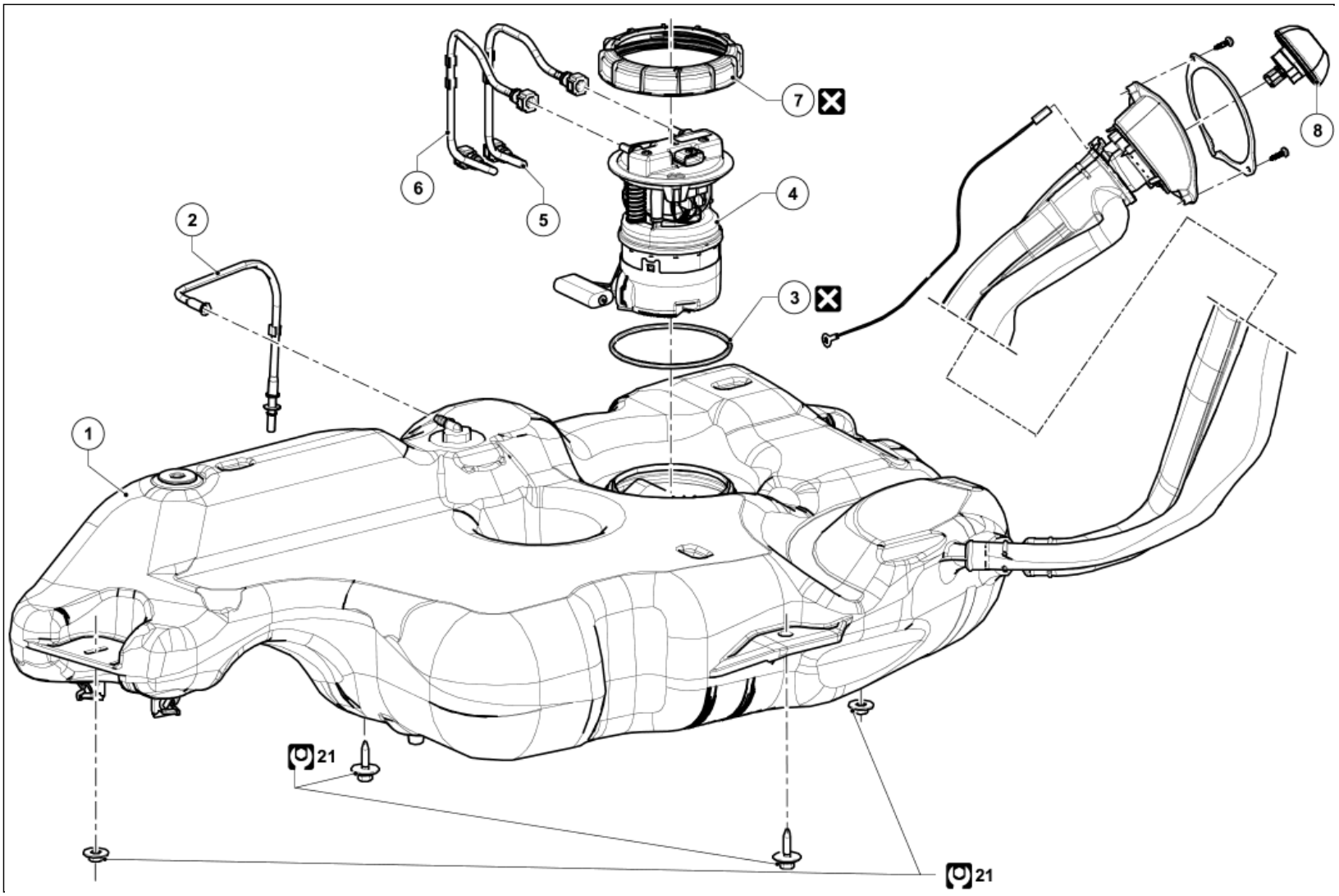


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Fuel tank	(see 19C, Tank, Fuel tank: Removal - Refitting)
2	Fuel vapour pipe	
3	Fuel level sensor module seal	
4	Fuel level sensor module	(see 19C, Tank, Fuel level sensor module: Removal - Refitting)
5	Fuel supply pipe	
6	Fuel return pipe	
7	Fuel level sensor module ring	(Mot. 1397)
8	Fuel filler cap	

XSL version : 3.02 du 22/07/11

FUEL TANK: DRAINING

Note, one or more warnings are present in this procedure

Special tooling required	
Union for taking fuel pressure measurements.	Mot. 1311-08

Equipment required
pneumatic transfer pump for fuels

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Wear goggles with side protectors for this operation.

CAUTION

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

CAUTION

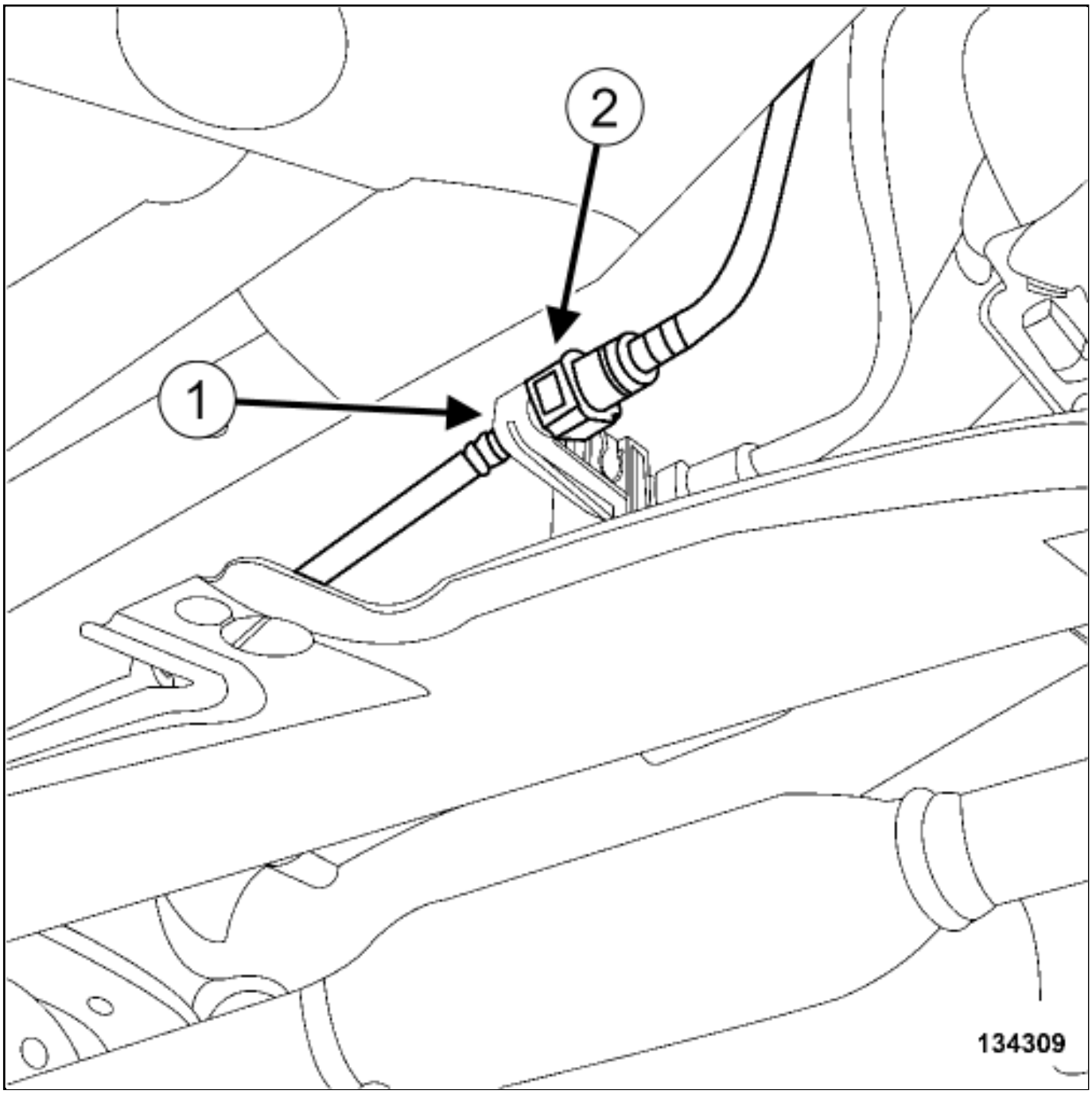
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

DRAINING

1. DRAINING PREPARATION OPERATION

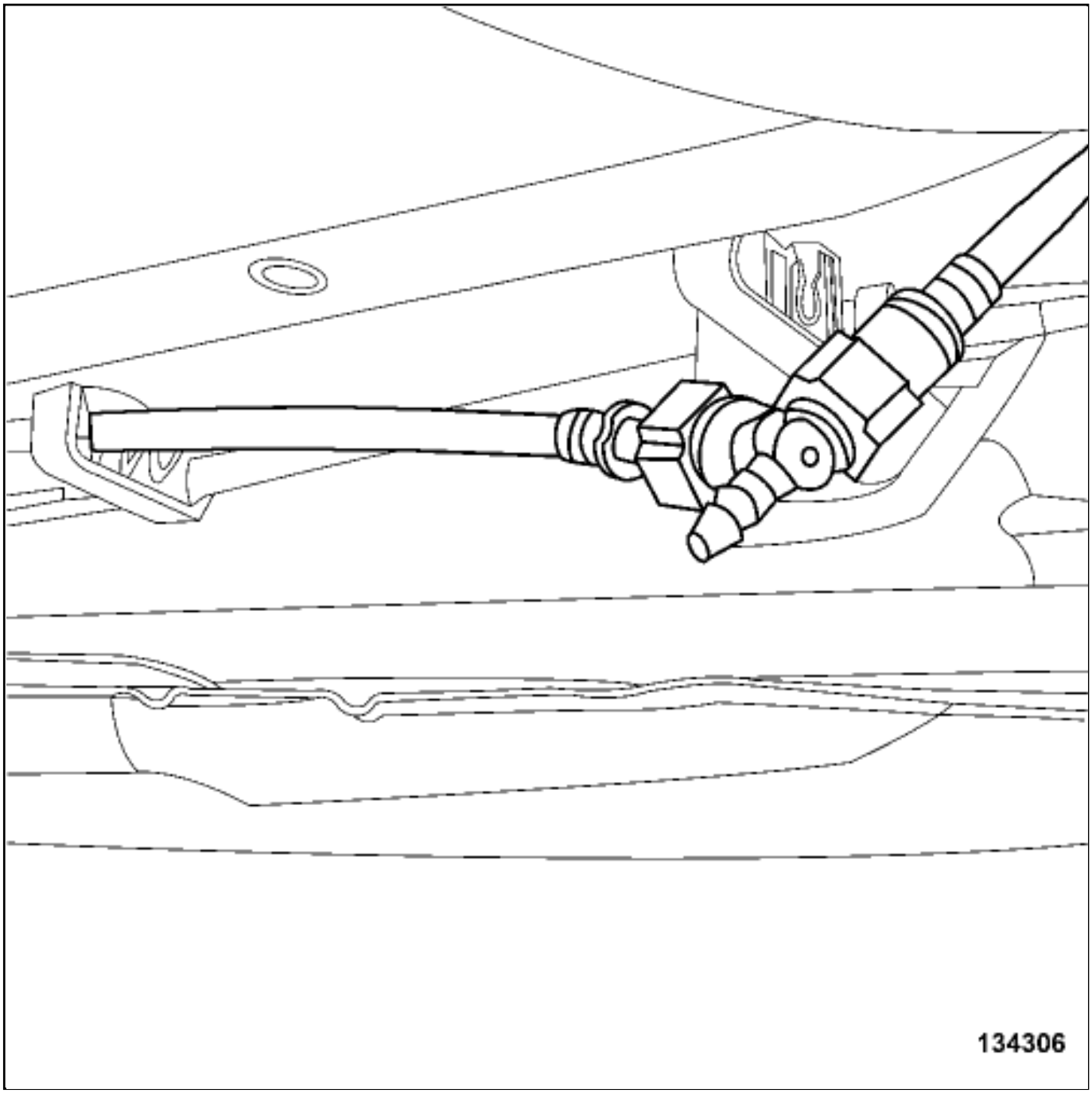
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .

2. DRAINING OPERATION



Unclip the fuel supply union at(1) .

Disconnect the fuel supply union at(2) .



- Fit a T-unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .
- Connect a pneumatic transfer pump for fuelsto the T-union outlet.
- Prepare for fuel outflow.

Drain the fuel tank.

REFITTING

Proceed in the reverse order to removal.

Repair-11x08x01-01x74-1-44-1.xml

XSL version : 3.02 du 22/07/11

FUEL TANK: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19C, Tank, Fuel tank assembly: Exploded view) .

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Wear goggles with side protectors for this operation.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

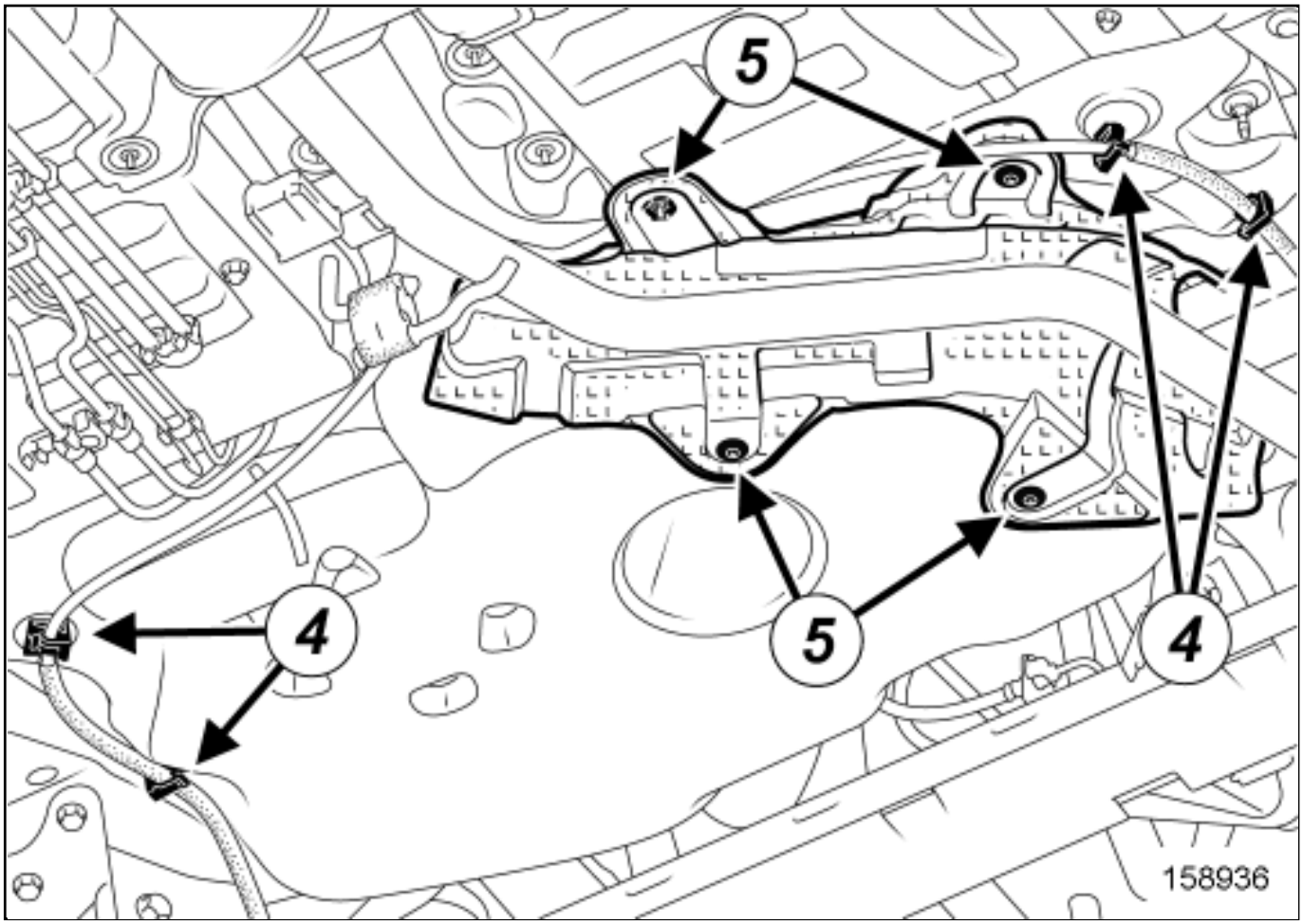
CAUTION

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Drain the fuel tank (see 19C, Tank, Fuel tank: Draining) .
- Remove the rear right-hand wheel Wheel: Removal - Refitting .
- Remove the rubber pad of the intermediate pipe.



- Unclip the parking brake cables from the fuel tank(4) .
- Remove:
  - the mountings(5) of the fuel tank heat shield,
  - the fuel tank heat shield.

2. REMOVAL OPERATION

- Disconnect the snap-on unions of the fuel tank outlet pipes(see 19C, Tank, Fuel tank assembly: Exploded view) .

CAUTION

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

- Fit blanking plugs on the fuel pipes.

- Remove (see 19C, Tank, Fuel tank assembly: Exploded view) :
  - the filler neck bolts,
  - the fuel tank nuts,
  - the fuel tank bolts.

- Lower the tank slightly.

- Disconnect the connector of the fuel pump(see 19C, Tank, Fuel tank assembly: Exploded view) .

Note:

This operation requires two people.

- Remove the fuel tank.

REFITTING

- Proceed in the reverse order to removal.

GEAR CONTROL UNIT: REMOVAL - REFITTING

Equipment required
Diagnostic tool

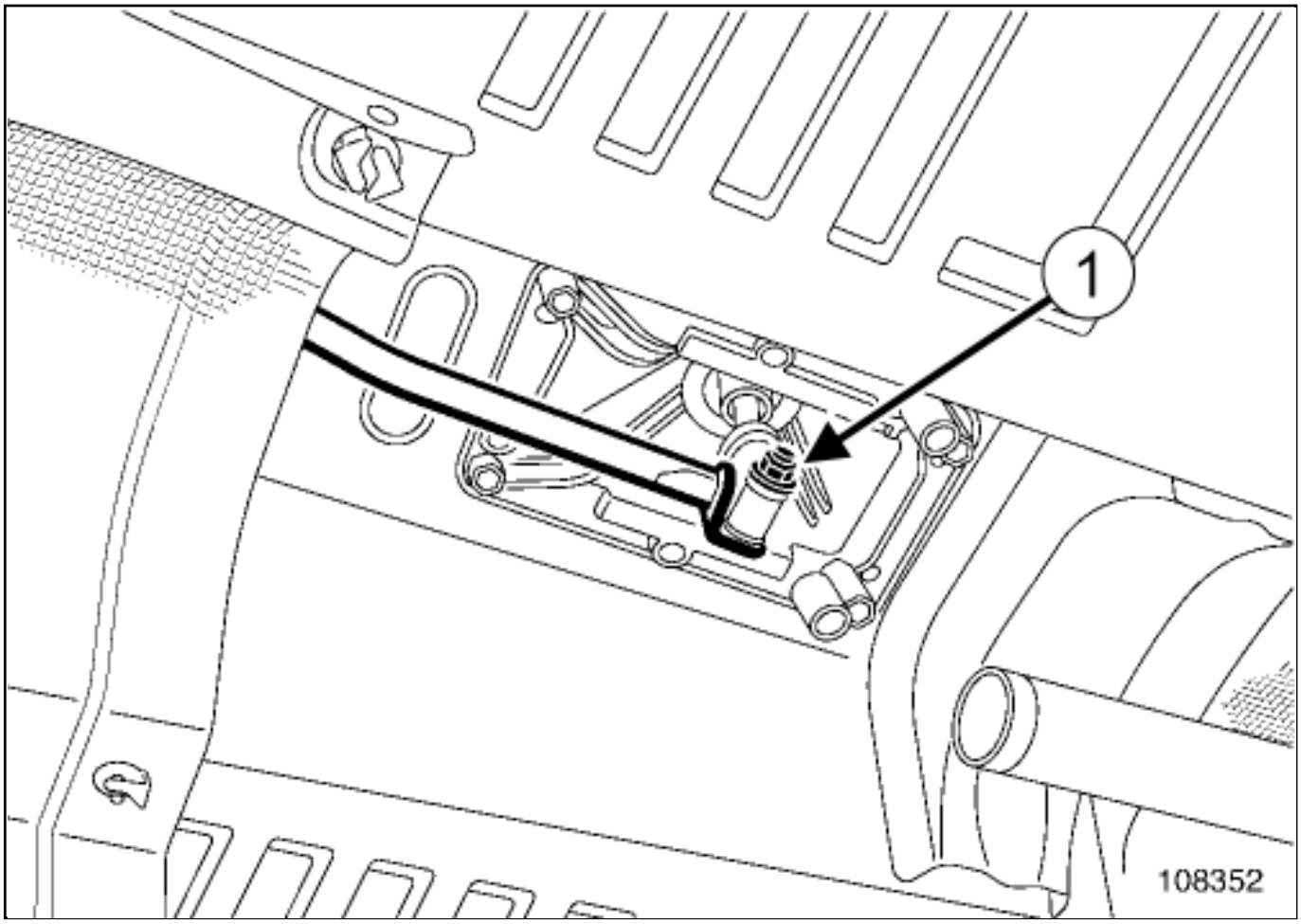
- Location and specifications (tightening torques, parts always to be replaced, etc.)(see 37A, Mechanical component controls, Gear control assembly: Exploded view) .

- For vehicles equipped with gearbox control linkage.

REMOVAL

1. REFITTING PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .



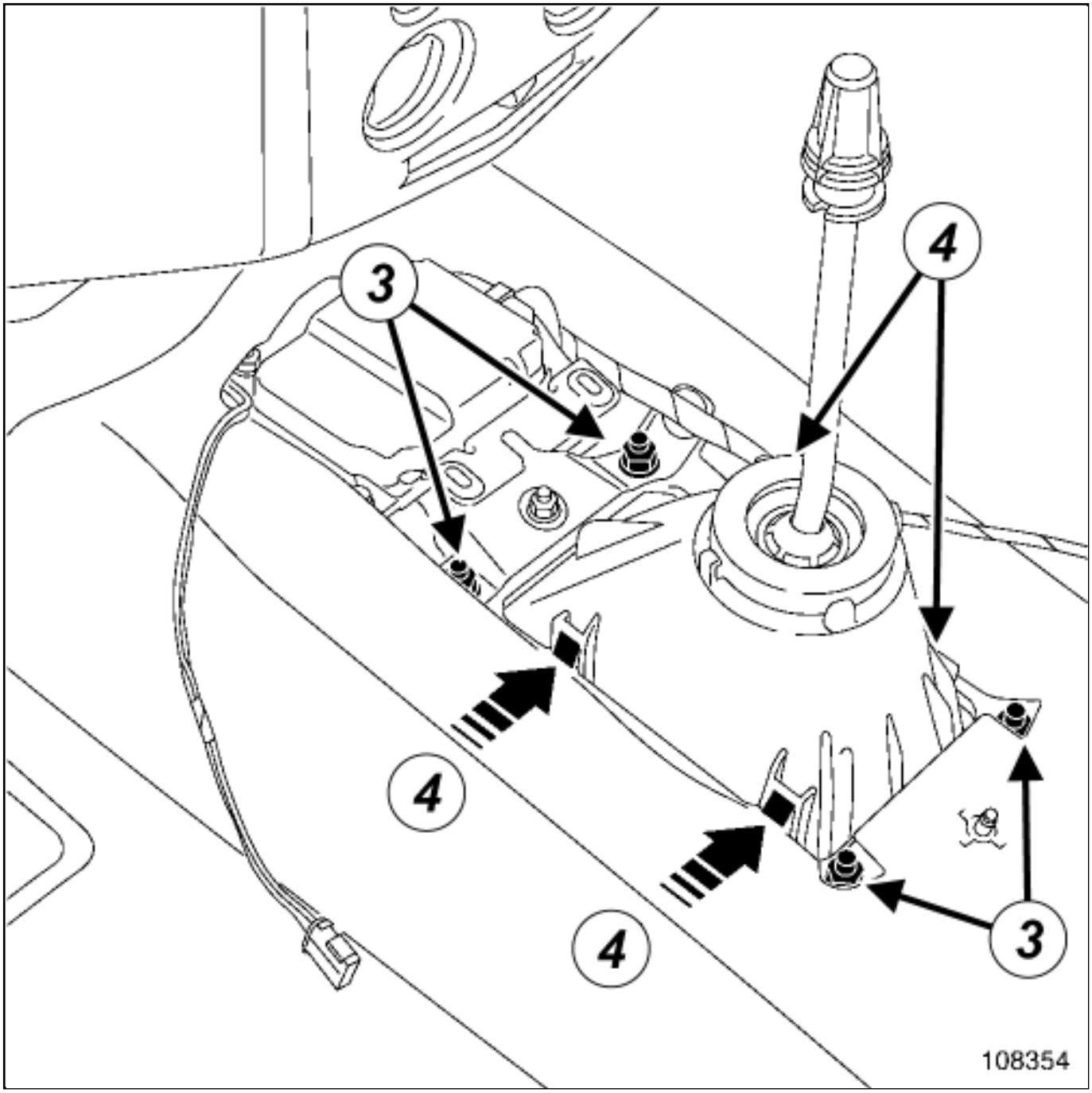
- Remove the nut(1) from the gearbox control linkage.

- Remove the engine undertray.

- Remove the exhaust pipe Exhaust assembly under body: Exploded view .

- Remove the central console Centre console assembly: Exploded view .

2. REMOVAL OPERATION



- Remove the nuts(3) from the gear control unit.
- Unclip the gear control unit from the floor at(4) .
- Remove the gear control unit(see 37A, Mechanical component controls, Gear control assembly: Exploded view) .

REFITTING

- Proceed in the reverse order to removal.

- Use SILICONE GREASEto coat the control linkage mounting shaft on the gear lever Vehicle: Parts and consumables for the repair .

- Torque tighten the gearbox control linkage nut (see 37A, Mechanical component controls, Gear control assembly: Exploded view) .

- Torque tighten the catalytic converter bolts on the exhaust manifold Exhaust assembly under body: Exploded view .

- Check that the system and gear selection are working correctly.

GEARBOXSHAFT:ADJUSTMENT

Note, one or more warnings are present in this procedure

Special tooling required	
Support plate for magnetic stand and 0.6 and 1.6 calibration shims.	Bvi. 1161
Backing plate for adjusting Primary and Secondary shaft play.	Bvi. 1527

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 21A, Manual gearbox , Manual gearbox: Precautions for the repair)** .

1. ADJUSTMENT PREPARATION OPERATION

- Remove the gearbox Manual gearbox: Removal - Refitting .
- Position the gearbox on the component support (see 21A, Manual gearbox , Gearbox support equipment: Use) .
- Remove:
  - the fifth gear housing 5th gear housing: Removal - Refitting ,
  - the fifth gear synchroniser and pinions 5th gear sprockets and synchronisers: Removal - Refitting ,
  - the mechanism housing (see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
  - the gearbox shafts (see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) .
- Strip down the output shaft (see 21A, Manual gearbox , Output shaft: Stripping - Rebuilding) .
- Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean:
  - the shafts,
  - the shaft mating surfaces.
  - the mechanism housing

2. ADJUSTMENT OPERATION

1- ADJUSTING THE PRETENSION OF THE TAPERED BEARINGS OF THE OUTPUT SHAFT

Note:

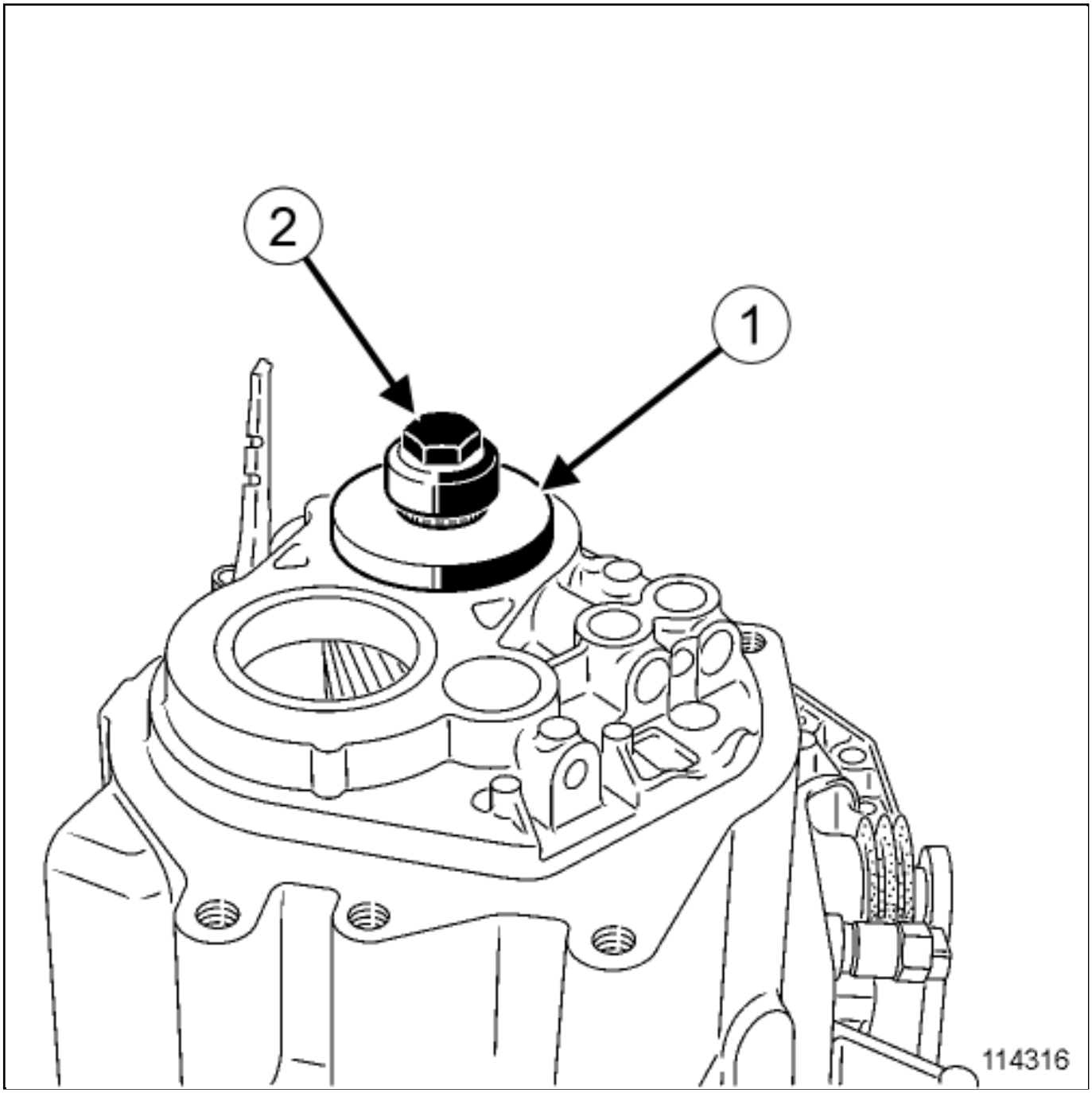
This adjustment only needs to be carried out when replacing the housings or output shaft.

- Position the output shaft only in the clutch housing together with its bearings and the pretensioning washer of the toolSupport plate for magnetic stand and 0.6 and 1.6 calibration shims.(Bvi. 1161) (1.60 mm in size - large outer diameter).

- Position the mechanism housing.

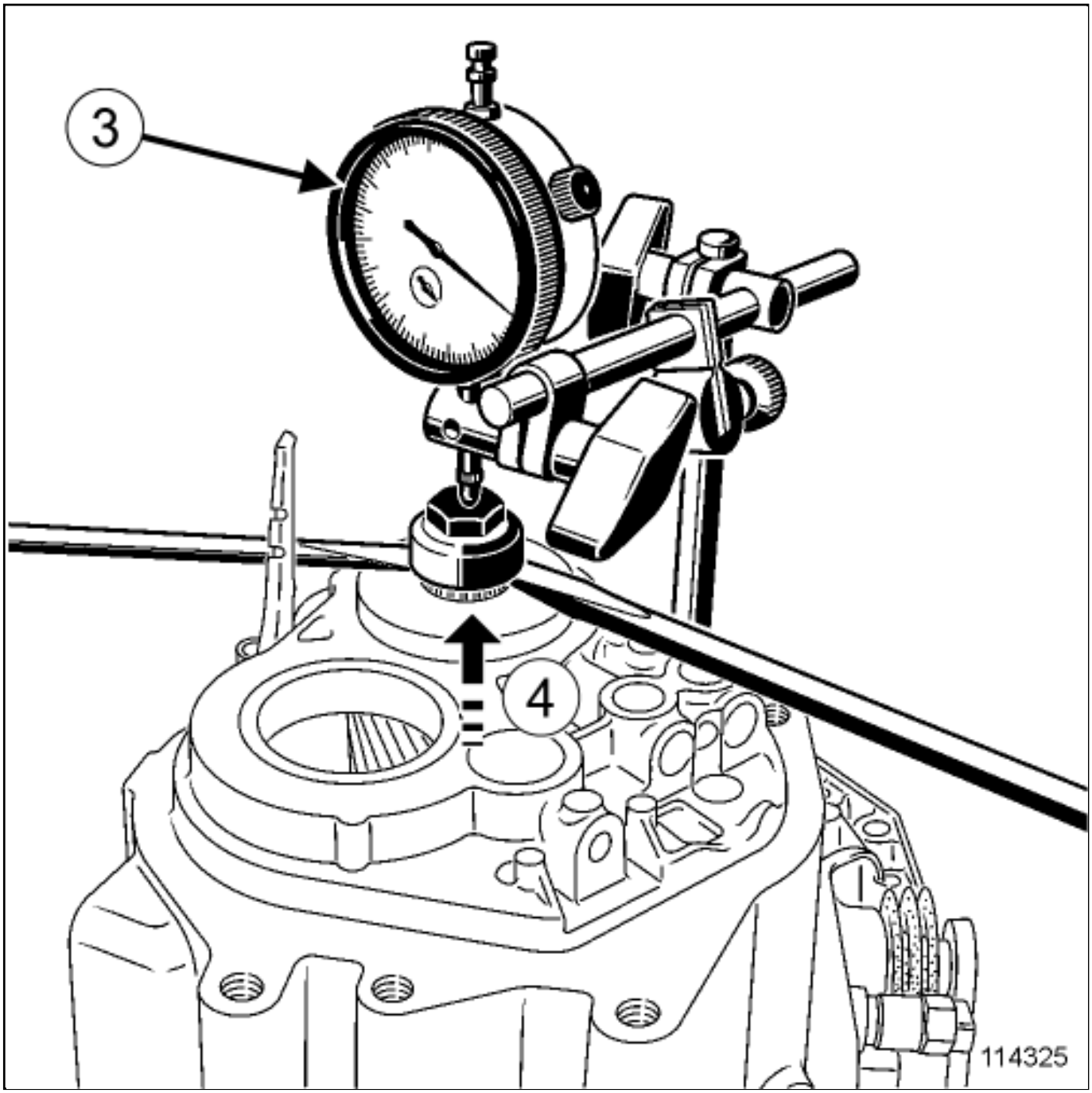
- Refit the mechanism housing bolts.

- Torque tighten the mechanism housing bolts(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) .



Fit:

- the back plateBacking plate for adjusting Primary and Secondary shaft play.(**Bvi. 1527**) (**1**) ,
- the bolt(**2**) .



- Fit the back plate of the toolSupport plate for magnetic stand and 0.6 and 1.6 calibration shims.(Bvi. 1161) secured with two bolts and fit a dial gauge(3) .

- Rotate the output shaft several times to fit the bearings.

- Set the dial gauge to zero.

- Pull the output shaft upwards(4) using two screwdrivers as levers.

- Take a reading from the dial gauge.

- Repeat this operation three times.

- Calculate the average of the readings.

1)CALCULATING THE THICKNESS OF THE BEARING PRETENSIONING SETTING WASHER

- Prescribed value + value of the pretensioning washer + average of the readings on the dial gauge = value of the pretensioning setting washer.

Example (value in mm): 0.26+ 1.60+ 0.49= 2.35

Note:

A set of adjustment washers with a thickness of 2.15 mmto 2.43 mmin gradations of 0.04 mmis supplied as a spare part .

2- ADJUSTING THE PRETENSION OF THE TAPERED BEARINGS OF THE INPUT SHAFT

Note:

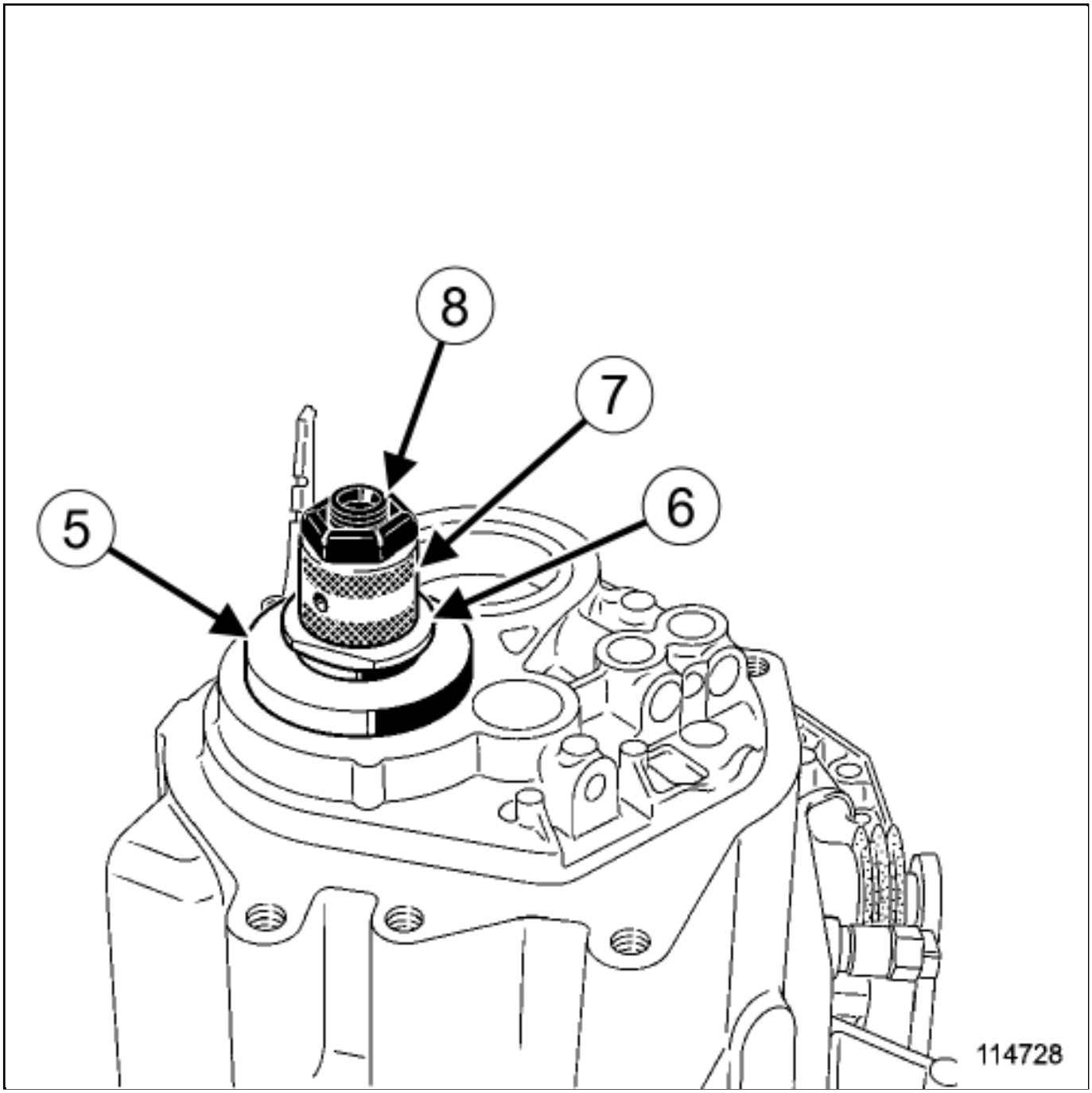
This adjustment only needs to be carried out when replacing the housings or output shaft.

- Position the input shaft only in the clutch housing together with its bearings and the pretensioning washer of the toolSupport plate for magnetic stand and 0.6 and 1.6 calibration shims.(Bvi. 1161) (0.62 mm in size - small outer diameter).

- Position the mechanism housing.

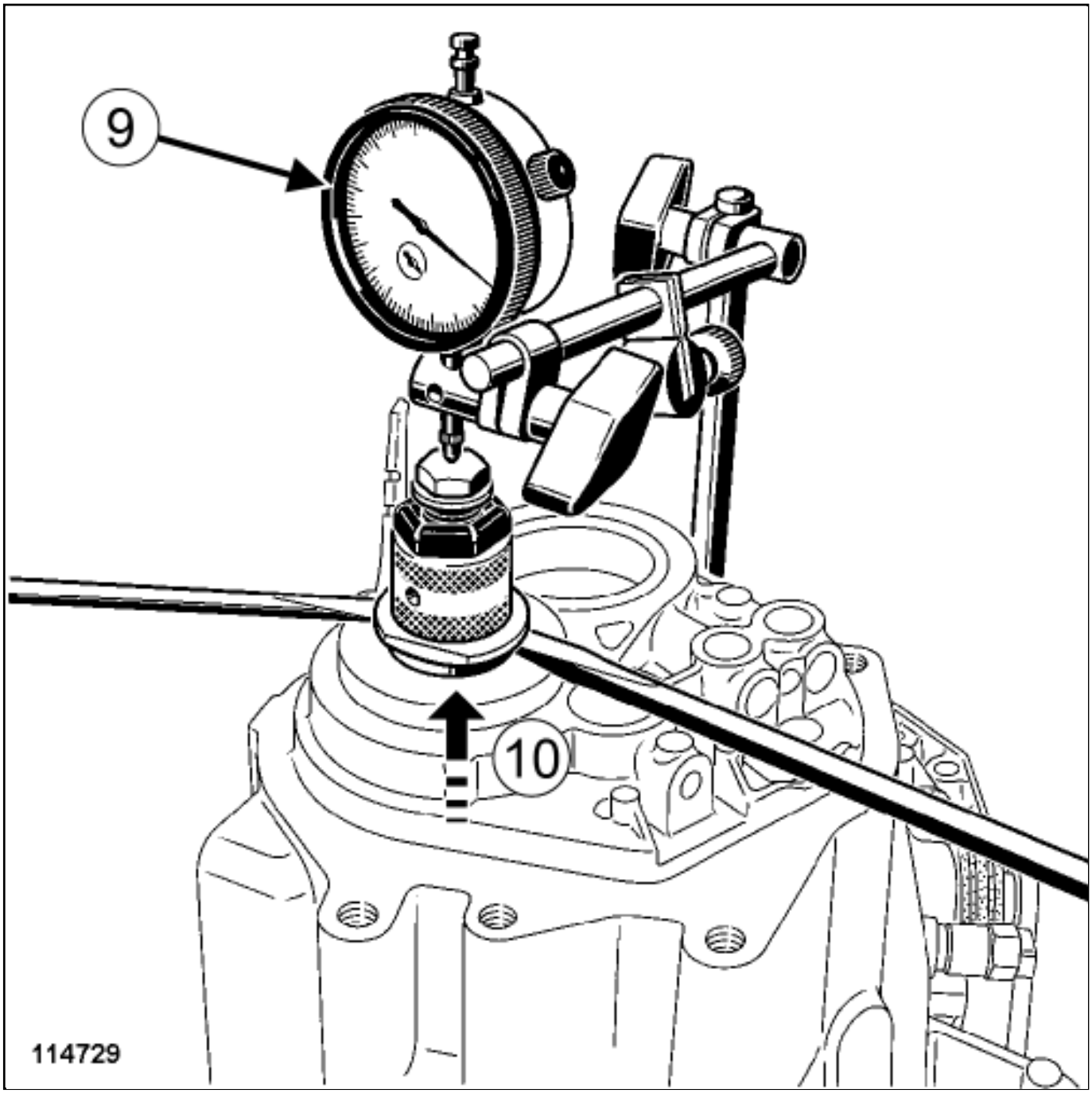
- Refit the mechanism housing bolts.

- Torque tighten the mechanism housing bolts(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) .



Fit:

- the back plateBacking plate for adjusting Primary and Secondary shaft play.(**Bvi. 1527**) (**5**) ,
- the lock washer(**6**) ,
- the gear supporting ring(**7**) ,
- the fully tightened nut(**8**) .



- Fit the back plate of the toolSupport plate for magnetic stand and 0.6 and 1.6 calibration shims.(Bvi. 1161) secured with two bolts and fit a dial gauge(9) .

- Rotate the input shaft several times to fit the bearings.

- Set the dial gauge to zero.

- Pull the input shaft upwards(4) using two screwdrivers as levers.

- Take a reading from the dial gauge.

- Repeat this operation three times.

- Calculate the average of the readings.

1)CALCULATING THE THICKNESS OF THE BEARING PRETENSIONING SETTING WASHER

- Prescribed value + value of the pretensioning washer + average of the readings on the dial gauge = value of the pretensioning setting washer.

Example (value in mm): 0+ 0.62+ 0.48= 1.10

Note:

A set of adjustment washers with a thickness of 0.86 mmto 1.30 mmin gradations of 0.04 mmis supplied as a spare part .

3. FINAL OPERATION

- Rebuild the output shaft(see 21A, Manual gearbox , Output shaft: Stripping - Rebuilding) .

- Refit:
  - the gearbox shafts(see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) ,
  - the mechanism housing(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
  - the fifth gear synchroniser and pinions5th gear sprockets and synchronisers: Removal - Refitting ,
  - the fifth gear housing5th gear housing: Removal - Refitting .

- Remove the gearbox from the component support(see 21A, Manual gearbox , Gearbox support equipment: Use) .

- Refit the gearboxManual gearbox: Removal - Refitting .

GEARBOX SUPPORT EQUIPMENT: USE

Equipment required
workshop hoist

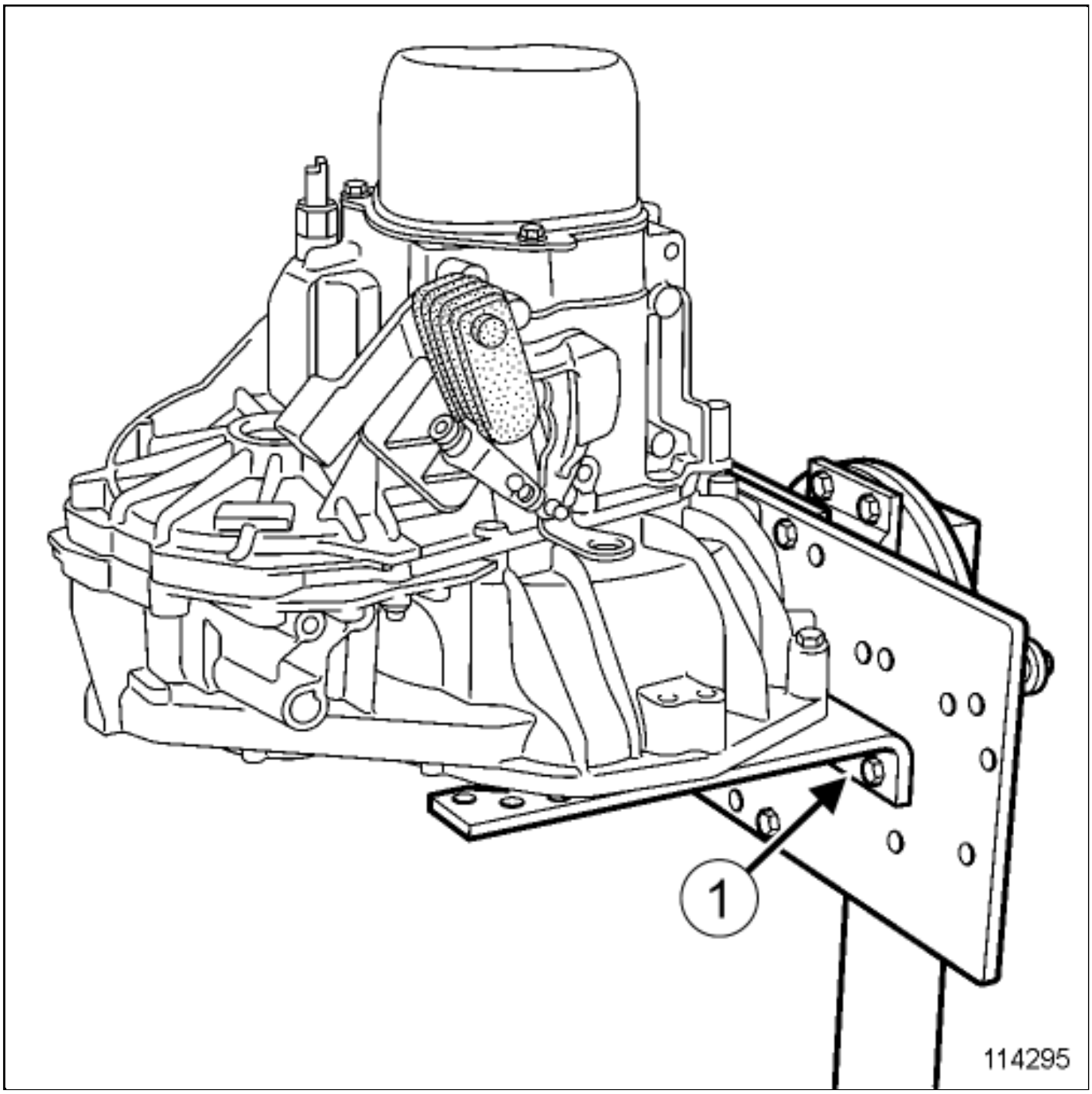
Note:

- To repair any gearbox parts, there are two organ supporting possible solutions:
  - use the housing support plate, if the garage is equipped with it,
  - use the workbench.

1. PREPARATION OPERATION FOR FITTING THE GEARBOX ON THE COMPONENT SUPPORT

- Remove the gearbox Manual gearbox: Removal - Refitting .

2. OPERATION FOR FITTING THE GEARBOX ON THE COMPONENT SUPPORT



- Position the stand plate(1) on the DESVIL tool or on the component support tool.

- Fit the gearbox on the stand plate using the workshop hoist.

- Secure the gearbox on the stand plate using bolts and nuts.

3. OPERATION FOR REMOVING THE GEARBOX FROM THE COMPONENT SUPPORT

- Remove:
  - the gearbox mountings on the stand plate,
  - the gearbox using the workshop hoist,
  - the stand plate from the component support.

4. FINAL OPERATION

- Refit the gearbox **Manual gearbox: Removal - Refitting** .

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1. PAINT

(see 04E, Paint, Colour code: Identification)

(see 04E, Paint, Anti-corrosion protection product: Description)

(see 04E, Paint, Anti-corrosion protection by cold electro zinc plating: Description)

(see 04E, Paint, Sealing product: Description)

2. GENERALITIES

(see 90A, General information, Paint: Precautions for the repair)

(see 90A, General information, Paint blend: Preparation and paint range)

(see 90A, General information, Paint touch up: Preparation and paint range)

(see 90A, General information, Proximity sensor: Preparation and paint range)

(see 90A, General information, Paint fault: Description)

3. PAINT APPLICATION RANGE FOR PANELS

(see 94A, Paint application range for panels, Steel bodywork component: Preparation and paint range)

(see 94A, Paint application range for panels, Aluminium bodywork component: Preparation and paint range)

(see 94A, Paint application range for panels, Underside of the vehicle: Preparation and paint range)

4. PAINT APPLICATION RANGE FOR PLASTIC

(see 95A, Paint application range for plastic, SMC bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, Polypropylene / polyethylene bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, Noryl bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, ABS bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, RIM polyurethane bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, Polycarbonate bodywork component : Paint preparation and range)

5. SPECIAL NOTES ON MASKING

(see 99A, Special notes on masking, Masking: Description)

GENERAL INFORMATION ON PLASTIC BODYWORK COMPONENT : CONTENTS

1. PLASTIC REPAIR

(see 50A, General information, Plastic material bodywork component: Description) ,

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) ,

(see 50A, General information, Plastic material bodywork component: Repair) ,

(see 50A, General information, Tools for plastic material bodywork components: Description) ,

(see 50A, General information, Products for plastic material bodywork components: Description) .

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1. WINDOWS: PRECAUTIONS FOR THE REPAIR

2. WINDOW TOOLS: DESCRIPTION

3. WINDOW REMOVAL TOOL: USE

4. WINDOW BONDING TOOL: USE

5. PRODUCTS FOR PREPARING AND BONDING WINDOWS: DESCRIPTION

6. WINDOW DETACHMENT: DESCRIPTION

7. WINDOW BONDING: DESCRIPTION

8. WINDOWS: REPAIR

9. BONDING SUNROOF OPERATING MECHANISMS: DESCRIPTION

10. DETACHMENT OF THE ROOF FRAMES: DESCRIPTION

11. WINDOW CEMENT BEAD: DESCRIPTION

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1. VEHICLE SEALING: GENERAL INFORMATION

2. SEALING TOOLS: DESCRIPTION

3. SEALING TOOLS: USE

4. BODYWORK SEALING PRODUCTS: DESCRIPTION

5. VEHICLE: CHECKING THE SEALING

6. WINDOWS: CHECKING THE SEALING

7. SIDE OPENING ELEMENTS: CHECKING THE SEALING

8. FRONT SECTION OF THE VEHICLE: CHECKING THE SEALING

9. REAR SECTION OF THE VEHICLE: CHECKING THE SEALING

10. ROOF: CHECKING THE SEALING

11. RETRACTABLE ROOF: CHECKING THE SEALING

12. UNDERSIDE OF THE VEHICLE: CHECKING THE SEALING

13. WINDOWS: REPAIRING THE SEALING

14. SIDE OPENING ELEMENTS: REPAIRING THE SEALING

15. FRONT SECTION OF THE VEHICLE: REPAIRING THE SEALING

16. REAR SECTION OF THE VEHICLE: REPAIRING THE SEALING

17. ROOF: REPAIRING THE SEALING

18. UNDERSIDE OF THE VEHICLE: REPAIRING THE SEALING

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RENAULT

N.T. 6525A

Vehicle	*Engine*
CLIO IV	**D4F 744**
SANDERO II / LOGAN II	**D4F 734**
DUSTER H79Ph2	**K4M 642**
LODGY J92 / DOKKER FK67	**K7M 828**
MEGANE / MÉGANE SCÉNIC	**K4M 866**
DUSTER H79Ph1	**K4M 616**
SANDERO B90, LOGAN	**K7M 818**
CLIO III/MODUS	**D4F 744**

Sub-section concerned: 17C

Diagnosis – GPL Landi Renzo System OMEGAS PLUS EURO 5

Edition n° 1 - MAY 2014 **EDITION ANGLAISE**

"The repair methods given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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DISCLAIMER

For every problem, DTC or consideration not reported in this NT, please refer to the NT of the same vehicles with petrol version

IMPORTANT!

1. SCOPE OF THIS DOCUMENT

This document introduces the special fault finding procedure applicable to all:

Vehicle(s): **Sandero II, Logan II (B52, L52), Clio IV (B98)** For Engines: **D4F*734, D4F*744** Function concerned: **LANDI RENZO LC03**	Computer Name: **LC03** Software reference: **RE3520xxG54** Software reference: **RE3521xxG54**
Vehicle(s): **Duster II (H79Ph2), Lodgy (J92), Dokker (FK67)** For Engines: **K4M*642, K7M*828** Function concerned: **LANDI RENZO LC03**	Computer Name: **LC03** Software reference: **RE3521xxG54**
Vehicle(s): **CLIO III (X85)** For Engines: **D4F 744** Function concerned: **LANDI RENZO LC02**	Computer Name: **LC02 (OMEGAS PLUS)** Software reference: **RE2504xxG34**
Vehicle(s): **SANDERO 1 (B90, FU90), LOGAN 1 (xx90)** For Engines: **K4M*642 , K7M*828** Function concerned: **LANDI RENZO LC02**	Computer Name: **LC02 (OMEGAS PLUS)** Software reference: **RE2504xxG34**
Vehicle(s): **Duster (H79), Scenic (BK95), Megane (BK95)** For Engines: **K4M 616, K4M866, K4M834** Function concerned: **LANDI RENZO LC02**	Computer Name: **LC02 (OMEGAS PLUS)** Software reference: **RE2504xxG34**

2. PREREQUISITES FOR FAULT FINDING

Documentation type

Fault finding procedures (this document):

– Assisted fault finding (integrated into the diagnostic tool), Dialogys.

Wiring Diagrams:

– Visu-Schéma (CD-ROM), paper.

Type of diagnostic tools

– CLIP + multiplex line sensor

Special tooling required

– A multimeter and checking bornier **Elé. 1681** Universal bornier

The present repair method **IS NOT APPLICABLE TO** Software **DR2020xxG24** or **RE2020xxG34**.

3. REMINDERS

Procedure

To run fault finding on the vehicle's computers, switch on the ignition in fault finding mode (forced + after ignition supply voltage).

With vehicles with card reader, proceed as follows:
– vehicle card in reader
– press and hold the Start button (longer than 5 seconds) with start-up conditions not fulfilled,
– connect the diagnostic tool and perform the required operations.

To **cut off the + after ignition supply voltage**, proceed as follows:
– disconnect the diagnostic tool,
– press the Start button twice briefly (less than 3 seconds),
– ensure that the + after ignition power supply has been cut off by checking that the computer indicator lights on the instrument panel have gone out.

Faults

Faults are displayed as present or stored (they appeared in a certain context and have since disappeared, or they are still present but cannot be diagnosed in the current context).

The **present** or **stored** status of faults should be taken into consideration when the diagnostic tool is used after the + after ignition power supply is switched on (without acting on the system components).

For a **present fault**, apply the procedure described in the **Interpretation of faults** section.

For a **stored fault**, note the faults displayed and apply the instructions in the **Notes** section.

If the fault is **confirmed** when the instructions are applied, the fault is present. Deal with the fault.

If the fault is **not confirmed**, check:
– the electrical lines which correspond to the fault,
– the connectors for these lines (for oxidation, bent pins, etc.),
– the resistance of the component detected as faulty,
– the condition of the wires (melted or split insulation, wear).

Conformity check

The aim of the conformity check is to check data that does not produce a fault on the diagnostic tool when the data is inconsistent. Therefore, this stage is used to:
– perform fault finding on faults that do not have a fault display, and which may correspond to a customer complaint.
– check that the system is operating correctly and that there is no risk of a fault recurring after repair.

This section gives the fault finding procedures for statuses and parameters and the conditions for checking them.

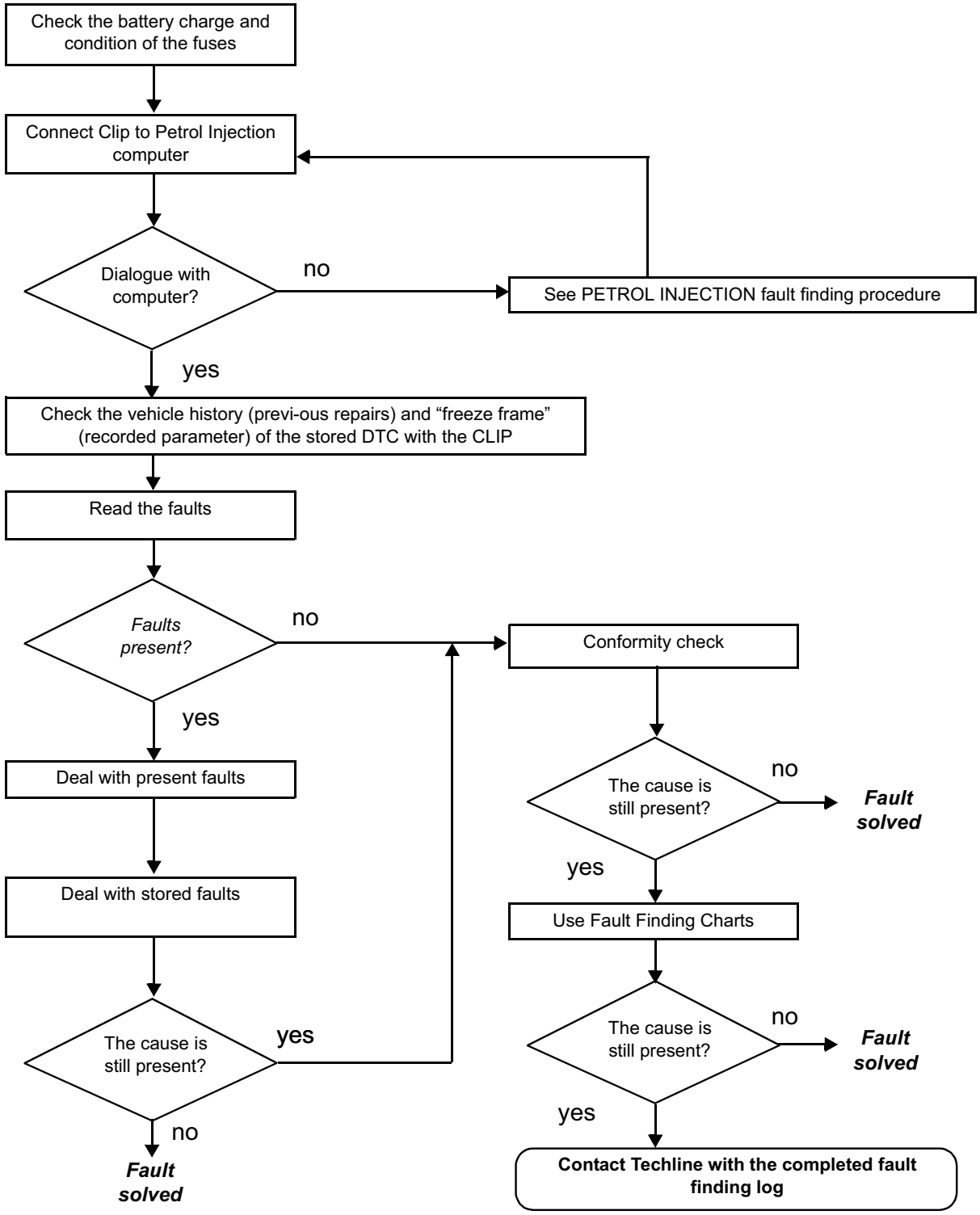
If a status is not behaving normally or a parameter is outside the permitted tolerance values, consult the corresponding fault finding page.

Customer complaints - Fault finding chart

If the test with the diagnostic tool is OK but the customer complaint is still present, the fault should be processed by Customer complaints.

A summary of the overall procedure to follow is provided on the following page in the form of a flow chart

4. FAULT FINDING PROCEDURE



4. FAULT FINDING PROCEDURE (continued)

Order of priority:

Electrical faults must be processed before Functional faults (**DTC2293, DTC0184, DTC1608, DTC109A, DTC0618, etc.**) and Customer Complaints.
Note that there must be no electrical failures either present or stored before dealing with Functional or Customer Complaints operational faults.
Other priorities are dealt with in the procedure for the fault in question, in the Notes section.

Wiring check:

Fault finding problems:
Disconnecting the connectors and/or manipulating the wiring may temporarily remove the cause of a fault.
Electrical measurements of the voltage, resistance and insulation are generally correct, especially if the fault is not present when the analysis is made (stored fault).

Visual inspection:
Look for damage under the bonnet and in the passenger compartment.
Carefully check the fuses, insulation and wiring routing.
Look for signs of oxidation.

Tactile inspection:
While manipulating the wiring, use the diagnostic tool to note any change in fault status from stored to present.
Check that the connectors are correctly tightened, apply light pressure to the connectors, twist the wiring harness.
If there is a change in status, try to locate the source of the fault.

Inspection of each component:
Disconnect the connectors and check the appearance of the clips and tabs, as well as their crimping (no crimping on the insulating section).
Make sure that the clips and tabs are properly locked in the sockets.
Make sure no clips or tabs have been dislodged during connection.
Check the clip contact pressure using an appropriate model of tab.

Resistance check:
Check the continuity of entire lines, then section by section.
Look for a short circuit to earth, to **+ 12 V** or with another wire.
If a fault is detected, repair or replace the wiring harness.

5. FAULT FINDING LOG

IMPORTANT!

IMPORTANT
Any fault on a complex system requires thorough fault finding with the appropriate tools. The FAULT FINDING LOG, which should be completed during the fault finding procedure, ensures a record is kept of the procedure carried out. It is an essential document when consulting the manufacturer.

IT IS THEREFORE MANDATORY TO FILL OUT A FAULT FINDING LOG EACH TIME FAULT FINDING IS CARRIED OUT.

You will always be asked for this log:
– when requesting technical assistance from Techline,
– for approval requests when replacing parts with mandatory approval, and to be enclosed when returning monitored parts on request. The log is needed for warranty reimbursement, and enables better analysis of the parts removed.

6. SAFETY INSTRUCTIONS

All work on components requires you to strictly follow safety rules to prevent any physical damage or human injury.
– Make sure the battery is properly charged to avoid damaging the computers with a low charge.
– Use the proper tools.

Safety instructions that must be followed before any operation is performed on the vehicle

– If a major LPG leak occurs, the vehicle must be isolated, away from buildings and any fire risks.
– The emergency services may be required to intervene if the situation cannot be controlled.
– All work on the LPG circuit must be performed by qualified and authorized personnel.
– Do not try to open the tank. Don't ever try to remove the multi-valve located at the end of the tank.
– Do not clean the engine compartment with detergent when the system is pressurized.
– Always refer to the RENAULT Workshop Repair Manual before performing any work.

Safety instructions that must be followed when any operation is performed on the vehicle

– All work must be carried out in a well-ventilated space.
– There must not be any flames, sparks, burning cigarettes or telephones near the area where work is being carried out.
– The operator must not wear acrylic clothes likely to generate static electricity.
– Disconnect the battery and leave the vehicle on the ground.
– If working on the tank, drain it by running the engine in LPG mode.
– Once it has been drained and removed, the tank can be sent to the GIAT Company, with the manual insulation valve in closed position (fully rotated clockwise) and fitted with its mounting.
– If work is to be done in the painting station, remove the tank (with its mounting).
– The tank must not be subjected to temperatures greater than 50°C.

Safety instructions that must be followed when any operation is performed on the vehicle

– After working on a LPG joint, check that it is not leaking after reassembling.
– Apply soapy water or the product distributed by SODICAM, part number 77 11 143 071 (leak detector) to the open joint(s).
– Fill the fuel tank with a few liters of LPG if it has been bled (the ignition must be switched off first).
– Crank the engine, switch in LPG mode and check again that there is no leak.
– If a leak is detected, retighten the relevant joint. If the leak persists, remake the joint.
– Fill the fuel tank (80 % of total volume). Start the engine, switch in LPG mode and check that there is no leak.

After reassembling, check that all the rubber and encased metal LPG pipes are not in contact with any parts that can be accessed by the user and may create a LPG leak.

WARNING
Before performing any work on the vehicle, drain the LPG circuit.
Only personnel who have undergone specific LPG training can work with LPG joints where liquid LPG is circulating and moving through the fuel tank from the filler neck to the expansion valve.
In addition, only personnel who have undergone specific LPG training can perform maintenance and repairs on LPG vehicles.
Workshops can only carry out work on the fuel tank if they have a degassing burner.
If the tank cannot be degassed, do not touch it and contact the:

Comité Français du Butane et du Propane
8, terrasse Bellini
92807 PUTEAUX cedex
E-Mail: contact@cfbp.fr
Tél: +33 (0)1 41 97 02 80
Fax: +33 (0)1 41 97 02 89

Maintenance operations

– No adjustment.
– Removal of internal components is not allowed, except when expressly authorized,.
– If LPG fixation clips and fittings are removed, they must be replaced.
– If LPG joints are removed, they must be replaced.

The tank must be empty before removing:

- the fuel tank,
- a component bolted onto the tank, before bleeding the LPG contained in the LPG circuit.

To remove the following, bleed all LPG contained in the LPG circuit (except the LPG in the tank):

- the filler neck,
- the pipes,
- the filter,
- The pressure reducer
- The LPG injector

7. GENERAL APPROACH TO FAULT FINDING

– Use Plus Max RE to identify the system fitted to the vehicle.

If the Software Version is in the form: RE35xxxxG54 the GCU is an LC03 adopted on vehicles compliant with EU5+ emis-sion norm.
If the Software Version is in the form: RE25xxxxG34 the GCU is an LC02 adopted on vehicles compliant with EuroV emission norm.

In the chapter "Fault Finding – Fault Interpretation" carefully follow the symbolism:

in order to ensure the correctness of the repair procedure.

1. LPG SYSTEM DESCRIPTION

1.1 Changeover from petrol to gas

The vehicle switch to LPG when:

1) The driver has selected the LPG fuel switch mode in the current trip or in the previous trip the engine stopped in LPG mode.
2) Coolant water temperature must be higher than the tuned threshold; this threshold depends on the temperature at the crank; usually the threshold is between 20 and 25°C.
3) A tuned delay is elapsed from the cranking; the delay depends on the temperature at the crank; usually cranking at a coolant temperature of 20°C the delay is 60s.
4) Gas Temperature must be higher than the tuned threshold usually between 2 and 5°C. Please note that with low winter temperature (for example -10°C), the delay requested to the LPG temperature to reach the threshold could be long and sometimes more than 5 minutes
5) RPM value must be greater than the tuned RPM threshold usually between 1300 and 1800 RPM depending on engine power and vehicle gearbox ratio.
6) LPG switching isn't allowed at very high engine loads, for example in full acceleration.
7) No LPG system fault must be present.

1.2 General checks

Before proceeding with repairs, verify that there are no additional faults stored in the petrol ECU.

The **operating pressure** of the LPG displayed on the DIAGNOSTIC TOOLS should be between **1.15 & 1.36 bar**, when the vehicle is running in LPG mode, at idle speed (750 rpm) and when the temperature of the coolant is over 70°C,with all auxiliary load (AC, fan,..) **switched off**.
[Usually the LPG pressure should be 0,9 - 0,95 bar over the intake manifold pressure].

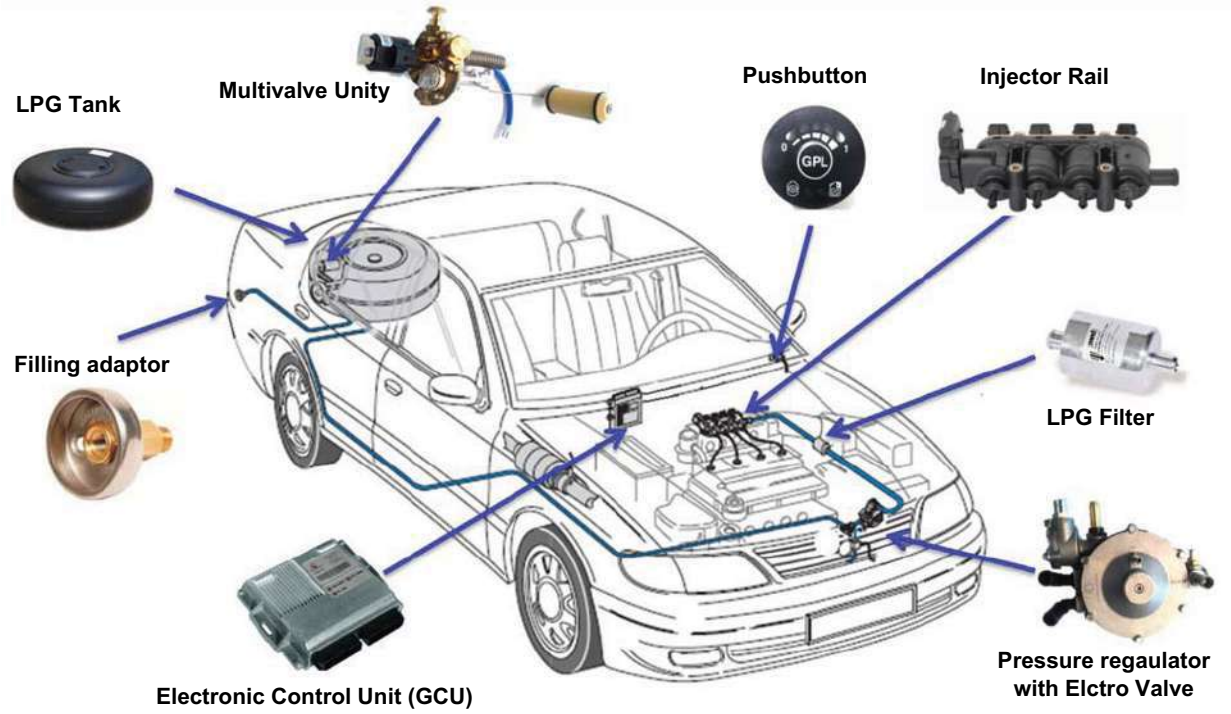
The **system automatically switches** the vehicle **back to petrol** when pressure drops below a safety threshold, depending on the engine load.
This switchback to petrol can occur when the LPG tank is empty; in this case no DTC code is stored in the memory of the diagnostic system.

The **"supply voltage of LPG injectors"** influences the correct operation of the LPG system. The voltage range for a correct operation is between **9 & 16 Volts**.

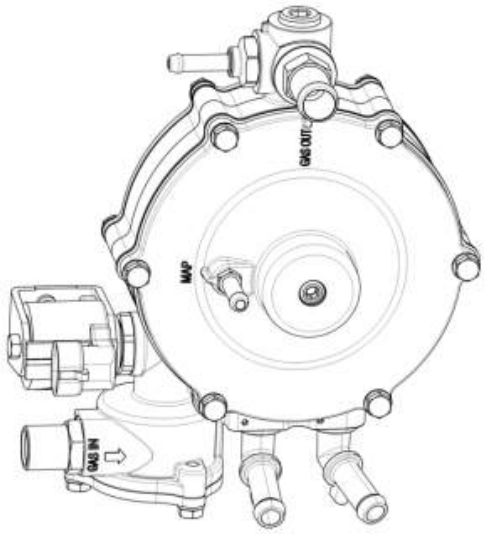
1.3 Road Test

If a road test is required make a comparison between Petrol Mode and LPG mode driving.
Perform the same tests and check for a different driving behaviour of the vehicle.

GAS SYSTEM COMPONENT OVERVIEW



COMPONENT DESCRIPTION



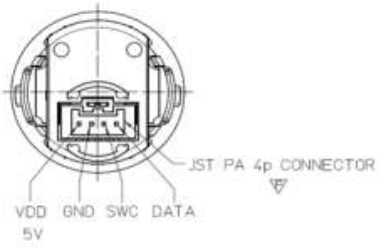
LI 10 PRESSURE REGULATOR

Aluminium body
ON-OFF solenoid safety valve
Filter incorporated in solenoid

Supply pressure:	**2.5 to 30 bar**
Calibration pressure:	**0,95 bar**
Temperature range:	**-20° to 120°C**
Solenoid power supply:	**6 to 16 Volts**
Maximum flow rate:	**30 Kg/h**
Weight:	**1450 g.**
Homologation:	**ECE/ONU R67/01**

COALESCENCE LPG FILTER

Type of gas:	**LPG or Methane**
Pipe diameter IN:	**14 mm**
Pipe diameter OUT:	**14 mm**
Maximum pressure:	**2.2 bar (absolute)**
Filtering grade:	**10 micron**
Weight:	**75 g**
Homologation:	**ECE R110 - ECE R67/01**

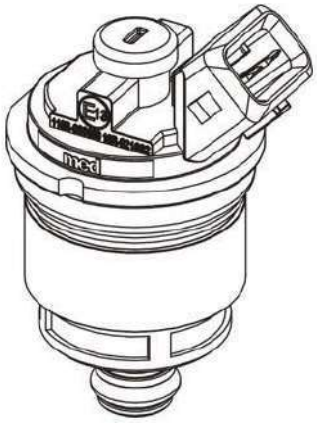


SWITCH

The switch shows the level of LPG and offers the driver a choice of fuels (gas/petrol).
The switch have an internal "buzzer" that work when the system switch back to petrol in case of any fault on LPG system or when the LPG tank is empty.

Pin assignment:

1) **+5V Power supply**
2) **Ground**
3) **Contact**
4) **Serial Data**

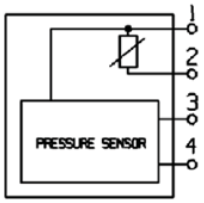


GAS INJECTOR

Current management:	**6/1.5A "Peak and hold"**
Supply voltage:	**6 to 16 Volts**
Temperature range:	**- 40 °C to +120 °C**
Nominal pressure:	**0.8 to 3 bar**
Opening time @12V:	**1.5 ms**
Dimensions:	**Ø 32 x h 73 mm**
Weight:	**120 g**
Homologation:	**ECE R 110 - ECE R 67/01**

LPG PRESSURE AND TEMPERATURE SENSOR

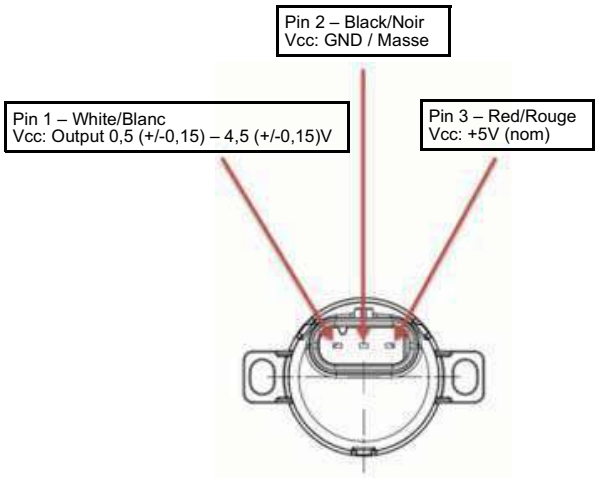
Supply voltage:	**4.5 to 5.5 Volts**
Temperature range:	**- 40 °C to +120 °C**
Nominal pressure:	**50 to 350 kPa**



Connector-Track assignment

Track 1	**Ground**
Track 2	**NTC resistor**
Track 3	**+5 V**
Track 4	**Output signal**

HALL EFFECT TANK LEVEL SENSOR (3 TERMINALS)



Level Sensor / Capteur Niveau X98, H79PH2, X92, X67 (463518000)
Clio IV, Duster 2, Lodgy, Dokker.

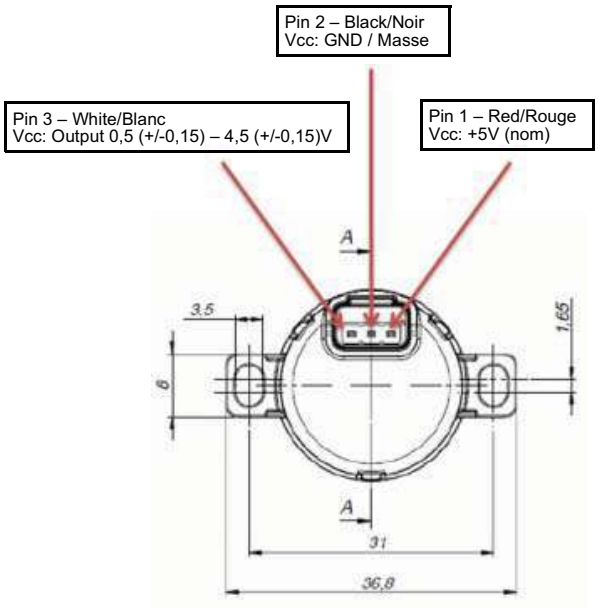
(External tank)

LC03

1) The level sensor must be supplied with 5,00 V nominal

2) Supply Voltage must be in the range 4,5 – 5,5 V. Below 4,5 V the measure isn't accurate; over 5,5 V the sensor could be damaged.

3) The Hall Effect Sensor Output Voltage is Ratiometric over the Power Supply



1) The level sensor must be supplied with 5,00 V nominal

2) Supply Voltage must be in the range 4,5 – 5,5 V. Below 4,5 V the measure isn't accurate; over 5,5 V the sensor could be damaged.

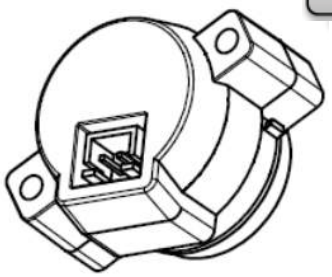
3) The Hall Effect Sensor Output Voltage is Ratiometric over the Power Supply

Level Sensor / Capteur Niveau X52 (616506000)
Sandero II

(Internal tank)

LC03

LC02 **RESISTIVE TANK LEVEL SENSOR (2 TERMINALS)**

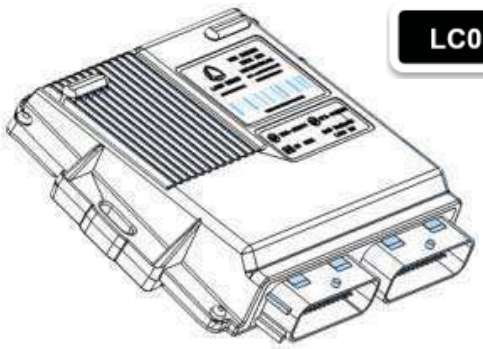


Temperature range:	**- 10 °C to +85 °C**
Nominal resistance:	**from 100 to 21800 ohm**

Connector-Track assignment

Track 1	**Tank Level Voltage**
Track 2	**Ground**

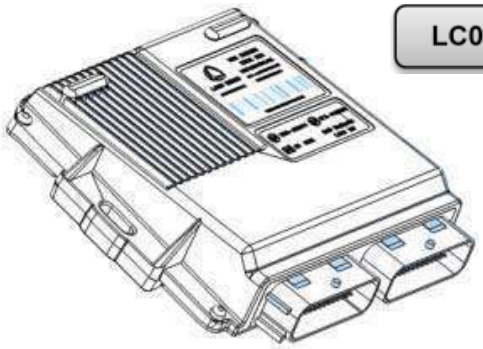
GCU PINOUT



LC03 GAS CONTROL UNIT

Automotive 16 bit 40 Mhz microprocessor Manages up to 6 injectors and 2 additional relay Internal self-diagnosis for sensors and actuators Temperature range – 40° to 105°C CAN communication

LANDIRENZO GCU PIN-OUT 56 WAYS			
PIN	FUNCTION DESCRIPTION	PIN	FUNCTION DESCRIPTION
1	N.C.	29	N.C.
2	Gasoline Pump Shutdown Relay Control when present on the specific vehicle)	30	N.C.
3	N.C.	31	N.C.
4	N.C.	32	N.C.
5	N.C.	33	N.C.
6	N.C.	34	N.C.
7	POWER GROUND	35	N.C.
8	N.C.	36	TNKLV_IN - LEVEL SENSOR IN
9	N.C.	37	+15_PINJ
10	Gasoline Pump Shutdown Relay Coil Feedback (when present on the specific vehicle)	38	N.C.
11	Gasoline Pump Shutdown Relay Status (when present on the specific vehicle)	39	N.C.
12	PC_TX	40	PC_RX
13	N.C.	41	N.C.
14	CAN H	42	CAN L
15	+30_POWER SUPPLY FROM BATTERY	43	+30_POWER SUPPLY FROM BATTERY
16	+15 INJECTOR SUPPLY (Safety Relay)	44	+15 INJECTOR SUPPLY (Safety Relay)
17	GV1_OUT - TANK SHUT OFF VALVE	45	GASP_IN - LPG PRESSURE
18	GV2_OUT - VAPORIZER SHUT OFF VALVE	46	GAST_IN - LPG TEMPERATURE
19	VCC_S +5V LPG PRESSURE SENSOR	47	VCC_S +5V TANK LEVEL SENSOR
20	HMI_GAS_L - SERIAL LINE SWITCH	48	LOGIC GROUND
21	VCC_HMI_GL - 5 VOLT SUPPLY SWITCH	49	F_SW_IN - LPG PUSHBUTTON SWITCH
22	POWER GROUND	50	+15_KEY-ON / +APC
23	INJECTOR 4 EMULATOR INJ SIDE	51	INJECTOR 4 EMULATOR GCU SIDE
24	INJECTOR 3 EMULATOR INJ SIDE	52	INJECTOR 3 EMULATOR GCU SIDE
25	INJECTOR 2 EMULATOR INJ SIDE	53	INJECTOR 2 EMULATOR GCU SIDE
26	INJECTOR 1 EMULATOR INJ SIDE	54	INJECTOR 1 EMULATOR GCU SIDE
27	GAS INJECTOR 1	55	GAS INJECTOR 3
28	GAS INJECTOR 2	56	GAS INJECTOR 4



LC02

LC02 GAS CONTROL UNIT

Automotive 16 bit 40 Mhz microprocessor Manages up to 6 injectors and 2 additional relay Internal self-diagnosis for sensors and actuators Temperature range – 40° to 105 °C CAN communication

LANDIRENZO GCU PIN-OUT 56 WAYS			
PIN	FUNCTION DESCRIPTION	PIN	FUNCTION DESCRIPTION
1	INJECTOR 1 EMULATOR GCU SIDE	29	INJECTOR 1 EMULATOR INJ SIDE
2	INJECTOR 2 EMULATOR GCU SIDE	30	INJECTOR 2 EMULATOR INJ SIDE
3	INJECTOR 3 EMULATOR GCU SIDE	31	INJECTOR 3 EMULATOR INJ SIDE
4	INJECTOR 4 EMULATOR GCU SIDE	32	INJECTOR 4 EMULATOR INJ SIDE
5	+15_KEY-ON / +APC	33	N.C.
6	GAST_IN - LPG TEMPERATURE	34	N.C.
7	N.C.	35	N.C.
8	GASP_IN - LPG PRESSURE	36	N.C.
9	VCC_S +5V LPG PRESSURE SENSOR	37	PRESSURE SENSOR LOGIC GROUND
10	PC_RXD	38	PC_TXD
11	SERIAL SUPPLY	39	SERIAL LOGIC GROUND
12	N.C.	40	N.C.
13	N.C.	41	N.C.
14	CAN H	42	N.C.
15	+30_POWER SUPPLY FROM BATTERY	43	+30_POWER SUPPLY FROM BATTERY
16	N.C.	44	N.C.
17	N.C.	45	N.C.
18	TNKLV_IN - LEVEL SENSOR IN	46	N.C.
19		47	HMI_GAS_L - SERIAL LINE SWITCH
20	CAN L	48	F_SW_IN - LPG PUSHBUTTON SWITCH
21	LEVEL SENSOR LOGIC GROUND	49	VCC_HMI_GL - 5 VOLT SUPPLY SWITCH
22	LOGIC GROUND	50	SWITCH LOGIC GROUND
23	GV2_OUT - TANK SHUT OFF VALVE	51	GROUND TANK SHUT OFF VALVE
24	GV1_OUT - VAPORIZER SHUT OFF VALVE	52	GROUND VAPORIZER SHUT OFF VALVE
25	POWER GROUND	53	POWER GROUND
26	+15 INJECTOR SUPPLY (Safety Relay)	54	+15 INJECTOR SUPPLY (Safety Relay)
27	GAS INJECTOR 1	55	GAS INJECTOR 3
28	GAS INJECTOR 2	56	GAS INJECTOR 4

SUMMARY OF FAULT THAT CAN BE READ WITH THE DIAGNOSTIC TOOL

RENAULT CLIP Faults (managed on LC02 & LC03)				CAN Message Faults	LPG System Failure Description
DF	DTC	Failure Type	Label	Label	Label
1362	2666	11	Tank Solenoid Valve Circuit	ElecDiagLPGTankValve_CC	Short Circuit to Ground
		15		ElecDiagLPGTankValve_OC	Short Circuit to Vbatt or Open Circuit
773	2294	11	Pressure Control Circuit Valve	ElecDiagPressureValve_CC	Short Circuit to Ground
		15		ElecDiagPressureValve_CC	Short Circuit to Vbatt or Open Circuit
1265	018A	12	LPG Pressure Sensor Circuit	ElecDiagGasPressure_CC_plus	Short Circuit to +5V
		13		ElecDiagGasPressure_OC	Open Circuit
1363	2293	21	LPG Pressure	FctDiagGazPressure_TooLow	Too Low Pressure
		22		FctDiagGazPressure_TooHigh	Too High Pressure
		64		FctDiagGazPresLPGTank_coherency	Inconsistence between gas level sensor ang gas pressure values
1361	0185	11	LPG Temperature Sensor Circuit	ElecGazTemperature_CC	Short Circuit to Ground
		15		ElecGazTemperature_OC	Short Circuit to Vbatt or Open Circuit
1267	0184	21	LPG Temperature	FctGazTemperature_TooLow	Too Low Temperature
		22		FctGazTemperature_TooHigh	Too High Temperature
1365	2265	15	LPG Tank Level Sensor Circuit	ElecDiagGasPressure_CC_plus	Short Circuit to +5V or Open Circuit
358	1608	4B	Injection Control Computer	ElecInjetorDrivers_Overtemp	GCU's PCB Over-Temperature
1364	109A	64	GCU Safety Relay	FctSafetyRelay_coherency	Internal Safety Relay Not coherent
1366	10A0	12	Cylinder 1 LPG Injector Circuit	ElecGazInj_1_CC_plus	Short Circuit to VBatt
		14		ElecGazInj_1_OC_or_CC	Short Circuit to Ground or Open Circuit
1367	10A1	12	Cylinder 2 LPG Injector Circuit	ElecGazInj_2_CC_plus	Short Circuit to Vbatt
		14		ElecGazInj_2_OC_or_CC	Short Circuit to Ground or Open Circuit
1368	10A2	12	Cylinder 3 LPG Injector Circuit	ElecGazInj_3_CC_plus	Short Circuit to VBatt
		14		ElecGazInj_3_OC_or_CC	Short Circuit to Ground or Open Circuit
1369	10A3	12	Cylinder 4 LPG Injector Circuit	ElecGazInj_4_CC_plus	Short Circuit to VBatt
		14		ElecGazInj_4_OC_or_CC	Short Circuit to Ground or Open Circuit
046	1610	16	Battery Voltage	ElecBatteryVoltage_U_min	Power Supply to GCU: too low voltage
		17		ElecBatteryVoltage_U_Sup	Power Supply to GCU: too high voltage
531	0618	46	LPG System	ElecE2PROM_DIAG	GCU Last trip data corrupted
-	1316	11	Gasoline Pump Relay	ElecGslPmpRelayDrv_OC_or_CC	Short Circuit to Ground or Open Circuit
		12		ElecGslPmpRelayDrv_CC_plus	Short Circuit to Vbatt

RENAULT CLIP Faults (<u>not</u> managed on LC02 & LC03), see method into CLIP				CAN Message Faults	LPG System Failure Description
DF	DTC	Failure Type	Label	Label	Label
633	1170	09	LPG Fuel Trim Function	Vxx_fmc_fsys_lpg_cpt	See description into CLIP tool

DTC2666 PRESENT OR STORED	TANK SOLENOID VALVE CIRCUIT 15: Open circuit 15: Short circuit to +12 V 11: Short circuit to ground.

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects a short circuit to +12V, a short circuit to ground, a wiring interruption or solenoid coil resistance out of range, in the circuit controlling the tank electrovalve solenoid.

DTC2666 TANK SOLENOID VALVE CIRCUIT

FAILURE TYPE 15 and 11	*NOTES*	**Priority of treatment if more than one fault is present:** If the fault **DTC2294** is present at the same time, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on GCU Track 16 and 44.

Check if the tank electrovalve plug has been properly connected. Repair if necessary.

Check the tank electrovalve connections. Repair if necessary.

Check the computer connections. Repair if necessary

Remove the GCU 56 way connector.

Ensure the continuity of the connection between:

LC03	**GCU connector Track 17 → Track 2 of the EV plug**
LC03	**Track 1 of the EV plug → Ground**

LC02	**GCU connector Track 23 → Track 1 of the EV plug**
LC02	**Track 2 of the EV plug → Ground**

Measure the resistance of the coil of the tank Electrovalve

Replace the coil if the resistance is not in the range 11,0 and 13,5 ohm at ambient temperature (20°C).

If the fault persist after these check, replace the coil.

DTC2294 PRESENT OR STORED	PRESSURE CONTROL CIRCUIT VALVE 15: Open circuit 15: Short circuit to +12 V 11: Short circuit to ground.

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele.1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects a short circuit to +12V, a short circuit to ground, a wiring interruption or solenoid coil resistance out of range, in the circuit controlling the tank electrovalve solenoid.

DTC2294 PRESSURE CONTROL CIRCUIT VALVE

FAILURE TYPE *15 and 11*	*NOTES*	**Priority of treatment if more than one fault is present:** If the fault **DTC2666** is present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on GCU Track 16 and 44.

Check if the pressure regulator electrovalve plug has been properly connected. Repair if necessary.

Check the pressure regulator electrovalve connections. Repair if necessary.

Check the computer connections. Repair if necessary

Remove the GCU 56 way connector.

LC03	**GCU connector Track 18 → Track 1 of the EV plug**
LC03	**Track 2 of the EV plug → Ground**

LC02	**GCU connector Track 23 → Track 1 of the EV plug**
LC02	**Track 2 of the EV plug → Ground**

If required, replace the faulty harness.

Measure the resistance of the coil of the electrovalve.

Replace the coil if the resistance is not in the range **11,0 and 13,5 ohm at ambient temperature (20 °C)**.

If the fault persist after these check, replace the coil.

DTC018A PRESENT OR STORED	LPG PRESSURE SENSOR CIRCUIT 12: Short-circuit to +5V 13: Open Circuit

NOTES	
	Conditions for applying the diagnostic to stored faults: If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the pressure sensor (risk of destroying it).

This electrical fault could occur when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or LPG Pressure Sensor in open circuit or short circuit) in the circuit acquiring the LPG Pressure Signal.

DTC018A LPG PRESSURE SENSOR CIRCUIT

FAILURE TYPE 12 and 13	*NOTES*	**Priority of treatment if more than one fault is present:** If the fault **DTC018A** is present at the same time, perform the current check first.

Check the LPG pressure connections. Repair if necessary

Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.

LC03	**GCU connector Track 19 → Track 3 of the sensor plug**
LC03	**GCU connector Track 45 → Track 4 of the sensor plug**
LC03	**Track 1 of the sensor plug → Ground**

LC02	**GCU connector Track 9 → Track 3 of the sensor plug**
LC02	**GCU connector Track 8 → Track 4 of the sensor plug**
LC02	**Track 1 of the sensor plug → Ground**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Ensure the insulation against Ground of the connection between:

LC03	**GCU connector Track 19 → Track 3 of the sensor plug**
LC02	**GCU connector Track 9 → Track 3 of the sensor plug**

Repair if necessary. If required, replace the faulty harness.

Reconnect the GCU 56 way connector and check for the presence of a 5V +/-10% supply voltage on Track 3 of the sensor when in Key-On and push button LEDs are turned on.

If the fault persist after these check, carry out a road test followed by a test using the diagnostic tool and proceed to fault finding of “Unexpected switch back to petrol” Chart 1.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC2293 PRESENT OR STORED	LPG PRESSURE 21: Low LPG pressure 22: High LPG pressure 64: Incoherence

NOTES	
	Conditions for applying the diagnostic to stored faults: If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the pressure sensor (risk of destroying it).

This functional fault could occur when the GCU Diagnostic System detects pressure parameters out of range (LPG pressure too low or too high to guarantee a regular operation of the engine, or pressure delay due to a leakage in the rubber hoses) in the circuit controlling the LPG pressure supply to the LPG rail. The 64 recurrence could be symptomatic of a clogged hose or a leakage in a rubber hose connection or damaged hose.

DTC2293 LPG PRESSURE

FAILURE TYPE 21 and 22	*NOTES*	**Priority of treatment if more than one fault is present:** Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time. Deal with the electrical fault **DTC018A** if is present at the same time.

Ensure that there are no leaks on the inlet manifold.

Repair if necessary.

If no fault is found, then there must be a problem with the LPG fuel system and proceed to fault finding of "Unexpected switch back to petrol" Chart 1 checking:

- Fuel check
- Fuel pressure sensor check
- Multivalve electrovalve check
- Fuel supply hoses check
- Fuel pressure regulator check

Replace the defective component.

For both

AFTER REPAIR	Deal with any other possible faults. Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagno-sis tool.

DTC2293 LPG PRESSURE

FAILURE TYPE *64*	*NOTES*	**Priority of treatment if more than one fault is present:** Deal with the electrical fault **DTC018A** if is present at the same time.

Ensure that there are no leaks on the inlet manifold.
Repair if necessary.

If no fault is found, then there must be a problem with the LPG fuel system and proceed to fault finding of:

Fault finding Assisted by PlusMaxRE
Chart LPG 2

FUEL SUPPLY CONFORMITY CHECK: LEAKAGE TEST
[DTC 2293-64]

FUEL SUPPLY CONFORMITY CHECK: TOO LOW PRESSURE
[DTC 2293-64]

"IMPOSSIBLE SWITCHING IN LPG MODE" Chart 3 and/or "IMPOSSIBLE TO SWITCH IN LPG MODE AND LPG SWITCH IS BUZZING" Chart 8.

For both

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC0185 PRESENT OR STORED	LPG TEMPERATURE SENSOR CIRCUIT 11: Open circuit 15: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or LPG Temperature Sensor in open circuit or short circuit) in the circuit acquiring the LPG Temperature Signal.

DTC0185 LPG TEMPERATURE SENSOR CIRCUIT

FAILURE TYPE *11 and 15*	*NOTES*	**Priority of treatment if more than one fault is present:** If the fault **DTC0184** is present at the same time, perform the current check first.

Check the LPG pressure connections. Repair if necessary

Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.

LC03	**GCU connector Track 46 → Track 2 of the sensor plug**
LC03	**Track 1 of the sensor plug → Ground**

LC02	**GCU connector Track 6 → Track 2 of the sensor plug**
LC02	**Track 1 of the sensor plug → Ground**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Ensure the insulation against +12V of the connection between:

LC03	**GCU connector Track 46 → Track 3 of the sensor plug**
LC02	**GCU connector Track 6 → Track 3 of the sensor plug**

Repair if necessary. If required, replace the faulty harness.

If the fault persist after these check, carry out a road test AND proceed to fault finding of “Unexpected switch back to petrol” Chart 1.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC0184 PRESENT OR STORED	LPG TEMPERATURE 21: Low LPG temperature 22: High LPG temperature

NOTES	
	Conditions for applying the diagnostic to stored faults: If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the pressure sensor (risk of destroying it).

This functional fault could occur when the GCU Diagnostic System detects temperature parameters out of range (LPG temperature too low or too high to guarantee a regular combustion and operation of the engine) in the circuit controlling the LPG pressure supply to the LPG rail.

DTC0184 LPG TEMPERATURE

FAILURE TYPE 21 and 22	*NOTES*	**Priority of treatment if more than one fault is present:** Deal with the electrical fault **DTC0185** if is present at the same time.

Proceed to fault finding of “wrong gas temperature” fault finding Chart 2

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC2265 PRESENT OR STORED	**LPG TANK LEVEL SENSOR CIRCUIT** 15: Open circuit or short-circuit to +5V

NOTES	
	Conditions for applying the diagnostic to stored faults: If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the tank level sensor (risk of destroying it).

This electrical fault could occur when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or LPG Level Sensor in open circuit or short circuit) in the circuit acquiring the LPG Tank Level Signal.

DTC2265 GAS TANK GAUGE VOLTAGE SIGNAL

FAILURE TYPE 15	*NOTES*	**Priority of treatment if more than one fault is present:** If faults **DTC2666** and **DTC2294** are present at the same time, perform a rear wiring harness check first.

Check the LPG Tank Level Signal. Repair if necessary

Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.

LC03	**GCU connector Track 47 → Track 1 of the sensor plug**
LC03	**GCU connector Track 36 → Track 3 of the sensor plug**
LC03	**Track 2 of the sensor plug → Ground**

LC02	**GCU connector Track 18 → Track (1) of the sensor plug**
LC02	**GCU connector Track 21 → Track (2) of the sensor plug**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

On LC03 Systems only, ensure the continuity of the connection between:

LC03	**Track 2 of the sensor plug → Ground**

Ensure the insulation against +12V of the connection between:

LC03	**GCU connector Track 47 → Track 2 of the sensor plug**
LC02	**GCU connector Track 21 → Track (2) of the sensor plug**

GCU connector Track 47 → Track 1 of the EV plug

Repair if necessary. If required, replace the faulty harness.

If the harness is conform replace just the level sensor, not the complete MultiValve.

Reconnect the GCU 56 way connector and check for the presence of a 5 +/-10% volt supply on Track 1 of the sensor when in Key-On and push button LEDs are turned on.

If there is no supply, replace the injection computer (reprogram and configure the computer: see introduction).

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC1608 PRESENT OR STORED	INJECTION CONTROL COMPUTER **4B**: GCU's Over temperature

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 8 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects as an over temperature of LPG Injector drivers due to a short circuit to +12V in the wiring harness, an intermittent wiring interruption or solenoid coil resistance out of range.

DTC1608 INJECTION CONTROL COMPUTER

FAILURE TYPE 4B	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

Check if the LPG Injectors plugs has been properly connected. Repair if necessary.

Check the connection and condition of the injector connector. Change the connector if necessary.

Check the ground connection to the chassis. Repair if necessary.

With the engine running in LPG mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned)**.

Connect the bornier in place of the computer and check the resistance value of the injector by measuring between **tracks 1 and 2 of the LPG injector**:

Track 16 and 27 for an injector 1;
Track 16 and 28 for an injector 2;
Track 44 and 55 for an injector 3;
Track 44 and 56 for an injector 4;

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC10A0 PRESENT OR STORED	CYLINDER 1 LPG INJECTOR CIRCUIT **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A0 CYLINDER 1 LPG INJECTOR CIRCUIT

FAILURE TYPE *12 and 14*	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection:**

LC03	**+15 INJECTOR SUPPLY GCU track 16**	→	**LPG Injector 1 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 26**	→	**LPG Injector 1 Track 1**

Repair if necessary.

If there is no supply voltage, check the insulation, continuity and absence of interference resistance of the connection:

LC03 LC02	**GAS INJECTOR 1 GCU track 27**	→	**LPG Injector 1 Track 2**

Repair if necessary.

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 1**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC10A1 PRESENT OR STORED	CYLINDER 2 LPG INJECTOR CIRCUIT **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A1 CYLINDER 2 LPG INJECTOR CIRCUIT

FAILURE TYPE *12 and 14*	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignement on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 16**	→	**LPG Injector 2 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 26**	→	**LPG Injector 2 Track 1**

Repair if necessary.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03 LC02	**GAS INJECTOR 1 GCU track 28**	→	**LPG Injector 2 Track 2**

Repair if necessary.

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 2**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC10A2 PRESENT OR STORED	CYLINDER 3 LPG INJECTOR CIRCUIT **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A2 CYLINDER 3 LPG INJECTOR CIRCUIT

FAILURE TYPE *12 and 14*	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignement on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 44**	→	**LPG Injector 3 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 54**	→	**LPG Injector 3 Track 1**

Repair if necessary.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03 LC02	**GAS INJECTOR 1 GCU track 55**	→	**LPG Injector 3 Track 2**

Repair if necessary.

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 3**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC10A3 PRESENT OR STORED	CYLINDER 4 LPG INJECTOR CIRCUIT **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A3 CYLINDER 4 LPG INJECTOR CIRCUIT

FAILURE TYPE *12 and 14*	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 44**	→	**LPG Injector 4 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 54**	→	**LPG Injector 4 Track 1**

Repair if necessary.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03 LC02	**GAS INJECTOR 1 GCU track 56**	→	**LPG Injector 4 Track 2**

Repair if necessary.

Check the resistance value of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 4**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC1570 PRESENT OR STORED	LPG SWITCH STATUS 13: Open circuit

NOTES	
	Conditions for applying the diagnostic to stored faults: The fault reappears in the memory after the engine has been running for 5 minutes in LPG mode.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects an open circuit of the contact of the pushbutton.

DTC1570 LPG SWITCH STATUS

FAILURE TYPE 13	*NOTES*	None

Check the pushbutton electrical connections. Repair if necessary.
Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.
Ensure the continuity of the connection between:

LC03	**GCU connector Track 49 → Track 3 of the pushbutton**
LC03	**Track 2 of the pushbutton plug → Ground**

LC02	**GCU connector Track 48 → Track 3 of the pushbutton**
LC02	**Track 2 of the pushbutton plug → Ground**

Repair if necessary. If required, replace the faulty harness.

If the fault persist after these checks, change the **Pushbutton**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC1610 PRESENT OR STORED	BATTERY VOLTAGE **16**: Too Low voltage **17**: Too High voltage

NOTES	**Conditions for applying the fault finding procedure to the fault stored** The fault is declared present during Power On, after the engine has been running in LPG Mode.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects a power supply voltage below 9V or over 16V for at least 3 seconds.

DTC1610 BATTERY VOLTAGE

FAILURE TYPE 16 and 17	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is in a good state of charge and, if necessary, check the charging circuit.

Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:

LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC03	**POWER GROUND GCU track 22**	→	**CHASSIS GROUND**
LC03	**POWER GROUND GCU track 7**	→	**CHASSIS GROUND**
LC03	**LOGIC GROUND GCU track 48**	→	**CHASSIS GROUND**

Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connections:

LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC02	**POWER GROUND GCU track 25**	→	**CHASSIS GROUND**
LC02	**POWER GROUND GCU track 53**	→	**CHASSIS GROUND**
LC02	**LOGIC GROUND GCU track 22**	→	**CHASSIS GROUND**

Repair if necessary.

If the fault persists after these checks, **reflash the GCU with the last released SW and Calibration**.

If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC109A PRESENT OR STORED	GCU SAFETY RELAY **64**: GCU Safety relay incoherence

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 3 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This functional fault could occur when the GCU Diagnostic System detects a failure in internal Solid State Safety Relay voltage feedback from safety relay detects an closed status when it should be open or viceversa.

DTC109A GCU SAFETY RELAY

FAILURE TYPE 64	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC2666, DTC2294,** are present, check for a wiring harness short circuit to battery on: GCU Track 16 and 17 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

With the engine running in gasoline mode and the LPG Pushbutton not selected, **check for the absence of +12 volts on the correct Track (17 or 18 for LC03 GCU and 23 or 24 for LC02 GCU) of the TANK and VAPORIZER SHUT OFF VALVE output**.

If there +12V is present when the GCU is running in gasoline mode:

1) Remove the GCU 56 way connector.
2) and **check the insulation of the connection between**:

LC03	**+ GCU connector Track 17**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**
LC03	**+ GCU connector Track 18**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**
LC02	**GCU connector Track 23**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**
LC02	**GCU connector Track 24**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**

Make sure that the cable connecting the GCU and the TANK SHUT OFF VALVE or GCU and VAPORIZER SHUT OFF VALVE are in good condition.

Repair if necessary.

If the fault persists after these checks, **contact Techline**

DTC0618 PRESENT OR STORED	LPG SYSTEM **46**: GCU's Last trip data corrupted

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 8 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This functional fault could occur when the GCU Diagnostic System detects a failure in recording last trip data information; typically this occurs when the battery clamp or LPG GCU Power Supply Ground is disconnected during a "Power-latch" of the GCU.

DTC0618 LPG SYSTEM

FAILURE TYPE 46	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connections:

LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC03	**POWER GROUND GCU track 22**	→	**CHASSIS GROUND**
LC03	**POWER GROUND GCU track 7**	→	**CHASSIS GROUND**
LC03	**LOGIC GROUND GCU track 48**	→	**CHASSIS GROUND**

Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connections:

LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC02	**POWER GROUND GCU track 25**	→	**CHASSIS GROUND**
LC02	**POWER GROUND GCU track 53**	→	**CHASSIS GROUND**
LC02	**LOGIC GROUND GCU track 22**	→	**CHASSIS GROUND**

Repair if necessary.

If the fault persists after these checks, **reflash the GCU with the last released SW and Calibration**.

If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC1316 PRESENT OR STORED	GASOLINE PUMP RELAY **00**: Open circuit **11**: Short circuit to ground **12**: Short circuit to +12 volts.

NOTES	
	Priority for dealing with a number of faults: First, deal with the DF46 battery voltage fault if it is present or stored.
	Conditions for applying the fault finding procedure to the fault stored: The fault is declared present 3 seconds after the switching in LPG mode.
	Special note: This fault could be present or stored on LC03 System only. LC03

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the gasoline pump relay.

DF1316 GASOLINE PUMP RELAY

FAILURE TYPE 11 and 12	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DF1366, DF1367, DF1368, DF1369,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Check the **condition of the clips** on the injection relay (on the engine fuse/relay plate).

Replace the clips if necessary.

With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the Track CDE+ of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned).**

If there is no power supply **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 16**	→	**FUEL PUMP CUT-OFF RELAY Track CDE+**

Repair if necessary.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Connect the bornier in place of the computer and **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**Gasoline Pump Shutdown Relay Control GCU track 02**	→	**FUEL PUMP CUT-OFF RELAY Track CDE-**
LC03	**Gasoline Pump Shutdown Relay Status GCU track 11**	→	**FUEL PUMP CUT-OFF RELAY Track CDE-**

Repair if necessary.

Check the resistance value of the relay by measuring between tracks CDE+ and CDE- of the relay.
Replace the relay if the resistance is not approximately: 65 ohms Ω ± 5 Ω at 25 ºC.

If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

1. REMINDERS

Landi Renzo diagnostic tool Plus Max Renault Version (in the following PluxMaxRe) is a diagnostic tool developed to run second level diagnostic on LPG system.

Always use the official diagnostic tool (Renault Clip) supplied by the manufacturer of the vehicle as primary diagnostic and repairing tool.

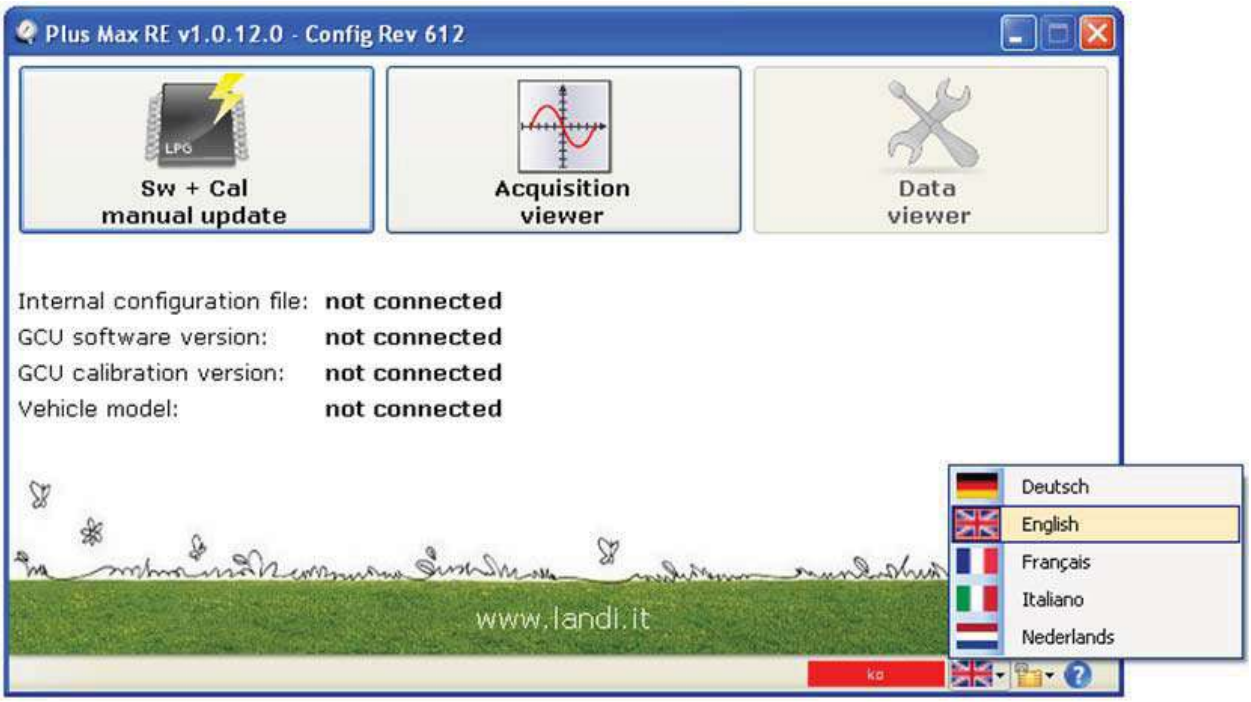
LR PlusMaxRE tools could be used in order to perform a second level diagnostic after the authorization of Renault's After Sales supervisors only.

2. PLUS MAX RE FUNCTIONS

See all the information relating the LPG System
OPERATIONS FOR REPLACING OR REPROGRAMMING THE GCU
Physical measurements
GCU test
Multimeter

PluxMaxRE can be installed on ANY PC running windows XP/VISTA/Windows 7 (32 bit only)

PlusMaxRE supports English French and Italian language.



How to select language

3. EXTRAS

3.1 Info

If the primary installation, follow the instructions, which is attached. If you already have an earlier version, it is recommended to uninstall and then follow the installation instructions.
It only works with original USB adapter.

3.2 Info

LR has created several versions of Diagnostic tools system named PlusMax. Just the version named Plus Max Renault Version (PluxMaxRe) must be connected to the LPG computer via Diag connector. It operates as a diagnostic interface, checking out a series of parameters as well as figuring out problems that you may then solve.

Previous version of PlusMax or other tools, as reflashing tools, or other unauthorized Tools could cause permanent damage to GCU calibration.

3.3 Info

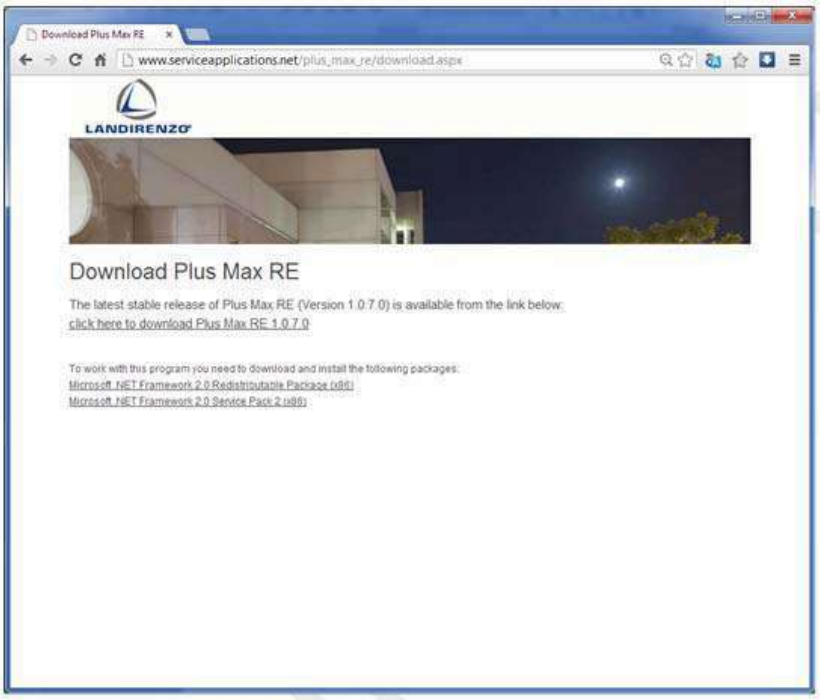
Always keep to the instructions supplied by the vehicle manufacturer. The equipment should be used by trained personnel only.

4. PLUS MAX RE INSTALLATION GUIDE

Before installing please uninstall previous version of PlusMaxRE if you have;

Download the latest Plus Max RE diagnostic tool from Landi Renzo Aftersales Center

http://www.serviceapplications.net/plus_max_re/download.aspx



Double click the downloaded installation file (setup_1.0.x.x.exe)
Follow instructions step by step

SW Installation completed

Desktop Icon

IMPORTANT:
The Diagnostic Functions of the PlusMaxRE tools are not enabled (blocked by code); just the check and SW updating function is allowed

5. OPERATIONS FOR REPLACING OR REPROGRAMMING THE GCU

5.1 Procedure to be applied before replacement

This procedure must be applied before replacing or reprogramming the Gas Control Unit (LPG Computer)

IMPORTANT:
– Connect a battery charger and switch on the vehicle + after ignition supply voltage.
– Switch off all the electrical consumers (lights, interior lighting, air conditioning, radio, etc.).

– Connect the diagnostic tool power supply (mains or cigarette lighter supply).
– Connect the LR USB interface to the diagnostic tool:

Part Number
7711392500

Description
KIT INTERFACCIA USB PER CENTRALINE USB TYPE (LR USB interface)

– Connect the LR USB interface connecting cable to the diagnosis plug on the LPG ECU.
– Switch on vehicle + after ignition (+APC) power supply and wait until the coolant temperature is **less than 60 ºC** and the air temperature **is less than 50 ºC** and LPG injector driver temperature is **less than 40 ºC**. Consult parameter GP103 Coolant temperature and GP104 Air temperature and GP030 LPG injector driver temperature.

IMPORTANT:
It is necessary to respect these temperature values in order to carry out the computer programming or reprogramming operations.

– Apply the programming or reprogramming operations described in **Technical Note Appendix A GCU Computer (re)programming procedure**.

IMPORTANT:
After (re)programming the computer, switch off the + after ignition (+APC) power supply and wait for the loss of communication message to appear on the PlusMaxRE diagnostic tool. If the message does not appear, wait for 60 seconds.
Failure to follow this procedure may cause the computer data to be corrupted.

5.2 Procedure to be applied after repair

This procedure must be applied after replacing or reprogramming the computer.

5.3 Injection computer initialisation

– Rigorously Clear any fault code using Clip connected to Gasoline ECU. (During the reprogramming of a generic vehicle computer this cannot send messages on the CAN Network; this could generate some DTCs in the ECU).
– Crank and stop the engine to initialize the computer and wait for the loss of communication message to appear on the diagnostic tool, if the message does not appear, wait for 60 seconds.
– The computer is automatically configured according to the GCU and options present on the LPG System.
– Verify the correct configuration of the LPG System.

5.4 Procedure to be applied during the reprogramming

This procedure must be applied during the reprogramming the Gas Control Unit (LPG Computer)
The operation replaces the Software and the Calibration inside the GCU with the latest version with the help of PlusMaxRE.
Reprogramming procedure concerns GCU already assembled in the vehicle and already operational, and GCU delivered already programmed by Spare Part Centers (Magasin Pièces de Rechanges).
The reprogramming operation avoids the systematic replacement of GCUs.

5.5 When reprogramming

The operation is done in the following sistuations:
When a well-defined Opération “Technique Spécifique” (OTS) or Note Technique Incidentielle (NTi) is put in effect in order to solve issues find in After Sales and/or an improvement of performances.
Following a RENAULT’s Techline request
Following RENAULT’s Technical Directive (Directives Techniques RENAULT)
Following a Landi Renzo’s Released Software Evolution
Following an ACTIS Solution

5.6 Operating Mode

The operating mode for both GCU Re-Calibration or GCU Reprogramming is strictly the same.
This operation must be done with PlusMaxRE diagnostic tools updated at the last version.

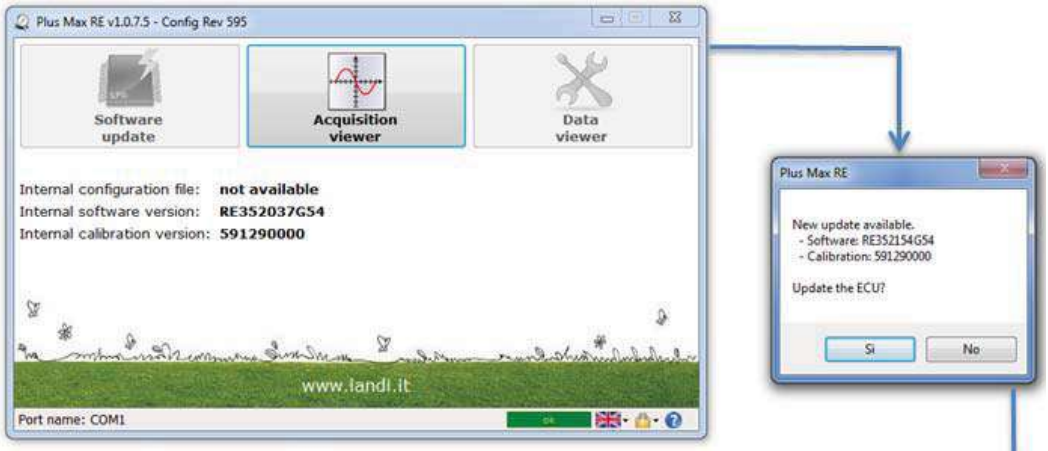
IMPORTANT:
Before any GCU Re-Calibration or GCU Reprogramming always update the tool downloading the latest Plus Max RE diagnostic tool from Landi Renzo Aftersales Center

IMPORTANT:
In order to avoid any malfunctioning, outage and blockaged of the GCU, the procedures MUST be rigorously observed:
Procedure to be applied before replacement
Procedure to be applied after repair

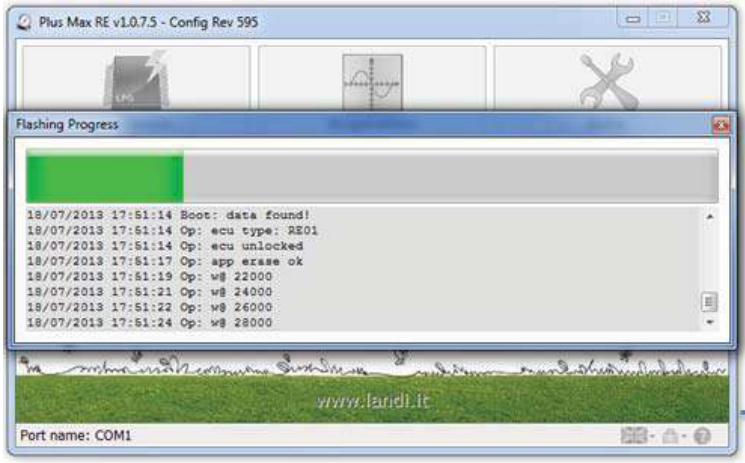
WARNING:
DO NOT WORK ON THE VEHICLE OR ON THE DIAGNOSTIC TOOL

6. AUTOMATIC GCU RE-CALIBRATION OR GCU REPROGRAMMING

The operation replaces the Software and the Calibration inside the GCU with the latest version released for the specific vehicle.



If new update available message appears, update the GCU clicking on Si / Yes



Waiting for download completion (100%)

At the end of the download it will appear the main page with new SW version.
After (re)programming the computer, switch off the + after ignition (+APC) power supply and wait for the loss of communication message to appear on the PlusMaxRE diagnostic tool, if the message does not appear, wait for 60 seconds.

7. MANUAL EMERGENCY PROCEDURE FOR GCU RE-CALIBRATION OR GCU REPROGRAMMING

This Manual Emergency Procedure must be applied when:

The operation of GCU Re-Calibration or GCU Reprogramming is interrupted by an Error Message (Example ER-ROR 110, ERROR 103, etc)
When the PlusMaxRE tool cannot automatically detects the vehicle, the original GCU Hardware Version, SW Version and Calibration version.

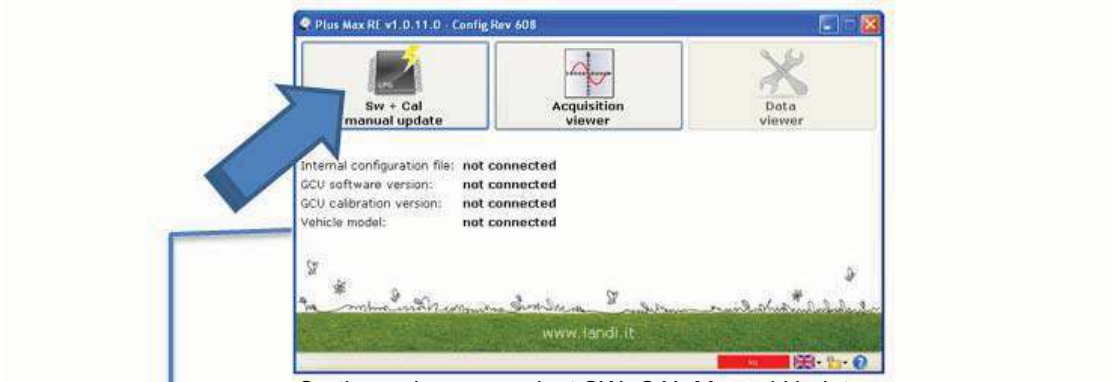
The operation replaces the Software and the Calibration inside the GCU with the latest version released for the specific vehicle.

The Manual Emergency Procedure consists in the Manual Selection of the vehicle for GCU Re-Calibration or GCU Reprogramming.
The procedure must be authorized by Renault Techline and registered on FIC to report following parameters:

The VIN of the vehicle.
The fabrication number of the vehicle.
The code of error message specified in PlusMaxRE or error description
The SW and CAL number present on the label of the GCU

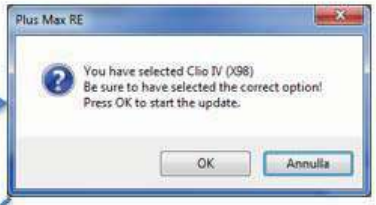
IMPORTANT:
The speed and relevance of the solution provided by Techline will depend on the accuracy with which this information is entered into the customer fault log.

After Techline analysis of the fault, you are authorized to apply the Manual Emergency Procedure for GCU Re-Calibration or GCU Reprogramming; depending on type of fault, this procedure can only be unlocked by a 6 character code (eg:F4A0B9).
This code is also necessary to perform all the diagnosis show in next chapter (in other word to open “parameter visualization” page)

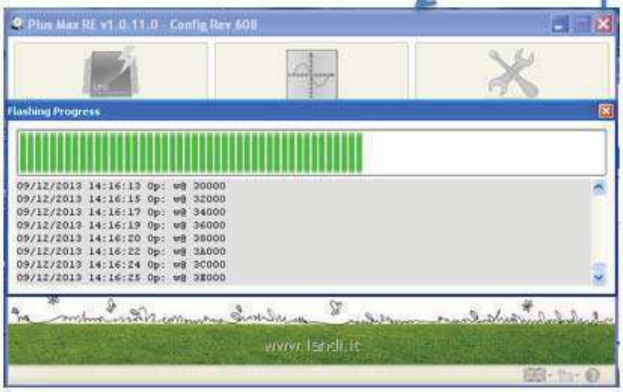


On the main page, select SW+CAL Manual Update

Select the vehicle



Check the correct vehicle is selected and start GCU Re-Calibration or d



Waiting for download completion (100%)

At the end of the download it will appear the main page with new SW version.
After (re)programming the computer, switch off the + after ignition (+APC) power supply and wait for the loss of communication message to appear on the PlusMaxRE diagnostic tool, if the message does not appear, wait for 60 seconds.

8. GENERAL INFO TO FAULT FINDING USING PLUS MAX RE

Always use the official diagnostic tool (Renault Clip) supplied by the manufacturer of the vehicle as primary diagnostic and repairing tool.
Always **clear any fault code using Clip** connected to Gasoline ECU and not using the Reset Pushbutton on the Diagnosis Page of PlusMaxRE.

9. DESCRIPTION FAULT PAGES IN PLUS MAX RE

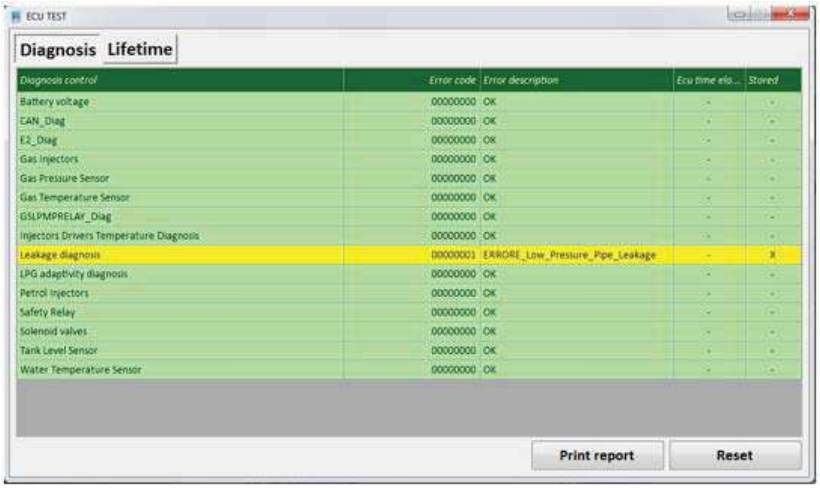
As in Clip, faults are displayed as present or stored (they appeared in a certain context and remain present since they are fix, or they are still present but cannot be diagnosed in the current context).

The **present** or **stored** status of faults should be taken into consideration when the diagnostic tool is used after the + ignition power supply is switched on (without acting on the system components).

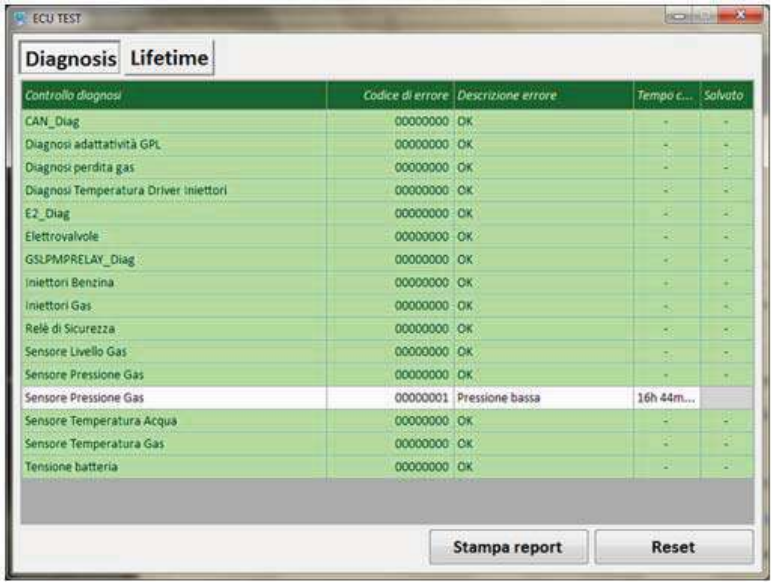
If the fault is **confirmed** when the instructions are applied, the fault is present. Deal with the fault.

If the fault is **not confirmed**, check:
– the electrical lines which correspond to the fault,
– the connectors for these lines (for oxidation, bent pins, etc.),
– the resistance of the component detected as faulty,
– the condition of the wires (melted or split insulation, wear).

Using PlusMaxRE to access the diagnostic page, click the "Fault List Page" link on top right of the main page. Present **faults** are **highlighted in yellow**; stored faults are **highlighted in white. Stored faults cannot be erased**. On stored faults the **"ECU time elapsed"** column indicates the GCU time elapsed from the moment when the fault appeared the last time. So a fault with an ECU time elapsed = 0h 01m appears just 1 minute before, while a fault with ECU time elapsed = 16 h 44 m appear 16 hours and 44 minutes before.



Example of present fault Highlighted in yellow



Example of stored fault Highlighted in white

10. COMPONENTS CONFORMITY CHECKS ASSISTED BY PLUSMAXRE

The aim of the conformity check is to check main LPG components in order to avoid wrong diagnostic and incorrect replacement of components.
This section gives the fault finding procedures supported by LR PlusMaxRE diagnostic Tool for behavior and parameters and the conditions for checking them.
If a behavior is not acting normally or a parameter is outside the permitted tolerance values, consult the corresponding fault finding page.

11. CUSTOMER COMPLIANT – CONFORMITY CHECK

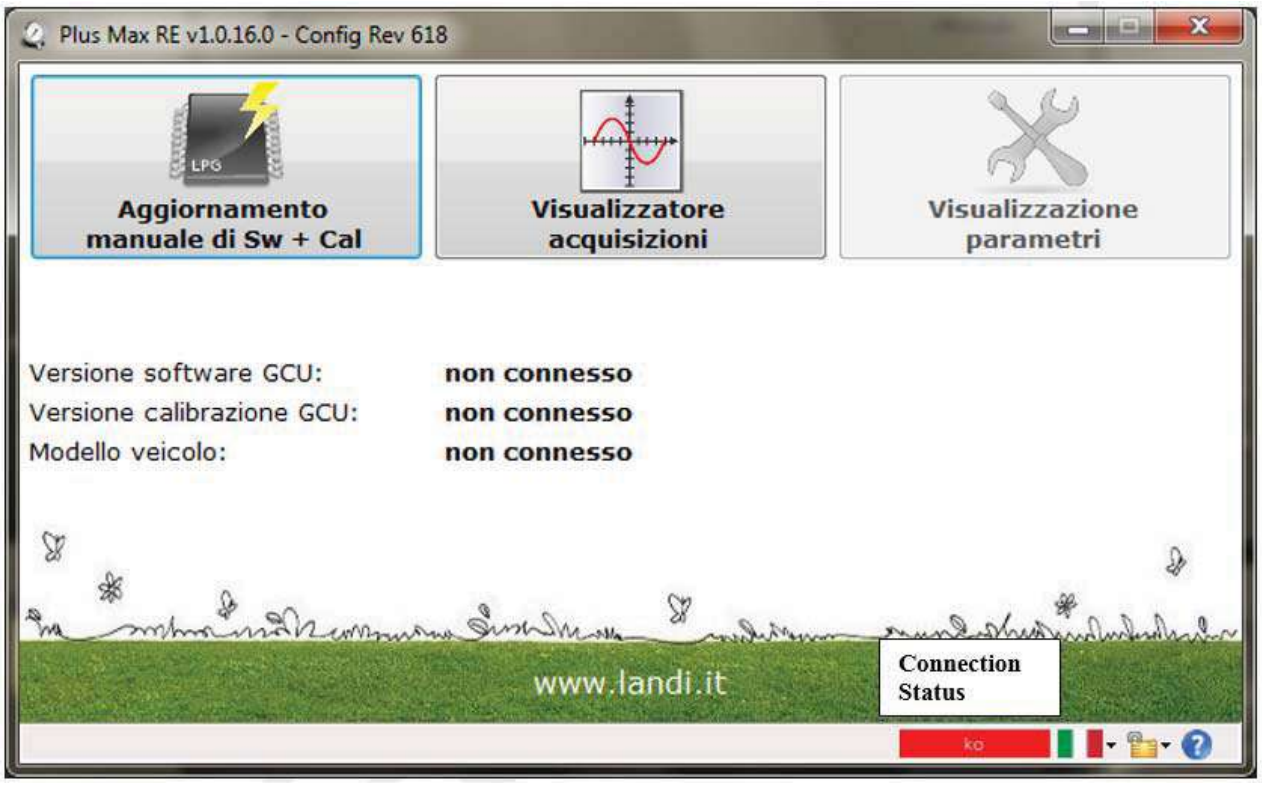
NOTES	Only check the Interpretation of Fault with PluxMaxRE tool after performing a complete check with the RENAULT's CLIP diagnostic tool. To open PlusMaxRE parameter page the unlock code is necessary.
	NOTE For any operation on a component of the LPG supply circuit, consult the safety instructions (see 17C).

NO DIALOGUE BETWEEN GCU AND TOOL	LPG 1
FUEL SUPPLY CONFORMITY CHECK	
LEAKAGE TEST	LPG 2
LOW PRESSURE	LPG 3
PRESSURE AND TEMPERATURE SENSOR CHECK	LPG 4
PRESSURE REGULATOR CHECK	LPG 5
INJECTORS CHECK	
MISFIRES	LPG 6
FUEL ADAPTATION	LPG 7
LPG LEVEL SENSOR CHECK	LPG 8

LPG 1	NO DIALOGUE BETWEEN GCU AND TOOL

NOTES	Use USB interface to connect your laptop to the diagnosis plug present in the GCU harness

This fault happens when the Tool isn't able to connect the diagnostic



The Area "Connection Status" must be green and parameters shown in the central part of the page.

If this area is red and parameters show "not connected message" there are no connection between PC and GCU, when key is ON.

Check:
GCU Power Supply: check if the GCU is properly supplied (check if the LPG push button is ON)
USB connection: maybe the interface isn't recognized by the PC USB port; restart the PC if necessary.
Cable connection: maybe the USB interface cable is damaged or unplugged; check cable connection.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

With the engine running in gasoline mode and the LPG Pushbutton selected, **check for the presence of +12 volts on the correct Track (17 or 18 for LC03 GCU and 23 or 24 for LC02 GCU) of the TANK and VAPORIZER SHUT OFF VALVE output**.

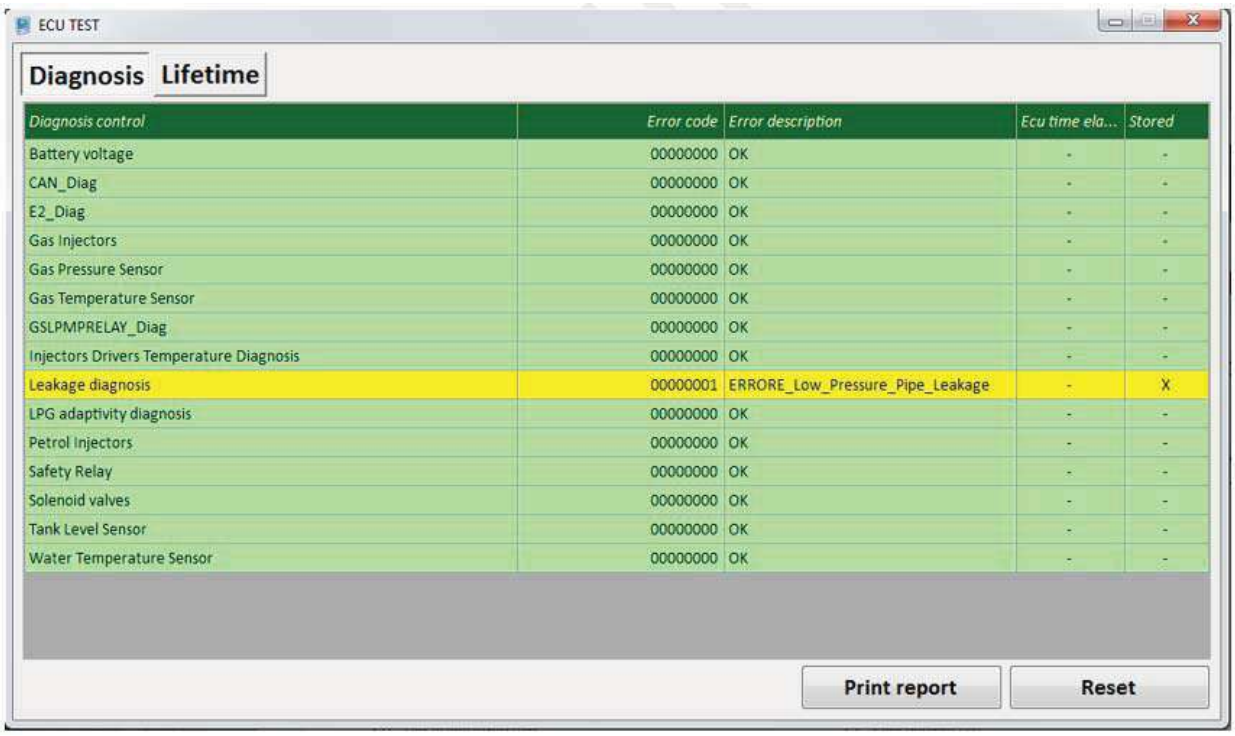
LPG 2	*FUEL SUPPLY CONFORMITY CHECK: LEAKAGE TEST [DTC 2293-64]*

NOTES	GCU Integrates a strategy to check if the functionality of fuel supply lines are verified. In case this check isn't successful an LPG fault is generated and sent to ECU.

When test is performed:

Injector pre-heating (Antisticking function) NOT active
Tank level > 20%
At least 10 engine cranking and powersafe (60sec) after vehicle assembling or after SW reflashing.
Engine run in gasoline mode
Engine-on by at least 2 sec
Coolant water temperature at cranking > 30 °C
No other fault on Tank Level Sensor, Regulator EV, Tank EV.

Failure appears as "Leakage diagnosis" in the PlusMaxRE GCU Test page.
The fault can happen only during petrol mode.



Diagnosis control	Error code	Error description	Ecu time ela...	Stored
Battery voltage	00000000	OK	-	-
CAN_Diag	00000000	OK	-	-
E2_Diag	00000000	OK	-	-
Gas Injectors	00000000	OK	-	-
Gas Pressure Sensor	00000000	OK	-	-
Gas Temperature Sensor	00000000	OK	-	-
GSLPMPRELAY_Diag	00000000	OK	-	-
Injectors Drivers Temperature Diagnosis	00000000	OK	-	-
Leakage diagnosis	00000001	ERRORE_Low_Pressure_Pipe_Leakage	-	X
LPG adaptivity diagnosis	00000000	OK	-	-
Petrol Injectors	00000000	OK	-	-
Safety Relay	00000000	OK	-	-
Solenoid valves	00000000	OK	-	-
Tank Level Sensor	00000000	OK	-	-
Water Temperature Sensor	00000000	OK	-	-

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Test is performed in 2 different phases:
Few seconds after crank both LPG electrovalves open for 1 second (if the condition to perform the test are verified).
In this phase the GCU check that the pressure reach at least 1.15 bar.
After both electrovalves closure the GCU monitor the LPG pressure for some seconds to verify if there is a pressure drop higher than a calibrated threshold.

The pressure doesn't reach 1.15 bar after EV opening:

LC03	**EV blocked:** the current supplies the coil but the EV of the regulator don't open	Replace mobile element
LC03	**Wrong level indication:** if no LPG is present in the tank but the sensor indicates more than 20% (not so common)	Fill the tank and check if the behavior is still present
LC03	**Low Pressure pipe disconnected:** a pipe is completely disconnected and LPG pressure sensor read atmospheric value	Reconnect the pipe
LC03	**Component or pipe clogged:** it can interrupt the flow of LPG inside the pipes, avoiding the rise of pressure	Not easy to detect, check if a pipe has an internal part that block it
LC03	**LPG Pressure/Temperature Sensor fault**	Check for DTC018A or DTC0185 present at the same time and deal with.

Drop of pressure during leakage test phase higher than the limit.

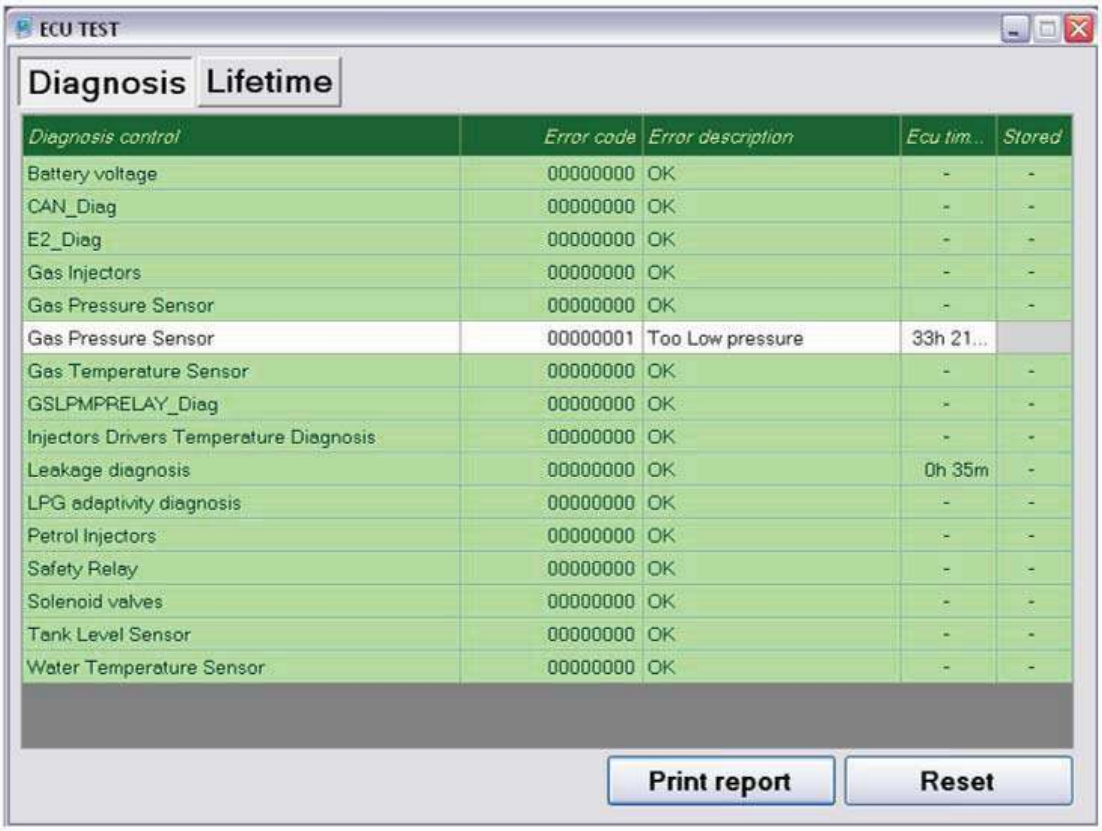
LC03	**Injector leakage in the manifold:** can create a drop of pressure and produce driveability issue during the test phase or during crank	Confirm the leakage from one single injector and replace it
LC03	**Hoses leakage:** Hose Clips, Double Wire Clips and Spring Band Clamps (Mubea Clamps) can be not correctly fixed	Fix correctly hoses or clamps
LC03	**Safety valve leakage:** the component not close correctly. If you remove the pipe you can smell LPG odour	Replace the regulator
LC03	**Regulator leakage:** if the membrane of the regulator is broken you can smell LPG odour from the MAP connection (after removing pipe)	Replace the regulator

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 3	*FUEL SUPPLY CONFORMITY CHECK: TOO LOW PRESSURE [DTC 2293-64]*

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

Failure appears as “Too low pressure” in the PlusMaxRE ECU Test page.
The fault can happen only in LPG mode.



Low pressure error:

LC03	**EV blocked:** Due to cranking condition, leakage test wasn’t performed in the current trip and EV don’t open when we switch to LPG	Replace mobile element
LC03	**Tank valve manually closed**	Open the valve and test again the system
LC03	**Hoses blocked:** if a pipe is clogged or bended, LPG flow can drop and decrease LPG pressure	Fix the pipes

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 4	*PRESSURE AND TEMPERATURE SENSOR CHECK*

NOTES	**Note the difference between functional and electrical error.**

DTC 2293 and DTC 0184 are related to **functional errors** and you **don't have** to replace the sensor in these cases.

"IMPOSSIBLE SWITCHING IN LPG MODE" Chart 3 and/or "IMPOSSIBLE TO SWITCH IN LPG MODE AND LPG SWITCH IS BUZZING" Chart 8.

With the vehicle stopped remove the sensor from the LPG rail
Leave the plug connected to be able to read the signals
After some minutes put the vehicle in key ON mode to supply the sensor
Check on the plus max RE the pressure and temperature value, they have to be coherent with the atmospheric value

Continuity check

LC03	Track 1 of LPG p/T sensor with ground Track 2 of LPG p/T sensor with pin 46 of the GCU Track 3 of LPG p/T sensor with pin 19 of the GCU Track 4 of LPG p/T sensor with pin 45 of the GCU
LC02	Track 1 of LPG p/T sensor with ground Track 2 of LPG p/T sensor with pin 6 of the GCU Track 3 of LPG p/T sensor with pin 9 of the GCU Track 4 of LPG p/T sensor with pin 8 of the GCU

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 5	*PRESSURE REGULATOR CHECK*

NOTES	**Note the difference between functional and electrical error.**

DTC2293-21 → Too low pressure
This error is never present on petrol ECU. When the GCU store this fault it consider the problem has a finish of LPG in the tank and didn't send any DTC to petrol ECU (if LPG level is different from 0 the error will be DTC2293-64)
DTC2293-22 → Too high pressure
DTC2293-64 → Incoherence between LPG level and pressure
This error appear when LPG pressure is too low but a normal value of pressure is attended (there is LPG inside the tank)

Regulator checks

TEST	EXPECTED PRESSURE VALUE
The **operating pressure** of the LPG displayed on the DIAGNOSTIC TOOLS should be between **1.15 & 1.36 bar**, when the vehicle is running in LPG mode, at idle speed (750 rpm) and when the temperature of the coolant is over 70°C,with all auxiliary load (AC, fan,..) **switched off**. [Usually the LPG pressure should be 0,9 - 0,95 bar over the manifold pressure].	**1.15 & 1.36 bar**
Idle, LPG mode, auxiliary load ON (AC, defrost, …), and when the temperature of the coolant is over 70 °C,	**1.35 & 1.55 bar**
Remove vacuum pipe, when the vehicle is running in LPG mode, at idle speed (750 rpm) and when the temperature of the coolant is over 70 °C,	**1.85 & 2.05 bar**
When the vehicle is running in LPG mode, gear in neutral position, push accelerator pedal driving	Pressure moves from **1.15 to 2 bar** according to manifold pressure
Open regulator's EV with +12V power supply (cold engine, only key ON) and check if you can immediately hear the sound of the opening	Not related with pressure value but to EV functionality

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 6	*LPG INJECTOR CHECK: MISFIRE*

NOTES	Injector issue, both electrical or functional, are always related to MIL lamp presence

If a fault code related to misfire occurs DTC030(x) (gasoline mode) or DTC130(x) (LPG mode) is stored in the petrol ECU.
Misfires can happen for different reasons, not only related to LPG injectors.

Customer Complain

Check if the issue happen during cold conditions (eg: low external temperature) and/or after few minutes from the switch to LPG.
Verify if the issue disappears when the engine is warm (coolant temperature over 70 °C).
If so a not correct vaporization of the regulator can be occurred.
In this case don't replace injector rail because they aren't responsible for the misfire.

DTC check

Check if there are other errors related to fuel combustion, for example related to lambda sensor or lean/rich combustion

Injectors check

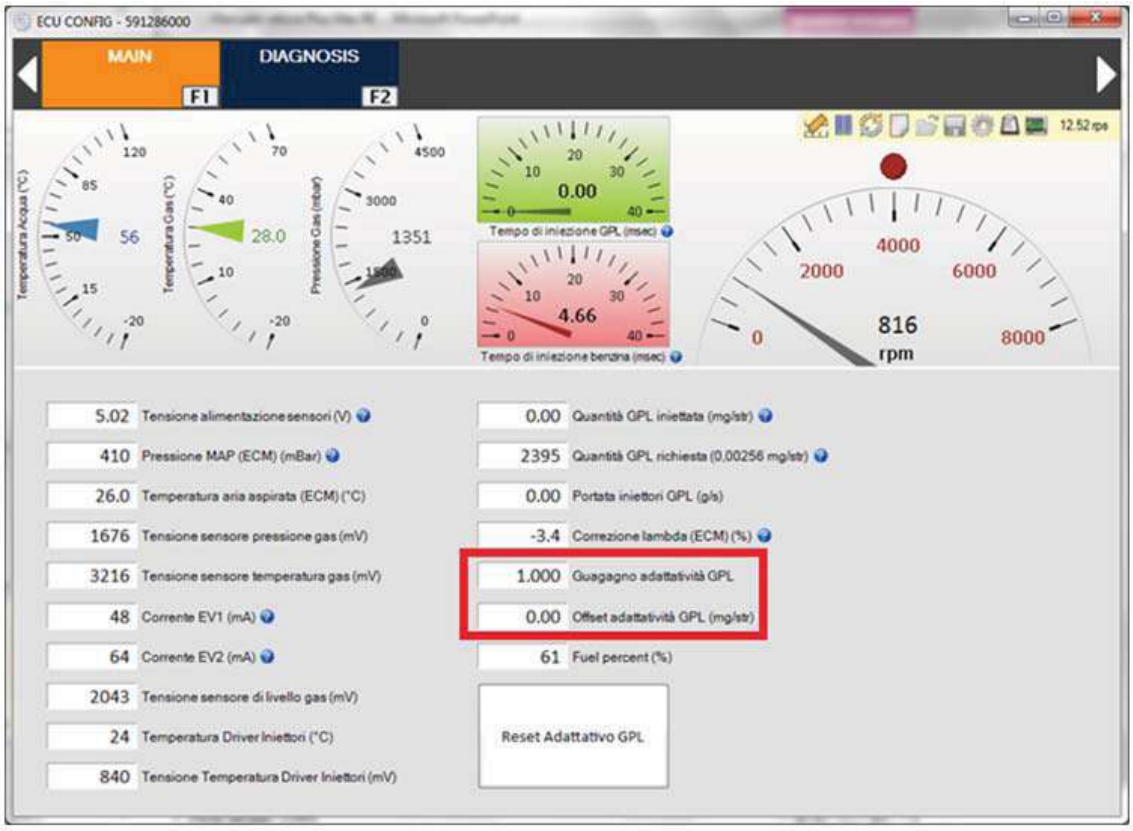
Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.
Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 7	*LPG INJECTOR CHECK: FUEL ADAPTIVITY*

NOTES	Injector issue, both electrical or functional, are always related to MIL lamp presence

LPG system has adaptive parameters similar to petrol that correct LPG fuel mass injected.
Gain: default value is 1. For value higher than 1 mass flow rate will be increased; for values lower that 1 mass flow rate will be decreased. Expected value are between 0.8 and 1.2
Offset: default value is 0. Expected value are between -2 and +2



When adaptivity reaches its own limits an error appears.
If this happen replace the injectors.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 8	*LEVEL SENSOR AND FUEL INDICATION CHECK*

NOTES	Remember that electrical fault and bad level indication should be manage in different ways

First of all analyze the costumer complaint: if the issue is related to blocked level indication (always 3 led for example), it can be a mechanical issue of the multivalve; if the complaint is about a bad or not coherent indication the system can be conform anyway.

As described in “Fault Finding – System Description” there are 3 different level sensors:

1) “3 wires” level sensor for internal tanks (X52 – Sandero II, Logan II)
2) “3 wires” level sensor for external tanks (Clio IV, Duster II, Lodgy, Dokker)
3) “2 wires” level sensor for old Euro5 tanks (Clio III, Sandero I, Logan I, Duster I)

Check if there are errors related to electrical fault of the level sensor and, if so, check the correct connection of the wiring.

On Plus Max RE it is also showed the voltage related to the sensor.

LC03	**This sensor has a continuous output that moves from less than 200 mV to more than 4 V**
LC02	**This sensor has only 5 discrete levels that correspond to LED on the switch (on full tank the resistance between the 2 pins is 21.8 kOhm**

During the vehicle driving you can see the value that moves during long turn or during slopes: **this indicates that the leverage inside the tank isn’t blocked**. Consider that the voltage has an hysteresis inside the GCU so the plus max value moves slower that the mechanical behavior of the leverage (this means that, also if you see a fixed value on the plus max, the leverage can’t be free to move).

If the leverage isn’t blocked and no electrical fault is present the system is conform and the indication should be consider coherent.

If you think, after previous test, that the leverage is blocked remove the tank MultiValve unit from the tank and manually test it (you can again check the coherence with the position of the level sensor and the switch).

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

UNEXPECTED SWITCH BACK TO PETROL	Chart 1
WRONG GAS TEMPERATURE	Chart 2
IMPOSSIBLE SWITCHING TO LPG MODE	Chart 3
IMPOSSIBLE TO CRANK THE ENGINE	Chart 4
GAS LEVEL INDICATOR: INCOHERENT WRONG LEVEL INDICATION	Chart 5
ENGINE STALL AT SWITCHING IN LPG MODE	Chart 6
MISFIRE – BAD DRIVEABILITY	Chart 7

CHART 1	*UNEXPECTED SWITCH BACK TO PETROL*
NOTES	Only consult this customer complaint after a complete check using the diagnostic tool

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type

↓

Fuel pressure sensor check:
– Remove the sensor from the gas rail and check that the pressure value is approximately at atmospheric value with +APC (1 bar at sea level, engine temperature isn't relevant).
If the value is considerably different replace the sensor.

↓

Tank Multivalve electrovalve check:
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.

↓

Fuel supply hoses check:
– Check that no low pressure hoses are pinched (especially after a removal operation).
– Check that no low pressure hoses are damaged and clips or strips are correctly closed
– Check that no foreign body is inside the low pressure hoses
– Check the condition of the fuel filter; change it if necessary.

– Engine in LPG mode, running in idle and auxiliary load OFF → **gas pressure target 1.15 - 1.36 bar**.

– Switch off the engine and check the pressure is still the same after 5 minutes, to assure that no leakage is present (don't switch on engine, only +APC to give power supply to the sensor)

↓

Pressure regulator check:
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.
– Check pressure on idle,GPL mode, AUX load OFF,warm engine → **gas pressure target 1.15 - 1.36 bar**.
– Remove vacuum pipe, idle, LPG mode → **pressure target 1.9 - 2 bar**
– In LPG mode, push accelerator and check that the pressure moves between **1.1 and 2 bar and Manifold Pressure reference shall be approximately 0,95 bar less than LPG pressure**.

CHART 2	*WRONG GAS TEMPERATURE*
NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

Fuel temperature sensor check:
– Park the car inside the garage, remove the sensor from the LPG pipe, but leave it electrically connected. Wait 15 minutes and check the LPG temperature using the diagnostic tool: it should be the same as ambient temperature. If the value is different replace the sensor (more than 15°C)

↓

Harness check:
– check that the plug of p/T sensor is correctly fixed
– check that wiring isn't damaged or broken.

↓

Customer complaint:
– Analyze the customer complaint: if the error occur at really low temperature (-10°C) consider the behavior has normal (at -10°C there is the diagnosys of too low temperature)

CHART 3	*IMPOSSIBLE SWITCHING TO LPG MODE: SWITCH BLINKING IN WAITING CONDITION OR LEDS SWITCHED OFF*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.
	Important: remember that the switch to LPG isn't allowed immediately after pressing the button. The system need to reach determinate conditions before switch to LPG mode, as described in chapter 6.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.?

↓

Pushbutton check:
– Check that the LEDs on the switch are ON; if not check the harness connection of the switch.

↓

Switching condition check:
To allow LPG switch a lot of condition must be reached.
Check that
– The driver has selected the LPG fuel switch mode in the current trip or in the previous trip the engine stopped in LPG mode.
– Coolant water temperature must be higher than set threshold; this threshold depends on the temperature at the crank; usually the threshold is between 20 and 25 °C.
– A calibrated delay is elapsed from the cranking. The delay depends on the temperature at the crank: usually cranking at a coolant temperature of 20 °C the delay is 60s.
– Gas Temperature must be higher than the tuned threshold usually between 2 and 5 °C. Please note that with low winter temperature (for example -10 °C), the delay requested to the LPG temperature to reach the threshold could be long and sometimes more than 5 minutes.
– RPM value must be greater than the tuned RPM threshold usually around 1500 RPM.
– LPG switching isn’t allowed at very high engine loads, for example in full acceleration.

If costumer complains on delayed switch explain him that in some cases we need more than 5 minutes to reach all the conditions. It is really important that the system reach the right temperature to have a correct vaporization of the gas, even it's in the tank LPG can have really low temperature.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.
– Check on diagnosis page if there are any errors.

↓

LPG Fuel Trim check:
– Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time.
– Contact Techline with the completed fault finding log.

CHART 4	*IMPOSSIBLE TO CRANK THE ENGINE*
NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

Battery and Fuse check:
– Make sure that **the battery is correctly charged**. If it is not, carry out fault finding on the charging circuit.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.
– If you experienced troubles to connect diagnostic tool, proceed with **GCU Power supply and Fuses check**.

↓

GCU Power supply and Fuses check:
Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance of the connections**:

LC03	+30_POWER SUPPLY FROM BATTERY GCU track 15	→	BATTERY FUSE
LC03	+30_POWER SUPPLY FROM BATTERY GCU track 43	→	BATTERY FUSE
LC03	POWER GROUND GCU track 22	→	CHASSIS GROUND
LC03	POWER GROUND GCU track 7	→	CHASSIS GROUND
LC03	LOGIC GROUND GCU track 48	→	CHASSIS GROUND

Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance of the connections**:

LC02	+30_POWER SUPPLY FROM BATTERY GCU track 15	→	BATTERY FUSE
LC02	+30_POWER SUPPLY FROM BATTERY GCU track 43	→	BATTERY FUSE
LC02	POWER GROUND GCU track 25	→	CHASSIS GROUND
LC02	POWER GROUND GCU track 53	→	CHASSIS GROUND
LC02	LOGIC GROUND GCU track 22	→	CHASSIS GROUND

Repair if necessary.

CHART 5	*GAS LEVEL INDICATOR: INCOHERENT WRONG LEVEL INDICATION*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.
– On Plus Max RE note which percentage is indicated for the LPG level
– During driving monitor the level sensor voltage (you can also record the signal on Plus Max RE) to understand if it is moving or not: if so the leverage of the multivalve isn't blocked (take into account the difference between the 2 level sensor, 2 or 3 wires)

↓

Customer complaint check:
– Analyze the costumer complaint in order to understand if there was a temporary block of the level gauge or the complaint is only due to the fluctuation of the LEDs of level indicator during the driving (uphill, downhill, roundabout); in this second case explain to the customer that the behavior is unfortunately normal and the best choice is to use the odometer to know accurately the mileage he can drive.

↓

Level indicator check:
– Drive the vehicle with PlusMaxRE connected and record Tank Level Sensor Electrical Signal; during acceleration, braking and turning, the electrical signal must change.
– Remove level indicator and check it can move freely and the position is correctly shown on the switch (wait 30 seconds for each position)
– If level sensor is "2 wires" version check the resistance is 21.8 kOhm at full level; if level sensor is "3 wires" version check the correct wiring connection (ground, +5V, signal)

↓

Multivalve check:
If the voltage of level sensor is fixed remove the multivalve from the tank to check it.
Check that
– The driver has selected the LPG fuel switch mode in the current trip or in the previous trip the engine stopped in LPG mode.
– Coolant water temperature must be higher than set threshold; this threshold depends on the temperature at the crank; usually the threshold is between 20 and 25°C.
– A calibrated delay is elapsed from the cranking. The delay depends on the temperature at the crank: usually cranking at a coolant temperature of 20°C the delay is 60s.
– Gas Temperature must be higher than the tuned threshold usually between 2 and 5°C. Please note that with low winter temperature (for example -10°C), the delay requested to the LPG temperature to reach the threshold could be long and sometimes more than 5 minutes.
– RPM value must be greater than the tuned RPM threshold usually around 1500 RPM.
– LPG switching isn't allowed at very high engine loads, for example in full acceleration.

CHART 6	*ENGINE STALL AT SWITCHING IN LPG MODE*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.
	Typically this issue is due to a lack of LPG in the low pressure side: during the switch pressure regulator needs few instants for fill the pipes (they should be already fill if no problem occurs)

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.

↓

Pressure in idle check:
– Check LPG pressure when:
  – Water temperature over 80°C
  – Engine is running in LPG mode in idle (≅ 750 RPM)
  – Auxiliary electrical loads OFF,

The **operating pressure** of the LPG displayed on the Diagnostic should be between **1.15 & 1.36 bar**, [usually the LPG pressure should be 0,9 - 0,95 bar over the manifold pressure].

↓

Tank Multivalve electrovalve check:
– Check that manual valve on the tank MultiValve unit is completely open.
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.

↓

Fuel supply hoses check:
– Check that no low pressure hoses are pinched (especially after a removal operation).
– Check that no low pressure hoses are damaged and clips or strips are correctly closed
– Check that no foreign body is inside the low pressure hoses
– Check the condition of the fuel filter; change it if necessary.

– Crank the engine monitoring:
  Gas Level (mV)
  Gas Pressure (mbar)
– Engine in LPG mode, running in idle and auxiliary load OFF → **attended pressure 1.3 bar**.
– Switch off the engine (leave key on to stay connected with the software) and check the pressure is still the same after 5 minutes, to assure that no leakage is present.

↓

Pressure regulator check:
- Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.
- Check pressure on idle,GPL mode, AUX load OFF,warm engine → **gas pressure target 1.15 - 1.36 bar**.
- Remove vacuum pipe, idle, GPL mode → **pressure target 1.9 - 2 bar**
- In LPG mode, push accelerator and check that the pressure moves between **1.1 and 2 bar and MAP reference shall be approximately 0,95 bar less than GPL pressure**

LPG Fuel Trim check:
- Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time.
- Contact Techline with the completed fault finding log

CHART 7	*MISFIRE – BAD DRIVEABILITY*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.
	Priority for dealing with a number of faults: First deal with petrol faults cylinder coils control, engine speed sensor; downstream and upstream oxygen sensors, heating of upstream and downstream oxygen sensors, if they are present or stored.

Petrol fuel supply check:
– Check the petrol fuel system:
  – If requested in the petrol repairing manual, check ignition system by checking the condition of the plug and the low and high voltage contacts of the cylinder coil. Replace any faulty components.
  – If requested in the petrol repairing manual, check the compression ratio of cylinders. Repair if necessary.
  – If requested check the flywheel target (warping or cracks). Replace the flywheel if necessary.
  – Ensure that there are no leaks on the inlet manifold. Repair if necessary.

↓

If no fault is found, then there must be a problem with the LPG fuel system. Therefore check:
– the conformity of LPG fuel.
– the condition of the LPG fuel filter,
– the LPG flow and pressure
– the Tank manual valve check,
– the Tank and Regulator Electrovalves
– the Fuel supply hoses check,
– the LPG Fuel Trim check,
Replace the defective component.

↓

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type

↓

Fuel filter check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

Pressure in idle check:
– Check LPG pressure when:
  – Water temperature over 80 °C
  – Engine is running in LPG mode in idle (≅ 750 RPM)
  – Auxiliary electrical loads OFF,

The **operating pressure** of the LPG displayed on the diagnostic tool should be between **1.15 & 1.36 bar**, [usually the LPG pressure should be 0,9 - 0,95 bar over the manifold pressure].

Tank Manual Valve Check:
– Check that manual valve on the tank MultiValve unit is completely open.

Fuel supply hoses check:
– Check that no low pressure hoses are pinched (especially after a removal operation).
– Check that no low pressure hoses are damaged and clips or strips are correctly closed
– Check that no foreign body is inside the low pressure hoses
– Check the condition of the fuel filter; change it if necessary.

– Engine in GPL mode, running in idle and auxiliary load OFF → **attended pressure 1.3 bar**.
– Switch off the engine (leave key on to stay connected with the software) and check the pressure is still the same after 5 minutes, to assure that no leakage is present.

Pressure regulator check:
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.
– Check pressure on idle,GPL mode, AUX load OFF,warm engine → **gas pressure target 1.15 - 1.36 bar**.
– Remove vacuum pipe, idle, GPL mode → **pressure target 1.9 - 2 bar**
– In GPL mode, push accelerator and check that the pressure moves between **1.1 and 2 bar and MAP reference shall be approximately 0,95 bar less than GPL pressure**

LPG Fuel Trim check:
– Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time.
– Contact Techline with the completed fault finding log

HAZARD WARNING LIGHTS AND CENTRAL DOOR CONTROL: REMOVAL - REFITTING

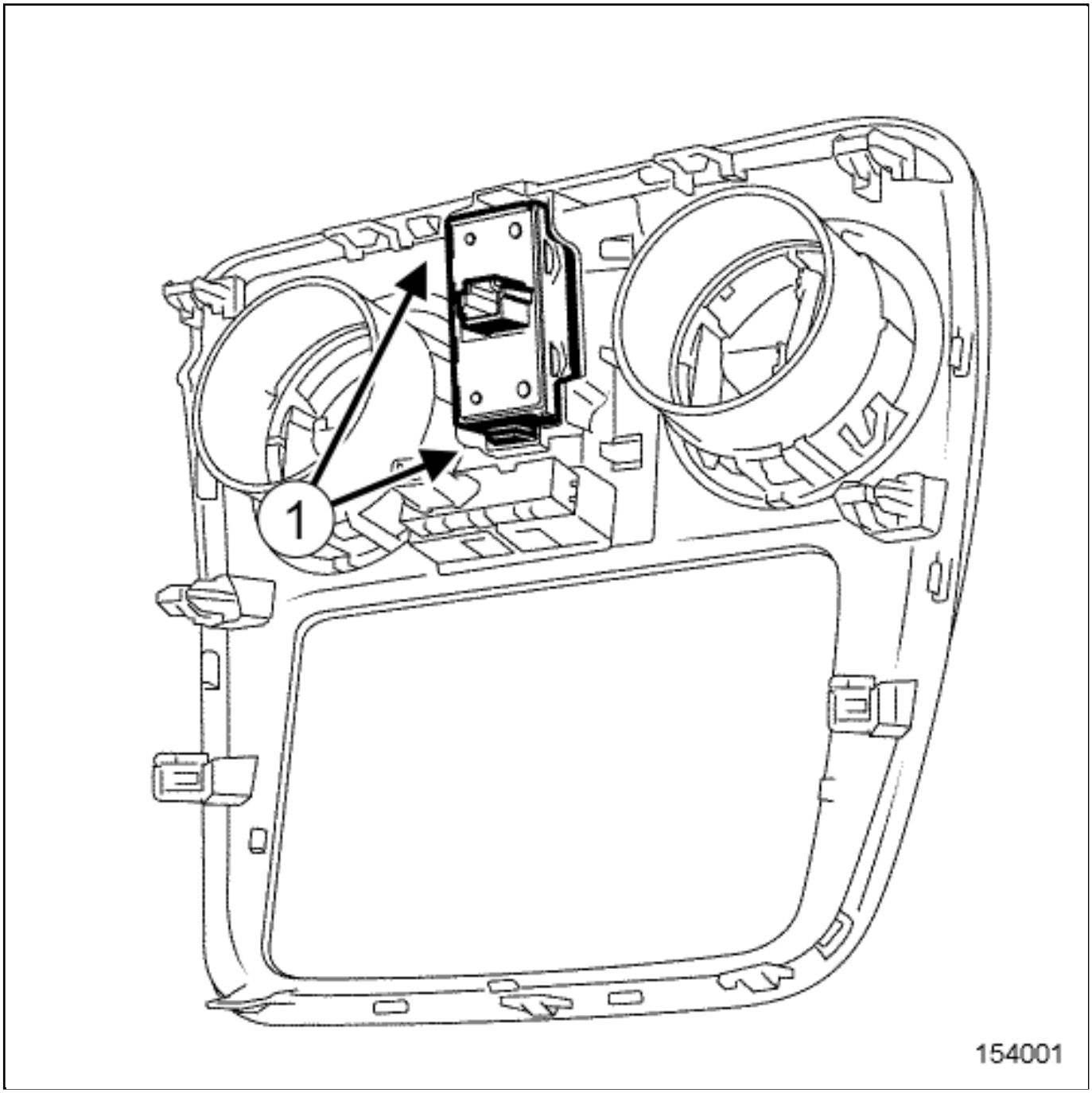
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Switch off the ignition.
- Unclip the trim radio tray Dashboard assembly: Exploded view .

2. REMOVAL OPERATION

- Disconnect the hazard warning lights switch connector.



- Remove the hazard warning light switch by pressing the clips(1) .

REFITTING

- Proceed in the reverse order to removal.

HEADLINING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Airbag and pretensioners: Precautions for the repair ,
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Disconnect the battery Battery: Removal - Refitting .

Remove (see 71A, Body internal trim, Roof trim assembly: Exploded view) :

- the interior lights,
- the sun visors,
- the grab handles.

Remove (see 71A, Body internal trim, Interior body side trim assembly: Exploded view) :

- the windscreen pillar trims,
- the B-pillar upper trim.

K52 L52(K52 OR L52)

Remove the C-pillar lower trim (see 71A, Body internal trim, Interior body side trim assembly: Exploded view) .

B52 K52(B52 OR K52)

Remove the rear parcel shelf.

K52(K52)

- Remove (see 71A, Body internal trim, Interior body side trim assembly: Exploded view) :
  - the rear side parcel shelf trim,
  - the rear pillar upper trim,
  - the C-pillar upper trim.

B52 L52(B52 OR L52)

- Remove the rear quarter panel trim(see 71A, Body internal trim, Interior body side trim assembly: Exploded view) .

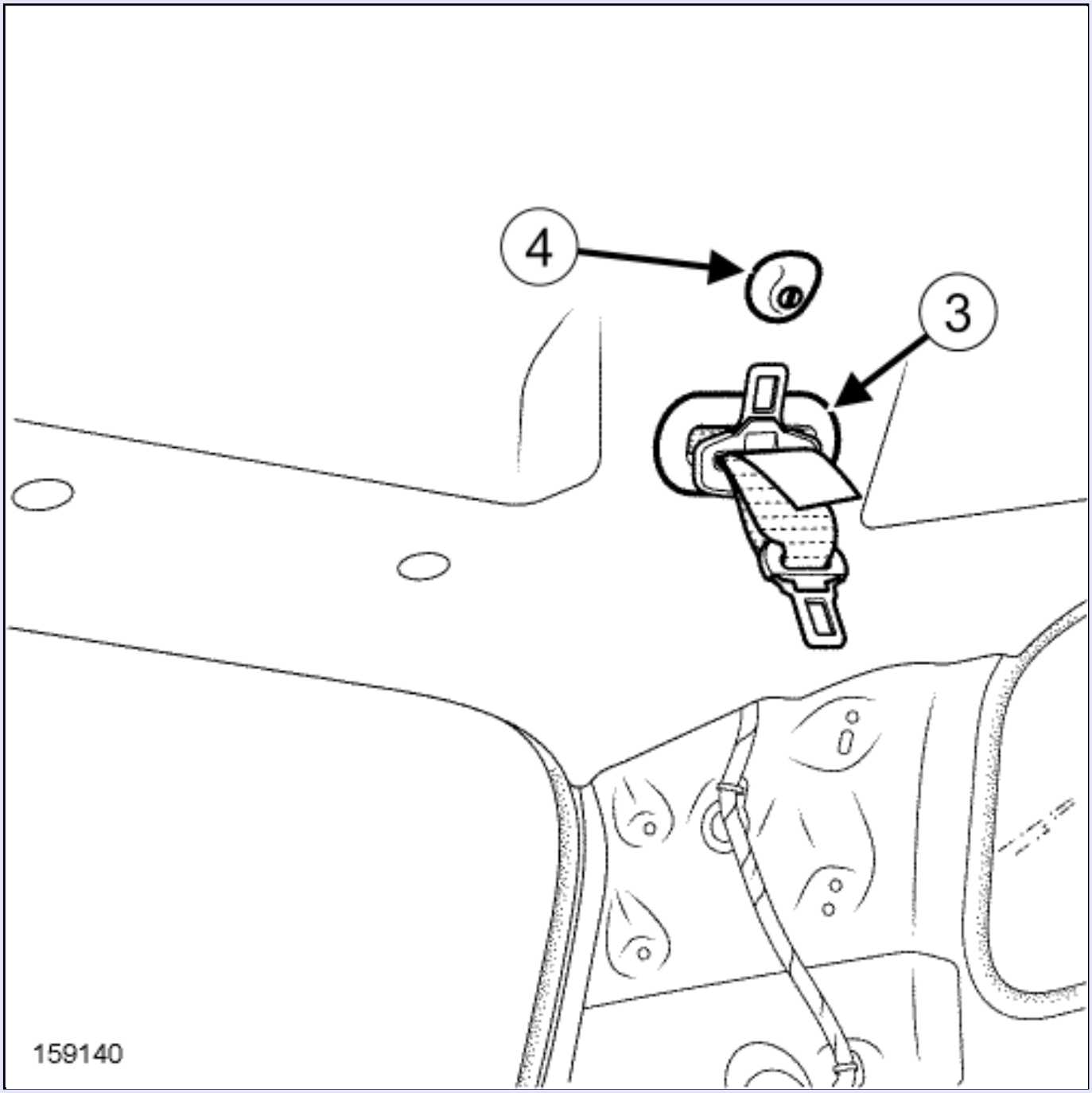
- Tilt the fronts seatbacks.

- Remove the rear bench seat baseRear bench seat assembly: Exploded view .

2. REMOVAL OPERATION

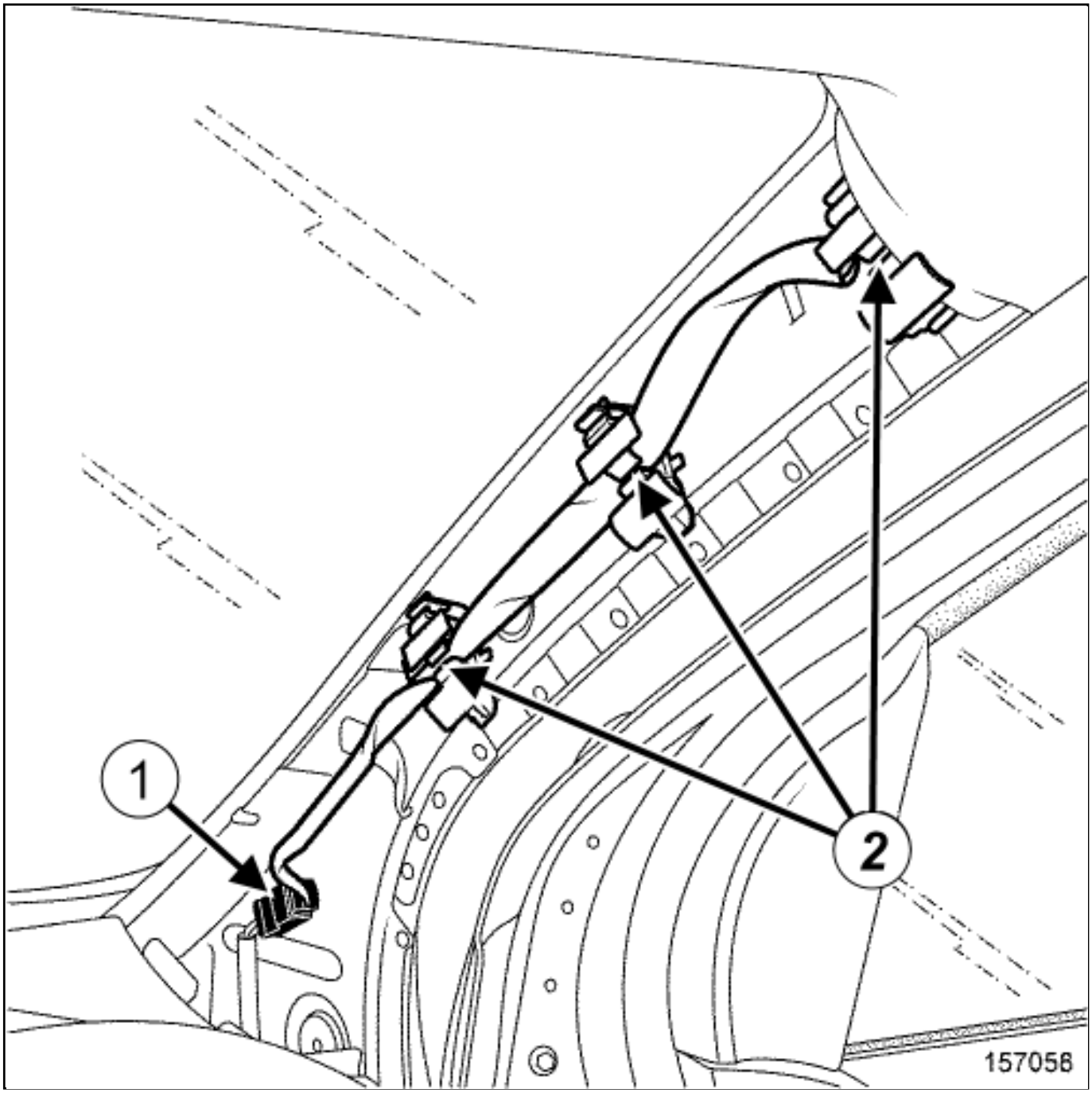
B52(B52)

- Remove (see 71A, Body internal trim, Roof trim assembly: Exploded view) :
  - the seat belt upper bolt cover,
  - the rear seat belt upper bolt.

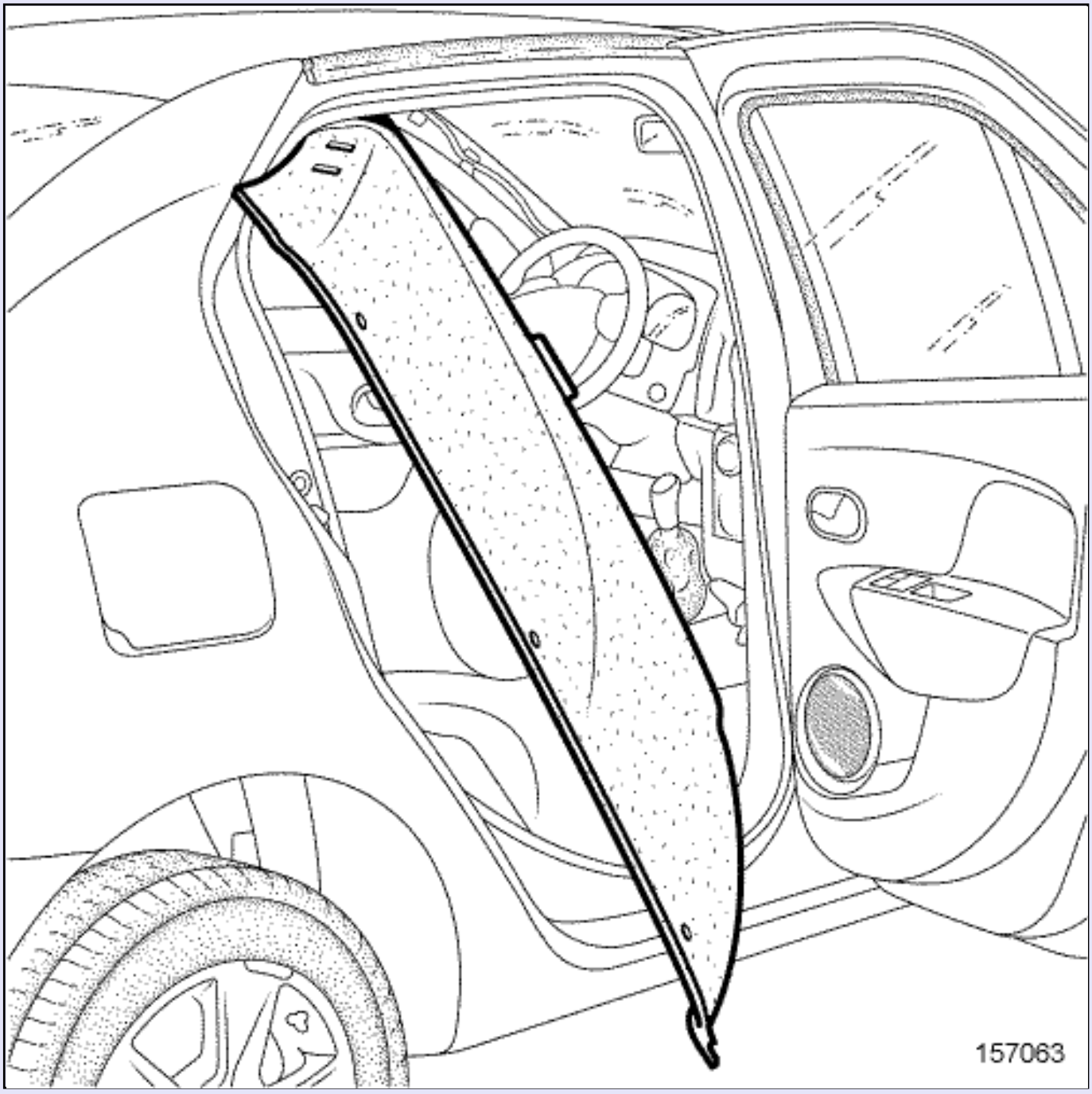


- Remove:
  - the seat belt guide(3) ,
  - the seat belt retaining trim piece(4) ,

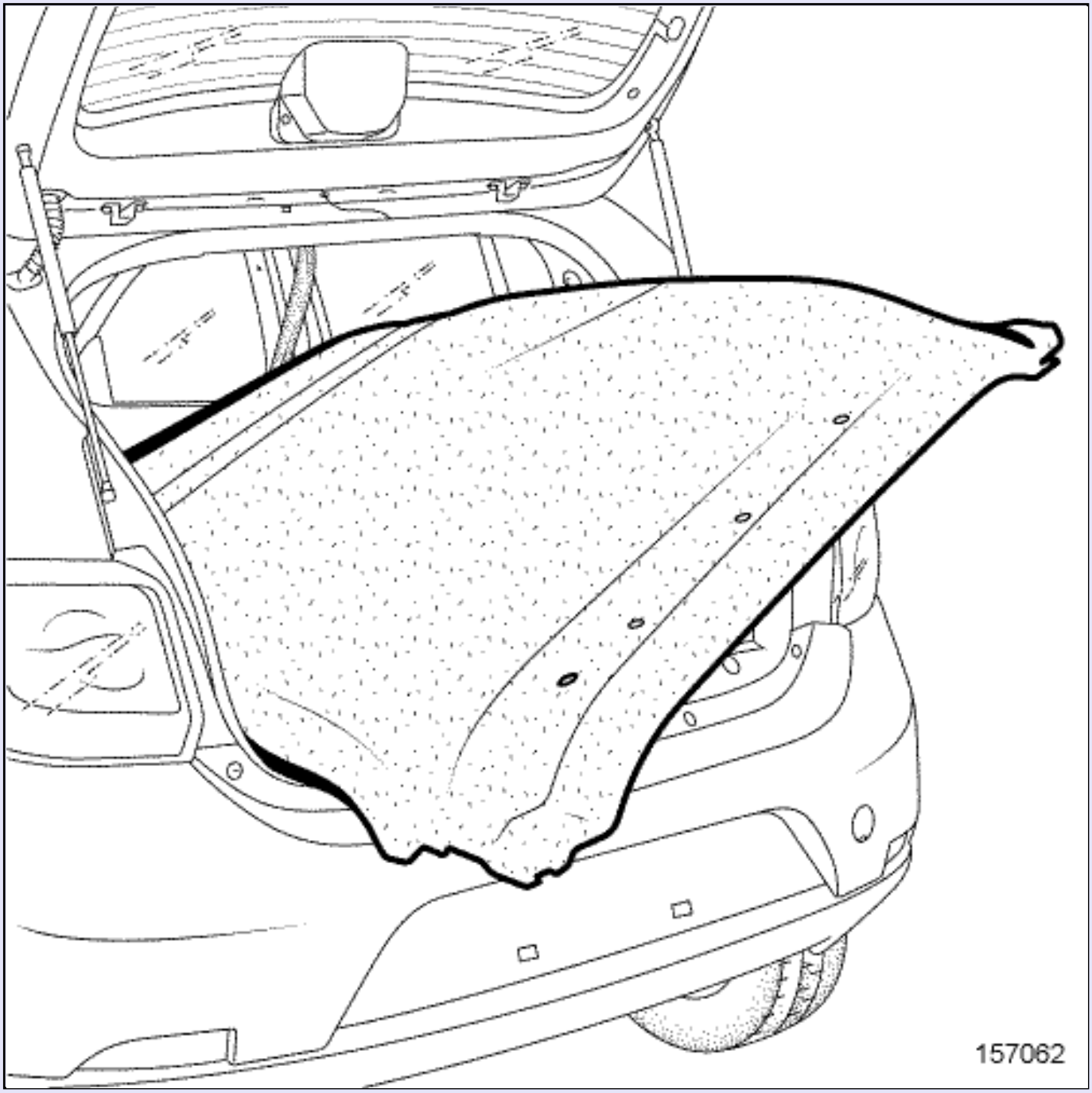
- Remove the clips using an unclipping tool(see 71A, Body internal trim, Roof trim assembly: Exploded view) .



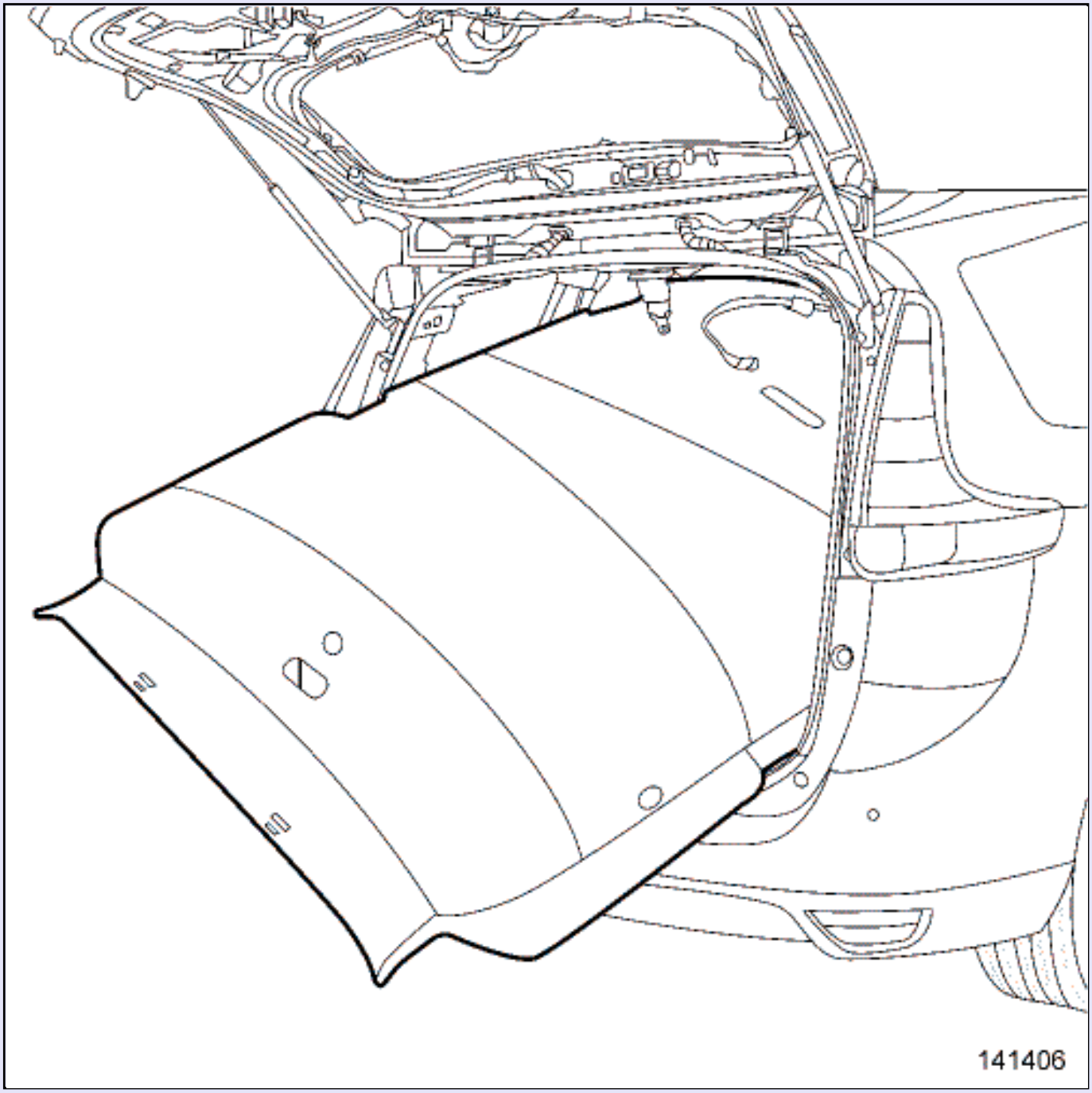
- Disconnect the connector(1) from the headlining wiring.
- Unclip the headlining wiring at(2) .



- Remove the headlining (this operation requires two people).

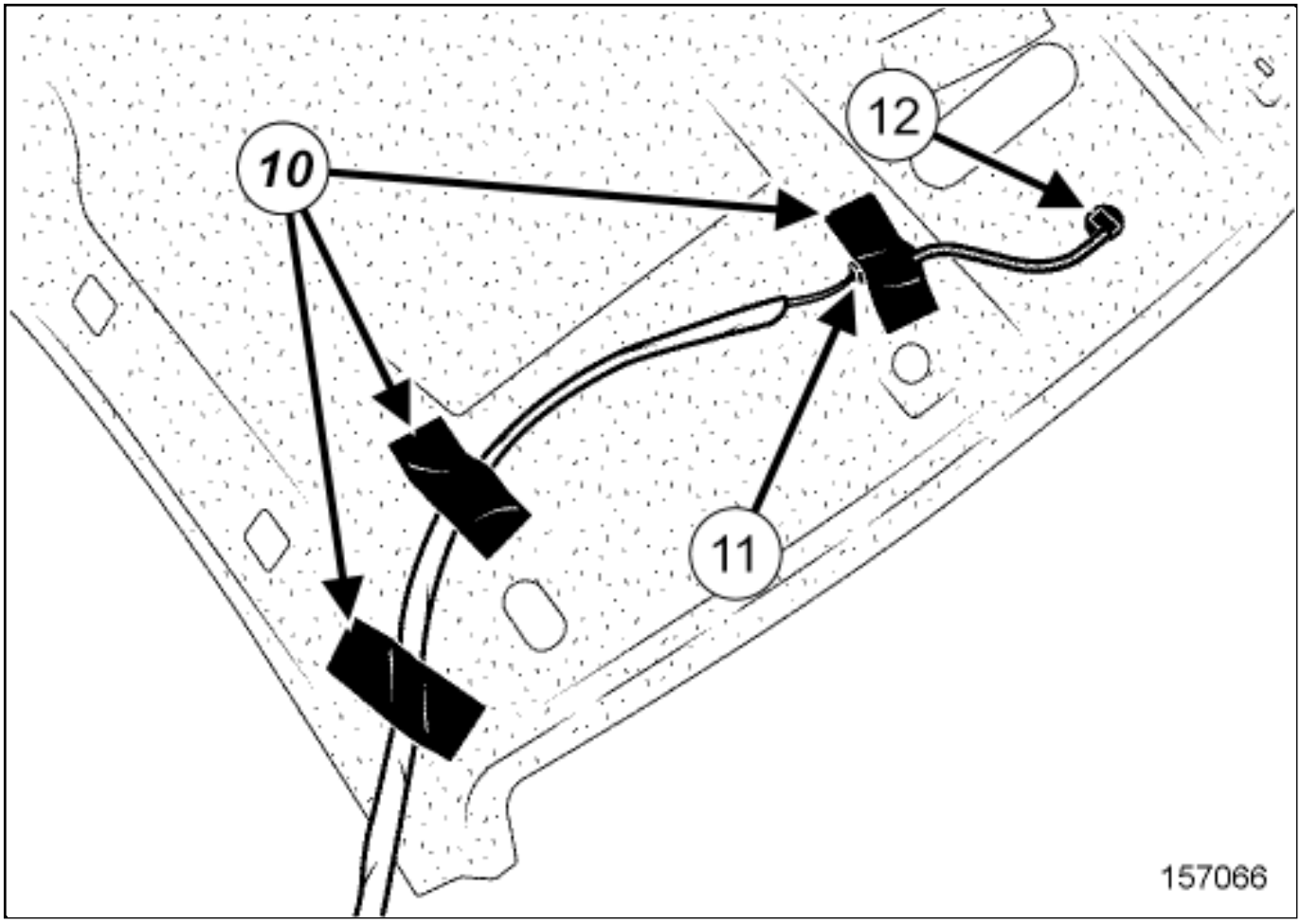


- Remove the headlining (this operation requires two people).



Remove the headlining (this operation requires two people).

1- IN THE EVENT OF REPLACEMENT



Remove the Velcro strips at(10) .

Disconnect the connector(11) of the "hands-free" microphone.

Unclip the "hands-free" microphone at(12) .

Remove :

- the "hands-free" microphone,
- the headlining wiring.

REFITTING

Proceed in the reverse order to removal.

Repair-70x02x04x02-01x37-1-33-1.xml

XSL version : 3.02 du 22/07/11

HEATER MATRIX: REMOVAL - REFITTING

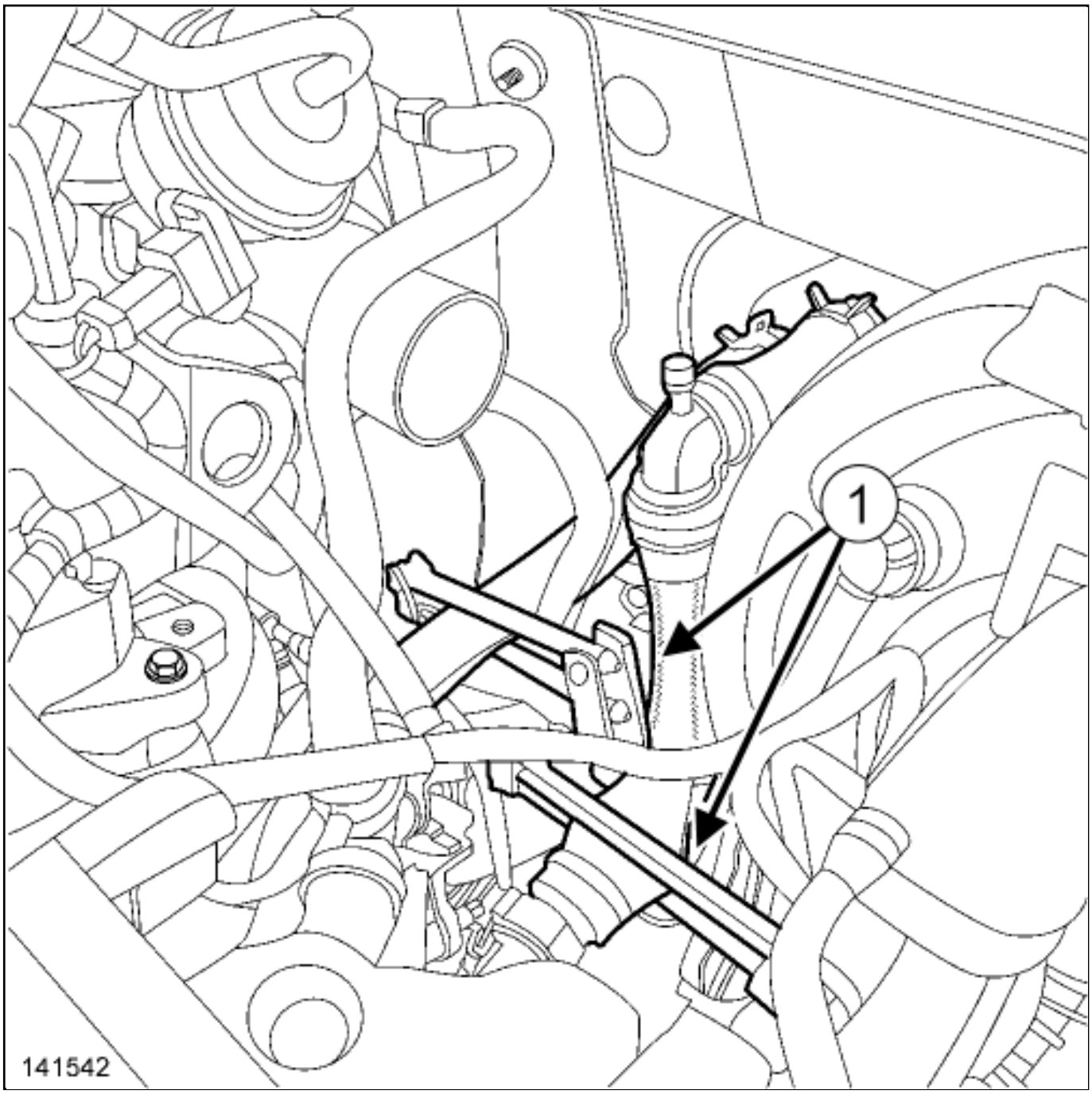
Note, one or more warnings are present in this procedure

Special tooling required	
Pipe clamps.	Ms. 583

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REMOVAL

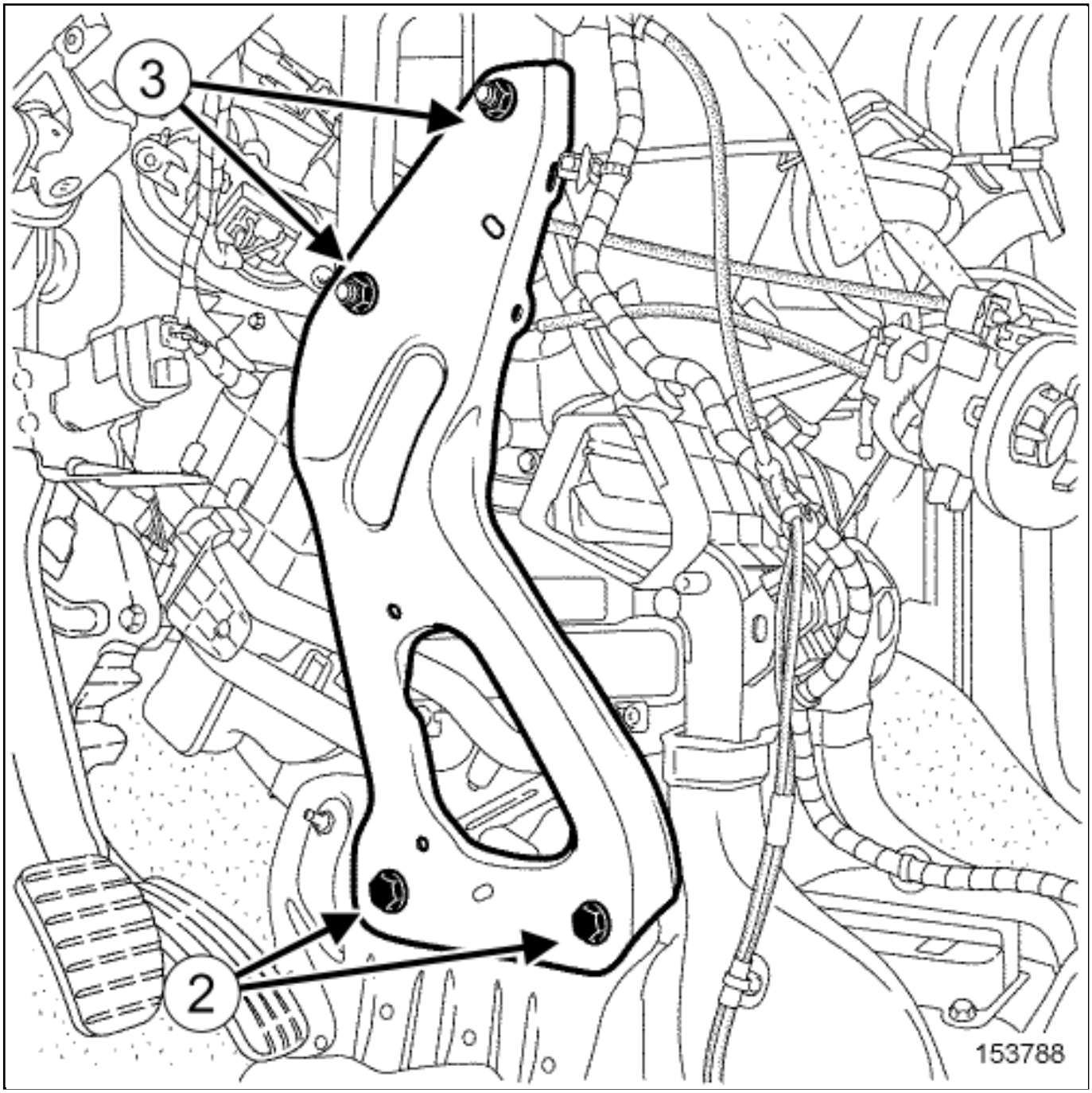
1. REMOVAL PREPARATION OPERATION



- Fit the Pipe clamps.(Ms. 583) on the heater matrix hoses(1) .

- Partially lift the floor carpetCentre floor front carpet: Removal - Refitting .

- Mark the position of the strut on the body before removing it.



- Remove :
  - the bolts(2) ,
  - the nuts(3) ,
  - the stay.

2. REMOVAL OPERATION

- Remove the heater matrix pipe clips(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

- Put a protective cover on the floor carpet.
- Position a container to collect the coolant under the heater matrix pipes.
- Move the heater matrix pipes aside(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .
- Remove the heater matrix(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REFITTING

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition.
The seal and the surface must be clean and scratch free.

- Proceed in the reverse order to removal.
- Fill up and bleed the cooling systemCooling system: Draining - Refilling .

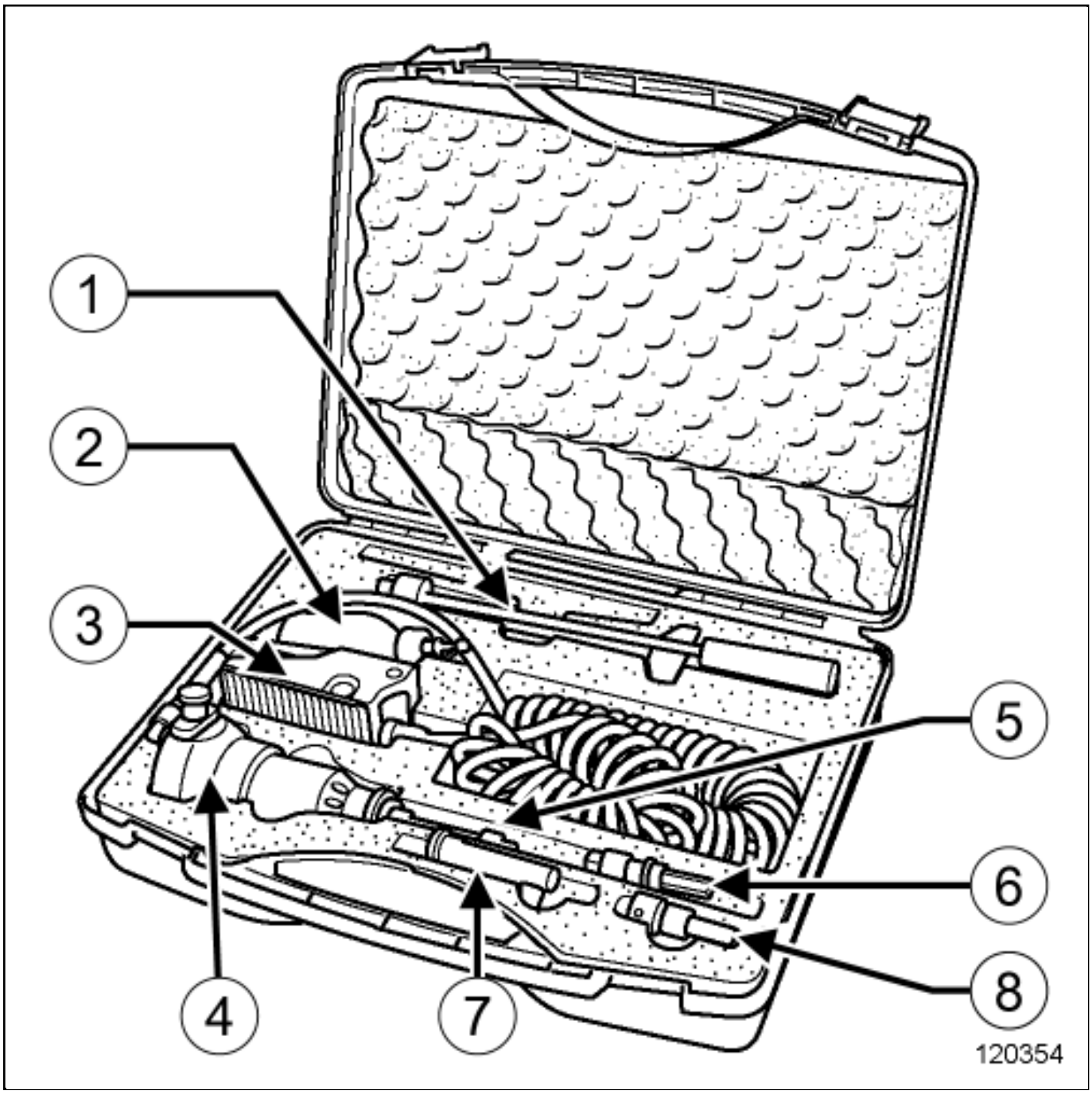
HEATER PLUG REMOVAL TOOL: USE

Note, one or more warnings are present in this procedure

Equipment required
protective goggles
roll pin punch
cut-resistant gloves

TheVibropackit, part number 77 11 420 611 , enables seized heater plugs to be removed.

1. DESCRIPTION OF THE VIBROPAC KIT



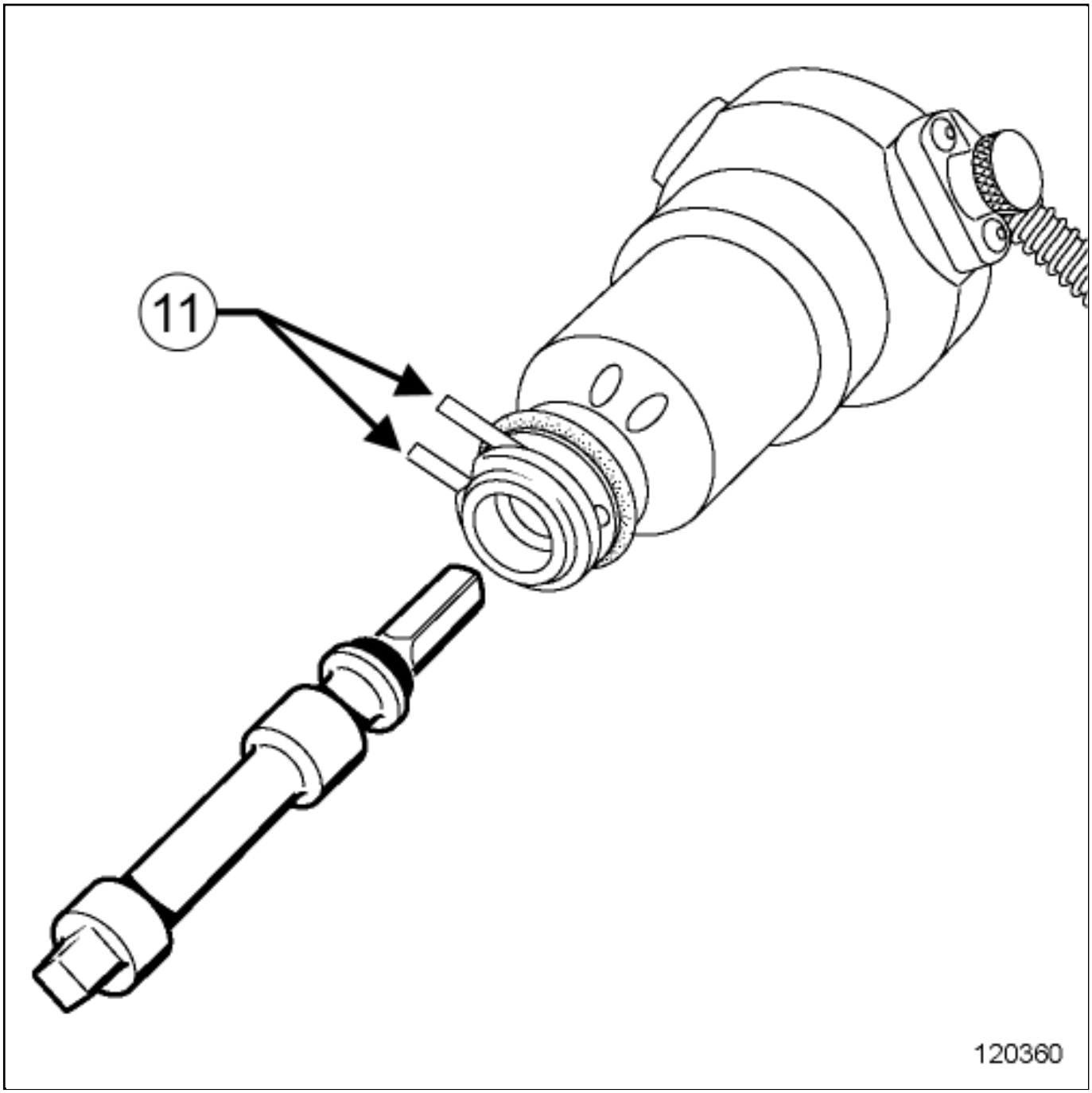
The kit includes:

- a torque bar(1) ,
- a can of lubricating oil(2) ,
- a control pedal(3) ,
- a vibropac(4) ,
- a 70 mm(5) extension piece,
- a 30 mm(6) extension piece,
- a 10 mm(7) right-hand socket,
- a short 10 mm(8) hinge socket.

Note:

As an option, there is a 12 mmsocket, part number 77 11 421 470 .

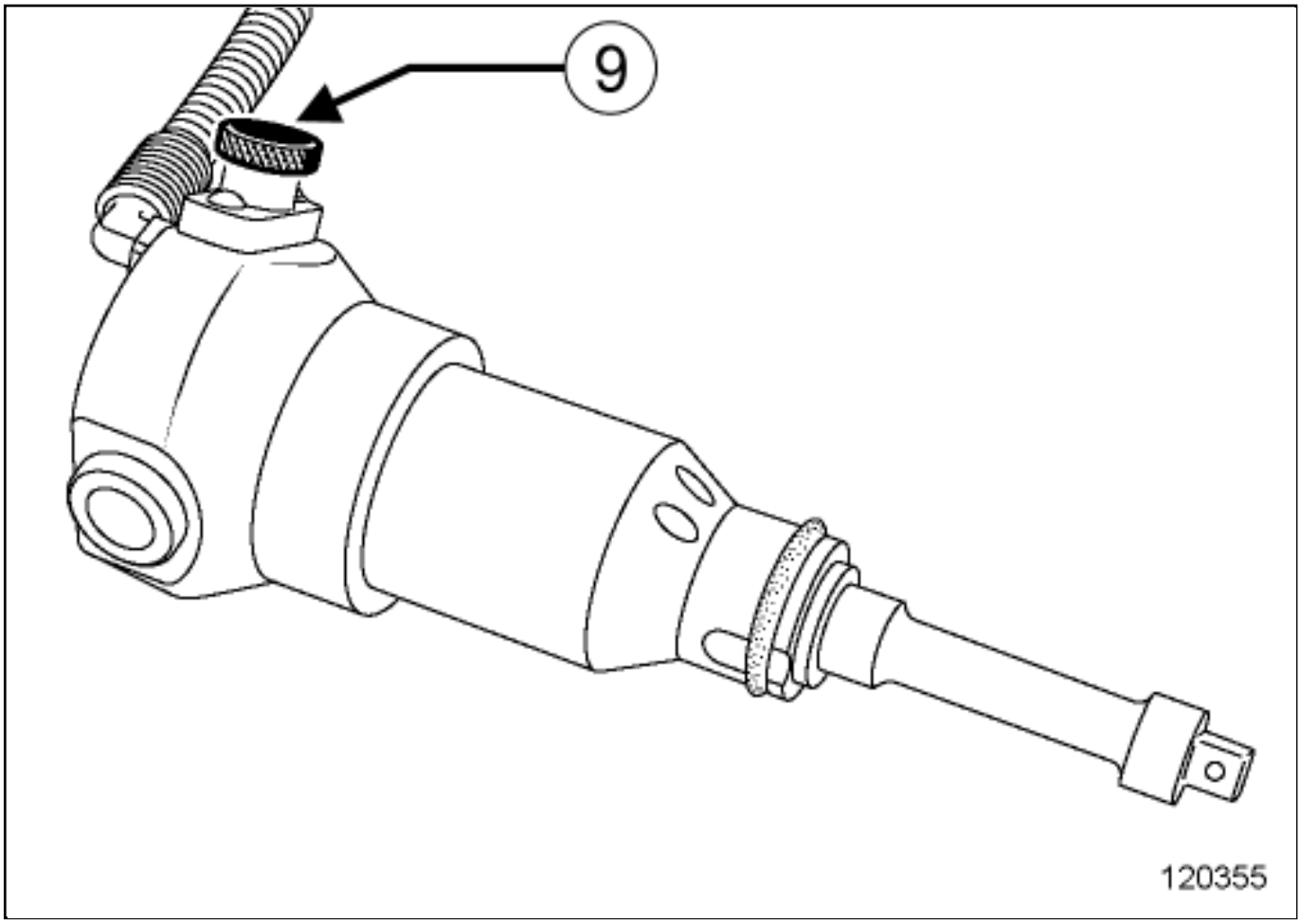
2. PRECAUTIONS BEFORE USE



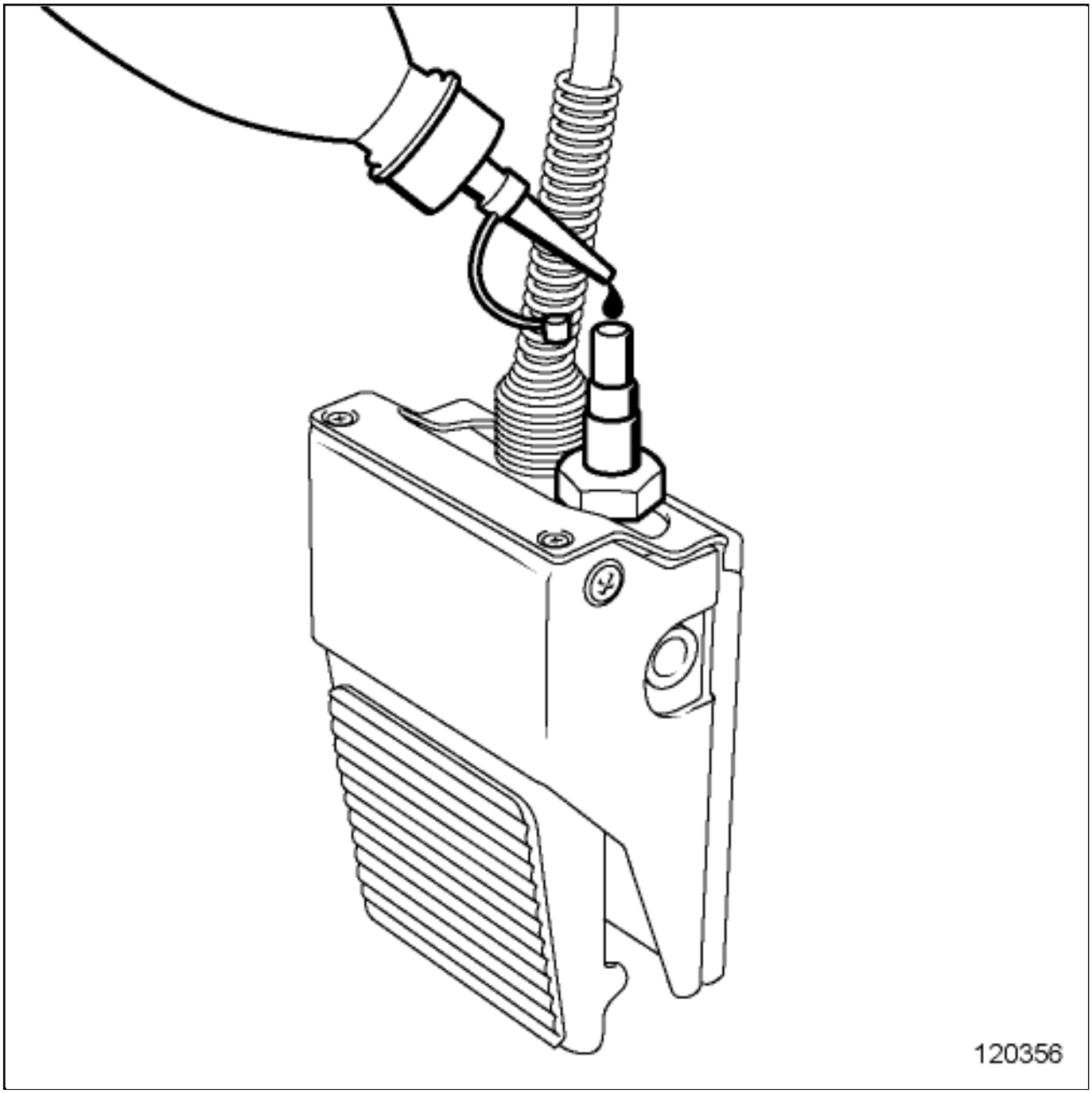
ATTENTION

To avoid damaging the two pins, do not operate the vibropac if it is not positioned on the heater plug(**11**) .

- Before using the heater plug removal tool, it is essential to:



- Shut off the(**9**) air supply tap on the vibropac.



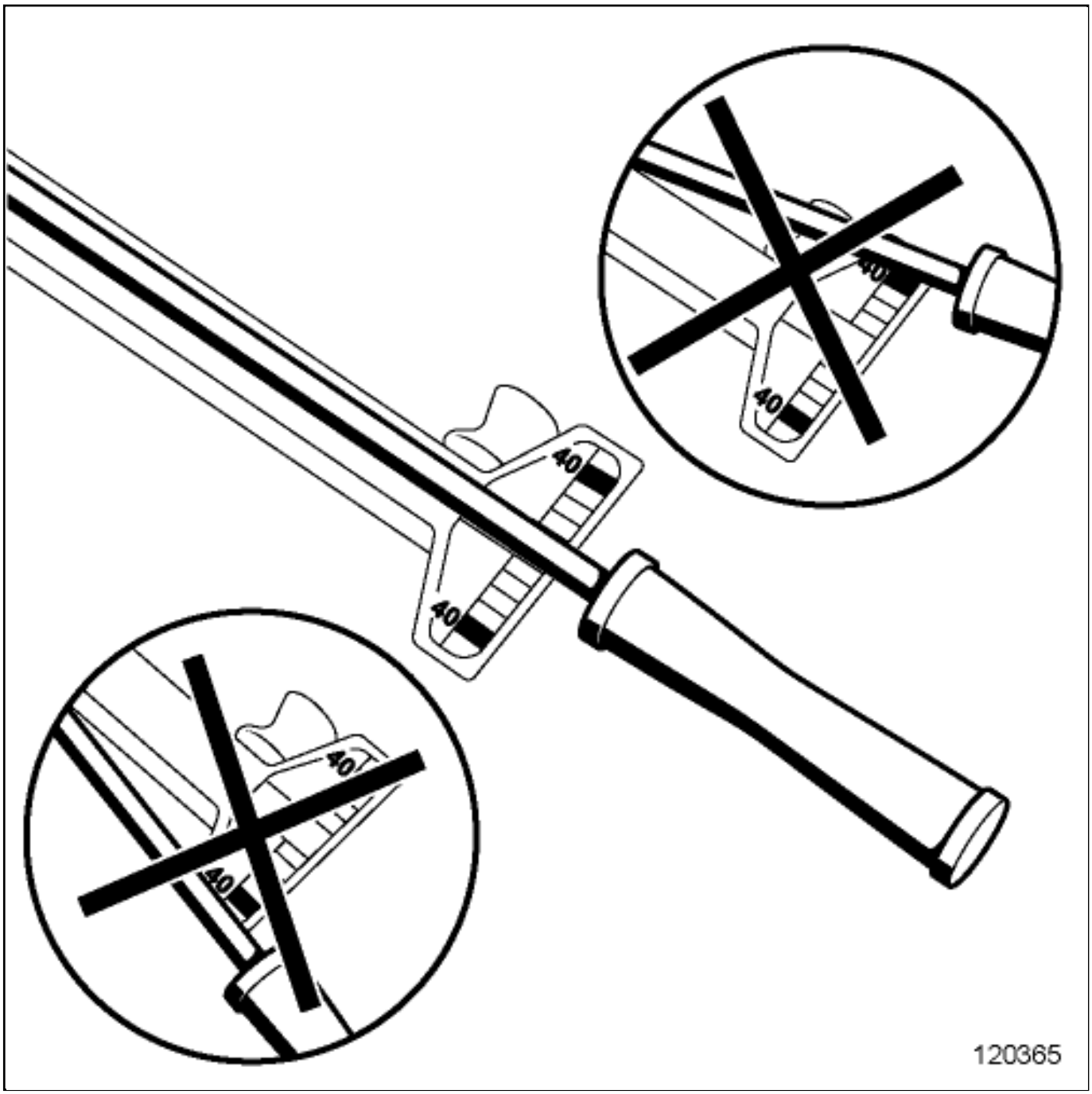
- Apply 3 drops of lubricantto the air inlet opening of the control pedal, using the applicator.

3. HEATER PLUG REMOVAL PROCEDURE

1- RECOMMENDATIONS FOR REPAIR OPERATIONS

IMPORTANT

- When handling:
  - wear cut-resistant gloves,
  - wear safety goggles fitted with side shields.



ATTENTION

During the removal of the heater plug, the maximum tightening torque of 40 N.m shown on the torque bar must not be exceeded as this could split the heater plug.

Note:

To facilitate the removal of the heater plugs, carry out the operation when the engine is warm.

2- PARTS AND CONSUMABLES FOR THE REPAIR

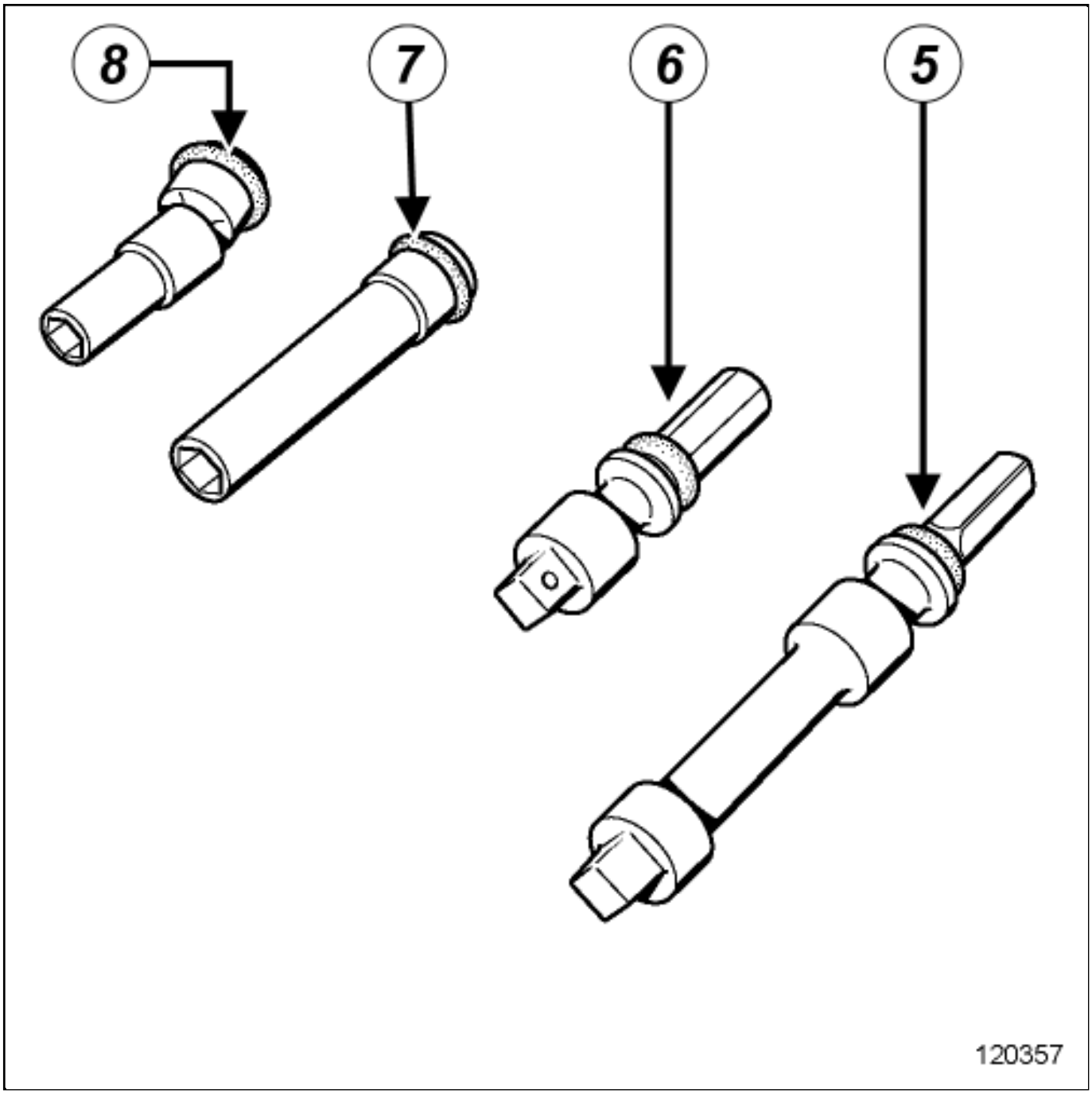
Parts always to be replaced

- Heater plugs.

Consumables

- Super releasing agent, part number 77 11 236 166 or 77 11 420 439 .

3- REMOVAL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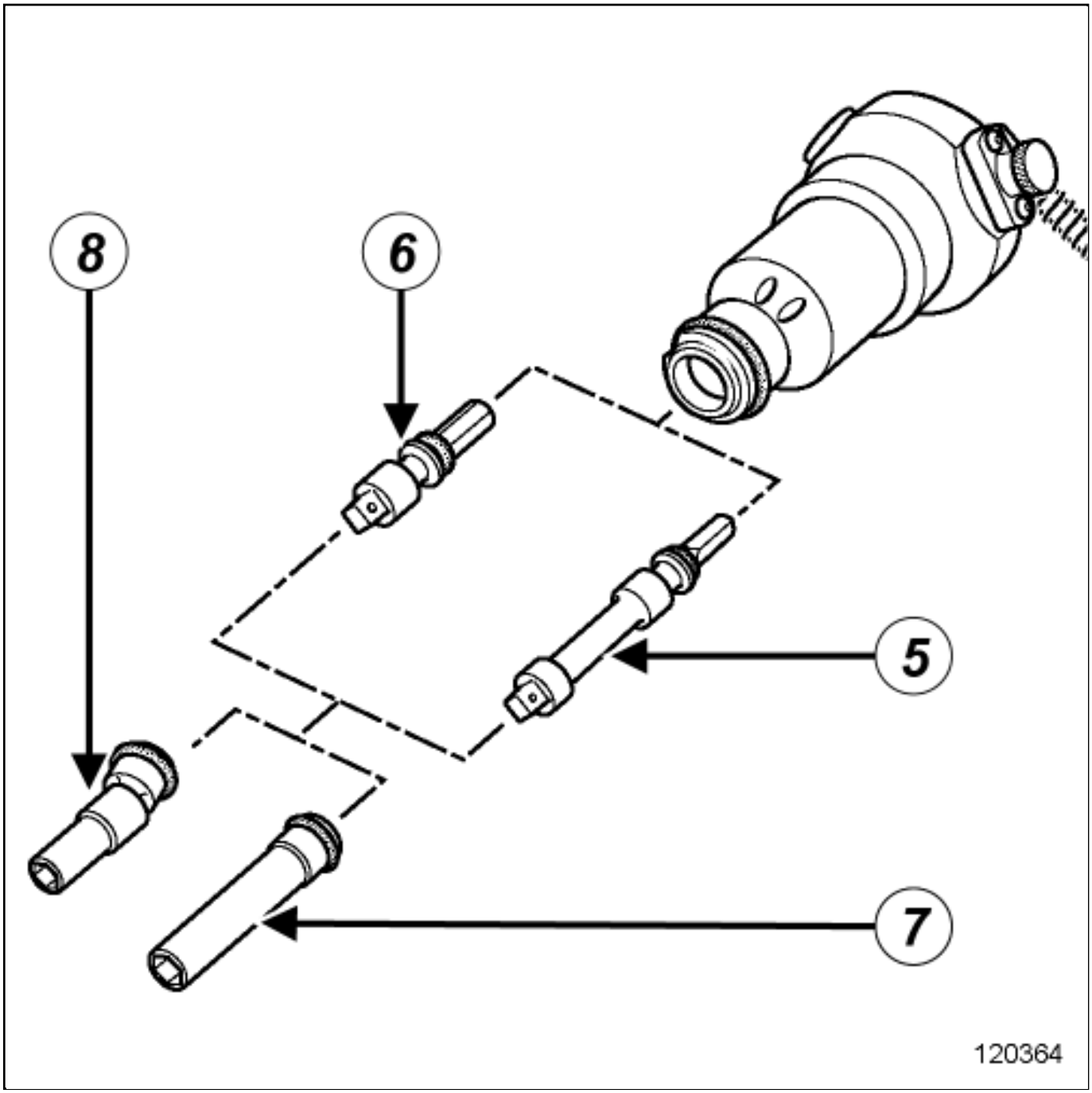
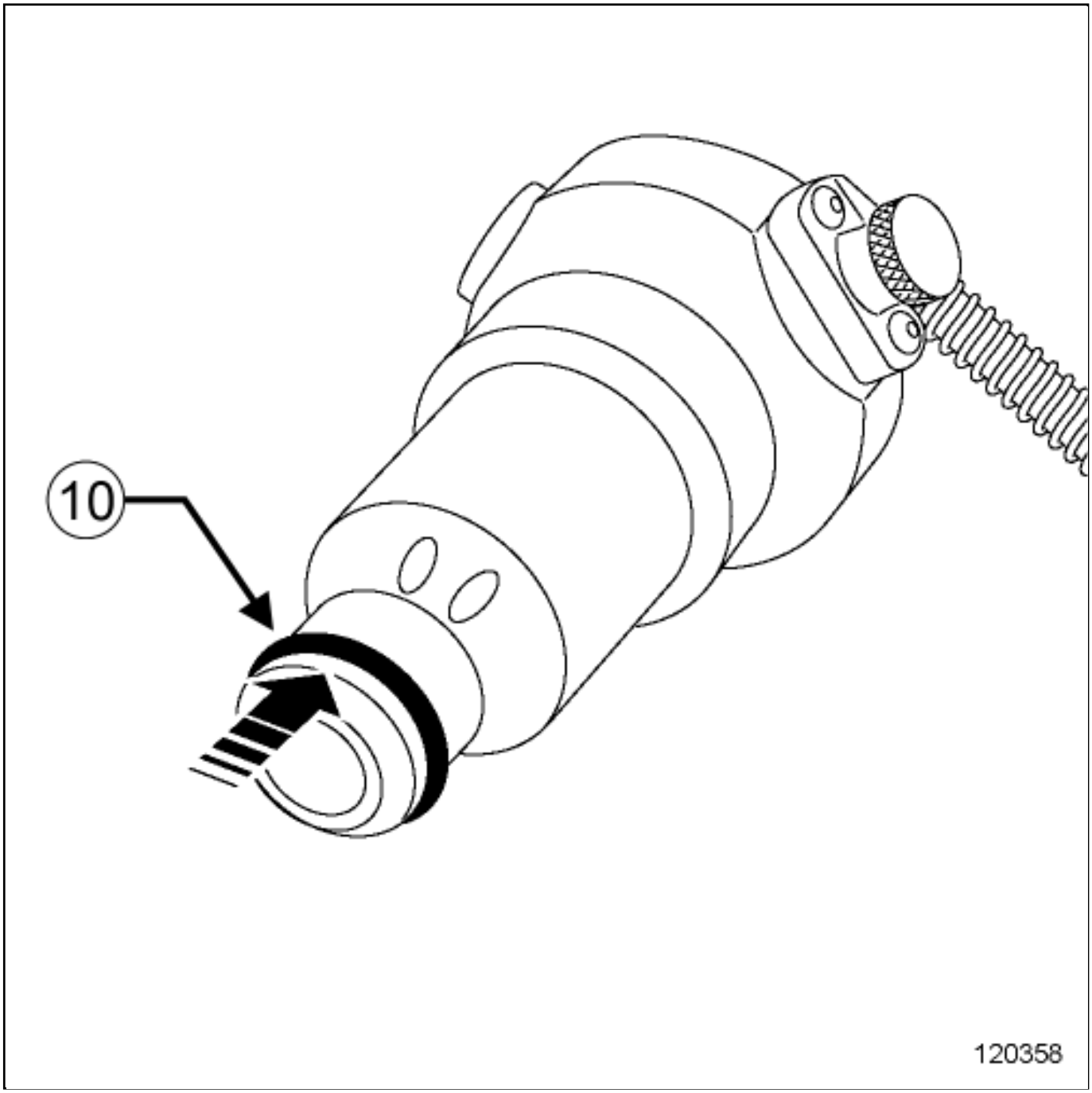
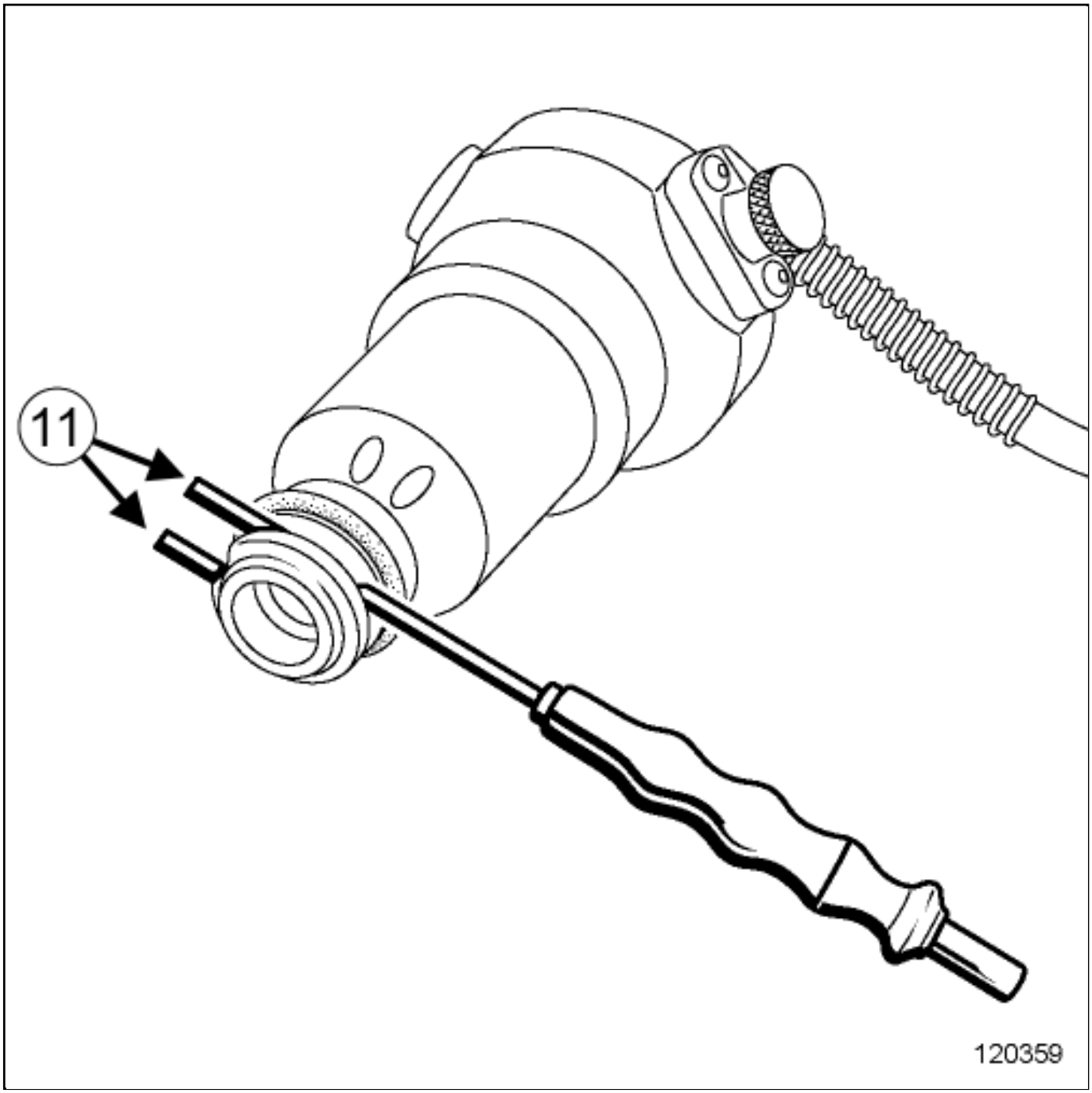


- Choose the extension piece(5) or (6) and the socket(7) or (8) depending on the engine and the vehicle.

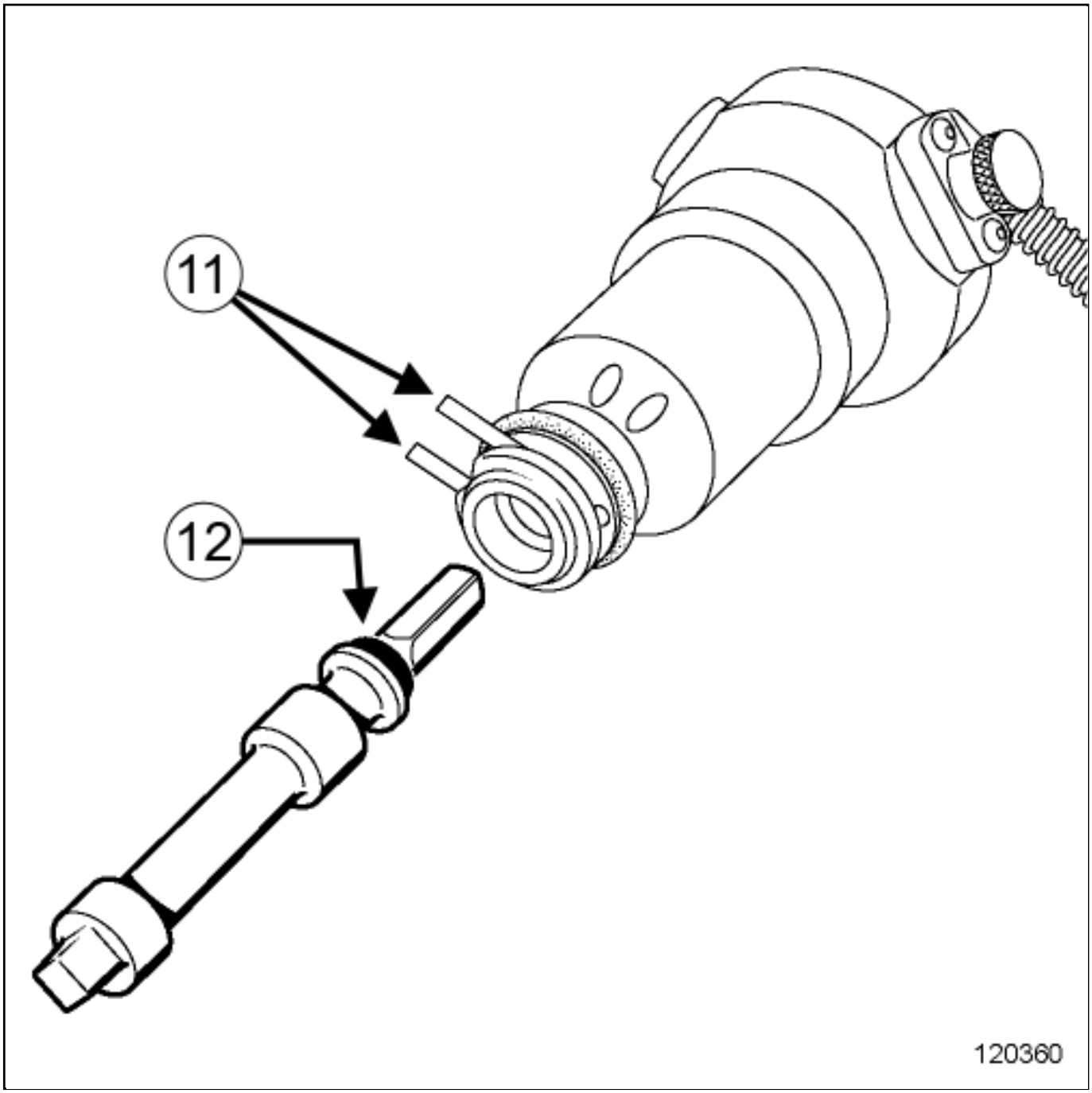
- Fit the chosen assembly to the vibropac using the following procedure.



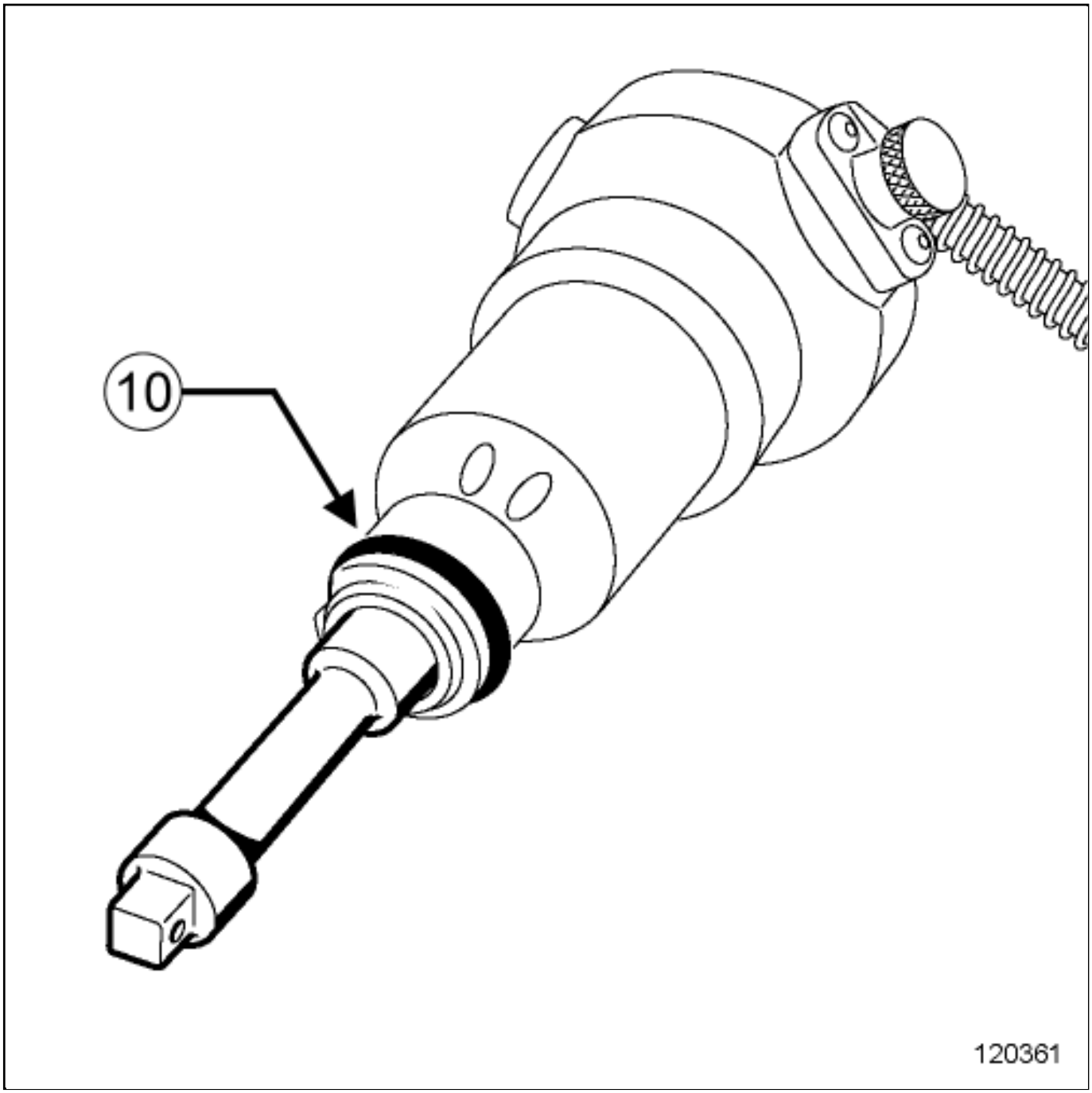
- Remove the O-ring(10) from its neck.



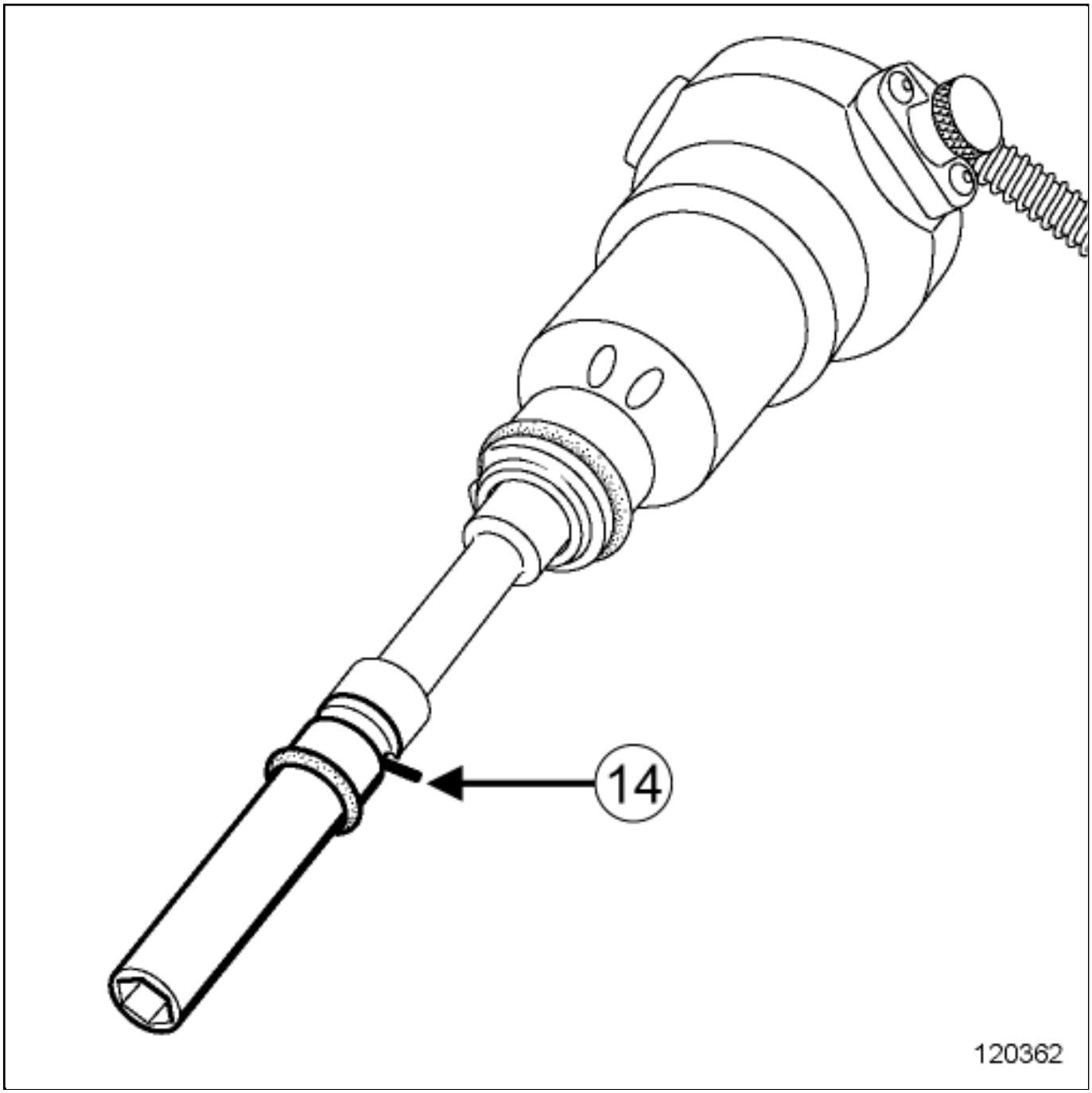
- Remove the two plastic pins(11) using a roll pin punch.



- Check for the O-ring(12) on the extension piece.
- Insert the extension piece into the vibropac.
- Refit the two plastic pins(11) .

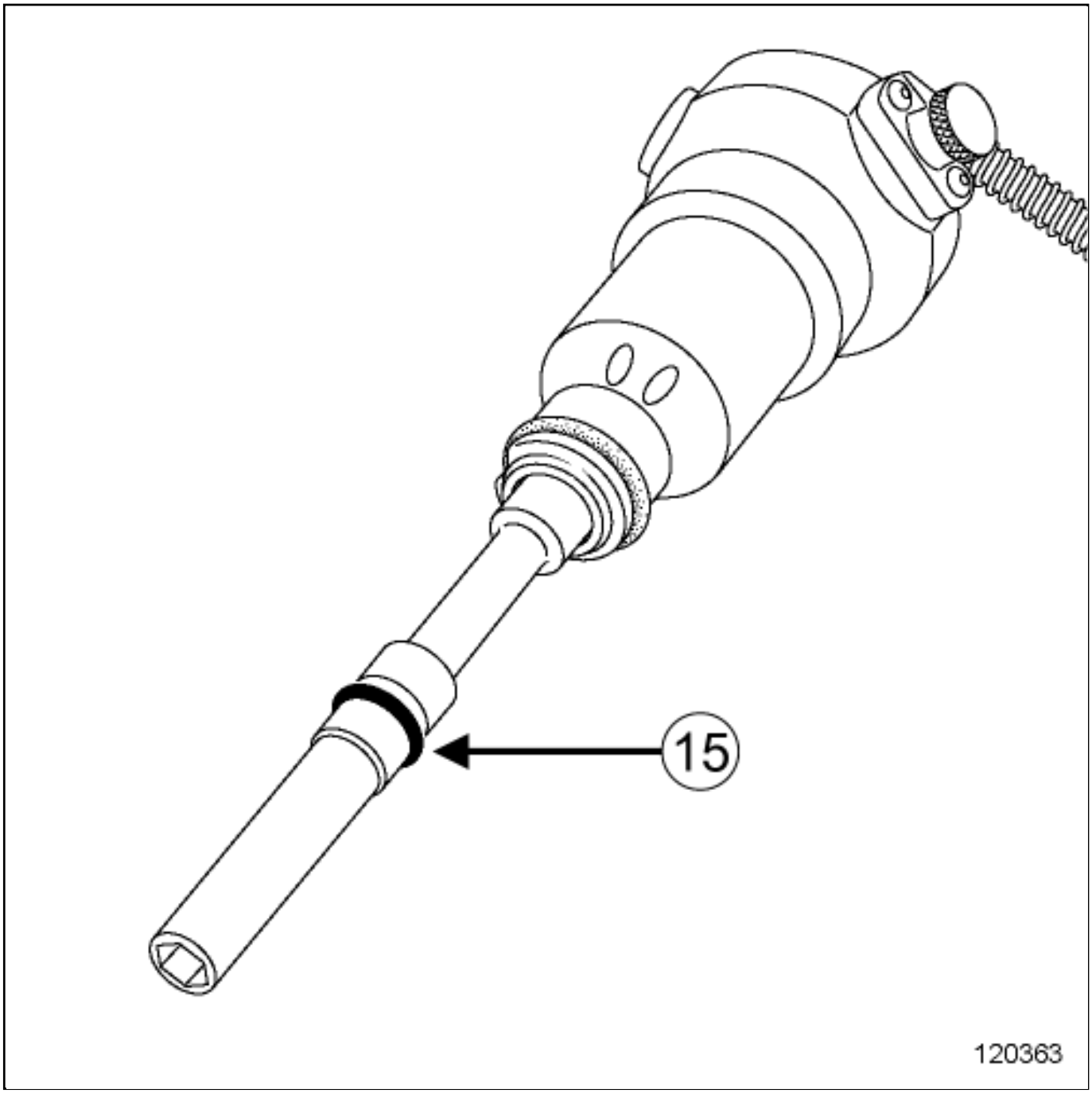


Refit the O-ring(10) into its neck to hold the pins in place.



Fit the socket(7) or (8) to the extension piece.

Insert the retaining pin(14) into the socket.

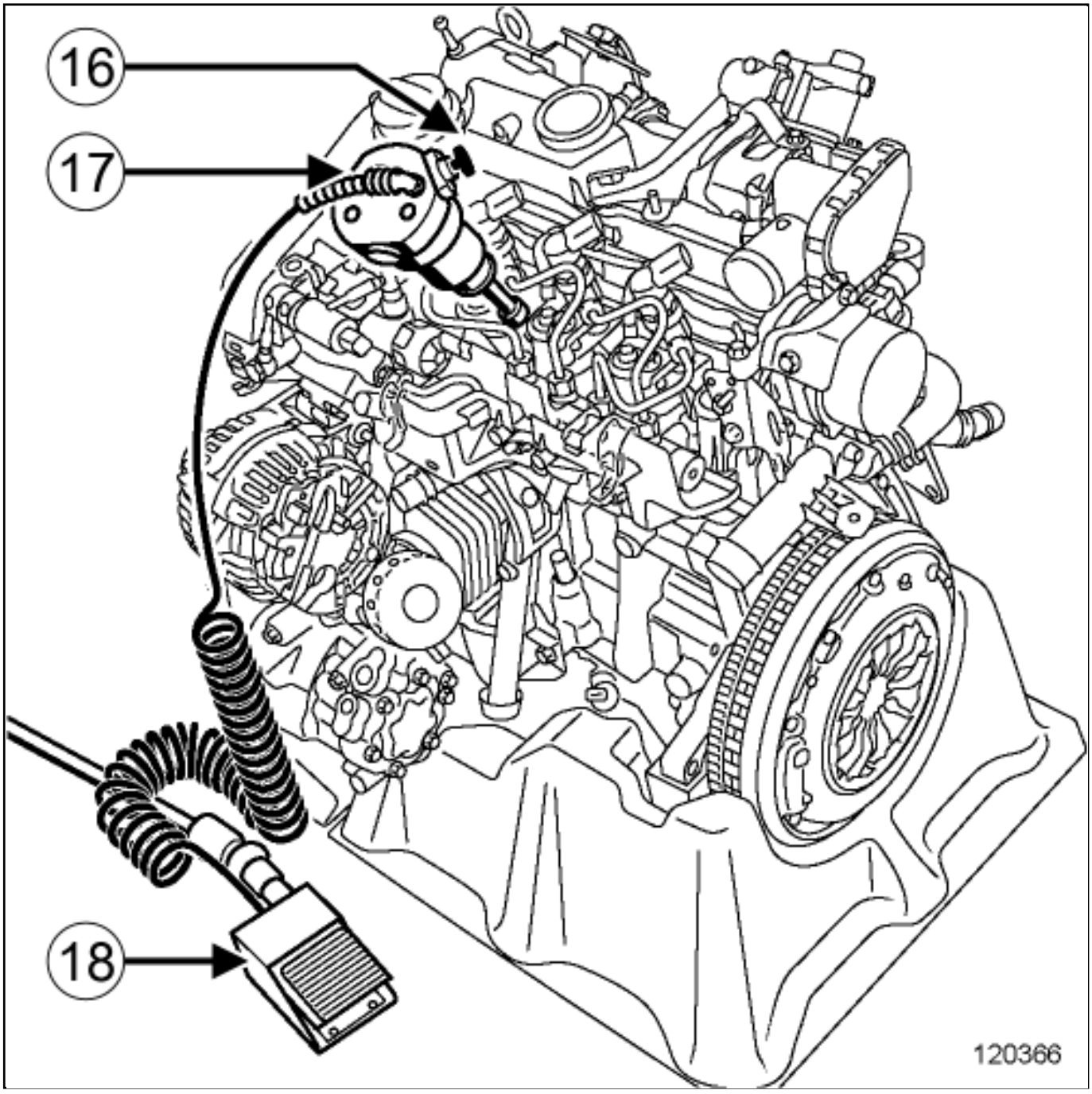


Fit the O-ring(15) into its neck to hold the pin in place.

Place:

- the cut-resistant gloves,
- the protective goggles.

Spray releasing agentonto the base of the heater plug.



Check that the air supply tap(16) on the vibropac is closed.

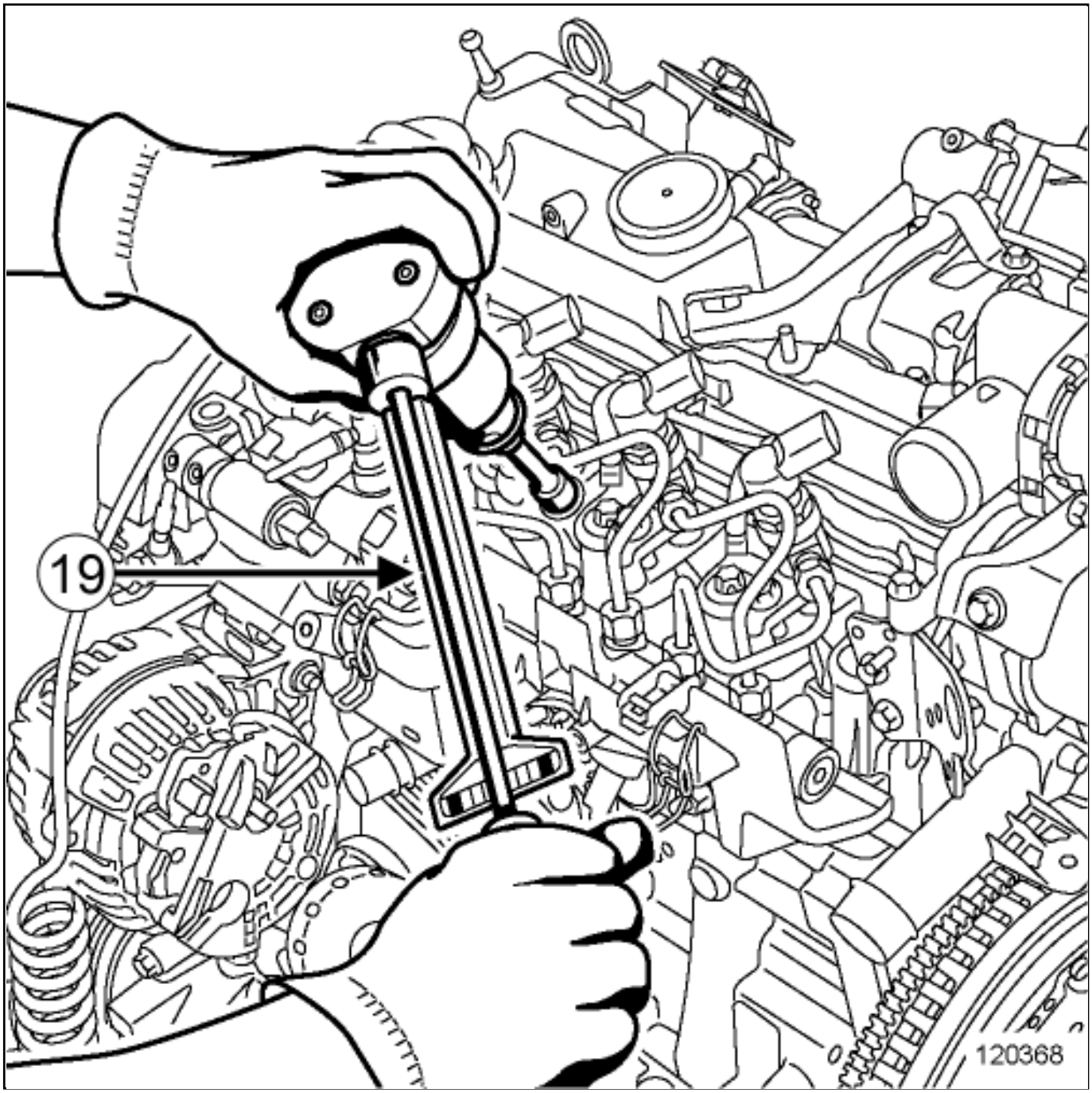
Place the vibropac onto the heater plug(17) .

Connect the air inlet to the control pedal(18) .

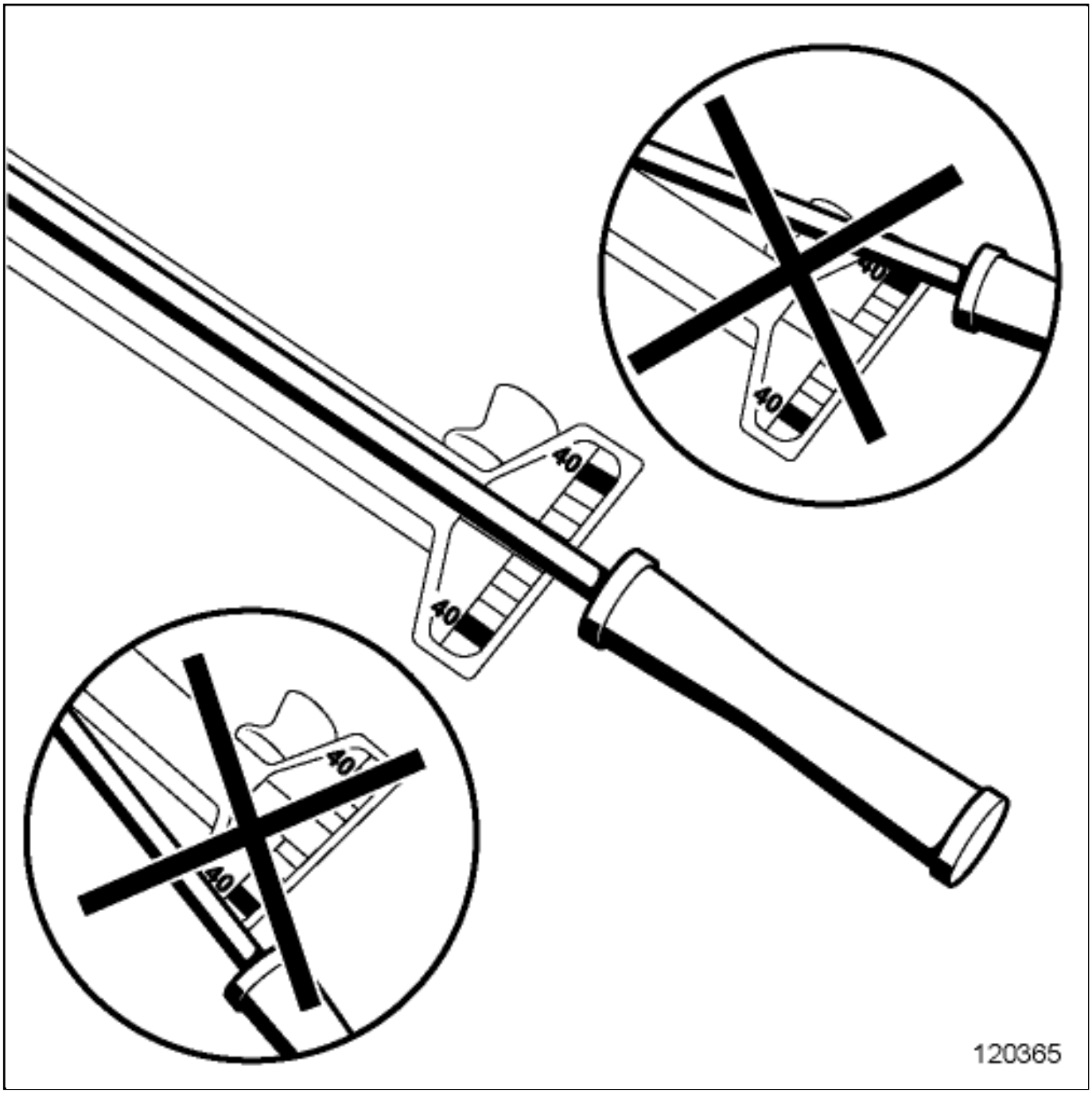
- Press on the control pedal.
- Gradually open the air supply tap on the vibropac.
- Let the vibropac run for about 20 seconds.
-

Undo the heater plug using the vibropac (while it is running). If the heater plug does not come undone, carry out the following operations.

Spray releasing agentonto the base of the heater plug (if necessary).



Place the torque bar(19) onto the vibropac.



- Run the vibropac while carrying out a tightening - loosening movement with the torque bar (without exceeding the torque value of 40 N.m) so as not to damage the heater plug.

- Stop the vibropac occasionally and spray releasing agent (if necessary) onto the base of the heater plug.

- Carry out the previous operations until the heater plug is removed.

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HEATER PLUGS: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
hinged wrench for heater plug
compressed air nozzle
heater plug removal tool

WARNING

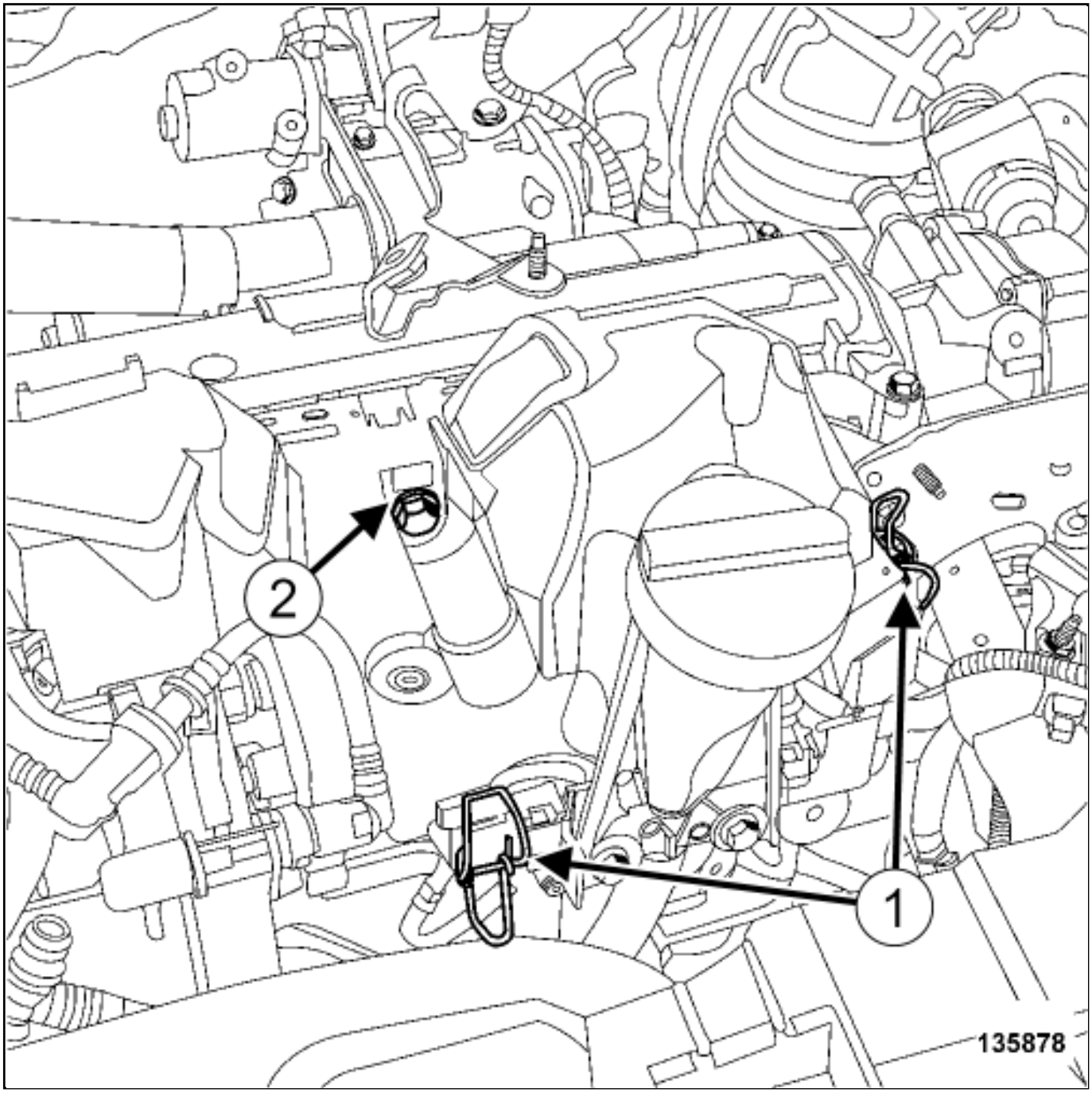
Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

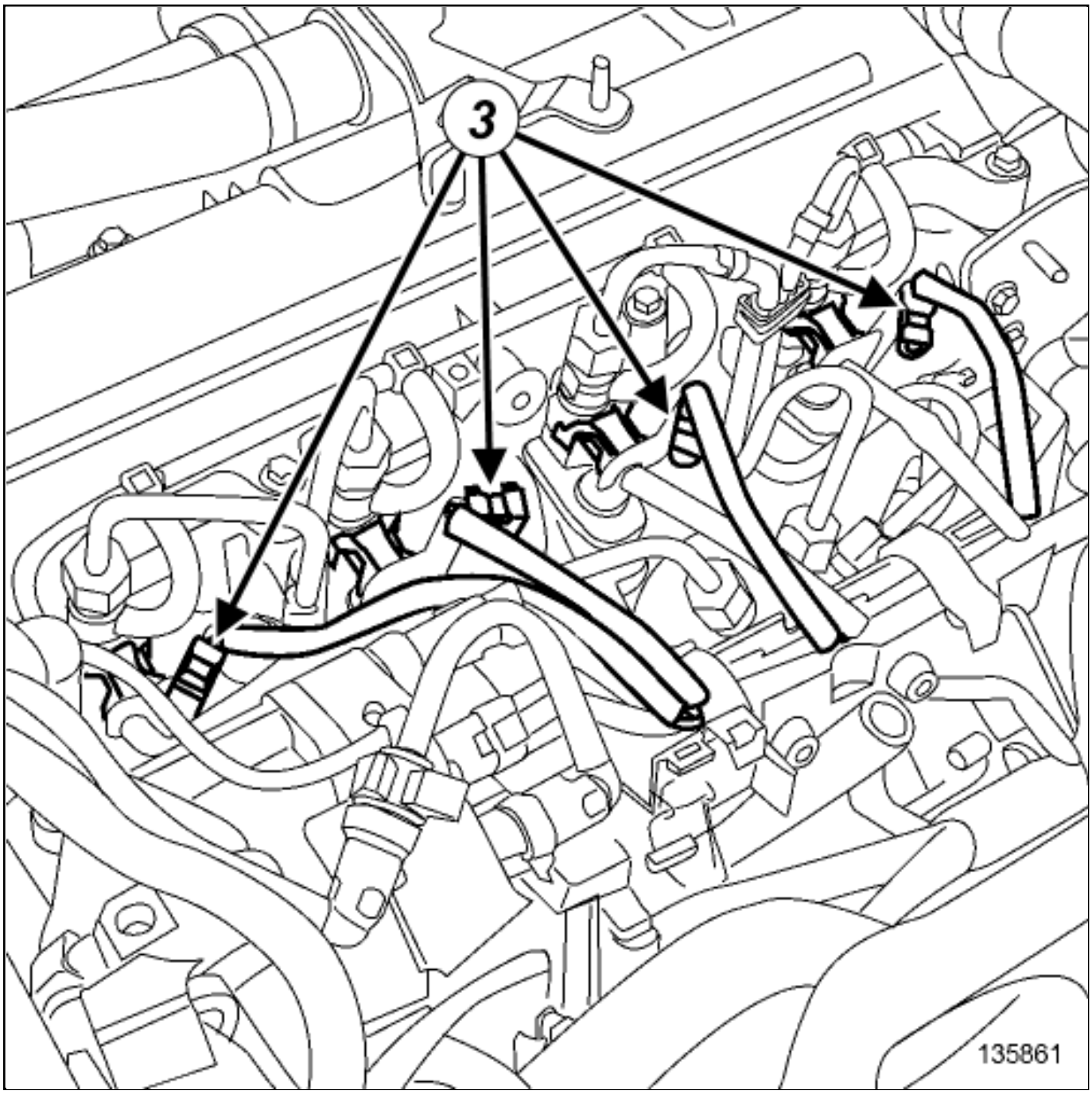
- the engine cover,
- the turbocharger air outlet pipe**Intercooler air inlet pipe: Removal - Refitting** .



- Unclip the injector rail protector cover at(1) .

- Remove:
  - the injector rail protector cover bolt(2) ,
  - the injector rail protector cover,

2. OPERATION FOR REMOVAL OF PART CONCERNED

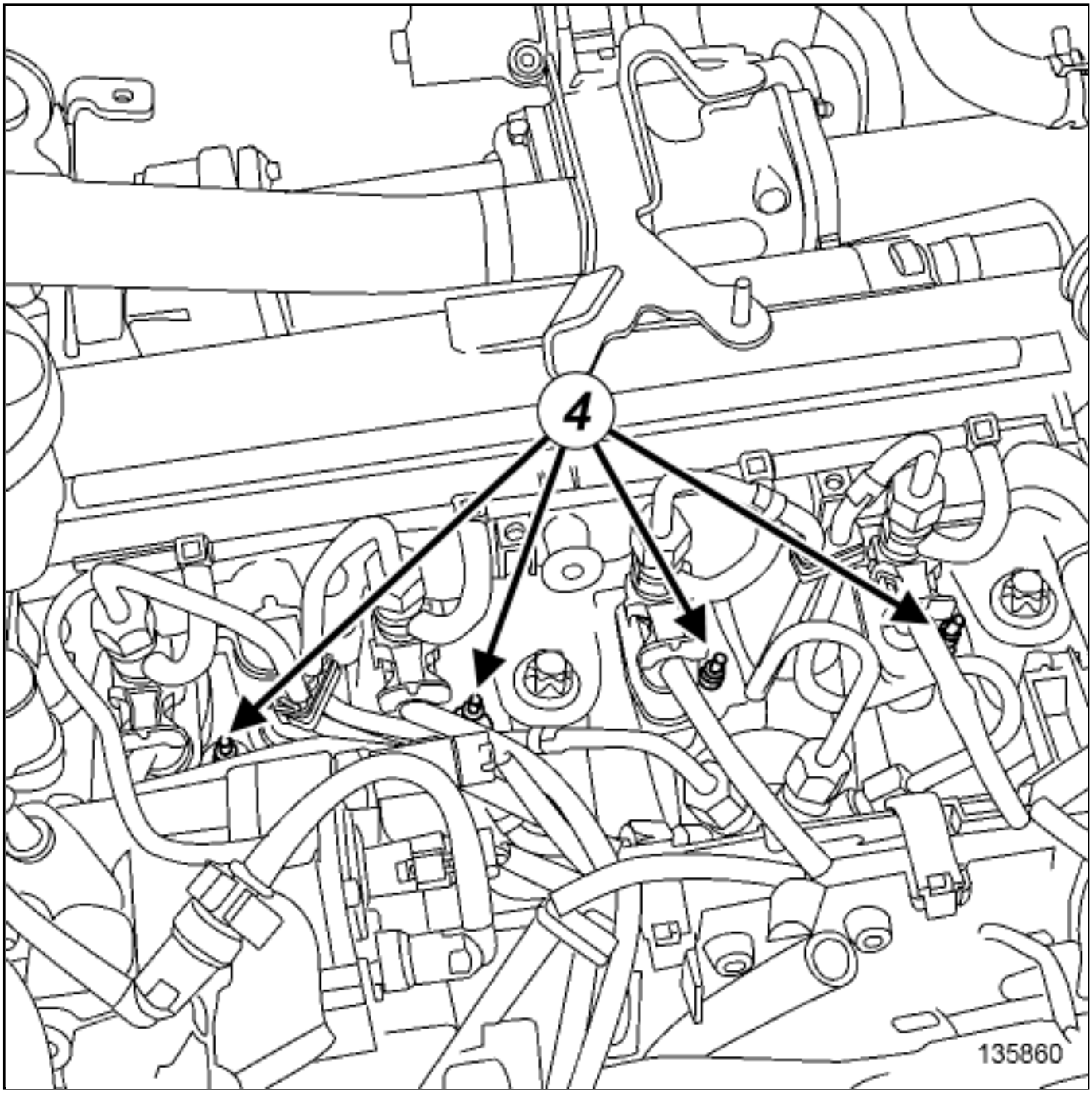


- Disconnect the connector(3) from each heater plug.

WARNING

Wear goggles with side protectors for this operation.

- Clean around the outside of the heater plugs with a compressed air nozzleto prevent any impurities from entering the cylinders.



Note:

If the heater plugs are seized, use the heater plug removal tool(see Heater plug removal tool: Use) (Technical Note 5197A, 06A, Tooling).

Unscrew the heater plugs(4) using a 10 mmlong radio socket connected to a universal joint or a hinged wrench for heater plug.

Use a hose to unscrew the heater plugs completely(4) .

Remove the heater plugs.

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Without tightening, fit the heater plugs using the hose.

Torque tighten the heater plugs15 N.m.

Connect the connector for each heater plug.

2. FINAL OPERATION

Refit the injector rail protector cover.

Clip on the injector rail protector cover.

Refit:

- the turbocharger air outlet pipe**Intercooler air inlet pipe: Removal - Refitting** ,
- the engine cover.

HEATING RESISTORS: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the dashboardDashboard assembly: Exploded view .

2. REMOVAL OPERATION

- Disconnect the heating resistor connector(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

- Remove the heating resistor(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REFITTING

- Proceed in the reverse order to removal.

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HIGH PRESSURE PIPE BETWEEN PUMP AND RAIL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Offset wrench for tightening High Pressure pump pipes.	

parts always to be replaced:

High pressure pipe between the pump and rail

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 13B, Diesel injection, Diesel injection: Precautions for the repair)**

WARNING

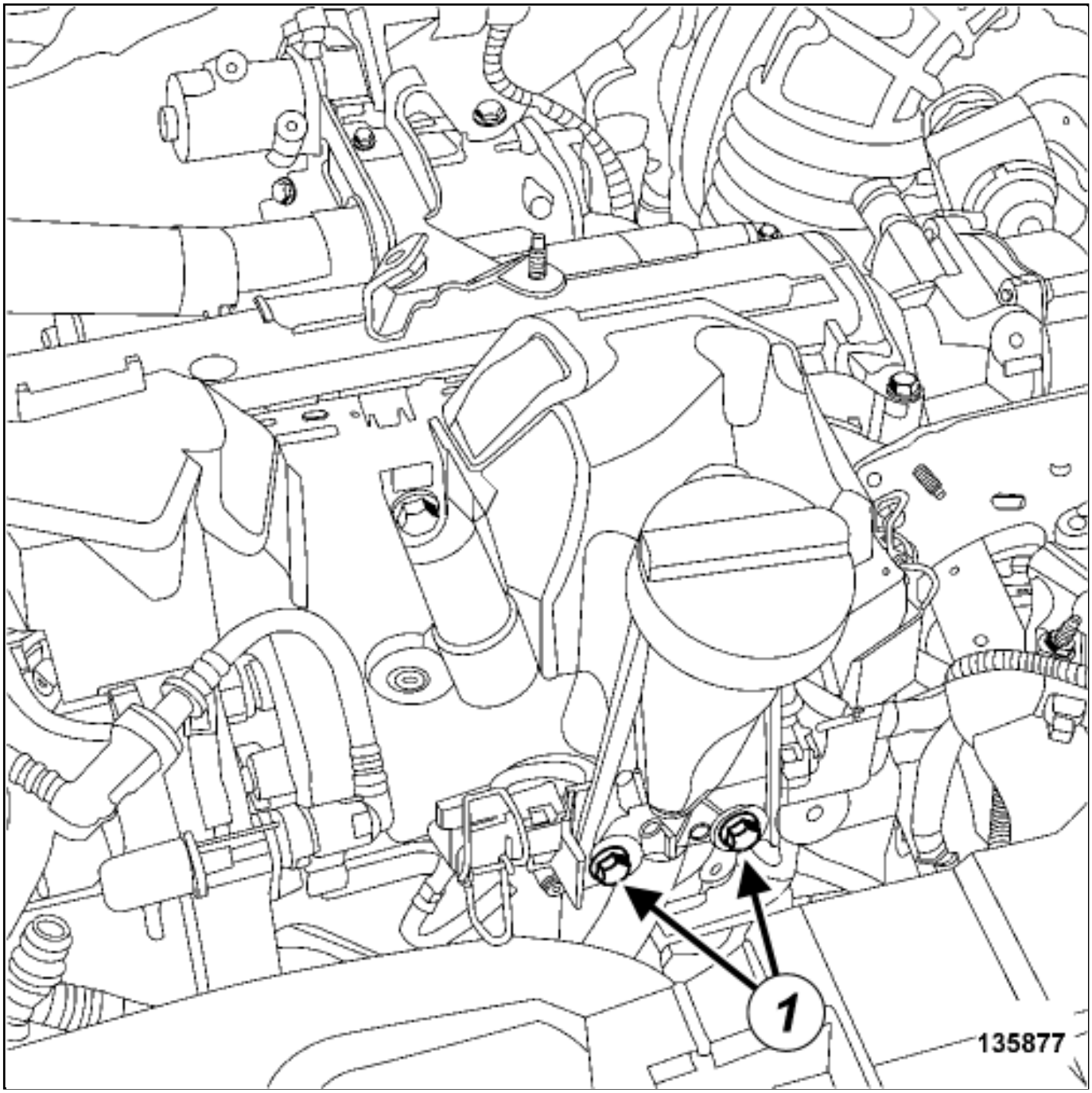
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery(see **Battery: Removal - Refitting**) .

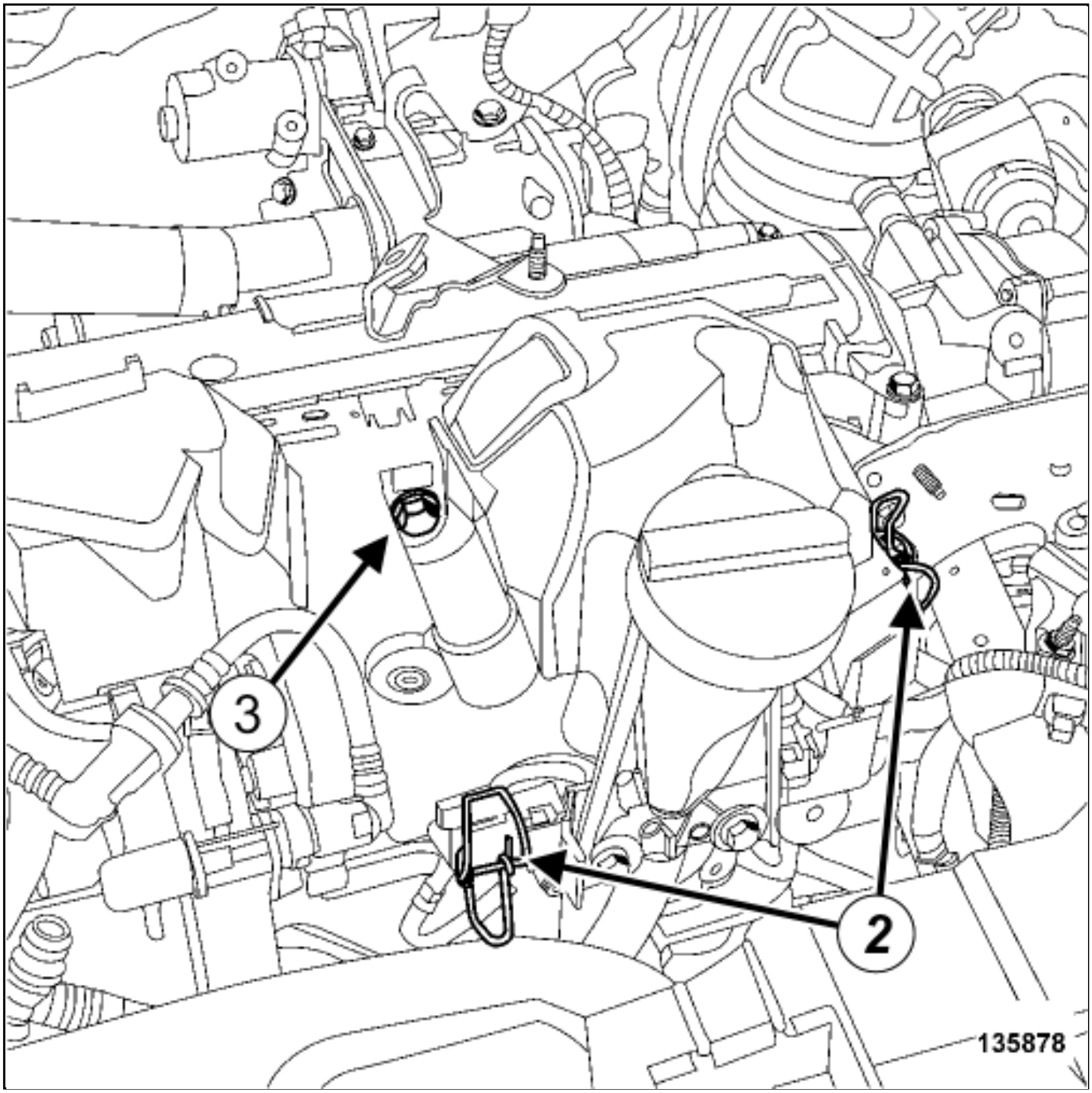
Remove the turbocharger outlet air pipe[Intercooler air inlet pipe: Removal - Refitting] .



Remove:

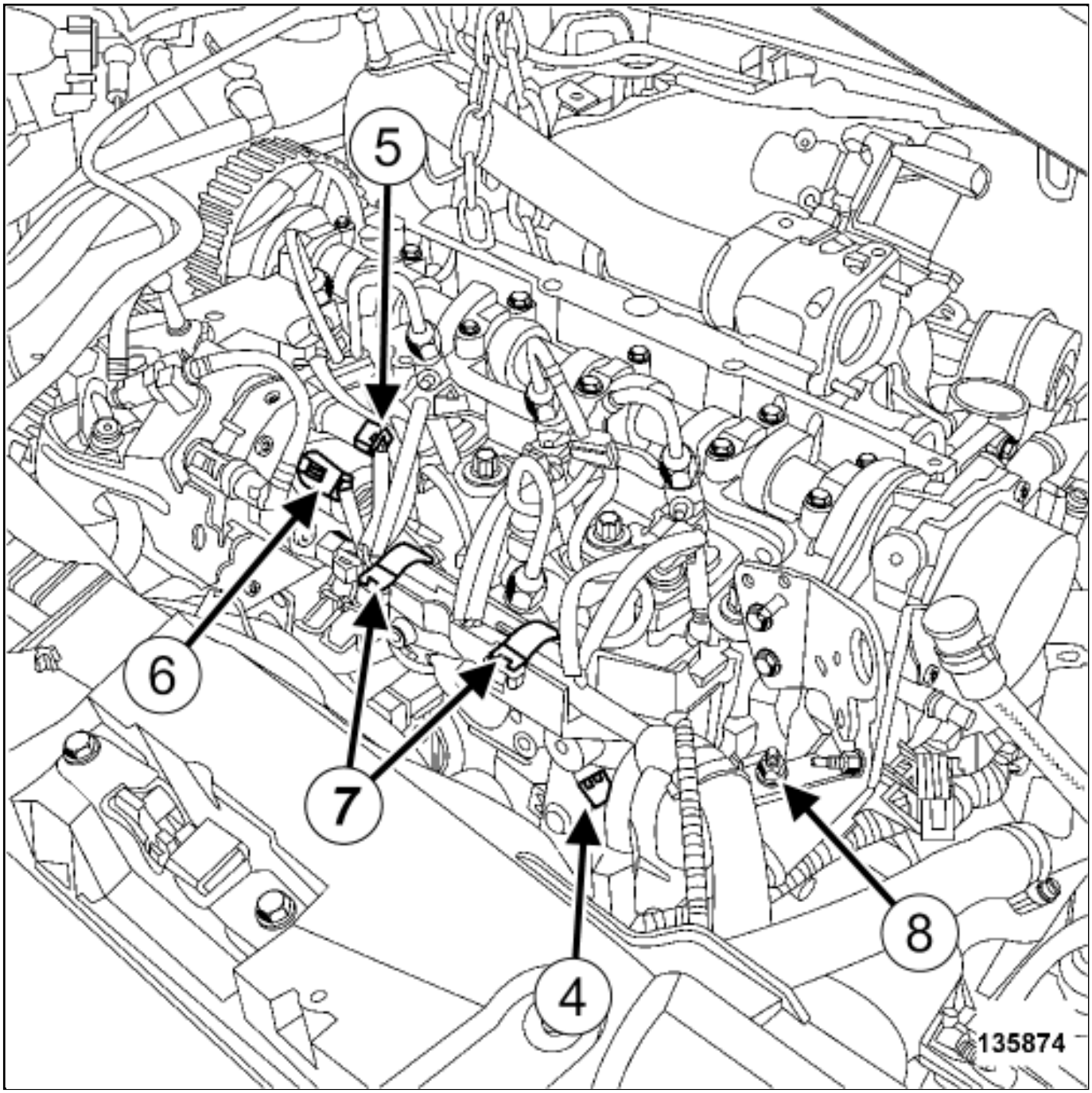
- the dipstick,
- the dipstick guide bolts(1) .

Move aside the dipstick guide.



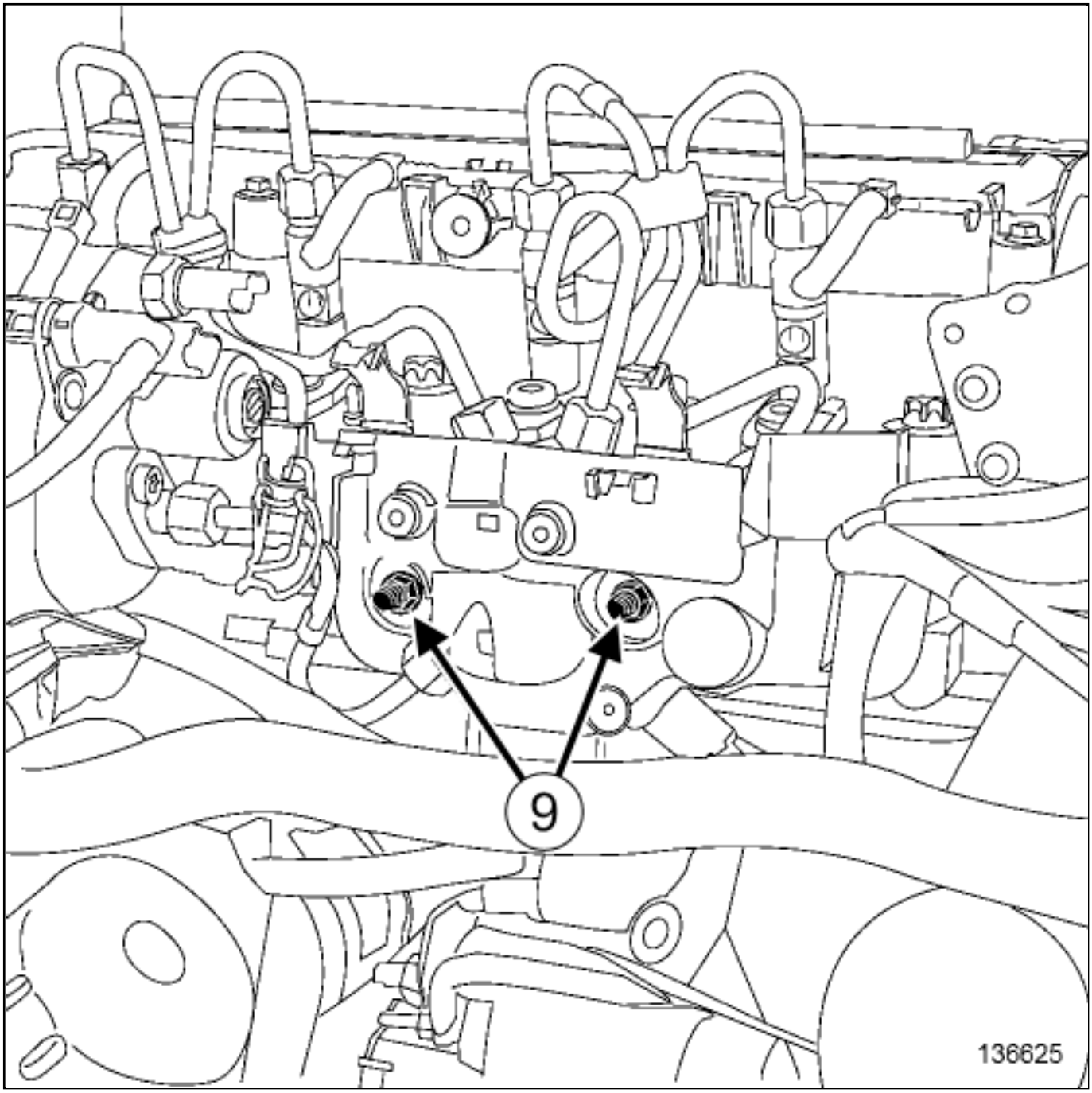
- Unclip the injector rail protector cover at(2) .

- Remove
  - the injector rail protector cover bolt(3) ,
  - the injection rail protector cover,



- Disconnect:
  - the connector(4) from the injector rail pressure sensor,
  - the fuel temperature sensor connector(5) ,
  - the connector(6) for the fuel flow regulation solenoid valve,
  - all heater plug connectors,
  - the connector for each diesel injector.
- Unclip the injection wiring clips(7) .
- Remove the nut(8) from the injection wiring bracket.

Move aside the injection wiring.



Remove:

- the nuts(9) from the injector rail protector,
- the injector rail protector.

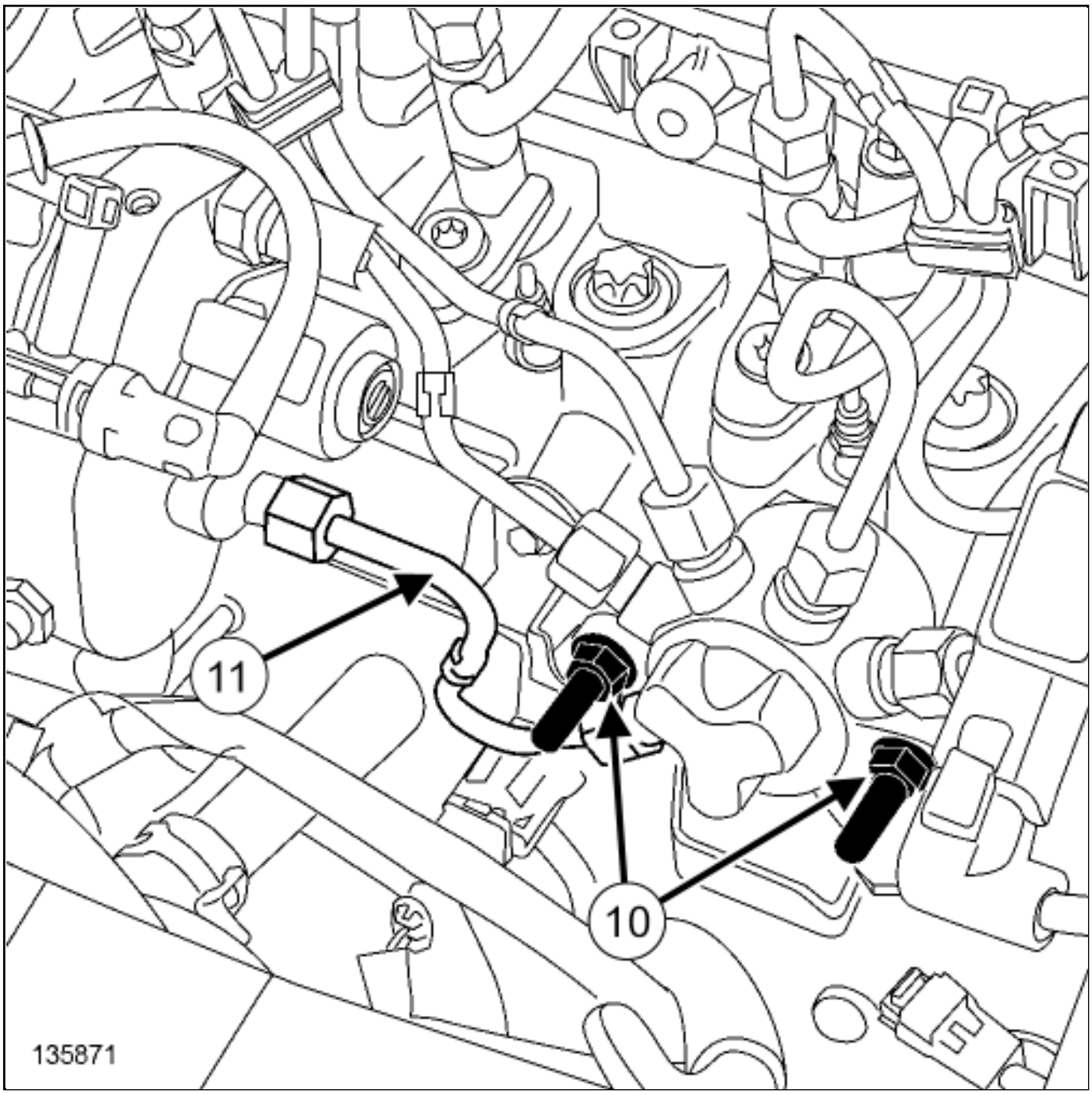
2. REMOVAL OPERATION

Clean the unions of the high pressure pipes between the high pressure pump and the injector rail

(see 13B, Diesel injection, Diesel injection: Precautions for the repair)

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.



CAUTION

Always hold the intermediate injector union in place with a wrench when loosening the high pressure pipes.

Do not damage the injector return nozzle.

Undo the injector rail nuts(10) .

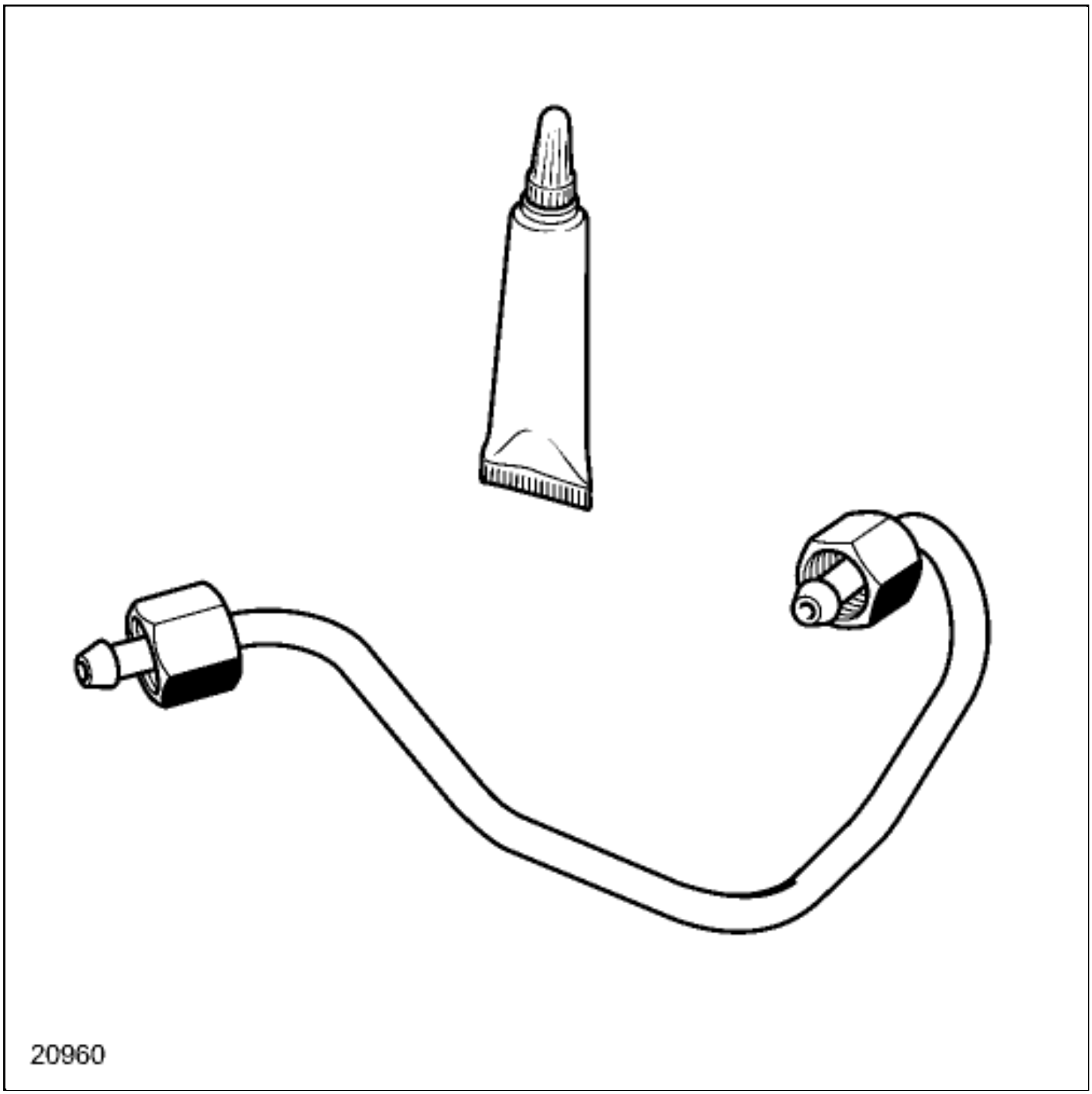
Remove the high pressure pipe(11) between the high pressure pump and the injector rail.

Place a suitable blanking plug on:

- the high pressure pump opening,
- the injector rail opening.

REFITTING

1. REFITTING PREPARATION OPERATION



CAUTION

Before fitting a new high pressure pipe, lightly lubricate the nut threads with the oil from the applicator provided in the new parts kit.

Be careful not to allow oil into the high pressure pipe.

Do not lubricate high pressure pipes supplied without an applicator, as these high pressure pipes are self-lubricating.

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

parts always to be replaced: High pressure pipe between the pump and rail .

2. REFITTING OPERATION

Remove the blanking plug from:

- the high pressure pump opening,
- the injector rail opening.

Fit the new high pressure pipe between the injector rail and the high pressure pump.

Screw on the nuts for the high pressure pipe between the high pressure pump and the injector rail by hand without tightening, starting at the injector rail end.

Using the toolOffset wrench for tightening High Pressure pump pipes. , torque tighten the nuts for the high pressure pipe between the high pressure pump and the injector rail28 N.m.

Torque tighten the injector rail nuts28 Nm .

3. FINAL OPERATION

Refit the injector rail protector.

Fit the injection wiring.

Refit the injection wiring bracket nut.

Clip on the injection wiring clip.

Connect:

- the connector for each diesel injector,
- all heater plug connectors,
- the connector for the fuel flow regulation solenoid valve,
- the fuel temperature sensor connector,
- the injector rail pressure sensor connector.

Refit:

- the injector rail protector cover,
- the injection rail protector cover bolt.

Clip on the injector rail protector cover plate.

Fit the dipstick guide tube.

Refit:

- the dipstick guide bolts,
- the dipstick.

Refit the turbocharger air outlet pipe**Intercooler air inlet pipe: Removal - Refitting** .

Connect the battery**Battery: Removal - Refitting** .

Reprime the fuel circuit using the manual priming pump.

Check that there are no diesel leaks(see **High pressure pipe: Check**) .

HIGH PRESSURE PIPE BETWEEN RAIL AND INJECTOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Offset wrench for tightening High Pressure pump pipes.	
Set of high pressure pipe removal wrenches (diameter 14,17,19)	

parts always to be replaced:
High pressure pipe between the rail and injector

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 13B, Diesel injection, Diesel injection: Precautions for the repair)** .

WARNING

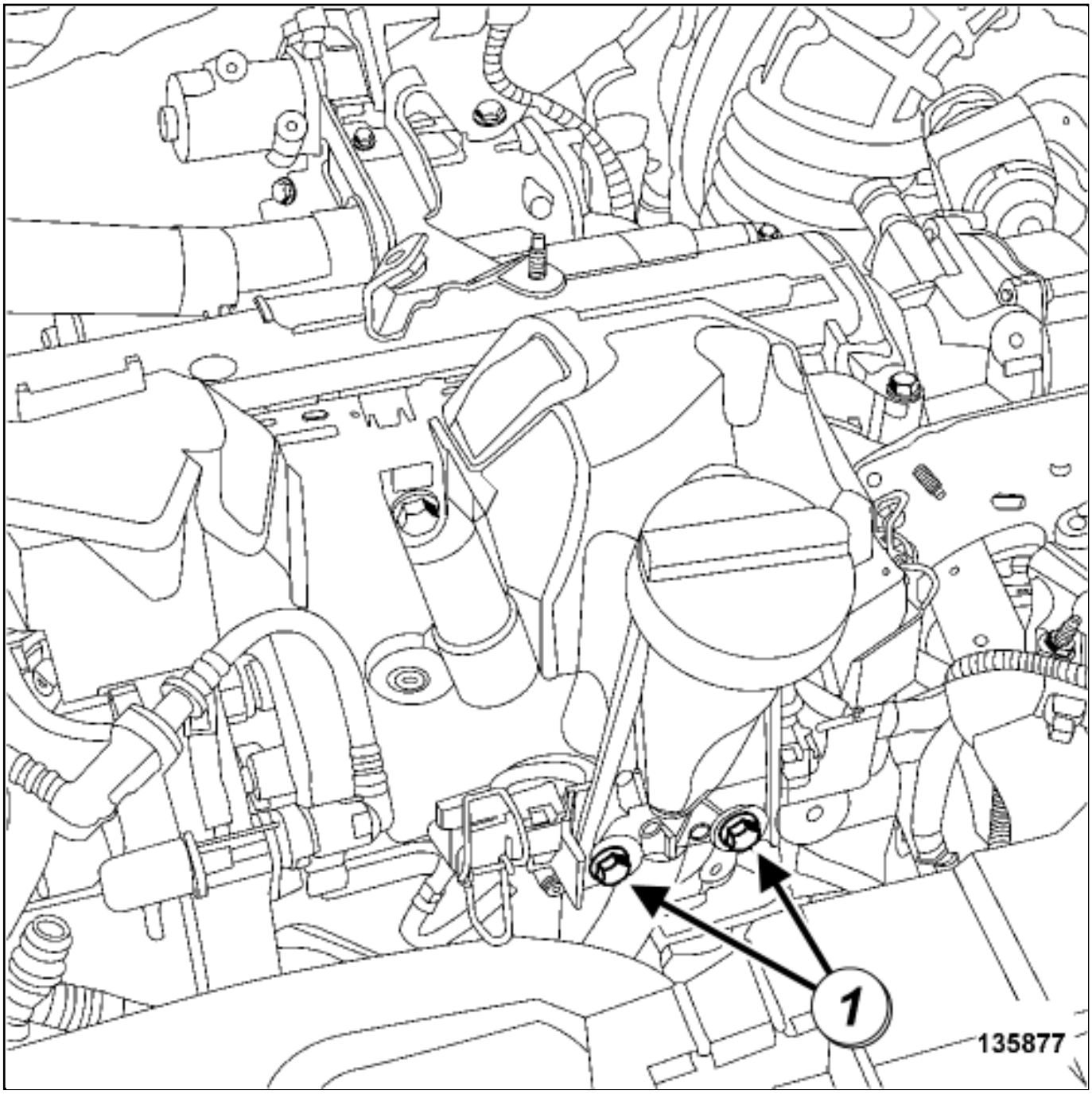
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery(see **Battery: Removal - Refitting**) .

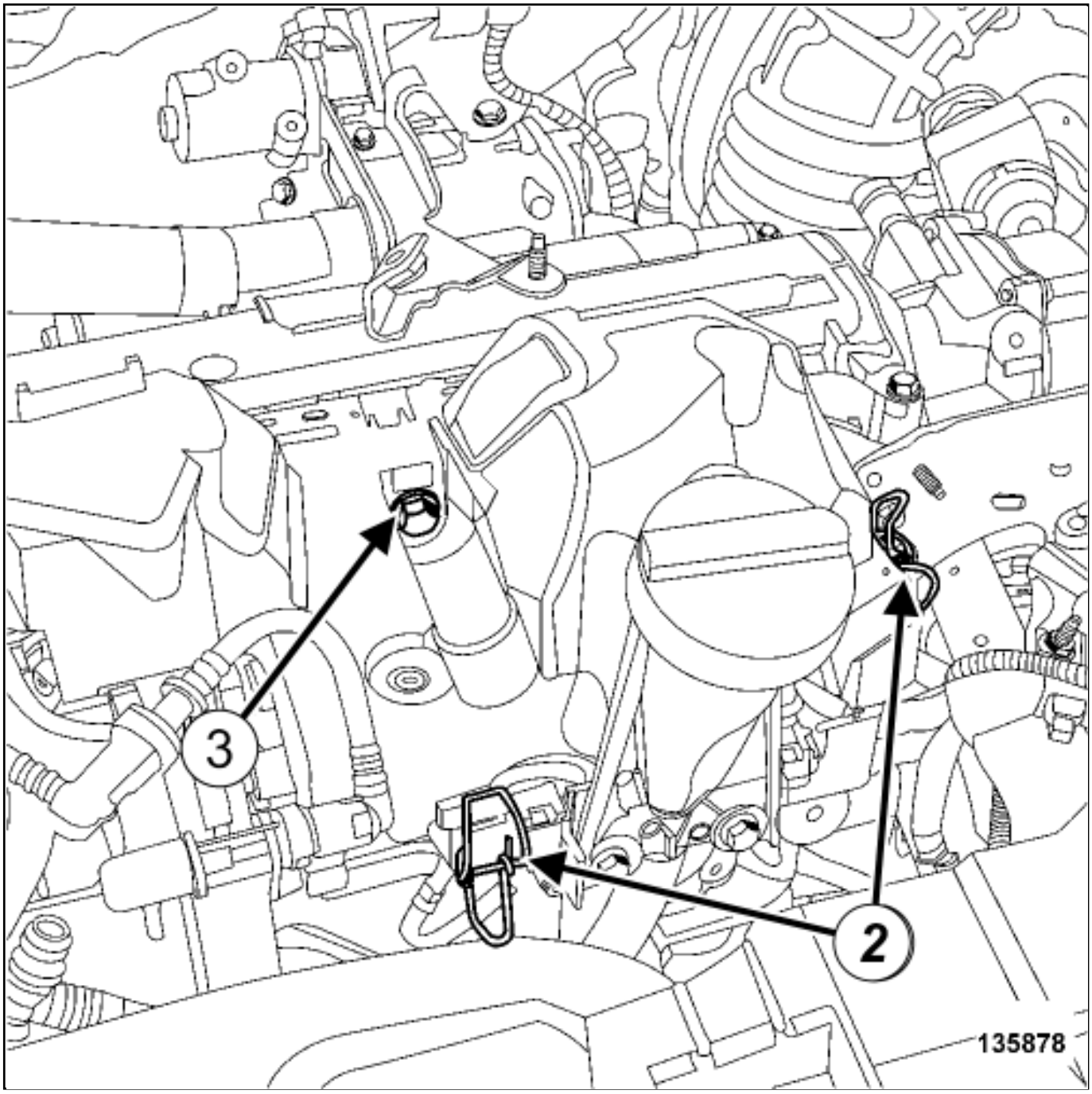
- Remove the turbocharger air outlet pipe**Intercooler air inlet pipe: Removal - Refitting** .



- Remove:

  - the dipstick,
  - the dipstick guide bolts(1) .

- Move aside the dipstick guide.

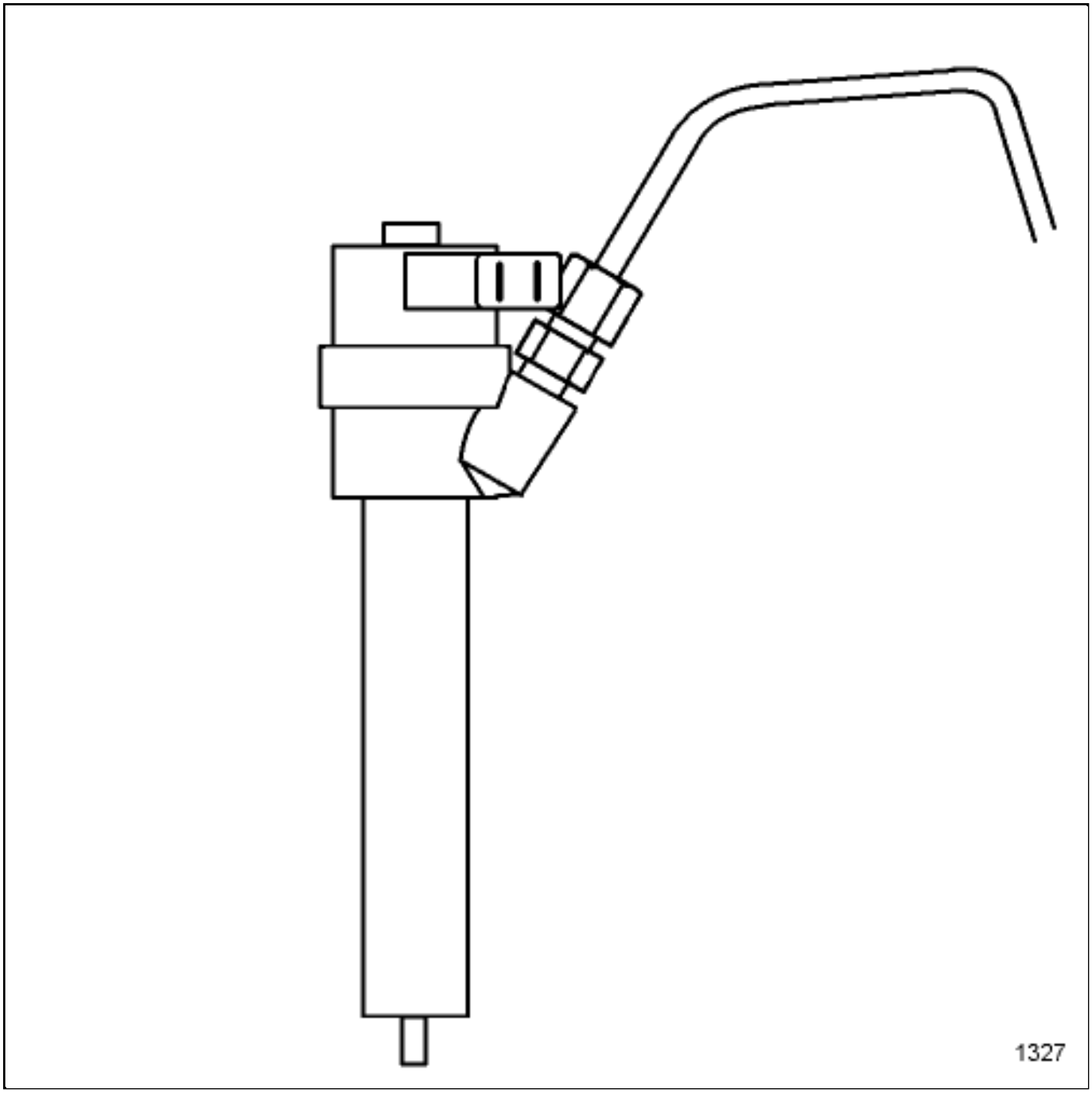


- Unclip the injector rail protector cover at(2) .

- Remove:
  - the injector rail protector cover bolt(3) ,
  - the injection rail protector cover,

- Clean the high pressure pipe unions between the rail and the diesel fuel injectors(see 13B, Diesel injection , Diesel injection: Precautions for the repair) .

2. REMOVAL OPERATION



CAUTION

Always hold the intermediate injector union in place with a wrench when loosening the high pressure pipes.

Do not damage the injector return nozzle.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

Loosen the nuts for the high pressure pipe(s) between the injector rail and the diesel fuel injector(s), using the toolSet of high pressure pipe removal wrenches (diameter 14,17,19) .

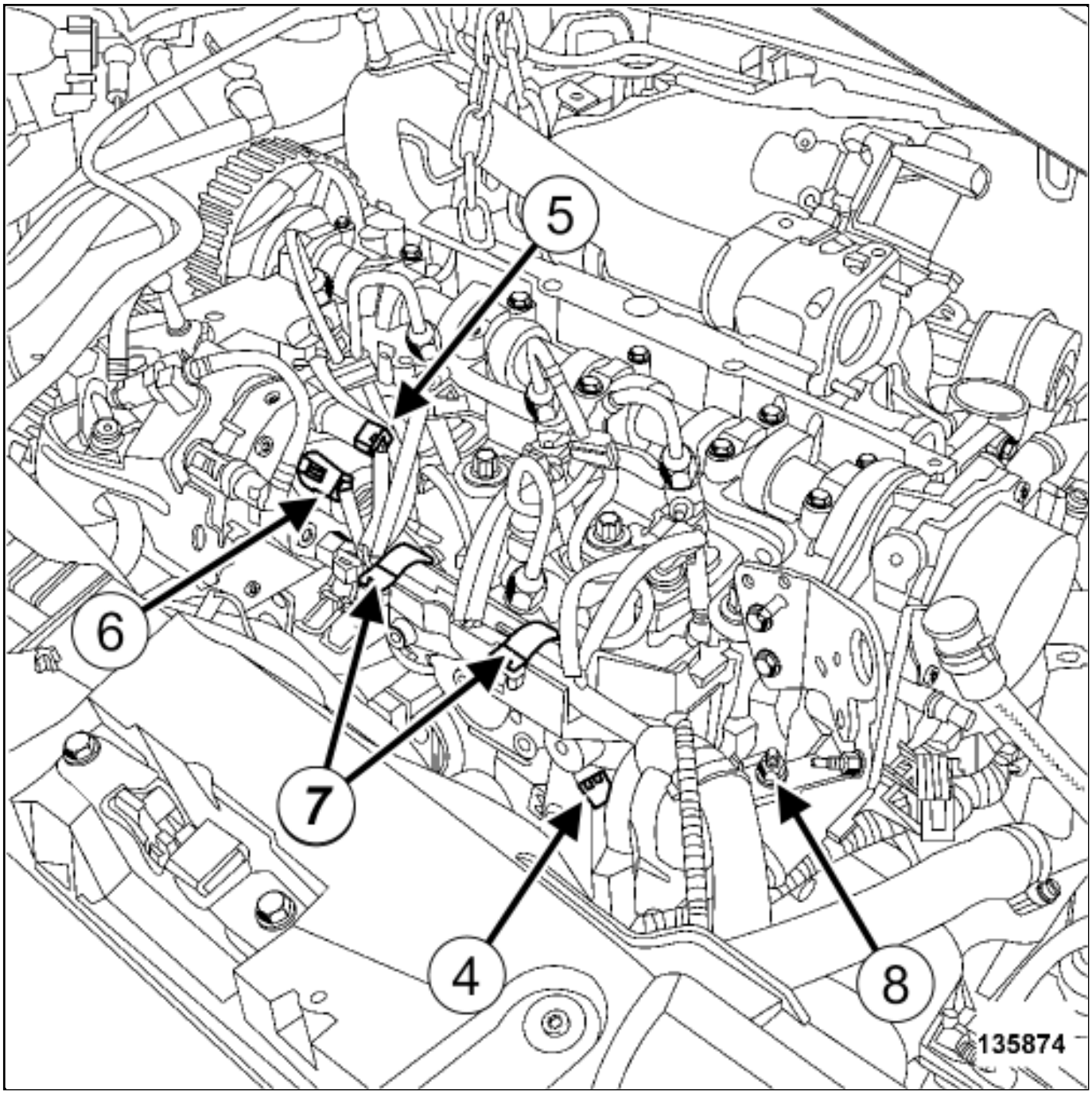
Remove:

- the nuts for the high pressure pipe(s) between the injector rail and the diesel fuel injector(s) on the injector rail side,
- the nuts for the high pressure pipe(s) between the injector rail and the diesel fuel injector(s) on the injector side,
- the high pressure pipes between the injector rail and the diesel injectors concerned.

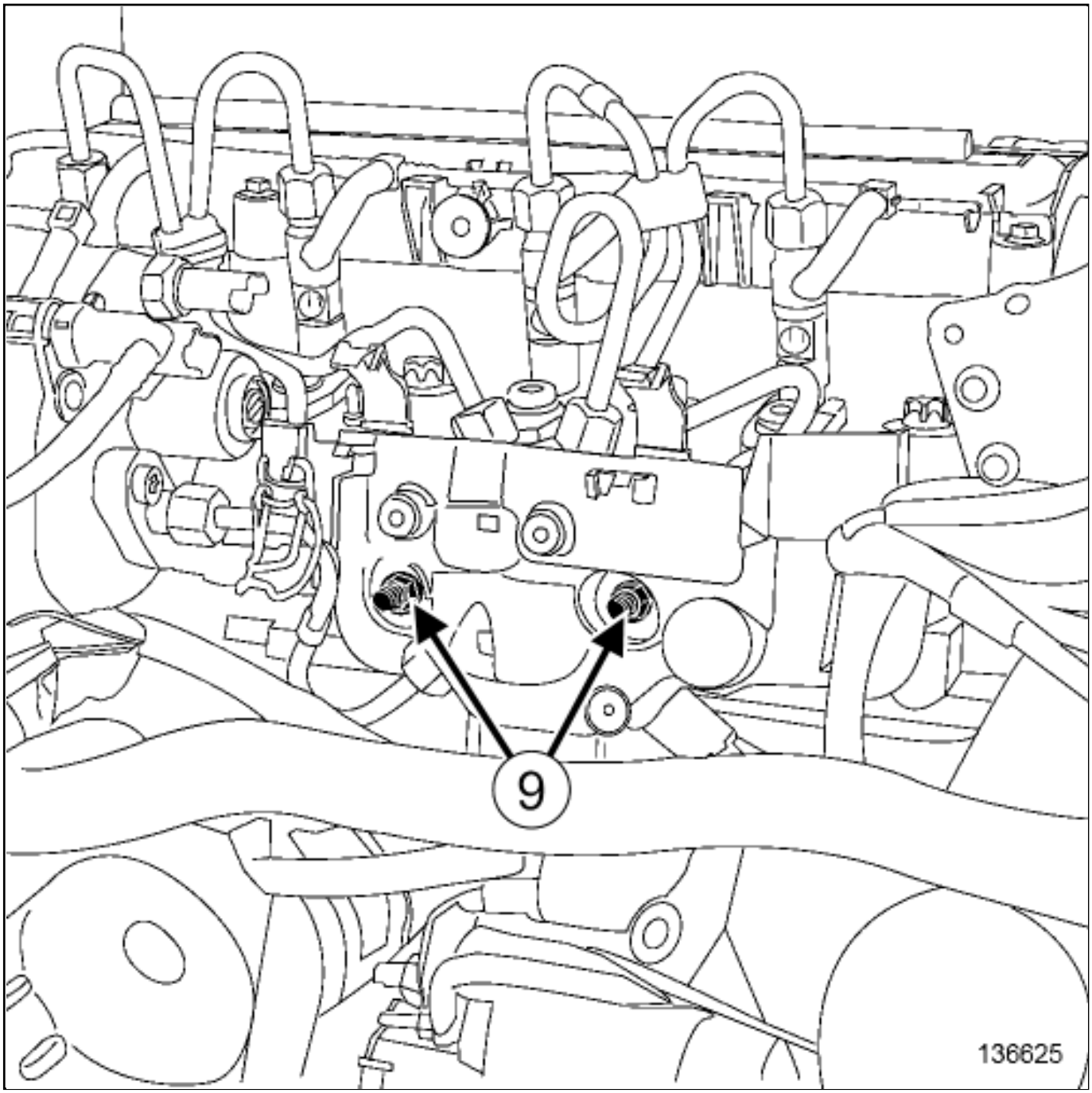
Fit suitable blanking plugs on:

- the opening(s) on the injector rail,
- the opening of the diesel fuel injector(s).

2- REMOVING THE FOUR HIGH PRESSURE PIPES

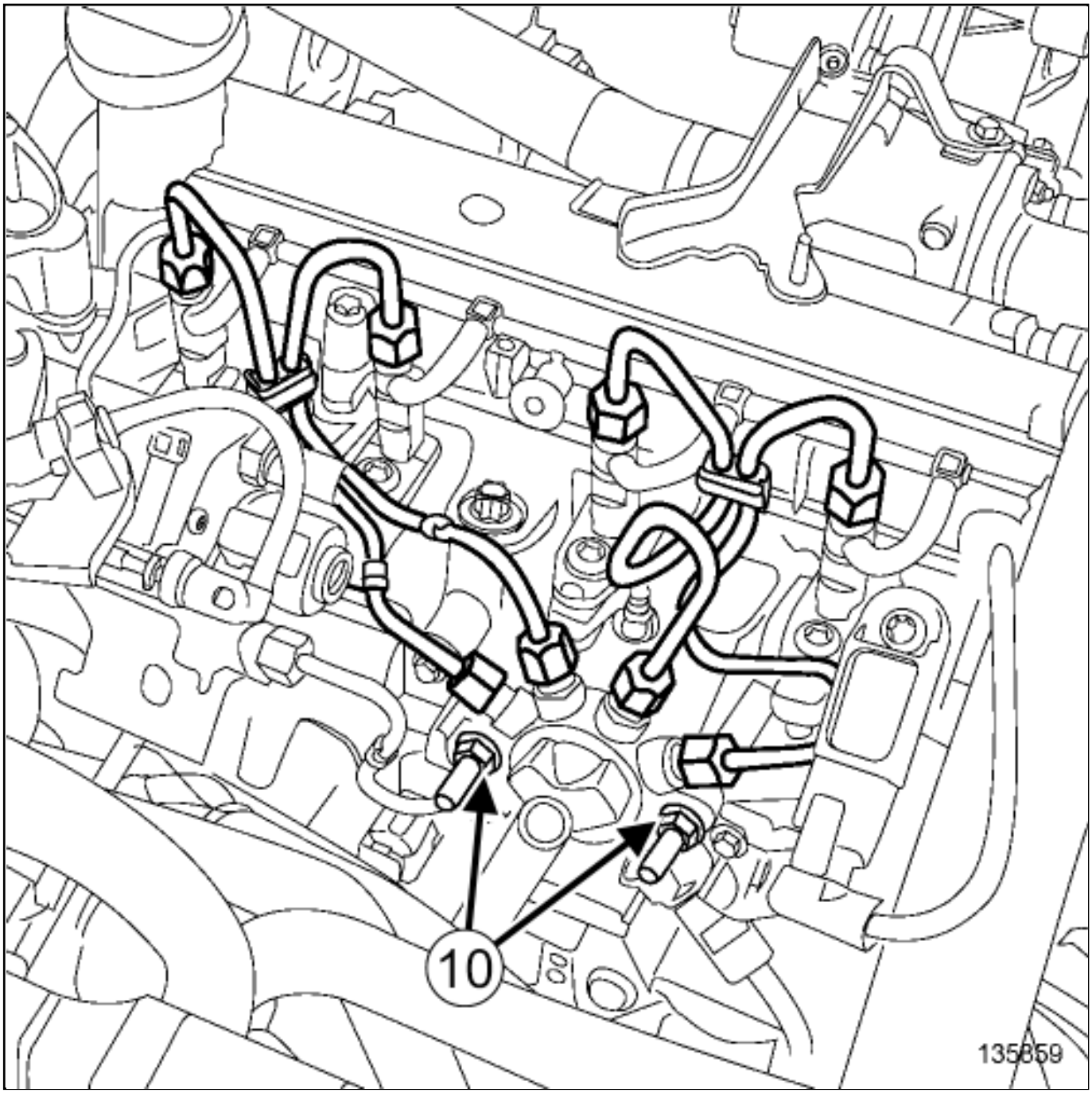


- Disconnect:
  - the connector(4) from the injector rail pressure sensor,
  - the fuel temperature sensor connector(5) ,
  - the connector(6) for the fuel flow regulation solenoid valve,
  - all heater plug connectors,
  - the connector for each diesel injector.
- Unclip the injection wiring clips(7) .
- Remove the nut(8) from the injection wiring bracket.
- Separate the injection wiring.

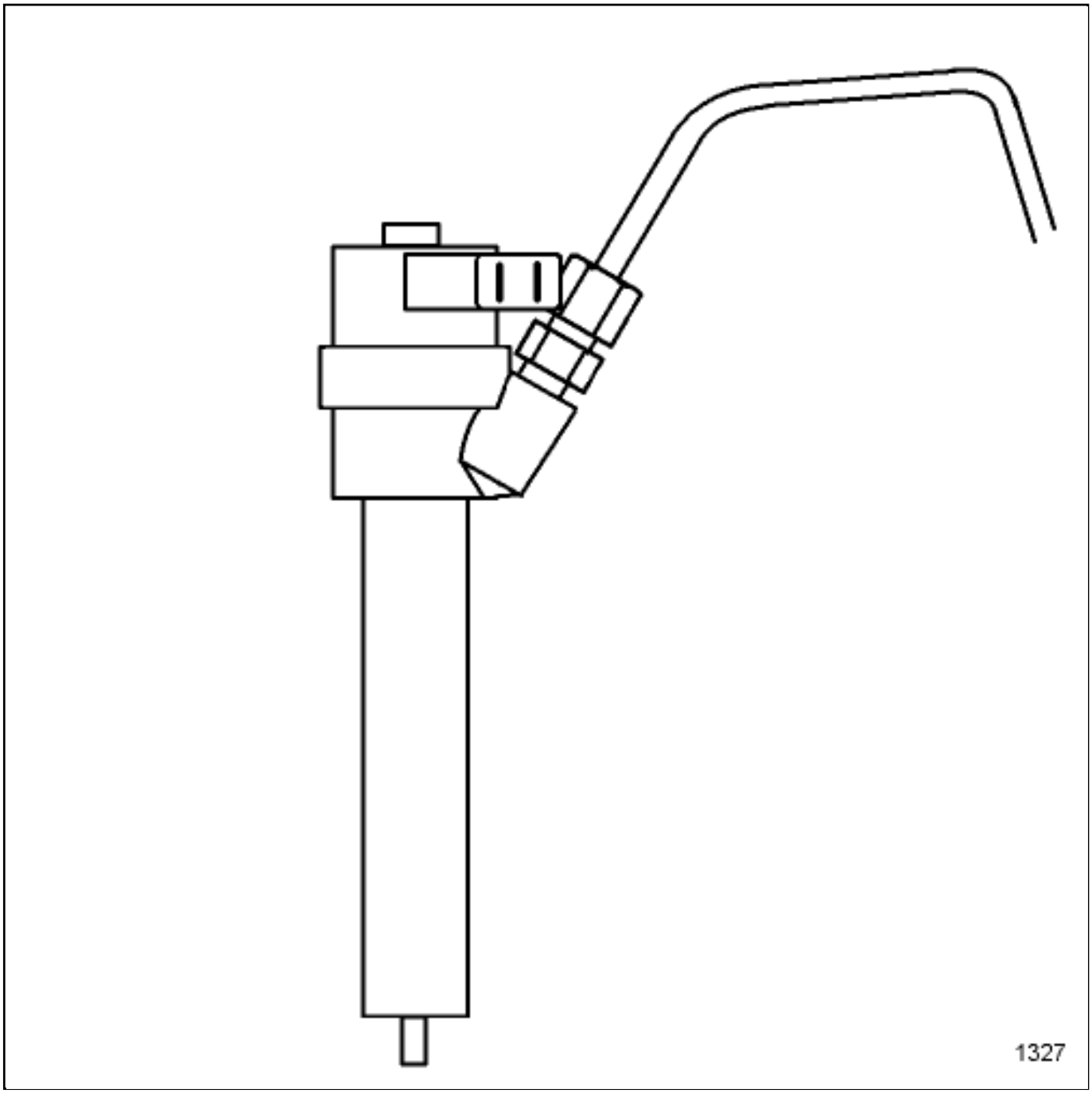


Remove:

- the nuts(9) from the injector rail protector,
- the injector rail protector.



- Undo the injector rail nuts(10) .



CAUTION

Always hold the intermediate injector union in place with a wrench when loosening the high pressure pipes.

Do not damage the injector return nozzle.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

Undo the high pressure pipe nuts between the rail and the injector using the toolSet of high pressure pipe removal wrenches (diameter 14,17,19) .

Remove:

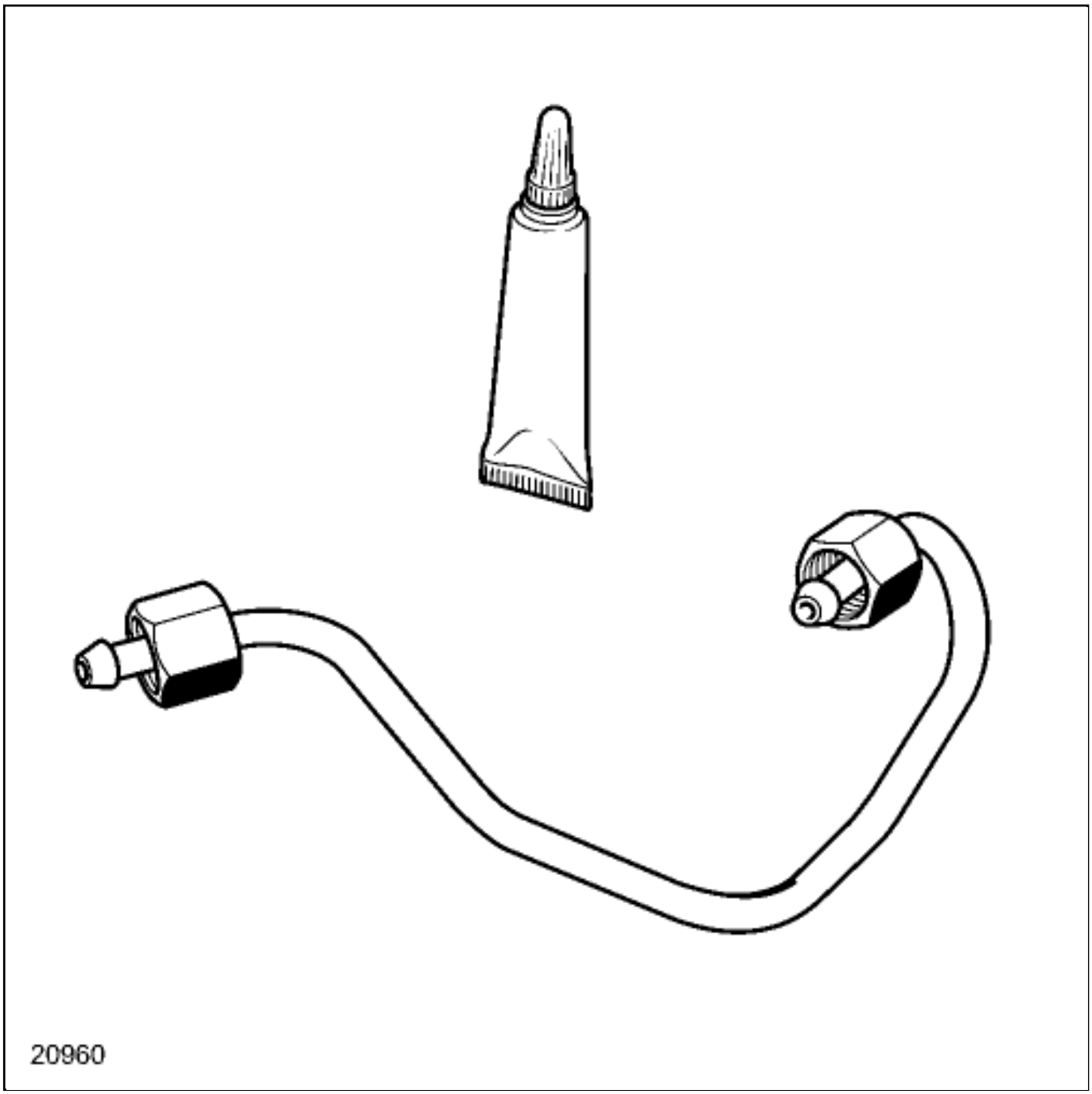
- the nut for the high pressure pipes between the injector rail and the diesel fuel injectors on the injector rail side,
- the nut for the high pressure pipes between the injector rail and the diesel fuel injectors on the injector side,
- the high pressure pipes between the injector rail and the diesel fuel injectors concerned.

Fit suitable blanking plugs on:

- the injector rail openings,
- the opening of each diesel injector.

REFITTING

1. REFITTING PREPARATION OPERATION



CAUTION

Before fitting a new high pressure pipe, lightly lubricate the nut threads with the oil from the applicator provided in the new parts kit.

Be careful not to allow oil into the high pressure pipe.

Do not lubricate high pressure pipes supplied without an applicator, as these high pressure pipes are self-lubricating.

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

parts always to be replaced: High pressure pipe between the rail and injector .

2. REFITTING OPERATION

1- REFITTING ONE, TWO OR THREE HIGH PRESSURE PIPES

Remove the blanking plugs from:

- the injector rail opening(s),
- the opening of the diesel injector(s).

Screw on the nuts for the high pressure pipe(s) between the injector rail and the diesel injector(s) by hand without tightening, starting on the injector rail side.

Using the toolSet of high pressure pipe removal wrenches (diameter 14,17,19) or the toolOffset wrench for tightening High Pressure pump pipes. , torque tighten the nuts for the high pressure pipe(s) between the injector rail and the diesel injector(s)28 N.m.

2- REFITTING THE FOUR HIGH PRESSURE PIPES

Remove the blanking plugs from:

- the injector rail openings,

- the opening of each diesel injector.

Screw on the nuts for the high pressure pipe(s) between the injector rail and the diesel injector(s) by hand without tightening, starting on the injector rail side.

Torque tighten:

- the injector rail nuts 28 N.m,
- using the toolSet of high pressure pipe removal wrenches (diameter 14,17,19) or the toolOffset wrench for tightening High Pressure pump pipes. the nuts for the high pressure pipes between the injector rail and the diesel injectors 28 N.m.

Refit the injector rail protector.

Fit the injection wiring.

Refit the injection wiring bracket nut.

Clip on the injection wiring clip.

Connect:

- the connector for each diesel injector,
- all heater plug connectors,
- the connector for the turbocharging fuel flow regulation solenoid valve,
- the fuel temperature sensor connector,

the injector rail pressure sensor connector.

3. FINAL OPERATION

Refit:

- the injector rail protector cover,
- the injection rail protector cover bolt.

Clip on the injector rail protector cover plate.

Fit the dipstick guide tube.

Refit:

- the dipstick guide bolts,
- the dipstick.

Refit the turbocharger air outlet pipe**Intercooler air inlet pipe: Removal - Refitting** .

Connect the battery**Battery: Removal - Refitting** .

Reprime the fuel circuit using the manual priming pump.

Check that there are no diesel leaks(see **High pressure pipe: Check**) .

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HIGH PRESSURE PIPES: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Changes have been made to the high pressure pipes between the high pressure pump and the injector rail, and to the pipes between the rail and the injectors on all K9K engines.

The procedure for operating on the high pressure pipes has not been modified (see MR for the vehicle concerned: 13B, Diesel injection) but the pipe tightening torque has changed according to the colour of the high pressure pipe.

- Torque tighten:
  - the yellow high pressure pipe unions 24 Nm ,
  - the silver high pressure pipe unions 28 Nm .

WARNING

- Torque tighten to 38 Nm the pump-rail and rail-injector high pressure pipes with the following part numbers:
  - 77 01 207 025,
  - 77 01 207 026,
  - 77 01 207 027,
  - 77 01 207 028,
  - 77 01 207 029.

For high pressure pipes with different part numbers, torque tighten the pipes according to the colour of the high pressure pipe.

HIGH PRESSURE PUMP: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
High pressure pump pulley support tool.	
Gear extractor for tapered hub injection pump.	Mot. 1525
Adapter claws for Mot. 1525.	
Set of 5 crankshaft and camshaft pulley timing pins.	Mot. 1430
Injection pump pulley extraction claws.	Mot. 1768

Equipment required
Diagnostic tool

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

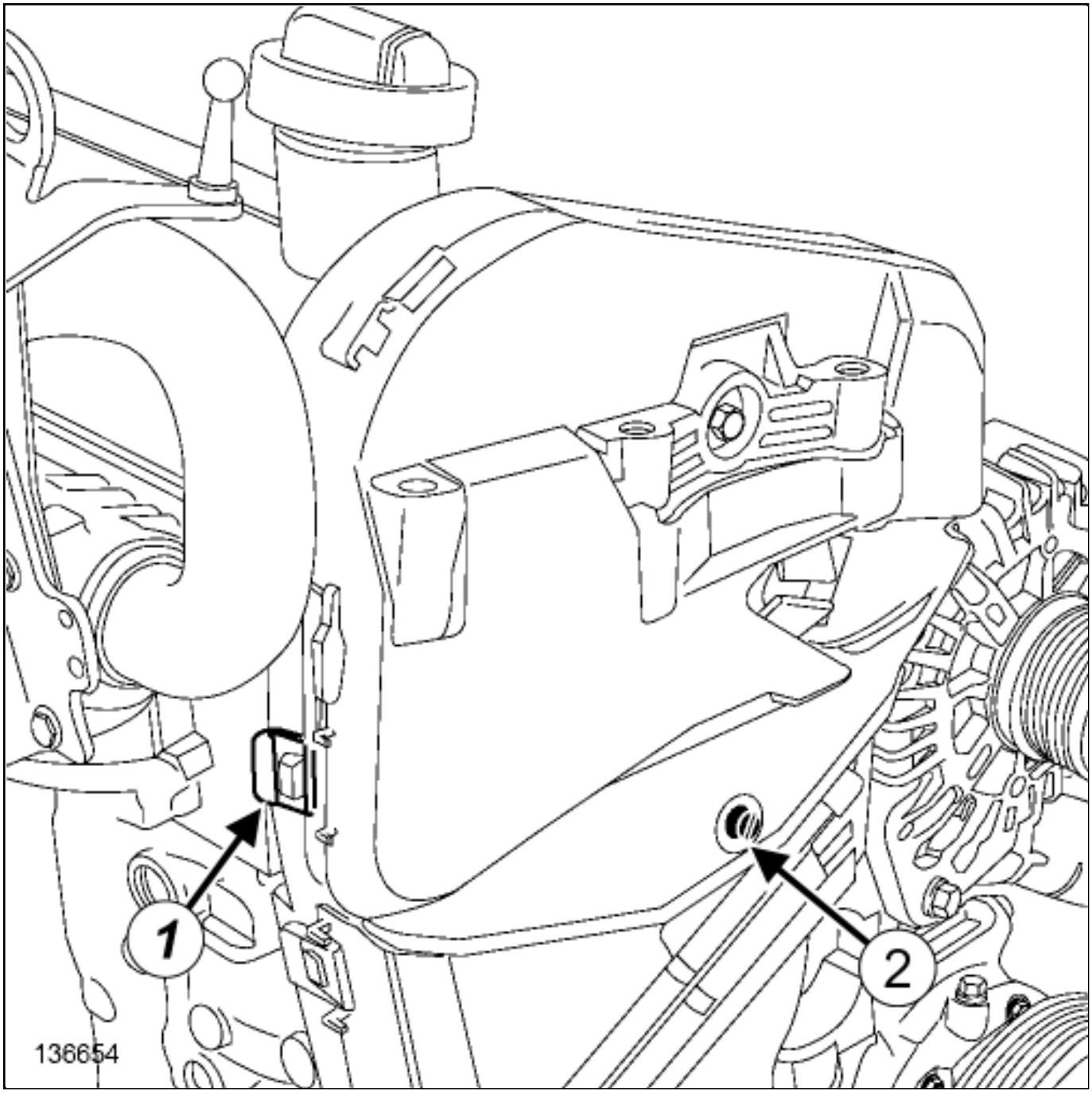
WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 13B, Diesel injection, Diesel injection: Precautions for the repair)** .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the front right-hand wheel Wheel: Removal - Refitting ,
  - the front section of the front right-hand wheel arch liner(see **Front wheel arch liner: Removal - Refitting**) ,
  - the engine undertray bolts,
  - the engine undertray,
  - the accessories belt(see **Accessories belt: Removal - Refitting**) ,
  - the crankshaft accessories pulley(see **Crankshaft accessories pulley: Removal - Refitting**) ,
  - the lower engine tie-bar Lower engine tie-bar: Removal - Refitting ,
  - the right-hand suspended engine mounting Right-hand suspended engine mounting: Removal - Refitting ,
  - the camshaft position sensor (see 13B, Diesel injection, Camshaft position sensor: Removal - Refitting) ,
  - the turbocharger air outlet pipe Intercooler air inlet pipe: Removal - Refitting ,
  - the high pressure pipe between the high pressure pump and the injector rail (see 13B, Diesel injection, High pressure pipe between pump and rail: Removal - Refitting) .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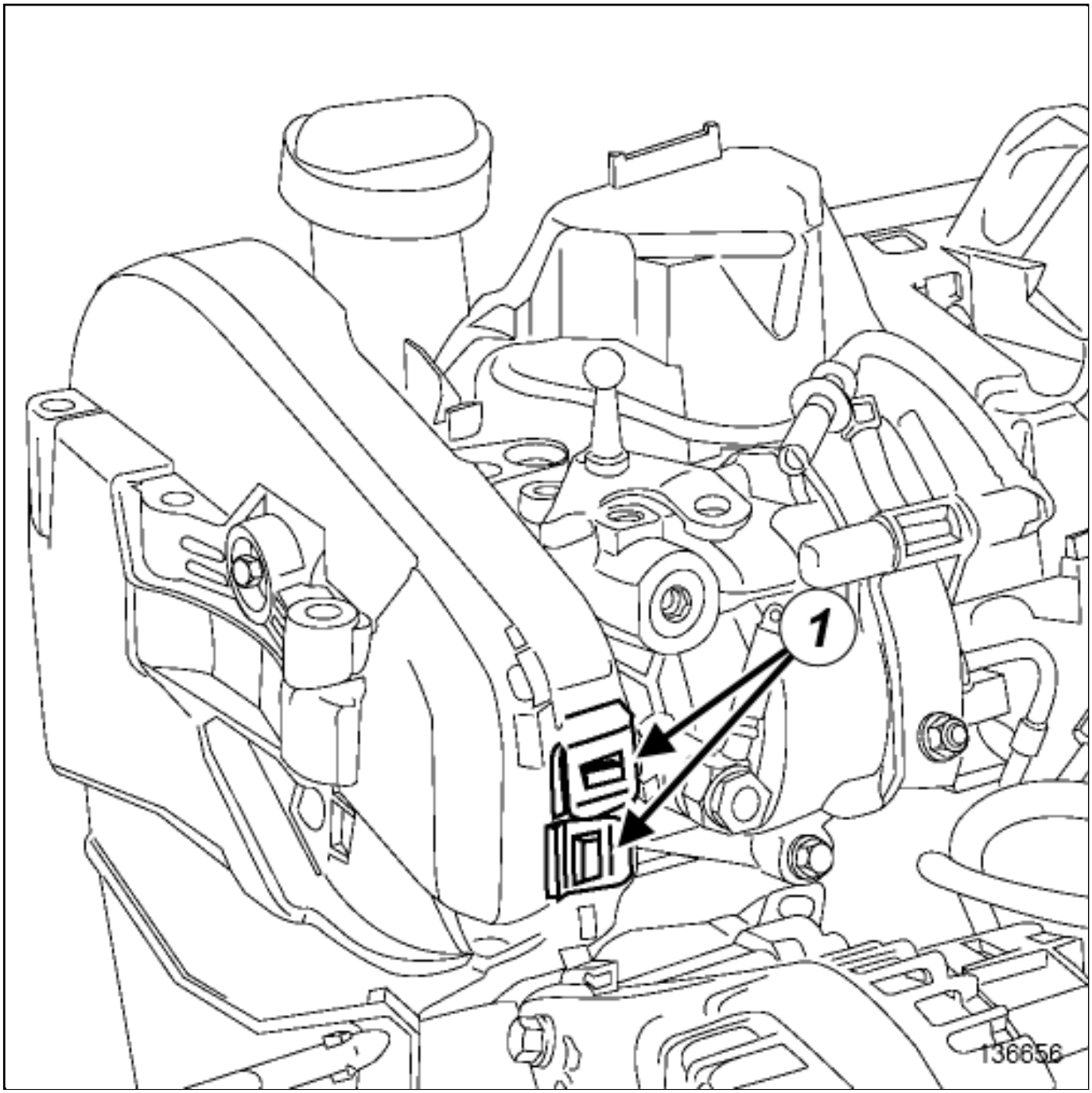
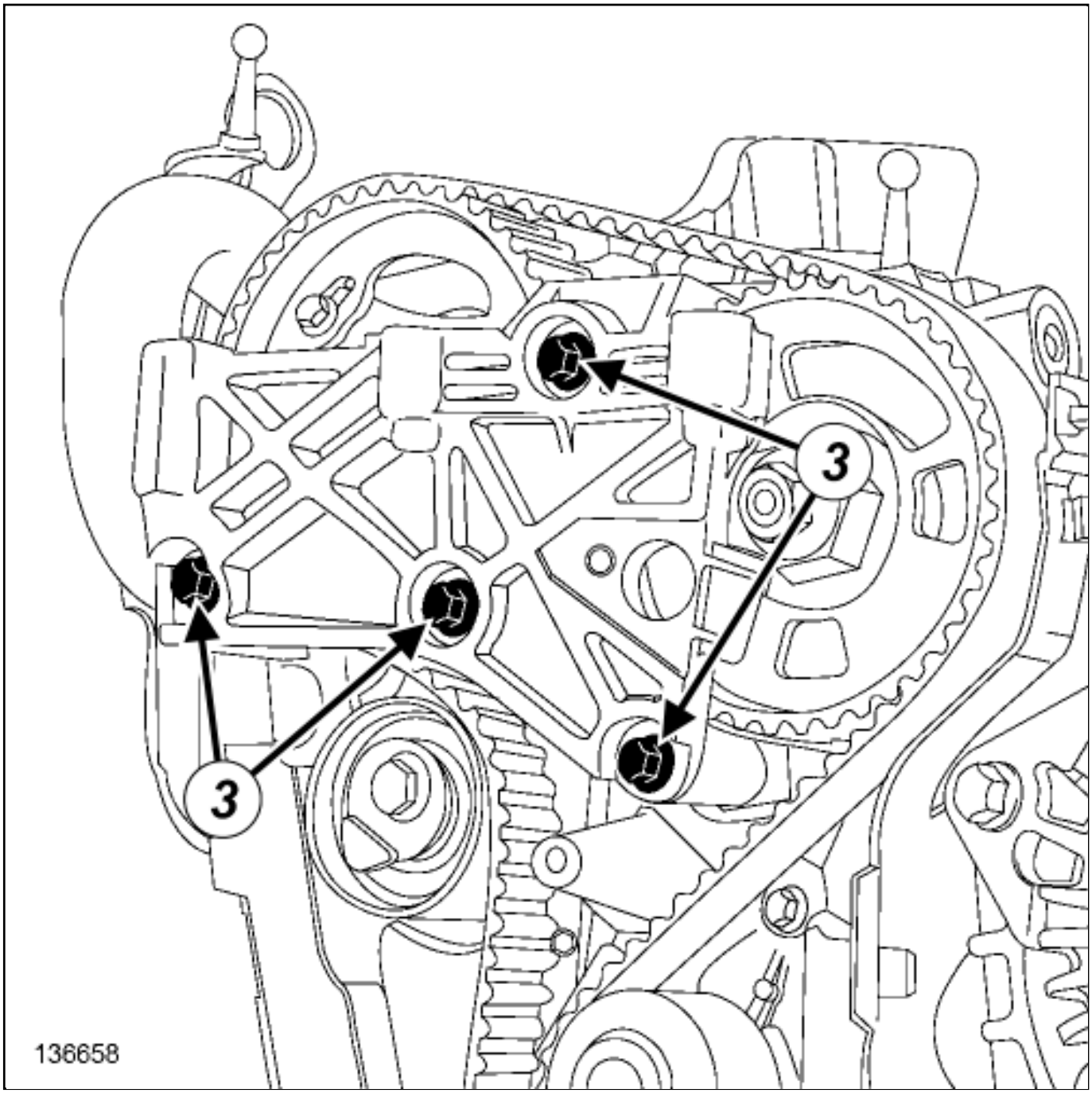


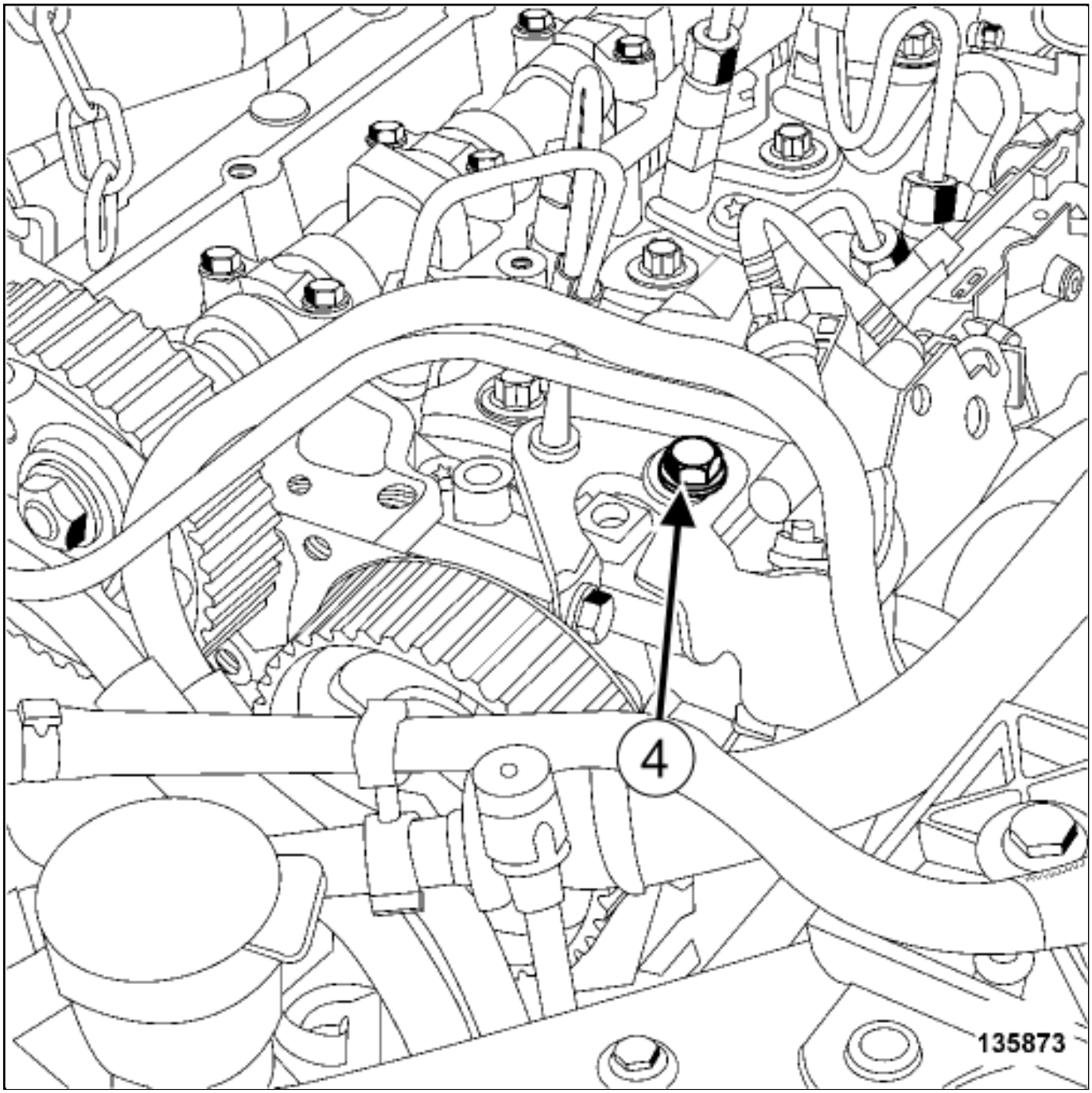
- Unclip the upper timing cover at(1) .

- Remove:
  - the bolt(2) from the upper timing cover,
  - the upper timing cover.



Remove:

- the right-hand suspended engine mounting support bolts(**3**) ,
- the right-hand pendulum suspension support.



- Remove:
  - the bolt(4) from the high pressure pump protector,
  - the high pressure pump protector.

- Clean the fuel supply unions on the high pressure pump(see 13B, Diesel injection, Diesel injection: Precautions for the repair) .

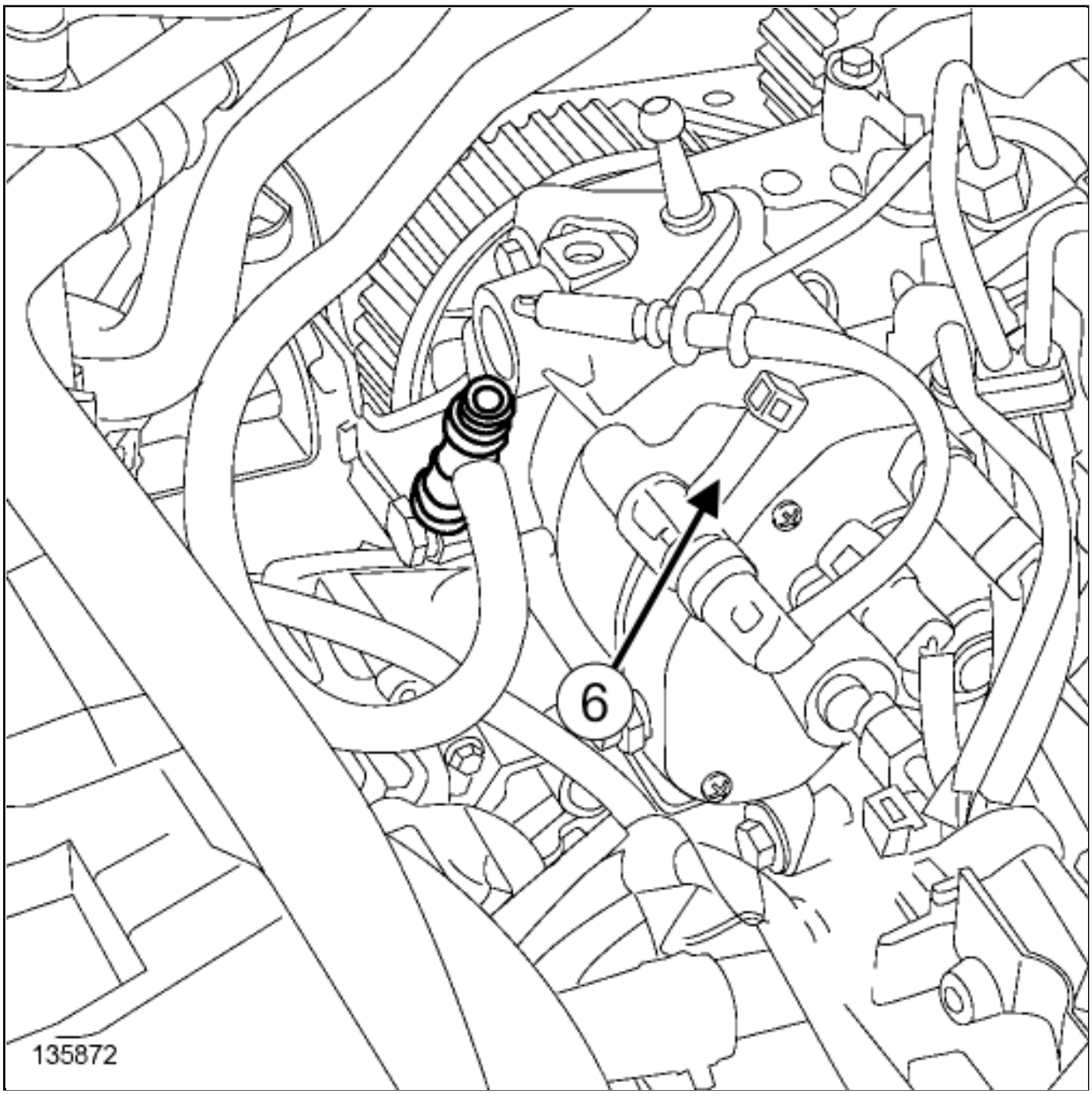
CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- Disconnect the fuel supply pipe union from the high pressure pump(5) .

- Fit suitable blanking plugs on:
  - the high pressure pump opening,
  - the fuel supply pipe opening.

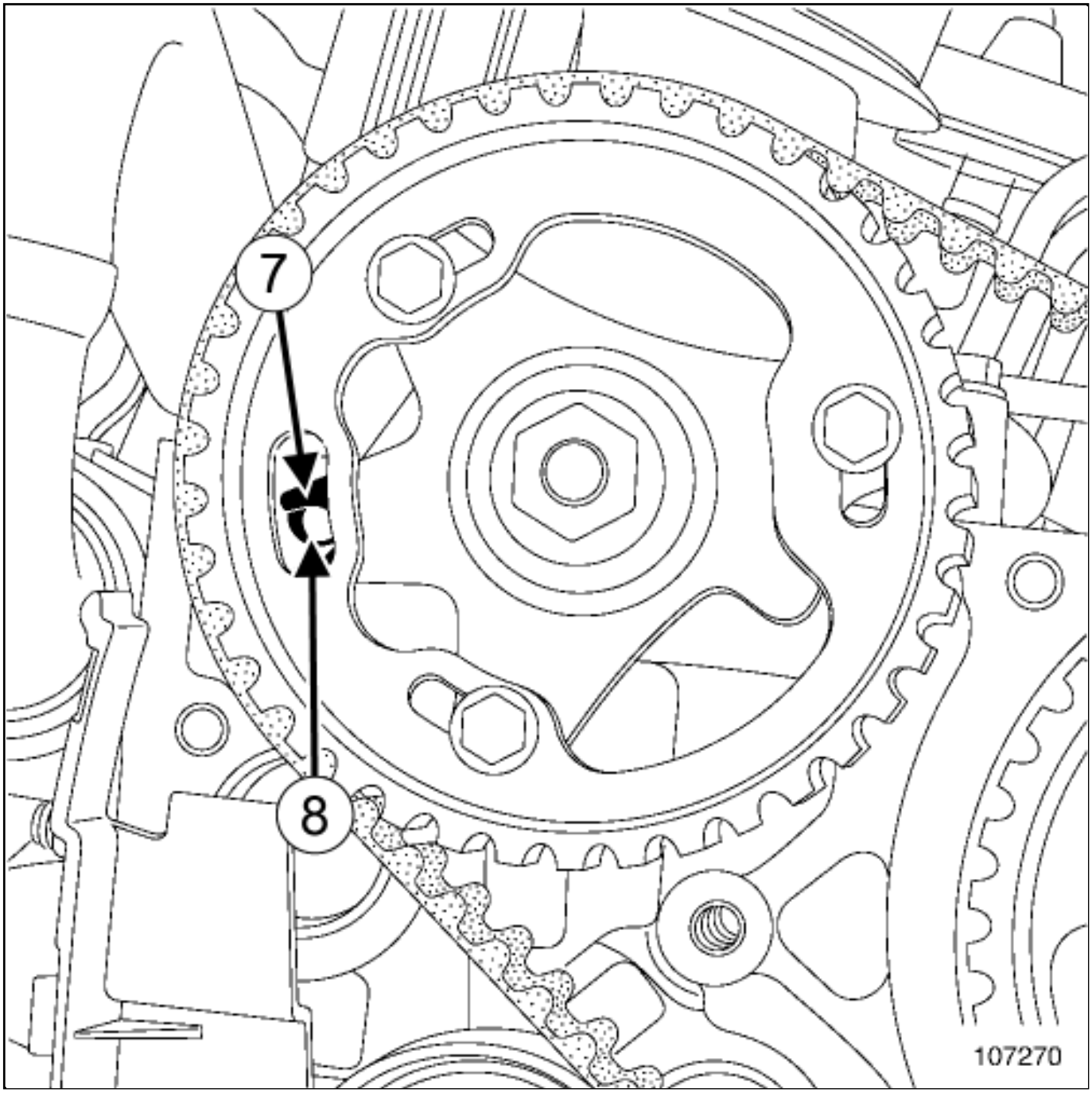
Clean the fuel return unions on the high pressure pump(see 13B, Diesel injection, Diesel injection: Precautions for the repair) .



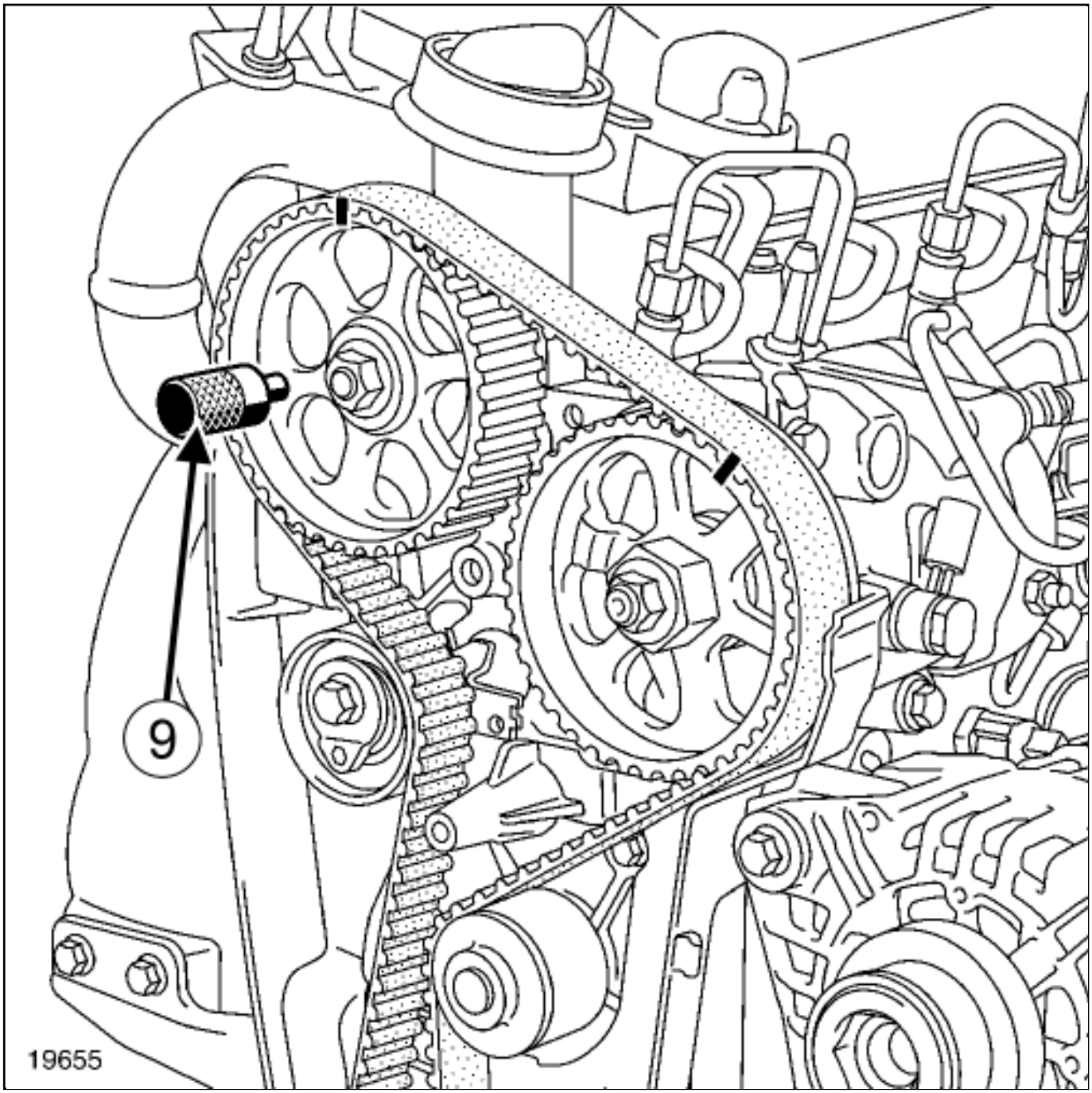
Disconnect the diesel injector fuel return rail from the high pressure pump(6) .

Fit suitable blanking plugs on:

- the high pressure pump opening,
- the opening of the diesel injector fuel return rail.



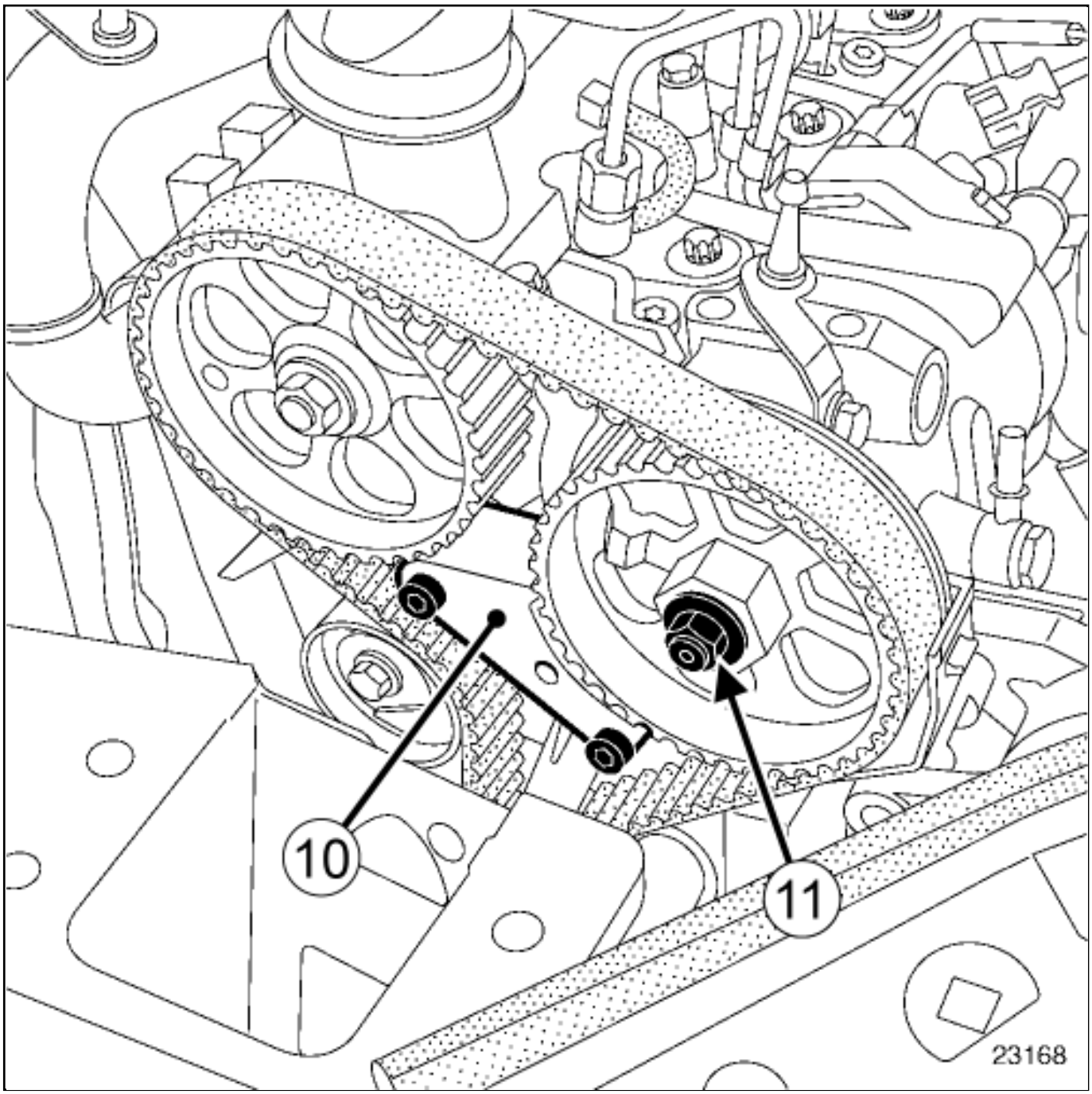
- Position the engine at Top Dead Centre. The camshaft pulley hole(7) should be opposite the cylinder head hole (8) .



- Insert the toolSet of 5 crankshaft and camshaft pulley timing pins.(Mot. 1430) (9) in the hole of the camshaft pulley hub and the hole of the cylinder head.

- Remove the toolSet of 5 crankshaft and camshaft pulley timing pins.(Mot. 1430) .

2. REMOVAL OPERATION

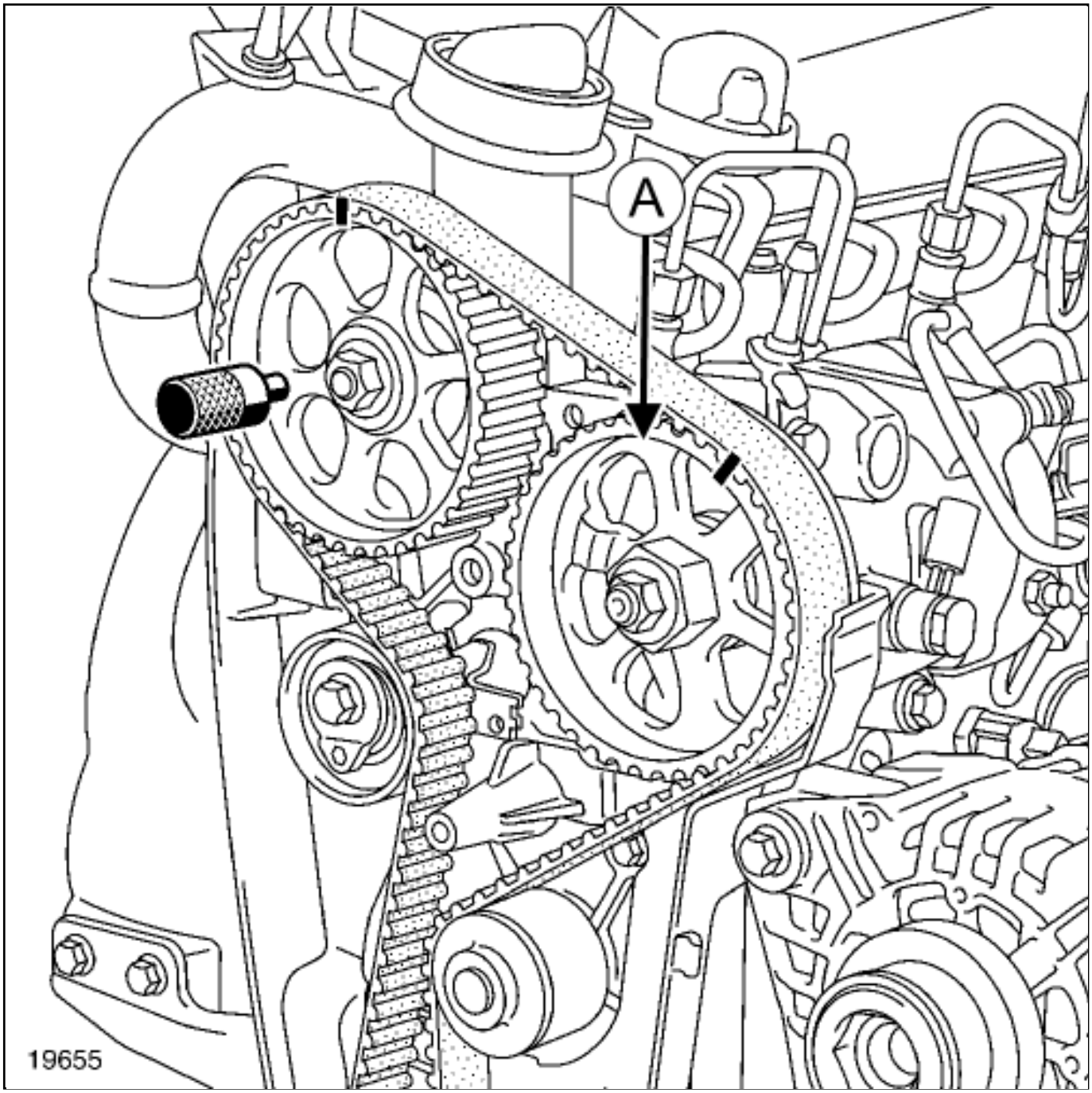


- Fit the High pressure pump pulley support tool.(10) on the cylinder head.

Note:

If necessary, turn the engine slowly to adjust the position of theHigh pressure pump pulley support tool. on the high pressure pump pulley teeth.

- Remove the nut(11) from the high pressure pump pulley, immobilising the high pressure pump pulley using a 32 mmspanner in order not to constrain the toolHigh pressure pump pulley support tool. .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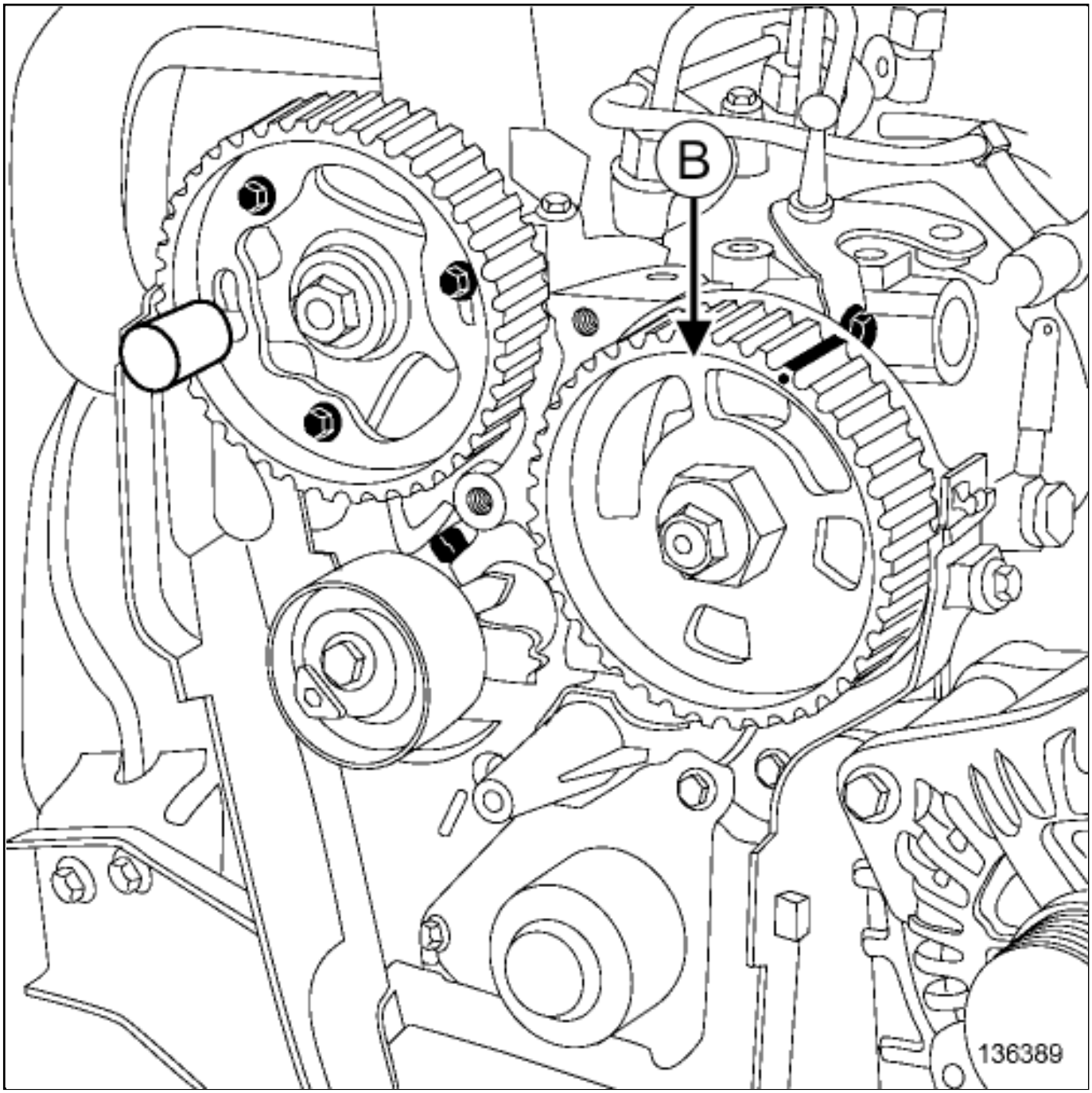
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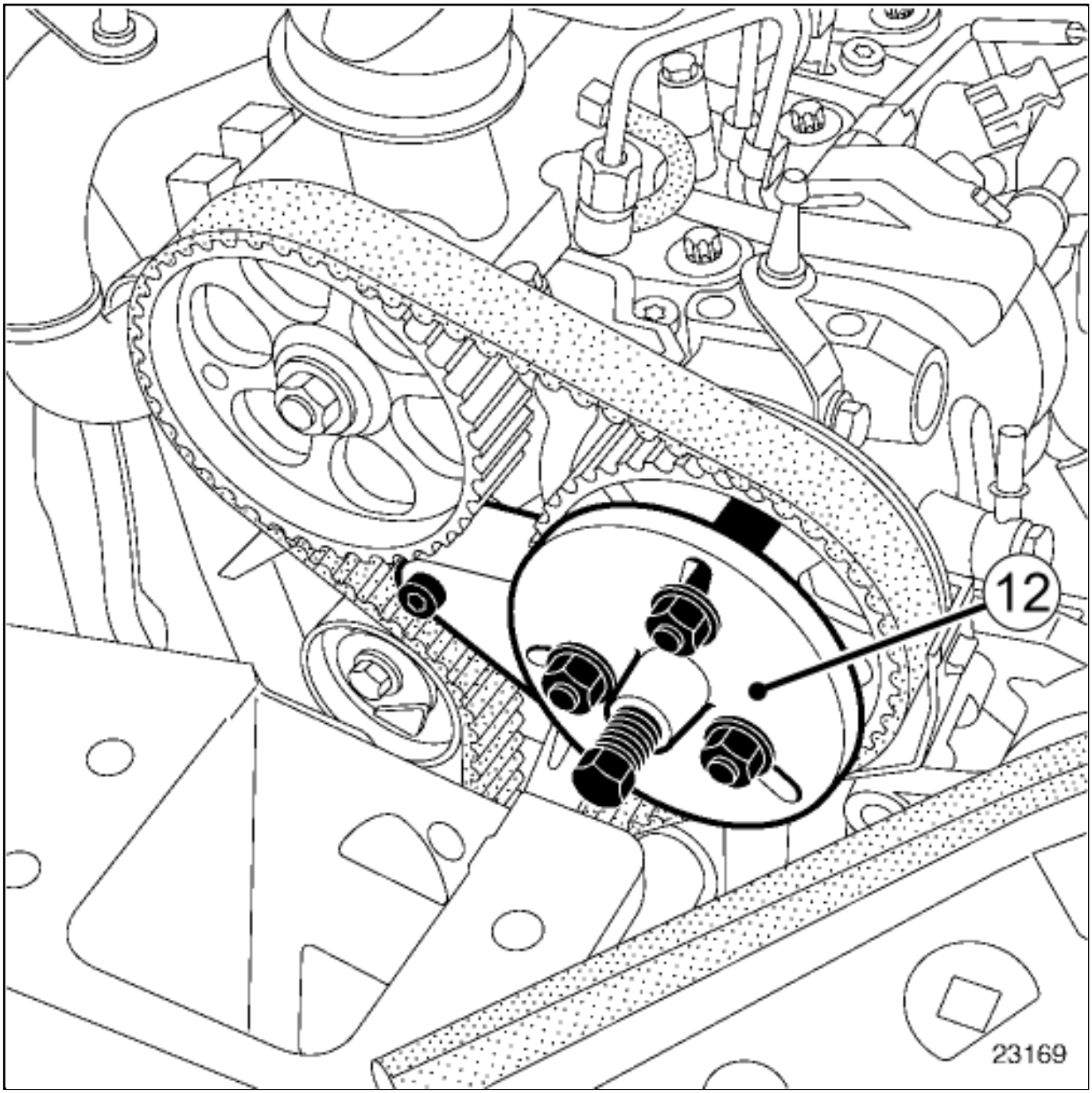
Note:

There are 2 possible fittings for the high pressure pump pulleys:

- the first type of pulley fitting(A) comprises 6 spokes which are spaced equally apart,
- the second type of pulley fitting(B) comprises 4 spokes which vary in width.

To extract the pulley(A) of the high pressure pump, use the toolAdapter claws for Mot. 1525. in addition to toolGear extractor for tapered hub injection pump.(Mot. 1525) .

To extract the pulley(B) of the high pressure pump, use the toolInjection pump pulley extraction claws. (Mot. 1768) in addition to toolGear extractor for tapered hub injection pump. (Mot. 1525) .



Fit the toolGear extractor for tapered hub injection pump.(Mot. 1525) (12) equipped with the tool adapted according to the type of high pressure pump pulley.

Note:

Remove the spacer at the end of the pushrod from the toolGear extractor for tapered hub injection pump.(Mot. 1525) to improve the positioning on the high pressure pump shaft.

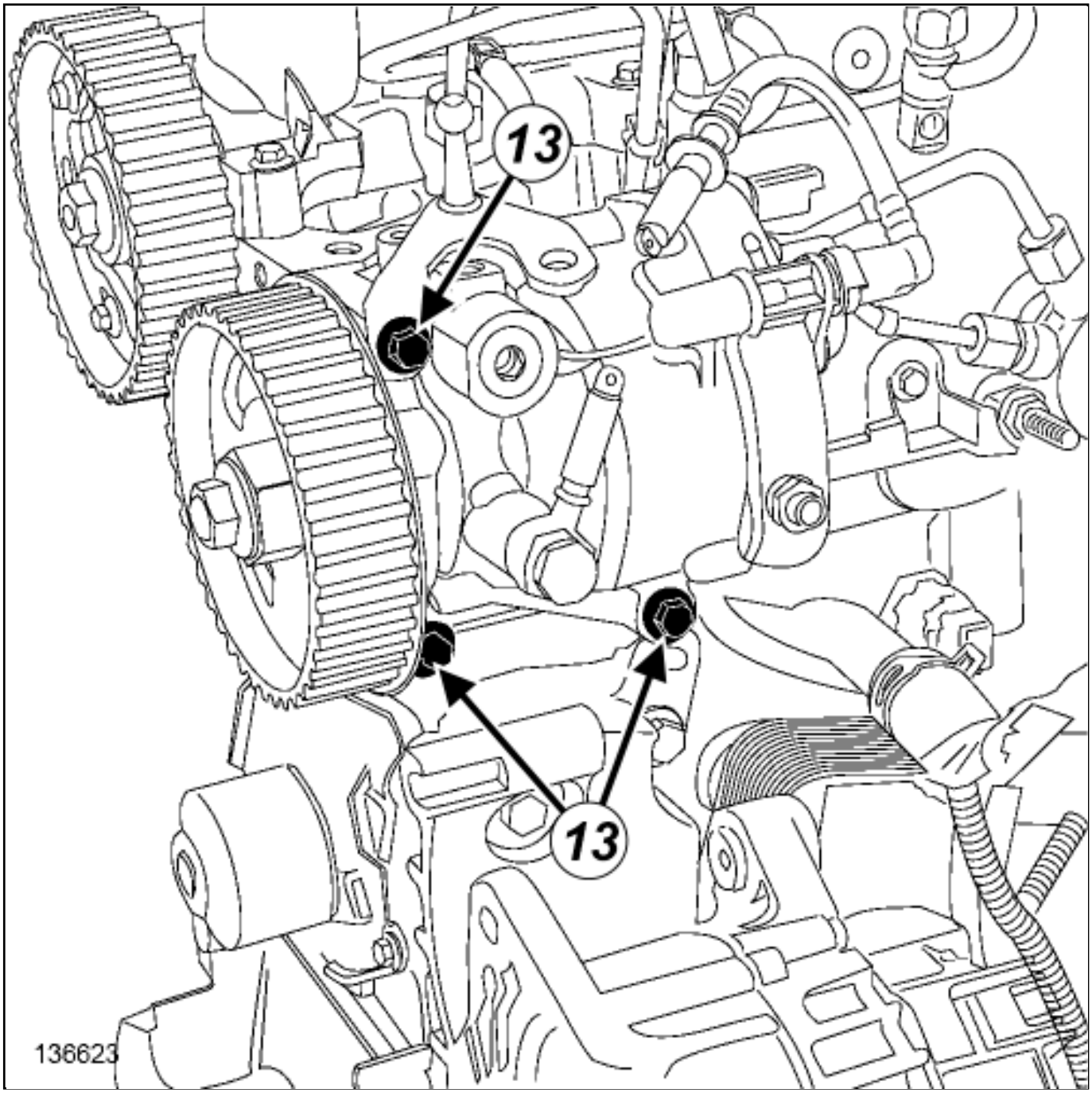
Note:

Place the claws of the toolsAdapter claws for Mot. 1525. orInjection pump pulley extraction claws. (Mot. 1768) on the spokes of the high pressure pump pulley in order to ensure that the claws are secure when removing the pulley and to avoid damaging the pulley spokes.

Screw the pushrod of the toolGear extractor for tapered hub injection pump.(Mot. 1525) until it makes contact with the high pressure pump shaft.

Note:

Check that the pushrod of the toolGear extractor for tapered hub injection pump.(Mot. 1525) is correctly oriented and is pressing against the high pressure pump shaft. Adjust the toolGear extractor for tapered hub injection pump.(Mot. 1525) if necessary.



Remove the high pressure pump bolts(13) .

Gradually screw the pushrod of theGear extractor for tapered hub injection pump.(Mot. 1525) until the high pressure pump becomes detached.

Note:

Guide and support the high pressure pump with one hand as it is being removed using the Gear extractor for tapered hub injection pump.(Mot. 1525)

- Remove the high pressure pump.

Note:

If the high pressure pump is being reused, keep it in a sealed bag during the removal operation.

- Remove the toolGear extractor for tapered hub injection pump.(Mot. 1525) from the high pressure pump pulley.

REFITTING

1. REFITTING PREPARATION OPERATION

- Check for an index pin on the high pressure pump shaft.

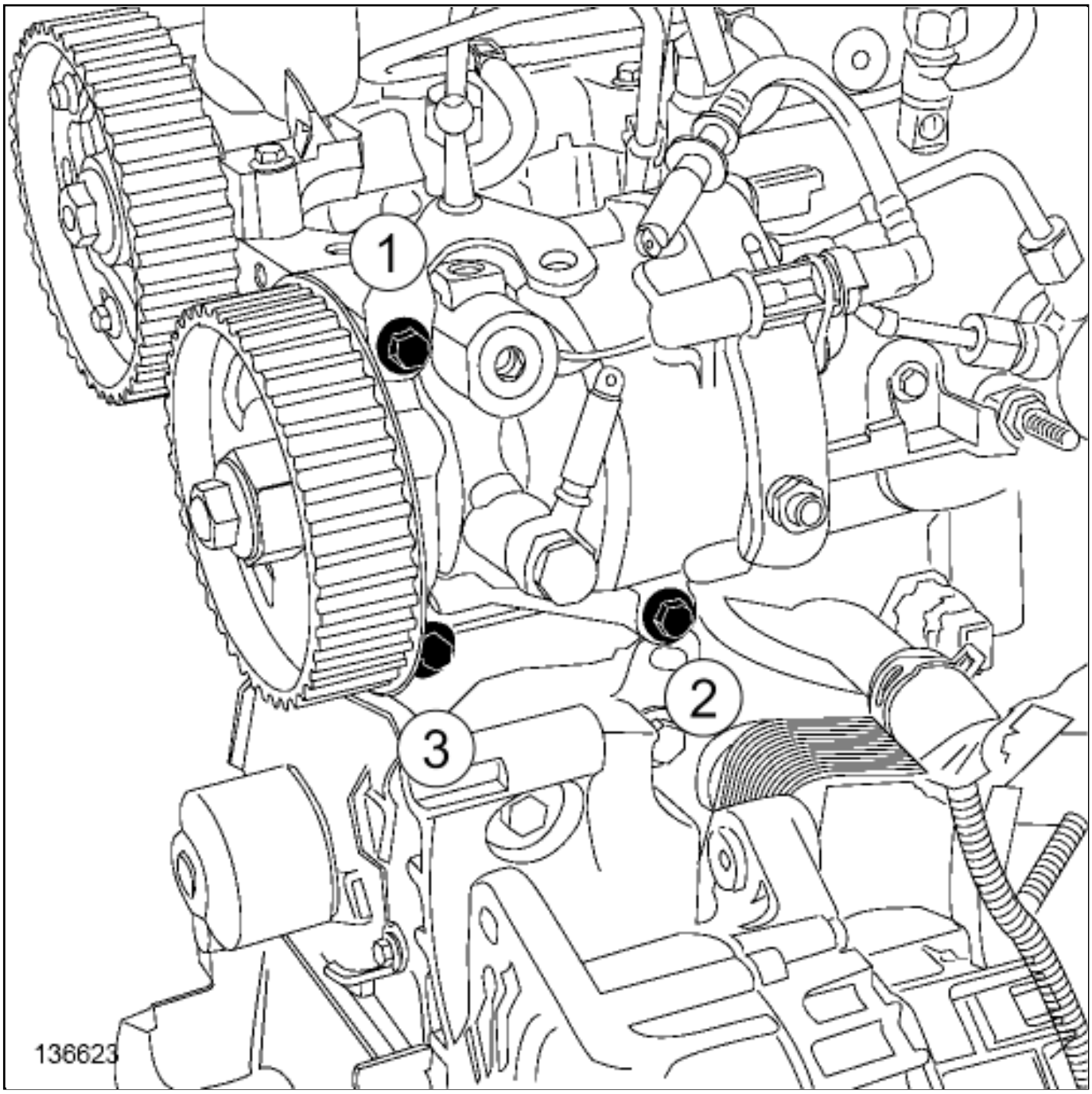
2. REFITTING OPERATION

- Refit the high pressure pump on the cylinder head by inserting it into the high pressure pump pulley.

Note:

Check that the high pressure pump shaft is correctly orientated in relation to the high pressure pump pulley.

Fit the high pressure pump bolts without tightening them.



Torque tighten in order the high pressure pump bolts23 N.m.

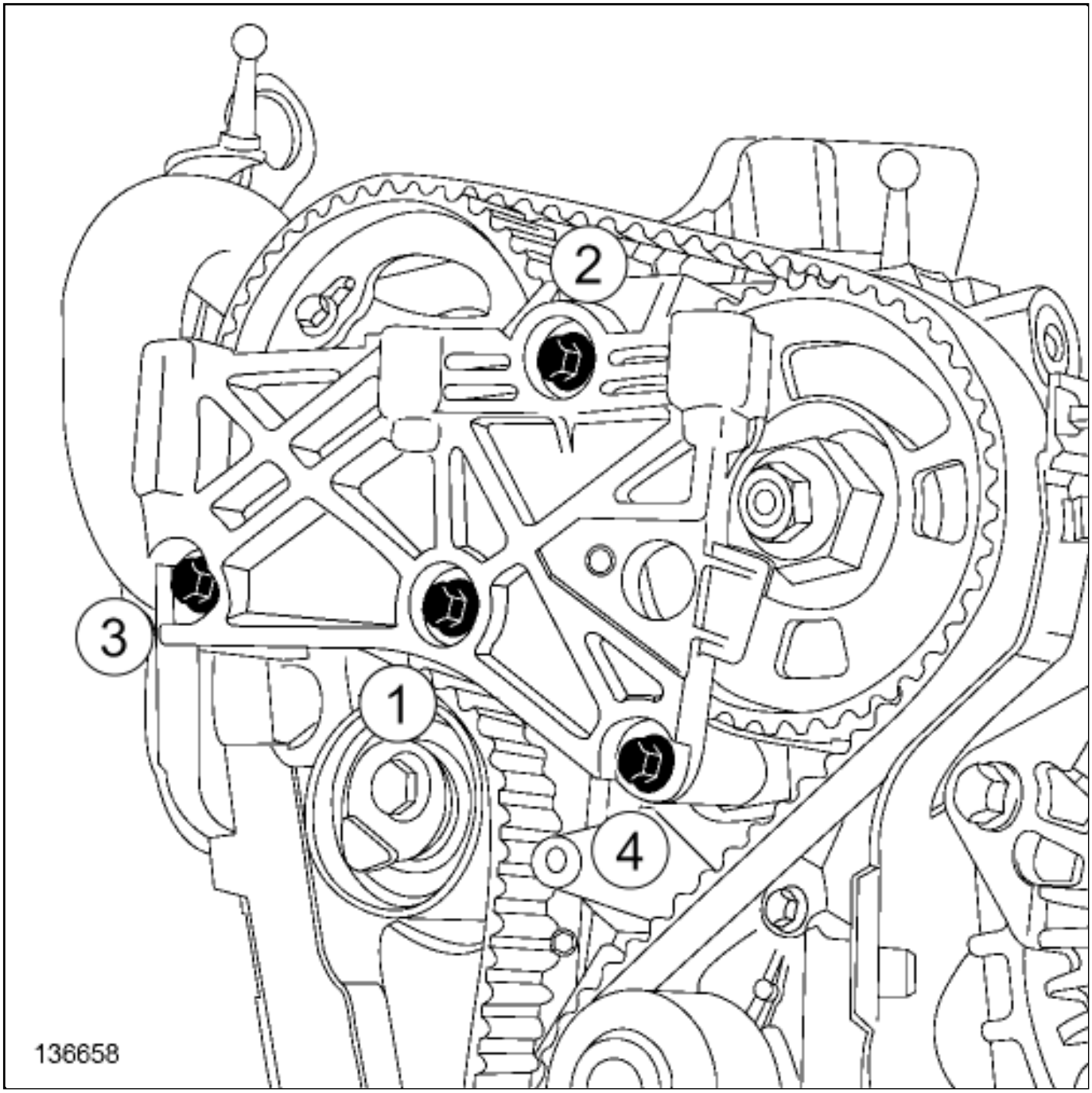
Torque tighten the high pressure pump pulley nut70 N.mwhile holding the high pressure pump pulley using a 32 mmspanner.

Note:

Check that the timing belt is correctly positioned and in good condition.

Remove the High pressure pump pulley support tool. from the cylinder head.

3. FINAL OPERATION



Refit the right-hand suspended mounting support.

Torque tighten in order the right-hand suspended engine mounting support bolts25 N.m.

Refit:

- the upper timing cover,
- the upper timing cover bolt.

Clip on the upper timing cover.

Remove the blanking plugs from:

- the diesel injector fuel return rail opening,
- the high pressure pump opening.

Connect the diesel injector fuel return rail to the high pressure pump.

Remove the blanking plugs from:

- the fuel supply pipe opening,
- the high pressure pump opening.

Connect the fuel supply pipe to the high pressure pump.

Refit:

- the high pressure pump protector,

- the high pressure pipe between the high pressure pump and the injector rail (see 13B, Diesel injection, High pressure pipe between pump and rail: Removal - Refitting),
- the turbocharger air outlet pipe Intercooler air inlet pipe: Removal - Refitting,
- the camshaft position sensor (see 13B, Diesel injection, Camshaft position sensor: Removal - Refitting),
- the right-hand suspended engine mounting Right-hand suspended engine mounting: Removal - Refitting,
- the lower engine tie-bar Lower engine tie-bar: Removal - Refitting,
- the crankshaft accessories pulley (see **Crankshaft accessories pulley: Removal - Refitting**),
- the accessories belt (see **Accessories belt: Removal - Refitting**),
- the engine undertray,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**),
- the front right-hand wheel Wheel: Removal - Refitting.

Connect the battery Battery: Removal - Refitting.

Reprime the fuel circuit using the manual priming pump.

Check that there are no diesel leaks.

Apply the after repair procedure using the Diagnostic tool Diagnostic tool : Use :

-Computer concerned by the After repair procedure:

"Injection computer",

-Component affected by the After repair procedure:

"Injection pump" .

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HYDRAULIC BRAKE UNIT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
pedal press
refrigerant charging station

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 38C, Anti-lock braking system, ABS: Precautions for the repair) ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

CAUTION

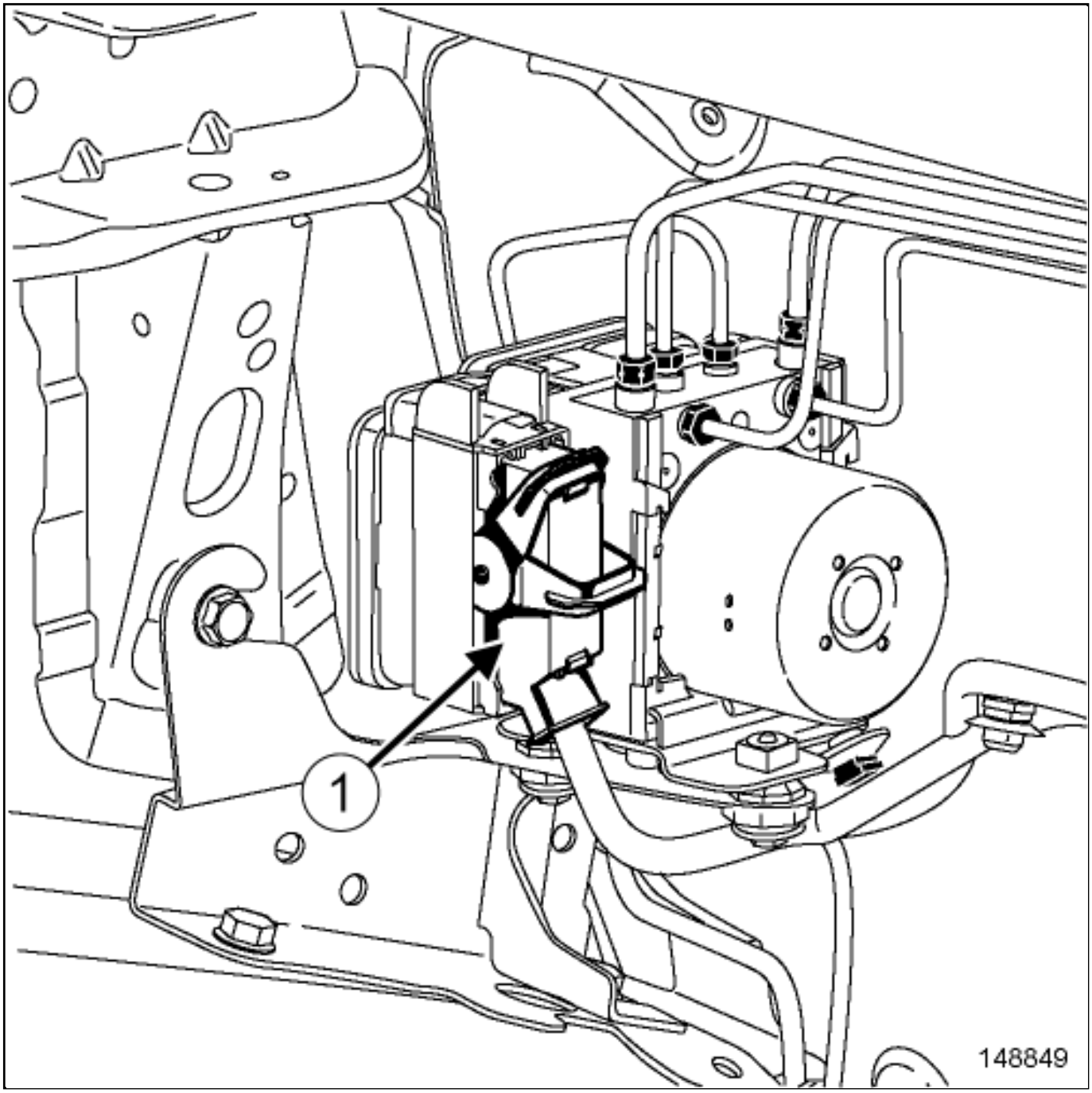
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

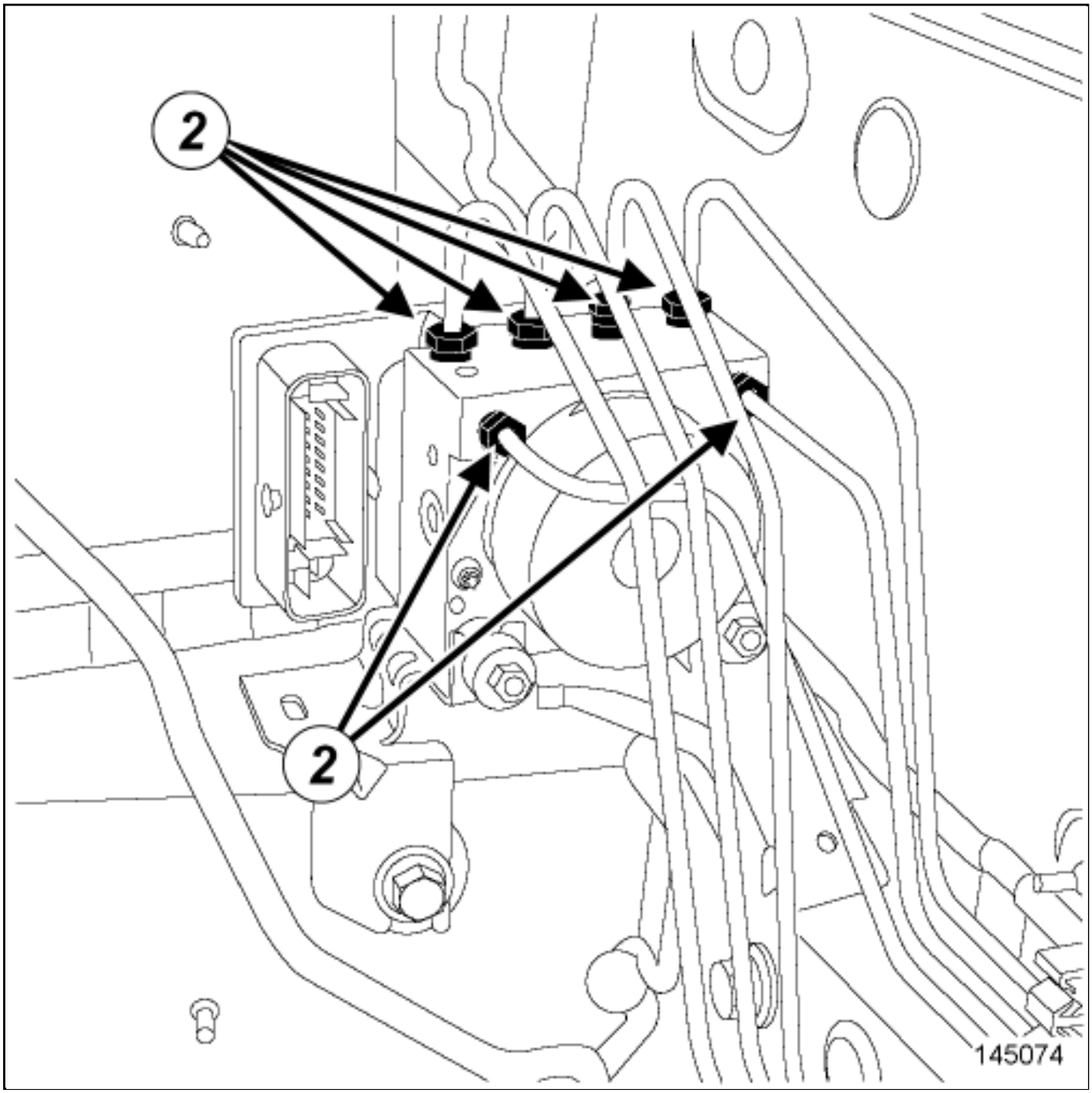
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Disconnect the batteryBattery: Removal - Refitting .
- Fit a pedal presson the brake pedal to limit the outflow of brake fluid.
- Remove the soundproofing clips from the bulkhead.
- Move the soundproofing away from the bulkhead to access the hydraulic brake unit.

2. REMOVAL OPERATION

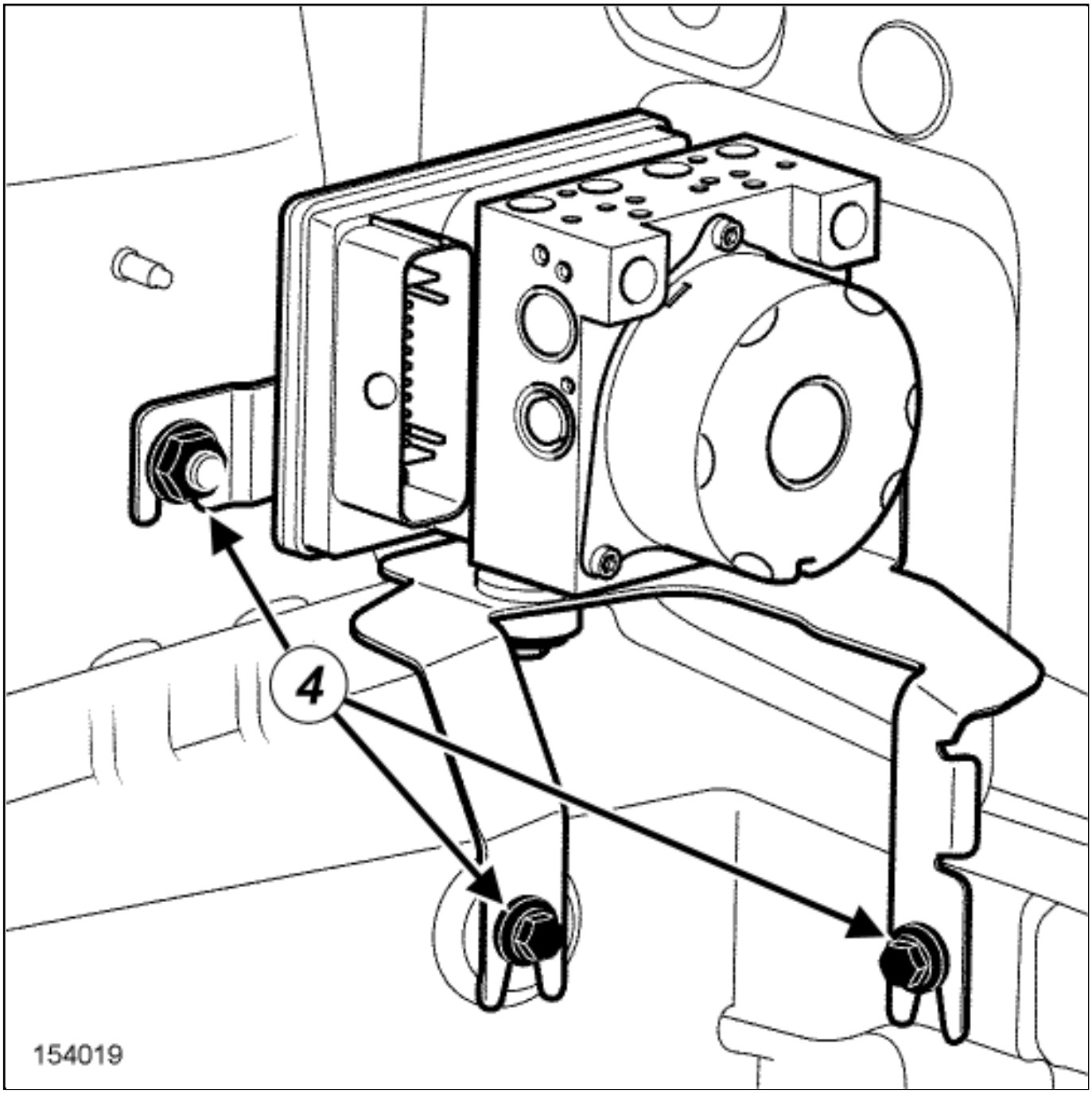


- Disconnect the hydraulic brake unit connector(1) .



- Unscrew the rigid pipe unions(2) from the hydraulic brake unit.

- Fit blanking plugs on the openings of the hydraulic unit and brake pipes.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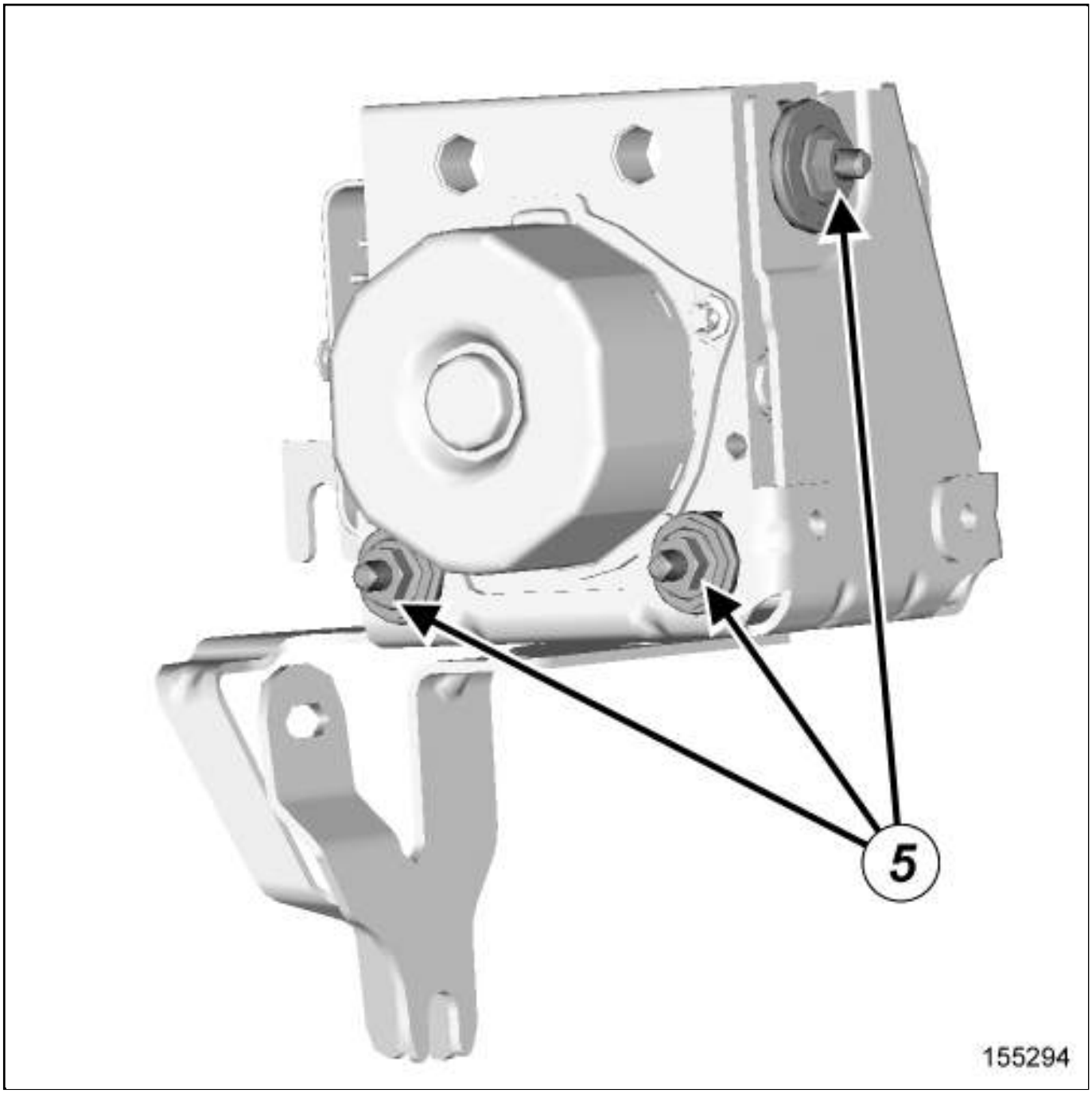


Remove:

- the hydraulic unit support mounting bolts(4) ,
- the hydraulic unit with its support,
- the hydraulic unit from its support(5) .

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.

Torque tighten **Brake circuit: Tightening torque** :

- the bolts of the hydraulic unit support,
- the hydraulic unit bolts on its support.

2. FINAL OPERATION

Bleed the brake circuit **Braking circuit: Bleed** .

Apply the after repair procedure using the Diagnostic tool **Diagnostic tool : Use** :

-Computer concerned by the after repair procedure:

- "ABS-ESP computer"

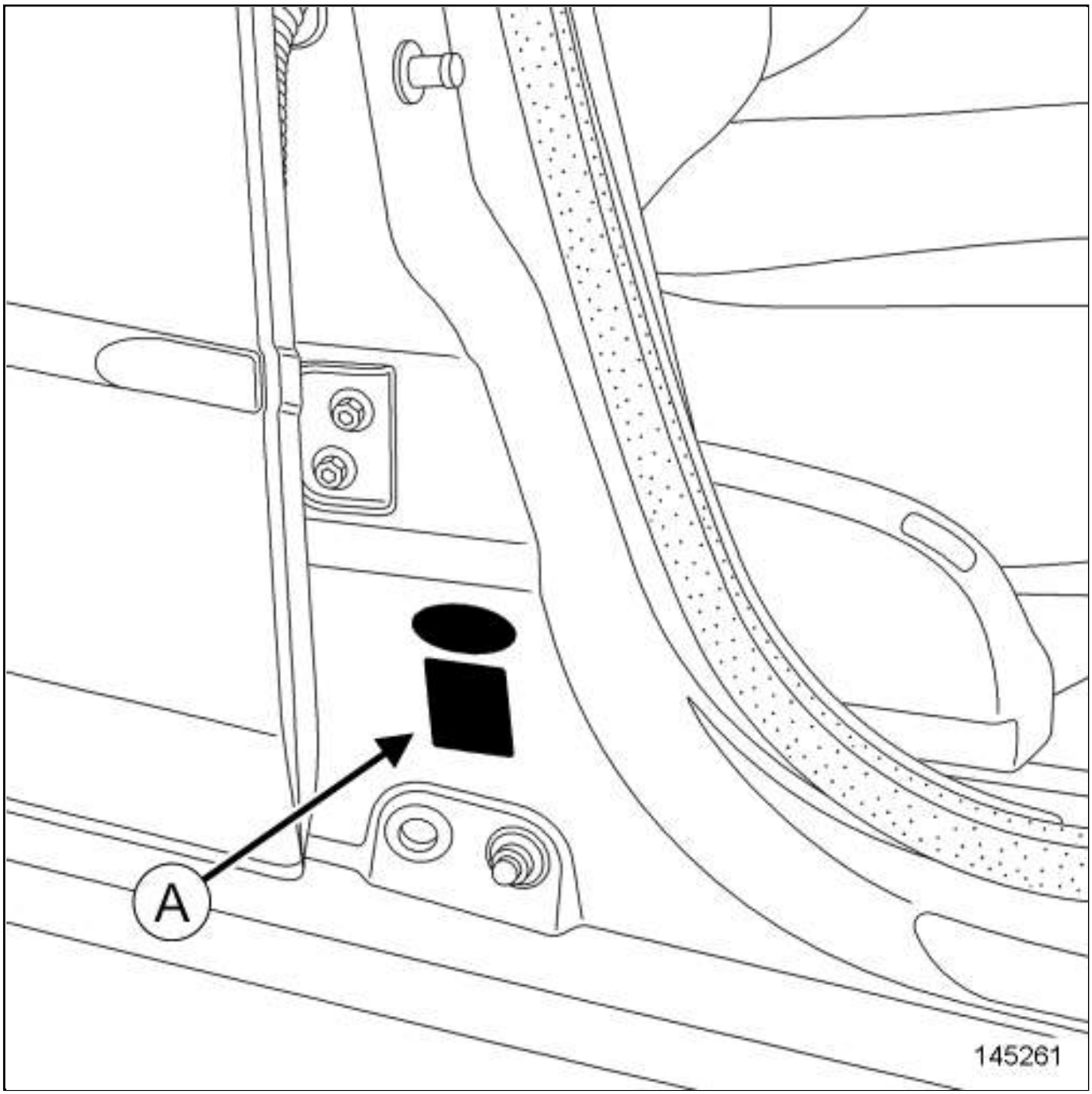
-Component hosted, concerned by the after repair procedure:

- "Hydraulic unit"

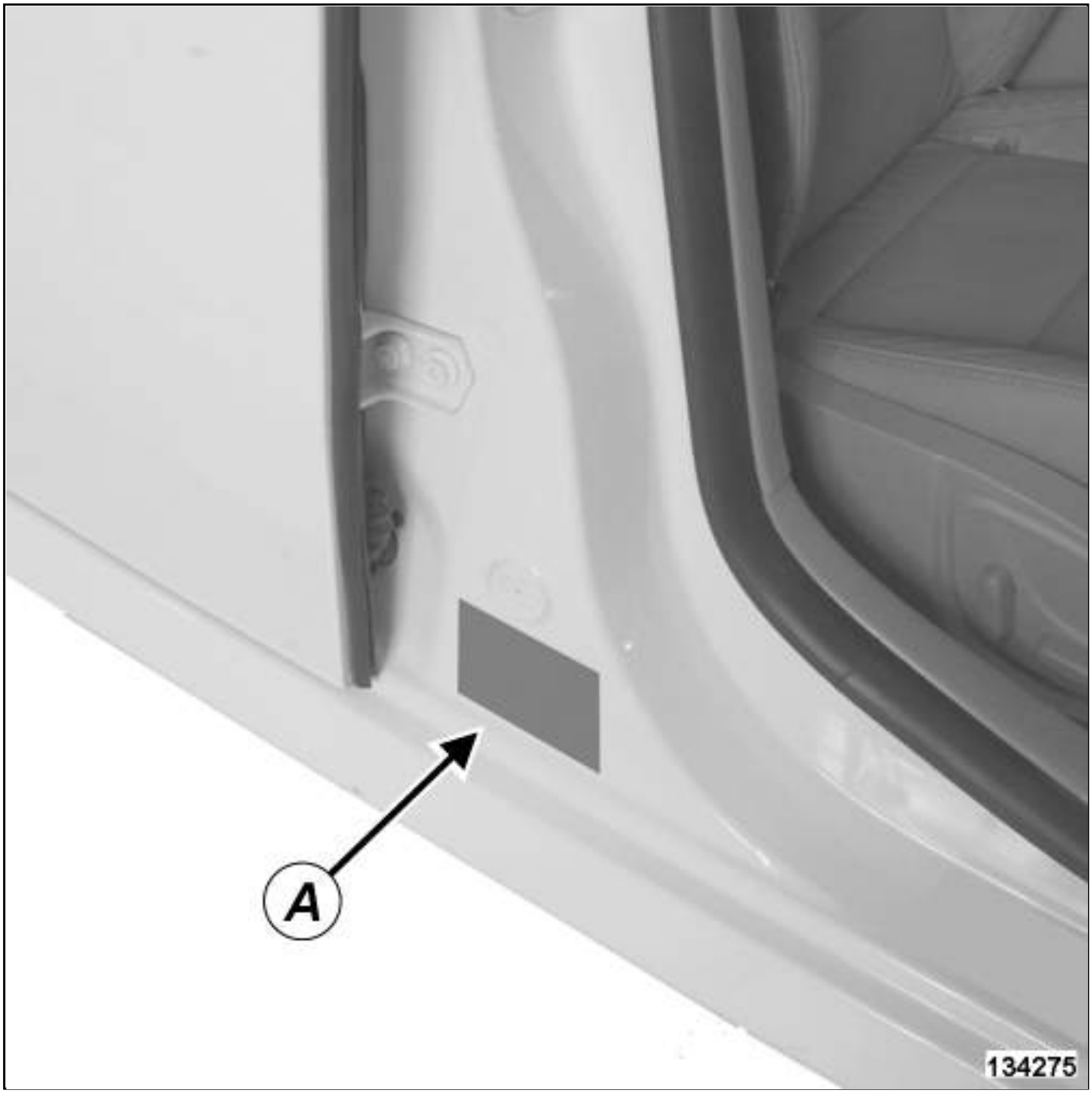
IDENTIFICATION

1. LOCATION OF VEHICLE IDENTIFICATION PLATE (A)

VERSION ONE

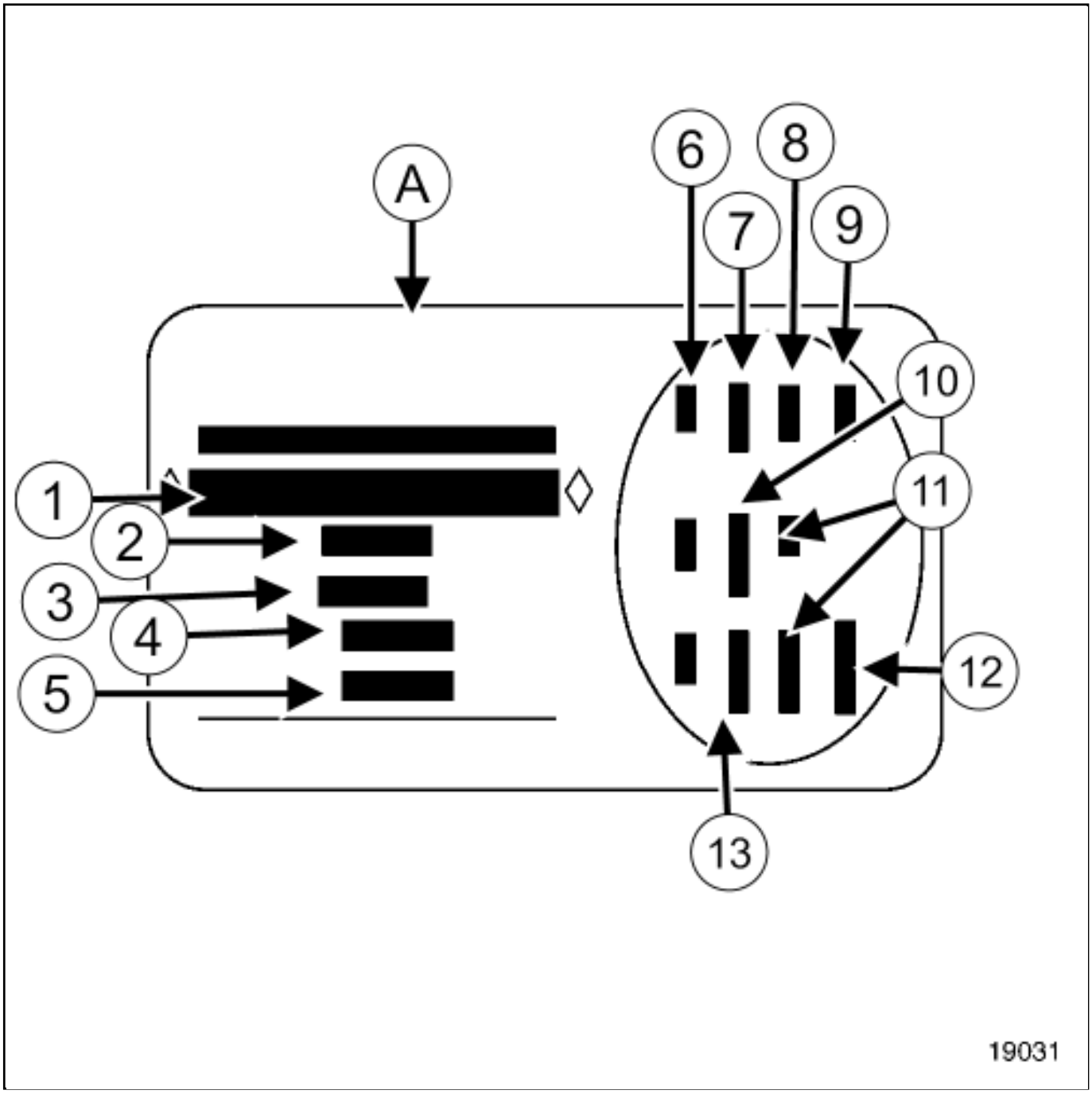


VERSION TWO



2. DETAILED VIEW OF THE VEHICLE IDENTIFICATION (A)

VERSION ONE



(1) Vehicle type mine and type number; this information also appears on marking (B)

(2) MGVW (Maximum Gross Vehicle Weight)

(3) GTW (Gross train weight, vehicle under load with trailer)

(4) Maximum permissible front axle load

(5) Maximum permissible rear axle load

(6) Vehicle technical specifications

(7) Paintwork reference number

(8) Equipment level

(9) Vehicle type

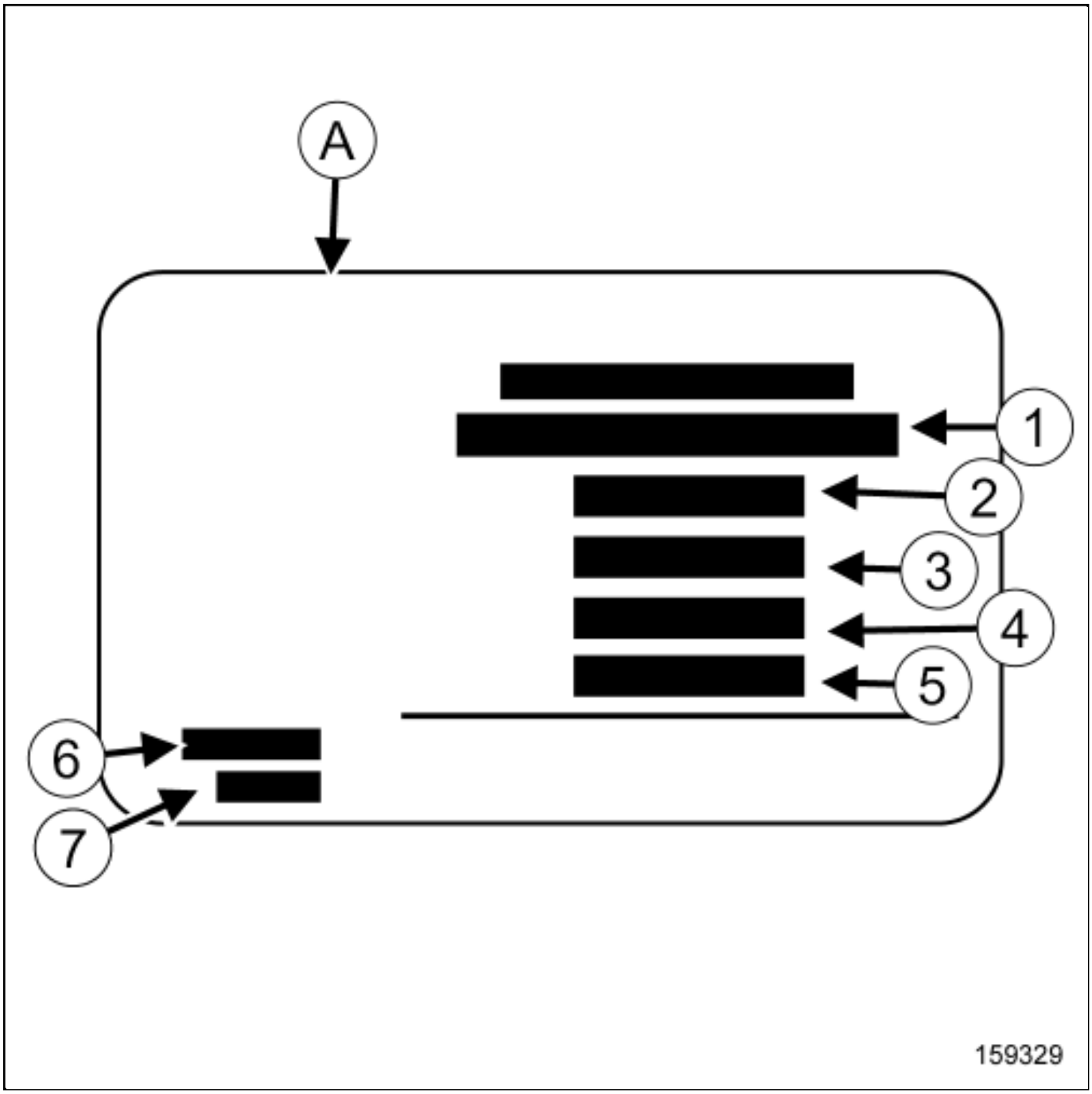
(10) Upholstery code

(11) Additional equipment details

(12) Fabrication number

(13) Interior trim code

VERSION TWO



(1) Vehicle type mine and type number; this information also appears on marking (B)

(2) MGVW (Maximum Gross Vehicle Weight)

(3) GTW (Gross train weight, vehicle under load with trailer)

(4) Maximum permissible front axle load

(5) Maximum permissible rear axle load

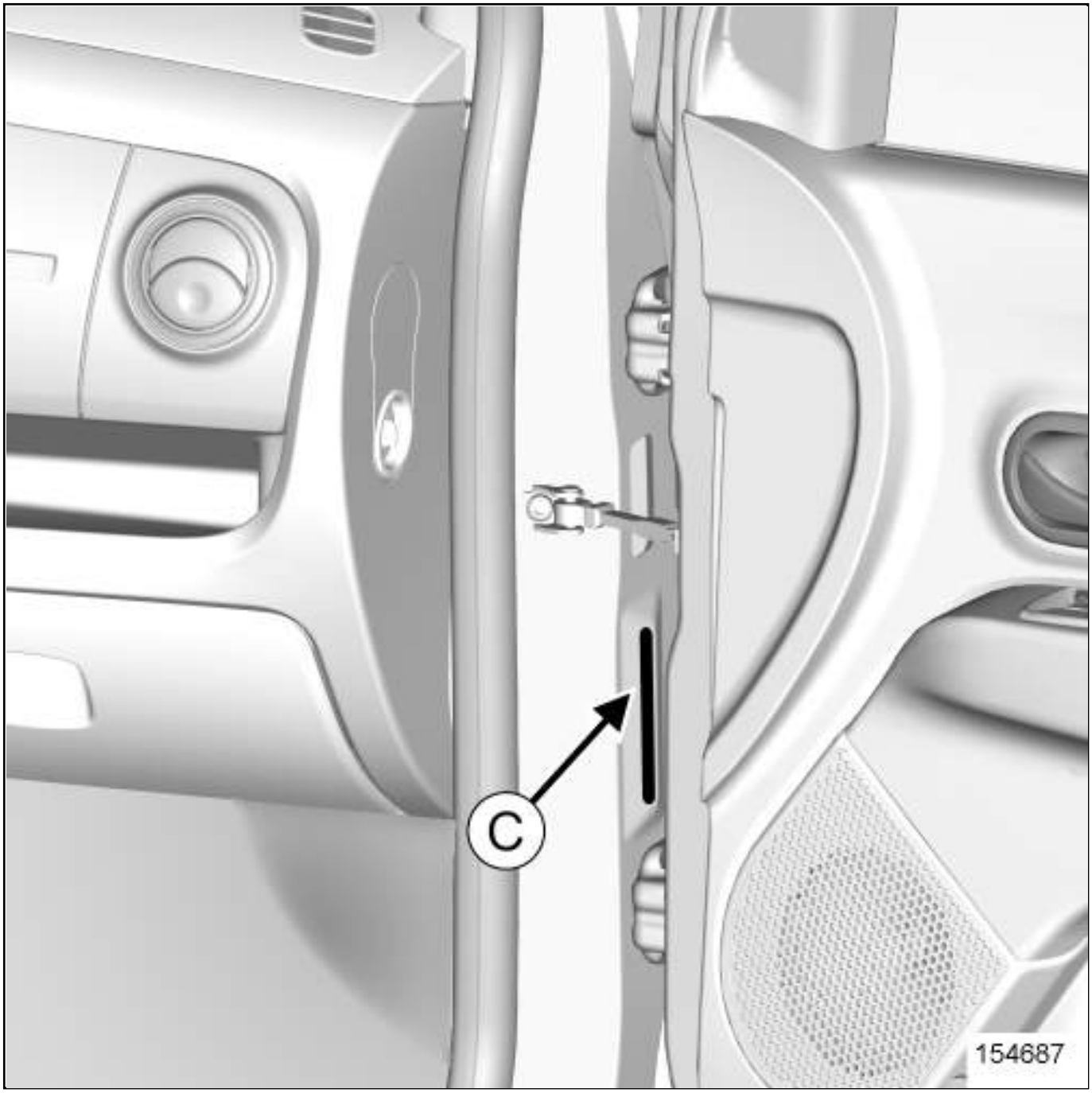
(6) Paintwork reference number

(7) Absorption coefficient (Diesel exhaust emissions)

3. LOCATION OF THE VEHICLE IDENTIFICATION NUMBER (B)

4. COLD-MARKING OF THE BODY

MARKING (C)



Note:

If the complete body is being replaced, it must be marked in compliance with the current regulations.

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IGNITION SWITCH: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Ignition switch bolt

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

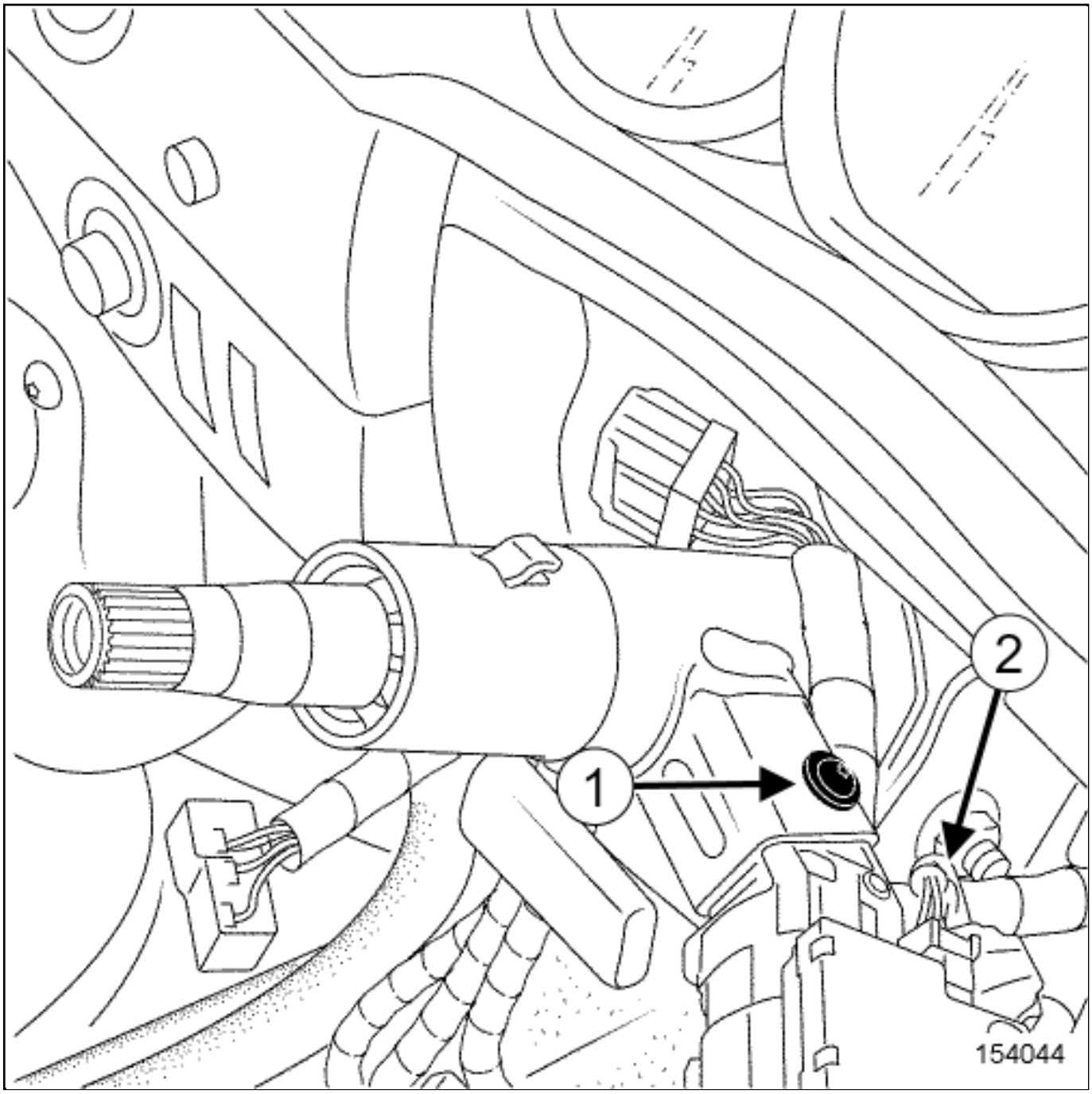
- Airbag and pretensioners: Precautions for the repair ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

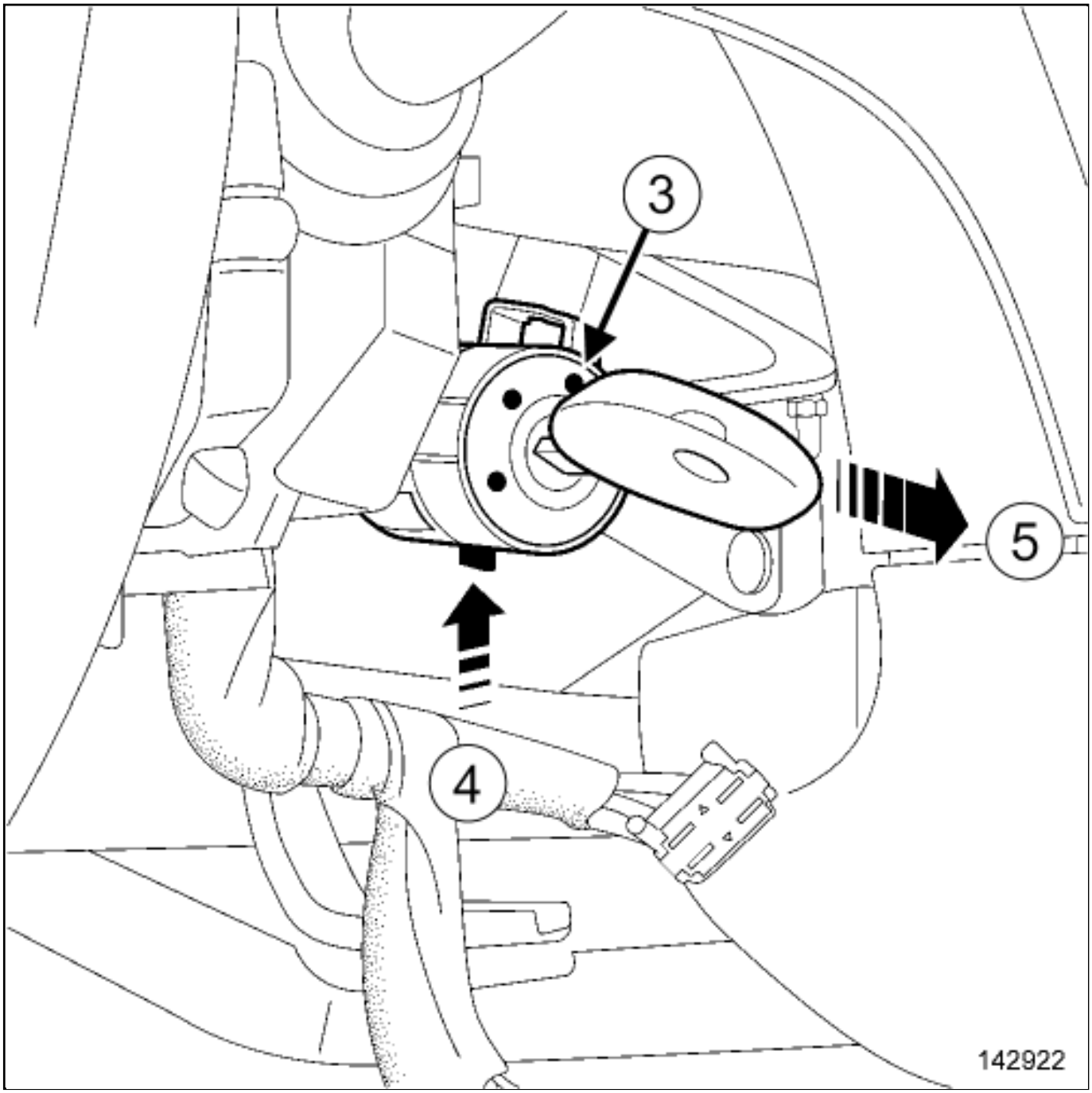
1. REMOVAL PREPARATION OPERATION

- Set the wheels straight ahead.
- Lock the airbag computer Airbag and pretensioners: Precautions for the repair .
- Switch off the ignition.
- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the driver's frontal airbag Driver's frontal airbag: Removal - Refitting ,
  - the steering wheel Steering assembly: Exploded view ,
  - the steering wheel control assembly Steering column switch assembly: Removal - Refitting .
- Remove the transponder ring (see 82A, Engine immobiliser, Immobiliser system: List and location of components) .

2. REMOVAL OPERATION



- Remove the shear bolt(1) using a punch.
- Disconnect the ignition switch connector(2) .
- Remove:
  - the steering column bolts**Steering assembly: Exploded view** ,
  - the steering column partially.



- Position the ignition key to position(3) .
- Press the retaining lug at(4) .
- Remove the ignition switch at(5) .

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: Ignition switch bolt.

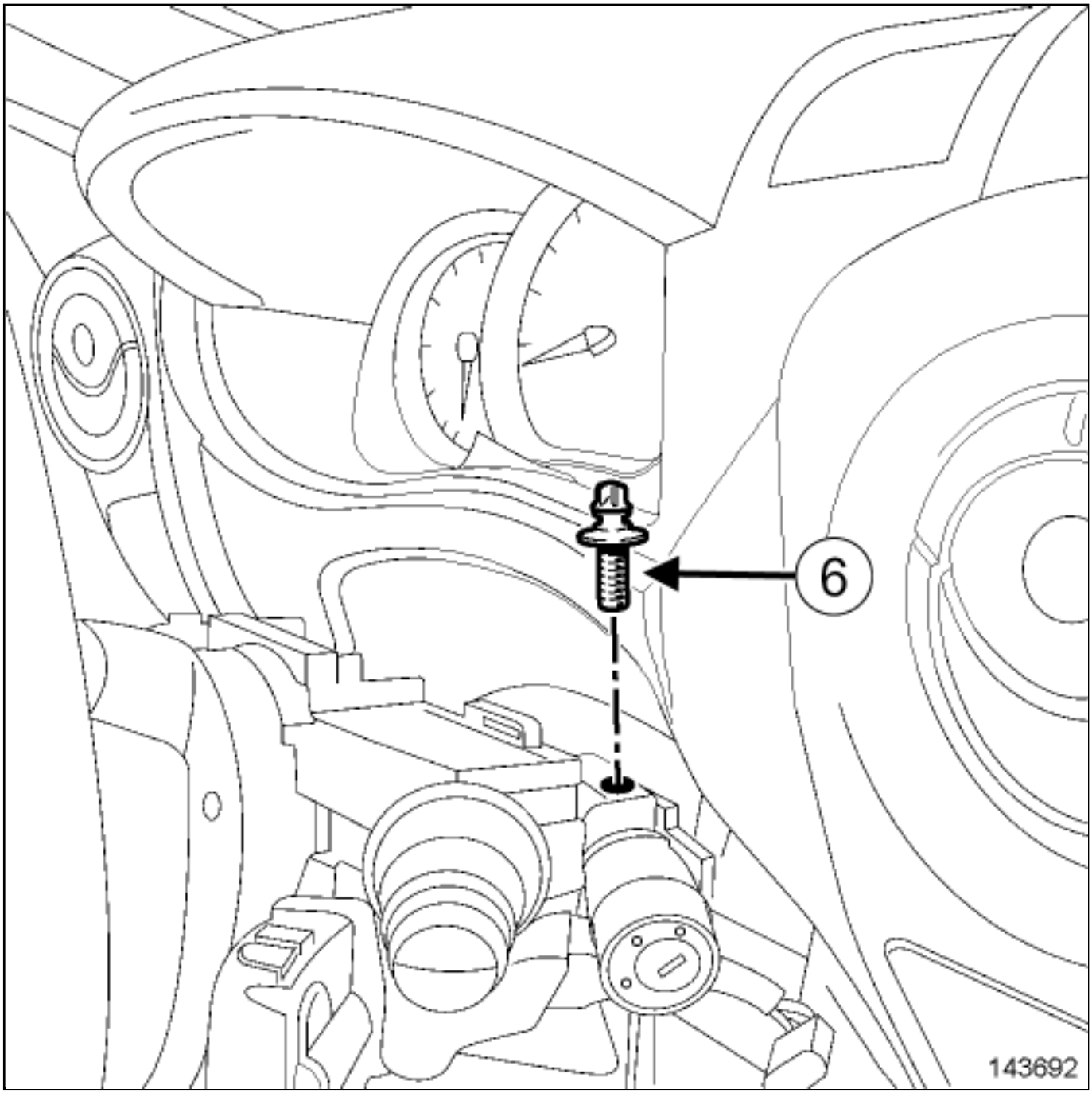
2. REFITTING OPERATION

Note:

To protect against tampering, always secure the ignition switch with a shear bolt.

Be sure to recover the sheared-off part of the bolt after it has been tightened.

- Position the ignition key to position(3) .
- Press the retaining lug.
- Fit the ignition switch.



- Tighten the shear bolt(6) until the bolt head shears off.

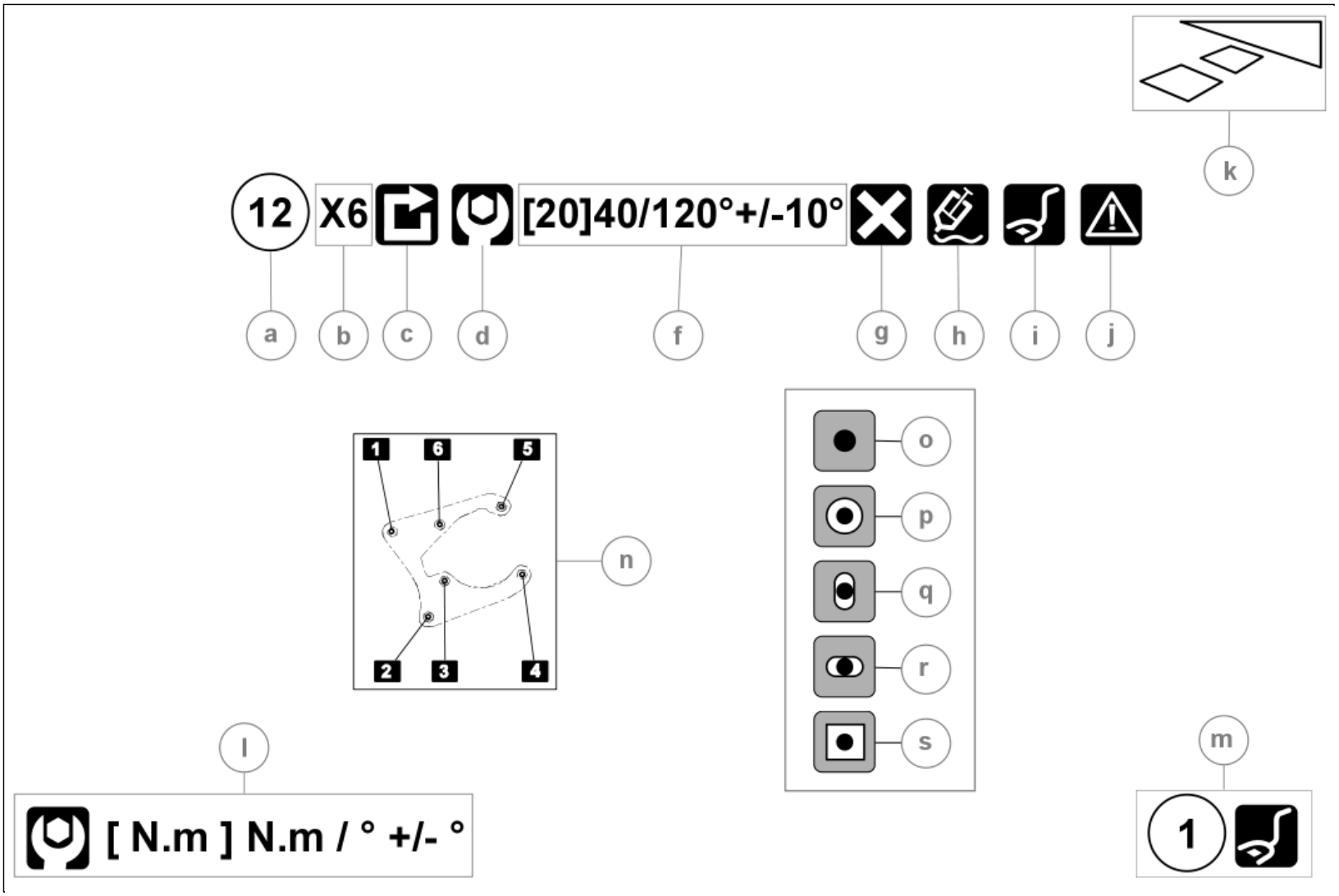
- Refit Steering assembly: Exploded view :
  - the steering column,
  - the steering column bolts.

- Connect the ignition switch connector.

- Lock the ignition switch connector.

3. FINAL OPERATION

- Proceed in the reverse order to removal.
- Unlock the airbag computer **Airbag and pretensioners: Precautions for the repair** .
- Switch on the ignition.
- Check that there are no faults.



LEGEND FOR ICONS

a	No.
b	Part number
c	A tightening order must be respected
D	Non-standard tightening torque / angle
f	[Initial torque] tightening torque / tightening angle +/- tightening angle tolerance
g	Part always to be replaced
h	Product / Consumable
i	Special tooling / Equipment required
j	Safety precaution
k	Front of the vehicle
l	Tightening units
m	Special tooling / Equipment required to use on all of the assembled parts
n	Tightening order to be respected

The following icons represent the adjustment possibilities for the bodywork components:

- the black dot in the centre represents the body of the bolt,

- the grey section represents the component to be adjusted,

- the white section represents the adjustment area.

o	No adjustment possible
p	Adjustment possible along all axis
q	Adjustment possibly only along vertical axis
r	Adjustment possibly only along horizontal axis
s	Adjustment possible along all axis

IMMOBILISER SYSTEM: LIST AND LOCATION OF COMPONENTS

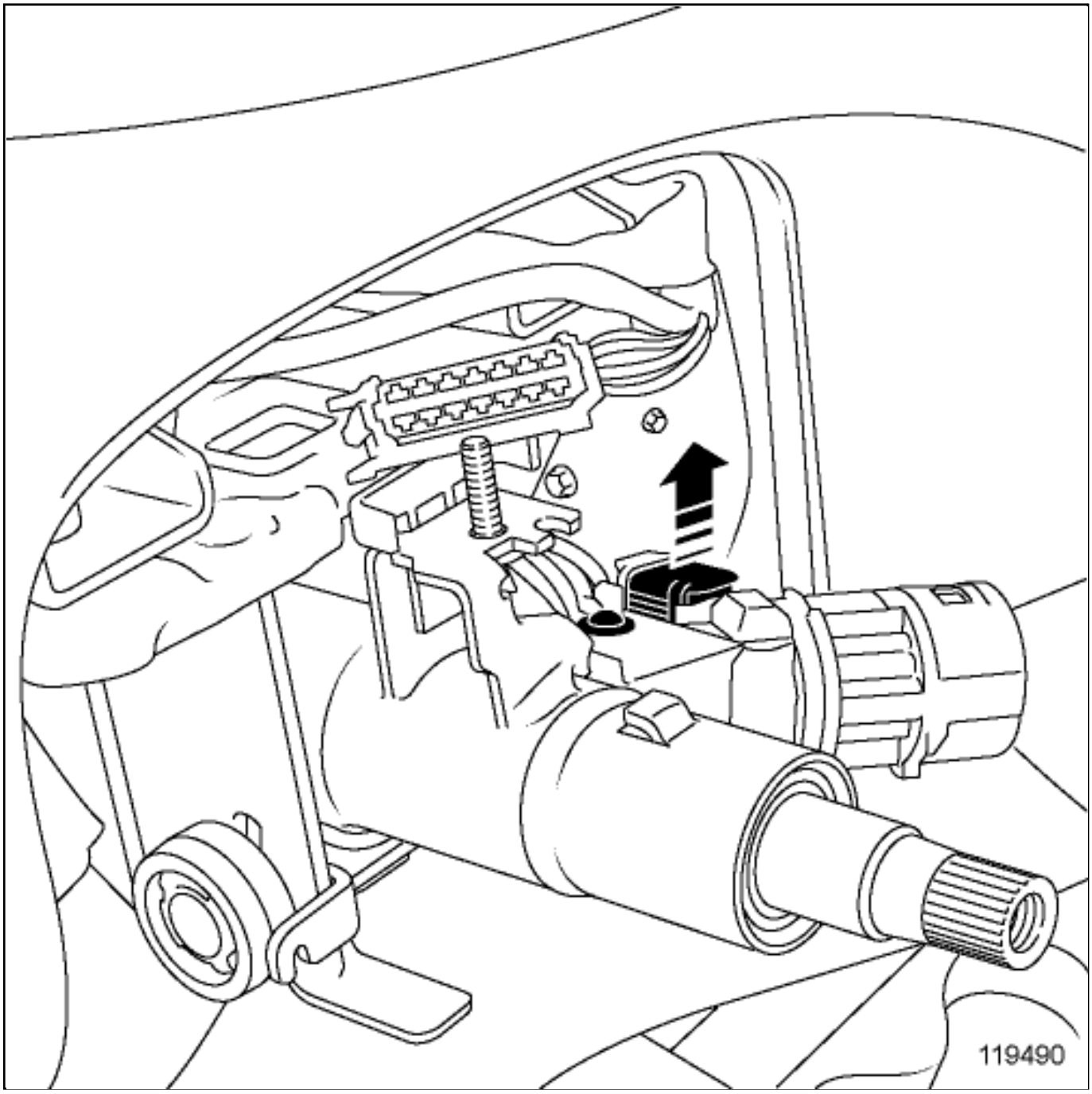
1. LIST OF COMPONENTS

1- THE IMMOBILISER SYSTEM CONSISTS OF:

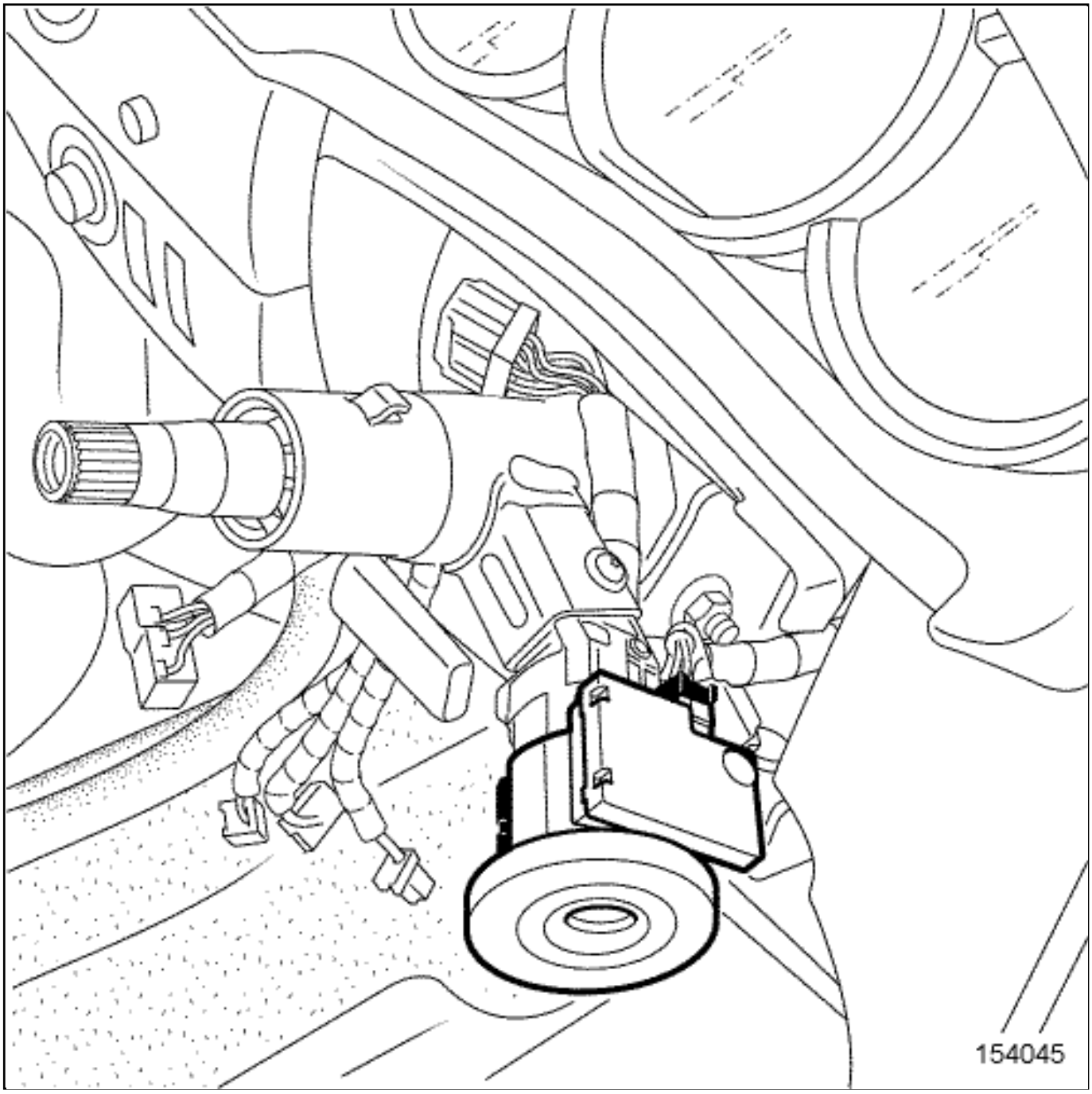
- an ignition switch(see 82A, Engine immobiliser, Ignition switch: Removal - Refitting)
- a transponder ring(see **Transponder ring: Removal - Refitting**)
- a UCHUCH: Removal - Refitting
- an ignition key

2. LOCATION OF COMPONENTS

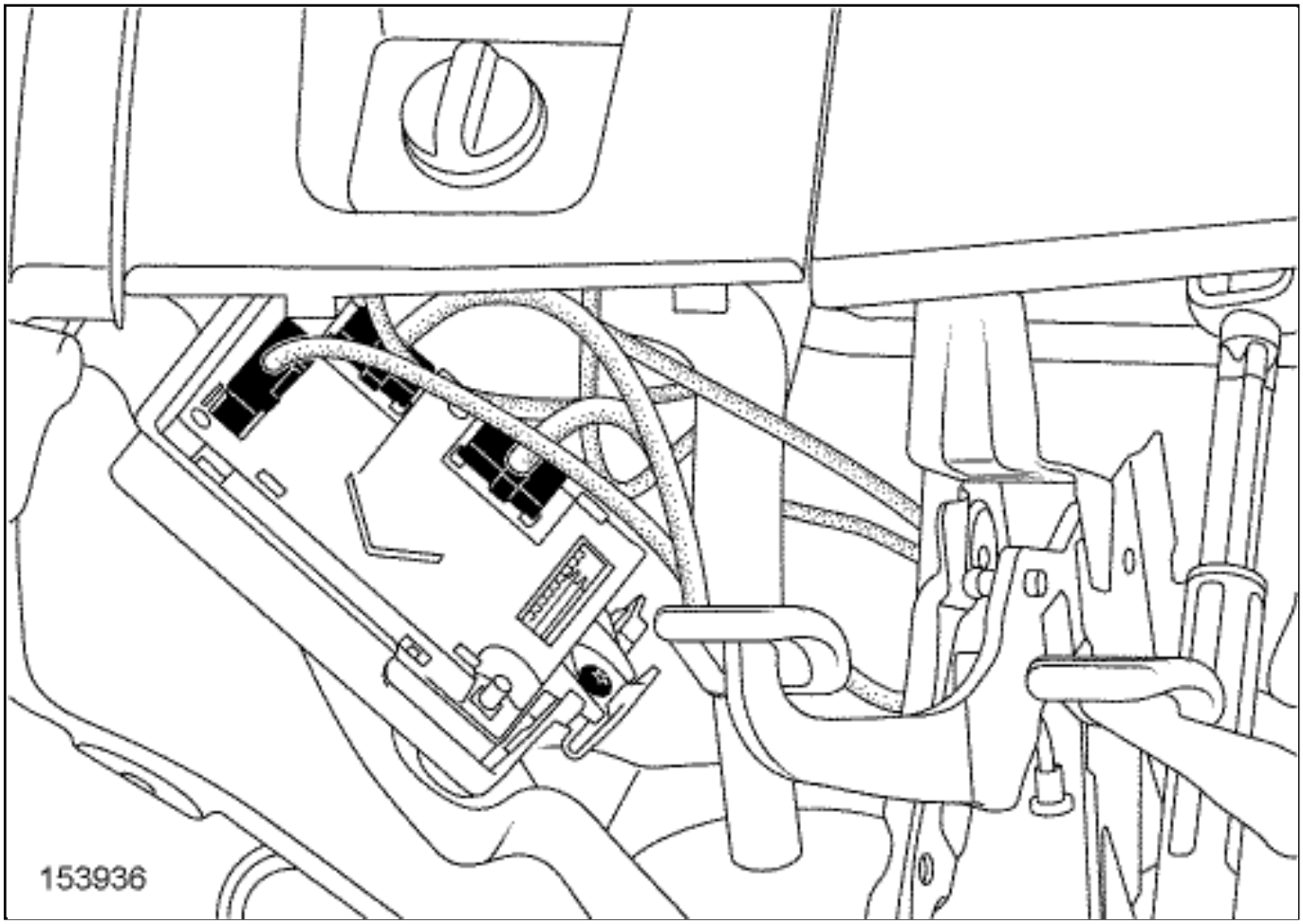
IGNITION SWITCH



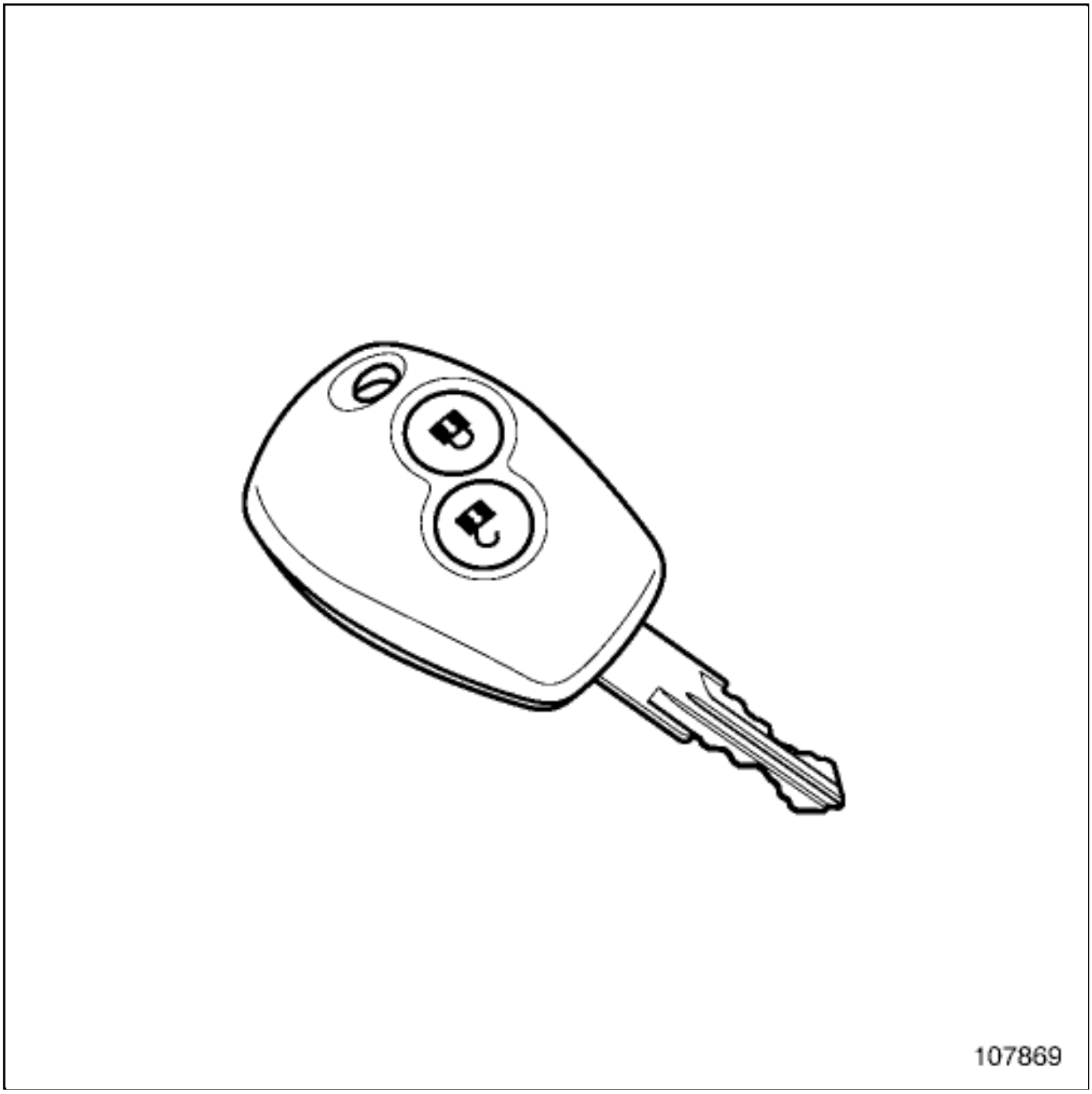
TRANSPONDER RING



UCH



IGNITION KEY


107869

IMPACTFAULTFINDING:DESCRIPTION

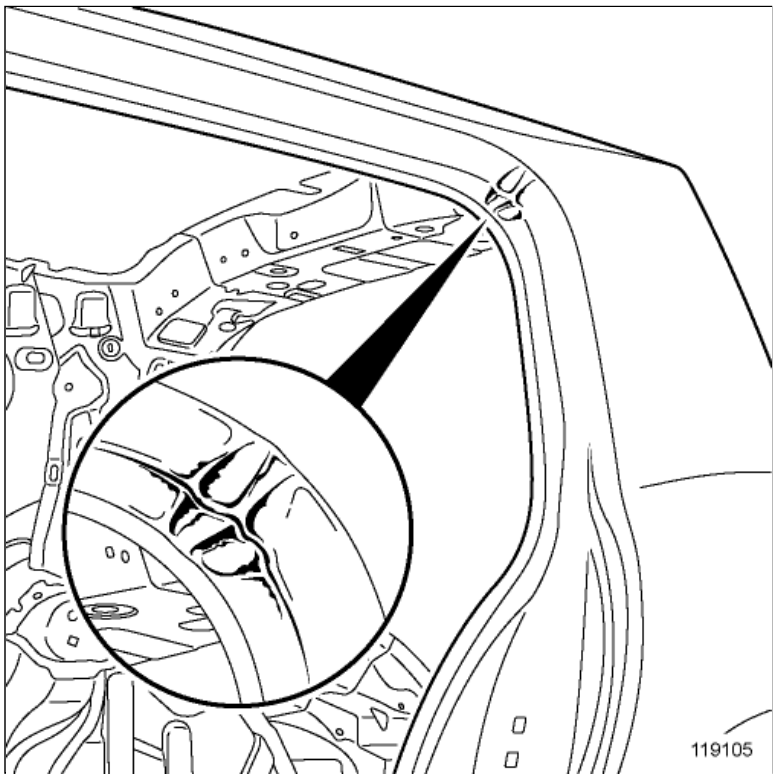
1.INTRODUCTION

Before undertaking bodywork repairs on a vehicle, carry out a series of checks in order to determine:

- firstly, whether the vehicle's road holding and behaviour has been affected by the impact,
- the type of equipment to use according to the deformity found on the subframe,
- the parts to order for the repairs.

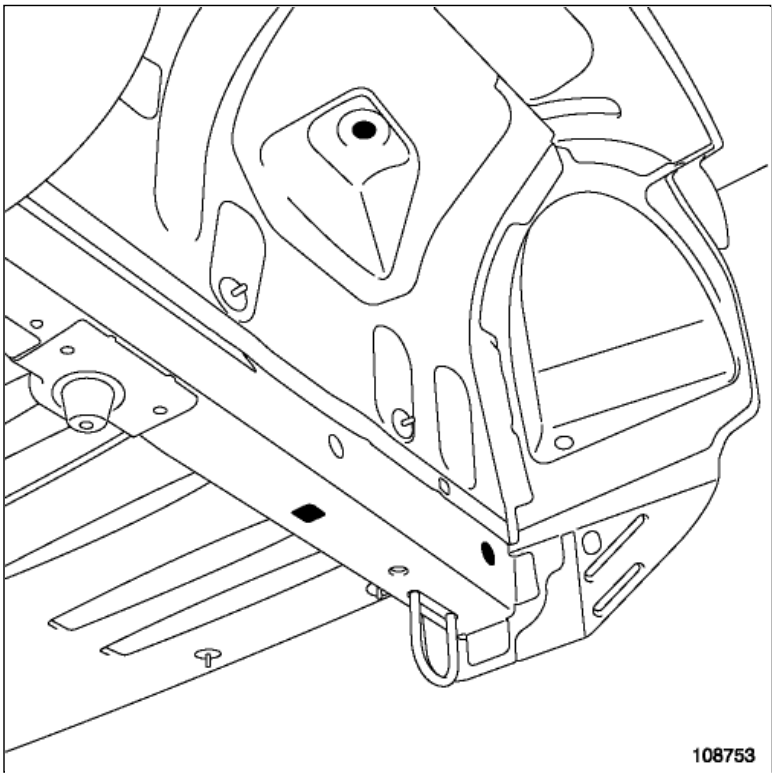
The checks consist of examining the vehicle structure in order to detect any significant crumpling or blistering.

2. VISUAL INSPECTION OF THE UPPER STRUCTURE



With the vehicle on the ground, check the edge clearances of the opening elements and remove the door entry seals to check for any damage to the door frame angles.

3. VISUAL INSPECTION OF THE SUBFRAME



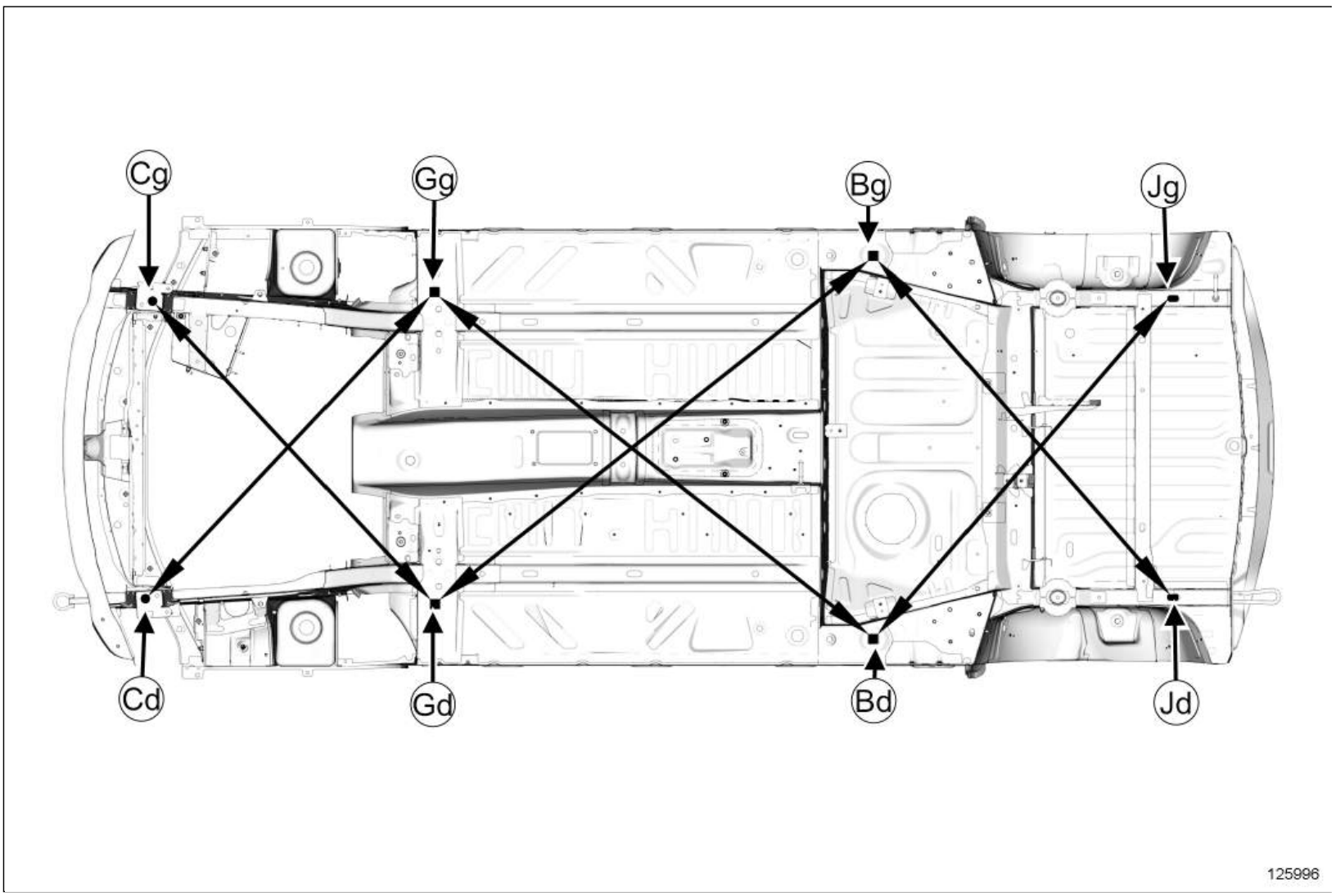
It is preferable to position the vehicle on a two-post lift and examine the side members around the original crumple zones, mechanical component mountings (engine, gearbox, subframe, shock absorber cups) and then the floors.

Note:

- For small impacts or "contentious" impacts, the subframe check may be supplemented by:
  - a comparison measurement using a mechanical gauge,
  - a three-dimensional measurement with an expert report (be sure to measure several points on the component being checked in order to reveal the tendency for deformation, to confirm the fault finding), followed by a check of the axle assemblies before any repairs, on a special 4-post lift.

For impacts to the wheels without any visible structural damage, begin fault finding by checking the axle geometry, after having replaced the damaged wheels.

4. CHECKING THE SUBFRAME USING A MEASURING TOOL



Chronological order of checks:

Front impact

(Bg) - (Gd) = (Bd) - (Gg)

(Bg) - (Jd) = (Bd) - (Jg)

Rear impact

(Bg) - (Gd) = (Bd) - (Gg)

(Gg) - (Cd) = (Gd) - (Cg)

5. TYPE OF REPAIRS

Three main categories:

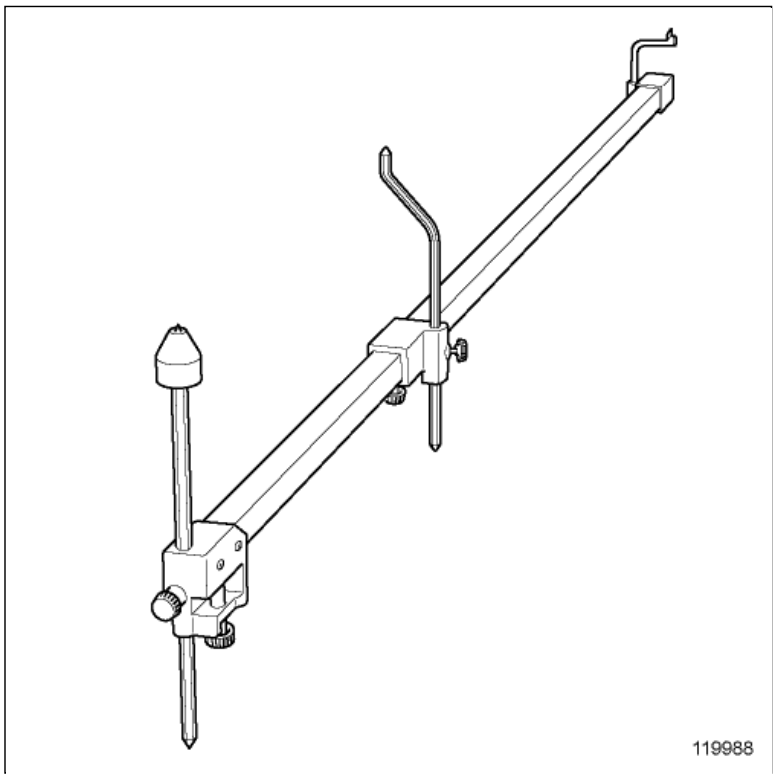
- cosmetic damage only: dent removal without the need for jacking,
- damage with slight deformation of the end of a side member requiring some jacking, without risk to the vehicle's road holding,
- damage with deformation of the subframe geometry likely to have affected the vehicle's road holding(see 40A, General information, Straightening a component: Description) .

Note:

The indications necessary for identifying the points on the subframe which affect the vehicle's road holding are given in the MR for each vehicleStructural components to be positioned on the repair bench: Description .

IMPACT FAULT FINDING EQUIPMENT: USE

1. MANUAL TRAMMEL GAUGE



Checking by symmetrical comparison of geometric deformation of the ends of side members or other points on the bodywork.

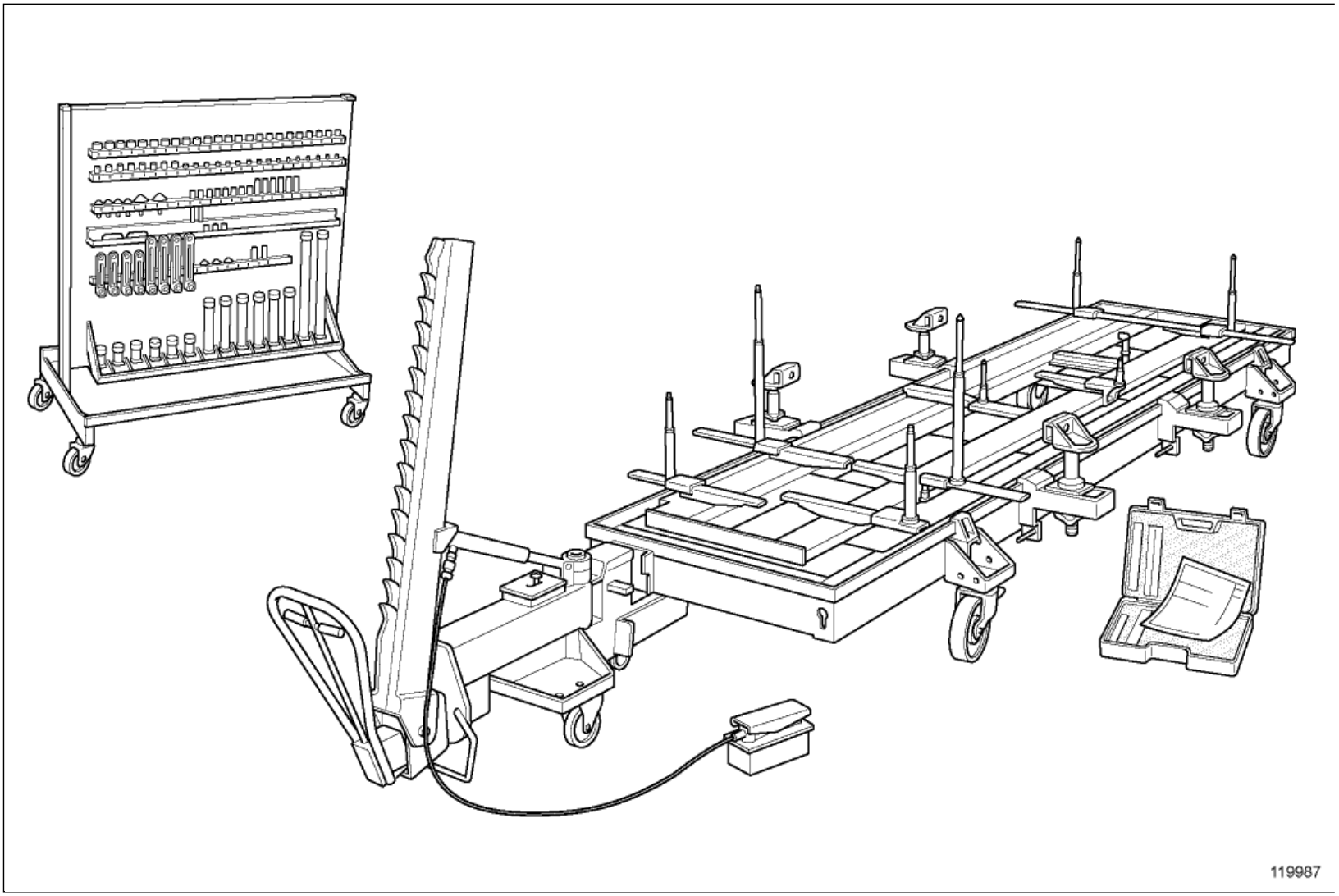
Advantages:

- simple, precise method.

Disadvantages:

- cannot be used to take measurements as coordinates (X; Y; Z),
- cannot be used to measure asymmetric points.

2. MECHANICAL MEASURING SYSTEM



For measuring the understructure of a vehicle as a whole, with or without its mechanical components.

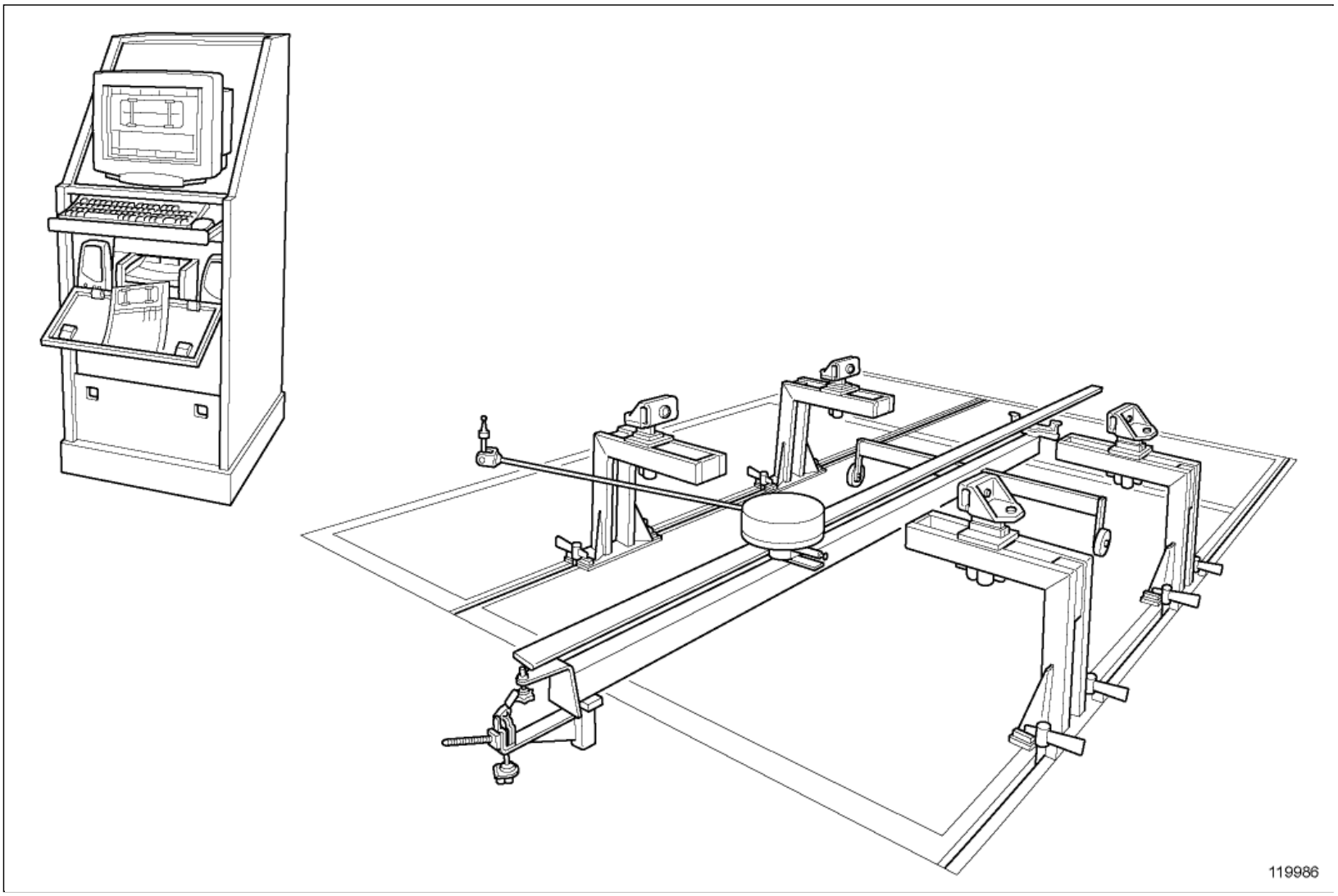
Advantages:

- enables geometric alignment of the parts.

Disadvantages:

- time-consuming to run fault finding procedure.

3. CAE MEASURING SYSTEM



For measuring the understructure of a vehicle as a whole, with or without its mechanical components.

Advantages:

- can be implemented quickly,
- best method for fault finding,
- gives a measurement report.

Disadvantage:

- Does not enable geometric alignment of the parts.

Repair-00x04x03x25-01x79-1-1-1.xml

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INHIBITOR SWITCH: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

REMOVAL

1. REMOVAL PREPARATION OPERATION

WARNING

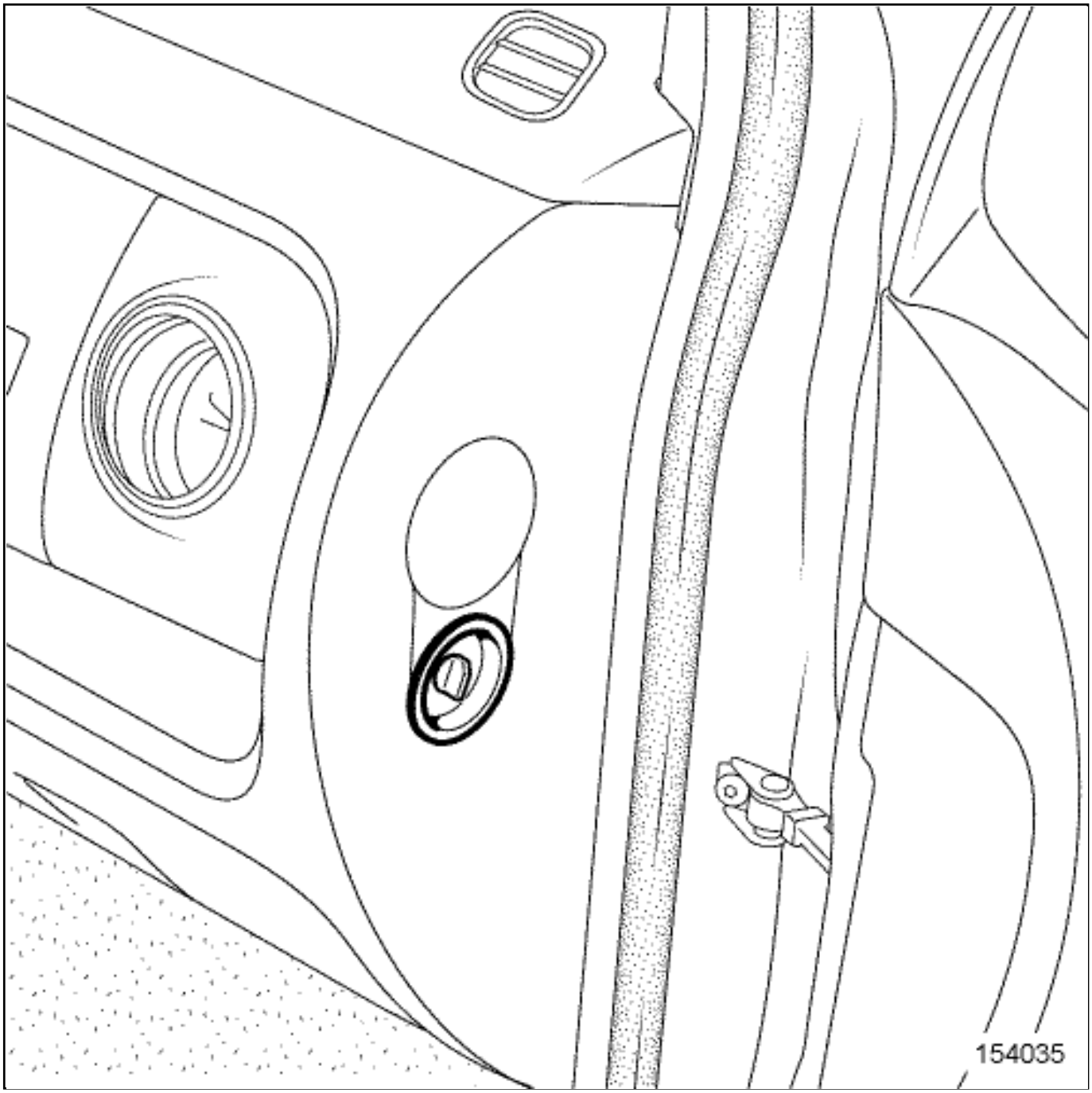
To avoid any risk of triggering when working on or near a pyrotechnic component (airbags or pretensioners), lock the airbag computer using the diagnostic tool.

When this function is activated, all the trigger lines are inhibited and the airbag warning light on the instrument panel lights up continuously (ignition on).

WARNING

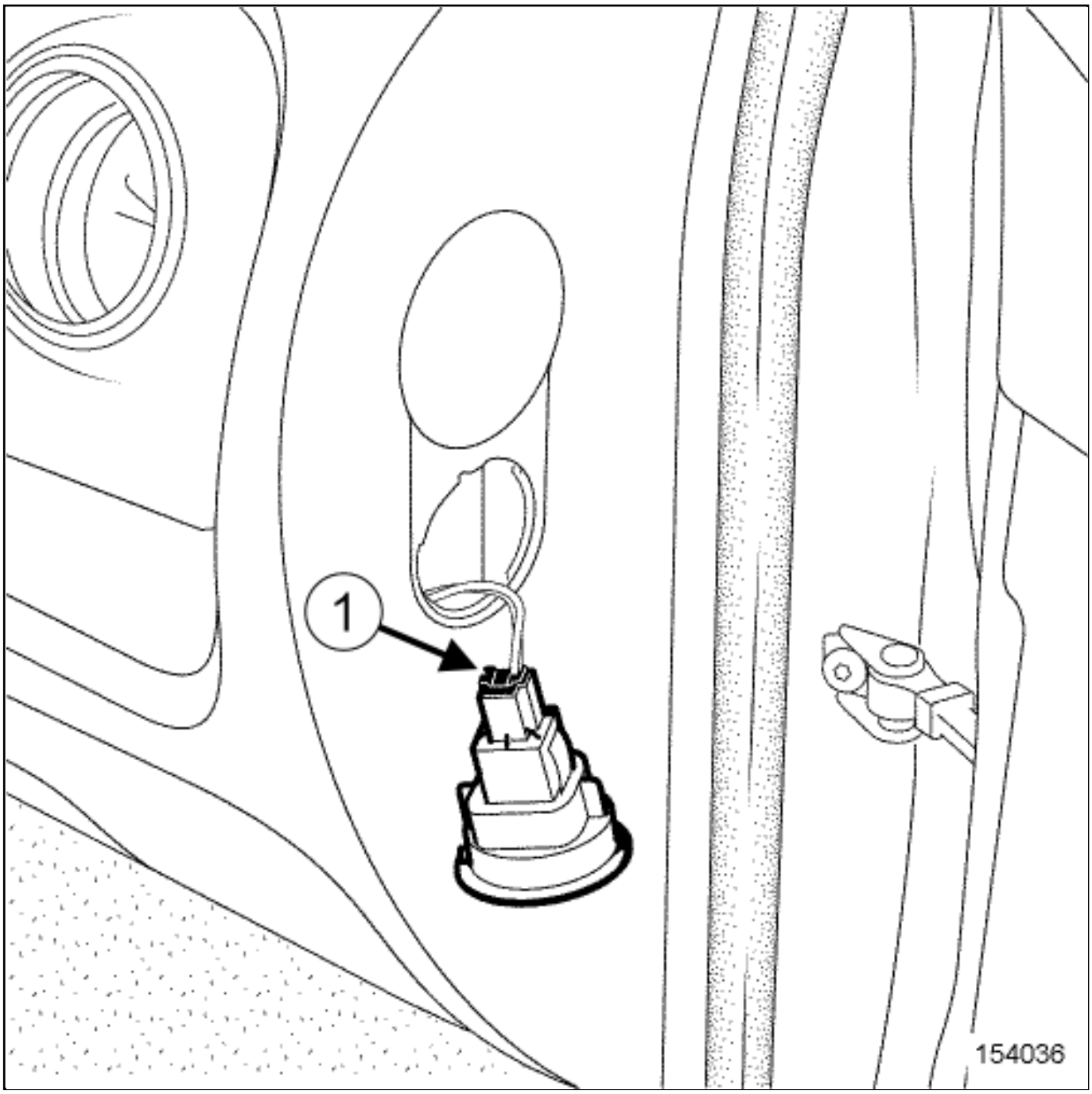
Never handle the pyrotechnic systems (pretensioners or airbags) near to a source of heat or naked flame - they may be triggered.

- Lock the airbag computer (see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .
- Disconnect the battery Battery: Removal - Refitting .



- Remove the inhibitor switch.

2. REMOVAL OPERATION



- Disconnect the inhibitor switch connector(1) .

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

2. FINAL OPERATION

- Connect the battery Battery: Removal - Refitting .

- Unlock the airbag computer (see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

- Perform an operational check by moving the switch from the "ON" position to the "OFF" position.

- In the "OFF" position, check the appearance of the "airbag OFF" message on the instrument panel.

Repair-31x02x01x25-01x37-1-22-1.xml

XSL version : 3.02 du 22/07/11

INJECTOR LEAK FLOW: CHECK

Note, one or more warnings are present in this procedure

Special tooling required	
Kit for measuring the injector fuel flow rate.	

Equipment required
Diagnostic tool
self-contained starter

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 13B, Diesel injection, Diesel injection: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

WARNING

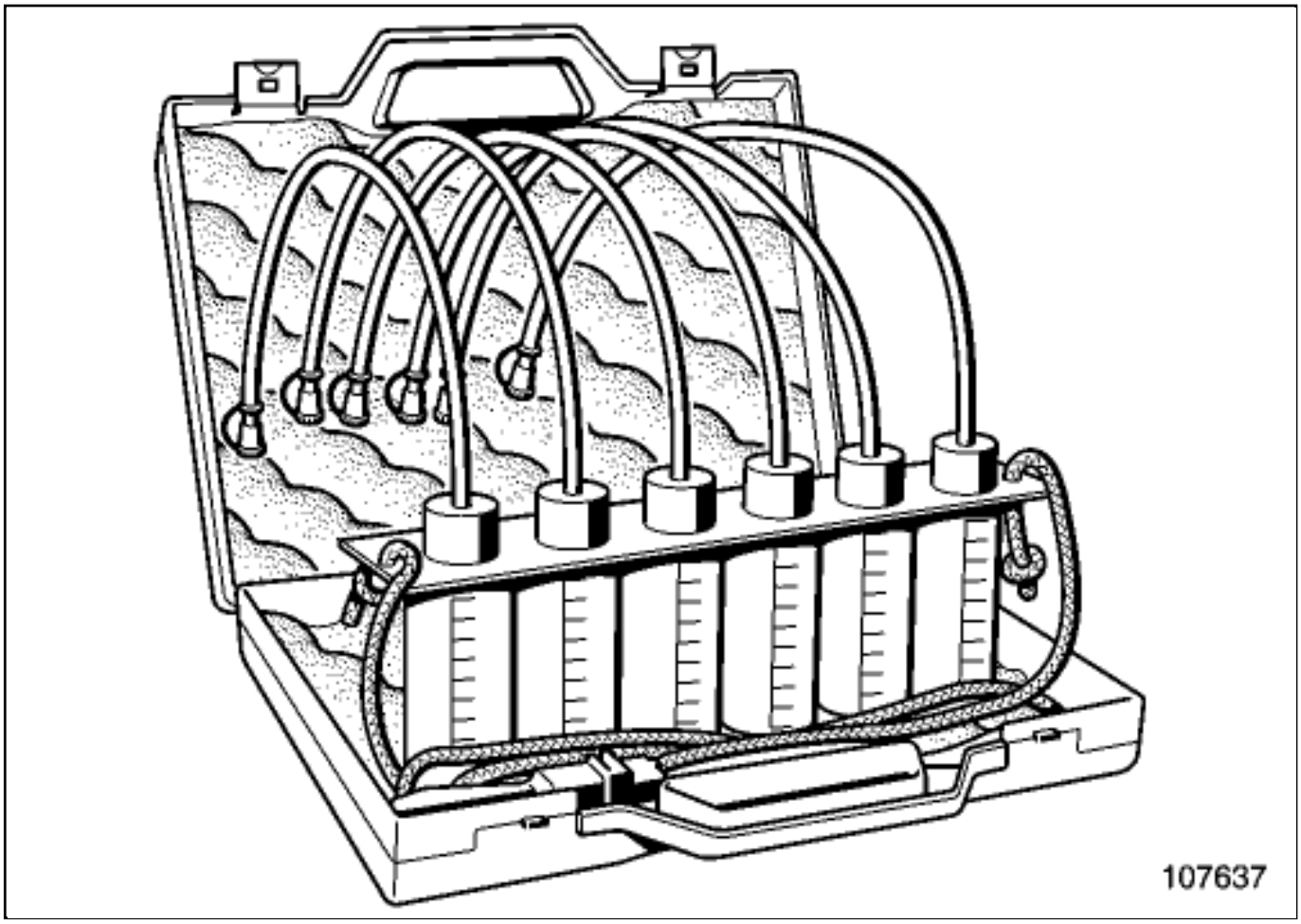
Wear leaktight gloves (Nitrile type) for this operation.

CHECK

1. PREPARATION OPERATION FOR CHECK

Remove:

- the intercooler air inlet pipeIntercooler air inlet pipe: Removal - Refitting ,
- the injector rail protector(see 13B, Diesel injection, Injector rail protector: Removal - Refitting) .



- Connect the four transparent hoses of the toolKit for measuring the injector fuel flow rate. on the diesel injectors in place of each union of the diesel injector fuel return rail.

Note:

The hose must be fitted with force on the diesel injector fuel return nipple.

If a hose of the toolKit for measuring the injector fuel flow rate. fits too easily onto the diesel injector fuel nipple, due to hose deformation, cut off the widened section of this hose in order to obtain a smaller diameter and to ensure that the hose is secure on the injector during the pressurised test phase.

- Insert these hoses in the four graduated measuring cylinders of the toolKit for measuring the injector fuel flow rate. .

- Refit the clip of the intercooler air outlet pipe.

- Clip the intercooler air outlet pipe on the damper valve.

- Connect the turbocharger pressure sensor connector.
- Refit the clip of the turbocharger air outlet pipe.
- Clip the intermediate air pipe between the turbocharger and the intercooler onto the turbocharger air outlet pipe.

2. CHECKING OPERATION

- Connect a self-contained starter.
- Force the vehicle's + after ignition feed.
- Connect the Diagnostic tool.
- Run command VP036: "Fuel supply inhibition" .
- Run the starter for 15 seconds.
- Check that the diesel injector return volume is greater than 15 ml.
- Repeat the starting phase twice, allowing an interval of 30 secondsbetween each starting phase.
- Run command VP037: "Stop fuel supply inhibition" .
- Disconnect:
  - the Diagnostic tool,
  - the self-contained starter.

3. FINAL OPERATION

- Proceed in the reverse order to removal.

INJECTOR RAIL PROTECTOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 13B, Diesel injection, Diesel injection: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Use the diagnostic tool before any operation is carried out on the injection circuit to check:

- that the rail is not under pressure,
- that the fuel temperature is not too high.

Working on the circuit with the engine running is strictly forbidden.

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

CAUTION

The part removed is subject to customer safety controls, the safety instructions detailed in this procedure must be observed when removing and refitting.

CAUTION

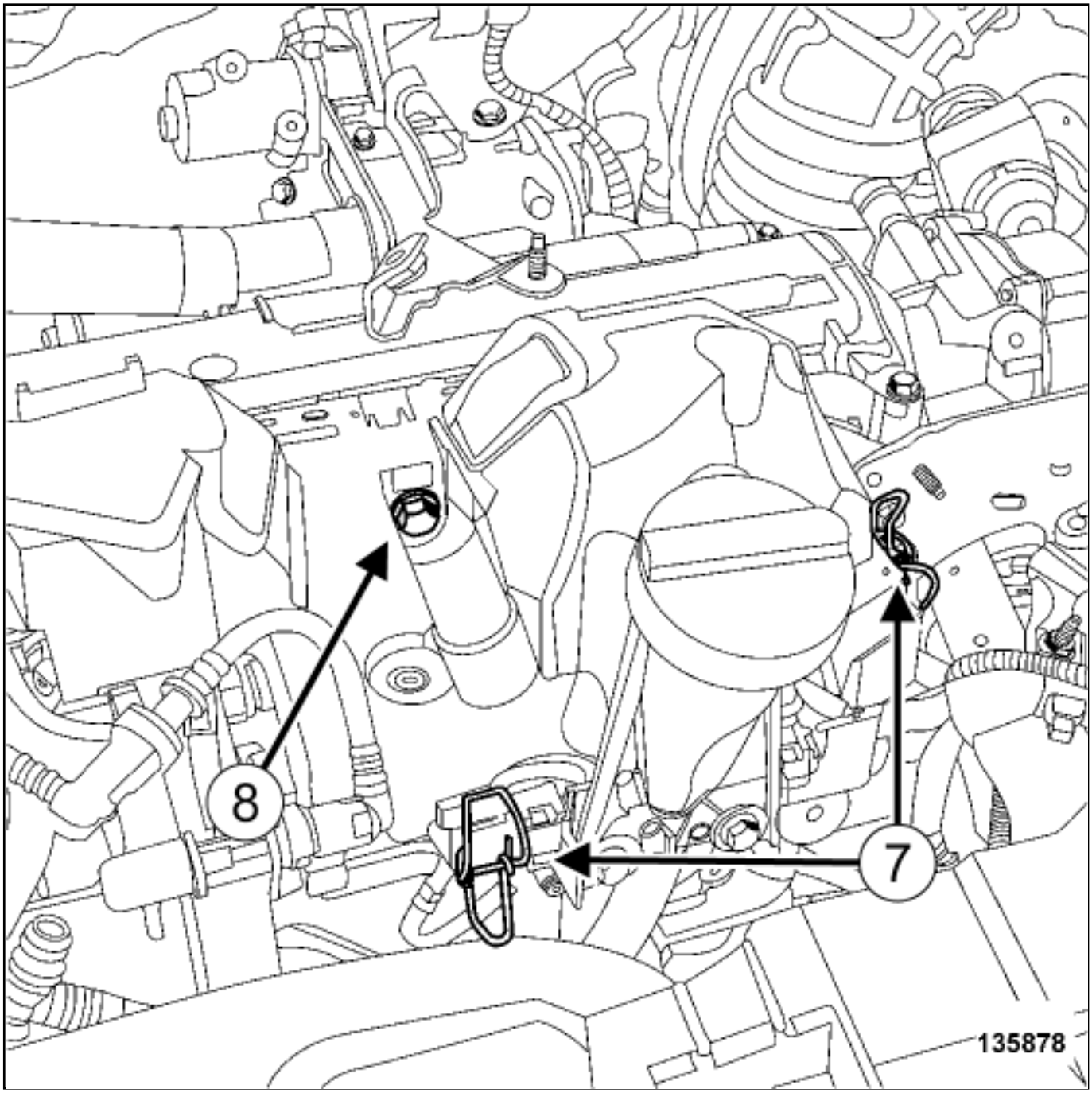
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .
- Remove the intercooler air inlet pipe Intercooler air inlet pipe: Removal - Refitting .

2. REMOVAL OPERATION



- Unclip the injector rail protector at(7) .
- Remove:
  - the injector rail protector bolt(8) ,
  - the injector rail protector.

REFITTING

Proceed in the reverse order to removal.

Repair-11x05x06x09-01x37-1-33-1.xml

XSL version : 3.02 du 22/07/11

INJECTOR RAIL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair **(see 13B, Diesel injection, Diesel injection: Precautions for the repair)** .

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

The part removed is subject to customer safety controls, the safety instructions detailed in this procedure must be observed when removing and refitting.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

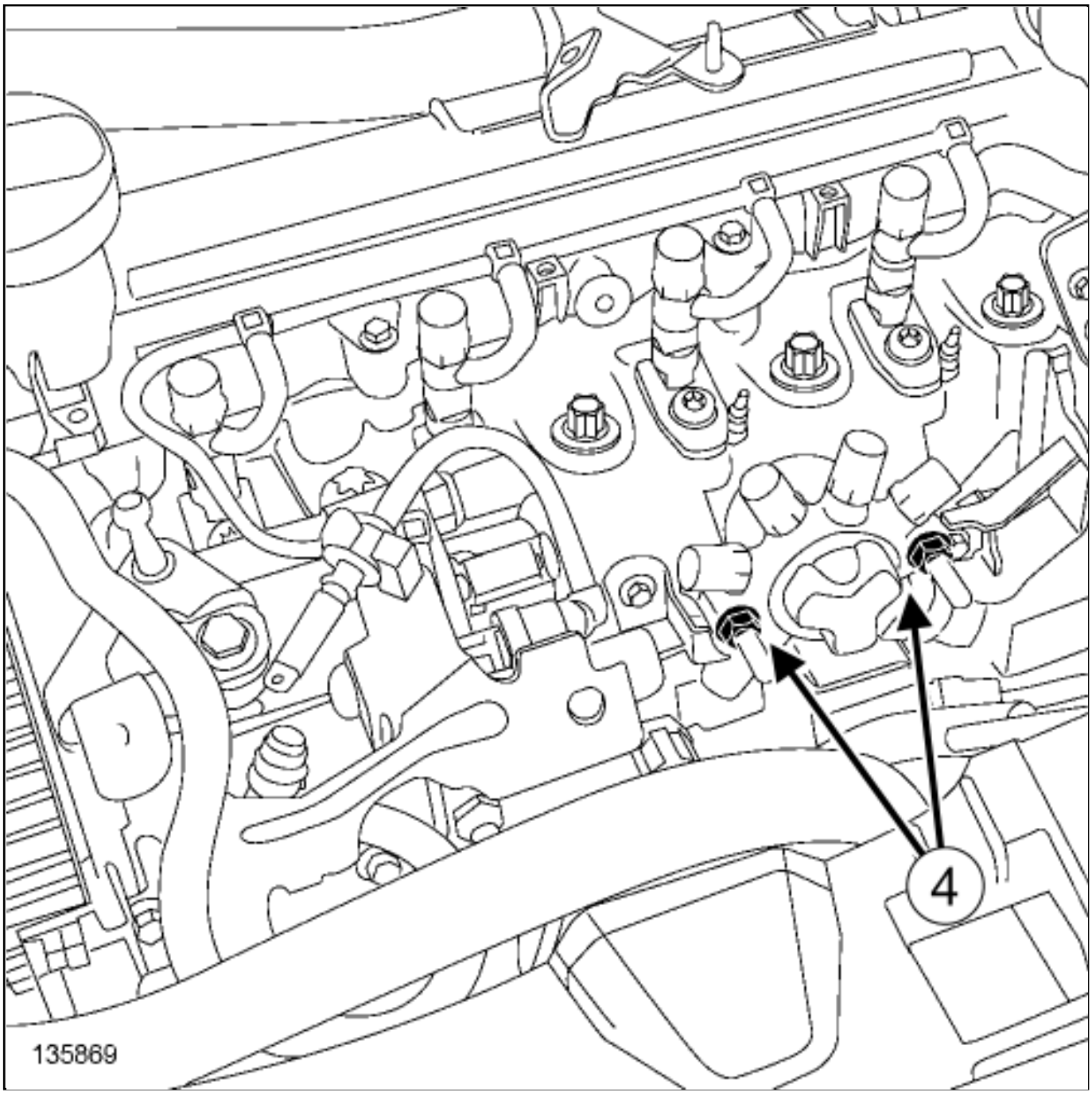
1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .

- Remove:
  - the intercooler air inlet pipe Intercooler air inlet pipe: Removal - Refitting ,
  - the injector rail protector (see 13B, Diesel injection, Injector rail protector: Removal - Refitting) ,
  - the high pressure pipe between the pump and the rail (see 13B, Diesel injection, High pressure pipe between pump and rail: Removal - Refitting) ,

■ the high pressure pipes between the rail and the injectors(see 13B, Diesel injection, High pressure pipe between rail and injector: Removal - Refitting) .

2. REMOVAL OPERATION



- Remove the nuts(4) from the injector rail.

- Remove the injector rail.

REFITTING

1. REFITTING OPERATION

- Refit the injector rail.
- Without tightening, fit the injector rail nuts.

2. FINAL OPERATION

- Refit:
  - the high pressure pipes between the rail and the injectors **(see 13B, Diesel injection, High pressure pipe between rail and injector: Removal - Refitting)** ,
  - the high pressure pipe between the pump and the rail **(see 13B, Diesel injection, High pressure pipe between pump and rail: Removal - Refitting)** ,
  - the injector rail protector **(see 13B, Diesel injection, Injector rail protector: Removal - Refitting)** ,
  - the intercooler air inlet pipe **Intercooler air inlet pipe: Removal - Refitting** .
- Torque tighten the injector rail nuts 28 N.m.
- Connect the battery **Battery: Removal - Refitting** .
- Check that there are no diesel leaks.

INJECTOR WELL CLEANING TOOL: USE

Note, one or more warnings are present in this procedure

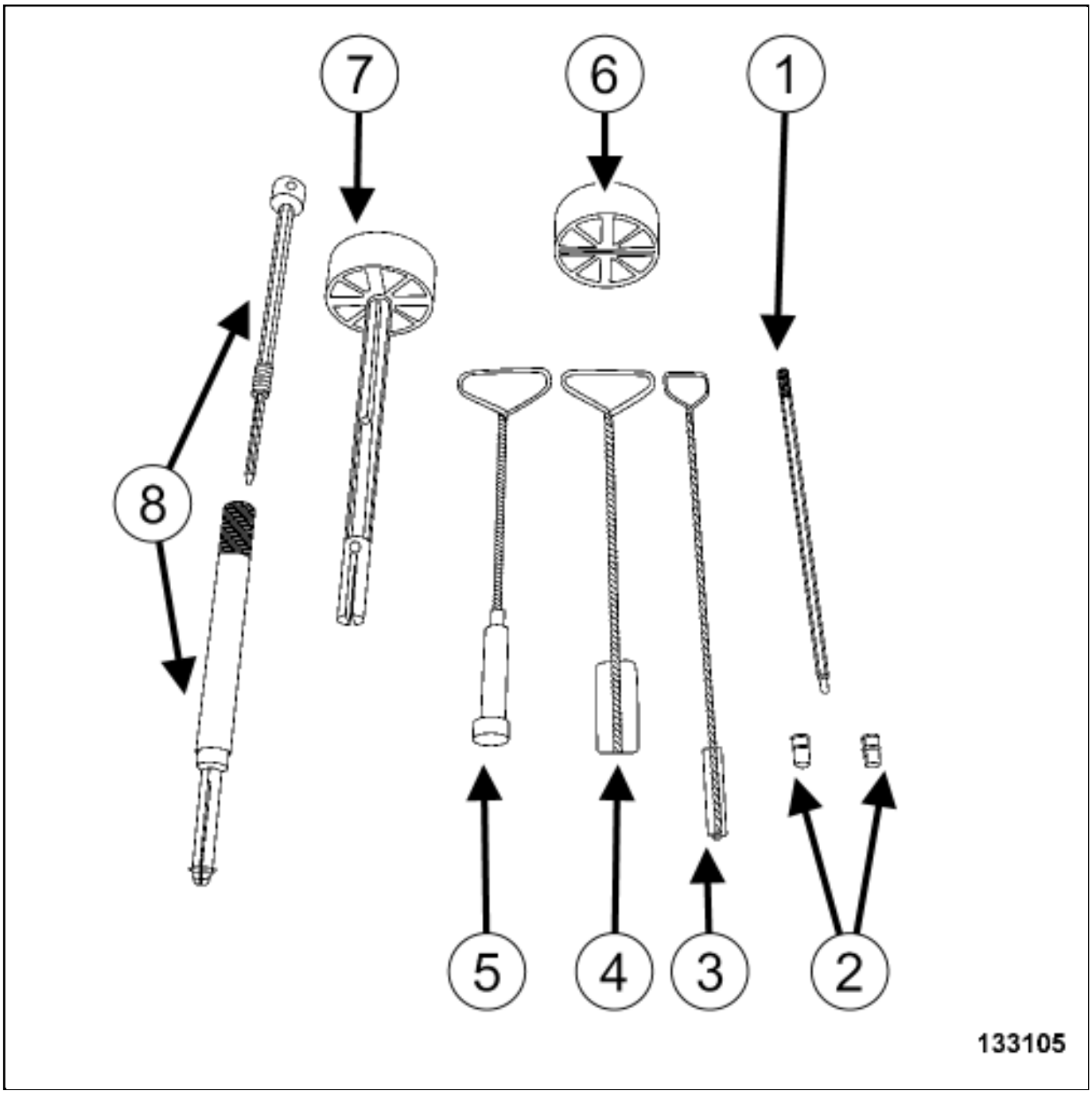
Special tooling required	
Kit of replacement brushes for Mot.1817	

Equipment required
compressed air nozzle

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

1. KIT PRESENTATION



(1) Plug manipulation rod

(2) Injector well bottom plugs* (there are two types of plugs)

(3) Injector nozzle passage opening cleaning brush (opening of injector well - combustion chamber connection)**

(4) Injector well wall cleaning brush**

(5) Injector well bottom cleaning brush**

(6) Brush manipulation knob

(7) Cleaning cloth manipulation rod

(8) Injector washer extraction tool

Note:

The injector washer extraction tool is composed of 2 components to be assembled.

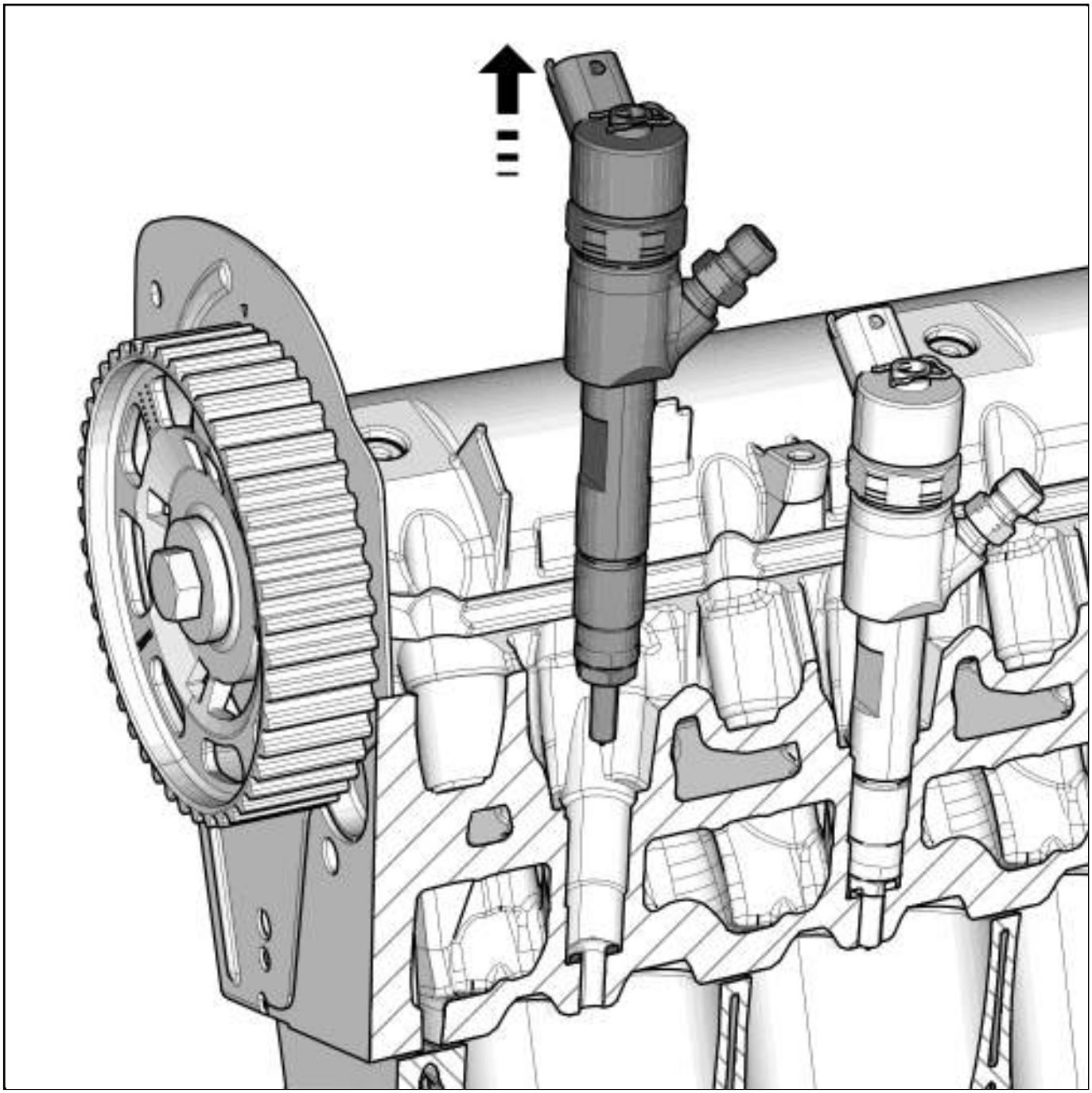
(*) Replacement seals for injector well bottom plugs are available in the kitKit of replacement brushes for Mot.1817 .

(**) Replacement brushes are available in the kitKit of replacement brushes for Mot.1817 .

2. CLEANING PREPARATION OPERATION

Note:

The cleaning of the injector well must be carried out for the injector removal and refitting operation.



- Remove the injector(see 13B, Diesel injection, Diesel injector: Removal - Refitting) .

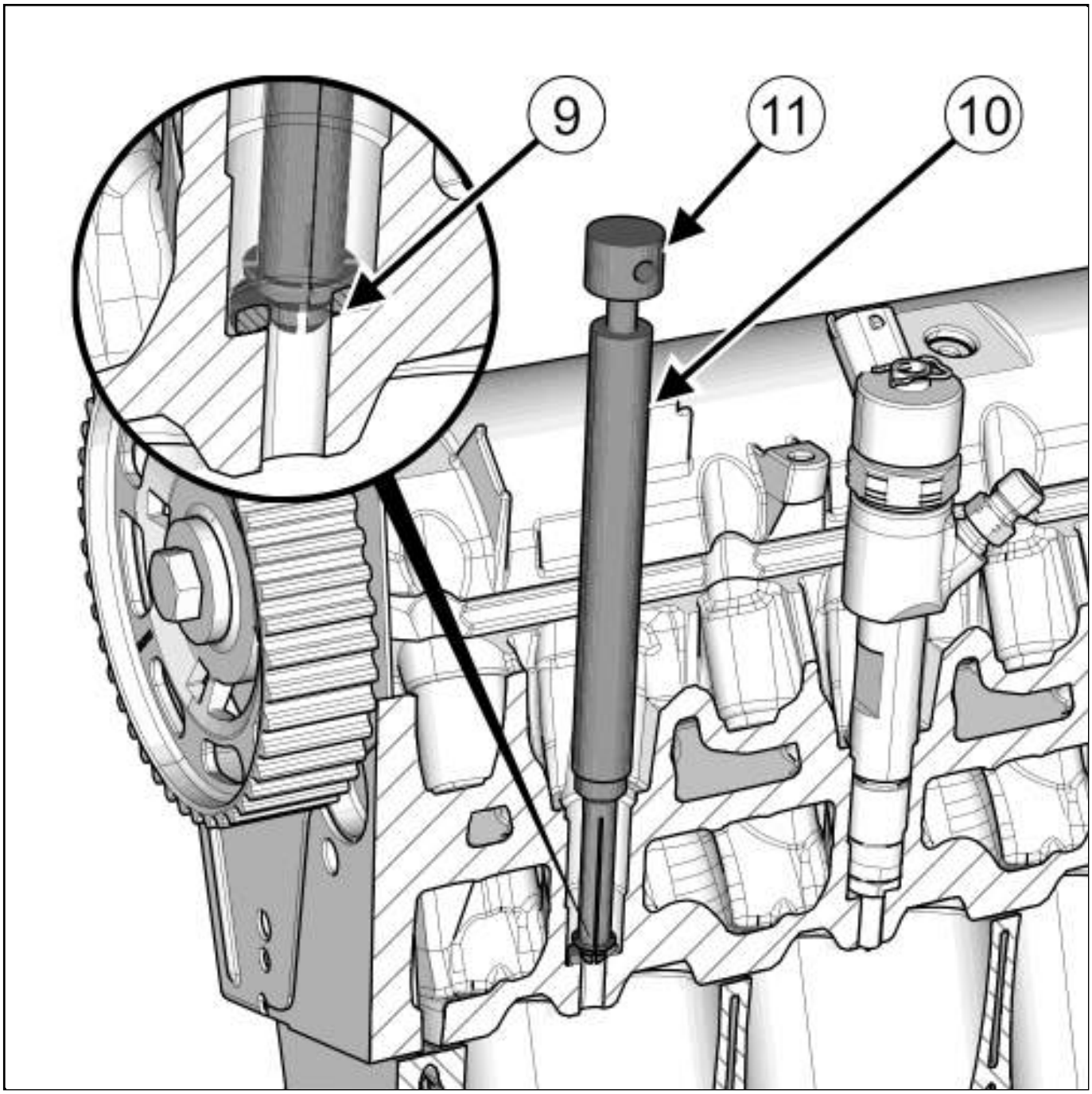
WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Wear goggles with side protectors for this operation.

3. INJECTOR WASHER EXTRACTION

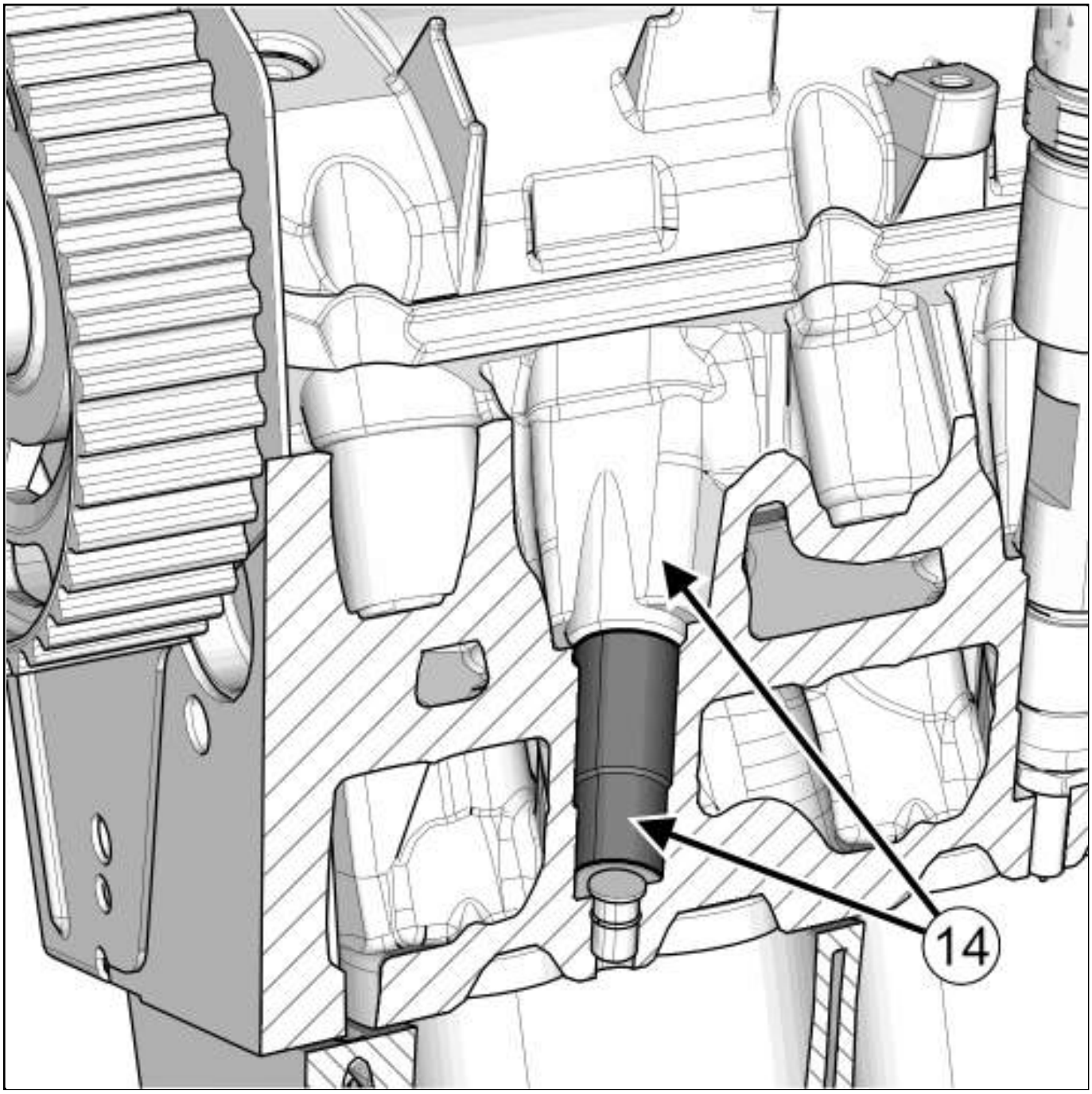


❏ Insert the end of injector washer extraction tool in the injector washer(9) as shown in the diagram above.

- Hold the injector washer extraction tool at(10) and bolt the socket(11) to lock the washer.

- Pull on the injector washer extraction tool to extract the washer.

4. CLEANING THE INJECTOR WELL



- Spray Brake cleaner Vehicle: Parts and consumables for the repair on the injector well wall.(14)

- 1) Brush the well wall(14) using the brush(4) and the knob(6) .

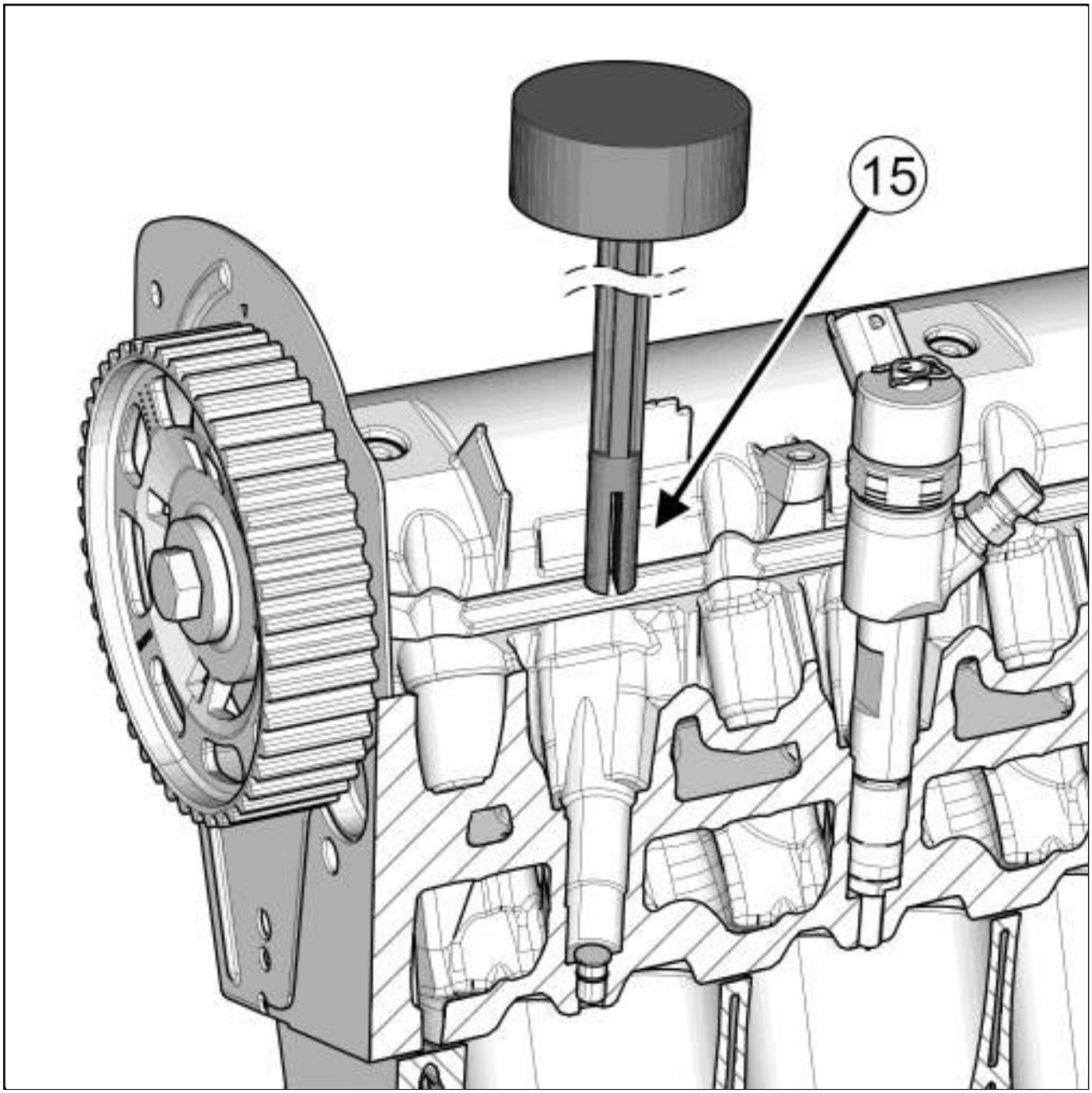
- 2) Blow inside the well at compressed air nozzle.

- Repeat the above steps 1 and 2.

- 3) Brush the bottom of the well using the brush(5) and the knob(6) .

- 4) Blow inside the well at compressed air nozzle.

- Repeat the above steps 3 and 4.



- 5) Use a cleaning cloth Vehicle: Parts and consumables for the repair folded in two to wipe the slot(15) in the tool.

6) Wrap the cloth around the tool rod.

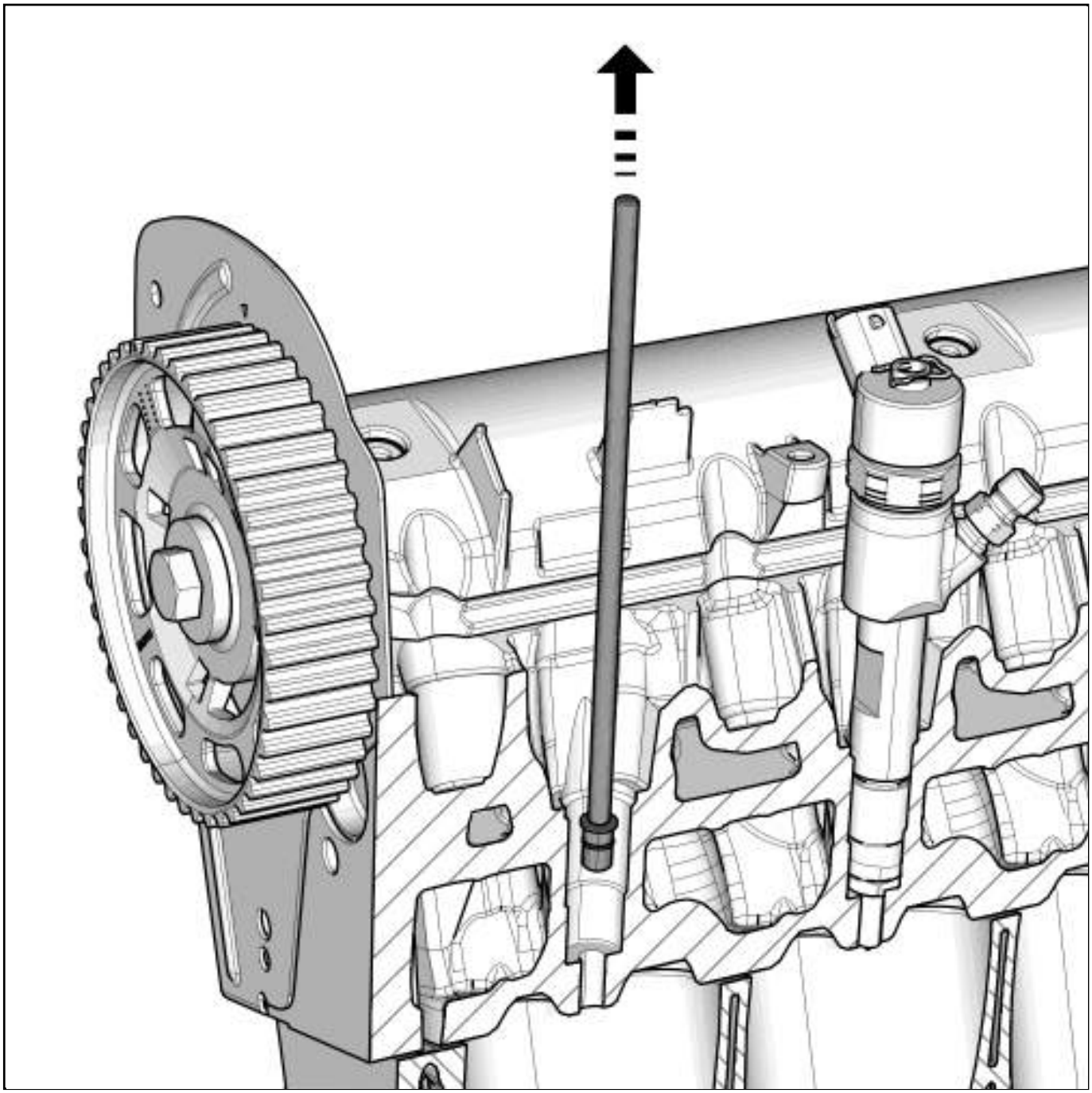
7) Soak the cloth with Brake cleaneror with Injector cleaner**Vehicle: Parts and consumables for the repair** .

8) Rub the wall and the bottom of the injector well using cloth wrapped around the tool.

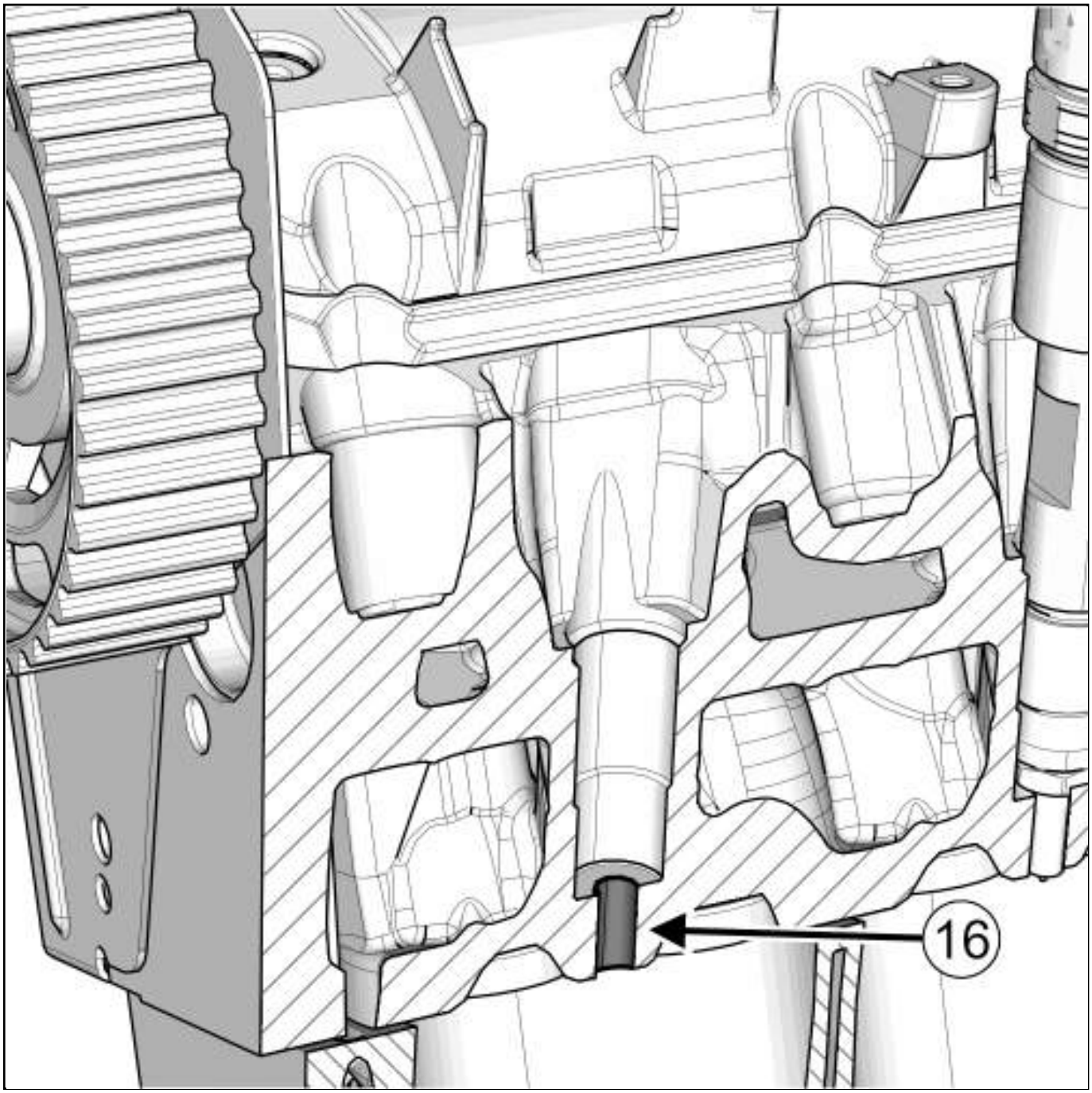
9) Dispose of the used cloth.

10) Blow inside the well at compressed air nozzle.

Repeat the above steps 5 to 10.



Remove the plug from the opening at the bottom of the well using the rod.



Brush the wall(16) of the opening at the bottom of the well using the brush(3) .

5. FINAL OPERATION

Refit the injector(see 13B, Diesel injection, Diesel injector: Removal - Refitting) .

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INPUT SHAFT LIP SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Tooling for extracting and fitting JB type gearbox guide tubes.	Bvi. 1445
Snap rivet and pressure plate for removal and refitting of the guide tube (JH1 gearbox)	Bvi. 1828

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

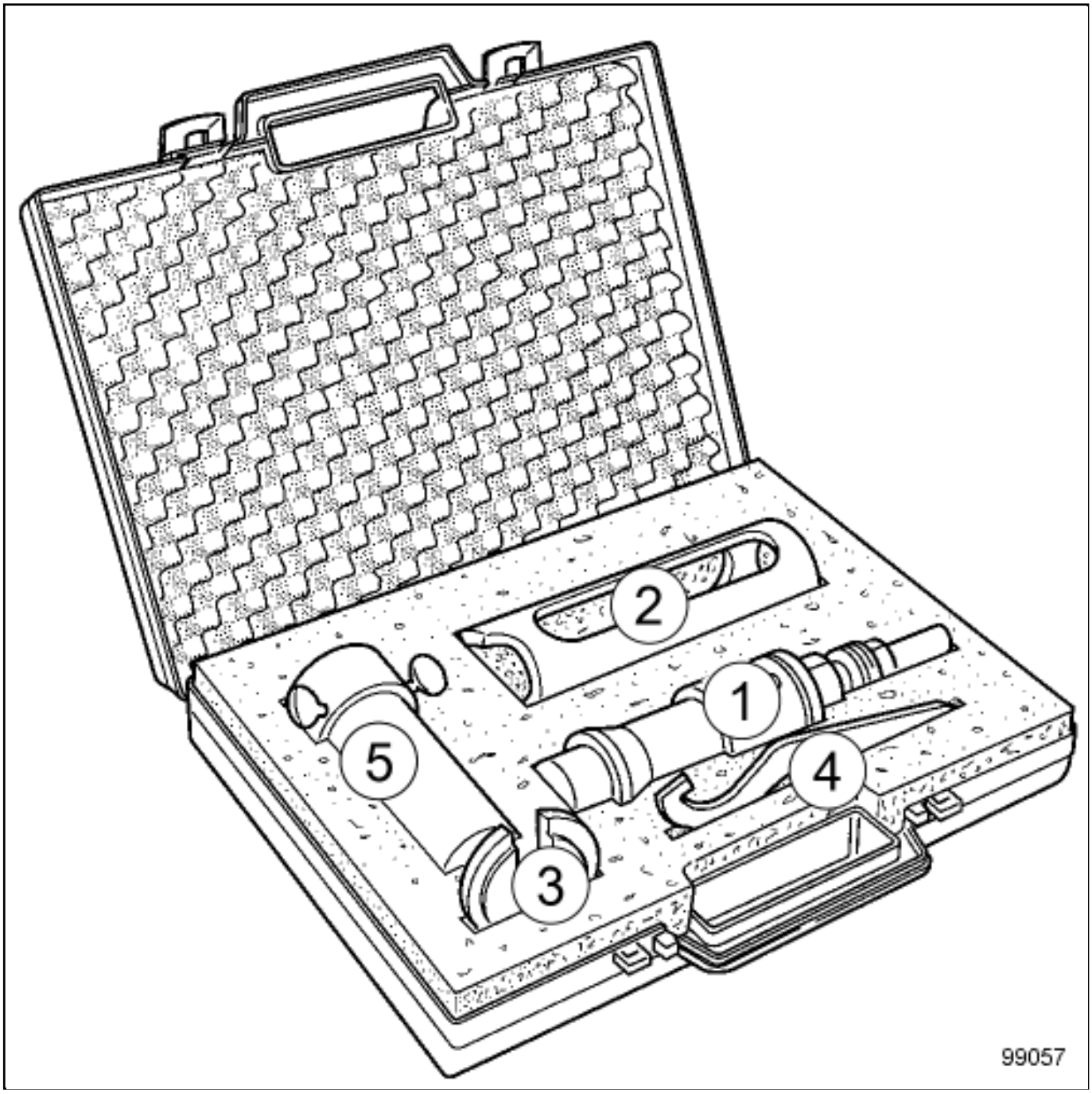
WARNING

To prevent the vehicle from falling, lash it to the vehicle lift using a strap.

Note:

The lip seal and the primary shaft bearing are built into the thrust bearing guide tube.

BVI. 1445



(1) Tightening clamp

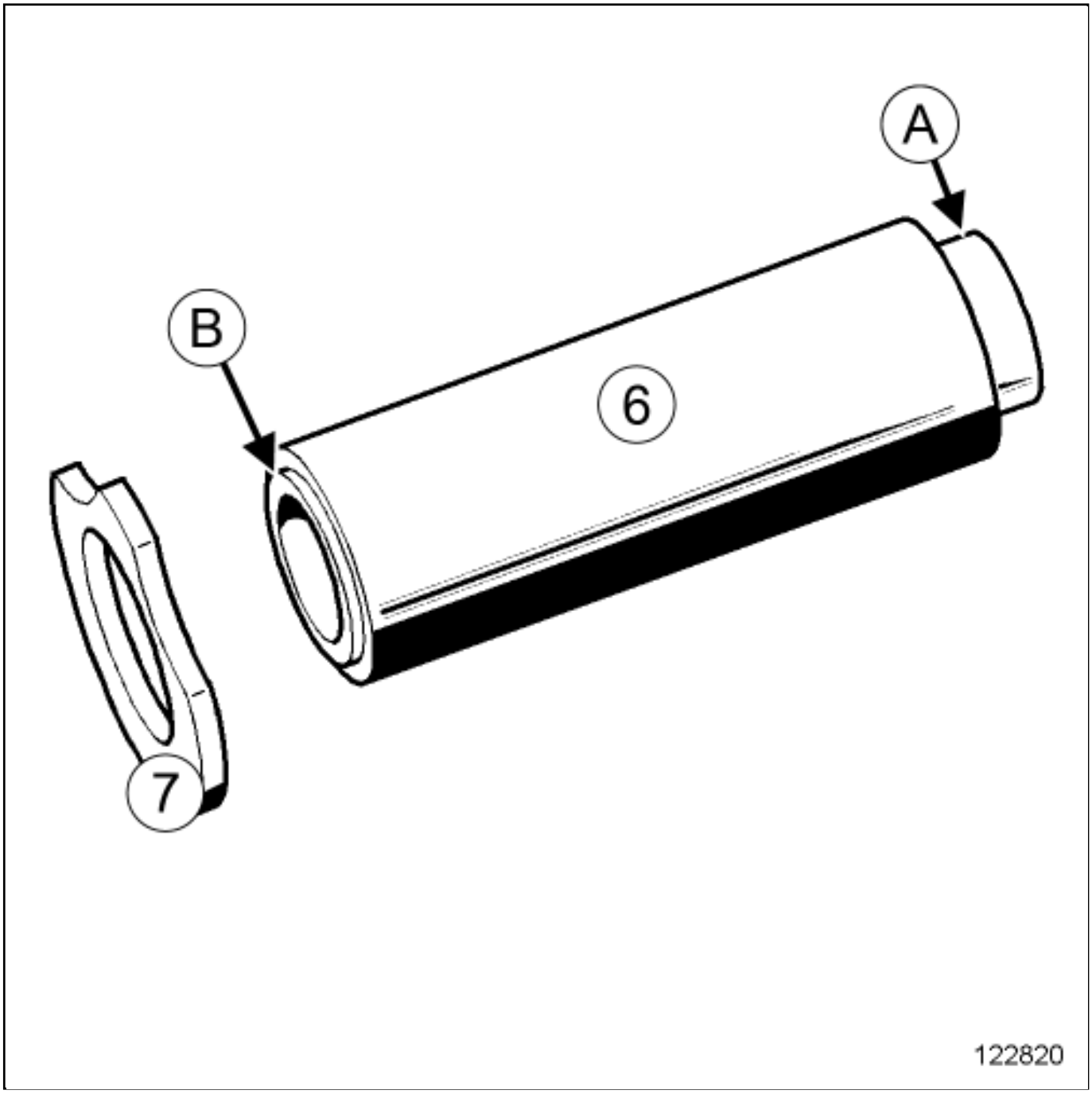
(2) Sleeve

(3) Split ring

(4) Key

(5) Sender

BVI. 1828



(6) Snap rivet

(7) Pressure plate

The thrust pad guide tube is removed using theTooling for extracting and fitting JB type gearbox guide tubes. (Bvi. 1445) and Snap rivet and pressure plate for removal and refitting of the guide tube (JH1 gearbox) (Bvi. 1828) .

Note:

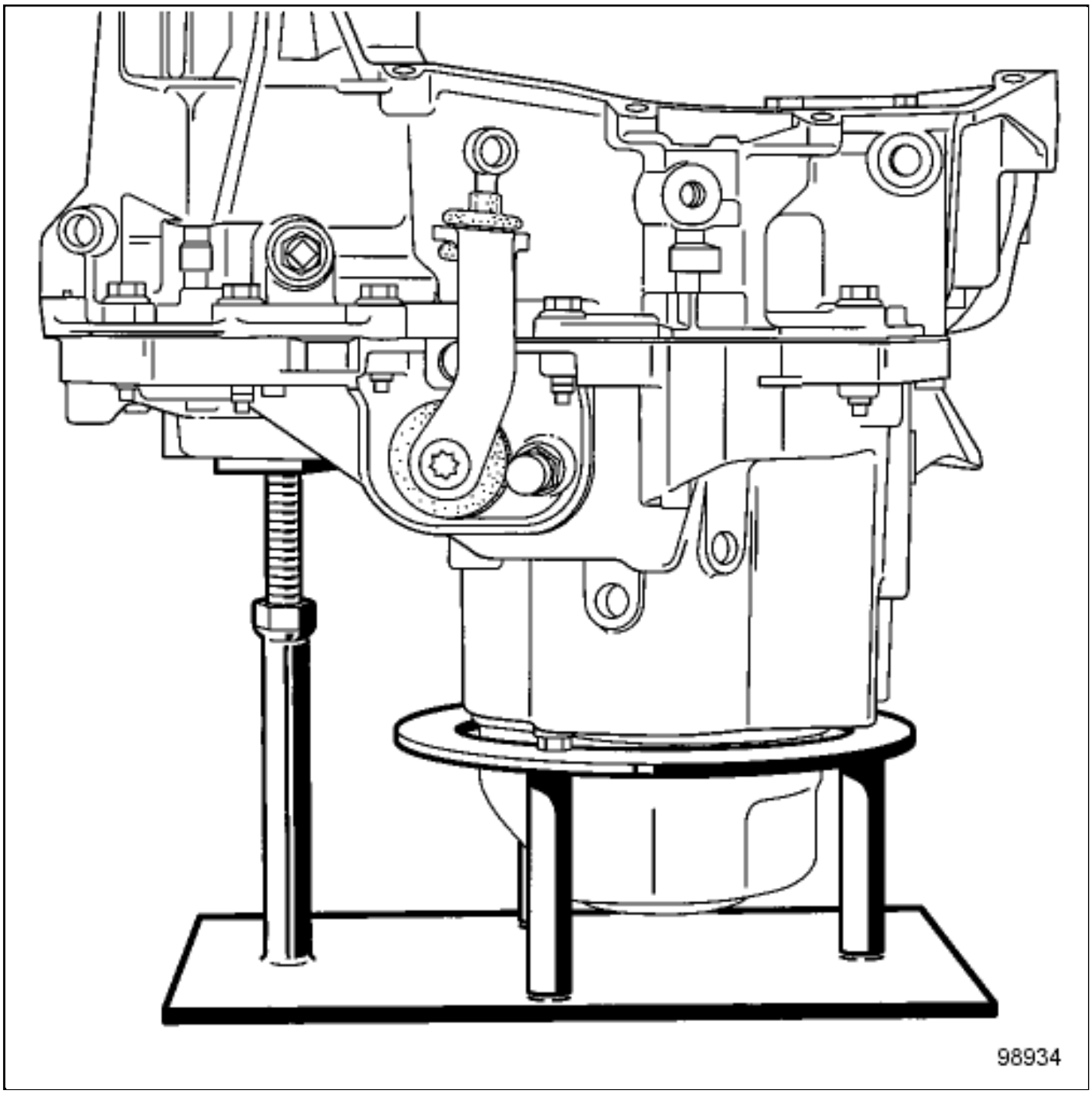
The gauge(5) is not used for the JH gearbox.

REMOVAL

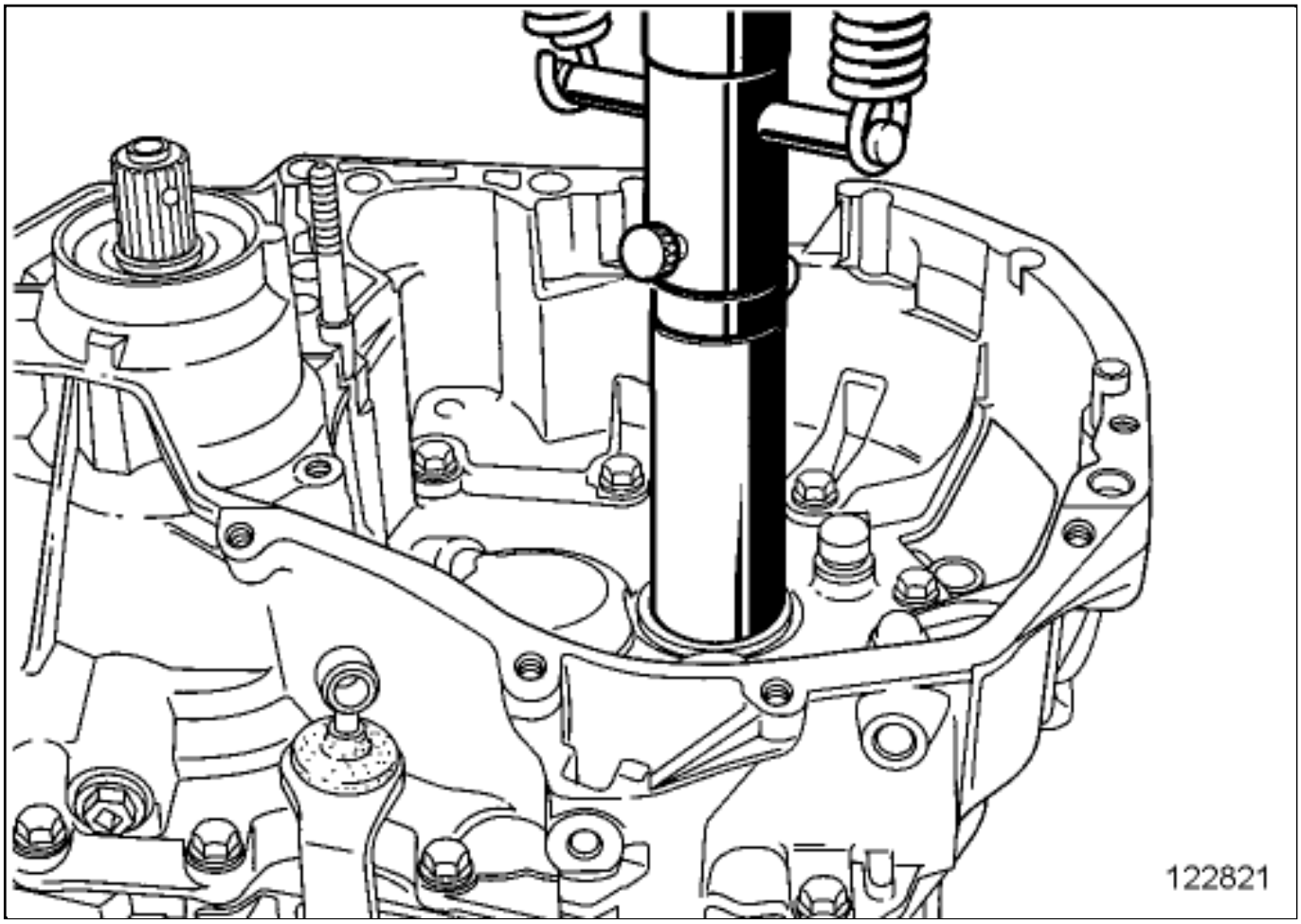
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove the manual gearbox (see 21A, Manual gearbox , Manual gearbox: Removal - Refitting) .
- Remove the clutch thrust bearing Clutch assembly: Exploded view .

2. REMOVAL OPERATION

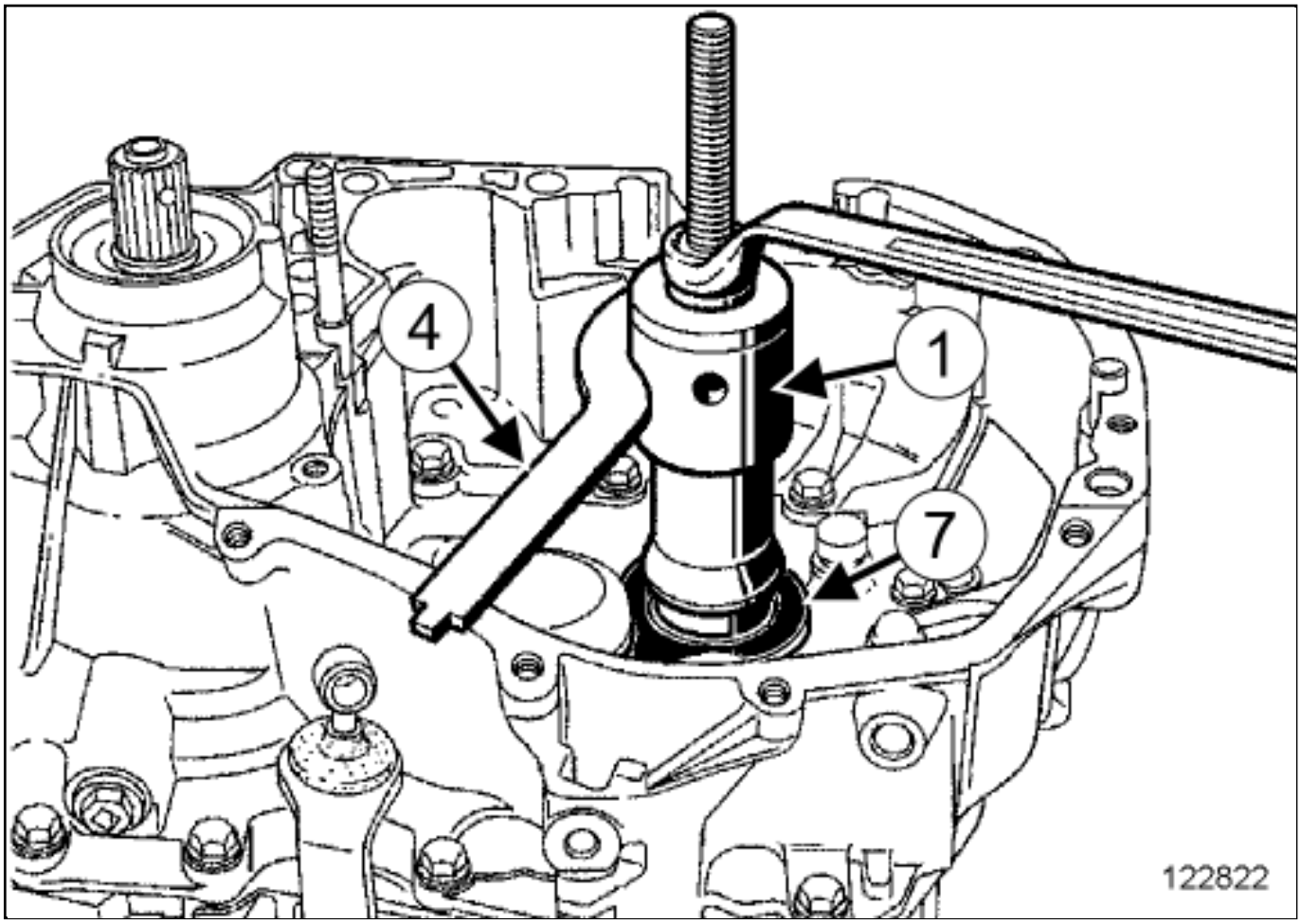


- Position the manual gearbox on the support.
- Adjust the adjustable support if necessary.



- Gently remove the guide tube with a press using the snap rivet(6) , section(A) of theSnap rivet and pressure plate for removal and refitting of the guide tube (JH1 gearbox)(Bvi. 1828) on the guide tube end.

- Degrease the guide tube.

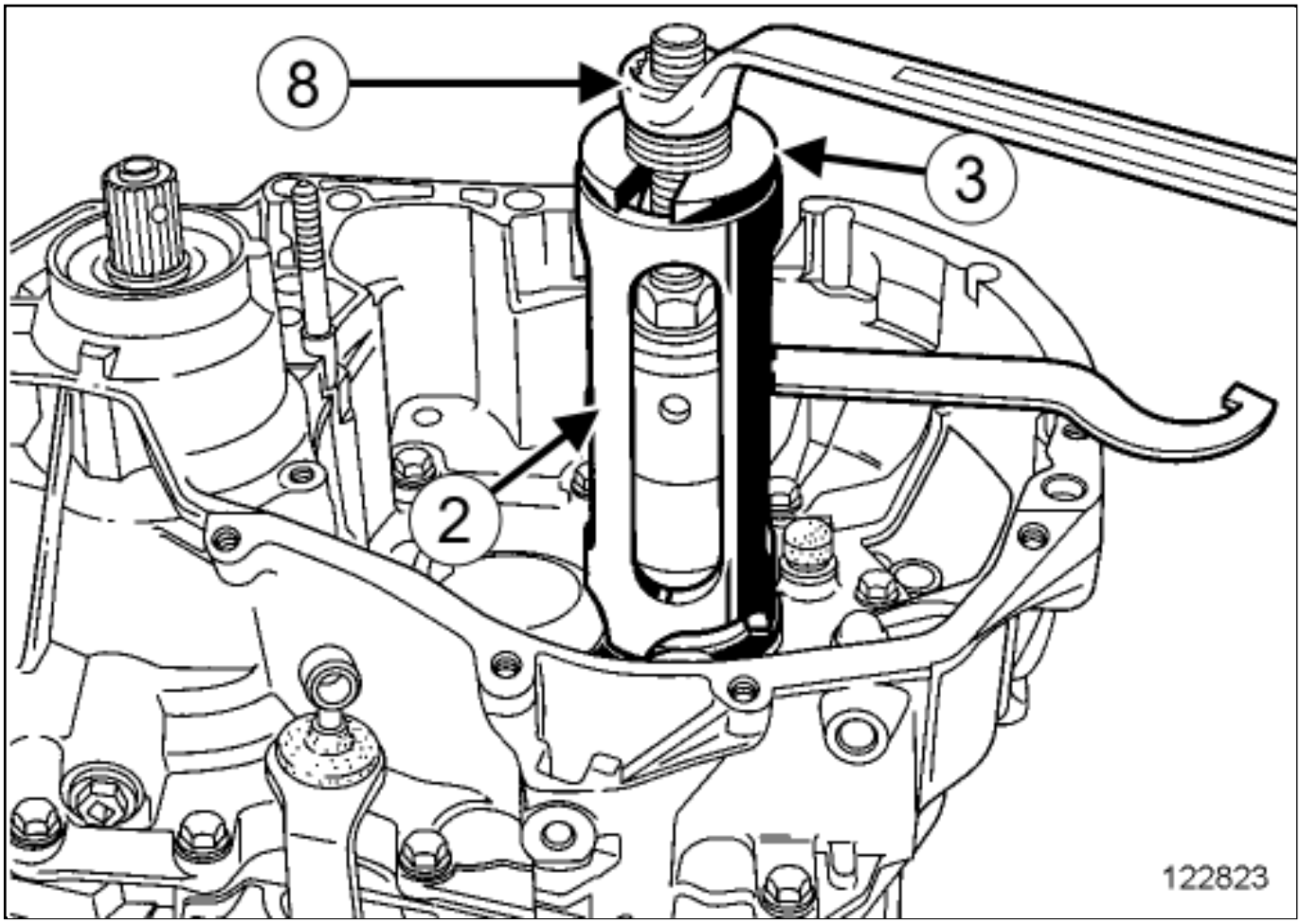


In order, fit the following on the guide tube:

- the pressure plate(7) of theSnap rivet and pressure plate for removal and refitting of the guide tube (JH1 gearbox) (Bvi. 1828) ,
- the tightening clamp(1) of theTooling for extracting and fitting JB type gearbox guide tubes.(Bvi. 1445) .

Immobilise the tightening clamp using the key(4) of theTooling for extracting and fitting JB type gearbox guide tubes.(Bvi. 1445) .

Tighten the nut firmly.

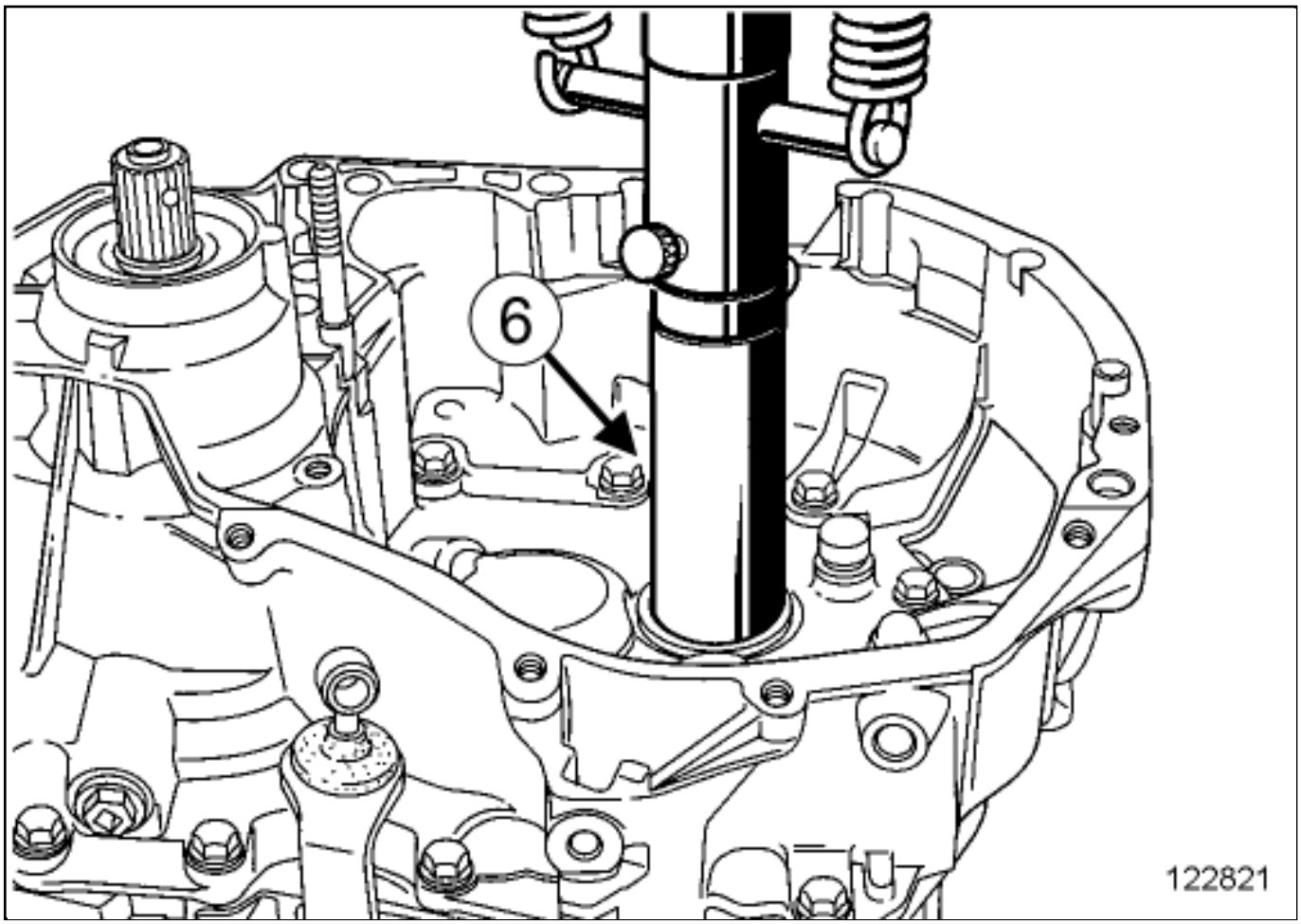


Position the sleeve(2) and the split ring in place(3) with the Tooling for extracting and fitting JB type gearbox guide tubes.(Bvi. 1445) .

Gently remove the guide tube by moving the upper nut(8) .

REFITTING

1. REFITTING OPERATION



Refit the new guide tube with a press until the snap rivet is flush(6) on theSnap rivet and pressure plate for removal and refitting of the guide tube (JH1 gearbox)(Bvi. 1828) with the housing, on the guide tube section side(B) .

2. FINAL OPERATION

Refit a new clutch thrust bearingClutch assembly: Exploded view .

Refit the manual gearbox(see 21A, Manual gearbox , Manual gearbox: Removal - Refitting) .

XSL version : 3.02 du 22/07/11

INSTRUMENT PANEL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Airbag and pretensioners: Precautions for the repair ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

When replacing the instrument panel, the following must be noted on the warranty booklet:

- that the instrument panel has been replaced,
- the mileage indicated by the instrument panel removed.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Apply the before repair procedure using Diagnostic tool Diagnostic tool : Use :

-Computer concerned by the before repair procedure:

- "Instrument panel"

-Component concerned by the before repair procedure:

- "Instrument panel"

Lock the airbag computer Airbag and pretensioners: Precautions for the repair .

Switch off the ignition.

Disconnect the battery Battery: Removal - Refitting .

Remove:

- the driver's frontal airbag Driver's frontal airbag: Removal - Refitting ,
- the steering wheel Steering wheel: Removal - Refitting .

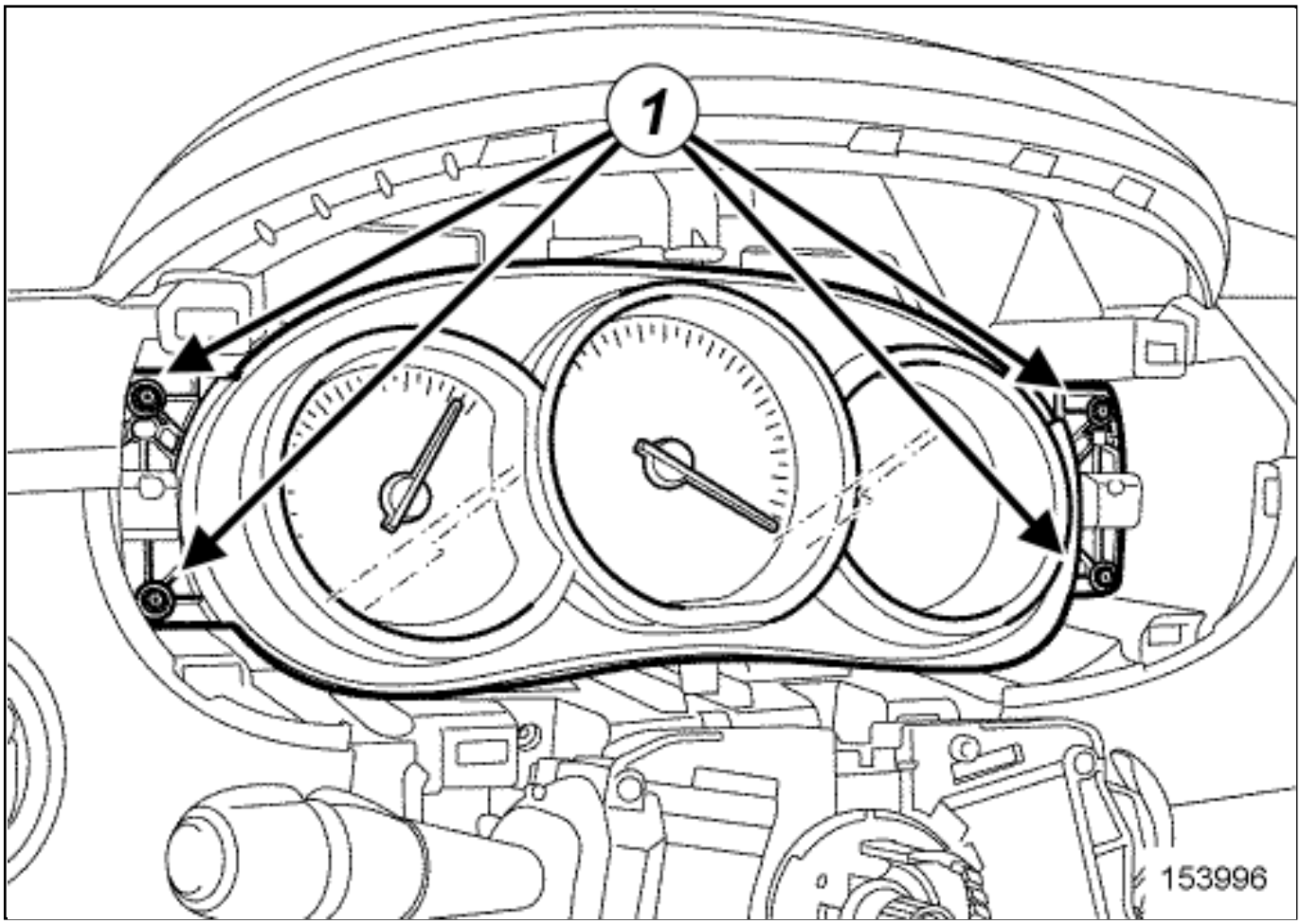
CAUTION

To prevent damaging the rotary switch, do not turn the mobile section of the rotary switch.

Remove Dashboard assembly: Exploded view :

- the upper half-shell,
- the instrument panel trim.

2. REMOVAL OPERATION



Remove the bolts(1) from the instrument panel.

Unclip the instrument panel.

Disconnect the instrument panel connector.

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Unlock the airbag computer **Airbag and pretensioners: Precautions for the repair** .

- Apply the after repair procedure using Diagnostic tool **Diagnostic tool : Use** :

-Computer concerned by the after repair procedure:

■"Instrument panel"

-Component concerned by the after repair procedure:

■"Instrument panel"

2. CHECKING AFTER REPAIR

- Switch on the ignition.

- Check the operation of the instrument panel.

INTERCOOLER AIR INLET PIPE: REMOVAL - REFITTING

Equipment required
tweezers

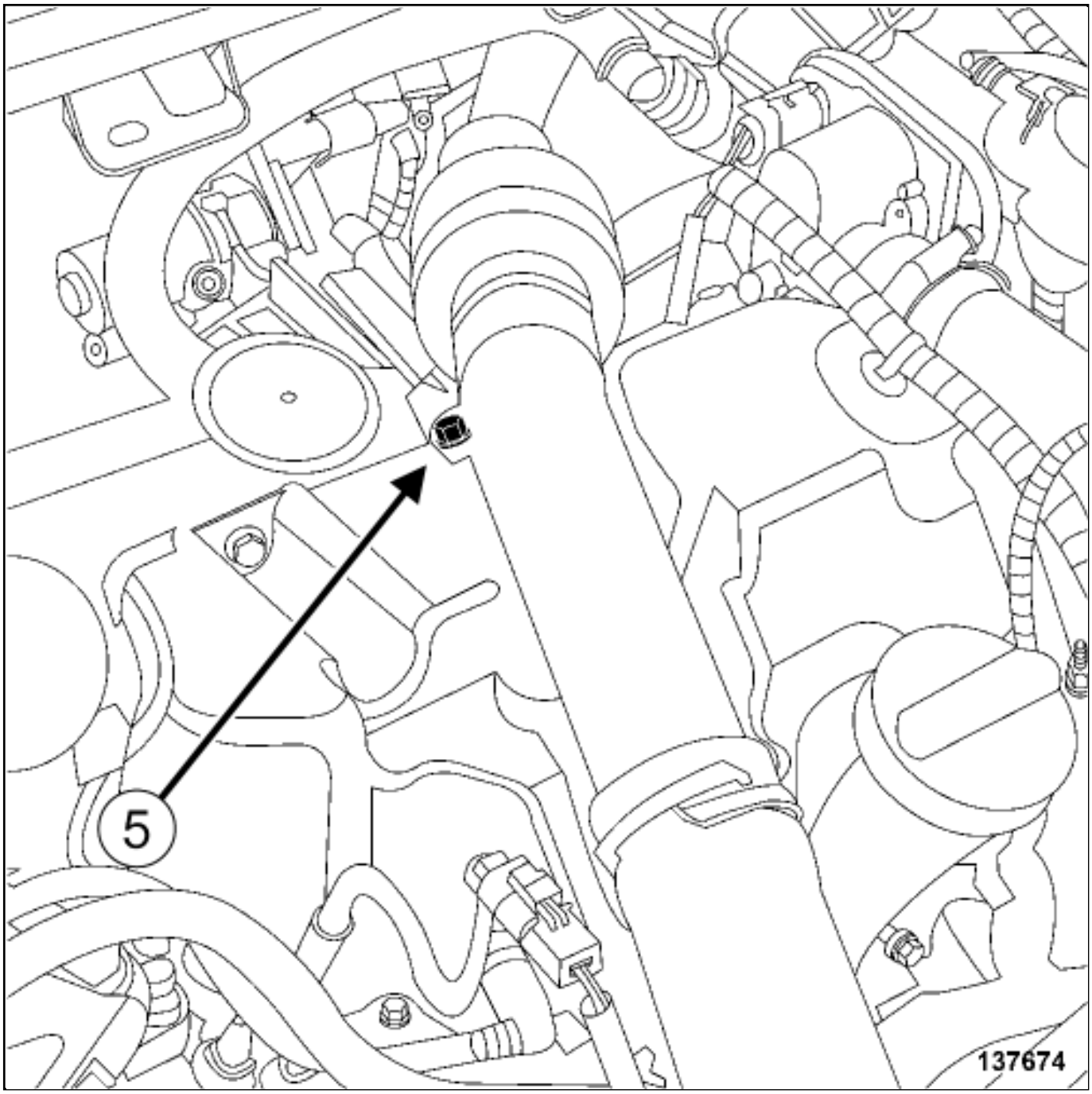
parts always to be replaced:
turbocharger air cooler air inlet pipe seal

REMOVAL

1. REMOVAL PREPARATION OPERATION

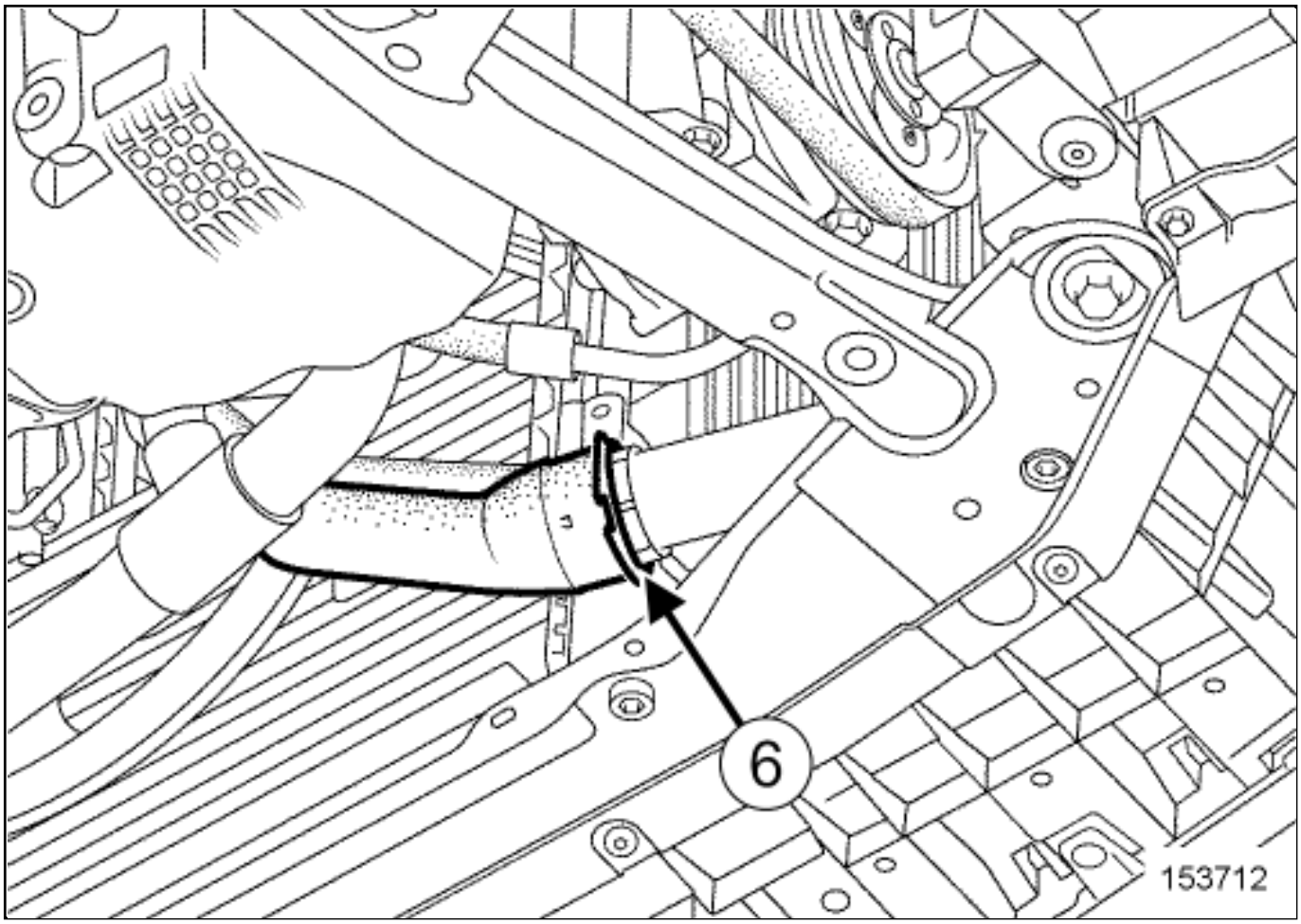
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the engine undertray bolts,
  - the engine undertray.

2. REMOVAL OPERATION



Remove :

- the bolt(**5**) from the turbocharger air outlet pipe,
- the turbocharger air outlet pipe,
- the seals from the turbocharger air outlet pipe.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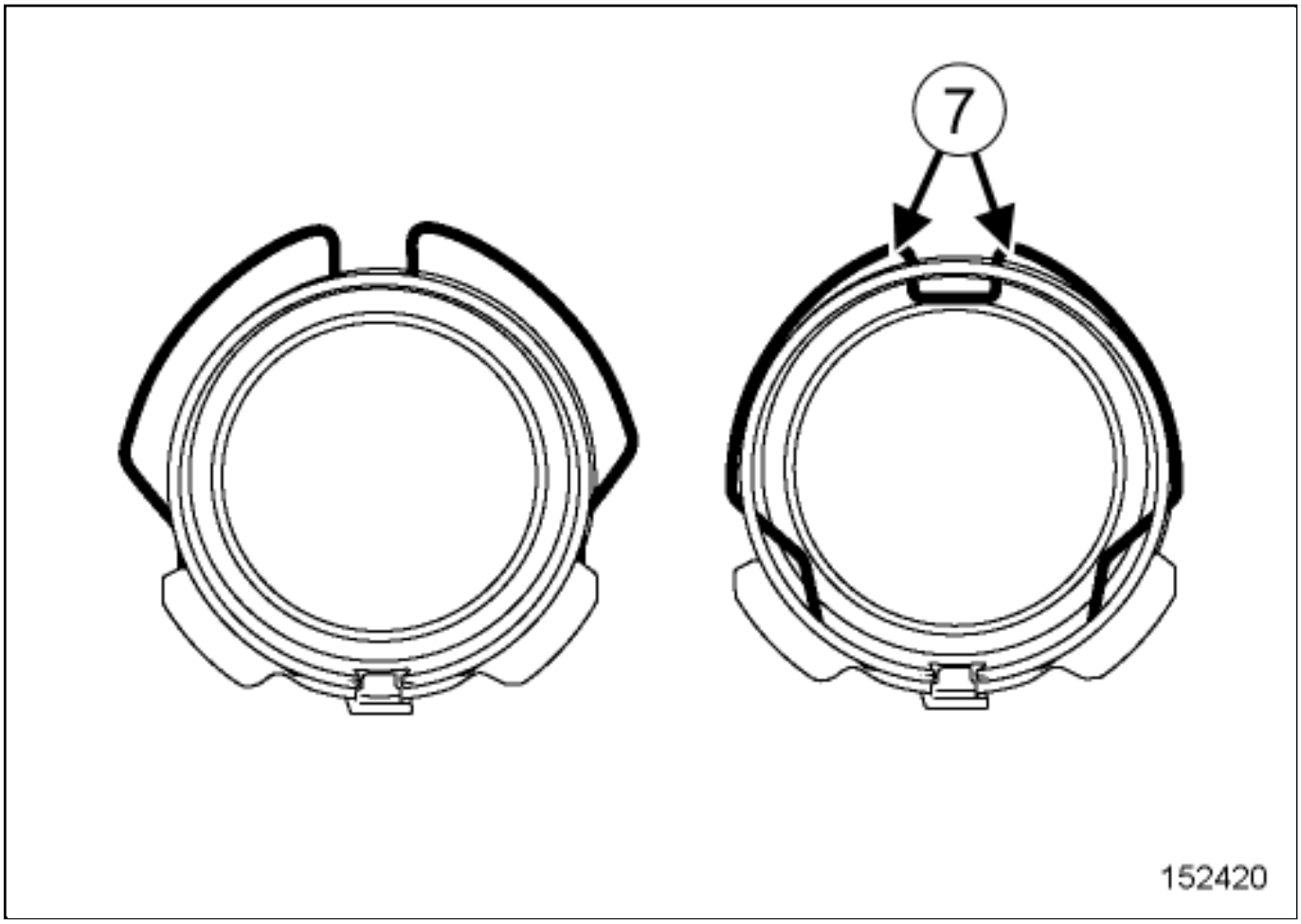
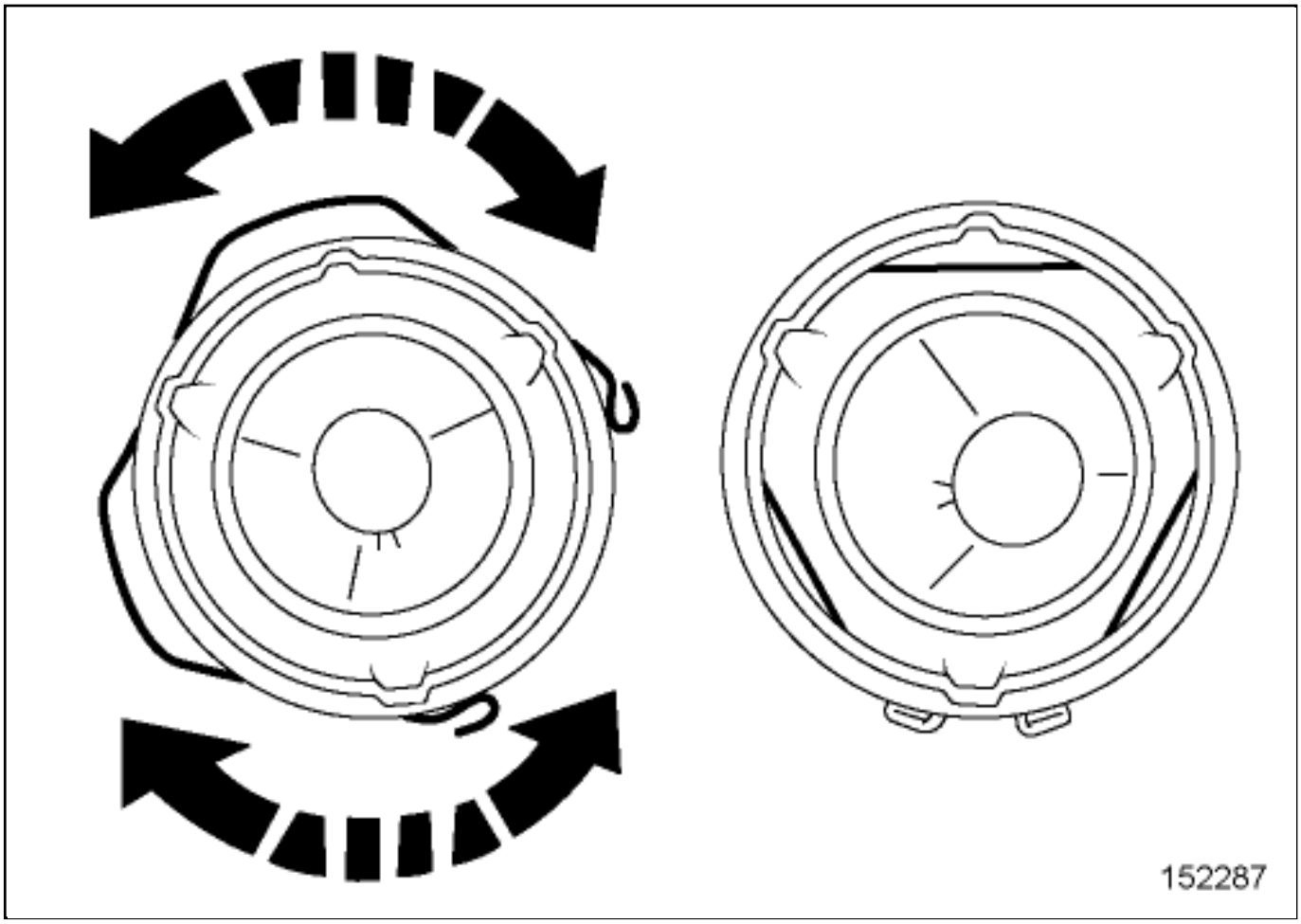


- Unlock the intercooler air inlet pipe clip(6) using a flat-blade screwdriver at(7) .
- Unclip the intercooler air inlet pipe from the intercooler.



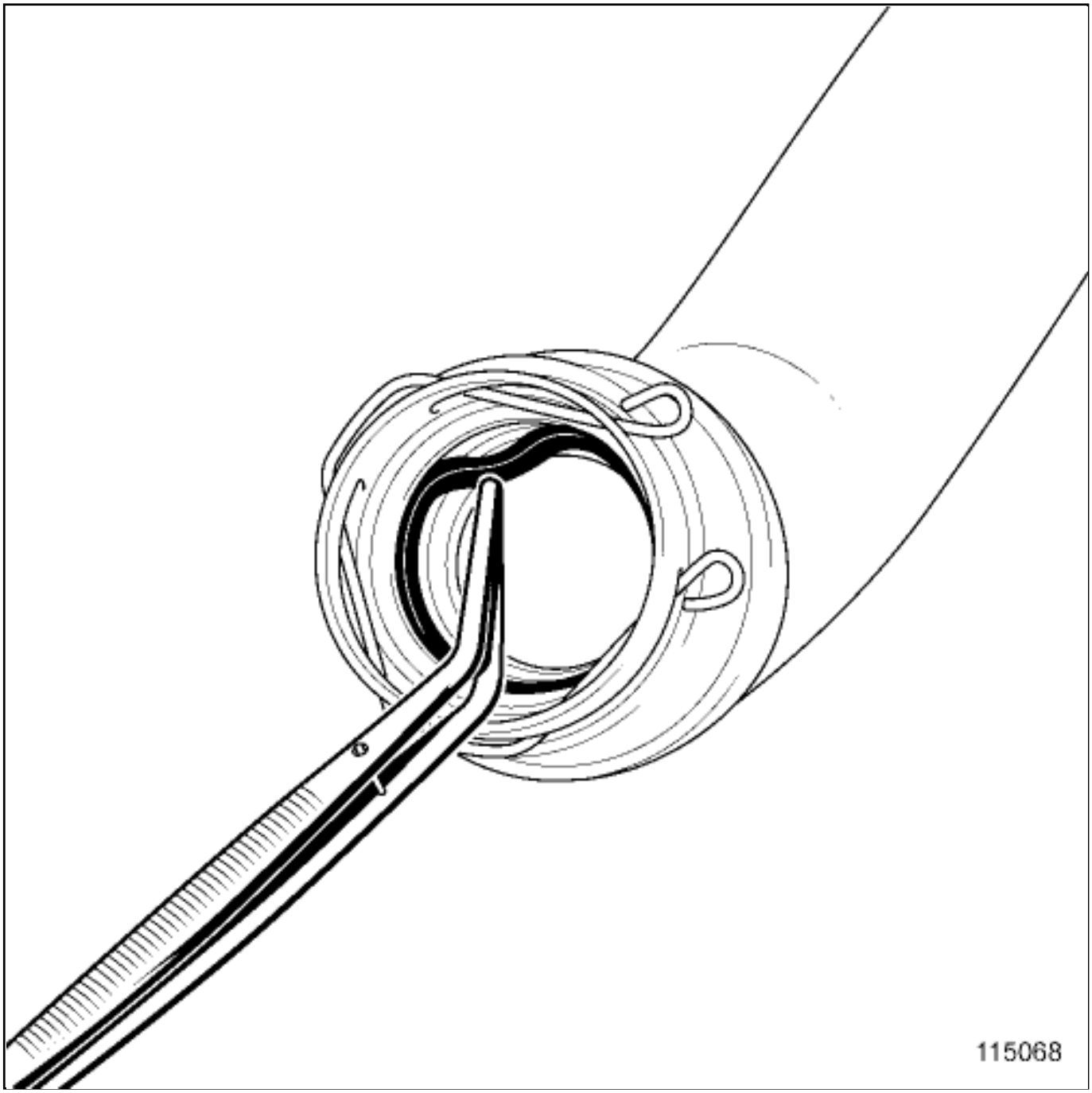
- Rotate the clip(3) of the intercooler air inlet pipe.
- Disconnect the intercooler inlet pipe.
- Remove the intercooler inlet pipe.

REFITTING

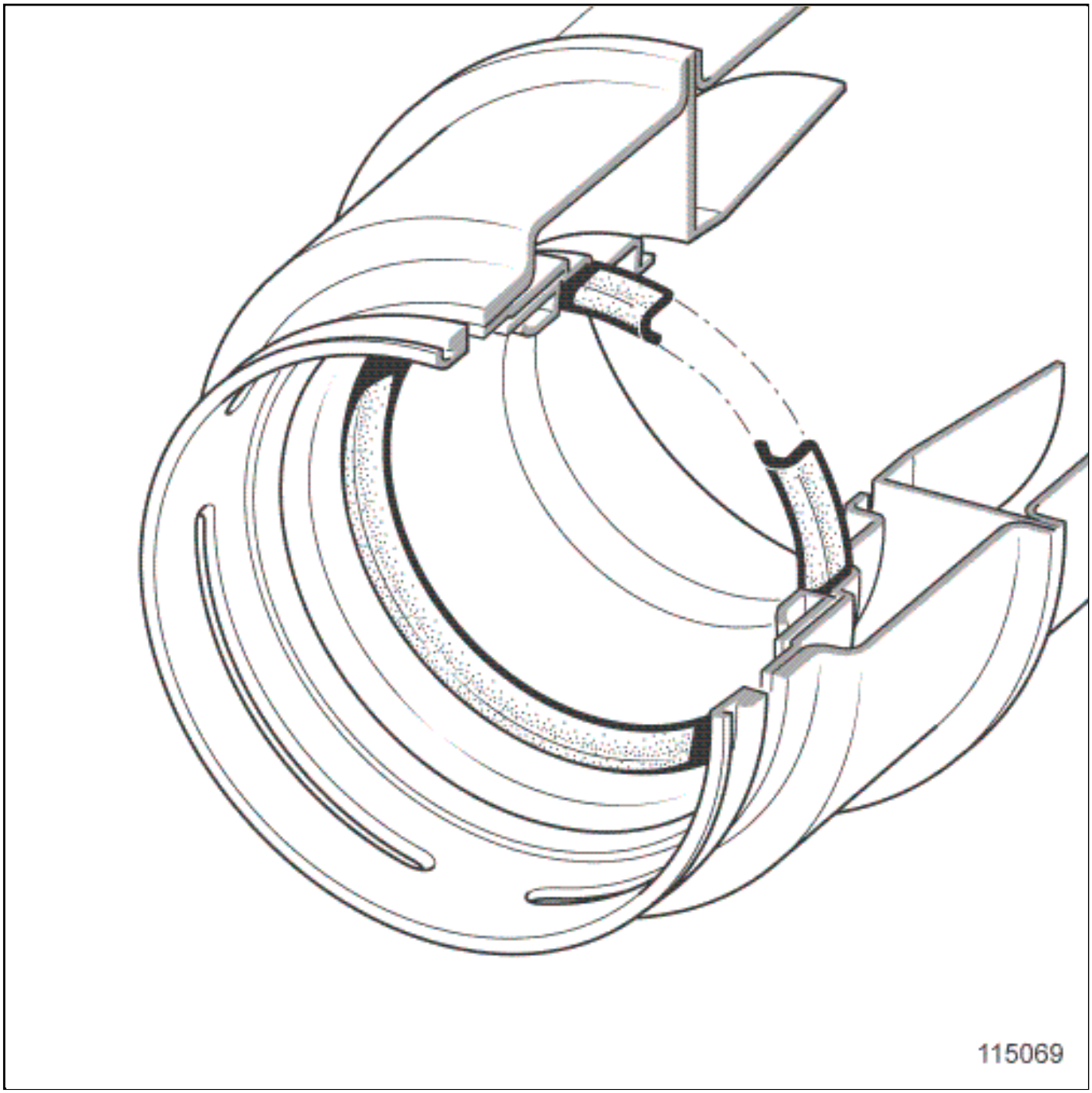
1. REFITTING OPERATION PREPARATION

-

parts always to be replaced: turbocharger air cooler air inlet pipe seal



Remove the intercooler air inlet pipe seals using a tweezers.



Note:

Ensure that the intercooler air inlet pipe seals are fitted in the correct direction.

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Note:

Check that the clip on the intercooler air inlet pipe is correctly locked before clipping it onto the turbocharger and onto the intercooler .

When the air pipe is clipped an audible "click" should be heard.

Then, shake the air pipe close to the turbocharger and to the intercooler to ensure it is correctly clipped on.

INTERCOOLER AIR OUTLET PIPE: REMOVAL - REFITTING

Equipment required
tweezers

parts always to be replaced:
turbocharger air cooler air outlet pipe seal

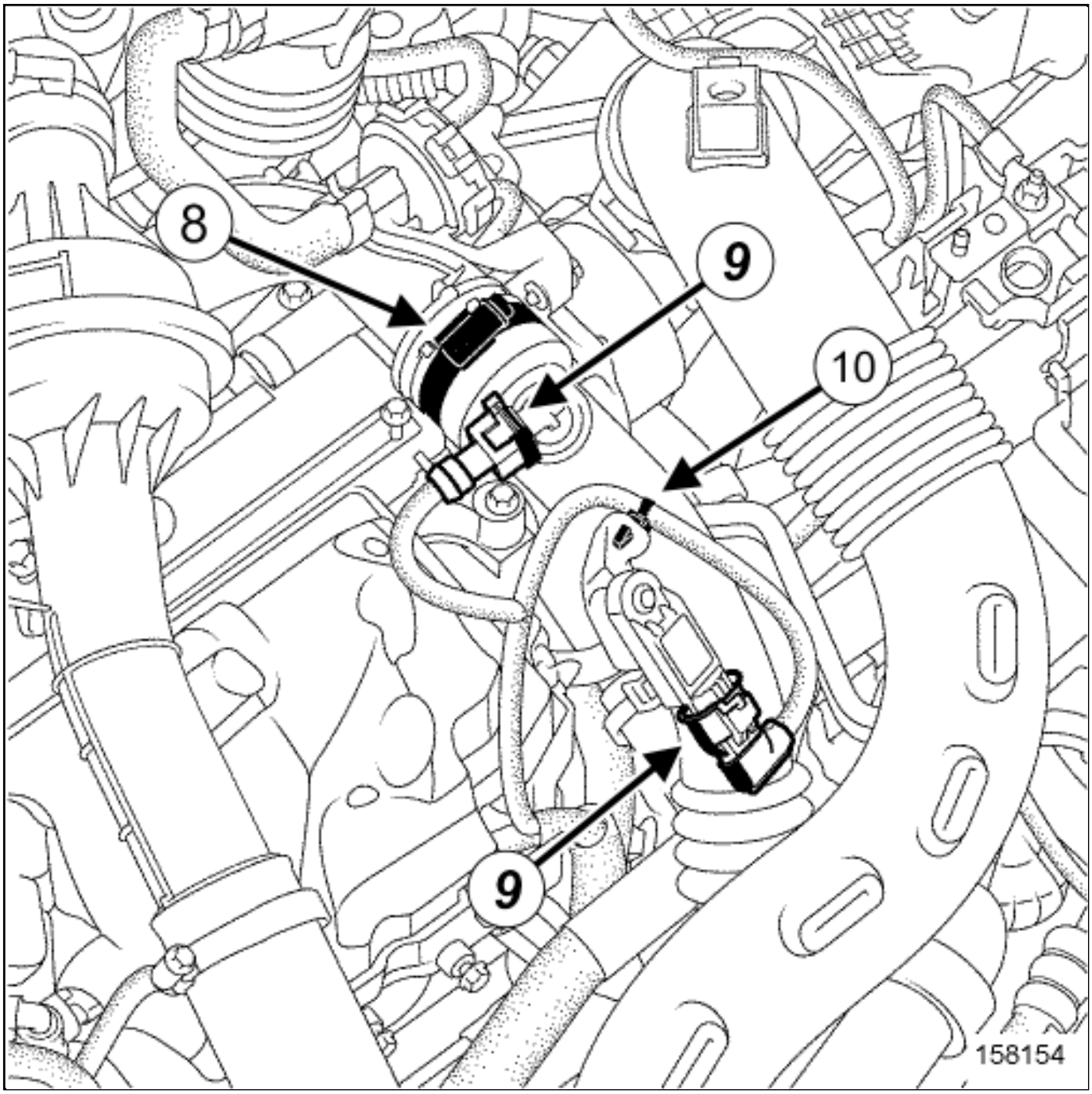
REMOVAL

1. REMOVAL PREPARATION OPERATION

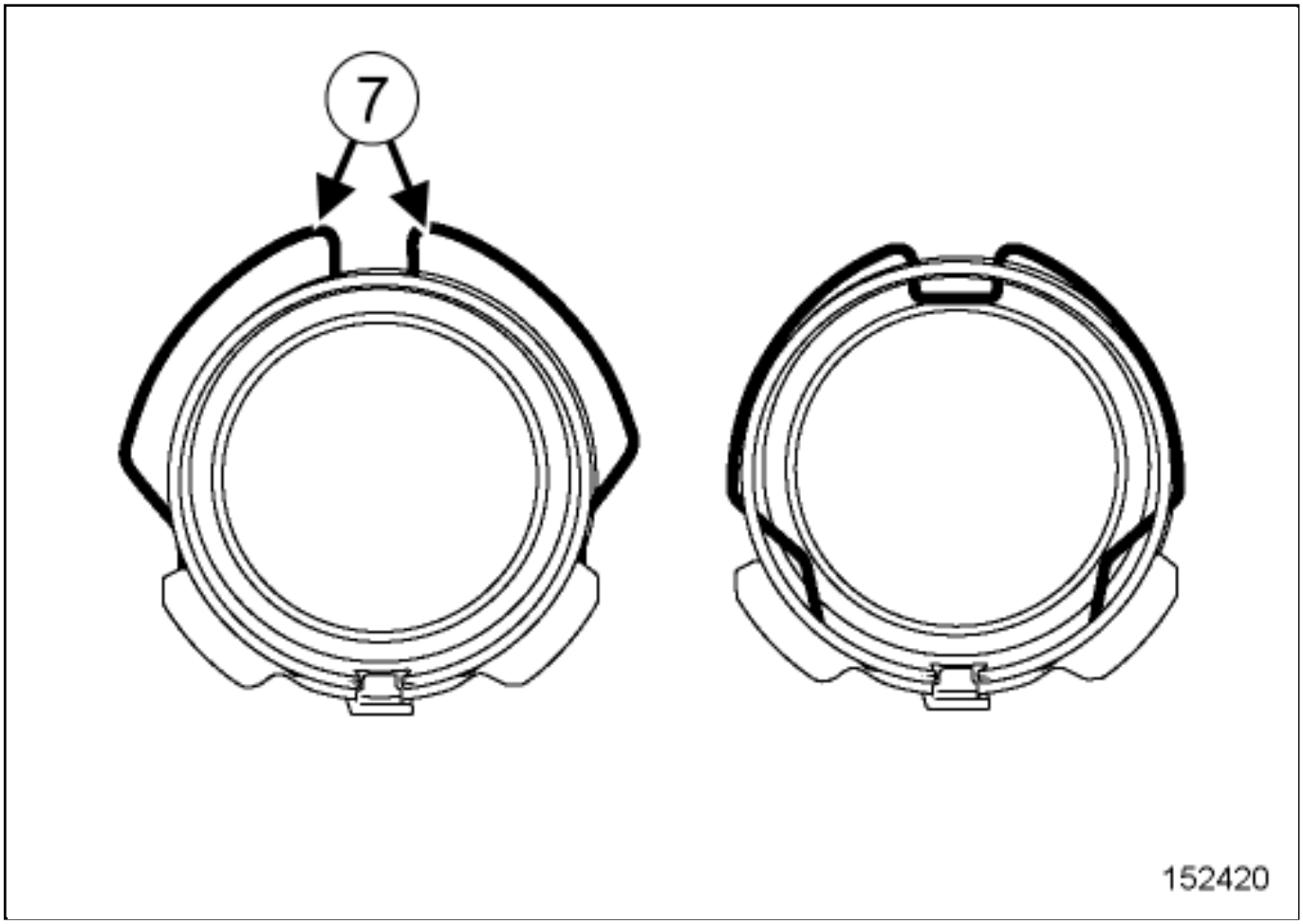
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .

- Remove:
  - the engine undertray bolts,
  - the engine undertray.

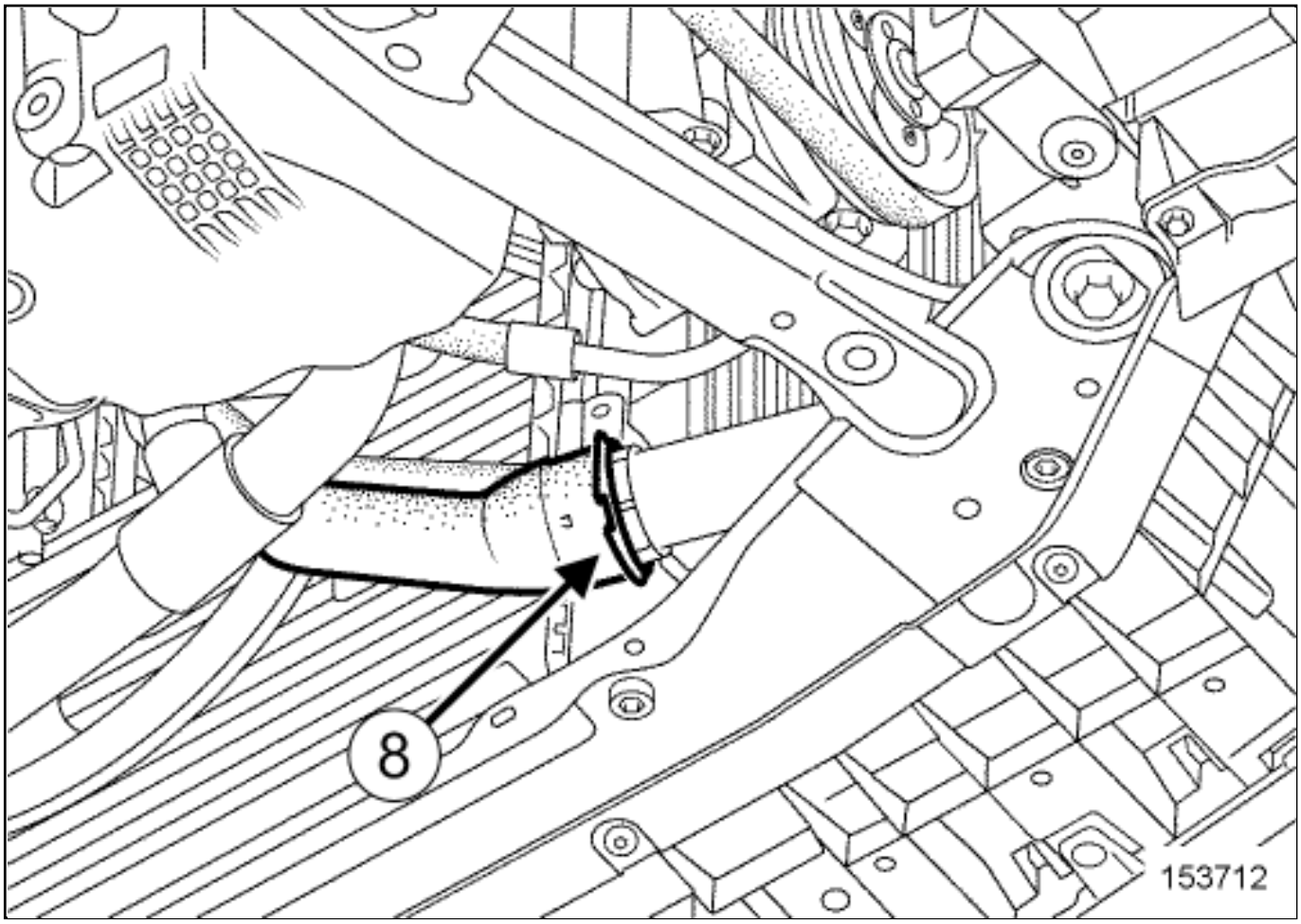
2. REMOVAL OPERATION



- Detach the pipe at(4) .
- Disconnect the connectors(5) .
- Unclip at (6) .



- Unlock the intercooler air outlet pipe clip(3) using a flat-blade screwdriver at(7) .
- Unclip the intercooler outlet pipe from the damper valve.



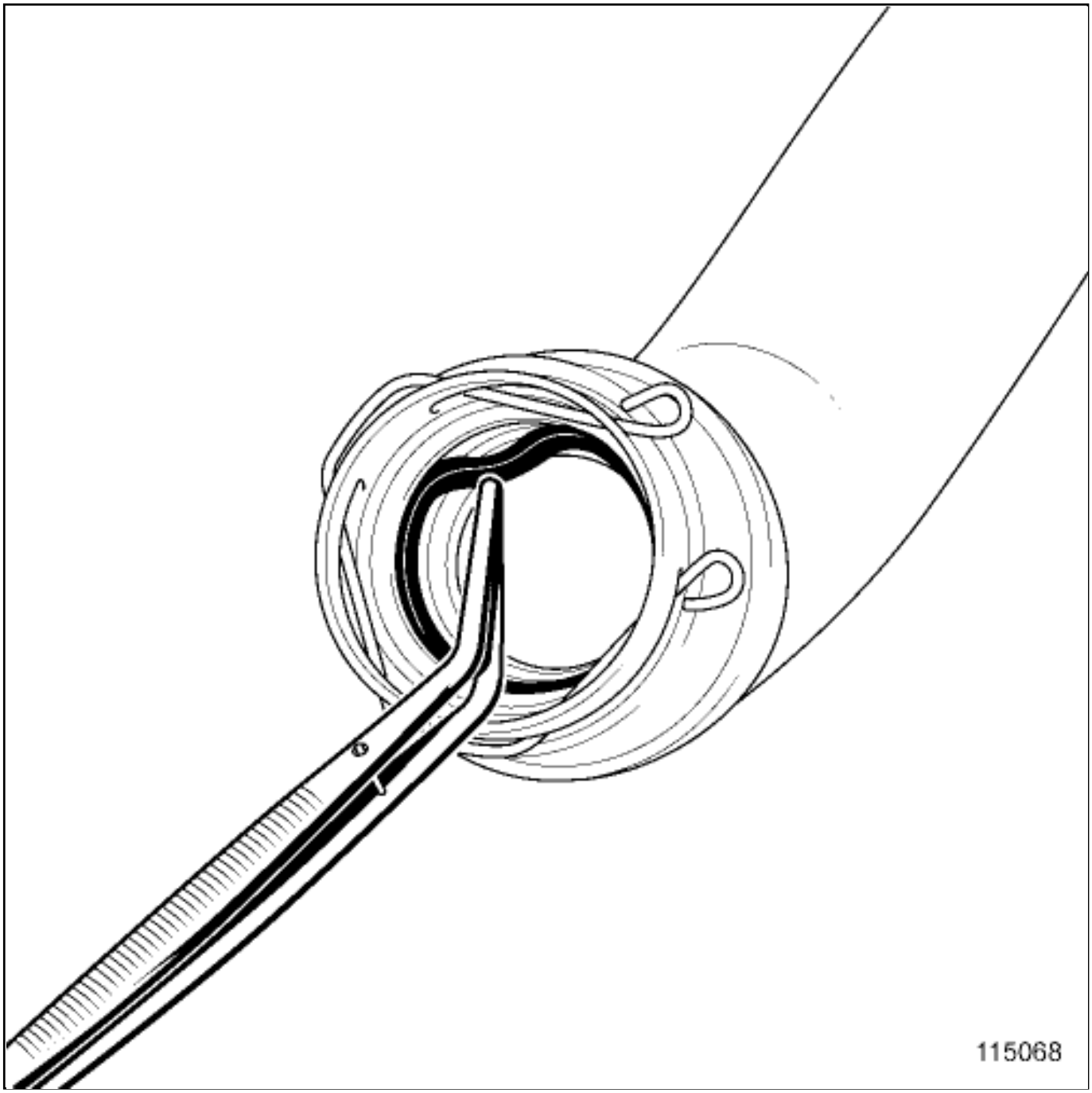
- Unlock the intercooler air outlet pipe clip(8) using a flat-blade screwdriver at(7) .
- Unclip the intercooler air outlet pipe from the intercooler.
- Remove the intercooler outlet pipe.

REFITTING

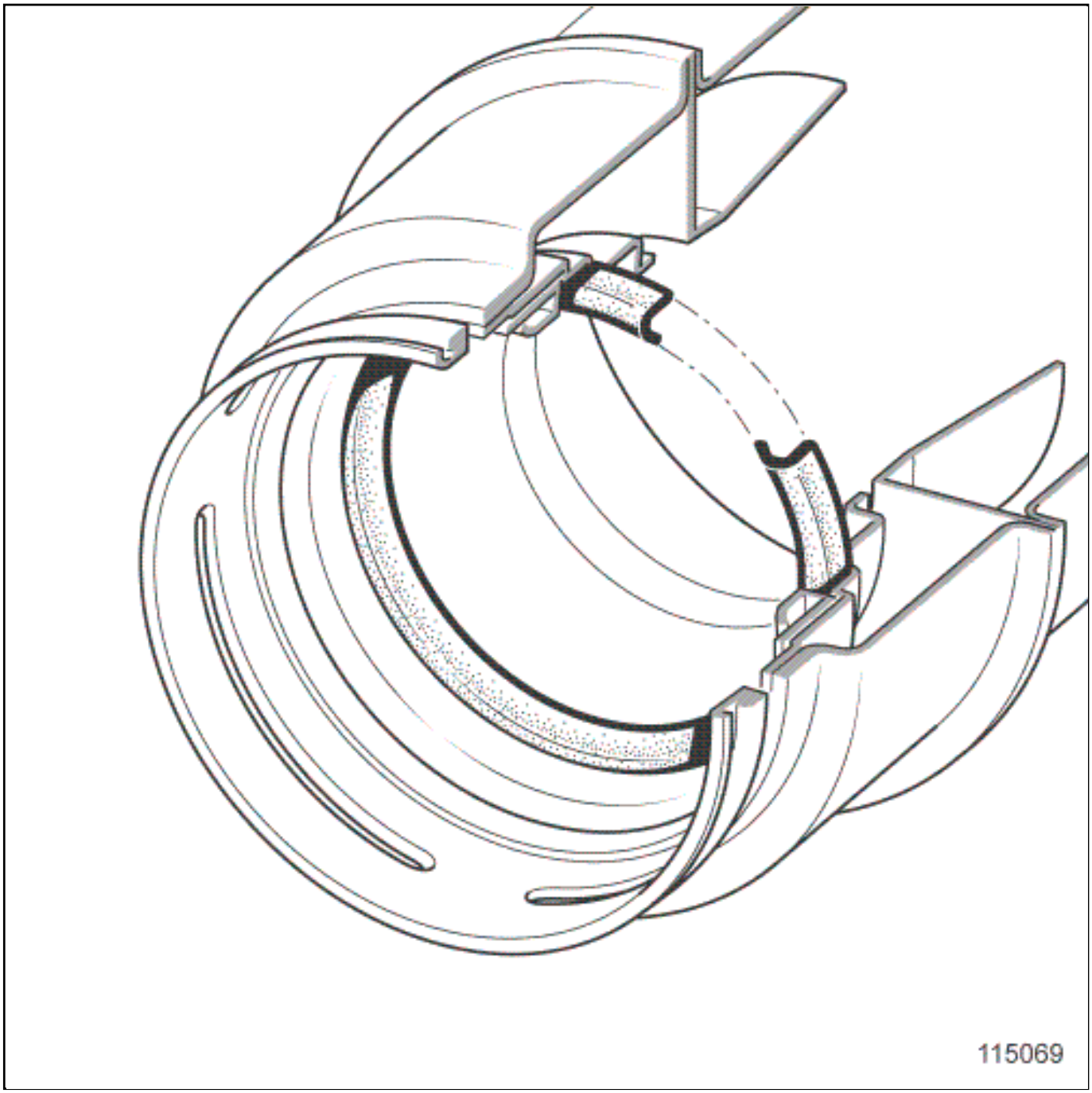
1. REFITTING OPERATION PREPARATION

-

parts always to be replaced: turbocharger air cooler air outlet pipe seal



- Remove the intercooler air outlet pipe seals using a tweezers.



Note:

Ensure that the intercooler air outlet pipe seals are fitted in the correct direction.

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Note:

Check that the clips on the intercooler air outlet pipe are correctly locked before clipping it onto the damper valve and onto the intercooler.

When the air pipe is clipped an audible "click" should be heard.

Then, shake the air pipe close to the damper valve and to the intercooler to ensure it is correctly clipped on.

INTERCOOLER: REMOVAL - REFITTING

Tightening torques	
front impact cross member bolts	21 N.m

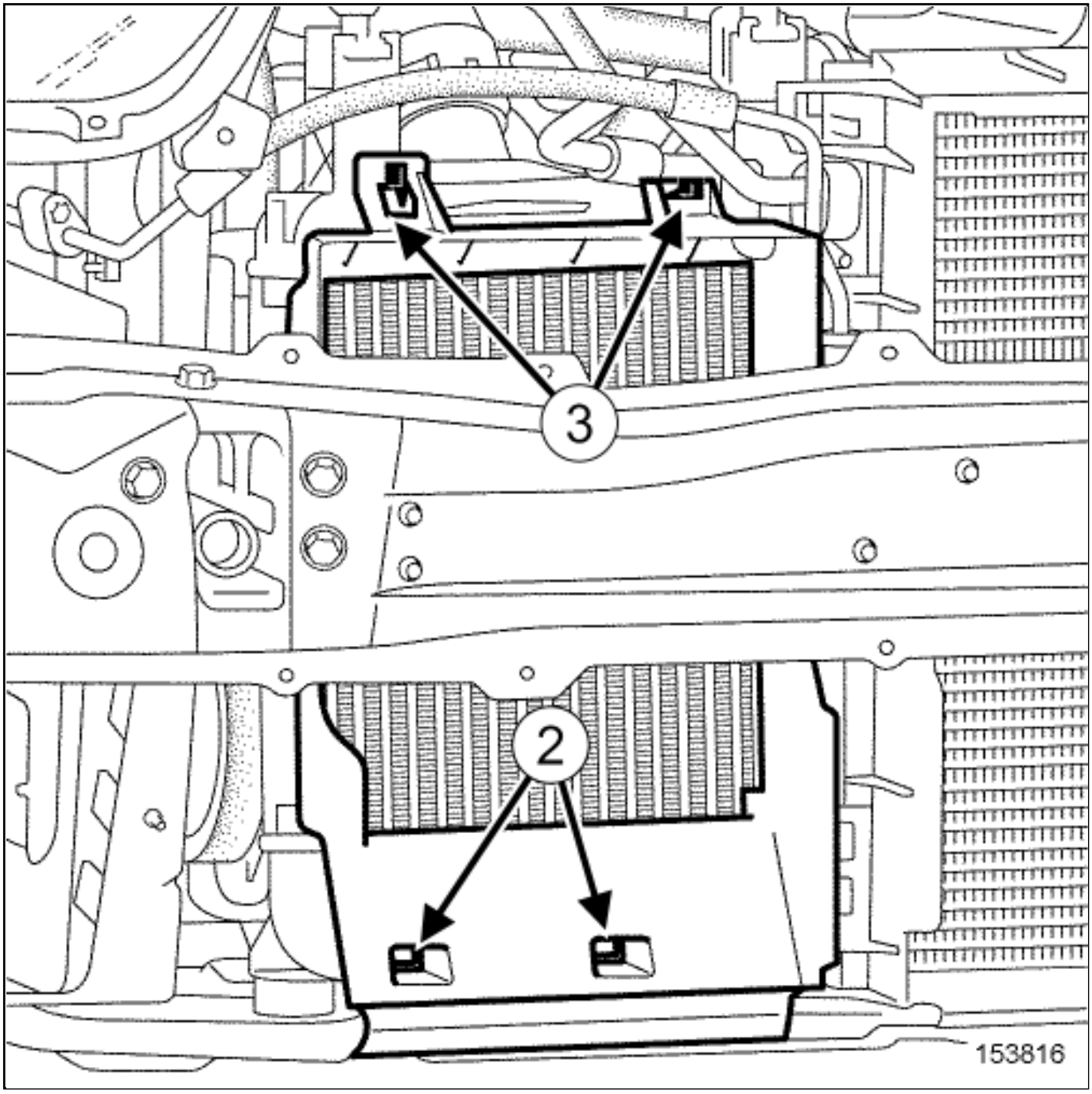
parts always to be replaced:
turbocharger air cooler air inlet pipe seal
turbocharger air cooler air outlet pipe seal

REMOVAL

1. REMOVAL PREPARATION OPERATION

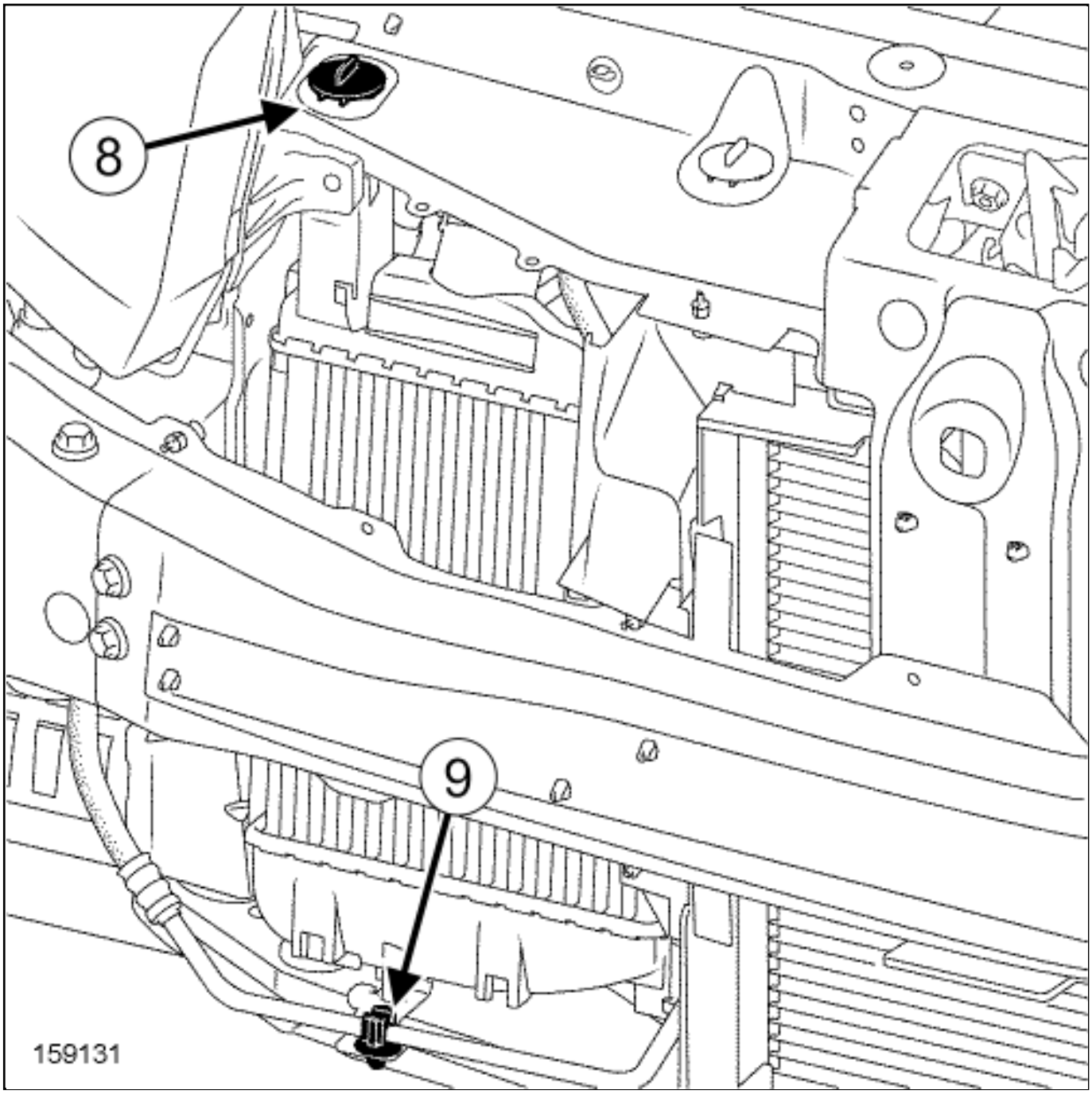
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .

- Remove:
  - the front wheels Front hub carrier assembly: Exploded view ,
  - the front section of the front wheel arch liner Exterior body front trim assembly: Exploded view ,
  - the front bumper Front bumper assembly: Exploded view .

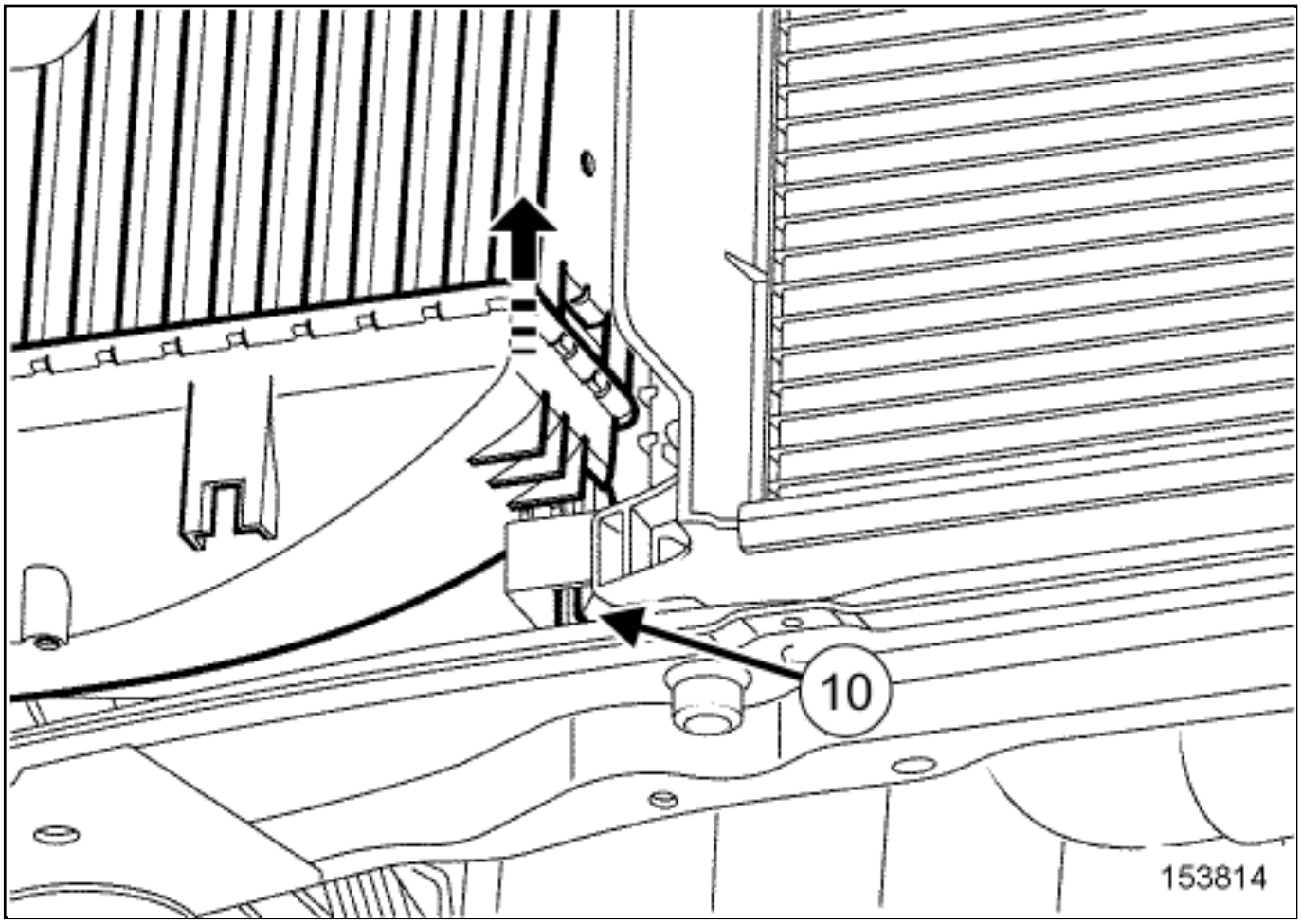


- Unclip the intercooler air deflector at(2) and (3) .
- Remove the intercooler air deflector.

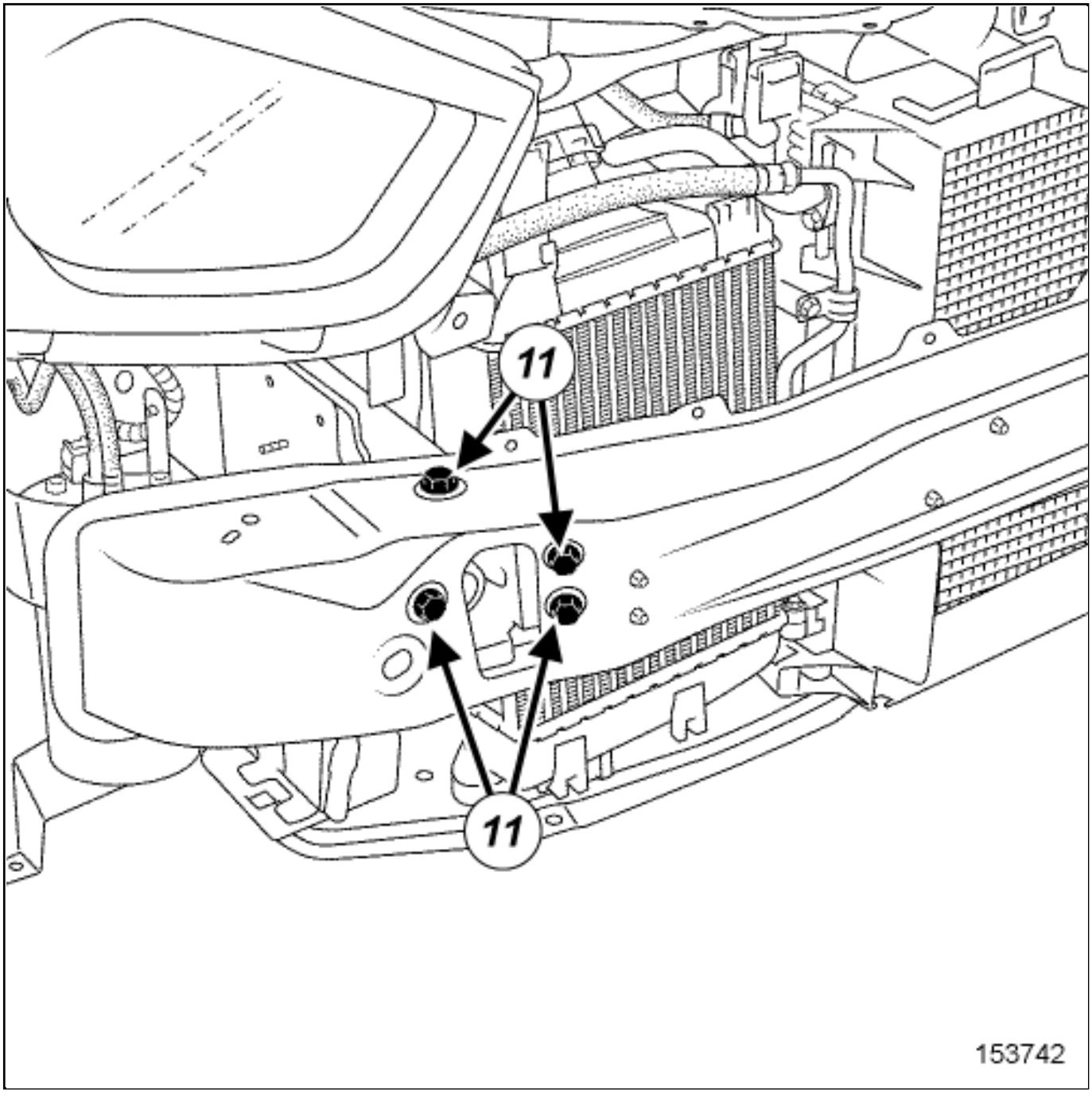
- Disconnect and move aside:
  - the intercooler air inlet pipe,
  - the intercooler air outlet pipe.



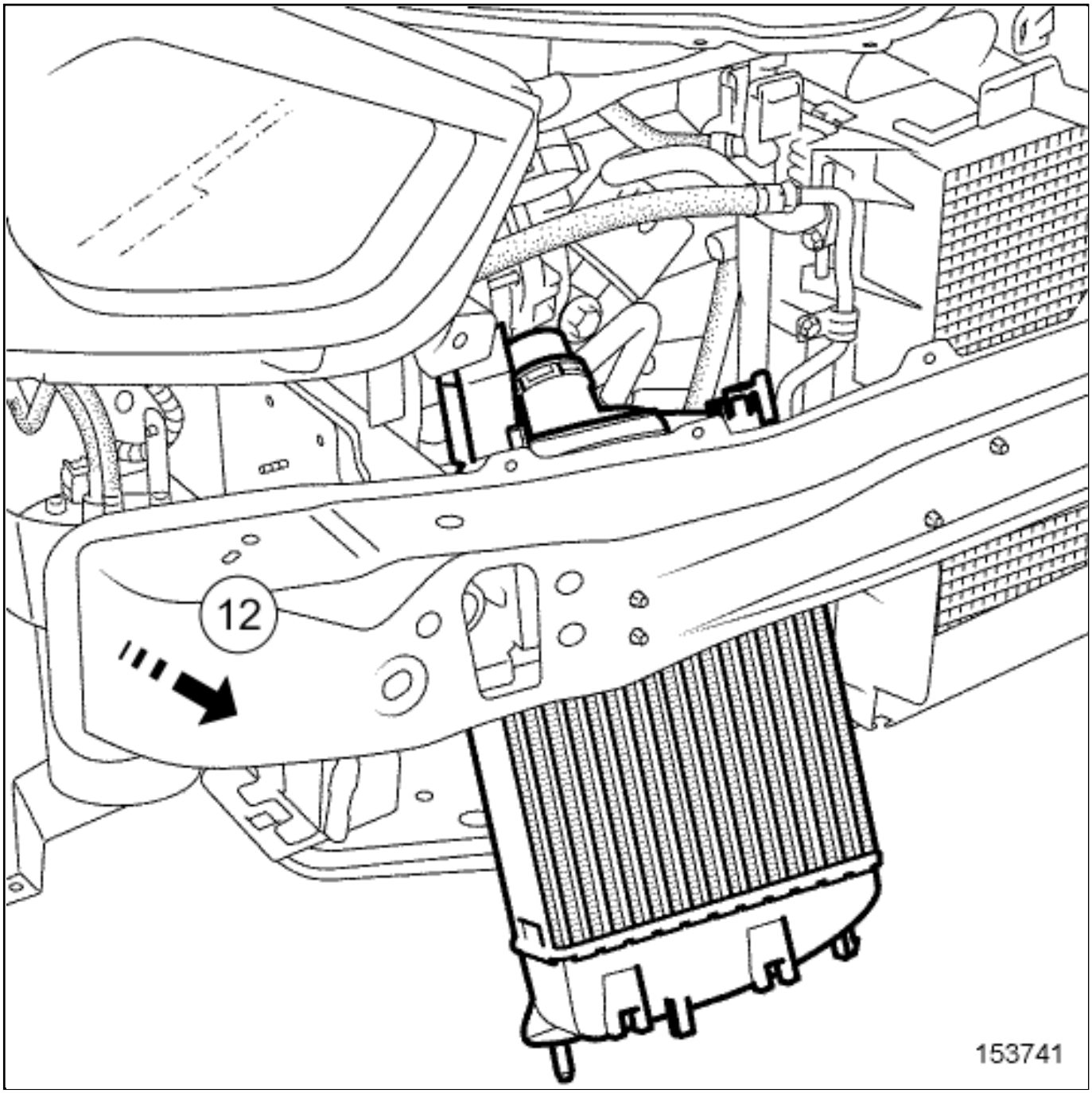
- Remove the centring pin(8) by turning it anticlockwise.
- Unclip the pipe(9) .



- Press the clips(10) and lift the intercooler in the direction indicated.



Remove the bolts(11) .



- Move aside the front impact cross member in the direction indicated(12) .
- Remove the intercooler.

REFITTING

1. REFITTING OPERATION PREPARATION

parts always to be replaced: turbocharger air cooler air inlet pipe seal .

parts always to be replaced: turbocharger air cooler air outlet pipe seal .

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Torque tighten the front impact cross member bolts21 N.m.

INTERIOR BODY SIDE TRIM ASSEMBLY: EXPLODED VIEW

B52(B52)

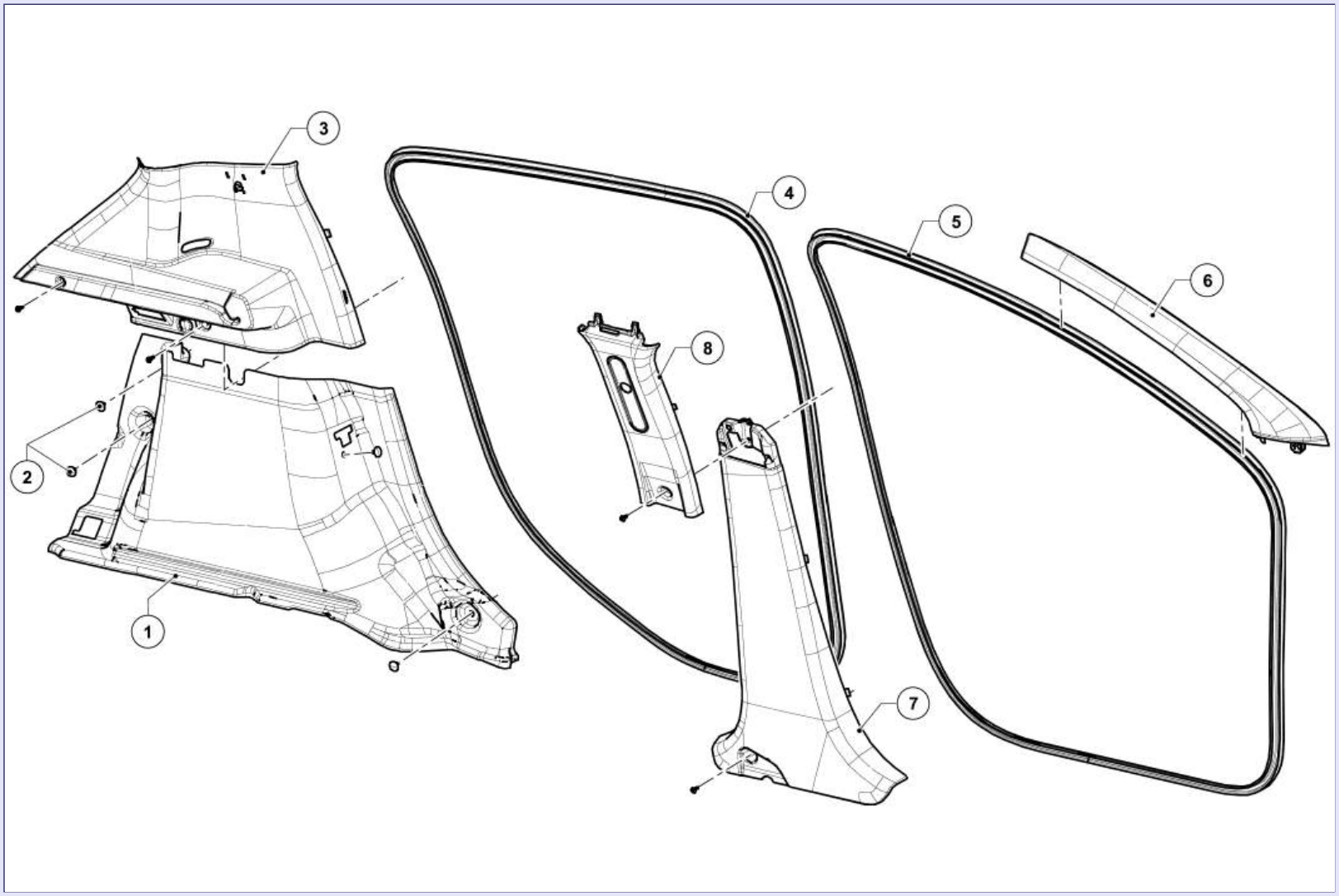


Illustration key: Description

Marks	Designations	Informations
1	Rear wheel arch trim	
2	Trim clip	
3	rear left-hand side panel trim	
4	Rear side door seal	
5	Front side door seal	
6	Windscreen pillar trim	
7	B-pillar lower trim	
8	B-pillar upper trim	

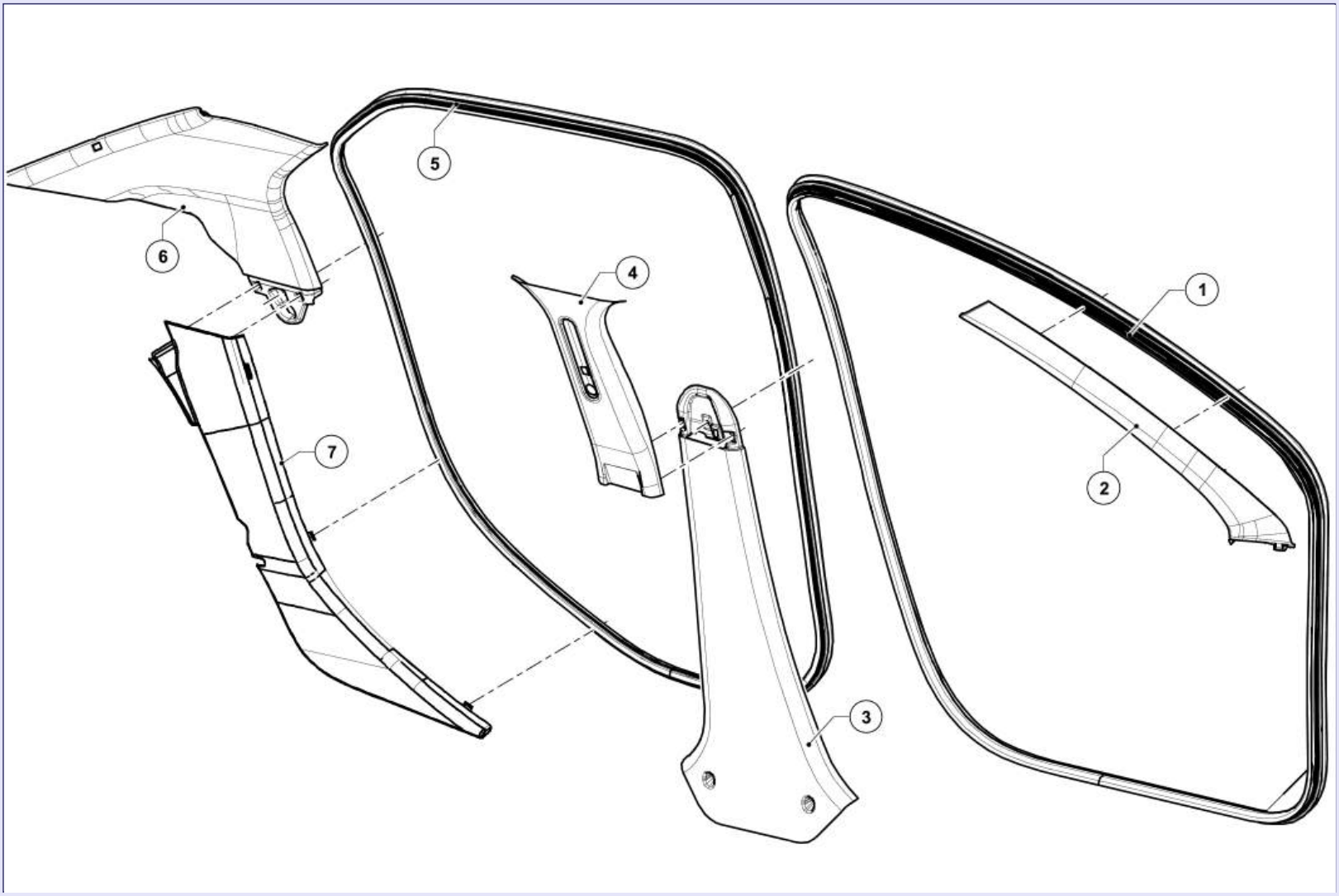


Illustration key: Description

Marks	Designations	Informations
1	Front side door seal	
2	Windscreen pillar trim	
3	B-pillar lower trim	
4	B-pillar upper trim	
5	Rear side door seal	
6	C-pillar upper trim	
7	C-pillar trim	

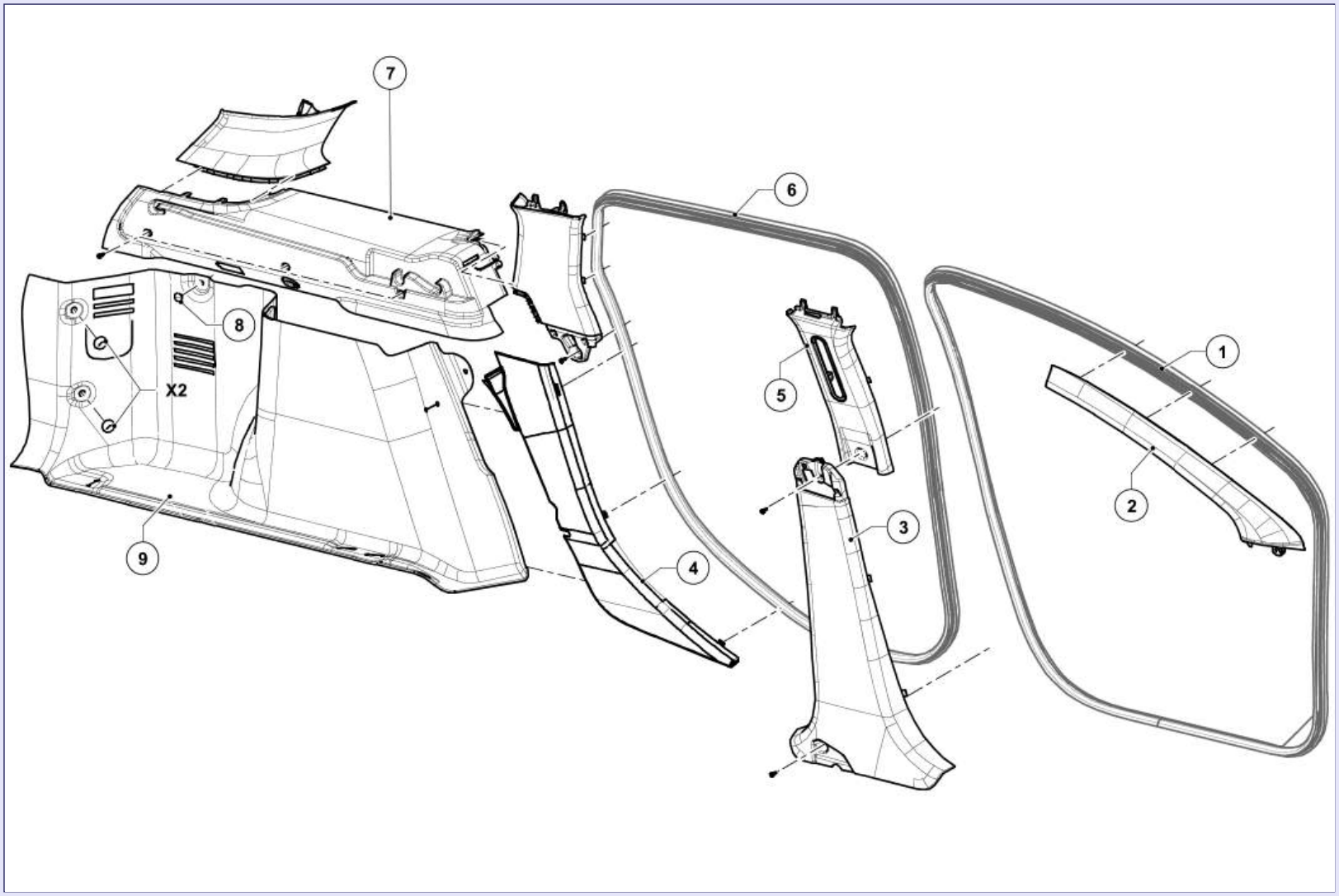


Illustration key: Description

Marks	Designations	Informations
1	Front side door seal	
2	Garniture de montant de pare brise	
3	B-pillar lower trim	
4	C-pillar trim	
5	B-pillar upper trim	
6	Rear side door seal	
7	Rear left-hand side panel trim	
8	Trim clip	
9	Rear wheel arch trim	

INTERIOR LIGHTING: LIST AND LOCATION OF COMPONENTS

Special tooling required	
Set of trim removal levers.	Car. 1363

1. LIST OF COMPONENTS

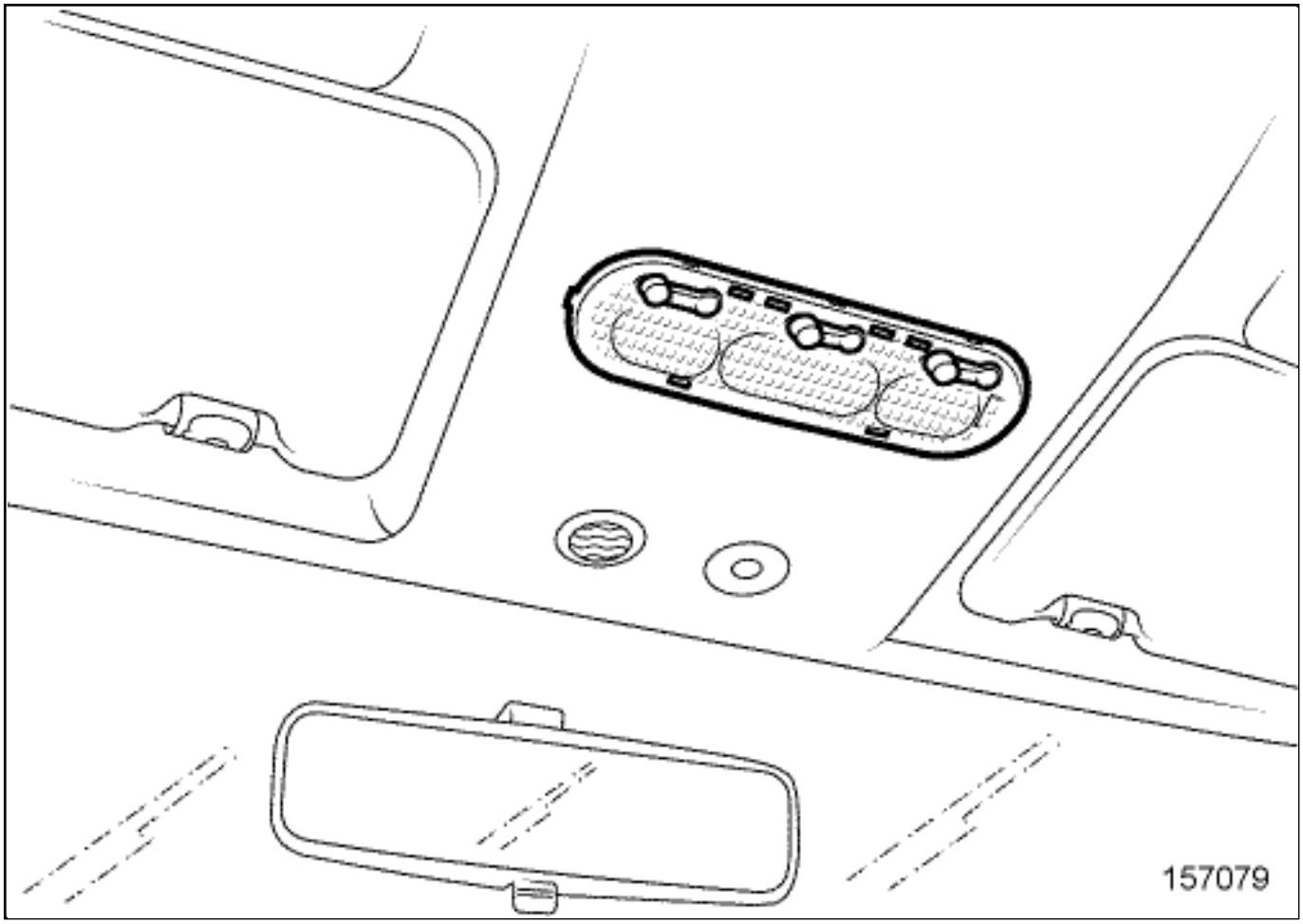
1- THE INTERIOR LIGHTING CONSISTS OF:

- courtesy light,
- luggage compartment light,
- door switches,
- luggage compartment switch.

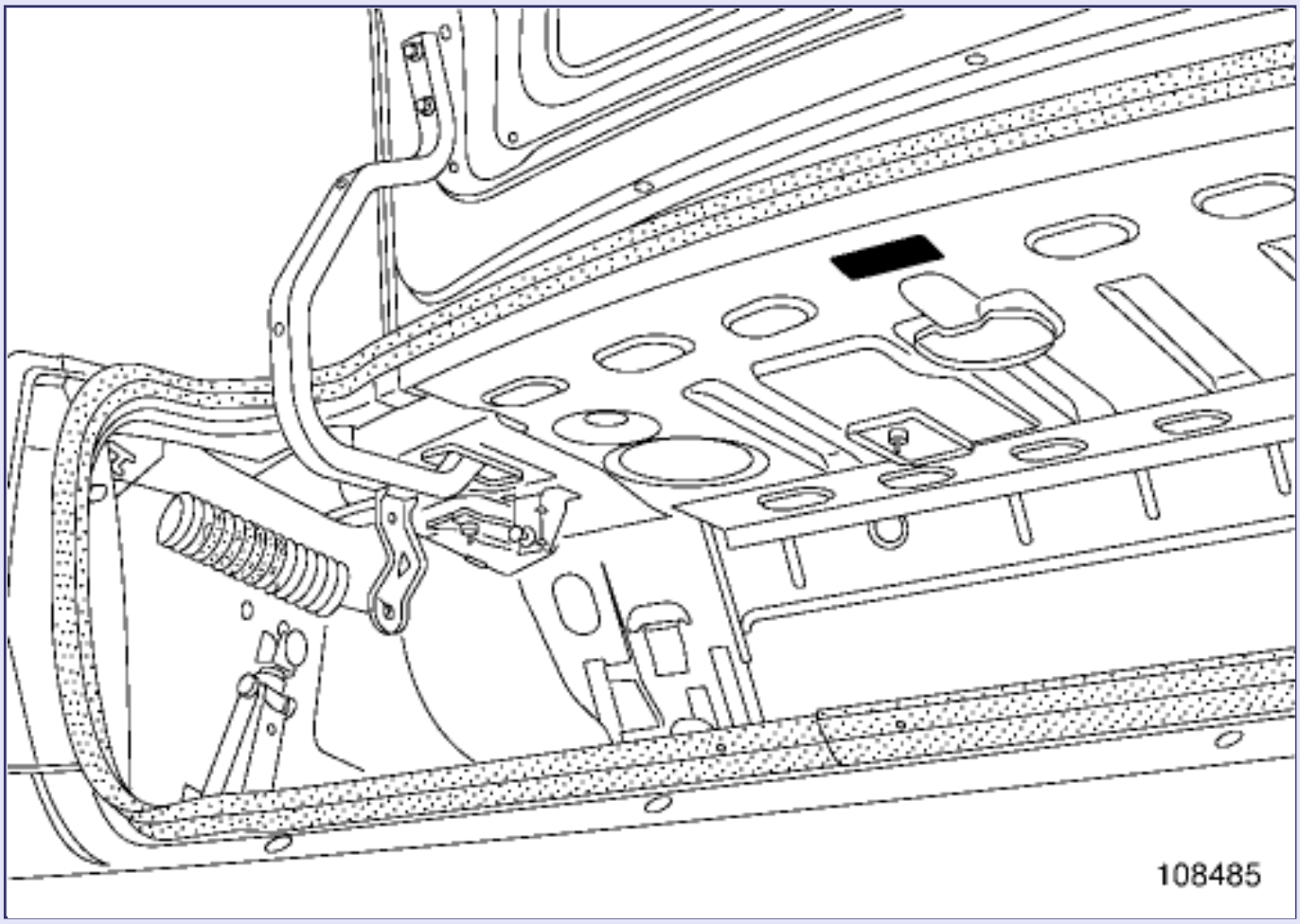
2. LOCATION OF COMPONENTS

Use the toolSet of trim removal levers.(Car. 1363) to remove-refit any interior lighting components.

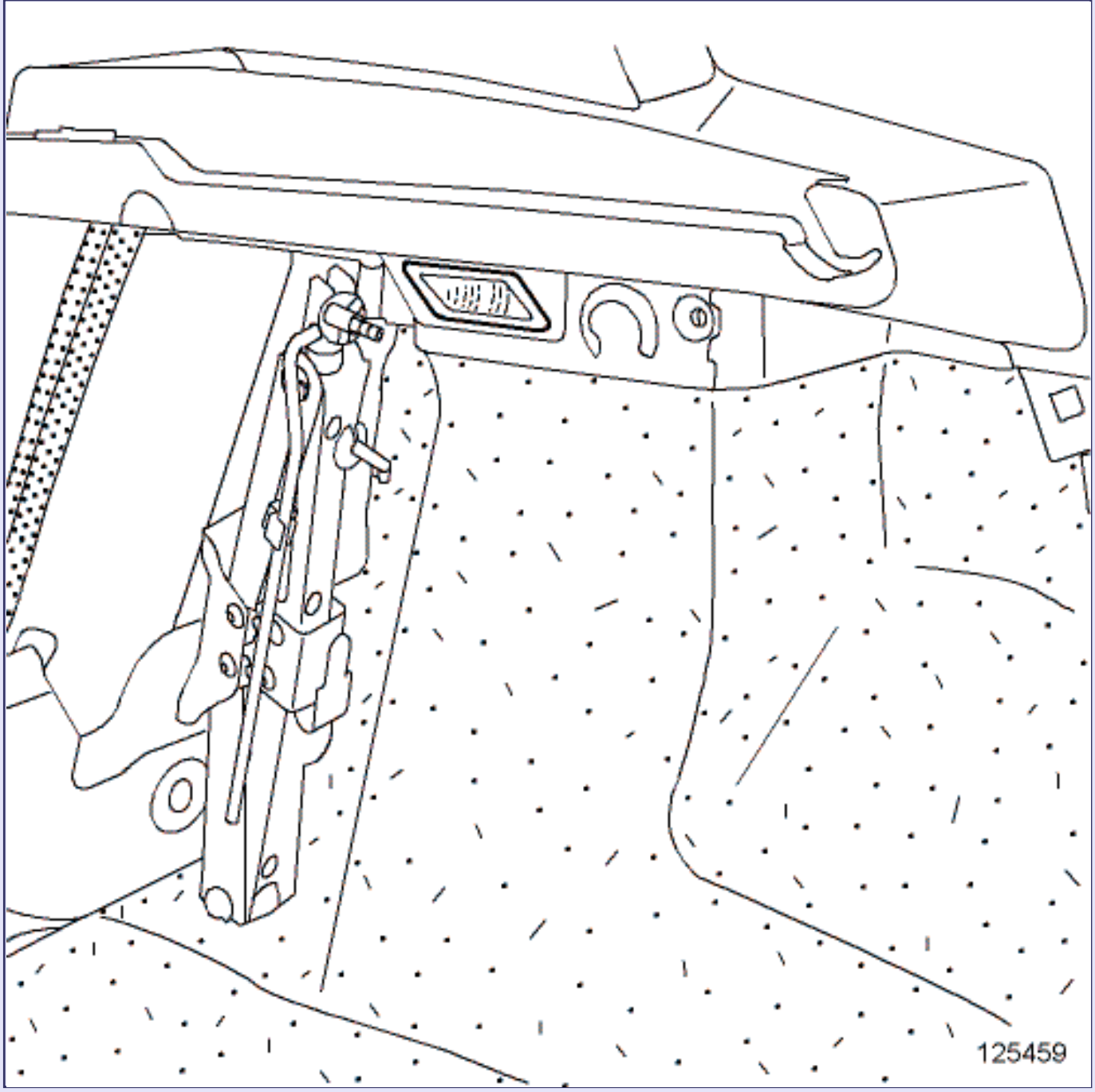
FRONT COURTESY LIGHT



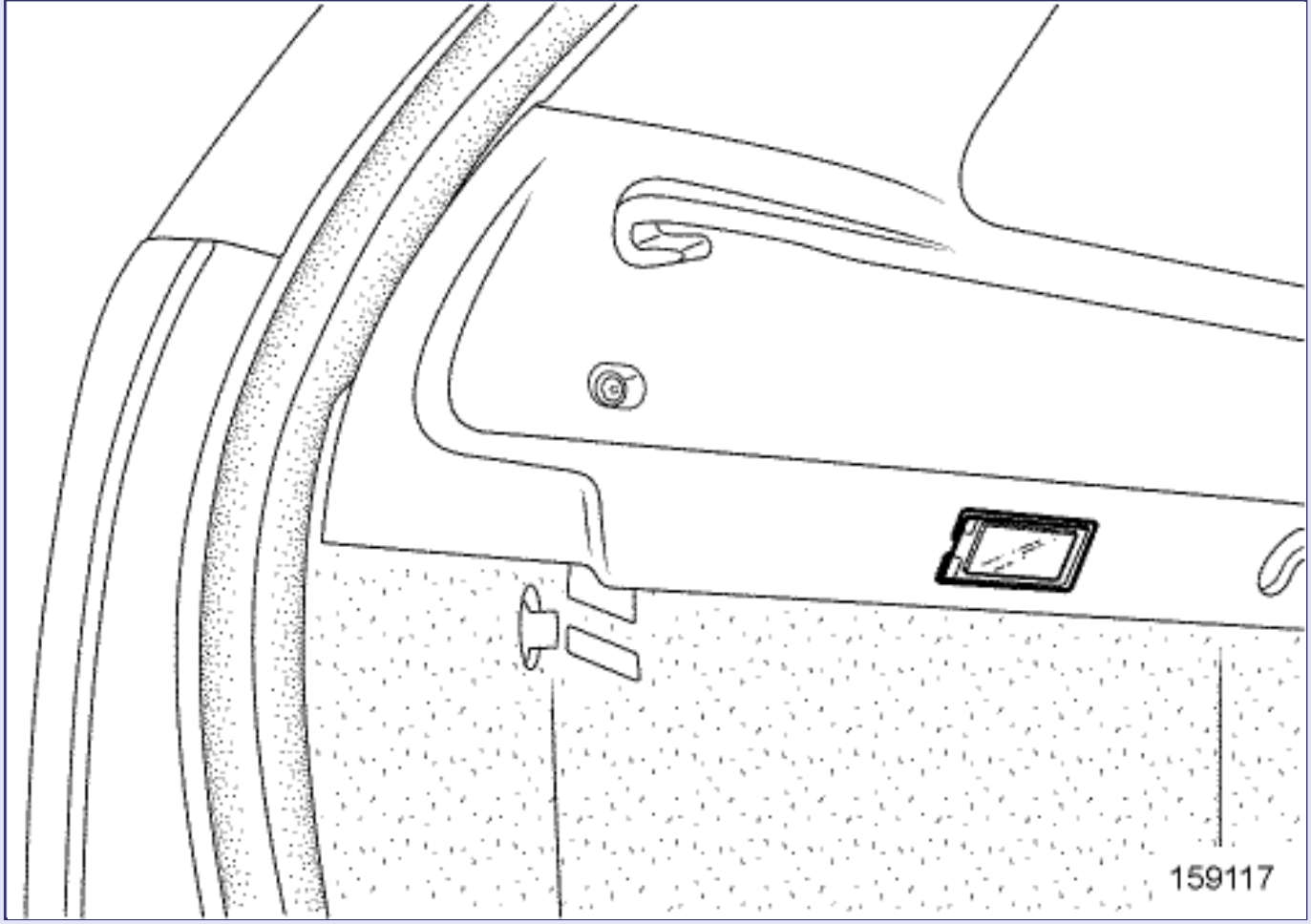
L52(L52) LUGGAGE COMPARTMENT LIGHT



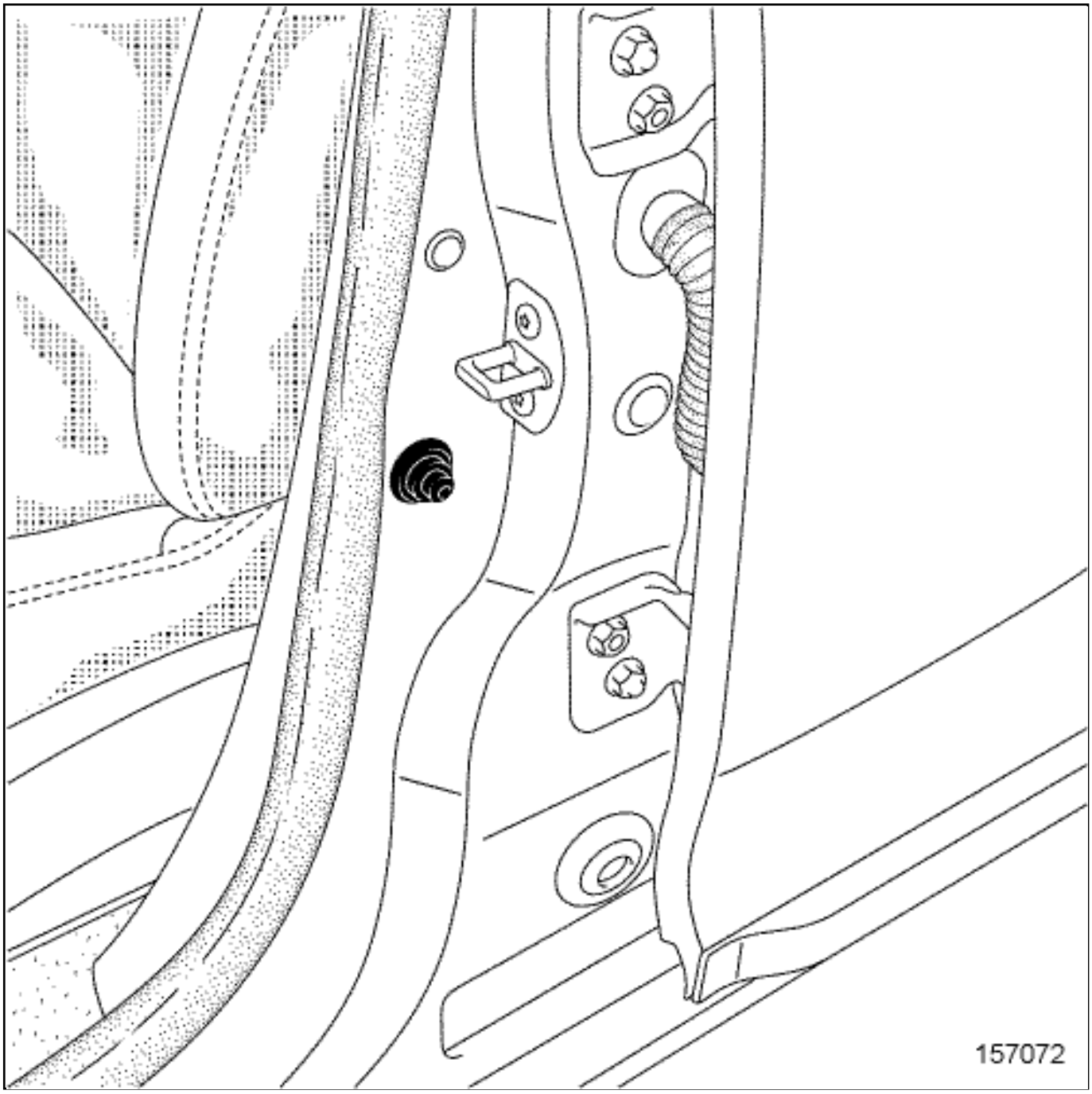
B52(B52) LUGGAGE COMPARTMENT LIGHT

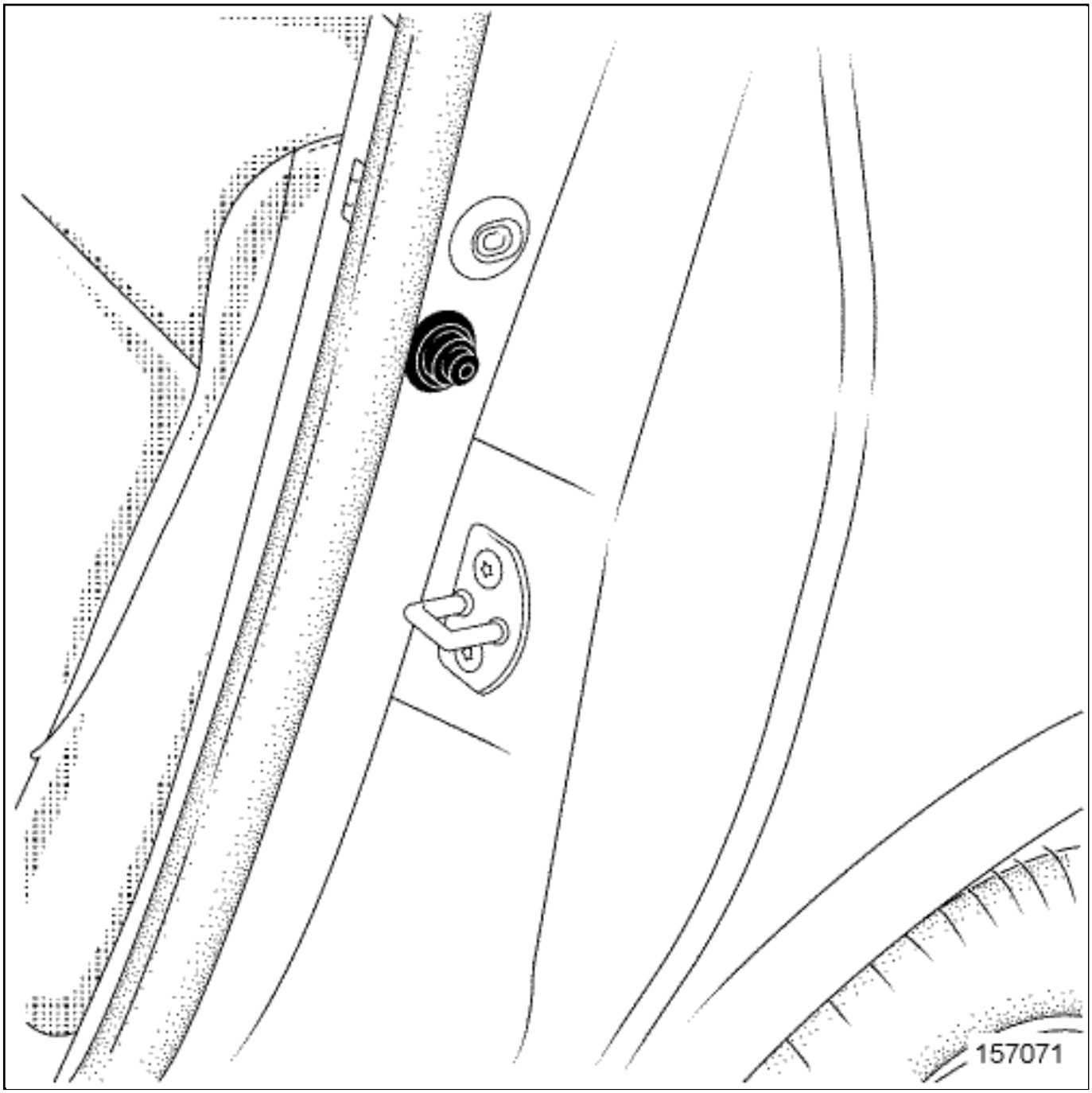


K52(K52) LUGGAGE COMPARTMENT LIGHT

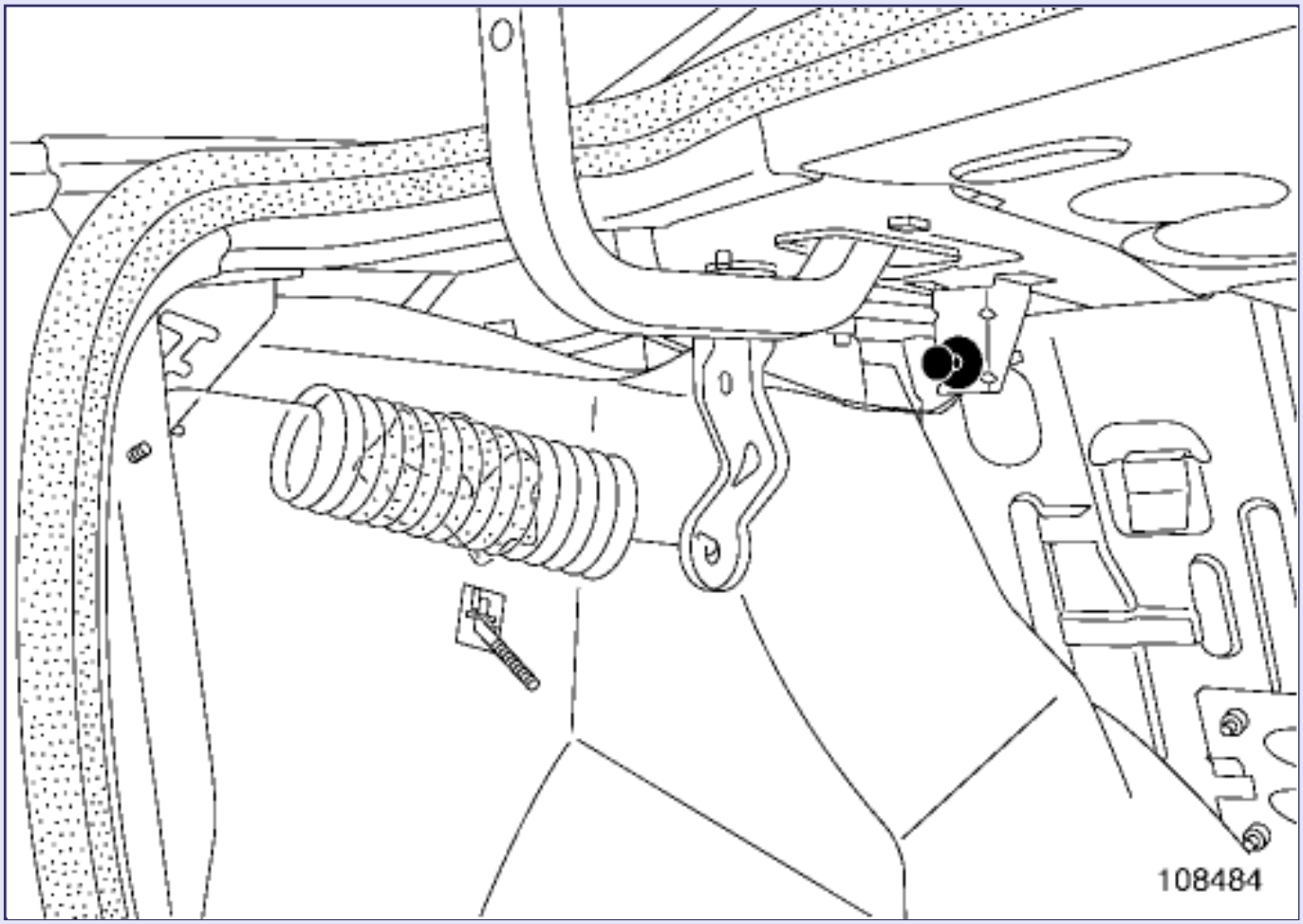


DOOR SWITCHES

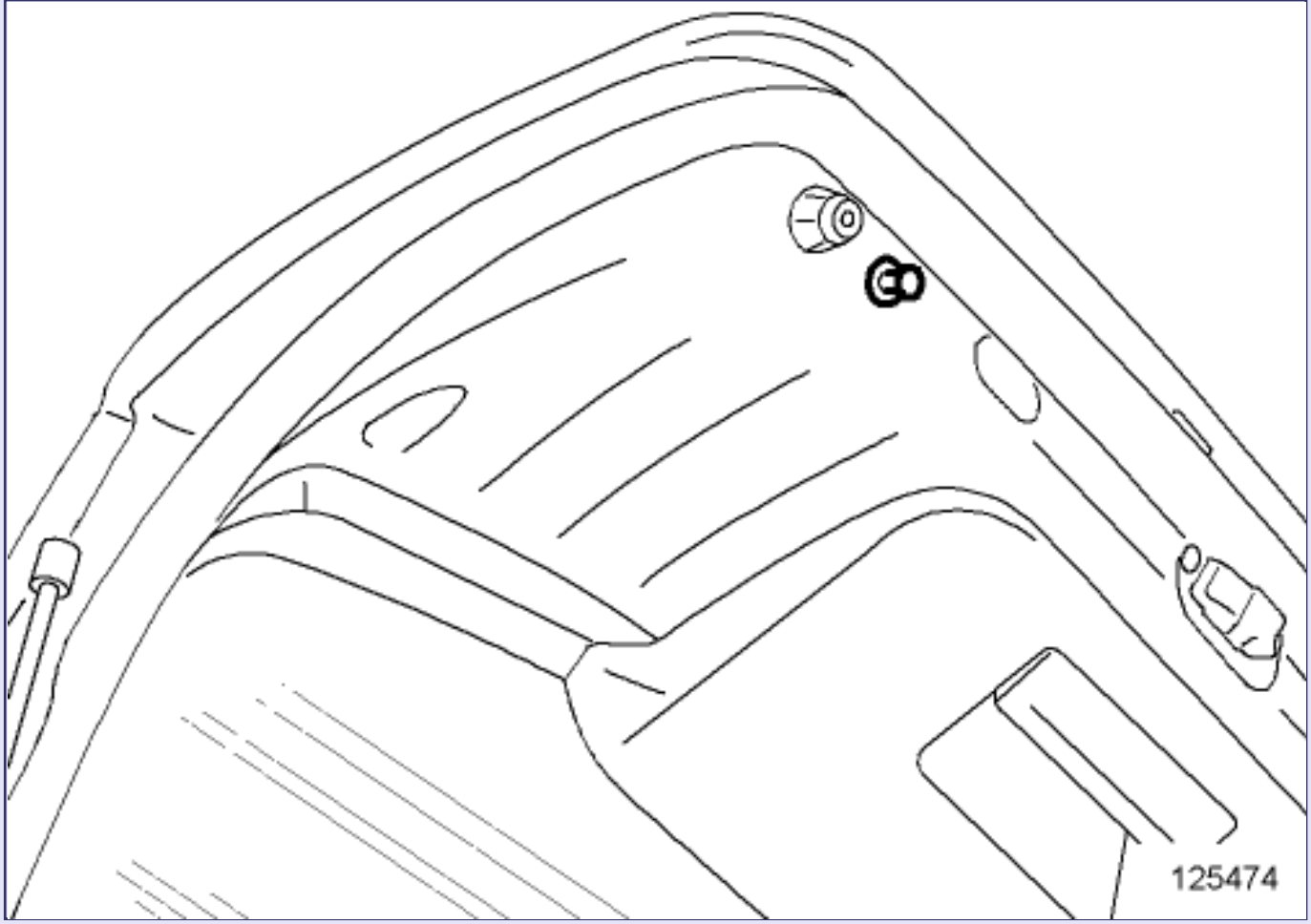

157072


157071

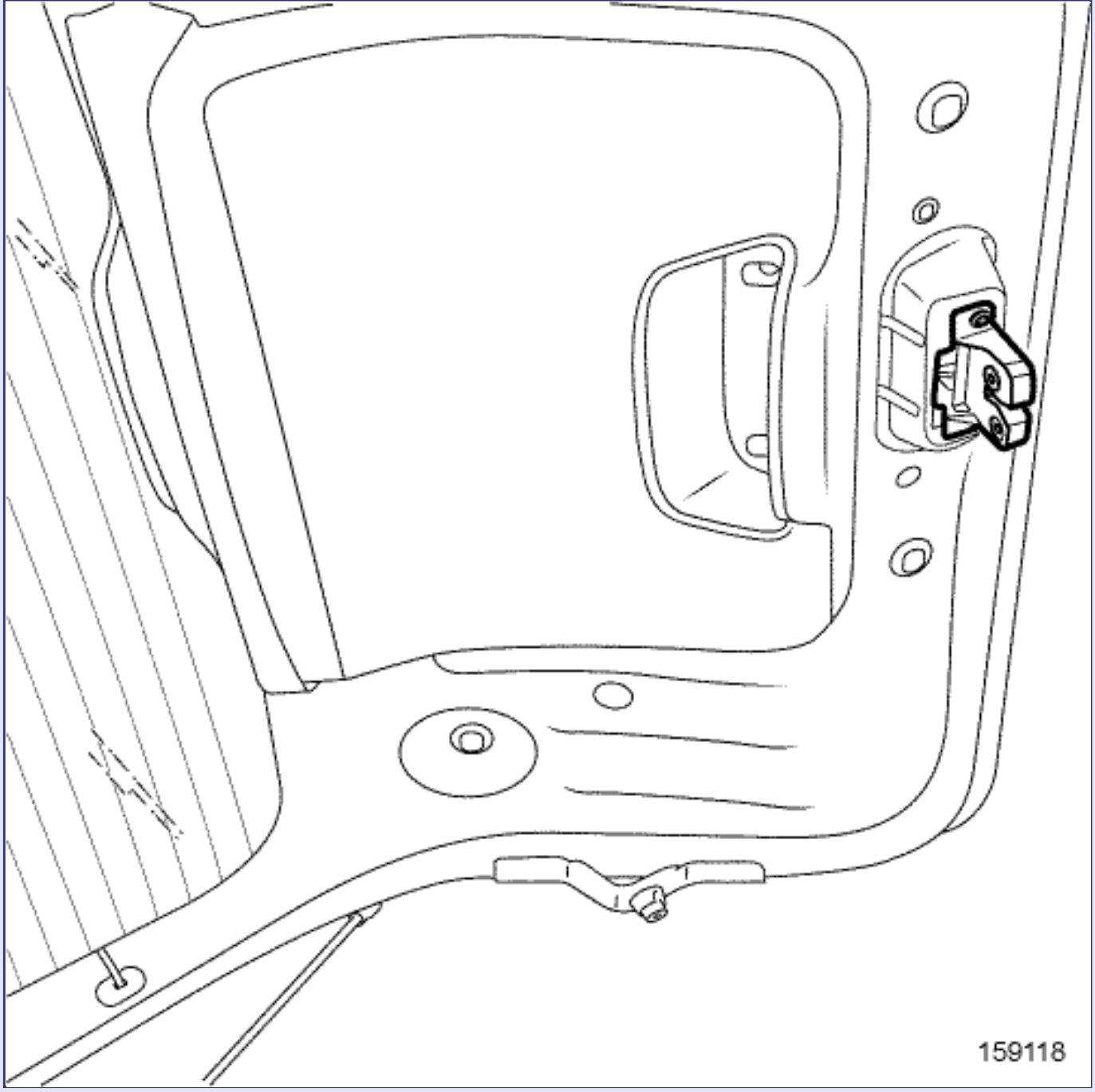
L52(L52) LUGGAGE COMPARTMENT SWITCH



B52(B52) LUGGAGE COMPARTMENT SWITCH



K52(K52) LUGGAGE COMPARTMENT SWITCH (INTEGRATED INTO THE TAILGATE LOCK)


159118

LEFT-HAND SUSPENDED ENGINE MOUNTING: REMOVAL - REFITTING

Special tooling required	
Engine anchorage support with multiple adjustments and retaining straps.	Mot. 1453

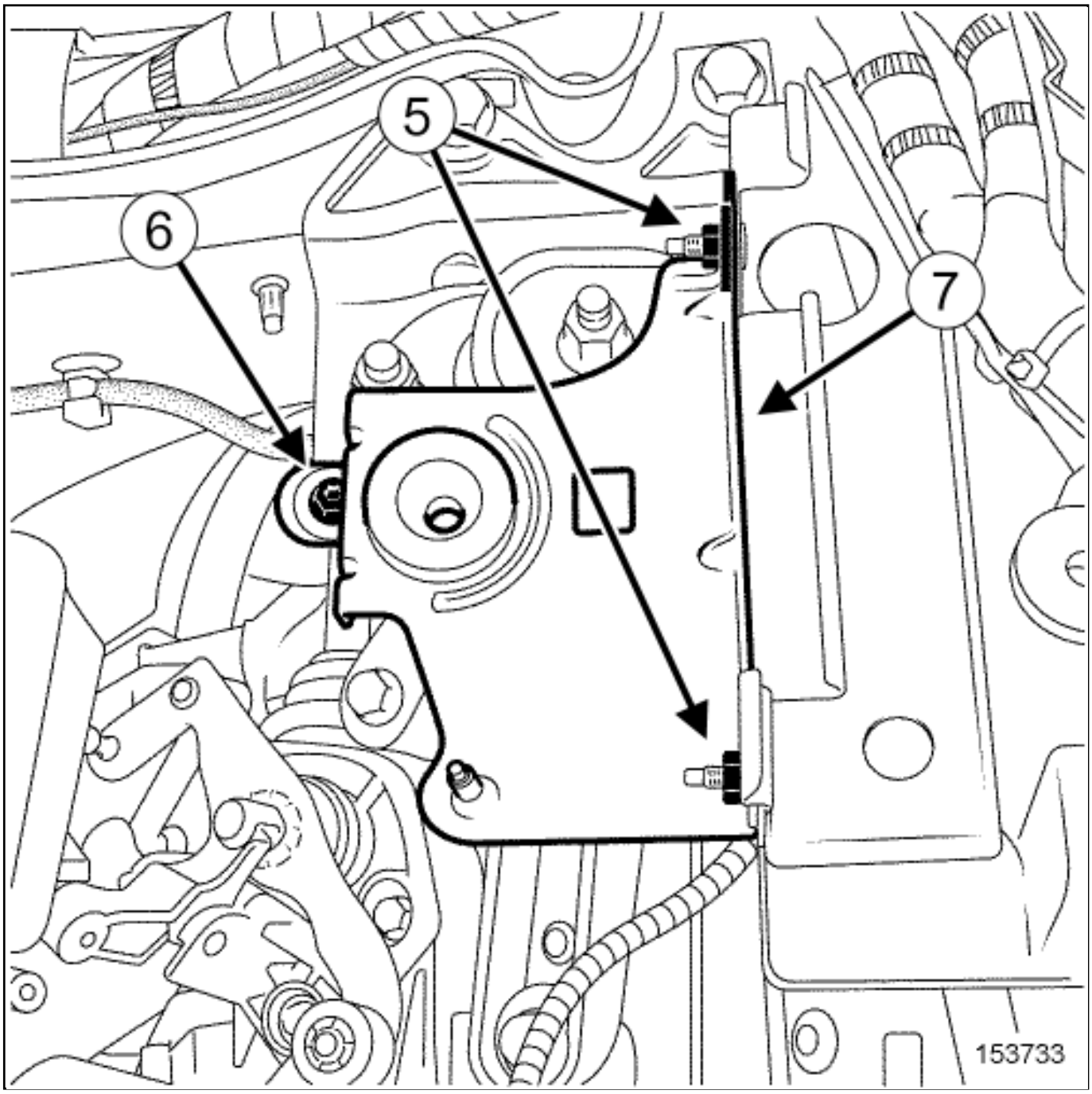
Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19D, Engine mounting, Engine-gearbox unit support assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

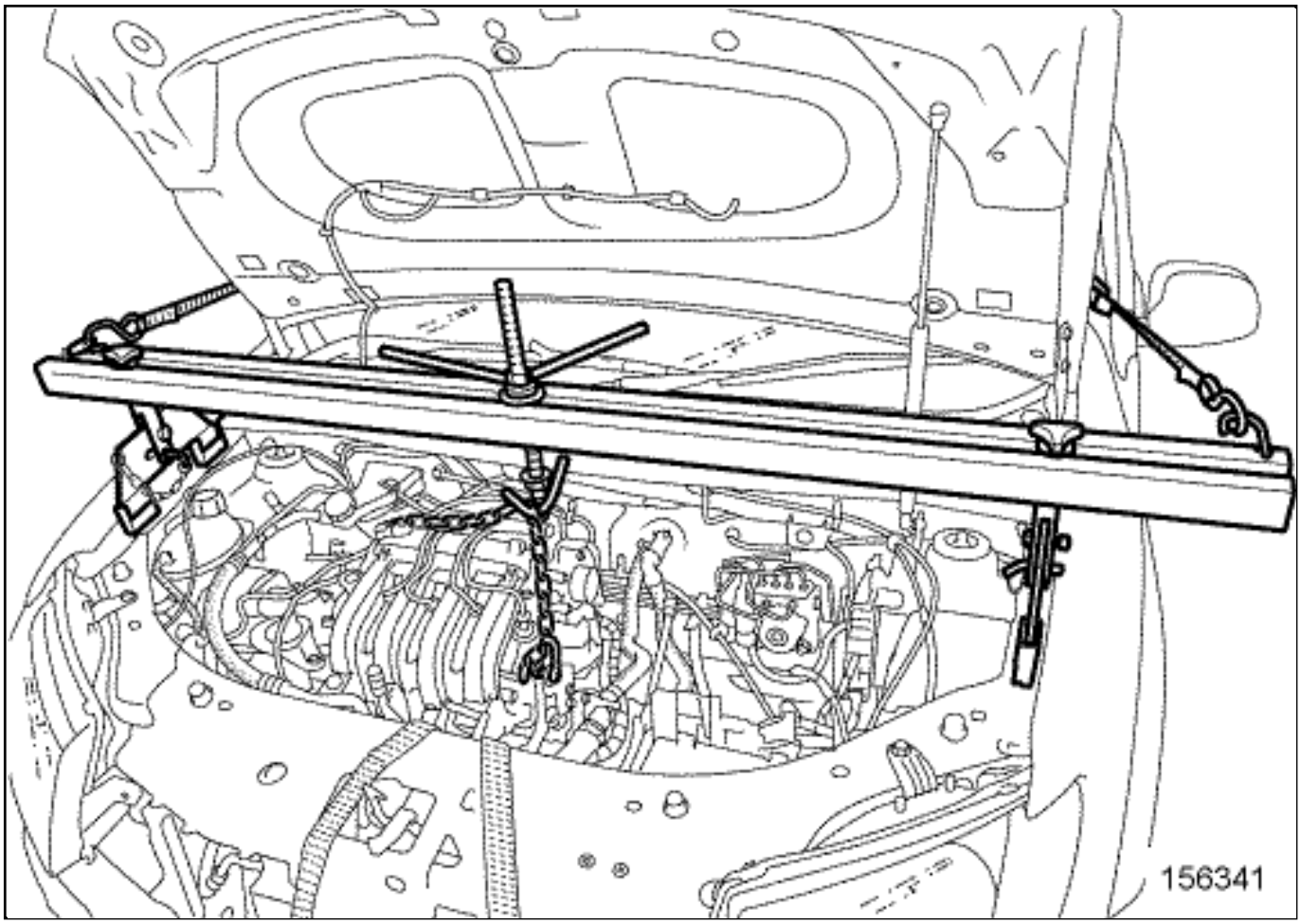
- Remove the batteryBattery: Removal - Refitting .

- Remove the air filter unitAir filter unit: Removal - Refitting .



Remove :

- the nuts(5) ,
- the bolt(6) ,
- the air filter suppport(7) .



- Fit the engine support toolEngine anchorage support with multiple adjustments and retaining straps. (Mot. 1453) with the retaining belt, taking the flywheel end lifting eye as an anchoring point.

- Mark the position of the left-hand suspended engine mounting on the body.

2. REMOVAL OPERATION

- Remove (see 19D, Engine mounting, Engine-gearbox unit support assembly: Exploded view) :
  - the gearbox support nuts on the rubber pad,
  - the left-hand suspended mounting bolts on the gearbox,
  - the left-hand suspended mounting on the gearbox,
  - the bolts from the left-hand rubber pad mounting on the body,
  - the left-hand rubber pad mounting.

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

LPG INJECTION: PRECAUTIONS FOR THE REPAIR

Note:

It is essential that you respect the following safety advice before carrying out any operation on a vehicle equipped with the LPG system.

1. AUTHORISED WORKSHOP

Repairs to the LPG system must only be carried out in workshops that meet the requirements for this type of operation.

The workshop must be equipped with a BC type approved extinguisher.

The operational area must be well ventilated.

Only workshops equipped with an LPG flare for draining the system may carry out work on the LPG tanks.

2. AUTHORISED STAFF

Only qualified personnel who have received training regarding the LPG system may carry out operations on the system.

3. GENERAL SAFETY ADVICE

LPG is heavier than air in its gaseous form; do not work in a basement garage.

When carrying out any type of work on the LPG system, do not wear clothes containing acrylic or any other material which could generate static electricity.

Keep naked flames and all ignition sources (sparks, cigarettes, mobile phones, etc.) away from the work area.

During any operation on the LPG circuit, place a sign on the driver's seat position: “GAS WORKS IN PROGRESS, DO NOT MOVE”, place signs in the working area: “GAS WORKS IN PROGRESS, DO NOT SMOKE”.

If LPG comes into contact with the skin, it can cause frostbite due to the cold. It is advisable to wear

protective gloves and goggles.

Before the operation, visually inspect that the LPG components are in good condition.

Carry out all of the operations with the battery disconnected.

When carrying out any operations on the LPG system, it is necessary to connect the vehicle to earth.

Before using the flare, it is essential to read the replacement frequencies and authorised frequency of use for the components of the flare provided by the supplier.

Never retighten a union under pressure.

Never plug a leaking union with filling product such as teflon sheath, sealing paste etc.

Never reseal a union by adding filling product. If the leak is still present after torque tightening, always replace the pipe.

Do not repair any of the LPG system faulty parts; they must always be replaced.

Never attempt to remove the tank without having first drained it and rendered it inert with nitrogen (risk of explosion).

Do not replace components fixed onto the LPG tank (LPG tank solenoid valve casing, overpressure valve).

When an LPG component is removed, it must immediately be replaced or refitted.

Do not wash the engine compartment with a pressurised system or using detergents. These can cause the expansion valve membranes to deteriorate.

After carrying out any operations on the LPG system, check the sealing on the entire gas supply system using the leak detectorVehicle: Parts and consumables for the repair (04B, Consumables - Products).

Storing a tank which has not been drained and not rendered inert with nitrogen is prohibited. All tanks replaced during a repair operation should be stored outside and away from any combustive material.

4. IF THERE IS A LEAK OR SMELL OF GAS

In the event of a significant gas leak, it is important to move the vehicle outside, away from any residential areas by pushing it, if necessary.

The emergency services may be required to intervene if the situation cannot be controlled.

5. INSTRUCTIONS TO BE FOLLOWED IF OPERATING ON THE HEAT SOURCE

LPG is stored in pressurised tanks. It is therefore advisable to avoid overheating.

Do not carry out any welding operations and do not use a heat source close to the LPG tank and pipes, otherwise it will be necessary to drain the LPG tank and pipes**(see 17C, LPG injection, LPG tank: Draining)** .

When the vehicle goes into a spray booth, see the Precautions for repair for painting**Paint: Precautions for the repair** .

LPG LEVEL SENSOR : REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

- It is essential to read the repair precautions(see 17C, LPG injection, LPG injection: Precautions for the repair) .
- Disconnect the batteryBattery: Removal - Refitting (80A, Battery).
- Cut the retaining clip of the multifunction valve protection(if the vehicle is equipped).
- Remove the protection of the multifunction valve.

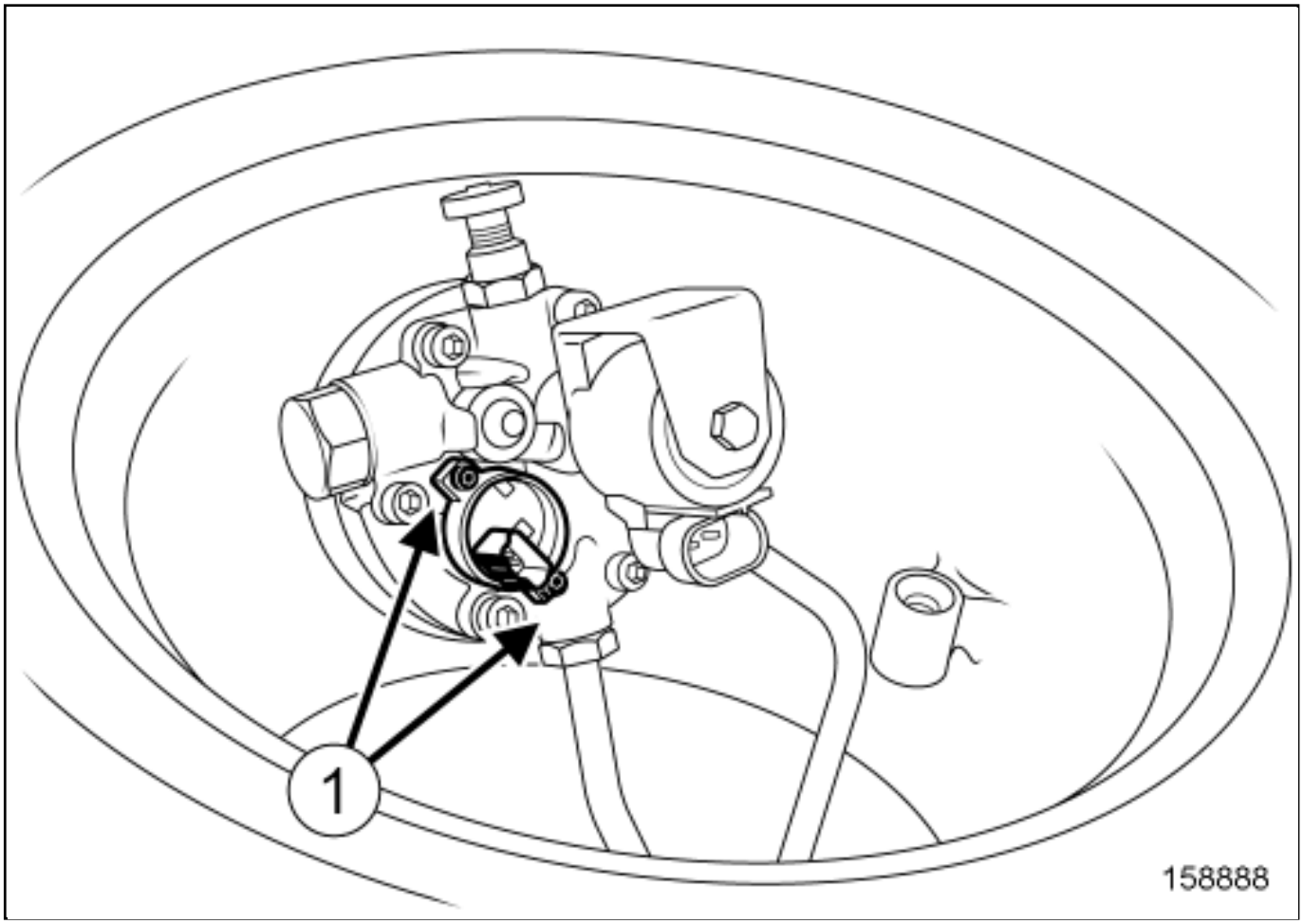
2. REMOVAL OPERATION

- Disconnect the connector of the LPG level sensor.

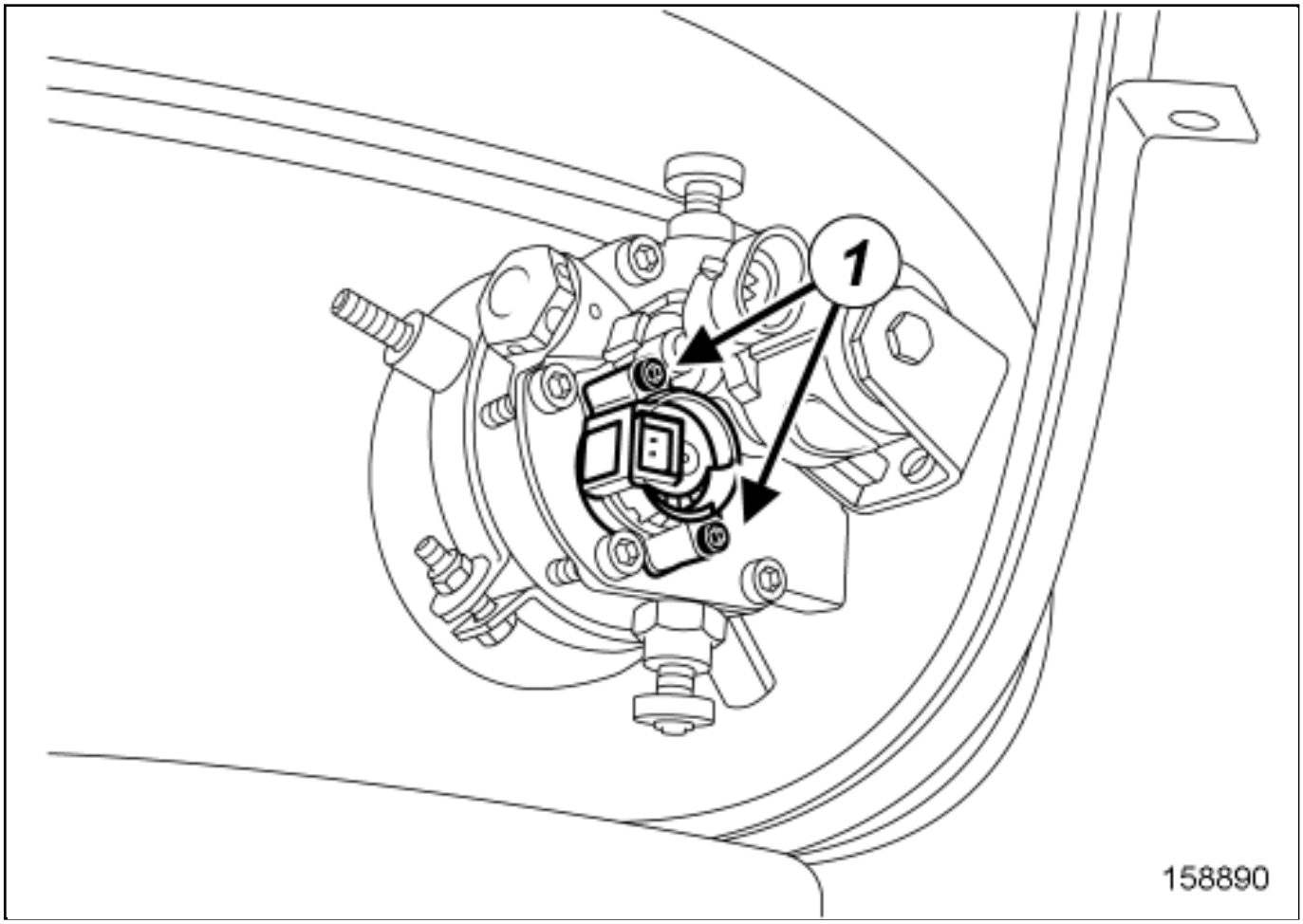
Note:

Note down the fitting position of the LPG level sensor.

LPG TANK IN THE LUGGAGE COMPARTMENT



LPG TANK UNDER THE VEHICLE



- Remove the bolts(1) of the LPG level sensor.

- Remove the LPG level sensor.

REFITTING

Note:

Refit the LPG level sensor in the position marked during removal

- Proceed in the reverse order to removal.

LPG TANK - NECK PIPE: REMOVAL - REFITTING

REMOVAL

- It is essential to read the repair precautions(see 17C, LPG injection, LPG injection: Precautions for the repair) .
- Park the vehicle outside.
- Disconnect the batteryBattery: Removal - Refitting (80A, Battery).
- Cut the retaining clip of the multifunction valve protection (if the vehicle is equipped).
- Remove the protection of the multifunction valve.
- Disconnect the connector of the LPG tank solenoid valve.
- Drain the neck - LPG tank pipe:
  - gradually undo the nut of the neck - LPG tank pipe on the LPG tank multifunction valve and allow all of the gas to escape.
- Take the vehicle back inside.
- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).
- Remove the protective housing from the underbody pipes.
- Remove the rear right-hand wheelWheel: Removal - Refitting (35A, Wheels and tyres).
- Remove the mounting bolts of the neck - LPG tank pipe on the body.
- Loosen the mounting nut of the neck - LPG tank pipe on the filler end piece.
- Remove the neck - LPG tank pipe.

REFITTING

Proceed in the reverse order to removal.

Torque tighten:

- the nut of the neck - LPG tank pipe on the filler end piece 14 N.m,
- the nut of the neck - LPG tank pipe on the LPG multifunction valve 14 N.m.

Check the sealing with leak detection product **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

LPG TANK: DRAINING

Note, one or more warnings are present in this procedure

Special tooling required	
Magnet for manually opening the LPG/CNG tank solenoid valve	

Equipment required
pneumatic or electric wrench

DRAINING

1. DRAINING PREPARATION OPERATION

- It is essential to read the repair precautions (see 17C, LPG injection, LPG injection: Precautions for the repair) .

Note:

Refer to the instructions for use of the AEM LPG igniter in addition to the installation instructions below.

- Park the vehicle outside.
- Cut the retaining clip of the multifunction valve protection.
- Remove the protection of the multifunction valve.
- Close the stop cock on the multifunction valve.
- Drain the LPG multifunction valve - LPG expansion valve unit pipe:
  - start the vehicle in LPG position,
  - let the engine run until it automatically switches to petrol mode.
- Disconnect the battery Battery: Removal - Refitting (80A, Battery).
- Loosen the nut of the LPG multifunction valve - LPG expansion valve unit pipe

2. DRAINING OPERATION

- Disconnect the connector of the LPG tank solenoid valve.
- Remove the bolt from the LPG tank solenoid valve.
- Remove the LPG tank solenoid valve.
- For flaring, use the pneumatic or electric wrench.
- Position the flare in a stable position in the flare area.
- Position the "TWINY" bottle further than 5 metresaway from the flare.
- Position the tank to be emptied further than 10 metresaway from the flare.

Note:

The "TWINY" propane bottle and the nitrogen bottle are not supplied with the flare.

- Ensure that all valves of all circuits are closed.
- To connect the pilot flame hose between the flare and the "TWINY" bottle:
  - Connect the quick-release union to the flare pilot flame end piece.
  - Clip the expansion valve to the bottle. The valve must be closed.
- For the connection between the tank and the flare:
  - Connect the self-sealing union on the end of the hose to the flare connection end piece, with the valve closed.
  - Fit the special pipe in place of the LPG multifunction valve - LPG expansion valve unit pipe.
  - Connect the self-sealing joint at the end of the hose to the connection socket of the special pipes.
- To connect the nitrogen circuit:
  - Position the nitrogen bottle near the LPG tank.
  - Attach the expansion valve onto the nitrogen bottle and tighten the expansion valve union.
  - Fit the adapter on the filler end piece,
  - Connect the special nitrogen pad to the LPG tank filler orifice and tighten manually. (make sure there is a seal).
  - After a check of all the seals to ensure there are no leaks, the system is ready for use.
- To light the pilot flame (operator correctly attired):
  - Open the "TWINY" bottle expansion valve switch.
  - Introduce a flame into the opening provided in the flare cylinder to light the pilot flame.
  - Check that the pilot flame is properly lit.
- To light the igniter:
  - The operator must be at least 10 metresaway from the flare and must ensure that this precaution is

respected by everyone.

- Control the tank solenoid valve by putting the toolMagnet for manually opening the LPG/CNG tank solenoid valve in place of the LPG tank solenoid valve.
- Open the stop cock of the multifunction valve,
- Open the progressive flow valve to position 1 (the maximum position is 5).
- The igniter lights.
- Check the passage of the liquid gas through the circulation indicator.
- Adjust the opening of the progressive flow control valve, increasing its opening to position 2 or 3 until the flow lines equalise through the circulation indicator.
- Try to open the progressive flow control valve slowly so as to not trigger the tank flow limiter. If the limiter is triggered, close the flow valve and start the operation again.
- After the flow has equalised, open the nitrogen bottle and adjust the expansion valve to a pressure 1 bargreater than the tank pressure (but not greater than 7 bar).

- After the main flame has gone out, let the nitrogen flame sweep at 3 bars with the flow valve completely open for 1 minuteper 10 litrescapacity (e.g: for a 60 litrestank: sweeping = 6 min).

- Close the tank solenoid valve and remove theMagnet for manually opening the LPG/CNG tank solenoid valve .

- Close the nitrogen circuit by resetting the expansion valve and closing the tap on the nitrogen bottle.

- Shut off the pilot flame by closing the expansion valve switch on the "TWINY" gas bottle.

- Close the progressive flow valve.

CAUTION

The flare should be left in place until it has cooled completely. Move the flare using the two side handles.

- Disconnect all of the unions.

- Wind up the hoses.

- Put away the equipment.

- Refit the LPG tank solenoid valve.

- Connect the connector of the LPG tank solenoid valve.

3. REFITTING OPERATION AFTER DRAINING

- Pretighten by hand the nut of the LPG multifunction valve - LPG expansion valve unit pipe.

Torque tighten the nut of the LPG multifunction valve - LPG expansion valve unit pipe11 N.m.

Check the sealing of the union between the LPG multifunction valve - LPG expansion valve unit pipe and the LPG multifunction valve with leak detection product**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- fill the tank with several litres of LPG,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the union,
- wait for 5 minutes,
- check that there are no leaks on the union,
- fill up the tank,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the union,
- wait for 5 minutes,
- check that there are no leaks on the union.

Refit the protection of the LPG multifunction valve.

LPG TANK MODULE : REMOVAL - REFITTING

REMOVAL

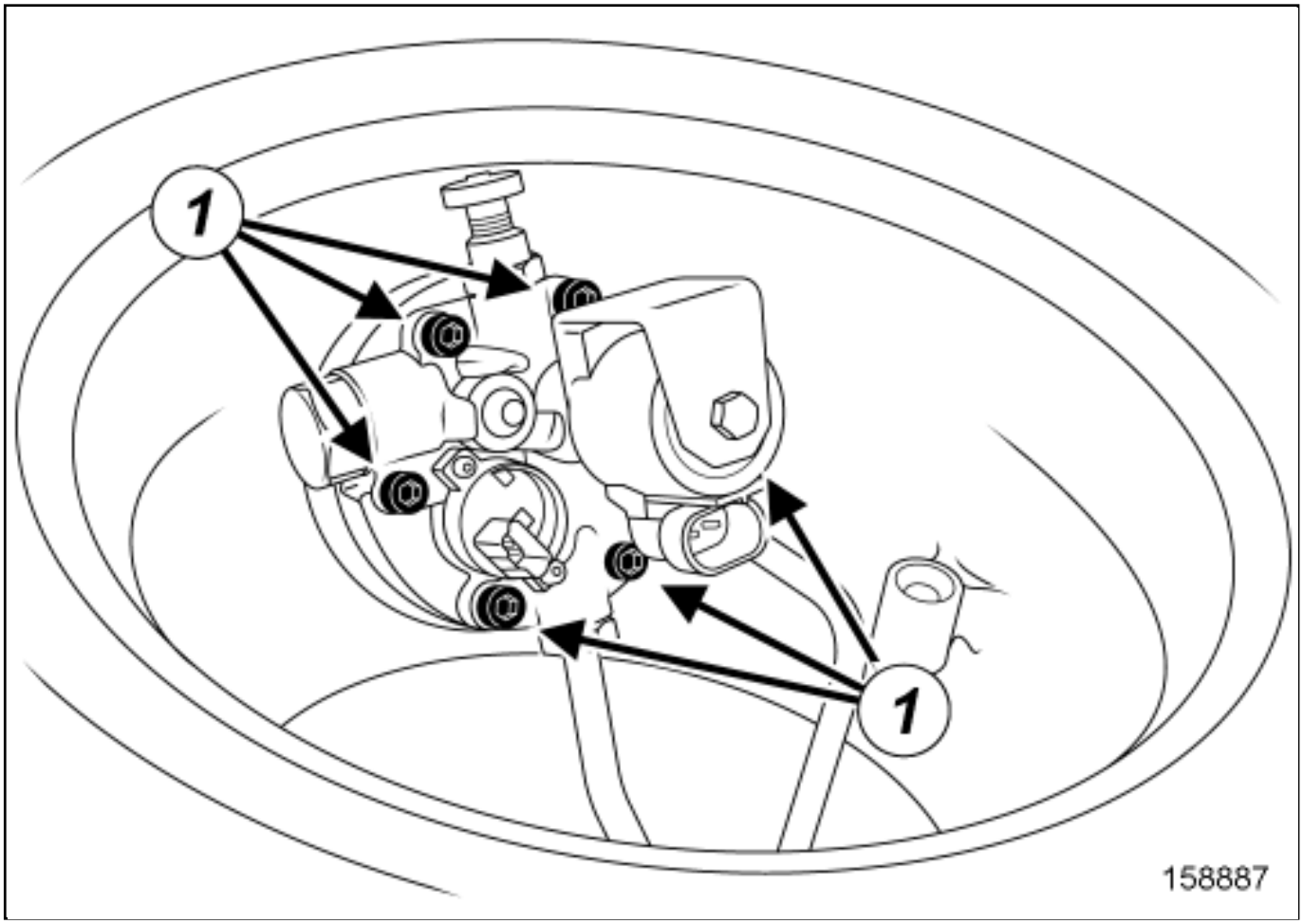
1. REMOVAL PREPARATION OPERATION

- It is essential to read the repair precautions(see 17C, LPG injection, LPG injection: Precautions for the repair) .
- Park the vehicle outside.
- Disconnect the batteryBattery: Removal - Refitting (80A, Battery).
- Partially remove the neck - LPG tank pipe on the LPG multifunction valve side(see 17C, LPG injection, LPG tank - neck pipe: Removal - Refitting) .
- Drain the LPG tank(see 17C, LPG injection, LPG tank: Draining) .
- Take the vehicle back inside.
- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).

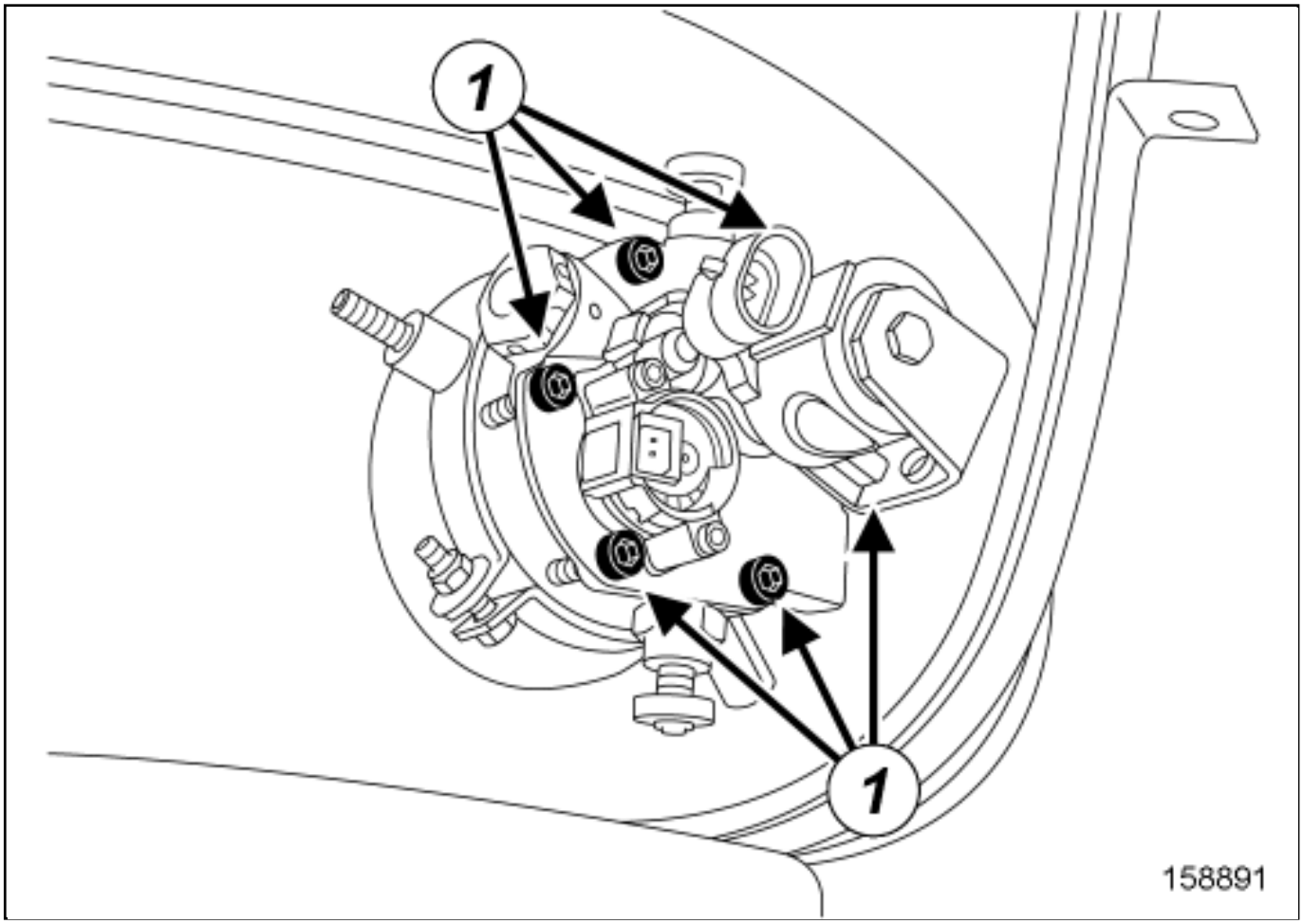
2. REMOVAL OPERATION

- Disconnect the connector of the LPG level sensor.

LPG TANK IN THE LUGGAGE COMPARTMENT



LPG TANK UNDER THE VEHICLE



- Loosen the LPG tank module bolts(1) .
- Detach the LPG tank module.
- Remove the LPG tank module bolts.

Note:

Do not force the float, the overpressure pipe or the plunger when removing

- Remove the LPG tank module.

REFITTING

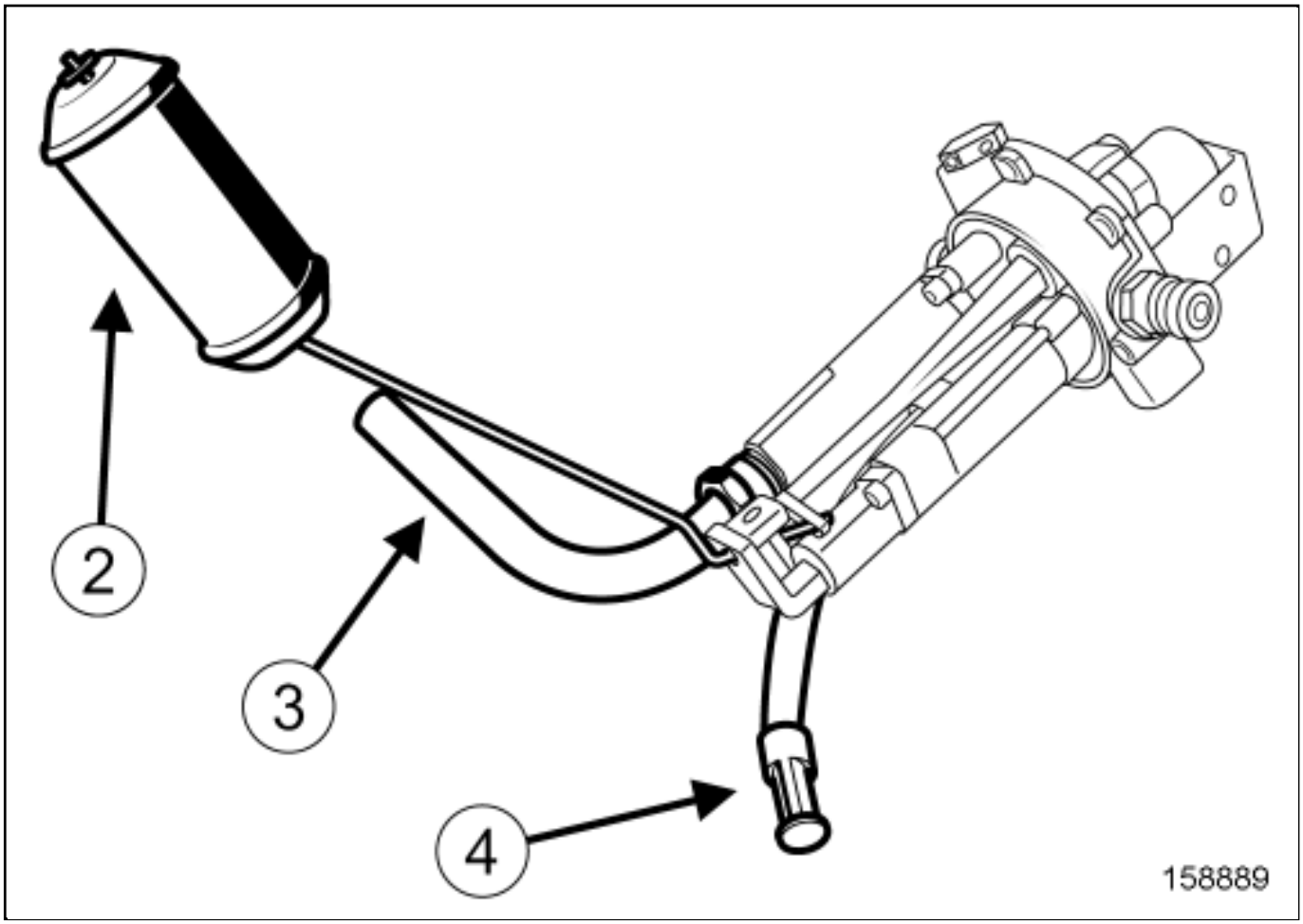
1. REFITTING PREPARATION OPERATION

- Check that the LPG tank module seal are the position correct.

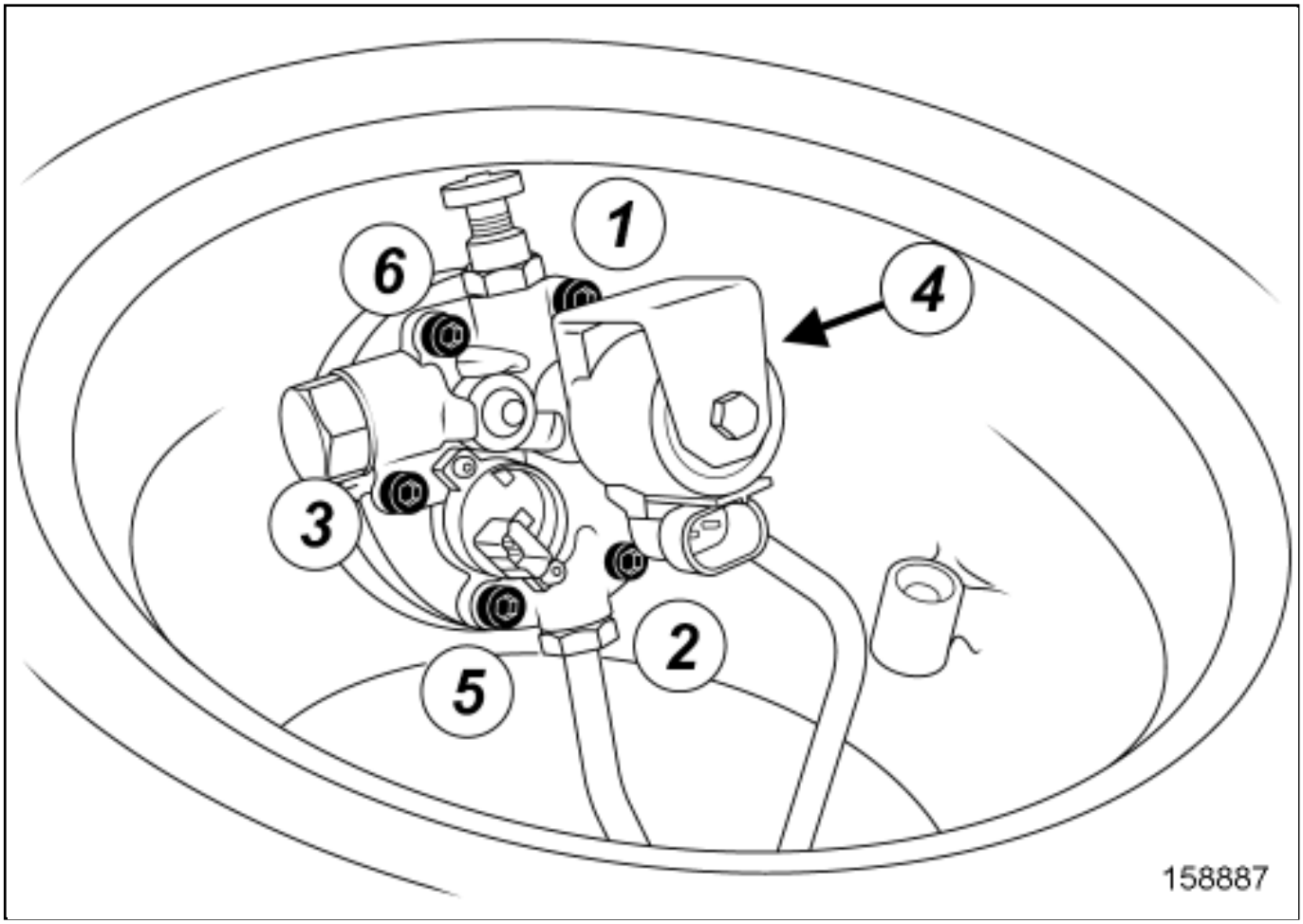
2. REFITTING OPERATION

Note:

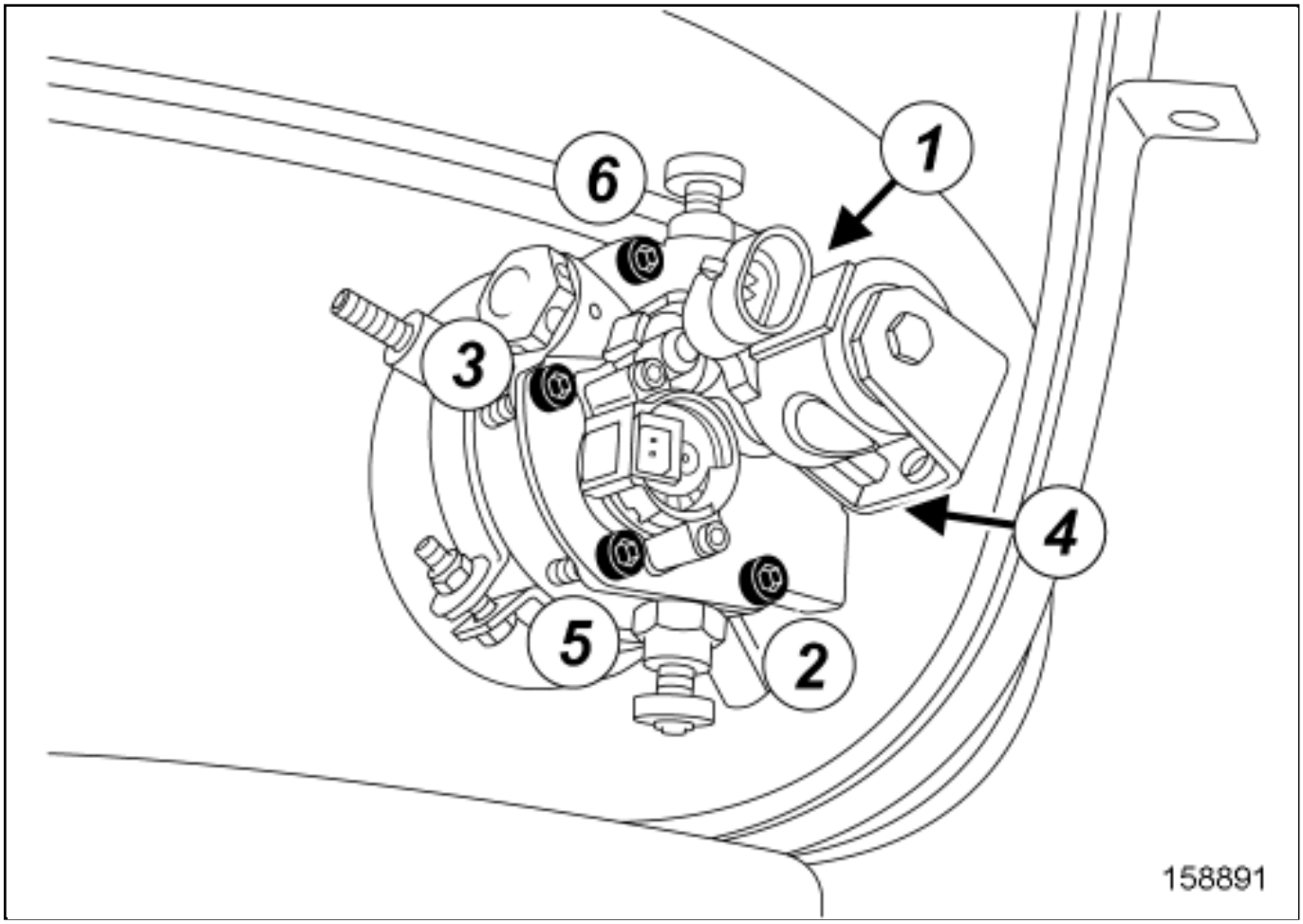
Do not force the float, the overpressure pipe or the plunger when refitting



LPG TANK IN THE LUGGAGE COMPARTMENT



LPG TANK UNDER THE VEHICLE



- Position the LPG tank module.

- Insert one after another into the LPG tank hole:
  - the float(2) ,
  - the overpressure pipe(3) ,
  - the plunger(4) .

- Tighten to torque and in order the LPG tank module bolts5 N.m.

3. FINAL OPERATION

- Proceed in the reverse order to removal.

- Torque tighten:
  - the nut of the neck - LPG tank pipe on the LPG tank multifunction valve14 N.m(see 17C, LPG injection, LPG tank - neck pipe: Removal - Refitting) ,
  - the nut of the LPG multifunction valve - LPG expansion valve unit pipe11 N.m(see 17C, LPG injection, LPG tank: Draining) .

- Check the sealing of the unions on the LPG multifunction valve with leak detection productVehicle: Parts and consumables for the repair (04B, Consumables - Products):
  - fill the tank with several litres of LPG,

- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the unions,
- wait for 5 minutes,
- check that there are no leaks,
- fill up the tank,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the unions,
- wait for 5 minutes,
- check that there are no leaks on the union.

Refit the protection of the LPG multifunction valve.

LPG TANK SOLENOID VALVE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair** .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- It is essential to read the repair precautions(see 17C, LPG injection, LPG injection: Precautions for the repair) .
- Disconnect the batteryBattery: Removal - Refitting (80A, Battery).
- Cut the retaining clip of the multifunction valve protection(if the vehicle is equipped).
- Remove the protection of the multifunction valve.

2. REMOVAL OPERATION

- Disconnect the connector of the LPG tank solenoid valve.
- Remove:
  - the bolt from the LPG tank solenoid valve,
  - the LPG tank solenoid valve.

REFITTING

- Proceed in the reverse order to removal.

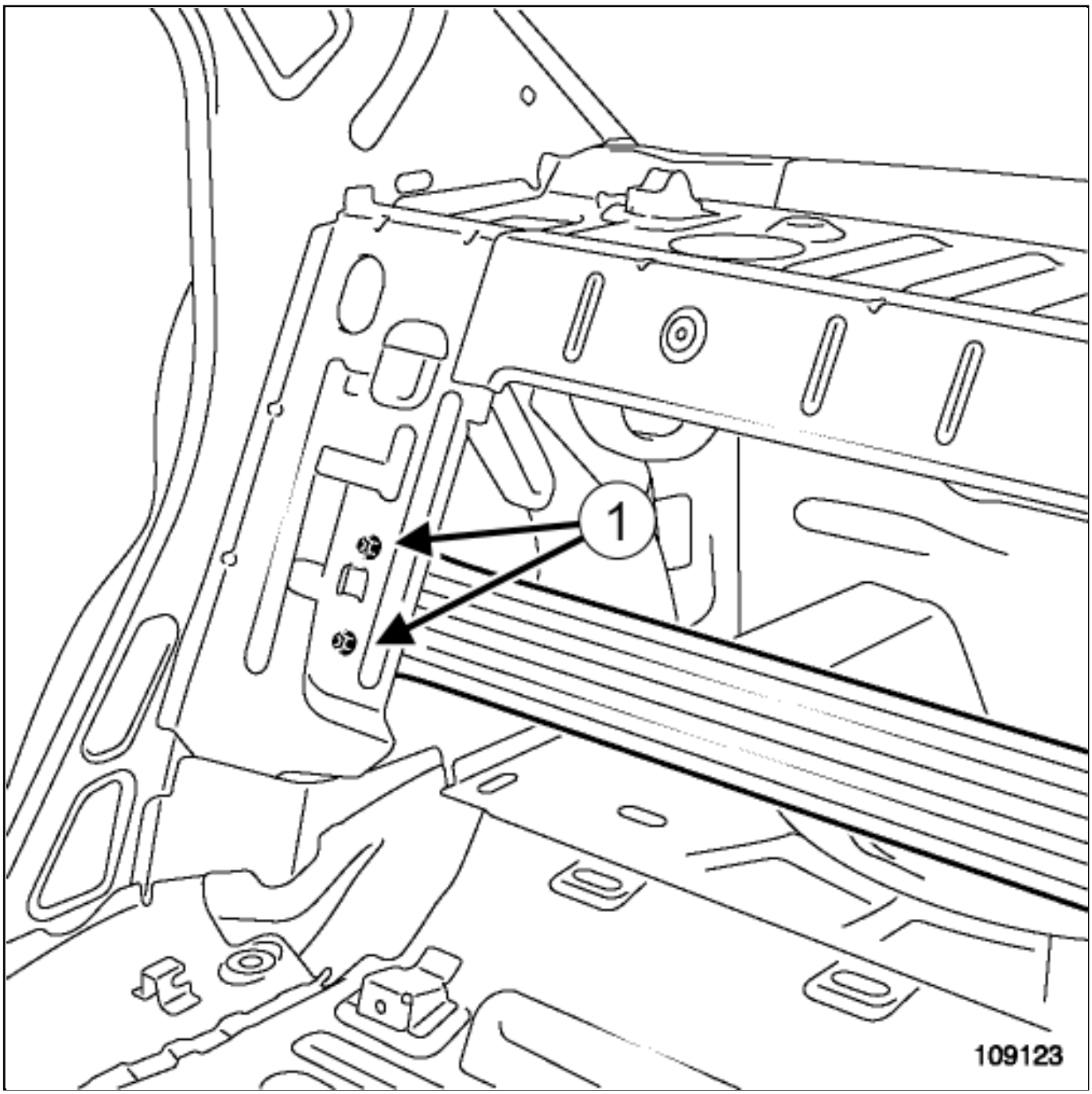
LUGGAGE RETAINING CROSS MEMBER: REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the rear bench seat Rear bench seat assembly: Exploded view .

2. REMOVAL OPERATION



- Remove the luggage retaining cross member bolts(1) on each side.

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Torque tighten the luggage retaining cross member bolts21 N.m.

MAINTENANCEOPERATIONALINSTRUCTIONS :SERVICE

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
Electronic check tool

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**Vehicle: Precautions for the repair**

The Renault maintenance programme includes all checks, top-ups, adjustments, and part replacements necessary for vehicle maintenance. For information on the specific service intervals for the vehicle, refer to the maintenance booklet or to ICM.

1. CONTENT OF THE DIFFERENT TYPES OF SERVICES AND THE ANNUAL INTERMEDIATE VISIT:

1- SERVICES:

The types of service (Maintenance Service, General Service, Renault Service) and the operations to be performed may vary depending on the vehicle and the date of manufacture. To find out which specific checks and operations should be performed on the vehicle, refer to the vehicle maintenance booklet.

1- ANNUAL INTERMEDIATE VISIT:

For vehicles for which the oil change is to be performed no later than every 2 years, a non-obligatory visit including the following operations is advised:

- check the engine oil level,
- check the level, condition, and sealing of the brake fluid circuit,
- check the coolant level,
- check the level, condition, and sealing of the power-assisted steering circuit,
- check the washer fluid level,
- electronic fault finding of the battery with the test tool,
- electronic fault finding of the computers,
- condition of the windscreen and rear view mirrors,

- wear of the windscreen wiper and rear wiper blades,
- check the exterior lighting and signals,
- condition and pressure of the tyres (including emergency spare wheel or tyre repair aerosol),
- condition of gaiters, rubber mounting bushes, and ball joints,
- exhaust system check,
- sealing of the front and rear shock absorbers,
- wear of the front and rear brake pads and brake discs.

NOTE: the content of the intermediate visit, as well as its commercial name, may vary from one country to another. Thus additional checks and / or operations could be added to this list. For more information, please contact the manufacturer's technical teams in your country

2. SPECIAL CONDITIONS OF CUSTOMER USE AND MAINTENANCE MANAGEMENT FOR VEHICLES EQUIPPED WITH THE OCS (OIL CONTROL SYSTEM) FOR GERMANY, ANDORRA, AUSTRIA, BELGIUM, DENMARK, SPAIN, ESTONIA, FINLAND, FRANCE, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SWEDEN, SWITZERLAND, CROATIA, ISRAEL:

Definitions:

What does it mean that a vehicle is operated under normal conditions of customer use?

A vehicle is operated under normal conditions of customer use if it is not operated under the special conditions of customer use (see below). In this case, observe the standard maintenance programme provided in the maintenance booklet or ICM (Shared World Information).

What does it mean that a vehicle is operated under special conditions of customer use?

A special condition of customer use affects the replacement frequency of one or several parts of the maintenance programme (service, air filter replacement, fuel filter replacement, etc.). The vehicle is said to operate under special conditions of customer use if:

− The instrument panel displays that a service is required (change engine oil and oil filter), only for vehicles equipped with the OCS (Oil Control System) oil quality control device. See "List of vehicles equipped with OCS or information in ICM (Shared World Information)",

− At least 50% of the vehicle operating time is with the engine idling (example: constant door-to-door driving without stopping the engine),

− At least 50% of trips are at an average speed of less than 18 mph (30 km/h) (primarily urban use, taxi, etc.),

− At least 30% of the miles driven involve towing a trailer, caravan, etc. weighing more than 500 kg (condition only for passenger vehicles),

- Use in a dusty environment (work-site, + than 600 miles (1000 km)/year on unpaved roads, etc.),

- Extended use (+ than 3000 miles (5000 km)/year) at temperatures continuously below -15˚C.

What is the OCS (Oil Control System) and what does it detect?

The OCS is a device that evaluates oil degradation by calculations, taking into account the severe engine operating conditions that affect the oil. Thus, under certain driving conditions, the instrument panel indicates to the customer that a service is required.

Which vehicles are equipped with the OCS device?

THE MODELS EQUIPPED WITH THE OCS ARE FOR THE COUNTRIES OF GERMANY, ANDORRA, AUSTRIA, BELGIUM, DENMARK, SPAIN, ESTONIA, FINLAND, FRANCE, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SWEDEN, SWITZERLAND, CROATIA, AND ISRAEL:

Note :

For the Dacia vehicles consult the ICM for the vehicles manufactured starting from 14/06/2011, before consulting the table.

For the Renault vehicles consult the ICM for the vehicles manufactured starting from 01/01/2010, before consulting the table.

Model	engine	Engine suffix	Vehicles affected:
Dacia	K9K emission control standard Euro 5	all	all
WIND	D4F, K4M	All	All
TWINGO II	D4F turbocharged	All	All
TWINGO II	K4M emission control standard Euro 5	All	All
TWINGO II	K9K	718	All
TWINGO II	K9K	740	Vehicles with oil service every 18 000 miles (30 000 Km) /2 years
TWINGO II	K9K emission control standard Euro 5	All	All
CLIO III phase 1	K9K	764	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
CLIO III phase 2	K9K emission control standard Euro 5	All	All
CLIO III	D4F turbocharged	All	All

CLIO III	D4F	742	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
CLIO III	K4M	862	All
MODUS	D4F turbocharged	All	All
MODUS	D4F	742	All
MODUS	K9K	764	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
MODUS	K9K without particle filter	All	Vehicles with oil service every 18 000 miles (30 000 Km) /2 years
MODUS	K9K emission control standard Euro 5	All	All
KANGOO II	K4M emission control standard Euro 5	All	All
KANGOO II	K9K	All	All
MEGANE II and SCENIC II	K9K	732	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
MEGANE II and SCENIC II	M9R	700,721,722	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
MEGANE II	M9R	724	Vehicles with oil service every 12,000 miles (20,000 Km) / 1 year
MEGANE II and SCENIC II	F9Q	816,818	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year

FLUENCE and MEGANE III/SCENIC III	K9K	830	Vehicles with oil service interval every 2 years
FLUENCE and MEGANE III/SCENIC III	K9K	832, 834, 836, 837	All
FLUENCE and MEGANE III/SCENIC III	K9K emission control standard Euro 5	All	All
MEGANE III/SCENIC III	F9Q, M9R, H4J, F4R, R9M	All	All
Koleos	M9R emission control standard Euro 5	All	All
LAGUNA III	K9K,M9R,V9X	All	All
LAGUNA III	M4R	726	All
ESPACE IV	M9R	All	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
LATITUDE	Diesel	All	All
MASTER II phase 3	G9U	All	All
TRAFIC phase 2 and 3	M9R	All	Vehicles manufactured from 01/12/06
TRAFIC phase 2 and 3	G9U	All	All
MASTER III	All	All	All

1- FOR TURKEY, ROMANIA AND BULGARIA :

For the vehicles sold starting from 01/01/2011, consult the ICM.

1- MANAGEMENT OF VEHICLE MAINTENANCE IN CASE OF DRIVING UNDER SPECIAL CONDITIONS OF CUSTOMER USE:

It is ESSENTIAL to read the instructions:

Depending on whether the vehicle is fitted with OCS or not, refer to the corresponding table below.

The tables below contain X's or notes to specify the maintenance operations to be performed depending on the special conditions of customer use.

For the other maintenance programme parts that need not be replaced early, the maintenance interval is the same as recommended for normal conditions of customer use (see the maintenance booklet or ICM). If this interval will be reached before the next customer visit, replace this part ahead of schedule.

If the vehicle is operated under several of these special conditions of customer use, apply the most stringent recommendation for replacement specified for the special conditions of use concerned.

FOR MODELS WITHOUT OCS:

	Divide by 2 the engine oil and oil filter service interval for normal conditions of use		Divide by 2 the air filter replacement interval for normal conditions of use (1)		Divide by 2 the diesel filter replacement interval for normal conditions of use (1)		Replace the belts and rollers 18,000 miles (30,000 km) sooner than for normal use conditions (1)(2)	Replace the cabin filter during every service for normal conditions of use (1)
	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time		
At least 50% of the vehicle operating time with the engine idling (e.g. constant door-to-door driving without stopping the engine)	X	X	X	X	X	X	X	
At least 50% of trips at an average speed of less than 18 mph (30 km/h) (primarily urban use, taxi, etc.),	X		X		X		X	X

At least 30% of the miles driven while towing a trailer, caravan, etc. weighing more than 500 kg (condition only for passenger vehicles),	X				X		X	
Use in a dusty environment (work-site, + than 600 miles (1000 km)/year on unpaved roads, etc.),	X		X		X		X	X
Extended use (+ than 3000 miles (5000 km) /year) at temperatures continuously below -15˚C.	X							

(1) If the recommended interval will be reached before the next customer visit, replace the part concerned ahead of schedule.

(2) Certain pulleys of certain engines must be replaced when replacing the accessories belt. See the "Supplementary operations" section.

FOR MODELS WITH OCS (SEE THE TABLE OF MODELS EQUIPPED WITH THE

OCS AND THE COUNTRIES CONCERNED):

	Divide by 2 the engine oil and oil filter service interval for normal conditions of use (1)		Divide by 2 the air filter replacement interval for normal conditions of use (1)		Divide by 2 the diesel filter replacement interval for normal conditions of use (1)		Replace the belts and rollers 18,000 miles (30,000 km) sooner than for normal use conditions (1)(2)	Replace the cabin filter during every service for normal conditions of use (1)
	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time		
Instrument panel display that a service is required (engine oil and oil filter service) due to the OCS (Oil Control System).	Observe the message on the vehicle instrument panel and perform the service (engine oil and oil filter service) when it is requested(1).							
At least 50% of the vehicle operating time with the engine idling (e.g. constant door-to-door driving without stopping the engine)			X	X	X	X	X	

At least 50% of trips at an average speed of less than 18 mph (30 km/h) (primarily urban use, taxi, etc.),			X		X		X	X
At least 30% of the miles driven while towing a trailer, caravan, etc. weighing more than 500 kg (condition only for passenger vehicles),					X		X	
Use in a dusty environment (work-site, + than 600 miles (1000 km)/year on unpaved roads, etc.),	X		X		X		X	X

Extended use (+ than 3000 miles (5000 km) /year) at temperatures continuously below -15˚C.	X							

(1) If the recommended interval will be reached before the next customer visit, replace the part concerned ahead of schedule.

(2) Certain pulleys of certain engines must be replaced when replacing the accessories belt. See the "Supplementary operations" section.

3. SPECIAL CONDITIONS OF CUSTOMER USE (OIL CONTROL SYSTEM) FOR THE COUNTRIES NOT MENTIONED ABOVE:

See the vehicle's maintenance booklet.

4. PROCEDURES FOR PERFORMING OPERATIONS AND CHECKS DURING THE MAINTENANCE OR SERVICE:

The customer must be warned if a check reveals a fault.

Checks marked with an asterisk depend on the vehicle or the country.

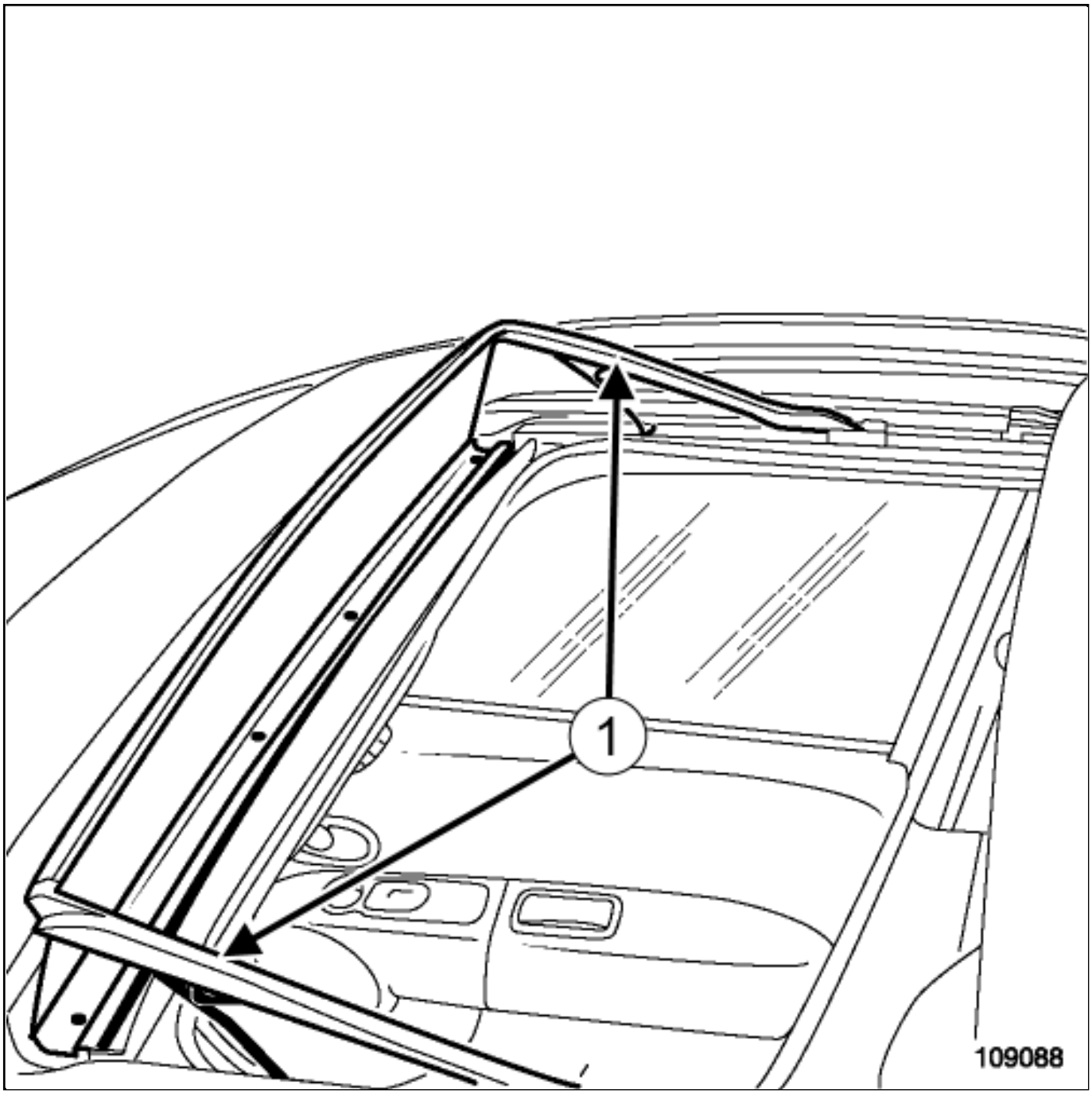
1- BODYWORK: ANTICORROSION CHECK

- Visually inspect the condition of the:
  - vehicle,
  - underside of the vehicle,
  - wheel arches.

Indicate any damage to the underbody protection, and all cuts, ruptures, scratches or corrosion anywhere on the vehicle.

This inspection contributes to the validity of the anticorrosion warranty. It is therefore necessary to complete the maintenance sheets in the maintenance booklet.

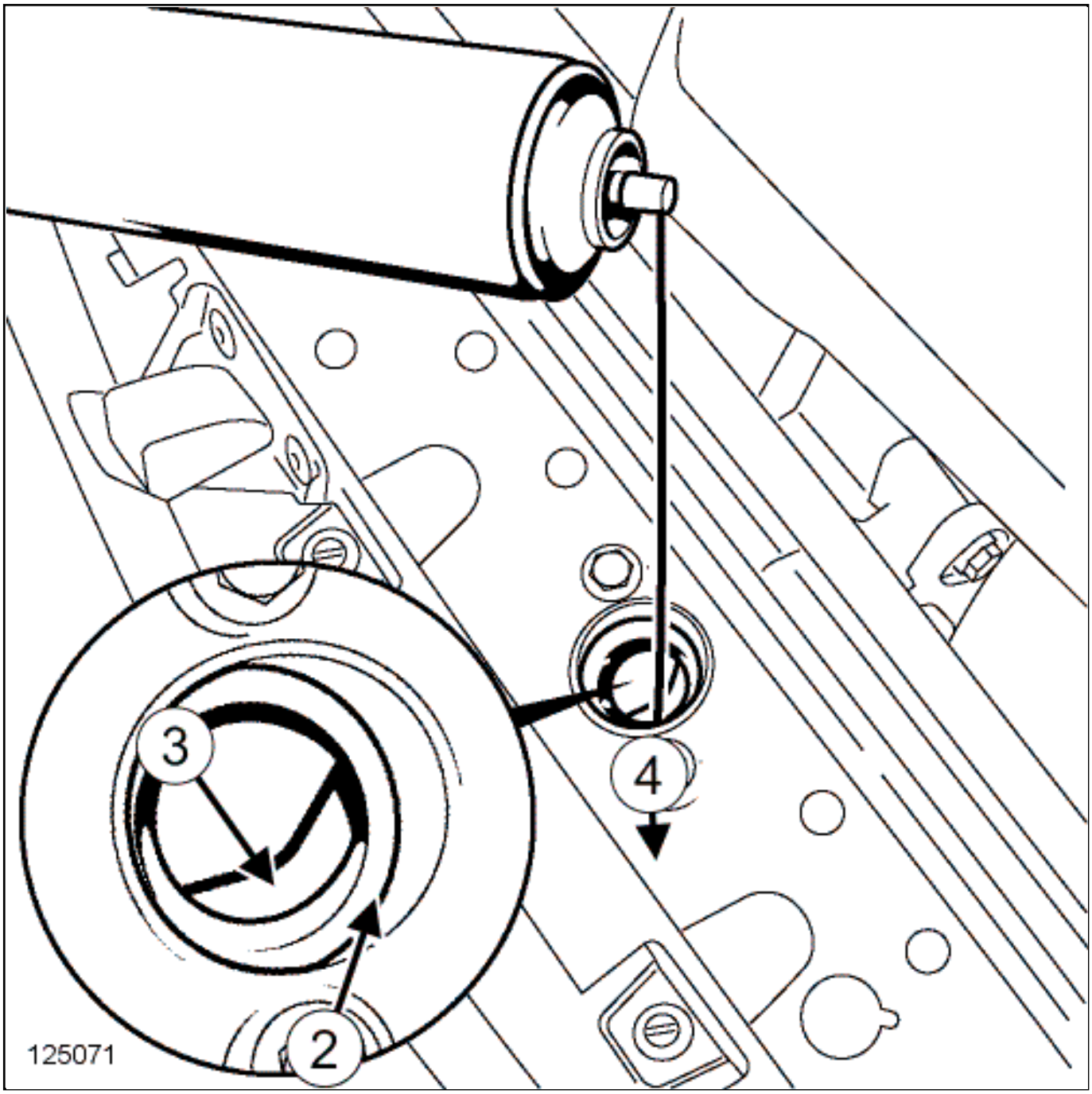
2- BODYWORK: CLEANING THE DEFLECTOR ARMS AND PANORAMIC SUNROOF MOBILE PANEL



Use a dry, lint-free cloth to clean the sunroof deflector arms (1) and the section of the mobile panel with which they come into contact.

3- BODYWORK: CHECKING THE BONNET LOCK LUBRICATION AND OPERATION

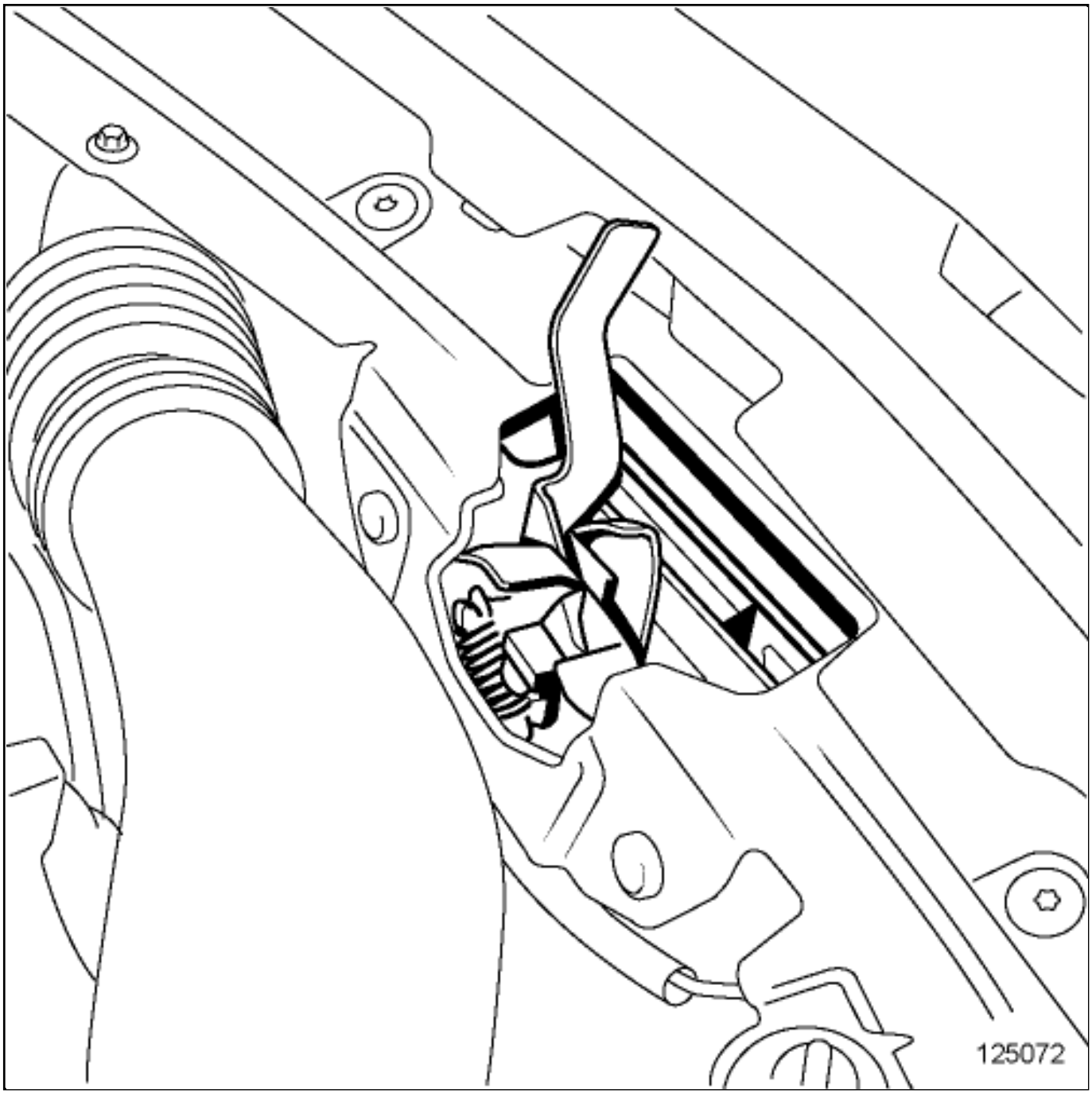
1)GUILLOTINE TYPE LOCK



As specified in the photo above, apply silicone-free lubricant Vehicle: Parts and consumables for the repair (04B, Consumables - Products), placing it between the body of the lock (2) and the lock blade (3) in the direction of the lock blade hinge shaft (4).

Let it set for1 minute, then manoeuvre 10 times from the bonnet release catch in the passenger compartment.

2)OTHER TYPES OF LOCK



Apply silicone-free lubricant[Vehicle: Parts and consumables for the repair](04B, Consumables - Products) to the catch assembly.

Let it set for1 minute, then manoeuvre 10 times from the bonnet release catch in the passenger compartment.

4- GREASING OF THE REAR DOOR HINGES AND THE UPPER STRIKER PANEL HOOK OF THE SLIDING SIDE DOOR(MASTER II PHASE 3)

Apply opening element greaseto the rear door hinges and the upper striker panel hook of the sliding side door (see **Vehicle: Parts and consumables for the repair**)

5- ENGINE: DRAINING THE ENGINE OIL

The oil grade is essential for maintaining the service life of the engine. Carefully follow the manufacturer's recommendations specified in the Technical Note **Engine oil: Specifications** (Technical Note 6013A, 04A, Lubricants).

Use the correct quantity of oil and the correct sump plug sealing washer **Engine oil: Draining - Refilling** (10A, Engine and peripherals).

After topping up, let the oil run for approximately 10 minutes before checking the level. The oil level maximum mark on the dipstick must never be exceeded (risk of damage to the engine).

6- ENGINE: REPLACING THE OIL FILTER

Replace the engine oil filter after each oil service **Oil filter: Removal - Refitting** (10A, Engine and peripherals).

7- ENGINE: CHECKING THE EXHAUST SYSTEM

☐ Visually inspect:

- that there is no corrosion, piercing or impact to the silencer, expansion chamber, catalytic converter and particle filter*,
- that the rubber mounting bushes are not torn or cracked,
- that the exhaust pipe is not in contact with the underside of the vehicle.

8- ENGINE: BLEEDING WATER FROM THE FUEL FILTER* (IF THE PART HAS NOT REACHED ITS REPLACEMENT INTERVAL)

Bleed the water from the fuel filter by unscrewing the water bleed cap and letting the water run into a suitable container.

9- ENGINE: CHECKING THE CLUTCH PLAY* FOR LOGAN-SANDERO (EXCEPT FOR AUTOMATIC COMPENSATION)

(Logan and Sandero only) Use the recommended checking procedure **Clutch control: Adjustment** (37A, Mechanical component controls).

10- CHECKING THE LEVELS, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: HYDRAULIC POWER-ASSISTED STEERING*

Check the hydraulic steering fluid level: it should be between the minimum and maximum level on the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

11- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: COOLING

Check the coolant level: it should be between the minimum and maximum level on the reservoir.

Visually check the circuit sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

12- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: HYDRAULIC BRAKE/CLUTCH*

Visually check the circuit sealing, checking the condition and that there are no leaks around the engine compartment, under the vehicle or at the unions.

- Check the brake fluid level:
  - If the level is between the minimum and maximum, do not add brake fluid as wear on the discs, pads, drums and linings leads to a progressive drop in the brake fluid level in the tank which will usually be rectified once these components are replaced. However, the brake fluid level should never drop below the minimum mark.
  - If there is an abnormal loss of fluid, the cause of which cannot be found with this check, advise the customer.

13- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: SEQUENTIAL GEARBOX HYDRAULIC UNIT*

Check the hydraulic unit oil level: it should be between the minimum and maximum level on the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

14- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: SEQUENTIAL GEARBOX HYDRAULIC CLUTCH*

Check the hydraulic clutch fluid level, it should be at the middle level of the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

15- CHECKING THE CHASSIS: CONDITION OF THE GAITERS, RUBBER MOUNTING BUSHES AND BALL JOINTS

Check the condition of the driveshaft and steering rubber gaiters, all ball joints and the rubber mounting bushes. There must not be any signs of tearing or cracks.

16- CHECKING THE CHASSIS: TYRE CONDITION AND PRESSURE (INCLUDING EMERGENCY SPARE WHEEL OR PRESENCE OF TYRE-REPAIR AEROSOL)

Check that the tread depth of the tyres has not reached the wear warning strips, explain the degree of tyre wear to the customer.

Check that there is no abnormal tyre wear, and no bulges, blisters, tears or foreign objects (sharp object, screw, etc.).

Check and readjust the tyre inflation pressure when cold according to the type of driving.

Check the pressure and condition of the emergency spare wheel, or if not supplied with the vehicle, check that there is a tyre repair aerosol in the vehicle.

Respect the recommended pressure shown on the label on the door (if the vehicle does not have one, refer to the Driver's Handbook or.

17- CHECKING THE CHASSIS: PRESENCE OF THE WHEEL VALVE CAPS

Check that each valve cap is present.

18- CHECKING THE CHASSIS: SEALING OF THE FRONT AND REAR SHOCK ABSORBERS

Visually check that there is no oil leaking along the length of the shock absorbers.

19- CHECKING THE CHASSIS: WEAR OF THE FRONT AND REAR BRAKE PADS AND BRAKE DISCS*, AND SWAPPING THE FRONT AND REAR WHEELS

In order to perform a quality check, always remove the wheels (an electric impact wrench or a pneumatic wrench can be used to loosen the wheel bolts and nuts).

Check the thickness of the brake pads and compare to the minimum authorised value. In case of partial wear, advise the customer of the degree of wear to the brake pads.

Check the thickness of the front brake discs and the thickness of the rear brake discs and compare to the minimum authorised value. In case of partial wear, advise the customer of the degree of wear to the brake discs.

Refit the wheels. For Duster 4X4, swap the front and rear wheels.

When refitting the wheels, an electric impact wrench set at low speed can be used to fit the wheel bolts and nuts until contact, then torque tighten them.

20- CHECKING VISIBILITY: EXTERIOR LIGHTING AND SIGNALS

Check the side lights, dipped headlights, main beam headlights, front and rear fog lights, the direction

indicators and side mounted indicators, the reversing lights, the hazard warning lights, the brake lights, the registration plate lighting and the additional cornering lights*.

21- CHECKING VISIBILITY: INTERIOR LIGHTING

Checking door lighting, interior lights and sun visors, glovebox and luggage compartment lights.

22- CHECKING VISIBILITY: CONDITION OF THE WINDSCREEN AND DOOR MIRRORS

Check that there are no cracks or chips.

23- CHECKING VISIBILITY: WEAR ON THE FRONT AND REAR WINDSCREEN WIPER BLADES

Check the quality of the wiping function and check that the wiper blades are not torn or cracked.

24- CHECKING VISIBILITY: FRONT AND REAR WINDSCREEN WASHER FLUID LEVEL

Check that there is windscreen washer fluid present.

Top up, if necessary.

25- LABELS: CHECKING THE AIRBAG SAFETY AND ENGINE COMPARTMENT LABELS ARE PRESENT AND CORRECTLY POSITIONED

☐ Check that the vehicle has the following original safety labels:

- airbag, located on the windscreen, sun visor and passenger side of the dashboard,
- battery, oil, cooling system, heating and air conditioning system, engine cooling fan located in the engine compartment.

26- ELECTRONIC CHECK: BATTERY

Check the condition of the battery with the tool "Midtronics R330".

27- ELECTRONIC CHECK: COMPUTERS

Note:

Always check the condition of the battery before checking the computers as insufficient voltage can affect the computers.

The purpose of this procedure is to see if any of the computers are faulty.

The following tools are essential for carrying out fault finding on these systems:

- an approved Renault Electronic check tool(QUEST) with the latest update,
- an approved Renault Diagnostic tool(CLIP) with the latest update,
- a CAN probe.

Running fault finding on the computers highlights possible faults not displayed by the system self-test procedure, and allows them to be analysed and deleted

28- CHECKING CHARGING CORD (ONLY TWIZY):

Visually check the charging cord without removing.

29- CHECKING ELECTRIC VEHICLE (ONLY KANGOO AND FLUENCE):

Electronic check :

Select the symptome in MCS (Modulate Targeting Symptome): R201, integrate it into the order of repair.

Make a electronic check of computers, see "Electronic check : computers".

Make the checks of symptome R201: "Maintenance Range".

NB :

Do not control the system Quick Dropbecause it is canceled.

30- ELECTRONIC FAULT FINDING: OPERATION OF THE INSTRUMENT PANEL WARNING LIGHTS

Check that the following warning lights come on when the ignition is switched on:

- STOP warning light,
- SERVICE warning light.

31- REINITIALISATION: MAINTENANCE/OIL SERVICE DISPLAY*

Reset the maintenance/oil service interval display (see Driver's Handbook).

32- SERVICE SHEETS: AFFIXING THE SERVICE LABEL IN THE ENGINE COMPARTMENT*

Fill in the maintenance label and affix it in the engine compartment.

5. SUPPLEMENTARY OPERATIONS:

The removal and refitting procedures and some of the checks to be carried out during maintenance are set out in the repair manuals or the technical notes. The information and repair methods given below are specific to the maintenance programme.

For an exhaustive description of the operations to be carried out during the maintenance operation, refer to the vehicle maintenance booklet.

1- REPLACEMENT OF THE ACCESSORIES BELT, ROLLERS, AND PULLEYS (PULLEY TO BE REPLACED DEPENDING ON THE VEHICLE)

When replacing the belt, it is essential to replace the tensioning rollers and fixed rollers across the whole range. It is also necessary to replace the damper pulley (also known as the crankshaft accessories pulley) or the alternator pulley on certain engines, see below.

Table of pulleys to be replaced during maintenance only according to the accessories belt replacement frequency. The vehicles concerned are those for which the maintenance booklets mention a replacement for certain engines. The detail of the vehicle variants concerned is given below (vehicles manufactured after June 2006):

1)FOR GERMANY, ANDORRA, AUSTRIA, BELGIUM, DENMARK, SPAIN, ESTONIA, FINLAND, FRANCE, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SWEDEN, SWITZERLAND, CROATIA, ISRAEL:

RECOMMENDATIONS FOR REPLACING THE DAMPER PULLEY (CRANKSHAFT ACCESSORIES PULLEY):

Engine type	Engine suffix	Recommendation for replacing the damper pulley during maintenance operations
F4R	714, 715, 720, 760, 761, 762, 763, 764, 765, 766, 767, 770, 771, 774, 776, 784, 786, 787, 792, 794, 795, 796, 797, 800, 811, 820, 830, 867, 870, 886, 887, 896, 897.	To be replaced each time the accessories belt and its rollers are scheduled for replacement
F9Q	260, 262, 264, 660, 664, 670, 674, 680, 755, 757, 758, 759, 800, 803, 804, 808, 812, 814, 816, 818, 820.	
M9R	610, 700, 720, 721, 722, 740, 760, 761, 780, 812.	
G9T equipped with air conditioning	600 ,605, 606, 607, 642, 645, 702, 703, 706, 707, 710, 712, 720, 722, 742, 743, 750.	
G9U equipped with air conditioning	630, 632, 650, 720, 724, 730, 750, 754.	
V9X	All	

RECOMMENDATIONS FOR REPLACING THE ALTERNATOR PULLEY:

Engine type	Engine suffix	Recommendations for replacing the alternator pulley during maintenance
F4R	802, 813.	To be replaced each time the accessories belt and its rollers are scheduled for replacement

2)OTHER COUNTRIES:

RECOMMENDATIONS FOR REPLACING THE DAMPER PULLEY (CRANKSHAFT ACCESSORIES PULLEY):

Engine type	Engine suffix	Recommendation for replacing the damper pulley
K4J equipped with air conditioning	730, 732, 740, 770, 780.	To be replaced each time the accessories belt and its rollers are scheduled for replacement
K4M equipped with air conditioning	604, 606, 680, 690, 694, 696, 697, 698, 716, 744, 745, 760, 761, 762, 764, 766, 768, 770, 780, 782, 788, 790, 791, 794, 800, 801, 804, 812, 813, 814, 824, 830, 831, 834, 835, 844, 854, 856, 862, 866.	
K4M equipped with air conditioning	838, 839, 848, 858	To be replaced every other time the accessories belt and its rollers are scheduled for replacement
K9K	782	

F4R	714, 715, 720, 760, 761, 762, 763, 764, 765, 766, 767, 770, 771, 774, 776, 784, 786, 787, 792, 794, 795, 796, 797, 800, 811, 820, 830, 867, 870, 886, 887, 896, 897.	To be replaced each time the accessories belt and its rollers are scheduled for replacement
K9K	278, 282, 288, 292, 732, 734, 764, 772, 780, 804, 806, 832, 836.	
F9Q	260, 262, 264, 660, 664, 670, 674, 680, 755, 757, 758, 759, 794, 800, 803, 804, 808, 812, 814, 816, 818, 820.	
G9T equipped with air conditioning	600 ,605, 606, 607, 642, 645, 702, 703, 706, 707, 710, 712, 720, 722, 742, 743, 750.	
G9U equipped with air conditioning	630, 632, 650, 720, 724, 730, 750, 754.	
M9R	610, 700, 720, 721, 722, 740, 742, 760, 761, 780, 812.	
V9X	All	
M9R	802, 803, 805, 809, 816, 830, 832, 833.	To be replaced every other time the accessories belt and its rollers are scheduled for replacement
M9T	All	To be replaced every other time the accessories belt and its rollers are scheduled for replacement

RECOMMENDATIONS FOR REPLACING THE ALTERNATOR PULLEY:

Engine type	Engine suffix	Recommendations for replacing the alternator pulley during maintenance
F4R	802, 813	To be replaced each time the accessories belt and its rollers are scheduled for replacement

2- REPLACING THE TIMING BELT AND ROLLERS

When replacing the belt, it is essential to replace the tensioning and fixed rollers across the whole range. Certain vehicle/engine specifications require associated parts to be replaced, therefore it is necessary to consult the repair procedure for the vehicle and engine for further details.

3- CHECKING THE REAR BRAKE LININGS FOR VEHICLES FITTED WITH DRUMS

Check the wheel cylinders for any possible leaks.

Remove any dust from the brake linings using a brake cleaning product.

Check the thickness of the drum linings and compare it to the minimum authorised thickness..

4- CLEANING THE AIR CONDITIONING SYSTEM

The air conditioning system is cleaned by cleaning the evaporator.

6. STANDARD OF PROFESSIONAL ACTIVITY

The Standard of Professional Activity is a tool which describes the operation to perform in an optimised order favouring time and quality. This way of working allows for the elimination and reduction of unnecessary actions, the grouping together of operations by operation area and a reduction in down time.

Order of performance	Principal steps	Key points
Preparing the vehicle:		
1	Consult the repair order and ICM editions to find out:- The works to be performed and additional operations- The presence of OTS	
2	Check that the driver's protections are in place (front seat, steering wheel, floor carpet, gear lever)	
3	Check for the maintenance booklet and the wheel anti-theft key (if equipped) on the passenger seat	
4	Check the instrument panel warning lights with the ignition on	Warning light (STOP and SERVICE)
5	Start the vehicle and check that all the warning lights go out	No warning light lit
6	Move the vehicle to the workstation, leave the engine running	
Passenger compartment checks:		
7	Step out of the vehicle and connect the exhaust gas extraction system	

8	☐ Check the exterior signals and lights: ■ Side lights, ■ Dipped headlights, ■ Main beam headlights, ■ Front and rear fog lights, ■ direction indicators and side mounted indicators, ■ Front and rear hazard warning lights, ■ Brake lights, ■ number plate lighting, ■ Reversing lights, ■ Additional cornering lights,	Use a mirror If not done whilst walking around the vehicle
9	☐ Check the interior lighting: ■ Courtesy lights, ■ Sun visors, ■ Glovebox.	
10	Release the bonnet, and remove the diagnostic socket cover	
11	Reset the distance before oil change/maintenance display	
12	Switch off the engine and switch on the ignition again	
13	Step out of the vehicle, take the wheel anti-theft key	
Front visibility check:		
14	Check the condition of the windscreen wiper blades	
15	Check the condition of the windscreen	
Engine compartment checks:		
16	Open the bonnet	

17	Run fault finding on the battery with the "MIDTRONICS R330" tool.	
18	Grease the bonnet catch using silicone-free lubricant	
19	Go back into the passenger compartment, switch on the ignition and connect the Diagnostic tool "Clip" or Electronic check tool "Quest" and run the computer scan	
20	Release the bonnet 10 times using the control in the driver's position	
21	Check the levels and sealing of the hydraulic circuits in the engine compartment: ■ the coolant circuit, ■ of the hydraulic power-assisted steering circuit (depending on the version), ■ of the brake fluid and clutch circuit (depending on the version), ■ hydraulic unit of the sequential gearbox (depending on the version).	Do not top up the brake fluid level
22	Check the washer fluid level.	
23	Remove the oil filler cap	
24	Loosen the oil filter if accessible from above.	
25	Check the clutch clearance (Logan version)	
26	Bleed the water from the fuel filter (if accessible)	Bleed the fuel filter if it has not reached its replacement interval

27	Check for the presence of the "Manufacturer's Recommendations" label located in the engine compartment	The "manufacturer's recommendations" labels include: oil, battery, cooling circuit, fan, air conditioning.
Check the condition of the bodywork on the driver's side:		
28	Check the lighting of the front door sill	
29	Read and retain the tyre pressure	
30	Check the condition of the rear view mirror	
31	Visually inspect the condition of the bodywork	
32	Check the lighting of the rear door sill (if equipped)	
33	Position the arms or pads of the lift (depending on the type of lift)	
34	Take the pressure gauge (if it is not present in the kit)	
Rear vehicle checks:		
35	Check the lighting of the luggage compartment	
36	Check the level of wear of the emergency spare wheel (if accessible through the luggage compartment)	
37	Check the pressure and the presence of the valve cap	

38	Check the condition of the rear screen wiper blade	
Check the condition of the bodywork on the passenger's side:		
39	Visually inspect the condition of the bodywork	
40	Check the lighting of the rear door sill	
41	Check the lighting of the front door sill	
42	Check the presence of the airbag label on the passenger's side	
43	Check the condition of the rear view mirror	
44	Position the arms or pads of the lift (depending on the type of lift)	
Computer checks		
45	Record the scan results of Diagnostic tool "Clip" or Electronic check tool"Quest"	
46	Disconnect the Diagnostic tool"Clip" or Electronic check tool "quest"	
Panoramic sunroof check		
47	Clean the arms of the sunroof deflector and the section of the mobile panel which comes into contact with them (if equipped)	
48	Raise the vehicle to chest height	

Check on driver's side front wheel		
49	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	
50	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
51	Check the level of brake pad wear	Note the degree of wear on the test certificate
52	Check the brake disc wear	
53	Check the condition of the brake hose	
54	Check the condition of the rubber mounting bushes and suspension arm ball joint	
55	Check the sealing of the shock absorber	
56	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
57	Check the condition of the driveshaft gaiters and steering gaiters	
58	Check the level of power-assisted steering fluid (Laguna 3)	
Check on driver's side rear wheel:		
59	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	

60	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
61	Check the level of wear of the brake pads, depending on the version	Note the degree of wear on the test certificate
62	Check the brake disc wear (if equipped)	
63	Check the condition of the brake hose	
64	Check the sealing of the shock absorber.	
65	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
Check on passenger's side rear wheel:		
66	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	
67	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
68	Check the level of wear of the brake pads, depending on the version	Note the degree of wear on the test certificate
69	Check the brake disc wear (if equipped)	
70	Check the condition of the brake hose	
71	Check the sealing of the shock absorber.	

72	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
Check on passenger's side front wheel		
73	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	
74	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
75	Check the level of brake pad wear	Note the degree of wear on the test certificate
76	Check the brake disc wear	
77	Check the condition of the brake hose	
78	Check the condition of the rubber mounting bushes and suspension arm ball joint	
79	Check the sealing of the shock absorbers.	
80	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
81	Check the condition of the driveshaft gaiters and steering gaiters	
82	Bleed the water in the fuel filter (if accessible through wheel arch) according to the maintenance programme)	

83	Raise the vehicle to the upper position	
Underbody operations		
84	Remove the protection plate underneath the engine and position the oil collector	
85	Remove the drain plug	Let the oil flow for 10 minutes
86	Remove the oil filter (version accessed from underneath)	
87	Check the exhaust system: Corrosion, contact with body and condition of the rubber mounting bushes	
88	Check the condition of the catalytic converter	
89	Check the condition of the spring, shock absorber cups and shock absorber on the right-hand and left-hand sides (if accessible fromunderneath)	
90	Check the condition of the underbody brake pipes	
91	Check the condition and pressure of the emergency spare wheel (if accessible from underneath)	
92	☐ Check the engine components using a lamp: ■ Cooling system hoses, ■ Coolant pump, ■ Engine block, ■ Turbocharger	

93	Parts are supplied using Dialogys and the physical values should be noted (tightening torque, oil grade and quantity)	
94	Refit the new oil filter (if accessible)	Lubricate the seal, tighten to torque depending on the model
95	Refit the drain plug	With new seal and according to recommended part number, for copper seals, the lips should be on the plug side (panel cover) Torque tighten depending on the model
96	Clean the oil residues	
97	Drain the oil collector.	
	Supplementary operation: replacement of fuel filter	See ICM/Maintenance booklet
98	Refit the protection plate underneath the engine	
99	Read the tyre pressure on the label on the driver's side door (if equipped)	Pressure to be applied depends on customer's driving type
100	Lower the vehicle to chest height	
Operations on driver's side front wheel		
101	Refit the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)

102	Check the tyre pressure and the presence of the valve cap	
Operations on driver's side rear wheel		
	Supplementary operation: remove dust and check the drum brake (if equipped)	See ICM/Maintenance booklet
103	Refit the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
104	Check the tyre pressures and the presence of the valve cap	
Operations on passenger's side rear wheel		
	Supplementary operation: remove dust and check the drum brake (if equipped)	See ICM/Maintenance booklet
105	Refit the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
106	Check the tyre pressures and the presence of the valve cap	
Operations on passenger's side front wheel		
	Remove - refit diesel filter (depending on the version)	See ICM/Maintenance booklet
107	Refit the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)

108	Check the tyre pressures and the presence of the valve cap	
109	Lower the vehicle to the low position	
Operations in the engine compartment		
110	Refit the new oil filter (if accessible)	Lubricate the seal, tighten by hand or to torque depending on the model
111	Fill the engine oil	Respect the grade and quantity of engine oil.
112	Replace the oil filler cap	
	Supplementary operation: replacement of diesel filter (depending on the version)	See ICM/Maintenance booklet
	Supplementary operation: replacement of fuel filter (depending on the version)	See ICM/Maintenance booklet
	Supplementary operation: replacement of air filter	See ICM/Maintenance booklet
	Supplementary operation: replacement of spark plugs	See ICM/Maintenance booklet
	Supplementary operation: replacement of brake fluid	See ICM/Maintenance booklet
	Supplementary operation: replacement of coolant	See ICM/Maintenance booklet
	Supplementary operation: replacement of accessories belt and rollers	See ICM/Maintenance booklet

	Supplementary operation: replacement of damper pulley/alternator pulley (depending on the version)	See Technical Note 6018/Maintenance booklet
	Supplementary operation: replacement of timing belt and rollers	See ICM/Maintenance booklet
	Supplementary operation: check and clean air conditioning system	See ICM/Maintenance booklet
	Supplementary operation: replacement of cabin filter (depending on the version)	See ICM/Maintenance booklet
Internal vehicle operation		
113	Start the vehicle	
114	Switch off the ignition	
	Supplementary operation: replacement of cabin filter (depending on the version)	See ICM/Maintenance booklet
Wheel torque tightening		
115	Consult the tightening torque in the technical documentation	
116	Torque tighten the front wheel on the driver's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.
117	Torque tighten the rear wheel on the driver's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.
118	Torque tighten the rear wheel on the passenger's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.

119	Torque tighten the front wheel on the passenger's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.
Administrative operations		
120	Fill in the test certificate	
121	Indicate, according to the degree of importance, the next works to be performed in order to ensure vehicle conformity.	
Final inspection in the engine compartment:		
122	Fill in and position the maintenance label	
123	After waiting at least 10 minutes after the last top-up or starting the engine, check the oil level using the dipstick	
124	Top up if necessary	
125	Clean the engine cover and the battery cover	

MAINTENANCEVALUES:DESCRIPTION

Special tooling required	
Oil filter removing tool (76 mm diameter)	Mot. 1329
8 mm square engine drain plug spanner.	Mot. 1018
Front brake calliper piston return tool	Fre. 1842

1. ENGINE MAINTENANCE SUMMARY

Note:

(*) The engine oil grade and viscosity only applies to the following countries:

Germany, Andorra, Austria, Belgium, Denmark, Spain, Estonia, Finland, France, Great Britain, Greece, Hungary, Ireland, Iceland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Norway, Netherlands, Poland, Portugal, Czech Republic, Slovakia, Slovenia, Sweden, Switzerland, Croatia, Israel.

Important: for vehicles in countries which are not listed above, please refer to Technical Note 6013A Engine oil: Specifications .

OIL	Engine oil grade (*)	RN0720
	Oil viscosity if external temperature (*)	t > -25˚C 5W30 or 5W40 t > -30˚C 0W30 or 0W40
	Engine oil capacity with oil filter replacement	4,4 litres

DRAIN PLUG	Tool	8 mm square engine drain plug spanner.(Mot. 1018)
	Tightening torque	20 N.m
OILFILTER	Tool	Oil filter removing tool (76 mm diameter)(Mot. 1329)
	Tightening torque	3/4 of a turn manually after contact

COOLANT	Coolant grade	GLACEOL RX type D
	Cooling system capacity	5.45 litres

2. CHASSIS MAINTENANCE SUMMARY

WHEELS	Tightening torque	105 N.m

POWER-ASSISTED STEERING FLUID	Power-assisted steering fluid grade	ELF RENAULT MATIC D2

BRAKE FLUID	Brake fluid grade	DOT 4, ISO CLASS 6, RENAULT Standard: 03-50-006

FRONT BRAKES

Tools	Tool	Front brake calliper piston return tool(Fre. 1842)
Tightening torques	Front disc bolts	21 N.m
	Front guide pin bolts	28 N.m
	Front calliper support bolts	105 N.m

Measurement	Front disc diameter	258 mm 259 mm
	Minimum front brake disc thickness	10,6 mm (259 mm) 19.8 mm (258 mm)
	Minimum front brake pad thickness	7,5 mm

REAR BRAKES

Tightening torque	Rear drum nut	175 N.m
Measurement	Rear drum diameter	203.3 mm
	Maximum rear drum diameter	204.45 mm
	Minimum rear lining thickness	4,75 mm

MANUAL GEARBOX: CHECK

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair **(see 21A, Manual gearbox , Manual gearbox: Precautions for the repair)** .

1. PREPARATION OPERATION FOR CHECK

Remove the gearbox Manual gearbox: Removal - Refitting .

Position the gearbox on the component support (see 21A, Manual gearbox , Gearbox support equipment: Use) .

Remove:

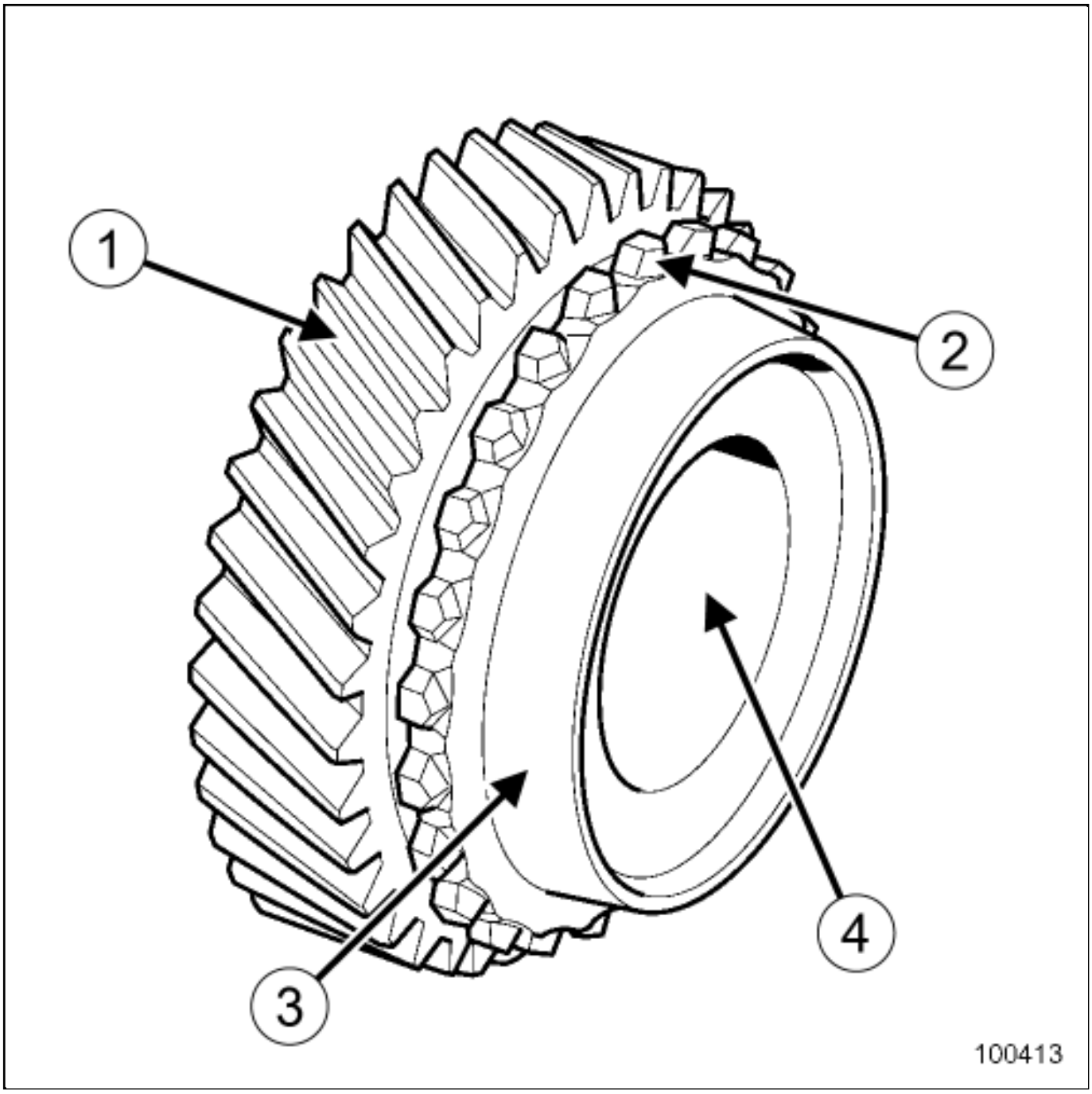
- the fifth gear housing 5th gear housing: Removal - Refitting ,
- the fifth gear synchroniser and pinions 5th gear sprockets and synchronisers: Removal - Refitting ,
- the mechanism housing (see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
- the gearbox shafts (see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) .

Strip down the output shaft (see 21A, Manual gearbox , Output shaft: Stripping - Rebuilding) .

Before any checks, clean the parts concerned (see 21A, Manual gearbox , Manual gearbox: Precautions for the repair) .

2. TEST OPERATION

1- GEARING

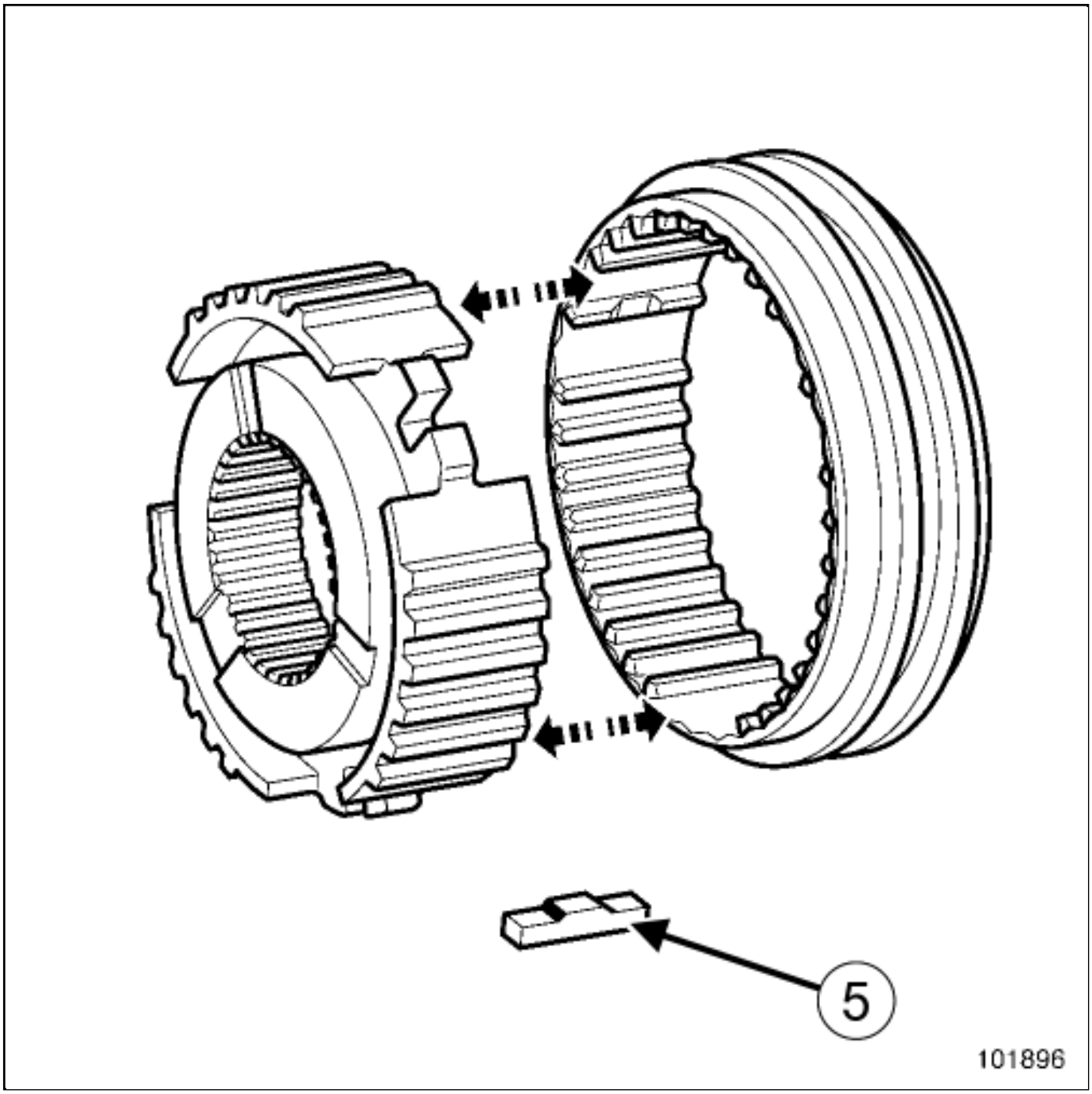


When checking, make sure that you pay particular attention to the appearance of the teeth, especially that of the chamfers and claws.

Check that:

- the teeth(1) are not broken or chipped,
- the claws(2) are not broken, chipped or worn,
- the friction cone(3) shows no sign of scratches or blue stains,
- the inner wall(4) shows no sign of sticking or wear.

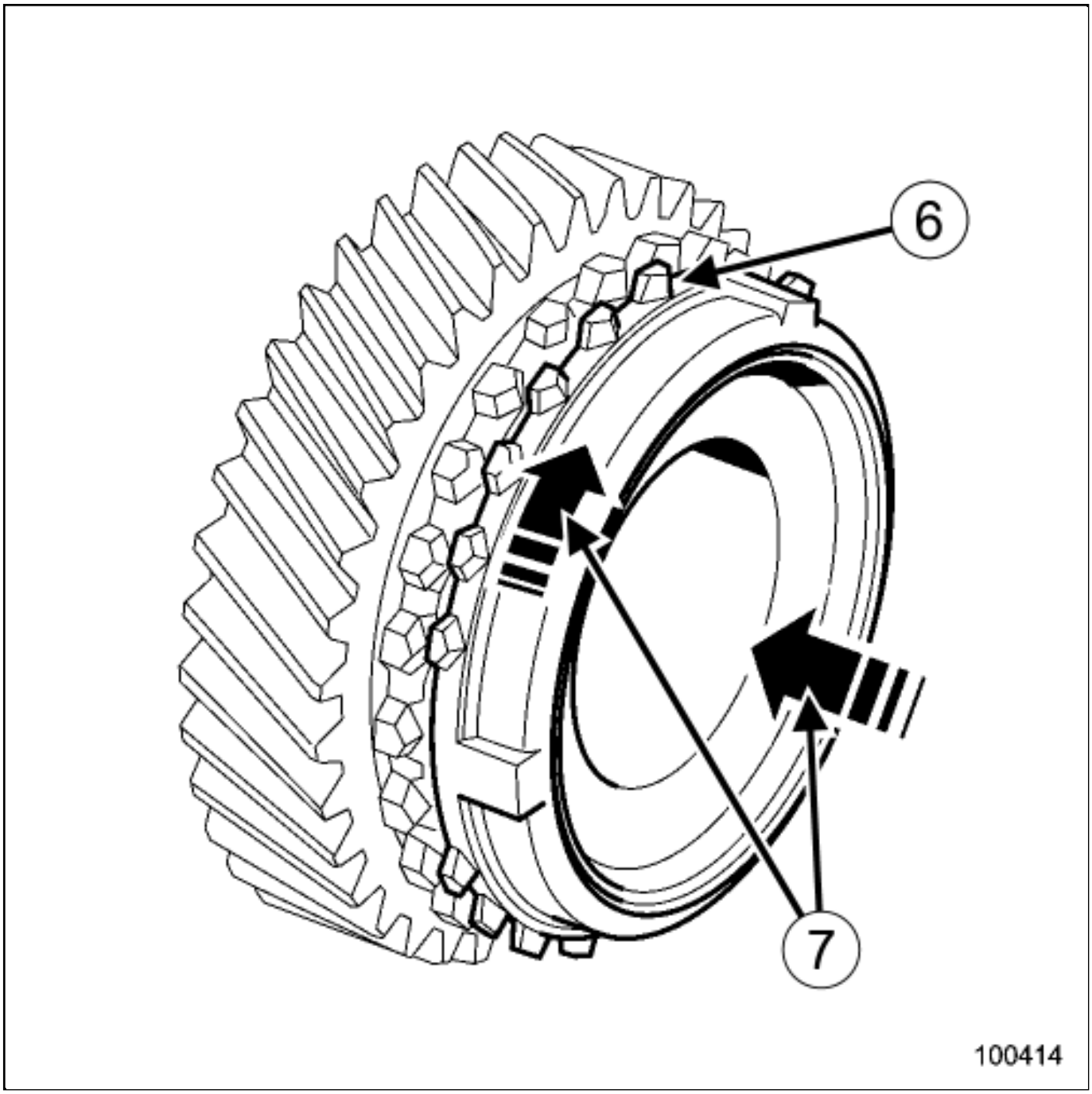
2- SYNCHRONISER HUB



Check:

- that the selector rod slides onto the hub easily,
- that the collets(**5**) are in good condition.

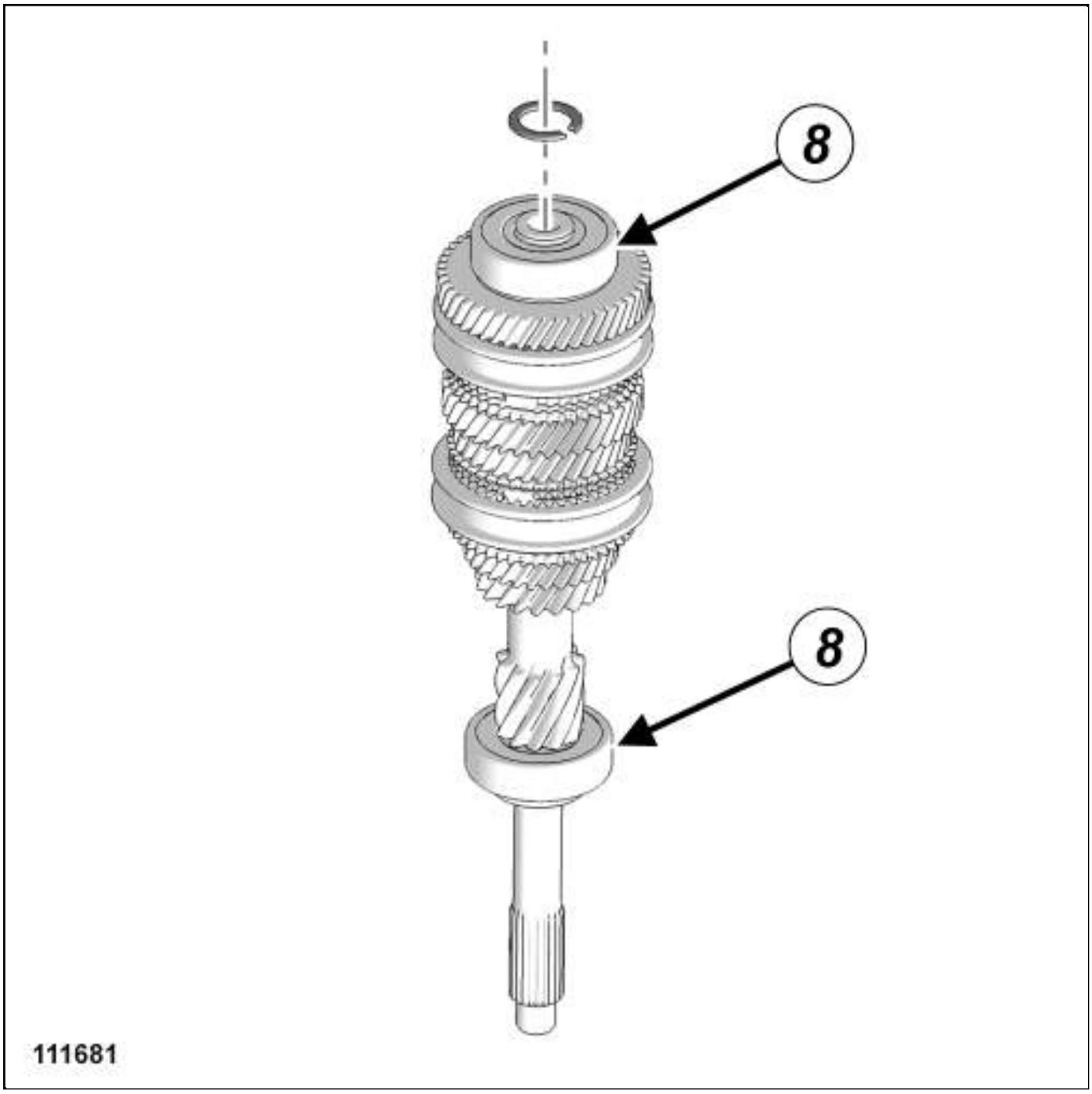
3- SYNCHROMESH RING



Check that the dog teeth(6) show no sign of wear or any fractures.

To check that the synchroniser ring is working correctly, push the ring on the friction cone and rotate(7) : the ring should not turn. Otherwise, replace the synchroniser ring.

4- BEARINGS



Make sure the bearings(8) are rotating properly.

If a bearing rotates unevenly or noisily, it must be replaced.

3. FINAL OPERATION

Rebuild the output shaft(see 21A, Manual gearbox , Output shaft: Stripping - Rebuilding) .

Adjust the output shaft(see 21A, Manual gearbox , Gearbox shaft: Adjustment) .

Refit:

- the gearbox shafts (see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) ,
- the mechanism housing (see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
- the fifth gear synchroniser and pinions 5th gear sprockets and synchronisers: Removal - Refitting ,
- the fifth gear housing 5th gear housing: Removal - Refitting .

Remove the gearbox from the component support (see 21A, Manual gearbox , Gearbox support equipment: Use) .

Refit the gearbox Manual gearbox: Removal - Refitting .

MANUAL GEARBOX DIFFERENTIAL BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Differential bearing fitting rings.	Bvi. 1059
Tool kit for repairing J gearboxes.	Bvi. 1554

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair **(see 21A, Manual gearbox , Manual gearbox: Precautions for the repair)** .

REMOVAL

1. REMOVAL PREPARATION OPERATION

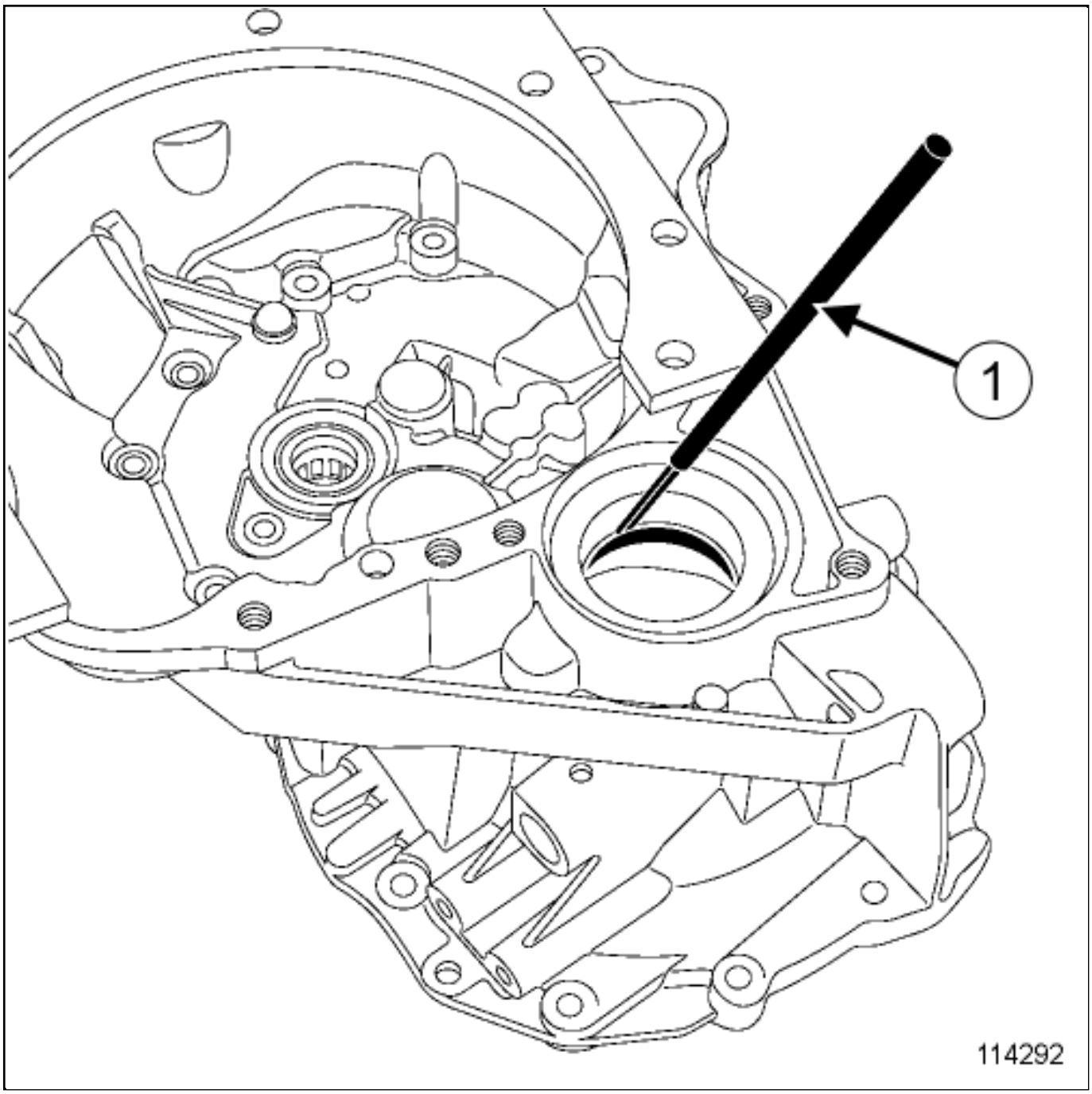
- Remove the gearbox Manual gearbox: Removal - Refitting .
- Position the gearbox on the component support (see 21A, Manual gearbox , Gearbox support equipment: Use) .
- Remove:
  - the fifth gear housing 5th gear housing: Removal - Refitting ,
  - the fifth gear synchroniser and pinions 5th gear sprockets and synchronisers: Removal - Refitting ,
  - the mechanism housing (see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
  - the gearbox shafts (see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) ,
  - the differential (see 21A, Manual gearbox , Manual gearbox differential: Removal - Refitting) .

2. OPERATION FOR REMOVAL OF PART CONCERNED

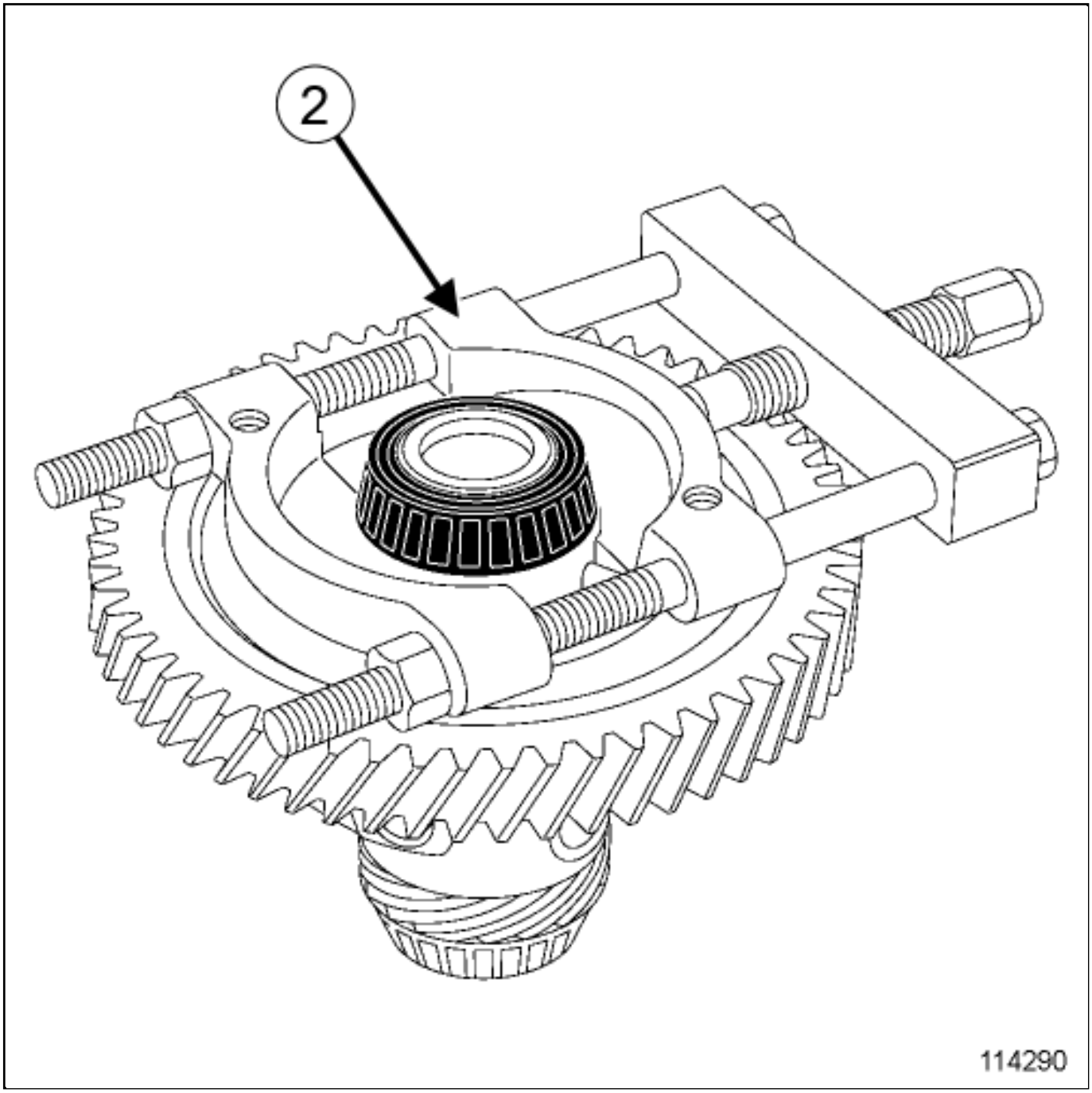
1- REMOVING THE BEARINGS FROM A CLOSED DIFFERENTIAL GEARBOX

Note:

The operation described is identical for both bearings.



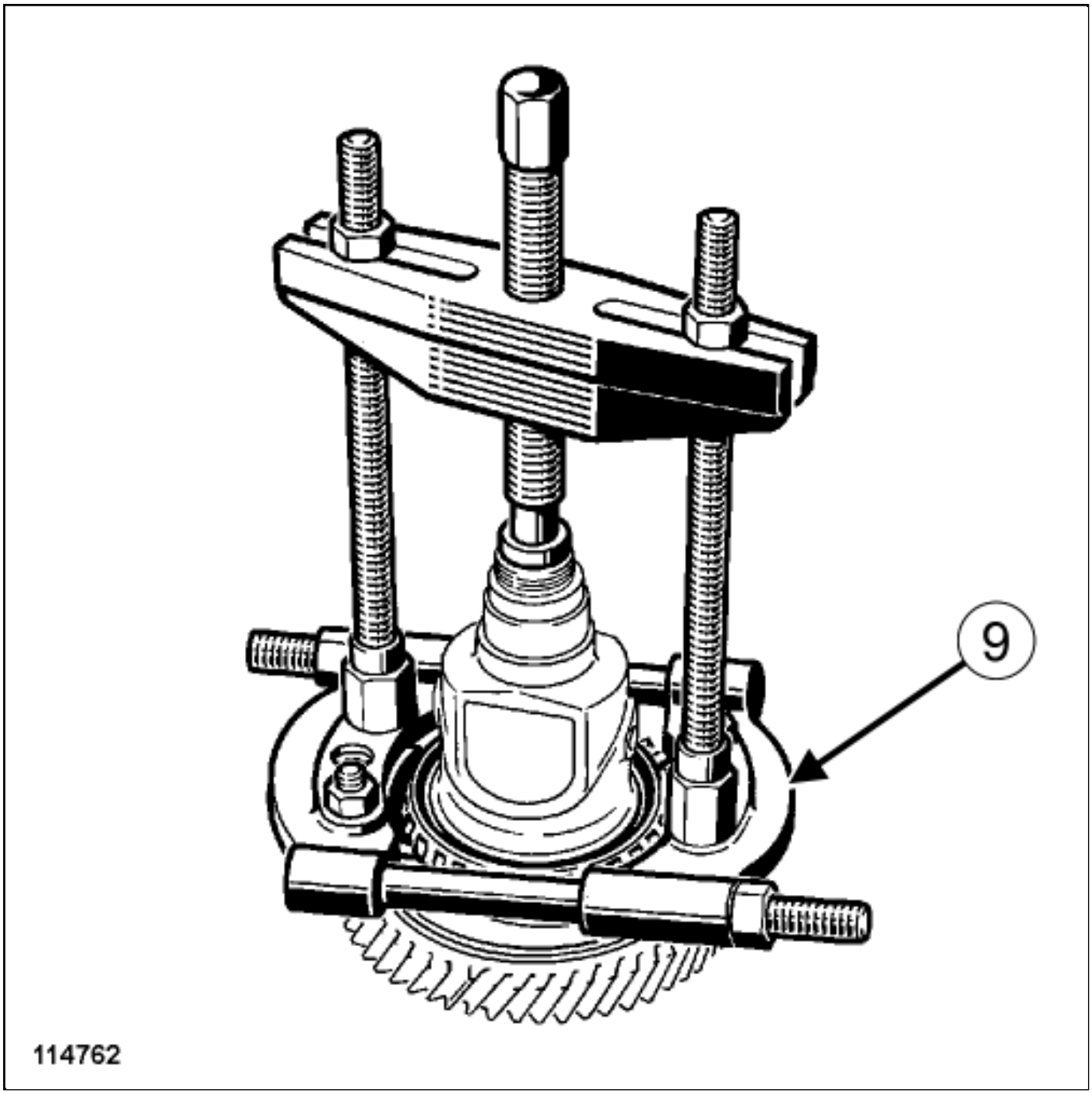
- Remove the bearing cup using a roll pin punch(1) .



- Remove the bearing with an extractor(2) .

2- REMOVING THE BEARINGS FROM AN OPEN DIFFERENTIAL GEARBOX

1)CROWNWHEEL SIDE



Remove:

- the bearing with an extractor(9) ,
- the bearing cup using a drift punch via the inside of the housing.

2)SUNWHEEL SIDE

Remove:

- the bearing with an extractor,
- the bearing cup using a drift punch.

REFITTING

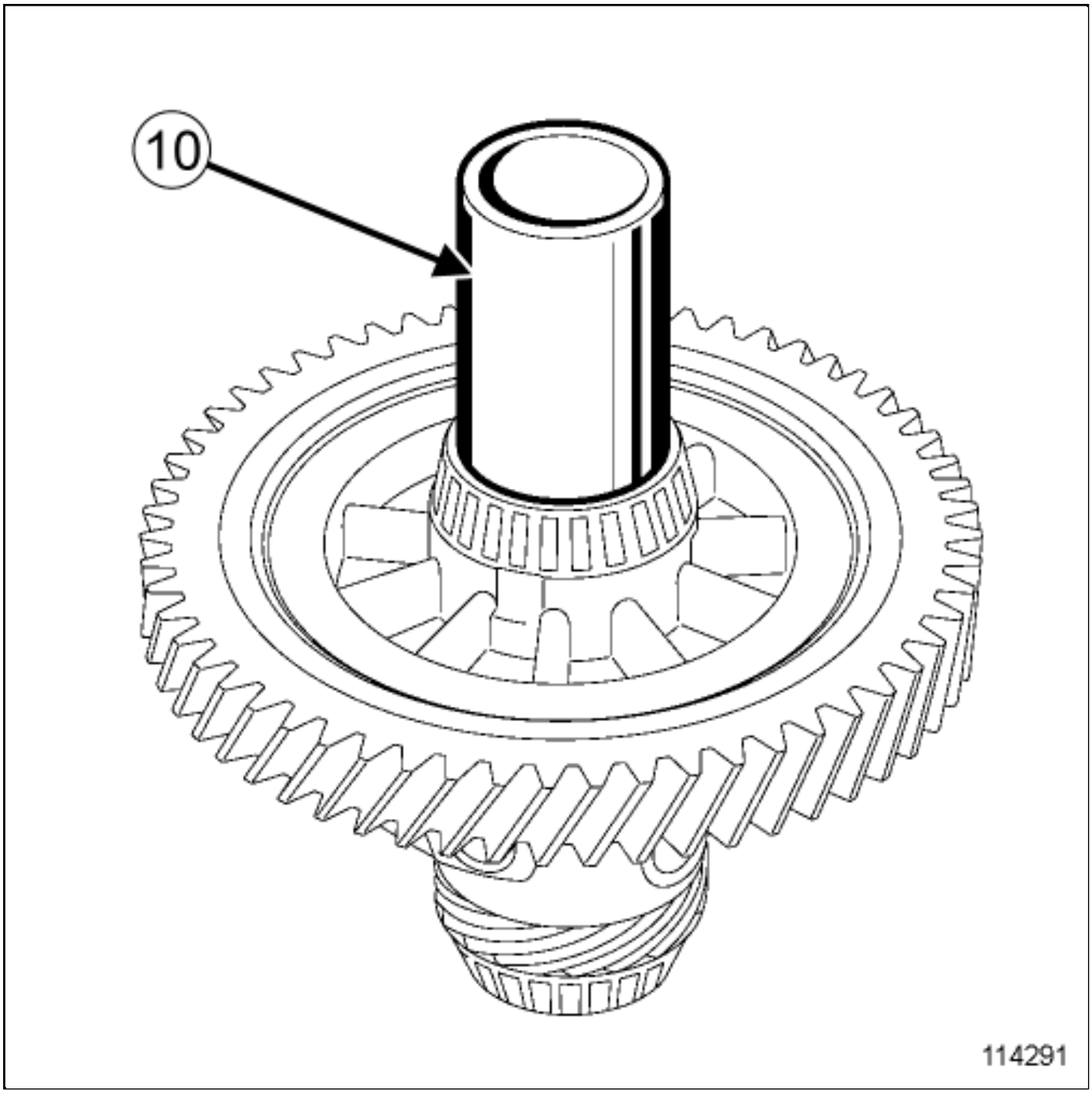
1. REFITTING PREPARATION OPERATION

- Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean:
  - the shafts,
  - the shaft mating surfaces,
  - the differential,
  - the mechanism housing,
  - the differential housing.

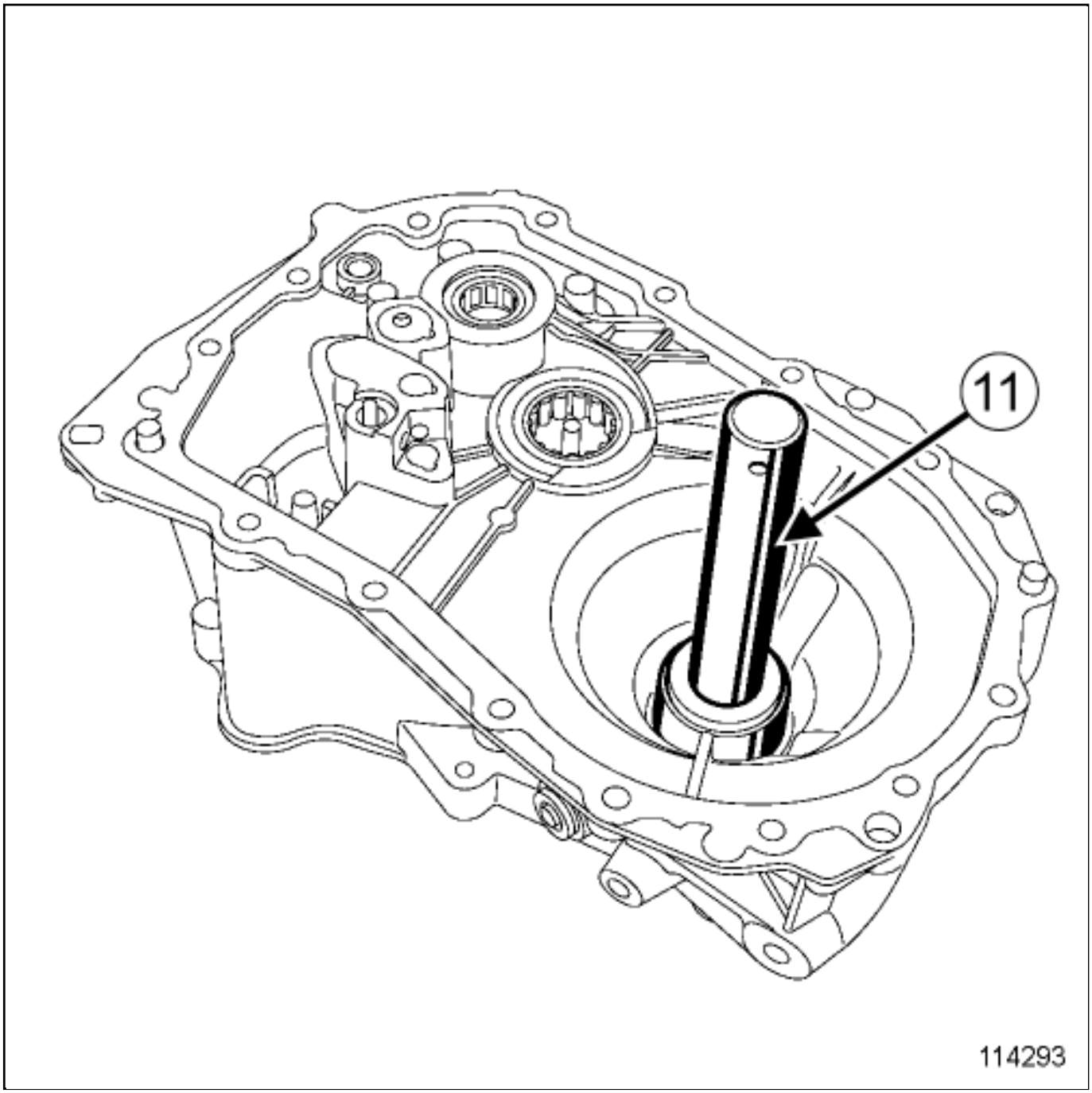
- Parts always to be replaced:
  - the lip seals,
  - the O-rings,
  - the clutch thrust bearing guide,
  - the gear lock rings,
  - the roll pins,
  - the input and output shaft bearing circlips,
  - the selector rod hub springs,
  - the hydraulic clutch slave cylinder (if fitted),
  - the magnet,
  - the lock ring of the differential,
  - the differential retaining nut.

2. REFITTING OPERATION FOR PART CONCERNED

1- REFITTING THE BEARINGS OF A CLOSED DIFFERENTIAL GEARBOX



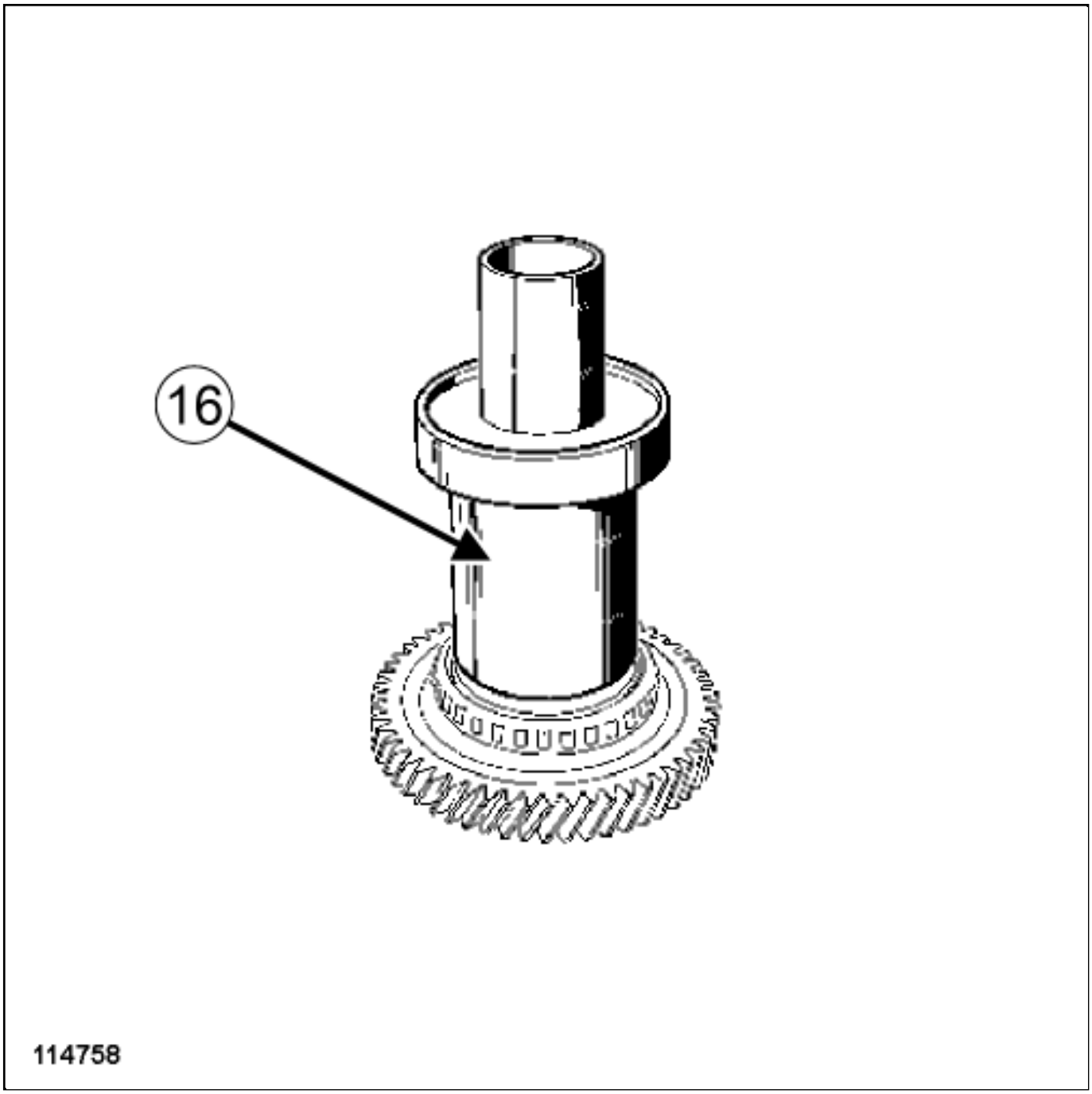
- Refit the bearings with a press using a tube(10) with a diameter of 40 mm.



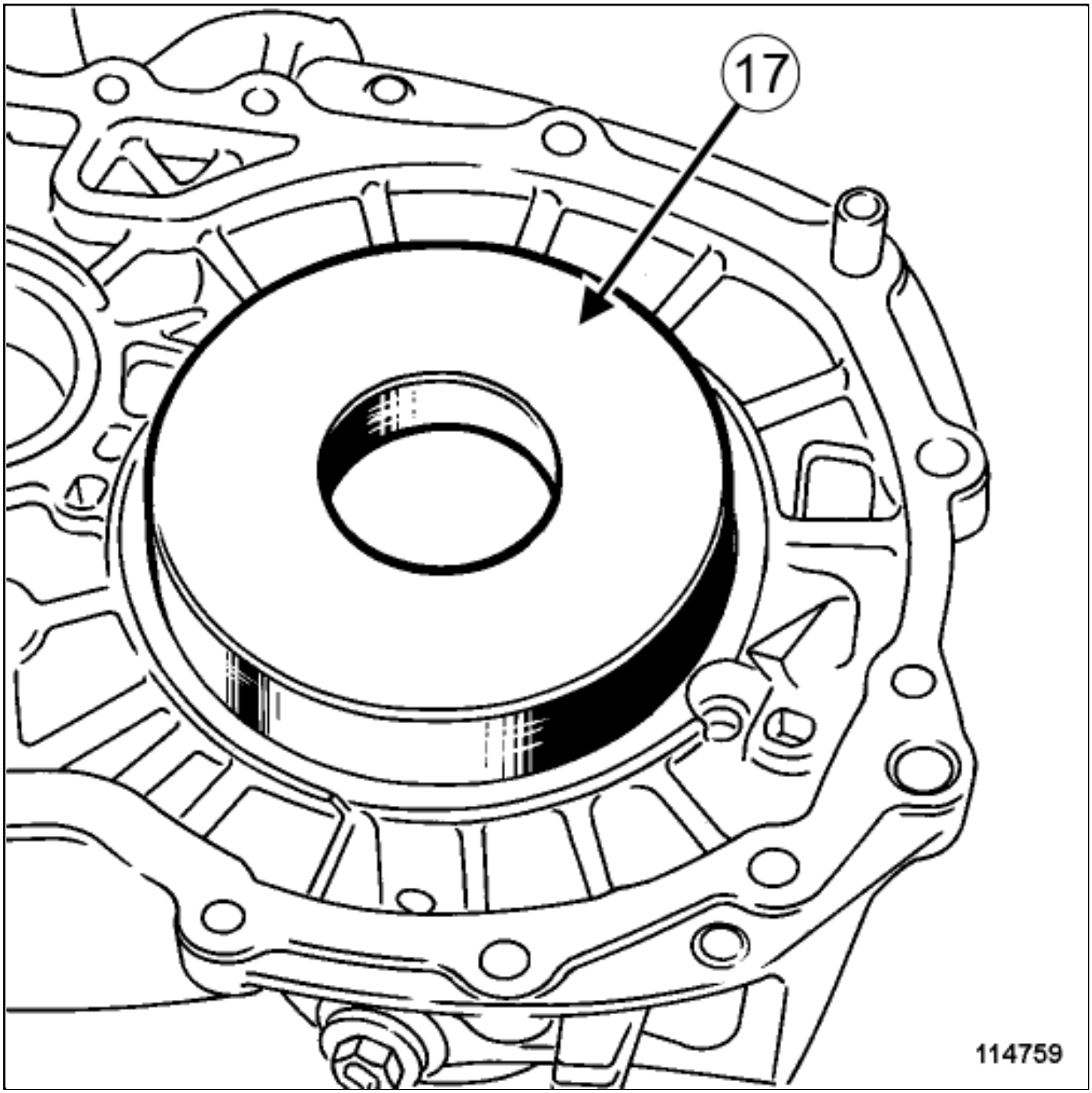
Refit the bearing cups using tools Cand Ffrom the kitTool kit for repairing J gearboxes.(Bvi. 1554) (11) .

2- REFITTING THE BEARINGS OF AN OPEN DIFFERENTIAL GEARBOX

1)CROWNWHEEL SIDE



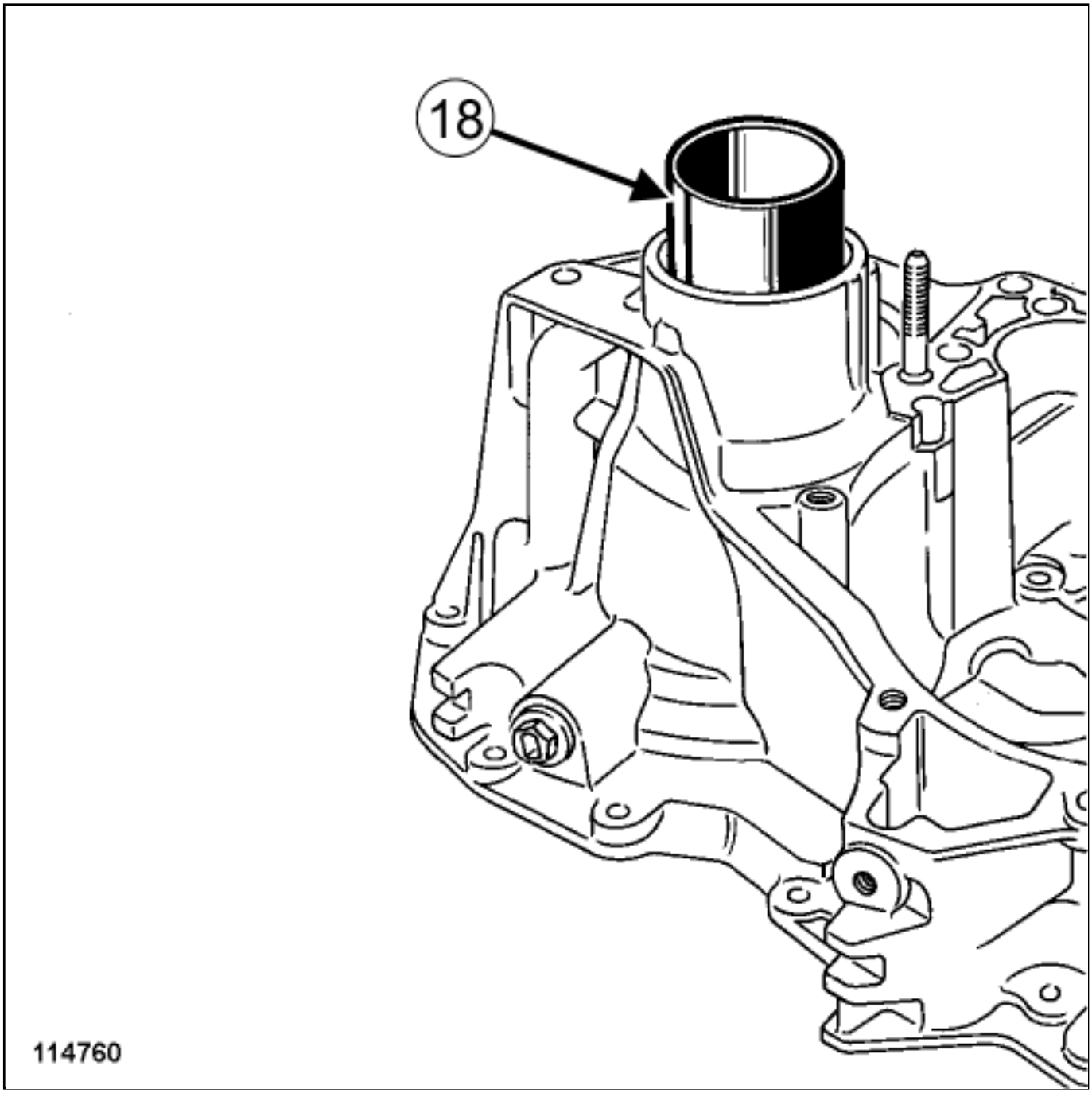
- Refit the bearing using the press and the toolDifferential bearing fitting rings.(Bvi. 1059) (16) .



Refit the large bearing cup using the press and the toolDifferential bearing fitting rings.(Bvi. 1059) (17) .

2)SUNWHEEL SIDE

Refit the bearing using the press and the toolDifferential bearing fitting rings.(Bvi. 1059) .



Refit the small bearing cup using the press and the toolDifferential bearing fitting rings.(Bvi. 1059) (18) .

3. FINAL OPERATION

Refit:

- the differential(see 21A, Manual gearbox , Manual gearbox differential: Removal - Refitting) ,

- the gearbox shafts (see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) ,
- the mechanism housing (see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
- the fifth gear synchroniser and pinions 5th gear sprockets and synchronisers: Removal - Refitting ,
- the fifth gear housing 5th gear housing: Removal - Refitting .

Remove the gearbox from the component support (see 21A, Manual gearbox , Gearbox support equipment: Use) .

Refit the gearbox Manual gearbox: Removal - Refitting .

MANUAL GEARBOX DIFFERENTIAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Mandrel for fitting locking spring ring to the sunwheel.	Bvi. 946
Differential rotation locking tool.	Bvi. 1057

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

WARNING

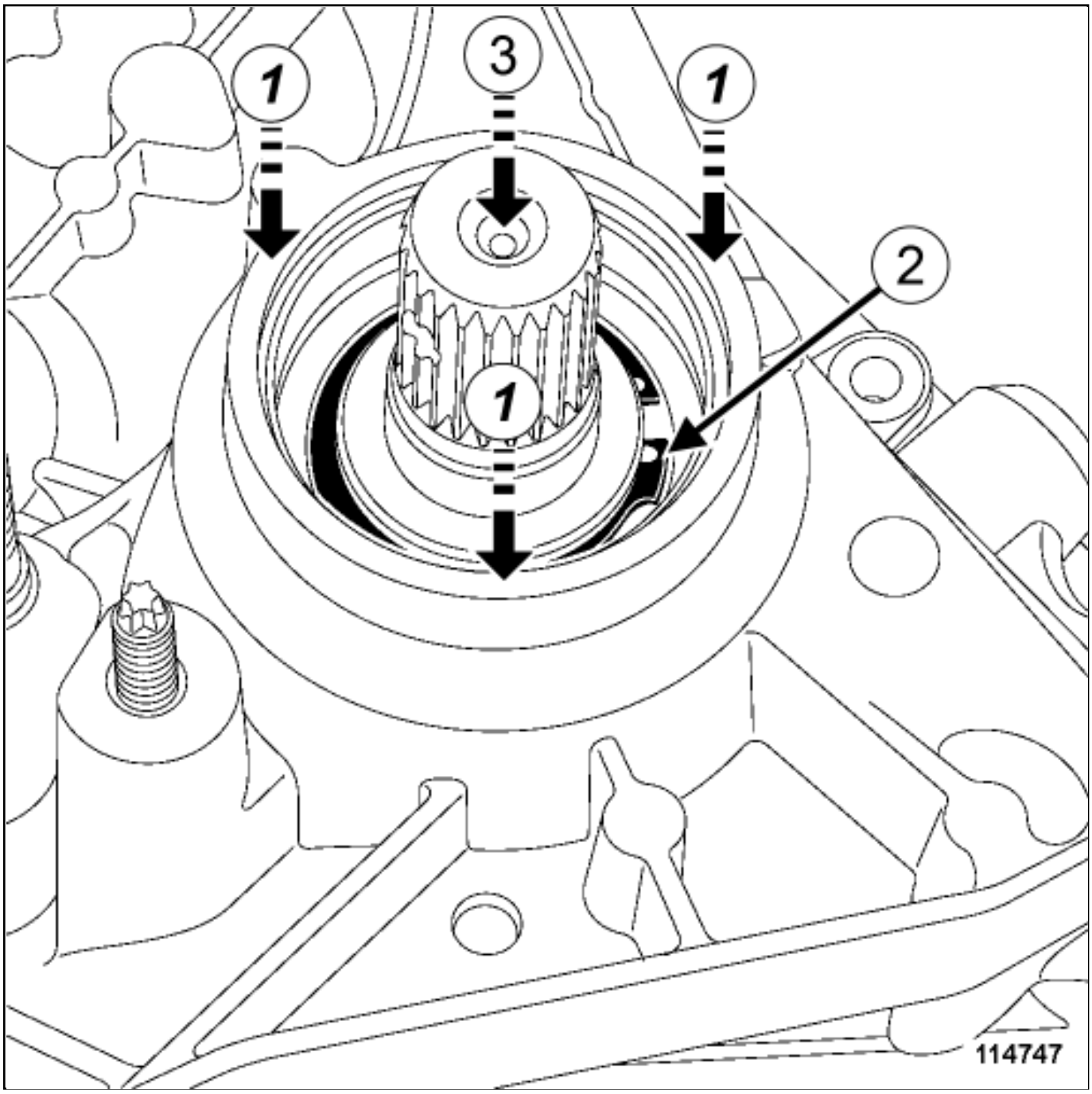
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair **(see 21A, Manual gearbox , Manual gearbox: Precautions for the repair)** .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the gearbox **Manual gearbox: Removal - Refitting** .
- Position the gearbox on the component support **(see 21A, Manual gearbox , Gearbox support equipment: Use)** .
- Remove:
  - the fifth gear housing **5th gear housing: Removal - Refitting** ,
  - the fifth gear synchroniser and pinions **5th gear sprockets and synchronisers: Removal - Refitting** ,
  - the mechanism housing **(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting)** ,
  - the gearbox shafts **(see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting)** .

2. OPERATION FOR REMOVAL OF PART CONCERNED



Note:

A press should be used in order to release the strain between the lock ring and the housing.

Fit:

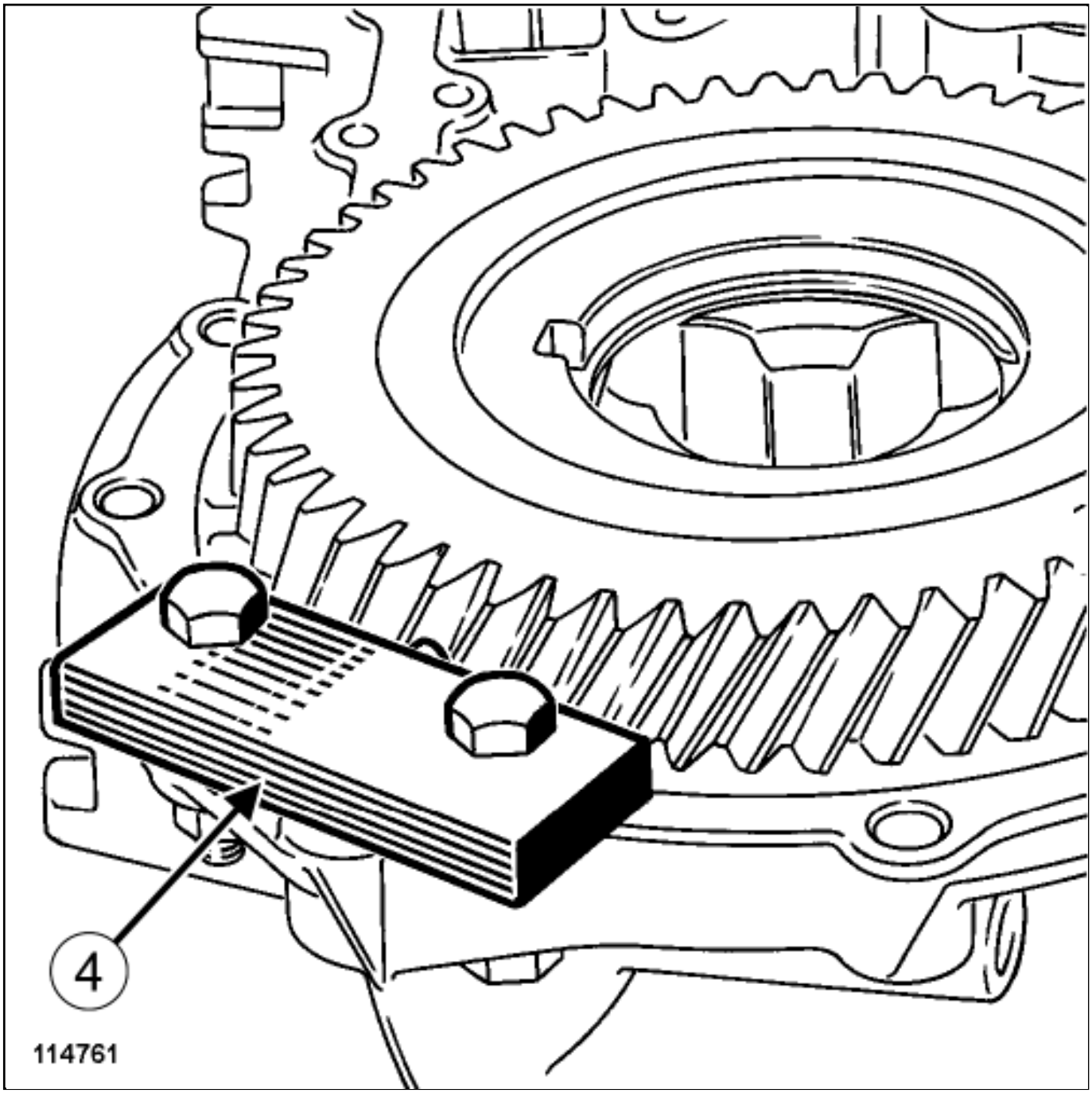
- a rubber or wooden block on the press plate,
- the crownwheel side of the differential on the rubber or wooden block.

Take a tube suitable for the outer diameter of the differential output housing and push the housing at (1) using the press to release any strain in the lock ring.

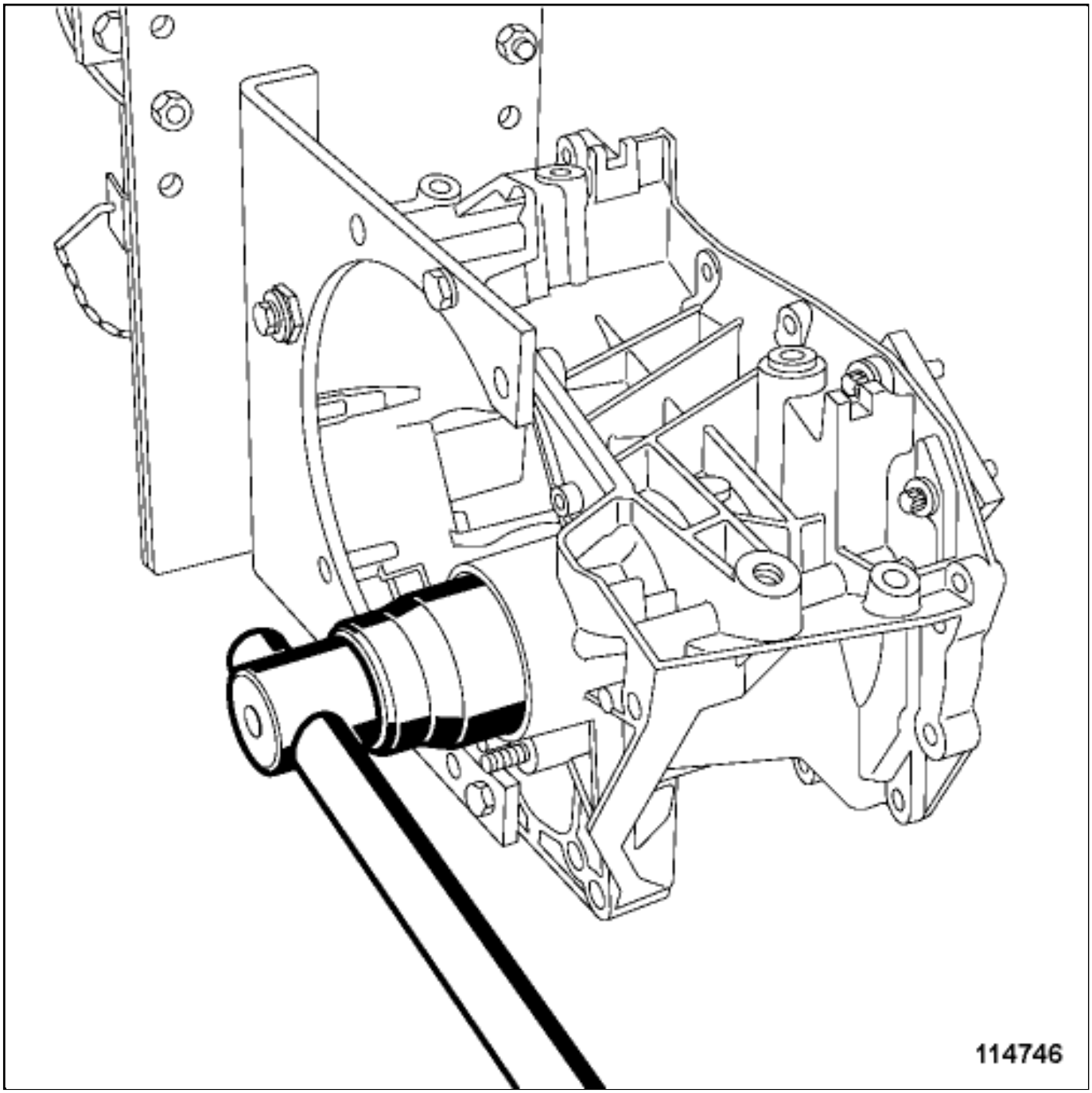
Remove:

- the lock ring(2) using circlip pliers,
- the differential by pushing it with the sunwheel(3) .

2- JR OPEN DIFFERENTIAL GEARBOX



Immobilise the differential using the toolDifferential rotation locking tool.(Bvi. 1057) (4) .



Remove:

- the differential retaining nut,
- the differential using the sunwheel for support.

REFITTING

1. REFITTING PREPARATION OPERATION

Use SURFACE CLEANERVehicle: Parts and consumables for the repair to clean:

- the shafts,

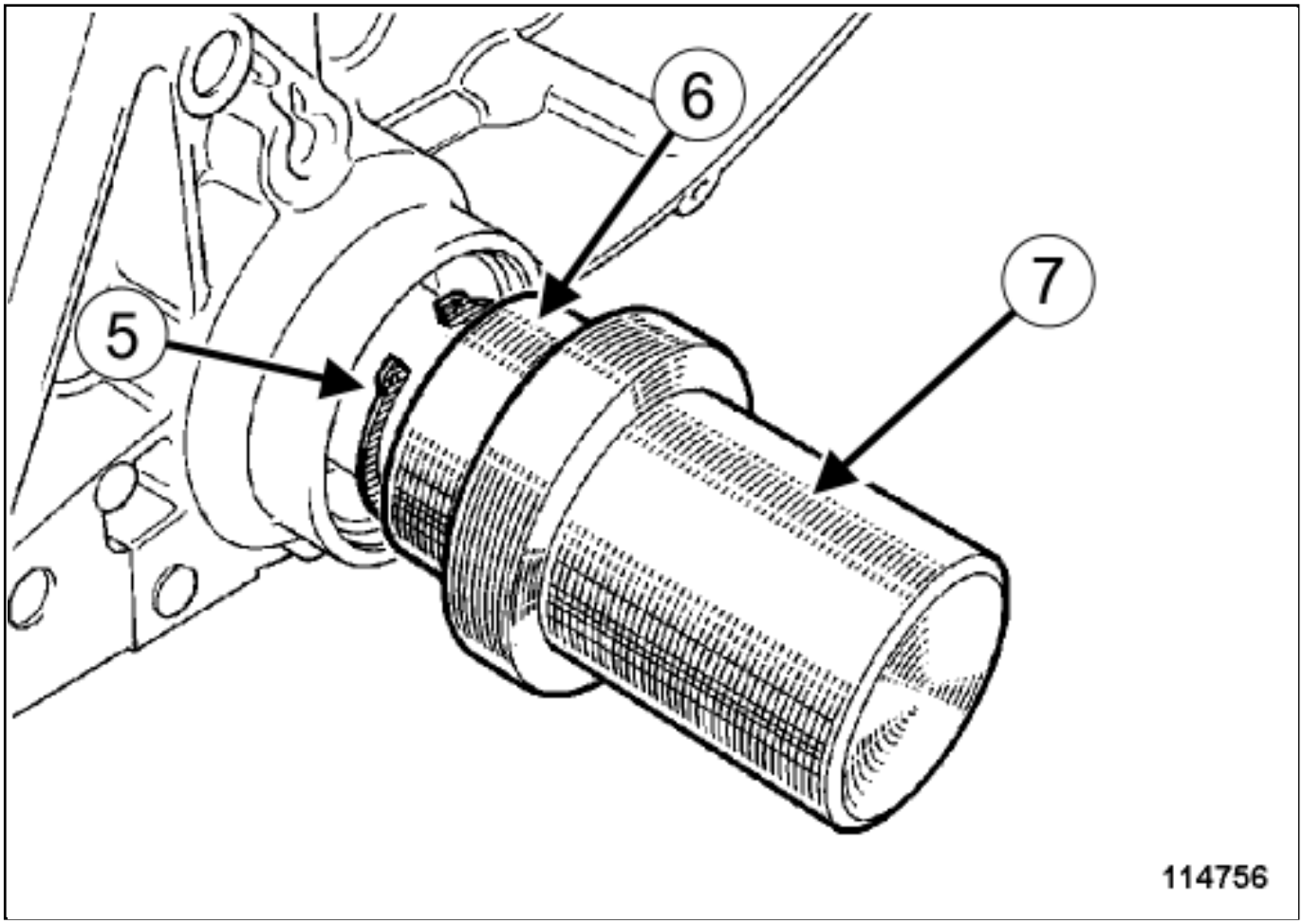
- the shaft mating surfaces,
- the differential,
- the mechanism housing,
- the differential housing.

Parts always to be replaced:

- the lip seals,
- the O-rings,
- the clutch thrust bearing guide,
- the gear lock rings,
- the roll pins,
- the input and output shaft bearing circlips,
- the selector rod hub springs,
- the hydraulic clutch slave cylinder (if fitted),
- the magnet,
- the lock ring of the differential,
- the differential retaining nut.

2. REFITTING OPERATION FOR PART CONCERNED

1- JH OPEN DIFFERENTIAL GEARBOX



Note:

A press should be used to refit the lock ring.

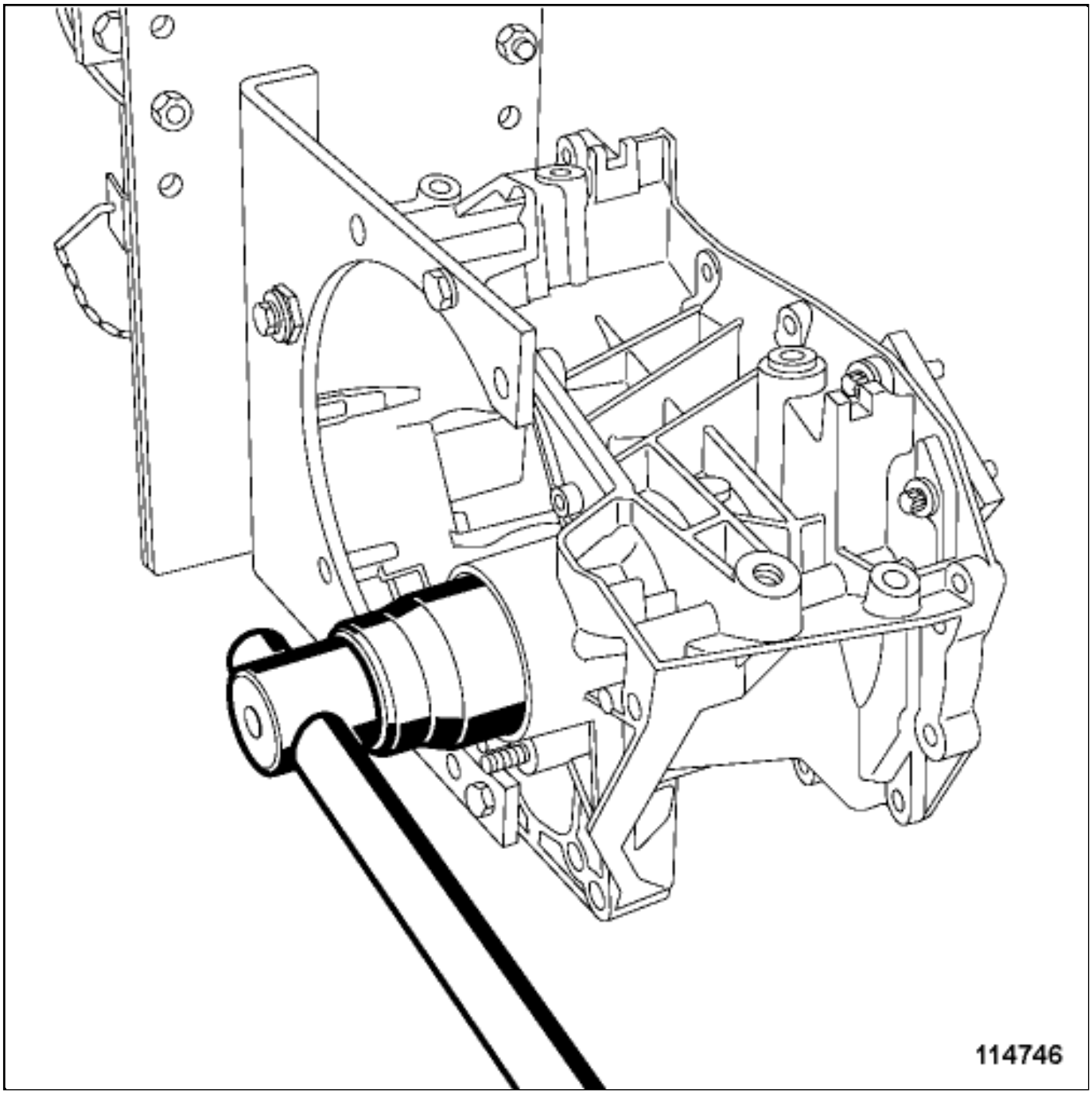
- Fit:
  - the crownwheel side of the differential on the rubber or wooden block,
  - the box casing on the differential.

- Position the lock ring(5) on the cone(6) of the toolMandrel for fitting locking spring ring to the sunwheel. (Bvi. 946) (7) .

- Fit the toolMandrel for fitting locking spring ring to the sunwheel.(Bvi. 946) (7) and its cone(6) on the differential output shaft.

- Push the assembly using the press until the lock ring is positioned.

2- JR OPEN DIFFERENTIAL GEARBOX



- Refit:
  - the differential in the housing,
  - the bearing (slightly oiled).

- Place the pretensioning adjusting washer.

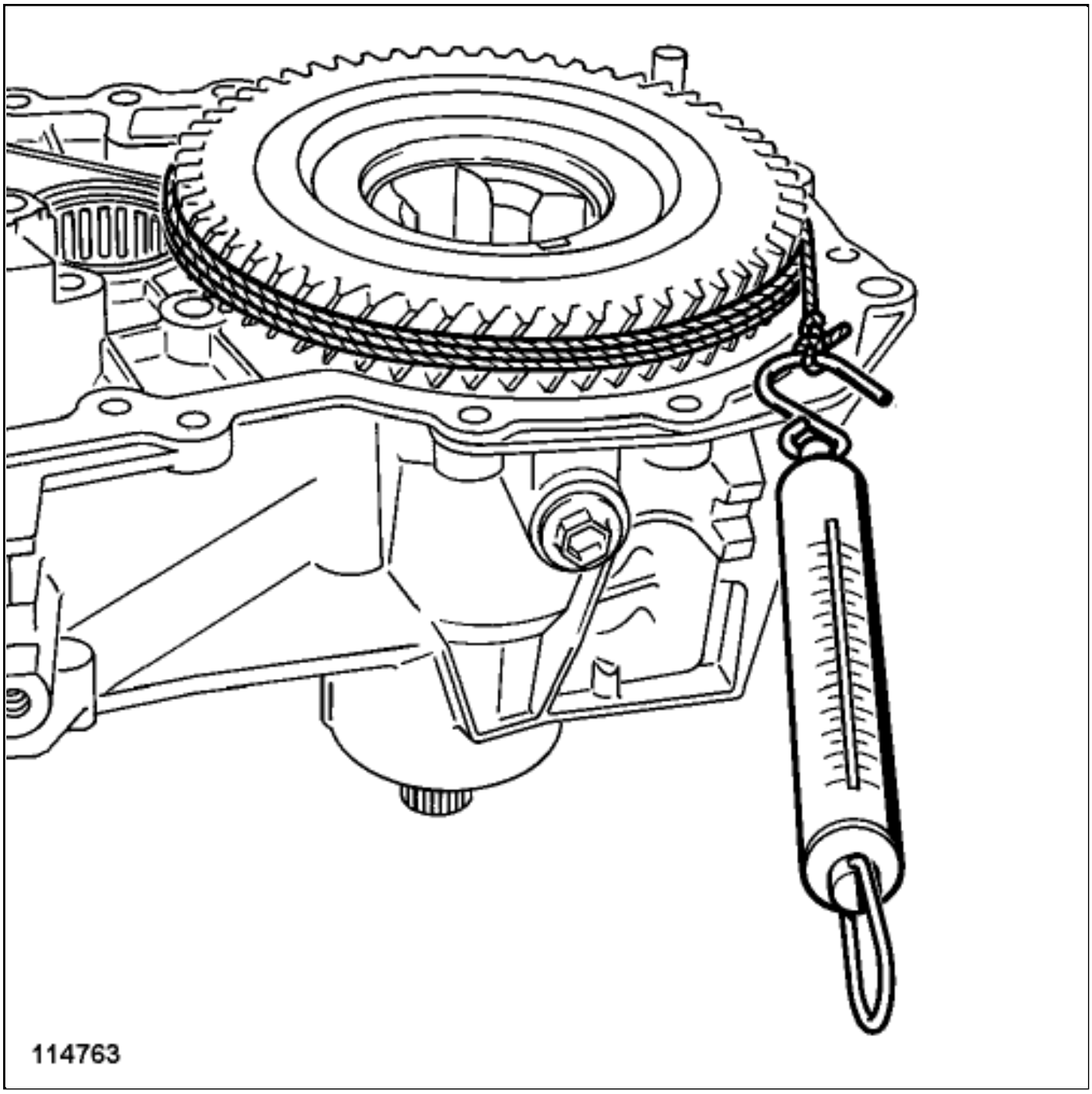
- Refit a new differential retaining nut.

- Torque tighten the differential retaining nut (initial torque)20 N.m.

- Rotate the differential several times to fit the bearings.

- Refit the Differential rotation locking tool.(Bvi. 1057) .
- Torque tighten the differential retaining nut130 N.m .
- Remove the toolDifferential rotation locking tool.(Bvi. 1057) and rotate the differential several times.

3. ADJUSTING THE BEARING PRETENSIONING TORQUE



- The differential must rotate under a load between:
  - 5 N.mand 20 N.mfor reused bearings,

16 N.mand 32 N.mfor new bearings.

If the adjustment is not correct, determine the thickness of the adjusting shim, given that the pretensioning torque increases by 7to 8 N.mwhen the thickness of the adjustment washer decreases 0.05 mm and vice versa.

4. FINAL OPERATION

Refit:

- the gearbox shafts(see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) ,
- the mechanism housing(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
- the fifth gear synchroniser and pinions5th gear sprockets and synchronisers: Removal - Refitting ,
- the fifth gear housing5th gear housing: Removal - Refitting .

Remove the gearbox from the component support(see 21A, Manual gearbox , Gearbox support equipment: Use) .

Refit the gearboxManual gearbox: Removal - Refitting .

RENAULT

Technical Note 6511A

PKX, PFX, TL4, NDX, JBX, JCX, JHX, JR5

Sub-section concerned: 01E

Manual gearbox fault finding

All vehicles with PK4, PK5, PK6, PK7, PK9, PF1, PF6, TL4, JB0, JB1, JB2, JB3, JB4, JB5, JB9, JC5, JC7, JH1, JH3, JR5, ND0 manual gearboxes

Fault finding procedures for incorrect gear changes

77 11 399 122 **Edition 1 - APRIL 2007** **Edition Anglaise**

"The repair procedures given by the Manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which its vehicles are constructed."

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Contents

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01E FAULT FINDING INTRODUCTION

Fault finding - Introduction	01E-1
Fault finding - Customer Complaints	01E-4
Fault finding - Fault finding chart	01E-5

1. SCOPE OF THIS DOCUMENT

This document presents the fault finding procedure applicable to all computers with the following specifications:

Vehicle(s): **All 2 wheel drive vehicles**

Function concerned: **Manual gearboxes**

2. PREREQUISITES FOR FAULT FINDING

Documentation type

Fault finding procedures (this manual):

…MR for the vehicle concerned.

…MR of the gearbox concerned:

*

Gearbox	Technical Note No.
PA6 - PK5 - PK6	**Technical Note 6003A**
TL4	**Technical Note 6019A**
JBX - JCX	**MR-BV-JB-JC**
PF6 - PK4	**Technical Note 6021A**
JA3, JH1, JH3, JR5	**Technical Note 6029A**
ND0	**Technical Note 6034A**

3. FAULT FINDING PROCEDURE

…Identify the type of gear change discrepancy using the definitions given (see definition of symptoms).
…Use the ALPs (fault finding charts) to identify the cause of the fault

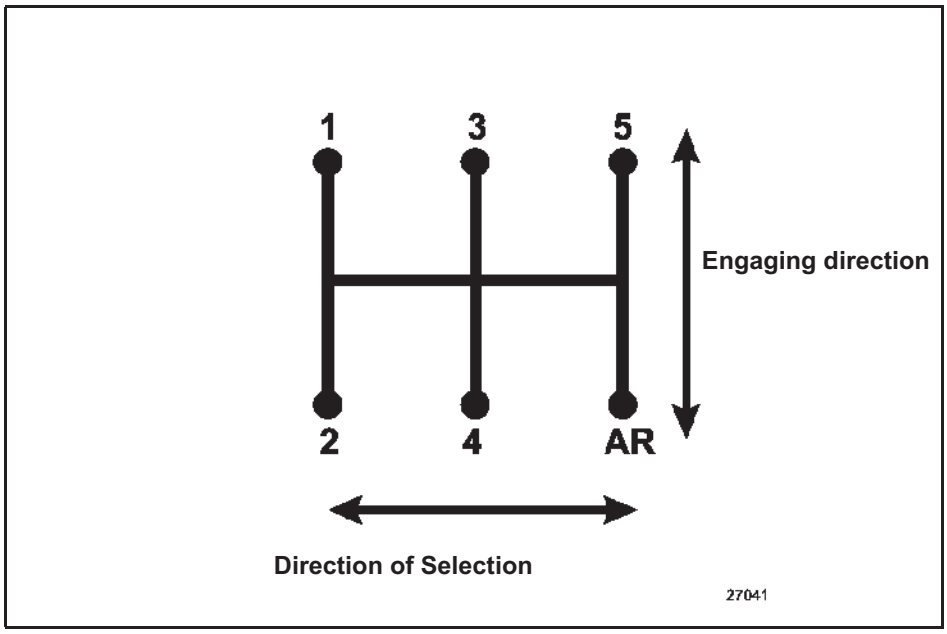
4. SAFETY INSTRUCTIONS

Safety rules must be observed during any work on a component to prevent any damage or injury:
The road tests referred to in this document should be carried out in accordance with Road Traffic Regulations (speed limits must be obeyed).

IMPORTANT
When carrying out road tests, obey Road Traffic Regulations, especially speed limits.

It may be necessary to carry out the road test with the customer to observe the driving habits of the customer (insufficient movement when changing gear, clutch not disengaged sufficiently etc.). The fault stated by the customer is due to ignorance or unfamiliarity with the normal operation of the gearbox.

5. DEFINITION OF SYMPTOMS



A. Gear change hitch:

Definition:
One or several points of resistance felt when moving the lever which stop or at least slow down movement. It appears randomly with regard to the gear being selected and how often it appears.

Appearance context:

- More likely to appear when the gearbox is cold (aggravating factor), for example in the first few miles of a journey (not on the motorway).
- Gear change sticks when changing up or down a gear.

B. Gear jumps:

Definition:
One or several of the gears selected jumps out of gear without touching the control lever.

Appearance context:
Generally occurs in only one of the following cases:

… at a stable engine speed,
… when accelerating
… when decelerating
… when lifting off the accelerator.

Note: the gear may jump in inverse proportion to torque or at a stable engine speed.

C. Hard or impossible to engage a gear (gear selected)

Definition:
Temporary difficulty in engaging a gear or impossible to do so.

Appearance context:
When engaging the gear, having already selected the gear (when all conditions making it possible for the gear to be engaged are present: clutch disengaged, gear selected, etc.).

D. Gear control blocked or inoperative:

Definition:
Impossible to engage or disengage a gear on one or several lines (as soon as the action begins and in the direction of selection) or with the gear engaged, the vehicle acts as though it is still in neutral.

Appearance context:
All conditions making it possible for the gear to be engaged are present: clutch disengaged, gear selected, etc.

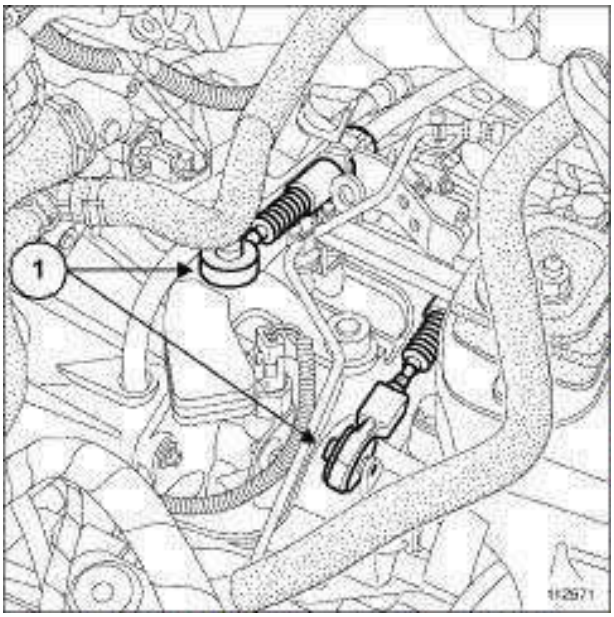
JAMMING WITH CABLE OPERATED GEARBOXES	ALP 1
JAMMING WITH ROD OPERATED GEARBOXES	ALP 2
CABLE OPERATED GEARBOXES JUMPING OUT OF GEAR	ALP 3
ROD OPERATED GEARBOXES JUMPING OUT OF GEAR	ALP 4
DIFFICULT OR IMPOSSIBLE TO ENGAGE GEARS FOR CABLE OPERATED GEARBOXES	ALP 5
DIFFICULT OR IMPOSSIBLE TO ENGAGE GEARS FOR ROD OPERATED GEARBOXES	ALP 6
GEARBOX LOCKED OR INEFFECTIVE FOR CABLE OPERATED GEARBOXES	ALP 7
GEARBOX LOCKED OR INEFFECTIVE FOR ROD OPERATED GEARBOXES	ALP 8

ALP 1	Jamming with cable operated gearboxes

NOTES	…**Before any operations, it is ESSENTIAL to read the entire ALP and the information library (ACTIS solution) relating to the customer complaints.** …**Check that the clutch pedal travel is not obstructed by the floor carpet.** …**If there is jamming in 2nd AND 3rd with the ND gearbox: see Technical Note 4559A, gears jamming when engaging 2nd or 3rd gear.** …**The customer notices a difference between the functions changed and those that were retained. Inform the customer of the importance of running in a gearbox.**

External control check

Visually inspect:
- The condition of the control (gaiter end (1) incorrectly fixed, cables clipped, etc.).



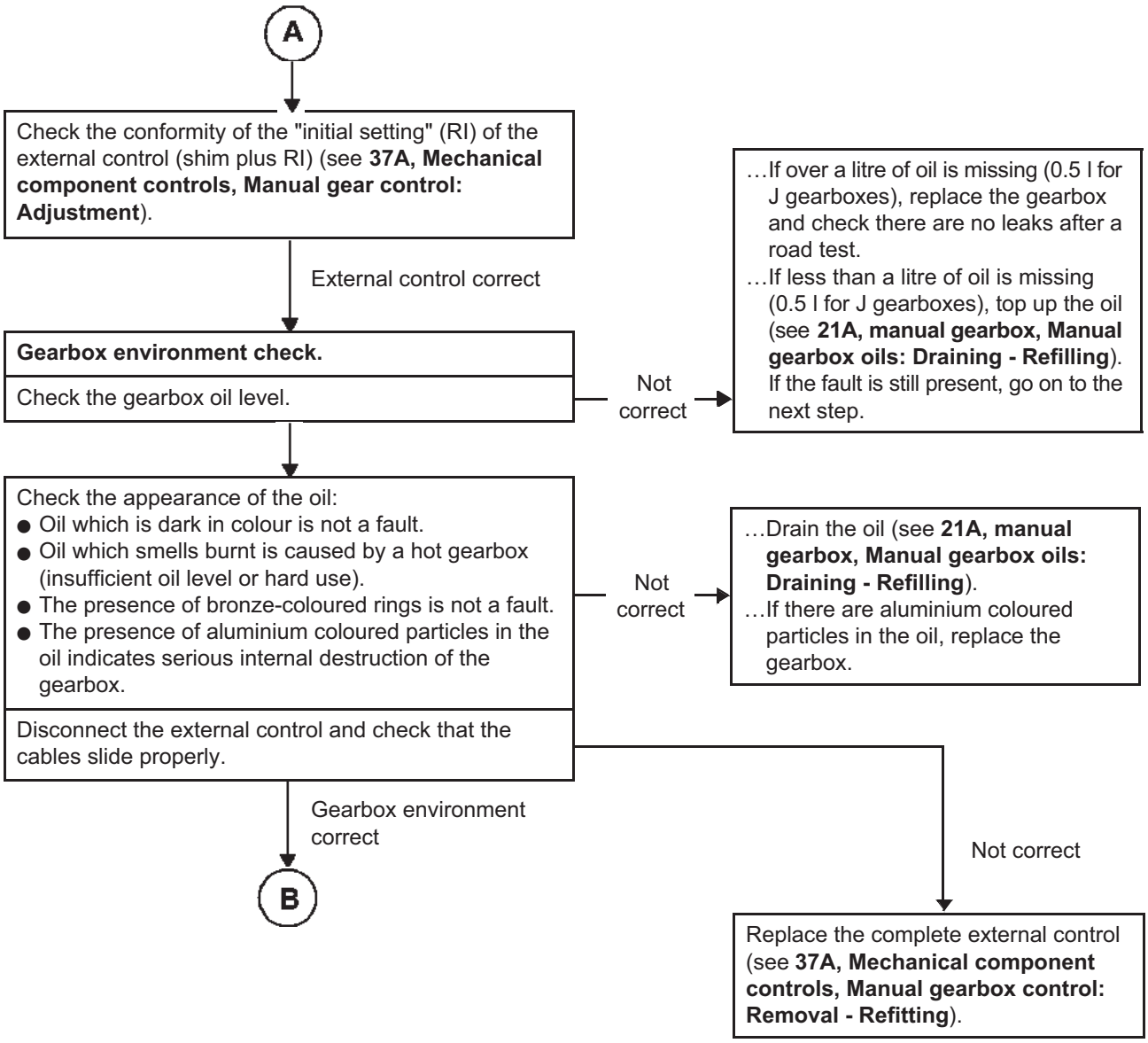
- Ensure the area surrounding the gearbox selector is correct (no foreign bodies etc.).
- The positioning of the gaiter of the control unit.

Not correct → Replace the faulty part or parts and/or clean the travel of the external control.

Not correct → Ensure the conformity of the Initial Setting (see **37A, Mechanical component controls, Manual gear control: Adjustment**).

A

ALP 1 CONTINUED 1	



ALP 1 CONTINUED 2	

B

Clutch check

Check that the clutch operates correctly (see **MR-394, 20A, Clutch, Fault finding chart**).

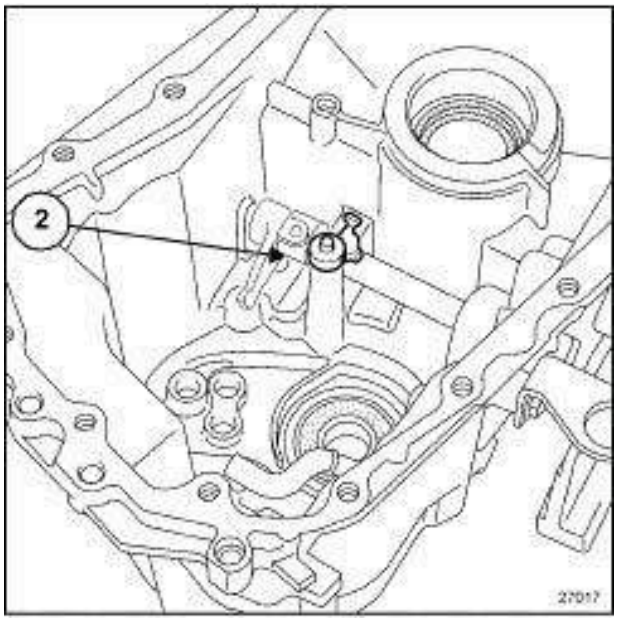
Check there is no clutch drag by checking its disengagement point (see **Technical Note 3451A, Clutch: Fault finding**).

Not correct → Carry out the corrective actions.

Gearbox environment correct

Remove and open the gearbox.

In the case of a complaint about jamming when shifting from 5th to 4th on a cable operated J gearbox.



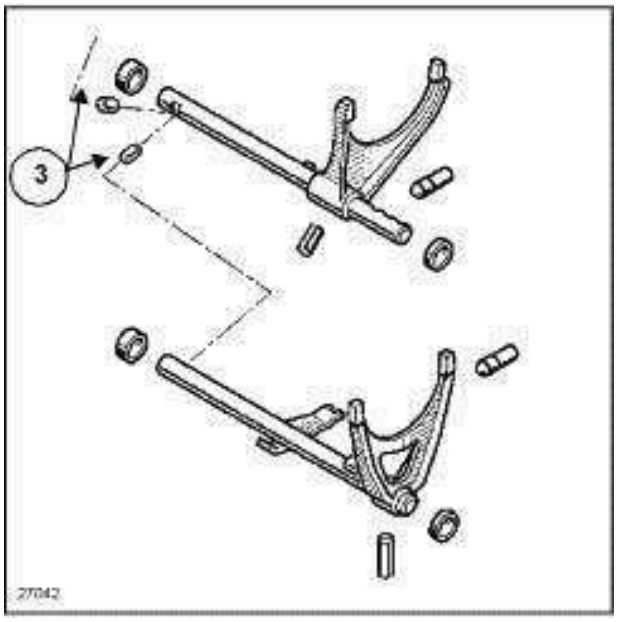
Not correct → Replace the latch kit (2) for reverse gear (see **Technical Note 6029A, manual gearbox, manual gearbox control shaft: Removal - Refitting**).

C

ALP 1 CONTINUED 3	

C

Check:
- The locking shafts slide correctly (3)
- The locking shafts are correct (3)



Not correct →

…Replace the locking shafts (see **Technical Note Gearbox*, manual gearbox, shafts and synchronisers: Refitting**).
…If the sliding fault is still present, contact Techline (clutch cover fault).

Locking shafts correct ↓

In all other cases and for all other gearboxes
Replace the function of the gear or gears corresponding to the customer complaint (pinion, hub, selector rod, blocking ring and engaging ring).

* see introduction

ALP 2	**Jamming with rod operated gearboxes**

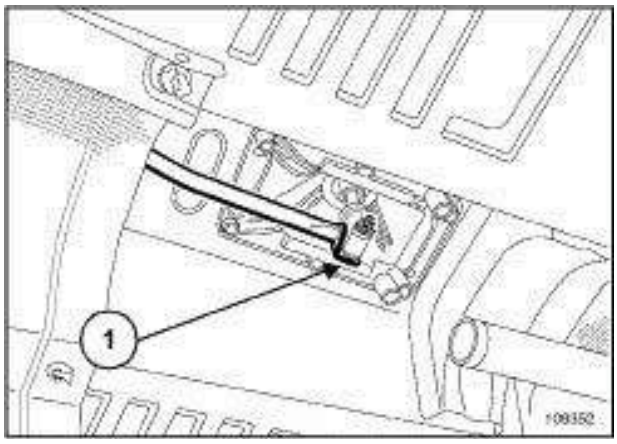
NOTES	**…Before any operations, it is ESSENTIAL to read the entire ALP and the information library (ACTIS solution) relating to the customer complaints.** **…Check that the clutch pedal travel is not obstructed by the floor carpet.** **…If there is jamming in 2nd AND 3rd with the ND gearbox: see Technical Note 4559A, gears jamming when engaging 2nd or 3rd gear.** **The customer notices a difference between the functions changed and those that were retained. Inform the customer of the importance of running in a gearbox.**

ALP 2 CONTINUED 1	

External control check

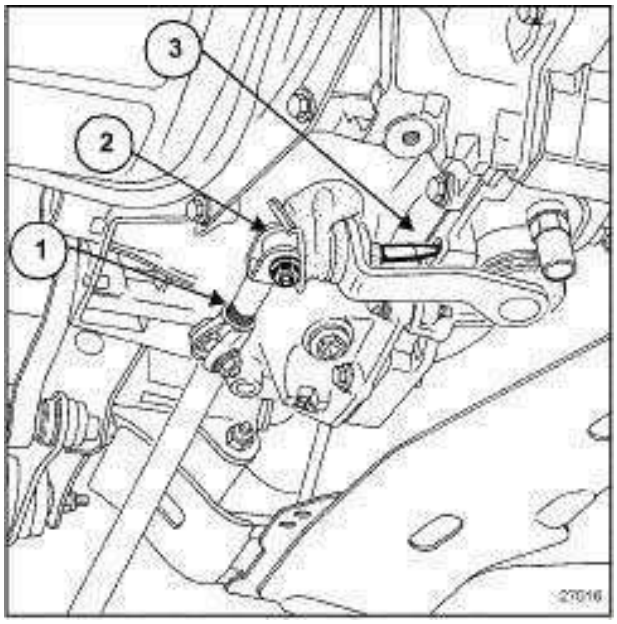
Visually inspect:

- The presence of grease (33 medium) on the control lever / selector linkage joint (1).



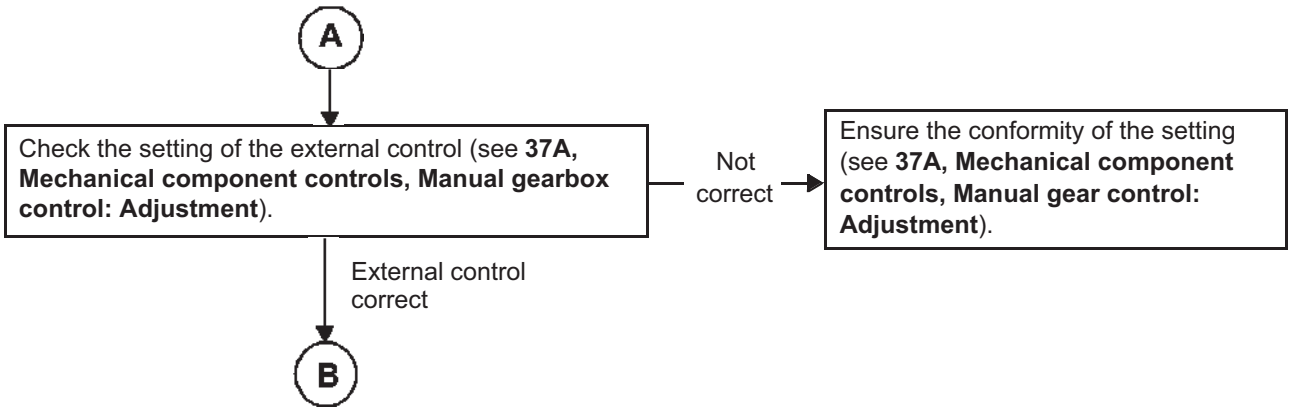
Not correct → Grease the parts that have insufficient grease

- The presence of grease (transmission grease) on the selector linkage / gearbox linkage joint (2) (detach the gaiter and remove the plastic clip if necessary).
- The presence of grease (33 medium) at the gearbox output lever / linkage joint (3).

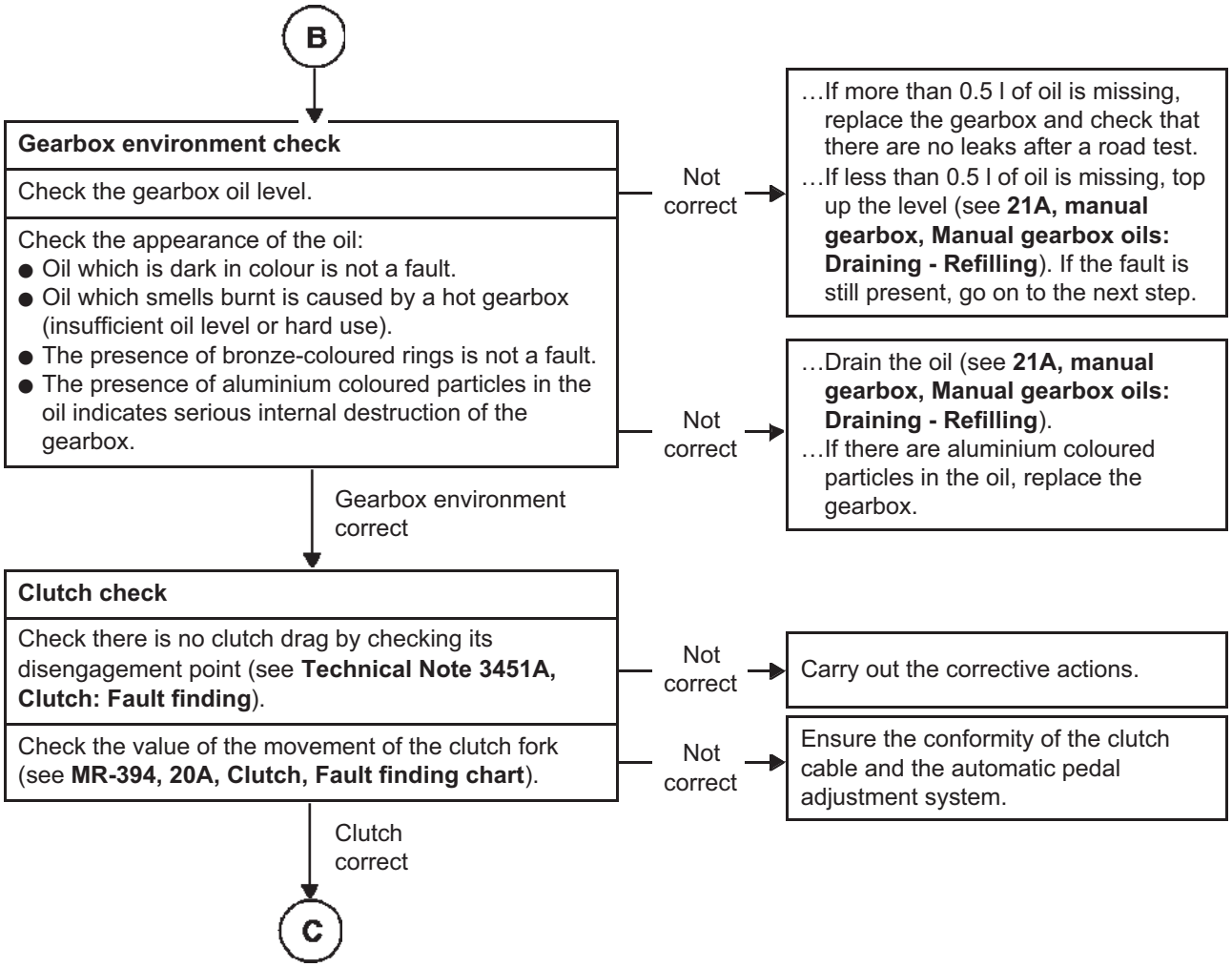


→ A

ALP 2 CONTINUED 2	



ALP 2 CONTINUED 3	

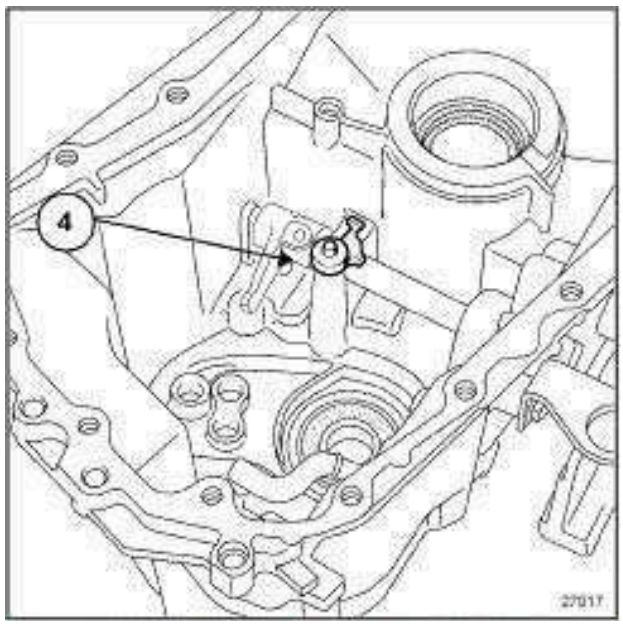


ALP 2 CONTINUED 4	

C

Remove and open the gearbox.

In the case of a complaint about jamming when shifting from 5th to 4th on a JH gearbox.



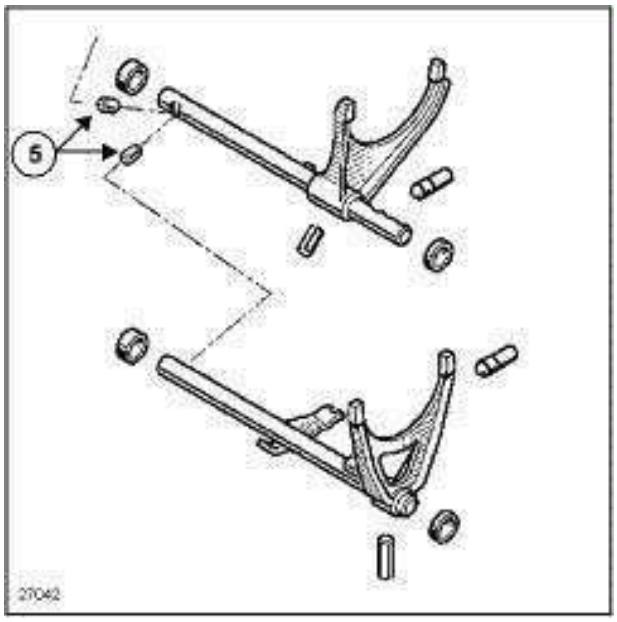
Not correct → Replace the latch kit for reverse gear (4) (see **Technical Note 6029A, manual gearbox, manual gearbox control shaft: Removal - Refitting**).

D

ALP 2 CONTINUED 5	

D

Check:
- The locking shafts slide correctly (5)
- The locking shafts are correct (5)



Not correct →

…Replace the locking shafts (see **Technical Note Gearbox*, manual gearbox, shafts and synchronisers: Refitting**).
…If the sliding fault is still present, contact the Techline for information on the clutch cover.

Locking shafts correct ↓

Replace the function of the gear or gears corresponding to the customer complaint (pinion, hub, selector rod, blocking ring and engaging ring).

* see introduction

ALP 3	Cable operated gearboxes jumping out of gear

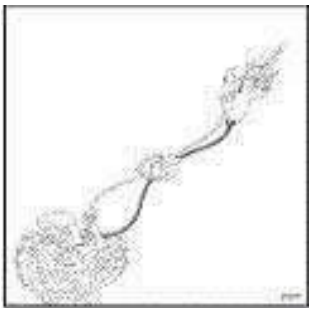
NOTES	…**Before any operations, it is ESSENTIAL to read the entire ALP and the information library (ACTIS solution) relating to the customer complaints.** …**Check that the clutch pedal travel is not obstructed by the floor carpet.** …**The customer notices a difference between the functions changed and those that were retained. Inform the customer of the importance of running in a gearbox.**

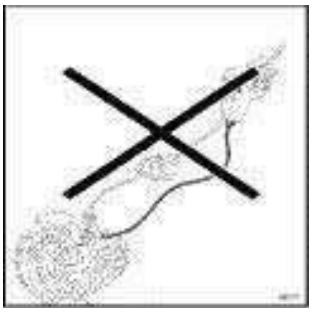
External control check:

Check there are no foreign bodies at the external control (control unit and gearbox side) which inhibit its operation.

Not correct → …Clean the external control cable routing.

Check that the cables move freely (sheath grommets, "corrugated sheaths", bulkhead grommets, etc.) for example, after a previous operation under the bonnet (incorrect refitting).





Not correct → …If there is no damage: correct the routing.
…If there is damage: replace the external control (see **37A, Mechanical component controls, Manual gearbox control: Removal - Refitting**).

Check that there is no significant or abnormal play at the lever (in the direction of the gear change).

- Unit side:
  - …no play at the cable sleeve stop,
  - …no play at the cable ball joint (in the direction of the gear change).
- Gearbox side:
  - …no play at the cable sleeve stop,
  - …no play at the cable ball joint (in the direction of the gear change),
  - …no play at the dampers (rubber particles indicating destruction of the dampers).

Not correct → …Replace the external control (see **37A, Mechanical component controls, Manual gearbox control: Removal - Refitting**).

External control correct → A

ALP 3 CONTINUED 1	

A

Engine and transmission assembly suspended mountings check:

Check the suspended mountings on the engine and gearbox sides and the engine tie-bar (broken, damaged, incorrectly tightened, incorrectly positioned, etc.).

Not correct → Replace the damaged suspended engine mounting or engine tie-bar (see **19D, Engine mounting**).

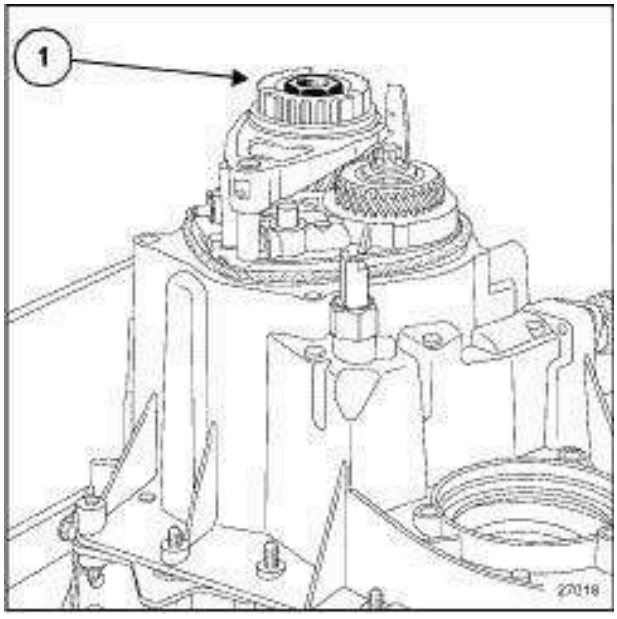
Check the suspended mounting rubber pads on the engine and gearbox sides and engine tie-bar (torn, damaged, incorrectly positioned, missing, etc.).

Not correct → Replace the damaged rubber pad (see **19D, Engine mounting**).

Engine and transmission assembly suspended mountings

Checking the 5th gear nut on the input shaft (1) (only on J gearbox)

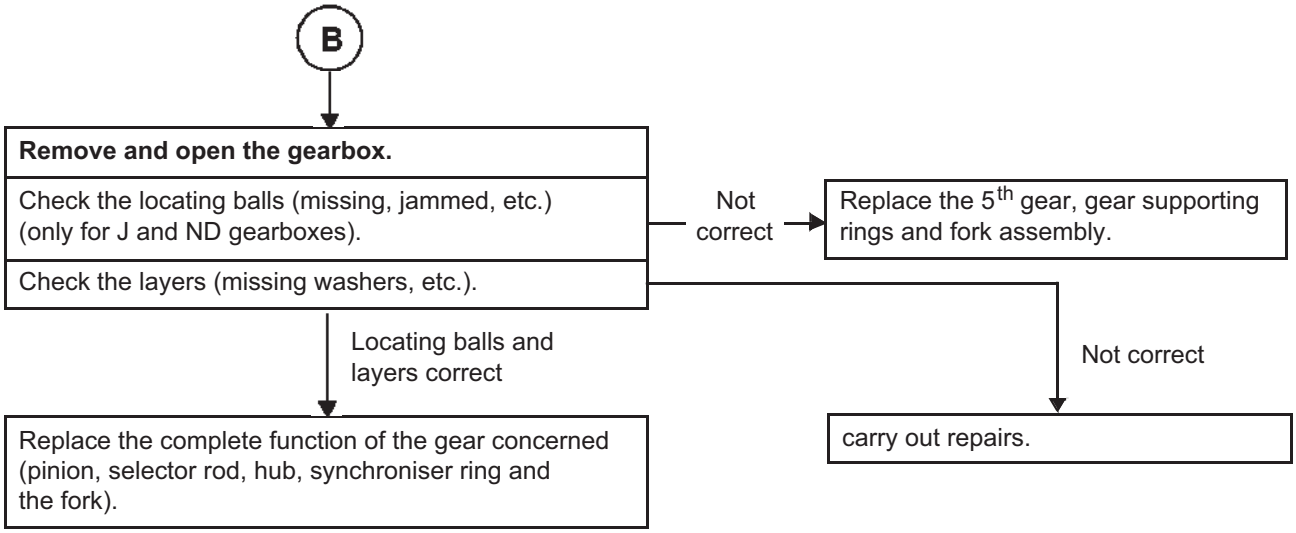
If the vehicle is fitted with a J gearbox and is only jumping out of gear in 5th.



Not correct → Replace the 5th gear, gear supporting rings and fork assembly.

5th gear nut correct → B

ALP 3 CONTINUED 2	



ALP 4	Rod operated gearboxes jumping out of gear

NOTES	…**Before any operations, it is ESSENTIAL to read the entire ALP and the information library (ACTIS solution) relating to the customer complaints.** …**Check that the clutch pedal travel is not obstructed by the floor carpet.** …**The customer notices a difference between the functions changed and those that were retained. Inform the customer of the importance of running in a gearbox.**

External control check

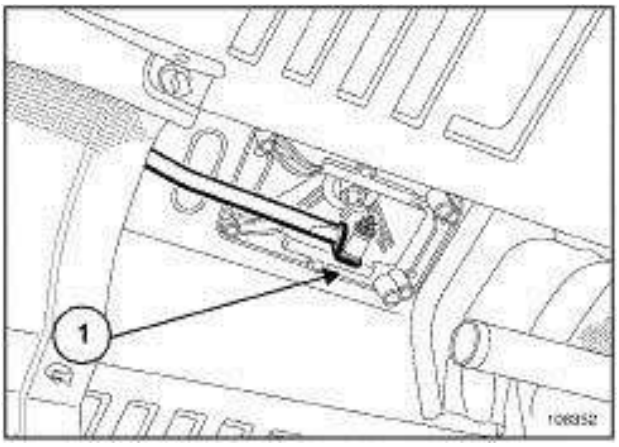
Check there are no foreign bodies at the external control (control unit and gearbox side) which inhibit its operation.

Not correct → Clean the external control cable route.

Check that there are no signs of impact on the gear selector rod.

Not correct → Replace the gear selector rod.

Check that there is no play at the lever (in the direction of the gear change).
- Module on the end of the selector rod (1) (see Technical Note 3439A, Mechanical component controls).



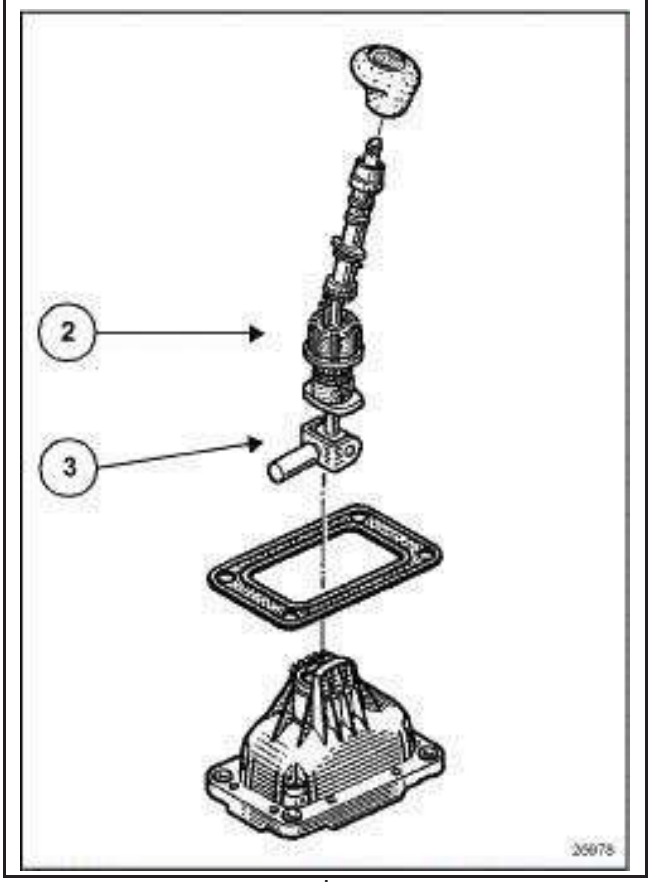
Not correct →
…If there is a fault on the unit side: replace the control lever or the complete function if one unit (see **37A, Mechanical component controls, Manual gear control: Removal - Refitting**).
…If there is a fault on the gearbox side: replace the selector rod (and spacer if required).

A

ALP 4 CONTINUED 1	

A

● Control unit side:
…no play at the lever ball joint (2),
…no play at the joint at the foot of the lever or the selector rod mounting (3),
…check that there is no tension at the gear lever gaiter (if necessary check without the gaiter).



Not correct →

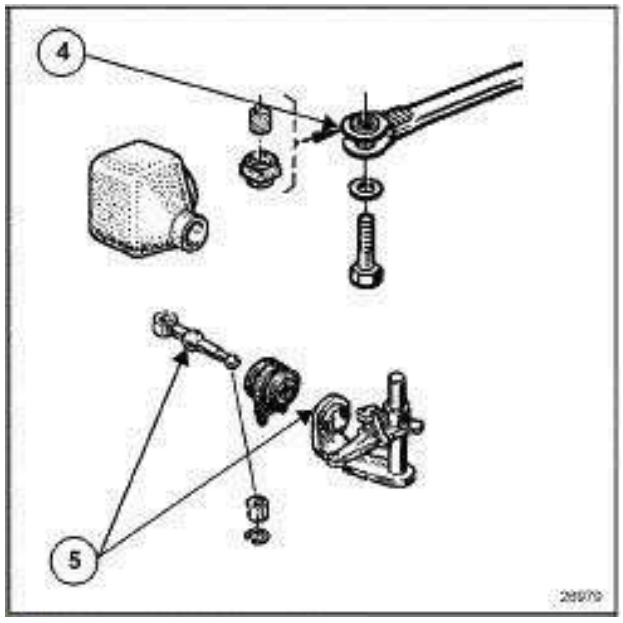
…If there is a fault on the unit side: replace the control lever or the complete function if it is not sold separately (see **37A, Mechanical component controls, Manual gear control: Removal - Refitting**).
…If there is a fault on the gearbox side: replace the selector rod (and spacer if required).

B

ALP 4 CONTINUED 2	

B

● Gearbox side:
…no play at the linkage - selector rod connection (4),
…no play at the manual gearbox lever ball joints (5).



External control correct

Engine and transmission assembly suspended mountings check:

Check the suspended mountings on the engine and gearbox sides and the engine tie-bar (broken, damaged, incorrectly tightened, incorrectly positioned, etc.).

Not correct → Replace the damaged suspended engine mounting or engine tie-bar (see **19D, Engine mounting**).

C

ALP 4 CONTINUED 3	

C

Check the suspended mounting rubber pads on the engine and gearbox sides and engine tie-bar (torn, damaged, incorrectly positioned, missing, etc.).

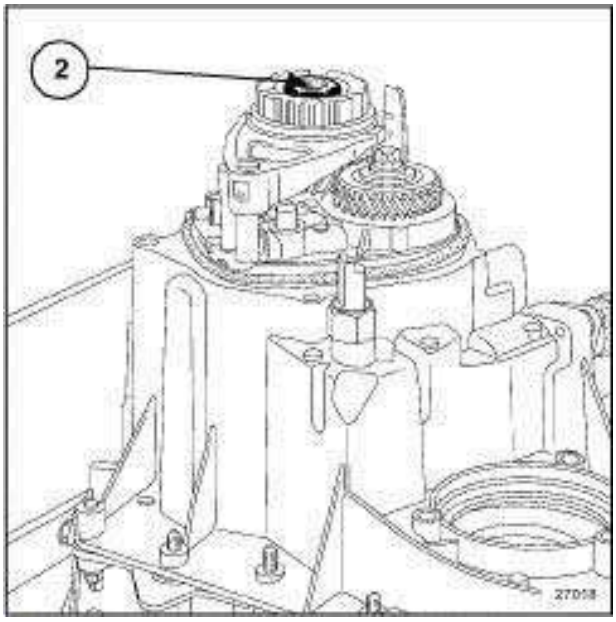
Not correct → Replace the damaged rubber pad (see **19D, Engine mounting**).

Engine and transmission assembly suspended mountings

Checking the 5th gear nut on the input shaft (only on J gearbox)

Not correct → Replace the 5th gear, gear supporting rings and fork assembly.

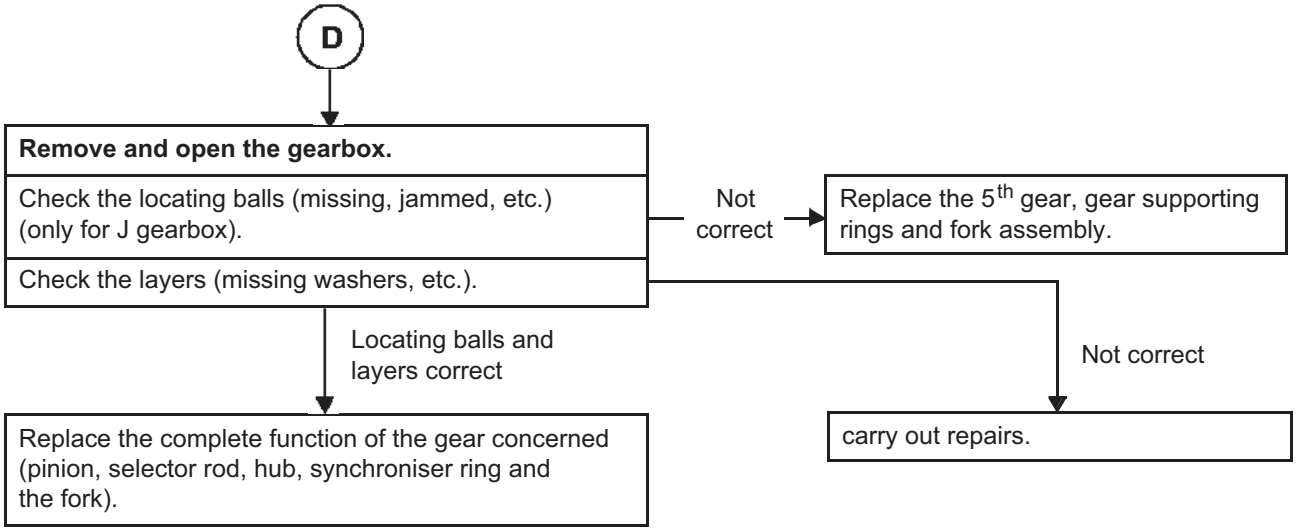
If the vehicle is fitted with a J gearbox and is only jumping out of gear in 5th.



5th gear nut correct

D

ALP 4 CONTINUED 4	



ALP 5	Difficult or impossible to engage gears for cable operated gearboxes

NOTES	…**Before any operations, it is ESSENTIAL to read the entire ALP and the information library (ACTIS solution) relating to the customer complaints.** …**Check that the clutch pedal travel is not obstructed by the floor carpet.** …**The customer notices a difference between the functions changed and those that were retained. Inform the customer of the importance of running in a gearbox.**

Oil level check

Check the gearbox oil level before any operations.

Not correct → If over a litre of oil is missing (0.5 l for the J range), replace the gearbox and check there are no leaks after a road test.
If less than a litre of oil is missing (0.5 l for the J range), top up the oil (see **21A, manual gearbox, Manual gearbox oils: Draining - Refilling**).
If the fault is still present, go on to the next step.

Oil level correct ↓

External control check

Check that there are no foreign bodies at the external control (control unit and gearbox side) that inhibit its operation.

Not correct → Correct the routing manually.

Check that the "initial setting" (RI) of the external control (shim plus RI) (see **37A, Mechanical component controls, Manual gear control: Adjustment**).

Not correct → Ensure the conformity of the Initial Setting (see **37A, Mechanical component controls, Manual gear control: Adjustment**).

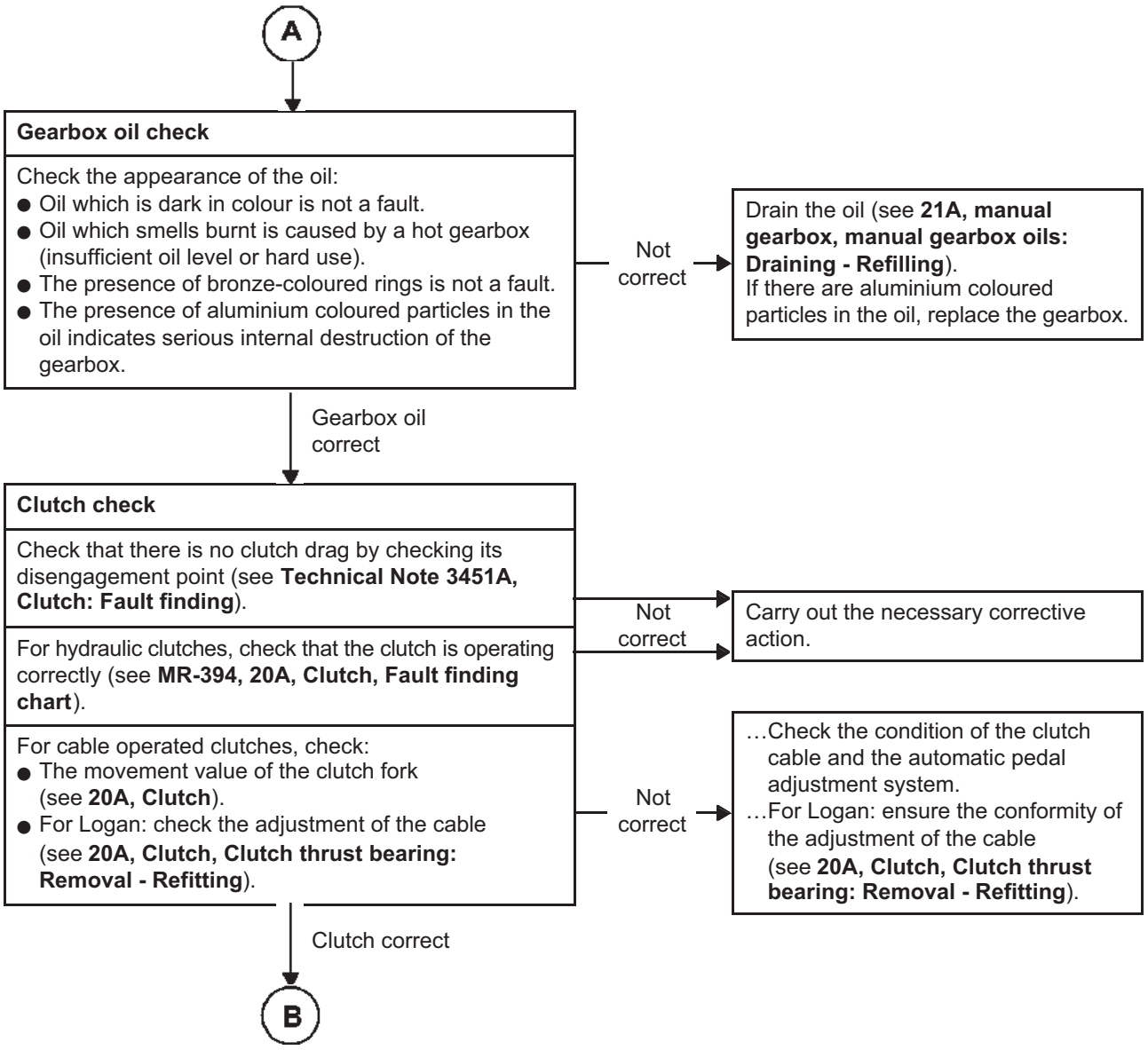
Check there is no significant or abnormal play at the lever (in the direction of selection).

Not correct → Replace the external control (see **37A, Mechanical component controls, Manual gearbox control: Removal - Refitting**).

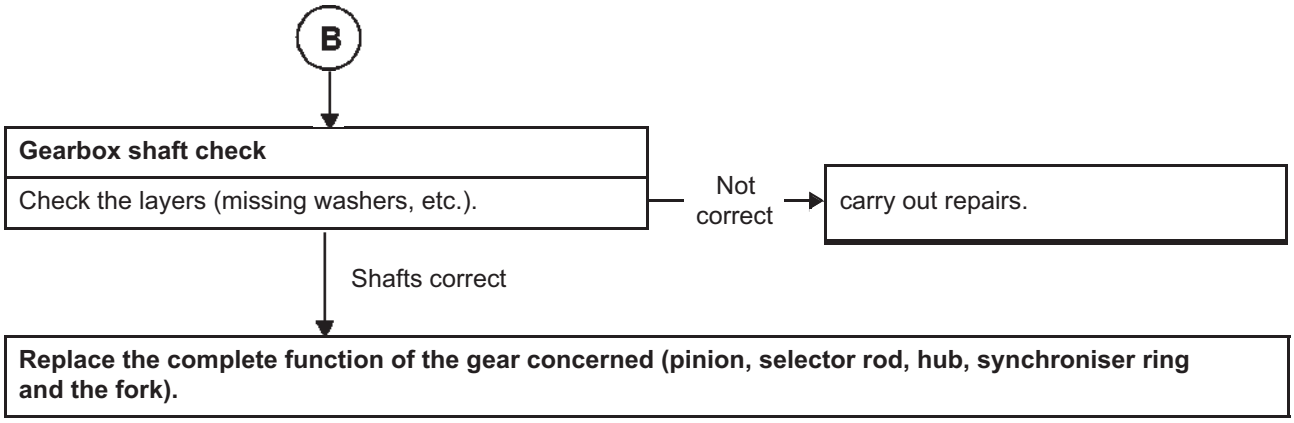
External control correct ↓

(A)

ALP 5 CONTINUED 1	

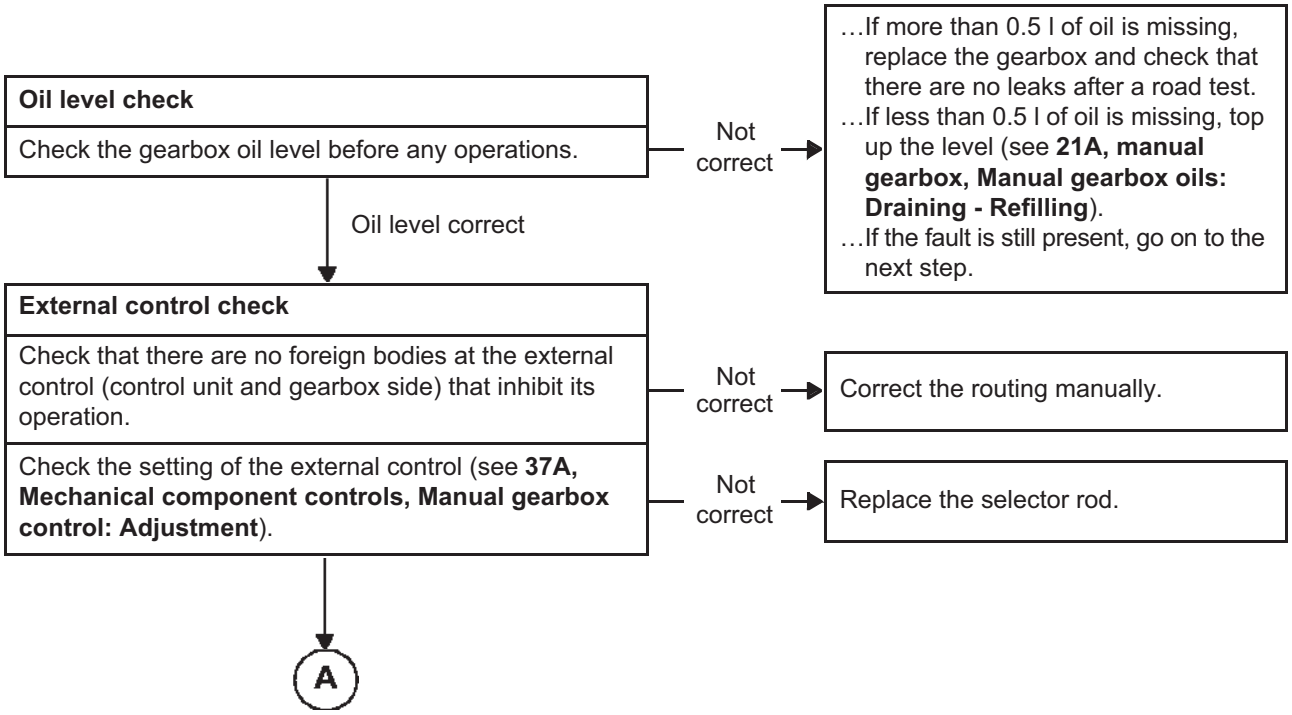


ALP 5 CONTINUED 2	



ALP 6	Difficult or impossible to engage gears for rod operated gearboxes

NOTES	…**Before any operations, it is ESSENTIAL to read the entire ALP and the information library (ACTIS solution) relating to the customer complaints.** …**Check that the clutch pedal travel is not obstructed by the floor carpet.** …**The customer notices a difference between the functions changed and those that were retained. Inform the customer of the importance of running in a gearbox.**

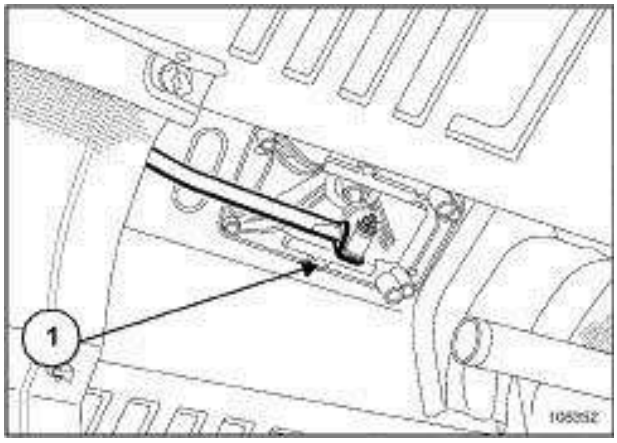


ALP 6 CONTINUED 1	

A

Check that there is no play at the lever (in the direction of the gear change).

- Module on the end of the selector rod (1) (See **Technical Note 3439A, Mechanical component controls**).



Not correct →

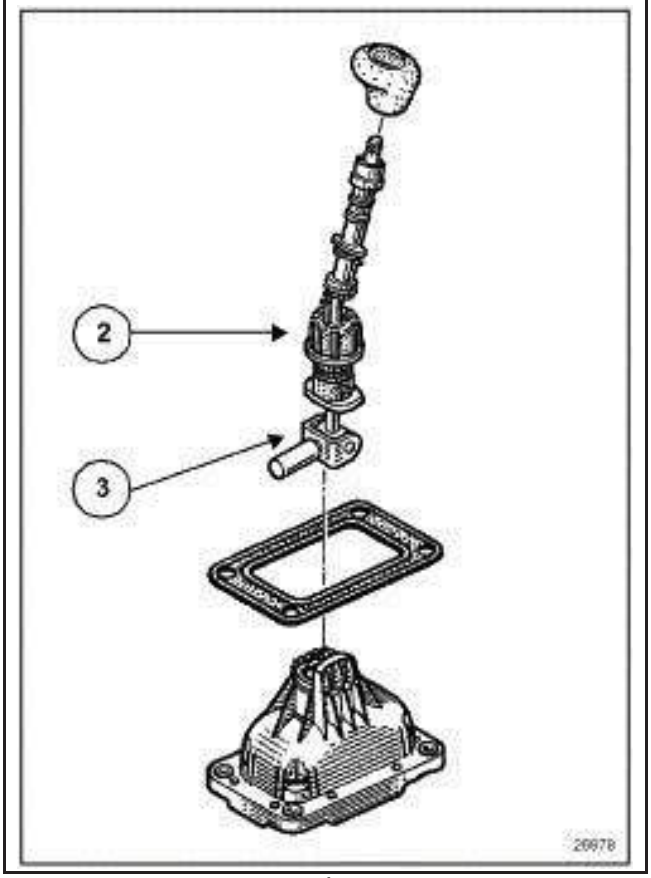
…If there is a fault on the unit side: replace the control lever or the complete function if it is not sold separately (see **37A, Mechanical component controls, Manual gear control: Removal - refitting**).
…If there is a fault on the gearbox side: replace the selector rod (and spacer if required).

B

ALP 6 CONTINUED 2	

B

● Control unit side:
…no play at the lever ball joint (2),
…no play at the joint at the foot of the lever or the selector rod mounting (3),
…check that there is no tension at the gear lever gaiter (if necessary check without the gaiter).



Not correct →

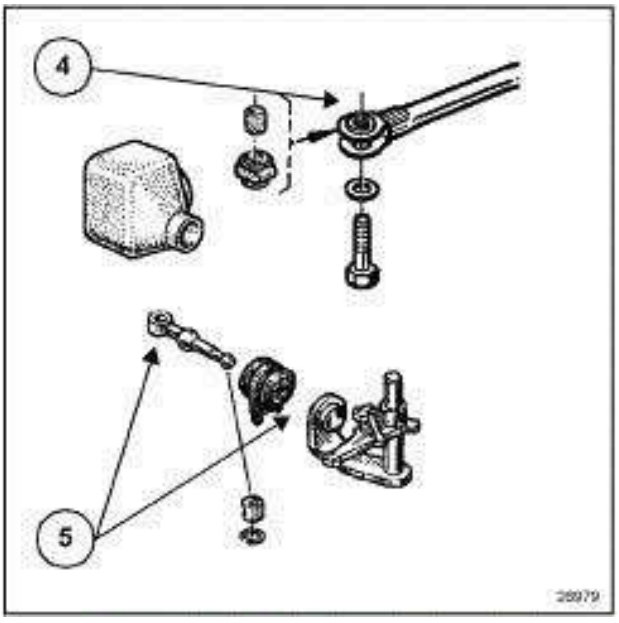
…If there is a fault on the unit side: replace the control lever or the complete function if it is not sold separately (see **37A, Mechanical component controls, Manual gear control: Removal - refitting**).
…If there is a fault on the gearbox side: replace the selector rod (and spacer if required).

C

ALP 6 CONTINUED 3	

C

● Gearbox side:
…no play at the linkage - selector rod connection (4)
…no play at the manual gearbox lever ball joints (5)



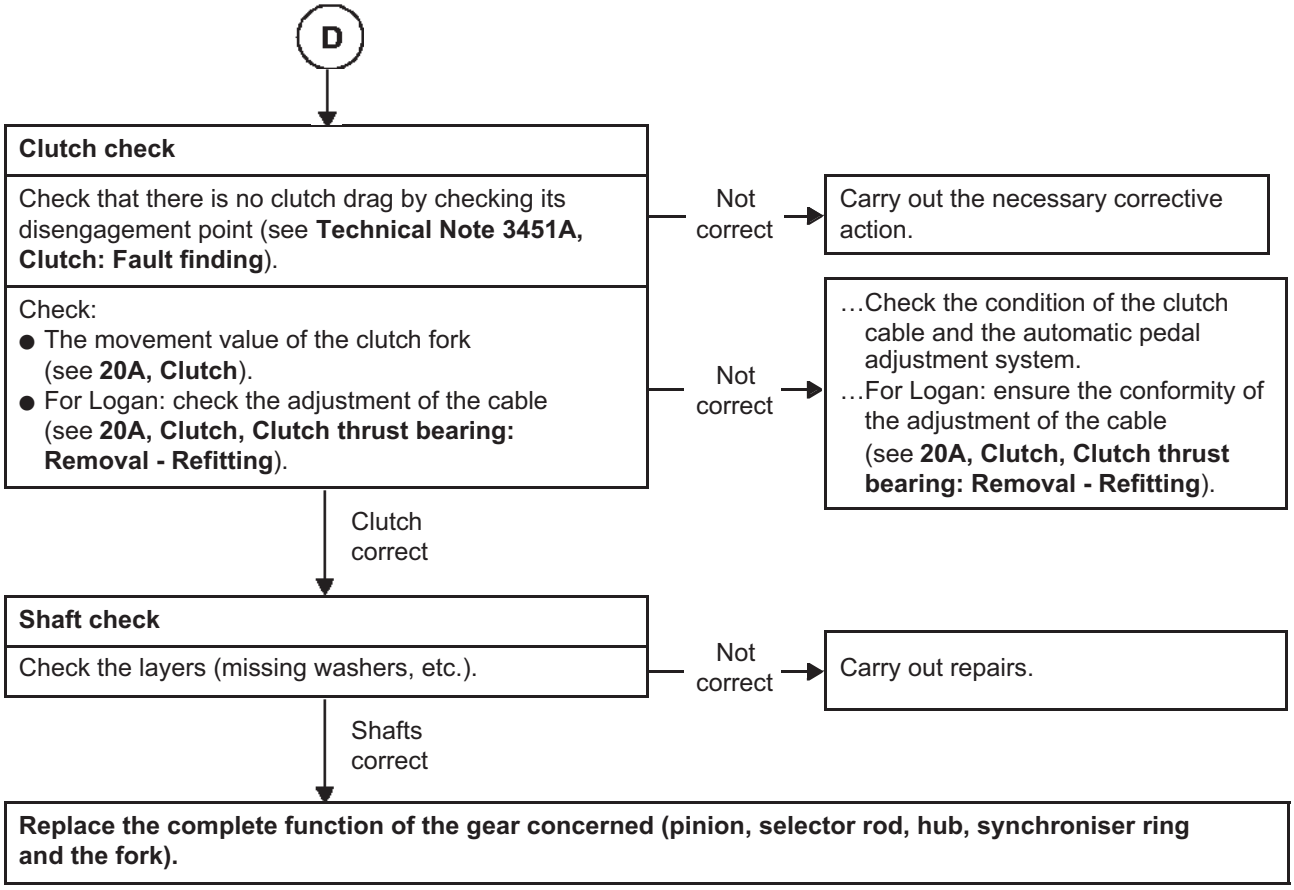
Gearbox oil check

Check the appearance of the oil:
- Oil which is dark in colour is not a fault.
- Oil which smells burnt is caused by a hot gearbox (insufficient oil level or hard use).
- The presence of bronze-coloured rings is not a fault.
- The presence of aluminium coloured particles in the oil indicates serious internal destruction of the gearbox.

Not correct → …Drain the oil (see **21A, manual gearbox, Manual gearbox oils: Draining - Refilling**).
…If there are aluminium coloured particles in the oil, replace the gearbox.

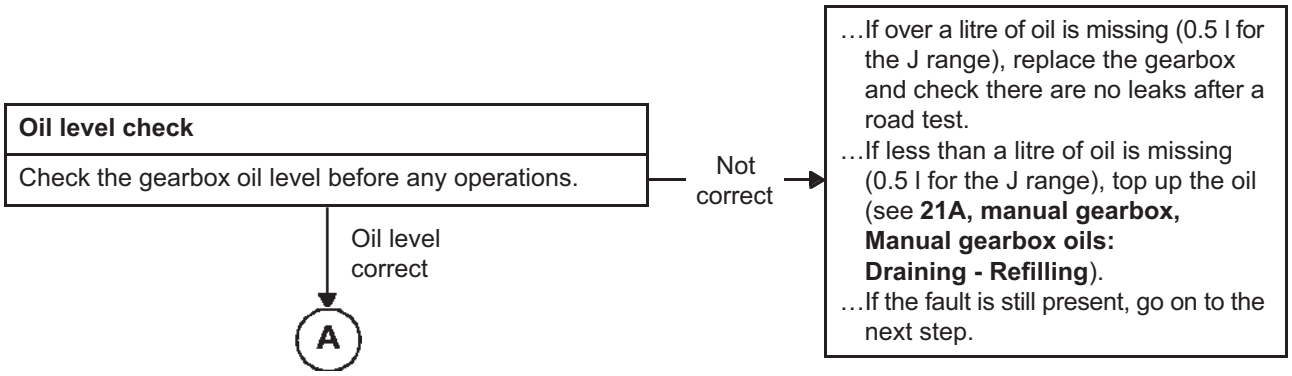
Gearbox oil correct → D

ALP 6 CONTINUED 4	

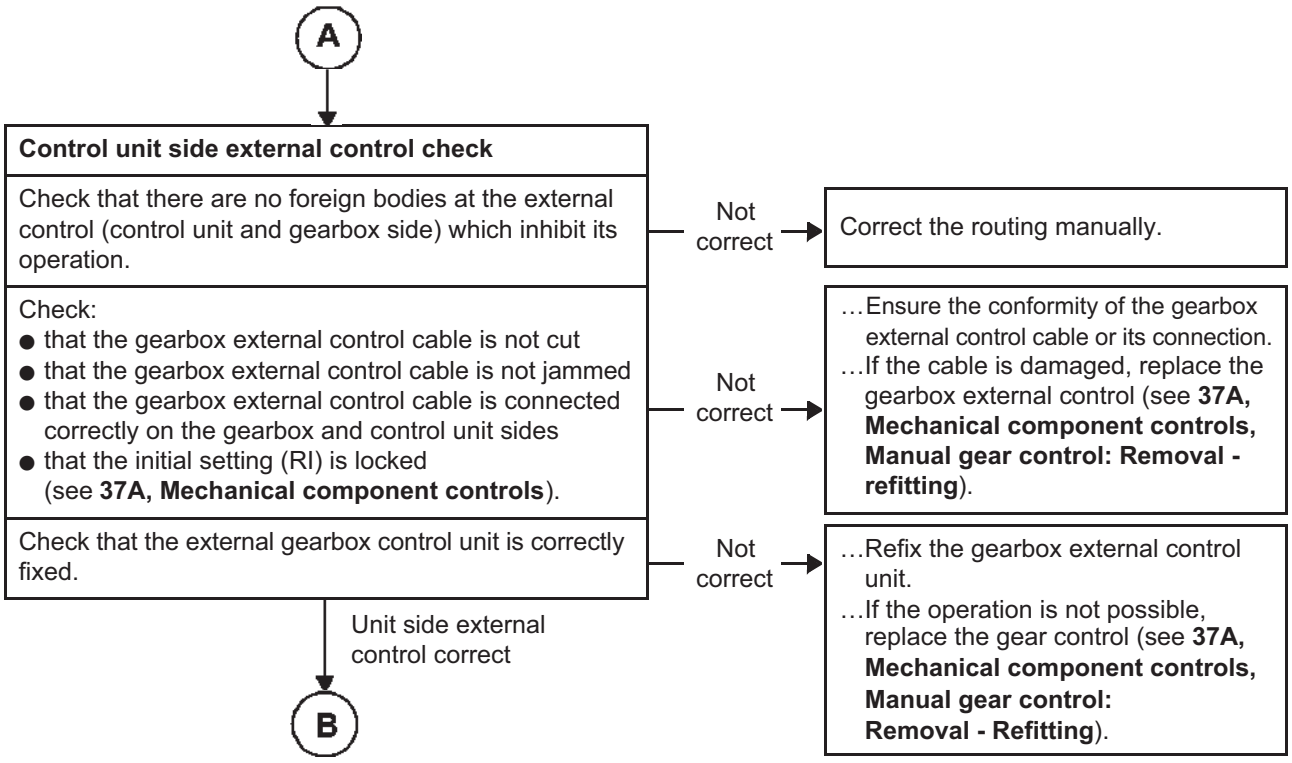


ALP 7	Gearbox locked or ineffective for cable operated gearboxes

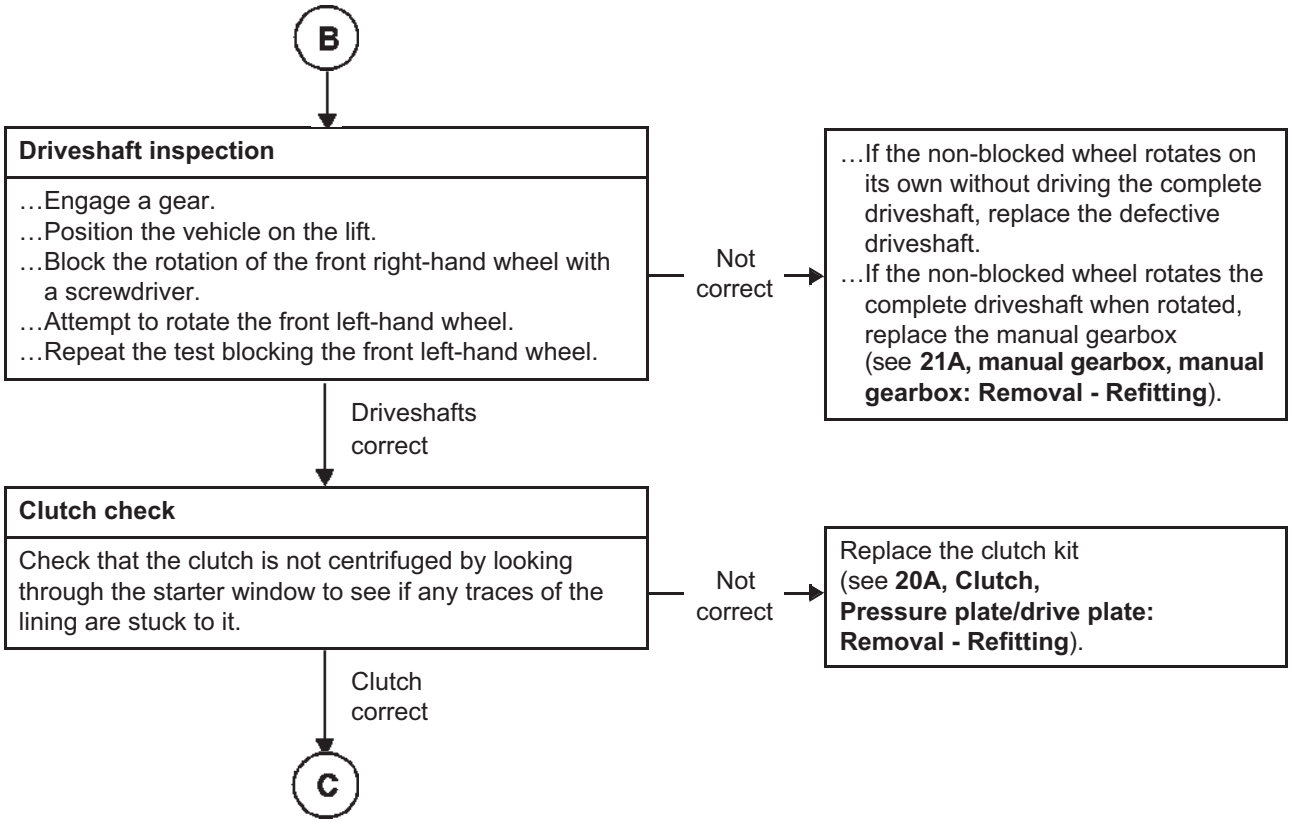
NOTES	…**Before any operations, it is ESSENTIAL to read the entire ALP and the information library (ACTIS solution) relating to the customer complaints.** …**Check that the clutch pedal travel is not obstructed by the floor carpet.** …**The customer notices a difference between the functions changed and those that were retained. Inform the customer of the importance of running in a gearbox.**



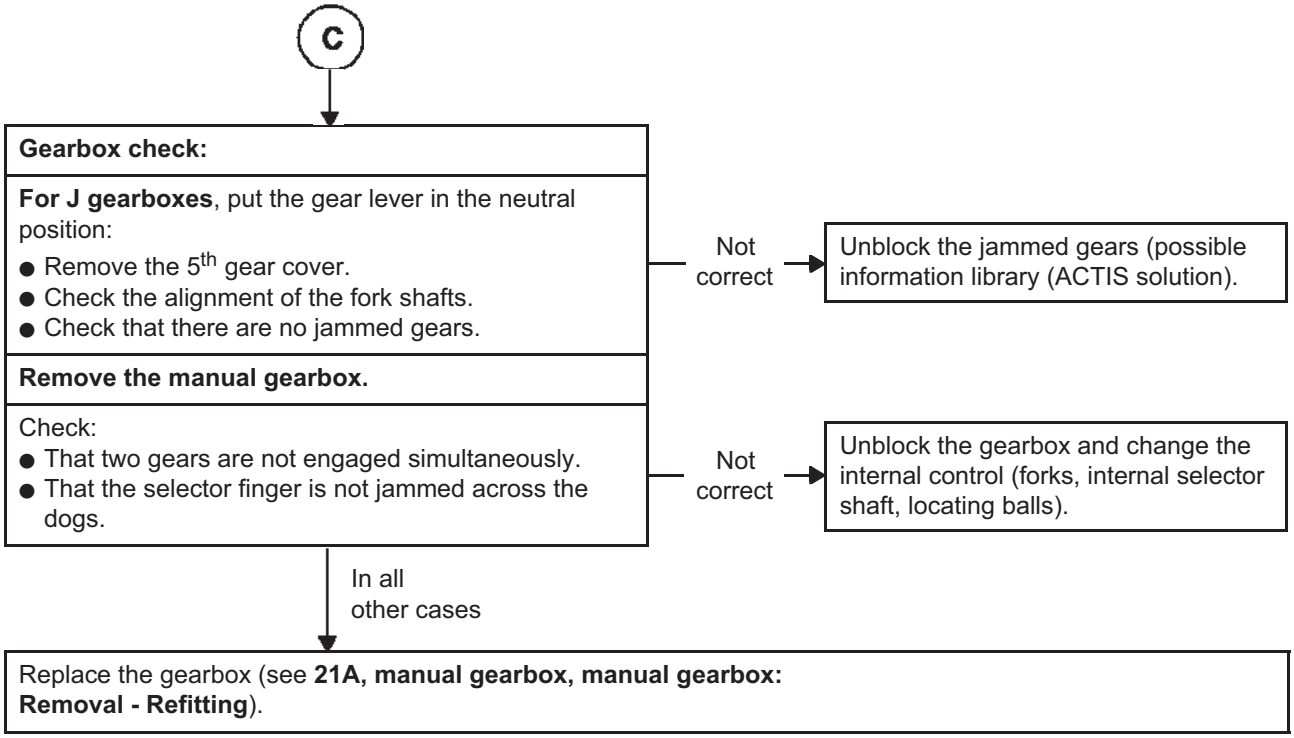
ALP 7 CONTINUED 1	



ALP 7 CONTINUED 2	



ALP 7 CONTINUED 3	



ALP 8	**Gearbox locked or ineffective for rod operated gearboxes**

NOTES	…**Before any operations, it is ESSENTIAL to read the entire ALP and the information library (ACTIS solution) relating to the customer complaints.** …**Check that the clutch pedal travel is not obstructed by the floor carpet.** …**The customer notices a difference between the functions changed and those that were retained. Inform the customer of the importance of running in a gearbox.**

Oil level check

Check the gearbox oil level before any operations.

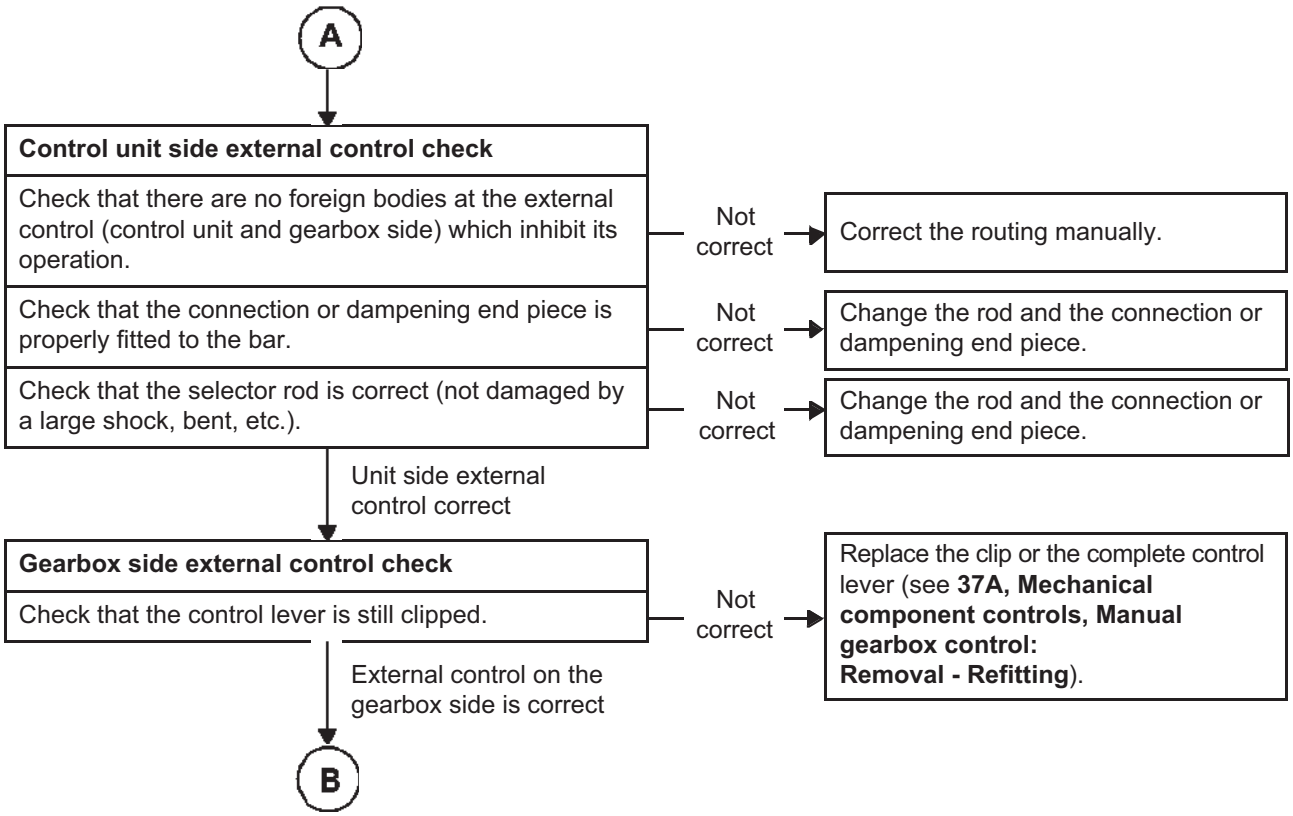
Not correct →

…If more than 0.5 l of oil is missing, replace the gearbox and check there are no leaks after a road test.
…If less than 0.5 l of oil is missing, top up the level (see **21A, manual gearbox, Manual gearbox oils: Draining - Refilling**). If the fault is still present, go on to the next step.

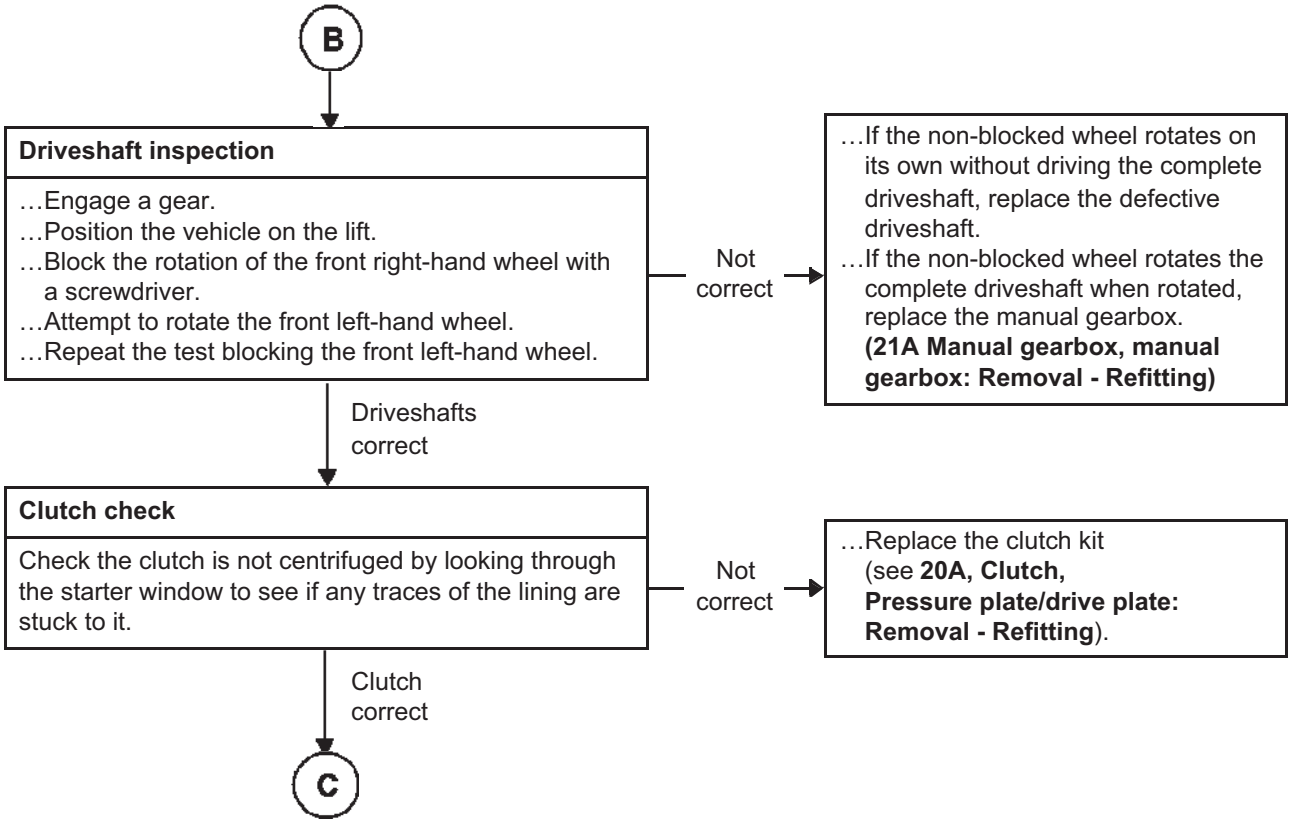
Oil level correct ↓

A

ALP 8 CONTINUED 1	



ALP 8 CONTINUED 2	



ALP 8 CONTINUED 3	

C

Gearbox check

Put gear lever in the neutral position:
- Remove the 5th gear cover.
- Check the alignment of the fork shafts.
- Check that there are no jammed gears.

Not correct → Unblock the jammed gears (possible information library (ACTIS solution)).

Remove the manual gearbox.

Check:
- That two gears are not engaged simultaneously.
- That the selector finger is not jammed across the dogs.

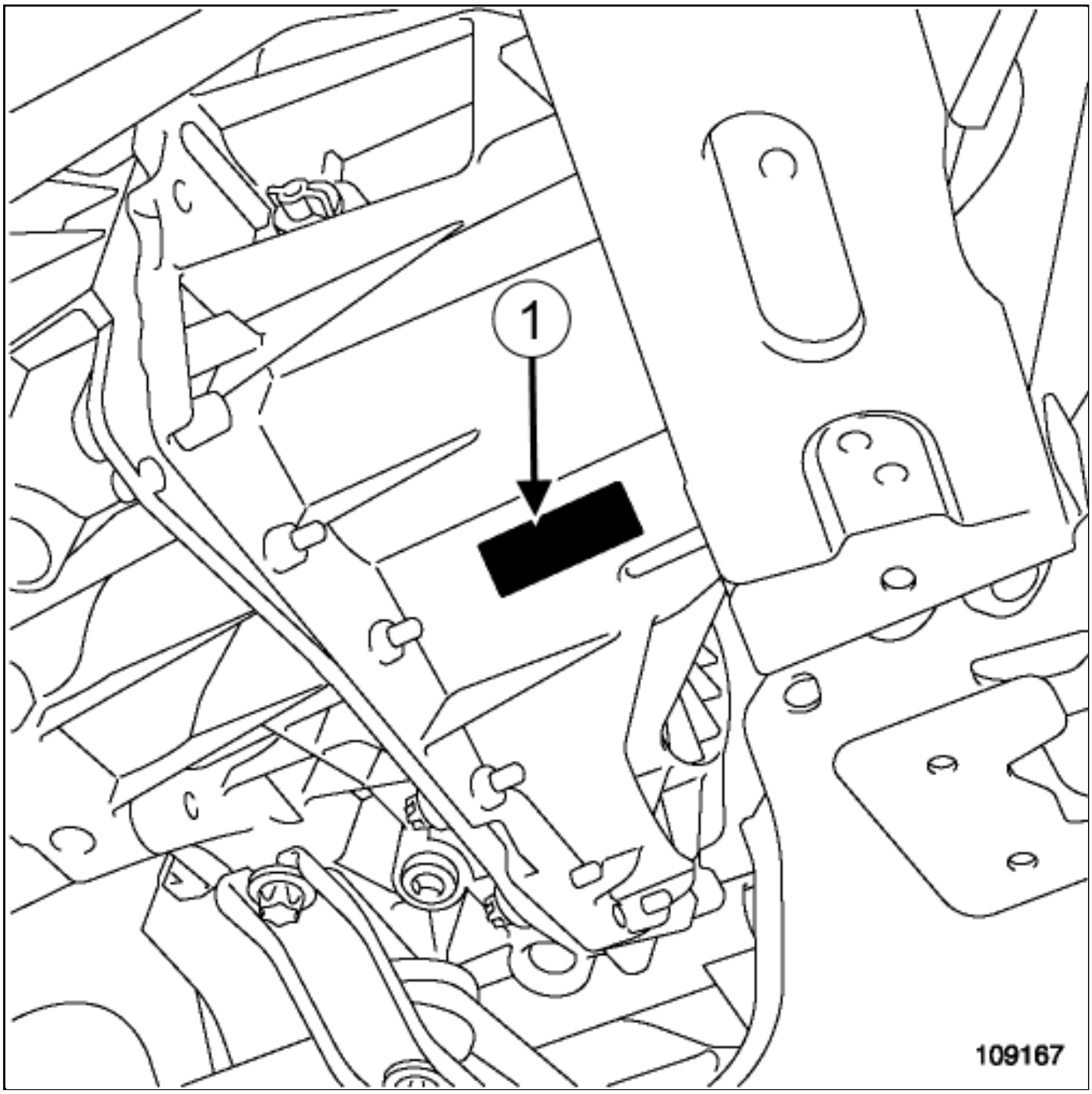
Not correct → Unblock the gearbox and change the internal control (forks, internal selector shaft, locating balls).

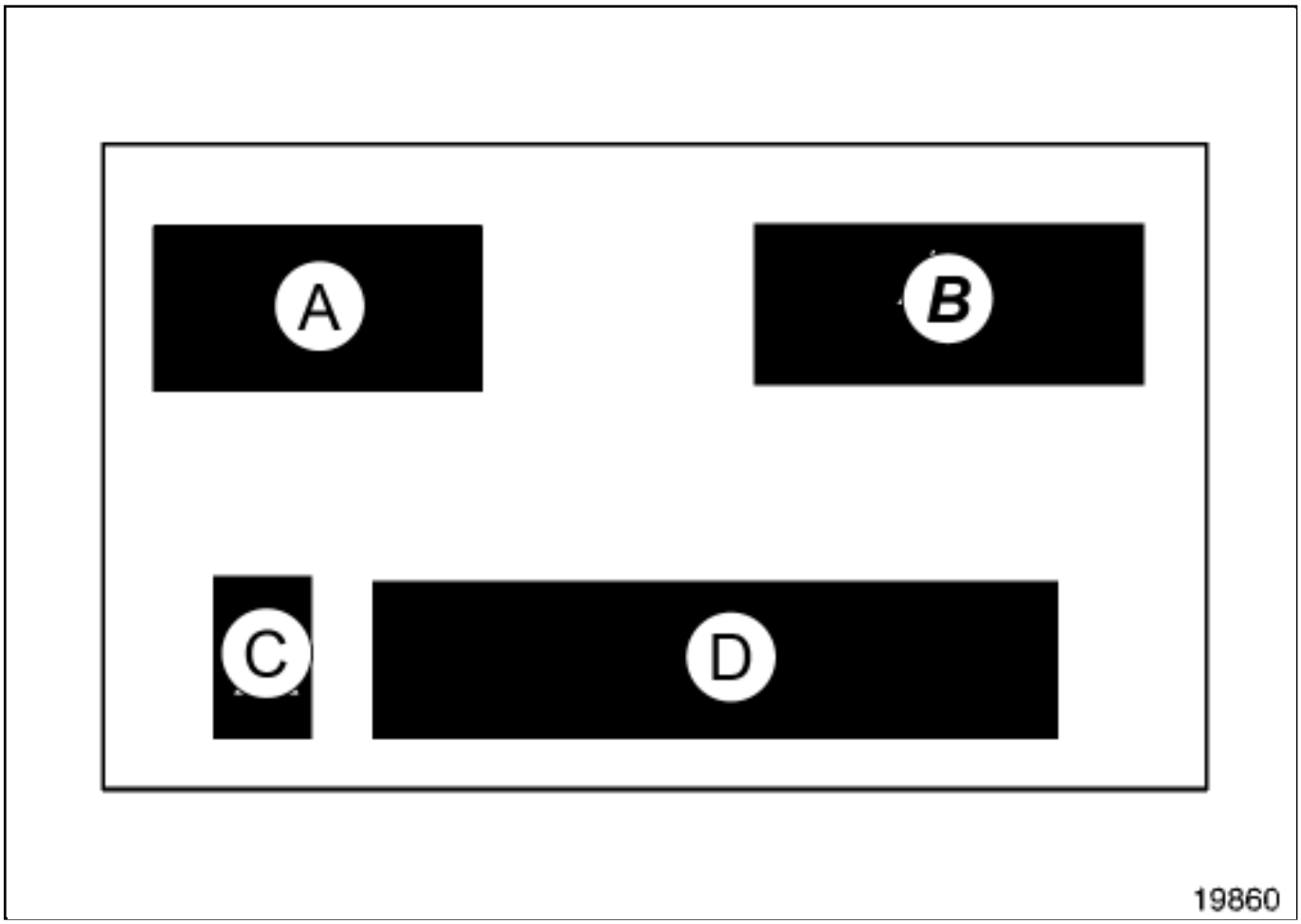
In all other cases

Replace the gearbox (see **21A, manual gearbox, manual gearbox: Removal - Refitting**).

MANUALGEARBOXIDENTIFICATION

A marking(1) on the gearbox casing indicates:



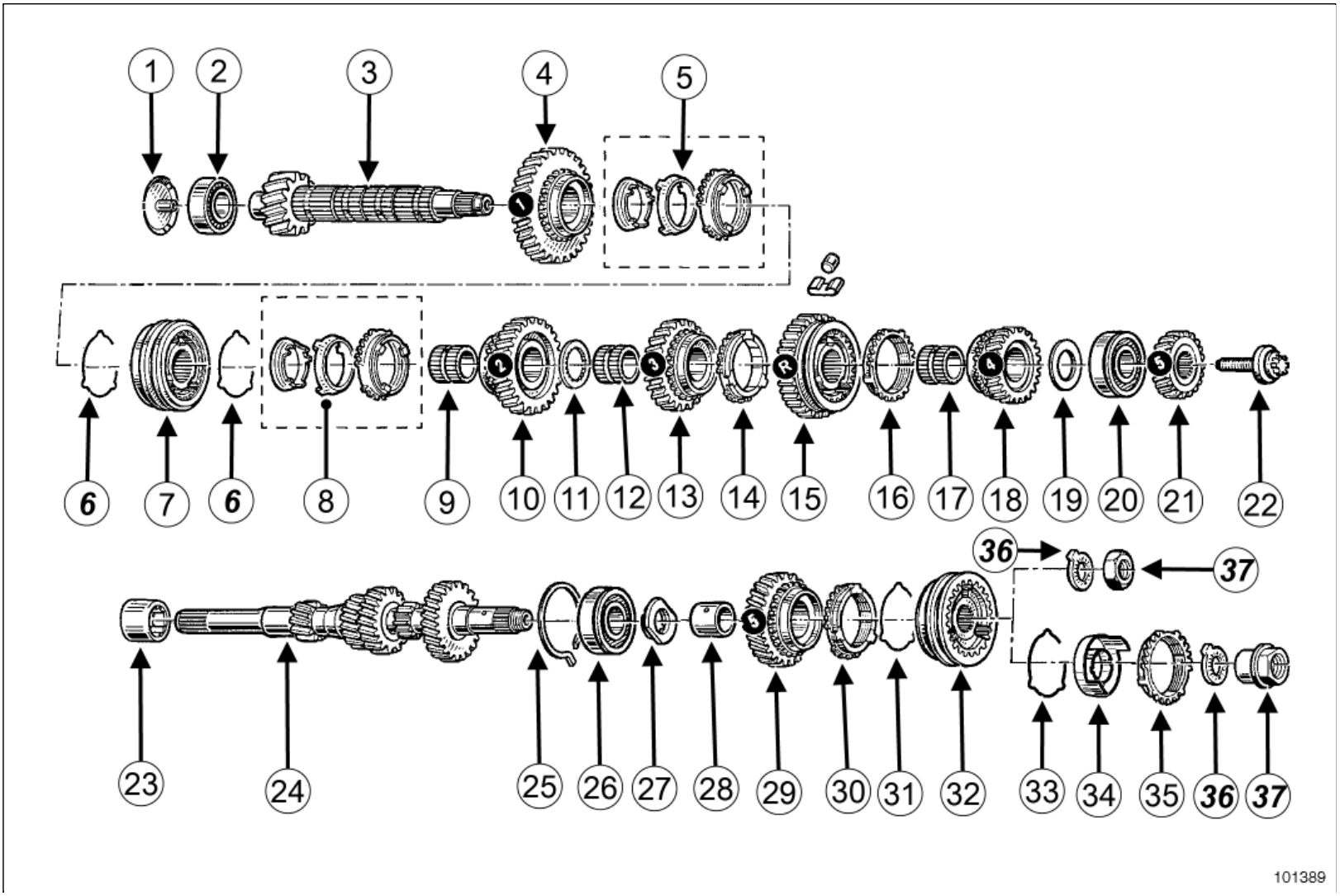


(A) Gearbox type

(B) Gearbox suffix

(C) Production plant

(D) Production number



(1) Oil deflector

(2) Bearing

(3) Output shaft

(4) First gear pinion

(5) Synchromesh ring

(6) Spring

(7) First-second gear synchroniser hub

(8) Synchromesh ring

(9) Sprocket supporting ring

(10) Second gear pinion

(11) Splined washer

(12) Sprocket supporting ring

(13) Third gear pinion

(14) Synchromesh ring

(15) Third-fourth gear synchroniser hub

(16) Synchromesh ring

(17) Sprocket supporting ring

(18) Fourth gear pinion

(19) Adjustment washer

(20) Bearing

(21) Fifth gear pinion

(22) Output shaft bolt

(23) Bearing guide

(24) Primary shaft

(25) Retaining clips

(26) Bearing

(27) Lock washer

(28) Sprocket supporting ring

(29) Fifth gear pinion

(30) Synchromesh ring

(31) Spring

(32) Synchroniser hub

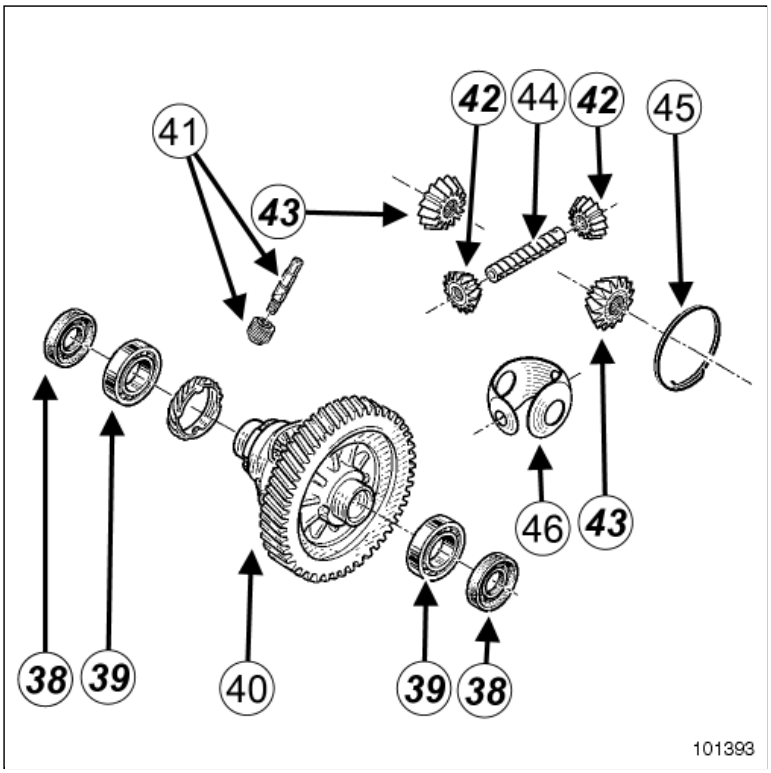
(33) Spring

(34) Friction cone

(35) Synchromesh ring

(36) Washer

(37) Input shaft nut



(38) Differential seal

(39) Bearing

(40) Differential

(41) Tachometer sprocket (if fitted to the vehicle)

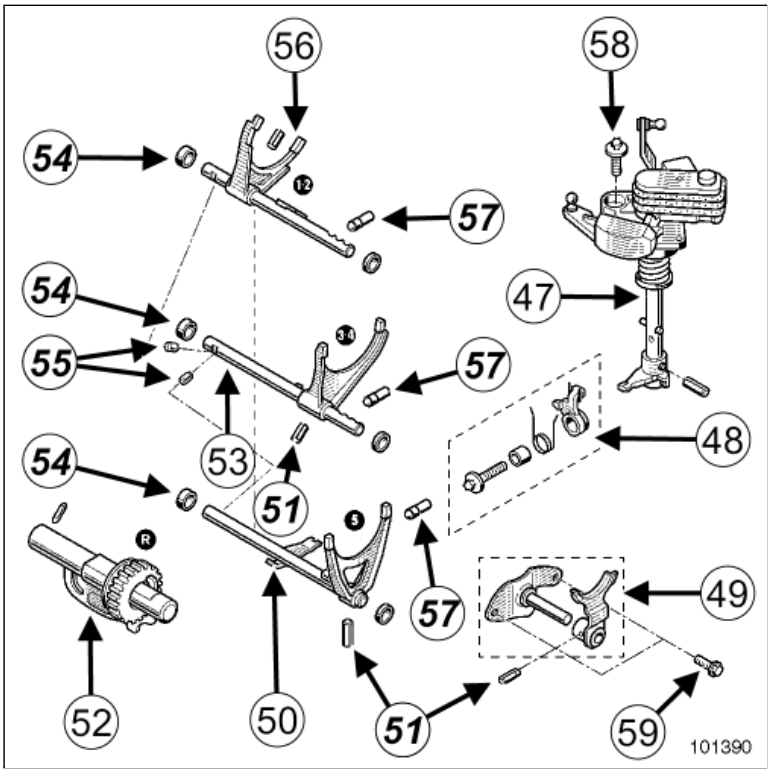
(42) Satellite

(43) Sunwheel

(44) Axis

(45) Shaft retaining spring

(46) Friction cover



(47) Selector shaft

(48) Gear shift catch

(49) Reverse gear brake fork and shaft

(50) Fifth gear fork and shaft

(51) Pin

(52) Reverse gear shaft

(53) Third-fourth gear fork and shaft

(54) Ring

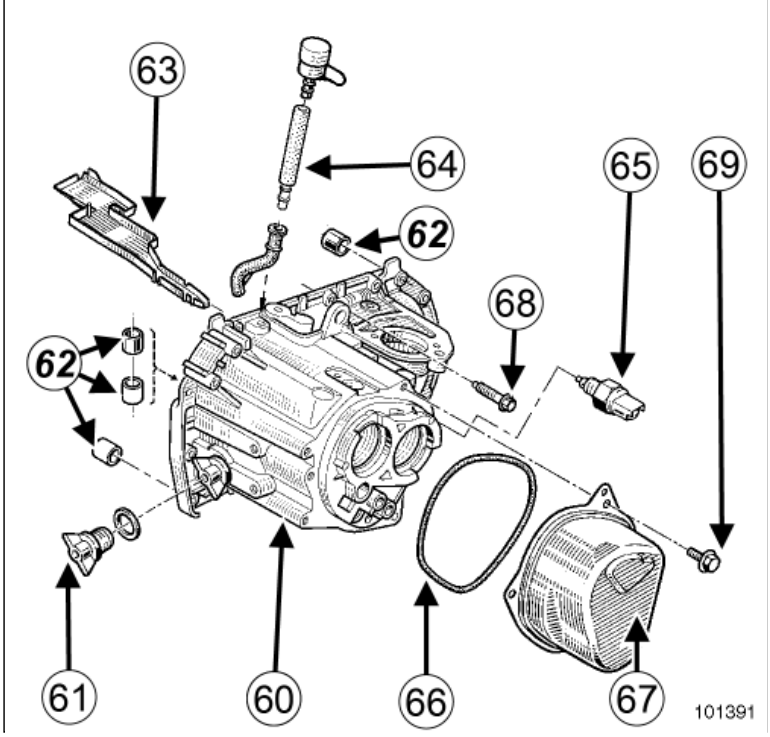
(55) Lock shaft

(56) First-second gear fork and shaft

(57) Retaining locating ball cartridge

(58) Selector shaft bolt

(59) Reverse gear fork shaft bolt



(60) Mechanism housing

(61) Filler plug

(62) Spacer

(63) Oil channel

(64) Breather pipe

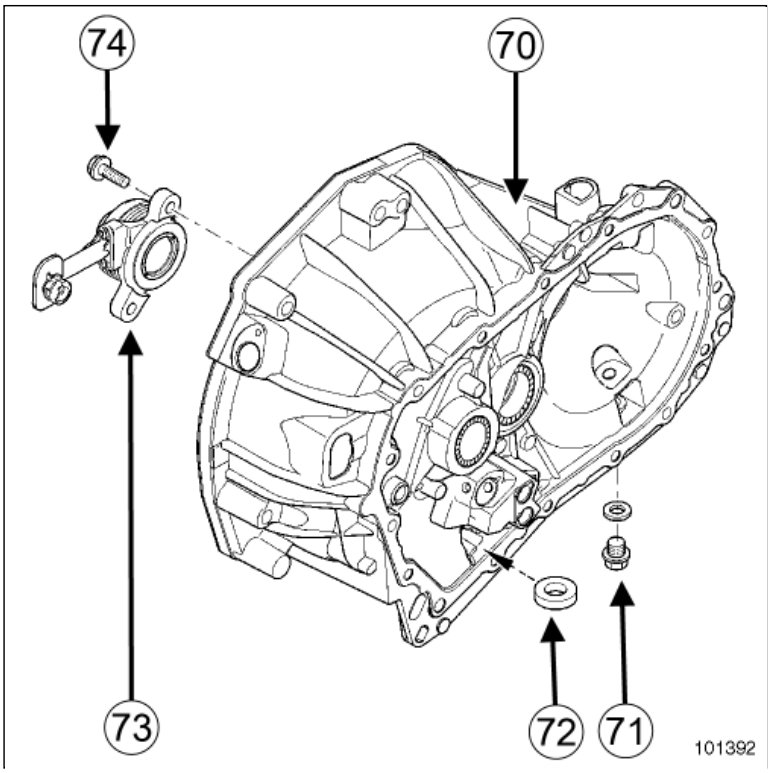
(65) Reverse gear sensor

(66) O-ring

(67) Fifth gear housing

(68) Gearbox bell housing bolt

(69) Fifth gear housing bolt



(70) Clutch housing

(71) Drain plug

(72) Magnet

(73) Hydraulic clutch release bearing

(74) Hydraulic clutch release bearing bolt

MANUAL GEARBOX: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

1. SAFETY

1- GENERAL INFORMATION

This method provides information which will allow you to:

- acquire good knowledge of the component on which you will be working,
- benefit from the best repair conditions,
- obtain optimum component operation and meet customer requirements,
- optimise component repair time.

It is worth taking the time to read this method as you will gain time later on during the repairs.

1)GENERAL RECOMMENDATIONS

Observe basic principles of vehicle repair.

The quality of repair depends first and foremost on the care exercised by the person in carrying it out.

Carry out the operation on the component on a clean working area.

To ensure good repair:

- use the recommended consumables**Vehicle: Parts and consumables for the repair** ,
- use the recommended tools,
- observe the tightening torques,
- observe the recommendations for parts that should always be replaced after removal, refitting or replacement operations,
- clean and degrease the sections to be bonded, to ensure they bond correctly.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

Use professional products and apply them with care, for example do not apply too much sealing paste to the sealing surface to prevent damaging the component.

CAUTION

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid may cause damage to some components.

- Observe the chronological order of the steps:
  - remove the component,
  - clean the component before repairing,
  - remove the part(s) concerned
  - check the part(s) removed,
  - replace faulty part(s) with new part(s),
  - perform the necessary adjustments and/or settings so that the component operates correctly,
  - observe the tightening torques.

Note:

To prevent any pollution and to ensure the quality of the repair, it is strictly forbidden to reuse the drained gearbox oil.

Note:

Ensure sure that the parts removed match up and ensure that they are refitted in the correct order.

2)SPECIAL TOOLING

Use suitable tools which are in good condition (use of "multi-purpose" tools, such as adjustable pliers, etc., should be avoided wherever possible).

For good quality repairs and for working in safe conditions, use only special tooling.

3)SAFETY

Equipment risks:

- The "Note" heading used in the description of the method indicates that particular care should be taken for the operation described.
- The "Important" heading used in the description of the method indicates that there is a risk of damage to the component.

Working safely:

- The "Warning" heading used in the description of the method indicates that particular care should be taken for the operation described and that there is a human risk,
- use supports and adopt a correct posture when performing heavy work or raising loads,
- check that the working area is clean and tidy during the operation,
- use personal protection (gloves, goggles, work shoes, masks, skin protection, etc.),
- do not use harmful products in unventilated rooms,
- do not ingest any chemicals (brake fluid, coolant, etc.).

Respecting the environment:

- sort waste according to its particular qualities,
- do not burn discarded products (tyres, etc.).

4)CONCLUSION

Respecting the recommended methods will guarantee the best performance and reliability of the component.

MANUAL GEARBOX: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Engine anchorage support with multiple adjustments and retaining straps.	Mot. 1453
Additional handle nut for engine lifting support tool Mot. 1453.	Mot. 1453-01

Equipment required
component jack

parts always to be replaced:
Differential output seal
Clutch thrust bearing

WARNING

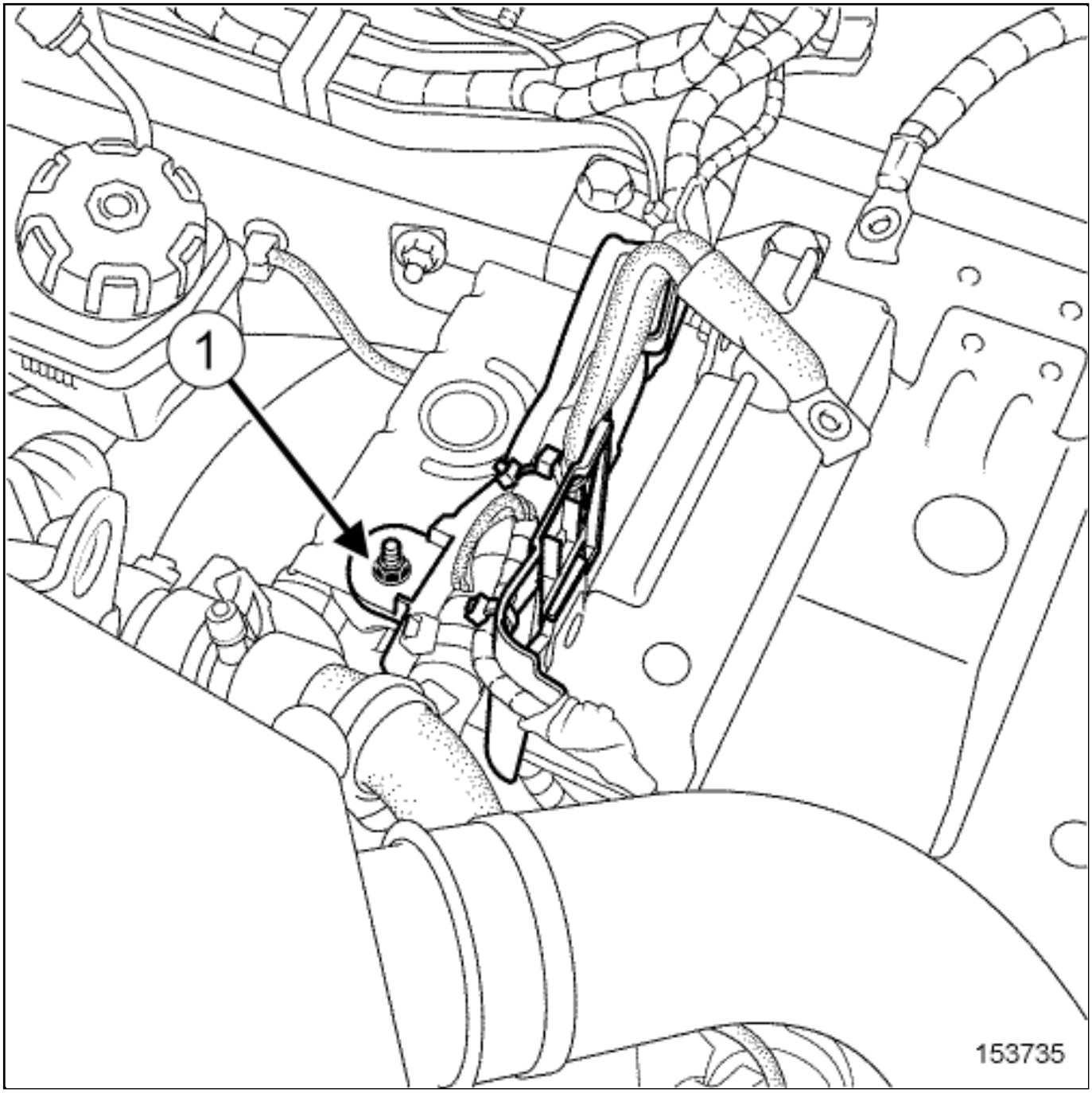
To prevent the vehicle from falling, lash it to the vehicle lift using a strap.

REMOVAL

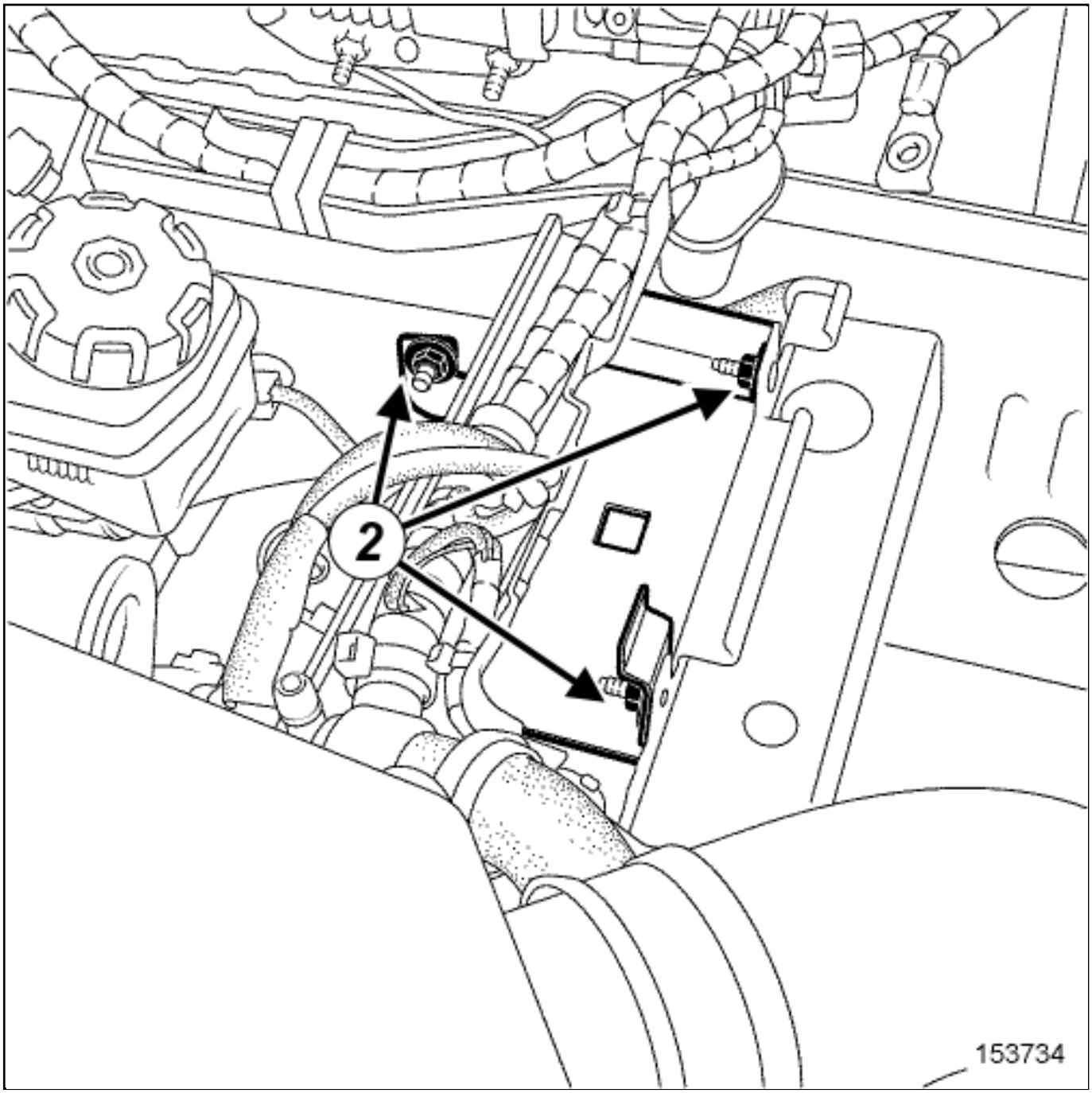
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove:
  - the engine undertray bolts,
  - the engine undertray,
  - the front wheels Wheel: Removal - Refitting ,
  - the front left-hand wheel arch side liner Exterior body front trim assembly: Exploded view ,
  - the front bumper Front bumper assembly: Exploded view .
- Drain the manual gearbox.
- Remove:
  - the battery Battery: Removal - Refitting ,

- the air filter box **Air filter unit: Removal - Refitting** ,
- the intercooler air outlet pipe **Intercooler air outlet pipe: Removal - Refitting** .

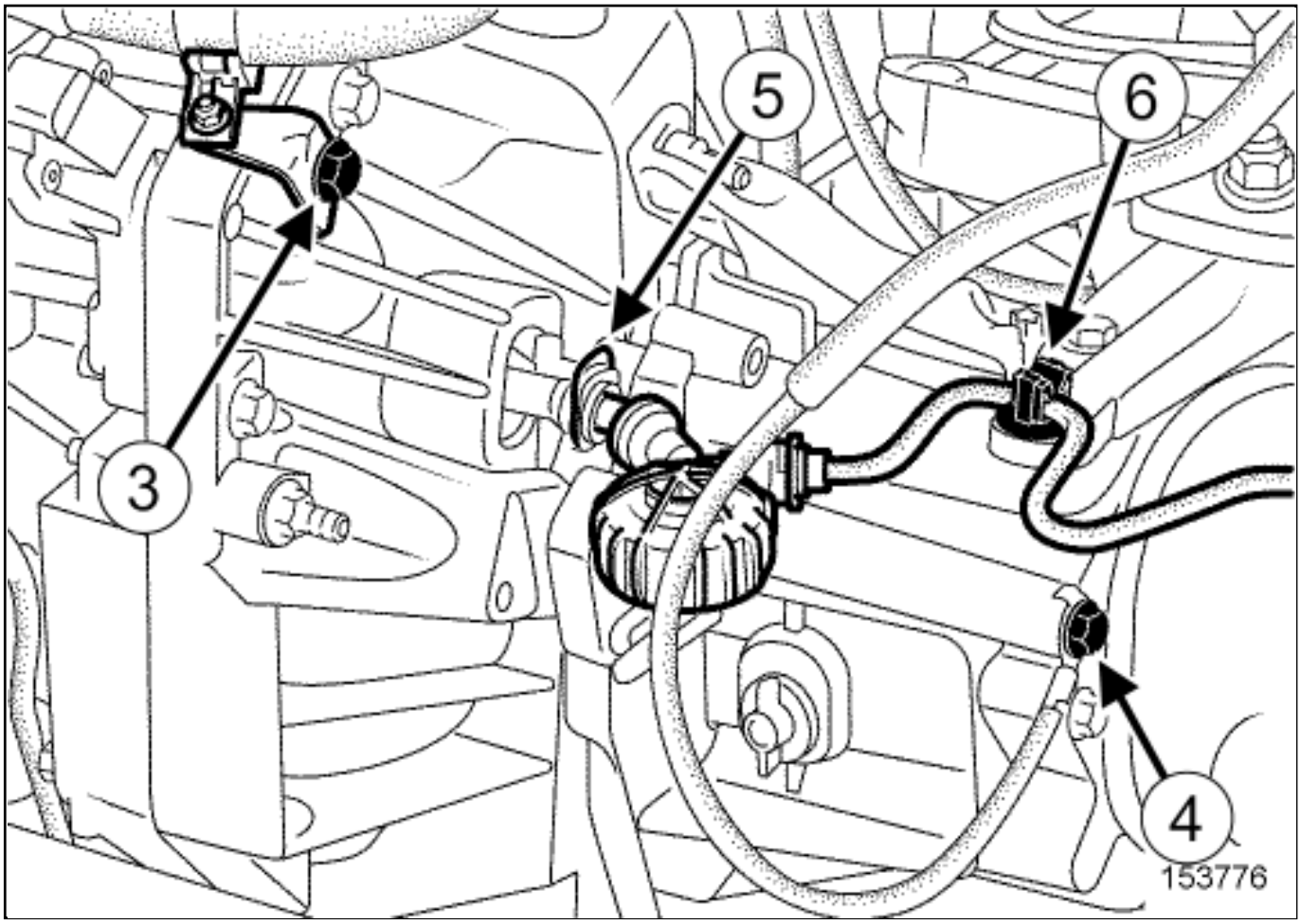


- Remove the nut(1) from the engine wiring channel.
- Move aside the wiring channel.



Remove:

- the air filter unit support nuts(2) ,
- the air filter unit support.

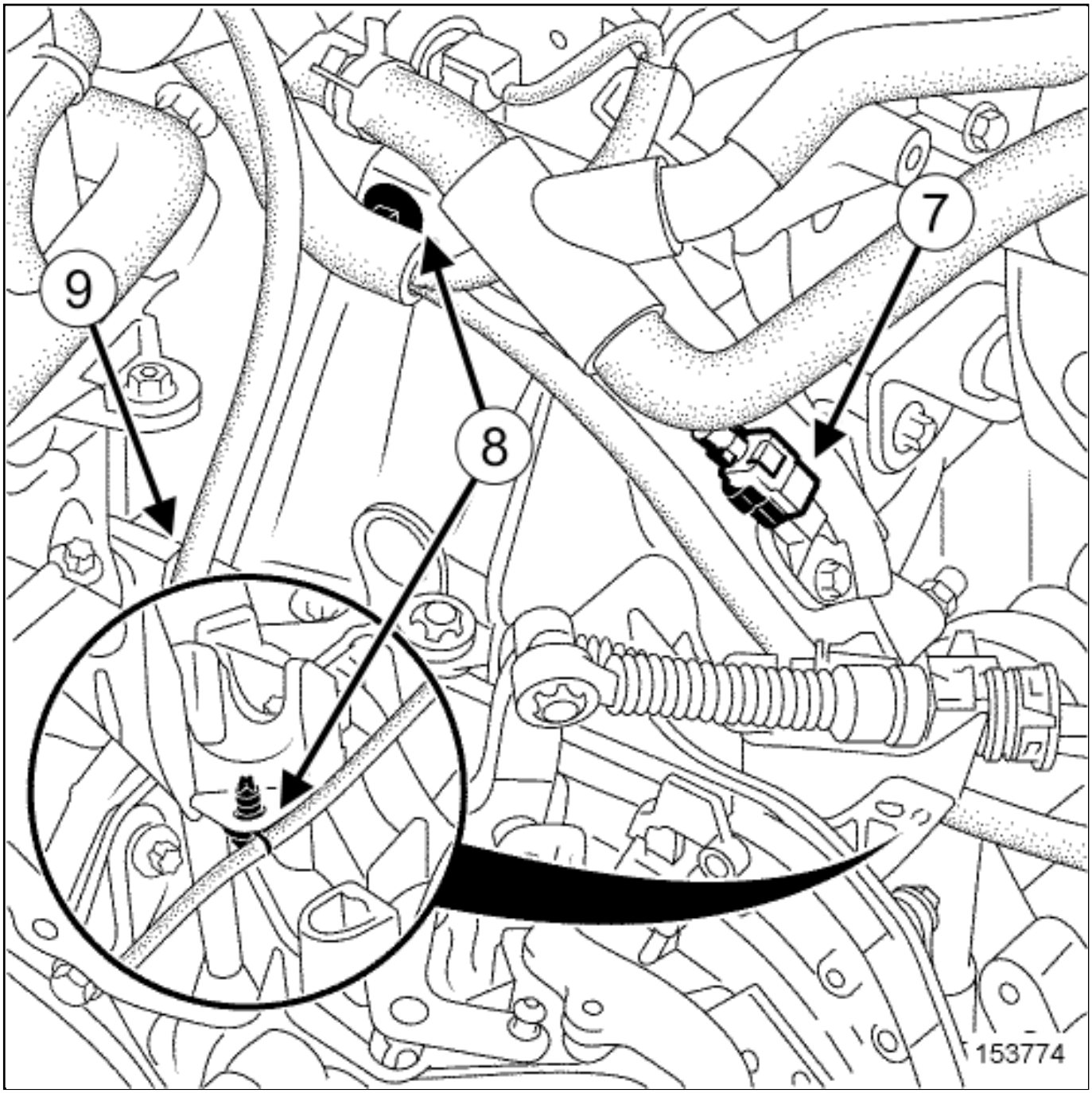


- Remove:
  - the wiring bracket bolt(3) ,
  - the earth cable bolt(4) ,

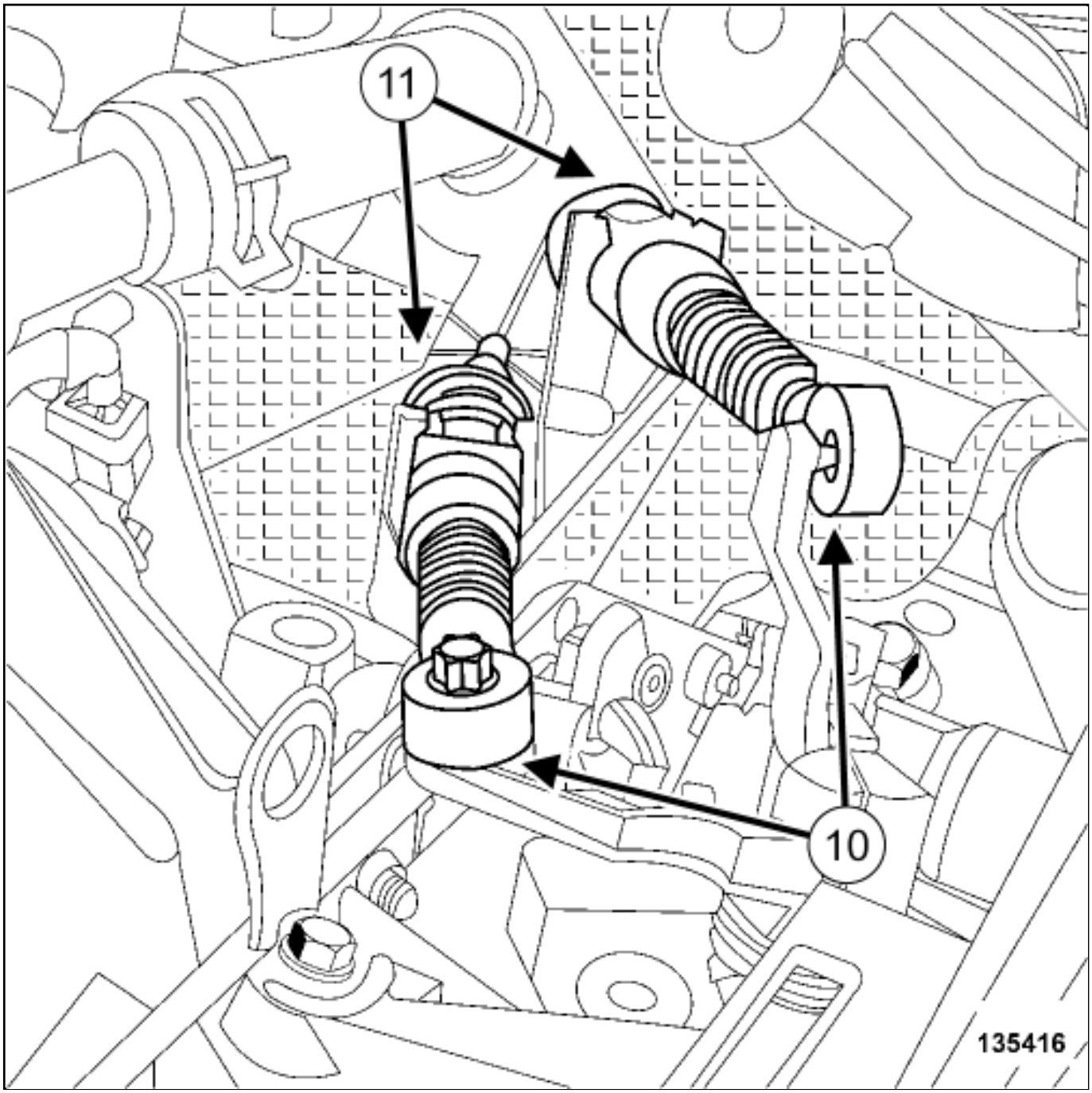
- Disconnect the clutch pipe union from the hydraulic clutch slave cylinder by pressing the clip(5) .

- Fit blanking plugs to the hydraulic clutch pipe openings.

- Unclip the hydraulic clutch control pipe at(6) .



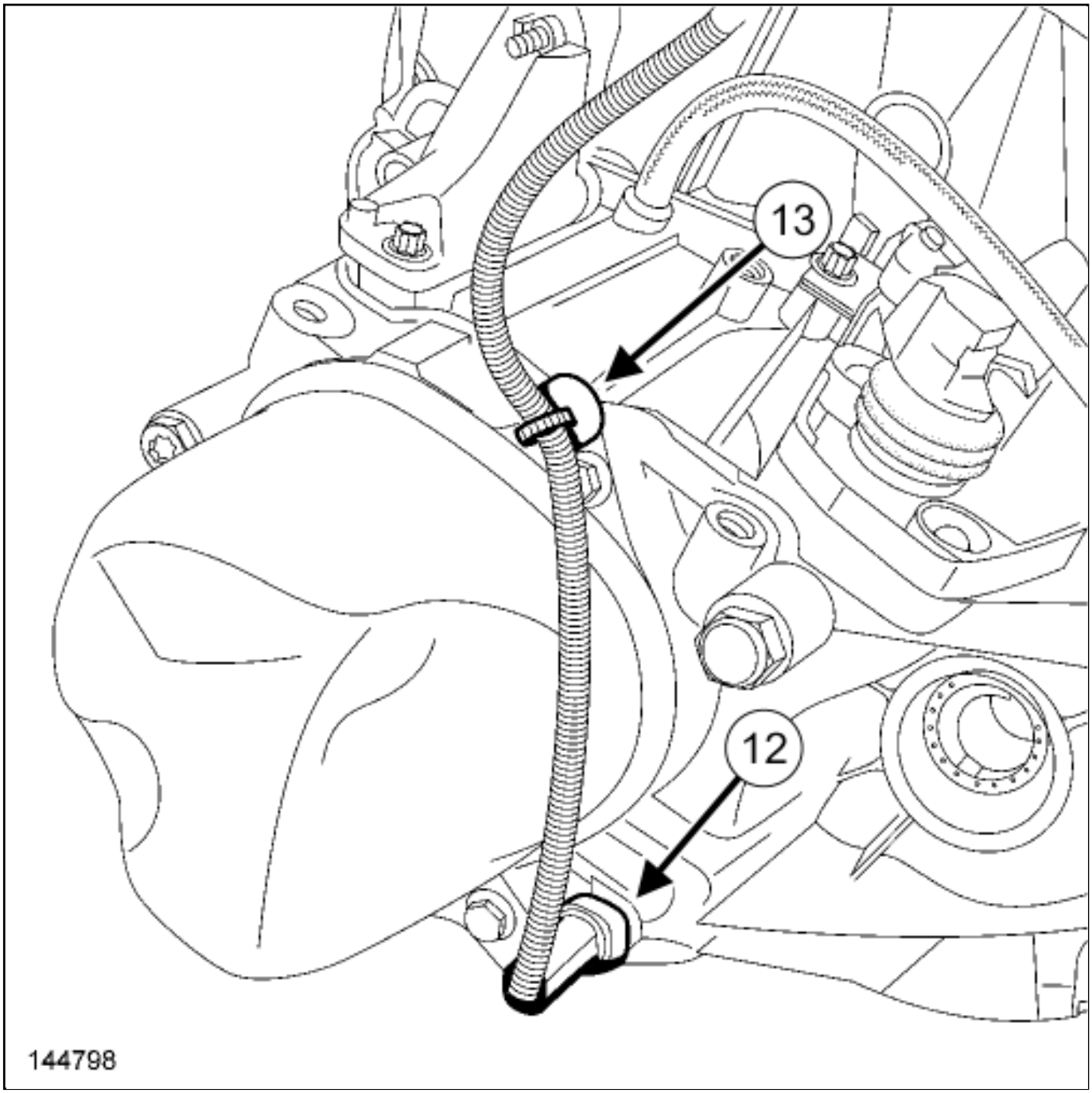
- Disconnect the connector(7) from the crankshaft position sensor.
- Unclip the wiring from the gearbox at(8) .
- Move aside the wiring channel.
- Disconnect the breather pipe(9) from the gearbox.



Unclip:

- the gear control cables(**10**) from the selector ball joints using an open-jawed spanner,
- the gear control cables(**11**) from their support.

Move the gear control cables away from the manual gearbox.



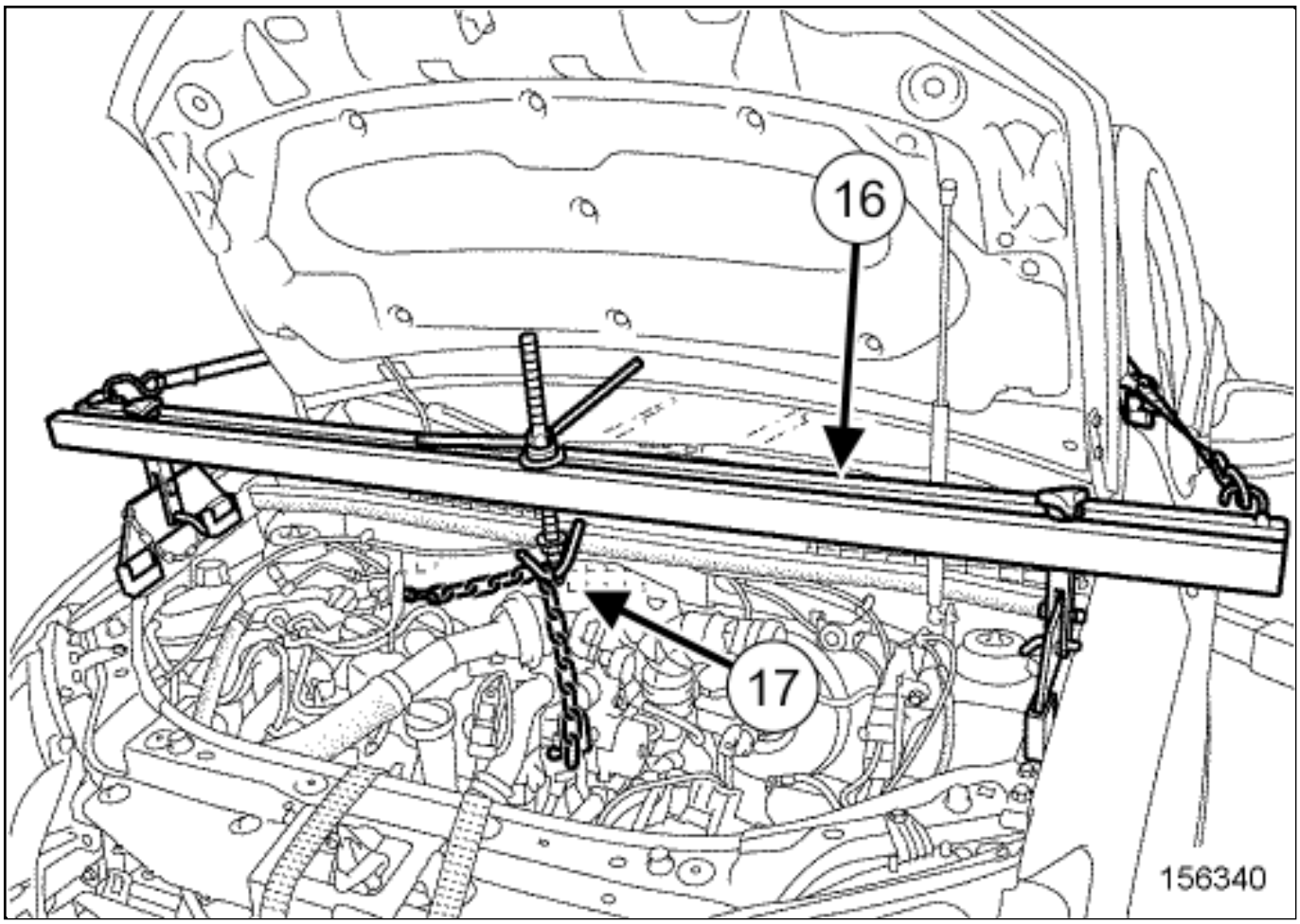
- Disconnect the connector(12) from the reverse gear switch.
- Unclip the reverse gear switch wiring from the manual gearbox at(13) .
- Remove:
  - the starterStarter: Removal - Refitting ,
  - the front left-hand driveshaftFront left-hand driveshaft: Removal - Refitting ,
  - the front right-hand driveshaftFront right-hand driveshaft: Removal - Refitting .
- Remove the steering box universal joint boltSteering assembly: Exploded view .
- Remove Power-assisted steering assembly: Exploded view :

- the high pressure pipe union on the steering box,
- the low pressure pipe union on the steering box.

Fit blanking plugs in the pipe openings.

Remove:

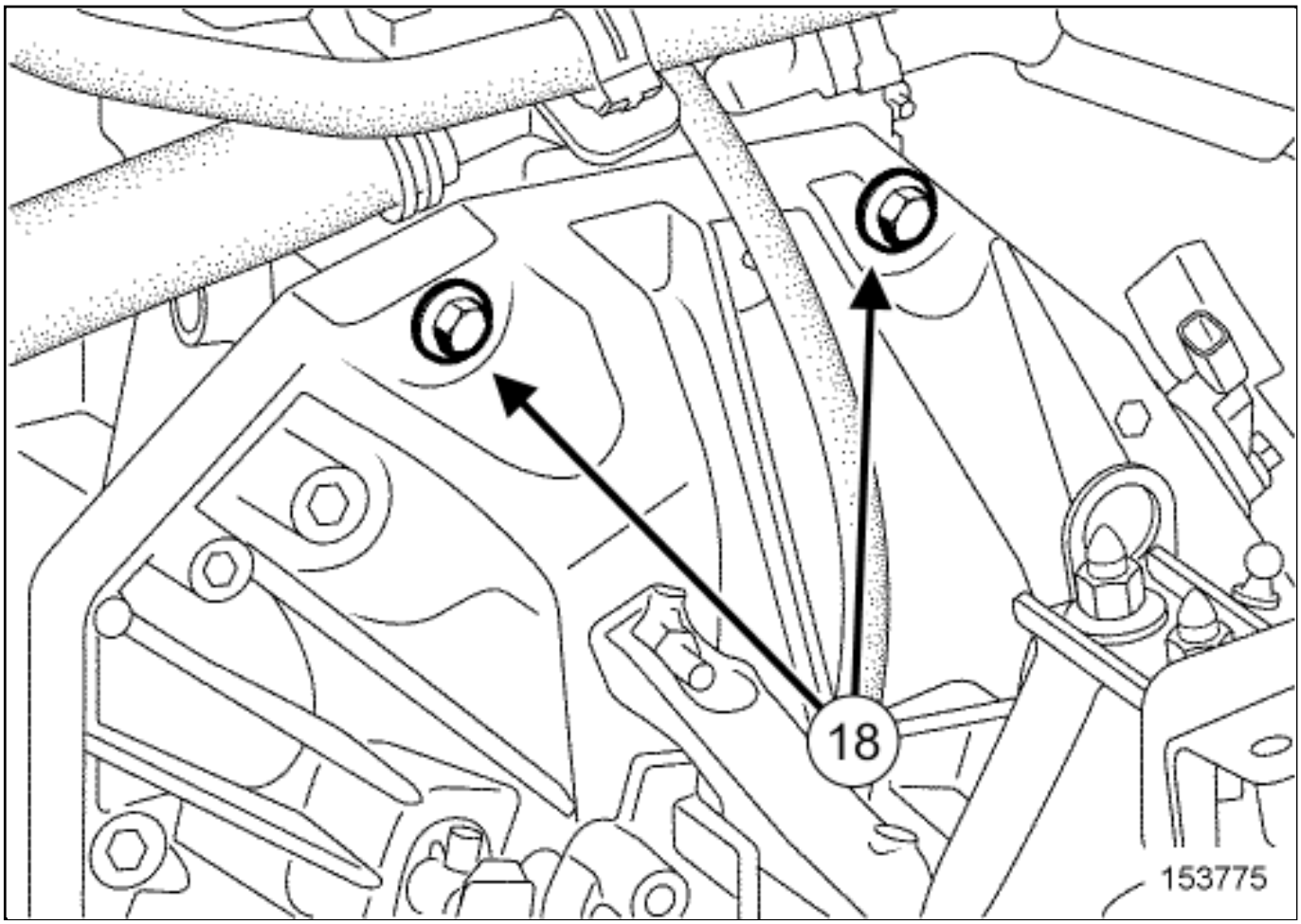
- the lower engine tie-bar Engine-gearbox unit support assembly: Exploded view ,
- the front axle subframe Front axle assembly: Exploded view .



Fit the Engine anchorage support with multiple adjustments and retaining straps.(Mot. 1453) (16) fitted with the Additional handle nut for engine lifting support tool Mot. 1453.(Mot. 1453-01) (17) .

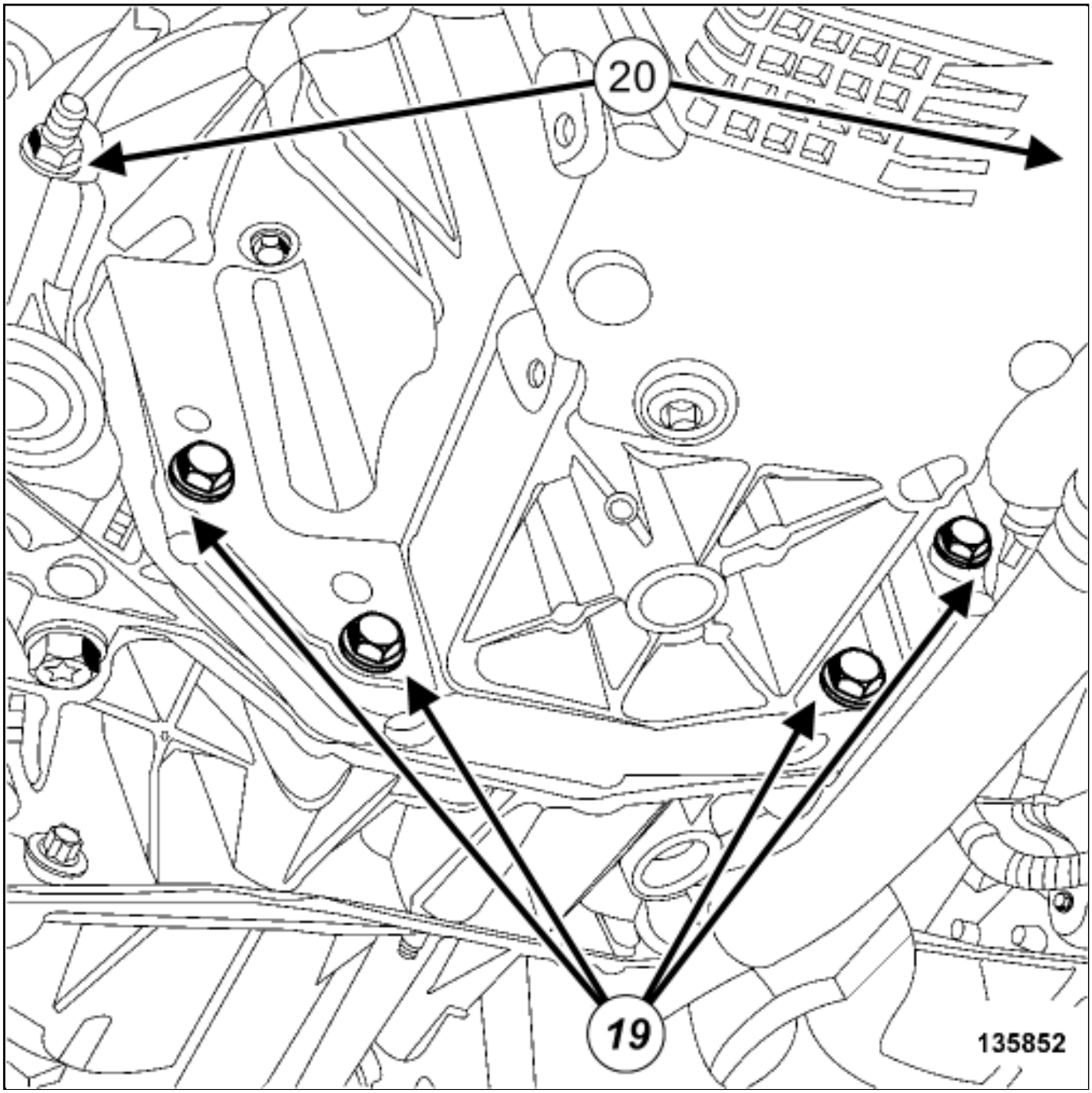
Remove the left-hand suspended engine mounting Engine-gearbox unit support assembly: Exploded view .

2. REMOVAL OPERATION



Remove the manual gearbox upper bolts(18) .

Slightly lower the engine using the toolEngine anchorage support with multiple adjustments and retaining straps. (Mot. 1453) in order to detach the gearbox.



Remove the gearbox lower bolts(19) .

Fit a component jackunder the gearbox.

Remove:

- the gearbox nuts(20) ,

- the gearbox using a component jack,
- the clutch slave cylinder mounting bolts Clutch assembly: Exploded view ,
- the clutch slave cylinder Clutch assembly: Exploded view ,
- the differential output seals (see 21A, Manual gearbox , Differential output seal: Removal - Refitting) .

1- IF REPLACING THE GEARBOX

Remove:

- the reverse gear switch (see 21A, Manual gearbox , Reverse gear switch: Removal - Refitting) ,
- the crankshaft position sensor (see **Crankshaft position sensor: Removal - Refitting**) .

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Differential output seal .

parts always to be replaced: Clutch thrust bearing .

CAUTION

To avoid damaging the slave cylinder, do not coat the gearbox output shaft with grease.

CAUTION

Do not grease the clutch shaft splines.

Check that there are centring rings in place on the manual gearbox.

1- IF REPLACING THE GEARBOX

Refit:

- the crankshaft position sensor(see **Crankshaft position sensor: Removal - Refitting**) ,
- the reverse gear switch(see 21A, Manual gearbox , Reverse gear switch: Removal - Refitting) .

2. REFITTING OPERATION

Refit:

- the differential output seals(see 21A, Manual gearbox , Differential output seal: Removal - Refitting) ,
- the clutch slave cylinderClutch assembly: Exploded view ,
- the clutch slave cylinder mounting boltsClutch assembly: Exploded view ,
- the gearbox using a component jack.

Remove the component jack.

Torque tighten:

- the manual gearbox nuts44 N.m,

- the manual gearbox bolts44 N.m,
- the manual gearbox earth cable bolt44 N.m.

Proceed in the reverse order to removal.

Perform the following operations:

- fill up the gearbox,
- fill and bleed the power-assisted steering circuitPower-assisted steering circuit: Bleeding ,
- bleed the clutch circuitClutch circuit: Bleed .

MANUALGEARBOX:REPAIR

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 21A, Manual gearbox , Manual gearbox: Precautions for the repair)** .

REMOVAL

1. REPAIR PREPARATION OPERATION

- Remove the gearbox**Manual gearbox: Removal - Refitting** .

- Position the gearbox on the component support**(see 21A, Manual gearbox , Gearbox support equipment: Use)** .

2. REMOVAL OPERATION

- Remove:
  - the fifth gear housing**5th gear housing: Removal - Refitting** ,
  - the fifth gear synchroniser and pinions**5th gear sprockets and synchronisers: Removal - Refitting** ,
  - the mechanism housing**(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting)** ,
  - the gearbox shafts**(see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting)** ,
  - the differential**(see 21A, Manual gearbox , Manual gearbox differential: Removal - Refitting)** .

3. REPAIR OPERATION

- Strip down the output shaft**(see 21A, Manual gearbox , Output shaft: Stripping - Rebuilding)** .

Remove:

- the differential bearings (see 21A, Manual gearbox , Manual gearbox differential bearing: Removal - Refitting) ,
- the bearings of the mechanism housing (see 21A, Manual gearbox , Mechanism housing bearing: Removal - Refitting) ,
- the bearings of the clutch housing (see 21A, Manual gearbox , Clutch housing bearing: Removal - Refitting) ,
- the gearbox selector shaft (see 21A, Manual gearbox , Manual gearbox selector shaft: Removal - Refitting) .

Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean all of the removed parts.

Check (see 21A, Manual gearbox , Manual gearbox: Check) :

- the pinions (teeth, claws, friction cone, inner wall),
- the synchroniser hubs,
- the synchroniser rings,
- the bearings.

Replace worn or damaged parts.

REFITTING

1. REFITTING PREPARATION OPERATION

Parts always to be replaced:

- the lip seals,
- the O-rings,
- the clutch thrust bearing guide,
- the gear lock rings,
- the roll pins,
- the input and output shaft bearing circlips,
- the selector rod hub springs,
- the hydraulic clutch slave cylinder (if fitted),
- the magnet,
- the selector shaft rings,
- the lock ring of the differential,
- the differential retaining nut.

2. REFITTING OPERATION

Refit:

- the gearbox selector shaft (see 21A, Manual gearbox , Manual gearbox selector shaft: Removal - Refitting) ,
- the bearings of the clutch housing (see 21A, Manual gearbox , Clutch housing bearing: Removal - Refitting) ,
- the bearings of the mechanism housing (see 21A, Manual gearbox , Mechanism housing bearing: Removal - Refitting) ,
- the differential bearings (see 21A, Manual gearbox , Manual gearbox differential bearing: Removal - Refitting) .

Rebuild the output shaft (see 21A, Manual gearbox , Output shaft: Stripping - Rebuilding) .

3. REMOVAL OPERATION

Refit:

- the differential (see 21A, Manual gearbox , Manual gearbox differential: Removal - Refitting) ,
- the gearbox shafts (see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) .

Adjust the shafts (see 21A, Manual gearbox , Gearbox shaft: Adjustment) if replacing a shaft or housing.

Refit:

- the mechanism housing (see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
- the fifth gear synchroniser and pinions 5th gear sprockets and synchronisers: Removal - Refitting ,
- the fifth gear housing 5th gear housing: Removal - Refitting .

4. FINAL OPERATION

Remove the gearbox from the component support (see 21A, Manual gearbox , Gearbox support equipment: Use) .

Refit the gearbox Manual gearbox: Removal - Refitting .

MANUAL GEARBOX SELECTOR SHAFT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 21A, Manual gearbox , Manual gearbox: Precautions for the repair)** .

REMOVAL

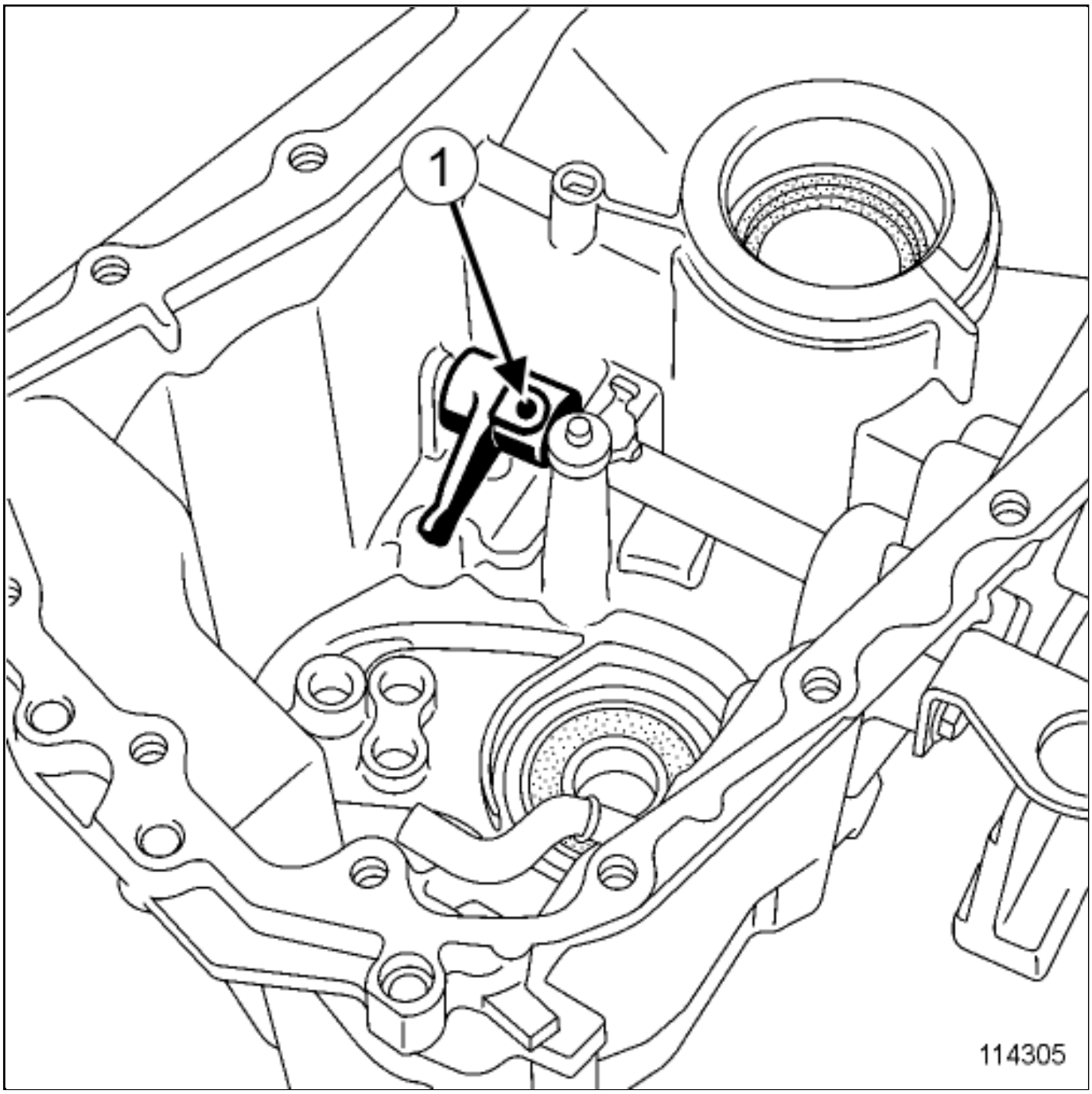
1. REMOVAL PREPARATION OPERATION

- Remove the gearbox**Manual gearbox: Removal - Refitting** .

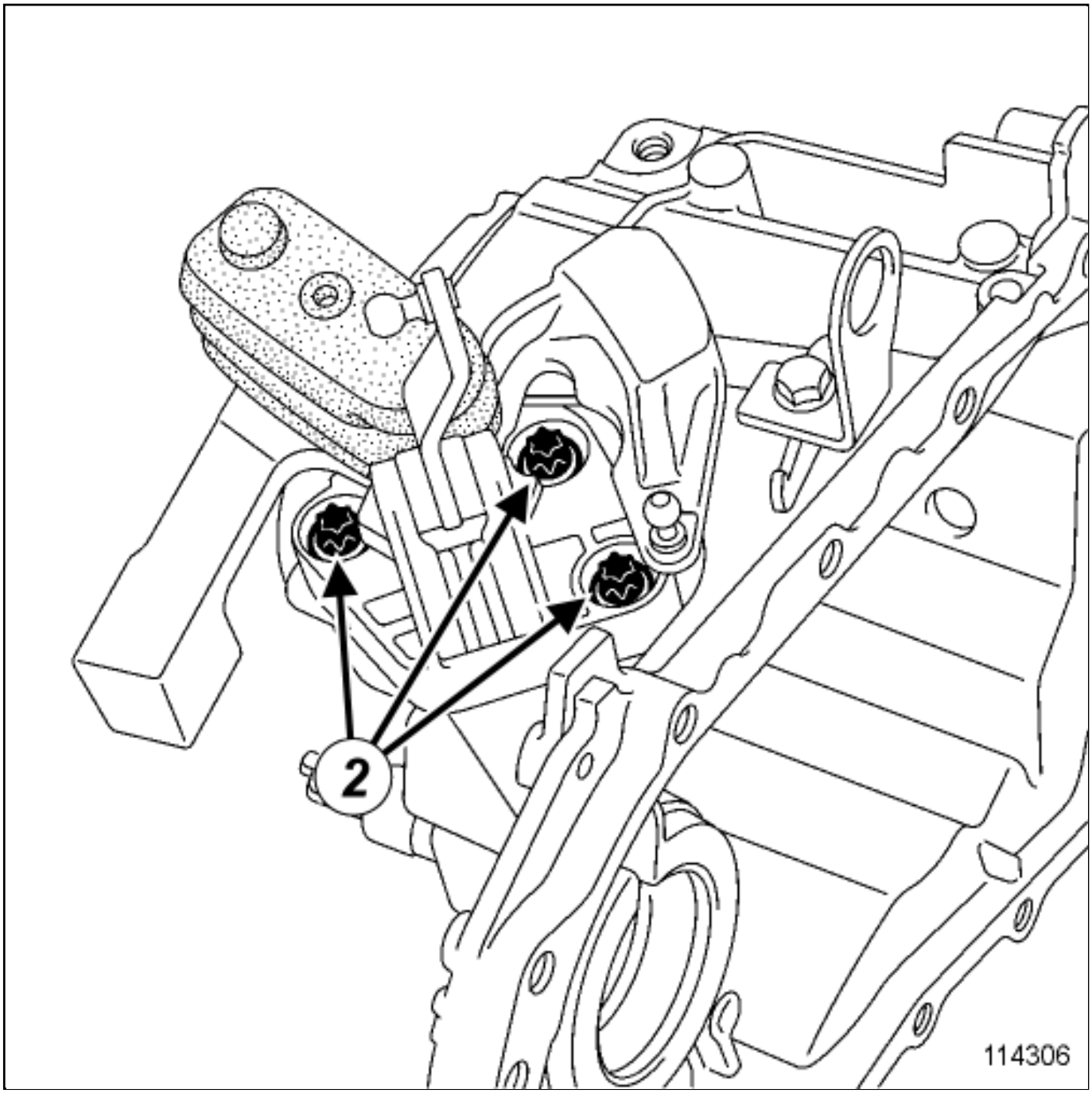
- Position the gearbox on the component support**(see 21A, Manual gearbox , Gearbox support equipment: Use)** .

- Remove:
  - the fifth gear housing**5th gear housing: Removal - Refitting** ,
  - the fifth gear synchroniser and pinions**5th gear sprockets and synchronisers: Removal - Refitting** ,
  - the mechanism housing**(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting)** ,
  - the gearbox shafts**(see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting)** ,
  - the differential**(see 21A, Manual gearbox , Manual gearbox differential: Removal - Refitting)** .

2. OPERATION FOR REMOVAL OF PART CONCERNED

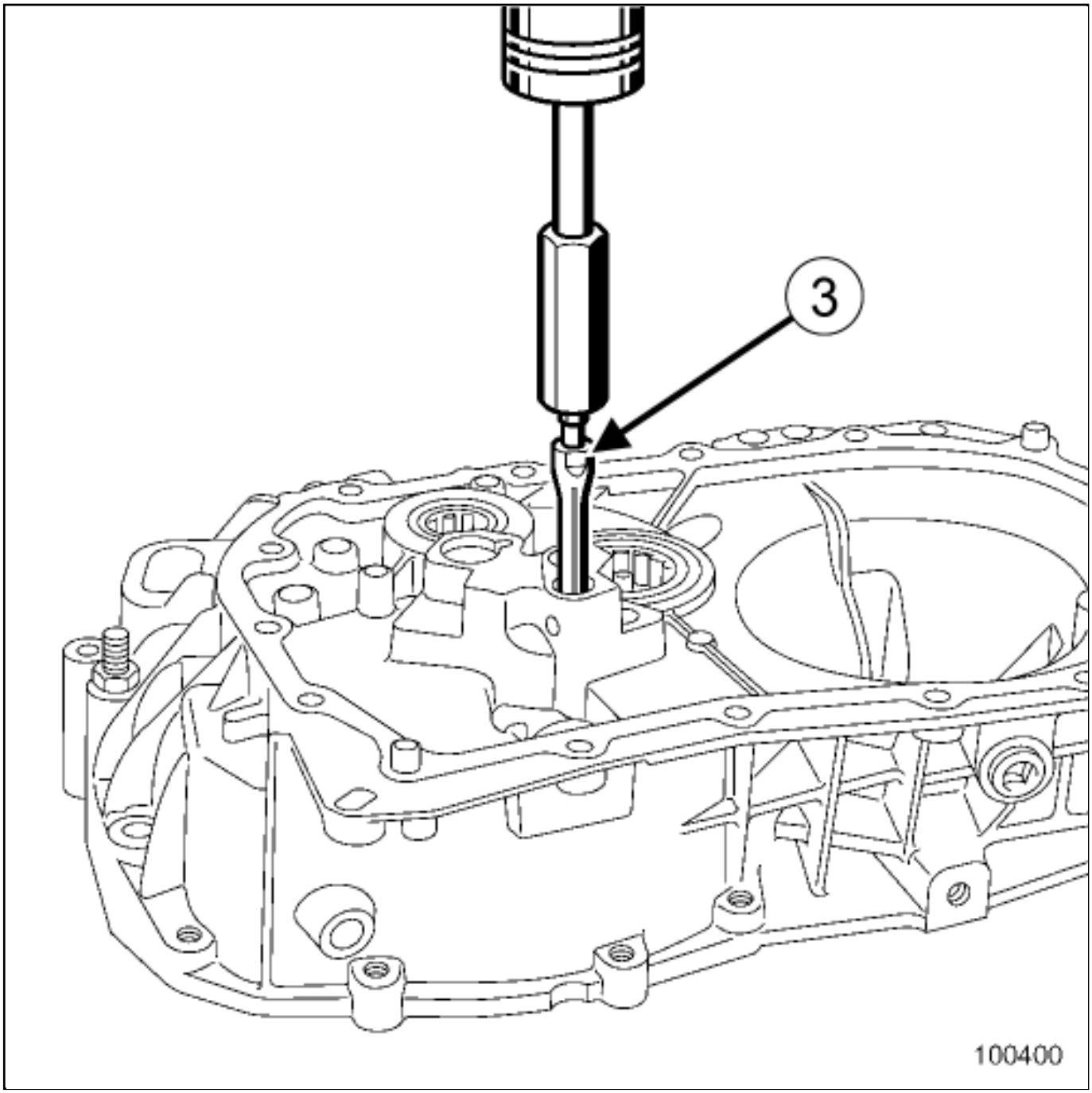


- Unpin the selector finger(1) .



Remove:

- the bolts(2) of the control assembly,
- the control assembly.



Extract the gearbox selector shaft rings using a slide hammer(3) .

REFITTING

1. REFITTING PREPARATION OPERATION

Use SURFACE CLEANERVehicle: Parts and consumables for the repair to clean:

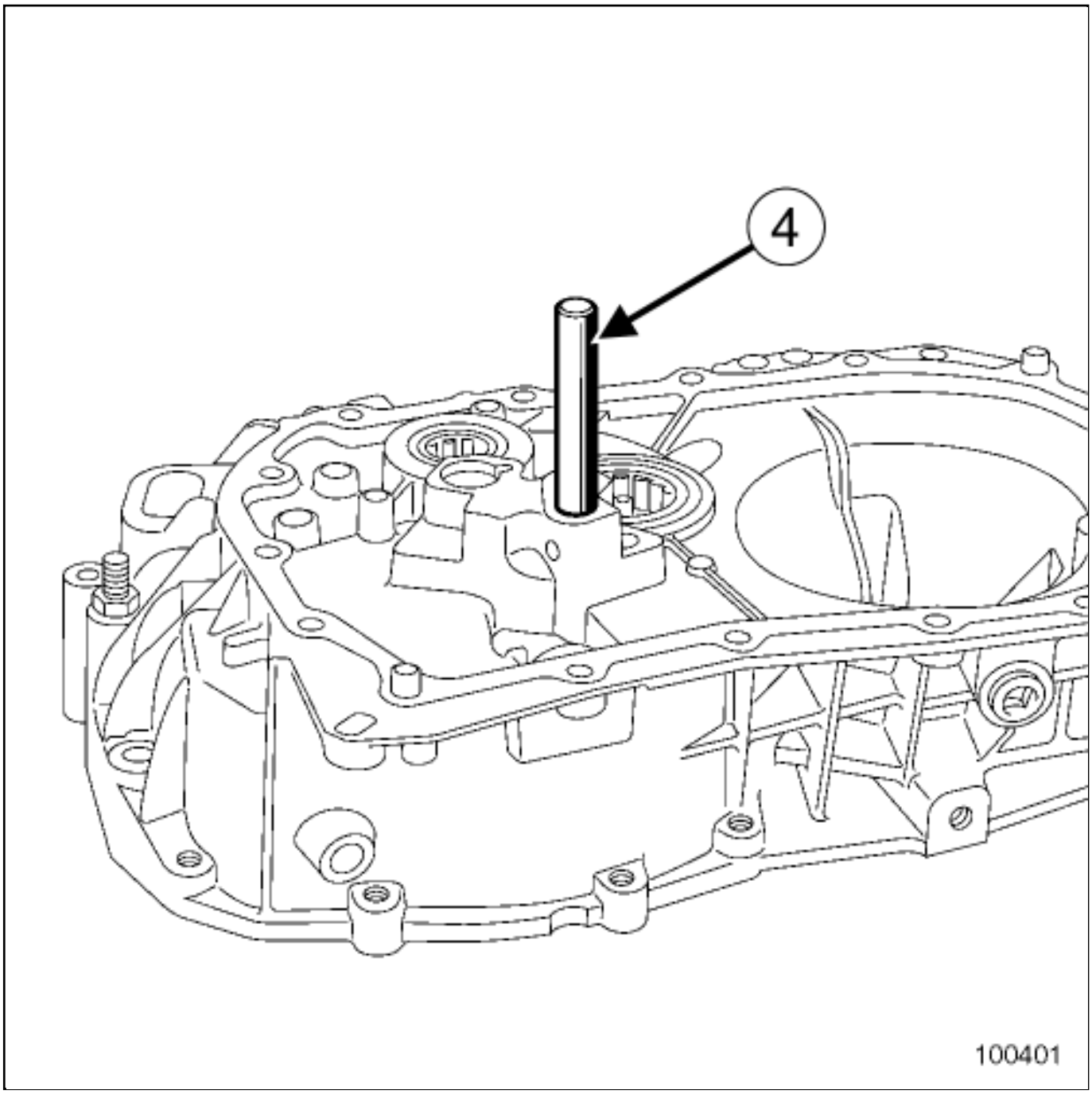
- the mating surfaces of the two rings for the gearbox selector shaft in the mechanism housing,
- the shafts,
- the shaft mating surfaces,

- the differential,
- the mechanism housing,
- the differential housing.

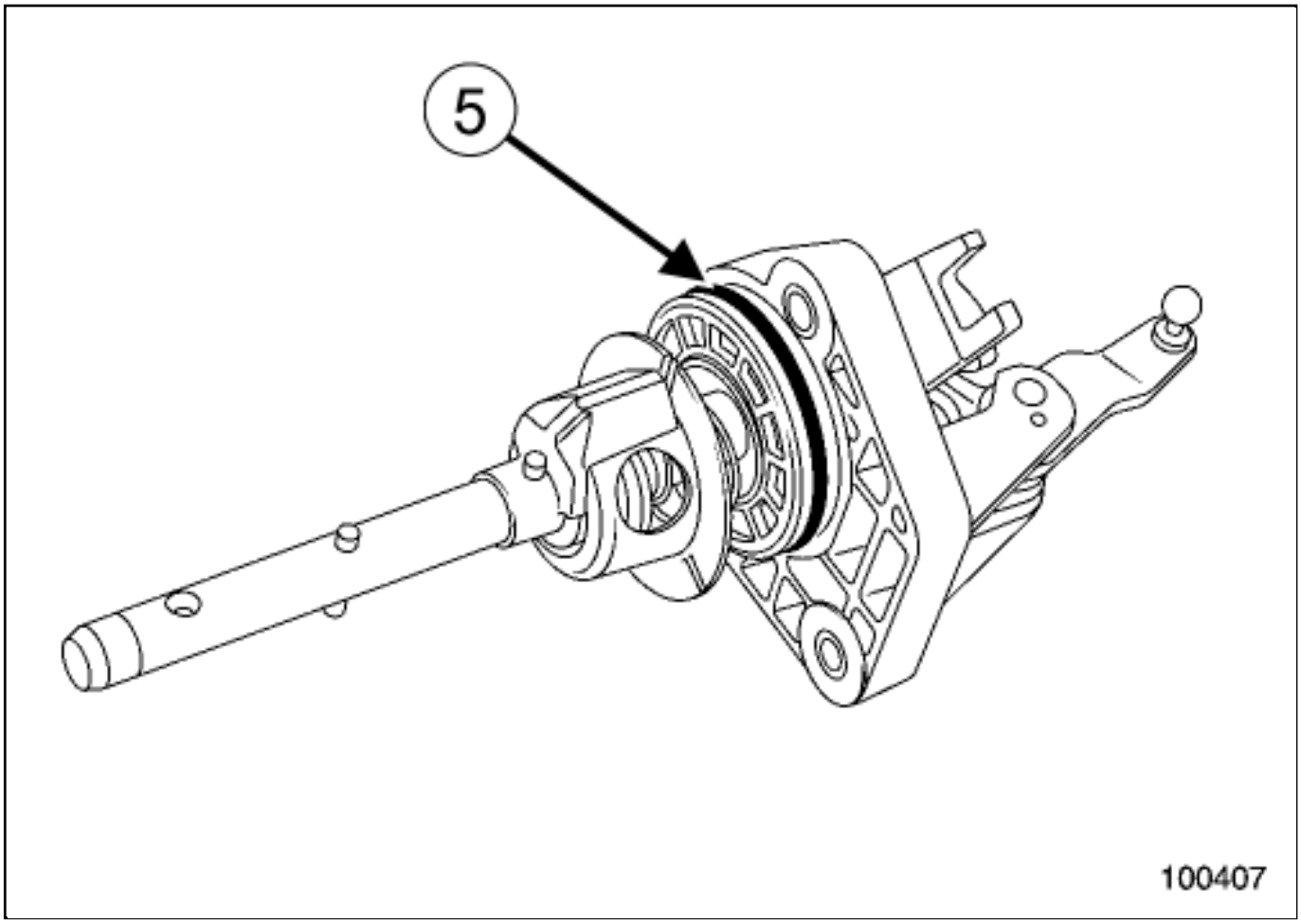
Parts always to be replaced:

- the rings of the gearbox selector shaft,
- the lip seals,
- the O-rings,
- the clutch thrust bearing guide,
- the gear lock rings,
- the roll pins,
- the input and output shaft bearing circlips,
- the selector rod hub springs,
- the hydraulic clutch slave cylinder (if fitted),
- the magnet,
- the lock ring of the differential,
- the differential retaining nut.

2. REFITTING OPERATION FOR PART CONCERNED



Refit the gearbox selector shaft rings properly using a tube(4) with a diameter of 14.5 mm.



Refit:

- the control assembly equipped with a new O-ring(5) ,
- the bolts of the control assembly.

Torque tighten the control assembly bolts25 N.m.

Pin the selector finger.

3. FINAL OPERATION

Refit:

- the differential (see 21A, Manual gearbox , Manual gearbox differential: Removal - Refitting) ,
- the gearbox shafts (see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) ,
- the mechanism housing (see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
- the fifth gear synchroniser and pinions 5th gear sprockets and synchronisers: Removal - Refitting ,
- the fifth gear housing 5th gear housing: Removal - Refitting .

Remove the gearbox from the component support (see 21A, Manual gearbox , Gearbox support equipment: Use) .

Refit the gearbox Manual gearbox: Removal - Refitting .

MANUALGEARBOX:SPECIFICATIONS

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

1. GEAR RATIOS

Suffix	First	Second	Third	Fourth	Fifth	Reverse gear	Final drive	Tachometer
JA3 sequential gearbox								
JA3-001	11/41	21/43	28/39	34/35	39/32	11/39	14/61	None
JA5 sequential gearbox								
JA5-001	11/41	21/43	28/37	35/34	41/31	11/39	16/55	None
JE3 manual gearbox								
JE3-001	11/41	21/43	28/39	34/35	39/32	11/39	15/56	None
JE3-002	11/37	22/41	28/37	30/29	42/31	11/39	15/56	None
JE3-003	11/41	21/43	28/37	30/29	42/31	11/39	15/58	None
JE3-004	11/41	21/43	28/39	34/35	37/33	11/39	16/57	None
JH1manual gearbox								
JH1-004	11/37	22/41	28/37	34/35	39/32	11/39	14/59	21/19
JH1-013	11/37	22/41	28/37	34/35	39/32	11/39	15/61	21/19
JH1-014	11/37	22/41	28/37	30/29	39/32	11/39	15/58	21/19
JH1-015	11/37	22/41	28/37	30/29	41/31	11/39	15/56	21/19
JH1-016	11/37	22/41	28/37	34/35	39/32	11/39	14/59	None
JH1-017	11/37	22/41	28/37	34/35	39/32	11/39	15/61	None

JH1-019	11/37	22/41	28/37	34/35	39/32	14/59	14/59	21/19
JH1-018	11/37	22/41	28/37	30/29	41/31	11/39	15/56	21/19
JH1-020	11/41	21/43	28/39	34/35	39/31	11/39	14/59	None
JH1-021	11/41	21/43	28/39	34/35	39/31	11/39	14/59	None
JH1-053	11/41	21/43	28/39	34/35	39/31	11/39	14/59	22/18
JH1-054	11/41	21/43	28/39	34/35	39/31	11/39	15/56	21/19
JH1-055	11/37	21/41	28/37	34/35	39/31	11/39	16/55	21/19
JH3 manual gearbox								
JH3-050	11/41	21/43	28/39	34/35	39/31	11/39	15/56	21/19
JH3-052	11/41	21/43	28/39	34/35	39/32	11/39	14/59	22/18
JH3-053	11/37	22/41	28/37	30/29	42/41	11/39	15/58	22/18
JH3-054	11/41	21/43	28/37	30/29	41/31	11/39	14/63	22/18
JH3-055	11/41	21/43	28/37	30/29	39/31	11/39	14/63	22/18
JH3-056	11/41	21/43	28/37	30/29	41/31	11/39	14/61	22/18
JH3-057	11/41	21/43	28/39	34/35	39/31	11/39	14/59	None
JH3-058	11/41	21/43	28/39	34/35	39/32	11/39	14/59	22/18
JH3-059	11/45	22/47	28/39	34/35	37/33	11/39	14/69	22/18
JH3-060	11/41	21/43	28/39	34/35	39/31	11/39	14/59	22/18

JH3-061	11/41	21/43	28/39	34/35	39/31	11/39	14/61	22/18
JH3-062	11/41	21/43	28/39	34/35	39/31	11/39	14/61	22/18
JH3-063	11/41	21/43	28/39	34/35	39/32	11/39	14/61	22/18
JH3-064	11/41	21/43	28/39	34/35	39/32	11/39	14/59	22/18
JH3-065	11/41	21/43	28/39	34/35	39/32	11/39	14/59	22/18
JH3-066	11/41	21/43	28/29	34/35	39/31	11/39	14/63	22/18
JH3-067	11/37	22/41	28/37	34/35	39/32	11/39	14/63	22/18
JH3-068	11/41	21/43	28/39	34/35	39/32	11/39	14/59	22/18
JH3-069	11/41	21/43	28/39	34/35	39/31	11/39	14/59	22/18
JH3-071	11/41	21/43	28/37	30/29	39/31	11/39	14/63	22/18
JH3-072	11/41	21/43	28/37	34/35	39/32	11/39	14/59	22/18
JH3-073	11/41	21/43	28/39	34/35	39/31	11/39	14/63	None
JH3-074	11/41	21/43	28/39	34/35	39/31	11/39	14/61	22/18
JH3-076	11/41	21/43	28/37	30/29	41/31	11/39	14/61	22/18
JH3-079	11/41	21/43	28/37	30/29	39/31	11/39	14/61	22/18
JH3-080	11/41	21/43	28/37	30/29	39/31	11/39	14/61	22/18
JH3-081	11/41	21/43	28/39	34/35	39/31	11/39	14/63	None
JH3-082	11/41	21/43	28/37	30/29	41/31	11/39	14/59	22/18

JH3-084	11/41	21/43	28/37	30/29	39/31	11/39	14/61	None
JH3-085	11/45	21/47	28/39	34/35	39/31	11/39	14/63	22/18
JH3-086	11/41	21/43	28/39	34/35	39/31	11/39	14/59	22/18
JH3-087	11/45	21/47	28/39	34/35	39/31	11/39	14/63	None
JH3-088	11/41	21/43	28/39	34/35	39/31	11/39	14/59	None
JH3-089	11/41	21/43	28/37	30/29	41/31	11/39	14/63	22/18
JH3-090	11/41	21/43	28/39	34/35	39/31	11/39	14/63	None
JH3-091	11/41	21/43	28/37	30/29	39/31	11/39	14/63	22/18
JH3-092	11/41	21/43	28/39	34/35	39/31	11/39	14/59	22/18
JH3-093	11/41	21/43	28/39	34/35	39/31	11/39	14/59	None
JH3-094	11/45	21/47	28/39	34/35	39/32	11/39	14/69	None
JH3-095	11/41	21/43	28/37	30/29	41/31	11/39	14/59	None
JH3-105	11/41	21/43	28/39	31/34	37/33	11/39	14/59	None
JH3-106	11/41	21/43	28/39	34/35	39/32	11/39	14/63	None
JH3-128	11/41	21/43	28/39	34/35	39/32	11/39	14/61	None
JH3-129	11/41	21/43	28/39	31/34	37/33	11/39	15/61	None
JH3-131	11/41	21/43	28/39	31/34	37/33	11/39	15/58	None
JH3-132	11/37	22/41	28/37	30/29	42/41	11/39	15/58	None

JH3-137	11/41	21/43	28/39	31/34	37/33	11/39	14/59	None
JH3-141	11/37	22/41	28/37	30/29	42/41	11/39	15/58	None
JH3-142	11/41	21/43	28/39	31/34	37/33	11/39	15/61	None
JH3-143	11/41	21/43	28/39	31/34	37/33	11/39	15/61	None
JH3-144	11/41	21/43	28/39	31/34	37/33	11/39	15/61	None
JH3-145	11/37	22/41	28/37	30/29	42/31	11/39	16/57	None
JH3-150	11/37	22/41	28/37	30/29	42/41	11/39	15/58	None
JH3-154	11/41	21/43	28/39	31/34	37/33	11/39	16/61	None
JH3-155	11/41	21/43	28/39	31/34	37/33	11/39	15/58	None
JH3-160	11/37	22/41	28/37	30/29	42/31	11/39	15/58	22/18
JH3-166	11/41	21/43	28/37	30/29	42/31	11/39	16/55	None
JH3-169	11/41	21/43	28/39	34/35	39/31	11/39	14/59	None
JH3-170	11/41	21/43	28/39	34/35	39/32	11/39	14/63	None
JH3-171	11/37	22/41	28/37	34/35	39/31	11/39	15/61	None
JH3-172	11/41	21/43	28/39	31/34	37/33	11/39	15/61	None
JH3-173	11/41	21/43	28/39	31/34	37/33	11/39	15/61	None
JH3-174	11/37	22/41	28/37	30/29	42/31	11/39	15/58	None
JH3-175	11/37	22/41	28/37	30/29	42/31	11/39	15/58	None

JH3-176	11/41	21/43	28/39	34/35	39/32	11/39	14/61	None
JH3-177	11/41	21/43	28/39	31/34	37/33	11/39	15/61	None
JH3-179	11/41	21/43	28/39	31/34	37/33	11/39	15/58	None
JH3-183	11/41	21/43	28/39	34/35	39/32	11/39	14/59	None
JH3-184	11/41	21/43	28/39	34/35	39/32	11/39	15/58	None
JH3-185	11/41	21/43	28/39	34/35	39/32	11/39	15/58	None
JH3-186	11/41	21/43	28/39	34/35	39/32	11/39	15/58	None
JH3-187	11/41	21/43	28/39	34/35	39/32	11/39	15/58	None
JH3-189	11/37	22/41	28/37	30/29	42/31	11/39	15/56	None
JH3-190	11/37	22/41	28/37	30/29	42/31	11/39	15/56	None
JH3-193	11/41	21/43	28/37	30/29	42/31	11/39	16/55	None
JH3-199	11/41	21/43	28/39	34/35	39/32	11/39	14/59	None
JH3-309	11/41	21/43	28/39	34/35	39/32	11/39	15/58	None
JH3-310	11/37	22/41	28/37	30/29	42/31	11/39	15/58	22/18
JH3-312	11/41	21/43	28/37	30/29	42/31	11/39	16/57	None
JH3-313	11/41	21/43	28/37	30/29	42/31	11/39	16/57	None
JH3-315	11/41	21/43	28/37	30/29	42/31	11/39	16/57	None
JH3-321	11/41	21/43	28/39	34/35	39/31	11/39	14/59	22/18

JH3-334	11/41	23/45	30/37	31/28	47/31	11/39	14/63	None
JH3-335	11/41	23/45	30/37	31/28	47/31	11/39	14/59	None
JH3-336	11/41	23/45	30/37	31/28	47/31	11/39	14/63	None
JH3-342	11/41	21/43	28/37	30/29	42/31	11/39	16/57	None
JH3-343	11/41	21/43	28/39	34/35	39/31	11/39	14/61	None
JH3-345	11/37	22/41	28/37	30/29	42/31	11/39	15/58	22/18
JH3-346	11/37	22/41	28/37	30/29	42/31	11/39	15/58	22/18
JH3-347	11/41	21/43	28/39	34/35	39/31	11/39	14/59	22/18
JH3-351	11/41	23/45	30/37	31/28	47/31	11/39	14/63	None
JH3-358	11/41	21/43	28/37	30/29	39/31	11/39	14/63	None
JH3-365	11/41	21/43	28/39	34/35	41/31	11/39	14/63	None
JH3-367	11/41	21/43	28/39	34/35	39/31	11/39	14/63	None
JH3-369	11/41	21/43	28/39	34/35	41/31	11/39	14/63	22/18
JH3-370	11/41	21/43	28/39	34/35	39/31	11/39	14/59	22/18
JH3-375	11/41	21/43	28/39	34/35	39/31	11/39	14/63	None
JR5 manual gearbox								
JR5-003	11/37	22/41	28/37	34/35	39/32	11/39	15/61	None
JR5-004	11/41	21/43	28/37	35/34	41/31	11/39	16/55	None

JR5-008	11/41	21/43	29/39	31/34	37/33	11/39	15/58	None
JR5-015	11/41	21/43	28/39	31/34	37/33	11/39	15/58	None
JR5-016	11/41	21/43	28/37	35/34	41/31	11/39	16/55	None
JR5-017	11/41	21/43	28/39	31/34	37/33	11/39	15/61	None
JR5-018	11/37	22/41	28/37	34/35	39/32	11/39	15/61	None
JR5-051	11/41	21/43	28/37	35/34	41/31	11/39	14/69	None
JR5-052	11/41	21/43	28/37	35/34	39/32	11/39	14/69	None
JR5-113	11/41	21/43	28/37	35/34	41/31	11/39	16/57	None
JR5-116	11/41	21/43	28/37	35/34	41/31	11/39	16/55	21/19
JR5-124	11/41	21/43	28/37	35/34	41/31	11/39	16/55	None
JR5-126	11/37	21/41	28/37	35/34	42/31	11/39	15/58	21/19
JR5-144	11/37	21/41	28/37	35/34	42/31	11/39	15/58	21/18
JR5-145	11/41	21/43	28/37	35/34	41/31	11/39	16/55	21/19
JR5-147	11/41	21/43	28/37	35/34	42/31	11/39	15/58	22/18
JR5-148	11/41	21/43	28/39	31/34	39/31	11/39	15/56	None
JR5-149	11/41	21/43	28/39	31/34	42/31	11/39	15/58	22/18
JR5-151	11/41	21/43	28/37	35/34	39/31	11/39	14/63	22/18
JR5-152	11/41	21/43	28/37	35/34	39/32	11/39	14/63	None

JR5-153	11/41	21/43	28/39	31/34	37/33	11/39	14/61	None
JR5-155	11/41	21/43	28/37	35/34	41/31	11/39	15/56	None
JR5-156	11/41	21/43	28/37	35/34	39/32	11/39	15/58	None
JR5-158	11/41	21/43	28/37	35/34	42/31	11/39	15/61	22/18
JR5-164	11/41	21/43	28/37	35/34	41/31	11/39	16/55	None
JR5-165	11/41	21/43	28/37	35/34	42/31	11/39	14/69	22/18
JR5-166	11/41	21/43	28/37	35/34	42/31	11/39	16/57	22/18
JR5-168	11/41	21/43	28/37	35/34	41/31	11/39	14/69	None
JR5-169	11/41	21/43	28/37	35/34	42/31	11/39	14/73	22/18
JR5-170	11/41	21/43	28/37	35/34	42/31	11/39	14/69	22/18
JR5-171	11/41	21/43	28/37	35/34	39/32	11/39	14/63	None
JR5-172	11/41	21/43	28/39	31/34	37/33	11/39	14/63	22/18
JR5-173	11/41	21/43	28/37	35/34	39/32	11/39	14/61	None
JR5-175	11/41	21/43	28/37	34/35	39/32	11/39	15/56	None
JR5-176	11/41	22/41	28/37	35/34	42/31	11/39	15/56	None
JR5-183	11/41	21/43	28/37	35/34	39/32	11/39	14/59	None
JR5-184	11/41	21/43	28/37	35/34	39/32	11/39	15/58	None
JR5-185	11/41	21/43	28/37	35/34	41/31	11/39	17/56	None

JR5-187	11/41	21/43	28/37	35/34	39/32	11/39	14/69	None
JR5-189	11/41	21/43	28/37	35/34	41/31	11/39	14/59	None
JR5-193	11/41	21/43	28/37	35/34	41/31	11/39	1756	None
JR5-301	11/41	21/43	28/37	35/34	41/31	11/39	15/56	None
JR5-302	11/41	21/43	28/37	35/34	41/31	11/39	14/69	None
JR5-303	11/41	21/43	28/37	35/34	41/31	11/39	14/69	None
JR5-306	11/41	21/43	28/37	31/29	45/31	11/39	17/56	None
JR5-308	11/41	21/43	28/37	31/29	45/31	11/39	18/57	None
JR5-309	11/41	21/43	28/37	31/29	45/31	11/39	17/56	None
JR5-310	11/41	21/43	28/37	35/34	41/31	11/39	14/59	22/18
JR5-316	11/41	21/43	28/37	35/34	41/31	11/39	14/63	None
JR5-322	11/41	21/43	28/37	35/34	41/31	11/39	17/56	None
JR5-324	11/41	21/43	28/37	35/34	39/31	11/39	14/63	22/18
JR5-327	11/41	21/43	28/37	35/34	42/31	11/39	14/69	22/18
JR5-331	11/41	21/43	28/37	35/34	42/31	11/39	15/58	21/19
JR5-332	11/41	23/45	30/37	31/28	47/31	11/39	16/57	None
JR5-335	11/41	23/45	30/37	31/28	47/31	11/39	18/57	None
JR5-336	11/41	23/45	30/37	31/28	47/31	11/39	18/57	None

JR5-337	11/41	21/43	28/37	31/29	45/31	11/39	16/57	None
JR5-340	11/41	23/45	30/37	31/28	47/31	11/39	16/57	None
JR5-341	11/41	23/45	30/37	31/28	47/31	11/39	15/56	None
JR5-342	11/41	21/43	28/39	31/34	39/32	11/39	14/63	None
JR5-345	11/41	23/45	30/37	31/28	47/31	11/39	15/56	22/18
JR5-346	11/41	21/43	28/37	35/34	42/31	11/39	15/58	22/18
JR5-347	11/41	21/43	28/39	31/34	37/33	11/39	14/59	22/18
JR5-348	11/41	21/43	28/37	35/34	42/31	11/39	15/61	22/18
JR5-349	11/41	21/43	28/37	35/34	41/31	11/39	14/59	22/18
JR5-350	11/41	21/43	28/37	35/34	41/31	11/39	14/59	22/18
JR5-351	11/41	21/43	28/37	31/29	45/31	11/39	16/55	22/18
JR5-352	11/41	21/43	28/39	31/34	39/32	11/39	14/63	None
JR5-353	11/41	21/43	28/37	31/29	45/31	11/39	18/57	None
JR5-354	11/41	21/43	28/37	31/29	45/31	11/39	18/57	None
JR5-355	11/41	23/45	30/37	31/28	47/31	11/39	15/58	None
JR5-356	11/41	23/45	30/37	31/28	47/31	11/39	15/56	None
JR5-357	11/41	23/45	30/37	31/28	47/31	11/39	14/69	None
JR5-358	11/41	23/45	30/37	31/28	47/31	11/39	15/56	None

JR5-360	11/41	21/43	28/37	35/34	42/31	11/39	14/69	None
JR5-361	11/41	21/43	28/37	35/34	39/31	11/39	14/63	None
JR5-363	11/41	21/43	28/39	31/34	37/33	11/39	14/61	None
JR5-366	11/41	21/43	28/37	35/34	42/31	11/39	15/58	None
JR5-368	11/41	23/45	30/37	31/28	47/31	11/39	16/57	None
JR5-369	11/41	23/45	30/37	31/28	47/31	11/39	15/56	None
JR5-371	11/41	21/43	28/37	35/34	41/31	11/39	14/59	24/18
JR5-372	11/41	21/43	28/37	35/34	41/31	11/39	14/63	24/18
JR5-373	11/41	23/45	30/37	31/28	47/31	11/39	18/57	None
JR5-374	11/41	23/45	30/37	31/28	47/31	11/39	16/57	None
JR5-377	11/41	23/45	30/37	31/28	47/31	11/39	15/61	None
JR5-378	11/41	23/45	30/37	31/28	47/31	11/39	18/57	None
JR5-379	11/41	21/43	28/37	35/34	39/32	11/39	14/69	24/18
JR5-380	11/41	21/43	28/37	35/34	41/31	11/39	14/63	None
JR5-381	11/41	21/43	28/37	35/34	41/31	11/39	14/59	24/18
JR5-382	11/41	21/43	28/37	35/34	39/32	11/39	14/69	24/18
JR5-383	11/41	21/43	28/37	35/34	41/31	11/39	14/59	24/18
JR5-384	11/41	21/43	28/37	35/34	41/31	11/39	14/63	None

JR5-385	11/41	23/45	30/37	31/28	47/31	11/39	14/61	None
JR5-393	11/41	21/43	28/37	31/29	41/31	11/39	14/69	None
JR5-399	11/41	23/45	30/37	31/28	47/31	11/39	15/58	None
JR5-513	11/41	21/43	28/37	31/29	41/31	11/39	14/69	None
JR5-514	11/41	21/43	28/37	35/34	39/32	11/39	14/69	24/18
JR5-517	11/41	21/43	28/37	35/34	42/31	11/39	14/69	22/18
JR5-549	11/41	21/43	28/39	31/34	42/31	11/39	15/58	22/18
JR5-551	11/41	21/43	28/37	35/34	39/31	11/39	14/63	22/18
JS3 manual gearbox								
JS3-001	11/39	21/47	28/41	30/29	42/31	11/39	14/63	None
JS3-002	11/39	21/47	28/41	30/29	47/31	11/39	14/69	None

MASKING: DESCRIPTION

Note:

The vehicle must be clean and degreased with surface cleaner before masking Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Procedure 1 : masking for painting an opening element,
- Procedure 2 : masking for painting an opening element and a rear wing panel,
- Procedure 3 : masking for painting a roof,
- Procedure 4 : masking the windows.

Note:

The interior of the components to be painted must be masked to prevent paint fog and dust from the spray gun pressure being deposited on them.

1. PROCEDURE 1: MASKING FOR PAINTING AN OPENING ELEMENT

Put the opening element in the open position.

Apply half of the 50 mm(1) masking tape, inside the component perimeter, leaving the other half sticking out.

Block the holes accessible from the interior with 25 mm masking tape (for example, windscreen jets, protective moulding and badges).

Close the opening element.

Fix the part of masking tape(2) that sticks out on the adjacent component with 19 mm masking tape.

Mask the whole vehicle with a cover (disposable or reusable plastic).

Continue with the masking of the vehicle. Use the most suitable dimensions for the components to be protected (paper, plastic).

2. PROCEDURE 2: MASKING FOR PAINTING A DOOR AND A REAR WING

Open the side door.

Apply the 19 mm foam tape(3) , inside the rear wing.

Close the door while checking that the foam seals completely.

Put 50 mm masking tape(4) , on the wing inside the wheel arch.

Continue protecting the wheel with paper(5) fixed to the part of the masking tape that sticks out.

Mask the whole vehicle with a cover (disposable or reusable plastic).

Continue with the masking of the vehicle. Use the most suitable dimensions for the components to be protected (paper, plastic).

3. PROCEDURE 3: MASKING FOR PAINTING A ROOF

Apply the special tape(6) , by sliding the rigid part of the tape inside the windscreen seal beforehand.

Vehicle: Parts and consumables for the repair (04B, Consumables - Products)

Note:

Apply 19 mm foam tape inside the upper side door pillars of the doors for the vehicles concerned.

Apply masking tape(7) in the rear section of the roof letting it stick out over the tailgate.

Fix the adhesive tape(7) with 19 mm masking tape.

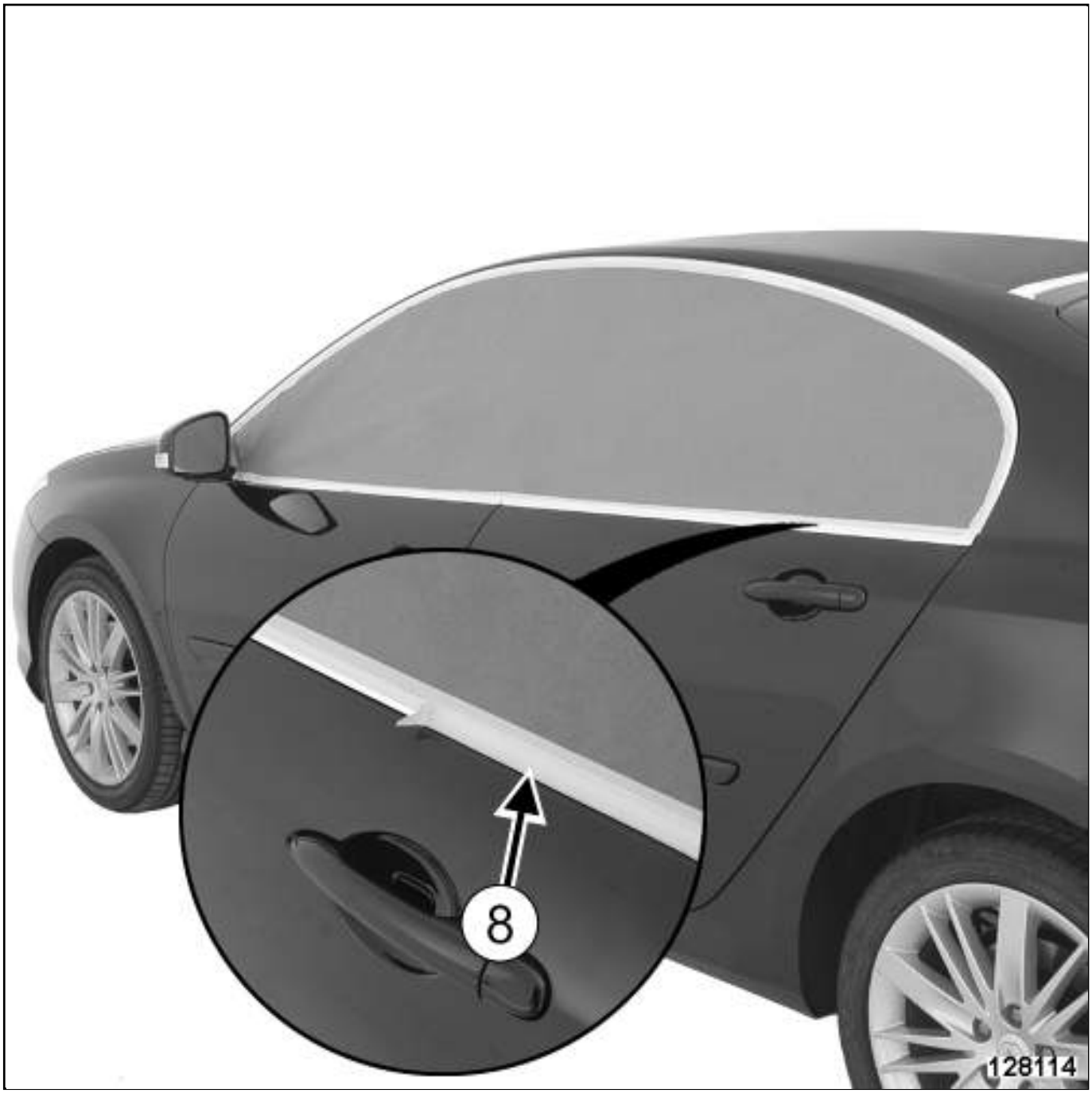
Continue with the masking of the vehicle. Use the most suitable dimensions for the components to be protected (paper, plastic).

4. PROCEDURE 4: MASKING THE WINDOWS

128112

Fit the paper suitable for the component.

Cut the paper and fix it with 19 mm masking tape at 0.5 cm from the edge.



Last, place 19mm finishing masking tape(8) on the whole perimeter of the window (remove it as soon as the painting is finished and before drying).

MASTER CYLINDER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 37A, Mechanical component controls, Braking control assembly: Exploded view) .

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - Brake circuit: Precautions for the repair ,
  - Vehicle: Precautions for the repair .

CAUTION

Always replace the master cylinder if it is dropped or in the event of an impact (risk of malfunction).

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

1. REMOVAL PREPARATION OPERATION

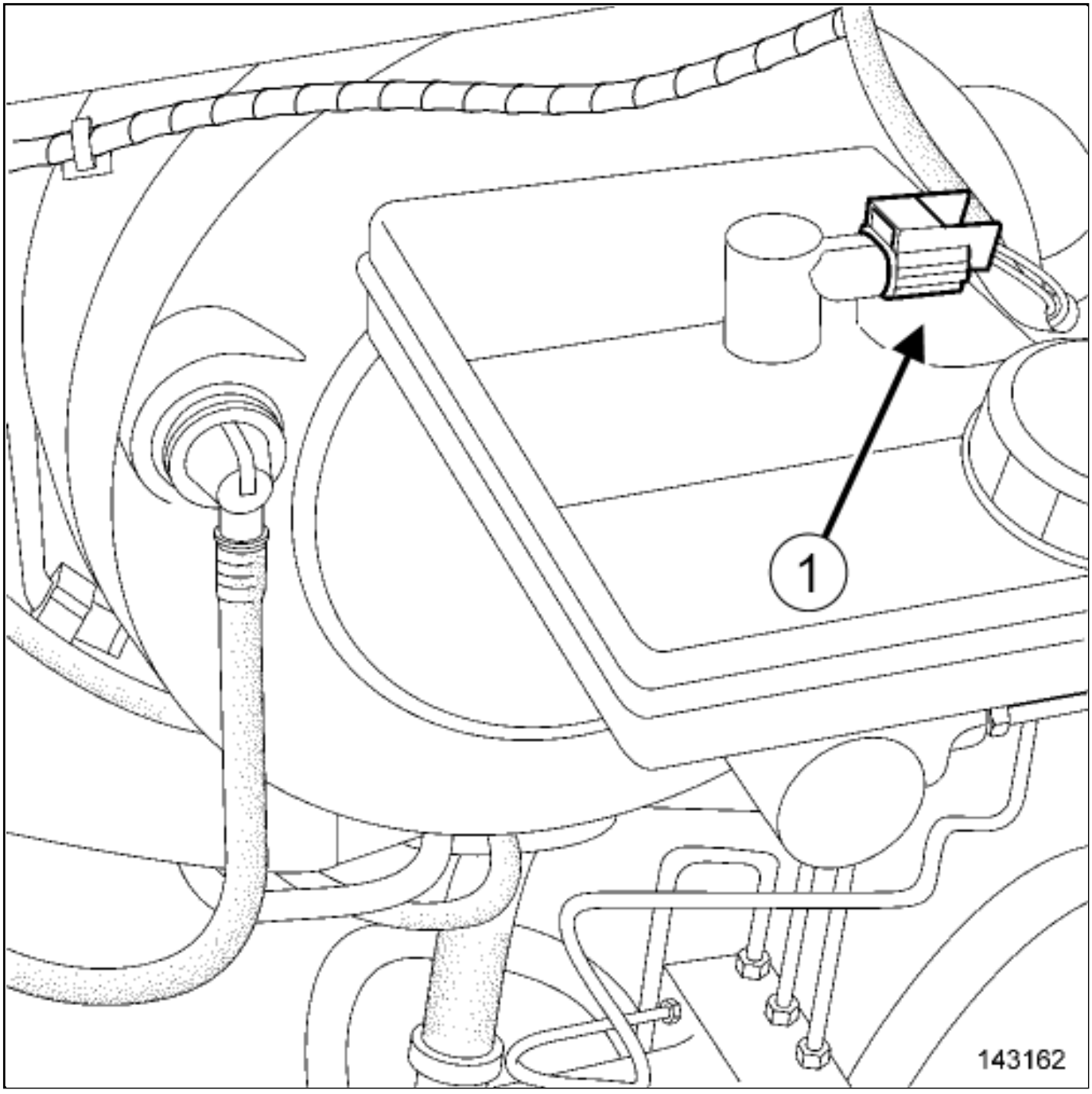
- Disconnect the battery Battery: Removal - Refitting .

- Remove the air filter inlet duct Air filter unit: Removal - Refitting .

2. REMOVAL OPERATION

- Drain the brake fluid reservoir with a syringe.

- Position a container to catch any brake fluid remaining in the master cylinder which may run out.



- Disconnect the brake fluid level sensor connector(1) .

- Disconnect the supply pipe from the clutch master cylinder(see 37A, Mechanical component controls, Braking control assembly: Exploded view) .

- Remove (see 37A, Mechanical component controls, Braking control assembly: Exploded view) :
  - the brake fluid reservoir retaining pin,
  - the brake fluid reservoir.

- Insert the blanking plugs.

- Remove (see 37A, Mechanical component controls, Braking control assembly: Exploded view) :
  - the rigid pipe unions,
  - the master cylinder.

- Fit blanking plugs on the openings of the master cylinder and the brake pipes.

REFITTING

- Proceed in the reverse order to removal.

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

- Torque tighten (see 37A, Mechanical component controls, Braking control assembly: Exploded view) :
  - the nuts on the brake servo,
  - the brake fluid reservoir bolt,
  - the rigid brake pipe unions on the master cylinder.

- Bleed the braking circuit Braking circuit: Bleed .

- Bleed the clutch circuit (see 37A, Mechanical component controls, Clutch circuit: Bleed) .

MECHANISM HOUSING BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Mandrel for refitting the mechanism housing bearings.	Bvi. 1576

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair **(see 21A, Manual gearbox , Manual gearbox: Precautions for the repair)** .

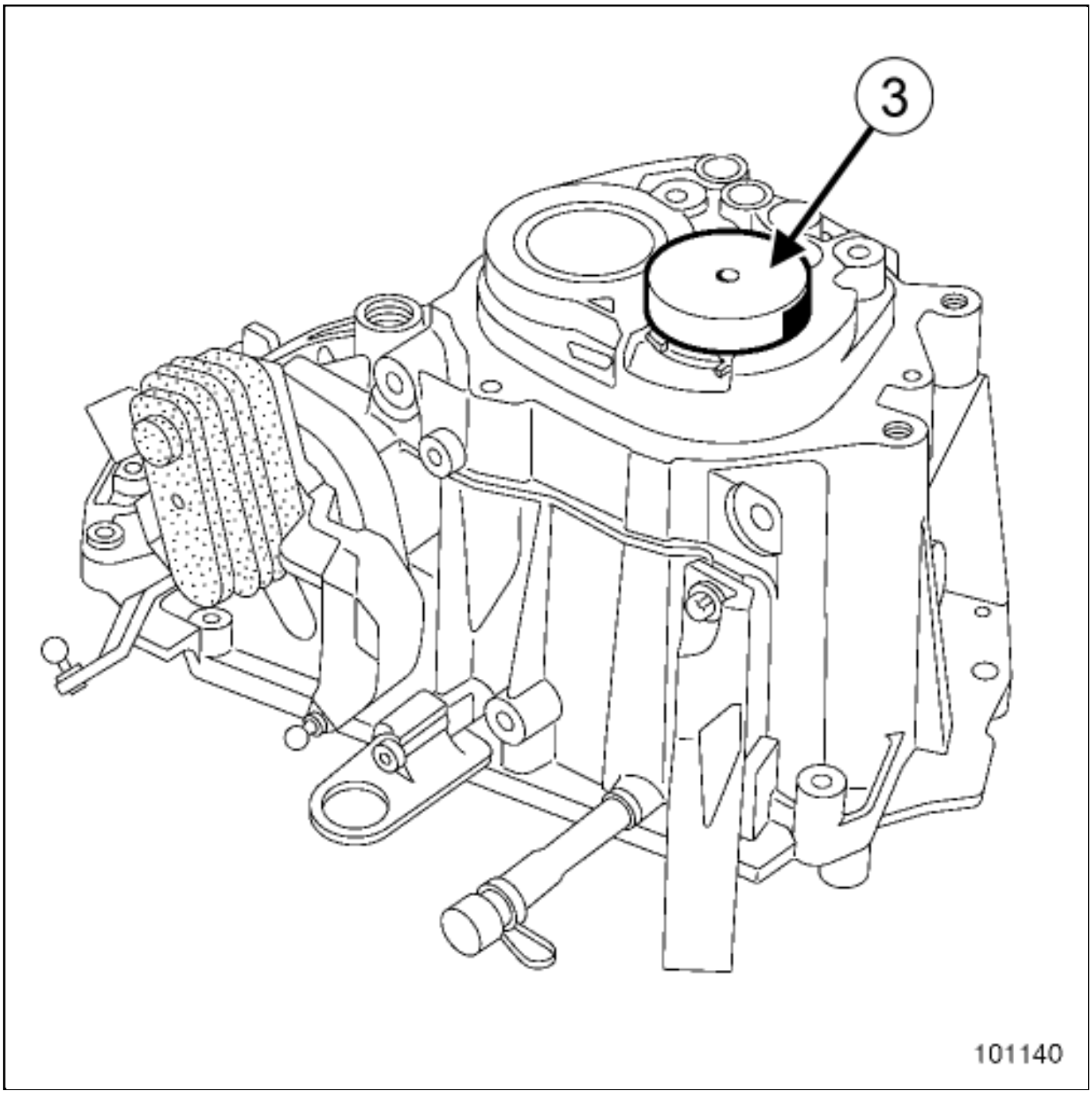
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the gearbox Manual gearbox: Removal - Refitting .
- Position the gearbox on the component support (see 21A, Manual gearbox , Gearbox support equipment: Use) .
- Remove:
  - the fifth gear housing 5th gear housing: Removal - Refitting ,
  - the fifth gear synchroniser and pinions 5th gear sprockets and synchronisers: Removal - Refitting ,
  - the mechanism housing (see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) .

2. OPERATION FOR REMOVAL OF PART CONCERNED

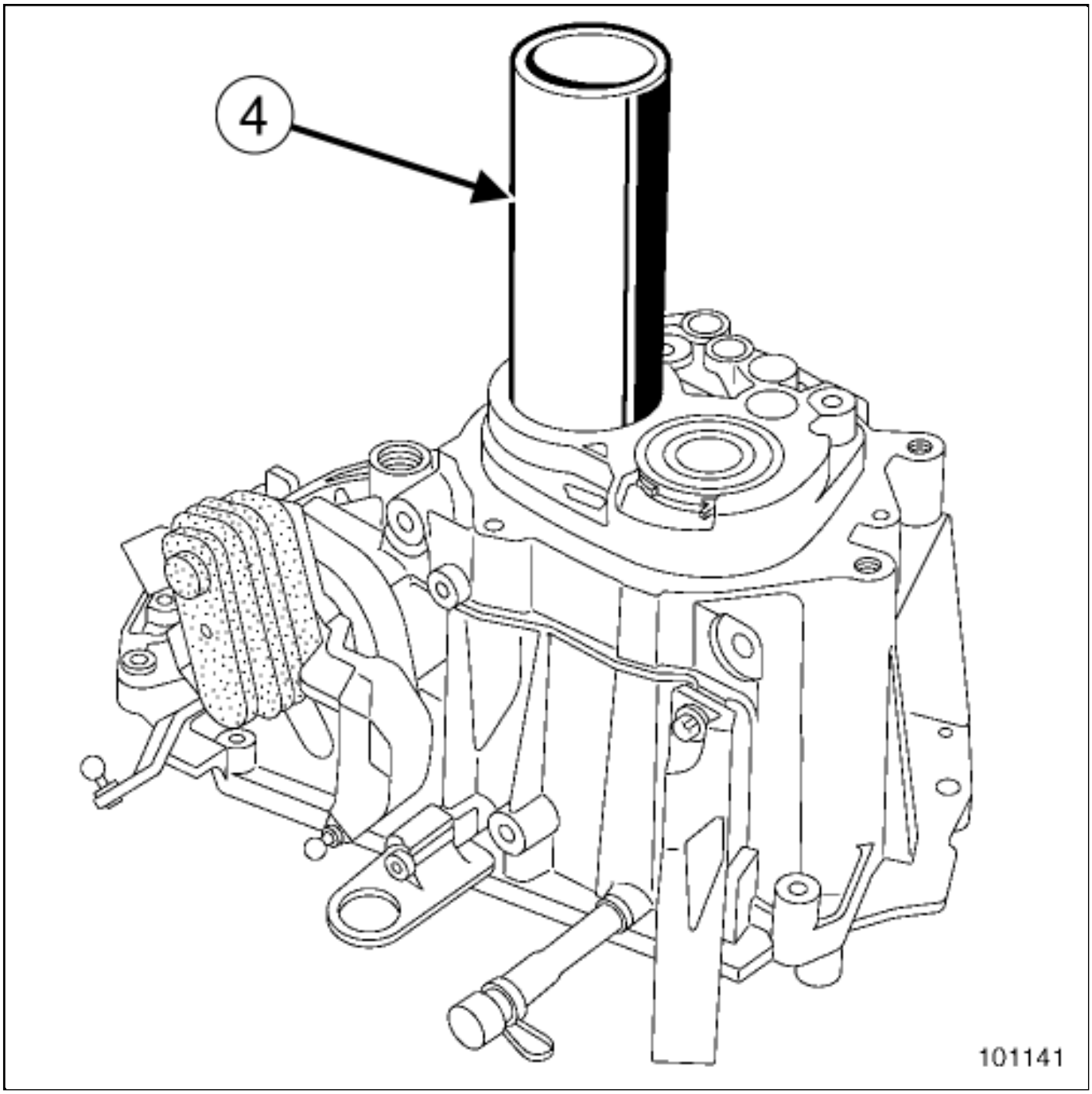
1- INPUT SHAFT SIDE BEARING



- Separate the circlip.

- Remove the bearing towards the inside of the mechanism housing using the toolMandrel for refitting the mechanism housing bearings.(Bvi. 1576) (3) .

2- OUTPUT SHAFT SIDE BEARING



- Remove the bearing cup on the output shaft side using a tube(4) with a diameter of 55 mm.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use SURFACE CLEANERVehicle: Parts and consumables for the repair to clean:
  - the bearing mating faces in the mechanism housing,
  - the mechanism housing.

- Parts always to be replaced:
  - the removed bearings,
  - the lip seals,
  - the O-rings,
  - the clutch thrust bearing guide,
  - the roll pins,
  - the input and output shaft bearing circlips,
  - the mechanism housing bearing circlips,
  - the hydraulic clutch slave cylinder (if fitted),
  - the magnet.

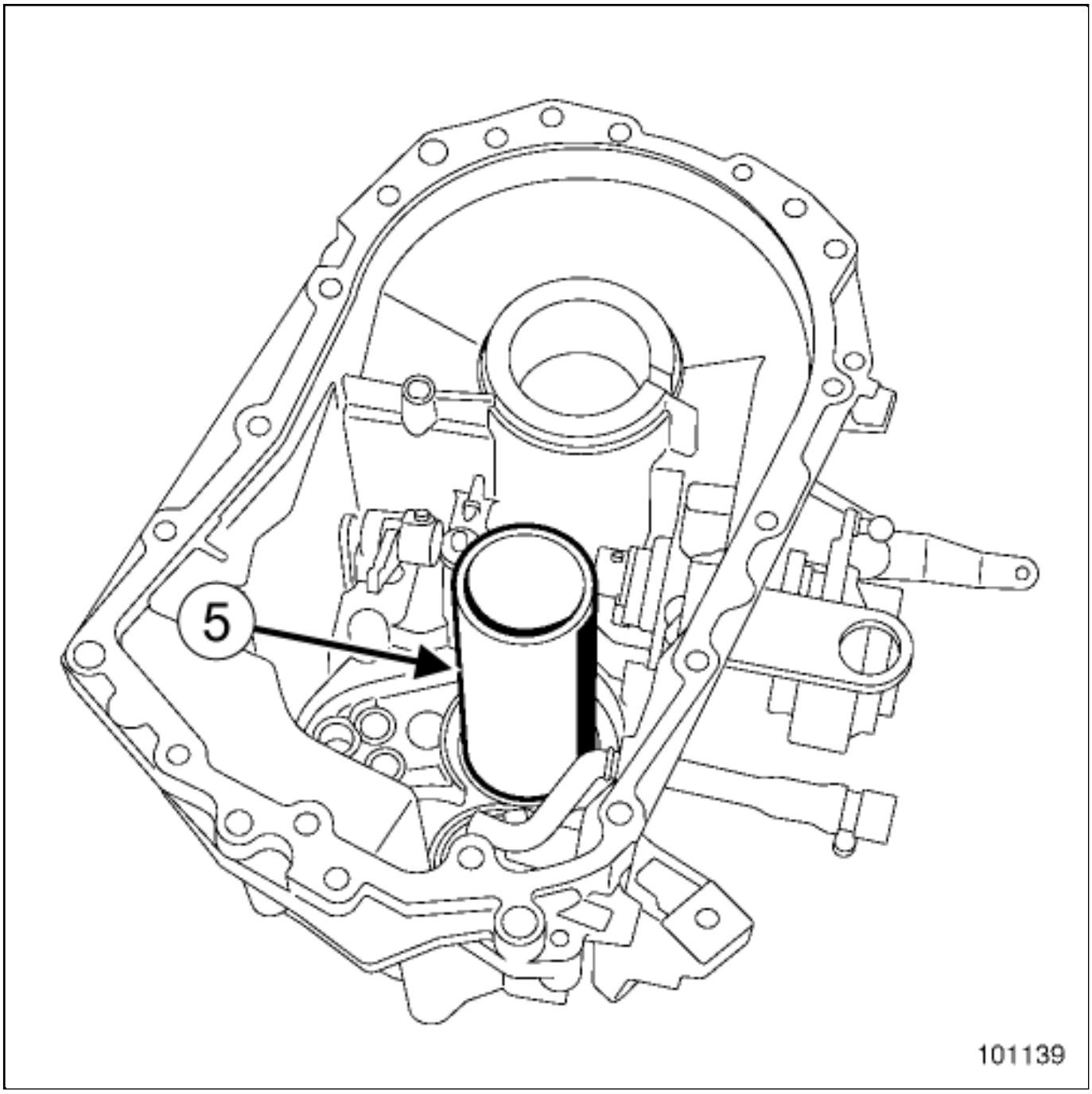
2. REFITTING OPERATION FOR PART CONCERNED

1- INPUT SHAFT SIDE BEARING

- Fit a new circlip.

- Refit the bearing using the toolMandrel for refitting the mechanism housing bearings.(**Bvi. 1576**) .

2- OUTPUT SHAFT SIDE BEARING



Refit the bearing cup using a 60 mmdiameter tube (5) .

3. FINAL OPERATION

Refit:

- the mechanism housing(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
- the fifth gear synchroniser and pinions5th gear sprockets and synchronisers: Removal - Refitting ,
- the fifth gear housing5th gear housing: Removal - Refitting .

Remove the gearbox from the component support(see 21A, Manual gearbox , Gearbox support equipment: Use) .

- Refit the gearbox **Manual gearbox: Removal - Refitting** .

MECHANISM HOUSING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Tightening torques	
mechanism housing bolts	25 N.m
reverse gear switch	25 N.m

Special tooling required	
Tools for fitting the fork shaft locking bearings.	Bvi. 1570
Socket for removing/refitting reverse gear switch	Bvi. 1934

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

WARNING

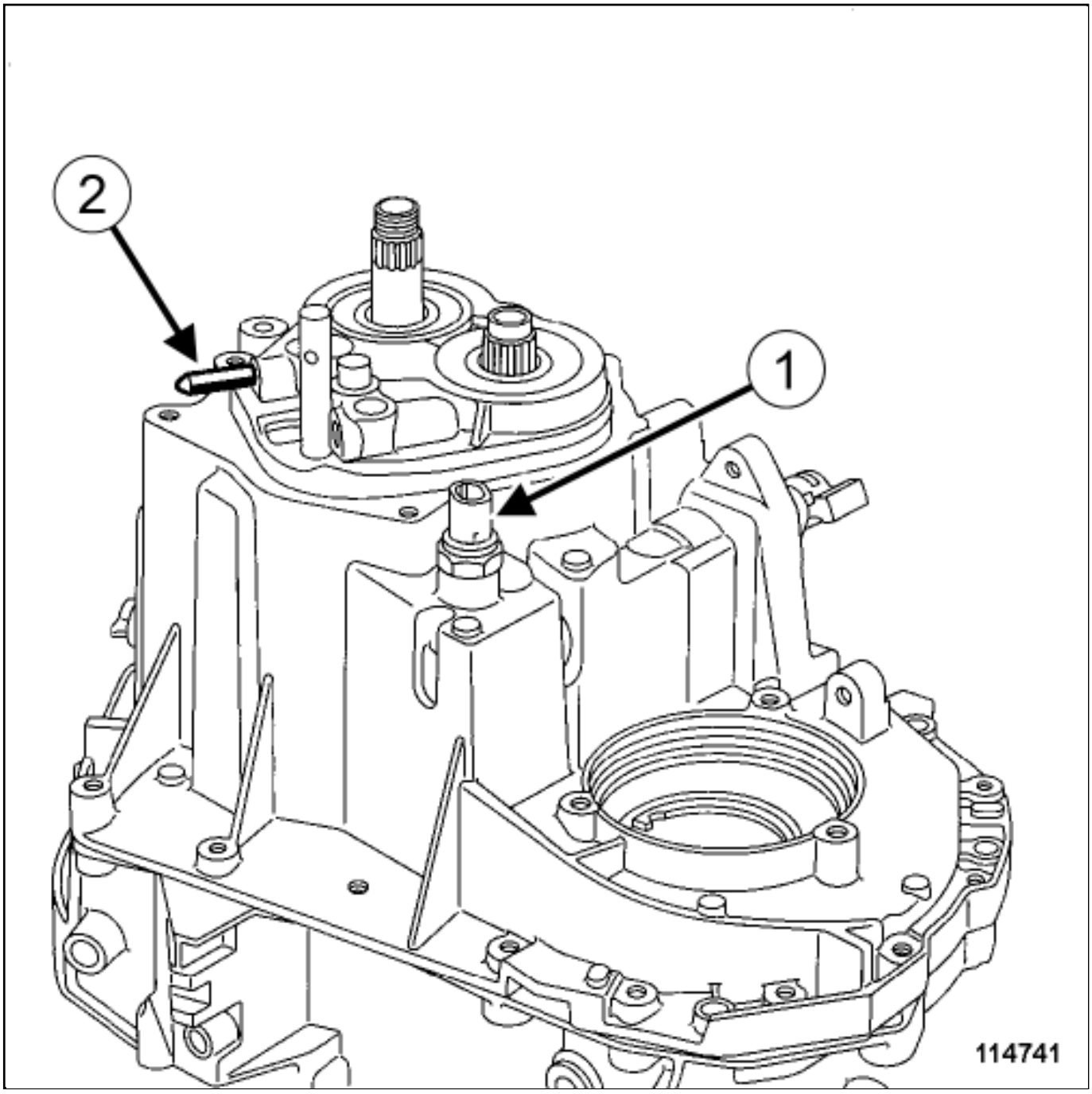
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair **(see 21A, Manual gearbox , Manual gearbox: Precautions for the repair)** .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the gearbox Manual gearbox: Removal - Refitting .
- Position the gearbox on the component support (see 21A, Manual gearbox , Gearbox support equipment: Use) .
- Remove:
  - the fifth gear housing 5th gear housing: Removal - Refitting ,
  - the fifth gear synchroniser and pinions 5th gear sprockets and synchronisers: Removal - Refitting .

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove:

- the mechanism housing bolts,
- the reverse gear switch(1) using the toolSocket for removing/refitting reverse gear switch(Bvi. 1934) ,
- the retaining pin(2) of the reverse gear shaft (if equipped).

Engage third gear.

Detach and remove the mechanism housing.

REFITTING

1. REFITTING PREPARATION OPERATION

- Clean the joint faces of the mechanism housing using SUPER CLEANING AGENT FOR JOINT FACES Vehicle: Parts and consumables for the repair .

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

- Remove the residue using a plastic spatula.

- Use SURFACE CLEANERVehicle: Parts and consumables for the repair to clean:
  - the joint face of the mechanism housing and the clutch housing,
  - the mechanism housing.

CAUTION

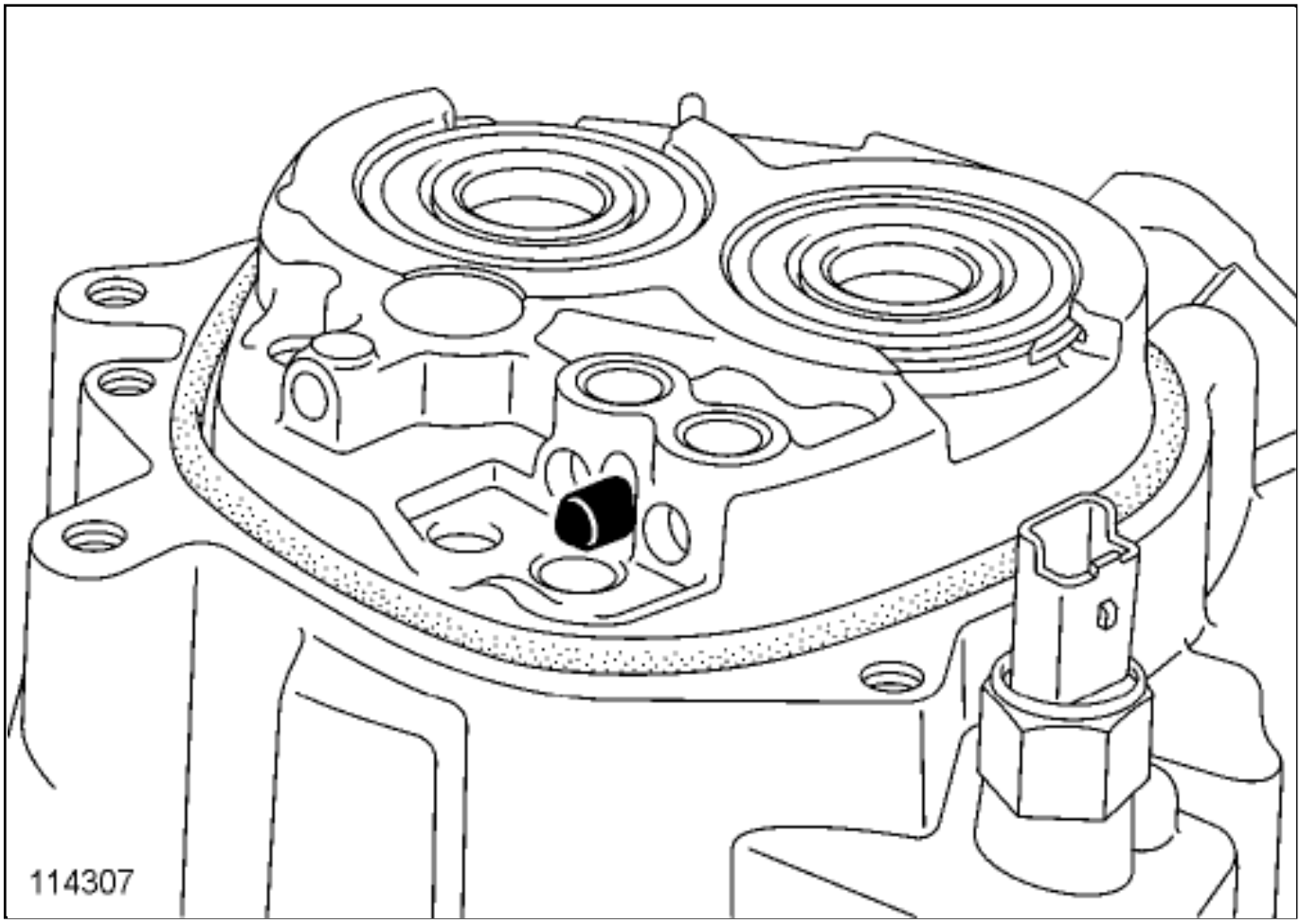
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

CAUTION

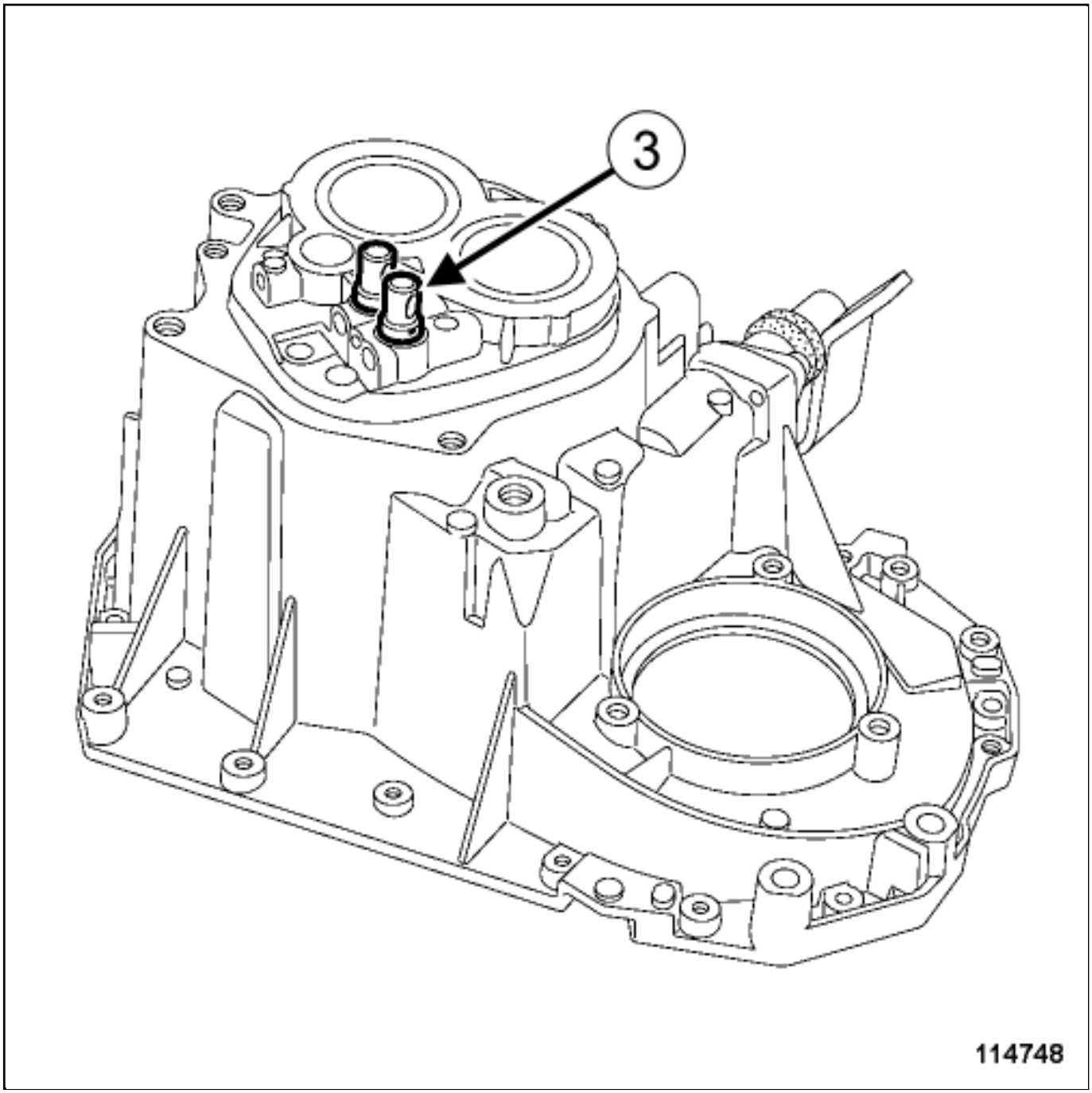
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid may cause damage to some components.

- Parts always to be replaced:
  - the lip seals,
  - the O-rings,
  - the clutch thrust bearing guide
  - the gear lock rings,
  - the roll pins,
  - the input and output shaft bearing circlips,
  - the selector rod hub springs,
  - the hydraulic clutch slave cylinder (if fitted),
  - the magnet.

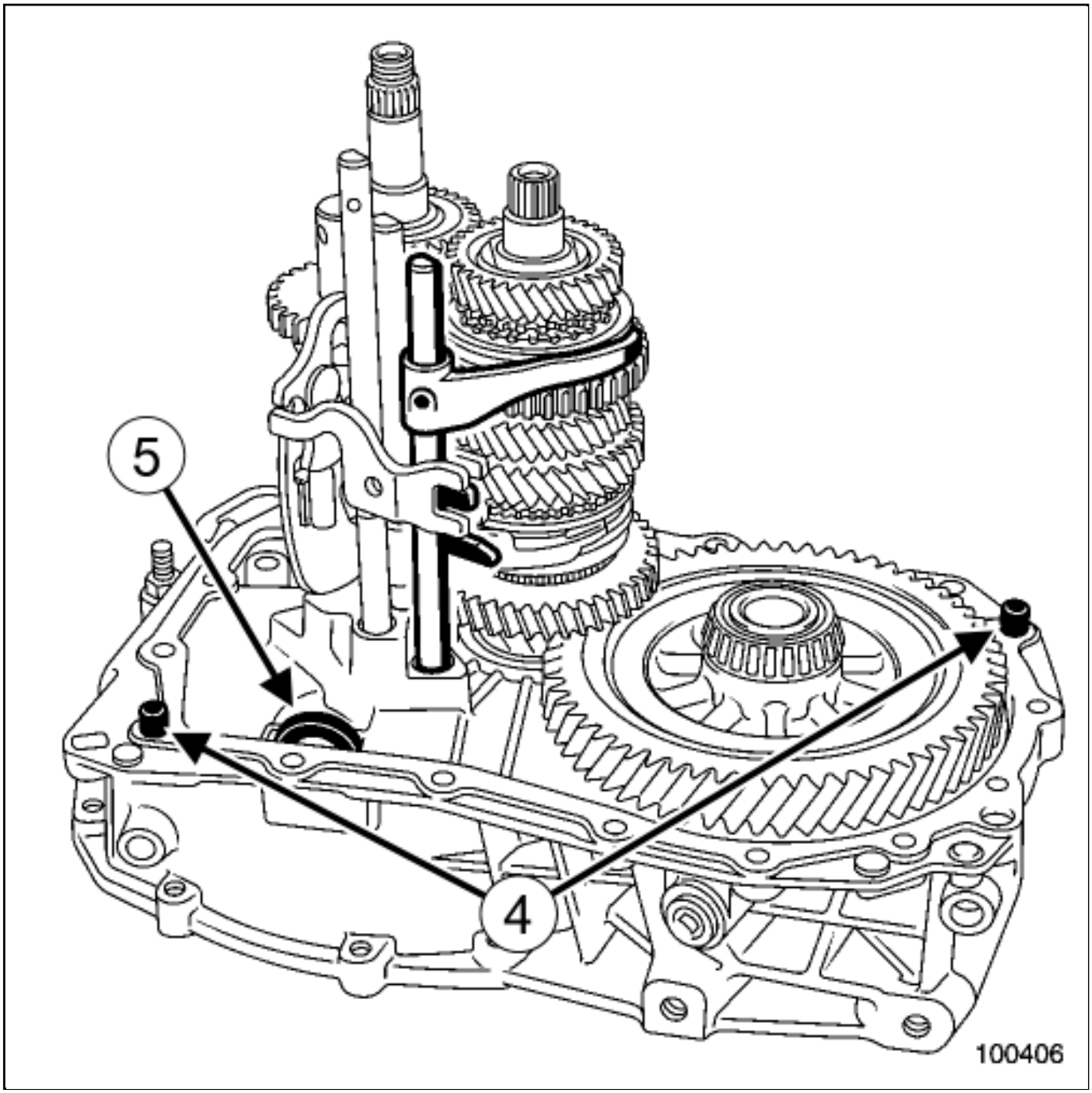
2. REFITTING OPERATION FOR PART CONCERNED



- Fit the first-second, third-fourth and fifth gear shaft locating ball cartridges into the gearbox housing.



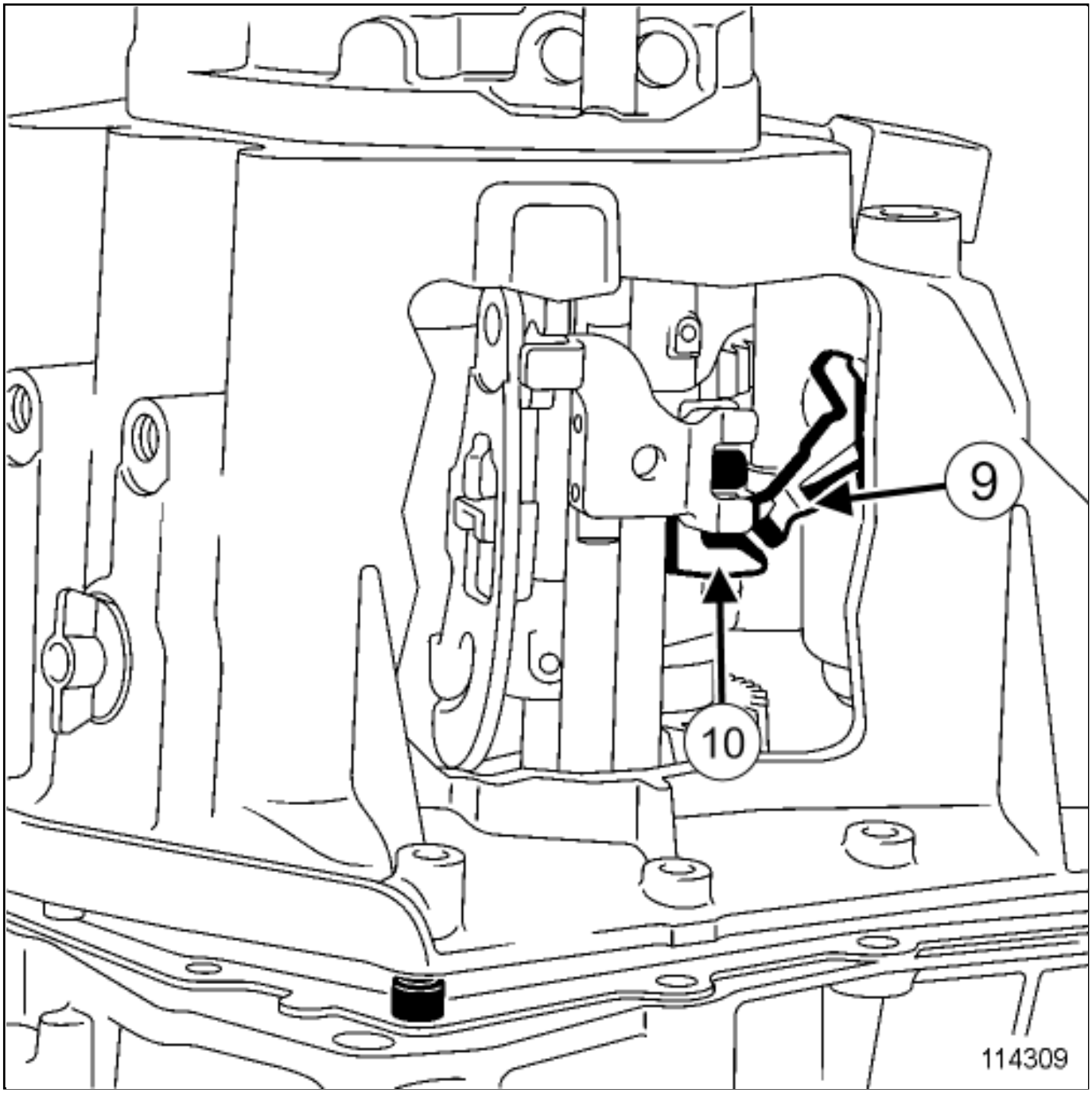
- Fit the springs and balls for gearboxes which are not fitted with a locating ball cartridge.
- Engage the ball assemblies using theTools for fitting the fork shaft locking bearings.(Bvi. 1570) (3) .



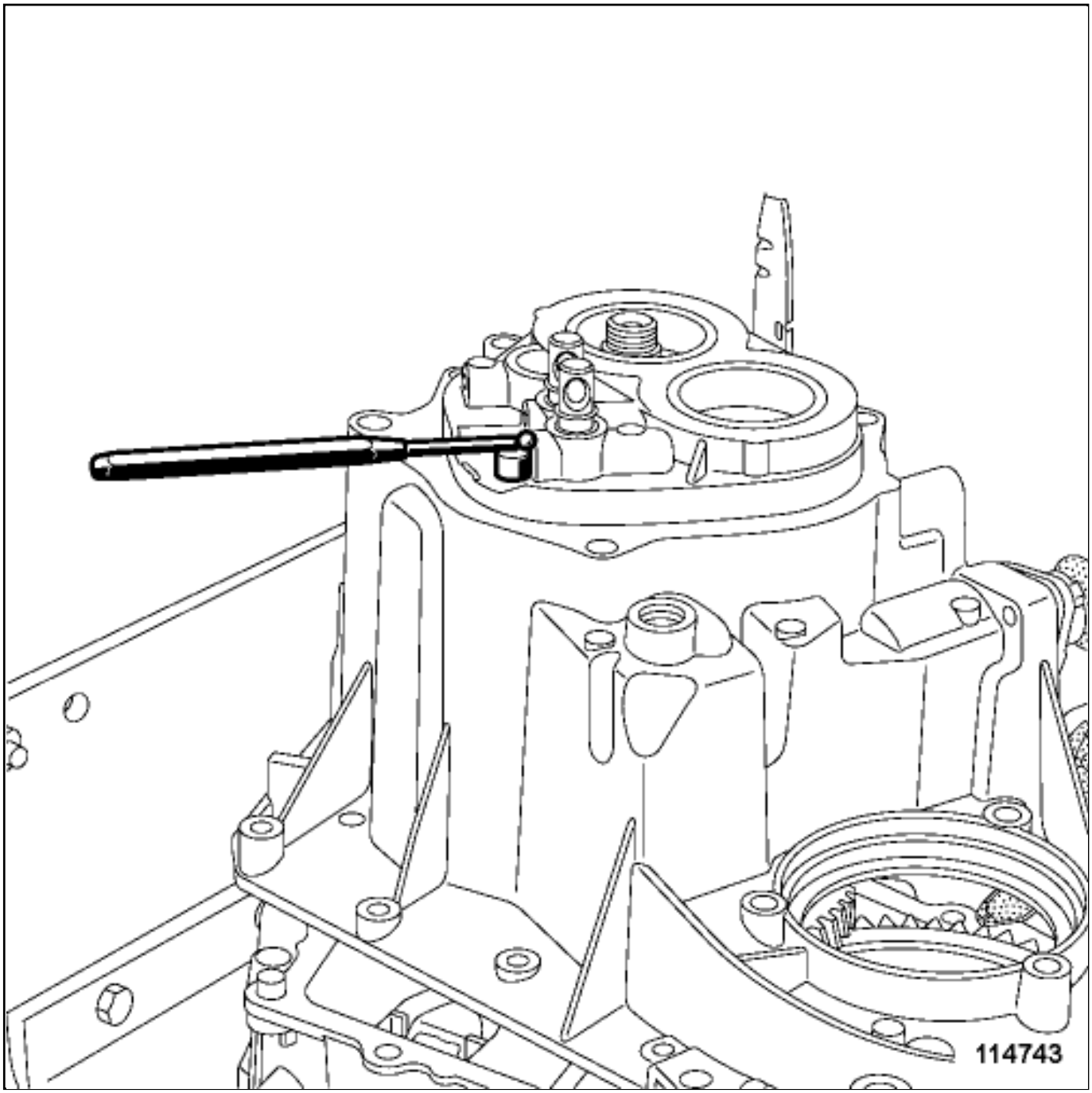
- Engage third gear.

- Check the positioning:
  - of the centring dowels(4) ,
  - of the magnet(5) .

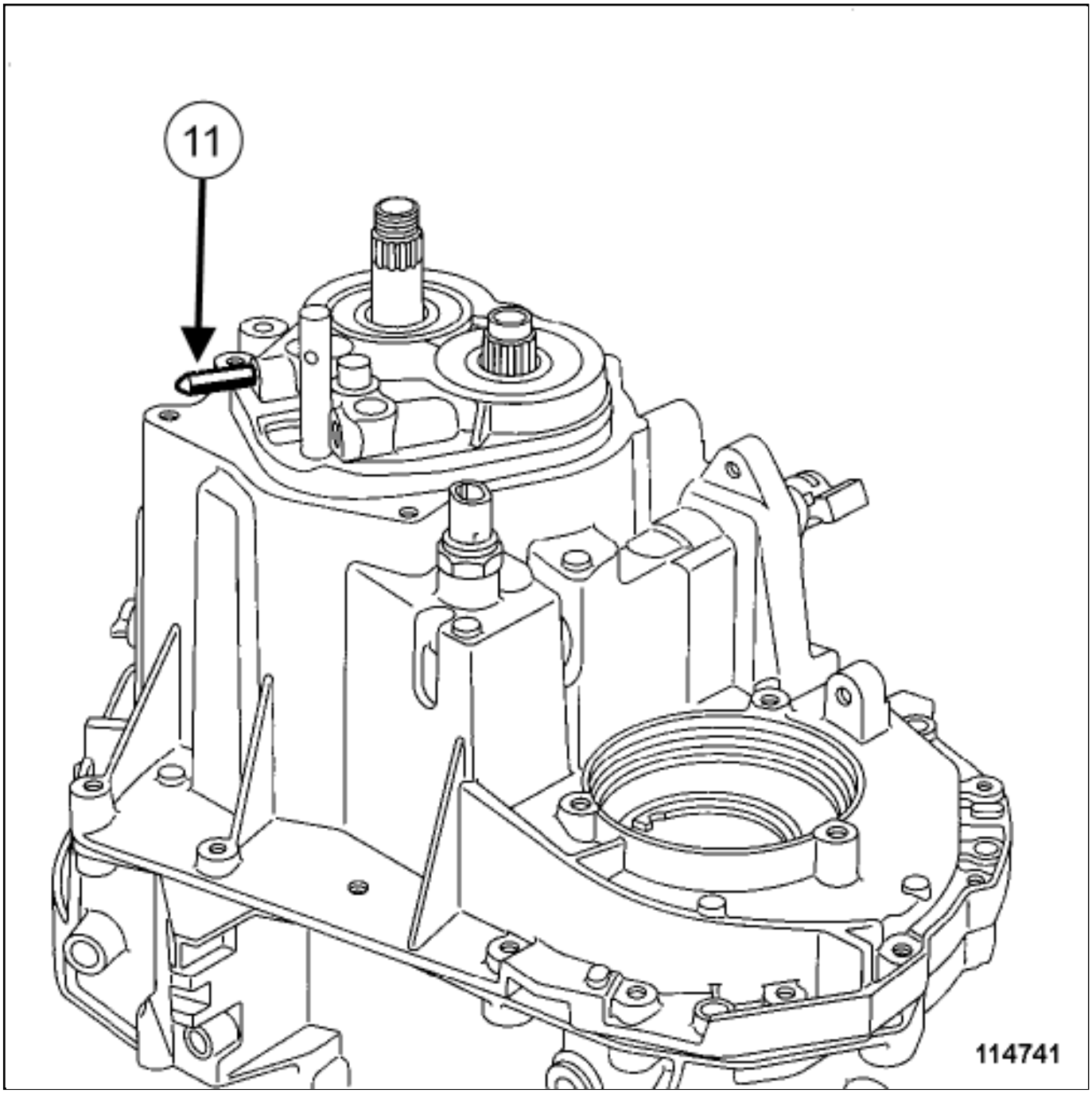
- Apply a bead of RESIN ADHESIVE**Vehicle: Parts and consumables for the repair** to the joint face of the mechanism housing.



Refit the gearbox housing, guiding the shift finger(9) into the fork of the third gear(10) .



Engage the locating ball for the fifth gear shaft for gearboxes not fitted with a locating ball cartridge.



- Insert the reverse gear shaft retaining pin(11) (if fitted).

- Pretighten the mechanism housing bolts.

- Turn the input shaft to ensure correct engagement of the bearings.

Torque tighten the mechanism housing bolts25 N.m.

Refit the reverse gear switch with the toolSocket for removing/refitting reverse gear switch(Bvi. 1934) .

Torque tighten the reverse gear switch25 N.m.

3. FINAL OPERATION

Refit:

- the fifth gear synchroniser and pinions5th gear sprockets and synchronisers: Removal - Refitting ,
- the fifth gear housing5th gear housing: Removal - Refitting .

Refit the gearbox on the component support(see 21A, Manual gearbox , Gearbox support equipment: Use) .

Refit the gearboxManual gearbox: Removal - Refitting .

MODULATE VARIATION OF SPEED OF FAN ASSEMBLY FOR PASSENGER COMPARTMENT : REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REMOVAL

- Remove the modulate variation of speed of fan assembly for passenger compartement(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REFITTING

- Proceed in the reverse order to removal.

MULTIFUNCTION SUPPORT: REMOVAL - REFITTING

Tightening torques	
multifunction support bolts on the cylinder block	44 N.m
multifunction support bolt on the sump	25 N.m

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the front right-hand wheel Wheel: Removal - Refitting ,
  - the front right-hand wheel arch side liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the engine undertray bolts,
  - the engine undertray,
  - the front bumper Front bumper assembly: Exploded view and Exterior body front trim assembly: Exploded view (55A, Exterior protection),
  - the accessories belt (see **Accessories belt: Removal - Refitting**) .
- Remove the intercooler Intercooler : Removal - Refitting .
- Remove the alternator Alternator: Removal - Refitting .
- Disconnect the air conditioning compressor connector.
- Remove the air conditioning compressor bolts (without opening the circuit) Compressor: Removal - Refitting (62A, Air conditioning).
- Attach the air conditioning compressor to the lower front cross member.

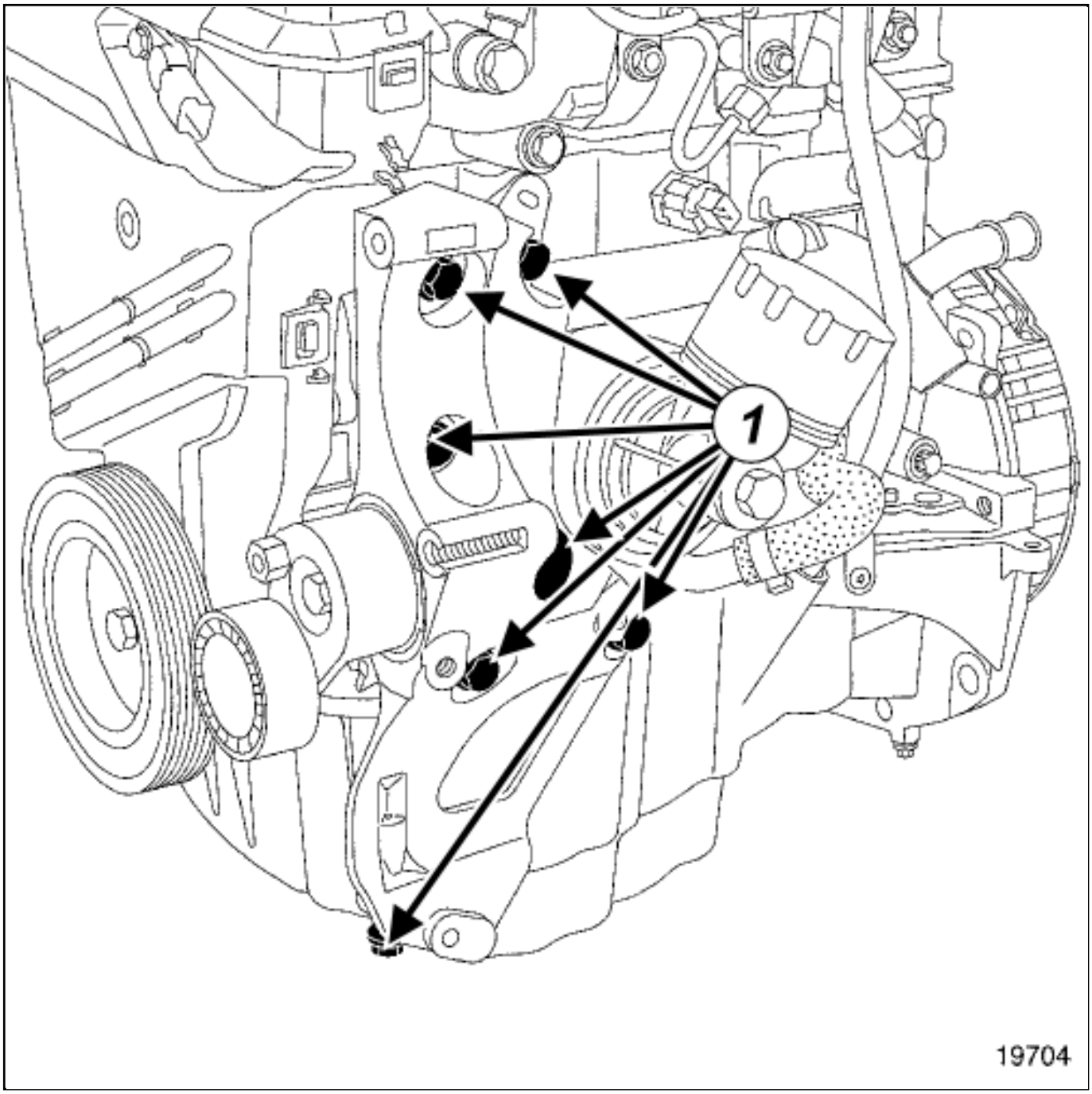
MECA PUMP POWER STEE 1(GPM01)

- Remove the power-assisted steering pump bolts from the multifunction support Power-assisted steering assembly: Exploded view .
- Attach the power-assisted steering pump to the subframe, without opening the circuit.

Unpick the wiring harness on the multifunction support.

2. REMOVAL OPERATION

MECA PUMP POWER STEE 1(GPM01)



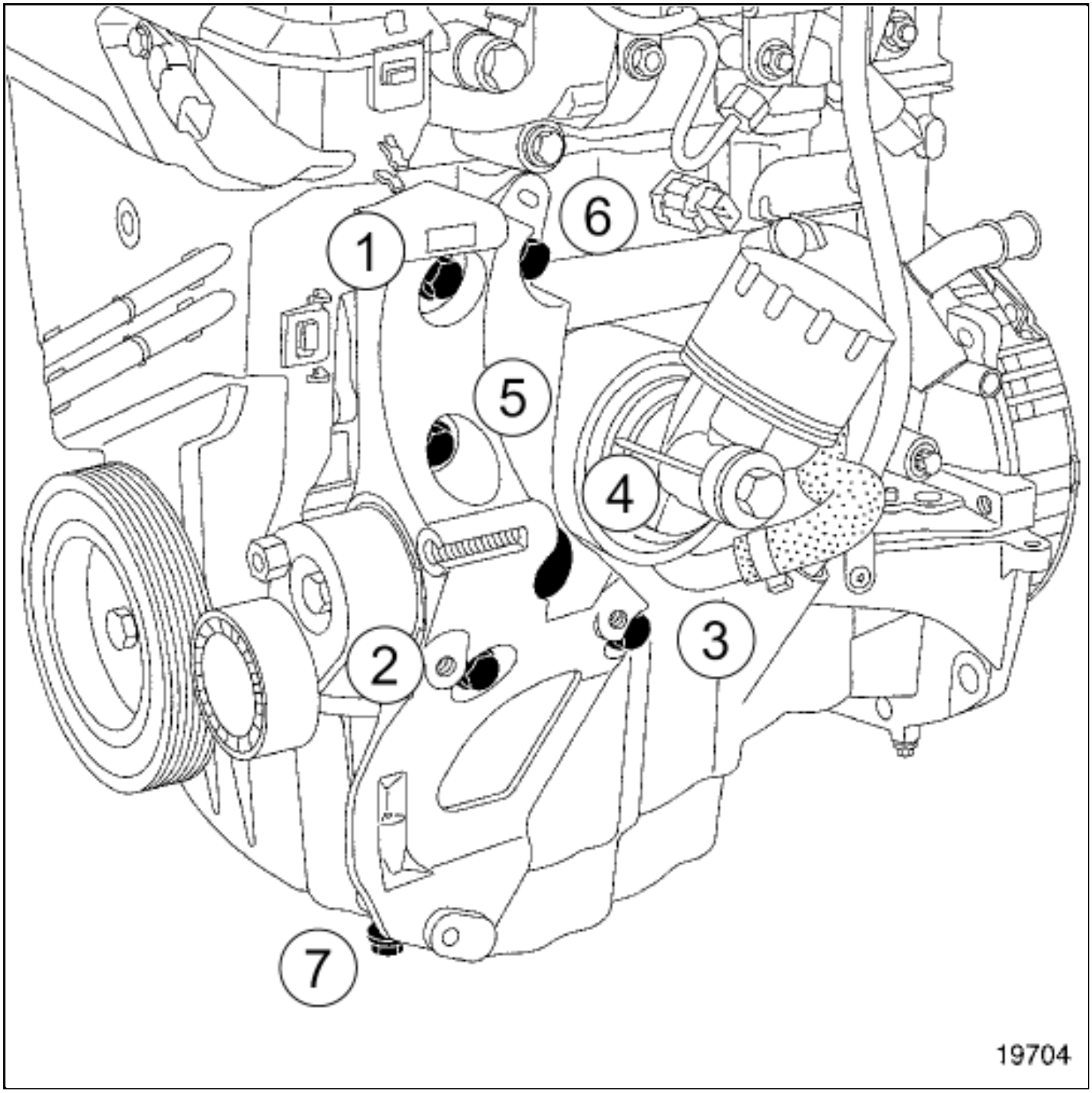
Remove:

- the multifunction support bolts(1) ,
- the multifunction support.

REFITTING

1. REFITTING OPERATION

MECA PUMP POWER STEE 1(GPM01)



- Refit the multifunction support.
- Position bolts (1) to (7) without tightening them.
- Pretighten the multifunction support bolts(1) and (2) on the cylinder block 5 N.m.
- Loosen bolts (1) and (2) a half-turn.

- Pretighten the multifunction support bolt(7) on the sump 5 N.m.
- Pretighten the multifunction support bolts(1) and (2) on the cylinder block 5 N.m.
- Pretighten the multifunction support bolts(3) , (4) , (5) , (6) on the cylinder block 5 N.m.
- Torque tighten in order(1) , (2) , (3) , (4) , (5) , (6) the multifunction support bolts on the cylinder block 44 N.m.
- Torque tighten the multifunction support bolt on the sump25 N.m(7) .

- Proceed in the reverse order to removal.

NAVIGATIONPREPARATION:DESCRIPTION

R-LINK and ULC:

[] Enter the anti-theft code (see Radio user manual,

[] Insert the SIM card and SD card in the housing,

[] Set the language.

NEW VEHICLE FINISH: DESCRIPTION

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

1. NEW VEHICLE OPERATIONAL INSTRUCTIONS FOR FINISHING

1- INTRODUCTION

1)ADMINISTRATIVE:

[] The operations described in finishing must be carried just before the handover of the vehicle. If the preparation has been done in the dealership, ensure that Flash AVES was made on receipt of the vehicle in the dealership.

[] If the commercial secretary has not done 24 hours before the finishing, check that the vehicle is not affected by OTS (Special Technical Operations), based in ICM (Shared Information World) or other information available (eg VIN list for which one or more OTS apply).

2)ACCESSORIES (TO BE FITTED BY THE WORKSHOP):

[] Have accessories fitted. The vehicle will need to be transferred to the workshop (towbar, professional features, sports kit, etc.).

3)SERVICES ACTIVATION:

[] Check on the New Vehicle Delivery Quality sheet if all the subscribed services were activated within five previous days. If not, contact the commercial secretary.

[] Perform 2 starts vehicle in area covered by telephone operators.

[] Check the level of fuel, if necessary, add fuel.

2- VEHICLES ACCESSORIES:

[] Check the presence of the duplicate keys and cards.

[] Check the conformity of the vehicle documentations (model , language, exhaustivity).

1- CLEANING:

[] If necessary, wash the vehicle bodywork and vacuuming the interior of vehicle and the boot.

- [] Clean:
  - the dashboard,
  - the windows (inside and outside).

2- ENGINE COMPARTMENT:

1)CHECKING THE BATTERY:

Note:

Transfer the vehicle to the workshop if you reply << YES >> to one of the following 4 questions.

[] 1) Did the vehicle not start on its own?

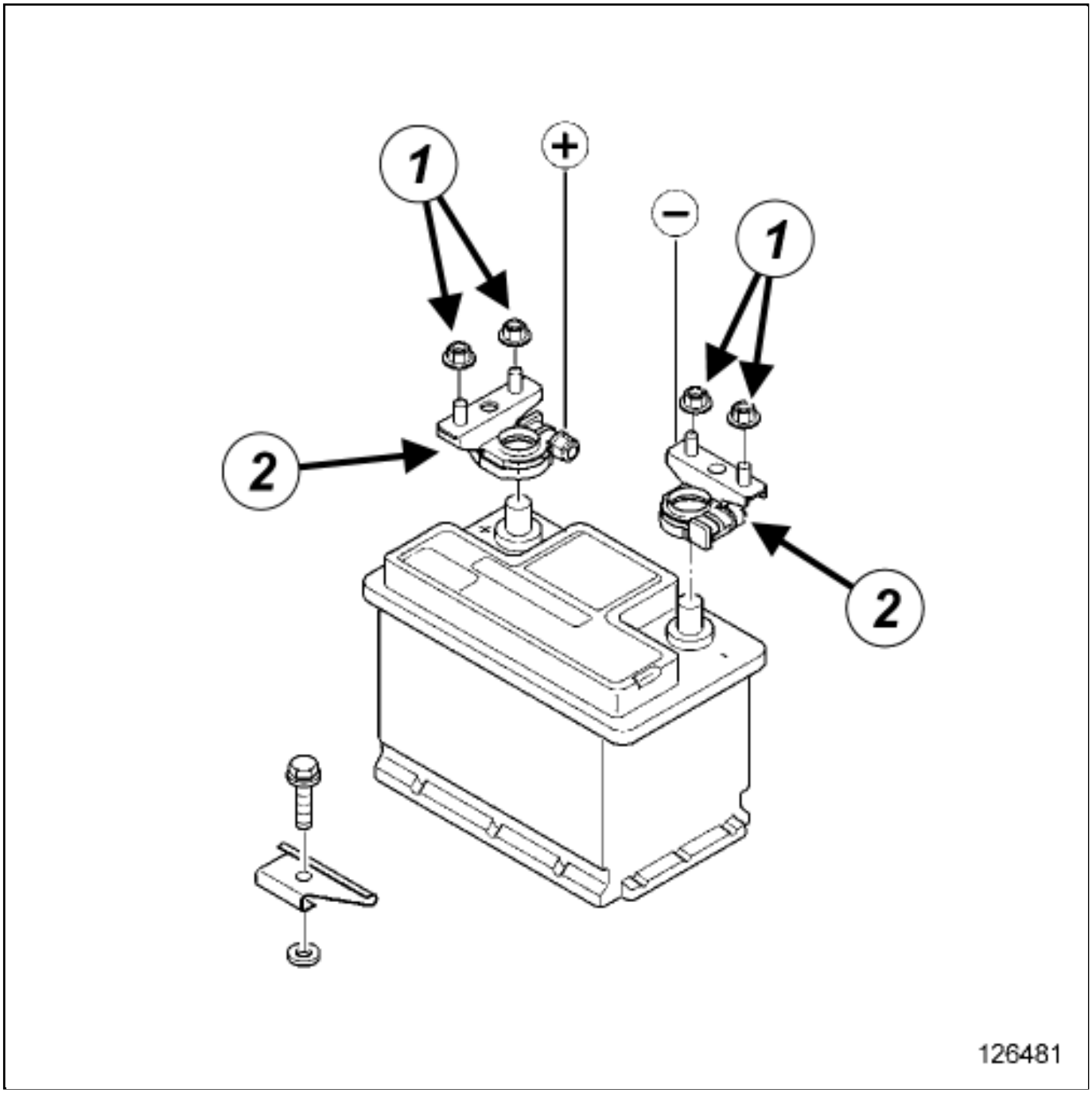
[] 2) Is the battery's magic eye not green or is there a specific message on the instrument panel?

Note:

Specific message on the instrument panel, 2 possibilities:

1 - Written message: "Recharge battery" or "Battery low, start the engine".

2 - Battery charge warning light flashes.



[] 3) Are the stud nuts(1) loose (turn the cables from right to left)?

[] 4) Are the battery stud terminal(2) nuts loose (turn the terminals from right to left)?

3- VEHICLE INTERIOR: PASSENGER COMPARTMENT CONTROLS

1)ACTIVATE AND INITIALISE:

[] The navigation system, store the customer's address (see the user manual for the navigation system).

[] The trip computer display (see Driver's Handbook, Trip computer).

[] Remove the vehicle's interior protection (except from the driver's seat).

[] The oil service interval display on the trip computer (see Driver's Handbook, Trip computer).

[] If a warning light comes on or an error message is displayed on the instrument panel, the vehicle will need to be transferred to the workshop.

4- ACCESSORIES (TO BE FITTED BY THE TECHNICIAN PREPARING THE NEW VEHICLE):

[] Fit the accessories not requiring the vehicle to be transferred to the workshop (mats etc.).

[] Fit the antenna (depending on the vehicle).

[] Fit the wheel trims.

[] Fit the registration plates.

[] Fit the wheel plugs.

[] Fit the phone support.

5- APPEARANCE:

[] Treat non-compliance can be supported by the preparation (small scratches can be removed by the polish, stains, ...).

[] For matt paintings, all alterations must be made in the workshop. prohibiting the use of abrasives, polish typ.

NEW VEHICLE: GENERAL INFORMATION

INFORMATION

You will find 2 types of operational instructions in this Technical Note 3598A:

I . New vehicle operational instructions for preparation: The first part is applicable to vehicles that have not undergone new vehicle preparation. It describes all of the operations to be carried out before handing the vehicle over to the customer (see 01D, Mechanical introduction, New vehicle preparation: Description) .

II . New vehicle operational instructions for finishing: The second part is applicable to vehicles that have undergone new vehicle preparation outside the dealership (e.g. local subcontractor or centralised preparation such as in the United Kingdom, Belgium, Luxembourg and the Netherlands). It describes the final operations to be carried out before handing the vehicle over to the customer (see 01D, Mechanical introduction, New vehicle finish: Description) .

Edition number	Period	Addition
Edition 14	from 01/03/2008 to 30/06/2008	battery check procedure
Edition 15	from 01/07/2008 to 31/10/2008	special notes on X61, X35 and X45
Edition 16	from 01/11/2008 to 31/01/2009	special notes on X95
Edition 17	from 01/02/2009 to 31/05/2009	Navigation preparation: Description procedure
Edition 18	from 01/06/2009 to 31/09/2009	- special notes on X62 - Voice selection table in the Navigation preparation: Description procedure
Edition 19	from 01/10/2009 to 31/04/2010	- special notes on X38
Edition 20	from 01/05/2010 to 31/09/2010	special notes on X33
Edition 21	from 01/10/2010 to 31/12/2010	special notes on X43 additional information on the date of the battery check
Edition 22	from 01/01/2011 to 31/05/2011	commercial names of the new vehicles
Edition 23	from 01/06/2011 to 30/11/2011	special notes on electrical vehicles (X38 and X61

Edition 24	from 01/12/2011 to 31/01/2012	special notes on X09
Edition 25	from 01/02/2012 to 31/03/2012	special notes on X92
Edition 26	from 01/04/2012 to 30/11/2012	special notes on X10, X67 and X98
Edition 27	from 01/12/2012 to 20/05/2014	special notes on X52 and X87
Edition 28	from 20/05/2014 to __/__/____	special notes on X07 and X82

Code	Vehicle
X06	Twingo
X44	Twingo II
X76	Kangoo
X61	Kangoo II
X35	Thalia or Symbol
X65	Clio II
X85	Clio III
X77	Modus
X90	Logan or Sandero
X64	Mégane or Scénic
X84	Mégane II or Scénic II
X95	Mégane III or Scénic III
X45	Koleos
X91	Laguna III
X81	Espace IV
X83	Trafic I

X70	Master II
X62	Master III
X38	Fluence or Mégane Fluence
X24	Master Propulsion or Mascott
X33	Wind
X79	Duster
X43	Latitude
X09	Twizy
X92	Lodgy
X10	Zoé
X67	Dokker
X52	Logan II
X98	Clio IV
X47	Talisman
X87	Captur
X07	Edison
X82	Trafic II
XFC	Espace Concept

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NEW VEHICLE MAINTENANCE: DESCRIPTION

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

This Technical Note describes the steps to be followed for the maintenance of new vehicles during storage. You can use this Technical Note as a monitoring sheet: Enter into the appropriate box the date that the operation is carried out.

This sheet should be stored in the storage compartment of the driver's side front door until the vehicle is prepared before delivery.

1.

VIN:	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
Factory release date:	_ _ / _ _ / _ _ _ _																

MAINTENANCE OPERATIONS				
	At 3 months	At 6 months	At 9 months	> = 12 months
Recharge the battery (see Battery - Charge) (Technical Note 6512A, 80A, Battery)	X	X	X	
After each recharge, disconnect the battery Battery: Removal - Refitting (See MR for the vehicle), for Mégane II, Scénic II, Espace IV, Koleos.	X	X	X	
Replace the battery whilst the vehicle is being prepared before delivery Battery: Removal - Refitting				X
Remove the foam panels Removing the vehicle protection: Description	X			
Remove the protection film or copolymer layer Removing the vehicle protection: Description		X		

Additional operations for a vehicle stored in the showroom

	Every week	Every month
Check the battery charge(see **Battery: Check**) (Technical Note 3682A, 80A, Battery)and recharge it if necessary (See Battery - Charge) (Technical Note 6512A, 80A, Battery)	X	
Recharge the battery (see Battery - Charge) (Technical Note 6512A, 80A, Battery)		X

Maintenance type	Date performed (DD/MM/YY)	Performed by (Name)	Signature
At 3 months			
At 6 months			
At 9 months			
> = 12 months			

NEW VEHICLE PREPARATION: DESCRIPTION

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

1. NEW VEHICLE OPERATIONAL INSTRUCTIONS FOR PREPARATION

This first part is applicable to vehicles that have not undergone new vehicle preparation. It describes all of the operations to be carried out before finishing which must be done .

1- ACCESS TO THE PREPARATION STATION

Note:

If the vehicle does not start, transfer it to the workshop.

Check the operation of the windscreen wiper.

Check the operation of the windscreen and headlight washer jets.

Check the operation of the rear screen wiper.

Check the ventilation in all positions with the air vents open (including manual or automatic air conditioning mode). Do not close the air vents after the check.

2- REMOVING THE PROTECTION AND CHECKING THE APPEARANCE OF THE VEHICLE

1)REMOVING THE VEHICLE PROTECTION

Remove the wiper blade shims.

Remove the rubber and adhesive protection (rear screen, rear windows, etc.).

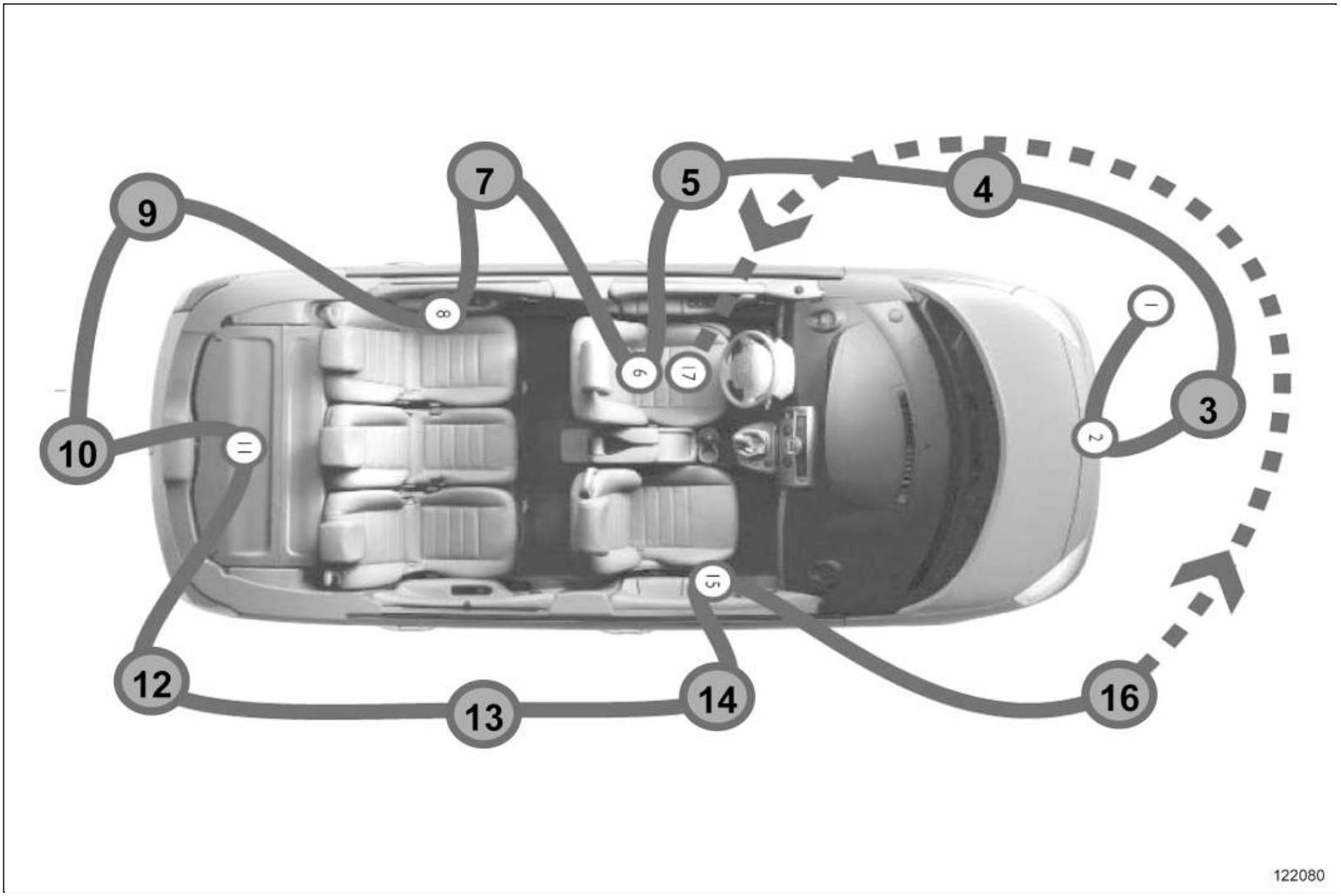
Remove the protective shims on the rear lights.

For vehicles that are protected by film(packaging code 2): remove the vehicle protection **(see 01C, Vehicle bodywork specifications, Removing the vehicle protection: Description)**

For vehicles that are protected by copolymer(packaging code 4): Remove the vehicle protection **(see 01C, Vehicle bodywork specifications, Removing the vehicle protection: Description)**

Watch the bodywork.

1)CHECKING THE APPEARANCE OF THE VEHICLE



Open the bonnet from the carrier.

Area to check	Check
3 - Front end panel	
Bonnet	Operation and noise when opening and closing the bonnet Damage to appearance (panelwork, paintwork) Damage to headlights, fog lights Leaks under the vehicle and underbody protruding components
Roof	
Windscreen	
Headlights	
Radiator grille	
Front bumper	
4 - Left-hand side panel and roof / front left-hand wing panel	
Left-hand side panel and roof	Damage to appearance (panelwork, paintwork)
Front left-hand wing	
5 - Front left-hand door	
Front left-hand door Front left mirror	Operation and noise when opening and closing the front left-hand door Damage to appearance (panelwork, paintwork) Window cracks
7 - Rear left-hand door	
Rear left-hand door	Operation and noise when opening and closing the rear left-hand door Damage to appearance (panelwork, paintwork)
9 - Rear left-hand wing / left-hand side panel	
Rear left-hand wing	Damage to appearance (panelwork, paintwork)
Left-hand side panel, quarter panel and roof	Damage to appearance (panelwork, paintwork)
10 - Rear panel	
Rear panel: tailgate, luggage compartment lid, rear screen, rear bumper, lights, etc.	Operation and noise when opening and closing the luggage compartment lid or tailgate Damage to appearance (panelwork, paintwork) Parts protruding under the vehicle
12 - Rear right-hand wing	
Rear right-hand wing	Damage to appearance (panelwork, paintwork)
13 - Rear right-hand door	
Rear right-hand door	Operation and noise when opening and closing the rear right-hand door Damage to appearance (panelwork, paintwork)
14 - Front right-hand door	

Front right-hand door Front right mirror	Operation and noise when opening and closing the front right-hand door Damage to appearance (panelwork, paintwork) Window cracks
16 - Front right-hand wing / right-hand side panel and roof	
Front right-hand wing	Damage to appearance (panelwork, paintwork)
Right-hand side panel and roof	Damage to appearance (panelwork, paintwork)

1- ENGINE COMPARTMENT

1)CHECKING THE BATTERY

Note:

Transfer the vehicle to the workshop if one of following failure occurs.

Did the vehicle not start on its own?

Is the battery more than 12 months old?

Does the battery show traces of acid and/or sulphation and/or impact?

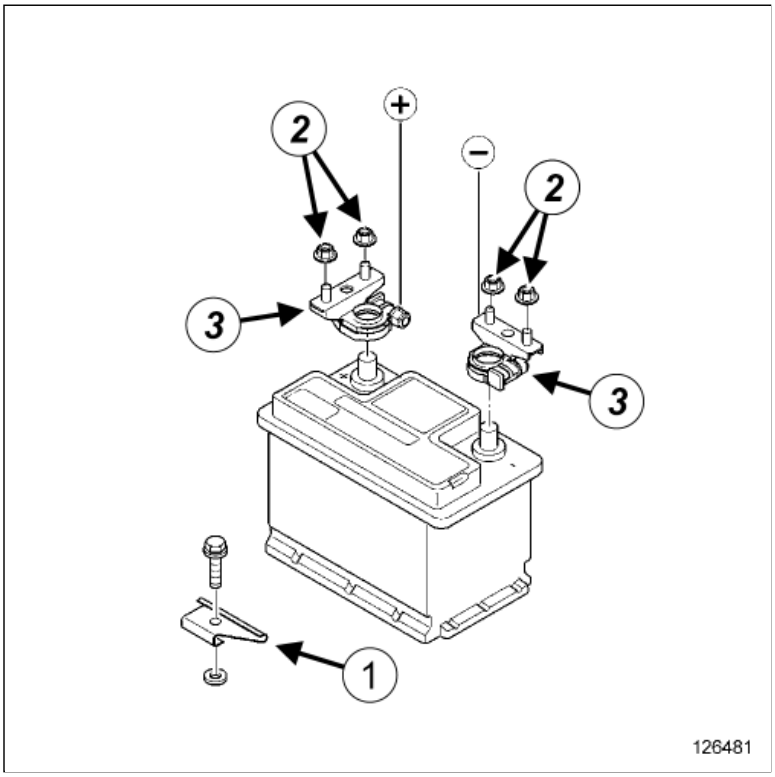
Is the battery's magic eye not green or is there a specific message on the instrument panel?

Note:

Specific message on the instrument panel, 2 possibilities:

1 - Written message: "Recharge battery" or "Battery low, start the engine".

2 - Battery charge warning light flashes.



Is the battery bracket(1) loose (turn the battery from right to left)?

Are the stud nuts(2) loose (turn to the cables from right to left)?

Are the battery stud terminal nuts(3) loose (turn the terminals from right to left)?

Position the battery cover ready in the luggage compartment Battery: Removal - Refitting (MR for the vehicle, 80A, Battery).

Fit the cover onto the diagnostic socket.

2)CHECKING AND TOPPING UP THE FLUIDS (IF NECESSARY) (ENGINE OFF AND COLD)

Note:

All vehicle levels following the new vehicle preparation process must comply with the acceptance criteria described below.

Topping up the fluid is often required because of a leak in the circuit.

CAUTION

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

Wipe away any oil run-off.

	Minimum value	Maximum value	Type of gauge
[]Windscreen washer fluid	Maximum	Maximum	
[]Power-assisted steering fluid (depending on model and engine)	Medium between minimum and maximum	Maximum	On the reservoir
[]Brake fluid (two possible procedures depending on the vehicle)	Medium between minimum and maximum or instrument panel warning light	Maximum or instrument panel warning light	On the reservoir
	Check that the brake fluid level warning light goes out on the instrument panel (see Driver's Handbook)		
[]Coolant	Minimum + 10 mm	Maximum	On the reservoir
[]Engine oil	Maximum - 5 mm	Maximum	Mechanical on the engine

2- WHEELS AND TYRES

Check if the tyres are damaged (tyres with notches, scratched, etc.).

Check that the valve caps are present, including the emergency spare wheel.

Check and inflate the tyres, including the emergency spare wheel (see Driver's handbook, Tyre pressure).

3- BOOT

Check that the tyre repair aerosol is present (depending on the vehicle).

Check that the luggage compartment light is operating correctly.

Check that the tool kit is present (jack, hubcap tool, tow eye, wheel wrench).

4- VEHICLE EXTERIOR: PASSENGER COMPARTMENT CONTROLS

1)CHECK THAT THE FOLLOWING ARE OPERATIONAL

Locks and keys or cards (including duplicates).

Unlock and lock from the inside

Side lights.

Dipped headlights.

Cornering dipped headlights.

Main beam headlights.

Fixed cornering lights.

Direction indicators.

Fog lights.

Brake lights.

Reverse gear lights.

Hazard warning lights.

Number plate lights.

5- VEHICLE INTERIOR: PASSENGER COMPARTMENT CONTROLS

1)CHECK THAT THE FOLLOWING ARE OPERATIONAL

Note:

Transfer the vehicle to the workshop in the event of a fault.

Front and rear interior lights and map reading light.

Glove box light,

Courtesy lights.

Storage compartment lights.

Instrument panel lighting (**Instrument panel: Removal - Refitting**).

Lights-on reminder buzzer (with a door open).

Seats (including access to the rear seats).

Steering wheel adjsutment

Rear door safety catch.

Rear view mirrors.

2)ACTIVATE AND INITIALIZE

The radio: enter the anti-theft code (see Radio user manual).

The daytime running lights (see Driver's handbook, Exterior lighting and signage).

The anti-intruder device (see Driver's Handbook, Anti-intruder device).

The Carminat TomTom Navigation system and R-link ,put the SD card and store the customer's address**(see 01D, Mechanical introduction, Navigation preparation: Description)** .

The time (see Driver's handbook, Clock).

The trip computer display (see Driver's Handbook, Trip computer).

The oil service interval display on the trip computer (see Driver's Handbook, Trip computer).

3)CHECKER

If a warning light comes on or an error message is displayed on the instrument panel, the vehicle will need to be transferred to the workshop.

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XSL version : 3.02 du 22/07/11

RENAULT

Technical Note 5164A

TTY

Noise fault finding

All types

General Methods

77 11 398 922 December 2006 EDITION ANGLAISE

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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General information

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Noise diagnostic tool – Use 01E-101

1. SCOPE OF THIS DOCUMENT

This document covers the following topics:

- Noise from the drive train,
- Noise when changing gear,
- Air inlet noises,
- Noise from the turbocharger,
- Noise from the exhaust
- Interference noise (suspension, steering, etc.)
- Noise from the dashboard,
- Noise from the upholstery,
- Noise from the sunroof,
- Noise from the window winders,
- Noise from the speakers.

This document presents the fault finding procedure applicable to all vehicles with the following specifications:

- Vehicles with 2 drive wheels for the drive train,
- Manual gearboxes (for drive train noises)
- Original sliding/tilting sunroof.

2. PRE-REQUISITES FOR FAULT FINDING

Documentation type

- Fault finding procedure (this document):
- Repair Manual for the vehicle concerned

Type of diagnostic tools

- CLIP to lock the airbags (if necessary)
- Noise diagnostic tool (see **01E GENERAL VEHICLE INFORMATION, Noise diagnostic tool - Use**)

3. FAULT FINDING PROCEDURE

1st time
complete the fault finding log
with the customer (with or without a test)

↓

2nd time
Use the Customer Complaint classification chart to identify the cause of the noise and
the corresponding ALP based on the conditions under which the noise appears

↓

3rd time
Apply the corresponding **F**ault **F**inding **C**hart (ALP).
Identify the origin of the fault

Rules for dealing with a noise-related customer complaint when the vehicle is received or in the workshop:

Rule no. 1: When the customer complaint is registered.

When the appointment is made by telephone, ask if the customer would be able to reproduce the noise in the workshop (enable the cotech to hear the noise with the customer present so that the fault finding procedure is more efficient).

If the customer cannot, preferably offer a date when they are not busy in order to deal with the noise.

Rule no. 2: Take information in a methodical manner.

The fault finding log must be completed to accurately describe the customer complaint in addition to the Order of repair.

4. FAULT FINDING LOG

IMPORTANT!

WARNING
All problems involving a complex system call for thorough diagnostics with the appropriate tools. The FAULT FINDING LOG, which should be completed during the fault finding procedure, ensures a record is kept of the procedure carried out. It is an essential item when discussing the fault with the manufacturer.

It is therefore mandatory to fill out a fault finding log for each fault finding procedure.

You will always be asked for this log:

- when requesting technical assistance from the Techline,
- for approval requests before replacing parts for which approval is compulsory
- which must be attached to monitored parts for which reimbursement is requested. It is therefore used to decide whether a reimbursement will be made under warranty and leads to improved analysis of the removed parts.

A blank log is available on the following pages

FAULT FINDING LOG

Administrative identification

Date	2 0
Log completed by	
VIN	
Engine	
Diagnostic tool	CLIP
Update version	

Customer complaint

	520	Abnormal noise, vibrations

Other — Your comments:

Conditions under which the customer complaint occurs

		In forwards gear (whilst driving)
		Whilst reversing
		When starting (increased engine speed in 1st)
		Whilst parking
		When stationary (engine running)
		When stationary (engine not running)
		Switching the engine on/off

– Engine

	Engine fitted with a turbocharger		Petrol		Diesel

– Vehicle speed

	between 0 and 30 mph (0-50 km/h)		between 30 and 54 mph (50-90 km/h)		between 54 and 78 mph (90-130 km/h)
	constant		variable		

FAULT FINDING LOG

– Engine speed

	at idle speed (neutral)		at low engine speed Diesel and Petrol < 1500 rpm		at medium engine speed 1500 < Diesel < 3000 rpm 1500 < Petrol < 4000 rpm
	at high speed Diesel > 3000 rpm Petrol > 4000 rpm		stabilised		variable
	under speed		over speed		increasing engine speed (no load)
	lessens when engine speed increases				

– Engine temperature

	When cold		When warm		Quieter when hot
	Worse when hot				

– Driving conditions

	In neutral		When decelerating		Heavy acceleration
	On a hill		Pedal released suddenly after it is fully depressed		

– Vehicle speed

	Stabilised: vehicle speed or engine speed constant.		Accelerating

– Driver's action on the accelerator (acceleration or deceleration)

	no pressure		foot resting on or lightly depressing the accelerator pedal		Accelerator pedal moderately depressed and held (neither slightly nor fully depressed)
	pedal held fully depressed		pedal fully depressed suddenly (on-off)		Accelerator pedal gradually released
	Accelerator pedal suddenly released		disappears when pedal released without braking		

FAULT FINDING LOG

– Driver's action on the gear lever (gearbox)

	when changing gear (one or more)		gets worse when changing gear quickly		only appears when engaging the gear.
	Always appears when engaging AND disengaging gear.		worse when downshifting		

– Driver's action on the clutch

	the customer complaint disappears when declutching and reappears when engaging the clutch		the customer complaint disappears when changing gear, disengaged.		the customer complaint lessens when changing gear, disengaged. (test type handling in a motor show)

– Driver's action on the steering wheel

	Little movement (pressure change, cornering)		Significant movement (roundabout, manoeuvres)		

– Driver's action on a vehicle fitting

	Upholstery (adjustments)		Sunroof (opening/closing)		Sunblind (opening/closing the sunblind)
	Dashboard (glovebox, air conditioning controls, etc.)		Speaker (switching on)		whilst opening/closing the window
	whilst opening or closing the window fully		when closing the door (window half-open)		

FAULT FINDING LOG

– Weather conditions

	cold weather (frost)		hot weather (sun)		humid conditions
	dry conditions				

– Main beam

	smooth		cobbled		grooved
	in poor condition: unmade, road seams, drain cover, pot hole, etc.		When driving over a speed bump		Mounting/dismounting the pavement
	Corner (to the left or right)		parallel parking		

5. SAFETY INSTRUCTIONS

Safety rules must be observed during any work on a component to prevent any damage or injury:

The road tests referred to in this document should be carried out in accordance with Road Traffic Regulations (speed limits must be obeyed).

During the tests performed with the engine running, observe the safety advice. Pay particular attention to the accessories, moving parts or parts which heat up (fan assembly activation, increase in temperature of the air pipe at the turbocharger outlet, etc.)

WARNING
When carrying out road tests, obey Road Traffic Regulations, especially speed limits.

Within the framework of a fault finding test, two people are required to carry out the research and specific identification of the source of the noise.

6.1. DEFINITIONS OF CAUSES:

This document deals with the following causes of noise:

Drive train:

TEST PROTOCOL FOR CLASSIFICATION OF THE CUSTOMER COMPLAINT

A. If the customer complaint appears when driving
- Perform **gradual** accelerations and decelerations [1] [2] on each gear to determine which gear(s) display the customer complaint (on an even straight line with a good surface, warm engine and after having checked that the oil and coolant levels are correct). Note the vehicle speed, gear ratio and engine speed.
- **Disengage / re-engage**: if the customer complaint disappears when disengaging and reappears when re-engaging the gear and the engine speed is stabilised, there is a whining noise and/or growling.
- **Change pressure**: if the noise level is more pronounced or decreases when pressure is applied (when overtaking, cornering, on a roundabout, moving steering wheel to the left/right), this is not a drive train fault (check the wheel bearings).

B. If the customer complaint appears particularly during a parking manoeuvre (steering greater than one steering wheel revolution, in 1st or 2nd gear)
If a noise appears when accelerating and disappears when decelerating, there is a murmuring noise from the differential.

C. If the customer complaint appears when stationary
In neutral and disengaged, increase the engine speed **very** gradually [2].
If the noise identified when driving is still present at the same engine speed, it is not a drive chain fault.

[1]: The speed range under which the customer complaint appears may be restricted. It is necessary to slowly increase and decrease the engine speed for each gear.
[2]: Increased engine speed: as long as the noise can be heard.
- up to approximately 4500 rpm (petrol engine),
- up to approximately 3000 rpm (diesel engine).

Never go into the red zone.

Whining noise (drive train)
Definition: high-pitched noise caused by teeth engaging when driving.
Note: this customer complaint can be noticed from 0 miles. It is more noticeable on long journeys on a constant road type (motorway). Not to be confused with aerodynamic noise.

Test to identify the whining noise from the engaging teeth: during a road test, hold the gear lever to dampen the gearbox control driveshaft chain. If the noise is quieter or disappears, check the gear lever first and, if the gear lever is correct, consult ALP 13 - Whining noise from the drive train.

Murmuring (differential - relay bearings)
Definition: modulated noise which is similar to the cooing of a pigeon.
Note: this customer complaint can occur at any point in the vehicle's lifetime.

Test to identify the murmuring noise from a driveshaft: during a road test, if there is significant noise when driving in a straight line and when cornering, study the right-hand driveshaft relay bearing. If there is only significant noise when cornering, there is a fault in the gearbox, mainly with the differential.

Growling noise (drive train)
Definition: continuous noise which is similar to the noise when shaking a bag of nuts.
Note: appears particularly when hot and can be easily heard when the windows are open when passing alongside a wall. It is quite noticeable at low speed.

Test to identify the growling noise: during a road test, perform gentle accelerations in 1st and 2nd gear. If the noise dies down or disappears whilst holding the gear lever, study the control instead.

Noise from neutral (drive train)
Definition: sewing machine noise.
Note: disappears when accelerating and declutching.

Exhaust

Crackling from the pipe or ball joint.
Definition:
– For the pipe: noise like a bag of marbles shaken energetically. Very high frequency (very high-pitched).
– The ball joint may grate when fitted to the spring.
Note: can be heard easily from the outside or when the window is open (car park exit, when passing alongside a wall). The noise becomes more pronounced very quickly if no repair work is carried out on the vehicle. It can be reproduced when stationary by shaking the exhaust pipe.

Warning
The crackling may spread and get worse along the exhaust system, despite the cause being very localised at the beginning of the system (connecting hose or ball joint bracket). It may appear that the entire pipe is concerned but this is not the case.

Noise from underbody contact.
Definition: dull or bright metallic noise (fist banging on a table).
Note: it can be reproduced when stationary by shaking the exhaust pipe.

Exhaust leak noise.
Definition: none.
Note: it depends on the engine speed and can be heard according to the extent and location of the leak.

Turbocharger

Meowing noise from the turbocharger.
Definition: single frequency continuous noise, **sub-synchronous to the speed of the turbocharger**.
Note: the meowing noise from the turbocharger is quieter when hot.

Whistling noise from the turbocharger.
Definition: high-pitched whistling which follows the turbocharger rotation speed, **either synchronous to the turbocharger speed, or super-synchronous to this speed (vane number x turbocharger speed)**.
Notes:
– the whistling noise from the turbocharger is worse when hot.
– Any of the fittings installed, poor bonding of the windscreen or cable routing through the bulkhead may be the cause of the detected noise.

Blowing noise from the turbocharger.
Definition: noise similar to the noise made by a ventilation fan (passenger compartment ventilation, engine cooling system)
Note: the blowing noise from the turbocharger is even louder when the turbocharger air flow is higher.

Sighing noise from the turbocharger (Diesel terminology).
Definition: noise similar to a volume of pressurised air being released **suddenly**.
Note: the sighing noise from the turbocharger is even greater when the turbocharging pressure is greater as the pedal is released.

Releasing noise from the turbocharger: (petrol terminology).
Definition: noise similar to a volume of pressurised air being released **very suddenly** (activation of the turbocharger recirculation valve).
Note: the releasing noise from the turbocharger is even greater when the turbocharging pressure is greater as the pedal is released.

Air intake

Air inlet whistling.
Definition: high-pitched noise similar to whistling.

Test protocol.
Carry out at test in the workshop with the vehicle stationary and the bonnet open:
Warm engine: increased engine speed (neutral) to average speed (4000 rpm for a petrol engine; 3000 rpm for a diesel engine).

Warning.
The air inlet whistling noise must be distinguished from the turbocharger whistling noise. It is directly related to the engine speed and not to the speed of the turbocharger.

Air inlet humming.
Definition: dull noise which is similar to the noise of a bumblebee in flight.
Note: noise sensitive to engine load (petrol).
Noise not sensitive to engine load (diesel).

Noise when changing gear

Noise when engaging and disengaging gear.
Definition: more or less marked dull clicking (short thud).
Note:
– engine stopped, when static, if the same gears are engaged one after another (e.g. neutral- first), the first gear change is always the noisiest. On the other hand, if the gear is changed from neutral - 1st - 2nd then neutral - 1st, there will be as much noise during the first gear change in the first series as in the second.
– depending on the clutch "performance" (ability to separate the engine from the gearbox quickly) the noises when engaging/disengaging may be more pronounced.

Creaking:
Definition: onomatopoeia of a dry noise heard whilst engaging a gear (partially or completely). A malfunctioning gearbox can potentially be accompanied by successive shocks in the gear knob which may prevent gear engagement. Sporadic noise which is similar to a rattle.
Note: for basic range vehicles, it may be normal to notice creaking noises in reverse gear.

Banging during power take-up:
Definition: banging whilst changing gear or during torque inversion (successive acceleration or deceleration).
Note: mainly in the lower gears (1st, 2nd, 3rd).

Interference noise

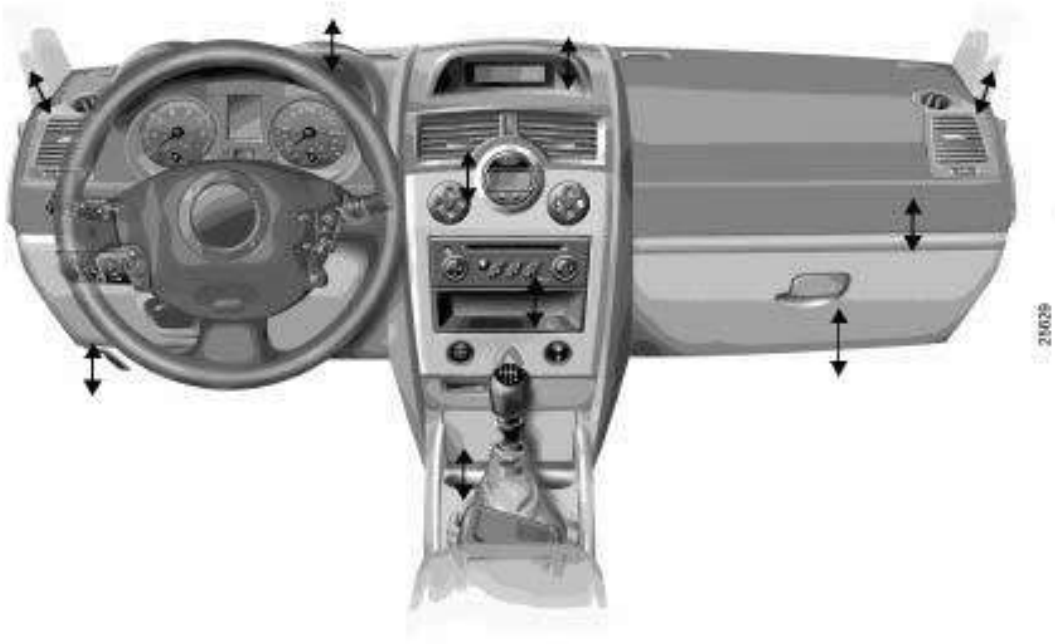
Definition: noise which is difficult to locate, due to a fault in the chassis, steering, engine and transmission assembly suspensions, underbody area, rotating components or front end panel.

Dashboard

There are three types of dashboard noise:

- **rubbing noises**: two components or sections rub against each other which produces a creaking or grating noise.
- **banging noises**: two components or sections knock together which produces a crackling or rattling noise.
- **vibration**: too much play between two components or sections

These noises are mainly related to contact between two components (cover or front panel and dashboard casing) or related to a component which moves with another component.



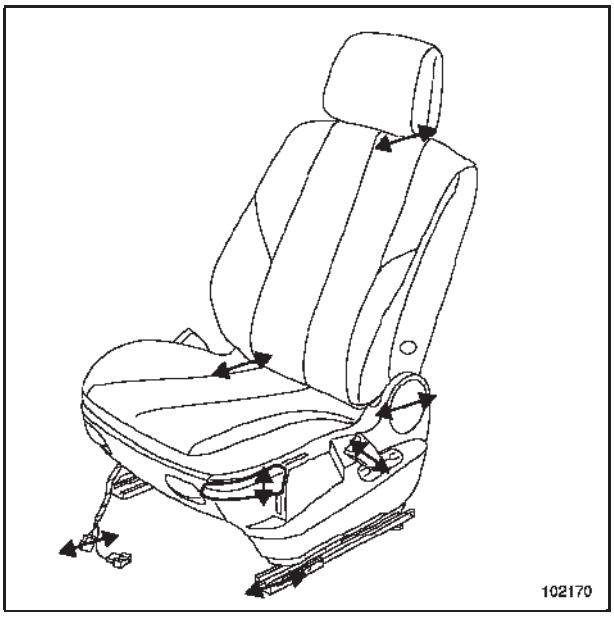
↔: Area likely to produce a noise

Noise from the upholstery

There are three types of seat noise:

- **rubbing noises:** two components or sections rub against each other which produces a squeaking or grating noise (e.g. adjustment lever)
- **banging noises**: two components or sections knock together which produces a crackling noise (e.g. cover) or a rattling noise (e.g. wiring)
- **vibration**: too much play between two components or sections

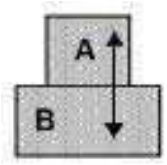
These noises are mainly related to contact between two components (e.g. cover and dashboard casing) or related to a component which moves against another component (e.g. runners)



↔: Area likely to produce a noise

Crackling from the speaker

Definition:



Crackling: quick alternating impact between two components.

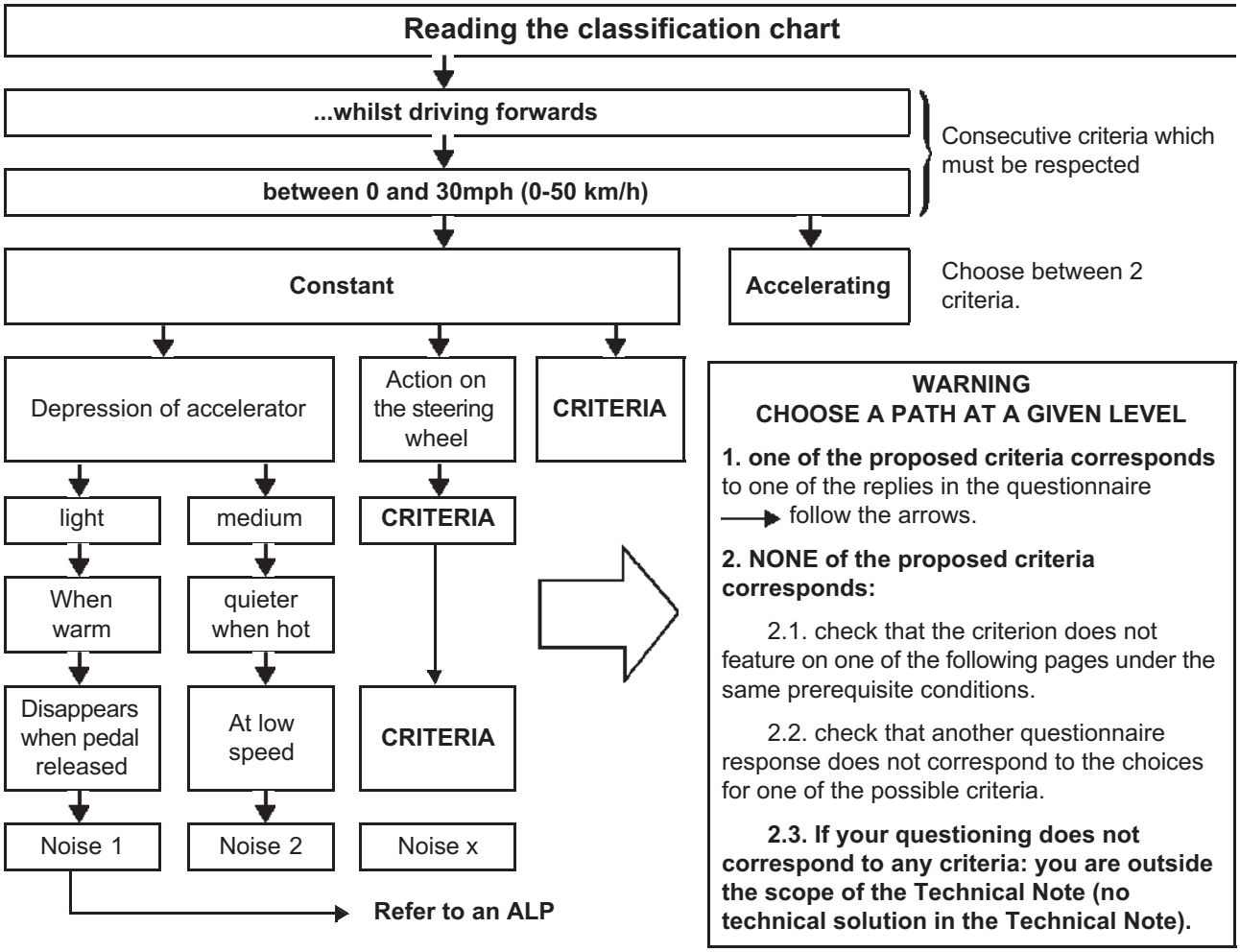
Sunroof:

Sunroof chattering: jerky movement of mobile panel when opening/closing (vertical movement of the panel while moving longitudinally)

6.2. CAUSE OF NOISE CLASSIFICATION CHART

WARNING
The Customer Complaint Classification Chart is used to identify the cause of a noise which has been detected by the customer. A Classification Chart is selected using a questionnaire which lists the different conditions under which the noise appears.

Only the **most common conditions** under which the noise occurs are listed in the classification chart. It is important to correctly identify with the customer **the main condition** under which the noise appears.



WARNING
CHOOSE A PATH AT A GIVEN LEVEL

1. one of the proposed criteria corresponds to one of the replies in the questionnaire → follow the arrows.

2. NONE of the proposed criteria corresponds:

2.1. check that the criterion does not feature on one of the following pages under the same prerequisite conditions.

2.2. check that another questionnaire response does not correspond to the choices for one of the possible criteria.

2.3. If your questioning does not correspond to any criteria: you are outside the scope of the Technical Note (no technical solution in the Technical Note).

CONDITIONS UNDER WHICH THE NOISE APPEARS

The noise is detected:		
	whilst driving forwards between 0 and 30 mph (0-50 km/h) and the noise depends on the road surface	conditions under which the noise appears no. 1
	whilst driving forwards between 0 and 30 mph (0-50 km/h) and the noise does not depend on the road surface	conditions under which the noise appears no. 2
	whilst driving forwards between 30 and 54 mph (50 and 90 km/h)	conditions under which the noise appears no. 3
	whilst driving forwards between 54 and 78 mph (90 and 130 km/h)	conditions under which the noise appears no. 4
	whilst driving forwards in a particular engine speed range	conditions under which the noise appears no. 5
	whilst driving forwards when the accelerator is depressed in a particular manner	conditions under which the noise appears no. 6
	whilst driving forwards when the gear lever is manipulated in a particular manner	conditions under which the noise appears no. 7
	whilst driving forwards	conditions under which the noise appears no. 8
	Whilst reversing	conditions under which the noise appears no. 9
	starting	conditions under which the noise appears no. 10
	whilst parking	conditions under which the noise appears no. 11
	when stationary, engine running	conditions under which the noise appears no. 12
	when stationary, engine may or may not be running	conditions under which the noise appears no. 13
	vehicle stationary, engine not running or switching ignition on/off	conditions under which the noise appears no. 14

Conditions under which the noise appears no. 1

The noise is detected...

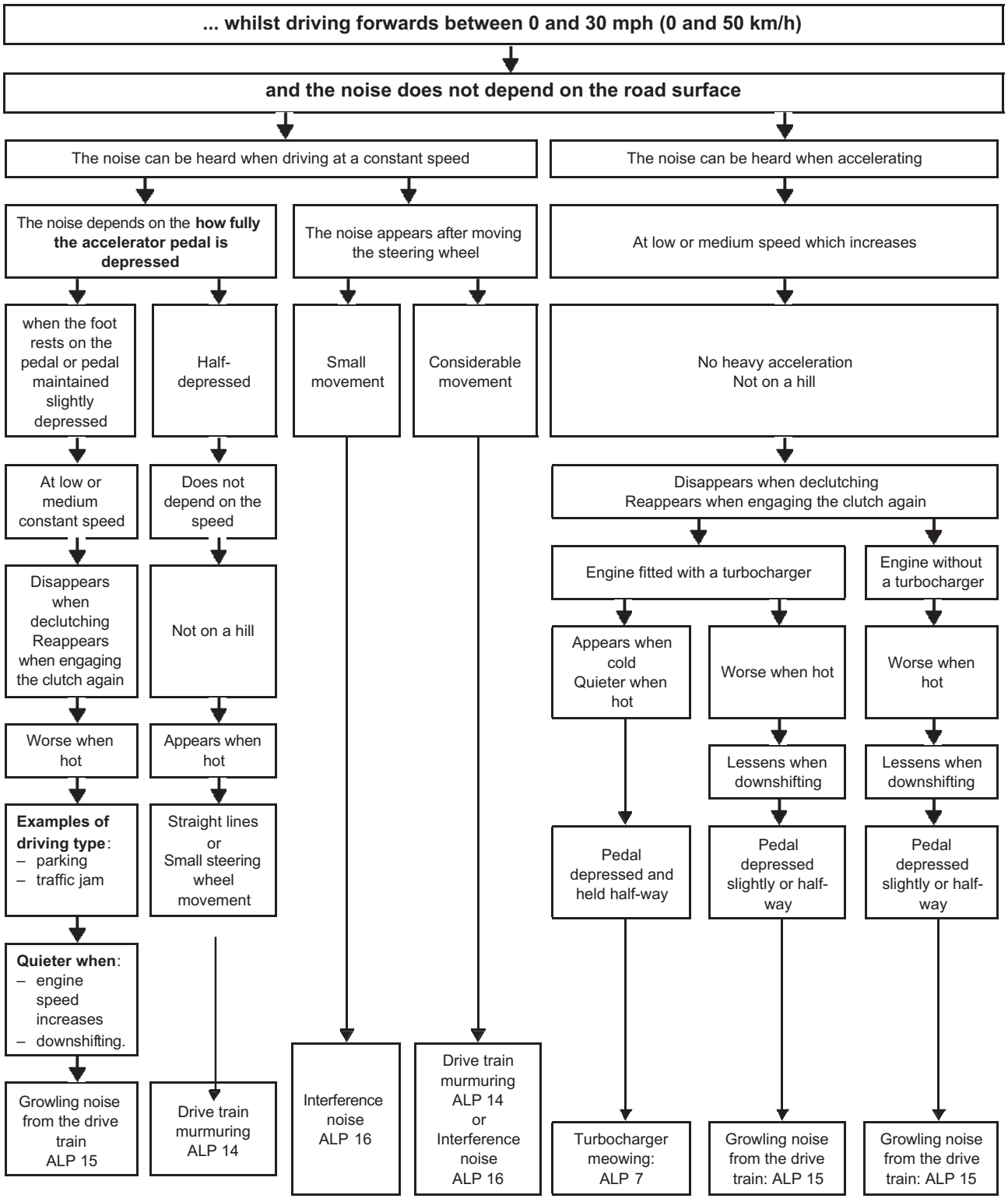
... whilst driving forwards between 0 and 30 mph (0 and 50 km/h)

and the noise depends on the road surface

- Smooth surface + Hot and dry weather → Sunroof creaking: ALP 24
- Cobbled surface → **It may be related to:** 1. Interference noise: ALP 16 2. Dashboard noise: ALP 18 3. Upholstery noise: ALP 19 4. Sunroof rattling: ALP 26 5. Underbody contact noise (exhaust): ALP 4
- Grooved surface → Interference noise: ALP 16
- Poor condition: unmade road, road seams, drain cover, pot hole, etc.
  - Weather has no effect → **It may be related to:** 1. Interference noise: ALP 16 2. Dashboard noise: ALP 18 3. Upholstery noise: ALP 19 4. Sunroof rattling: ALP 26 5. Underbody contact noise (exhaust): ALP 4
  - in hot and dry weather → Sunroof creaking: ALP 24
- On a speed bump → **It may be related to:** – Interference noise: ALP 16 – Sunroof rattling: ALP 26

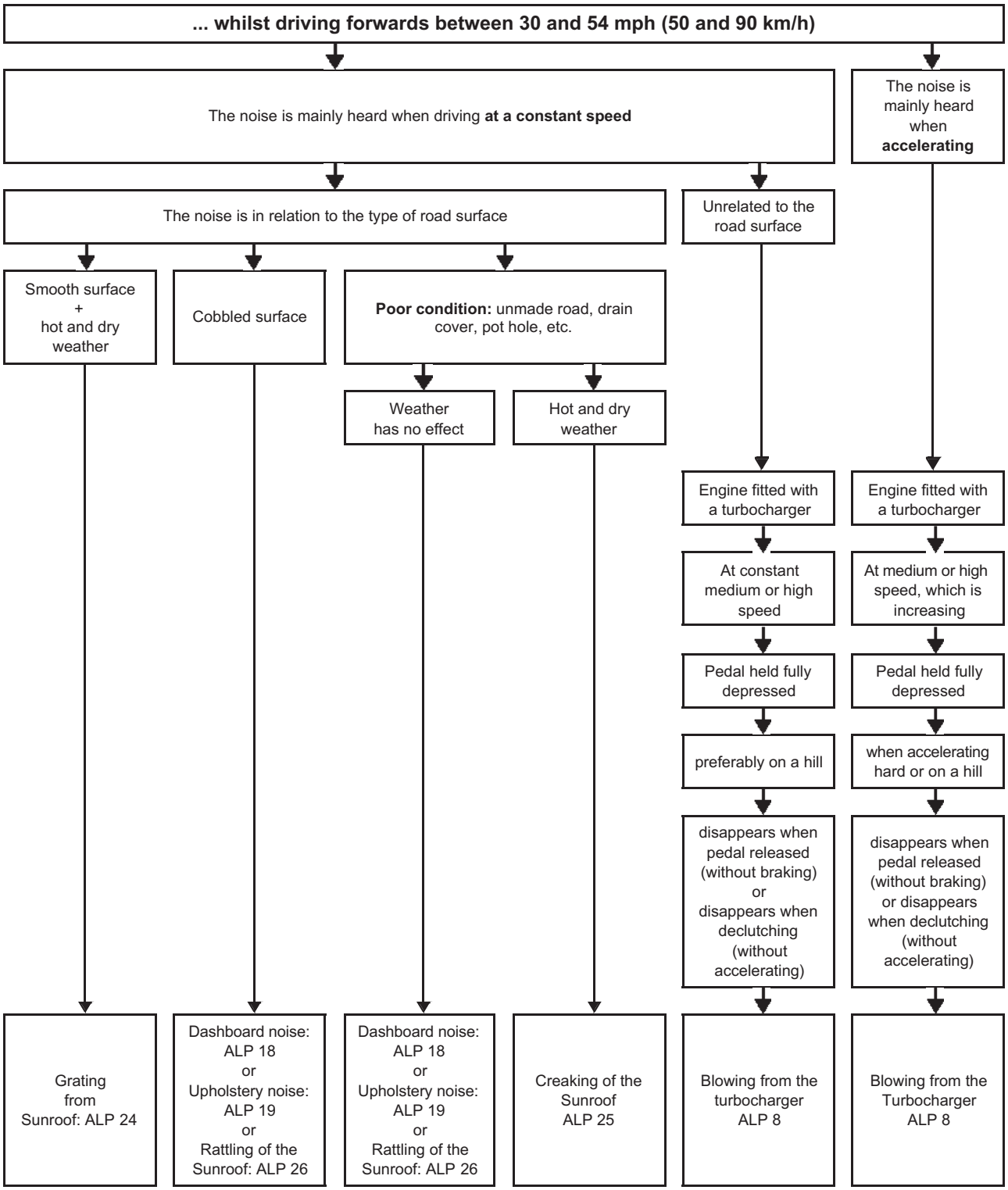
Conditions under which the noise appears no. 2

The noise is detected...



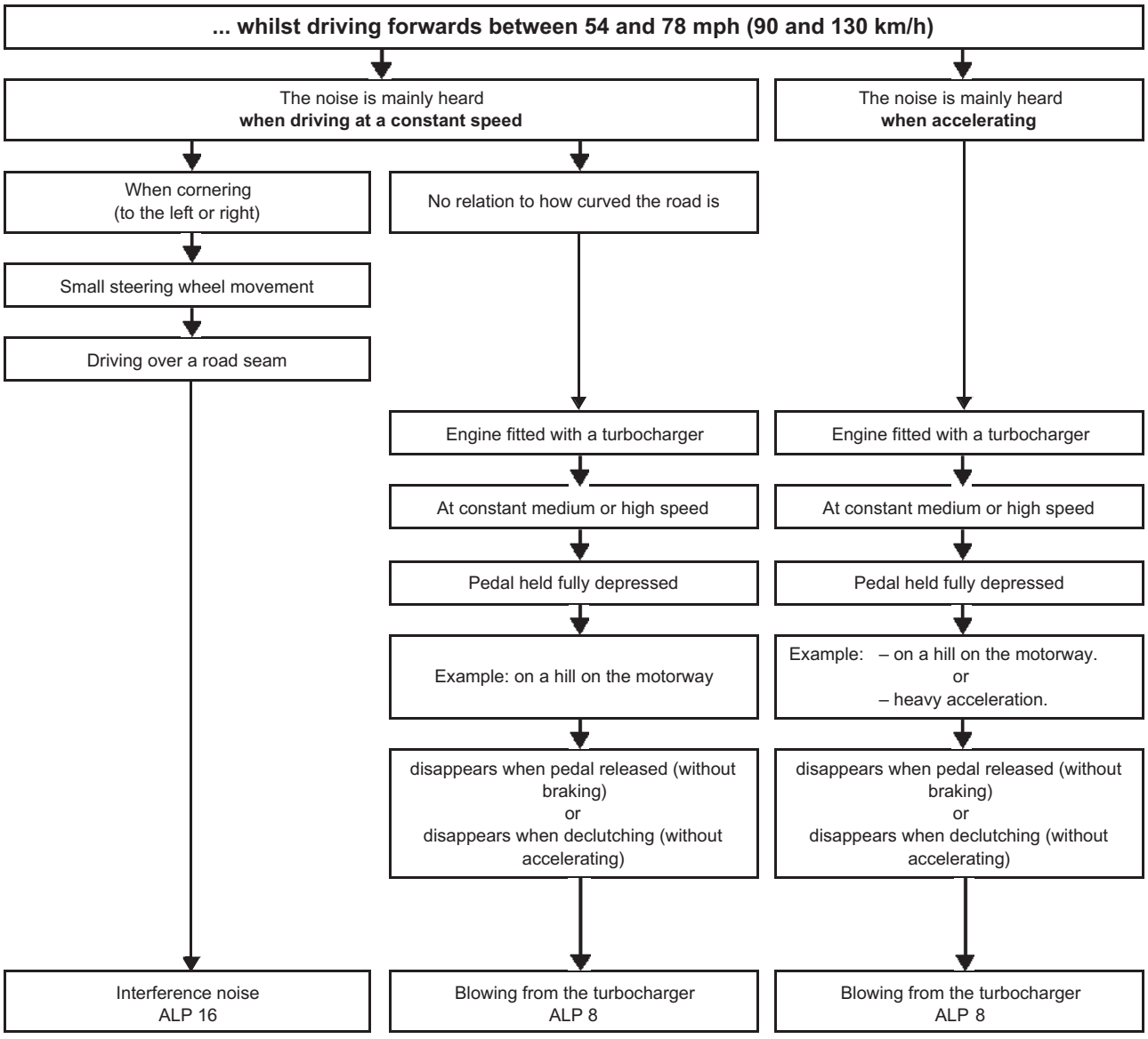
Conditions under which the noise appears no. 3

The noise is detected...



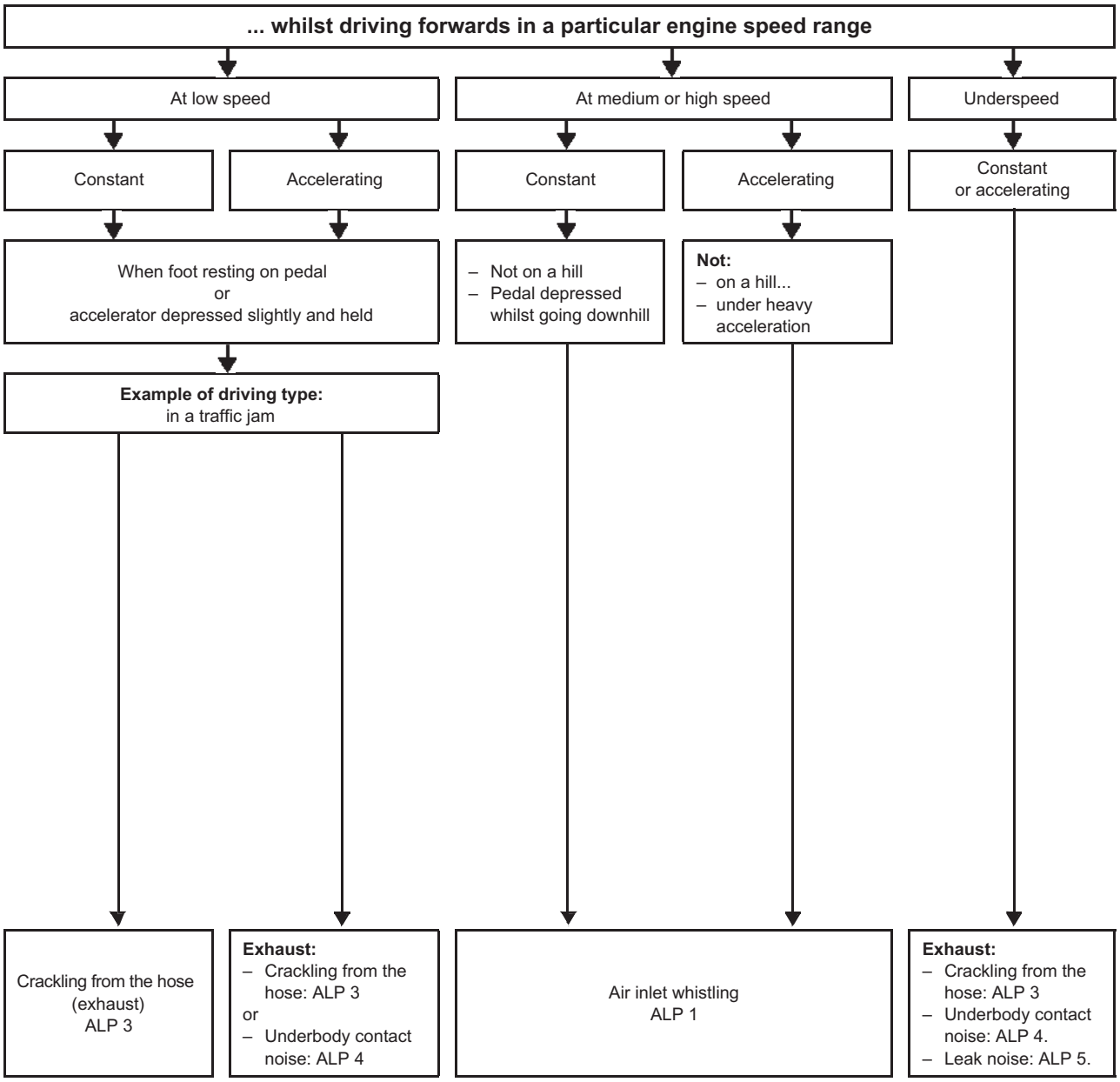
Conditions under which the noise appears no. 4

The noise is detected...



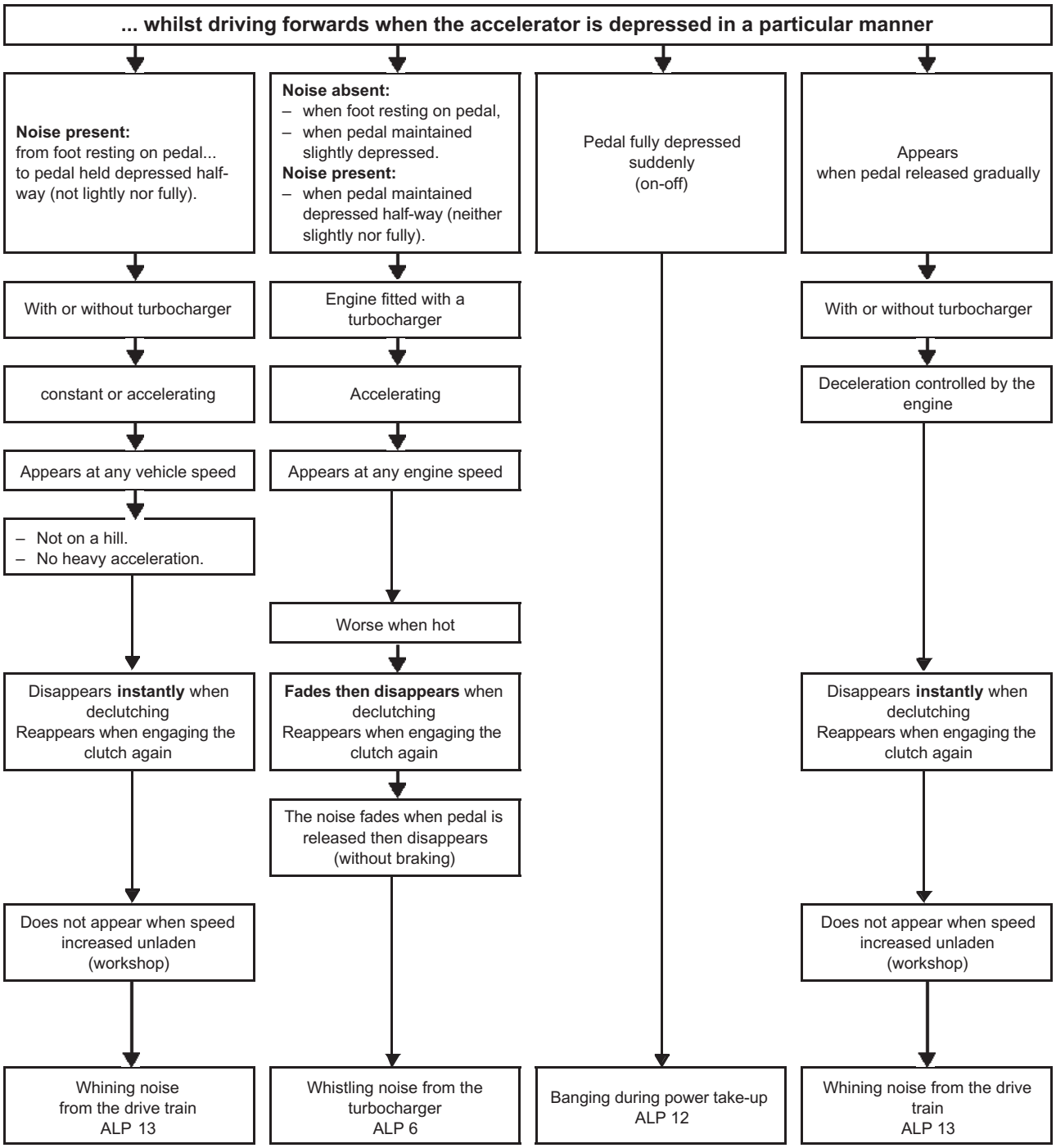
Conditions under which the noise appears no. 5

The noise is detected...



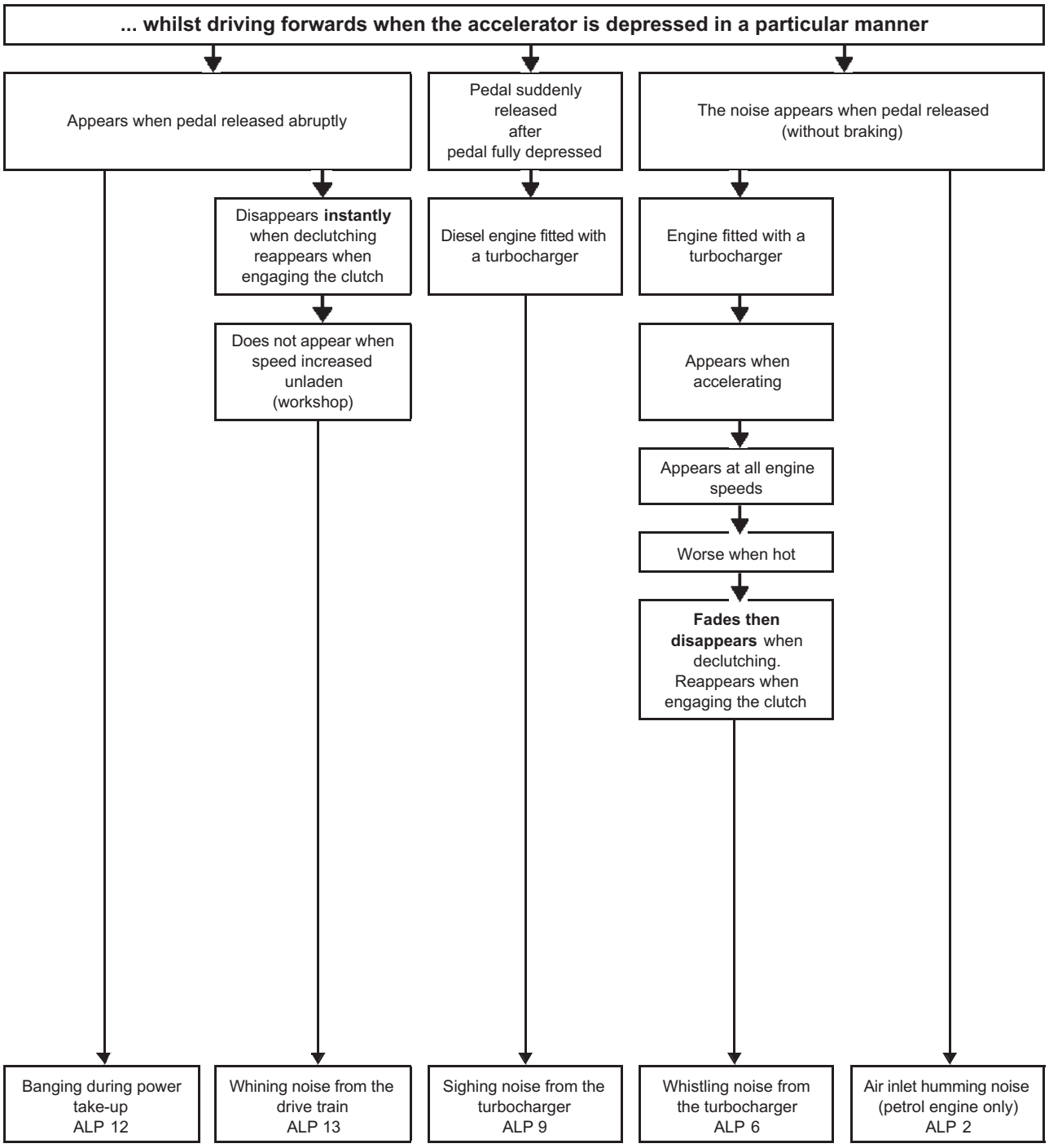
Conditions under which the noise appears no. 6

The noise is detected...



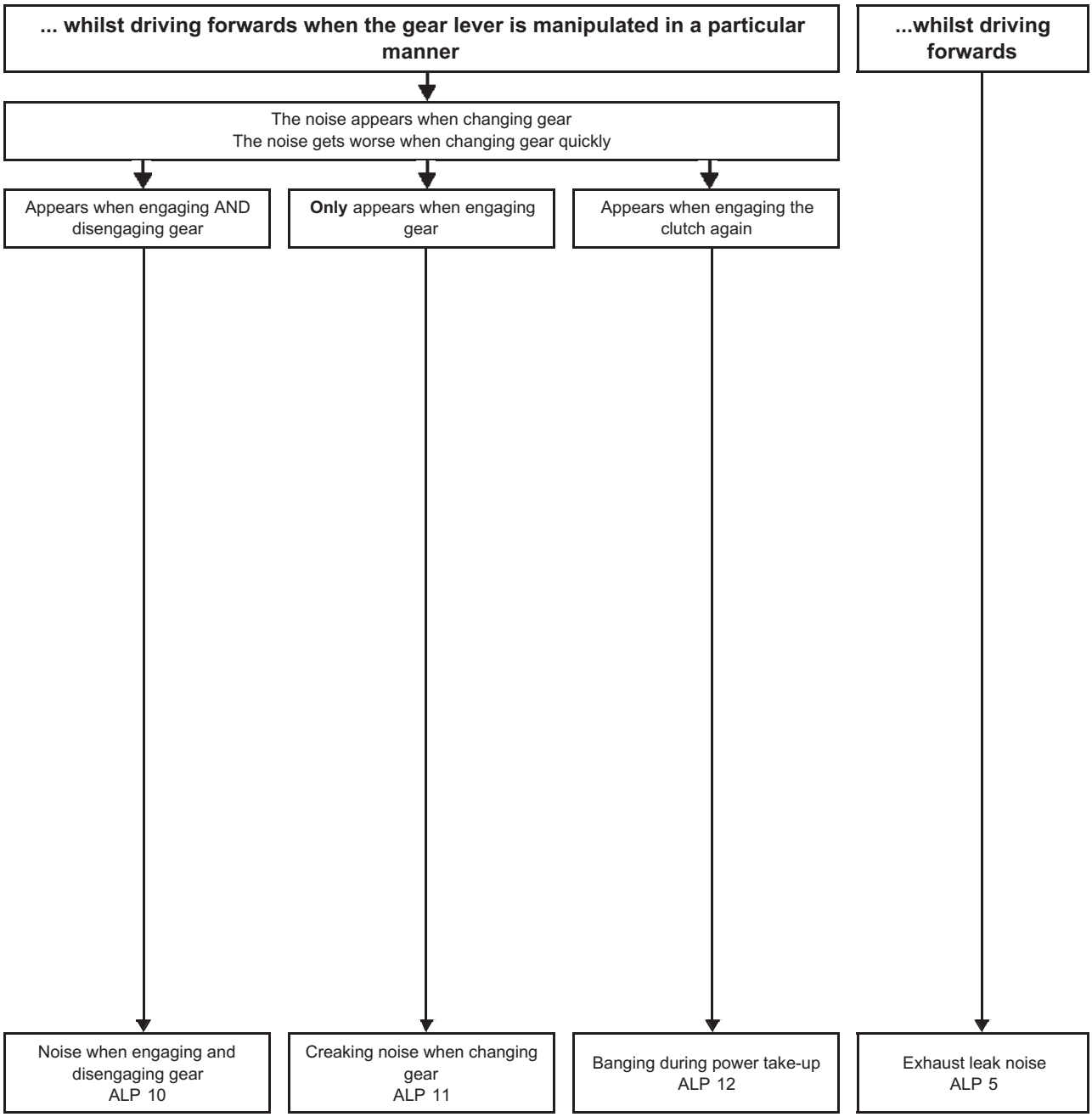
Conditions under which the noise appears no. 6 (continued)

The noise is detected...



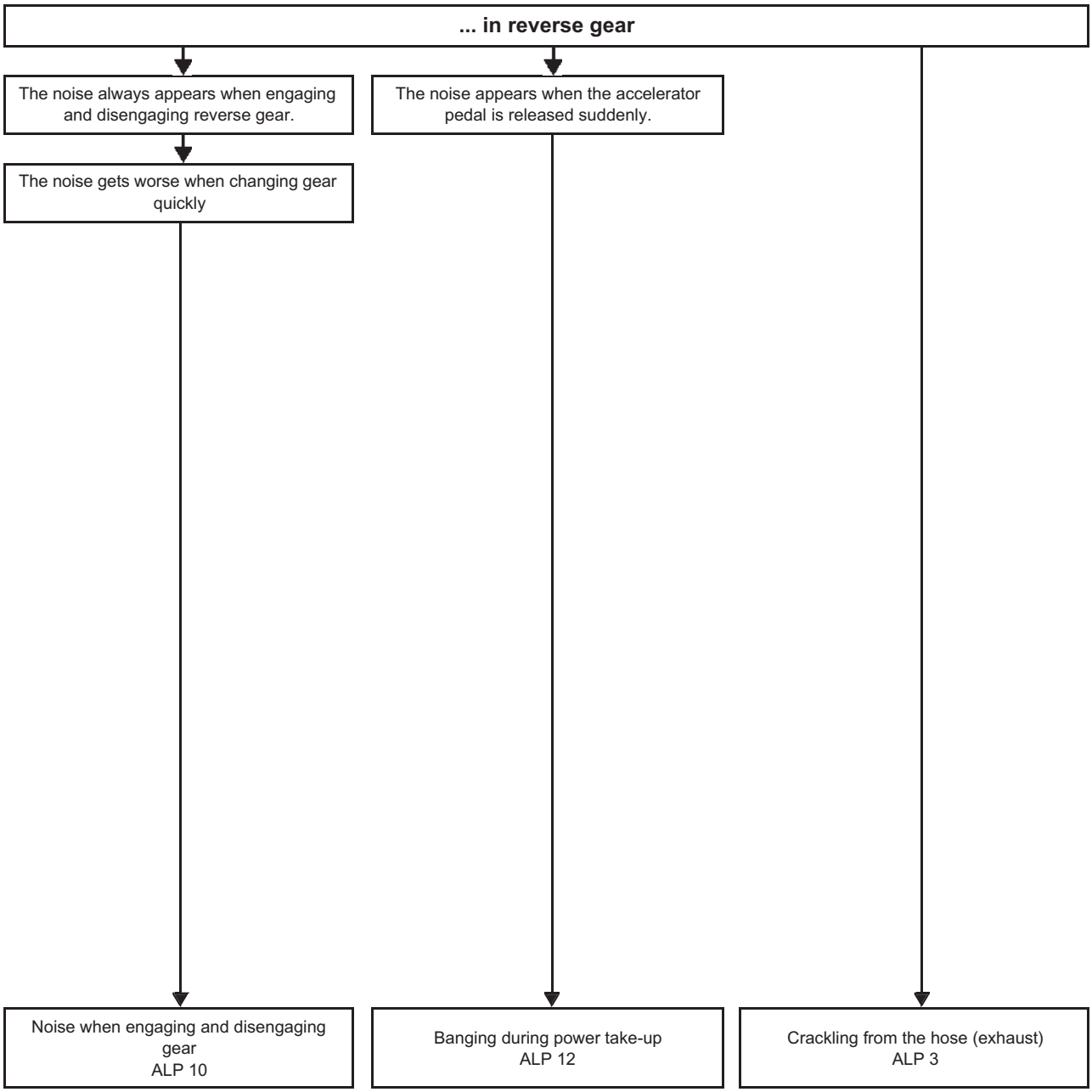
Conditions under which the noise appears nos. 7 and 8

The noise is detected...



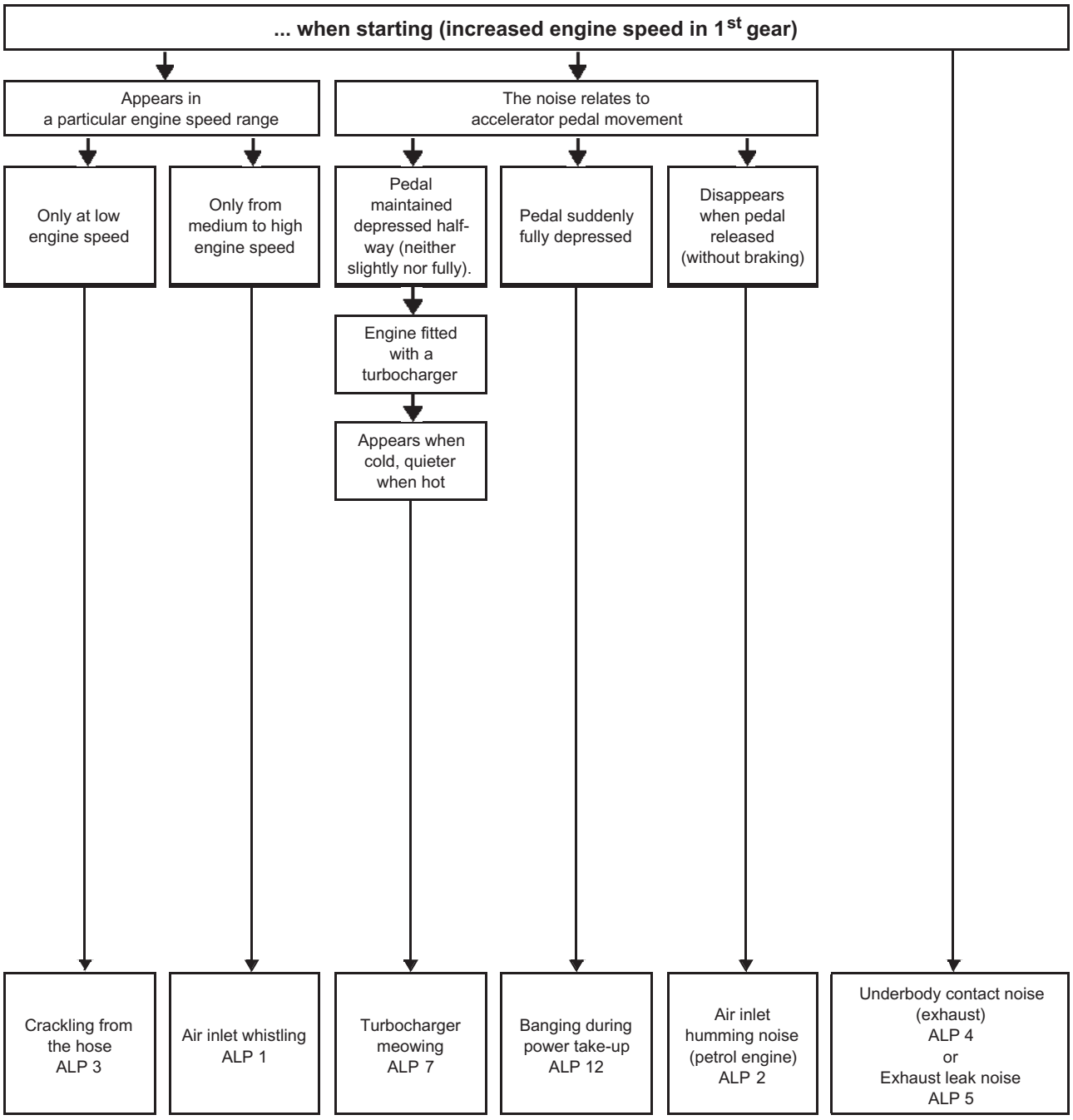
Conditions under which the noise appears no. 9

The noise is detected...



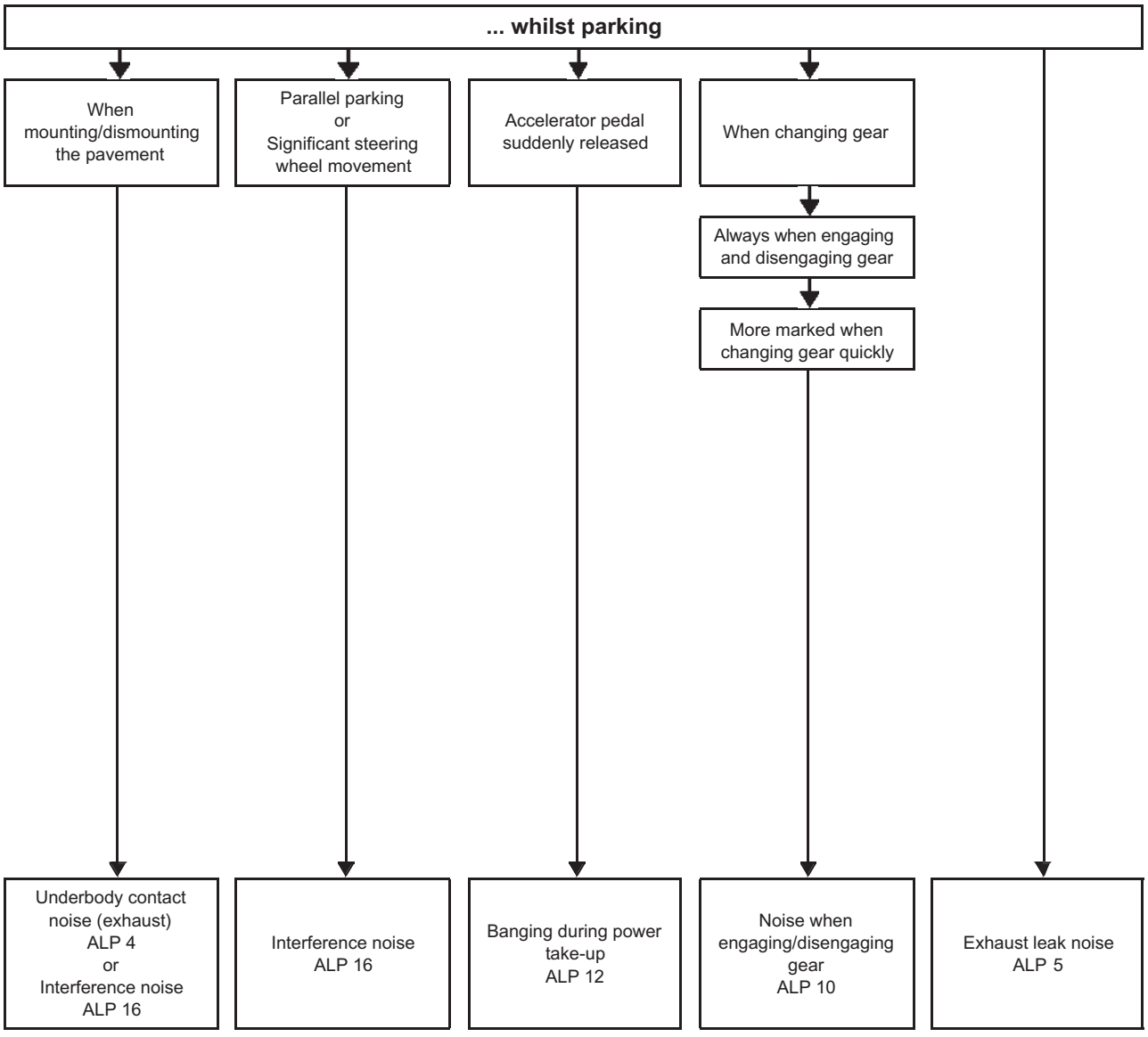
Conditions under which the noise appears no. 10

The noise is detected...



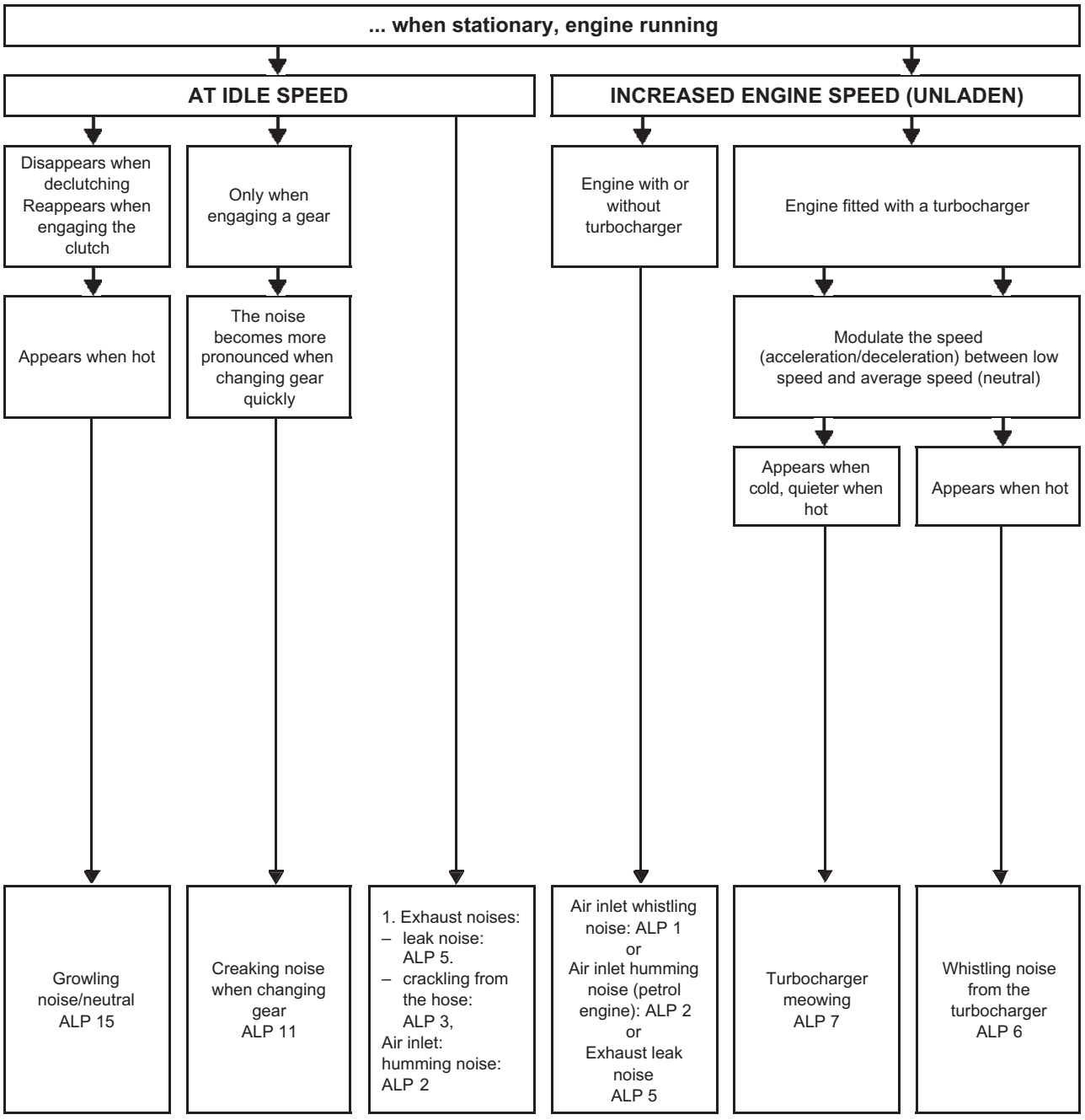
Conditions under which the noise appears no. 11

The noise is detected...



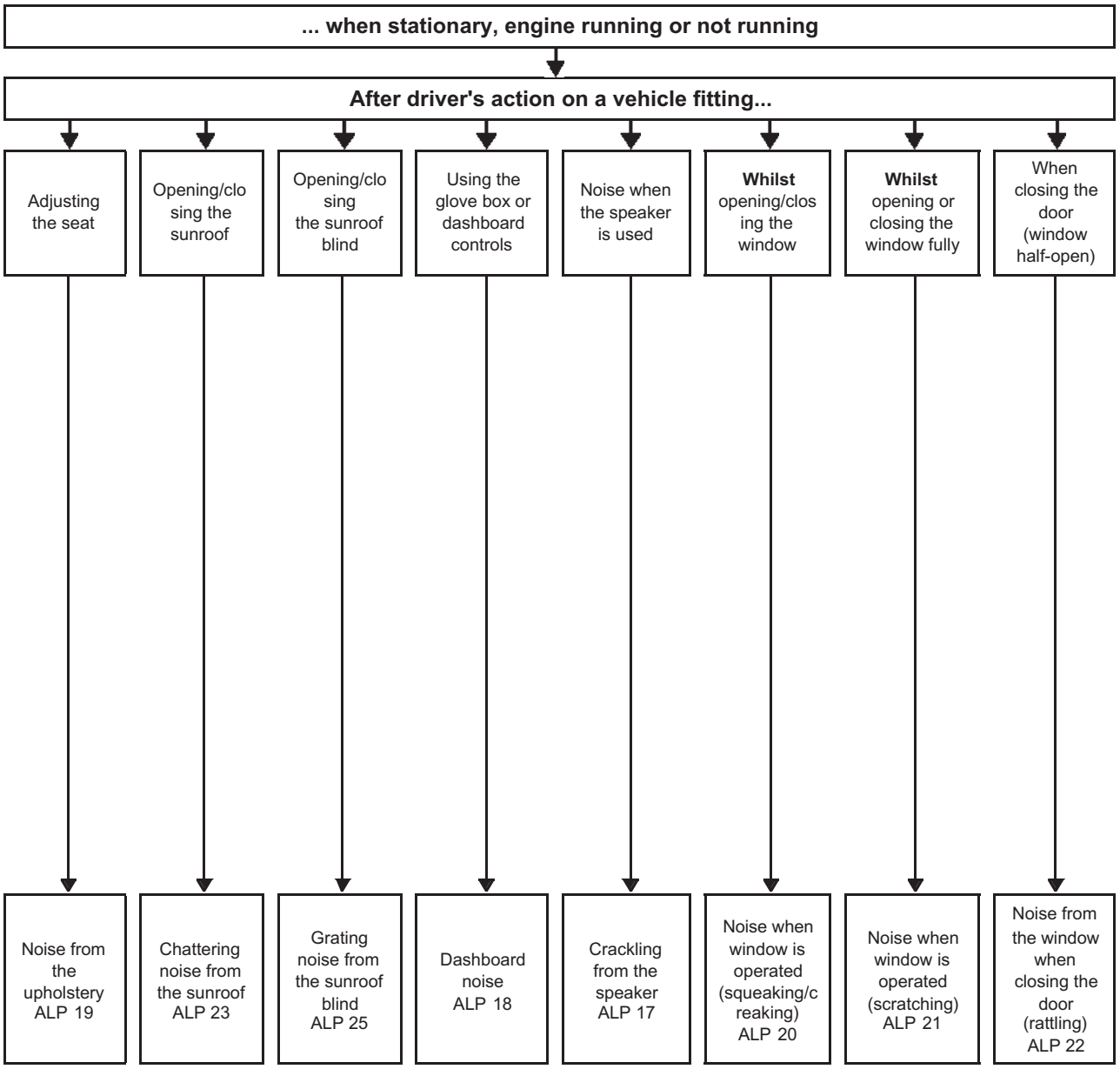
Conditions under which the noise appears no. 12

The noise is detected...



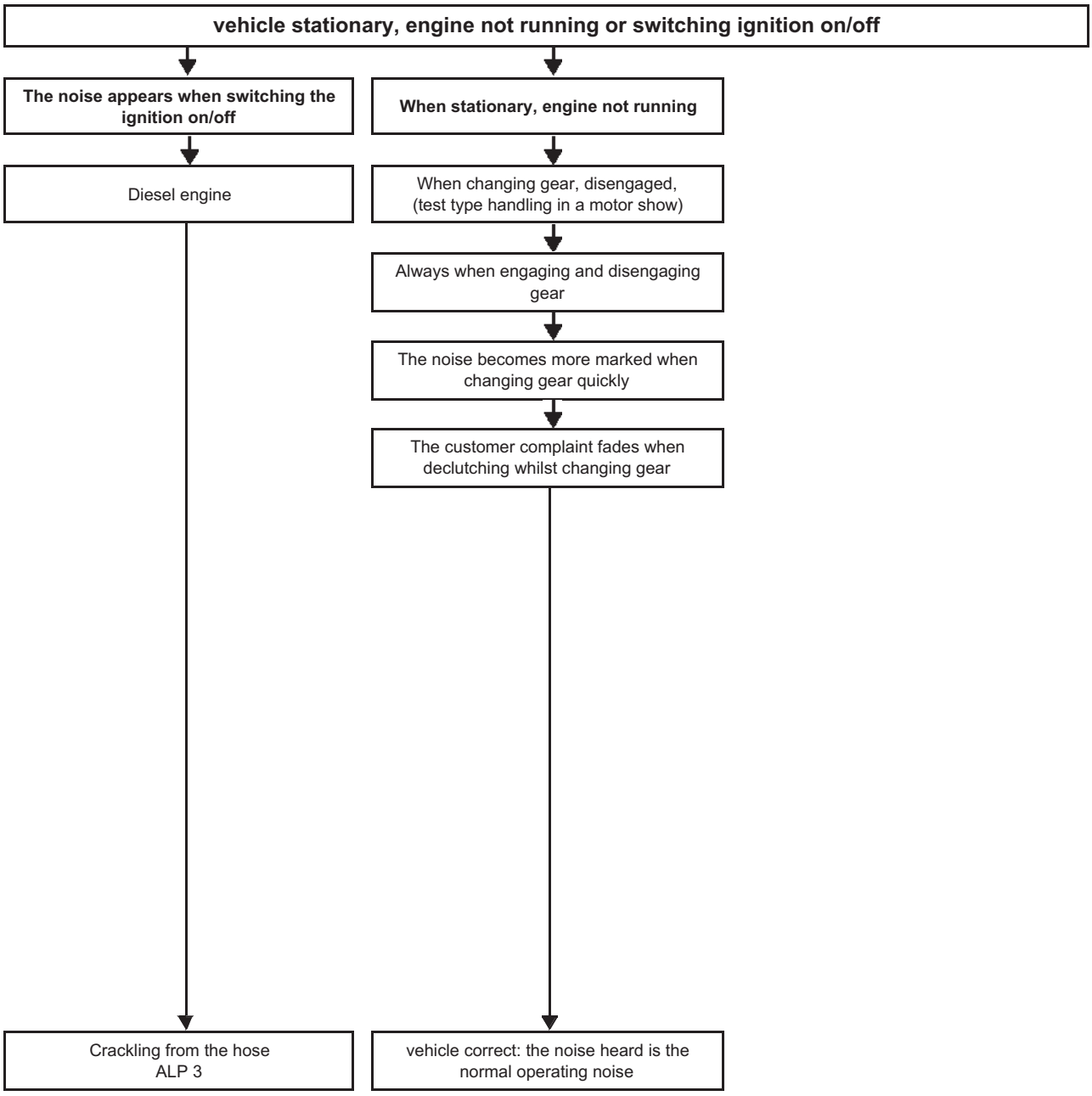
Conditions under which the noise appears no. 13

The noise is detected...



Conditions under which the noise appears no. 14

The noise is detected...



AIR INLET WHISTLING NOISES	ALP 1
AIR INLET HUMMING NOISES	ALP 2
CRACKLING NOISES FROM THE CONNECTING HOSE OR BALL JOINT BRACKET (DEPENDING ON VERSION) (EXHAUST)	ALP 3
UNDERBODY CONTACT NOISE (EXHAUST)	ALP 4
EXHAUST LEAK NOISE	ALP 5
WHISTLING NOISE FROM THE TURBOCHARGER	ALP 6
MEOWING NOISE FROM THE TURBOCHARGER	ALP 7
BLOWING NOISE FROM THE TURBOCHARGER	ALP 8
SIGHING NOISE FROM THE TURBOCHARGER (DIESEL ENGINE)	ALP 9
NOISE WHEN ENGAGING/DISENGAGING GEAR	ALP 10
CREAKING NOISE WHEN CHANGING GEAR	ALP 11
BANGING DURING POWER TAKE-UP OR TORQUE INVERSION	ALP 12
WHINING NOISE FROM THE DRIVE TRAIN	ALP 13

DRIVE TRAIN MURMURING	ALP 14
GROWLING/NOISE FROM NEUTRAL (DRIVE TRAIN)	ALP 15
INTERFERENCE NOISES	ALP 16
CRACKLING FROM THE SPEAKERS	ALP 17
NOISE FROM THE DASHBOARD	ALP 18
NOISE FROM THE UPHOLSTERY	ALP 19
NOISE WHEN WINDOW IS OPERATED (SQUEAKING/CREAKING)	ALP 20
NOISE WHEN WINDOW IS OPERATED (SCRATCHING)	ALP 21
NOISE FROM THE WINDOW WHEN CLOSING THE DOOR (RATTLING)	ALP 22
SUNROOF CHATTERING: JERKY MOVEMENT WHEN OPENING/CLOSING SUNROOF MOBILE PANEL	ALP 23
SUNROOF CREAKING	ALP 24
GRATING NOISE FROM THE SUNBLIND	ALP 25
SUNROOF RATTLING	ALP 26

ALP 1	Air inlet whistling noises

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Preliminary step: determine the area concerned (if accessible).
With the engine running, reproduce the whistling noise and detect the cause by placing a hand (part by part) or using the noise diagnostic tool (see **Noise diagnostic tool - Use**) on components which may be causing the noise and examining the entire circuit.
Two possible scenarios can arise:
– scenario no. 1 - The area is identified: only apply the ALP to the suspect area.
– scenario no. 2 - The area is not identified: follow the ALP, applying it to the entire air circuit.

↓

Check with the engine not running.

Condition of the air circuit assembly
The noise may be caused by:
– a damaged seal,
– a poorly fitted pipe,
– a damaged component.

– Check that all of the pipes are correctly clipped and/or fitted to each other, from one end of the circuit to the other.
– Check that the air filter unit, air resonators, air pipes and turbocharging air cooler are secured correctly.
– Check that the clips are tight enough.

not correct →

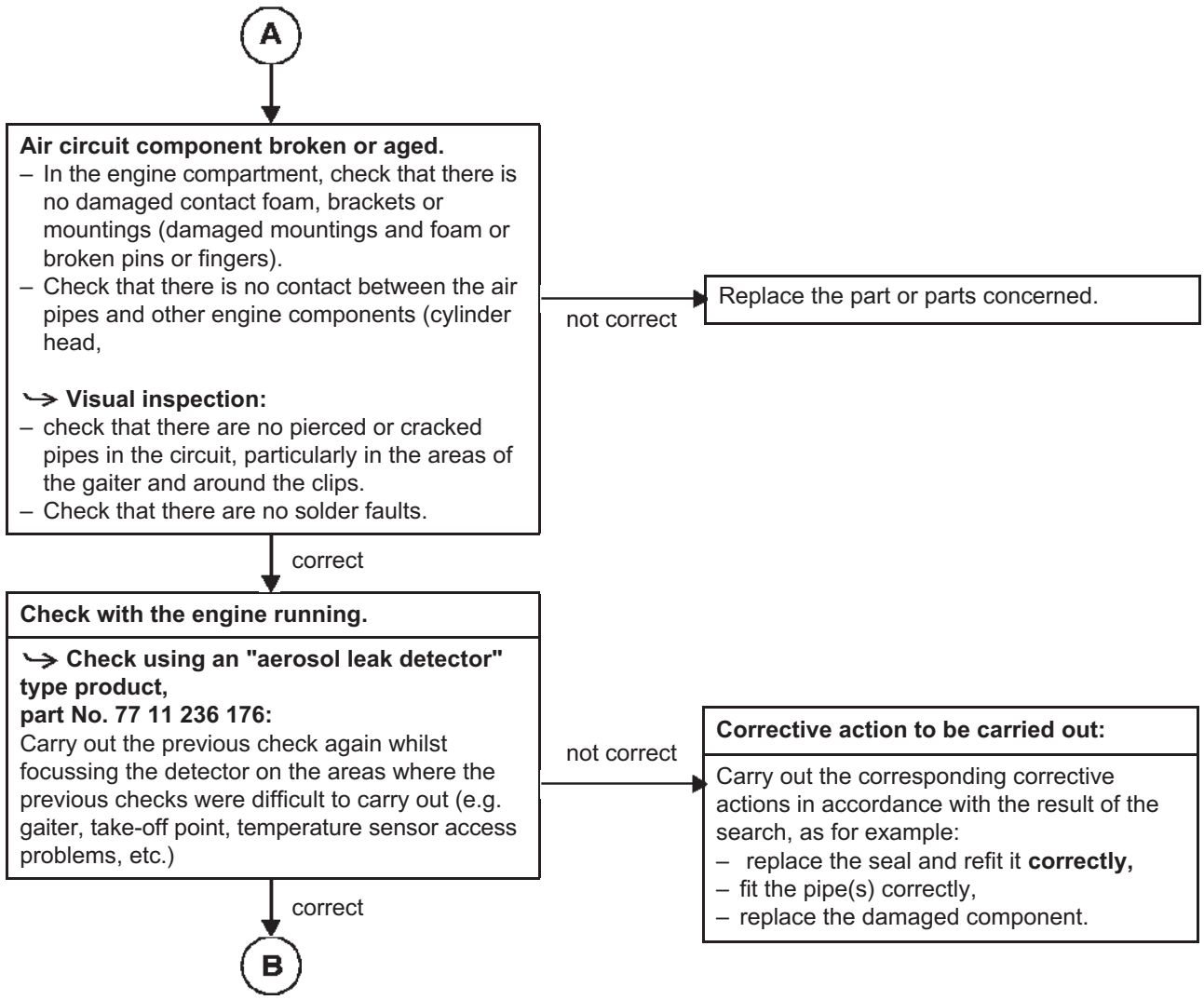
Corrective action to be carried out:

In all cases, repair the air circuit, by fitting the pipes correctly and checking that the clips are correctly torque tightened using a release torque wrench preset to the recommended tightening torque.

correct ↓

(A)

ALP 1 CONTINUED 1	Air inlet whistling noises



ALP 1 CONTINUED 2	Air inlet whistling noises

Checking the internal air circuit passages, with the air pipes removed

Check the internal air circuit passages, and in particular:
↪ **Air filter:**
– air filter seal on the unit or its slide,
– air filter not damaged,
– air filter conformity (compare manufacturer's recommendations with the filter part number)
↪ **Other internal passage or part:**
– resonator not blocked,
– air pipe not blocked.

not correct →

Corrective action to be carried out:

Replace the part or parts concerned.

ALP 2	Air inlet humming noises

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Preliminary step: determine the area concerned (if accessible).
With the engine running, recreate the humming noise and locate the source by placing a hand (part by part) on the components which may be the cause and examining the entire circuit.
Two possible scenarios can arise:
– scenario no. 1 - The area is identified: only apply the ALP to the suspect area.
– scenario no. 2 - The area is not identified: follow the ALP, applying it to the entire air circuit.

↓

Check with the engine not running.

Condition of the air circuit assembly
The noise may be caused by:
– a damaged seal,
– a poorly fitted pipe,
– a damaged component.
– Check that all of the pipes are correctly clipped and/or fitted to each other, from one end of the circuit to the other.
– Check that the air filter unit, air resonators, air pipes and turbocharging air cooler are secured correctly.
– Check that the clips are tight enough.

not correct →

Corrective action to be carried out:

In all cases, repair the air circuit, by fitting the pipes correctly and checking that the clips are correctly torque tightened using a release torque wrench preset to the recommended tightening torque.

Air circuit component broken or aged.
– Check that there is not too much clearance in the air circuit created by the old component.
– In the engine compartment, check that there is no damaged contact foam, brackets or mountings (damaged mountings and foam or broken pins or fingers).

↪ **Visual inspection:**
– check that there are no pierced or cracked pipes in the circuit, particularly in the areas of the gaiter and around the clips.
– Check that there are no solder faults.

not correct → Replace the part or parts concerned.

correct ↓

ALP 2 CONTINUED	Air inlet humming noises

Checking the internal air circuit passages, with the air pipes removed

Check the internal air circuit passages, and in particular:
↪ **Air filter:**
– air filter seal on the unit or its slide,
– air filter not damaged,
– air filter conformity (compare manufacturer's recommendations with the filter part number)
↪ **Other internal passage or part:**
– resonator not blocked,
– air pipe not blocked.

not correct →

Corrective action to be carried out:

Replace the part or parts concerned.

ALP 3	Crackling noises from the connecting hose or ball joint bracket (depending on version) (exhaust)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Preliminary step:
visually determine if the exhaust system has a ball joint bracket or a connecting hose (see vehicle MR, **19B EXHAUST**).

Check the tightening torques

With the vehicle raised on a lift, check that the torque wrench, which is preset to the recommended tightening torque, is released at the recommended tightening torque of the bracket (flat or ball joint) at the start of the exhaust system (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

→ **Corrective action to be carried out:**

Tighten to the recommended torque (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

Check the exhaust system manually ON A VEHICLE LIFT (engine stopped)

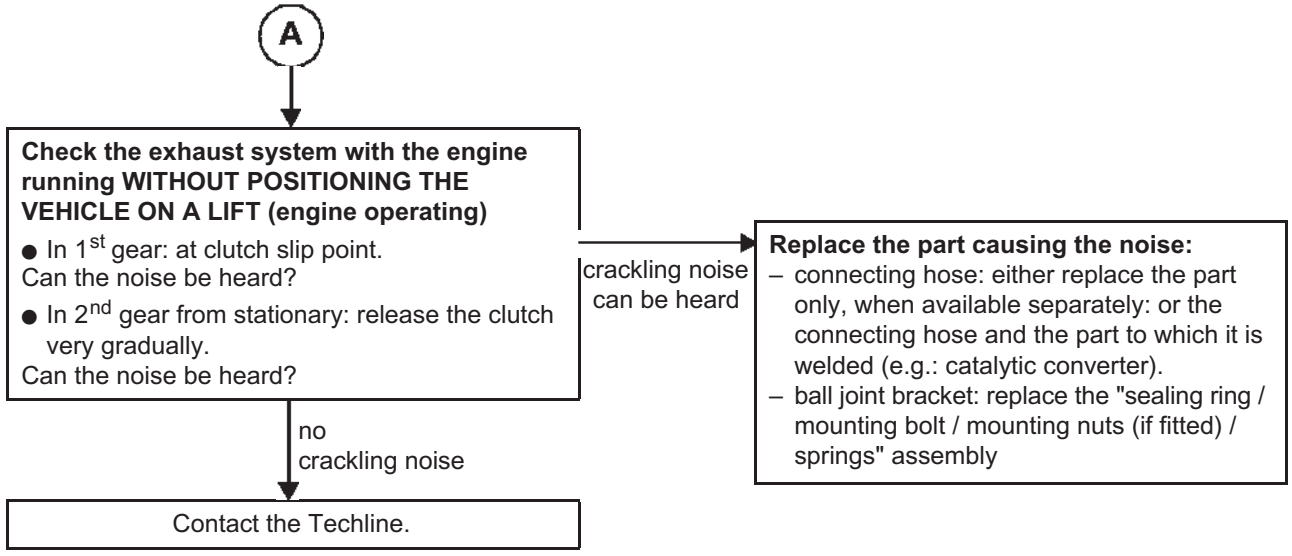
With the exhaust system cold, lightly knock the exhaust system by hand in several places (especially on the front axle subframe), without reaching its stops.
Note:
If the exhaust system is suspended from the subframe, remove the suspension mounting(s) in order to knock the pipe.

crackling noise can be heard →

Replace the part causing the noise:
- **connecting hose:** either replace the part only, when sold separately; or the connecting hose and the part to which it is welded (e.g. catalytic converter).
- **ball joint bracket:** replace the "sealing ring / mounting bolt / mounting nuts (if fitted) / springs" assembly

no crackling noise

ALP 3 CONTINUED	Crackling noises from the connecting hose or ball joint bracket (depending on version) (exhaust)



ALP 4	Underbody contact noise (exhaust)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the tightening torques

With the vehicle raised on a lift, check that the torque wrench, which is preset to the recommended tightening torque, is released at the recommended tightening torque of the bracket (flat or ball joint) at the start of the exhaust system (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

→ **Corrective action to be carried out:**

Tighten to the recommended torque (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

↓

Visually and manually check the exhaust system

Knock the exhaust system with force in several places (cold pipe) to accurately identify the areas of the exhaust system in contact with:
– heat shields,
– suspension bolt(s) or rubber mounting bush(es),
– exhaust pipe anchorage point(s) on the body,
– suspension bracket,
– exhaust sleeve.

→ contact noises noticeable

Corrective action to be carried out:

Perform one or more of the following operations:
- Replace or manually correct the heat shield
- Check the heat shield mountings.
- Replace the suspension bolt(s).
- Replace the component on which the anchorage points or brackets may be broken or damaged.
- Reposition the exhaust pipe, by moving the sleeve or the exhaust pipe clamp (see MR for vehicle, **19B EXHAUST, Exhaust: Precautions for repair)**

↓ no contact noise

Consult ALP 16: Interference noise

These noises may be similar to exhaust system contact noises.

ALP 5	Exhaust leak noise

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

DO NOT BLOCK the exhaust pipe output.
Remove the engine undertray.

Safety
Rules which MUST be respected when the engine is operating:
– heat-protective gloves must be worn when handling the hot exhaust
– connect an exhaust gas extractor

Check the exhaust system, which must only be carried out with the vehicle ON A LIFT, and the engine running

At idle speed (visual, aural and tactile inspection):
Wearing a heat-resistant glove, use one hand to lightly touch the exhaust system from the exhaust manifold to the exhaust tailpipe end.

More specifically, check:
– the seal on the exhaust manifold,
– the condition of the welds on the entire exhaust system,
– the exterior appearance of the exhaust system (impact, corrosion, cracks, welds, holes),
– the condition of the removable connections on the exhaust system (sleeves, clips and brackets)
– the presence of condensed water under the vehicle.

In certain cases and whenever possible in order to determine the leak, check the area in question using an "aerosol leak detector" type product, part no.77 11 236 176.

leak noises noticeable

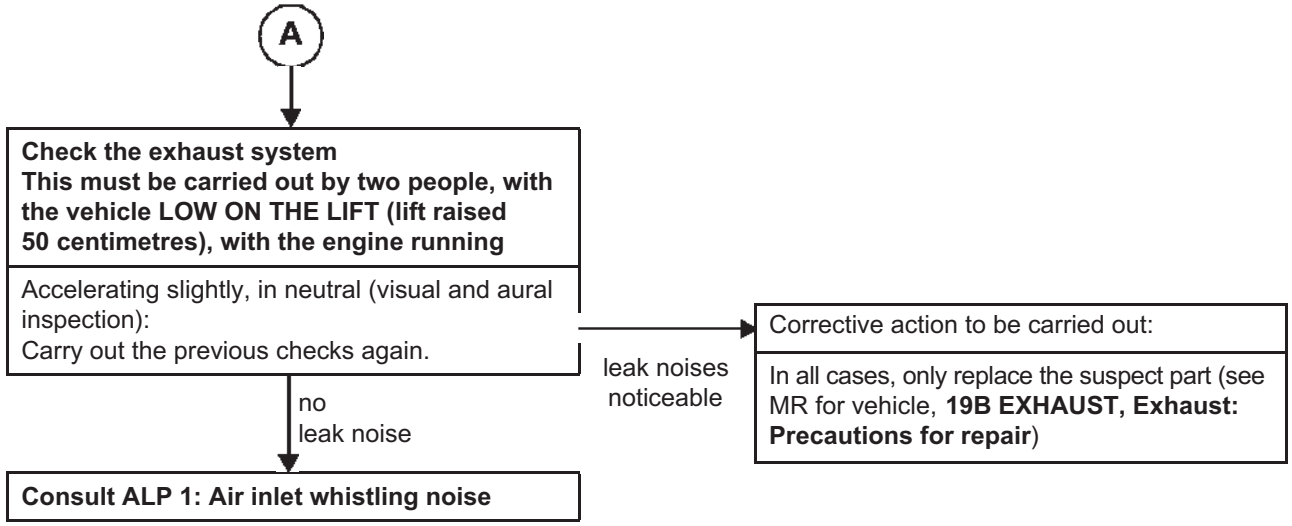
Corrective action to be carried out:

In all cases, only replace the suspect part (see MR for vehicle, **19B EXHAUST, Exhaust: Precautions for repair**)

no leak noise

A

ALP 5 CONTINUED	Exhaust leak noise



ALP 6	Whistling noise from the turbocharger

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Checking the engine oil level

Check the oil level.

not correct → Adjust the level (not excessively) using the manual dipstick (do not exceed the maximum level)

Checking the engine oil grade

1. By checking the Maintenance Booklet.

if the oil service interval has passed or is close → Change the oil.
Drive so that the engine cooling fan is triggered. (to homogenise the viscosity of the engine oil).
If the noise disappears: end of turbocharger fault finding.

2. By checking if the noise appears when the engine starts from cold.
If this is the case, the oil is the cause (excessive thickening)

if noise when cold → Change the oil.
Drive so that the engine cooling fan is triggered. (to homogenise the viscosity of the engine oil).
If the noise disappears: end of turbocharger fault finding.

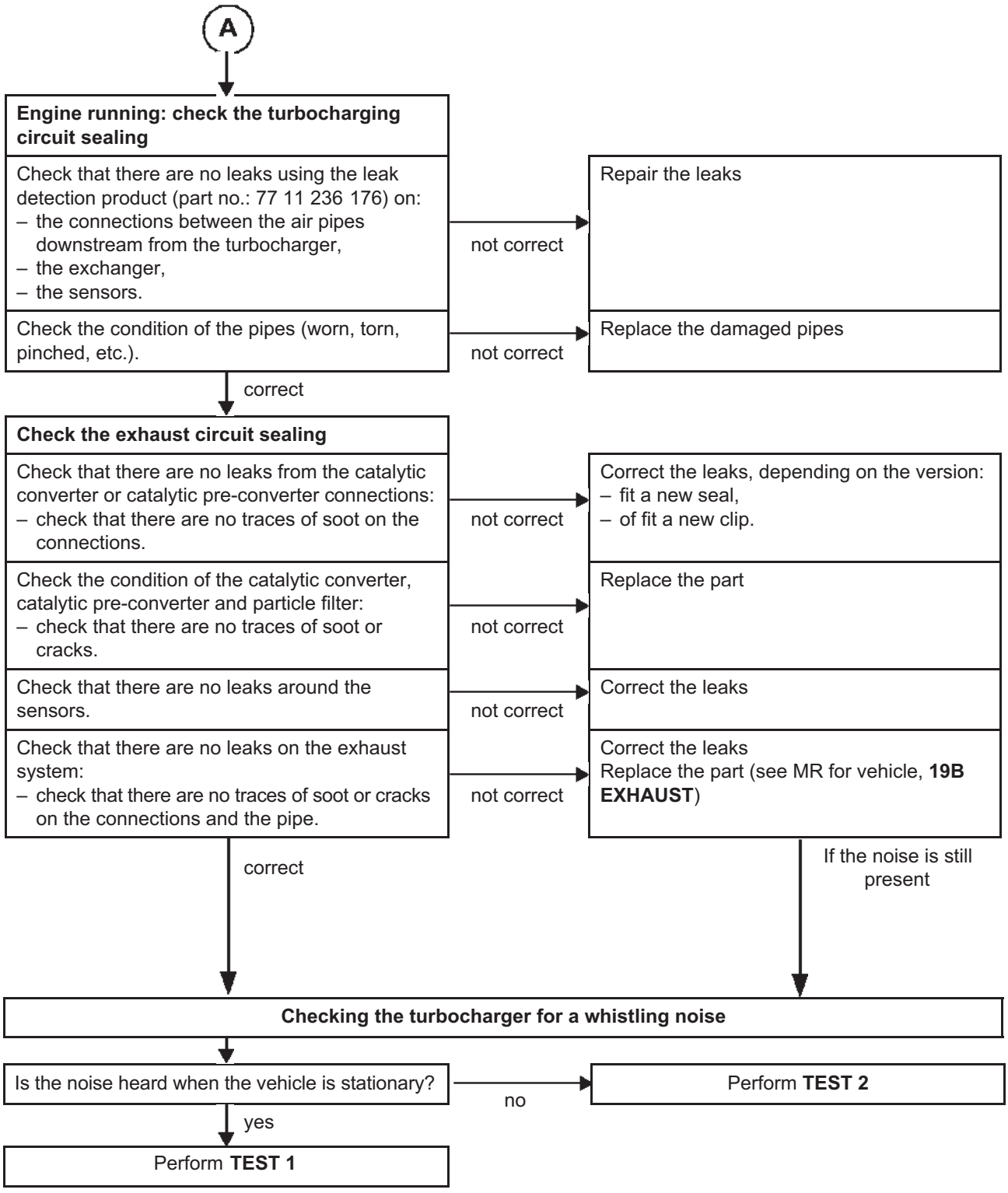
Oil service interval correct and no noise when cold → A

If the noise is still present → **Is the noise more pronounced?**

no → Continue the ALP → A

yes → Replace the turbocharger (see MR for vehicle, **12B TURBOCHARGING, Turbocharger: Removal - Refitting**)

ALP 6 CONTINUED 1	Whistling noise from the turbocharger



ALP 6 CONTINUED 2	Whistling noise from the turbocharger

TEST 1

Configurations: vehicle stationary, **disengaged**, engine running and warm
Before the test, clearly identify the speed conditions under which the noise appears
A) For a vacuum-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Only for a turbocharger on G9T 710* engine: create a vacuum to control the regulator using a pressure-vacuum pump at a vacuum value of 0.6 bar (opening the pressure regulation valve).
B) For a pressure-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Create pressure to control the regulator using a pressure-vacuum pump at a maximum pressure value of 1.4 bar (opening the turbocharger by-pass valve).
These operations aim to lower the speed of the turbocharger which changes the conditions under which the noise appears.
** On the G9T 710 engine, the turbocharger controls are inverted.*

If the noise changes → **Replace the turbocharger** (see MR for vehicle, **12B TURBOCHARGING, Turbocharger: Removal - Refitting**)

If the noise does not change → The turbocharger is not the cause of the noise (end of turbocharger whistling fault finding)

TEST 2

Configurations: vehicle driving when warm
Before the test, clearly identify the speed conditions under which the noise appears
A) For a vacuum-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Only for a turbocharger on G9T 710* engine: create a vacuum to control the regulator using a pressure-vacuum pump at a vacuum value of 0.6 bar (opening the pressure regulation valve).
B) For a pressure-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Create pressure to control the regulator using a pressure-vacuum pump at a maximum pressure value of 1.4 bar (opening the turbocharger by-pass valve).
These operations aim to lower the speed of the turbocharger which changes the conditions under which the noise appears.
** On the G9T 710 engine, the turbocharger controls are inverted.*

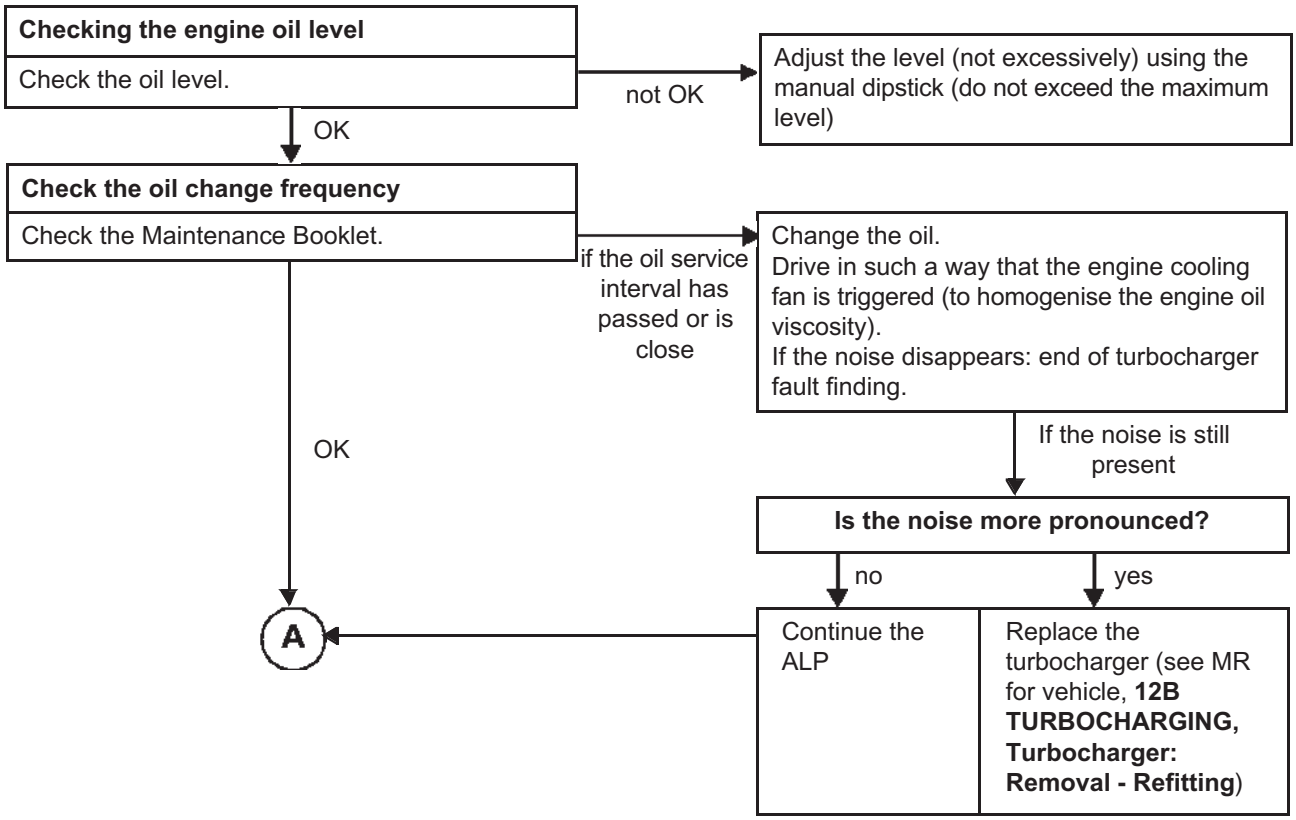
If the noise changes → **Replace the turbocharger** (see MR for vehicle, **12B TURBOCHARGING, Turbocharger: Removal - Refitting**)

If the noise does not change → The turbocharger is not the cause of the fault (end of turbocharger whistling noise fault finding) **Consult the ALP: Whining noise in the drive train**

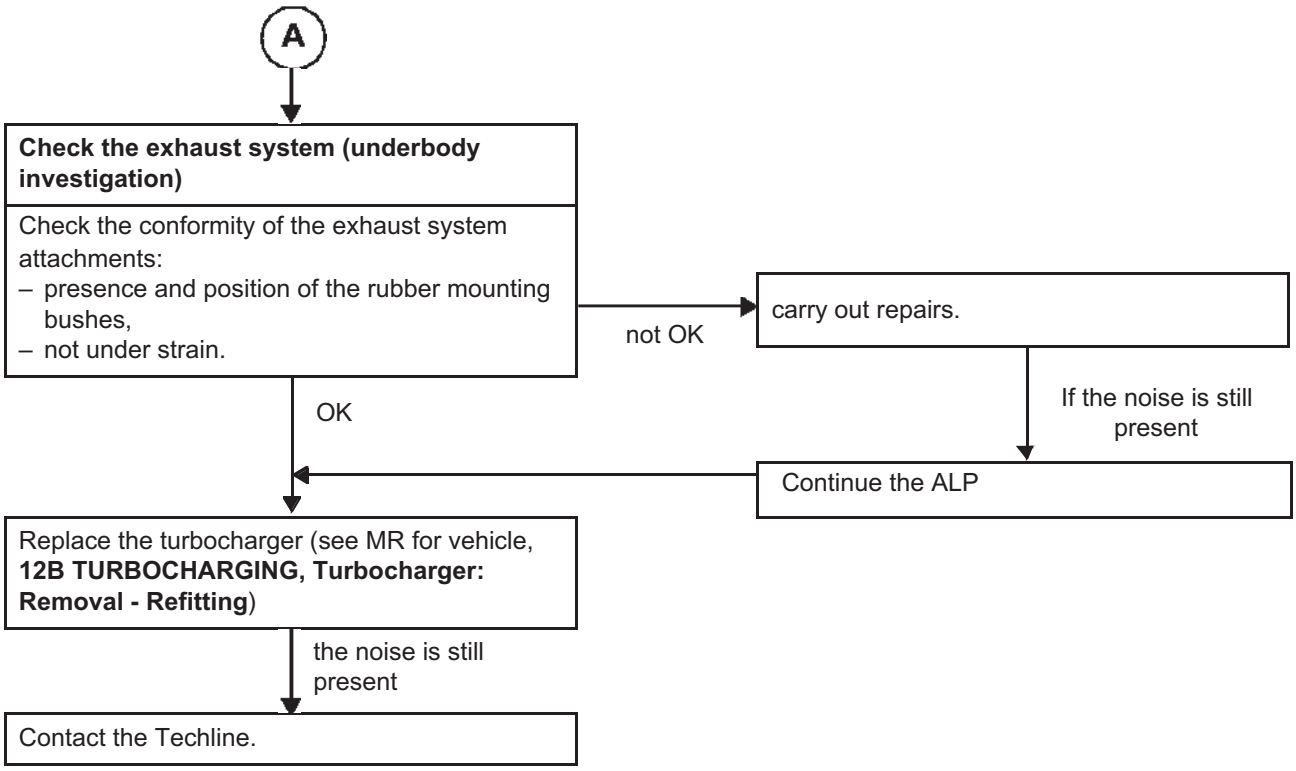
ALP 7	Meowing noise from the turbocharger

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

IMPORTANT:
Consult the vehicle's history in the ICM database and check that the exhaust system has not been replaced (even partially) and that no work has been undertaken on the high pressure air circuit.
If this is the case, check that the operation was carried out correctly.



ALP 7 CONTINUED	Meowing noise from the turbocharger



ALP 8	Blowing noise from the turbocharger

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

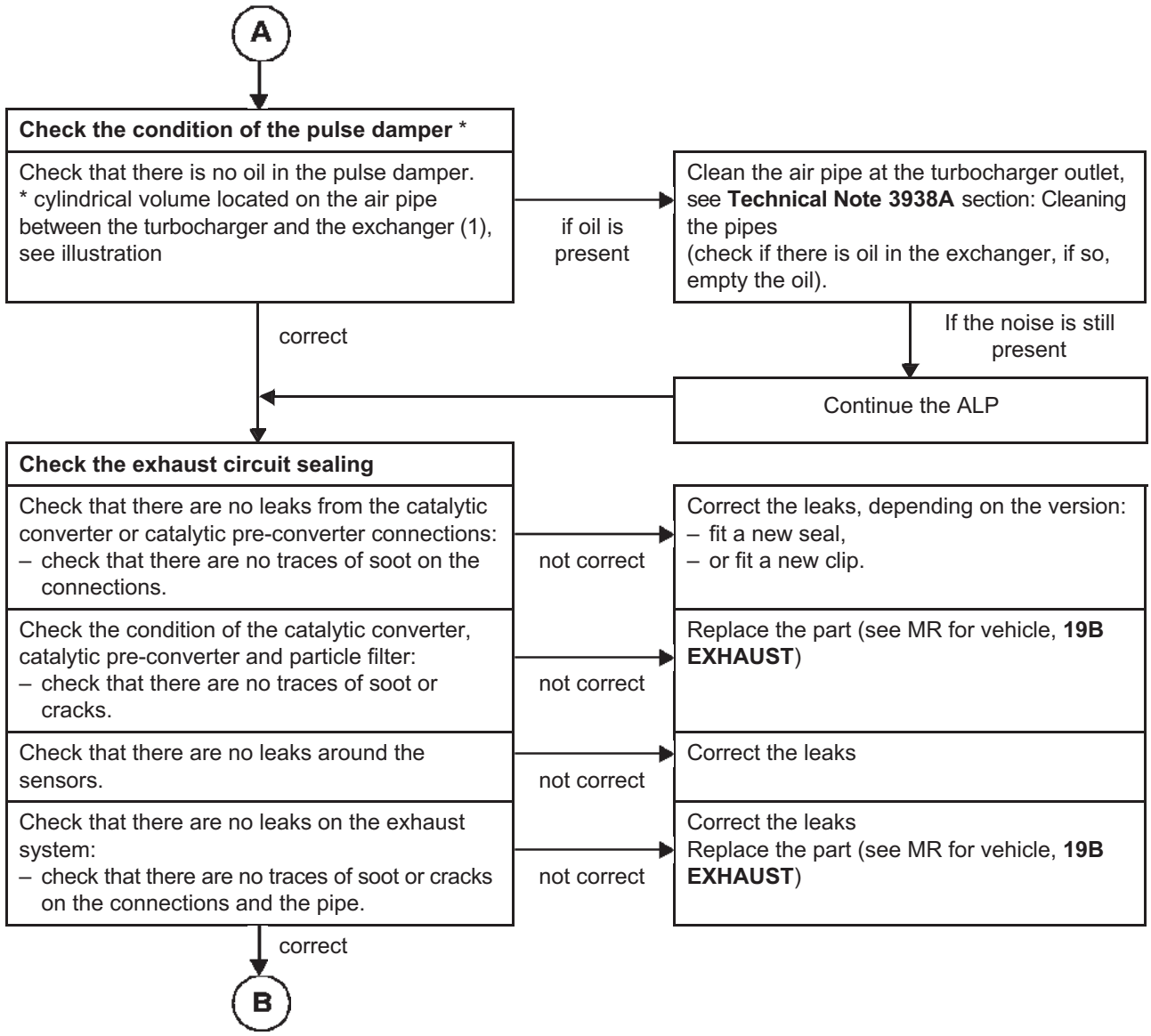
IMPORTANT:
Consult the vehicle's history in the ICM database and check that the exhaust system has not been replaced (even partially) and that no work has been undertaken on the high pressure air circuit.
If this is the case, check that the operation was carried out correctly.

Check the turbocharging circuit sealing		
Check that there are no leaks on the connections between the air pipes downstream from the turbocharger and on the exchanger: – use the leak detection product (part no.: 77 11 236 176)	not correct →	Repair the leaks
Check that there are no leaks around the sensors: – use the leak detection product (part no.: 77 11 236 176)	not correct →	Repair the leaks
Check the condition of the pipes (worn, torn, pinched, etc.).	not correct →	Replace the part (see MR for vehicle, **19B EXHAUST**)
Check that the ducts are correctly fitted and check that the clips are correctly positioned on the cylindrical part of the end pieces.	not correct →	Repair

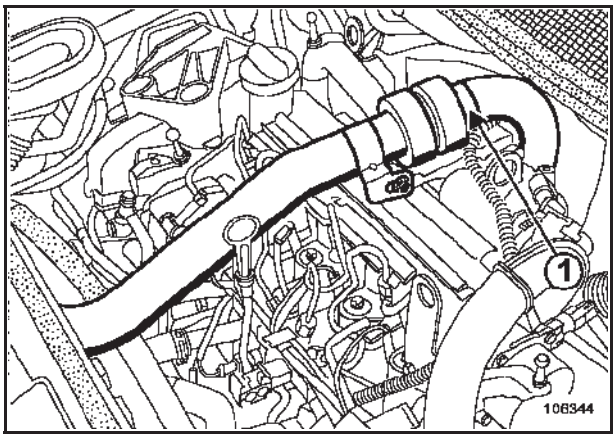
correct ↓

A

ALP 8 CONTINUED 1	Blowing noise from the turbocharger



ALP 8 CONTINUED 2	Blowing noise from the turbocharger



B

Check the operation of the EGR solenoid valve

See Fault Finding MR for the vehicle, **13B DIESEL INJECTION, Fault finding - Conformity check**

not OK → Carry out repairs

If the noise is still present → Continue the ALP

OK → The vehicle is correct

ALP 9	Sighing noise from the turbocharger (diesel engine)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

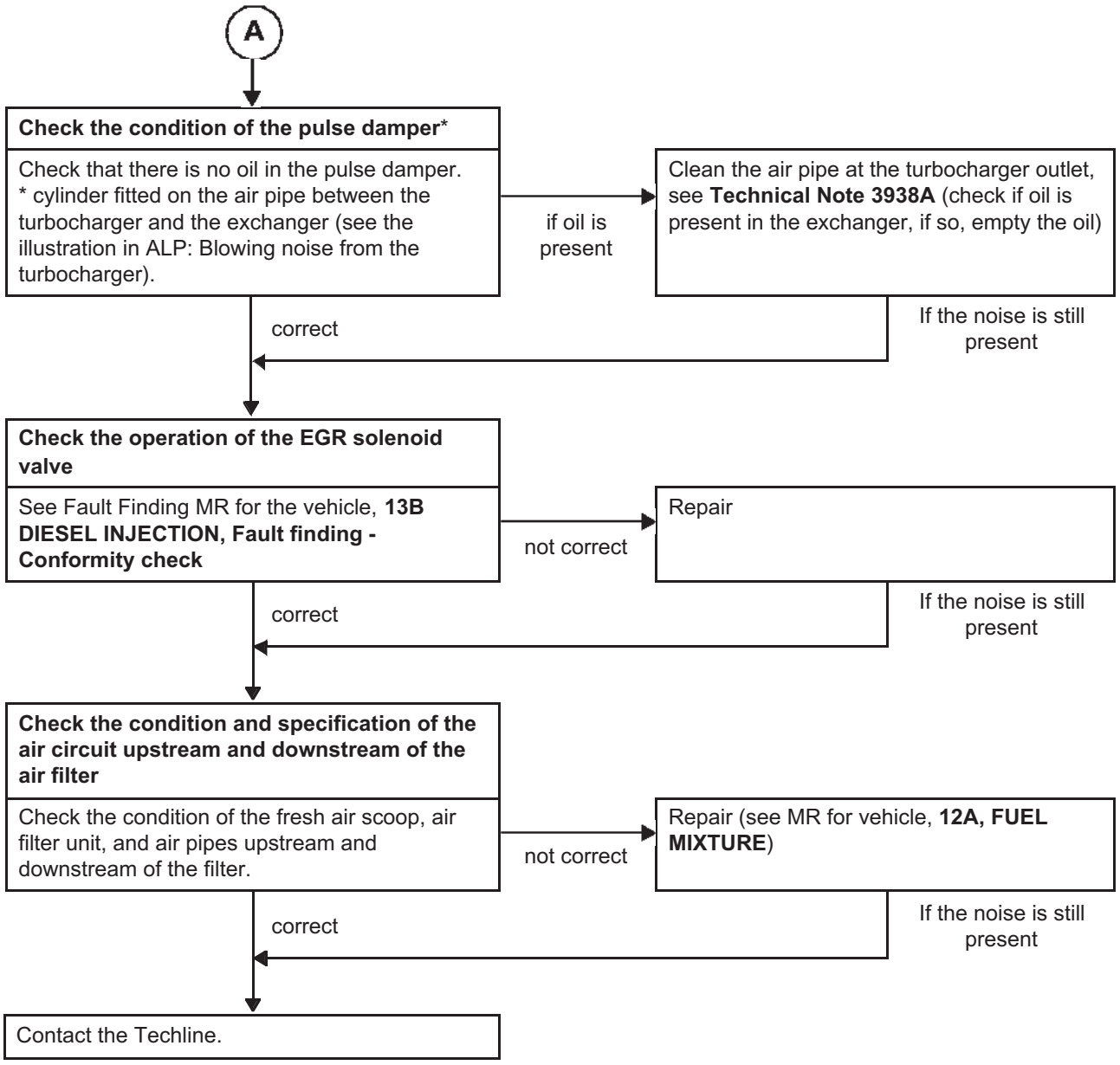
IMPORTANT: Consult the vehicle's history in the ICM database and check that the exhaust system has not been replaced (even partially) and that no work has been undertaken on the high pressure air circuit.
If this is the case, check that the operation was carried out correctly.

Check the turbocharging circuit sealing **IMPORTANT***:* *Under no circumstances must the sealing test be performed by plugging the exhaust system (risk of damaging the shaft line seals)*		
Check the condition of the air pipes (worn, torn, pinched, etc.).	not correct	Replace the defective part
Check that the ducts are correctly fitted and check that the clips are correctly positioned on the cylindrical part of the end pieces.	not correct	Repair the ducts
Check that there are no leaks on the connections between the air pipes downstream from the turbocharger and on the intercooler; use leak detection product (part no.: 77 11 236 176)	not correct	Repair the leaks
Check that there are no leaks around the sensors: – use the leak detection product (part no.: 77 11 236 176)	not correct	Repair the leaks

correct

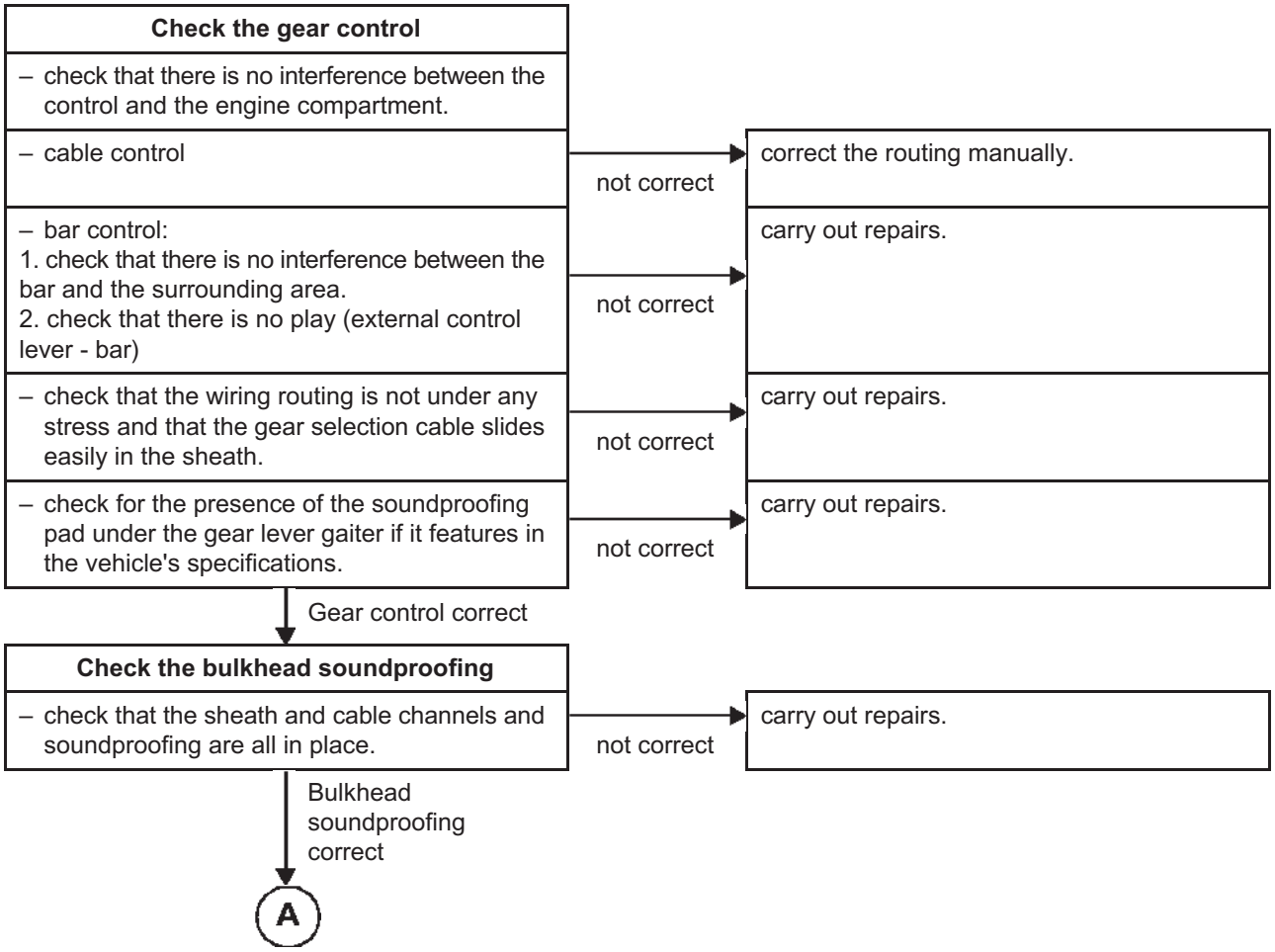
A

ALP 9 CONTINUED	Sighing noise from the turbocharger (diesel engine)

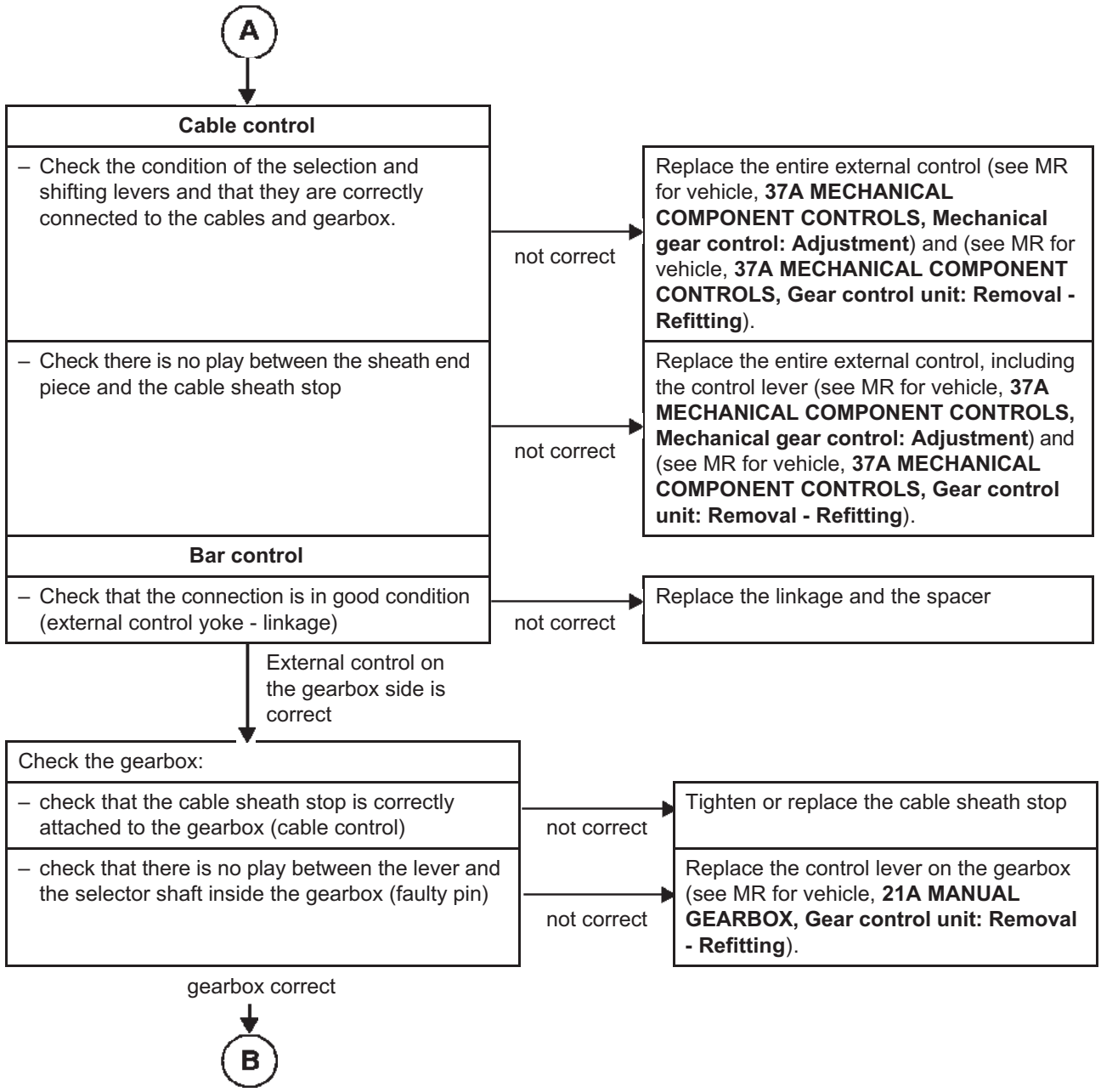


ALP 10	Noise when engaging/disengaging gear

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.



ALP 10 CONTINUED 1	Noise when engaging/disengaging gear

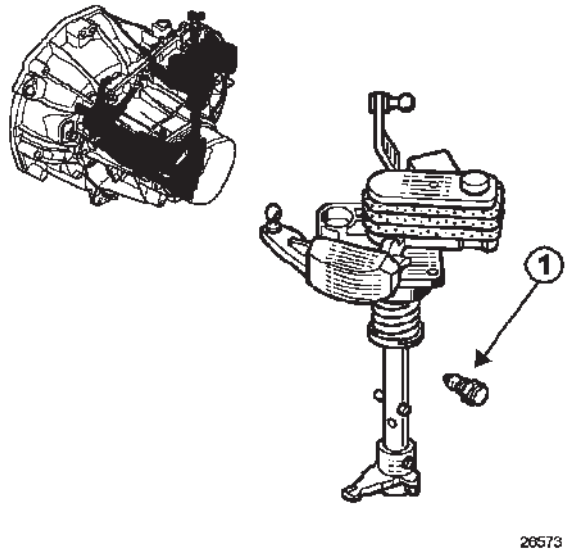


ALP 10 CONTINUED 2	Noise when engaging/disengaging gear

B

Only for JH JR gearboxes

Replace the locating ball unit (1)



gearbox correct

If the noise is still present, contact the Techline

*

Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

ALP 11	Creaking noise when changing gear

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

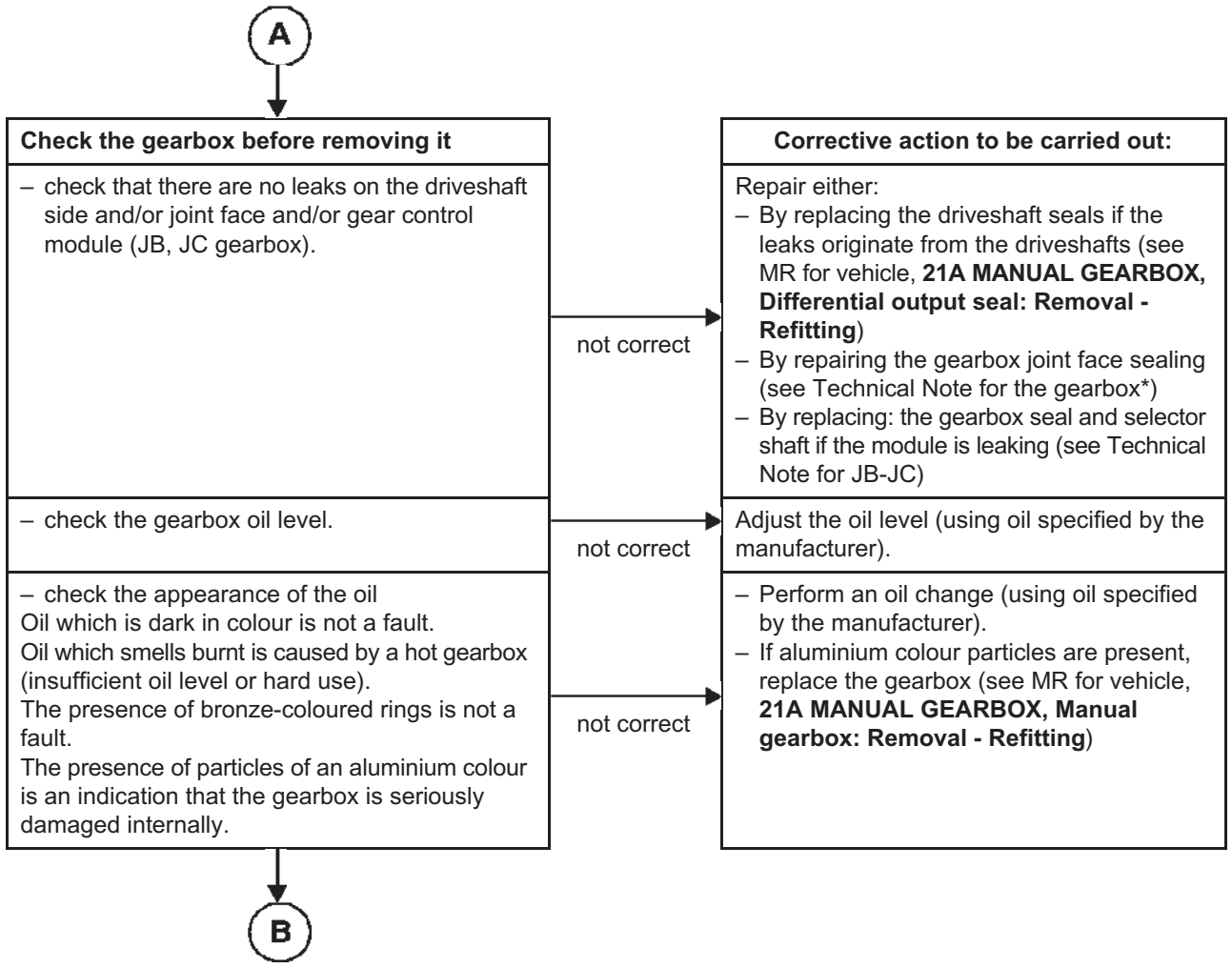
Check that no vehicle mat is preventing the clutch from operating when changing gear.
Check that the gear control setting is correct (see MR for vehicle, **21A MANUAL GEARBOX, Manual gear control: Adjustment**).
WARNING
If creaking can be heard:
– **On EVERY gear ratio:** the customer may have complained previously about hard spots when selecting gear (cable clutches). Therefore it is ONLY the clutch which is concerned (see Technical Note 3451A)
– **When changing from Neutral / 1st or Neutral / Reverse:** start by checking the clutch and follow the ALP if the clutch is correct.
– **Other gears:** start DIRECTLY by checking the gearbox WITHOUT checking the clutch

Check the clutch		
– Check that the clutch release point is correct.		
– For mechanical clutch controls: Check the fork travel (see **Technical Note 3451A**)	not correct	Adjust the travel if manual adjustment (e.g. Logan). (see MR for vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch control: Adjustment**).
– For hydraulic clutch controls: Only check the release point (it must be possible to change gear with the pedal depressed 3/4 of its total travel)	not correct	Bleed the hydraulic circuit (see MR for vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch circuit: Bleeding**).

Clutch release point correct

A

ALP 11 CONTINUED 1	Creaking noise when changing gear



ALP 11 CONTINUED 2	Creaking noise when changing gear

B

Remove the gearbox		Corrective action to be carried out:
– Check the clutch wear.	not correct →	Replace the whole clutch system. *Important: the synchronisation must be checked as this might have been damaged following clutch damage.*
Open the gearbox		**Corrective action to be carried out:**
– Check the condition of the synchronisation, synchronisation springs, idle gear and synchroniser ring and the selector rod for the gear(s) concerned. (See MR for vehicle, **21A MANUAL GEARBOX, Manual gearbox: Check**)	not correct →	Replace all of the components of the damaged gear(s) (pinion, hub, selector rod, synchroniser ring and synchronisation spring) (see Technical Note for the gearbox*)

*

Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

ALP 12	Banging during power take-up or torque inversion

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

VERY IMPORTANT - Preliminary checks:	
– **Engine and transmission assembly suspension points:** Check the tightness and positioning of all of the engine and transmission assembly suspension points (engine tie-bar, engine and/or gearbox hydro-elastic rubber pads) using the centring tool mentioned in the MR concerned (if it exists).	– apply the tightening torques (see MR for vehicle, **19D ENGINE MOUNTING, Suspended engine mounting: Tightening torque**) – recentre (loosen and retighten all of the rubber pads)
– **Axle components:** Check, by comparison, the conformity of the axle components and that they are correctly tightened, in particular: the lower wishbone, anti-roll system, suspension and associated rubber mounting bushes.	– apply the recommended tightening torques (see MR for vehicle, **30A GENERAL INFORMATION, Front axle: Tightening torque**).
– **Subframe/steering rack:** Check the tightness and condition of the subframe and steering rack rubber pads.	– apply the recommended tightening torques (see MR for vehicle, **31A FRONT AXLE COMPONENTS, Front axle subframe: Removal - Refitting**). – only replace the rubber pads if they are extremely worn
– **Stub-axle (Hub-carriers):** Check the tightness of the stub-axles.	– apply the recommended tightening torques (see MR for vehicle, **31A FRONT AXLE COMPONENTS, Front driveshaft hub-carrier: Removal - Refitting) (Important: risk of driveshaft damage**).
– **Wheels:** check the tightness of the wheels.	– apply the tightening torques (see MR for vehicle, **35A WHEELS AND TYRES, Wheel: Removal - Refitting**)

correct

A

ALP 12 CONTINUED	Banging during power take-up or torque inversion

A

Check the driveshafts:

– Check the condition of the gaiters and the presence of grease on the gaiter exterior.	– replace the gaiters if they are damaged and/or replace the driveshaft if the gaiters are not sold separately or if there is play on the driveshaft connections (see MR for vehicle, **29A DRIVESHAFTS, Driveshaft: Removal - Refitting**)
– **Removing/refitting the right-hand driveshaft:** Check the wear of the coupling sleeve grooves on the relay bearing driveshaft (right-hand driveshaft - sunwheel) by removing/refitting the component (see MR for vehicle, **29A DRIVESHAFTS, Front right-hand driveshaft: Removal - Refitting**).	– It is essential to follow Infotech No. 4645.

Driveshafts correct

Check the clutch:

– check the progressiveness of the clutch by checking the clutch clearance, if it exists (see MR for the vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch control: Adjustment**) or the automatic pedal adjustment system.	1. Adjust the clearance (if it exists). 2. Replace the automatic adjustment system (see MR for vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch control: Removal - Refitting**) 3. If the clutch clearance or the mechanical adjustment system is correct and the clutch progressiveness is still not correct, replace the clutch kit (see MR for the vehicle, **20A CLUTCH, Pressure plate - Disc: Removal - Refitting**)
– Depending on the clutch version, remove the gearbox to: 1) Check that there are no traces of oil. OR 2) Check that the dual-mass flywheel springs are not damaged.	– Depending on the version, if it is in poor condition: 1) If there are traces of oil, look for the source of the leaks and repair. OR 2) Replace the dual-mass flywheel (see MR for vehicle, **20A CLUTCH, Flywheel: Removal - Refitting**)

Clutch correct

– Contact the Techline:
Gearbox concerned - request for approval.

ALP 13	Siren (drive train)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the oil level and grade in the gearbox (see MR for vehicle concerned, **21A MANUAL GEARBOX, Manual gearbox oil: Oil change**):

– if the oil level is low → Top up the level of oil in the gearbox

– check the appearance of the oil
Oil which is dark in colour is not a fault.
Oil which smells burnt is caused by a hot gearbox (insufficient oil level or hard use).
The presence of bronze-coloured rings is not a fault.
The presence of particles of an aluminium colour is an indication that the gearbox is seriously damaged internally

not correct → – Perform an oil change (using oil specified by the manufacturer).
– If aluminium colour particles are present, replace the gearbox (see MR for vehicle, **21A MANUAL GEARBOX, Manual gearbox: Removal - Refitting**)

oil level and grade correct

Check that all components under the cover are in good condition:

– if there is unwanted gearbox / cable or sheath contact → Correct the unwanted contact

– if the grommets and other bulkhead through-routes are incorrectly fitted → Carry out repairs

under-cover components correct

Check the condition, fitting and conformity of the gearbox mountings (see MR for vehicle concerned, **21A MANUAL GEARBOX, Manual gearbox: Removal - Refitting**):

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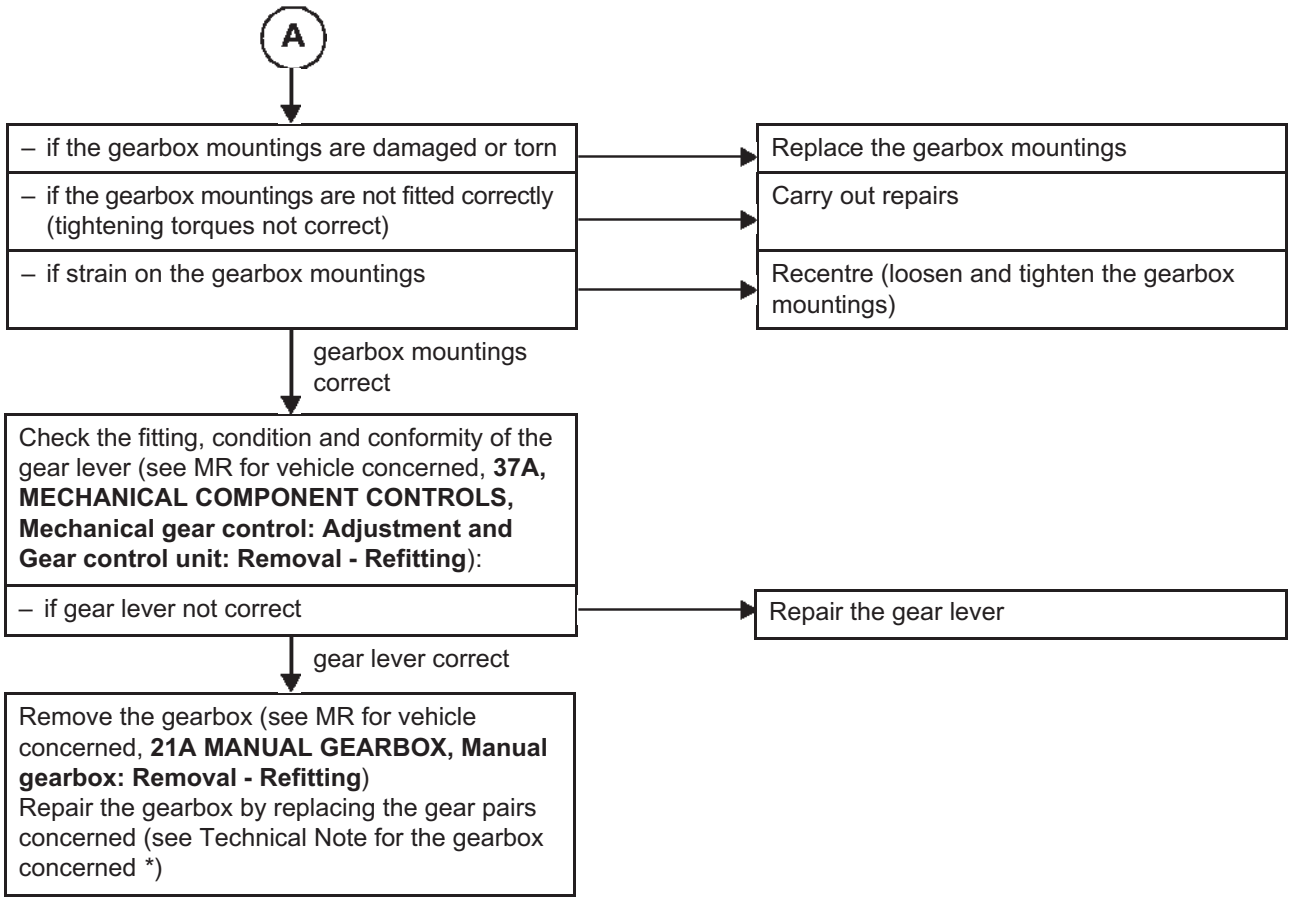
ALP 13 CONTINUED	Siren (drive train)



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Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

ALP 14	Drive train murmuring

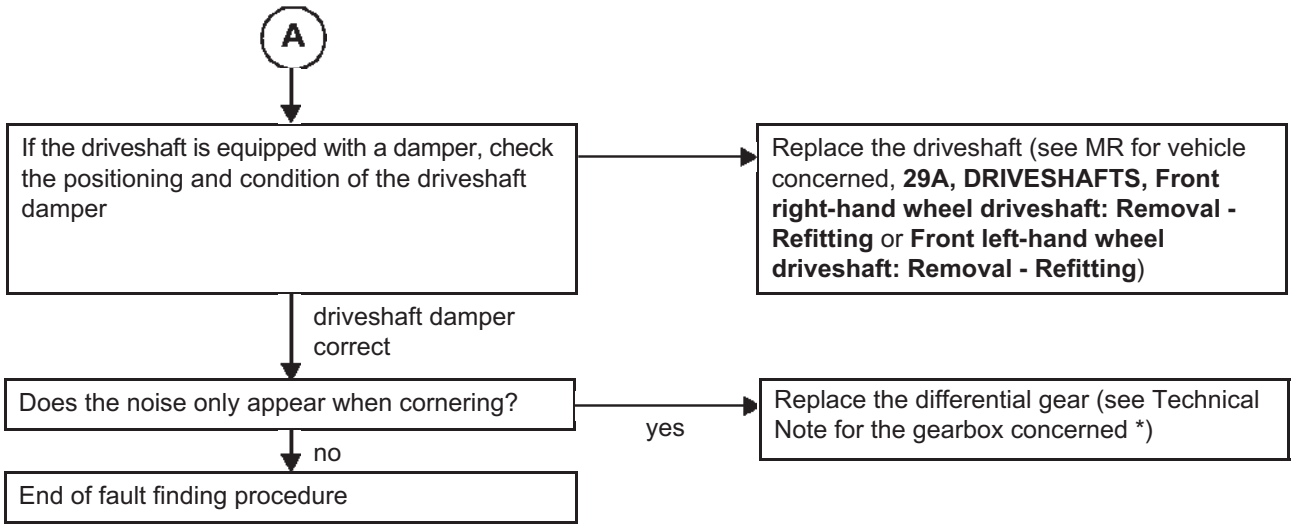
NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the fitting of the driveshaft relay bearing (see MR for vehicle concerned, **29A, DRIVESHAFTS, Front right-hand wheel driveshaft: Removal - Refitting**)	
– if the bearing plate tightness is not correct	Replace and tighten to torque the plate O-ring
– if bearing category not correct (flange colour)	Replace the bearing
– if fitting not correct (O-ring present without self-aligning bearing)	Realign the assembly
– if the relay bearing is incorrectly tightened on the engine	Retighten to torque
– For PK6 gearboxes, if the direction of fitting of the bearing tightness plate is not correct	Colour on the outer side (see MR for the vehicle concerned, **29A, DRIVESHAFTS, Driveshaft: Precautions for repair**)

driveshaft relay bearing correct

A

ALP 14 CONTINUED	Drive train murmuring



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Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

ALP 15	Growling / noise in neutral (drive train)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the engine idle speed

idle speed not correct → Perform fault finding on an incorrect idle speed (see Fault Finding Manual for the vehicle concerned, **13B, DIESEL INJECTION, Fault finding - Conformity check** or **17B, PETROL INJECTION, Fault finding - Conformity check**)

idle speed correct

Check that all components under the cover are in good condition:

- if there is unwanted gearbox / cable or sheath contact → Correct the unwanted contact
- if the grommets and other bulkhead through-routes are incorrectly fitted → Carry out repairs
- if there is interference between the engine and transmission assembly and body components (engine mountings, gearbox mountings, suspended engine mountings, acoustic filters, etc.) → Eliminate the interference by replacing the faulty components

under-cover components correct

If the clutch plate has a shock absorber component, replace the clutch plate (see MR for vehicle concerned, **20A, CLUTCH, Pressure plate - clutch plate: Removal - Refitting**)

ALP 16	Interference noise

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Identification of the noise identified by the customer

Is the origin of the noise known (dealt with by Infotech) or easily identifiable?
- yes → Proceed directly to the repair operation
- no ↓

Connect the noise diagnostic tool - Part no. **77 11 421 103** - (see **Noise diagnostic tool - Use**) to:
– the steering column,
– the universal joint
Does the noise come from this area?
- yes → See ALP 16.1. "Steering column area"
- no ↓

Connect the tool to the engine and transmission assembly suspensions
Does the noise come from this area?
- yes → See ALP 16.2. "Engine area"
- no ↓

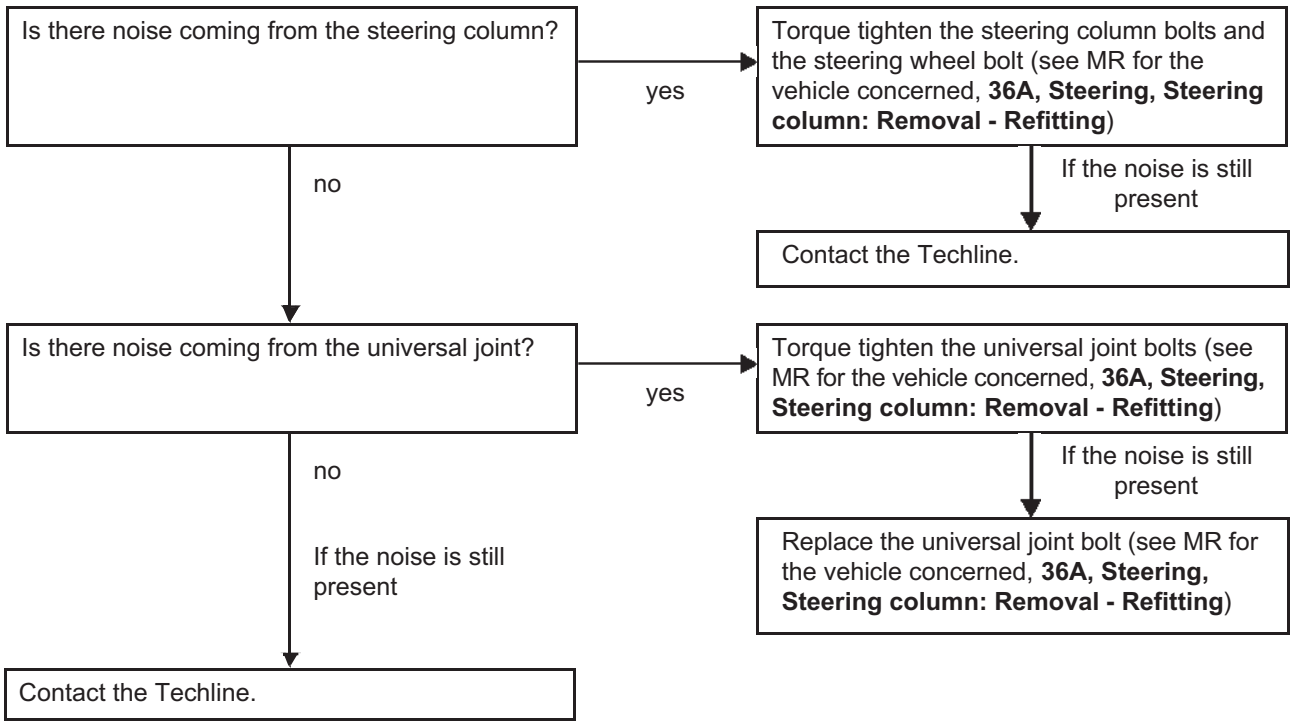
Connect the tool to:
– the front shock absorber bump stop
– the front suspension spring
– the front shock absorber
Does the noise come from this area?
- yes → See ALP 16.3. "Suspension area"
- no ↓

Connect the tool to:
– the steering box
– the track rod end
– the front lower wishbone
– the anti-roll bar tie rod
– the subframe
Does the noise come from this area?
- yes → See ALP 16.4. "Subframe area"
- no ↓

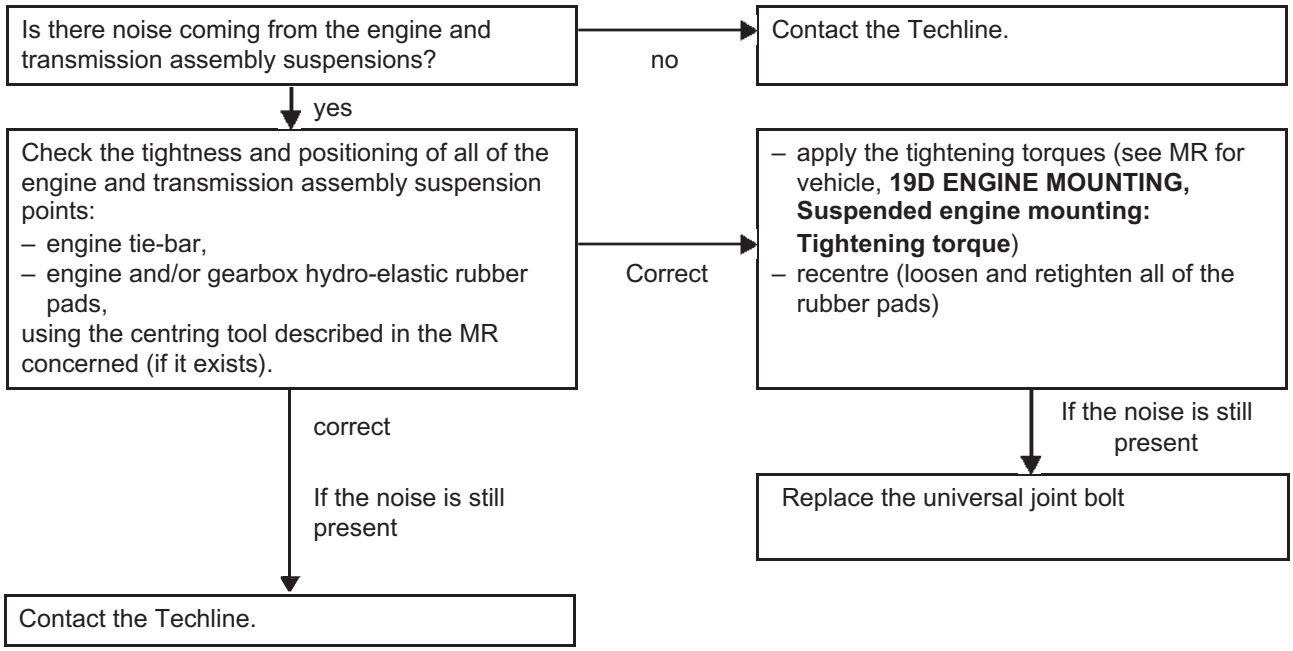
Is the noise still present?
- yes → Contact the Techline.
- no ↓

End of fault finding procedure

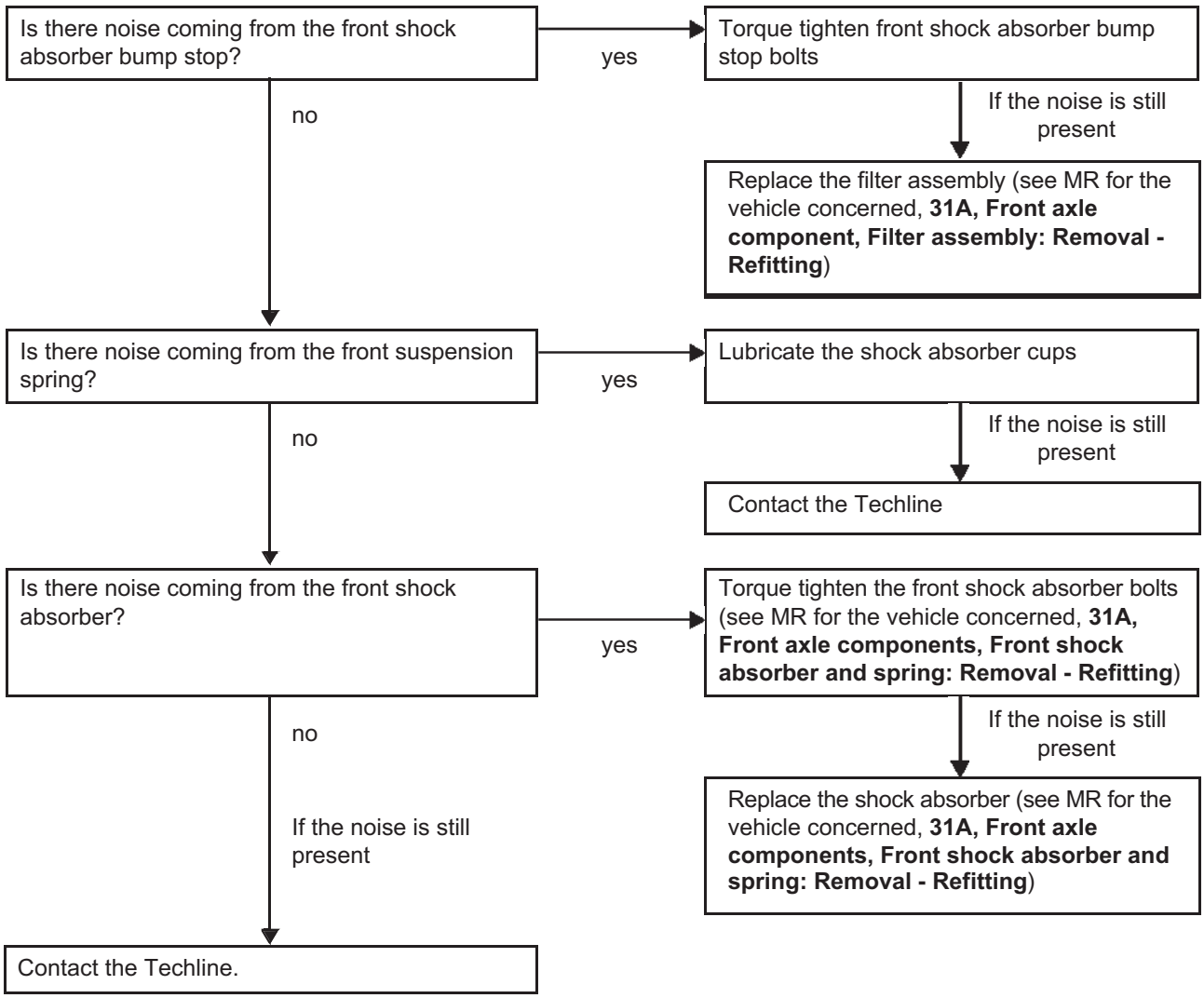
ALP 16.1	**Interference noise** Noise in the "steering column area"



ALP 16.2	**Interference noise** Noise in the "engine area"



ALP 16.3	**Interference noise** Noise in the "suspension area"



ALP 16.4	**Interference noise** Noise in the "subframe area"

Is there noise coming from the steering box?
yes → Replace the steering box (see MR for the vehicle concerned, **36A, Steering, Steering box: Removal - Refitting**)
no

Is there noise coming from the track rod end?
yes → Replace the track rod end (see MR for the vehicle concerned, **36A, Steering, Track rod: Removal - Refitting**)
no

Is there noise coming from the front suspension wishbone?
yes → Check the suspension lower ball joint (see MR for the vehicle concerned, **31A, Front axle components, Front driveshaft lower arm ball joint: Check**)
If the noise is still present → Torque tighten the front suspension wishbone bolts (see MR for the vehicle concerned, **31A, Front axle components, Front driveshaft lower arm: Removal - Refitting)**
If the noise is still present → Replace the front suspension wishbone (see MR for the vehicle concerned, **31A, Front axle components, Front driveshaft lower arm: Removal - Refitting**)
no

Is there noise coming from a front anti-roll bar tie rod?
yes → Torque tighten the anti-roll bar tie rod bolts (see MR for the vehicle concerned, **31A, Front axle components, Front anti-roll bar: Removal - Refitting**)
If the noise is still present → Replace the anti-roll bar tie rod (see MR for the vehicle concerned, **31A, Front axle components, Front anti-roll bar: Removal - Refitting**)
no

Is there noise coming from the subframe?
yes → Torque tighten all of the components fixed to the subframe (see MR for the vehicle concerned, **31A, Front axle components, front axle subframe: Removal - Refitting**)
no

If the noise is still present

Contact the Techline.

ALP 17	Crackling from the speakers

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

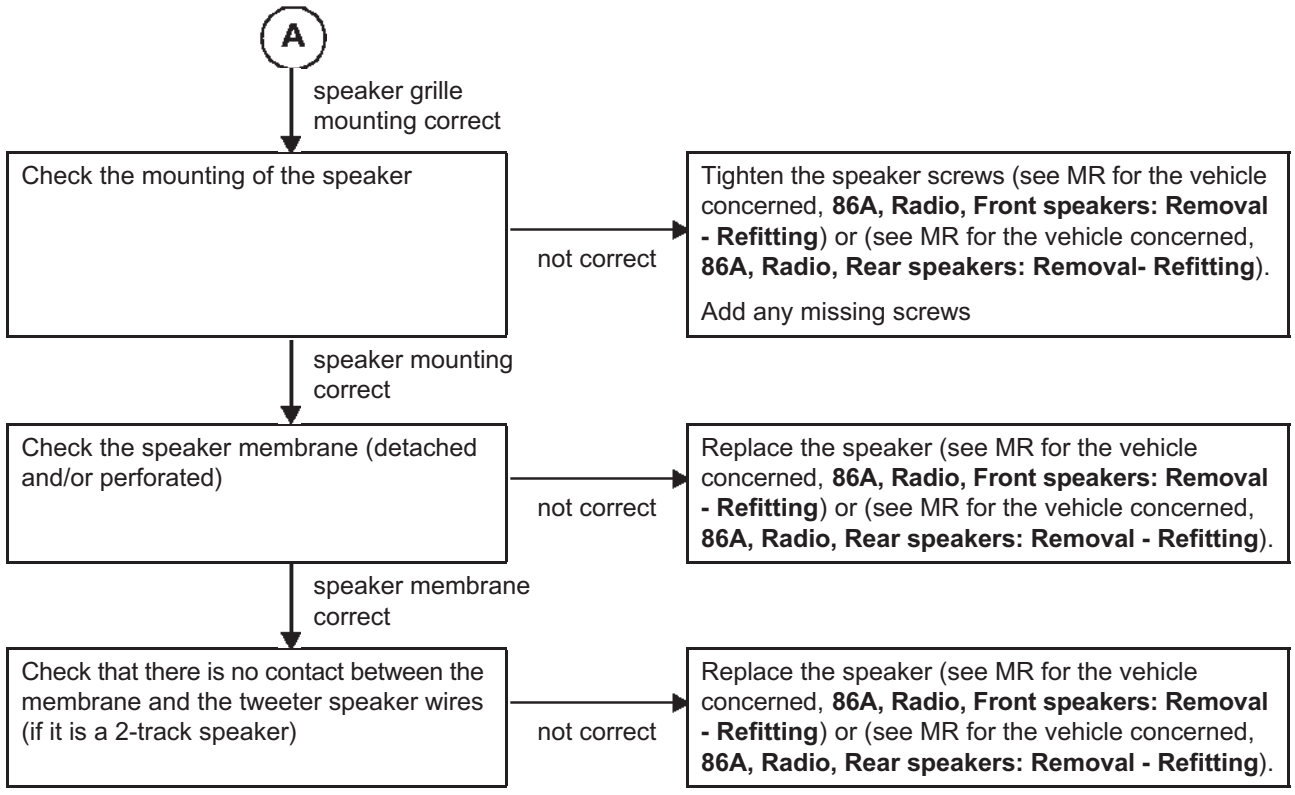
Ensure that there are no foreign bodies present in the passenger compartment.
Check that no parts are broken.
Switch on the sound system and adjust it as follows:
– volume slightly raised
– bass level set at MEDIUM
– treble level set at MEDIUM
Insert a CD or audio cassette which has strong bass tones.

Check the mounting of the speaker grille:		
if the grille is clipped onto the speaker	not correct	Clip the grille onto the speaker Replace the speaker grille if the clip is broken*
if the grille is screwed onto the speaker	not correct	Tighten the speaker grille screws* Add any missing screws*
if the grille is clipped onto the trim	not correct	Clip the grille onto the trim Replace the grille if the clip is broken*
if the grille is bonded onto the trim	not correct	Bond the grille onto the trim*

*: See MR for the vehicle concerned, **72A, Side opening element trim, Front side door trim: Removal - Refitting**) or (see MR for the vehicle concerned, **72A, Side opening element trim, Rear side door trim: Removal - Refitting**)

A

ALP 17 CONTINUED	Crackling from the speakers



ALP 18	Noise from the dashboard

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Start by checking the following points:

● **When stationary, engine not running.**

– Empty all of the storage compartments in the dashboard and doors.
– Ensure that there are no foreign bodies present in the passenger compartment.
– Check that no parts are broken
– Test all of the storage compartment covers and flaps and air vent grilles (catches, hinges, play, etc.)
– Check all of the dashboard trims, visors and clipped front panels (tactile inspection that the parts are secure).
– Visually check for the presence of the bolts

? It is essential to replace all of the faulty components (fasteners, clips, air vent grilles).

● **When stationary, engine running.**

– Accelerate slightly to detect any vibration of the trims and front panels clipped onto the dashboard.
– Test the heating distribution at different speeds to detect any foreign bodies in the heating ducts (air vent vanes, dead leaves, etc.).

? It is essential to replace any faulty component (fasteners, clips, air vent grilles, etc.).

● **Operational or road test in accordance with the customer complaint.**
(Different speeds, cobbled surface, with or without ventilation or heating system, etc.).

⇓

When all of these checks have been carried out and the fault is still present, proceed to the following step

ALP 18 CONTINUED 1	Noise from the dashboard

Check that no parts are broken.
It is essential to consult the Repair Manual for the vehicle concerned in order to observe the safety advice and recommended tightening torques.
After each operation, carry out a vehicle test to check that the vehicle has been repaired.

Check the operation of the storage flaps and covers.
Visually and manually inspect the joint play.
→ not correct → Replace any faulty parts (see MR for vehicle concerned, **57A, INTERIOR EQUIPMENT**)
↓ correct

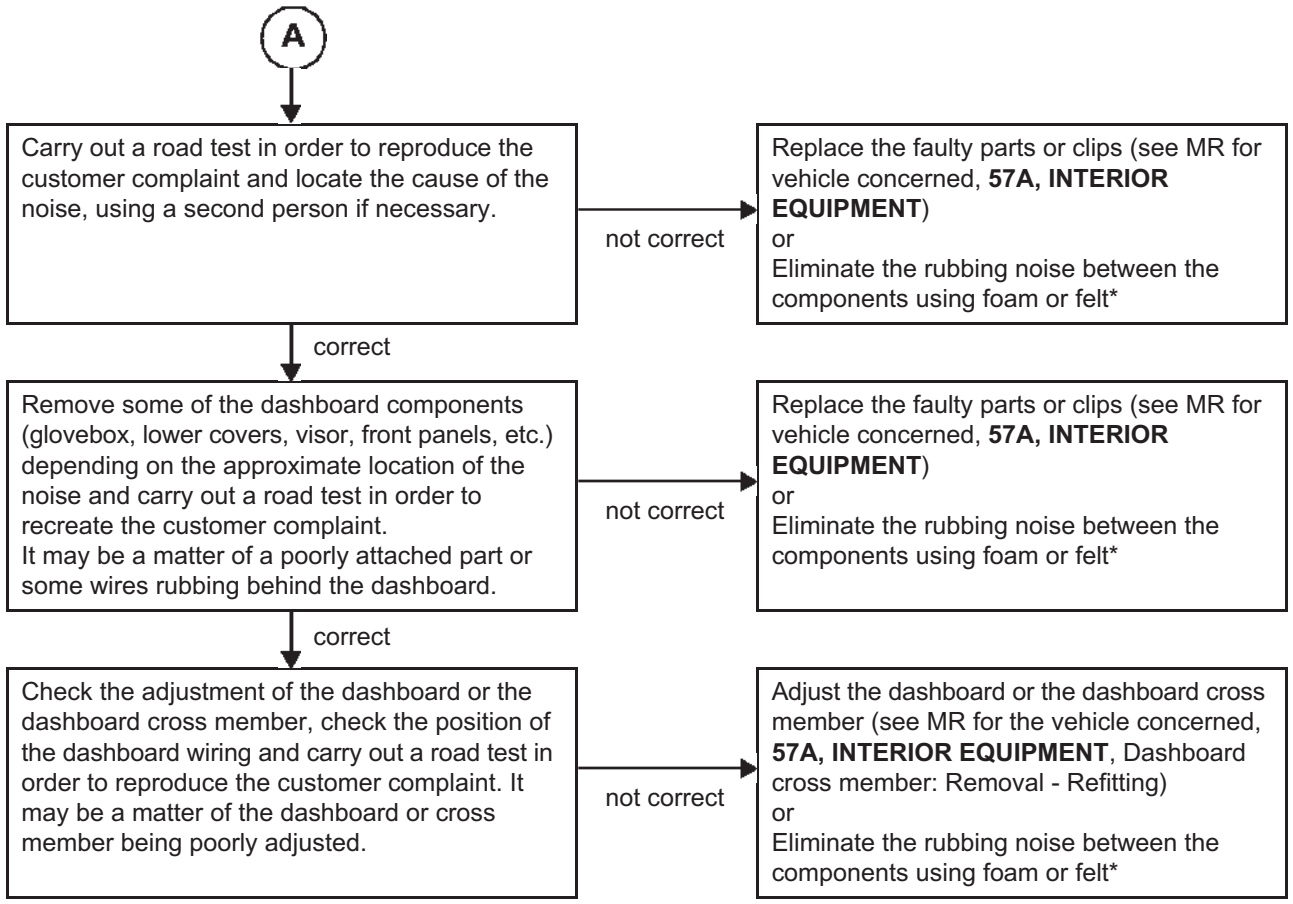
Check the centre and side air vent grilles.
Visually inspect if any components are missing and the clearance between the air vent vanes.
→ not correct → Replace the faulty parts (see MR for vehicle concerned, **57A, INTERIOR EQUIPMENT**)
↓ correct

Check that the covers, front panels, trim pieces and A-pillar trims are clipped on correctly.
Visually and manually inspect if any components are missing (bolts, clips, etc.) and check the clearance between the components.
→ not correct → Replace the faulty parts or clips (see MR for vehicle concerned, **57A, INTERIOR EQUIPMENT**)
or
Eliminate the rubbing noise between the components using foam or felt*
↓ correct

(A)

- *adhesive foam: **77 05 042 163**
- *adhesive foam: **77 05 042 122**
- *adhesive felt: **82 00 281 967**

ALP 18 CONTINUED 2	Noise from the dashboard

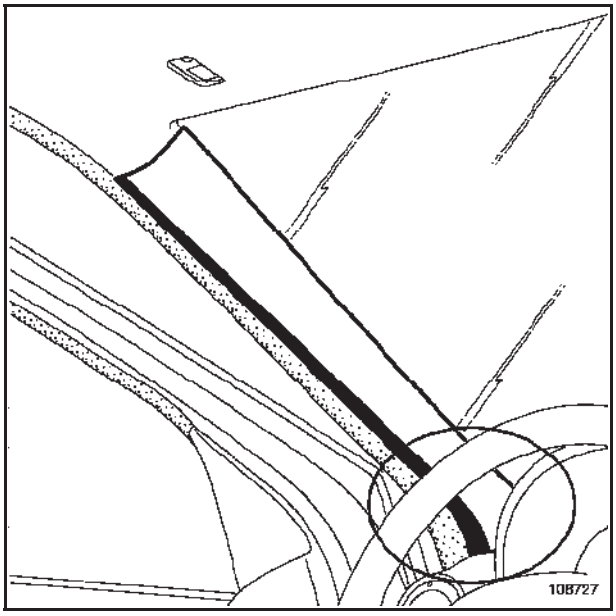


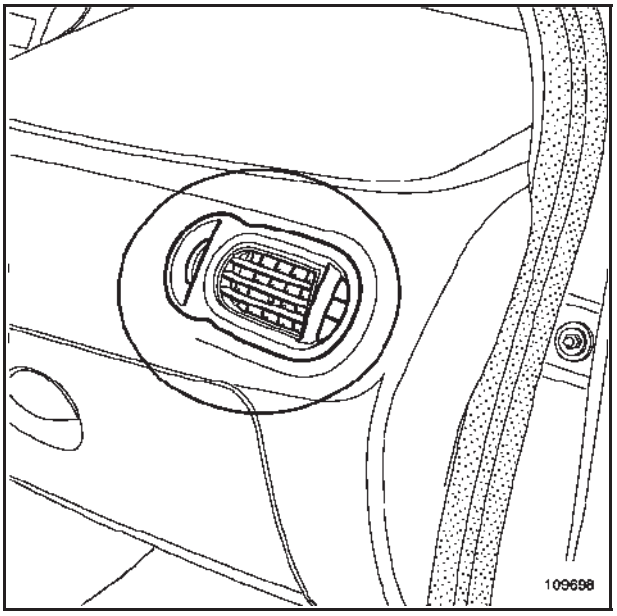
- *adhesive foam: **77 05 042 163**
- *adhesive foam: **77 05 042 122**
- *adhesive felt: **82 00 281 967**

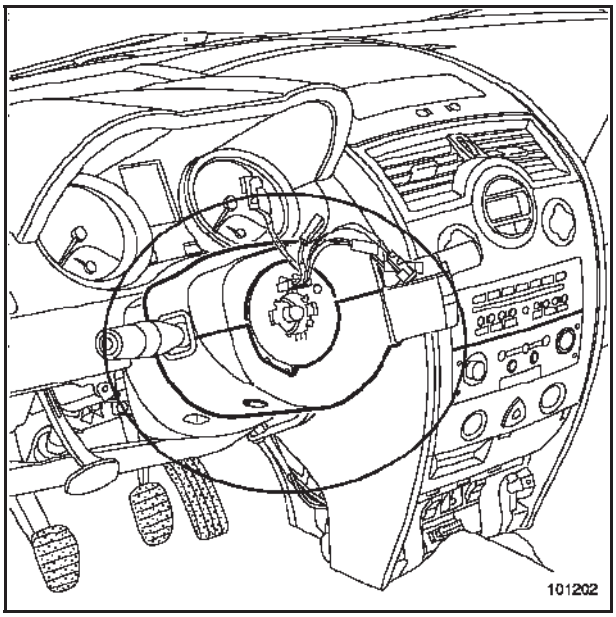
ALP 18 CONTINUED 3	Noise from the dashboard

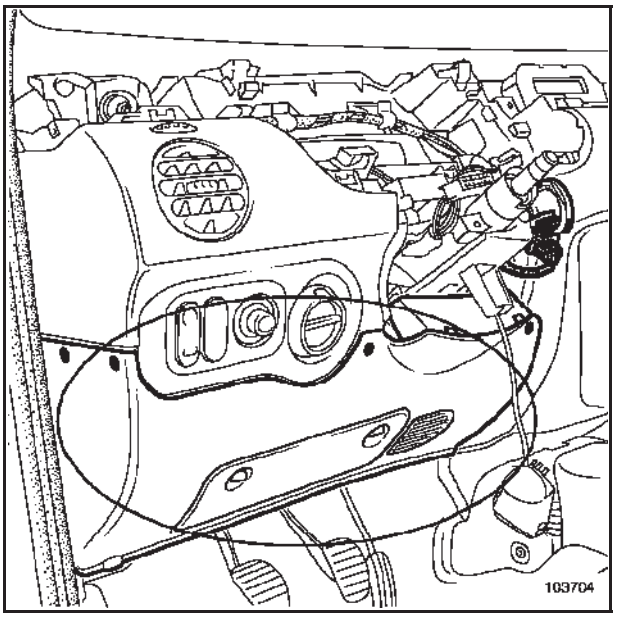
IMPORTANT:
It is essential to consult the MR for the vehicles concerned in order to observe the safety advice related to airbag locking.

Any parts connected to the dashboard body, (clipped, fitted and screwed parts) could potentially create noise (see parts below).

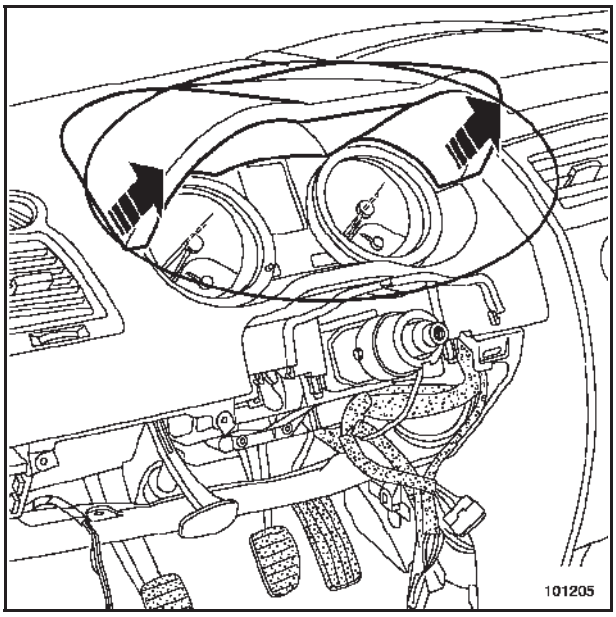


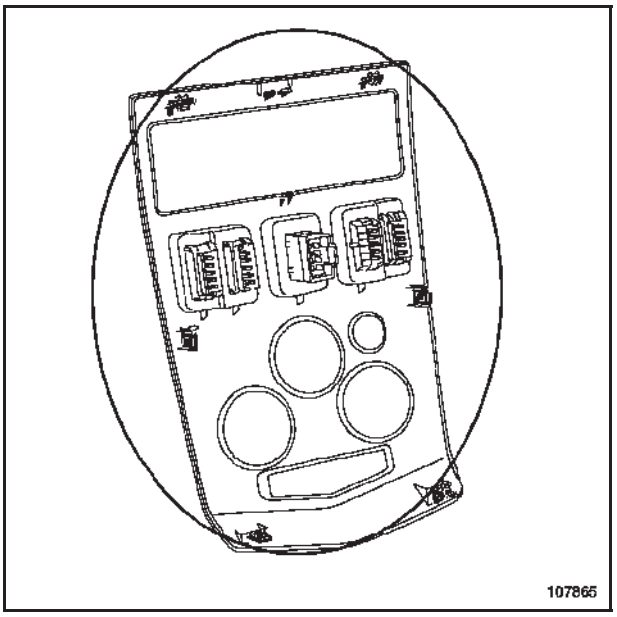


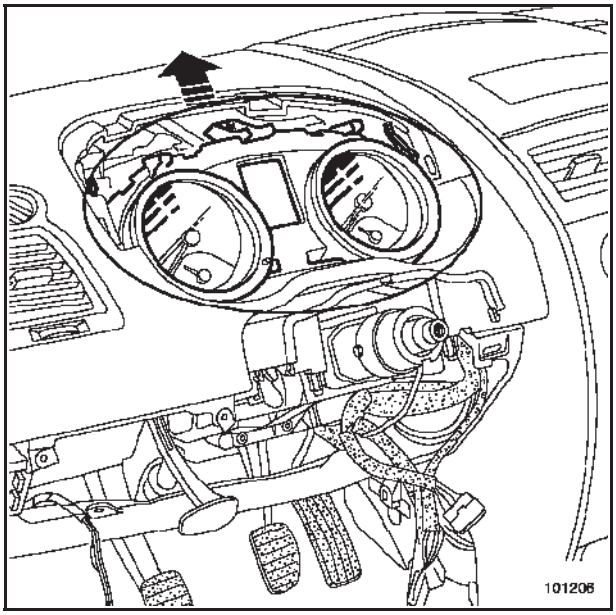


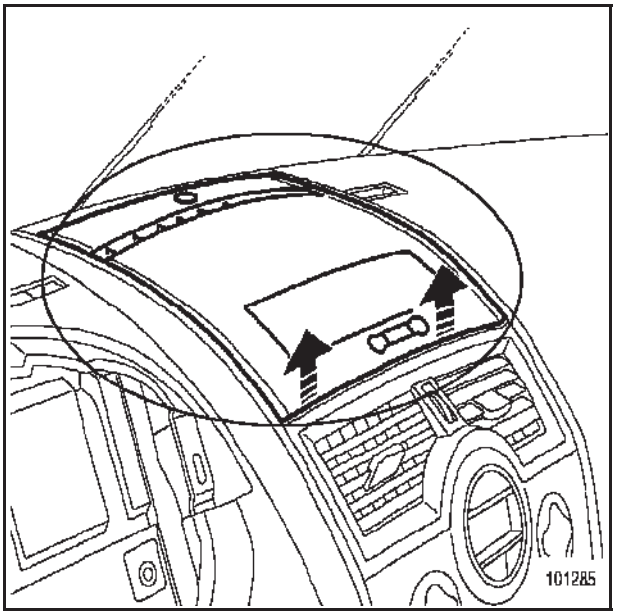


ALP 18 CONTINUED 4	Noise from the dashboard

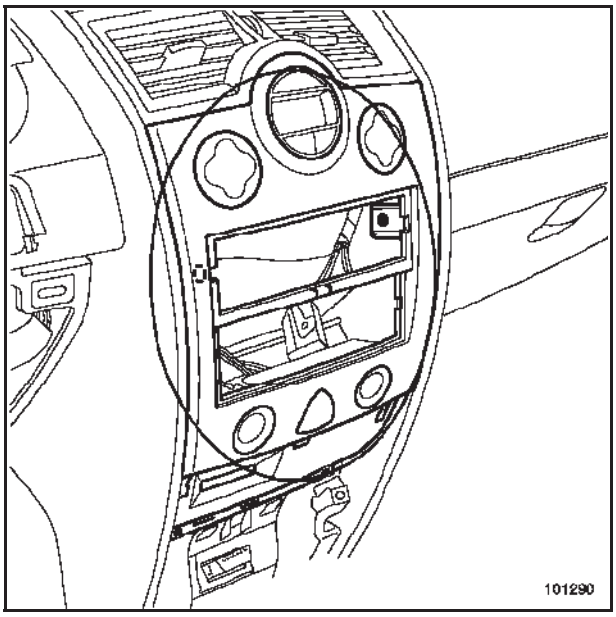


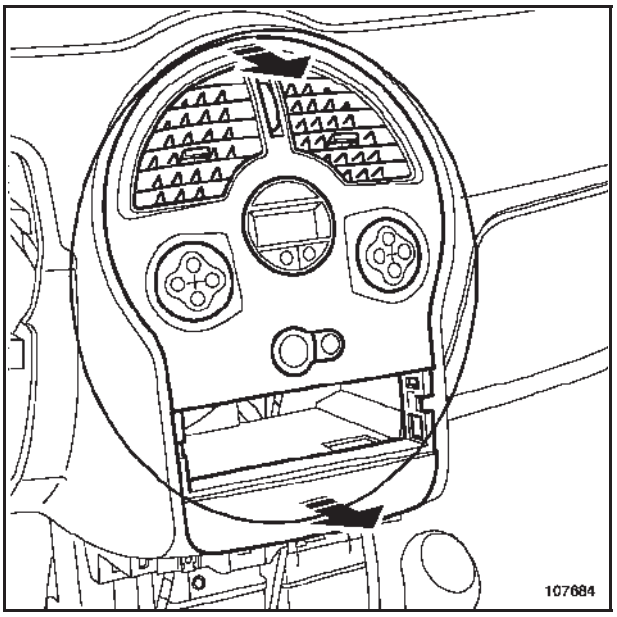


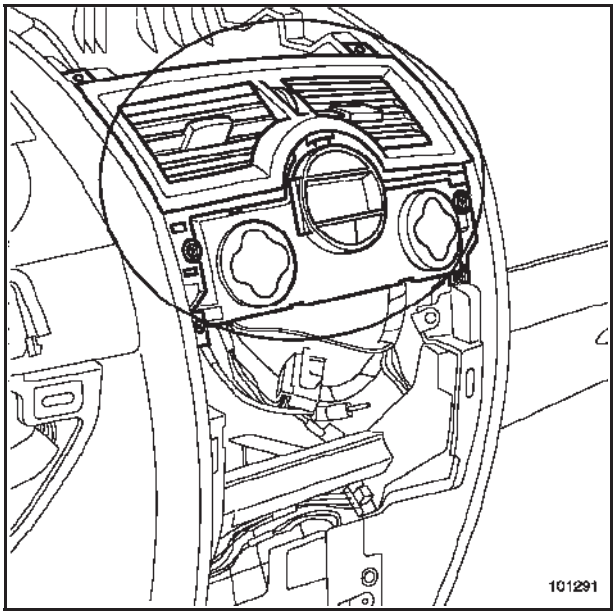


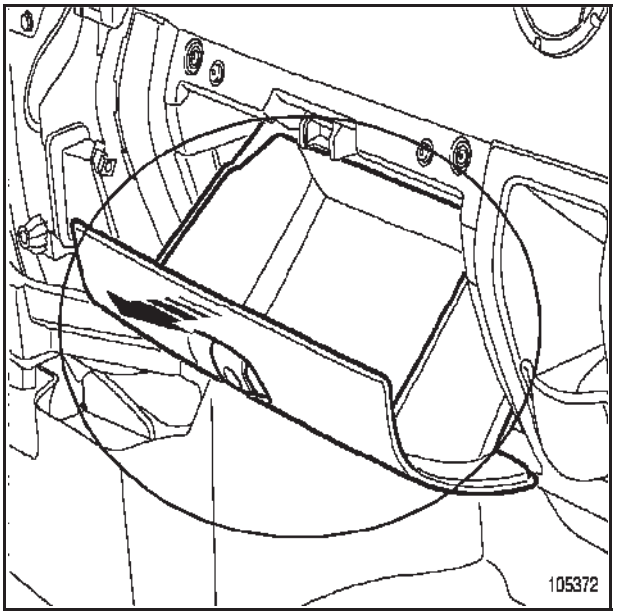


ALP 18 CONTINUED 5	Noise from the dashboard



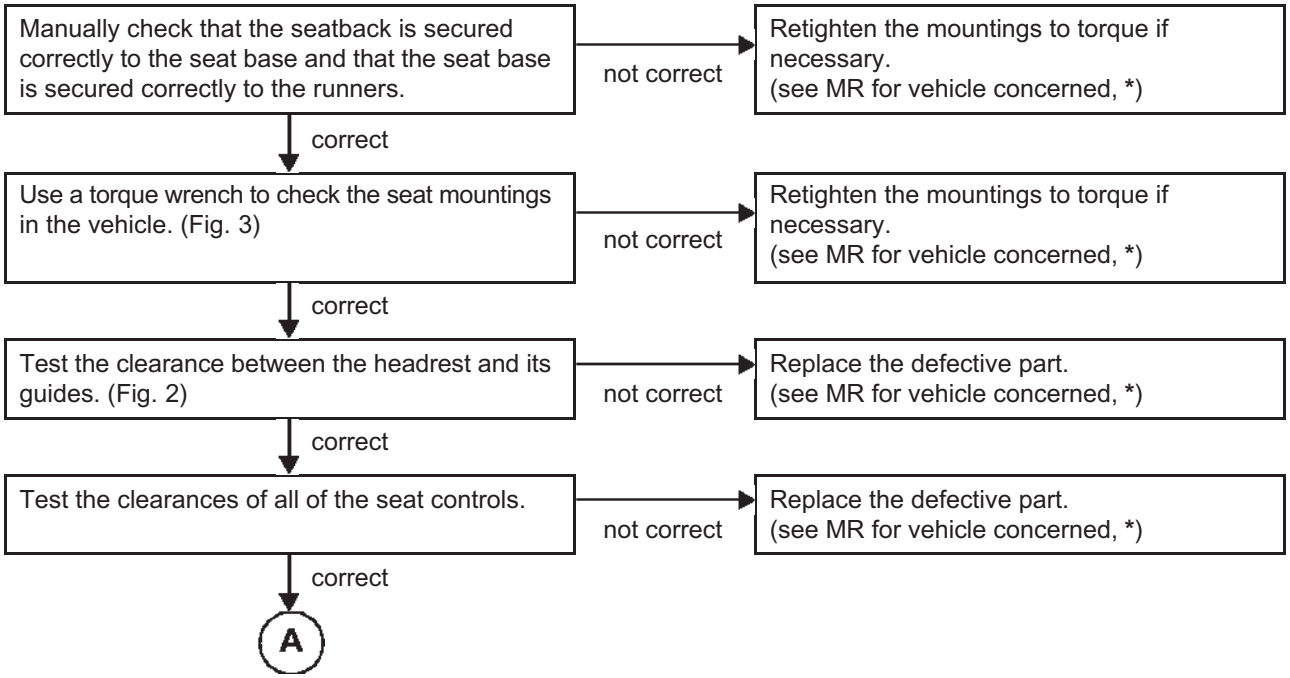






ALP 19	Noise from the upholstery

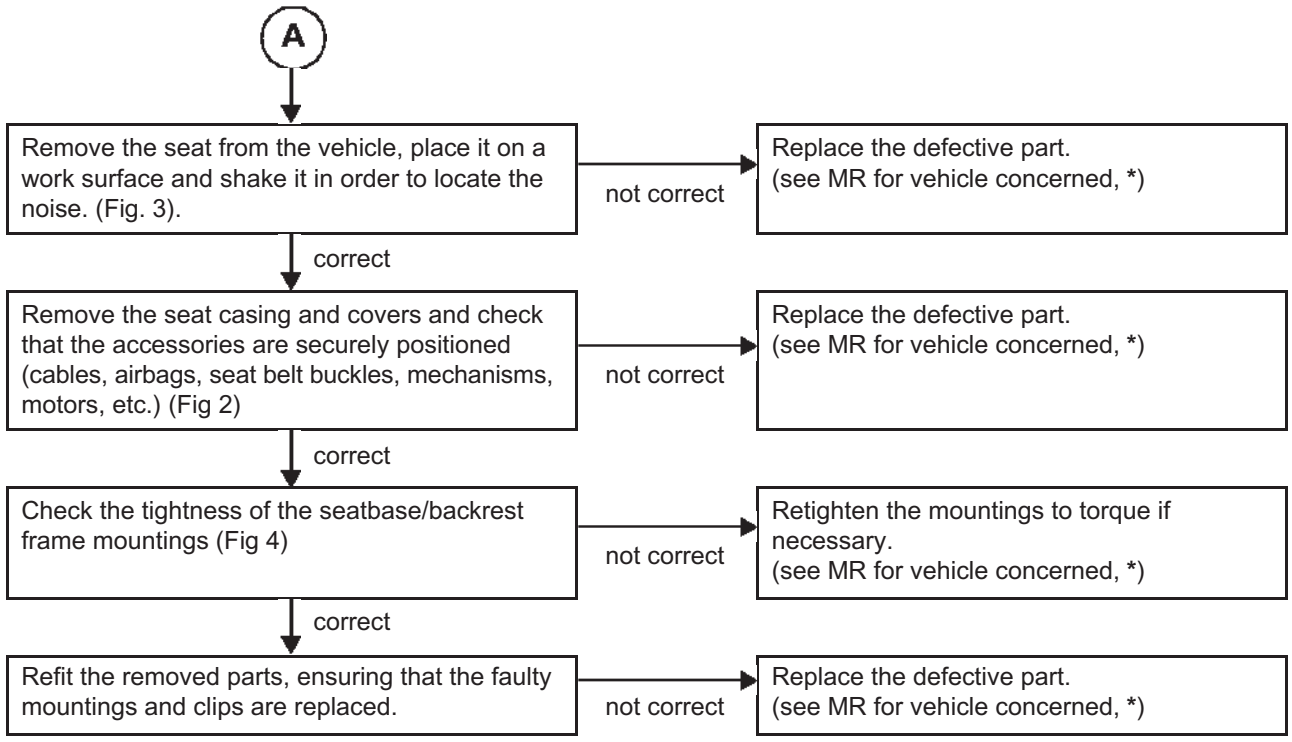
NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.



*

75A, FRONT SEAT FRAMES AND RUNNERS
76A, REAR SEAT FRAMES AND RUNNERS
77A, FRONT SEAT TRIMS
78A, REAR SEAT TRIMS

ALP 19 CONTINUED 1	Noise from the upholstery



*

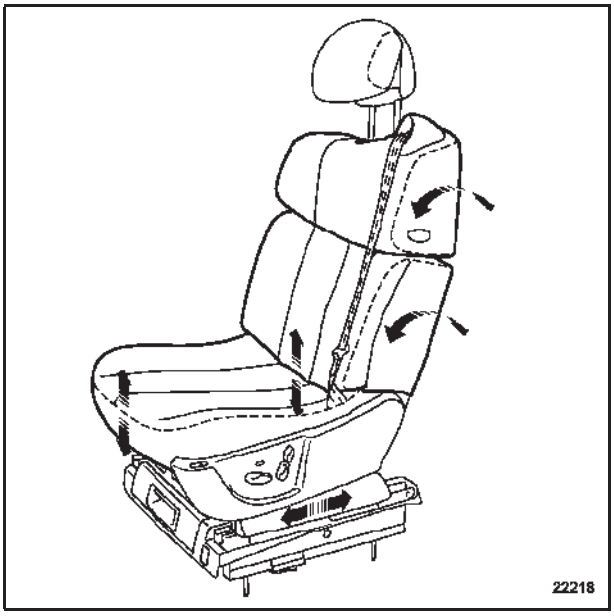
75A, FRONT SEAT FRAMES AND RUNNERS
76A, REAR SEAT FRAMES AND RUNNERS
77A, FRONT SEAT TRIMS
78A, REAR SEAT TRIMS

ALP 19 CONTINUED 2	Noise from the upholstery

Notes: before reading the ALP.

Fig. 1

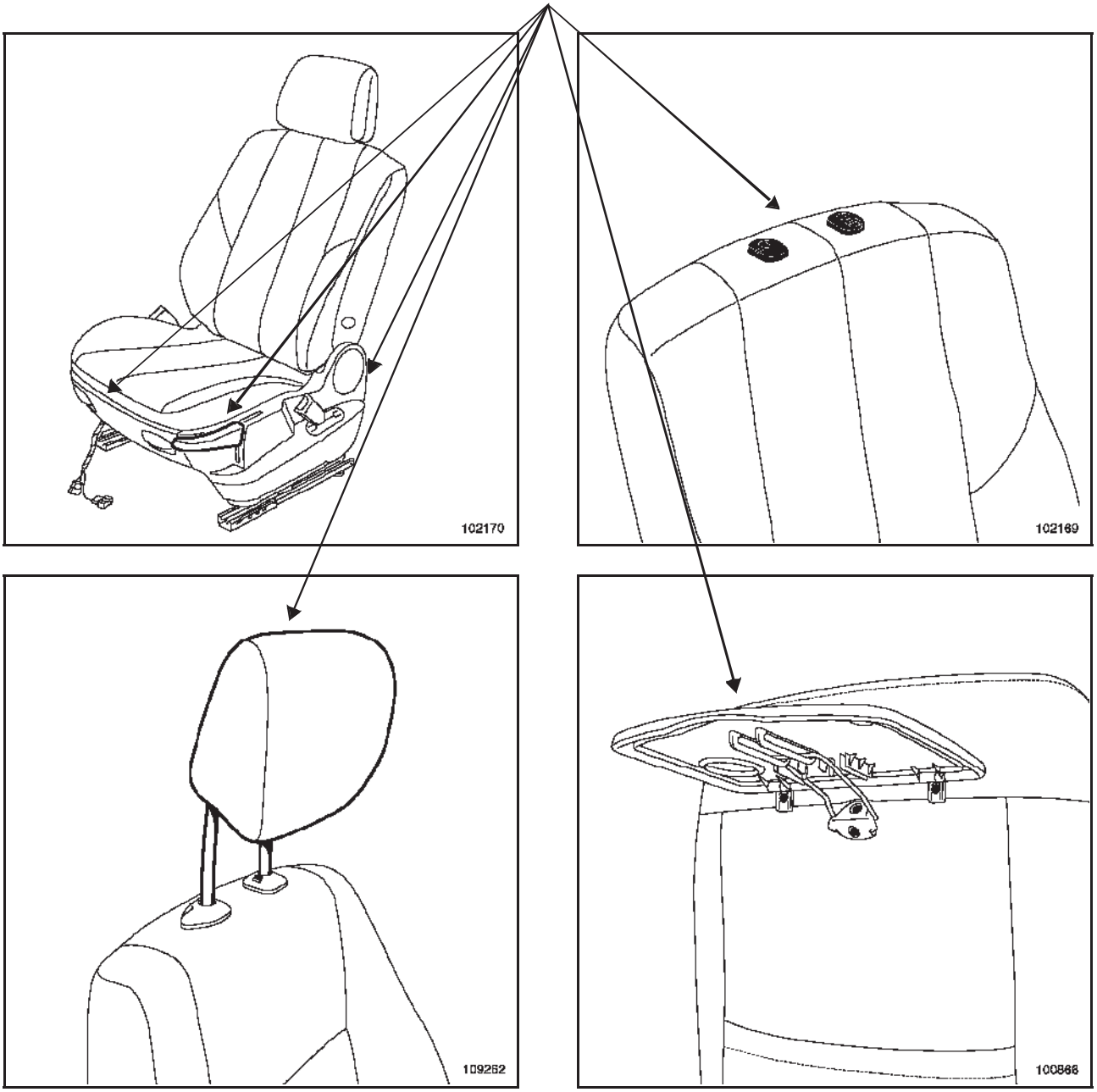
Carry out an operational test on the seat



ALP 19 CONTINUED 3	Noise from the upholstery

Fig. 2

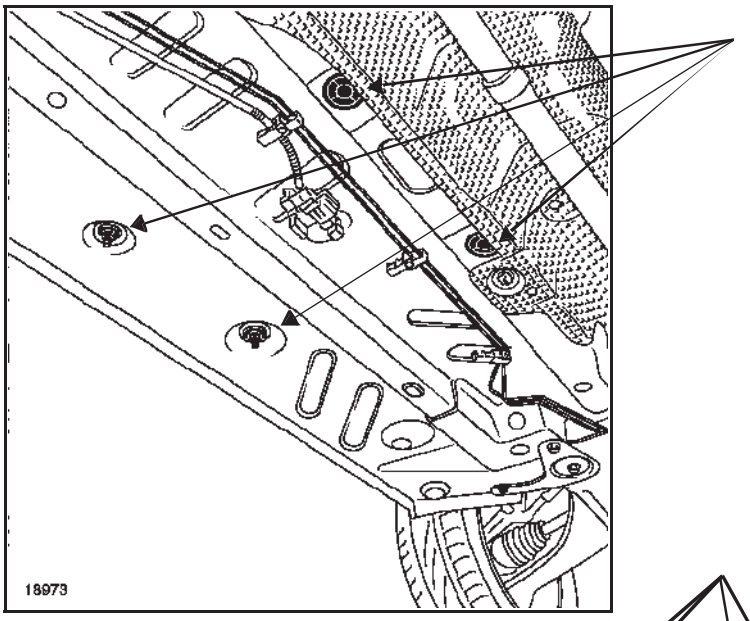
Check the resistance and mountings of the casings, control levers, headrest and guides, rear parcel shelf, etc.



ALP 19 CONTINUED 4	Noise from the upholstery

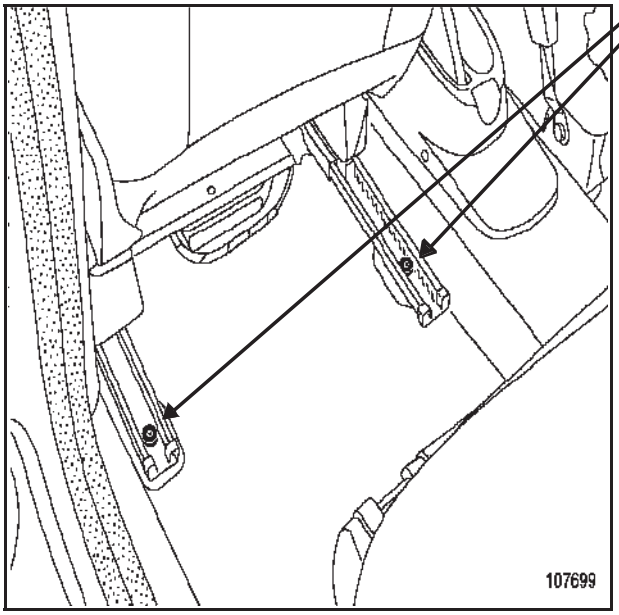
Fig. 3

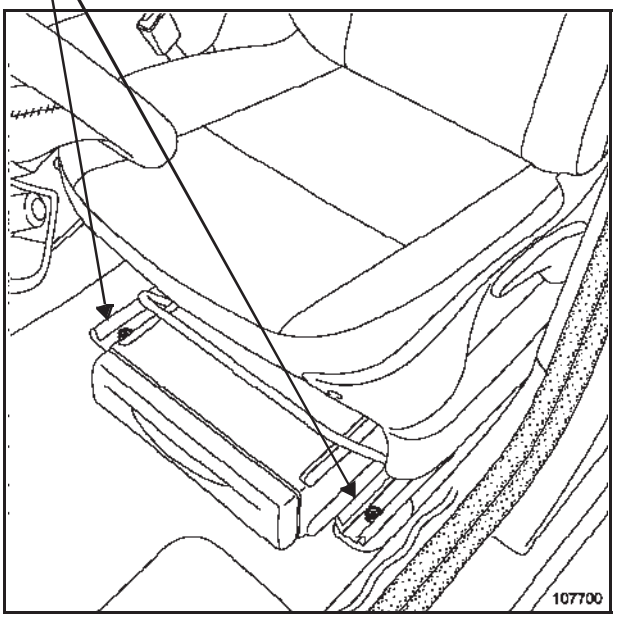
A seat can either be removed from underneath the vehicle or from the vehicle interior:



Mountings underneath the vehicle

Mountings inside the vehicle



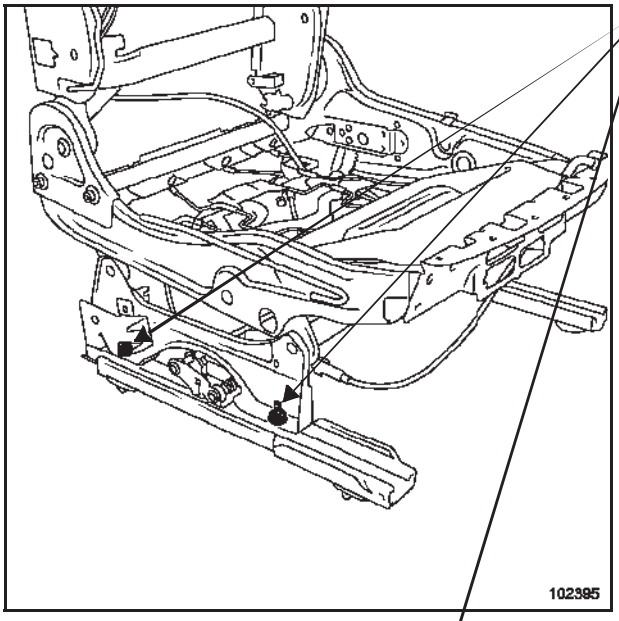


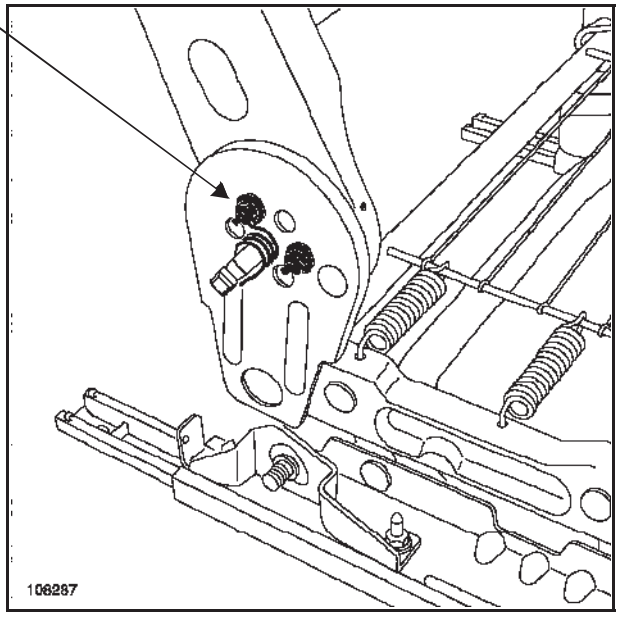
ALP 19 CONTINUED 5	Noise from the upholstery

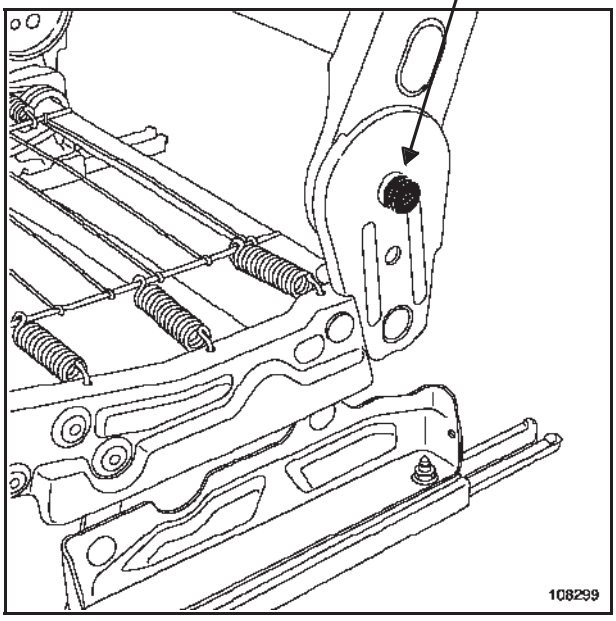
Fig. 4

The frame mountings to be checked include:

Seat base/backrest frame mountings and runners/seat base mountings







Consult the MR in order to respect the recommended tightening torques.

ALP 20	Noise when window is operated (squeaking/creaking)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies present
– no parts are loose, damaged or broken.

After the operation, check that the operation was successful by performing an operational test or road test.

Check that the runners* and the window winder drum are lubricated correctly

not correct → Clean the window winder (using a lint-free cloth soaked in heptane, Part no. 77 11 170 064), and lubricate the runners* and the window winder drum (mechanism lubricant: Part no. 77 11 419 865), removing the window winder mechanism if necessary (see MR for the vehicle, **51A, SIDE OPENING ELEMENT MECHANISMS, Front or rear manual or electric window mechanism: Removal - Refitting**)

correct

Check the cleanliness and wear of the exterior weatherstrip* and/or the glass run channel*.

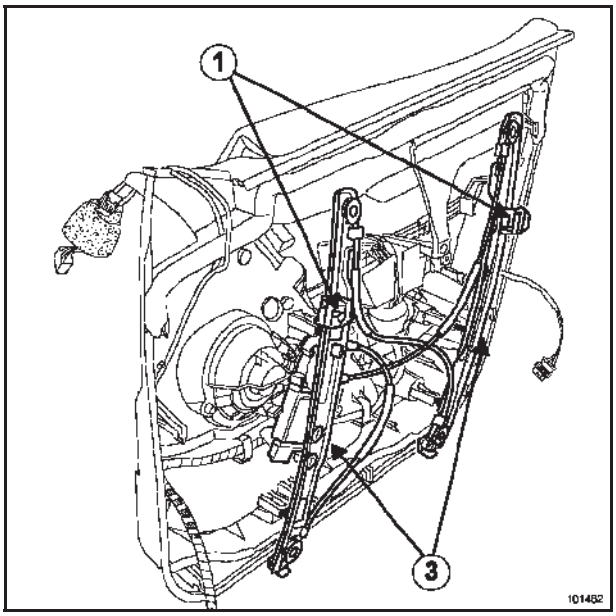
not correct → Remove the exterior weatherstrip* and/or the glass run channel* (see MR for vehicle, **66A WINDOW SEALING, Front or rear door exterior weather strip: Removal - Refitting** and **66A WINDOW SEALING, Front or rear door glass run channel: Removal - Refitting**)

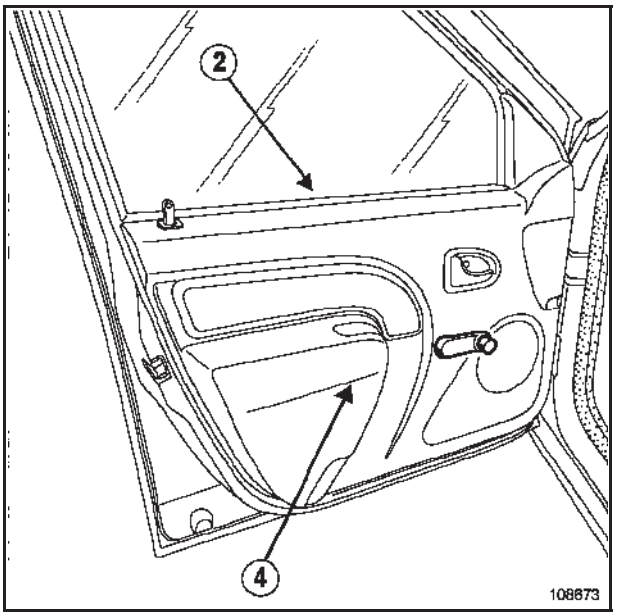
1) Clean the exterior weatherstrip* and/or the glass run channel* using a flexible brush and soapy water (under no circumstances must abrasive soap be used).

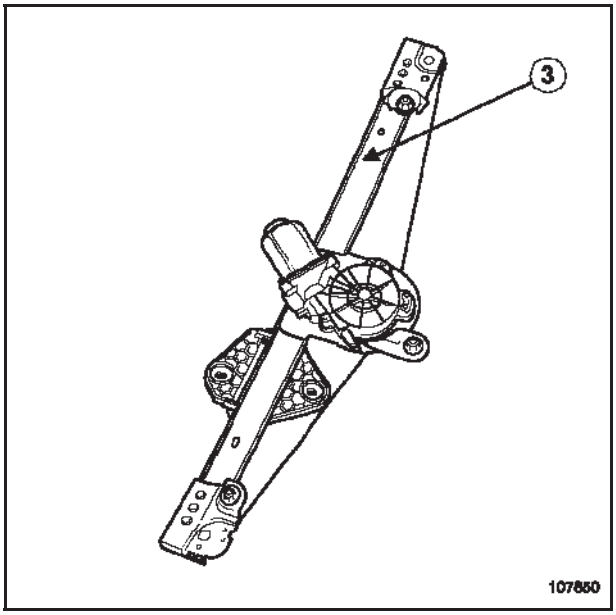
2) If the first operation is not successful, replace the weatherstrip* and/or the window channel*.

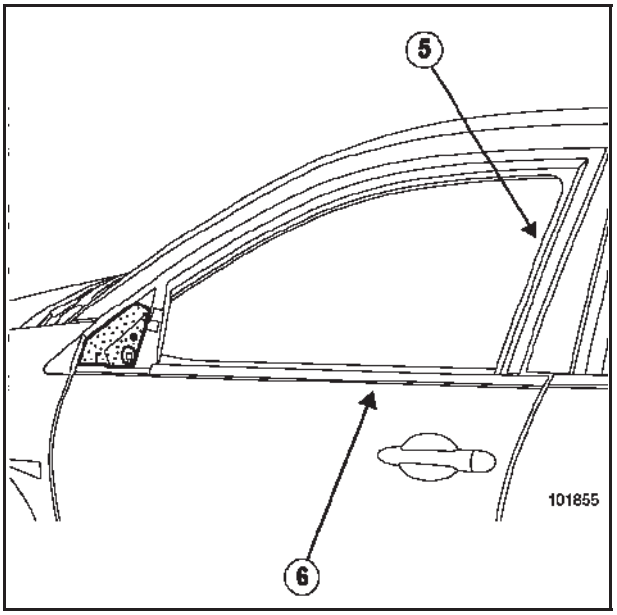
*: see the illustrations on the following page

ALP 20 CONTINUED	Noise when window is operated (squeaking/creaking)









1 Window winder sliders
2 Interior weatherstrip
3 Window winder mechanism runners
4 Interior door trim
5 Glass run channel
6 Exterior weatherstrip

ALP 21	Noise when window is operated (scratching)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies present
– no parts are loose, damaged or broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check that the internal section of the slide* is not damaged.

→ not correct →

1) Use the CAR 1363 special tool to realign the damaged section.

2) If the first operation is not successful, replace the glass run channel*. (see MR for the vehicle, **66A WINDOW SEALING, Front or rear door glass run channel: Removal - Refitting**)

*: see illustrations in ALP: Noise when window is operated (squeaking / creaking)

ALP 22	Noise from the window when closing the door (rattling)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies present
– no parts are loose, damaged or broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check that the interior * and/or exterior weatherstrip* are correctly positioned.

→ not correct

1) Reposition the interior* and/or exterior* weatherstrips.
2) If the first operation is not successful, replace the weatherstrip* on the front or rear door. (see MR for vehicle, **66A WINDOW SEALING, Front or rear side door exterior weatherstrip: Removal - Refitting** or **Front or rear side door trim: Removal - Refitting**).

↓ correct

Check that the internal section of the slide* is not damaged.

→ not correct

1) Use the CAR 1363 special tool to realign the damaged section.
2) If the first operation is not successful, replace the glass run channel*. (see MR for the vehicle, **66A WINDOW SEALING, Front or rear door glass run channel: Removal - Refitting**)

↓ correct

Check the play of the window winder slider* in relation to the window (check that no noise can be detected)

→ not correct

Fit a square piece of foam between the window and the window winder slider*
Part no.: 77 05 042 122

*: see illustrations in ALP: Noise when window is operated (squeaking / creaking)

ALP 23	Sunroof chattering: jerky movement when opening/closing sunroof mobile panel

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check the operation of the mobile panel* by initialising the sunroof motor, with the vehicle's engine running (see fault finding MR for vehicle, **87D ELECTRIC WINDOW - SUNROOF, Electric sunroof: Initialisation**)

↓ correct

Check the cleanliness of the side runners*

not correct → Clean the internal and external side runners* and, depending on the vehicle, only lubricate the internal side runners* or the external side runners* without removing the sunroof mobile panel (see MR for the vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

↓ correct

Check the condition of the mobile panel linkages*

not correct → Remove the mobile panel* and replace the runners and/or the mobile panel linkages. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

↓ correct

Check that the mobile panel* slides correctly (no jerky movement)

not correct → Replace the sunroof* motor. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS**, or **87D ELECTRIC WINDOWS - SUNROOF, Sunroof opening motor: Removal - Refitting**)

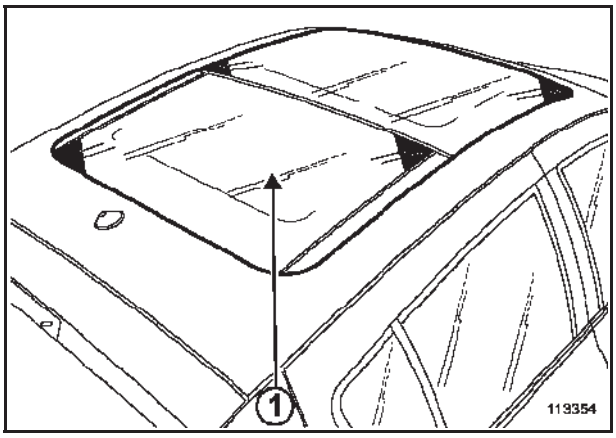
↓ correct

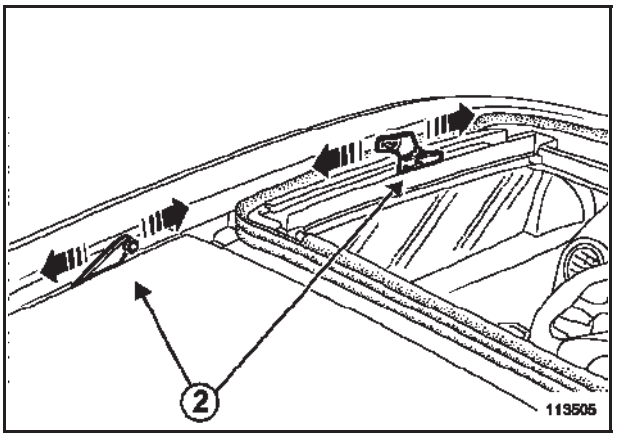
Check the conformity of the sunroof* (damaged runners, operating mechanism, etc.)

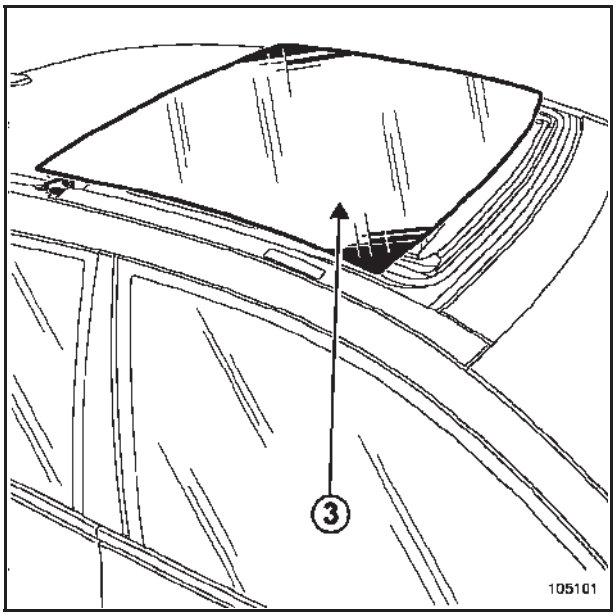
not correct → Replace the sunroof*. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof operating mechanism: Removal - Refitting**).

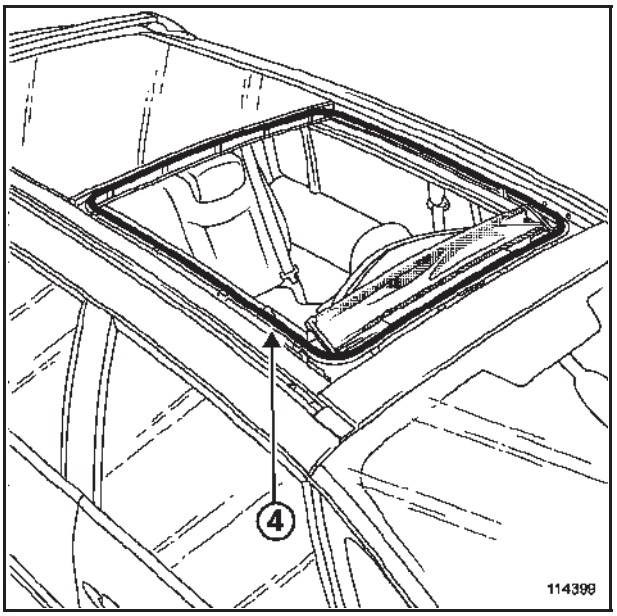
*: see the illustrations on the following page

ALP 23 CONTINUED 1	Sunroof chattering: jerky movement when opening/closing sunroof mobile panel



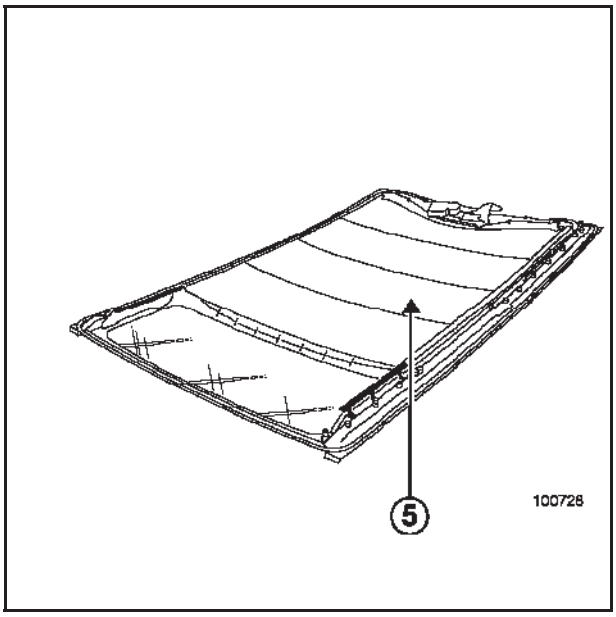


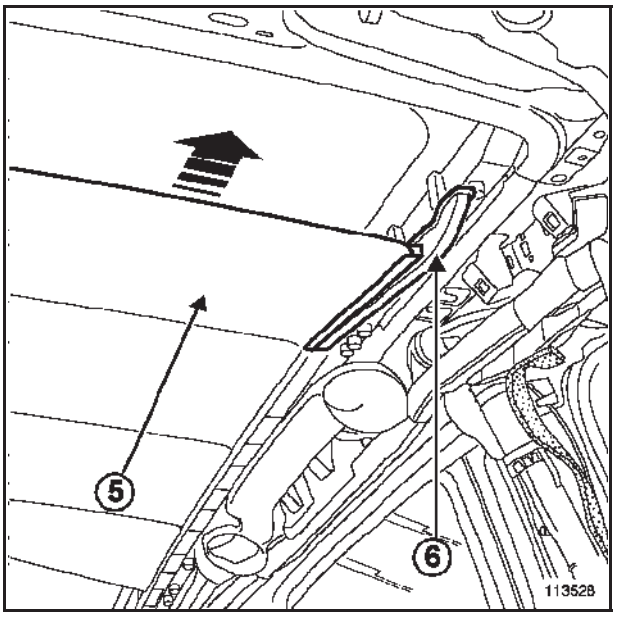


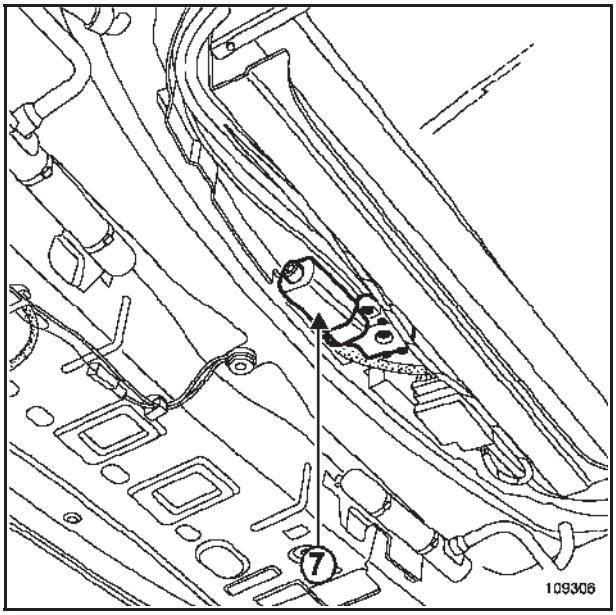


1 Sunroof operating mechanism (sunroof assembly)
2 Linkages and side runners (position of sliding linkages)
3 Sunroof mobile panel
4 Seal

ALP 23 CONTINUED 2	Sunroof chattering: jerky movement when opening/closing sunroof mobile panel







5 Sunroof blind (e.g. Espace IV)
6 Sunblind storage unit
7 Sunroof motor

ALP 24	Sunroof creaking

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check the cleanliness:
– of the seal on the front section of the sunroof*
– of the seal between the mobile panel* and the sunroof operating mechanism*.

→ not correct → In all cases: Clean the seals* using a sponge and soapy water (under no circumstances must abrasive soap be used).

↓ correct

Check the condition:
– of the seal on the front section of the sunroof*.
– of the seal between the mobile panel* and the sunroof operating mechanism*.

→ not correct → If the seal is worn and/or broken, replace:
– the seal* on the front section of the sunroof, and/or
– the seal* between the mobile panel* and the sunroof operating mechanism*.
(see MR for vehicle, **65A OPENING ELEMENT SEALING, Sunroof seal: Removal - Refitting**).

*: see the illustrations in ALP: Sunroof chattering

ALP 25	Grating noise from the sunblind

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Remove the headlining (see MR for vehicle, **71A BODY INTERNAL TRIM, Headlining: Removal - Refitting**)

↓ correct

Check the cleanliness of the side runners* and the sunblind storage units*.

not correct → Clean then lubricate the side runners* and the sunblind storage units* (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof blind: Removal - Refitting**).

↓ correct

Check the condition of the sunblind side runners*.

not correct → Clean and lubricate the sunblind side runners* (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof blind: Removal - Refitting**).

*: see the illustrations in ALP: Sunroof chattering

CHART 26	Sunroof rattling

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

Check the tightness of the **detachable** side runners* at the front of the sunroof*. (e.g. Modus)

not correct → Torque tighten the detachable side runners* (see MR for vehicle concerned, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

correct

Check the cleanliness of the side runners*

not correct → Clean the internal and external side runners* and, depending on the vehicle, only lubricate the internal side runners* or the external side runners* without removing the sunroof mobile panel (see MR for the vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

correct

Check the linkage* - linkage mounting contact.

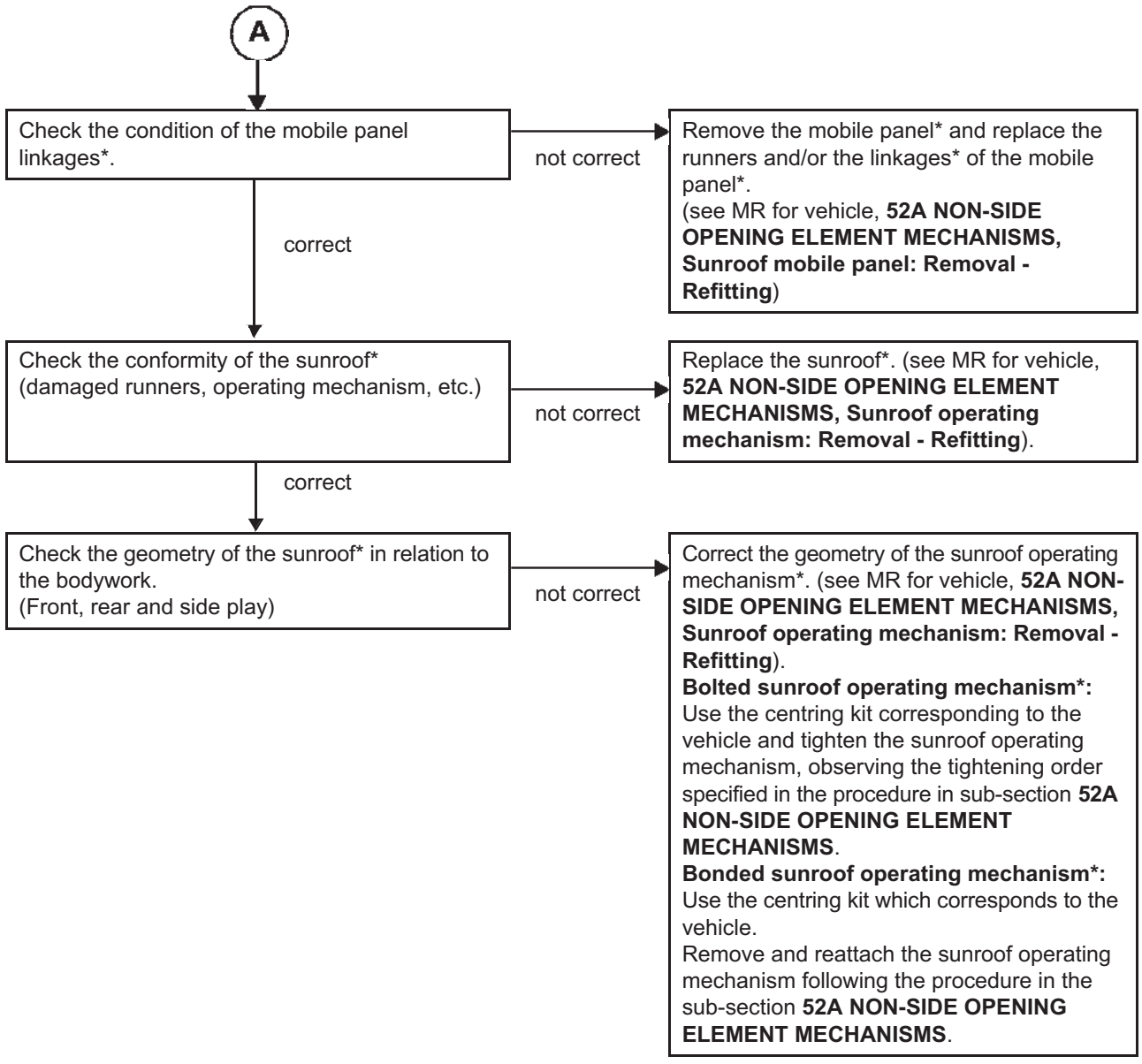
not correct → Insulate the contact between the linkage* and the linkage mounting by bonding a piece of felt (part no.: 82 00 281 967) to the front and/or rear linkages.

correct

A

*: see the illustrations in ALP: Sunroof chattering

CHART 26 CONTINUED	Sunroof rattling



*: see the illustrations in ALP: Sunroof chattering

Introduction:

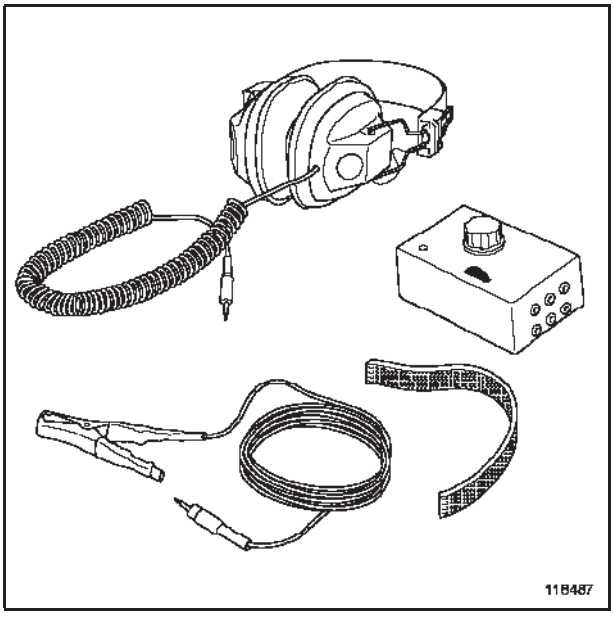
Before using the diagnostic tool (**Part no. 77 11 421 103**), it is essential to identify that the noise heard by the customer comes from the vehicle (and not from various objects in the vehicle or from the surrounding environment, etc.).

Note: Whenever possible, empty the contents of the vehicle's various storage compartments.

The **ChassisEar** is an electronic, versatile diagnostic tool designed to enable the user, during a road test, to amplify the sounds produced by different areas of the vehicle:

- Suspension
- Rotating components
- Front panel
- Engine
- Engine sub-frame
- Steering column
- Under body
- Rear face

Diagram of the tool:



The tool case is composed of the following:

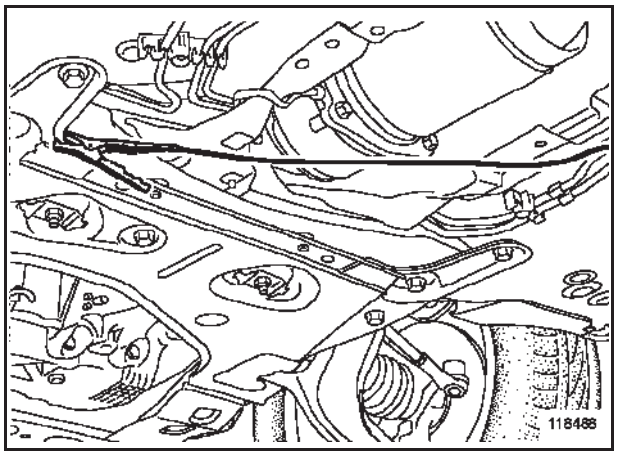
- Control unit (1)
- Clamp - Cable assembly (2)
- Headset (3)
- Velcro strip (4)

1) Fitting the tool:

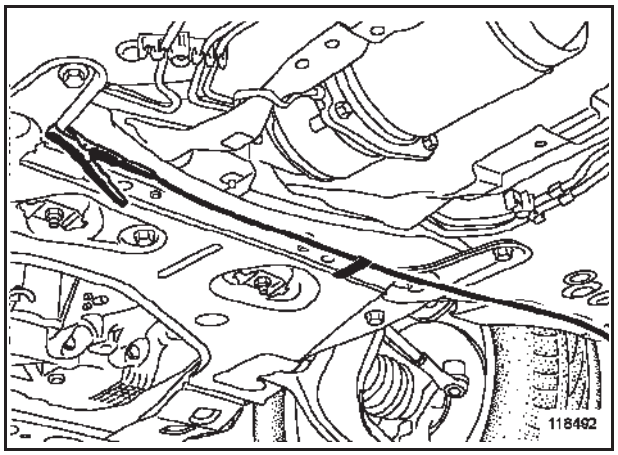
1.1) Precautions to observe when fitting the tool:

1.1.1) Assembly (wire – clamp):

– Ensure that the clamps are not:
  ● In contact with or near to sources of heat (exhaust, etc.)



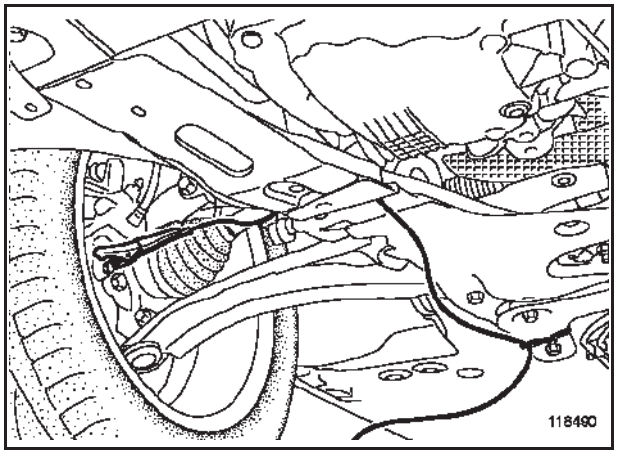
Incorrect fitting



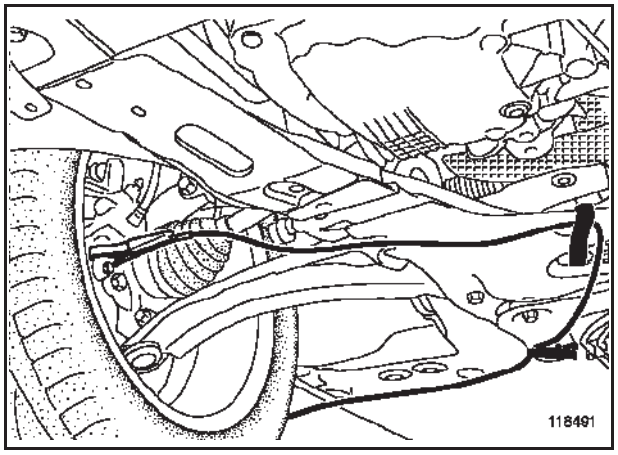
Correct fitting

  ● In contact with highly corrosive liquids (brake fluid, etc.).

– Ensure that the clamps are not:
  ● In contact with rotating components.



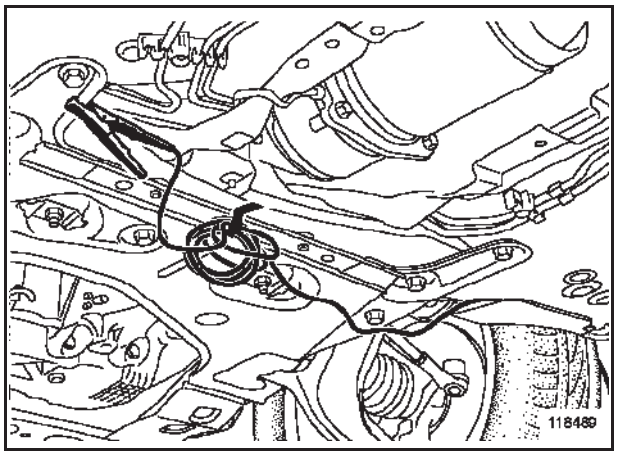
Incorrect fitting



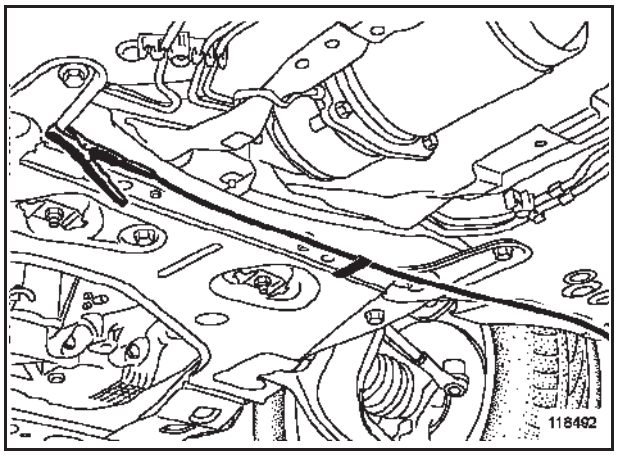
Correct fitting

  ● Make provision for parts to move whilst driving (wheels turned to full lock, movement) to prevent the clamp from becoming unclipped and the wire being severed.

- Do not twist the wires.



Incorrect fitting



Correct fitting

- Only attach the wires using the velcro strips supplied in the tool case.

1.1.1) Connection (Clamps-Control unit):

The control unit has 6 inputs which correspond to clamps of the following colours:

- **1: Red**
- **2: Green**
- **3: White**
- **4: Pink**
- **5: Blue**
- **6: Orange**

1.1.2) Fitting the tool:

– Place the vehicle on a lift.
– Fit the clamps to the components which may be causing the noise.
● Attach the wires using velcro strips.
● A coloured ring on the wire aids their identification.

– Remember the area or the component studied, according to the position of the clamps.
– Connect the clamps to the control unit.
– Connect the headset.

2) Stages of the test:

WARNING
When driving, **2 people are required**. Someone other than the driver must wear the headpiece.

Do not move the clamps during the driving test.
If the position of the clamps has to be adjusted, the vehicle must be in the workshop.

Perform the vehicle test according to the information collected and shown on the **Fault finding log**, when the customer complaint was registered (conditions under which noise appears).

Confirm the components in question during the test phase by a performing a check in the workshop:
– Special tooling.
– Visual or tactile inspection.

NON-SIDE OPENING ELEMENTS: ADJUSTMENT

1. BONNET

- Check that the peripheral components are adjusted correctly.

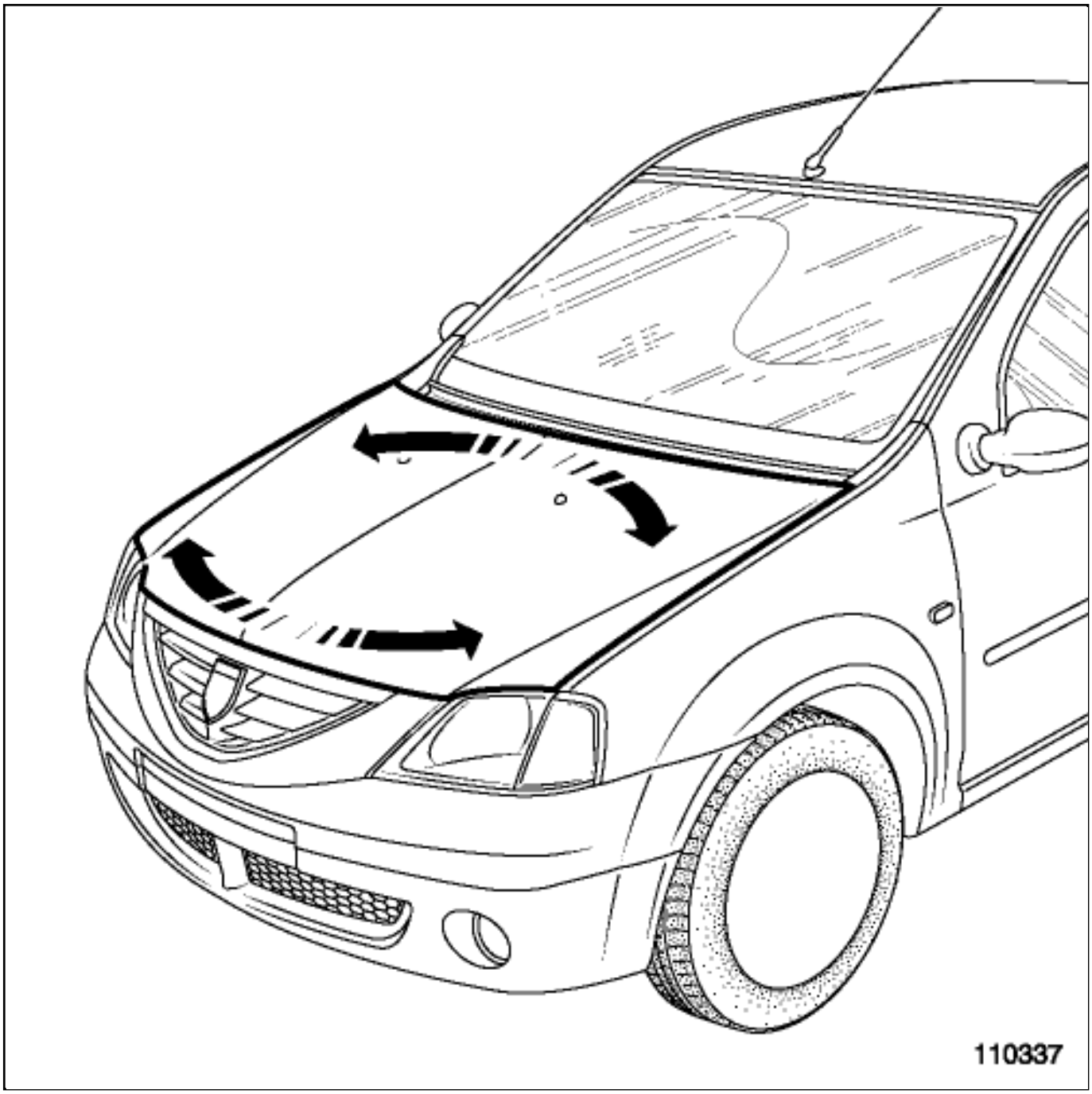
The lock and/or the retaining hook of the bonnet must be removed or loosened in order not to create any obstruction when in the closed position.

Fit the bonnet, pre-tightening in the middle of the adjustment.

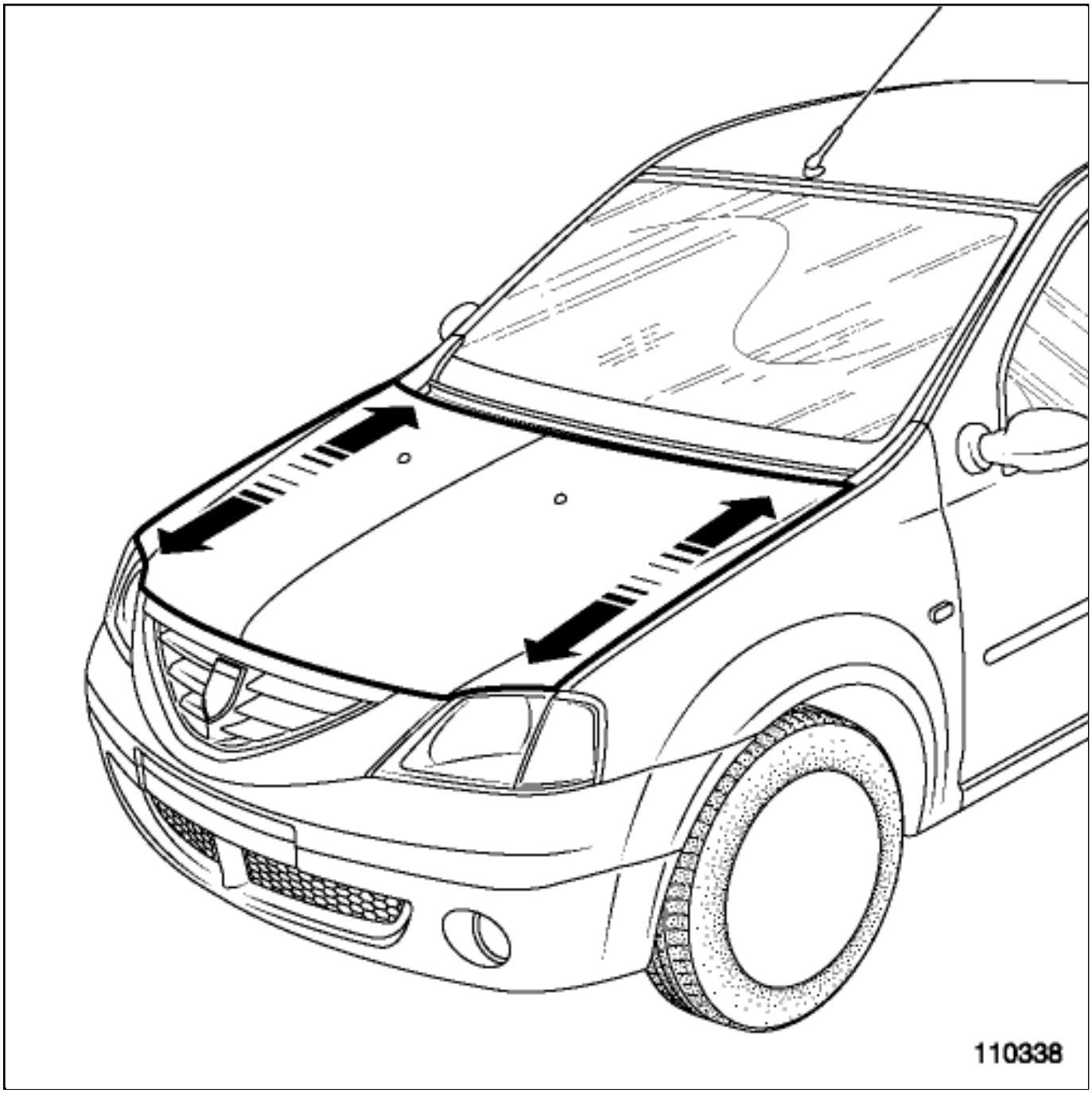
Note:

For information about the adjustment zones, refer to the MR for the vehicle concerned.

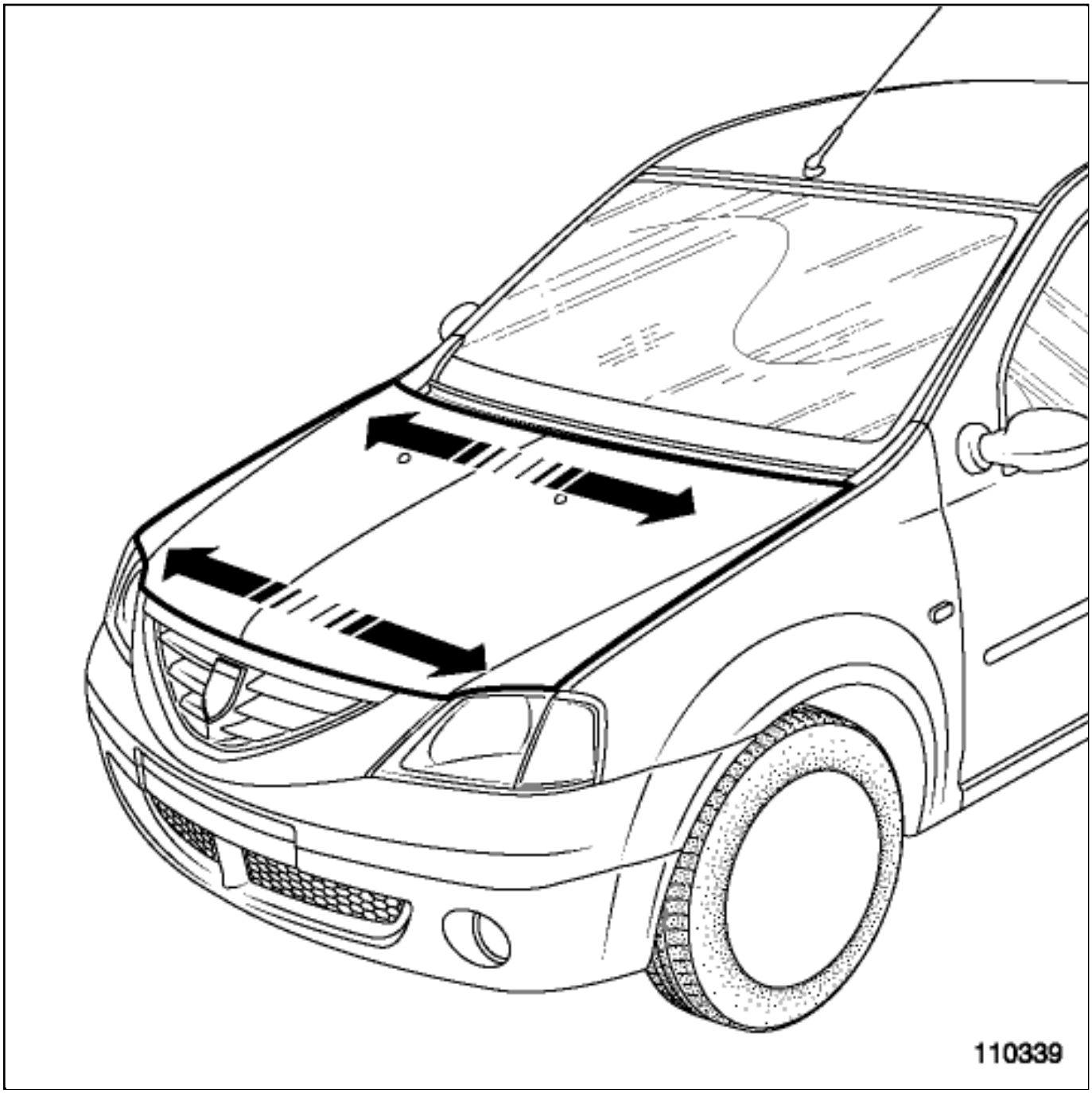
1- ADJUSTMENT CHRONOLOGY



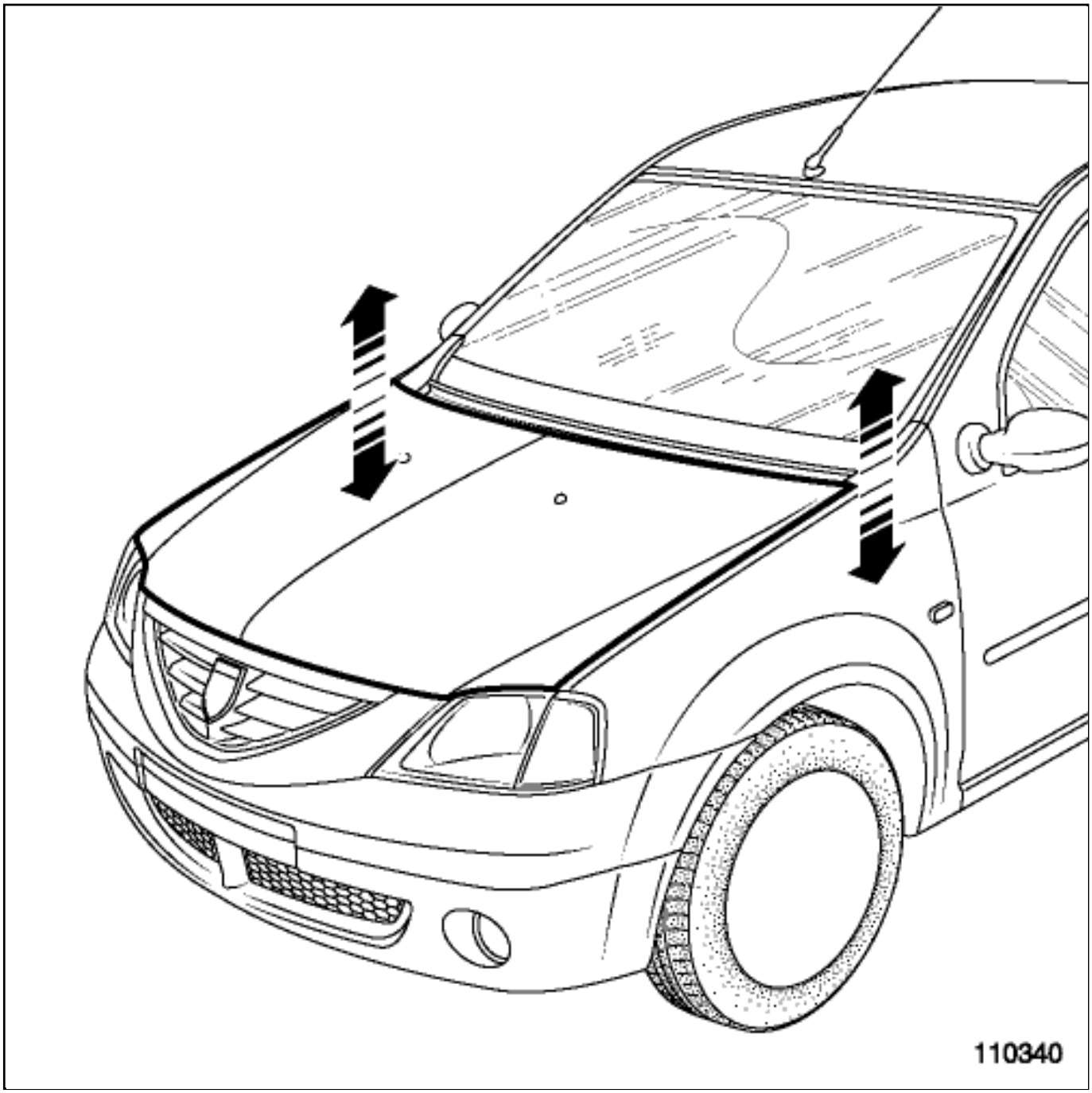
- Adjust the centring of the bonnet (angle).



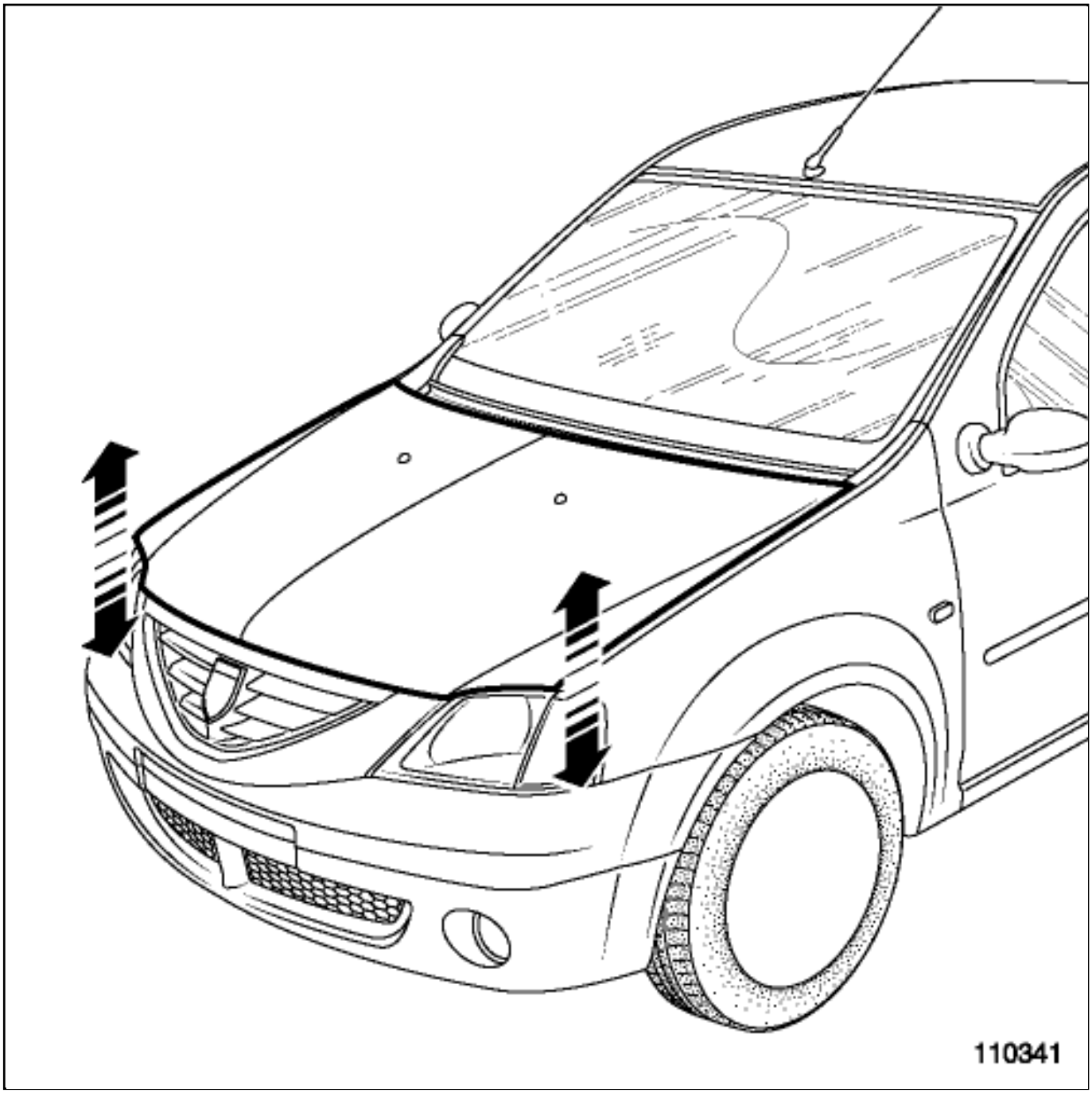
- Adjust the longitudinal alignment; the bonnet/windscreen pillar and bonnet/headlight alignment.



Adjust the side alignment of the bonnet/wings; this must be identical on each side, and there must be the possibility of clearance on the wing adjustments.



- Adjust the bonnet rear flush fitting.



- Adjust the bonnet front flush fitting.
- Check the adjustment and the correct operation then tighten into position.

2. TAILGATE

- Check that the peripheral components are adjusted correctly.

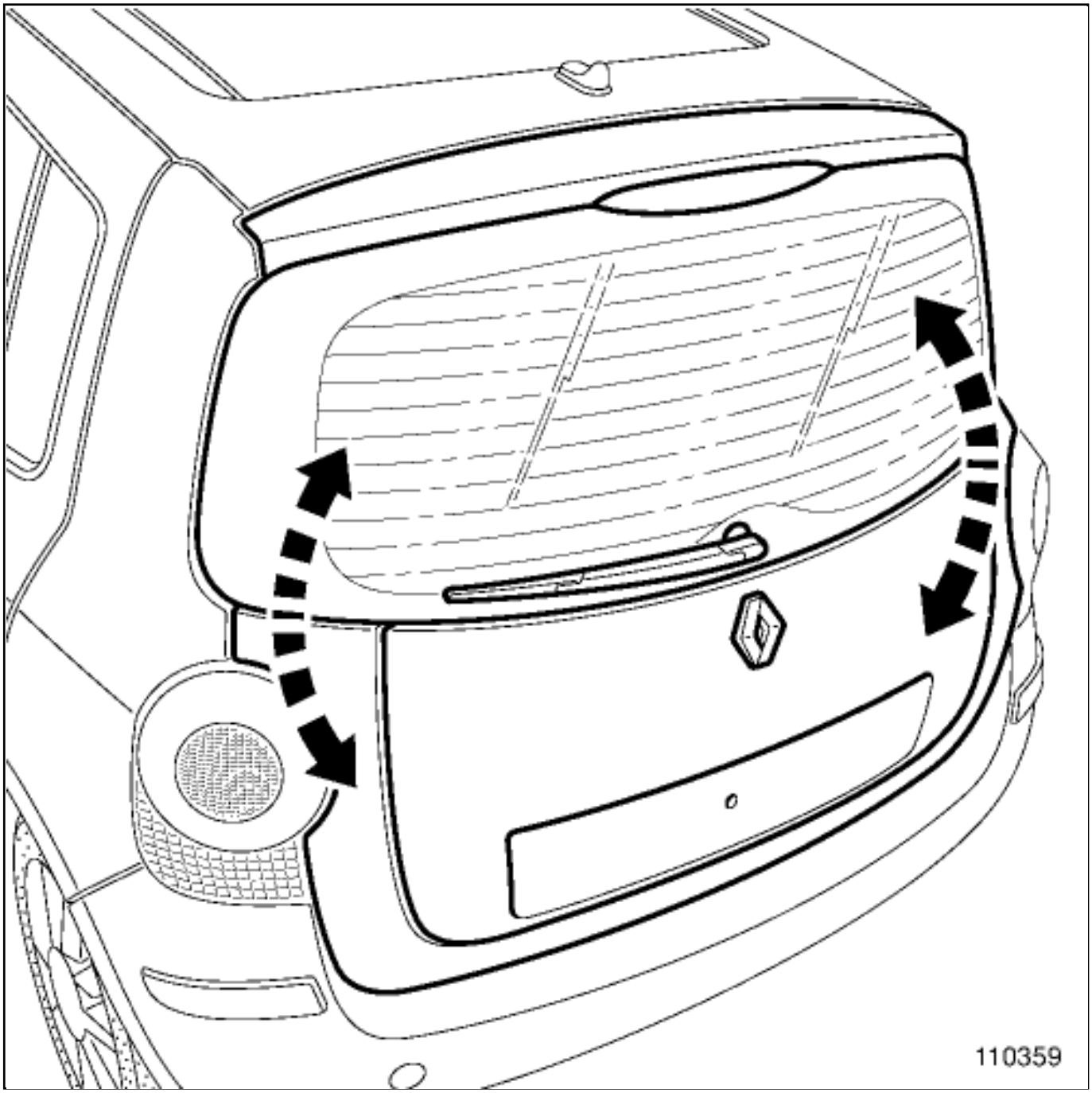
Refit all of the heavy fittings of the tailgate.

Release the striker panel and fit the tailgate, pre-tightening in the middle of the adjustments.

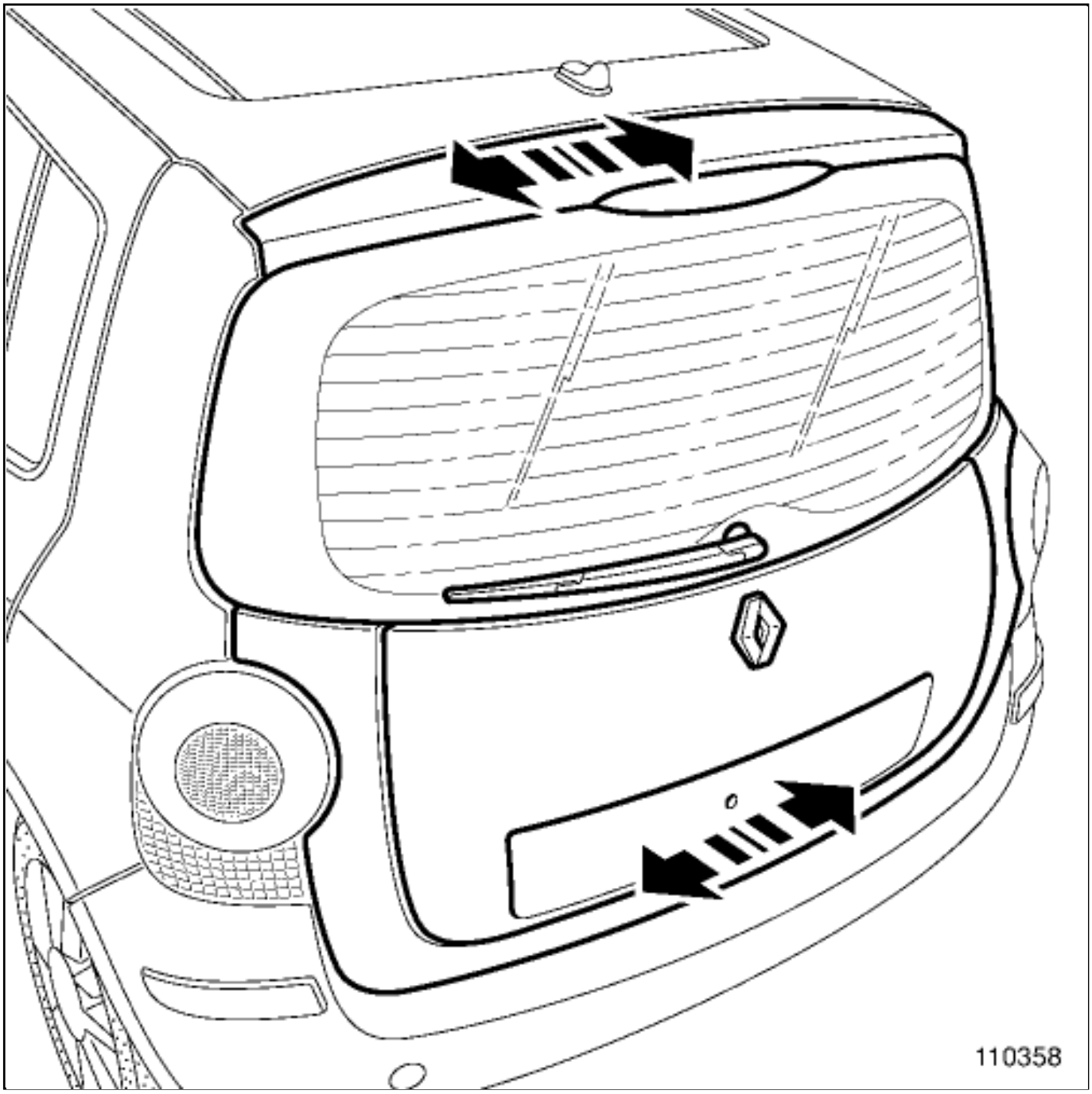
Note:

For information about the adjustment zones, refer to the MR for the vehicle concerned.

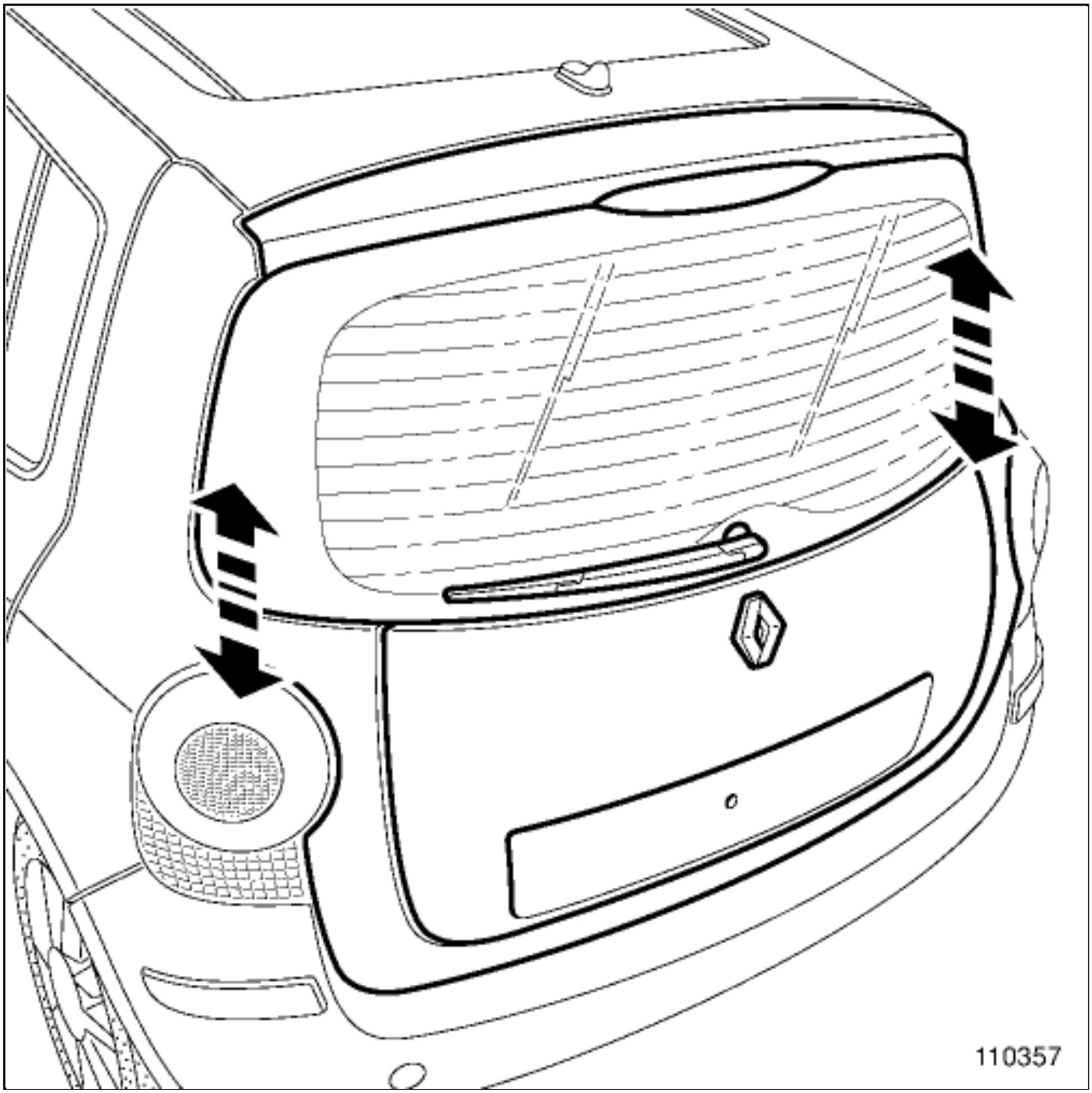
1- ADJUSTMENT CHRONOLOGY



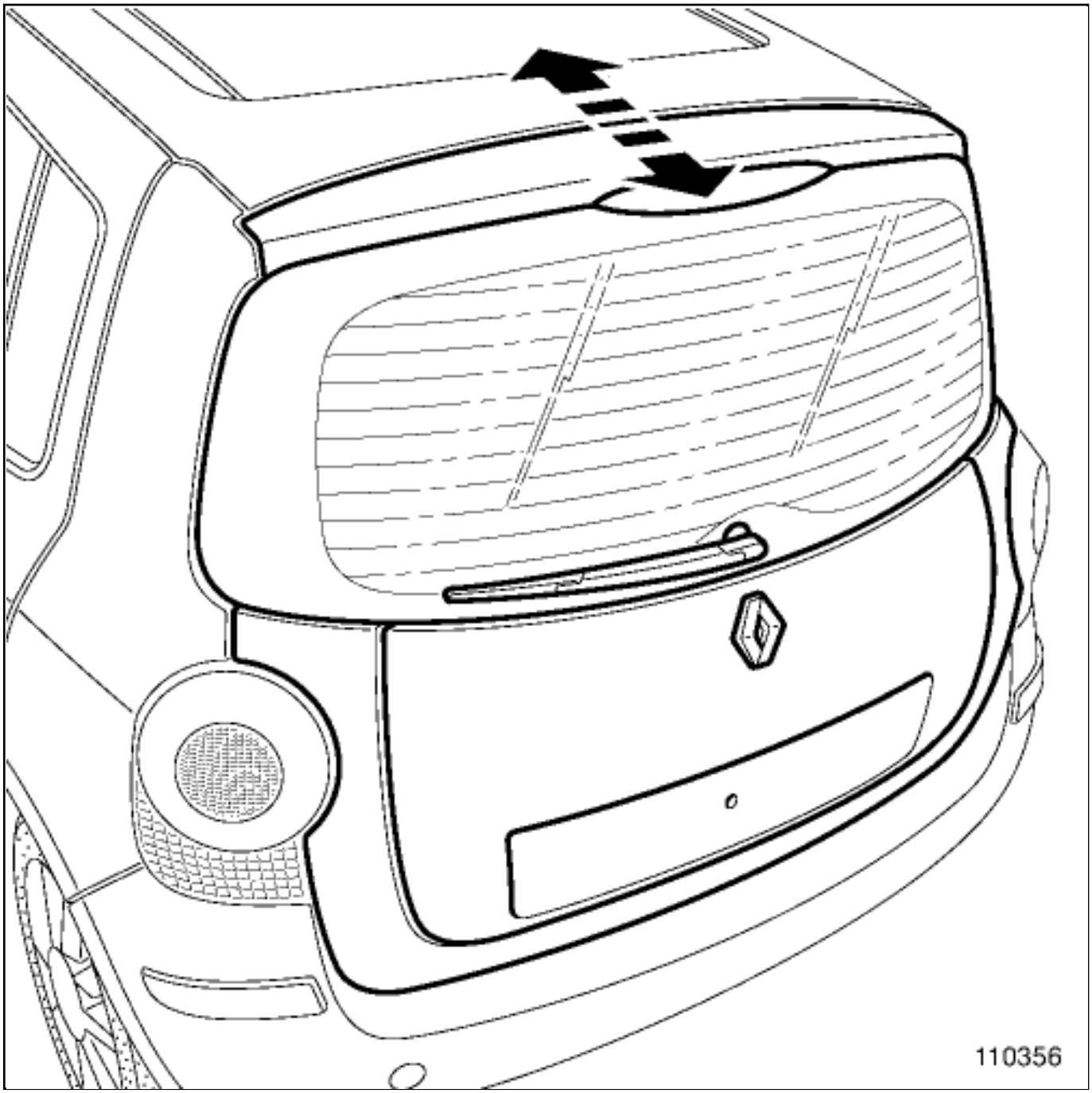
- Centre the tailgate.



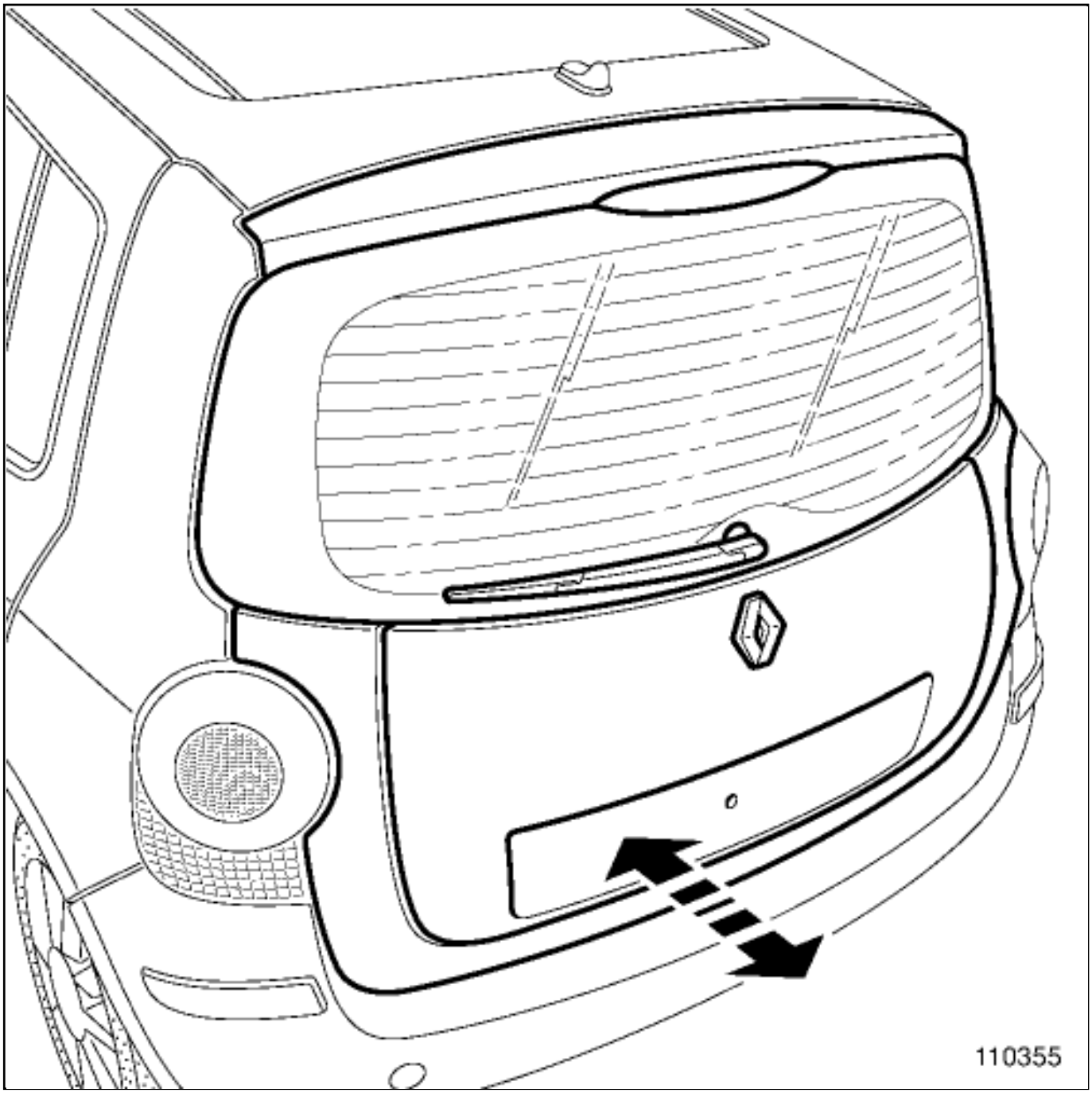
- Adjust the side alignment of the tailgate.



Adjust the height alignment of the tailgate.



Adjust the top flush fitting between the tailgate and roof.



Adjust the flush fitting of the bottom of the tailgate, as well as the contact and the closure firmness.

Check the adjustment and the correct operation then tighten into position.

3. BOOT LID

Check that the peripheral components are adjusted correctly.

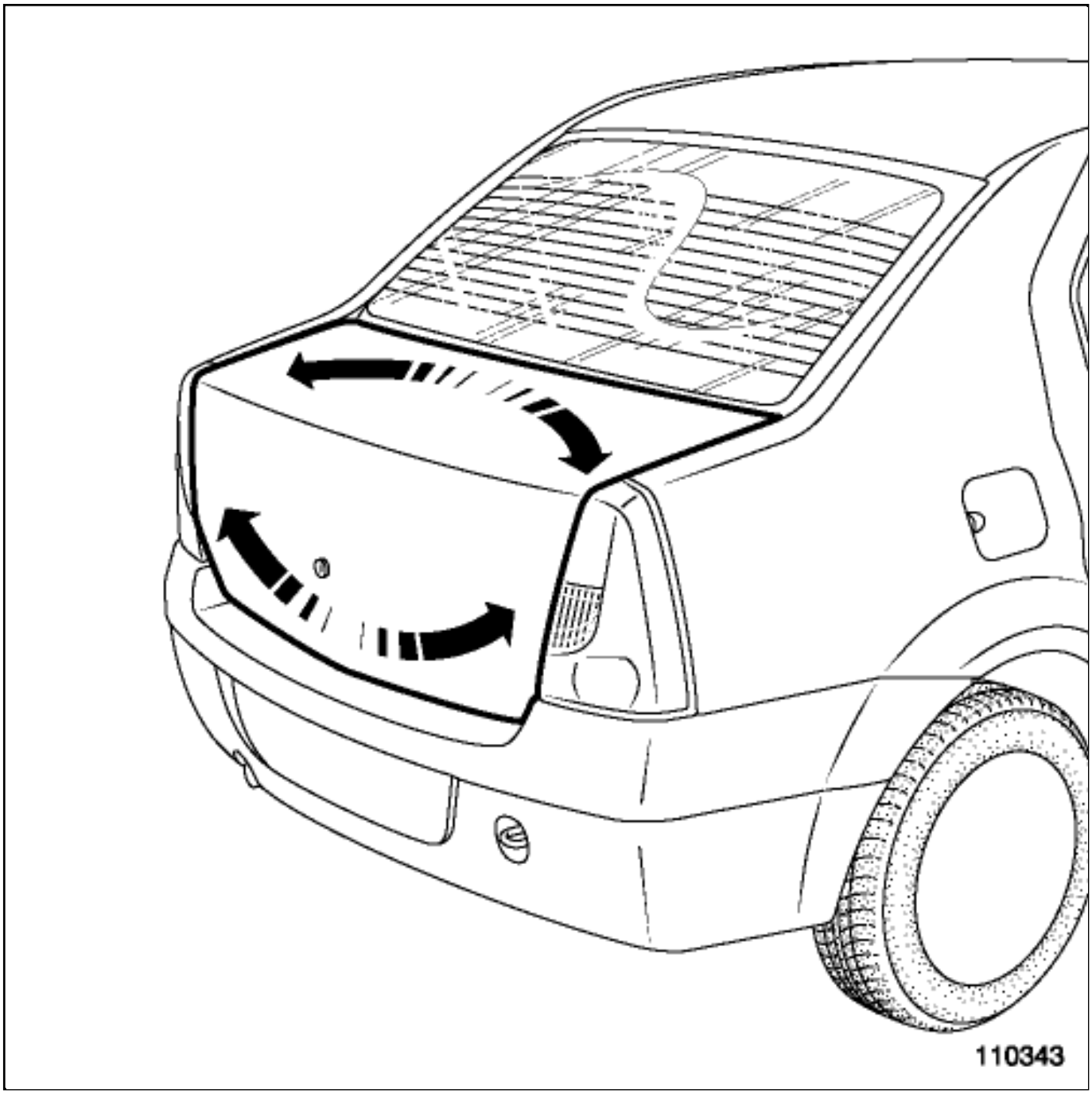
Refit all of the heavy fittings of the tailgate.

Release the striker panel and fit the tailgate, pre-tightening in the middle of the adjustments.

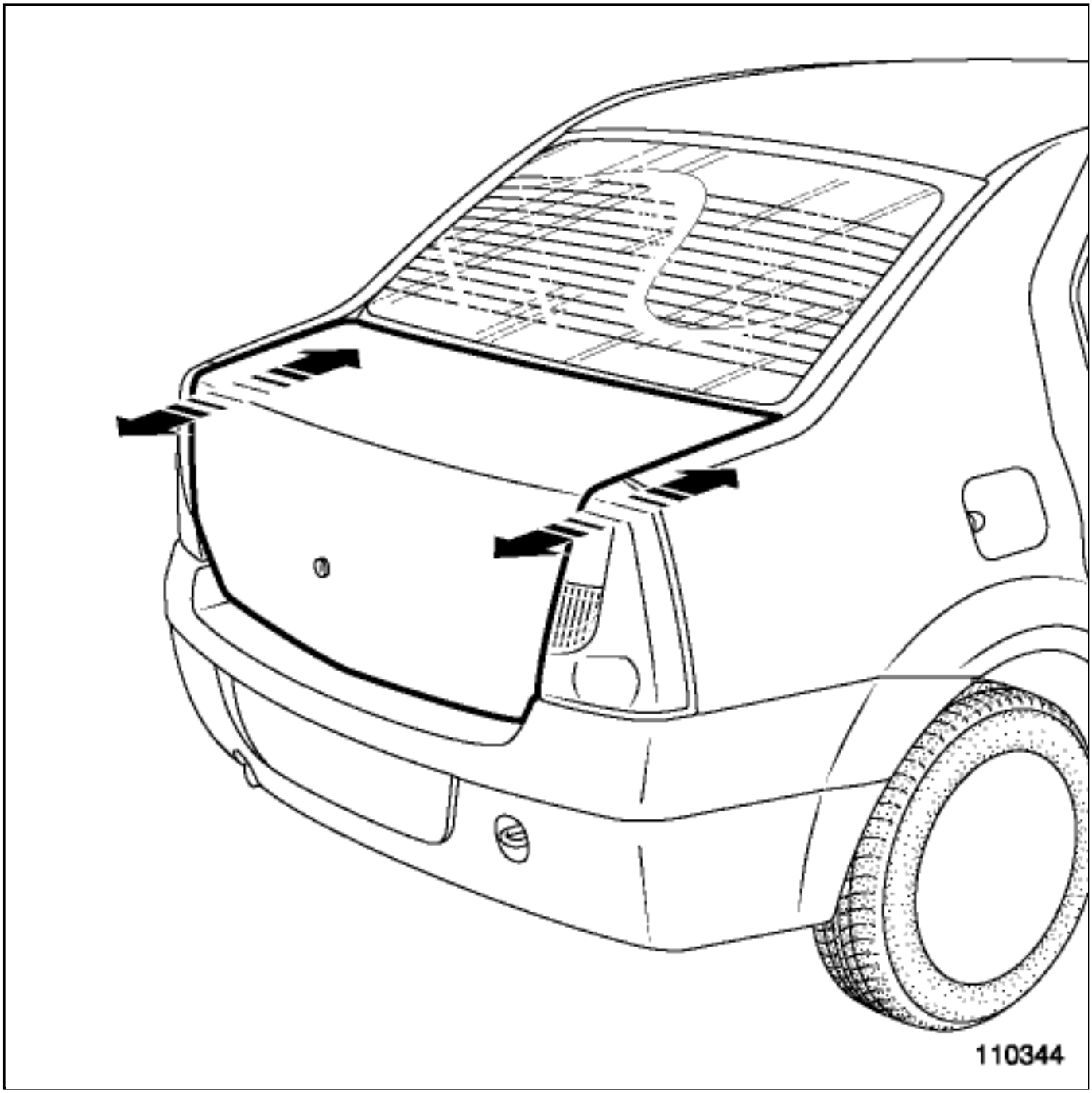
Note:

For information about the adjustment zones, refer to the MR for the vehicle concerned.

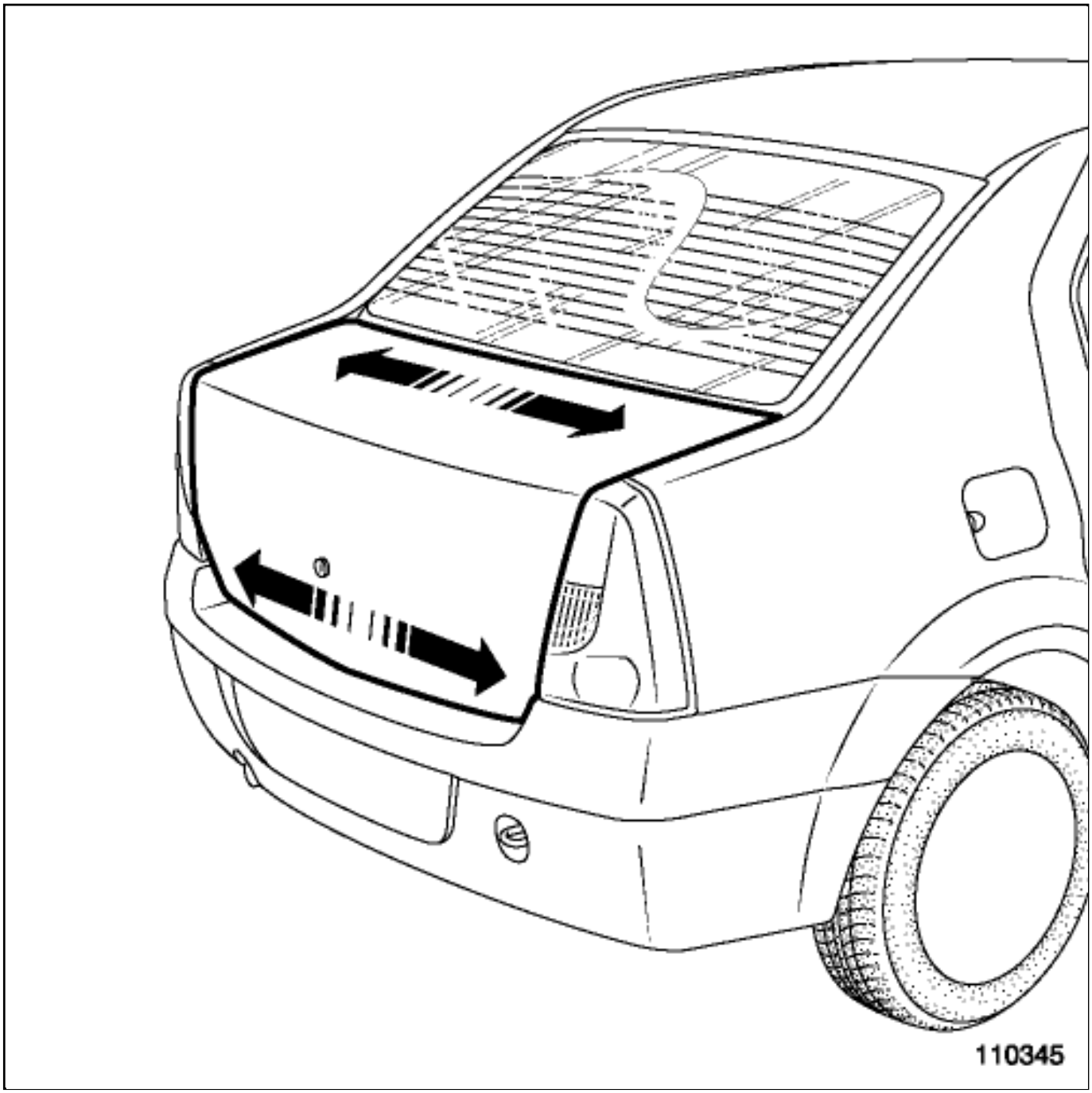
1- ADJUSTMENT CHRONOLOGY



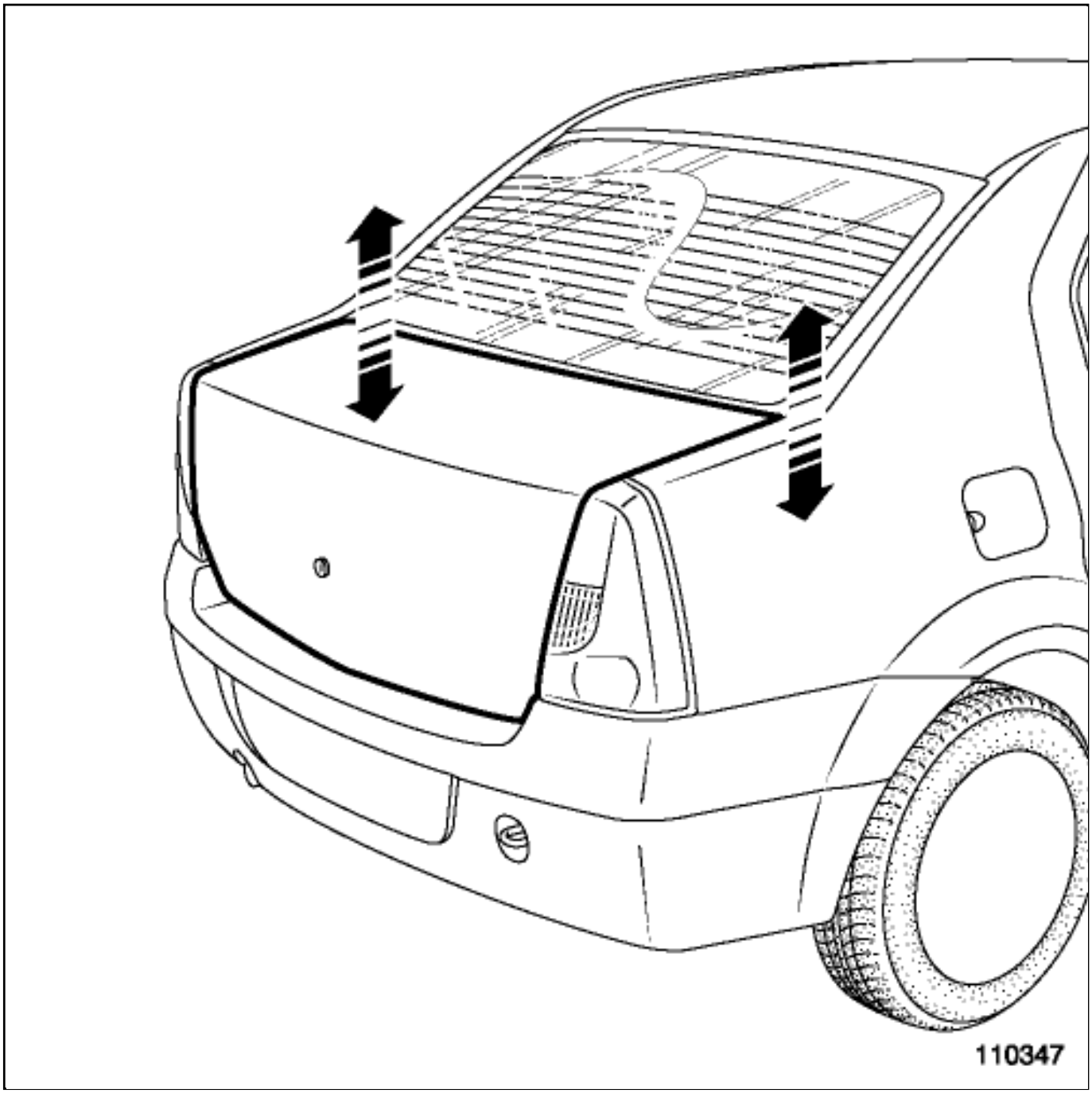
Centre the boot lid.



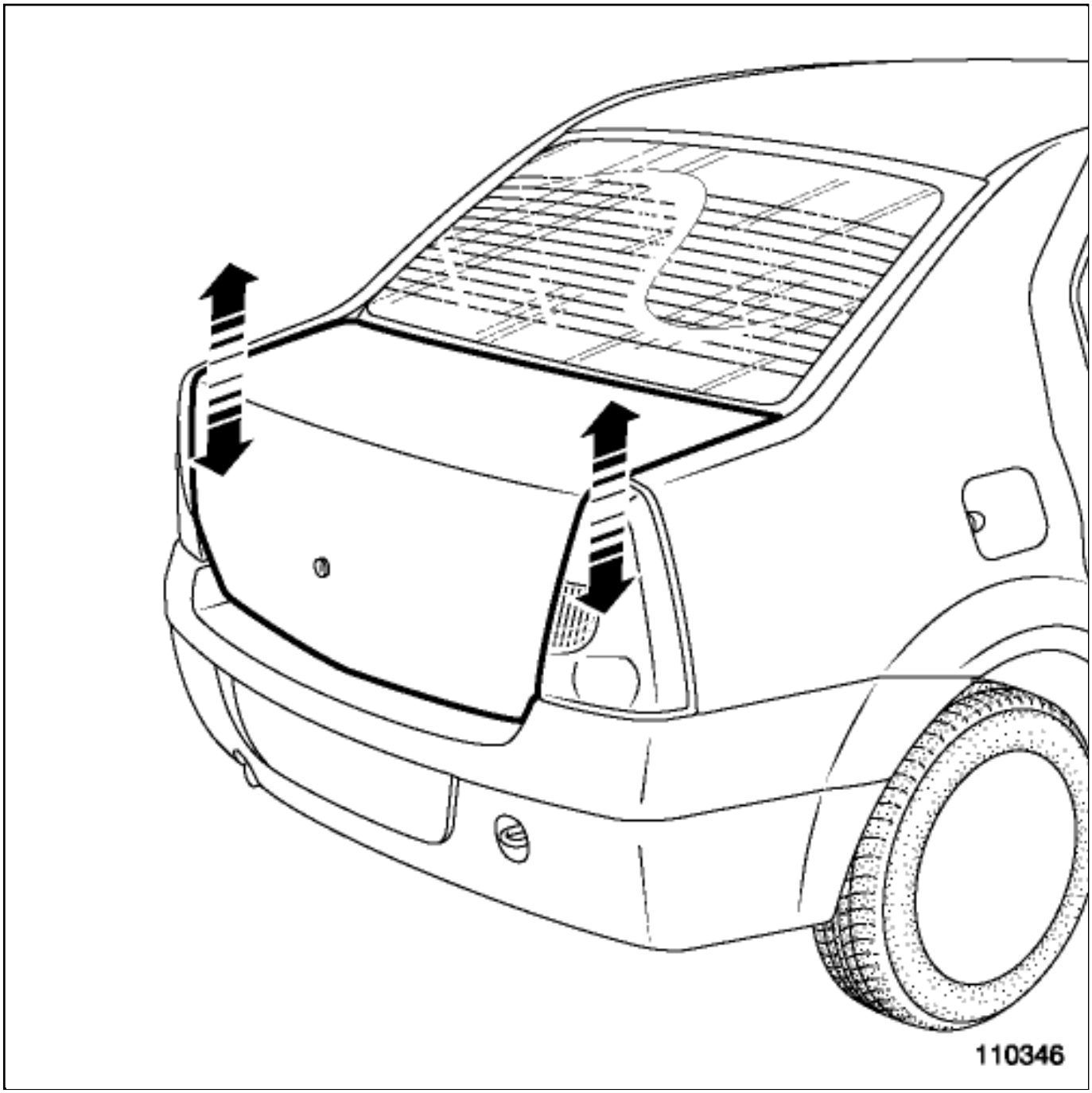
Adjust the longitudinal alignment of the boot lid.



Adjust the side alignment of the boot lid.



Adjust the rear flush fitting of the boot lid.



- Adjust the rear flush fitting of the boot lid, as well as the contact and the closure firmness.
- Check the adjustment and the correct operation then tighten into position.

4. REAR LOADING DOOR

Check that the peripheral components are adjusted correctly.

the adjustment can be carried out on both doors simultaneously, if the vehicle is equipped with two doors.

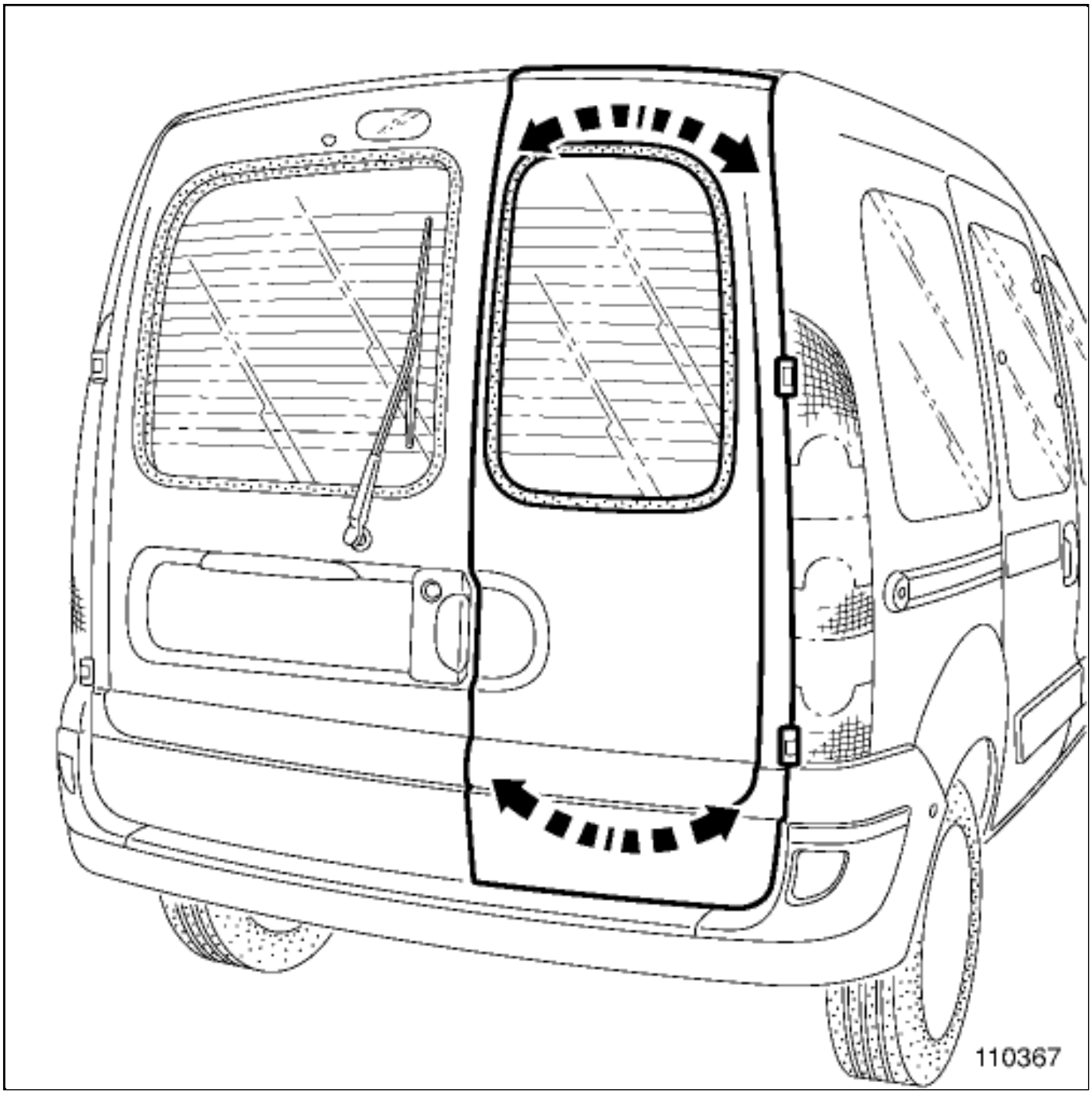
Refit all of the heavy door fittings.

Before carrying out the adjustments, release the striker panel and fit the door, pretightening in the middle of the adjustment.

Note:

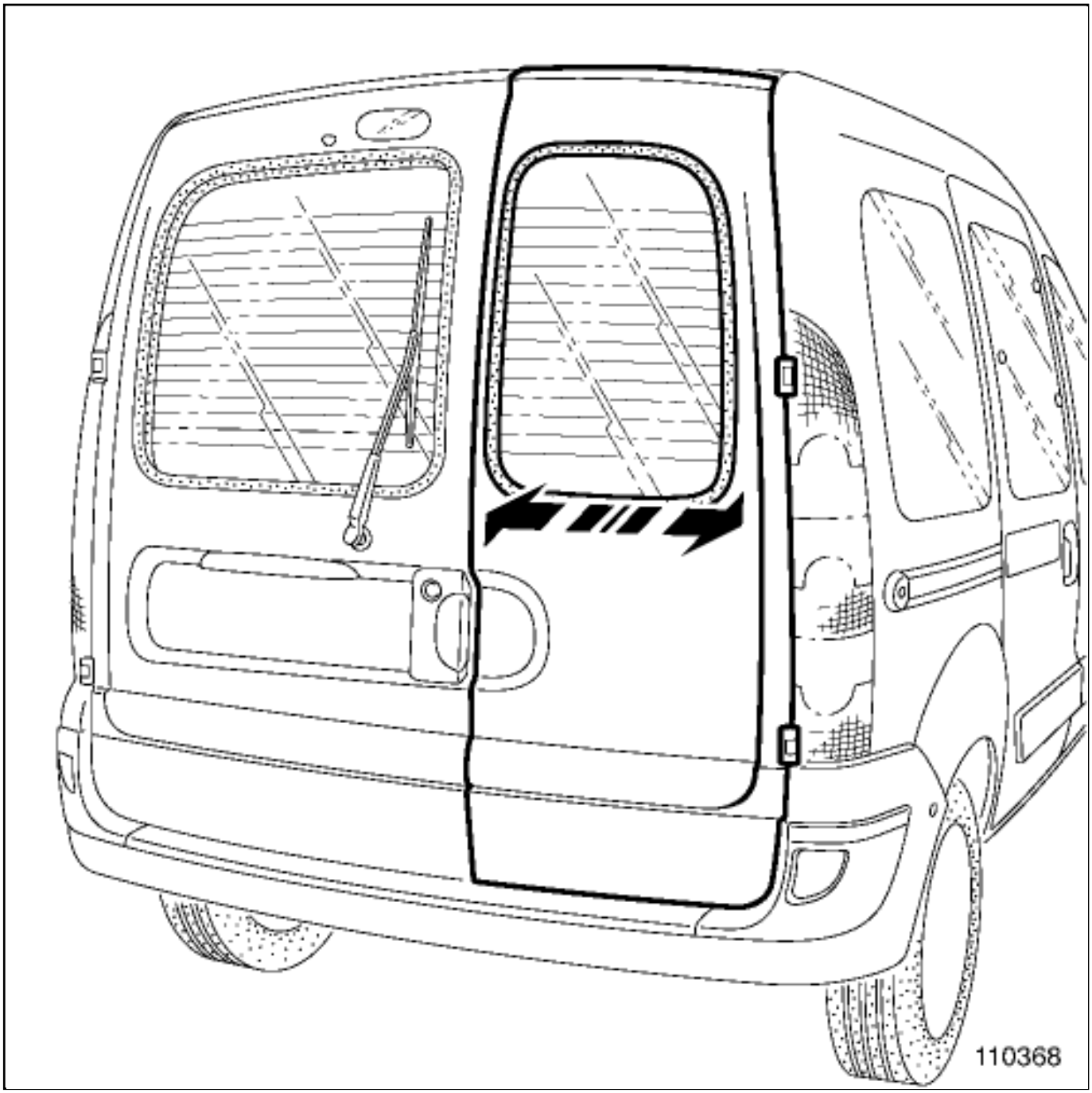
For information about the adjustment zones, refer to the MR for the vehicle concerned.

1- ADJUSTMENT CHRONOLOGY



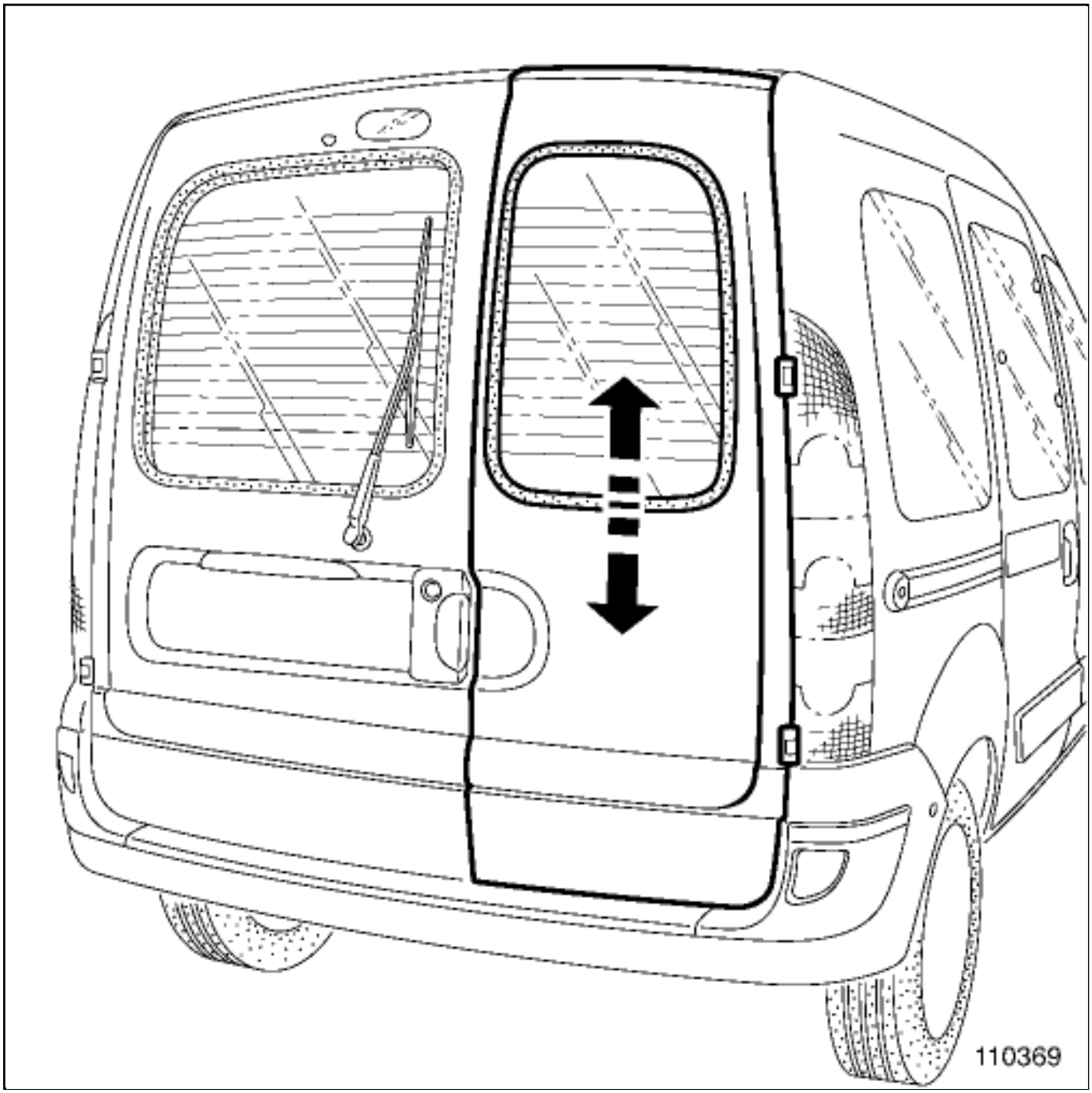
Adjust the centring of the door with the lock on the floor.

Adjust the centring of the door without the lock on the floor.

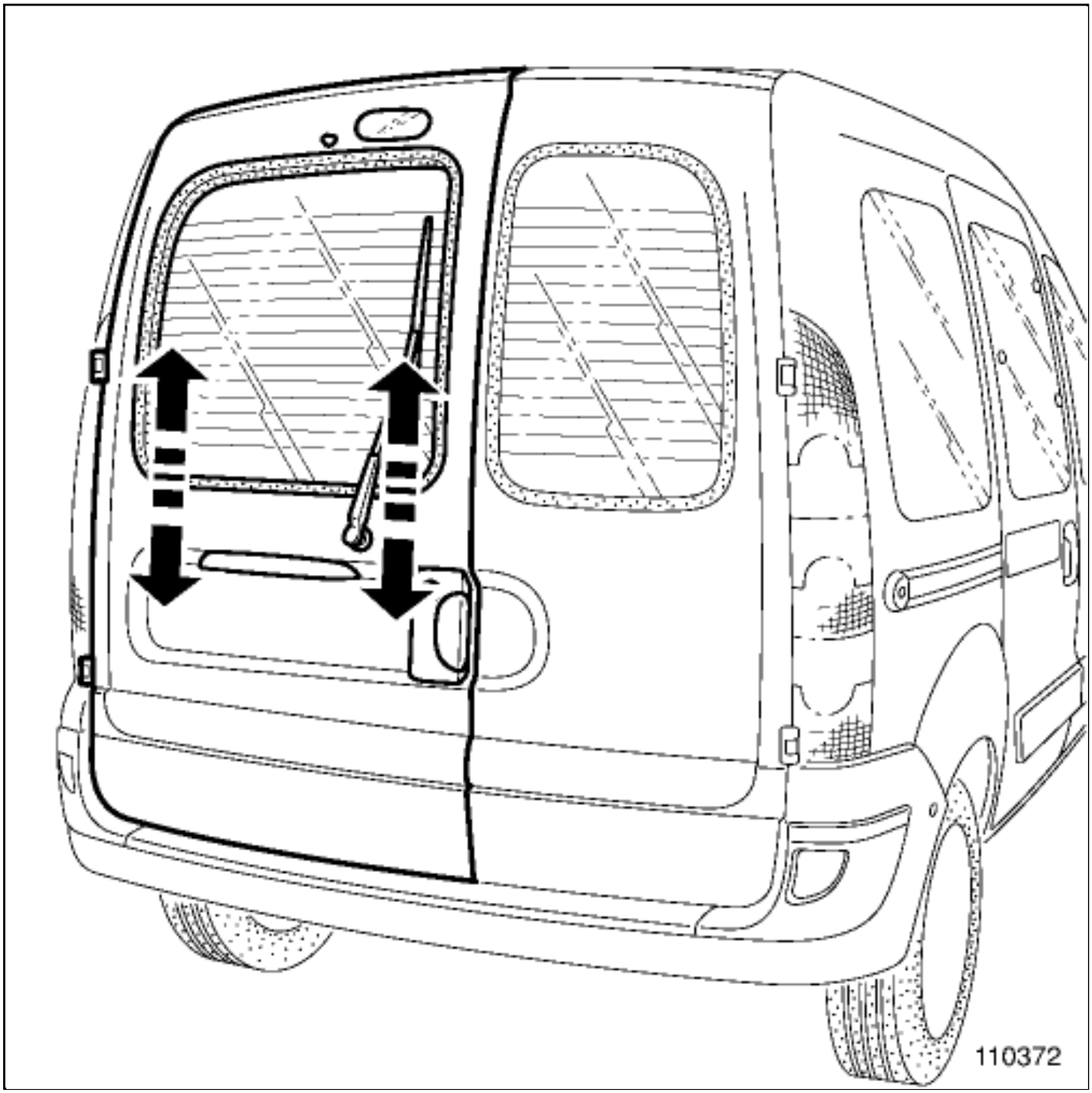


Adjust the side alignment of the door with the lock on the floor.

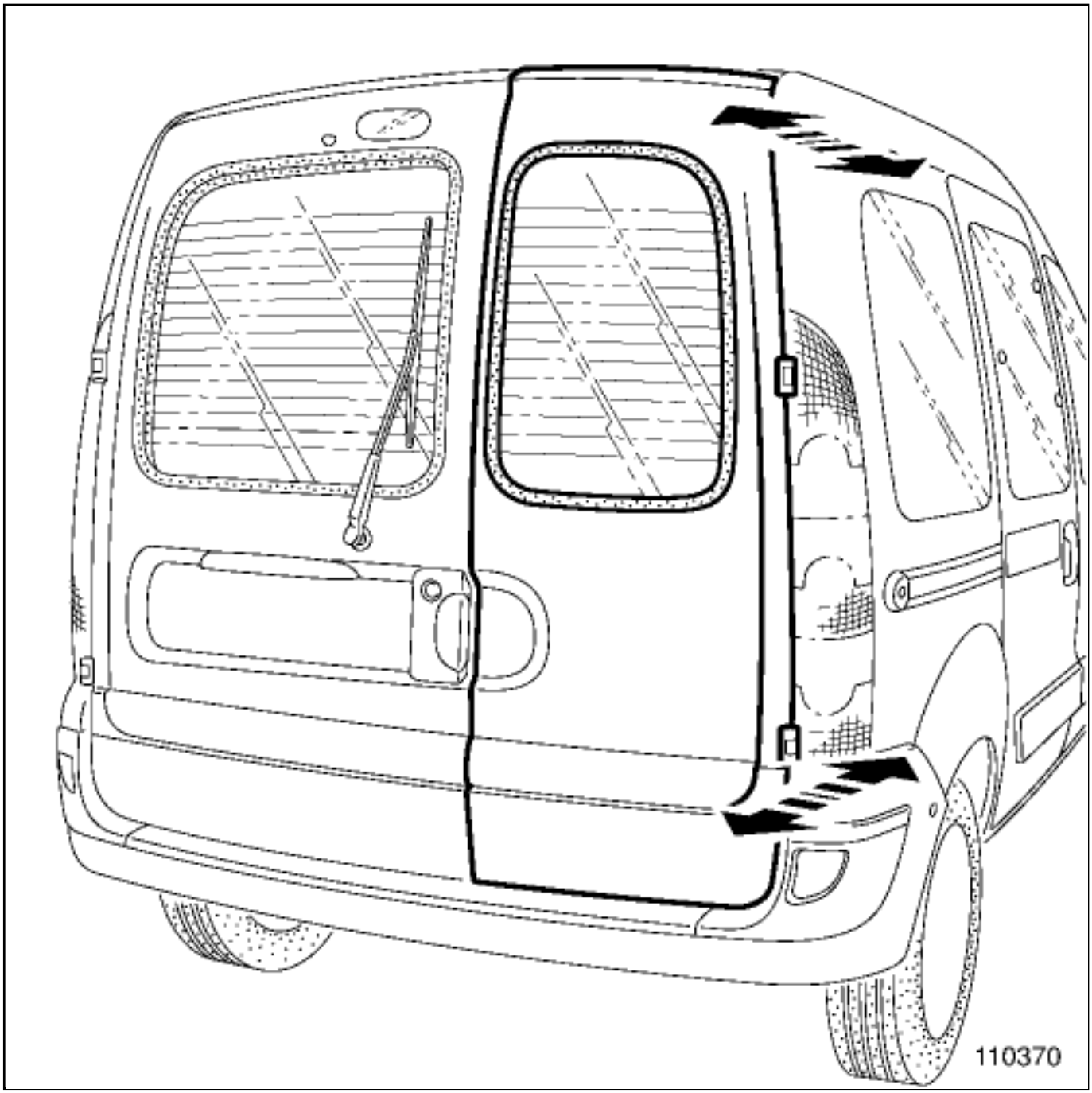
Adjust the side alignment of the door without the lock on the floor.



Adjust the vertical alignment of the door with the lock on the floor.

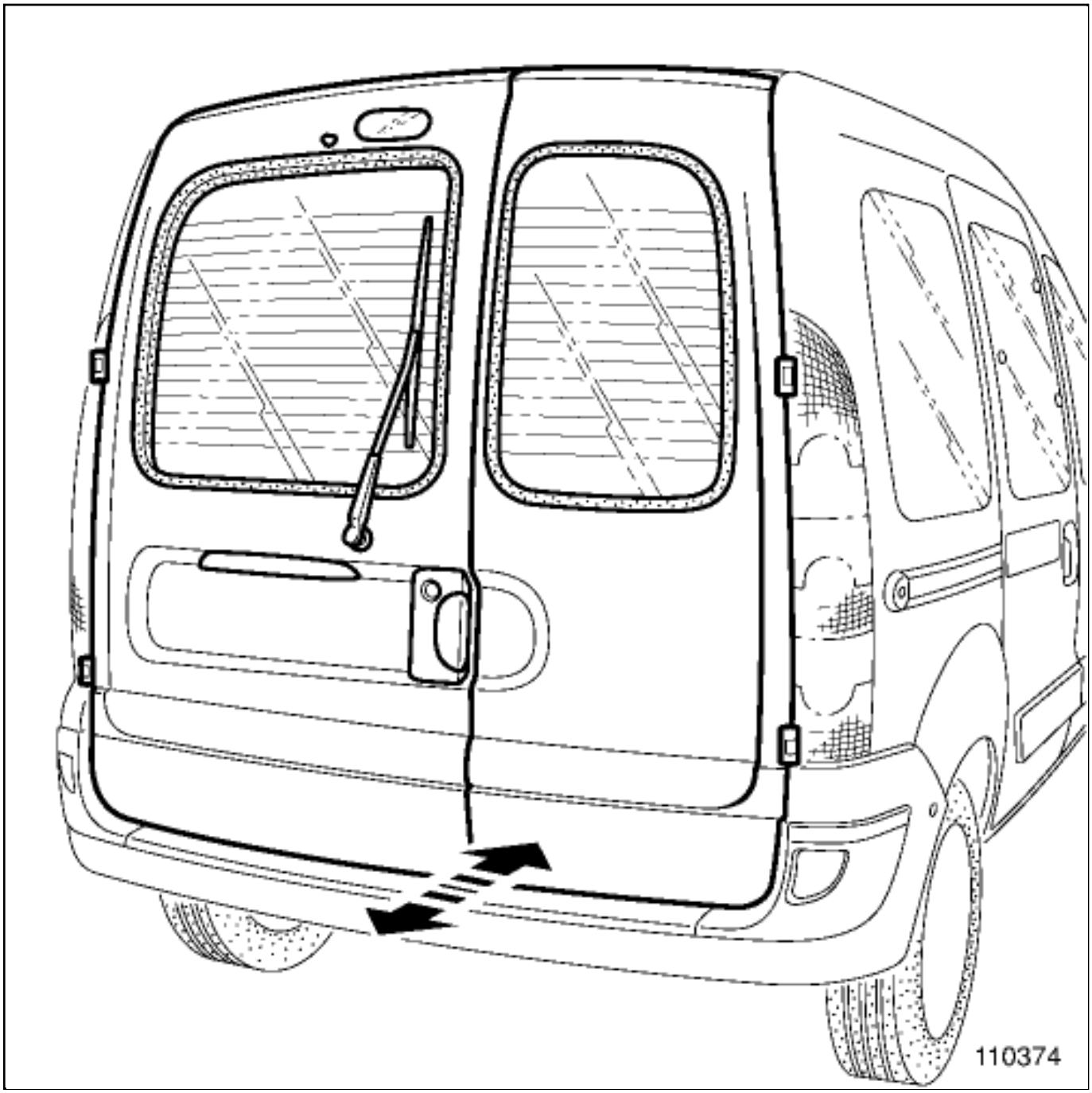


Adjust the vertical alignment of the door without the lock on the floor.



Adjust the flush fitting of the external section of the door with the lock on the floor.

Adjust the flush fitting of the external section of the door without the lock on the floor.



Adjust the flush fitting of the bottom central section of both doors.

- Adjust the flush fitting of the top central section of both doors.

- Check the adjustment and the correct operation then tighten into position.

OIL PRESSURE: CHECK

Note, one or more warnings are present in this procedure

Special tooling required	
22 mm socket for removal - refitting of oxygen sensors.	Mot. 1495-01
Oil pressure gauge kit.	Mot. 836-05

OIL PRESSURE TABLES:

Engine	Minimum oil pressure (bar)		Maximum oil pressure (bar)
	Idling speed	3000 rpm	3000 rpm
K7M	1.3	3.7	5.0
K9K	0.8	3.4	5.2

END PIECES TO BE USED:

Engine	End pieces
K7M	E + C + F
K9K	E + C + F

1. PREPARATION OPERATION FOR CHECK

CAUTION

Always check the oil level using the dipstick.

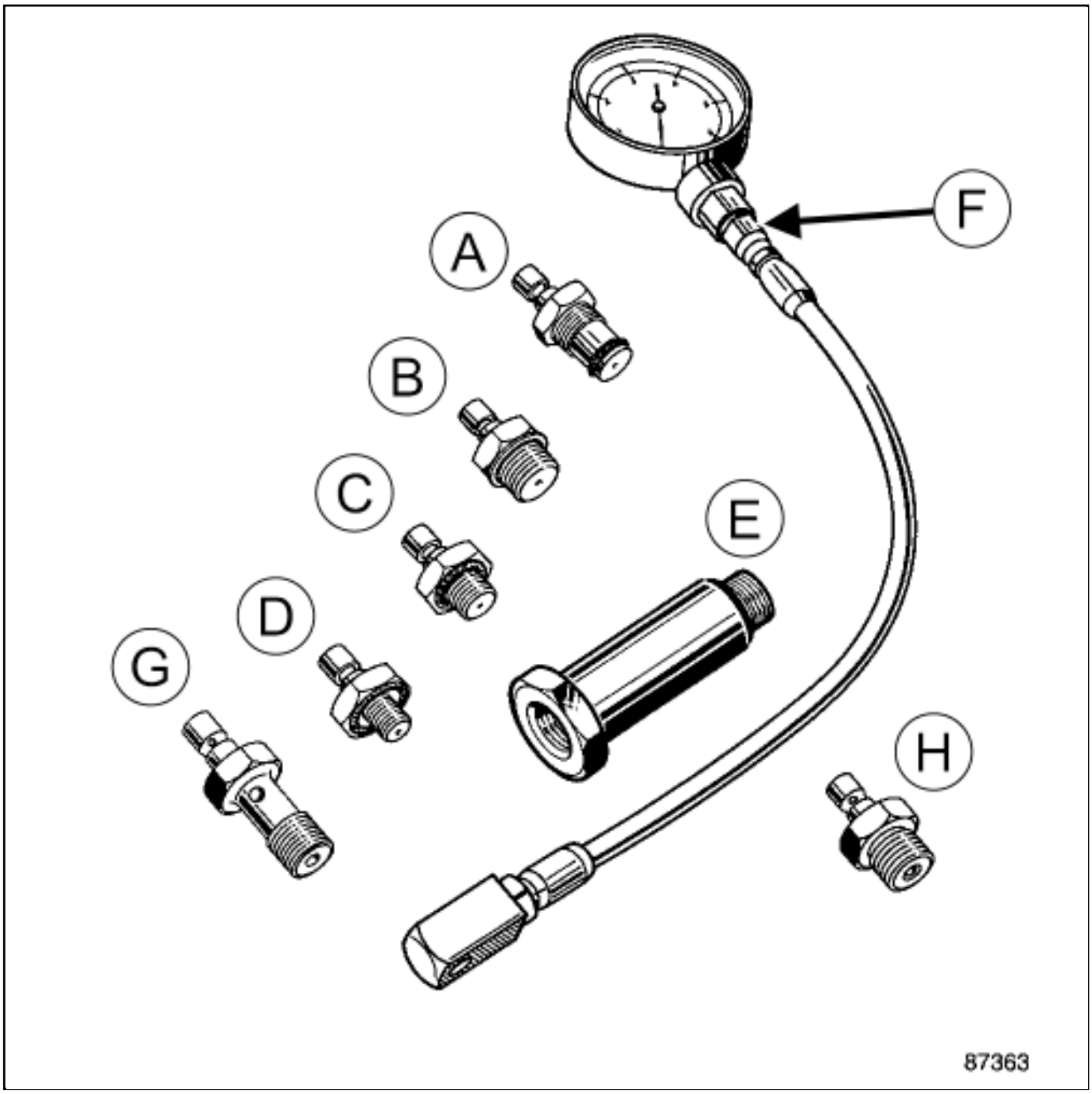
Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

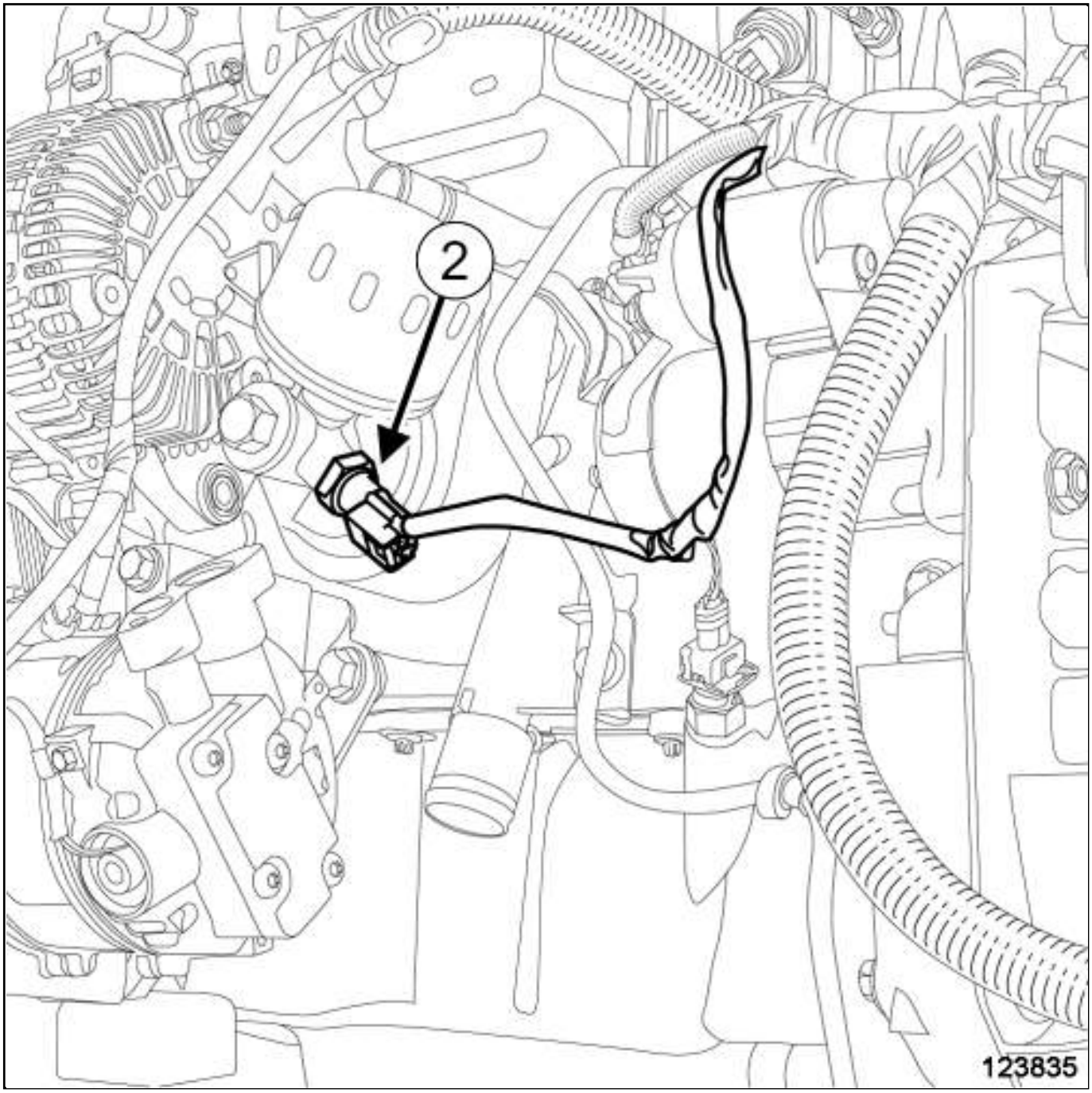
Note:

When topping up the engine oil, always leave at least 10 minbefore checking the level with a dipstick.

2. CHECKING



- Remove the oil pressure sensor (see 10A, Engine and cylinder block assembly, Oil pressure sensor: Removal - Refitting) .



- In place of the oil pressure sensor(2) , fit the toolOil pressure gauge kit. with suitable adapters using the tool22 mm socket for removal - refitting of oxygen sensors. or a 22 mm long socket.

- Start the engine.

- Monitor the engine oil pressure as the oil temperature rises (approximately 80˚Cor the first time the engine cooling fan is activated); it should not be less than the pressure at idle speed.

- If the oil pressure is lower than the pressure at idle speed, check that:
  - the oil filter is not clogged,
  - dirt or swarf is not present in the engine oil,

- the oil pump is in good condition and being correctly driven.

- Check the oil pressure in comparison with the values given in the table above.
- Switch off the engine.
- Remove the toolOil pressure gauge kit.(Mot. 836-05) with the end pieces.
- Refit the oil pressure sensor(see 10A, Engine and cylinder block assembly, Oil pressure sensor: Removal - Refitting) .
- Wipe any oil run-off with a cloth.
- Wait at least 10 min.
- Check the oil level using the dipstick.
- Top up the engine oil level if necessaryEngine oil: Specifications .
- Start the engine and check that there are no oil leaks at the oil pressure sensor.

OIL PRESSURE SENSOR: REMOVAL - REFITTING

Special tooling required	
22 mm socket for removal - refitting of oxygen sensors.	

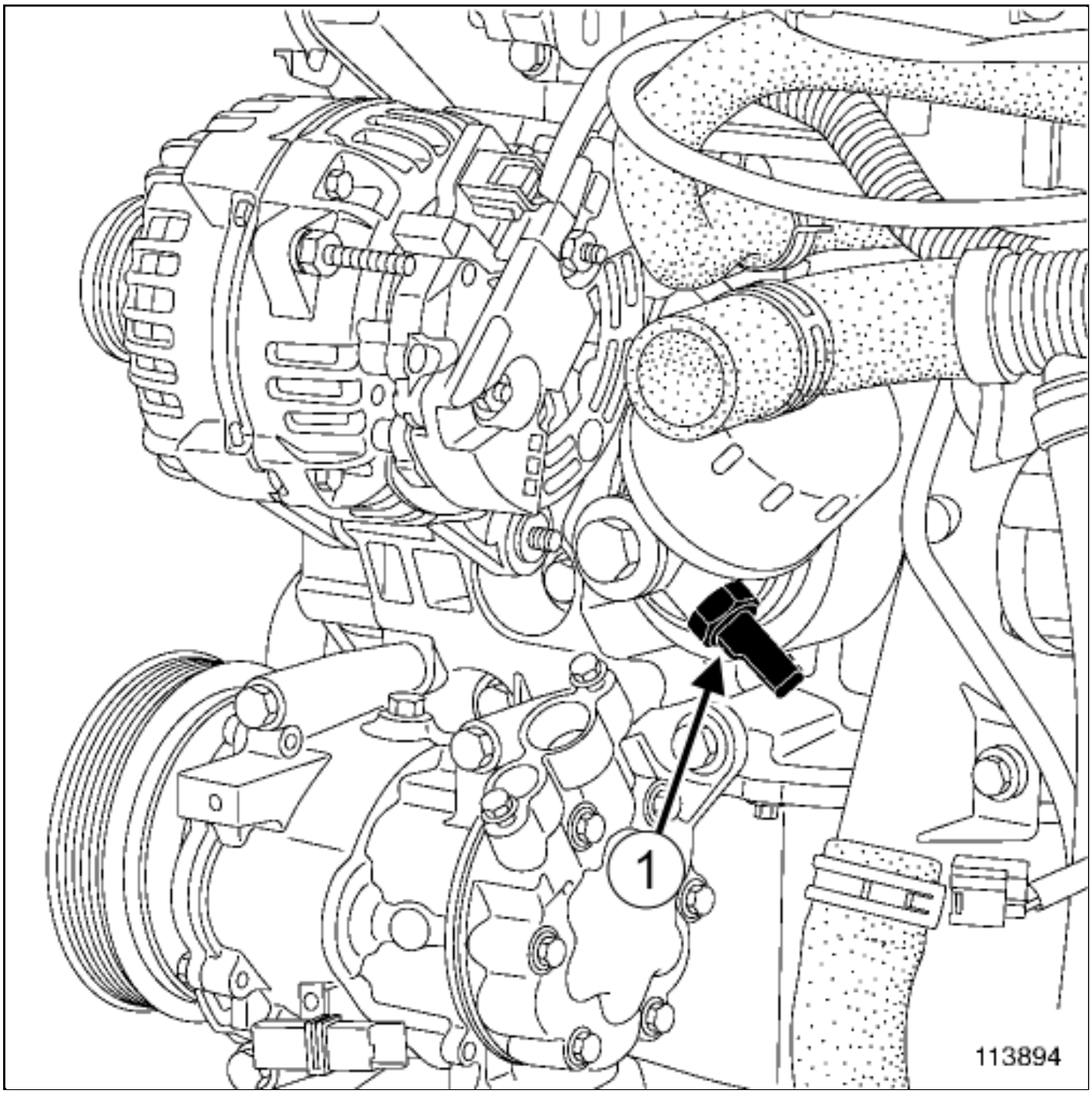
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).

- Remove:
  - the engine undertray bolts,
  - the engine undertray.

2. REMOVAL OPERATION



- Disconnect the oil pressure sensor connector.
- Remove the oil pressure sensor(1) using the 22 mm socket for removal - refitting of oxygen sensors. .

REFITTING

1. REFITTING OPERATION

- Refit the oil pressure sensor.

- Torque tighten the oil pressure sensor40 N.musing the 22 mm socket for removal - refitting of oxygen sensors. .

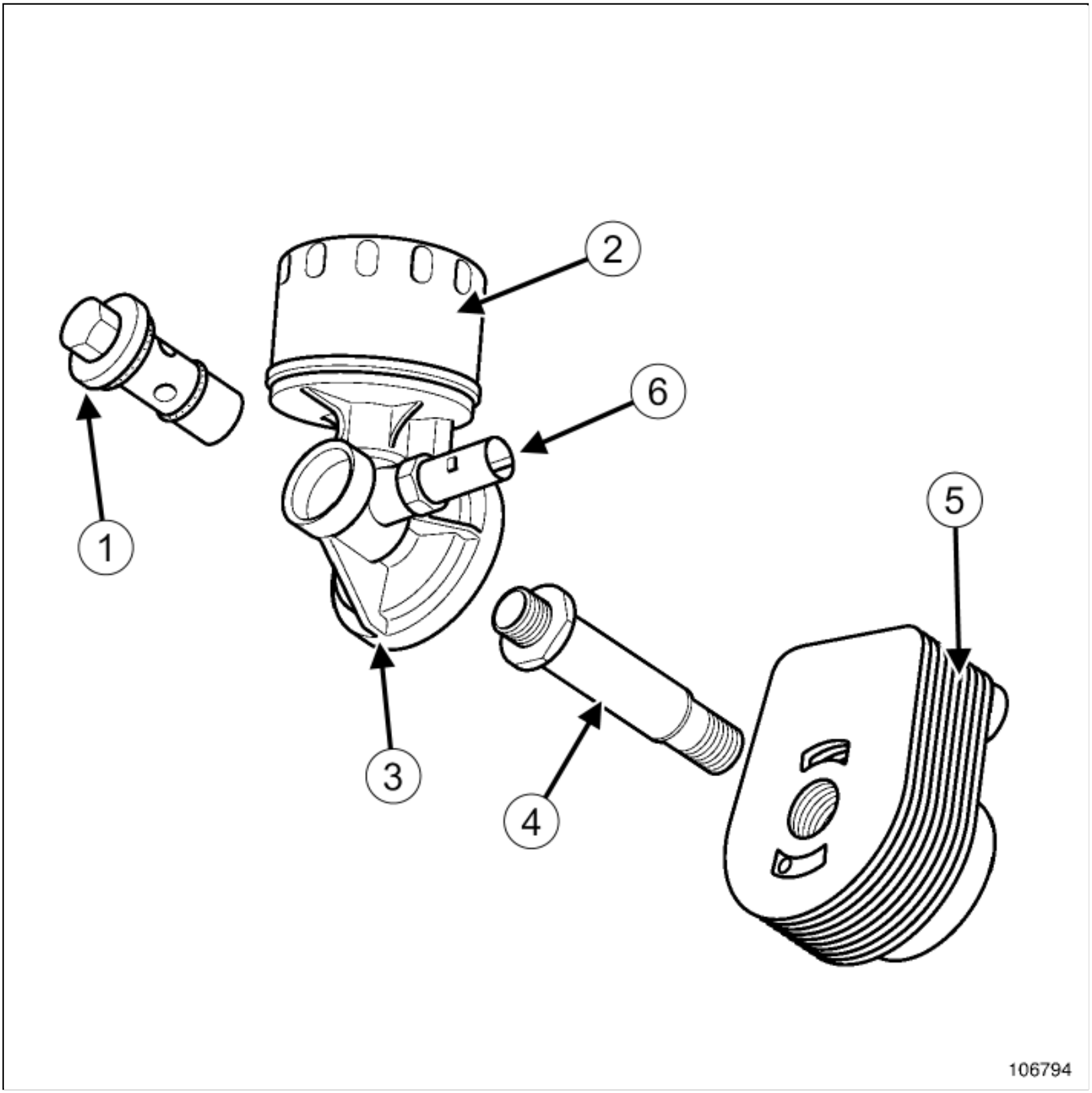
- Connect the oil pressure sensor connector.

2. FINAL OPERATION

- Refit the engine undertray.

OIL-COOLANT HEAT EXCHANGER: REMOVAL - REFITTING

parts always to be replaced:
coolant-engine oil heat exchanger seal on the cylinder block



(1) Oil filter bracket bolt

(2) Oil filter

(3) Oil filter holder

(4) Coolant-oil heat exchanger bolts

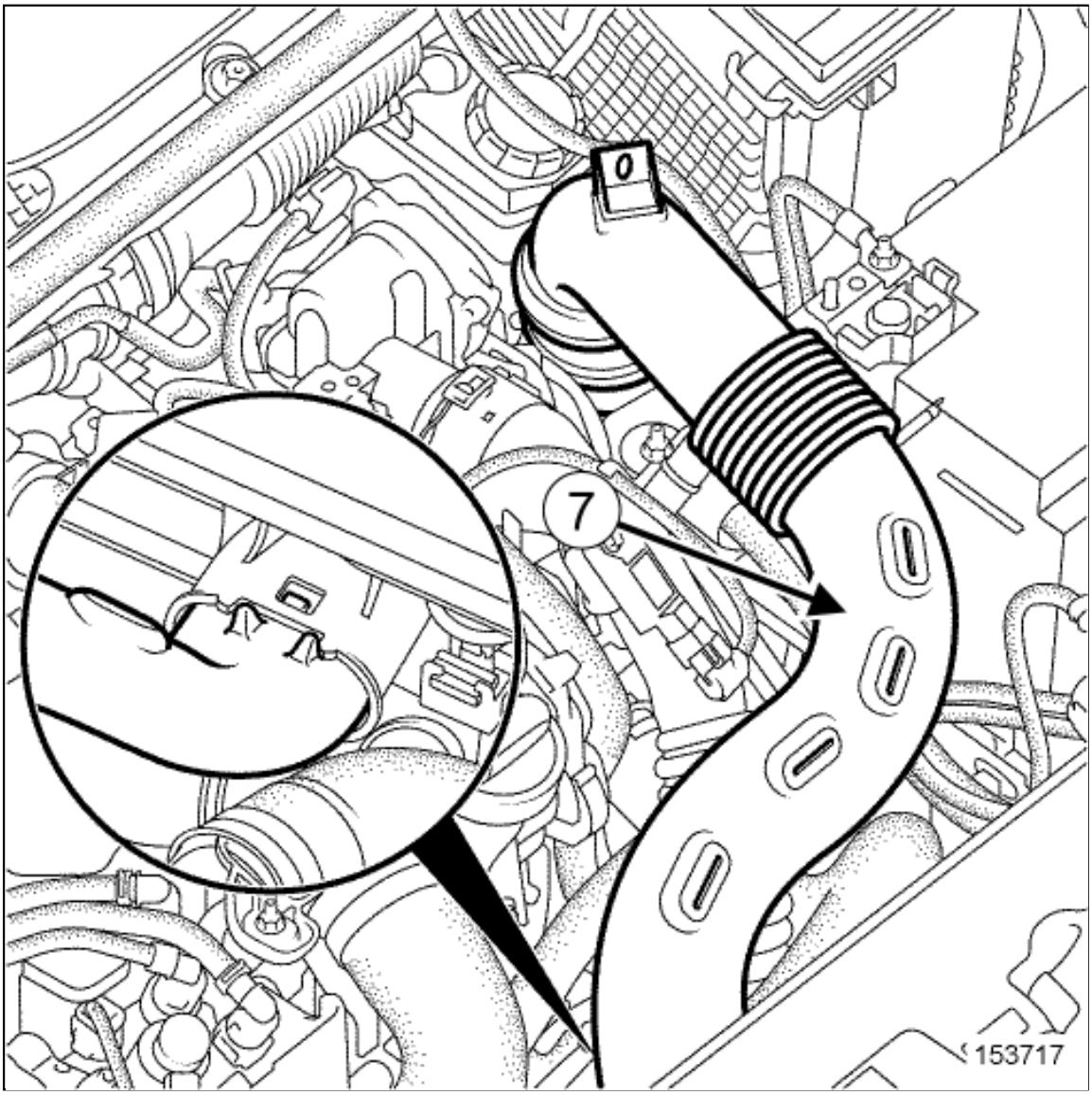
(5) Coolant-oil heat exchanger

(6) Oil pressure sensor

REMOVAL

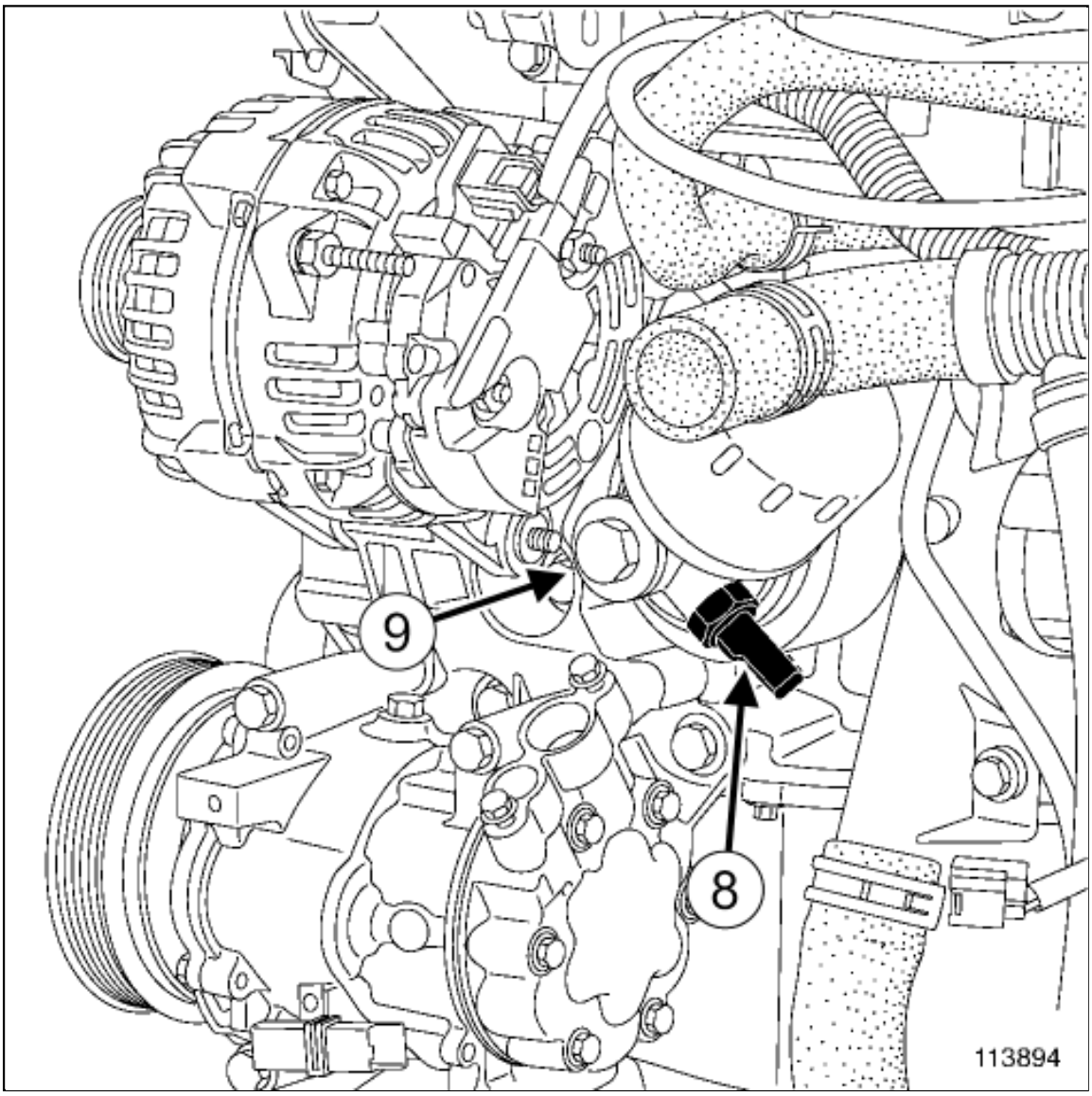
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).
- Remove:
  - the engine undertray bolts,
  - the engine undertray.
- Drain the cooling system Cooling system: Draining - Refilling .

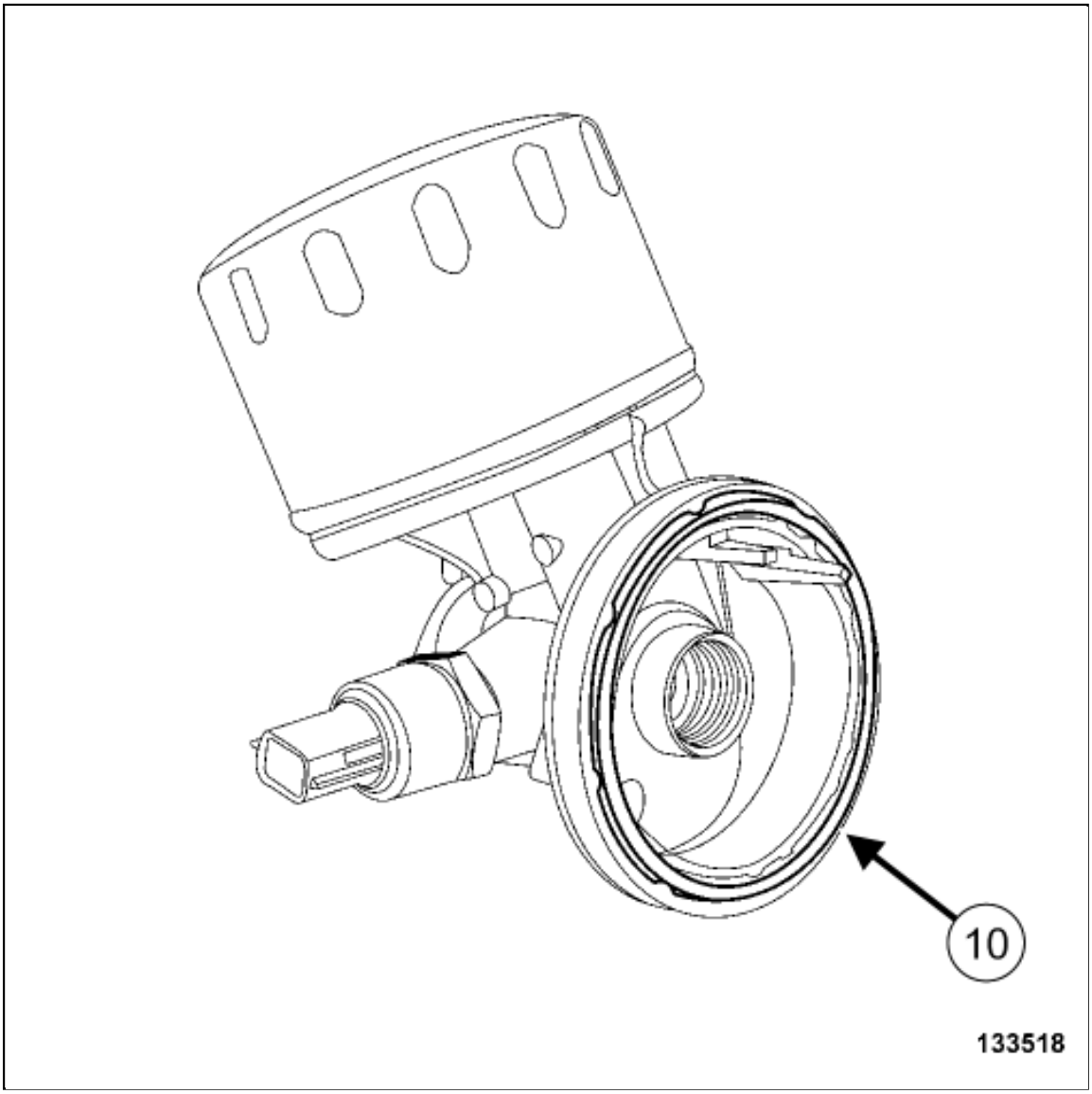


Remove:

- the air filter inlet air pipe(7) ,
- the intercooler air outlet pipe**Intercooler air outlet pipe: Removal - Refitting** .

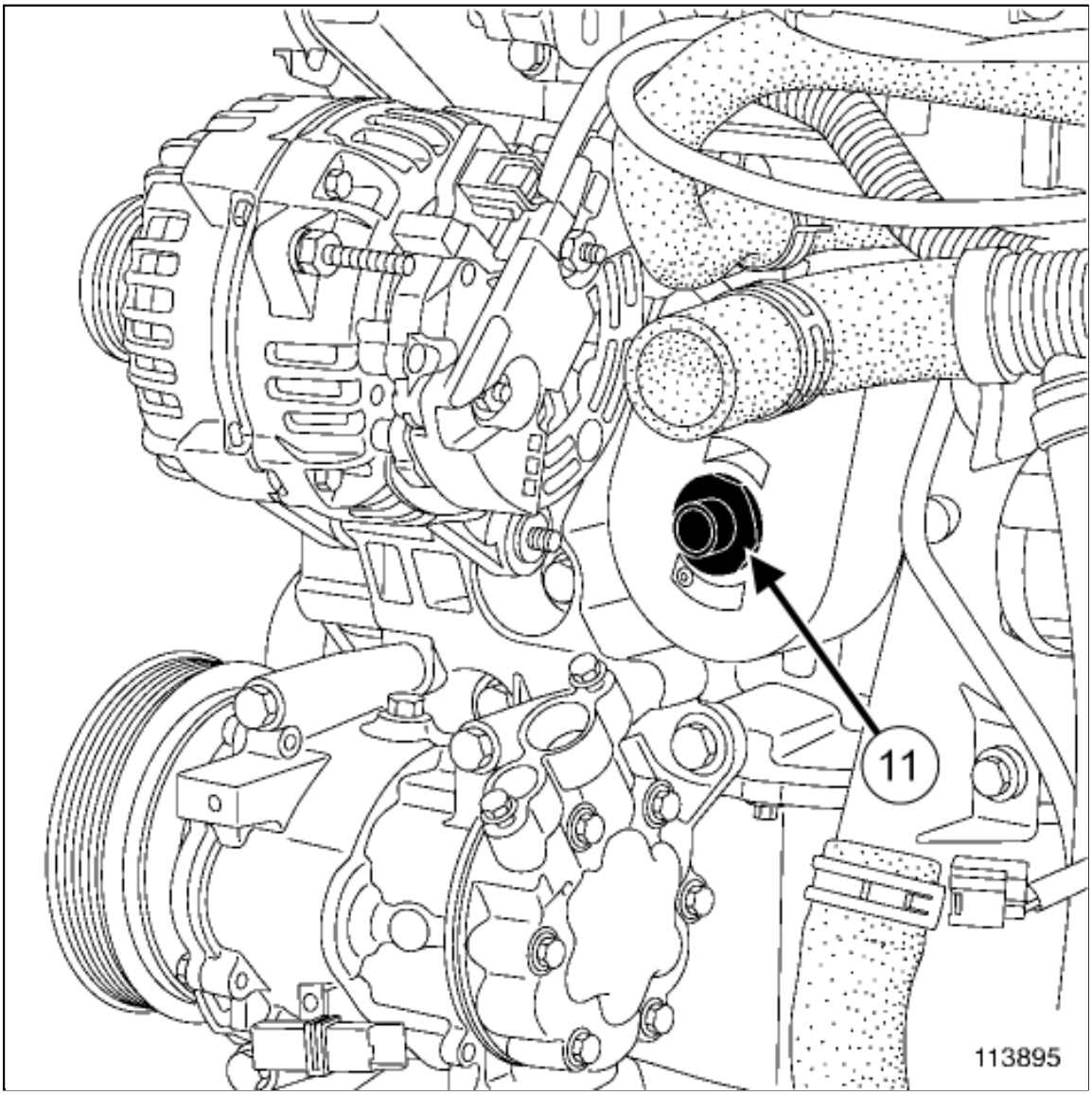


- Disconnect the oil pressure sensor connector(8) .
- Place a container under the engine on the oil filter side.
- Remove:
  - the bolt(9) from the oil filter support,
  - the oil filter support.



- Remove the seal(10) from the oil filter support.

2. REMOVAL OPERATION



- Remove:
  - the bolt(11) from the oil-coolant heat exchanger,
  - the oil-water heat exchanger.

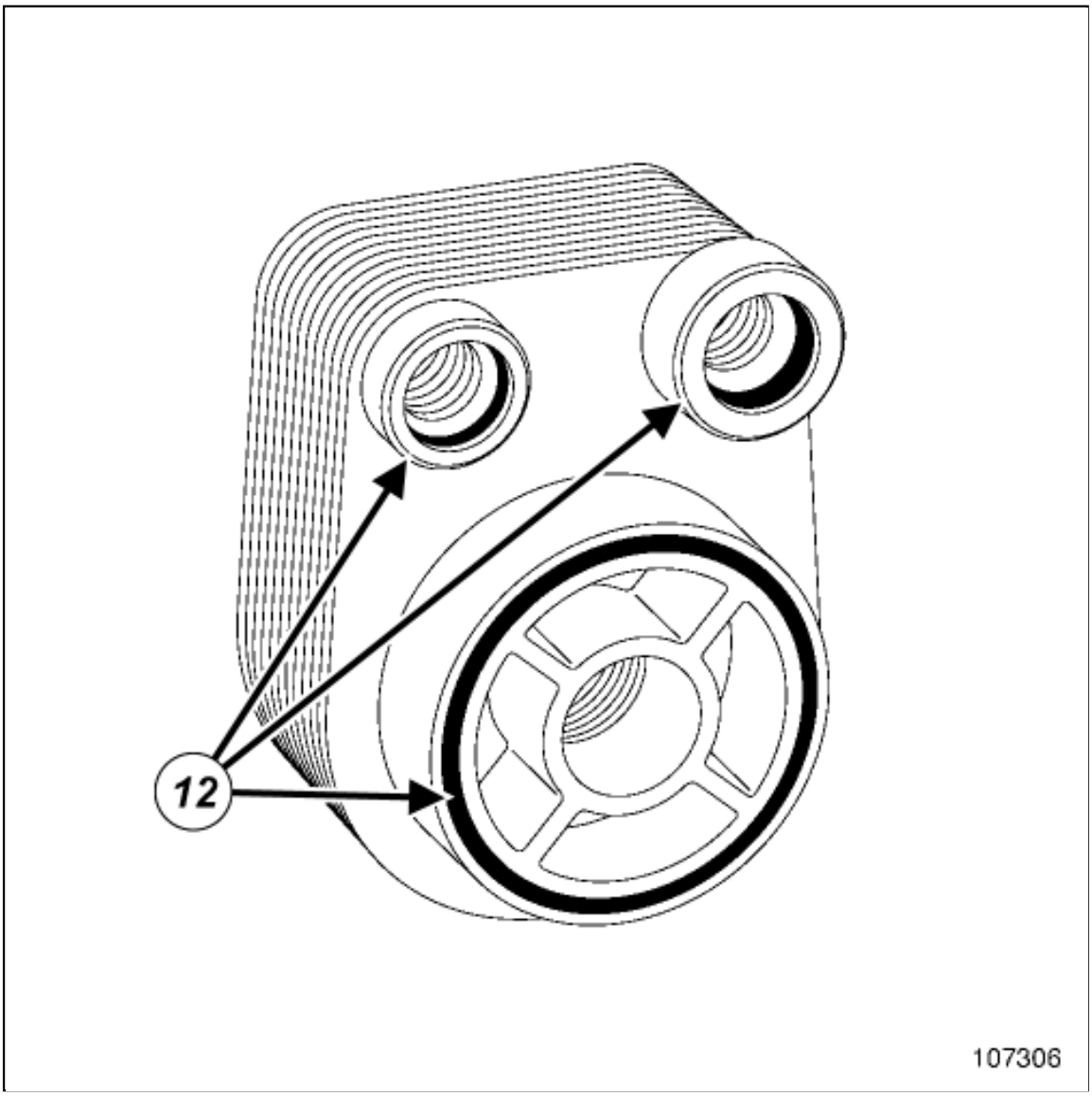
- Using a clean cloth, clean up any oil and coolant runs on the cylinder block and on the oil filter support.

REFITTING

1. REFITTING PREPARATION OPERATION

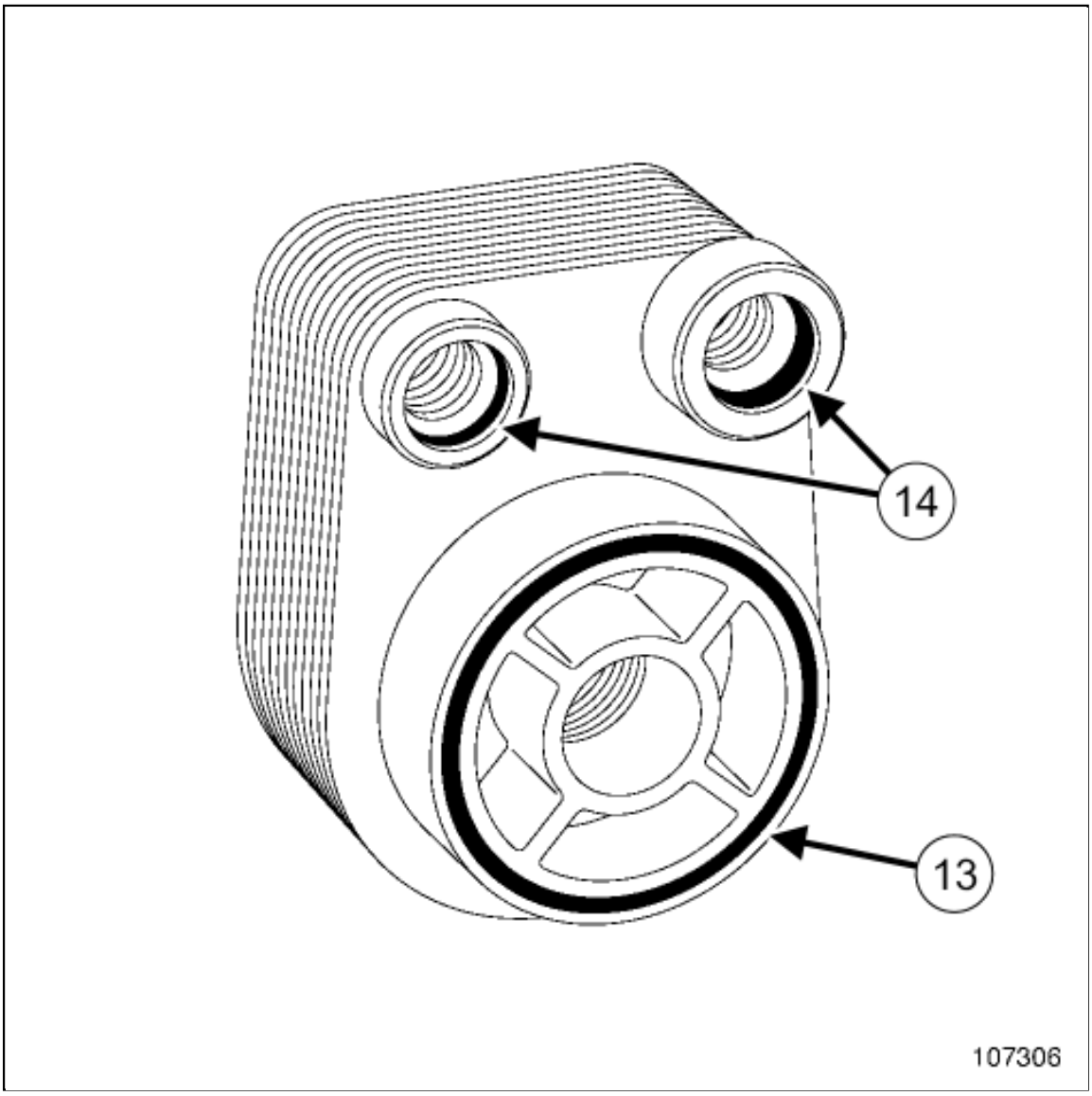
- parts always to be replaced: coolant-engine oil heat exchanger seal on the cylinder block.

- Always replace:
  - the seals of the oil filter support bolt,
  - the oil filter support seal.



- Remove the oil-water heat exchanger seals(12) .

- Use SURFACE CLEANERVehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean and degrease:
  - the housing of each seal in the oil-water heat exchanger if it is to be reused,
  - the oil-coolant heat exchanger seal face if it is to be reused,
  - the mating face of each seal on the coolant pump inlet pipe,
  - the joint face on the cylinder block,
  - the housing of each oil filter support seal,
  - the housing of each seal in the oil filter support.



Refit new seals(13) and (14) on the oil-water heat exchanger.

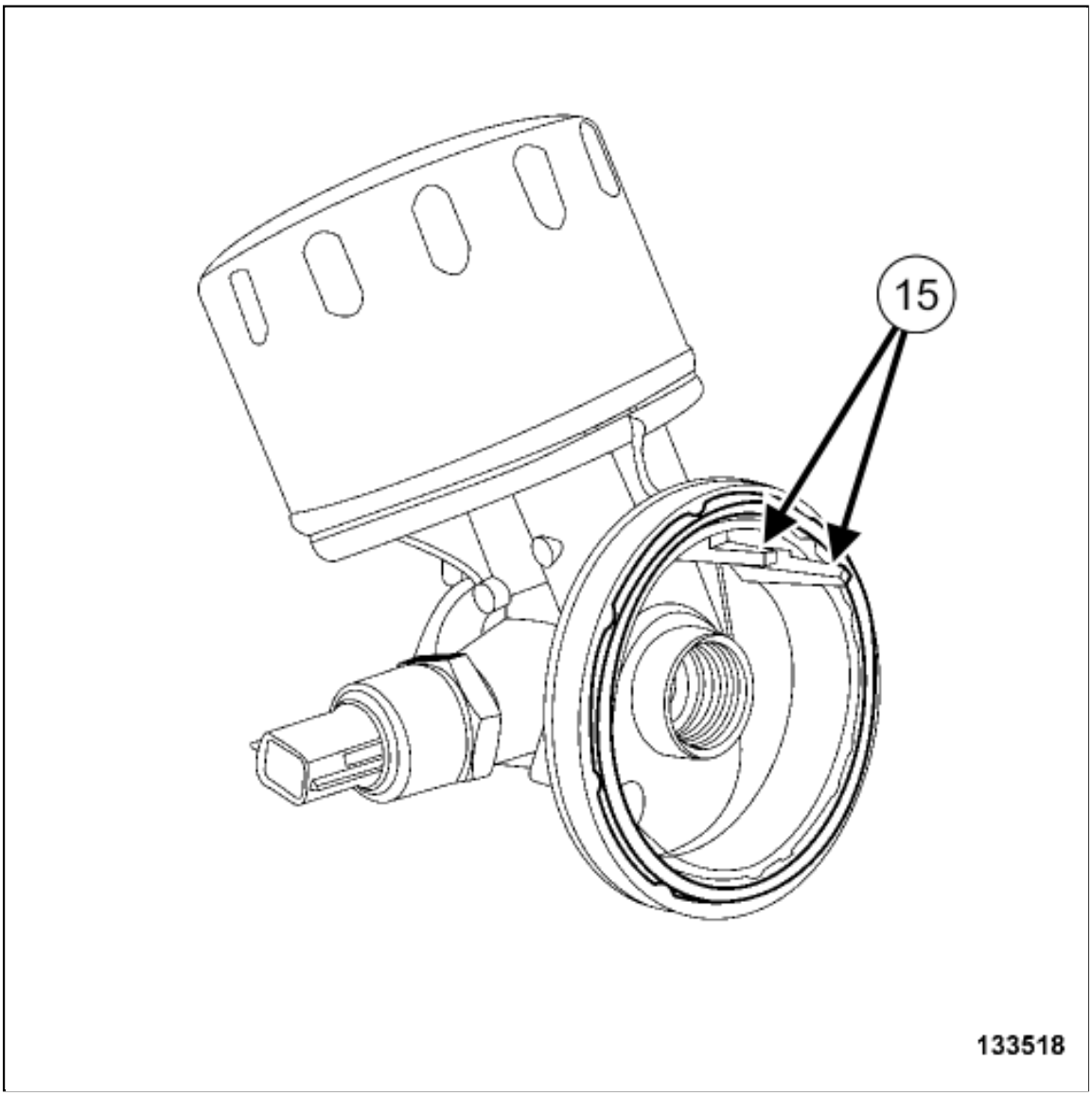
Apply soapy water to the two seals(14) in contact with the coolant pump inlet pipe.

2. REFITTING OPERATION

Refit the oil-water heat exchanger.

Torque tighten the oil heat exchanger bolt39 N.m.

3. FINAL OPERATION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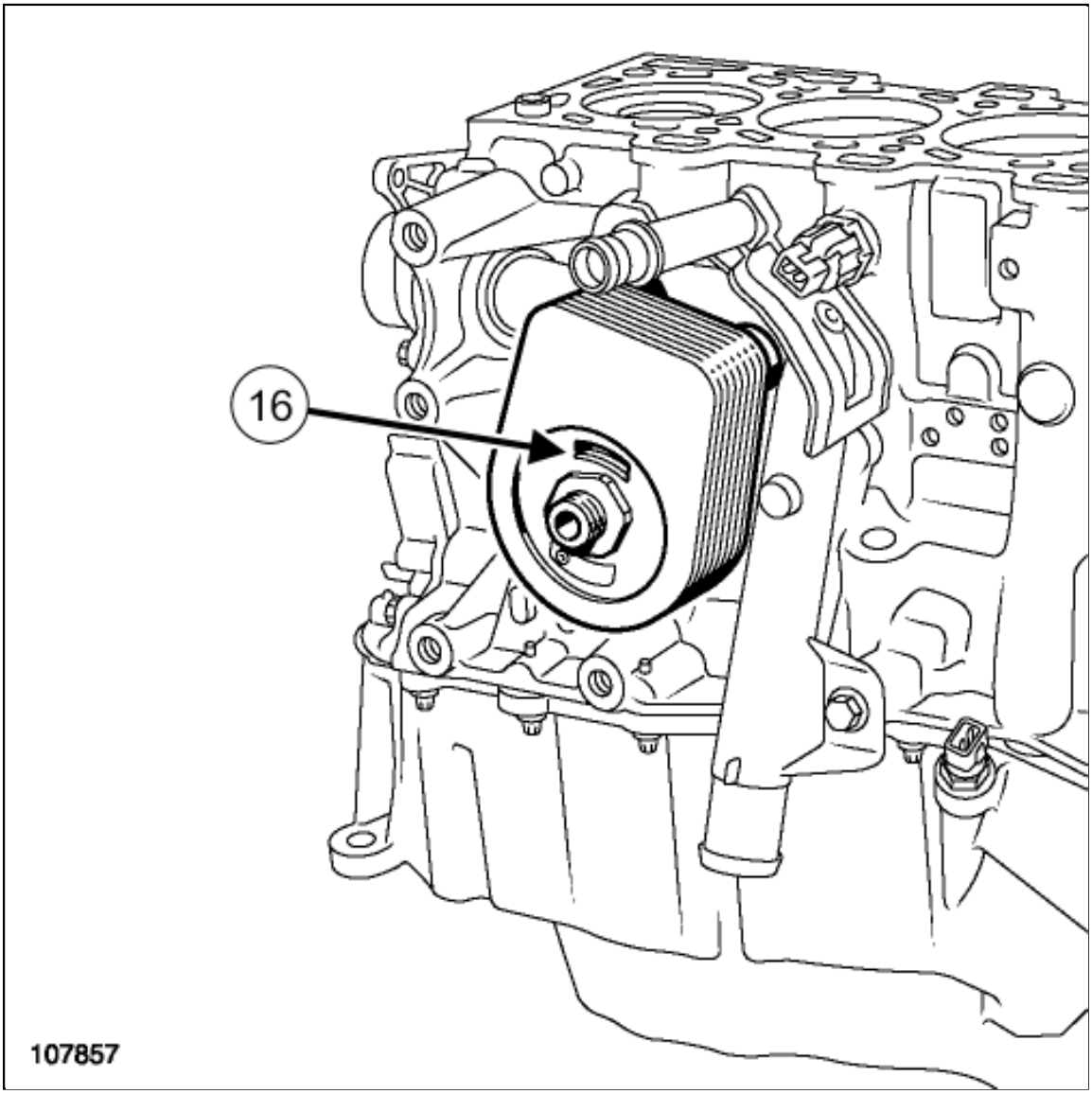


Refit:

- a new seal in the housing of the oil filter support,
- the oil filter support, positioning the lug(**15**) in the hole(**16**) of the oil-water heat exchanger,
- the oil filter holder bolt.

Torque tighten the oil filter support bolt28 N.m.

Connect the oil pressure sensor connector.

Refit:

- the intercooler air outlet pipe **Intercooler air outlet pipe: Removal - Refitting** ,
- the air filter inlet air pipe,
- the engine undertray.

Fill and bleed the cooling system **Cooling system: Draining - Refilling** .

Adjust the oil level, if necessary.

OUTER REAR WHEEL ARCH: REPLACEMENT

Note, one or more warnings are present in this procedure

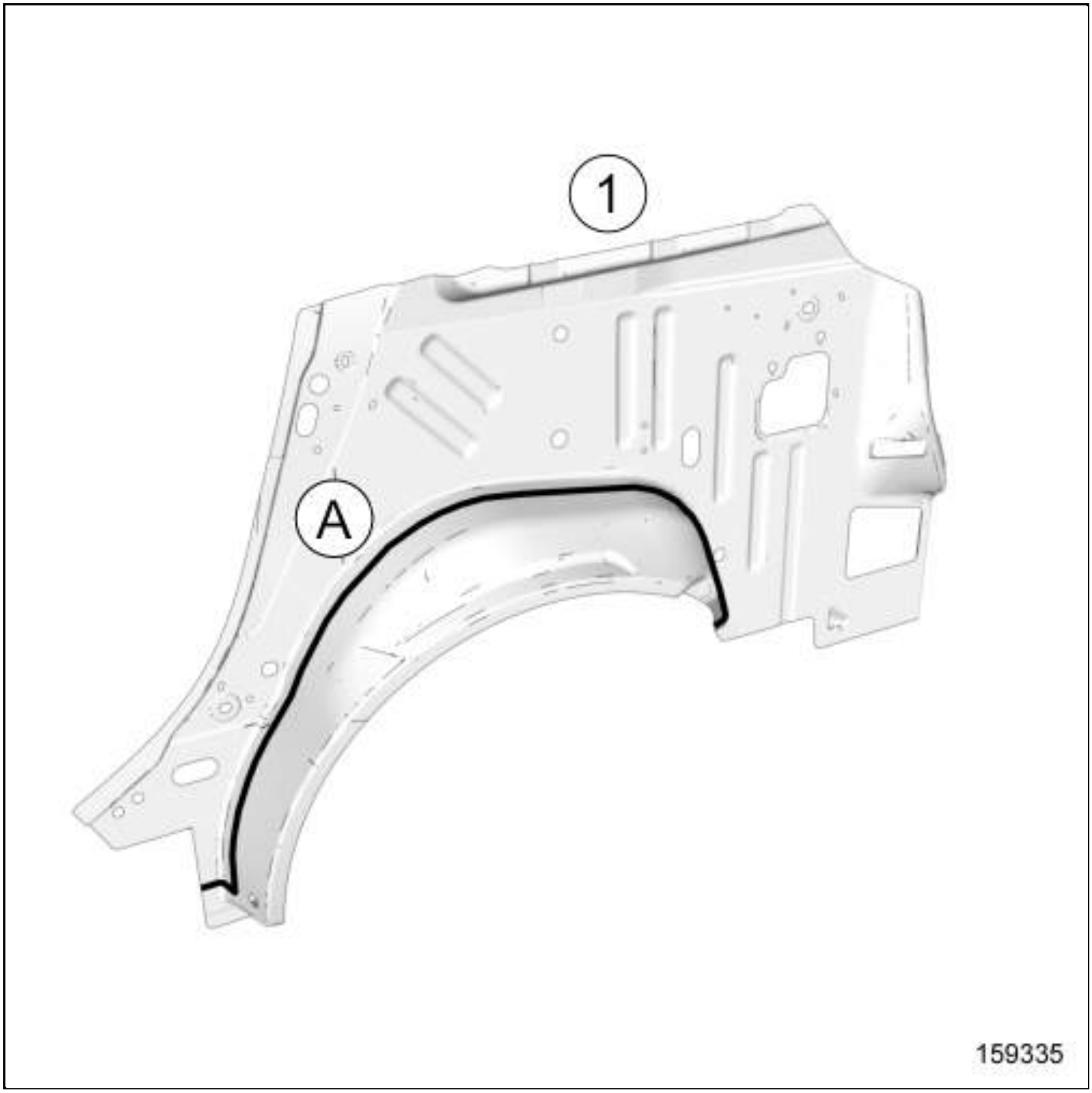
1. COMPOSITION OF THE SPARE PART

No.	Description	Thickness (mm)
(1)	Outer rear wheel arch	0.65

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- partial replacement along cut A.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

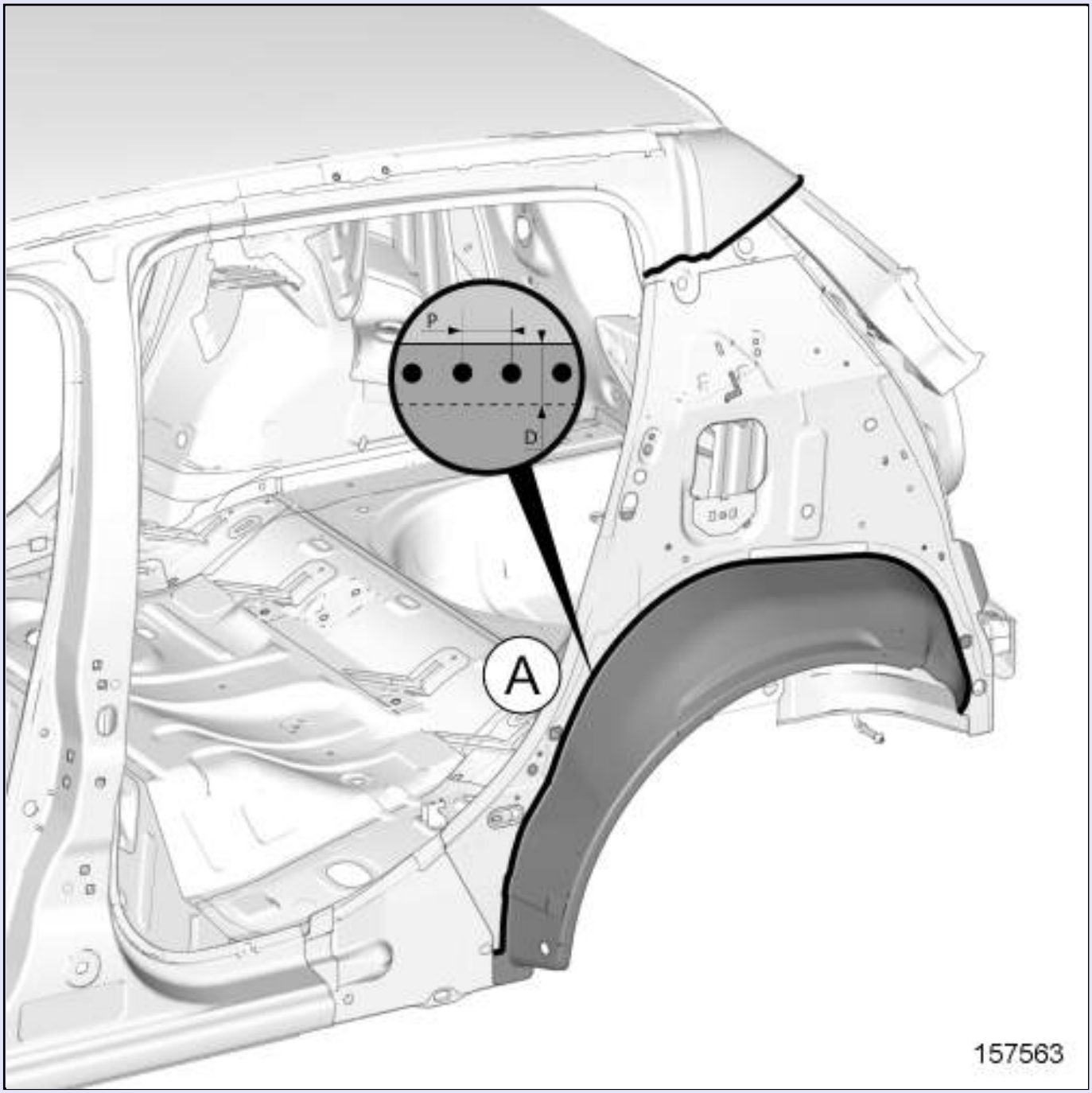
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

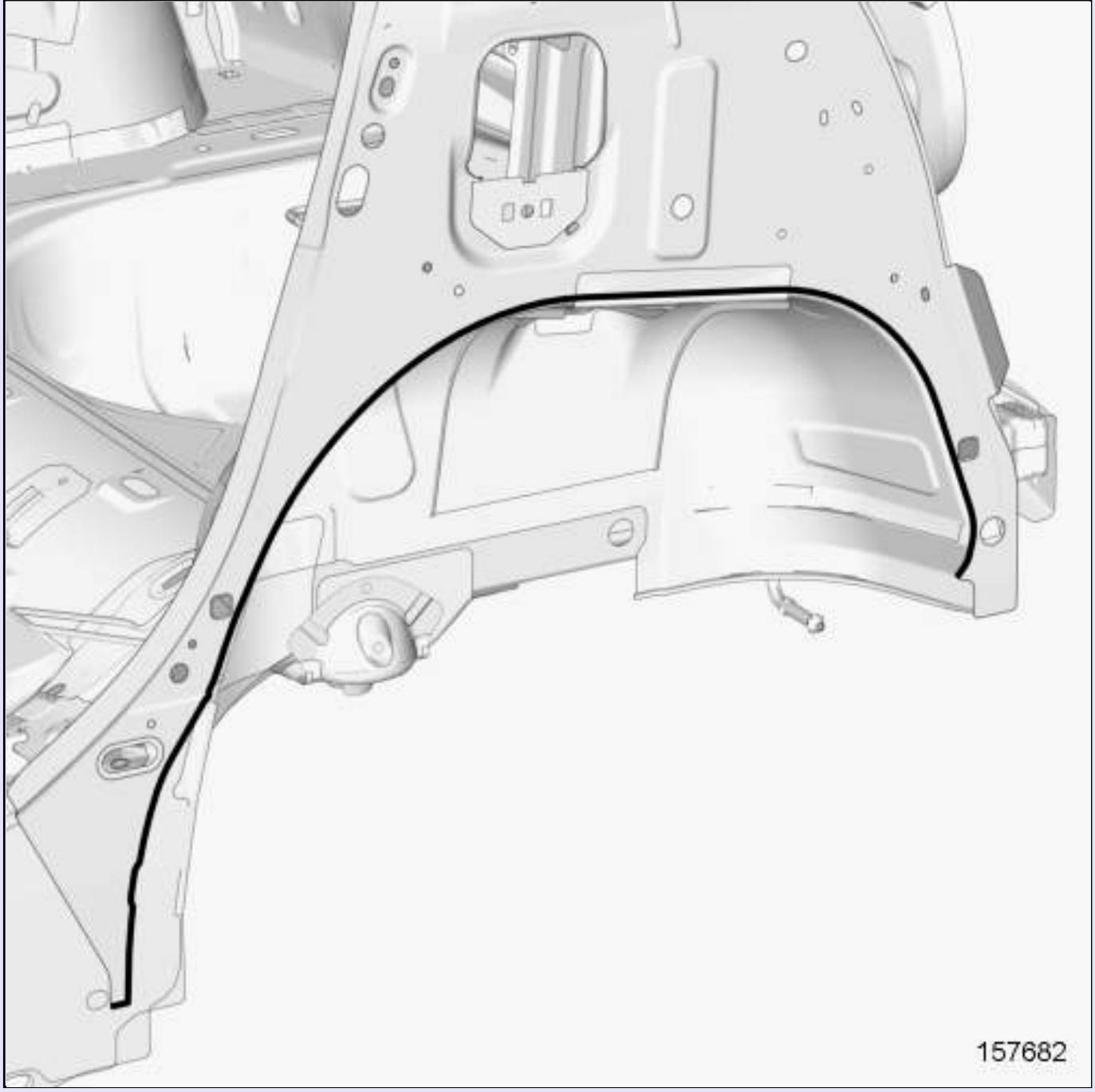
Locate the earths located near to the weld area Earths on body: List and location of components .

1- PARTIAL REPLACEMENT

1)PART IN POSITION



DETAILED VIEW A



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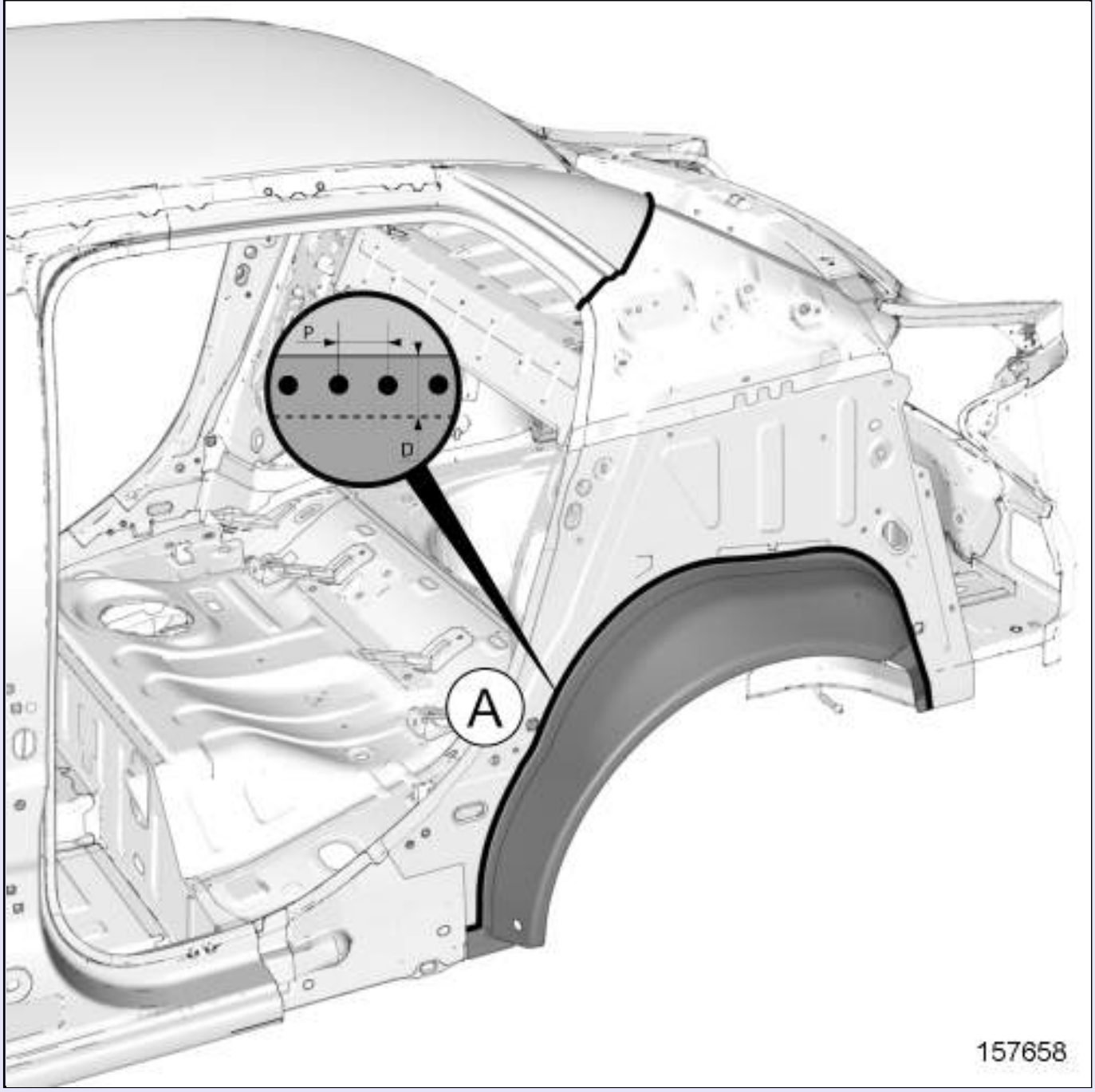
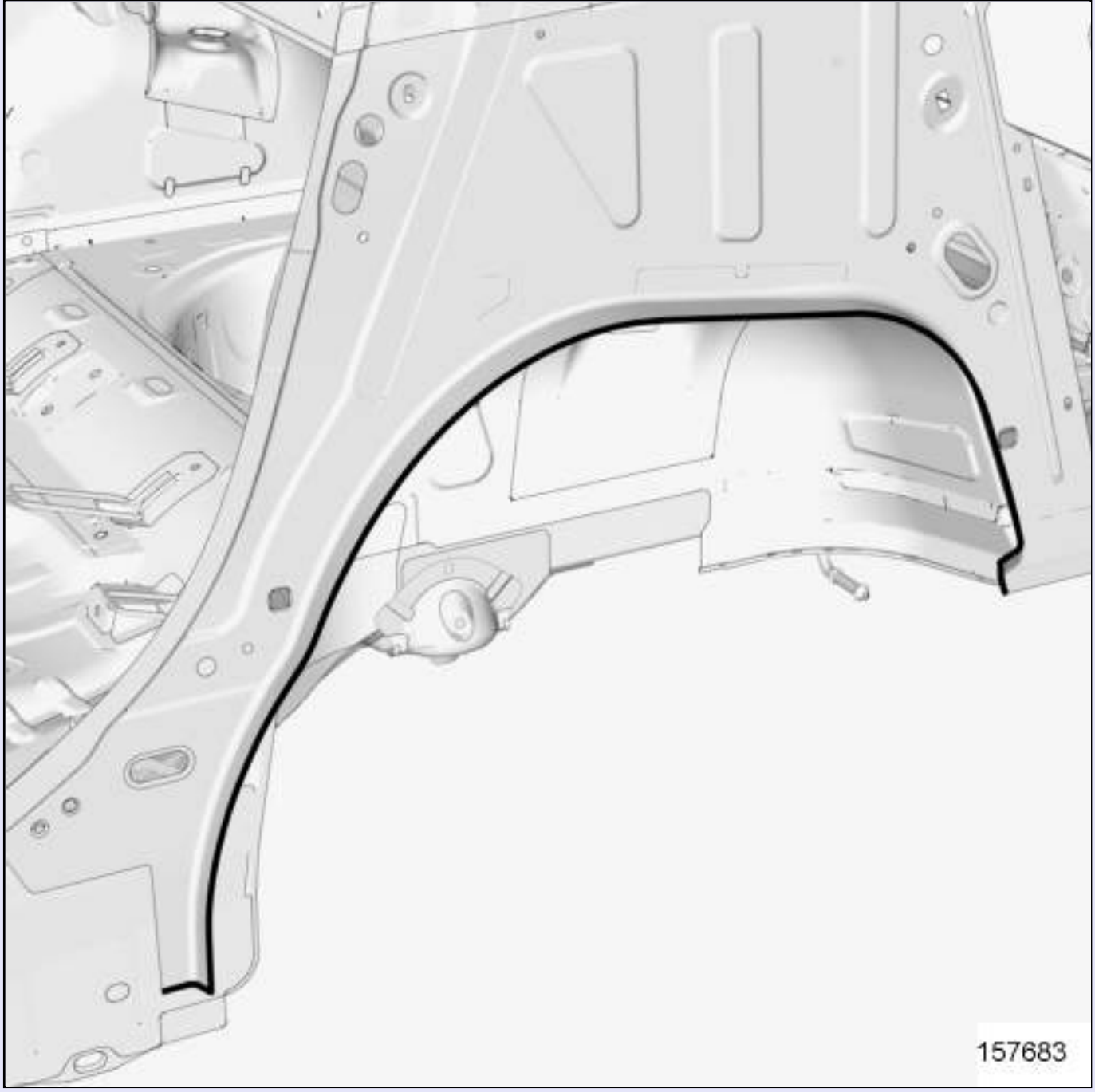


DETAILED VIEW A



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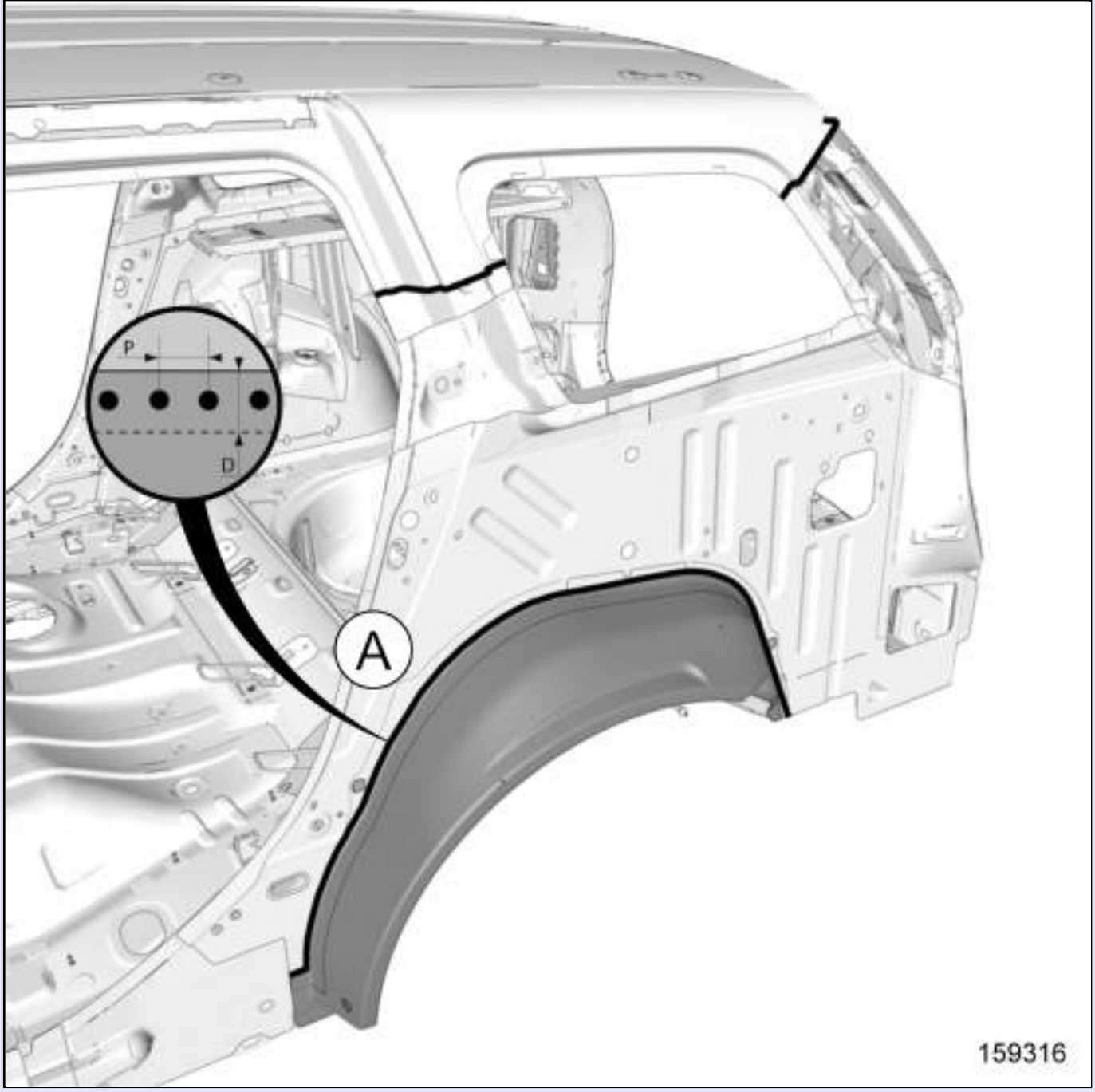
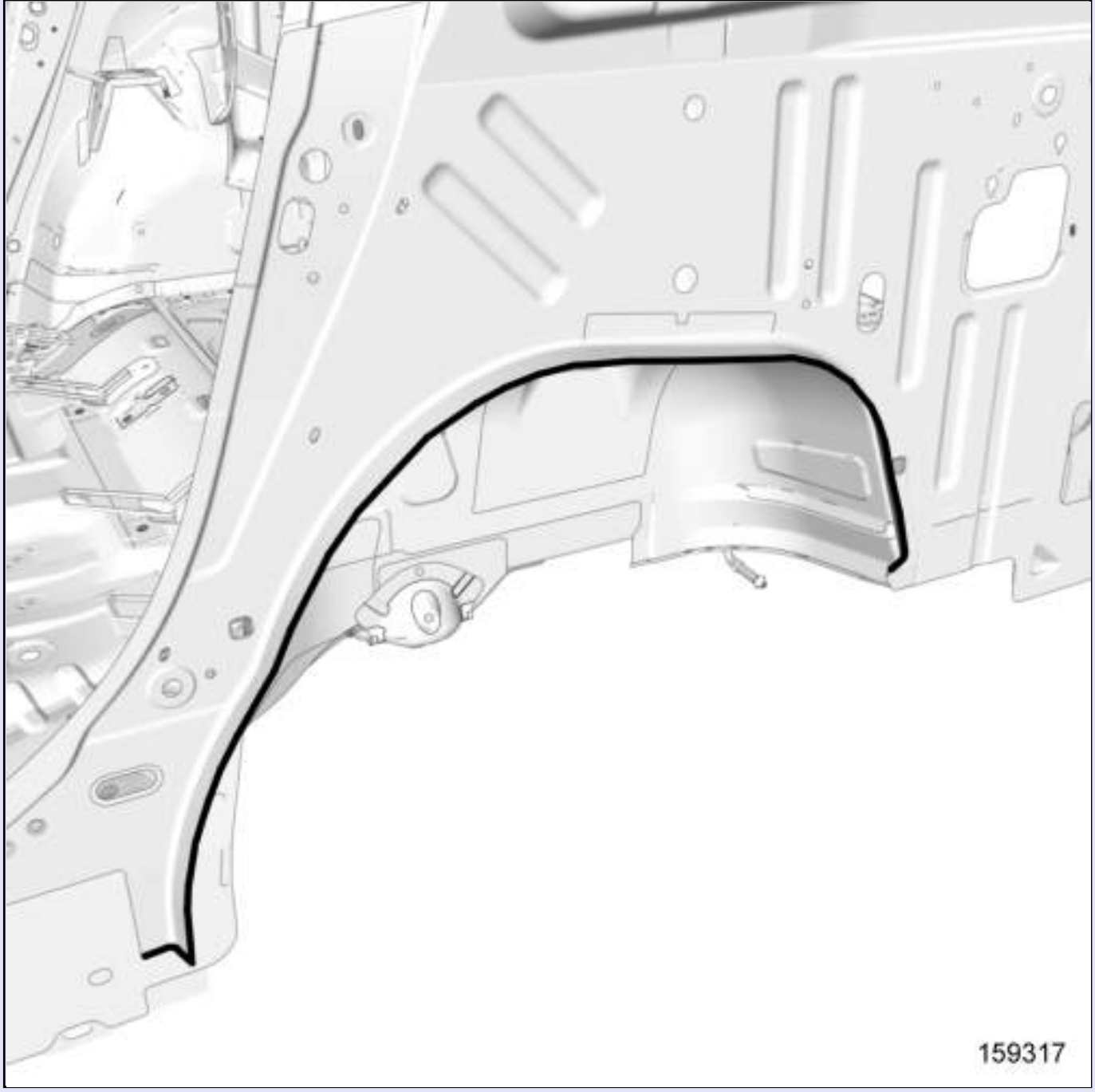


DETAILED VIEW A



P (Pitch) = 25mm

D = 30mm

Make a superimposed connection at(A) **Partial replacement connections by overlapping: Description** .

OUTPUT SHAFT: STRIPPING - REBUILDING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair **(see 21A, Manual gearbox , Manual gearbox: Precautions for the repair)** .

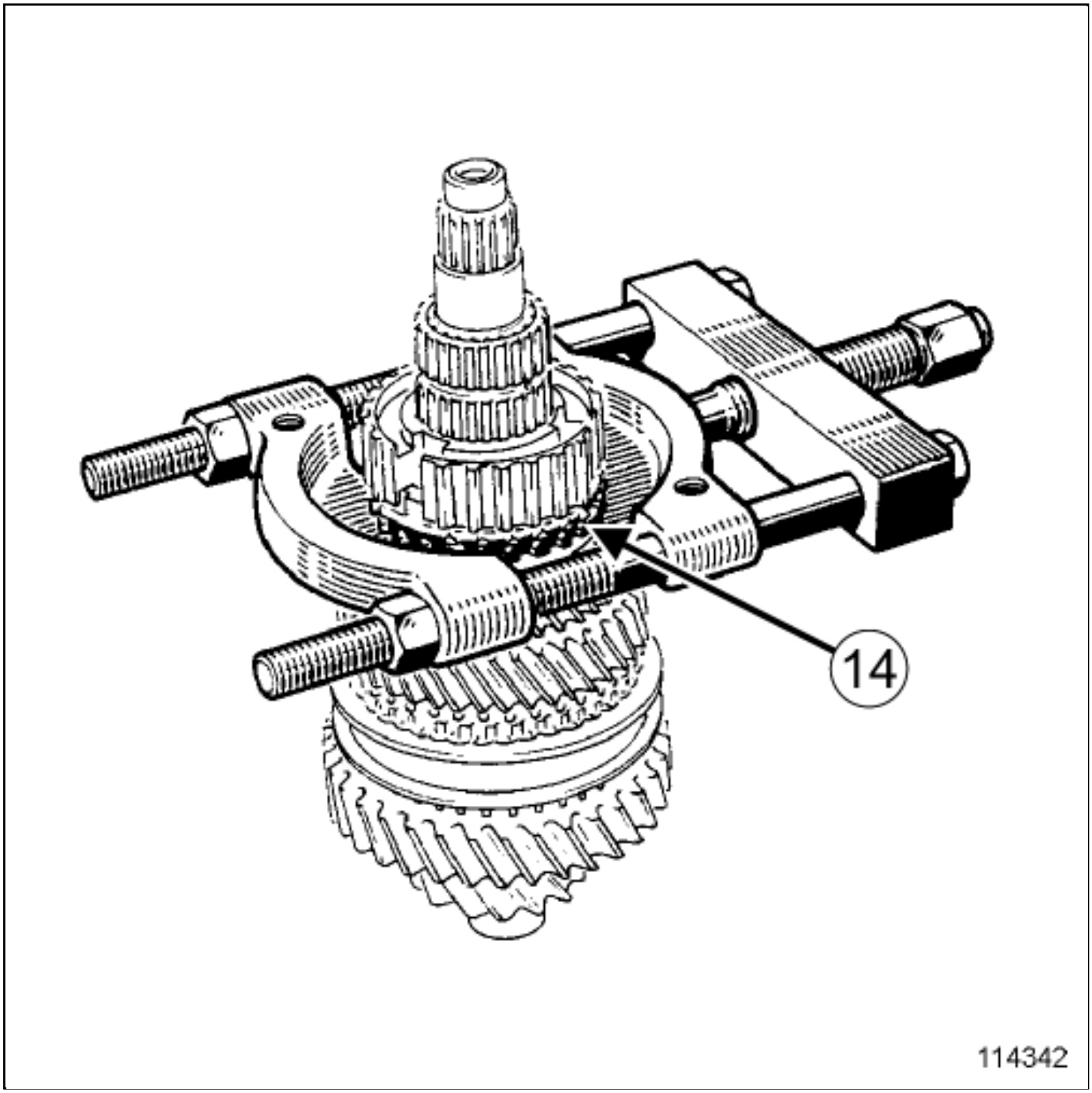
STRIPPING

1. STRIPPING PREPARATION OPERATION

- Remove the gearbox **Manual gearbox: Removal - Refitting** .
- Position the gearbox on the component support **(see 21A, Manual gearbox , Gearbox support equipment: Use)** .
- Remove:
  - the fifth gear housing **5th gear housing: Removal - Refitting** ,
  - the fifth gear synchroniser and pinions **5th gear sprockets and synchronisers: Removal - Refitting** ,
  - the mechanism housing **(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting)** ,
  - the gearbox shafts **(see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting)** .

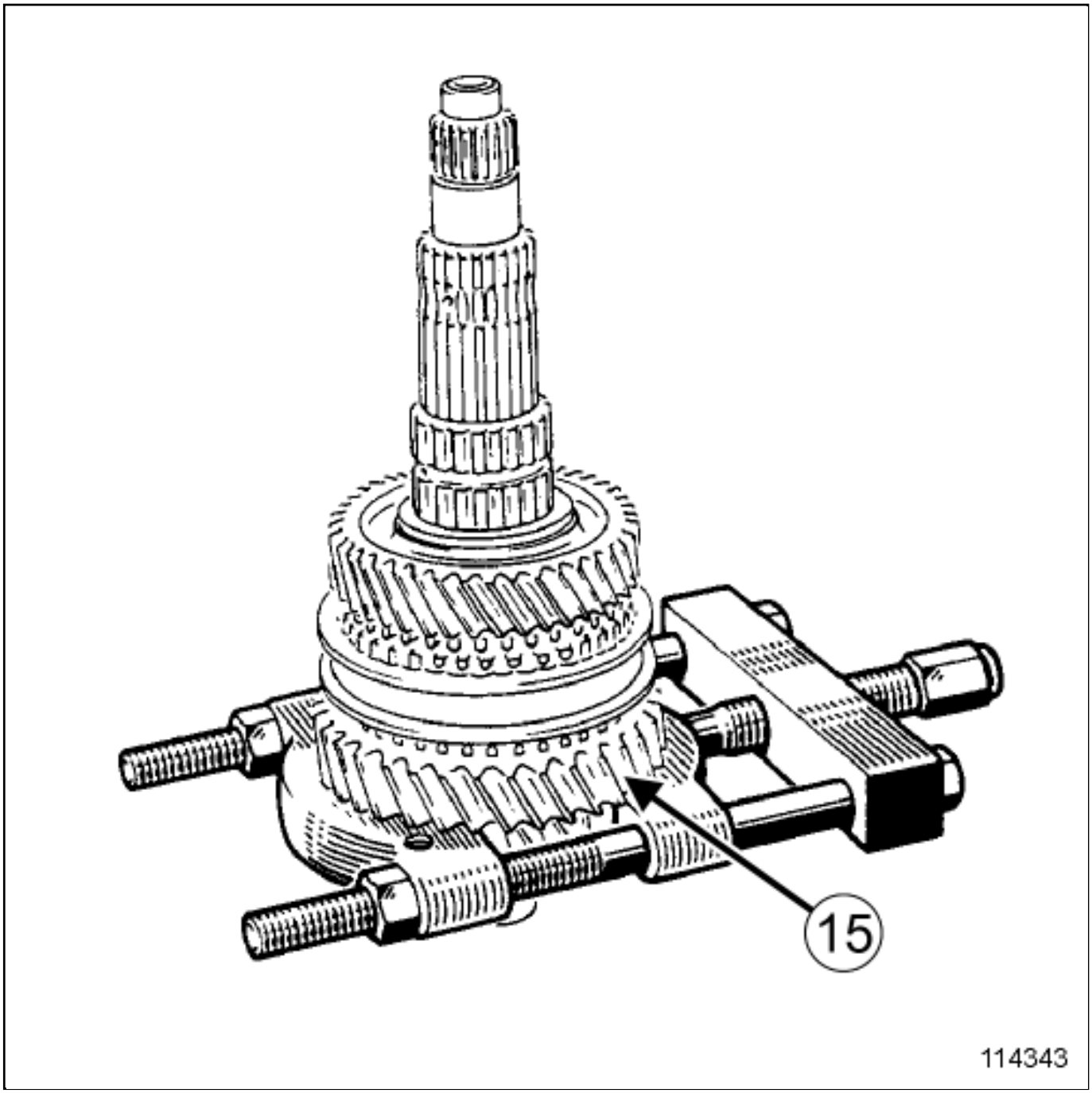
2. OPERATION FOR STRIPPING THE OUTPUT SHAFT

- The rings supporting the second, third and fourth gears are fitted tightened. These must always be replaced during refitting.



Remove:

- the bearing,
- the setting washer,
- the fourth gear pinion,
- the third-fourth gear selector rod,
- the "gear supporting ring, hub and third gear pinion" assembly using an extractor and a press and lifting it from underneath the claw teeth of the third gear pinion(**14**) .



Remove the "gear supporting ring, first and second gear pinions - hub - selector rod" assembly using an extractor and a press and lifting it from underneath the first gear pinion(15) .

REBUILDING

1. REBUILDING PREPARATION OPERATION

Use SURFACE CLEANERVehicle: Parts and consumables for the repair to clean:

- the shafts,
- the shaft mating surfaces,
- the mechanism housing.

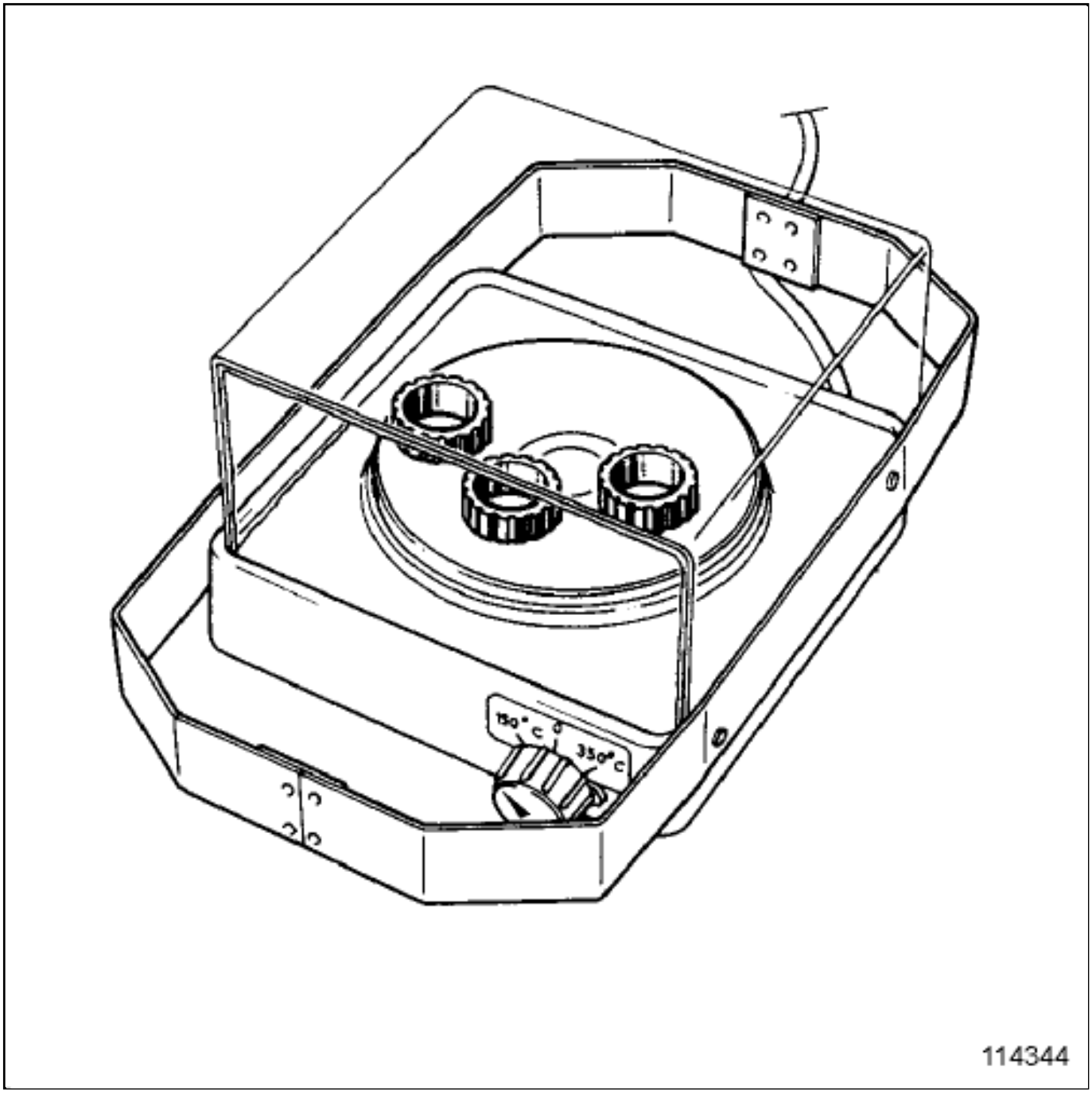
- Parts always to be replaced:
  - the lip seals,
  - the O-rings,
  - the clutch thrust bearing guide
  - the gear lock rings,
  - the roll pins,
  - the input and output shaft bearing circlips,
  - the selector rod hub springs,
  - the hydraulic clutch slave cylinder (if fitted),
  - the magnet,

- Always replace the gear supporting rings.

- Check all of the parts(see 21A, Manual gearbox , Manual gearbox: Check) .

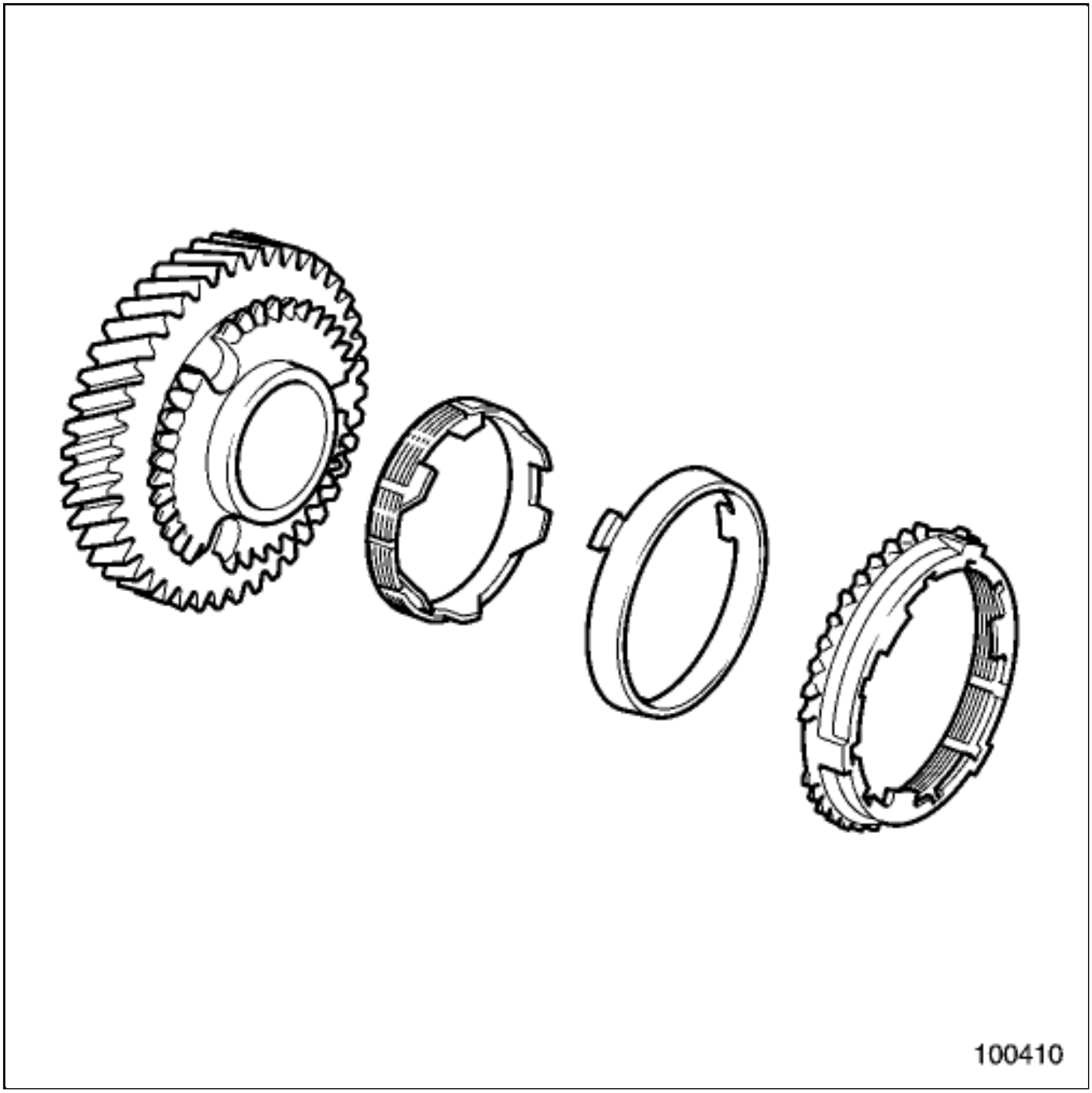
2. OPERATION FOR REBUILDING THE OUTPUT SHAFT

- When reassembling, use a hot plate set at 150˚C.



- Place the new rings on the hot plate.

- Heat the rings for 15 minutes, with the thermostat set at 150˚C.



- Oil the synchroniser rings.

Note:

Make sure that the notches on the double cone synchroniser are correctly positioned.

- Refit in the following order:
  - the first gear idler gear with its synchroniser,
  - the first-second gear synchroniser hub and align the notches of the hub with those on the synchroniser ring,
  - the ring under the second gear idler gear using a tube with an internal diameter of 33 mm until they are resting

on the hub,

- the second idle gear,
- the splined washer between the second and third gears,
- the ring under the third gear idler gear using a tube with an internal diameter of 33 mm until they are resting on the splined washer,
- the third gear idler gear,
- the third-fourth gear synchroniser hub and align the notches of the hub with those on the synchroniser ring,
- the ring under the fourth gear idler gear using a tube with an internal diameter of 33 mm until they are resting on the hub,
- the fourth gear idler gear,
- the setting washer,
- the bearing.

Adjust the output shaft (see 21A, Manual gearbox , Gearbox shaft: Adjustment) .

3. FINAL OPERATION

Refit:

- the gearbox shafts (see 21A, Manual gearbox , Gearbox shaft: Removal - Refitting) ,
- the mechanism housing (see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
- the fifth gear synchroniser and pinions 5th gear sprockets and synchronisers: Removal - Refitting ,
- the fifth gear housing 5th gear housing: Removal - Refitting .

Remove the gearbox from the component support (see 21A, Manual gearbox , Gearbox support equipment: Use) .

Refit the gearbox Manual gearbox: Removal - Refitting .

PAINT BLEND: PREPARATION AND PAINT RANGE

Note, one or more warnings are present in this procedure

Note:

The blending in method should be used on adjacent components when replacing a surface component.

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Use extra ventilation source.

1. BLENDING IN METHODS

water dilutable or solvent basecoats and clearcoats.

- Procedure 1 : Water dilutable basecoat union,
- Procedure 2 : Solvent basecoat union,
- Procedure 3 : LS - MS - HS clearcoat union.

1- WATER DILUTABLE BASECOAT UNION

1)PROCEDURE 1

Standard method:

Steps	Description	Special notes
1	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
2	Wipe / blow	
3	Sand	P400 - P500on the repaired zones / Grey dampened abrasive finishing pad or P1000at the edge
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Prepare the water dilutable basecoat	According to the PRODUCT TECHNICAL SHEET
7	Apply the water dilutable basecoat	a haze and one or two coats (covering) plus a fine fitting coat while overlapping towards the exterior of the repair zone Wide graduation with spray gun
8	Remove solvent / dry	Complete Masking (with or without forced ventilation)

Droplet method:

Steps	Description	Special notes
1	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
2	Wipe / blow	
3	Sand	P400 - P500on the repaired zones / Grey dampened abrasive finishing pad or P1000at the edge
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Prepare the water dilutable basecoat	According to the PRODUCT TECHNICAL SHEET
7	Apply the water dilutable basecoat	a haze and one or two coats (covering) plus a fine fitting coat while overlapping towards the exterior of the repair zone Wide graduation with spray gun
8	Dry / remove solvent	Complete Masking (with or without forced ventilation)
9	Prepare the union	Use the same mixture, reduce the air pressure so as to obtain fine spray droplets
10	Apply	a thin coat while redoing the whole graduation zone from the exterior towards the interior (the droplet appearance disappears during drying)
11	Remove solvent / dry	Complete Masking (with or without forced ventilation)

Basic stabilising additive:

Steps	Description	Special notes
1	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
2	Wipe / blow	
3	Sand	P400 - P500on the repaired zones / Grey dampened abrasive finishing pad or P1000at the edge
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Prepare the water dilutable stabilising basecoat	According to the PRODUCT TECHNICAL SHEET
7	Prepare the water dilutable basecoat	According to the PRODUCT TECHNICAL SHEET
8	Apply the water dilutable stabilising basecoat	a thin coat of stabilising basecoat on the whole component
9	Apply the coloured water dilutable basecoat	On the repaired zone in one or two coats (covering), plus a fitting coat by overlapping towards the exterior of the repaired zone
10	Remove solvent / dry	Complete Masking (with or without forced ventilation)

2- SOLVENT BASECOAT UNION

1)PROCEDURE 2

Standard method:

Steps	Description	Special notes
1	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
2	Wipe / blow	
3	Sand	P400 - P500on the repaired zones / Grey dampened abrasive finishing pad or P1000at the edge
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Prepare the solvent basecoat	Dilute the basecoat according to the PRODUCT TECHNICAL SHEET
7	Apply the solvent basecoat	Apply two or three coats of this mixture to obtain the cover while slightly overlapping towards the exterior of the repaired zone
8	Remove solvent / dry	Masking between each coat, leave for 15 minutes before applying the clearcoat

3- LS - MS - HS CLEARCOAT UNION

Note:

Polish the zones to be connected

1)PROCEDURE 3

Standard method:

Steps	Description	Special notes
1	Prepare the clearcoat	Catalyze and dilute according to the LS - MS - HS PRODUCT TECHNICAL SHEET
2	Apply the clearcoat	According to the type of clearcoat (3, 2 or one coat) Cover the basecoat painted zone Overlap slightly towards the exterior of the repaired zone
3	Apply the union thinner	Apply thin coats
4	Dry	According to the PRODUCT TECHNICAL SHEET

PAINTFAULT:DESCRIPTION

Types of paint faults
I GRAIN
II RUNS
III MONO or BI COMPONENT PRIMER POWDERING
IV BASECOAT POWDERING
V POROSITY in the MASTIC POLYESTER COATING
VI DAPPLING
VII ORANGE PEEL SKIN
VIII MARBLING
IX CURLS - CURLING
X VISIBILITY of REVARNISHED BICOAT BASECOAT MELTED UNIONS
XI VISIBILITY of MELTED UNIONS on DIRECT SHINY TOPCOAT
XII FOG FALLOUT
XIII REAPPEARANCE OF SANDING SCRATCHES
XIV FILM CREASING at REASSEMBLY
XV MARKS in the PRIMER COAT
XV MARKS and MICROBUBBLES in the CLEARCOAT and TOPCOAT

XVII LOSS of SHINE in the CLEARCOAT and TOPCOAT
XVIII POOR HARDENING of the CLEARCOAT and TOPCOAT
XIX POOR DRYING of the MONO or BI COMPONENT PRIMER
XX FORMATION of STAINS
XXI BURYING
XXII POLYESTER MASTIC TRIMMING
XXIII BI COMPONENT PRIMER TRIMMING
XXIV REJECTION (silicone)
XXV WEAKNESSES / CRACKS
XXVI DETACHMENT on PLASTIC MATERIALS
XXVII DETACHMENT of the UNDERCOAT
XXVIII DETACHMENT of the CLEARCOAT and TOPCOAT
XXIX DETACHMENT of the POLYESTER MASTIC
XXX BLISTERING

1. GRAINS

Description: Particles of various shapes and sizes, this fault can be seen on the film surface. It is important to find out on which coating thickness the fault appears so that the procedure to be carried out can be identified.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Incorrect maintenance of the booth	Clean the floor with a vacuum cleaner and repaint the booth walls Protection of the walls with a film or static product
The inlet and extraction air filters are clogged, thus causing turbulences	Replace the inlet and extraction filters Observe replacement frequencies: ■ ceiling 1000 hours, ■ floor 90 hours, ■ pre-filter 500 hours.
Booth depressurised	Adjust the ventilation to slight overpressure
Application gun dirty	Clean the gun straight away after use Never immerse it totally in thinner (clogging of the air circuit) Use a specific Base coat, Top coat or Clear coat gun
Dusty, dirty clothing or clothing that leaves fibres	Wear a clean anti-static overall, exclusively for the application
Non filtered products or dirty or pierced paint filters	Filter all the products after mixing Use cone filters or clean, non-pierced plastic filters
Contamination of the sprayed air	Bleed your compressor and use a submicronic purifier, check the cleanliness of the cartridges

CAUSES	REMEDIES
Deposits in the basecoat colours Usage limit date is exceeded	Use clean and non-pierced paint filters Take basecoat colours from a new batch
The caps and covers have not been closed correctly on the cans and boxes allowing impurities to get in.	Close the cans and boxes after use

3- METHODS

CAUSES	REMEDIES
The vehicle operating, washing, cleaning, blowing, degreasing methods are insufficient. The internal and external surfaces of the vehicle have not been cleaned with compressed air	Do not wipe with fluffy cloths or paper Wash and clean the internal surfaces of the vehicle: ■ clean with compressed air at a pressure greater than the one used for the application of the product (+ 1 bar), ■ wipe the vehicle and masking with a clean pad.
Masking paper on the support not suitable (newspaper type) Non-masked interiors: engine, wheel arches, etc	Use masking paper Cover the interior of the engine compartment (shiny side of the paper towards the outside)
Unsticking of the basecoat fog during clearcoat application	Fix the residual basecoat fog on the masking with a slight clearcoat haze by lowering the pressure
Lack of equipment maintenance and cleanliness in the whole workshop	Draw up a maintenance plan for the equipment
The bodywork surface is statically loaded which attracts dust	Install an Antistatic air pipe (see workshop equipment) In the booth: ■ connect the components to be painted to earth, ■ use an antistatic cleaner (composite material components)

2. RUNS

Description: This fault can be seen when there is too much product or a very localised excessive thickness on a vertical or tilted surface. This excess flows along the support, forming runs.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Incorrect adjustment of the gun	Correct the nozzle adjustments, flow, pressure and width of the spray according to the component to be painted
Gun dirty or faulty	Clean the cap, the nozzle, the point
Air Pressure incorrect	Adapt the application pressure according to the gun type
Lack of lighting	Check the operation of the neon lights in your booth
Ambient temperature too low (< 18˚C)	Increase the application temperature 18to 23˚C

2- PRODUCTS

CAUSES	REMEDIES
Thinner and hardener unsuitable	Use the hardener and thinner which correspond to the application temperature
Temperature of the product too low Viscosity does not comply with the Technical Sheet	Get the products to the correct temperature before application Adjust viscosity (see PRODUCT TECHNICAL SHEET)
Time for evaporation insufficient between coats	Make sure there is enough time for solvent evaporation between each coat

3- METHODS

CAUSES	REMEDIES
Support temperature too low	Increase the temperature of the support, (23°C) and the same for product
Support incorrectly degreased Dirty surface	Clean the support with a solvent surface cleaner
Supports poorly sanded	Check the methods for sanding the supports
Irregular nozzle Distance of application not complied with	Review the gun method

3. POWDERING OF THE MONO OR BI COMPONENT PRIMERS

Description: Dry spraying, usually granular texture without any shine and porous.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Very fast air speed	Improve booth ventilation (air speed): max 0.4 m/s
Dirty gun Incorrect spraying	Check the cleanliness of the gun
Air pressure too high	Check the application air pressure on the gun
Incorrect adjustment of the gun Nozzle unsuitable or too small	Correct the adjustment of your gun Choice of nozzle (see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
Viscosity does not comply with instructions	Adjust product viscosity
Thinner and hardener not appropriate for the application temperature Usage limit date is exceeded	Use a stronger evaporating thinner and in case of high temperatures add 5to 10%thinner Check the storage dates of the hardeners

3- METHODS

CAUSES	REMEDIES
Incorrect application of partial primings	Apply the undercoat in a pyramid shape: a very wide first coat on the repair and reducing for the following coats
Gun too far from the support	Observe the application distance for the correct product wetness

4. POWDERING OF THE BASECOATS

Description: Dry spraying, usually granular texture without any shine and porous. May cause a loss in the whole coating adherence.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Booth application temperature too high	Add a retarder (e.g. :D40)
Very fast air speed	Improve booth ventilation (air speed) max 0.4 m/s
Dirty gun Incorrect spraying	Check the cleanliness of the gun
Air pressure too high	Check the application air pressure on the gun
Incorrect adjustment of the gun Nozzle unsuitable or too small	Correct the adjustment of your gun Choice of nozzle (see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
Viscosity does not comply with instructions	Adjust product viscosity
Thinner and hardener not appropriate for the application temperature Usage limit date is exceeded	Use a stronger evaporating thinner Check the storage dates of the hardeners

3- METHODS

CAUSES	REMEDIES
Support too hot	Reduce the temperature of the support, if possible to the temperature of the product
Gun too far from the support	Observe the application distance for the correct product wetness

5. POROSITY IN THE POLYESTER MASTIC COAT

Description: Characterised by a group of small holes in the mastic coat. Can be seen during mastic application or after sanding.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Storage of the boxes of polyester mastic in a place which is too humid or which has a lot of temperature fluctuations	Store the boxes of polyester mastic at a temperature of between 18°Cand 23°Cand in a dry place
Use of knives in poor condition	Check the cleanliness of your mastic knives

2- PRODUCTS

CAUSES	REMEDIES
Quality of the polyester mastic	Use a standard polyester mastic then a finishing mastic to plug the porosities or, instead, use a finishing mastic which plugs and finishes directly Take into consideration the quality of the surface to be repaired (aluminium, zinc, etc)
The boxes of polyester mastic are incorrectly closed after use, causing the mastic to dry and allowing impurities get in.	Close the boxes of polyester mastic correctly, the solvent used for its manufacture contributes to the ease of application and to the final quality

3- METHODS

CAUSES	REMEDIES
On highly damaged supports mastic has been applied in a very thick layer	Apply polyester mastic twice
Porosity on the surface of the polyester mastic	Apply a very thin coat for finishing

6. DAPPLING

Description: Coloured area with darker sheen (clouded effect) with pearlescent or metallic colours due to migration of aluminium particles or of pearl particles forming small greyish clouds.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The temperature of your booth is too low	Regulate the temperature of your booth to between 18°Cand 23°Cin order to facilitate the evaporation of the solvents
The atomisation of your gun is not to standard	Make sure your gun is kept clean Check the tightening of the nozzle and air cap Modify the adjustment of your gun Carry out a test on paper
The air pressure is not correct	Check the pressure of your gun (see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
Viscosity does not comply with the Technical Sheet	Adjust viscosity (see PRODUCT TECHNICAL SHEET)
The thinner used for the solvent paints is not suitable for the surface or the temperature	Reconsider the choice of thinner, for large surface area or high temperature, slow thinner, avoid fast range

3- METHODS

CAUSES	REMEDIES
The support to be painted is too cold	Increase the temperature of the support and product to 23˚C
Your gun is too near or too far from the support The speed is irregular	Check the spray method, distance and speed depending on the gun The aluminium is placed on the last coat before the total evaporation of the solvents
The evaporation time between coats is insufficient	Allow enough time for evaporation between the basecoats and between the application of the basecoat and clearcoat (see PRODUCT TECHNICAL SHEET)

7. ORANGE PEEL

Description: Paint defect where spreading properties and imperfect drying conditions lead to a film with a flecked surface.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The application temperature is too high so the solvents evaporate too quickly	Adjust the temperature of your booth between 18°Cand 23°C and check the ventilation (air speed)
The air pressure is insufficient	Correct the air pressure. A pressure which is too low will not give a correct atomisation and will not disperse the product
The nozzle of your gun is unsuitable	Check the choice of your gun nozzle. If the nozzle is too strong, the flow will also be too strong (see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
The thinner and hardener are inappropriate for the application temperature	Adapt the thinner and hardener to the application temperature, for higher than 25°Cuse a slower thinner
The viscosity does not comply with the instructions	Adjust the viscosity of the top coat The product temperature must be between 18°Cand 23°C, reheat the product in the booth if necessary

3- METHODS

CAUSES	REMEDIES
Old surfaces that already have orange peel skins	Sand the surface to remove the existing orange peel skin Use a suction sander P320or P400dry
The spray method is incorrect The application speed is irregular	Correct the spray gun procedure Uniform gun spray

8. MARBLING

Description: Appearance fault in the grade of a metallic paint which leaves each gun spray pass visible. The aluminium flakes or the pearl particles are applied irregularly, which causes dark and light straight bands.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The temperature of your booth is too low	Adjust the product, support and booth temperature to between 18°Cand 23°C
The centre or the ends of the projection of your gun are loaded too much	Correct the adjustment of the gun Test on a sheet of paper (shape of the spray and product distribution)
The air pressure is not correct	Check the air pressure (see PRODUCT TECHNICAL SHEET)
Gun dirty, incorrect atomisation	Check the cleanliness of your gun

2- PRODUCTS

CAUSES	REMEDIES
The viscosity does not comply with the instructions	Adjust viscosity (see PRODUCT TECHNICAL SHEET)
The thinner used is inadequate	Choose a solvent that dries more quickly in colder or more humid conditions

3- METHODS

CAUSES	REMEDIES
The support to be painted is too cold	Increase the temperature of the support and product (see PRODUCT TECHNICAL SHEET)
Profusion of static electricity	Connect the vehicle to the booth earth
The overlapping of passes is irregular The gun is not perpendicular to the supports	Review the spray gun method. If the fault is only visible after the application of the clearcoat, dry, sand and apply a new basecoat and clearcoat.
The evaporation times between the coats are insufficient	Allow sufficient evaporation times between coats (see PRODUCT TECHNICAL SHEET)
The number of coats is excessive	Comply with the recommended number of coats (see PRODUCT TECHNICAL SHEET)

9. CURLING - CURLS

Description: Deterioration of the paint surface characterised by crinkling (at various depths), the film rising during the hardening process.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The application temperature is too low No evaporation of solvents	Increase the temperature of the support and the product to 23˚C

2- PRODUCTS

CAUSES	REMEDIES
The thinner used is too aggressive	Choose a lighter and less aggressive thinner
The viscosity is not correct	(see PRODUCT TECHNICAL SHEET)

3- METHODS

CAUSES	REMEDIES
No solvent compatibility test	Check surface sensitivity Solvent test (surface hardness)
Painting on not fully hardened top coat	Sand the surfaces fully and carry out the procedure again Insulate with a bi component primer or strip completely and carry out the procedure again
Hole on a vehicle with clearcoat sanded to the bi coat basecoat	Insulate with a bi component primer, applying thin coats to prevent soaking
The application is too wet from the first coat which causes the surface to be soaked	Apply a first very fine layer in order to insulate the surface
No evaporation of solvents	Allow sufficient evaporation time between coats

10. VISIBILITY OF THE MELTED UNIONS ON BI LAYER BASECOAT RE PAINTED WITH CLEARCOAT

Description: The outlines or edges of the union can be seen.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Application temperature too high	Decrease the application temperature (ideally between 18°Cand 23°C)
Lack of lighting Poor visibility	Check the cleanliness and the operation of the booth neons (see maintenance plan)
Application pressure too high	Check the application pressure
Incorrect gun adjustment (spray width, product flow)	Correct the gun adjustment according to the surfaces (flow) and according to your application: open to the maximum for a whole component, reduced for a small surface

2- PRODUCTS

CAUSES	REMEDIES
Inappropriate thinner, too light Incorrect positioning of the particles	Thinner intended for this use (see PRODUCT TECHNICAL USE)
Viscosity of the bi-layer basecoat not in compliance with the instructions	Adjust the viscosity according to PRODUCT TECHNICAL SHEET recommendations Take high temperature conditions into account (possibleover-diluting)
Too much difference in colour	Check the colour before application on a test plate
Time for evaporation insufficient between coats	Allow sufficient evaporation time between coats (see PRODUCT TECHNICAL SHEET)

CAUSES	REMEDIES
Poor preparation of the surface to be connected	Roughen the area to be faded out Use a grey abrasive pad or P1000and degrease the complete component Wipe and blow the component
Fog too dry or too much (dark areas)	Widen the layers by graduating uniformly to melt the union area Reapply clearcoat to the whole component (see Powdering the components)

11. VISIBILITY OF THE MELTED UNIONS ON THE DIRECT SHINY TOPCOAT

Description: The outlines or edges of the union can be seen.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Lack of lighting Poor visibility	Check the cleanliness and the operation of the booth neons (see maintenance plan)
Too much fluctuation in the application temperature	Adjust the application temperature to between 18°Cand 23°C
Application pressure too high	Check the application pressure
Incorrect gun adjustment (spray width, product flow)	Correct the gun adjustment according to the surfaces (flow) and according to your application: open to the maximum for a whole component, reduced for a small surface

2- PRODUCTS

CAUSES	REMEDIES
Inappropriate thinner Viscosity of the topcoat not in compliance with the instructions	Adjust viscosity (see PRODUCT TECHNICAL SHEET)
Too much difference in colour	Check the colour before application
Time for evaporation insufficient between coats	Allow sufficient evaporation time between coats

3- METHODS

CAUSES	REMEDIES
Poor preparation of the surfaces to be connected	Prepare the area to be faded out according to the method Buff the component surface (shiny part) Degrease, blow and wipe the component
Fog too dry and matt area too large	Widen while graduating the topcoats with light and wet coats. Over dilute with paint thinner and flood the fog area Finish with union thinner

12. FOG FALL OUT

Description: Small particles of paint spray fall on the vehicle during the first drying phase which causes lots of bubbles forming on the surface. Do not confuse with microbubbles, the appearance is practically identical, the causes are different.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Too high concentration of fog in the booth Clogged up filter	Replace the air extraction and inlet filters
The air extraction is insufficient Air circulation deficient	Get the air speed checked Adjust the opening valves of the air extraction and inlets on the chimneys Create a light overpressure
The air pressure is not correct (too powerful)	Check the air pressure at application (see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
The level of dilution is too high	Observe the level of dilution recommended by the paint manufacturer (see PRODUCT TECHNICAL SHEET)

3- METHODS

CAUSES	REMEDIES
Gun spray too far from the support	Review the gun method
Paint fog is already present on the vehicle	Remove the existing fog by polishing
Masking the vehicle carelessly	Completely mask the interior and exterior of the vehicle before painting Use of a disposable or reusable cover

13. REAPPEARANCE OF SANDING SCRATCHES

Description: When repairs are finished, sanding marks can be seen in the coating thickness. The parts concerned may also have no shine.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Buffing with an abrasive disc too rough before polyester application	Sand the transition areas Bevelling of the old paintwork with block sand papers P80 / P100.
Mastic and undercoat drying temperatures not complied with	Comply with the recommended temperature Use an Infrared dryer if possible

2- PRODUCTS

CAUSES	REMEDIES
Undercoat not suitable for the finish	Choose a protective bi component type undercoat for repair of 60 to 300µand an undercoat type 1K, for the new components max 30µ(see PRODUCT TECHNICAL SHEET)
Aggressive thinner (slowevaporation)	Use a lighter and less aggressive thinner
Sandpaper too rough	Sanding (see PRODUCT TECHNICAL SHEET): Sand the old paint surfaces (dry P500 to P600/ dry P400 to P800) Do not exceed more than three sizes of grain between every operation (example: the P240does not remove P80scratches, for this it is necessary to use P150or P180.

3- METHODS

CAUSES	REMEDIES
Original finishing Old surfaces sensitive to solvent	Identify the surfaces using a clean cloth soaked in solvent On damaged surfaces, sand down to the panel and insulate with a bi-component undercoat
Incorrect polyester finishing	Sand the polyester mastic dry They must be insulated with a pre-treatment primer
Hardening of the undercoat not sufficient (drying time)	Sand the polyester mastic dry They must be insulated with a pre-treatment primer
Undercoat not thick enough	Apply the undercoat in a pyramid shape on the whole surface while overlapping well on the mastic repair areas Apply a black matt sanding guide

14. FILM CREASING AT ASSEMBLY

Description: Paint film not fully hardened, remaining supple and deforming during accessory, aerial and door handle assembly, after tightening. The panel forms creases around the assembled parts.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The nozzle chosen for the gun is not suitable (diameter too large)	Check the choice of nozzle for your gun

2- PRODUCTS

CAUSES	REMEDIES
Product viscosity is not correct The product is too thick	Adjust product viscosity
The thinner used is not suitable, too heavy Poorevaporation	Check the thinner choice

3- METHODS

CAUSES	REMEDIES
Old paint has not hardened sufficiently	Heat the poorly hardened paint surfaces for 30 minat 60°C
Clearcoat or topcoat applied too thickly	Apply thinner coats (see PRODUCT TECHNICAL SHEET)
The number of coats is excessive	Comply with the advised number of coats
the drying is incorrect	Carry out the drying for the time and at the temperature recommended by the paint manufacturer Make sure there is total cooling before reassembly

15. MARKS IN THE PRIMER COAT

Description: Imperfection of a paint film characterised by the presence of small holes which look like needle holes.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The drying of the undercoat is not correct Incorrect usage of Infrared dryer	Heat (see PRODUCT TECHNICAL SHEET) using an Infrared dryer Observe the distances between the support and the Infrared dryer 60to 70 cm Observe the desolvation phase
The nozzle used on the gun is unsuitable or too large	Reconsider the choice of gun nozzle (see PRODUCT TECHNICAL SHEET)
Presence of impurities in the compressor, the purifier or the air pipes	Improve the compressor, sensor and air pipe cleanliness
The gun adjustment is inadequate	Correct the adjustment of the gun flow according to the application
The air pressure is not correct	Check the air pressure

CAUSES	REMEDIES
Viscosity does not comply with the recommendations (preparation without thinner) The thinner used is unsuitable	Check viscosity Observe the Technical Sheet recommendations Use a thinner which evaporates more slowly
Undercoat unsuitable for the load (example: 1K primer)	Apply a protective bi-component primer
Usage limit date is exceeded Hardeners that have absorbed humidity	Check the use limit date of the products

CAUSES	REMEDIES
Fault still present, after a previous repair not carried out following best practises	Check there are no marks on the support. If there are, sand until a homogenous surface, and then apply bi-component primer
The support to prime is too hot	Do not apply primer to a support that is too hot
Porosity of the polyester mastics	Cover the porosities with an extra fine polyester mastic before priming
Sanding residues Support sanded with water is not dry enough (humidity condensation)	Check the cleanliness of the support to be primed
Thick layer of primer coat applied	Apply thinner coats (see PRODUCT TECHNICAL SHEET)
The evaporation time between coats is insufficient	Allow sufficient evaporation time between coats (total mating)
The number of coats is excessive	Comply with the recommended number of coats (see PRODUCT TECHNICAL SHEET)

16. HOLES / MICROBUBBLES IN THE TOPCOAT OR CLEARCOAT

Description:

HOLES: Imperfection of a paint film characterised by the presence of small holes which look like needle holes.

MICROBUBBLES: Very small bubbles that can hardly be seen appear in the thickness of the film.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Temperature increases too quickly during drying phase	Adjust the booth with a desolvation stage of 5to 10 min before drying and an increase of 60˚Cin 7˚C/ min stages
Ventilation is too strong	Adjust the air speed to 0.40 m/s Add a retarder thinner temporarily
The temperature is high too for the application	Decrease the application temperature to between 18and 23˚C Avoid thermal shocks
The nozzle of the gun is not suitable, the flow is too strong	Check the nozzle choice for your gun
Presence of impurities in your compressor, purifier and air pipes.	Optimise the compressor, sensor and air pipe cleanliness
The adjustment of your gun is inadequate The air pressure is not correct	Correct the adjustment of your gun (paint flow / application speed) Check the air pressure

CAUSES	REMEDIES
Hardener is not suitable for the application temperature	Hardener must be chosen according to the application temperature (see PRODUCT TECHNICAL SHEET)
The thinner used is not suitable, too slow or too fast, it gets trapped in the successive coats	Use the solvent suitable for the temperature. A thinner which dries too quickly at a high temperature does not allow the solvents in the topcoats and clearcoats to evaporate in the correct way from 25°C
The viscosity does not comply with the recommendations and application conditions	Adjust the viscosity of your product (see PRODUCT TECHNICAL SHEET)
Usage limit date is exceeded	Observe the service life of the products

CAUSES	REMEDIES
Bicoat basecoat too thick, or not dry enough	Observe the thicknesses of the bicoat basecoat and the number of coats Observe the recovery time between the basecoat and the clearcoat
The support to be painted is too hot	Check the temperature of the supports and products in order to avoid a thermal shock
Clearcoat applied in a thick coat	Apply thinner coats. Comply with the recommended number of coats (see PRODUCT TECHNICAL SHEET)
The evaporation time between coats is insufficient	Allow sufficient evaporation times between coats, which may vary depending on the products and temperatures After application wait for 5to 10 minbefore the drying stage at 60°C
Thermal shock after drying	Allow the booth to cool down before getting the vehicle out

17. LOSS OF SHINE IN THE CLEARCOAT AND TOPCOAT

Description: This fault is characterised by less luminosity in the paint film and by a lack of shine and reflection. It can be localised or generalised on the whole of the repair area.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The booth temperature is irregular Strong humidity in the booth	Regulate the application temperature between 18and 23°C Do not spray the walls and the floor (stagnant water in the booth)
Too high concentration of fog	Replace the air extraction and inlet filters
Extraction fault (weak extraction) incorrect extraction of the solvents	Adjust the air speed in the cab 0.4 m/s It should be overpressurised
Impurity in the purifiers	Check the cleanliness of the purifiers
The nozzle of your gun is unsuitable	Correct the choice of gun nozzle Observe the recommendations
The adjustment of your gun is inadequate	Check the adjustment of your nozzle (product flow / application speed)
The drying is incorrect	Check that the booth performs a complete drying cycle: duration and temperature If the vehicle is not sufficiently dried, the polymerisation continues in the cold, outside and the hardener may absorb humidity

CAUSES	REMEDIES
The thinner or hardener used is inappropriate	Modify the choice of thinner or hardener
Viscosity is not in accordance with recommendations	Adjust product viscosity, an over dilution decreases the richness of the resin
Usage limit date is exceeded	Observe the service life of the products

3- METHODS

CAUSES	REMEDIES
Undercoat wet / wet too thick	Apply an undercoat max 20µ
Clearcoat or top coat applied either too thickly or too thinly	Observe the number of layers, thicknesses and evaporation time between coats (see PRODUCT TECHNICAL SHEET)
The evaporation times between Clearcoats and Topcoats are not complied with	Allow sufficient evaporation times between topcoats. Observe the evaporation time between the bicoat base and the clearcoat

18. INCORRECT HARDENING OF THE CLEARCOAT OR TOPCOAT

Description: This fault is perceptible with a slight finger touch, the surface is sticky or soft. The paint film may have light microbubbles, a loss of shine or a high sensitiveness to scratches.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Insufficient application temperature The atmosphere is too humid	Adjust the temperature of the support, products and booth to between 18and 23°C. Temperature lower than 5°Cstops polymerisation
The drying is incorrect, duration shortened Drying temperature not sufficient	Observe the recommended drying time and temperature The recommended time does not take into account the time for the temperature to increase
The air circulation in your booth is defective Incorrect discharge of solvents Not enough fresh air	Check the booth air speed at spraying 0.40 m/s During drying the air must be recycled 85to 90%to evacuate solvents and maintain the required oxygen rate
The choice of nozzle is unsuitable (diameter is too large)	Adapt the nozzle according to the product used (see PRODUCT TECHNICAL SHEET)
The adjustment of your gun is not appropriate	Correct the adjustment of your gun

2- PRODUCTS

CAUSES	REMEDIES
The clearcoat and hardener mixture ratio is not correct	Observe the recommended proportioning, (see PRODUCT TECHNICAL SHEET) More hardener does not dry faster
Excess of retarder or antisilicone thinner	Observe the operating instructions and recommended proportions
Hardener which has been subjected to humidity Incorrect choice of hardener	Put the caps back on the cans after use Check the cleanliness and the quality of your hardener Check the storage dates of the products

3- METHODS

CAUSES	REMEDIES
Basecoat too thick	Observe the thickness of the bi coat basecoat (see PRODUCT TECHNICAL SHEET)
The support to be painted is too cold	Increase the temperature of the support and product (23°C)
Topcoats and clearcoats applied very thickly	Apply thinner coats Take care not to overcharge flat surfaces
The evaporation time between coats is insufficient Solvent blocking	Allow sufficient evaporation times between coats
The number of coats is excessive	Comply with the recommended number of coats (see PRODUCT TECHNICAL SHEET)

19. INCORRECT DRYING OF THE MONO OR BI COMPONENT PRIMER

Description: Can be felt when touching slightly. The film is not hard. During sanding it can be noticed because the paper gets clogged. Can generate sanding scratches and loss of shine on all the finishes.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Application temperature not suitable The atmosphere is too cold or too humid	Increase the temperature of the support and product (23°C)
No drying of the undercoat	(see PRODUCT TECHNICAL SHEET) Dry the undercoat
The choice of nozzle is unsuitable (diameter is too large)	Choose the correct nozzle (nozzle diameter)
The adjustment of your nozzle is not appropriate (too much flow)	Readjust your gun: paint flow / application speed Check the air pressure

2- PRODUCTS

CAUSES	REMEDIES
The primer and hardener mixture ratio is not right	Observe the recommended proportions, too much hardener does not mean faster hardening
Hardener not suitable for loaded primers	Use recommended hardeners (see PRODUCT TECHNICAL SHEET)
Hardener which has been subjected to humidity	Put the caps back on the cans after use Check the cleanliness and the quality of your hardener

3- METHODS

CAUSES	REMEDIES
The support to apply primer to is too cold	Increase the temperature of the support and product (23°C)
Primer coat applied very thickly The number of coats is excessive	Apply thinner coats. Observe the PRODUCT TECHNICAL SHEET
The evaporation time between coats is insufficient, the solvents are blocked in the product thickness	Allow sufficient solvent evaporation time, increase the drying time in case of overloading

20. FORMATION OF STAINS

Description: This is characterised by a physical attack or a decolouration of the painted surface.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The nozzle is not cleaned correctly, particles from a previous application pollute the product to be applied	Check the cleanliness of your gun, do not immerse the gun during cleaning Clogging of the air circuit
Dirty cleaning solvents	Replace the cleaning solvents often

2- PRODUCTS

CAUSES	REMEDIES
Increase in peroxide, too much polyester mastic hardener has been used	Observe the correct proportions of peroxide hardener (see PRODUCT TECHNICAL SHEET- use scales) In case of excess, strip and start the mastic operation again

CAUSES	REMEDIES
Tree sap	Wash in soapy water for pollution less than 24 hours, after this time, clean with turpentine fluid
Guano	Wash with detergent and water ■ fine sanding, polishing, ■ sanding until all defects have disappeared. Reapply the primer and finishing coat
Stains without soaking, migration of an exterior agent: rubber support gallery, self-adhesive	Buff if the stains are superficial, otherwise sand then insulate with a bi-component primer and finish
Acid rains Bleached stains in the upper coat pigments	Wash with detergent and water ■ fine sanding, polishing, ■ sanding until all defects have disappeared. Reapply the primer and finishing coat
Cement stains	Wash in water and detergent for fresh projections Then Water + Acetic acid 10%
Reaction between the original finishing coat pigments and the solvents of the coat applied underneath. Poor pigment quality	Test the old finishing coat by applying a coloured coat on a small area.
Colour pigment appear of original or repair products that are sensitive to solvents (example: white on red = pinkish white)	Insulate the pigmentation with a bi component undercoat or a coat of black paint

21. BURYING

Description: Is characterised by a contracted appearance and a loss of shine. Along with the reappearance of sanding scratches.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The nozzle of your gun is unsuitable	Choose the correct nozzle (nozzle diameter)
The adjustment of your nozzle is not suitable, its flow is too strong	Readjust your nozzle: paint flow / application speed
Lack of equipment for drying the undercoats	Equip the workshop with an infrared type dryer To be used throughout the repair cycle

2- PRODUCTS

CAUSES	REMEDIES
Hardener and thinner inappropriate, procedure too fast	Check the choice of hardener and thinner (see PRODUCT TECHNICAL SHEET)
Incorrect hardener rate	Observe the hardener rate (see PRODUCT TECHNICAL SHEET)
The viscosity is not in compliance with the instructions	Adjust the viscosity of your products

3- METHODS

CAUSES	REMEDIES
Original topcoat sensitive to the solvents	Insulate with a bi-component primer, using thin coats
The bi coat basecoat is too thick	Comply with the number of recommended coats
Non-compliance with the technical sheets	Consult regularly and COMPLY with the technical sheets
The drying temperature has not been complied with for all the products used during painting	Observe the recommended drying time and temperature (see PRODUCT TECHNICAL SHEET) After drying and cooling, open the doors of your booth

22. POLYESTER MASTIC TRIMMING

Description: Reappearance of the edge of the repair area after undercoat drying. It leaves a lack of shine near the mastic and sanding scratches on the whole of the repair area.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Drying temperature of the polyester mastic not complied with	Observe the recommended drying times and temperature For complete drying, optimise the usage of infrared dryers
Insufficiently long and wide sanding blocks for the mastic surface.	Use a manual sander block adapted to the surface or a vibrating suction sander with a hard plate

2- PRODUCTS

CAUSES	REMEDIES
Polyester mastic insufficiently hard, incorrect proportion of peroxide hardener	Observe the proportion of peroxide hardener (see PRODUCT TECHNICAL SHEET) Use scales to visualise the proportions
Polyester mastic sanded with paper that is not suitable	Do not sand polyester mastic with grain that is: ■ too fine P240P320 : poor trimming, ■ too large P40P60 : scratches too deep, impossible to smooth scratches. Sand the polyester mastics with papers of grain P100 / P150PRODUCT TECHNICAL SHEET

3- METHODS

CAUSES	REMEDIES
Application of the polyester mastic on unknown surfaces	Identify the surfaces using a clean cloth soaked in solvent. Application of polyester mastic only on bare panels. Then insulate with a protective bi component undercoat or a polyester sprayable primer (see PRODUCT TECHNICAL SHEET)
Your buffing after straightening is too rough, poorly softened	After component straightening, dry sand with an orbital sander P80 or a block P100(hard plate) Smooth the old surfaces, repair areas should be perfect with no thicknesses
Mastic application insufficiently lengthened Mastic sanding incorrectly faded out	Apply mastic with knives suitable for repairing the surface by widening to the maximum
Mastic sanding with trimming on the edges	Begin the sanding at the centre of the mastic
Mastic sanding without block (or not suitable) to recover the flatness of the area on which the mastic has been applied	Apply a sanding guide Sand the polyester mastic with a block suitable for the surface For P150 P220Sand using crossed lines according to PRODUCT TECHNICAL SHEET

23. TRIMMING OF BI COMPONENT PRIMER

Description: This fault can be observed with partial primer application by sinking of the topcoat, structure contracted to around 5 mmwide on the edge of the primer after paint drying.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Drying temperature not complied with	Adjust the booth or the infra-red dryer to the recommended temperature and time Observe the recommended temperature (see PRODUCT TECHNICAL SHEET)
Sanding block not suitable Manual sanding	Sand with a suction orbital sander P320 P400 Use supple plates (sanding will be finer) For repairing large surfaces sand with a large block

2- PRODUCTS

CAUSES	REMEDIES
Incorrect dilution	Avoid diluting too much. Use the recommended thinner
Time for drying insufficient	Observe the number of coats and the recommended drying time Recommend the use of an infrared

3- METHODS

CAUSES	REMEDIES
Polyester mastic saturated with humidity	Always sand the polyester mastics dry, cover them quickly with pre-treatment primer and a bi-component primer
Non-adherence of the primer to shiny parts, lack of sanding	Sand correctly the mastic areas
Lack of sanding on the edge of the primer	Bevel with the sander the edge of the primer with fine sand paper P320 P400dry, finishing with P500 P600
Insufficient application of primer on the edge of the repaired areas Significant fog on the edge of partial primer	Apply the undercoat in a pyramid shape: a very wide first coat on the repair and reducing for the following coats

24. REFUSAL (SILICONE)

Description: Craters appear during or after the application, on surfaces of supports that have been polluted during or after the gun spray.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The booth ventilation is done in the workshop	Use exterior ventilation (see workshop equipment)

2- PRODUCTS

CAUSES	REMEDIES
The caps and covers have not been closed correctly on the cans and boxes allowing impurities to get in.	Close the cans and boxes after each use. The anti-silicone products to be mixed with the topcoat are only palliative products

3- METHODS

CAUSES	REMEDIES
The support has been cleaned carelessly Silicone, grease, oil residues etc.	Wash the vehicle with a solution composed of 20% vinegar or an alkaline solution with 10% ammonia in a bucket of hot water. Then rinse in clean water and dry
Greasy surface. Sweat stain. Soap, oil, exhaust smoke etc.	Carefully degrease small surfaces of the surfaces to be painted and wipe before evaporation
Use of silicone-based aerosols and buffing products in the workshop	Do not use silicone-based products. Silicone is very volatile, it can pollute a workshop very quickly
The vehicles are introduced in the booth with the engine running thus releasing their exhaust gases	Observe the cleanliness rules, push the vehicle manually into the booth with the engine switched off

25. WEAKNESSES / CRACKS

Description: Superficial cracks on paint type coating, characterised by small mosaic shaped cracks on the whole painted support.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The choice of the gun nozzle is inappropriate	(see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
Use of a very thick thermoplastic undercoat	Choose a bi-component undercoat
Application of a non-catalysed top coat (confusion with bi coat basecoat)	Observe the hardener and thinner proportions Sand down to stable surface then work upwards according to the product procedure

3- METHODS

CAUSES	REMEDIES
The wet undercoat and the top coat are too thick	Apply thinner coats Allow sufficient evaporation time for solvents between product coats
Application of a two component product on non hardened surfaces	Eliminate completely the areas concerned and if necessary start from the panel before proceeding with a complete application process
The weakening of the upper coat is caused by expansion due to the elasticity of the surface. Non stabilised surface, not hardened	Remove all sanding faults, then insulate with a bi-component undercoat

26. DETACHMENT ON PLASTIC MATERIALS

Description: Deterioration characterised by a loss of adherence which can be seen by the lifting of the film on the support or by the separation of coats.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The atmosphere is too humid, see humidity rate during application	Maintain the temperature of the support, booth and product between 18°Cand 23°C
Large quantities of various sorts of pollution in the compressor, purifier and air pipes (oil, humidity, dust, etc.)	Check the cleanliness of your compressor, purifier, filters and air pipes

2- PRODUCTS

CAUSES	REMEDIES
Adhesive primer inappropriate for the plastic support	Use an adhesive primer for plastic material
The proportion ratio of adhesive primer is not in compliance	Observe the proportion ratios (see PRODUCT TECHNICAL SHEET)

3- METHODS

CAUSES	REMEDIES
No support cleaning	Completely clean twice the surface to be painted with an Antistatic degreaser
The sanding is insufficient	Sand the components to be painted correctly, original primer or thermohardening
The adhesive primer coats are applied very thickly	Apply thinner coats. Comply with the number of recommended coats
The number of coats is excessive The recovery time is too long or too short	Observe the recovery time (chemical reaction) between the primary and the primer or the topcoat
Parts in drained supple polyurethane foam Composite materials (Plastic) soaked in mould removing agent	Proceed with drying for 1/2 hour at 60°C, to degrease again

27. DETACHMENT OF THE UNDERCOAT

Description: Deterioration characterised by a loss of adherence between the undercoat and the mastic or the original cataphoretic coating, which can be seen by lifts in the film on the support or by the separation of the coats.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The support to be painted is too hot	Maintain the temperature of the support, booth and product between 18°Cand 23°C
The atmosphere is too humid, see humidity rate	Maintain the temperature of the support, booth and product between 18°Cand 23°C
Incorrect usage of Infrared dryer	Observe the support/infrared and desolvation distance

2- PRODUCTS

CAUSES	REMEDIES
Hardener taken humidity, DLUoverlapped	Put the caps back on cans after use. Check the cleanliness and quality of your hardener, check the storage dates of the products
Hardener rate inappropriate Choice of thinner or hardenerinappropriate	Check the hardener rate Use the recommended thinner or hardener

3- METHODS

CAUSES	REMEDIES
No support cleaning	Clean the component to be painted completely with a surface cleaner
Sanding the old paint is not sufficient	Degrease and sand the surfaces to be primed with care, a matt appearance is essential Sand according to PRODUCT TECHNICAL SHEET
The support has either not received a filler or has received an unsuitable filler	Apply suitable filler on the bare supports (metal sheets, composite material) (see PRODUCT TECHNICAL SHEET)

28. DETACHMENT OF THE CLEARCOAT AND TOPCOAT

Description: Deterioration characterised by a loss of adherence which can be seen by the lifting of the film on the support or by the separation of coats.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Basecoat powdering	Avoid applications that are too dry Use the bicoat thinner, suitable for a temperature of 25°Cuse a slow thinner. (example: retarder thinner)

2- PRODUCTS

CAUSES	REMEDIES
Hardener which has been subjected to humidity	Put the caps back on cans after use. Check the cleanliness and quality of your hardener, check the storage dates of the products
Use of anti silicone in the basecoat to be recoated with clearcoat	Cleaning the support with an ammoniac product or applying thin coats of basecoat in order to block the silicone is not permitted
Hardener rate inappropriate Choice of thinner or hardener inappropriate	Check the hardener rate Use the recommended thinner or hardener

3- METHODS

CAUSES	REMEDIES
The sanding and cleaning of the old paint is insufficient	Degrease and sand the surfaces to be painted with care, there should be a matt finish before painting. The same applies with a polishing pad for a union
The bicoat basecoats are applied too thickly	Apply thinner bicoat basecoats 20 microns (see PRODUCT TECHNICAL SHEET)
The evaporation time between the bicoat basecoat and the clearcoat is too long	Observe the evaporation time between the bicoat base and the clearcoat

29. DETACHMENT OF THE POLYESTER MASTIC

Description: Characterised by the separation of the mastic from the panel or other types of support,

(electro, galva, alu).

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The mastic has been burnt with the use of an infrared device	Observe a distance of 60to 70 cmfrom the support when using an infrared device
The atmosphere is too humid. The temperature is too low during mastic application	See humidity rate Maintain the temperature during mastic application between 18°Cand 23°C

2- PRODUCTS

CAUSES	REMEDIES
Mastic inappropriate	Use mastic appropriate for the supports

3- METHODS

CAUSES	REMEDIES
No support cleaning	Completely clean the surface to be applied with mastic with a surface cleaner
Support too cold for mastic application	Increase the temperature of the support (the same as the product temperature) to avoid thermal shocks

30. BLISTERING

Description: Phenomenon characterised by the appearance of more or less voluminous damage under a coat of paint or under coats of complex coating. Small bubbles form in the film thickness.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Poor ventilation in the booth, high air humidity See humidity rate, exterior of site favouring humidity (water sources)	Regulate the workshop temperature between 18°Cand 23°Cas well as in the booth. Adjust the air speed 0.40 m/s Your booth must be overpressurised
Lifting due to too fast a temperature increase with an infrared dryer	Observe the desolvation phase and the distance between the support and infrared
Significant impurities and water in your compressor, purifier and air pipes	Clean your compressor. Check the cleanliness of the purifier filters and air pipes used in the paint workshop and the booth

2- PRODUCTS

CAUSES	REMEDIES
Thinner too aggressive, may cause the surface coats to deform or inflate.	Choose a thinner which is suitable for the finishing coat and the conditions in the workshop
Hardener which has been subjected to humidity	Check the cleanliness and the quality of your hardener Put the caps back on the cans after use
Polyester mastic sanded with water	Only sand the polyester products dry, cover them quickly with a pre-treatment primer and a bi-component primer

CAUSES	REMEDIES
Poor cleaning. Support contaminated by humidity. Sanding residues with grease, oil	Make sure the supports are cleaned. Wiping, blowing, degreasing
Support too cold	Heat the support. It must be at ambient temperature before paint application Avoid thermal shocks
The surface deforms or curls during application or drying	Remove the finishing coat of the areas concerned and reapply the paint. If required, remove all the paint and completely reapply on the bare metal

PAINT: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

All painting operations must be carried out in a location designed for these operations (e.g. booths).

The spray booths must comply with the standards currently in force (air speed at 0.40 m/sor above, no measurement below 0.30 m/s).

Periodic maintenance and checking of these facilities ensures their safety and quality.

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

When drying with an infrared device, it is important to respect:

- the distance, time and temperature specified on the product technical sheet. Use a distance thermometer part number: 77 11 237 210.
- the user and safety advice given by the manufacturer of the infrared device.

In the same way as for paintwork, the safety equipment (masks, filter cartridges, gloves, safety goggles, overalls, etc.) for this equipment can be acquired from your local IXELL supplier.

1. BODYWORK ON CNG / NGV VEHICLES

1- BOOTH TEMPERATURE (T):

- if (T) lower or equal to 65˚C: the CNGvehicle is permitted without emptying the fuel tank,
- if (T) between 65˚Cand 80˚C: the vehicle is permitted in the booth only if the fuel tank is emptied,
- if (T) greater than 80˚C: the CNGvehicle is not permitted in the booth unless the tank has been emptied and removed.

2. BODYWORK ON THE LPG VEHICLES

1- USING A SPRAY BOOTH

- When a vehicle enters a spray booth, remove the tank as a precaution or carry out flaring and degassing with a flare, then make it inert with a nitrogen flush.

■ If equipment (infrared lamp, etc.) needs to be used for drying mastic, primer or paint, near to the LPG tank, such as during a retouching procedure, it is essential to carry out flaring and degassing of the LPG tank and then to make it inert with a nitrogen flush.

Note:

If working at under 50˚C, it will be possible to leave the tank in place, on condition that it is filled to less than 70% of its capacity.

3. HIGH DURABILITY VARNISH

1- RECOMMENDATION

■ When the vehicle comes with original high durability varnish, it is strongly recommended that IXELL IXALIS type anti-scratch varnish is used during the repair.

■ Using this type of varnish guarantees the original function of the high durability varnish.

4. ANTI-CORROSION PROTECTION AFTER DRILLING

Each time a panel is stripped in the workshop when drilling, degrease and wipe the area and then use a fine paintbrush to apply the following:

■ A pre-treatment primer,
■ A bi-component primer
■ Paint in the vehicle body colour

5. FLEXIBLE PRODUCT

1- RECOMMENDATION

■ When painting a component which has been hit by gravel, it is advisable to add a flexible additive to the bi-component primer and to the varnish or topcoat.

6. TRICOAT PAINT OR TINTED CLEARCOAT

1- RECOMMENDATION

■ When the vehicle is equipped with a tricoat paint or a tinted clearcoat for each operation it must be assigned a labour time << additional to paint >> at the bicoat paint labour time for the operation of the concerned element.

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PAINT TOUCH UP: PREPARATION AND PAINT RANGE

Note:

The paint touch-ups on the matt paints are impossible, it is necessary to repaint the element.

Touch up for faults:

- Procedure 1 : Grains,
- Procedure 2 : Drips,
- Procedure 3 : Orange peel,
- Procedure 4 : Superficial scratches,
- Procedures 5 : Polishing method.

1. THE PRODUCTS

- Polishing liquid Vehicle: Parts and consumables for the repair (04B, Consumables - Products),
- Finishing liquid Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

2. PROCEDURE DESCRIPTIONS

1- PROCEDURE: GRAINS

Steps	Description	Special notes
1	Sand using the orbital sander or manual sanding block by graduating the sanding	P1500 to P2000
2	Finish with sanding finishing	(see 5 - PROCEDURE: POLISHING)

2- PROCEDURE: DRIPS

Steps	Description	Special notes
1	Sand using the orbital sander or manual sanding block by graduating the sanding	P1500 to P2000
2	Finish with sanding finishing	(see 5 - PROCEDURE: POLISHING)

3- PROCEDURE: ORANGE PEEL

Steps	Description	Special notes
1	Sand using the orbital sander or manual sanding block by graduating the sanding	P1500 to P2000
2	Finish with sanding finishing	(see 5 - PROCEDURE: POLISHING)

4- PROCEDURE: SUPERFICIAL SCRATCHES

Steps	Description	Special notes
1	Pass an indelible pen or paint across the scratch to use as a guide for sanding	White or black according to the colour of the support
2	Start by sanding to reduce the scratch without removing the sanding guide completely	P1500
3	Then, sand until the guide has totally disappeared by graduating the sanding	P2000
4	Finish with sanding finishing	(see 5 - PROCEDURE: POLISHING)

5- PROCEDURE: POLISHING

Note:

The temperature of plastic materials increase very quickly during the glazing process and the paint softens.

Steps	Description	Special notes
1	Use a little polishing liquid on the felt disc or on the foam plate	Polishing liquid
2	Repaint the sanded zone and the whole component	P2000
3	Polish until the product has disappeared	The abrasion will decrease progressively during polishing
4	Use a little polishing liquid on the felt disc or on the foam plate	Polishing liquid
5	Wipe with a sheepskin finishing cloth	Sheepskin

PANELWORKFINISHINGPRODUCTS

Note:

In compliance with the new European directive on recycling automobiles, vehicles manufactured after 1st July 2003 must no longer contain lead-based products.

Precisely, for bodywork repairs, these vehicles must no longer be repaired with tin solder, which contains a major proportion of lead.

The replacement solution for this type of operation is the use of aluminium loaded polyester mastic.

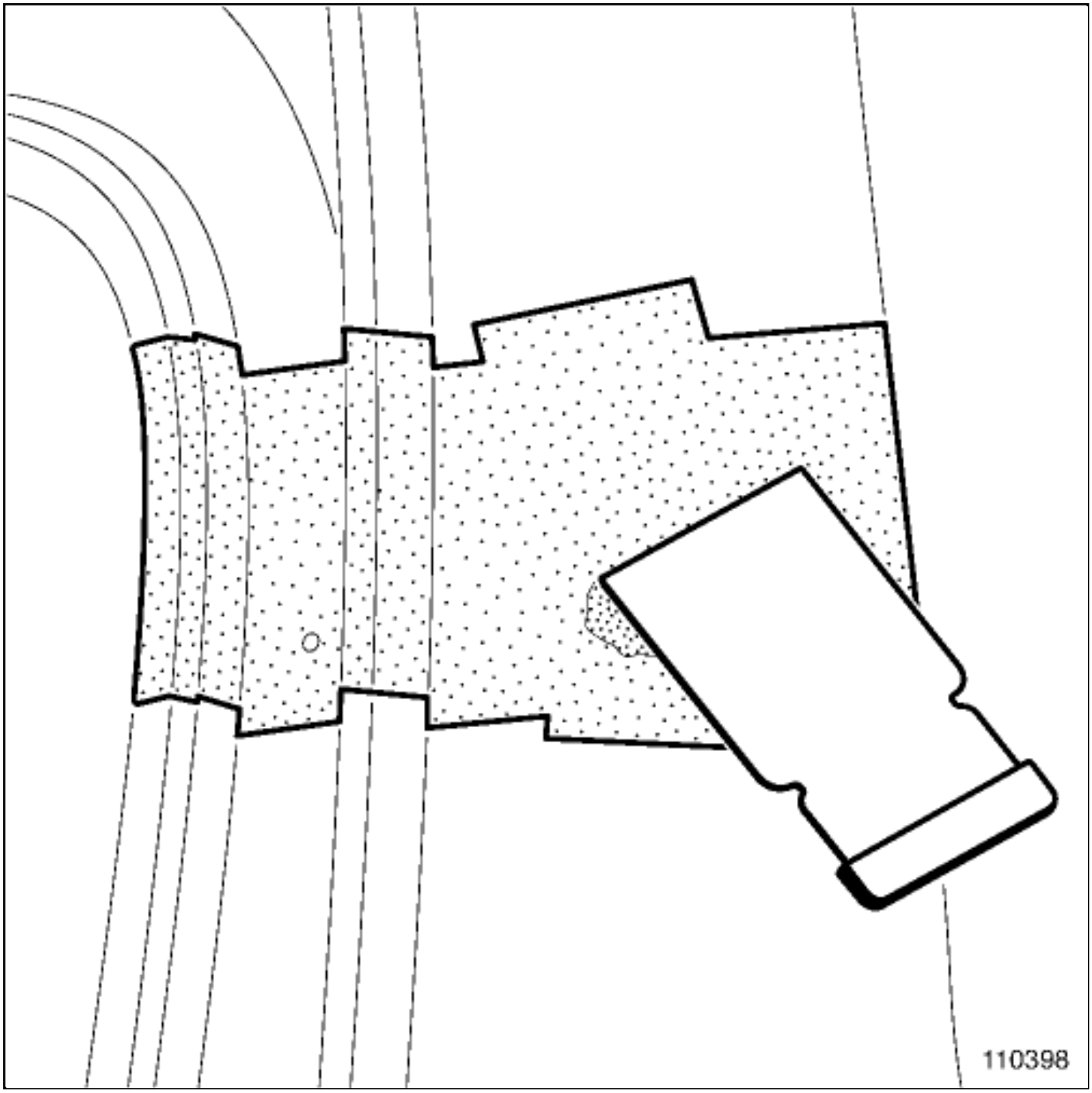
1. POLYESTER MASTIC

Use of bi-component polyester mastic for curves. The choice of the mastic polyester is made according to the nature of the support following the instructions in the Product technical datasheet.

This product is used only for surface finishing, and can never be used to remedy a lack of sheet thickness or be used as reinforcement to fill in a fold on a structure component.

Types of repair operations where surface finishing mastic is used:

- finishing after filing down chain bead welds,
- finishing the curve of a straightening job by "pull nail" type inertia,
- surface finishing of straightened zones,
- finishing of a scratch caused by hail or other causes.



Advantages:

- Easy to implement.
- Rapid drying.
- Easy to sand.

Disadvantage:

- No adhesion on surfaces applied with pre-treatment primer or non sanded surfaces.

Operator protection:

- obligatory respiratory protection,
- use extra ventilation source,
- obligatory hand protection.

2. PREPARATION

Note:

Observe the legislation in force in the country for all product usage.

Sand the repaired zones with P80 to P120.

Sand the edges of the zones to be repaired. Overlap the surface by approximately 60 to 70 mm for better adhesion of the mastic. Sand with P150 to P180.

(see 05B, Equipment and Tools, Tools for sanding a structural component: Use)

Dust the zones to be repaired by suction or with a cloth.

Blow and degrease with surface cleaner the zones to be repaired.

Vehicle: Parts and consumables for the repair

Note:

An excess of hardener in the mastic causes rings (modification of the pigmentation) that will be visible when the vehicle is painted**Paint fault: Description** (Technical Note 592A, 90A, General information).

Prepare the mastic, respecting the proportions of the hardener in accordance with the Product technical datasheet .

Comply with the drying times in accordance with the Product technical datasheet. It is recommended to use an infrared drying device to accelerate drying and facilitate sanding.

- Method for sanding the mastic:
  - Sand from the centre towards the exterior without touching the edge of the mastic.
  - Remove the scratches created previously by the sanding by starting to level the edges.
  - Sand the whole area to be repaired, overlapping by 150 to 200 mm with P240 to P280in order to apply undercoat.

Dust the zones to be repaired by suction or with a cloth.

Blow and degrease with surface cleaner the zones to be repaired.

Note:

Wet sanding of mastics is forbidden.

3. APPLICATION

1- SMALL SURFACES

Apply the mastic in a single coat, on the whole of the repaired surface creating a dome shape in the centre.

Comply with the drying times in accordance with the Product technical datasheet. It is recommended to use an infrared drying device to accelerate drying and facilitate sanding.

2- LARGE SURFACES

Fill in the faults remaining after panelwork operations by combing over with mastic.

Apply a second thick layer covering the entire zone to be repaired,three or four minutes (without prior sanding) after application of the first mastic layer.

Comply with the drying times in accordance with the Product technical datasheet. It is recommended to use an infrared drying device to accelerate drying and facilitate sanding.

4. FINISHING

Use a suitable grain in accordance with the Product technical datasheet.

- Method for sanding the mastic:
  - Sand from the centre towards the exterior without touching the edge of the mastic.
  - Remove the scratches created previously by the sanding by starting to level the edges.
  - Sand the whole area to be repaired, overlapping by 150 to 200 mm with P240 to P280in order to apply undercoat.

Apply the preparation procedure before painting

Steel bodywork component: Preparation and paint range (Technical Note 592A, 94A, Paint application procedure for panels).

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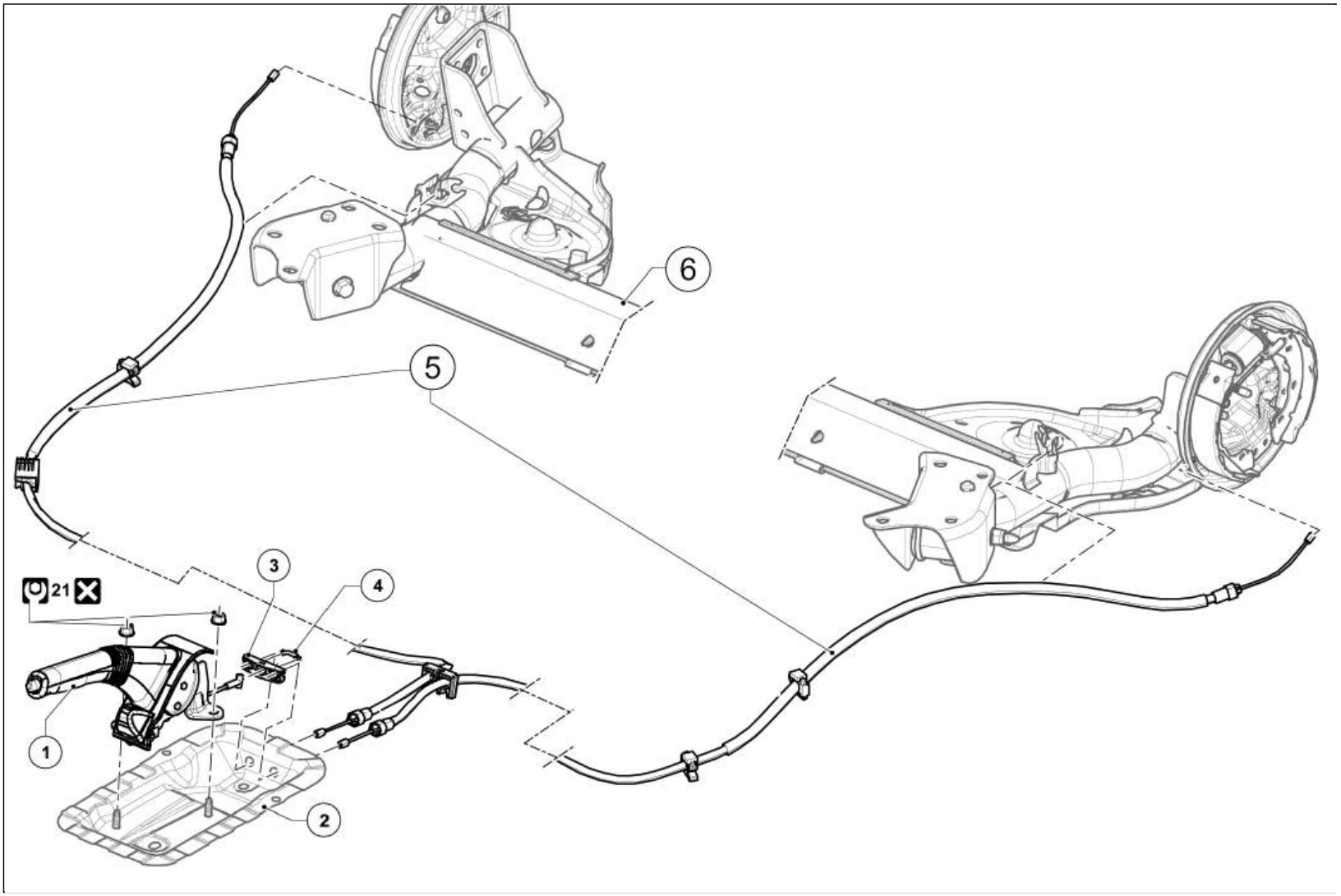
PARKING BRAKE ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Brake mechanism: Precautions for the repair ,
- Vehicle: Precautions for the repair .



(see **Illustration key: Description**) Legend .

Marks	Designations	Informations
1	Parking brake lever	Parking brake lever: Adjustment
2	Handbrake lever mounting reinforcement	
3	Compensator of the parking brake secondary cable	
4	Equalizer clip	
5	Parking brake cables	(see **Parking brake cables: Removal - Refitting**)
6	Rear axle assembly	Rear axle assembly: Exploded view

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PARKING BRAKE CABLES: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Brake circuit: Precautions for the repair ,
- Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced, etc.):

- Parking brake assembly: Exploded view ,
- Rear hub carrier assembly: Exploded view ,
- Rear drum brake assembly : Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove the central console Centre console assembly: Exploded view .

Remove the rear wheels Wheel: Removal - Refitting .

Remove the rear brake drums Rear drum brake assembly : Exploded view .

2. REMOVAL OPERATION

Remove the parking brake cable Parking brake assembly: Exploded view from the lever using pliers and a screwdriver.

Unclip Parking brake assembly: Exploded view :

- the parking brake cable sheath from the drum back-plate,

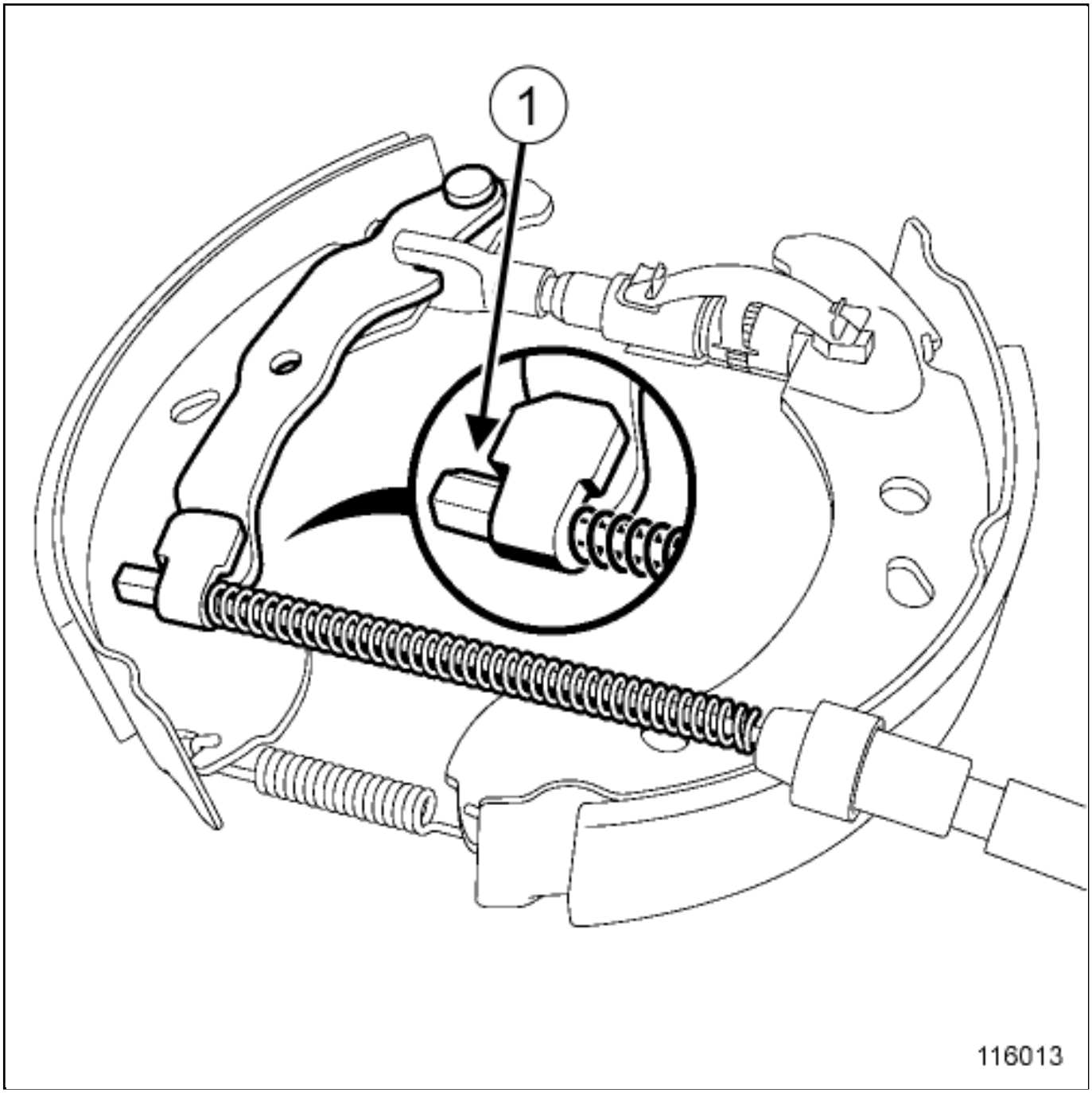
- the cables from their housing,
- the sheaths from their stop on the body using pliers,
- the parking brake cables from their guides.

Remove the parking brake cables Parking brake assembly: Exploded view .

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.



- Check that the cables(1) are correctly positioned on the levers.

- Adjust the parking brake cables(see 37A, Mechanical component controls, Parking brake lever: Adjustment) .

PARKING BRAKE LEVER: ADJUSTMENT

Note:

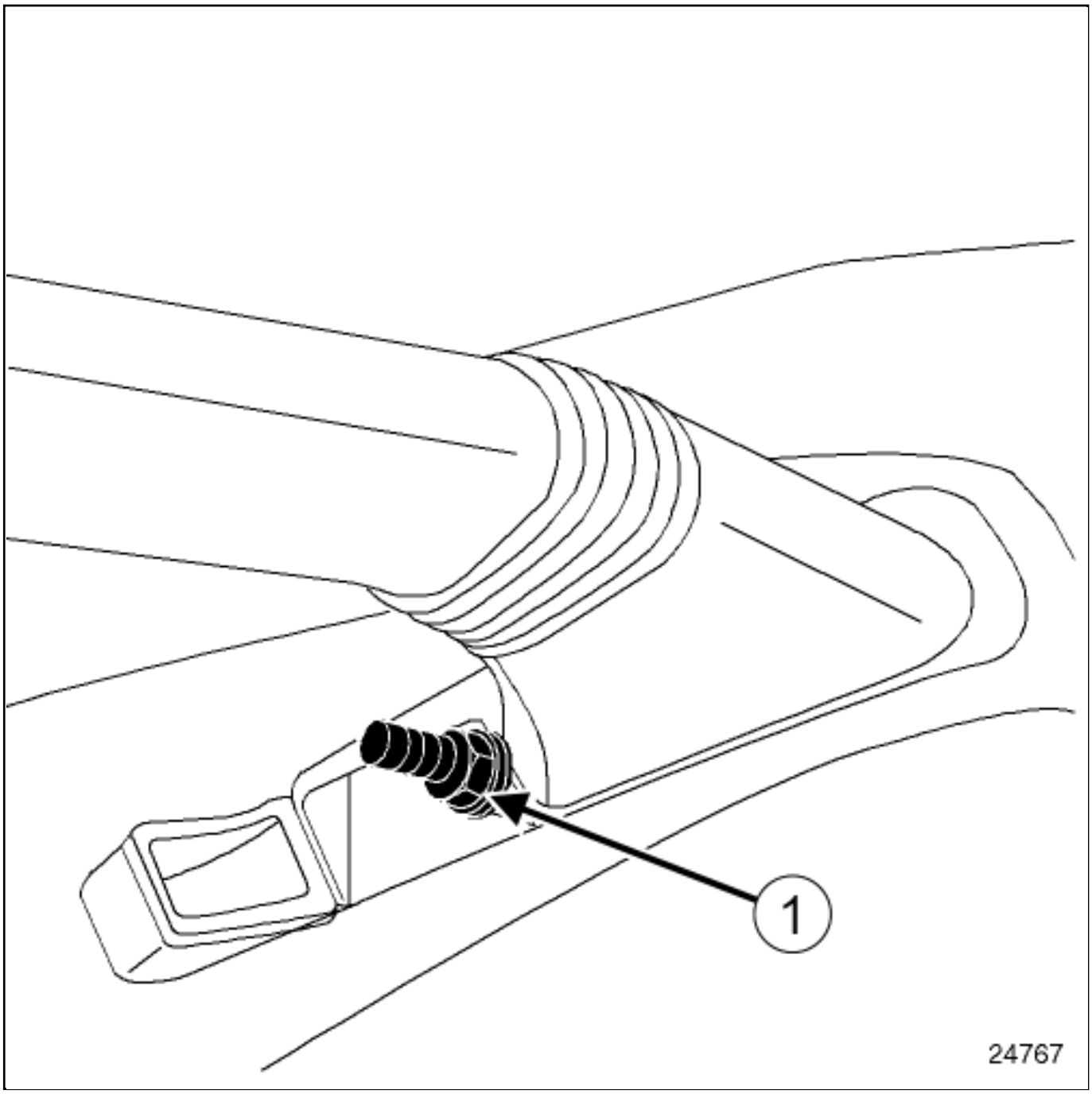
- A poorly adjusted parking brake:
  - prevents correct operation of the automatic compensation system for the brake shoes,
  - causes premature wear of brake shoes.

ADJUSTMENT

1. ADJUSTMENT PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Apply the parking brake five times to condition the cables for normal use.
- Put the parking brake lever into the released position.
- Check that the rear wheels turn freely. If they do not, check the following components and if necessary repair:
  - the parking brake cables,
  - the calliper piston,
  - the automatic compensation system,
  - calliper.
- Remove the rear wheels Wheel: Removal - Refitting .
- Remove the central console Centre console assembly: Exploded view .

2. OPERATION FOR ADJUSTMENT OF PART CONCERNED



- Loosen the nut(1) to release the cables.

- Position the parking brake lever at the 2nd notch.
- Move the adjustment nut until the disc or drum can no longer be turned by hand.
- Pull the brake lever several times.
- Put the parking brake lever into the released position.
- The disc or the drum must be able to turn freely. If not, move the nut gradually until the disc or drum

can turn freely.

3. FINAL OPERATION

- Refit the centre console **Centre console assembly: Exploded view** .

- Refit the rear wheels **Wheel: Removal - Refitting** .

PARKING DISTANCE CONTROL: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

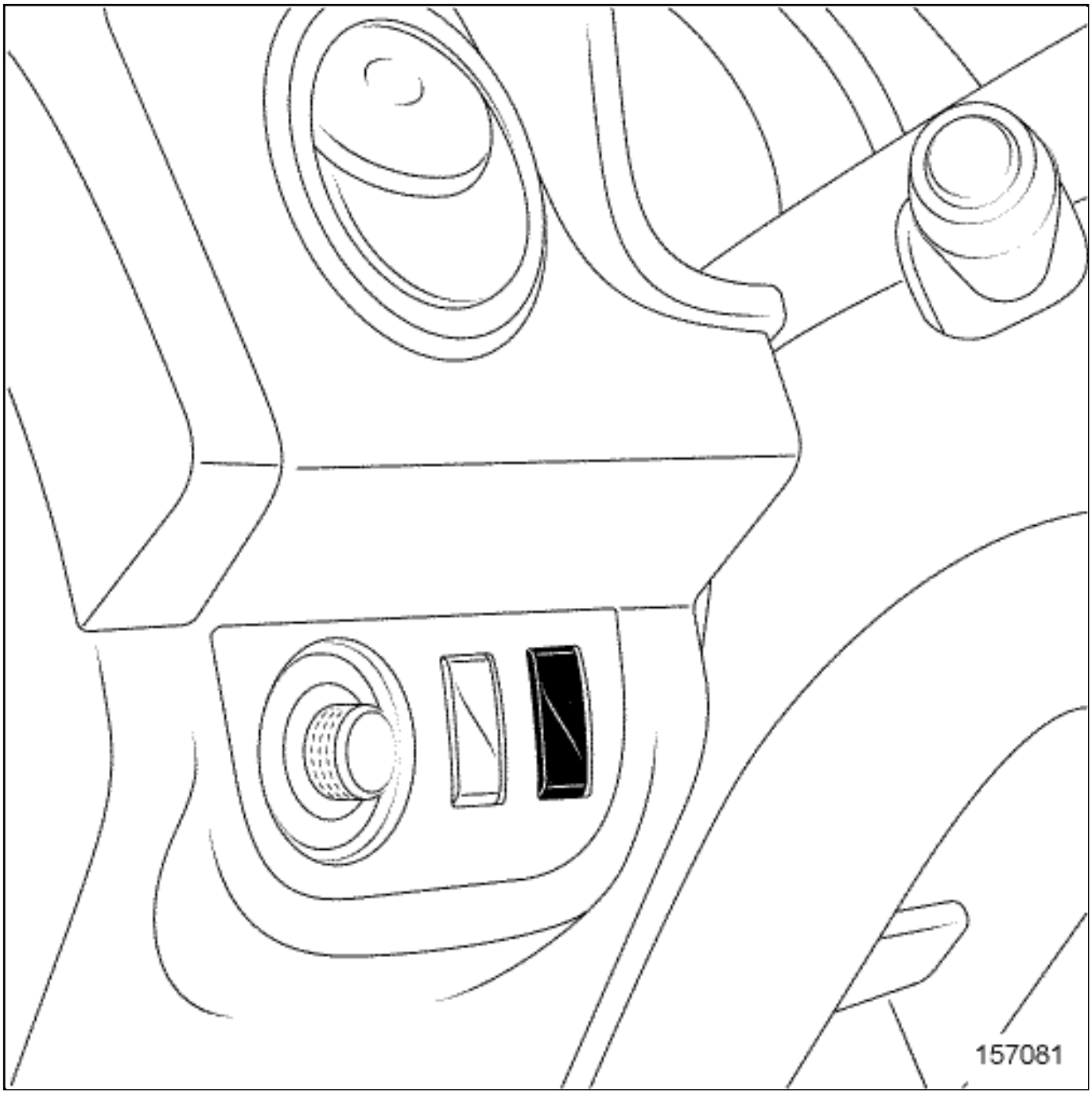
1. LIST OF COMPONENTS

1- THE PARKING DISTANCE CONTROL EQUIPMENT CONSISTS OF:

- a parking distance control switch
- a parking distance control computer
- rear proximity sensors**Rear bumper assembly: Exploded view**
- a rear parking distance control buzzer

2. LOCATION OF COMPONENTS

1- PARKING DISTANCE CONTROL SWITCH



Dashboard assembly: Exploded view

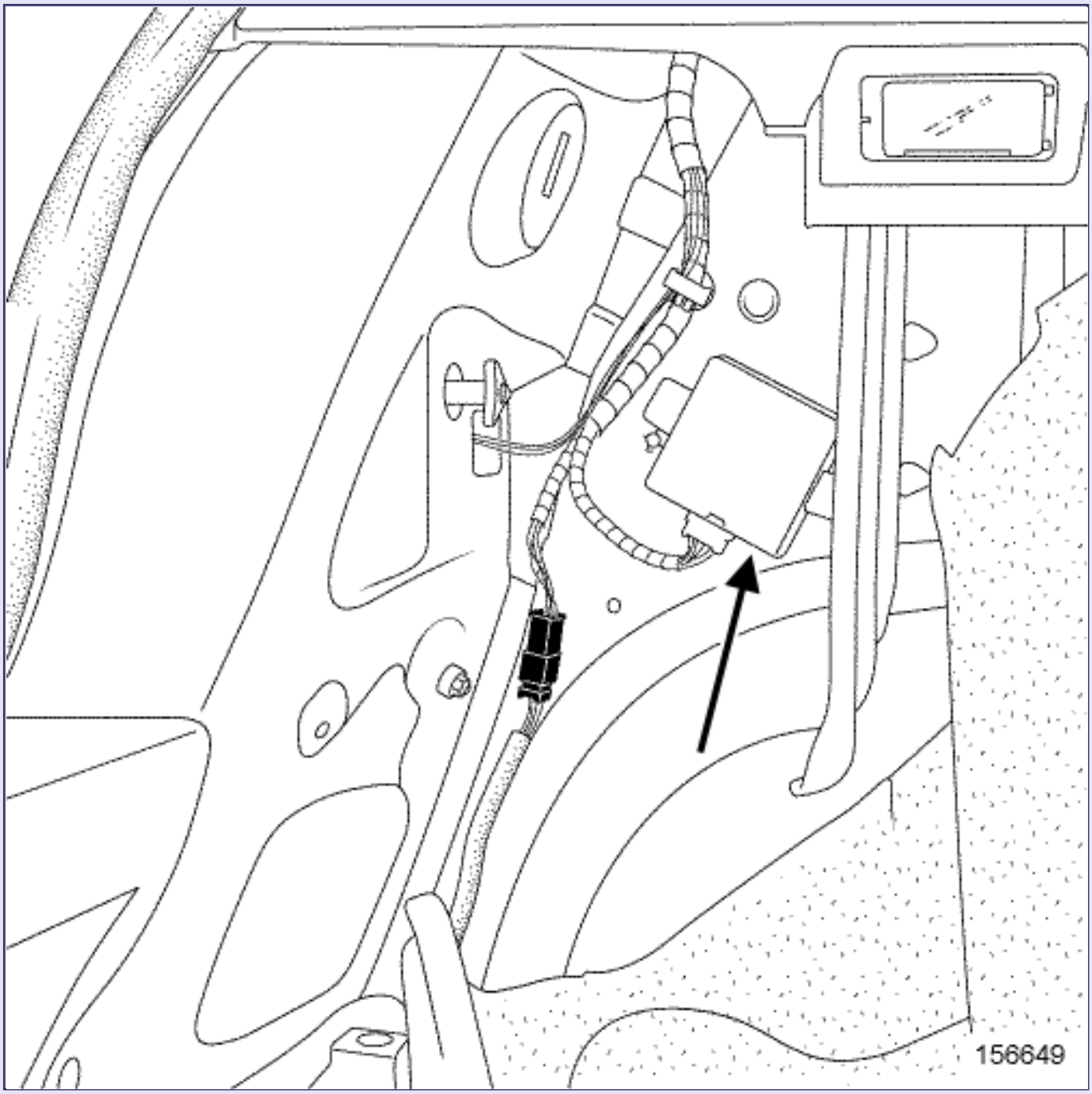
2- PARKING DISTANCE CONTROL COMPUTER

In the event of a replacement:

Apply the before / after repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

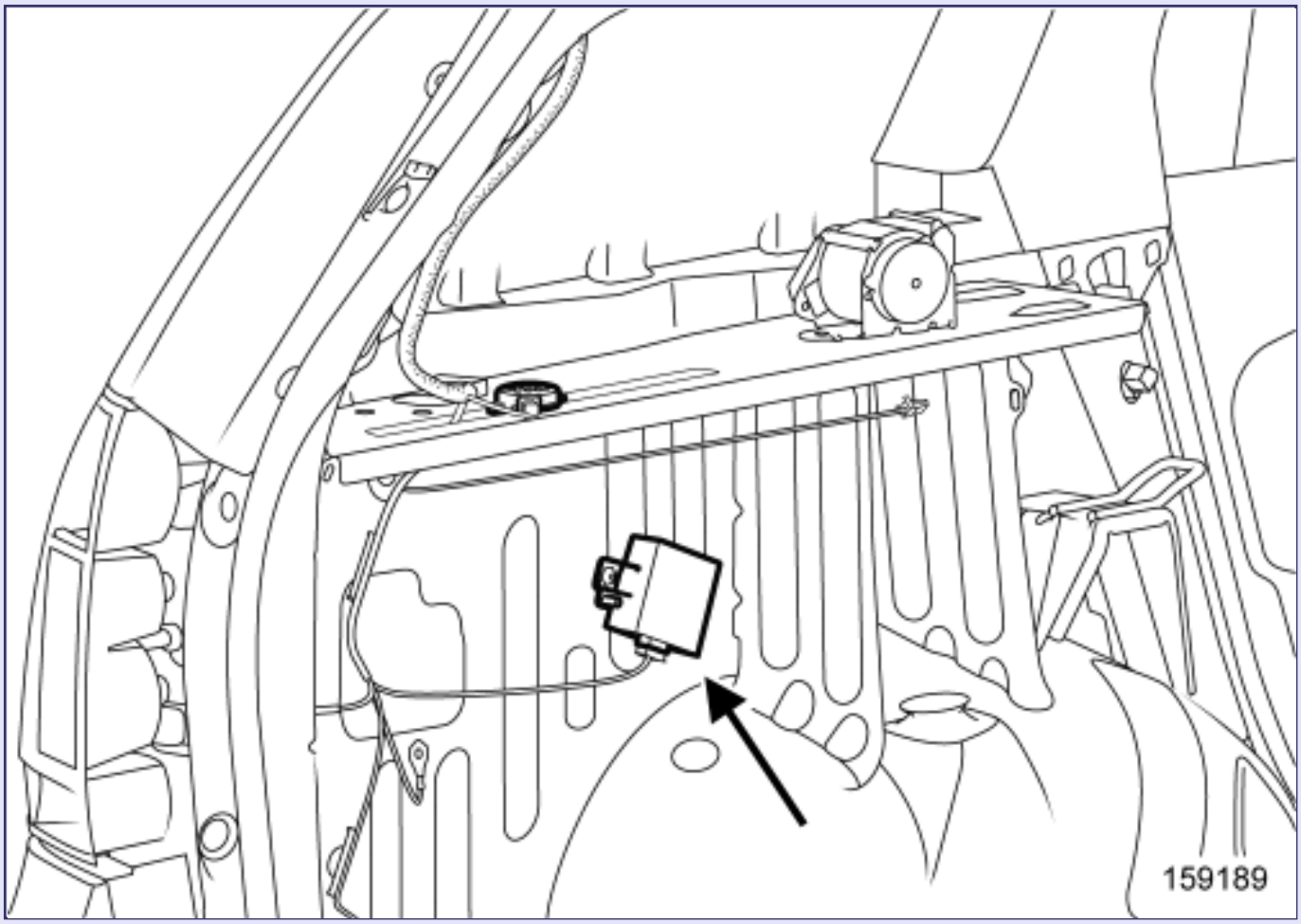
-Computer concerned by the Before / After repair procedure:

■"Parking distance control computer" .



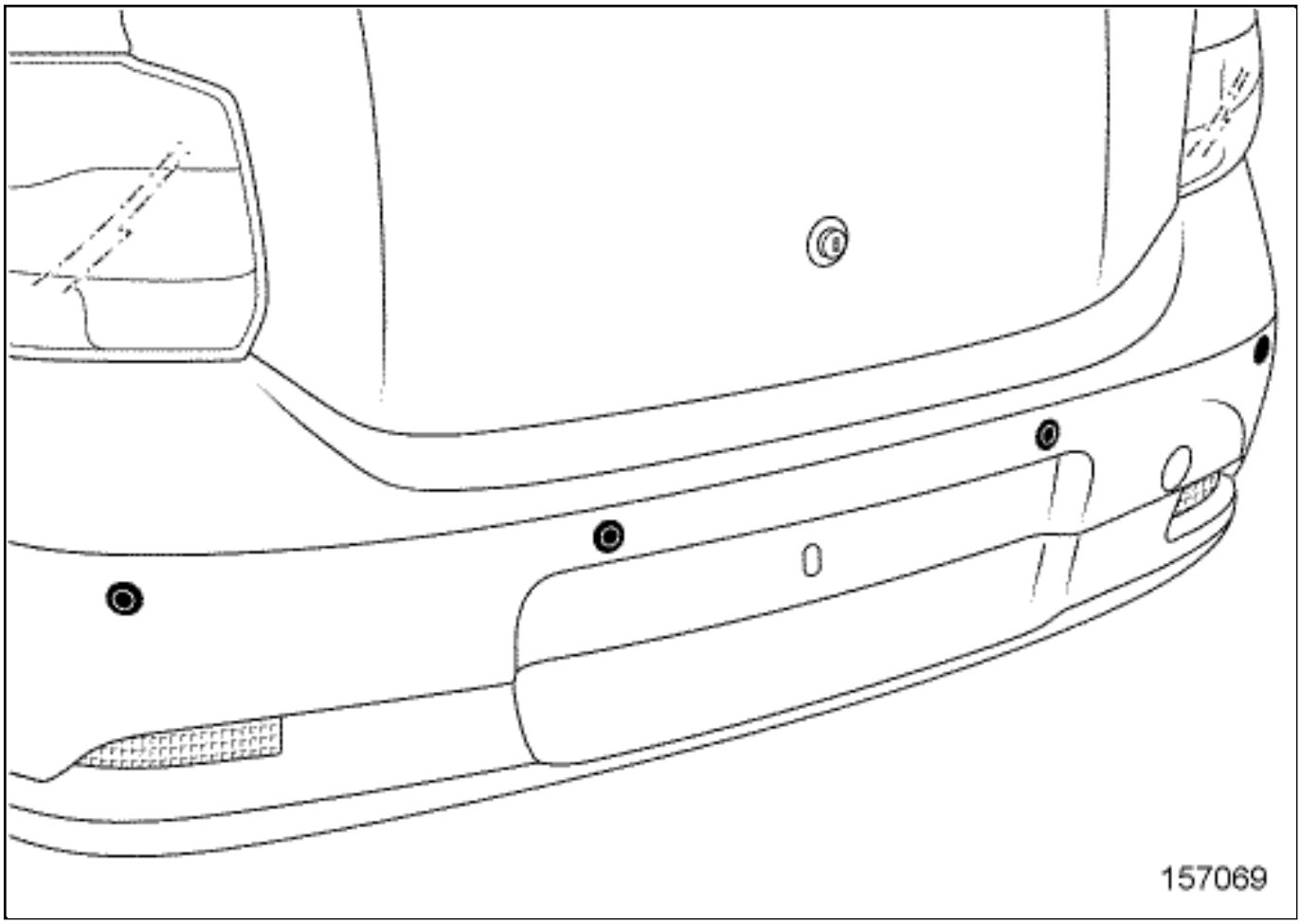
Remove the left-hand rear wheel arch trim Interior body side trim assembly: Exploded view **.**

K52(K52)



Remove the rear parcel shelf trim Interior body side trim assembly: Exploded view **.**

3- REAR PROXIMITY SENSORS

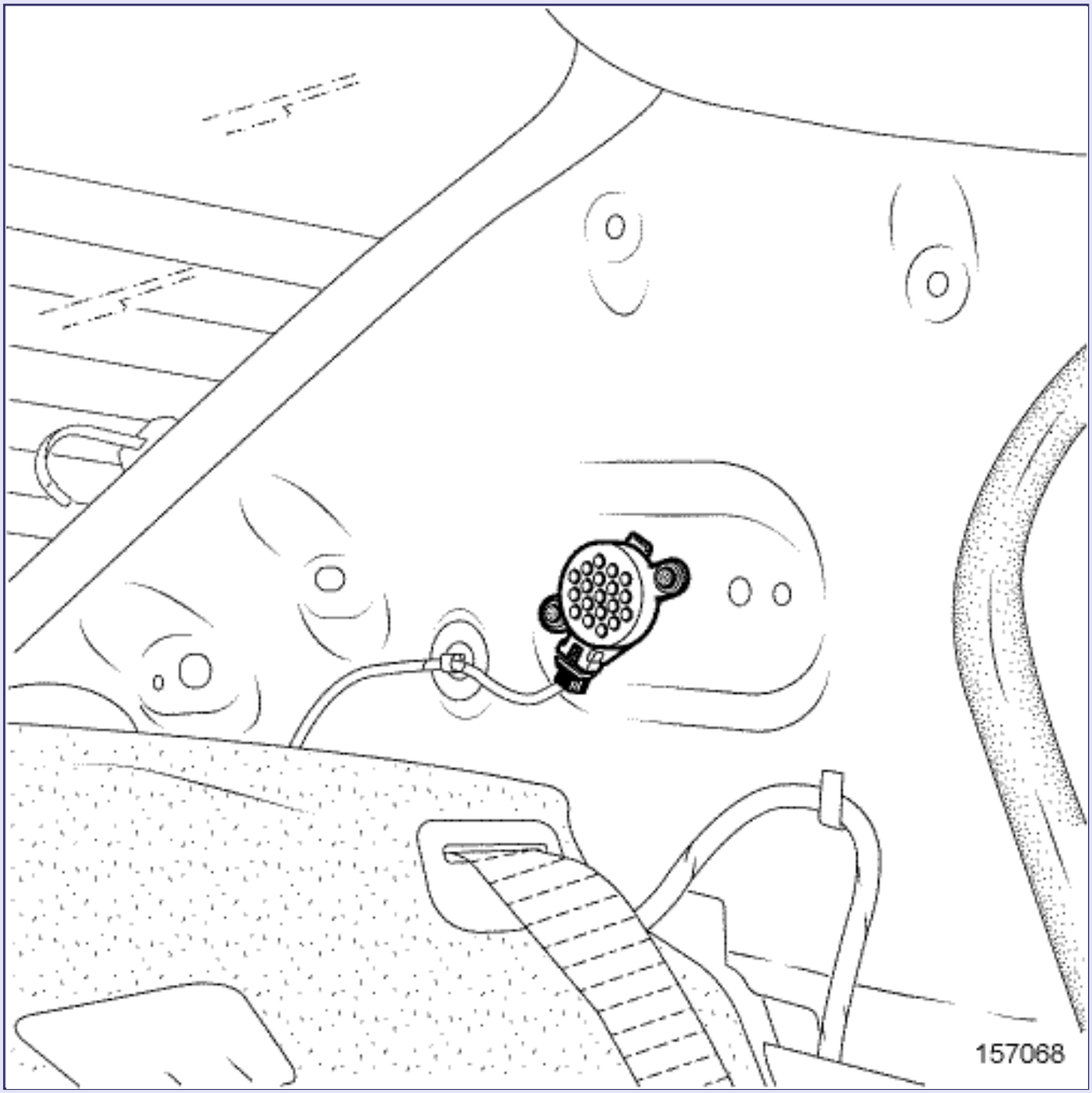


Rear bumper assembly: Exploded view

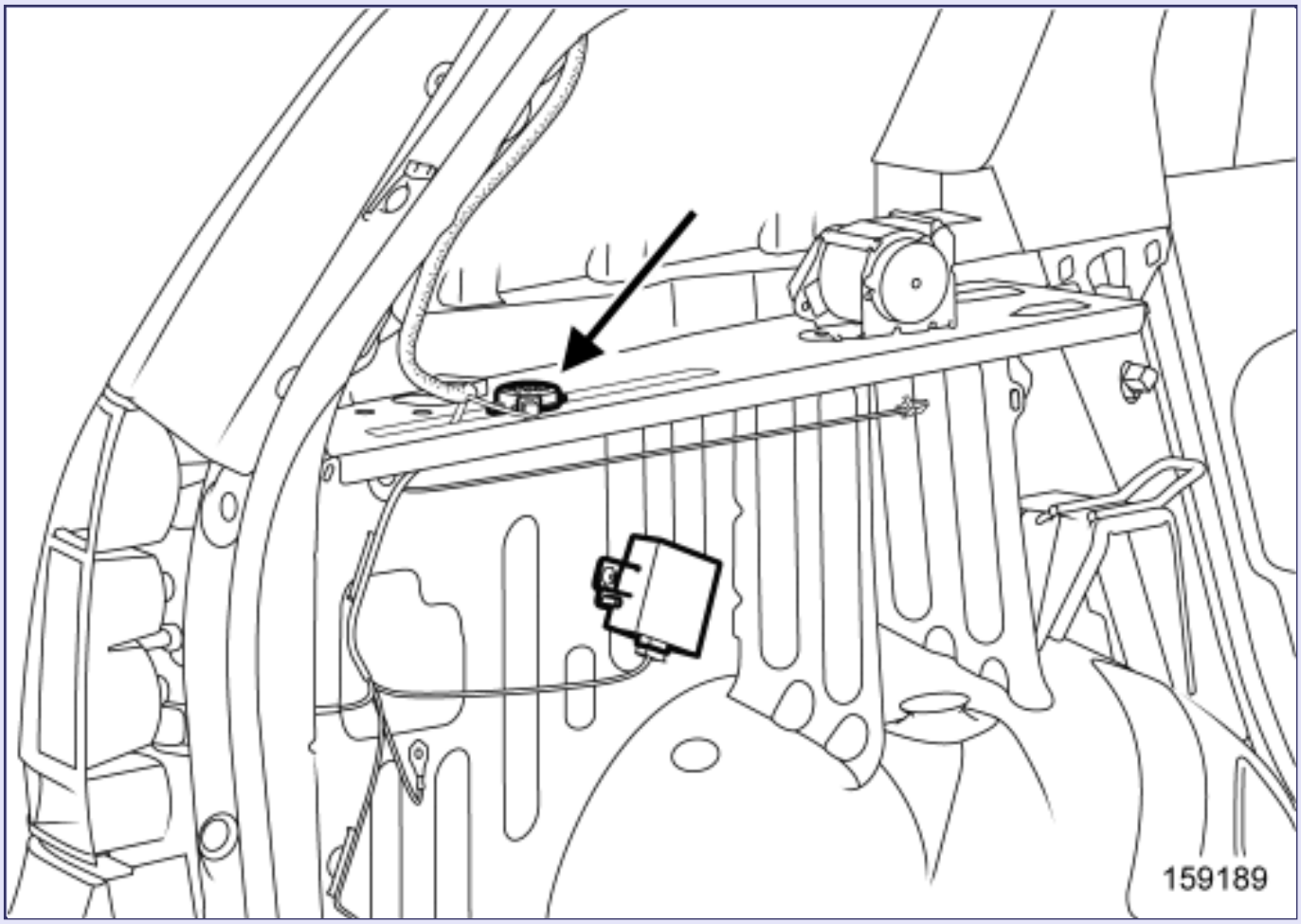
CAUTION

The proximity sensors are fragile. Handle with care as the external part cannot withstand impacts.

4- REAR PARKING DISTANCE CONTROL BUZZER



Remove the left-hand side quarter panel trim Interior body side trim assembly: Exploded view **.**



Remove the rear parcel shelf trim Interior body side trim assembly: Exploded view **.**

PARTICLEFILTER:CLEANING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
twin exhaust pipe kit
particle filter kit

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

Note:

Forced regeneration should only be carried out after the "SERVICE" warning light has come on accompanied by the "REGENERATE PARTICLE FILTER" message or the orange "CHECK EMISSIONS" warning light (see Driver's Handbook for vehicle concerned).

1. INSTRUCTIONS FOR CARRYING OUT A FORCED REGENERATION OF THE PARTICLE FILTER

1- PRECAUTIONS TO BE TAKEN DURING FORCED REGENERATION OF THE PARTICLE FILTER

- There are currently two additional kits for extracting exhaust gas in the workshop (see garage equipment catalogue), both of which are approved for use at the high temperatures produced during forced regeneration of the particle filter.

- The two kits approved for particle filter regeneration are:
  - the particle filter kitfor use with vehicles fitted with a single exit silencer,
  - the twin exhaust pipe kitfor use with vehicles equipped with a twin exhaust pipe on the silencer.

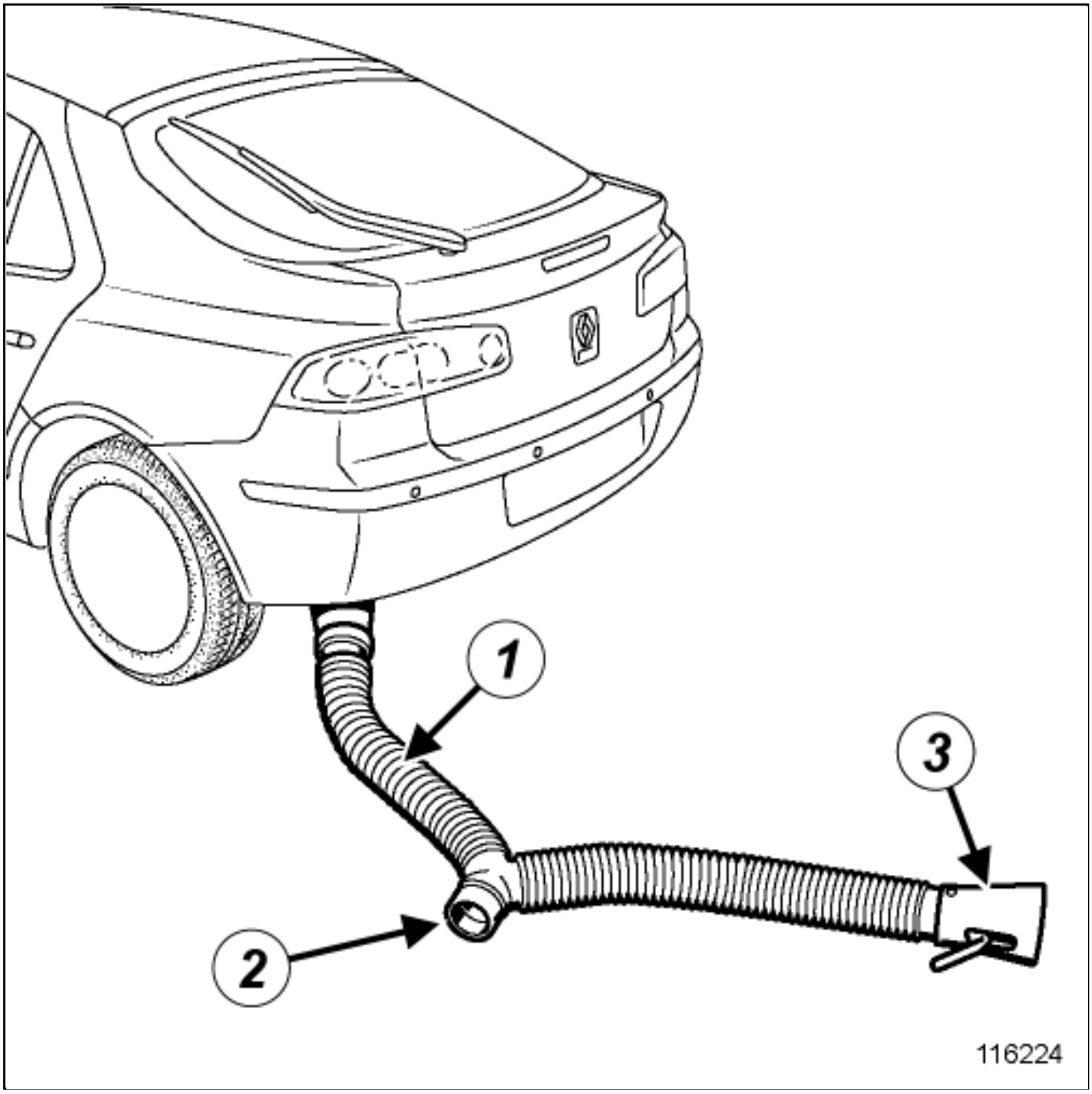
WARNING

During forced regeneration of the particle filter, the temperature of the exhaust pipe rises significantly.

Always use one of the two kits approved for the high temperatures reached during forced regeneration, whether the operation is carried out in the workshop using an exhaust gas extractor, or outside the workshop.

Ensure that when in use, the kit is not touching the rear bumper when carrying out forced regeneration of the particle filter.

TWIN EXHAUST PIPE KIT SPECIAL FEATURES



Note:

- When using a twin exhaust pipe kit(1) on a single exhaust pipe:
  - that an exhaust gas extractor is fitted to openings(2) and (3) if forced regeneration is being carried out in the workshop,
  - that openings(2) and (3) are positioned to direct the hot exhaust gases away from another vehicle or a person, if the operation is being carried out outside the workshop.

2. PROCEDURE FOR FORCED REGENERATION OF THE PARTICLE FILTER USING THE CLIP DIAGNOSTIC TOOL

- Open the bonnet before running the forced regeneration command.

CAUTION

To prevent engine racing, check the engine oil level using the dipstick before running the forced regeneration command.

The engine oil level must be between the "MIN" and "MAX" marks on the dipstick.

- If necessary, adjust the engine oil level.

- Connect the Diagnostic tool to the vehicle.

- Carry out forced regeneration of the particle filter (see Fault finding - Interpretation of commands) (13B, Diesel injection).

Note:

If required, the forced regeneration procedure may be stopped by pressing the engine Start button twice in succession.

Note:

Strong odours and thick smoke may be released during forced regeneration of the particle filter.

- When forced regeneration of the particle filter has finished, and using the Diagnostic tool:
  - deal with the present faults,
  - clear the stored faults.

WARNING

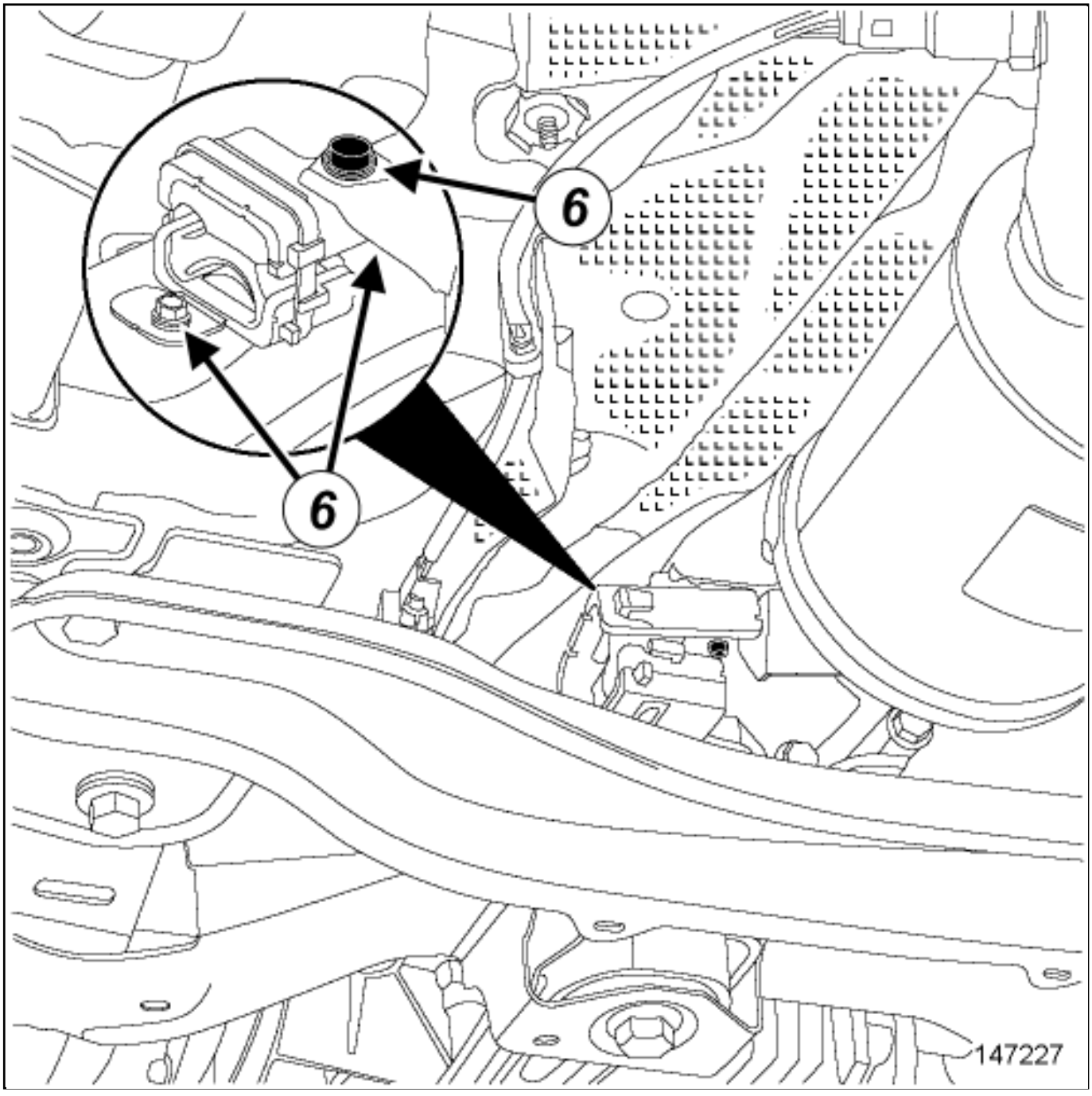
Wear heat protective gloves during the operation.

- Remove the kit for extracting the high temperature exhaust gas.

CAUTION

Check the engine oil level using the dipstick to avoid any risk of the engine racing.

The engine oil level must be between the "MIN" and "MAX" marks on the dipstick.



Note:

During the forced regeneration of the particle filter, the temperature in the exhaust pipe rises significantly.

When the vehicle is stationary, the condition of the intermediate pipe rubber mounting bushes may be impaired.

Always replace the exhaust pipe intermediate pipe rubber mounting bushes after each particle filter forced regeneration.

Beware of the temperature of the exhaust pipe.

WARNING

Wear heat protective gloves during the operation.

Remove:

- the intermediate pipe rubber mounting bush bolts(6) ,
- the intermediate pipe rubber mounting bush.

Refit:

- the new intermediate pipe rubber mounting bush,
- the intermediate pipe rubber mounting bush bolts.

PARTICLE FILTER PRESSURE SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19B, Exhaust, Exhaust assembly under body: Exploded view) .

WARNING

Wear heat protective gloves during the operation.

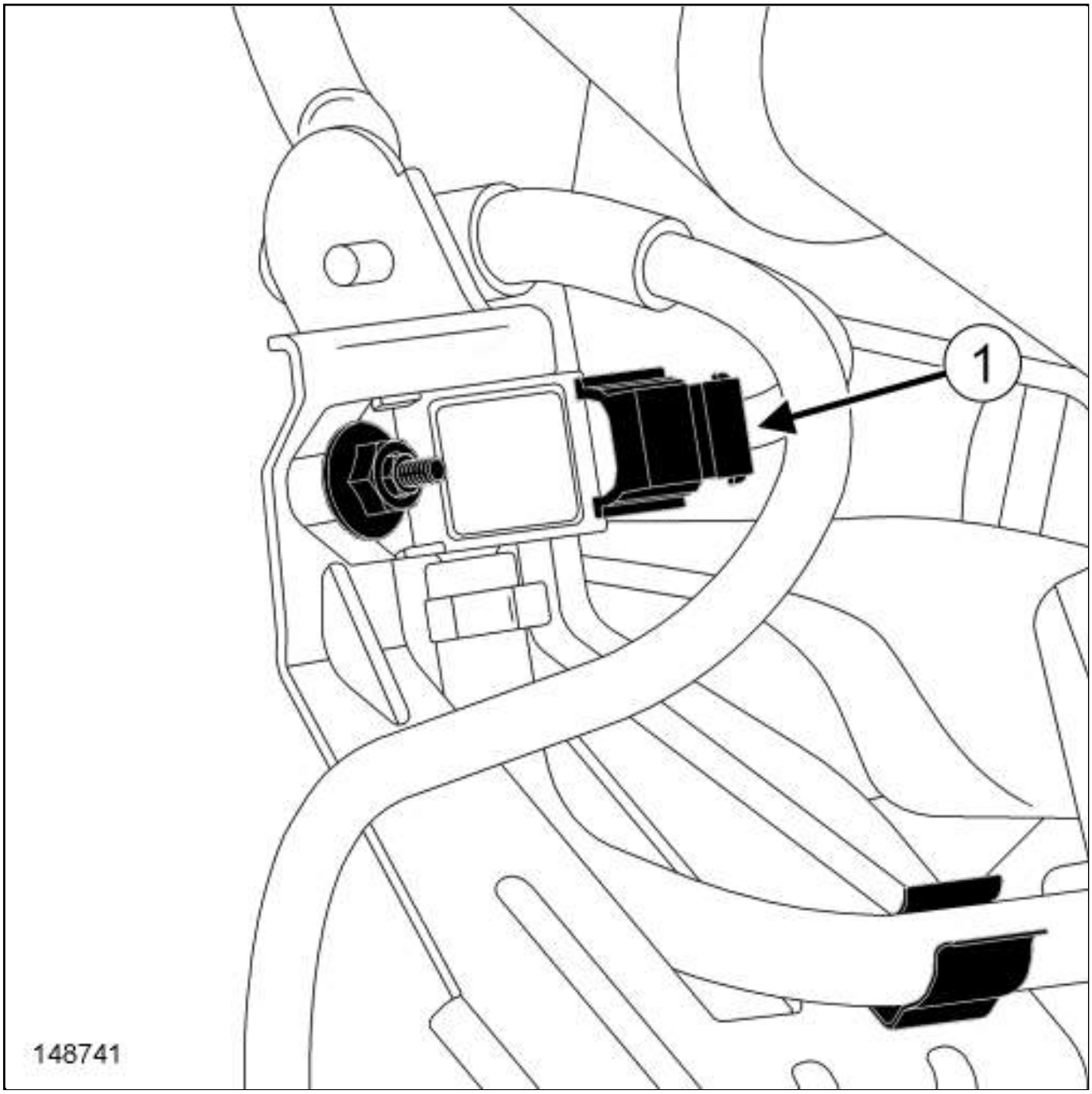
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the engine undertray bolts,
  - the engine undertray.

2. REMOVAL OPERATION



- Disconnect the particle filter pressure sensor connector(1) .

- Remove the particle filter pressure sensor(see 19B, Exhaust, Exhaust assembly under body: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

1- IF REUSING THE PARTICLE FILTER PRESSURE SENSOR

Coat the threading of the nut of the particle filter pressure sensor take-off pipe with copper anti-seize agentor copper - aluminium lubricantVehicle: Parts and consumables for the repair .

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool(see Diagnostic tool : Use) :

-Computer concerned by the after repair procedure:

■"Injection computer"

-Component concerned by the after repair procedure:

■"Particle filter pressure sensor"

PARTICLE FILTER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
component jack

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19B, Exhaust, Exhaust assembly under body: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair(see 19B, Exhaust, Exhaust: Precautions for the repair) .

WARNING

Wear heat protective gloves during the operation.

CAUTION

The part removed is subject to customer safety controls, the safety instructions detailed in this procedure must be observed when removing and refitting.

CAUTION

To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).
- Disconnect the battery Battery: Removal - Refitting (80A, Battery).
- Place a component jack under the particle filter.

CAUTION

Never separate the pressure measurement pipes from the particle filter pressure sensor.

Replace the "sensor - pipes - end piece" assembly, if necessary, supplied as a unit by the Parts Department.

- Remove (see 19B, Exhaust, Exhaust assembly under body: Exploded view) :
  - the take-off pipe of the particle filter temperature sensor,
  - the take-off pipe of the particle filter pressure sensor.

2. REMOVAL OPERATION

- Locate the area of the particle filter to be cut (see 19B, Exhaust, Exhaust assembly under body: Exploded view) .
- Cut the exhaust pipe (see 19B, Exhaust, Exhaust: Precautions for the repair) in the designated area to be cut (see **Exhaust: Parts and consumables for the repair**) .
- Remove (see 19B, Exhaust, Exhaust assembly under body: Exploded view) :
  - the particle filter,
  - the particle filter pressure sensor,
  - the particle filter temperature sensor.

REFITTING

1. REFITTING PREPARATION OPERATION

- Degrease and clean using surface cleanerVehicle: Parts and consumables for the repair :
  - the gasket surface of the turbocharger outlet exhaust gas duct,
  - the gasket face of the connecting hose,

- When re-using the sensors, coat the threading of the nut of the particle filter pressure sensor take-off pipe and the particle filter temperature sensor with copper anti-seize agentor copper - aluminium lubricant Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

2. REFITTING OPERATION

- Refit the particle filter(see 19B, Exhaust, Exhaust assembly under body: Exploded view) .

- Fit new After-Sales exhaust sleeves(see 19B, Exhaust, Exhaust: Precautions for the repair) .

WARNING

Position the "nut and bolt securing the sleeve" assembly so that the assembly cannot come into contact with the underbody.

- Tighten the sleeves while relieving the exhaust to ensure alignment(see 19B, Exhaust, Exhaust: Precautions for the repair) .

3. FINAL OPERATION

- Refit (see 19B, Exhaust, Exhaust assembly under body: Exploded view) :
  - the particle filter pressure sensor,
  - the particle filter temperature sensor.

- Connect the batteryBattery: Removal - Refitting (80A, Battery).

- Apply the after repair procedure using the Diagnostic tool(see Diagnostic tool : Use) :

-Computer concerned by the after repair procedure:

■"Injection computer"

-Component concerned by the after repair procedure:

■"Particle filter"

- Check:
  - that all the exhaust pipe heat shields are in place and properly attached,

- that there is no contact with the underbody.

Start the vehicle.

Check that there are no leaks and deal with them if necessary.

PASSENGER COMPARTMENT COOLING ASSEMBLY: EXPLODED VIEW

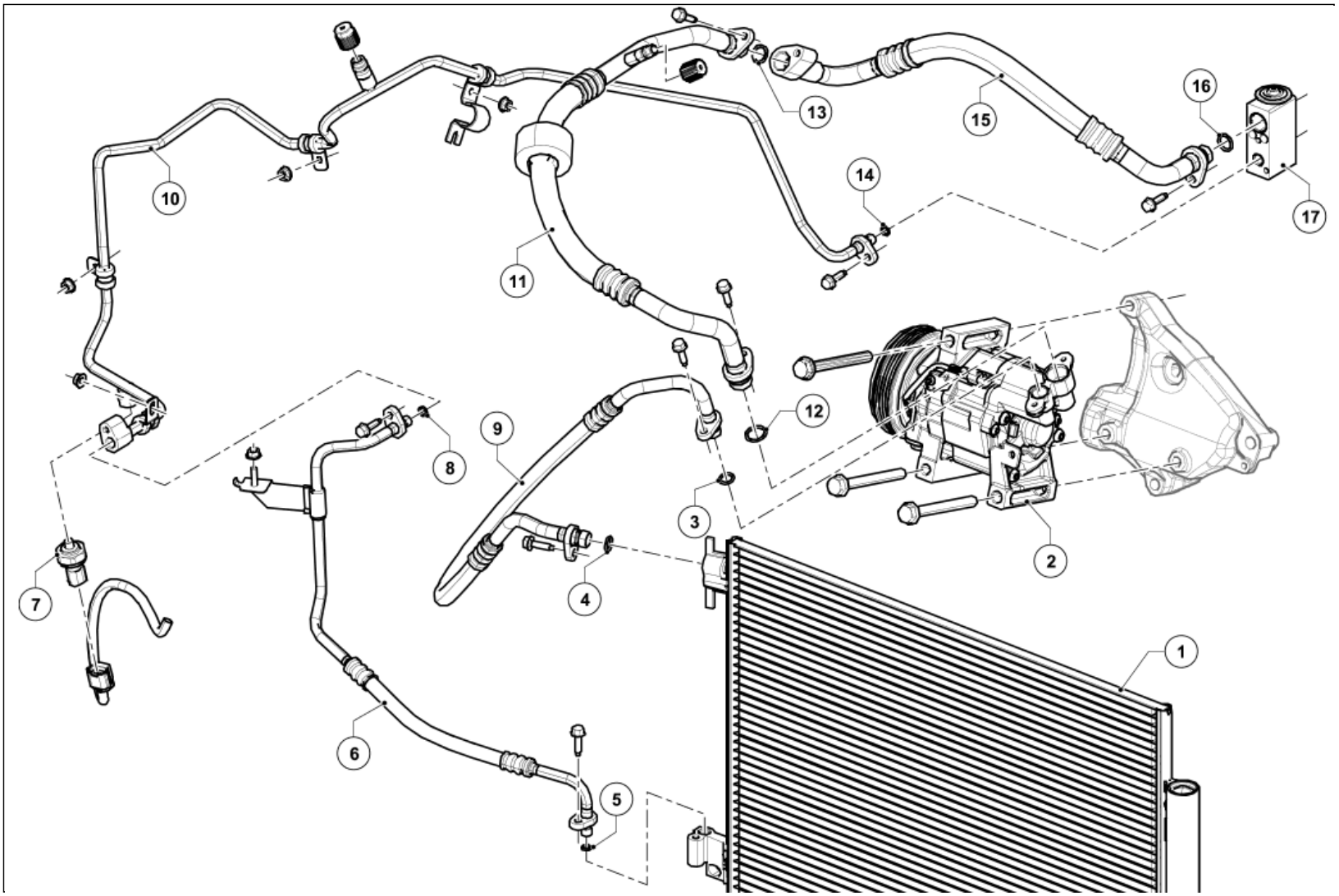


Illustration key: Description Legend .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Condenser	(see 62A, Air conditioning, Condenser: Removal - Refitting)
2	Compressor	(see 62A, Air conditioning, Compressor: Removal - Refitting)
3	Refrigerant pipe seal	(see 62A, Air conditioning, Refrigerant pipe seal: Removal - Refitting) and(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning)
4	Refrigerant pipe seal	(see 62A, Air conditioning, Refrigerant pipe seal: Removal - Refitting) and(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning)
5	Refrigerant pipe seal	(see 62A, Air conditioning, Refrigerant pipe seal: Removal - Refitting) and(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning)
6	Condenser - intermediate pipe connecting pipe	(see 62A, Air conditioning, Condenser - intermediate pipe connecting pipe: Removal - Refitting)
7	Pressure sensor	(see 62A, Air conditioning, Refrigerant pressure sensor : Removal - Refitting)
8	Refrigerant pipe seal	(see 62A, Air conditioning, Refrigerant pipe seal: Removal - Refitting) and(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning)
9	Condenser - compressor connecting pipe	(see 62A, Air conditioning, Compressor - condenser connecting pipe: Removal - Refitting)
10	Expansion valve/intermediate pipe connecting pipe	(see 62A, Air conditioning, Expansion valve - intermediate pipe connecting pipe at the expansion valve outlet: Removal - Refitting)
11	Intermediate pipe - compressor connecting pipe	(see 62A, Air conditioning, Compressor - intermediate pipe connecting pipe: Removal - Refitting)
12	Refrigerant pipe seal	(see 62A, Air conditioning, Refrigerant pipe seal: Removal - Refitting) and(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning)
13	Refrigerant pipe seal	(see 62A, Air conditioning, Refrigerant pipe seal: Removal - Refitting) and(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning)
14	Refrigerant pipe seal	(see 62A, Air conditioning, Refrigerant pipe seal: Removal - Refitting) and(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning)
15	Expansion valve/intermediate pipe connecting pipe	(see 62A, Air conditioning, Expansion valve - intermediate pipe connecting pipe at expansion valve inlet: Removal - Refitting)
16	Refrigerant pipe seal	(see 62A, Air conditioning, Refrigerant pipe seal: Removal - Refitting) and(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning)
17	Expansion valve	(see 62A, Air conditioning, Expansion valve: Removal - Refitting)

PASSENGERCOMPARTMENTHEATINGANDVENTILATIONASSEMBLY:EXPLODEDVIEW

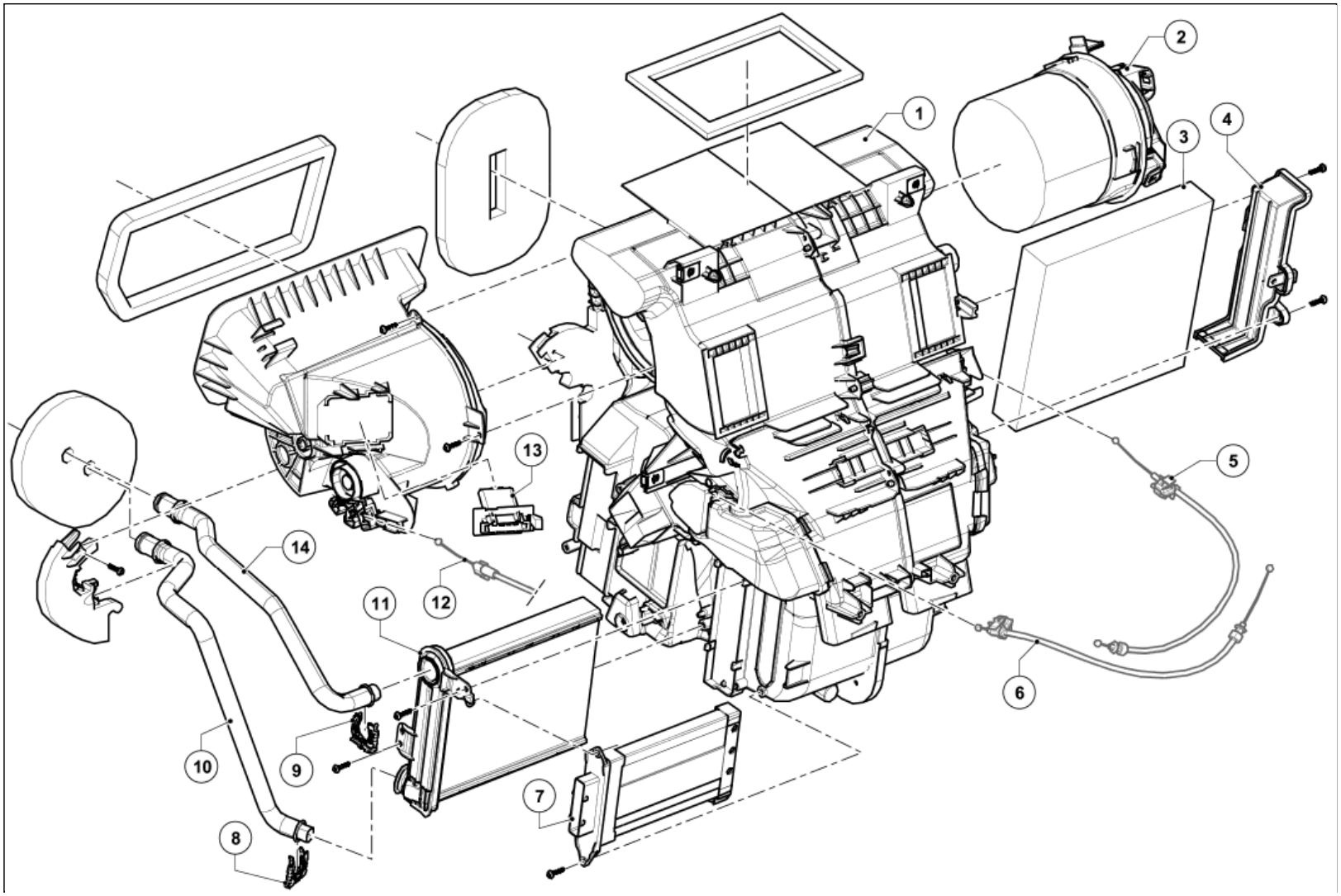


Illustration key: Description Legend .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Distribution unit	(see 61A, Heating, Distribution unit: Removal - Refitting)
2	Fan assembly	(see 61A, Heating, Fan assembly: Removal - Refitting)
3	Lower cabin filter	(see 61A, Heating, Cabin filter: Removal - Refitting)
4	Cabin filter flap	(see 61A, Heating, Cabin filter: Removal - Refitting)
5	Air mixing cable	(see 61A, Heating, Air mixing cable: Removal - Refitting)
6	Air distribution cable	(see 61A, Heating, Air distribution cable: Removal - Refitting)
7	Heating resistors	(see 61A, Heating, Heating resistors: Removal - Refitting)
8	Heater matrix pipe clip	(see 61A, Heating, Heater matrix: Removal - Refitting)
9	Heater matrix pipe clip	(see 61A, Heating, Heater matrix: Removal - Refitting)
10	Heater matrix pipe	(see 61A, Heating, Heater matrix: Removal - Refitting)
11	Heater matrix	(see 61A, Heating, Heater matrix: Removal - Refitting)
12	Recirculation control cable	(see 61A, Heating, Recirculation control cable: Removal - Refitting)
13	Modulate variation of speed of fan assembly for passenger compartment	(see 61A, Heating, Modulate variation of speed of fan assembly for passenger compartment : Removal - Refitting)
14	Heater matrix pipe	(see 61A, Heating, Heater matrix: Removal - Refitting)

PASSENGER'S FRONTAL AIRBAG: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

parts always to be replaced:
Passenger's frontal airbag mounting on dashboard

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

WARNING

Never handle the pyrotechnic systems (pretensioners or airbags) near to a source of heat or naked flame - they may be triggered.

Locations and specifications (tightening torques, parts to always be replaced, etc.)Dashboard assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

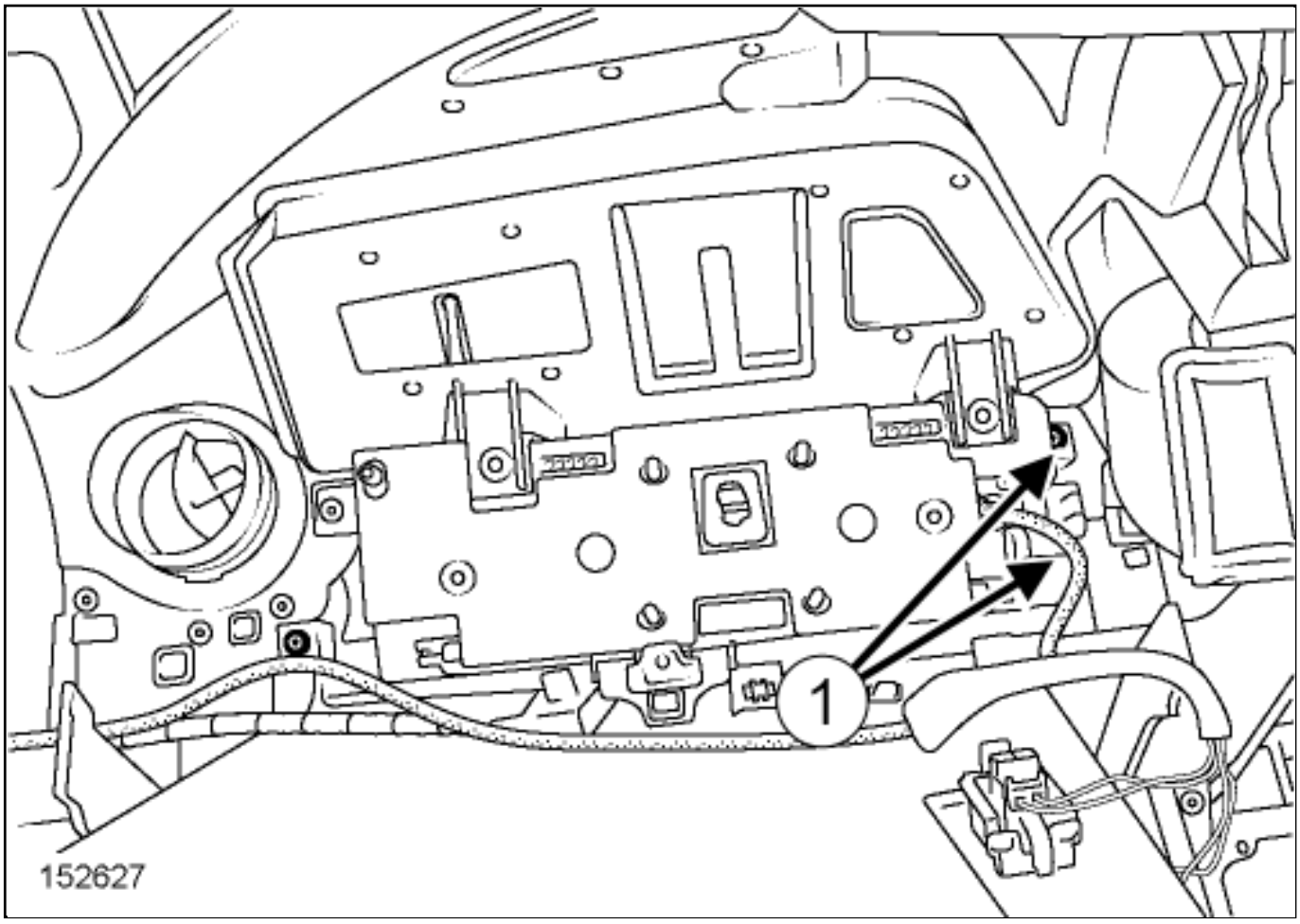
Lock the airbag computer(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

Switch off the ignition.

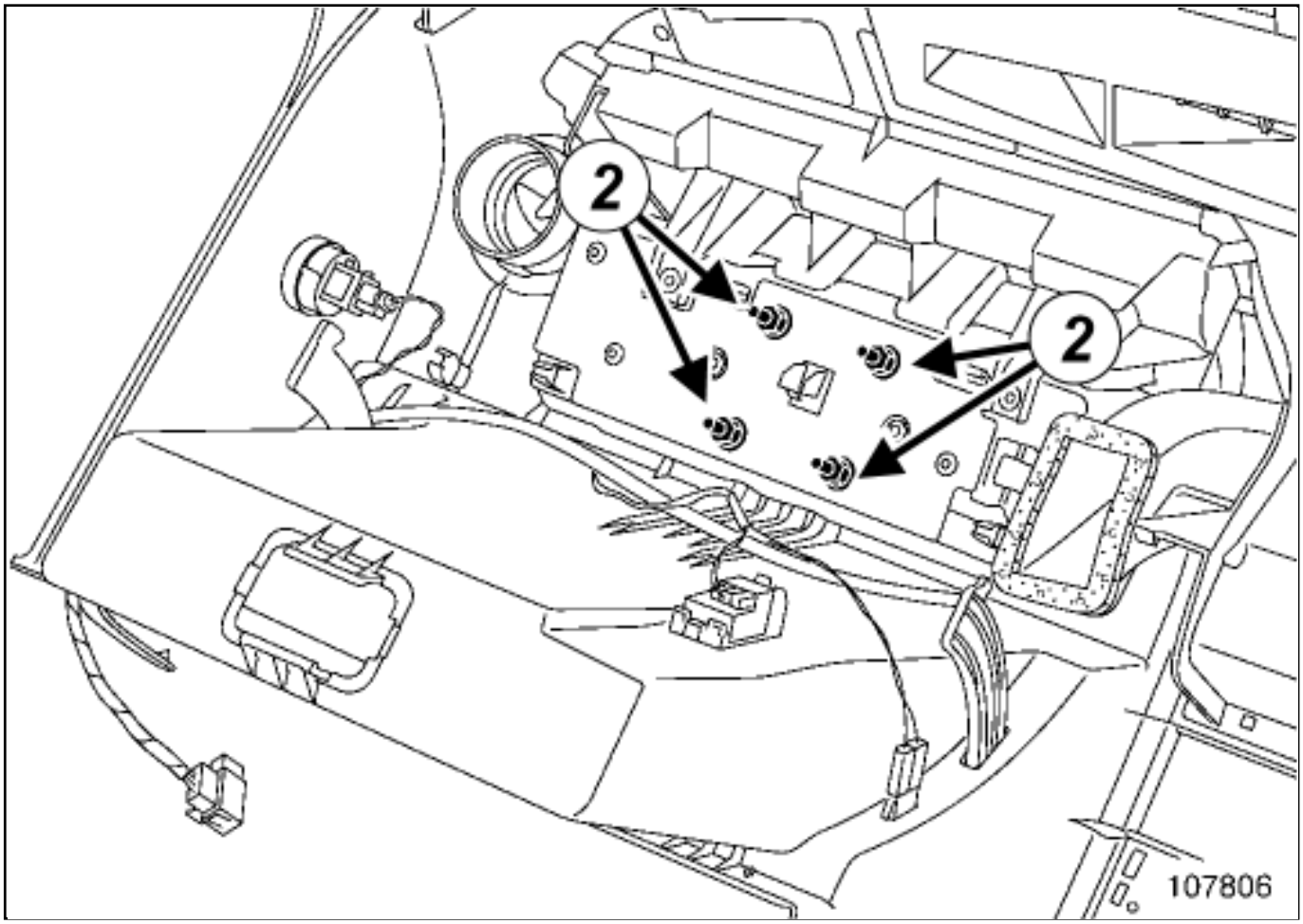
- Disconnect the battery Battery: Removal - Refitting .

- Remove the dashboard Dashboard assembly: Exploded view .

2. REMOVAL OPERATION



- Remove the bolts(1) .



-

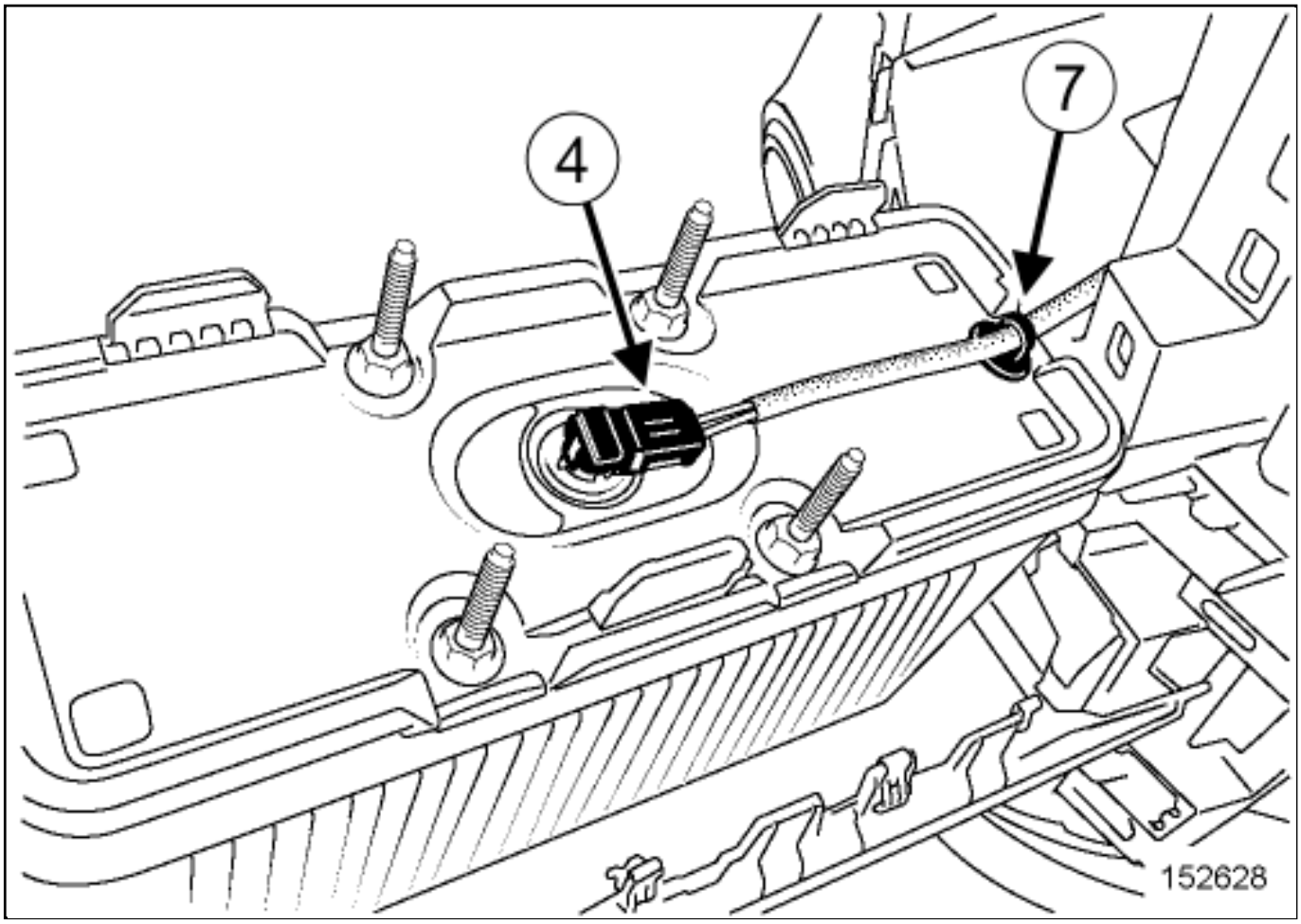
CAUTION

To prevent damage to the wiring harness when refitting, observe the original routing.

Mark the wiring routing at the airbag module.

- Remove the nuts(2) of the passenger's frontal airbag module.

- Unclip the passenger's frontal airbag module.


4
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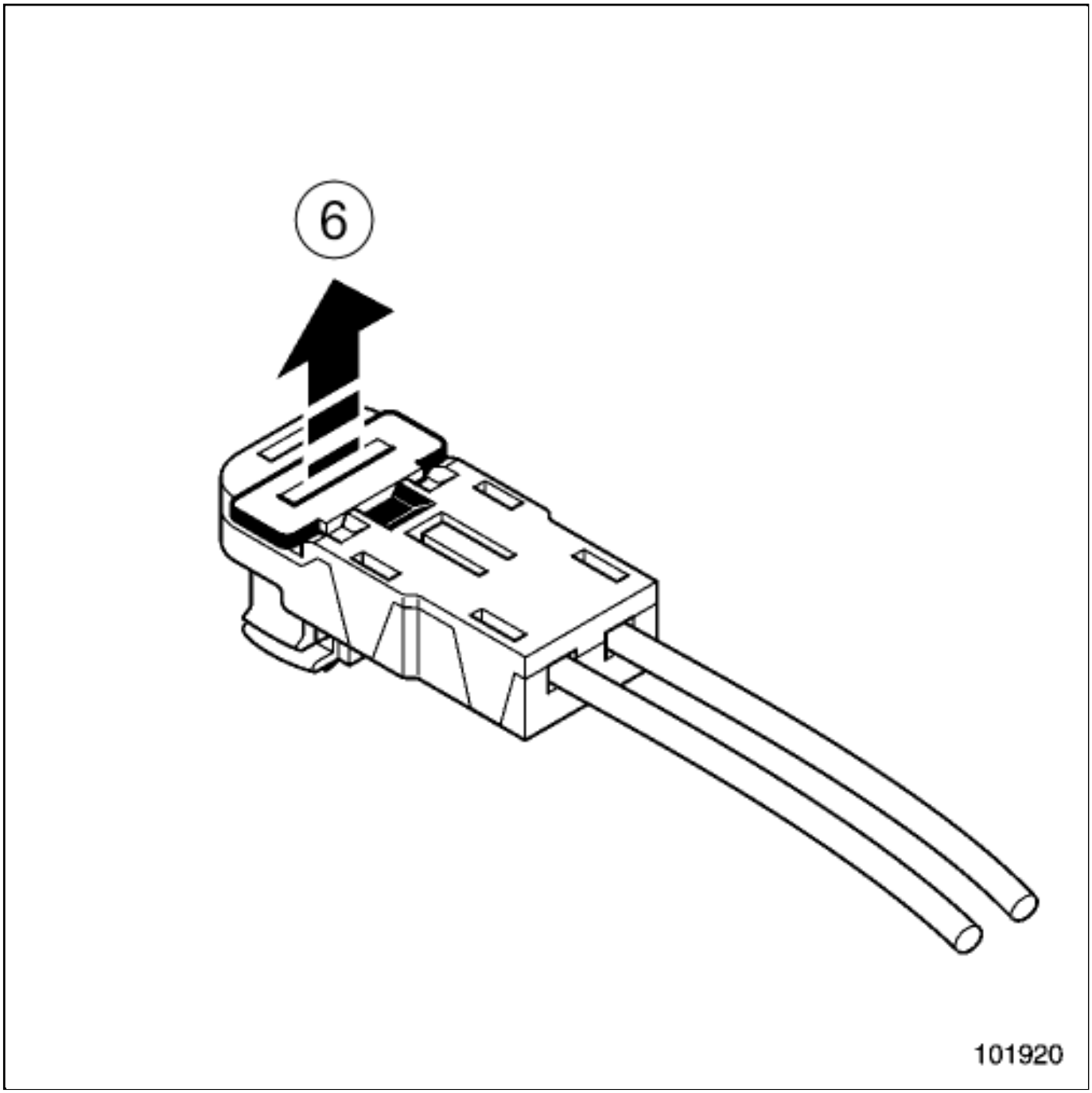


- Unlock the passenger's frontal airbag connector(4) at (6) .
- Disconnect the passenger's frontal airbag module connector.
- Unclip the wiring at(7) .
- Remove the passenger's frontal airbag module.

REFITTING

1. REFITTING PREPARATION OPERATION

WARNING

After a seat belt pyrotechnic component is triggered, it is essential to replace certain parts **(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair)**).

parts always to be replaced: Passenger's frontal airbag mounting on dashboard

2. REFITTING OPERATION

Clip the wiring at(7) .

Connect the passenger frontal airbag connector.

Lock the passenger frontal airbag connector.

Refit:

- the passenger's frontal airbag module,
- the new nuts of the passenger's frontal airbag module.

Tighten to torque the passenger's frontal airbag module nuts8 N.m.

Refit the bolts(1) .

Refit the wiring at the passenger's frontal airbag module in the position marked during removal.

3. FINAL OPERATION

Refit the dashboard Dashboard assembly: Exploded view .

Connect the battery Battery: Removal - Refitting .

WARNING

To prevent the pyrotechnic components from being permanently deactivated or triggered (airbags or pretensioners), check the airbag computer using the Diagnostic tool .

Unlock the airbag computer (see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

PEDAL ASSEMBLY: EXPLODED VIEW

FOR VEHICLES EQUIPPED WITH CLUTCH CABLE

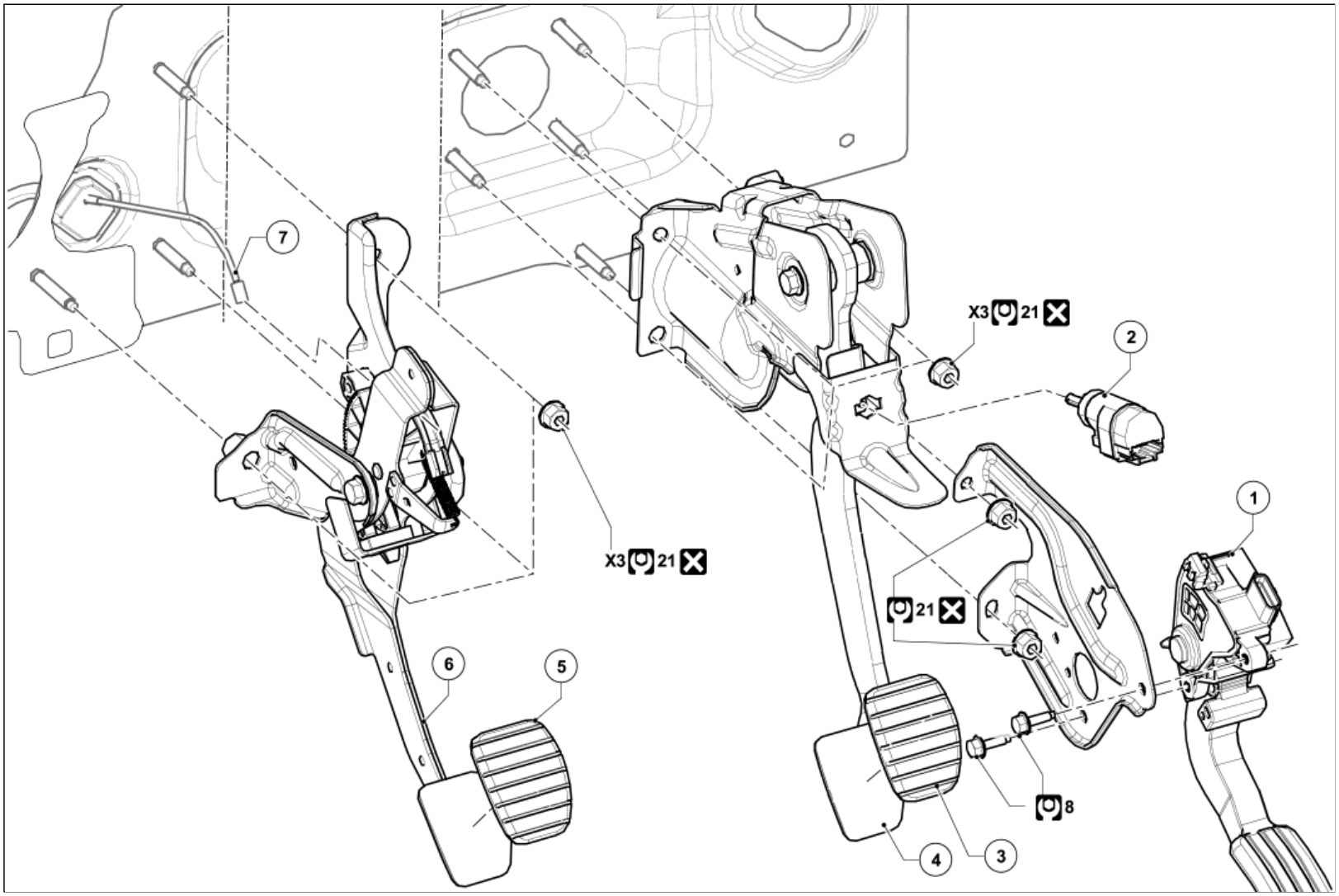


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

FOR VEHICLES EQUIPPED WITH CLUTCH CABLE

Marks	Designations	Informations
1	Accelerator pedal	
2	Brake pedal switch	(see 37A, Mechanical component controls, Pedal switches: Adjustment)
3	Brake pedal cover	
4	Brake pedal	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
5	Clutch pedal cover	
6	Clutch pedal	(see 37A, Mechanical component controls, Clutch pedal: Removal - Refitting)
7	Clutch cable	Clutch assembly: Exploded view

FOR VEHICLES EQUIPPED WITH HYDRAULIC CLUTCH SYSTEM

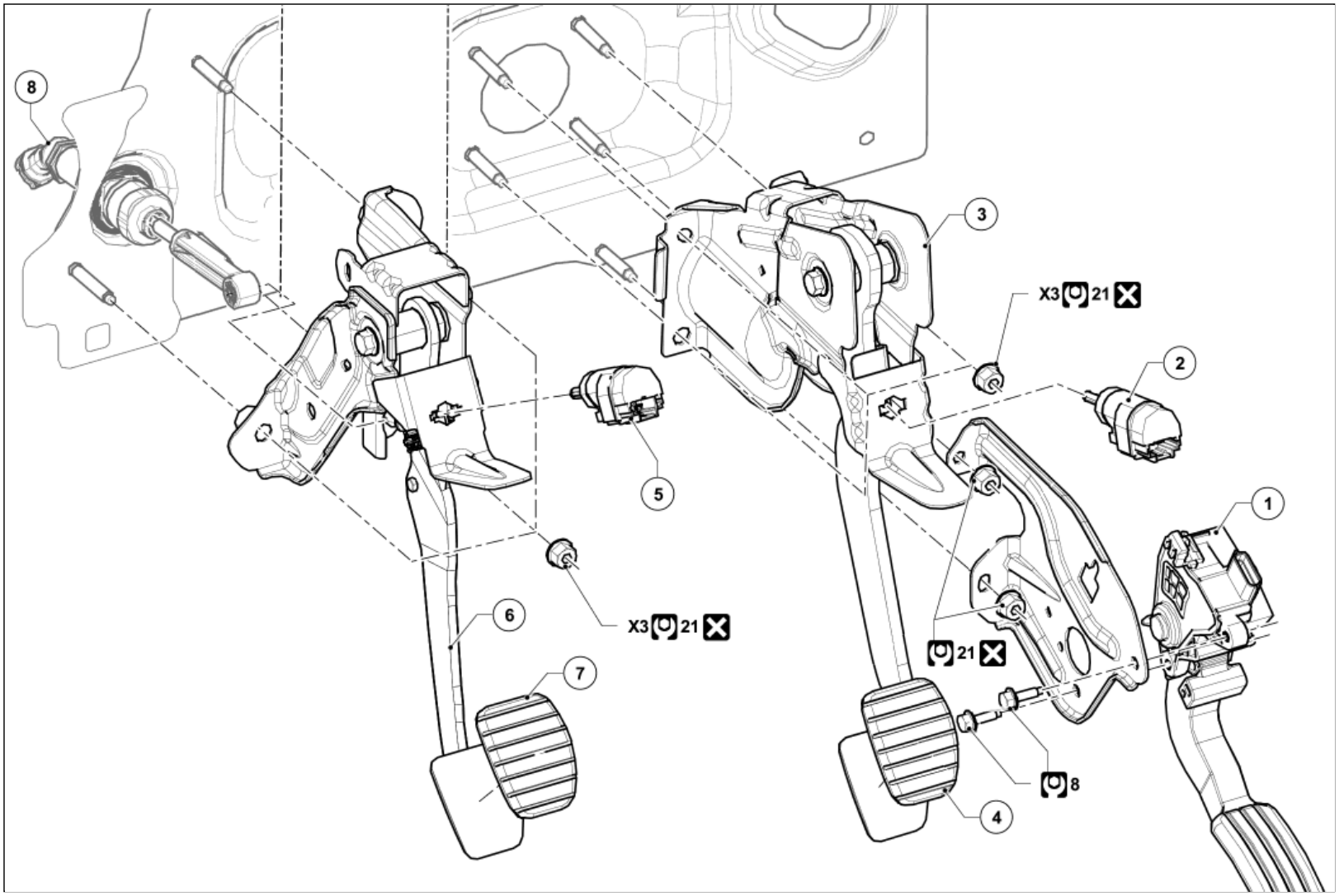


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

FOR VEHICLES EQUIPPED WITH HYDRAULIC CLUTCH SYSTEM

Marks	Designations	Informations
1	Accelerator pedal	
2	Brake pedal switch	(see 37A, Mechanical component controls, Pedal switches: Adjustment)
3	Brake pedal	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
4	Brake pedal cover	
5	Clutch pedal switch	(see 37A, Mechanical component controls, Pedal switches: Adjustment)
6	Clutch pedal	(see 37A, Mechanical component controls, Clutch pedal: Removal - Refitting)
7	Clutch pedal cover	
8	Clutch master cylinder	Clutch assembly: Exploded view

PEDAL ASSEMBLY MECHANISM: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. BRAKE PEDAL

WARNING

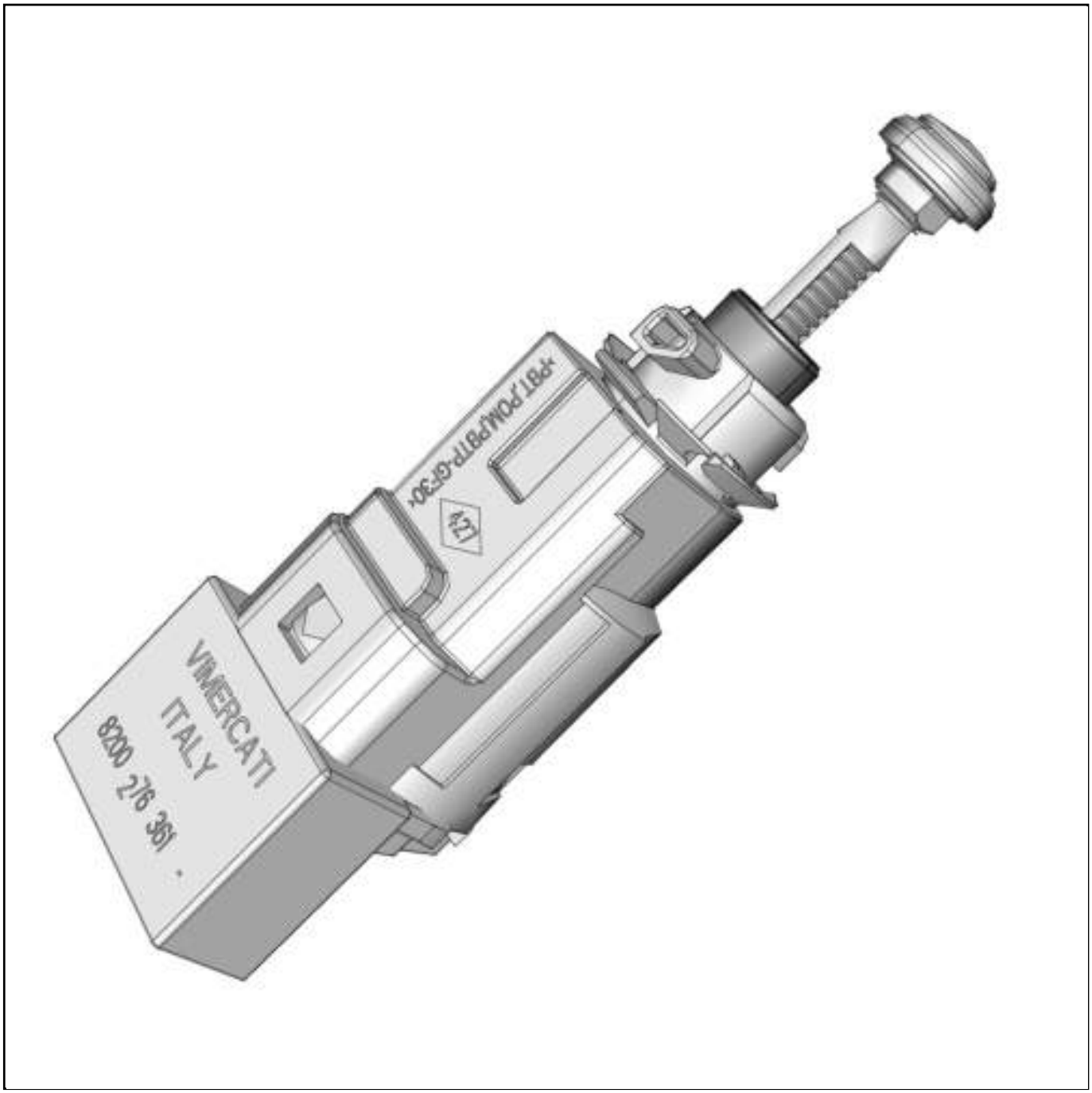
To avoid breaking the connection between the brake servo pushrod and the brake pedal, check that the safety clevis pin is locked onto the brake servo pushrod by tilting it from the top downwards.

2. PEDAL SWITCHES

CAUTION

Incorrect adjustment of the pedal switches may cause premature wear of the brakes or clutch, or a malfunction of the injection system.

VIMERCATI AND BITRON SWITCHES (GENERATION 1)



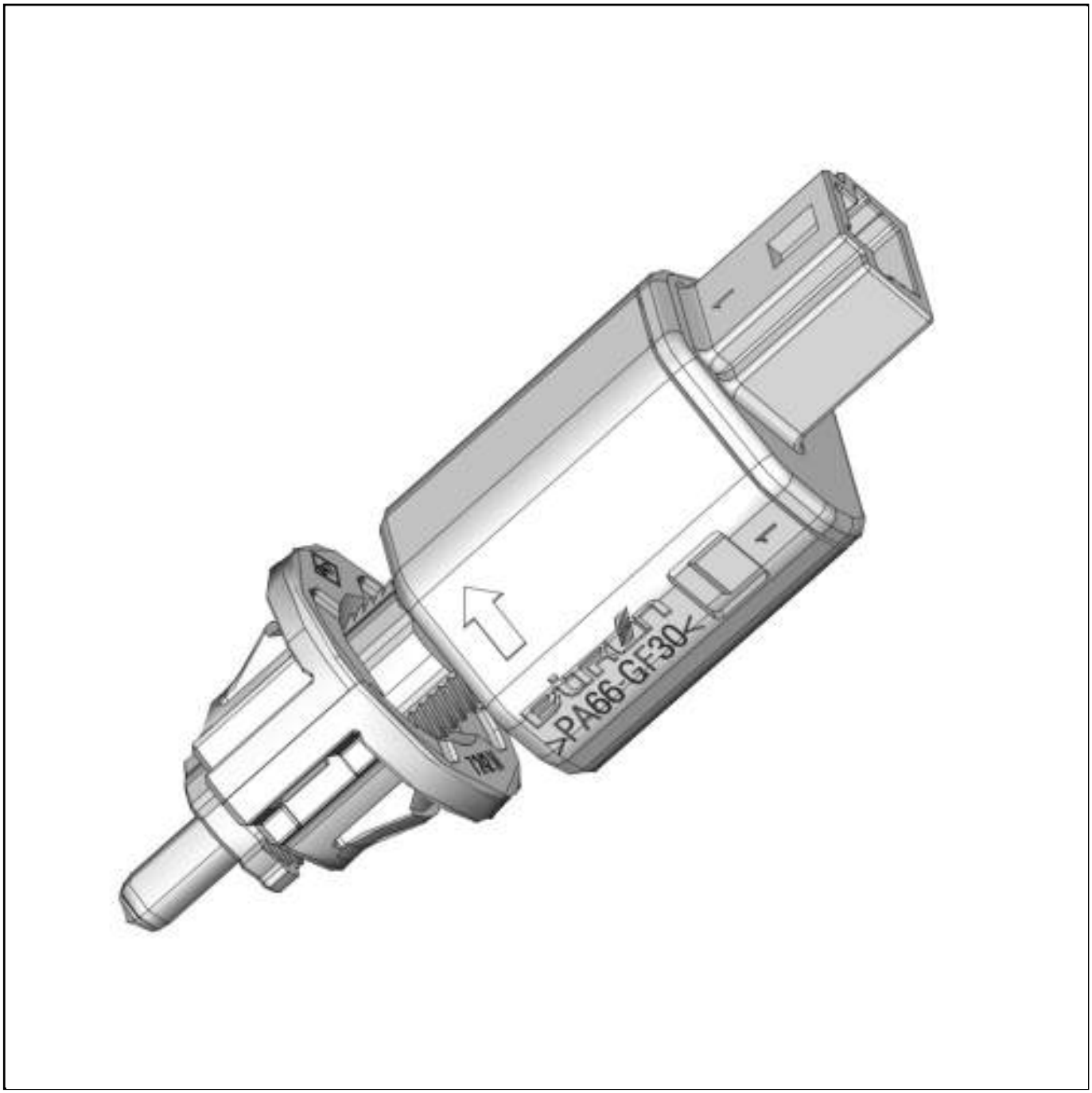
CAUTION

To ensure the correct operation of the switch, the notched rod must not be separated from the switch casing. Whenever the notched rod is completely removed, the switch must be replaced.

CAUTION

To avoid a possible loss of adjustment, replace the switch after 3 consecutive adjustments of the notched rod.

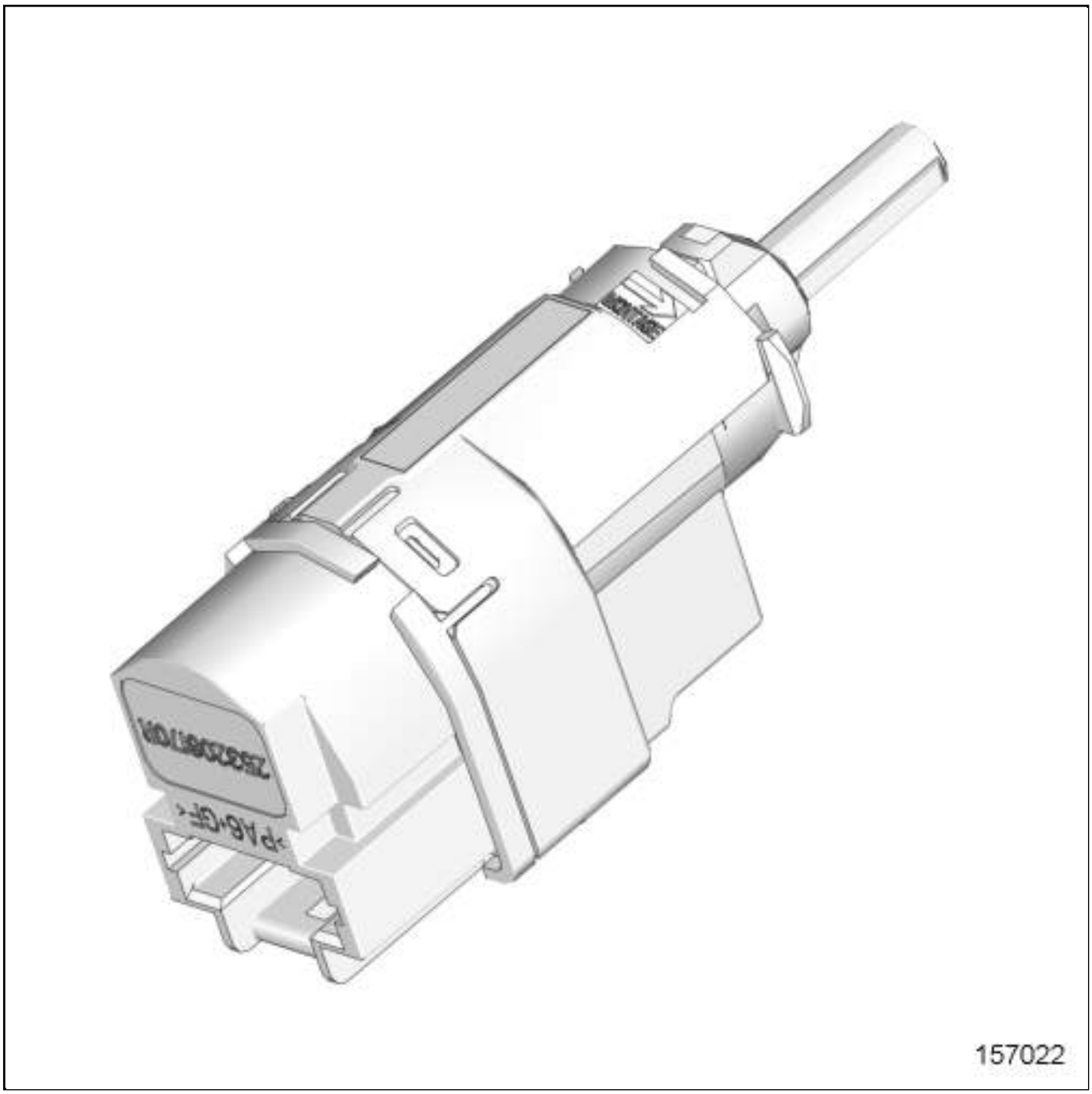
BITRON SWITCHES (GENERATION 2)



CAUTION

To avoid any malfunction (cruise control - speed limiter, starting function, braking function), the pedal switches must be replaced whenever they are removed.

METHODE ELECTRONICS (GENERATION 4)



CAUTION

To ensure the correct operation of the switch, the notched rod must not be separated from the switch casing. Whenever the notched rod is completely removed, the switch must be replaced.

Note:

Do not press or move the pedal during installation in order to avoid incorrect adjustment of the switch.

Note:

Do not press or move the pedal during disassembly in order to avoid damaging the switch.

Note:

Do not remove or fit the brake pedal switch if the brake pedal is not connected to the brake servo pushrod.

Note:

Do not remove or fit the clutch pedal switch if the clutch pedal is not connected to the clutch master cylinder.

PEDALSWITCHES: ADJUSTMENT

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
set of feeler gauges

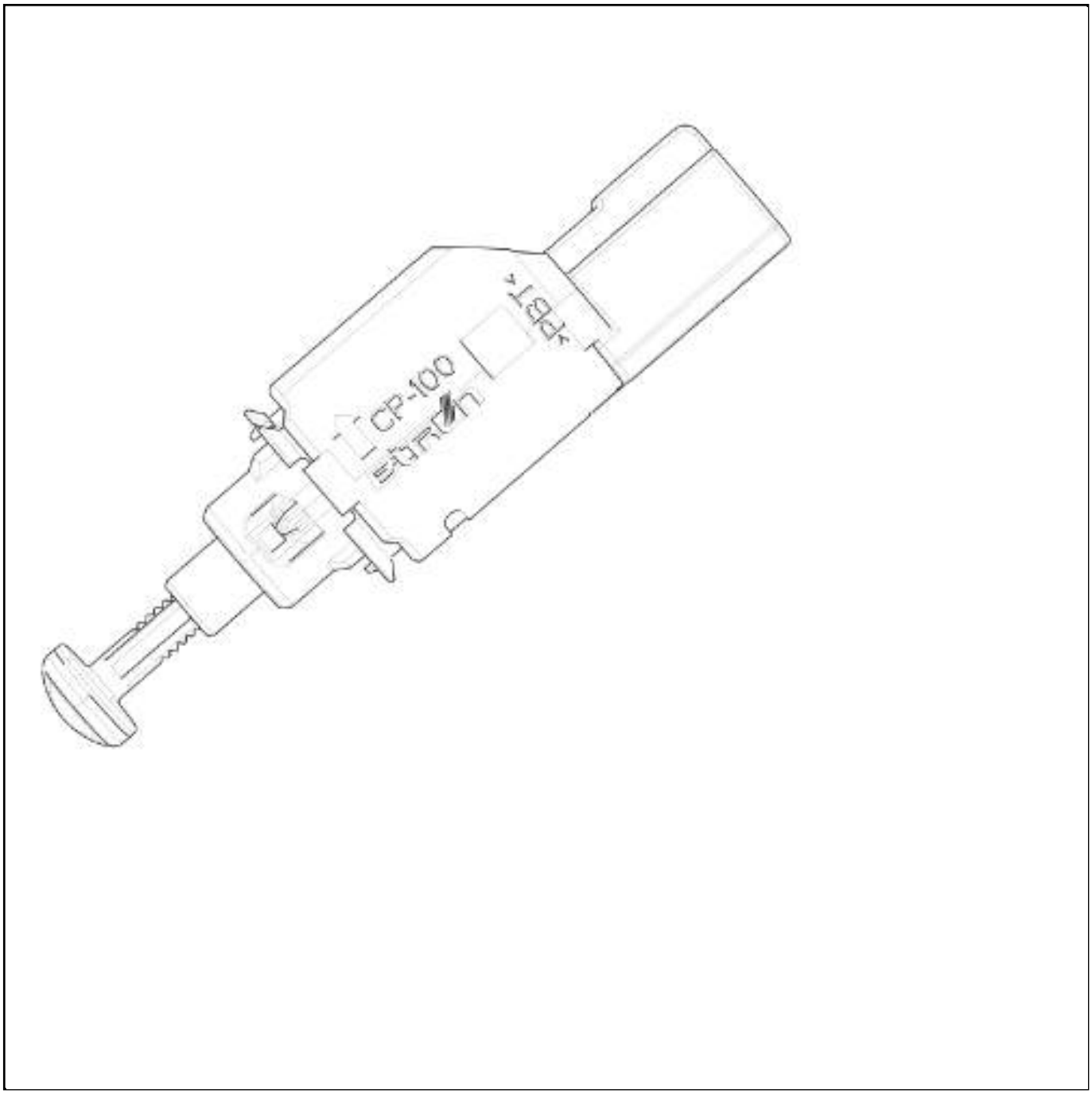
parts always to be replaced:
Brake pedal switch ring
Brake pedal switch
Clutch pedal switch ring
Clutch pedal switch

WARNING

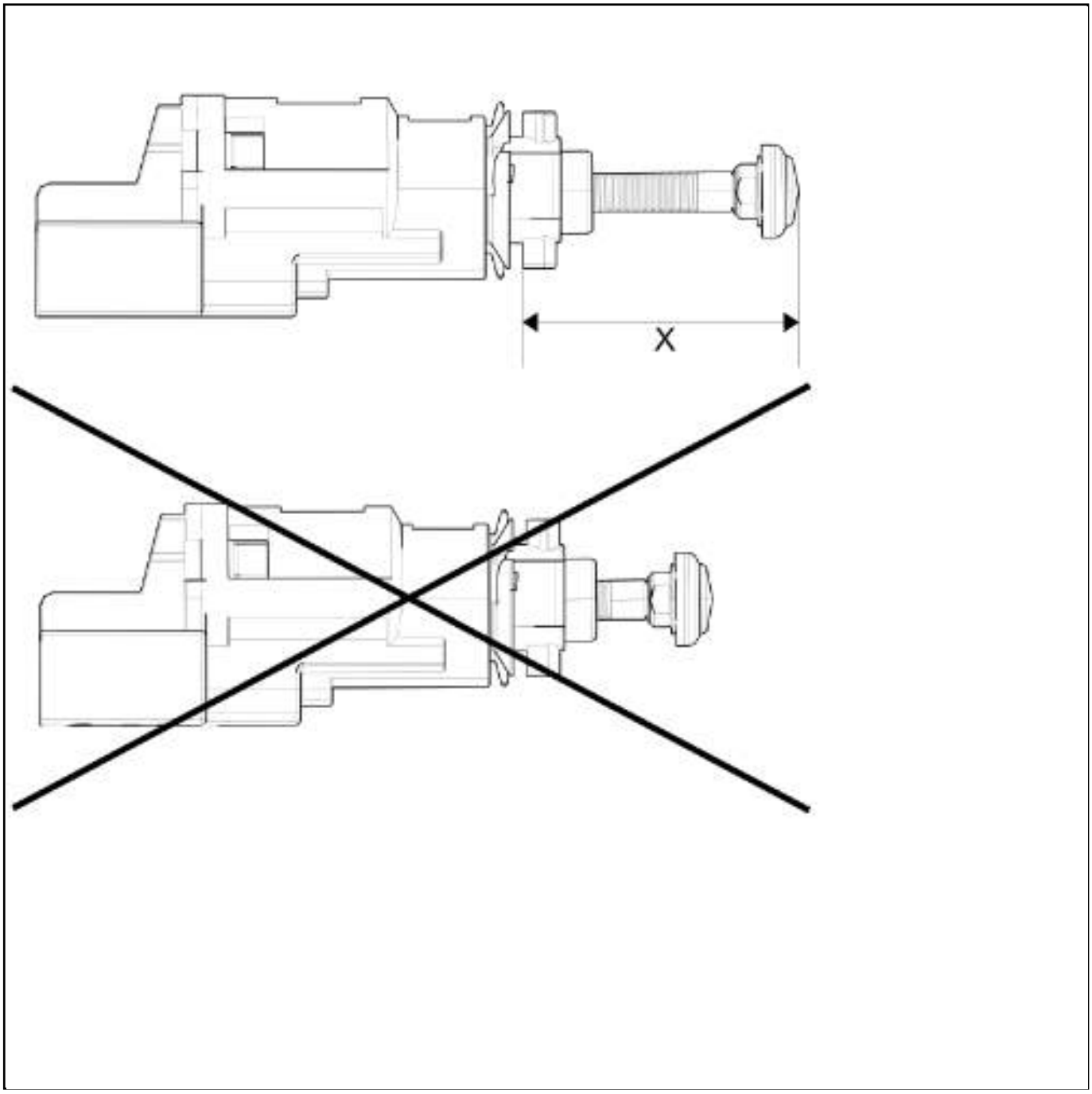
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 37A, Mechanical component controls, Pedal assembly mechanism: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

1. VIMERCATI AND BITRON SWITCH (GENERATION 1)



SWITCH BEFORE FITTING



- If adjusting the brake pedal switch, check that the brake servo pushrod is connected to the brake pedal.
- Depress the pedal by hand.
- Refit the switch
- Lock the switch by turning it a quarter of a turn clockwise.
- At the same time, carefully return the pedal.

Note:

The switch is automatically adjusted by fully depressing the pedal.

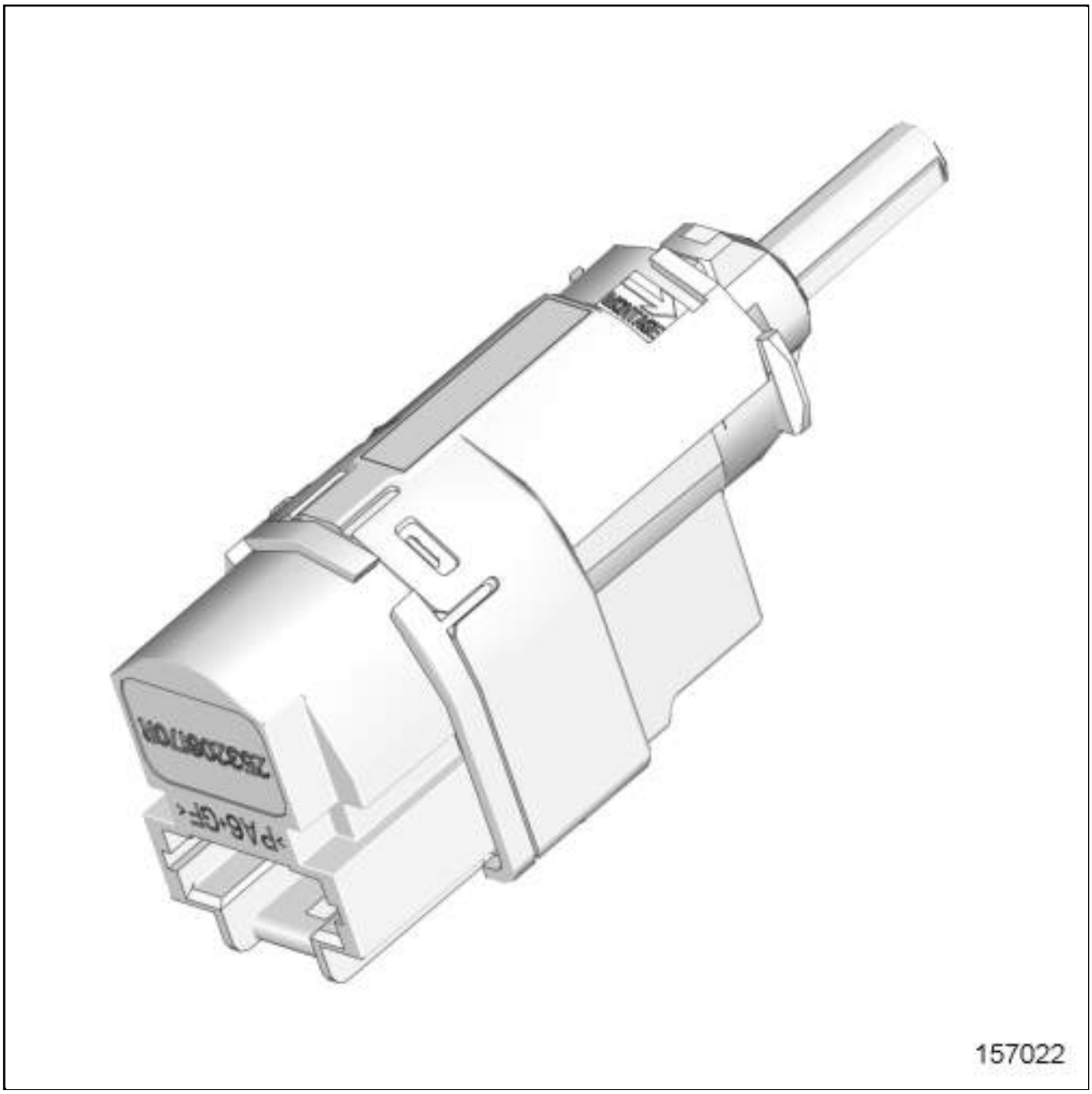
The automatic adjustment makes a clicking noise when in operation.

- Connect the switch connector.

2. BITRON SWITCH (GENERATION 2)

3. METHODE ELECTRONICS (GENERATION 4)

1- CLUTCH PEDAL SWITCH



Note:

Do not press or move the pedal during installation in order to avoid incorrect adjustment of the switch.

Note:

Do not press or move the pedal during disassembly in order to avoid damaging the switch.

Note:

Do not remove or fit the clutch pedal switch if the clutch pedal is not connected to the clutch master cylinder.

Note:

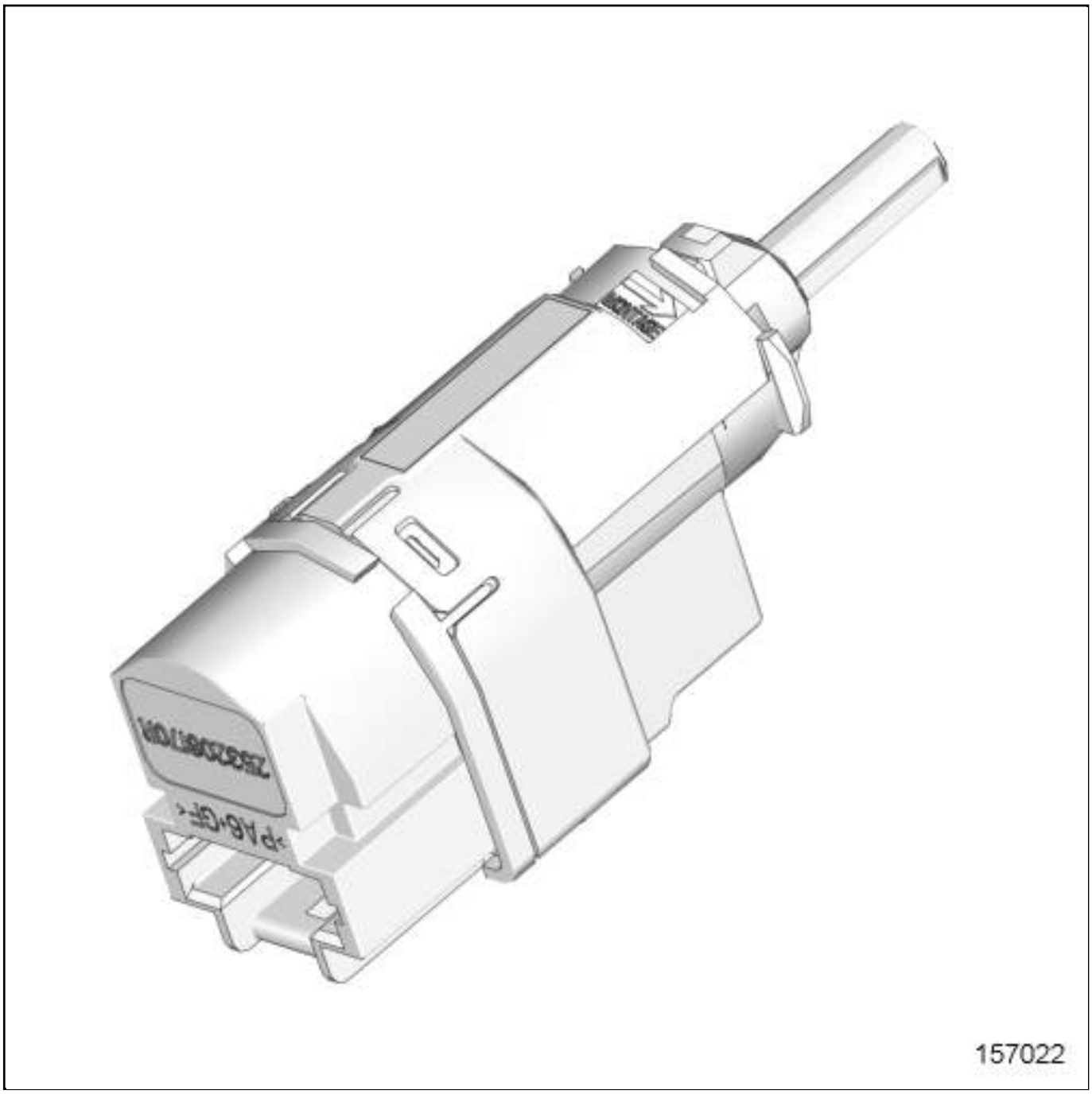
Hold the switch against the bracket.

- Remove the clutch pedal switch by turning it a quarter of a turn anti-clockwise.
- Press the switch against the bracket and hold it perpendicular to the pedal aperture.
- Refit the clutch pedal switch by turning it a quarter of a turn clockwise.

Note:

There is no adjustment operation for this type of clutch pedal switch.

2- BRAKE PEDAL SWITCH



Note:

Do not press or move the pedal during installation in order to avoid incorrect adjustment of the switch.

Note:

Do not press or move the pedal during disassembly in order to avoid damaging the switch.

Note:

Do not remove or fit the brake pedal switch if the brake pedal is not connected to the brake servo pushrod.

Note:

Hold the switch against the bracket.

- Remove the brake pedal switch by turning it a quarter of a turn anti-clockwise.
- Press the switch against the bracket and hold it perpendicular to the pedal aperture.
- Refit the brake pedal switch by turning it a quarter of a turn clockwise.

Note:

There is no adjustment operation for this type of brake pedal switch.

PLASTICMATERIALBODYWORKCOMPONENT:DESCRIPTION

1.INTRODUCTION

Plastic forms an integral part of:

- the vehicle's interior trim,
- the vehicle's exterior trim,
- possibly the entire bodywork,
- electronic equipment,
- certain mechanical parts.

The recommended repair product has been tested in the RENAULTlaboratories according to very precise specifications.

To ensure optimum safety and product quality, carefully observe:

- the safety instructions,
- use recommended products,
- the repair procedures.

Note:

Always refer to the product's technical sheet in addition to this Technical Note.

2. CLASSIFICATION OF PLASTICS

1- THERMOPLASTICS:

Thermoplastics are materials which, when exposed to heat, become malleable and soft. The advantage of this malleability is that they can be shaped. After cooling, they become hardened and keep their new shape.

If they are exposed to heat again, the above phenomenon reoccurs every time this operation is repeated.

1)THE MAIN THERMOPLASTICS:

Chemical description	ISO CODE 1043
Acrylonitrile, butadiene, styrene	A.B.S
Acrylate, Styrene, Acrylonitrile	A.S.A
Ethylene, propylene, diene, methylene	EPDM
Polycarbonate	PC
Polyamide	PA
Polypropylene	PP
Polyethylene	PE
Polyvinyl chloride	PVC
Polystyrene / Polyester	SB / PPO
Polyamide / Polyester	PA / PPO

2- THERMOSETTING PLASTICS

Thermosetting plastics are those which harden when exposed to heat and will burn under excessive heat.

1)THE MAIN THERMOSETTING PLASTICS:

Chemical description	ISO CODE 1043
Unsaturated Polyester	UP
Epoxy Resin	EP
Polyurethane Resin	PUR
Sheet Molding Compound	SMC
Resine Transfert Molding	RTM

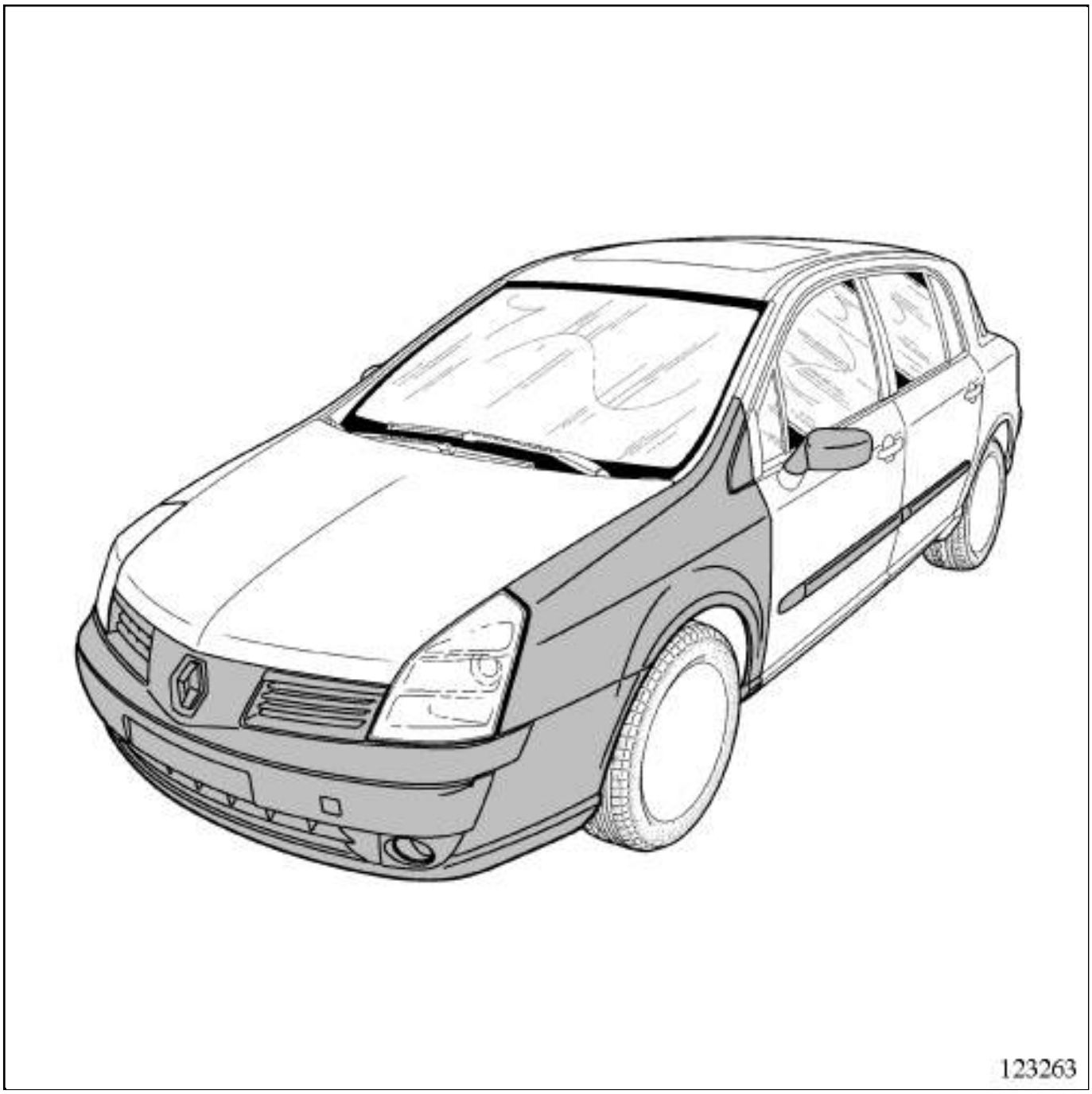
Note:

All plastics are categorised as either thermoplastics or thermosetting plastics.

Note:

Read the ISO code displayed inside the plastic part.

3. USING PLASTICS IN THE AUTOMOTIVE PRODUCTION INDUSTRY



According to the area of use, parts are manufactured either:

as thermoplastics:

- passenger compartment trim,
- dashboard,
- bumpers,
- wings,
- protective mouldings.

or as thermosetting plastics:

- wings,

- bonnet,
- doors,
- tailgate,
- leaf spring,
- driveshafts.

PLASTIC MATERIAL BODYWORK COMPONENT: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. PROTECTIVE GEAR

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Use extra ventilation source.

Use a supplied air mask if the area is not ventilated.

Note:

When repairing SMC type composite material, it is advisable to wear an antistatic suit.

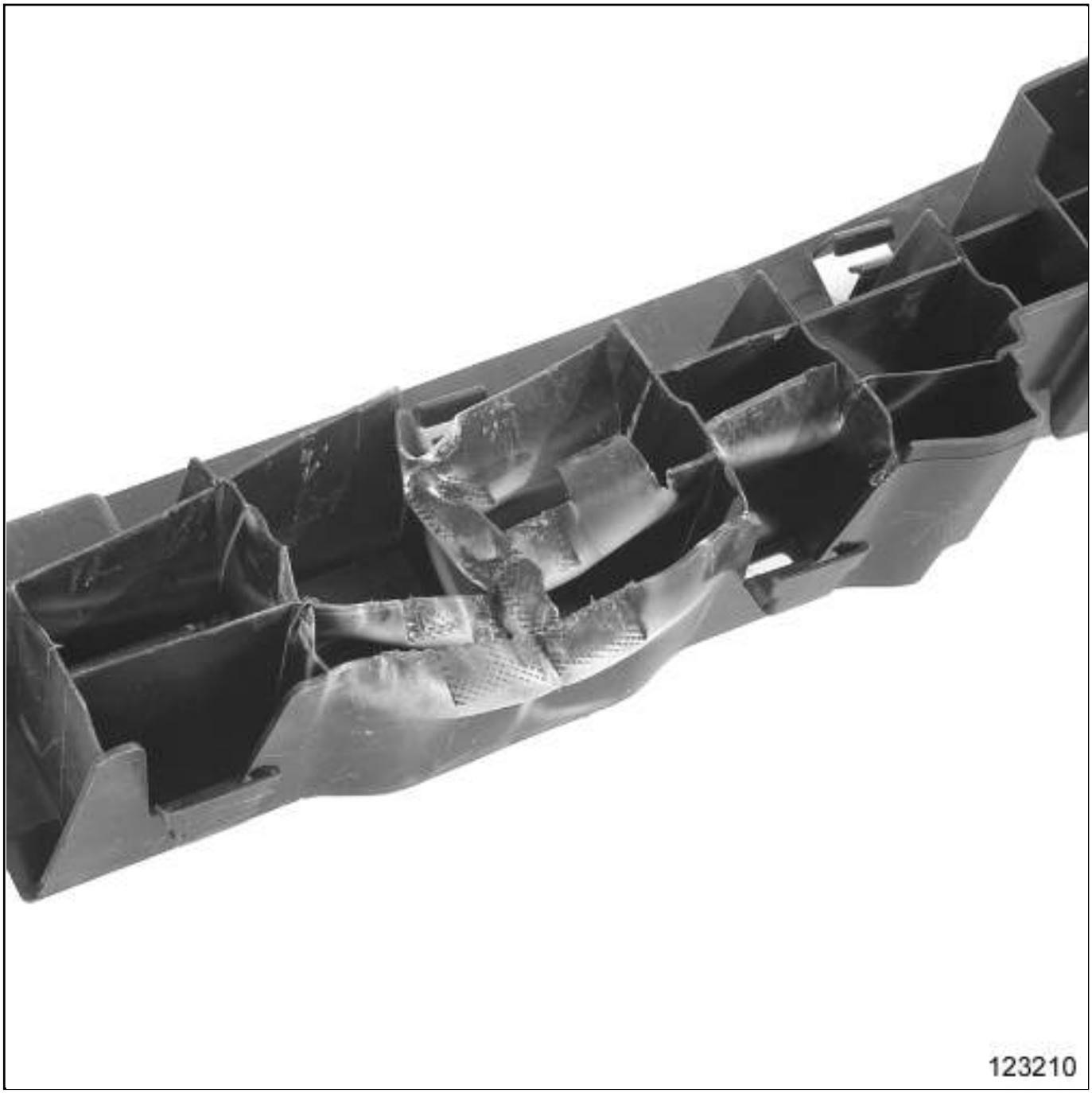
2. RECOMMENDATION

Note:

It is necessary to remove the part to be repaired, in order to check that the components located around the edge are not damaged.

Note:

It is recommended to limit the rotation speed when sanding with the orbital sander in order to prevent plastic material from overheating and the formation of dirt.



It is forbidden to carry out any repairs to safety components or areas such as absorbers, diffusers and any components which are listed in the vehicle's repair manual as components which cannot be repaired.

Fractures and tears must not exceed 100 mmin length and must be located outside the bumper absorber areas and away from the safety components.

The holes must not exceed 50 mmin diameter and must be located outside the bumper absorber areas and away from the safety components.

In all cases, the surface to be repaired should not exceed 20 cm^2 .

1- FOR BONDING:

If the primer is too thick, this will always cause loss of adherence when the product attaches.

Do not accelerate the primer drying time using infra-red light. Respect the primer drying time (refer to the manufacturer's instructions).

Apply the resin in the form of a dome in order to avoid damaging the support.

Note:

It is forbidden to repair Noryl. The composition of the material is likely to contain recycled products which are incompatible with the bi-component repair mastic.

2- FOR THE WELD:

Note:

The weld repair is carried out with the component removed.

The repair procedures differ depending on the type of plastic used.

For ABS, ASAand Polycarbonatematerials, only fractures can be repaired. The composition of the filler rod does not adhere to these materials.

For Norylmaterials, it is only possible to repair holes.

Welding is not possible on composite materials.

Never melt a piece of recovered plastic to perform a repair.

Do not use any other mesh than the one contained in the kit due to a risk of oxidation.

It is necessary to preheat and melt the rod by half its thickness, before contact with the support. This step activates the bonding agents contained in the rod.

3- FOR EPOXY RESIN

Use only for RTM thermosetting plastics

Repair-40x01x45x10-02x60-1-1-1.xml

XSL version : 3.02 du 22/07/11

PLASTIC MATERIAL BODYWORK COMPONENT: REPAIR

Note, one or more warnings are present in this procedure

1. PROCEDURES FOR REPAIRING PLASTICS

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Use extra ventilation source.

Use a supplied air mask if the area is not ventilated.

1- SPECIAL NOTES FOR REPAIRING PLASTICS

- Procedure 1 : repairing a deep scratch on a plastic chassis element.
- Procedure 2 : repairing a crack on a plastic chassis element.
- Procedure 3 : repairing a hole on a plastic chassis element.
- Procedure 4 : repairing a mounting bracket on a plastic chassis element.
- Procedure 5 : partial replacement of an element by cuting.
- Procedure 6 : partial replacement of an element by cuting with patcht drilling.

2. PROCEDURE 1

- Repairing a deep scratch on a plastic chassis element

1- BONDING METHOD

Note:

Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .

- Wash the component in soapy water and rinse in clean water.

- Clean the area to be repaired with a LINT-FREE CLOTH soaked in ANTISTATIC THINNER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Wipe the area with a clean, dry LINT-FREE CLOTH Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

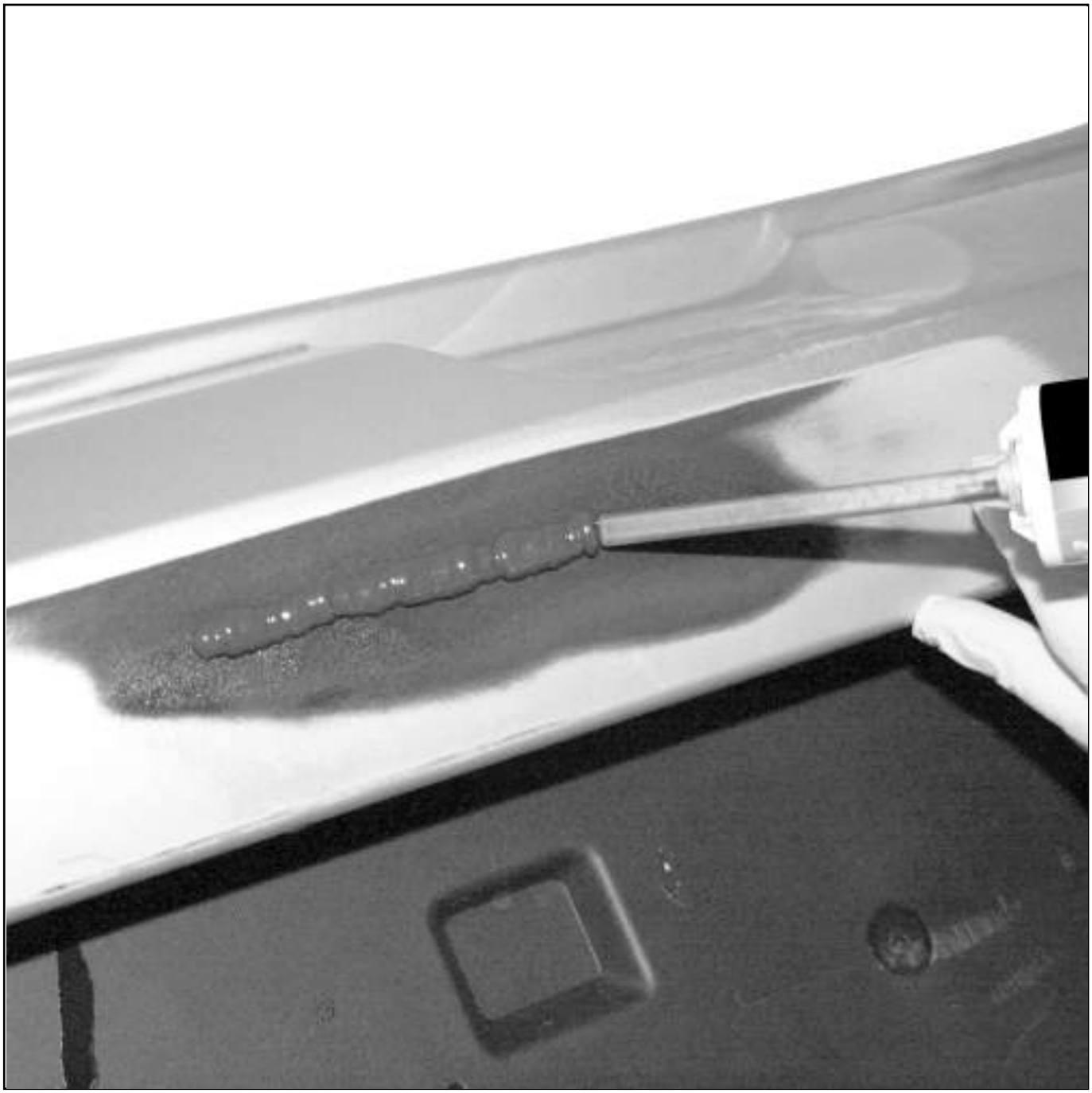
- Surface the scratch using the orbital sander with a P 150.

- Blow the component and clean the area to be repaired with the cleaner included in the Plastic repair kit.

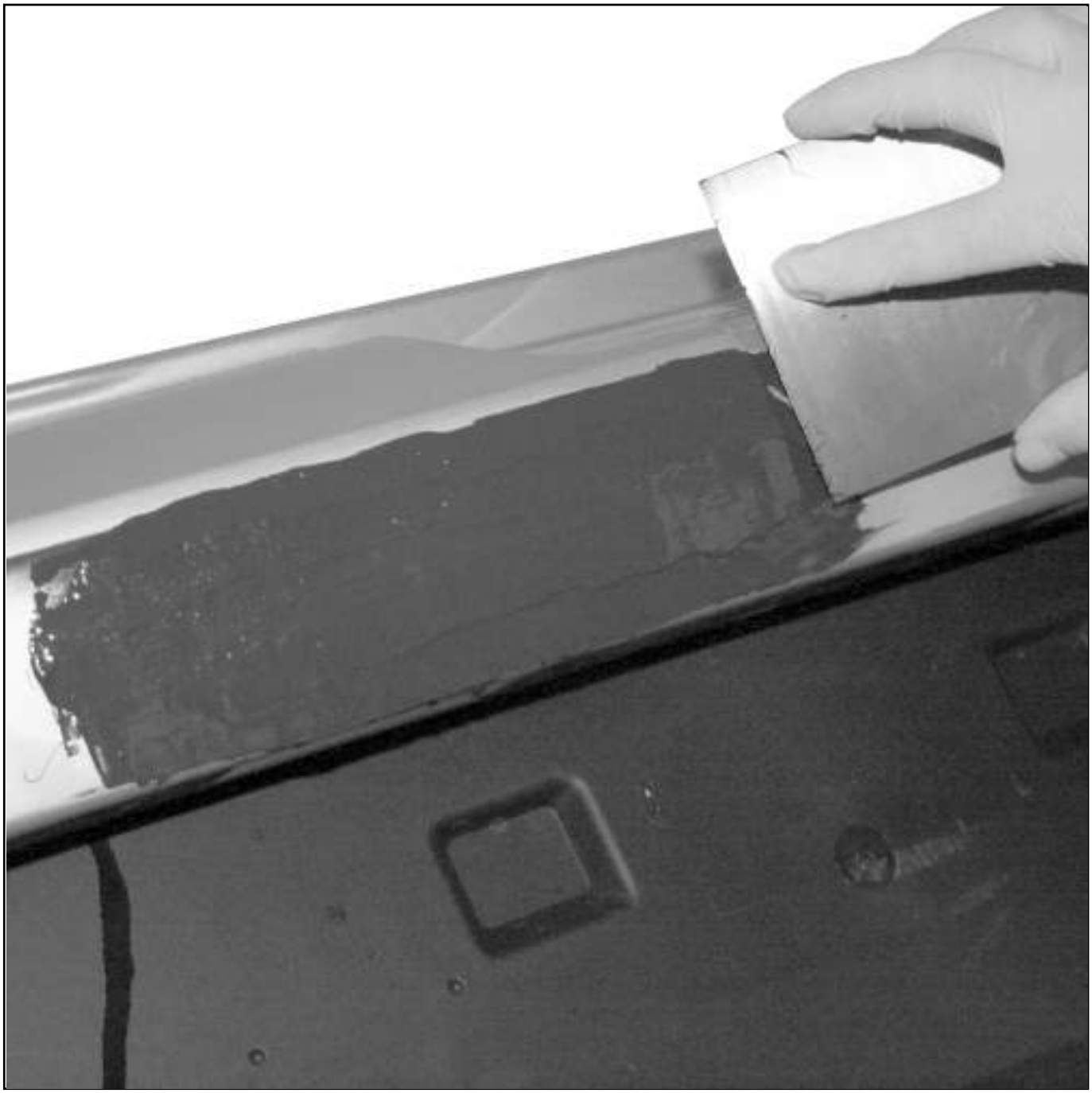
- Apply the adhesive primer included in the Plastic repair kit to the damaged area.

- Leave the adhesive primer to dry (see product technical sheet).

- Prepare the bi-component repair mastic (see 50A, General information, Products for plastic material bodywork components: Description) .



- Apply the bi-component repair mastic to the component.



- Smooth using a mastic block creating a dome shape.

- Leave the bi-component repair masticto dry (see product technical sheet).

- Surface with a P 150then finish with a P 240.
- Blow the component and clean the area to be repaired with the cleaner included in the Plastic repair kit.

If necessary, apply a finishing mastic(see product technical sheet) **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

Sand the finishing masticwith a P 150then finish with a P 240.

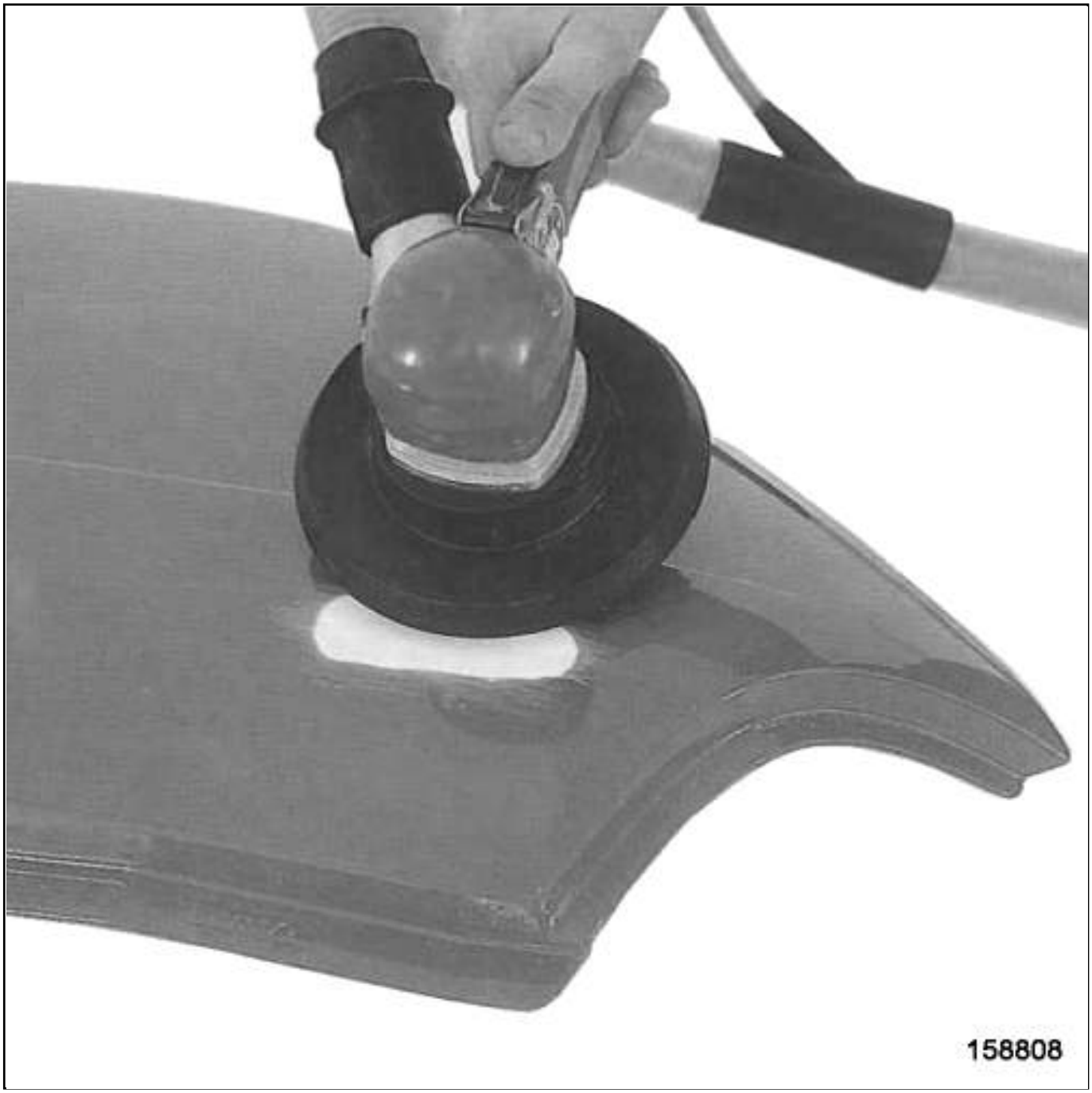
Follow the paint application procedure according to the material concerned:

- **SMC bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
- **Polypropylene / polyethylene bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
- **Noryl bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
- **ABS bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic).

2- RESIN EPOXY METHOD

Note:

Method apply only on RTM component.



- Chamfering 20 to 30mm around the crack using the orbital sander with a P 150.

- Sand the paint around the zone to be repaired using the orbital sander with a P 150

- Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

- Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .

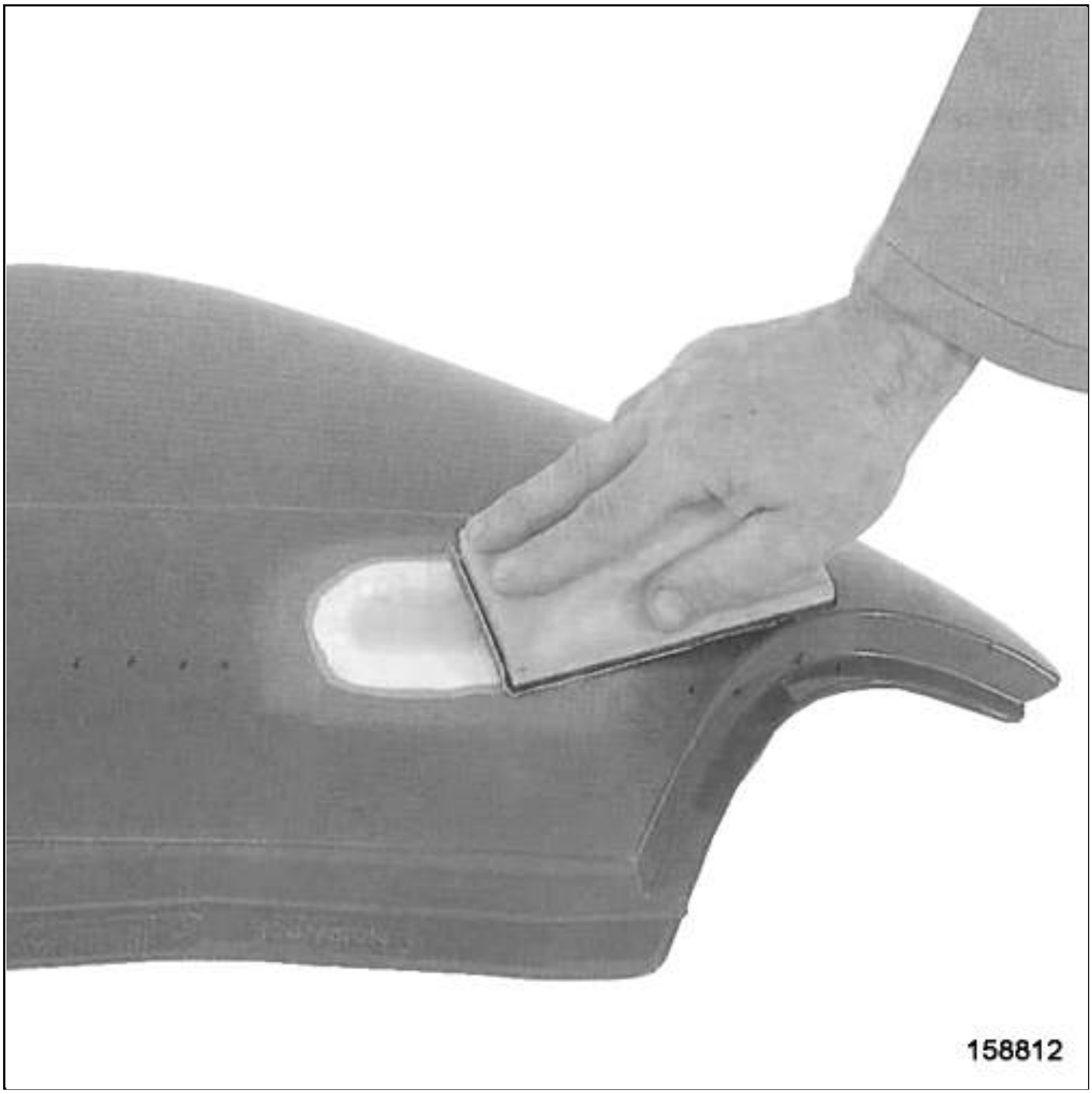
- Wet the chamfer using à brush soaked with Epoxy resin.

- Add short fibres with resin(50 % maxi.).

- Apply the mixture using a spatula.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).



- Sand using the orbital sander with a P 80then with a P180and P240.

- Apply if necessary a finishing mastic(see product technical sheet). (see **Vehicle: Parts and consumables for the repair**)

- Sand the finishing masticusing a P 150then finish using a P240.

3. PROCEDURE 2

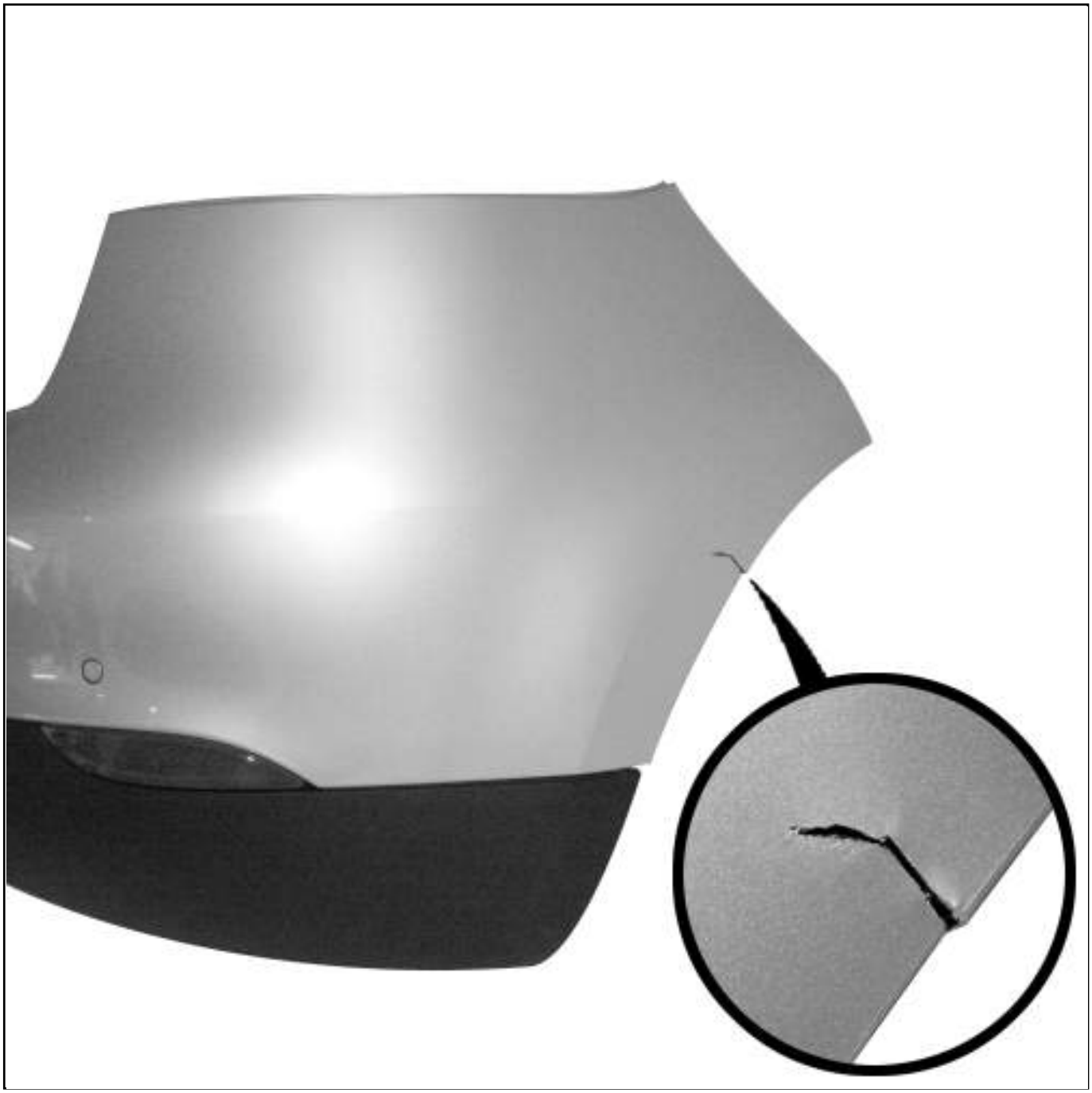
- Repairing cracks on a plastic chassis element.

Note:

Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .

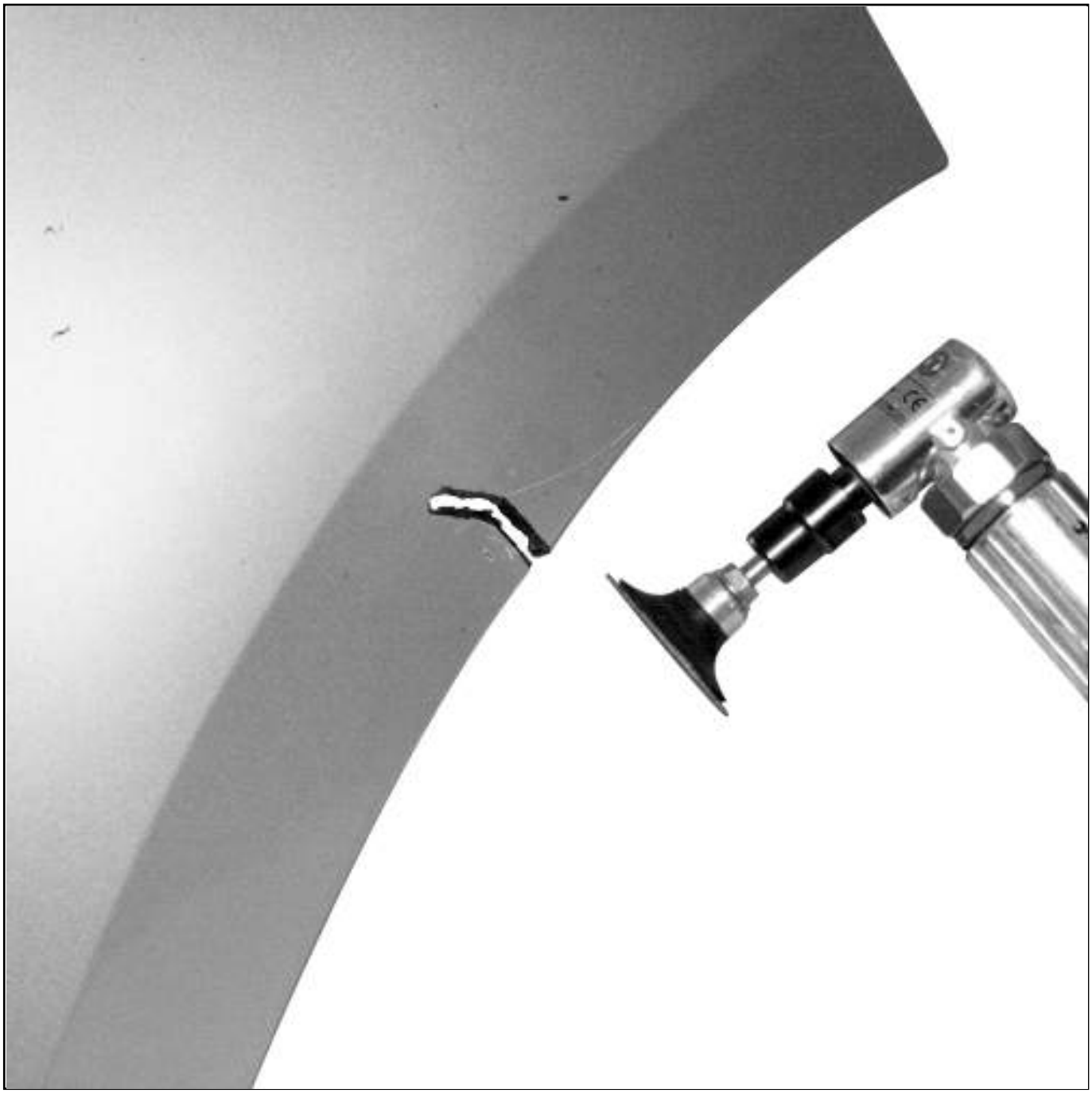


- Wash the component in soapy water and rinse in clean water.

- Clean the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).

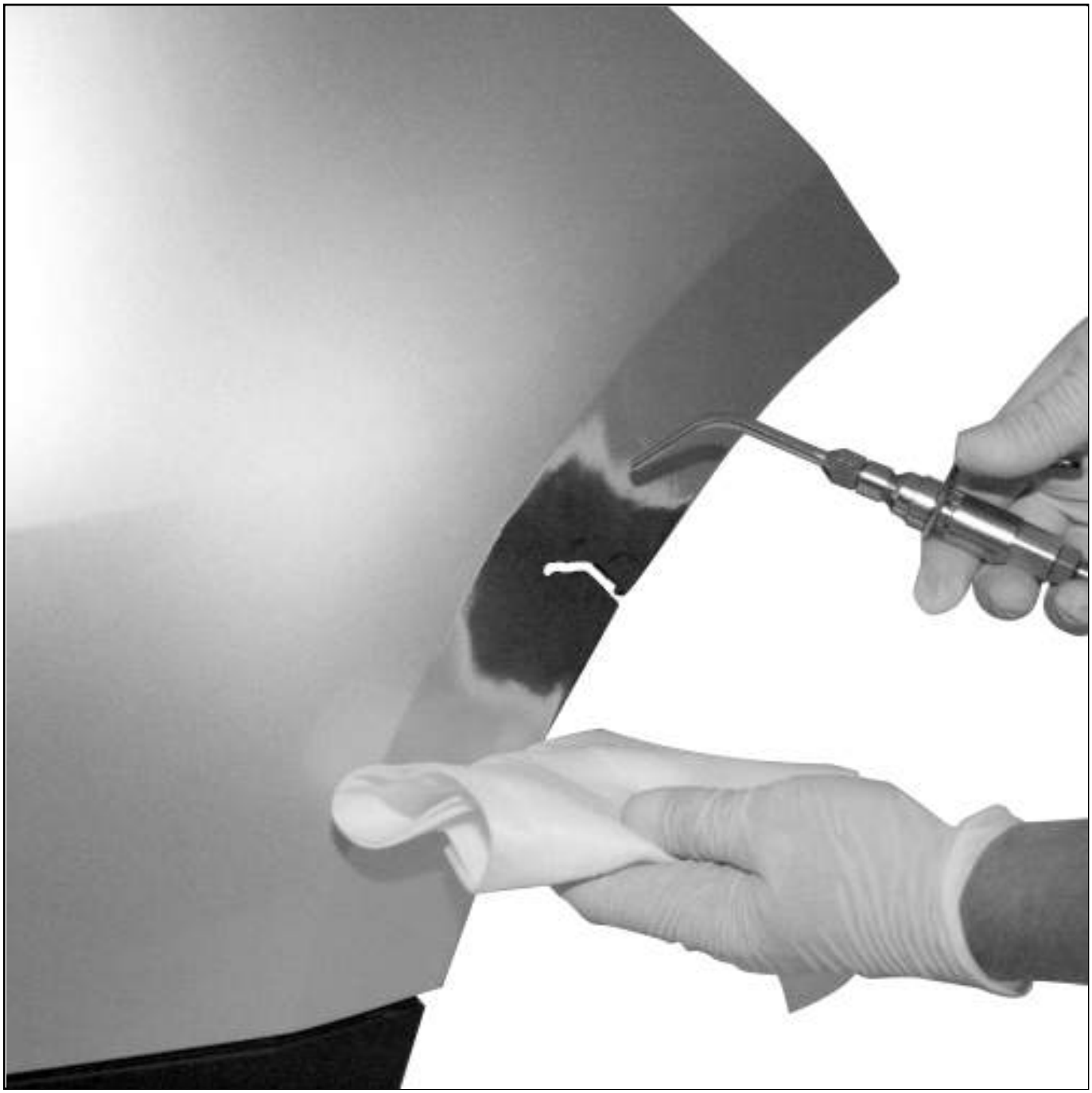
- Drill the end of the crack using a 4 mmdrill bit to stop it spreading.



- Extend the length of the crack by 2 mmusing an angle grinderor a sharp tool.

- Chamfer the crack on the exterior side using an angle grinder or a belt sander equipped with a P 120 abrasive pad.

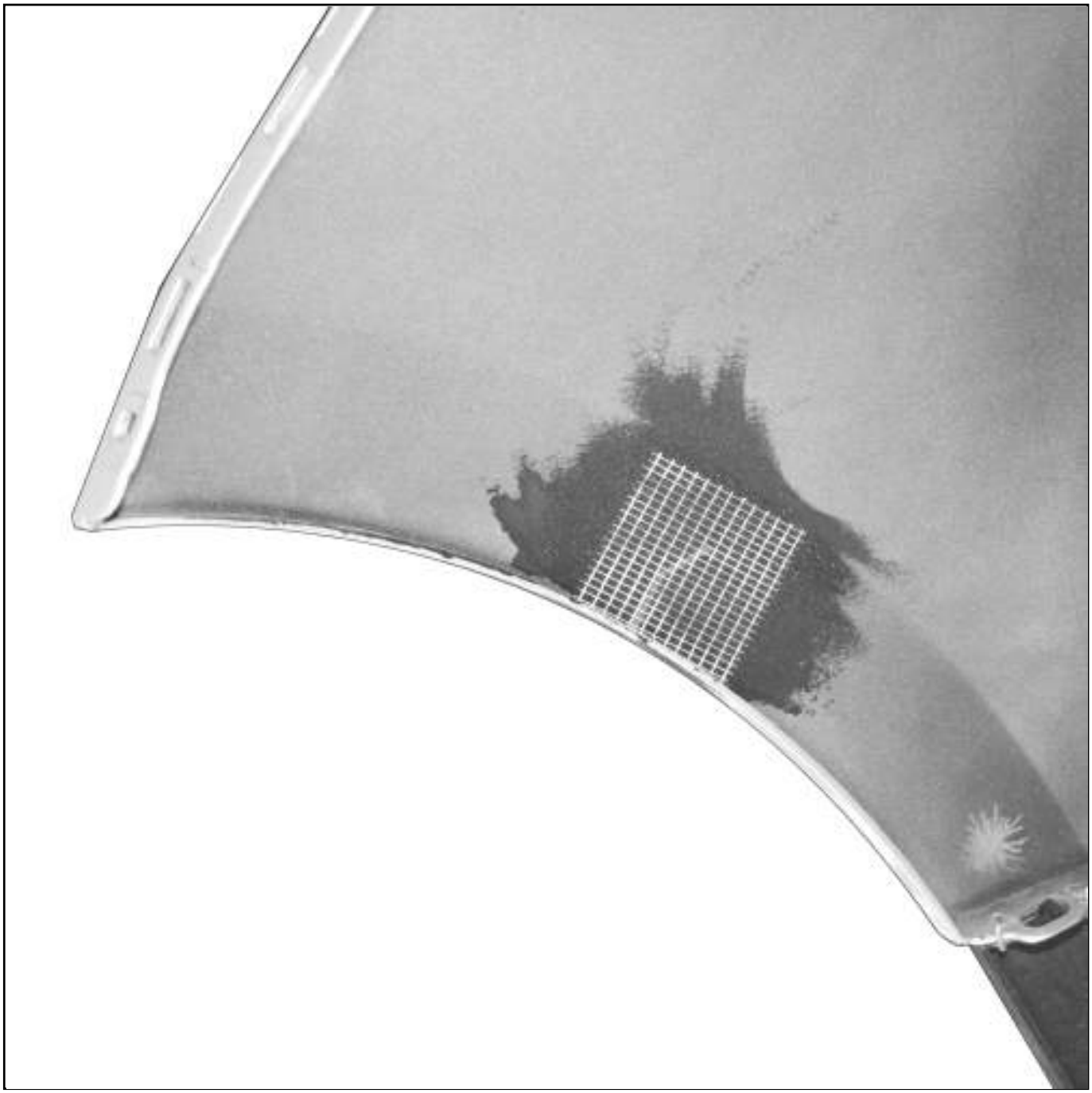
- Surface the interior and exterior areas to be repaired with a P 150.



- Blow the component and clean the area to be repaired with the cleaner included in the plastic repair kit box.

- Apply the adhesive primer included in the plastic repair kit to the interior and exterior areas.

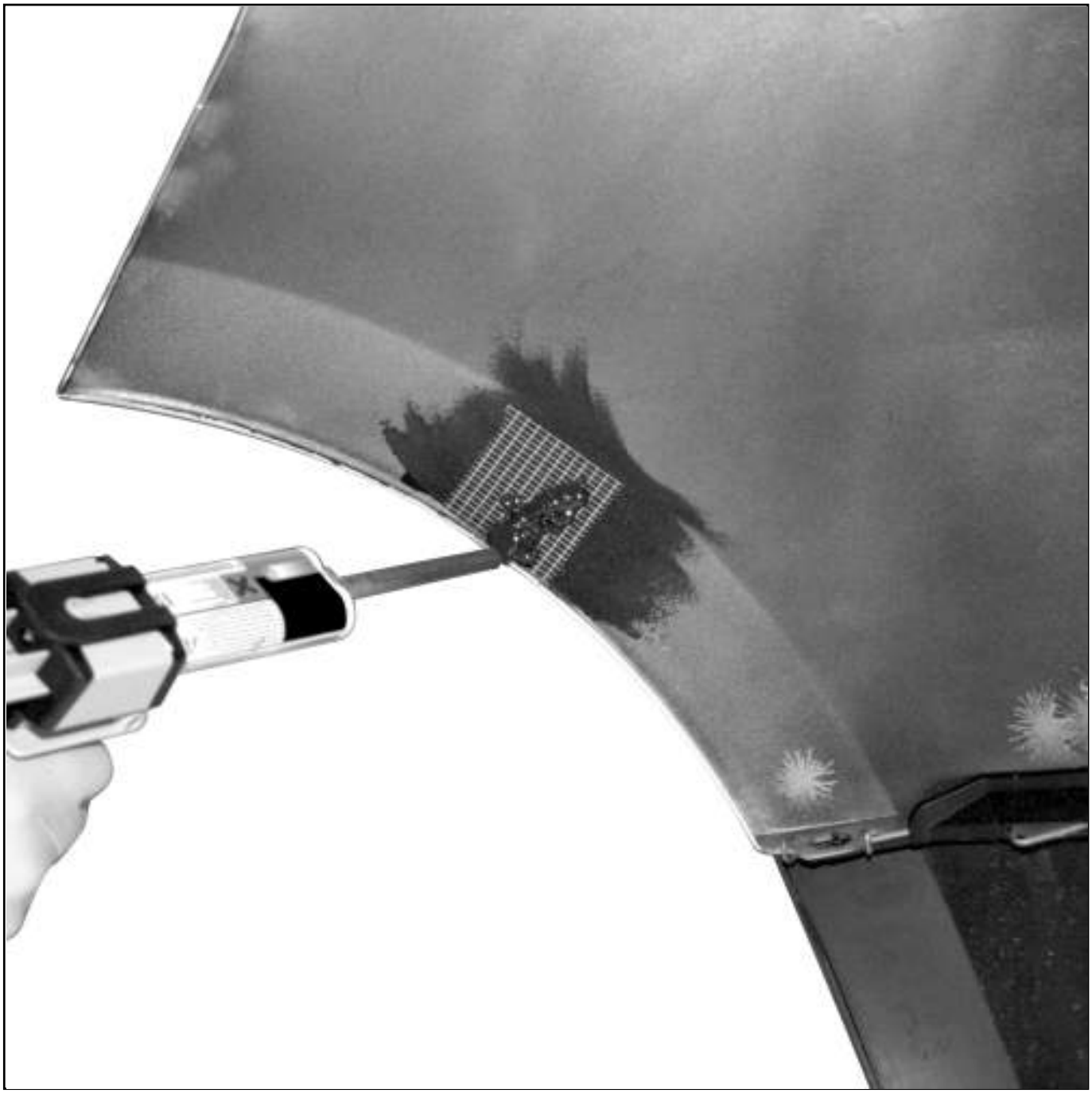
- Leave the adhesive primer to dry (see product technical sheet).



- Adjust a piece of reinforcing film (cloth)suitable for repairing the inside of the component.

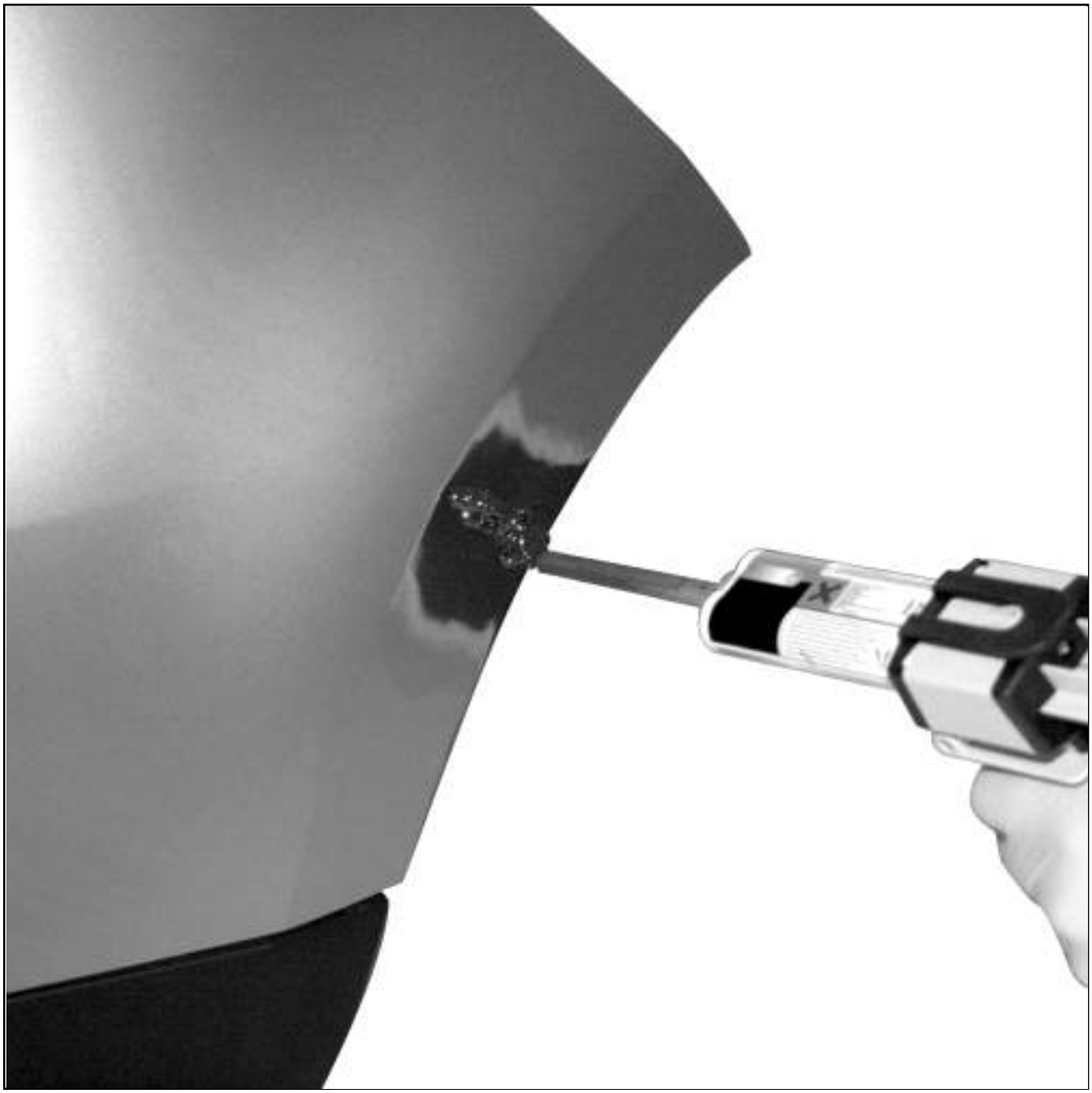
- Prepare the bi-component repair mastic(see 50A, General information, Products for plastic material bodywork components: Description) .

- Extrude a narrow bead around the area to be repaired on the inside of the component and apply reinforcing film (cloth).

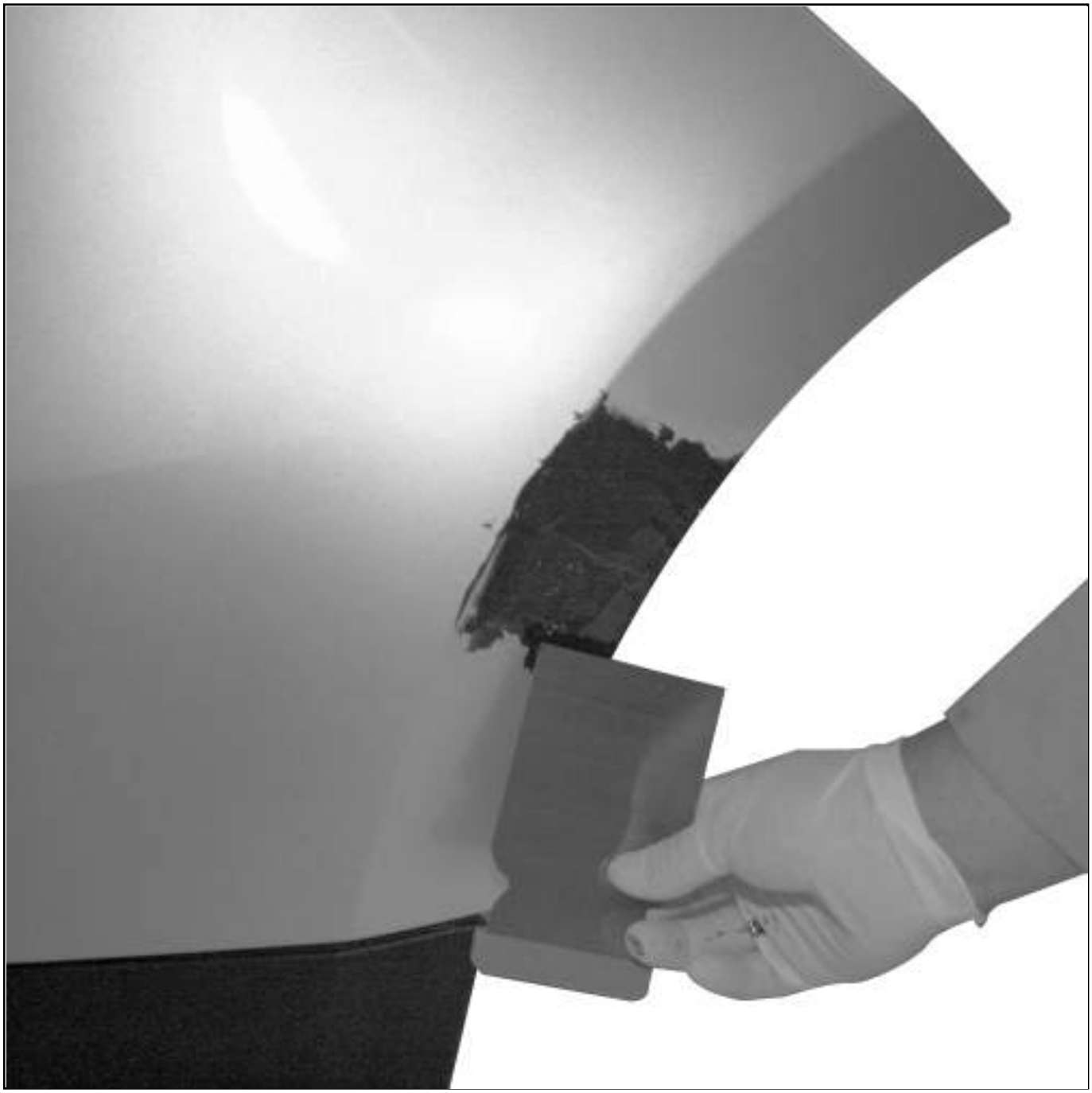


- Extrude a thick bead on the reinforcing film at the crack.

- Smooth using a spatula.



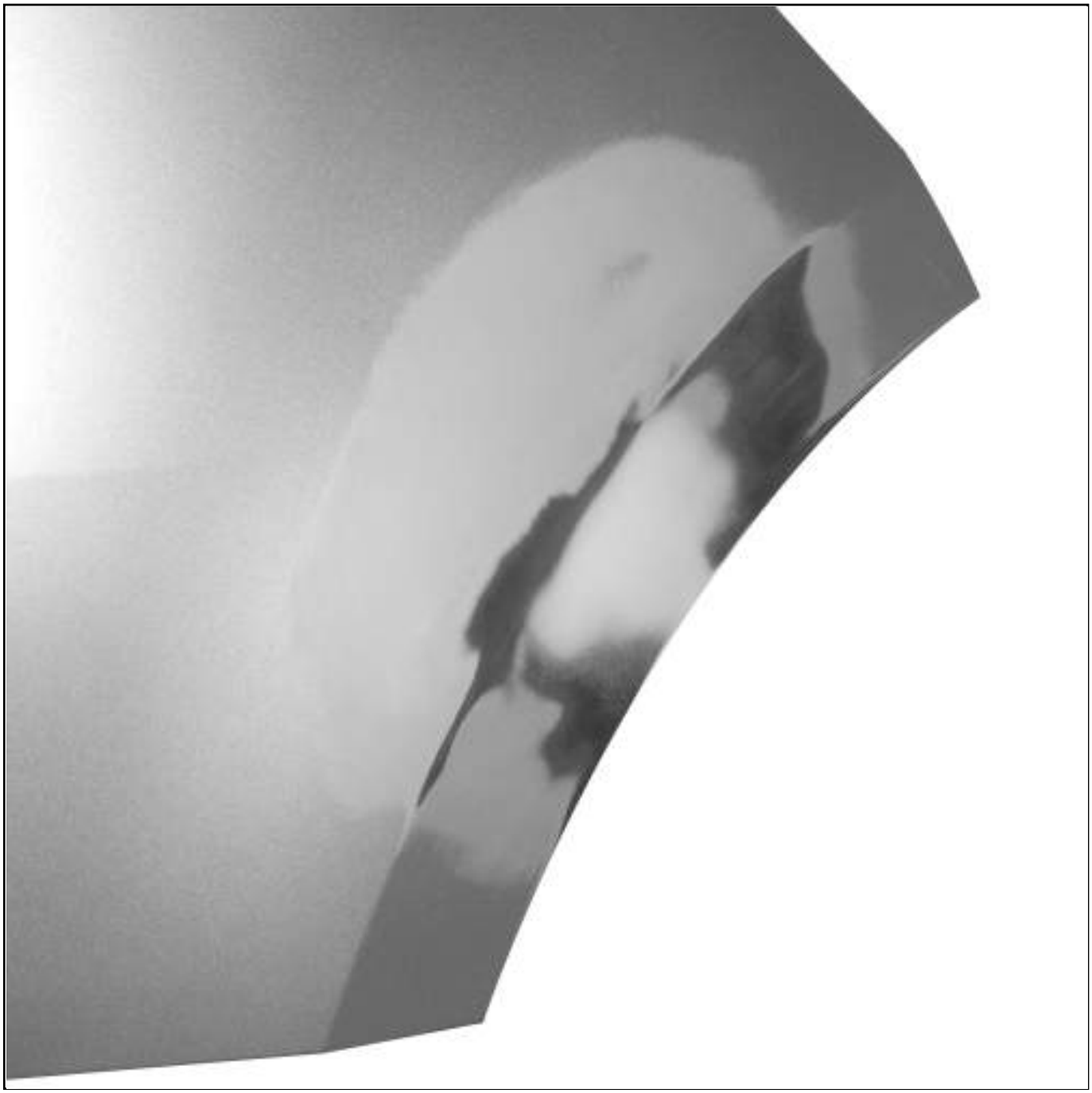
- Extrude a thick bead in the chamfer on the exterior side.



- Smooth using a spatula.
- Leave the bi-component repair masticto dry (see product technical sheet).
- Surface on the exterior side with a P 150then finish with a P 240.
- Blow the component and clean the area to be repaired with the cleaner included in the Plastic repair kit.

If necessary, apply a finishing mastic(see product technical sheet) **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

Sand the finishing masticwith a P 150then finish with a P 240.



Follow the paint application procedure according to the material concerned:

- **SMC bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
- **Polypropylene / polyethylene bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
- **Noryl bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
- **ABS bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic).

2- WELDING METHOD

Note:

Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .

- Wash the component in soapy water and rinse in clean water.
- Clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNERVehicle: Parts and

consumables for the repair (04B, Consumables - Products).

- Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).

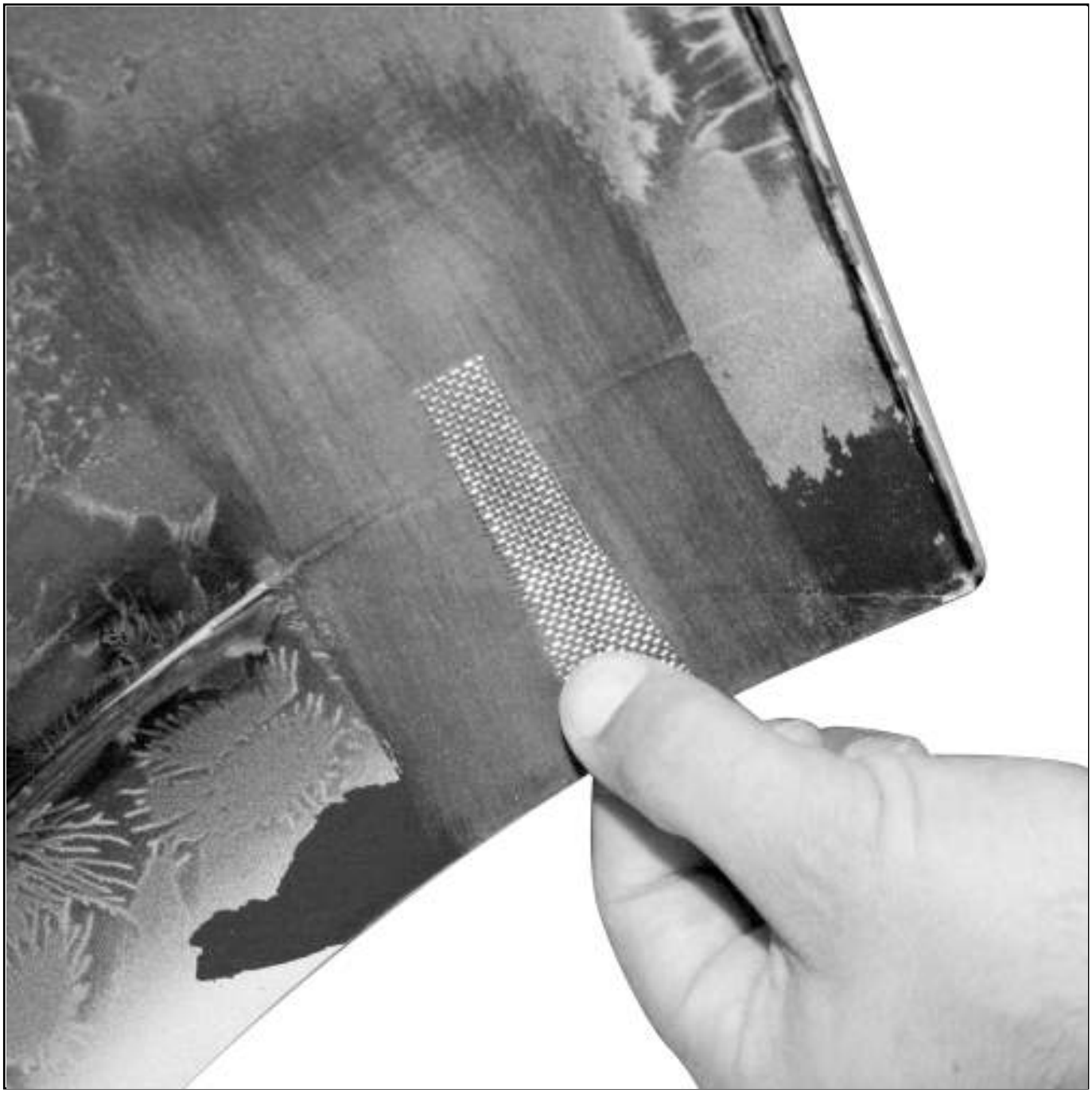
- Strip the paint with a P 150over a width of 50 mm.

- Blow the component and clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNER **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

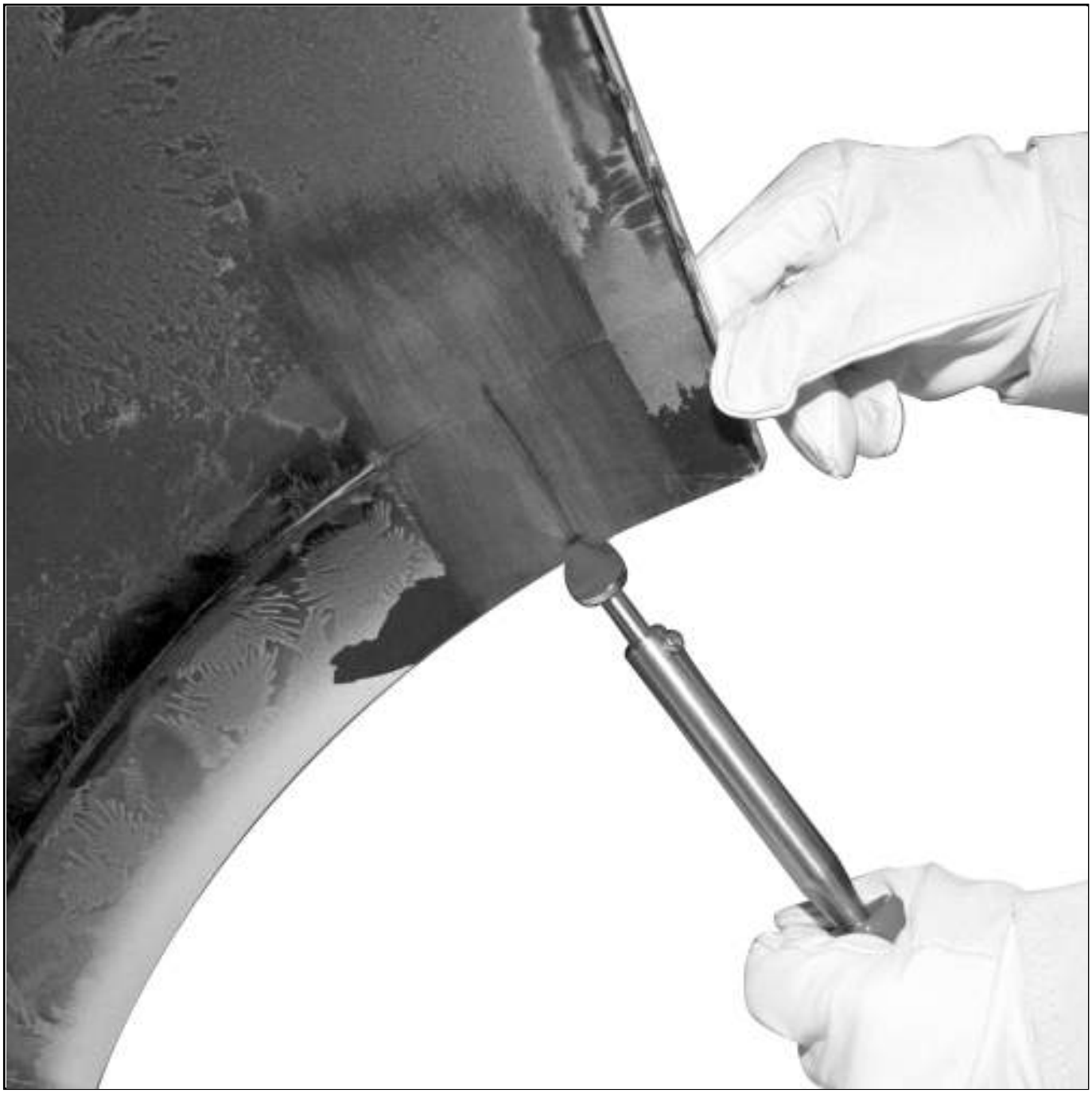
- Wipe the area with a clean, dry LINT-FREE CLOTH**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

- Preheat the soldering iron.

- Cut the stainless steel mesh wider at the start of the crack.

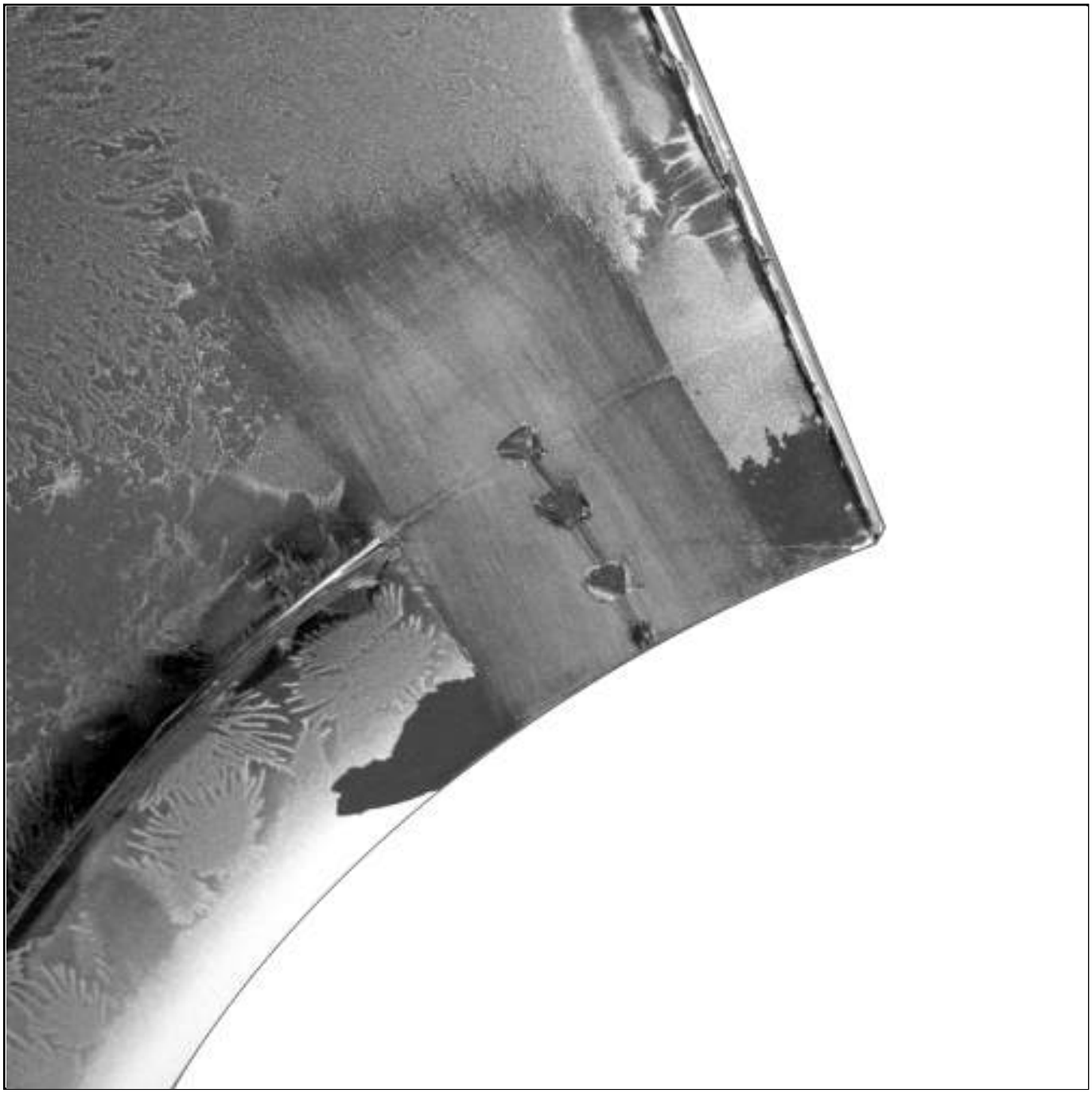


- Adjust the stainless steel mesh according to the shape of the support.



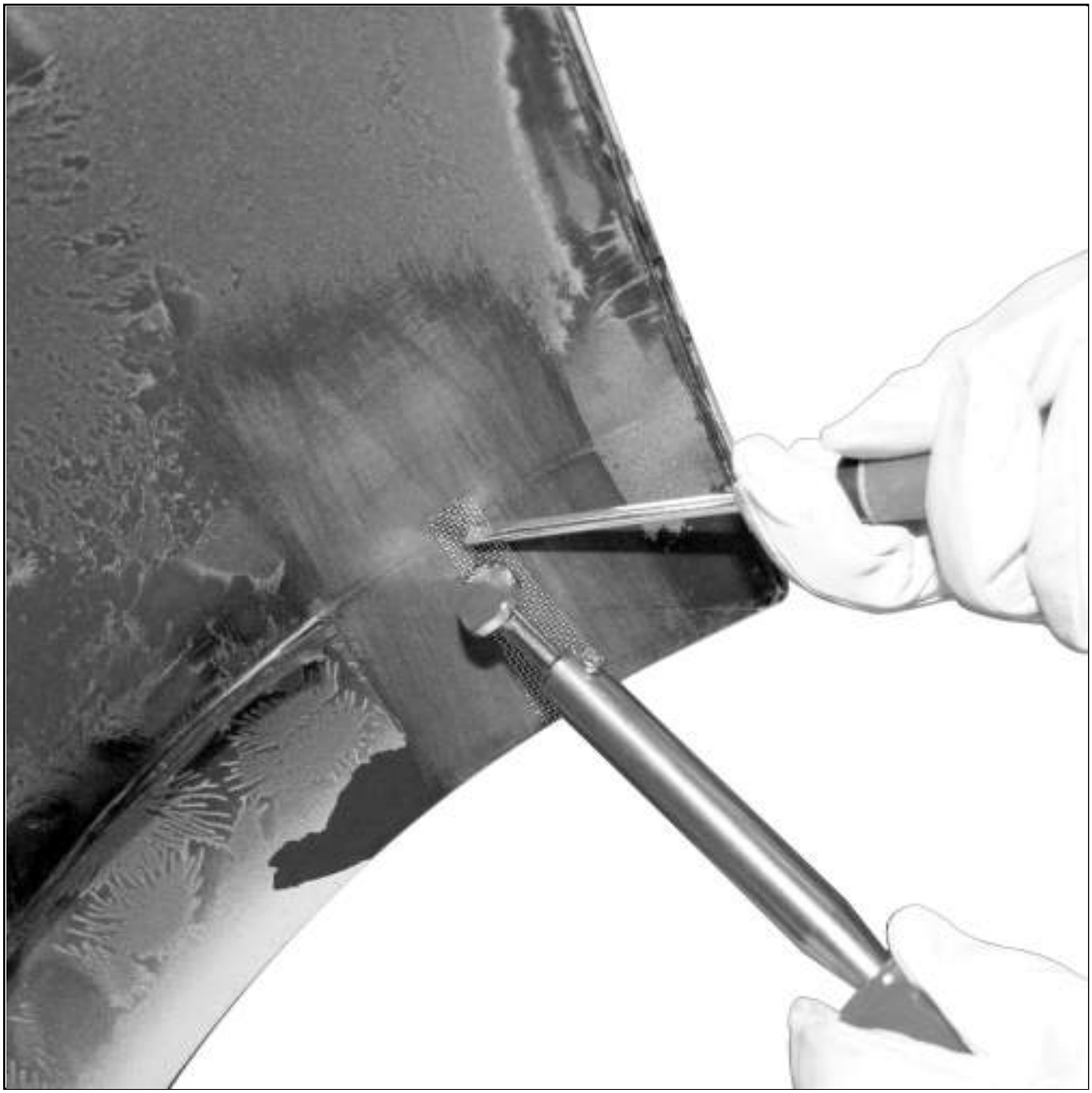
- Spot-weld the start of the crack with the tip of the soldering iron in order to maintain the shape.

- Cool the spot weld, for two seconds, vigorously with the cooler[Vehicle: Parts and consumables for the repair](04B, Consumables - Products).

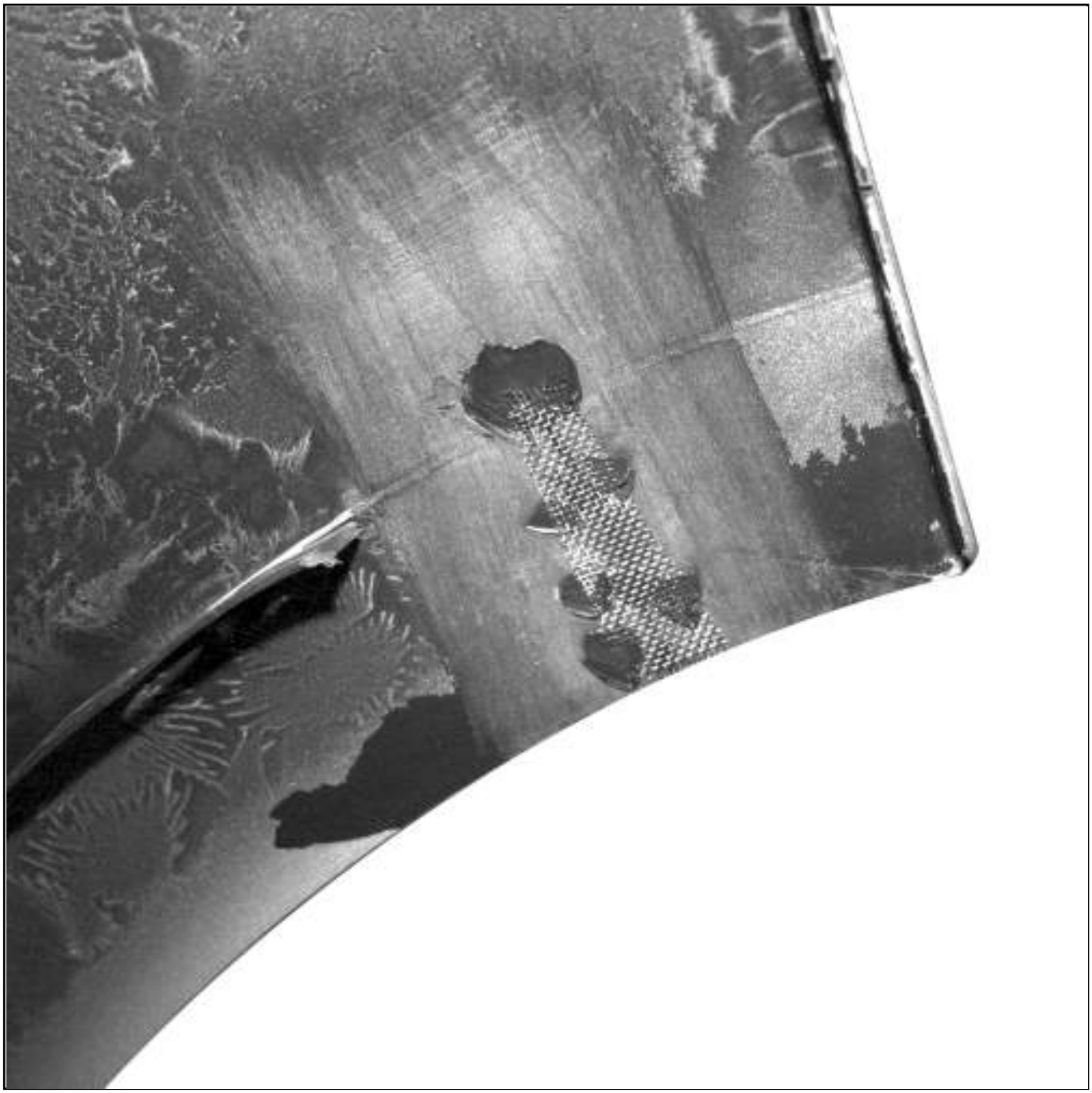


- Repeat this operation along the length of the crack.

- Cool each spot weld, for two seconds, vigorously with the cooler**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

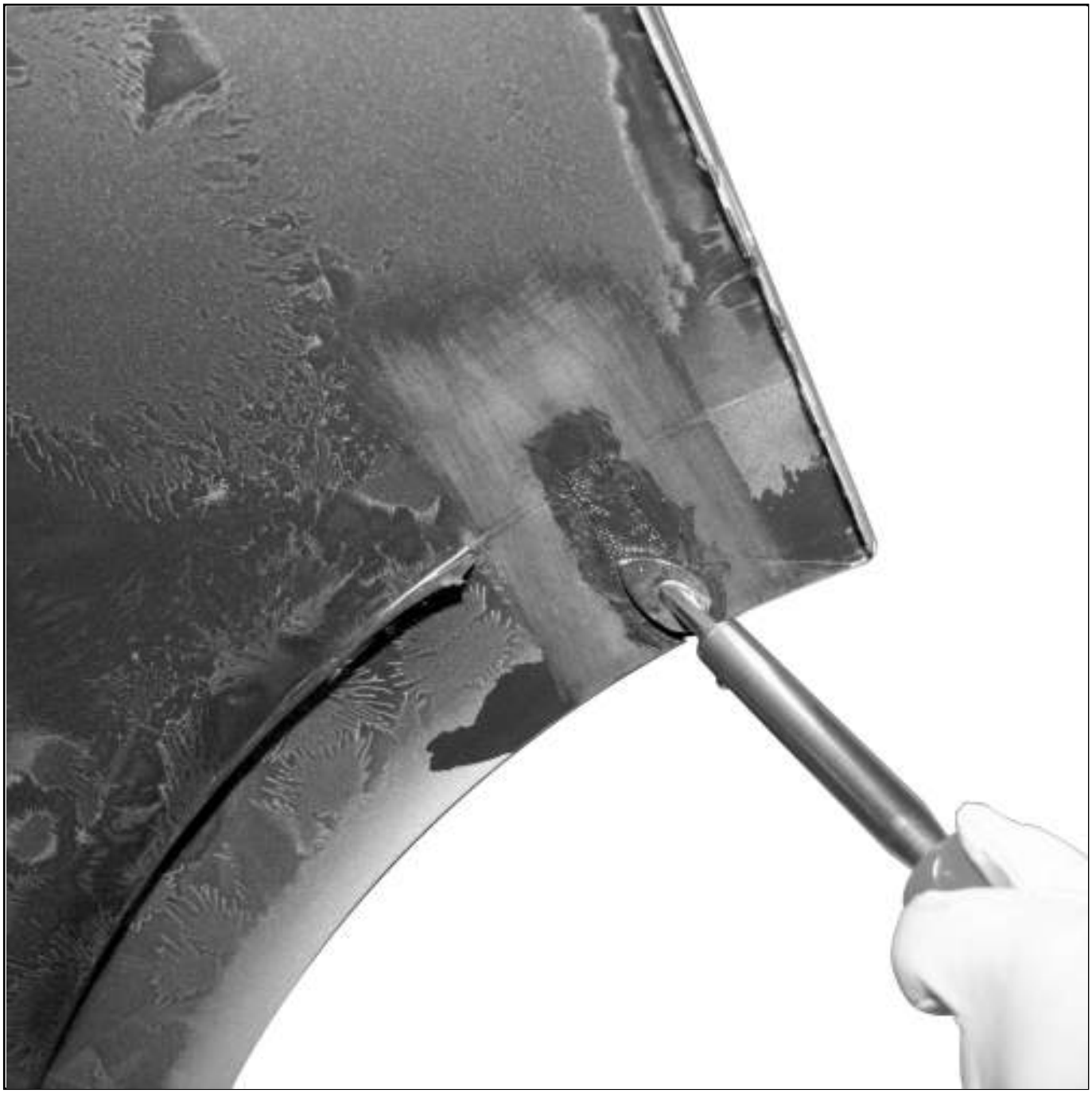


- Position the stainless steel mesh and hold it using a dedicated tool.



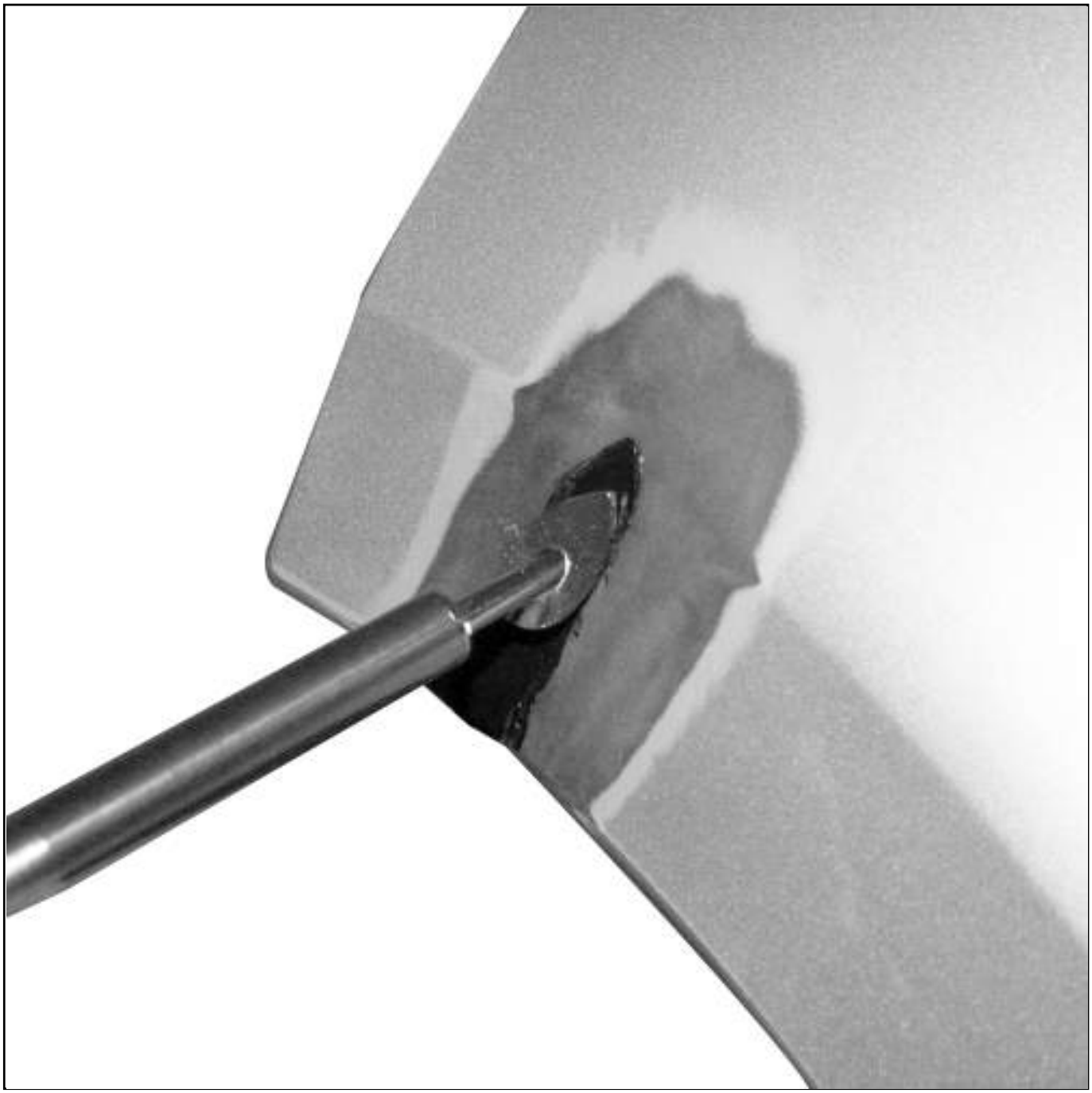
- Spot-weld the stainless steel mesh.

- Cool each spot weld, for two seconds, vigorously with the cooler**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

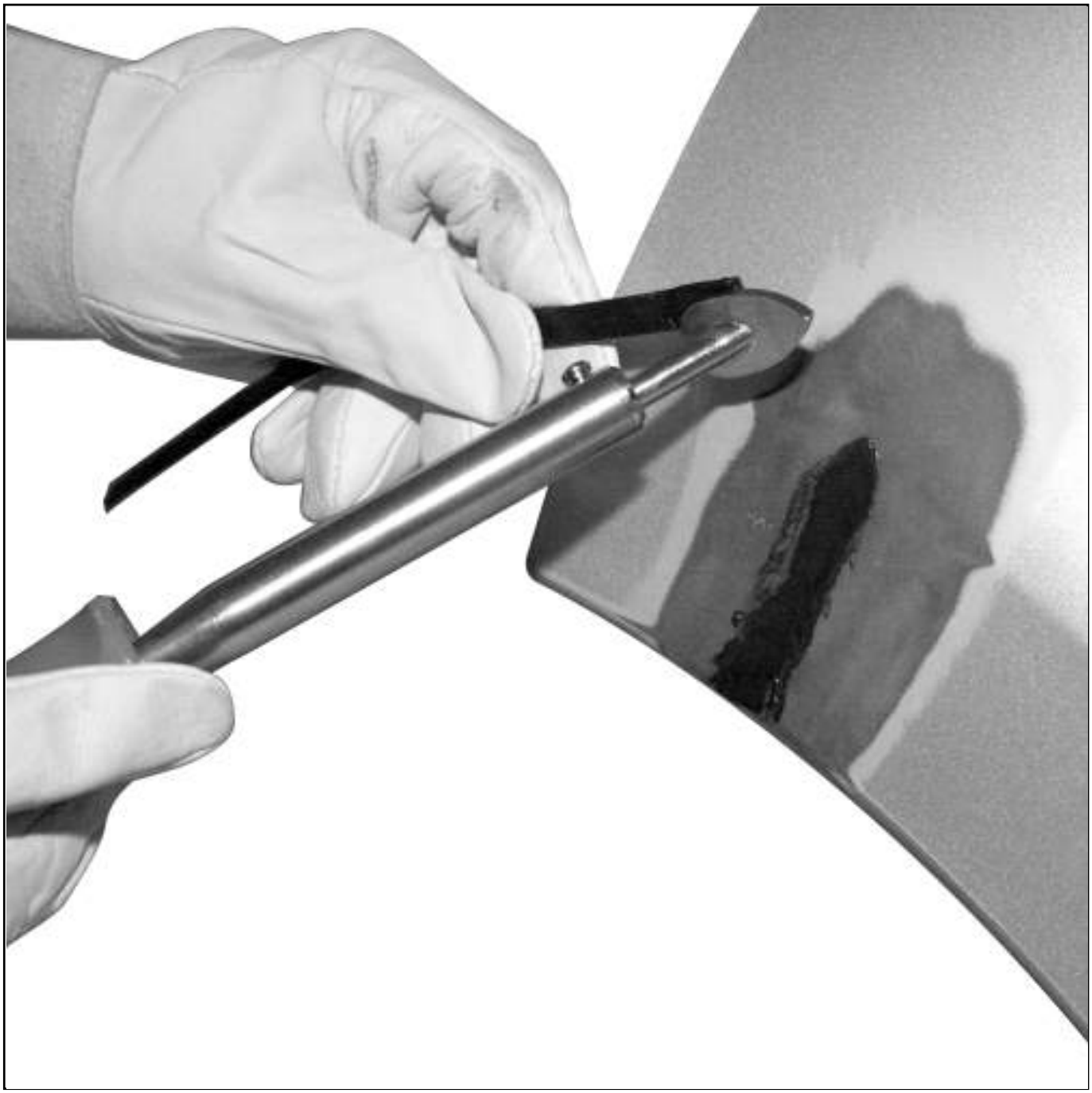


- Enclose the stainless steel mesh in the plastic material along the length of the crack.

- Cool the whole of the repaired area for two seconds, vigorously with the cooler**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).



- Weld the exterior part of the bumper.



❏ Add material by preheating the welding rod with the tip of the soldering iron (except for ABS, ASAand Polycarbonate type materials).

Note:

For ABS, ASAand Polycarbonate, fill the crack with the surrounding material

❏ Cool the whole of the repaired area for two seconds, vigorously with the cooler**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

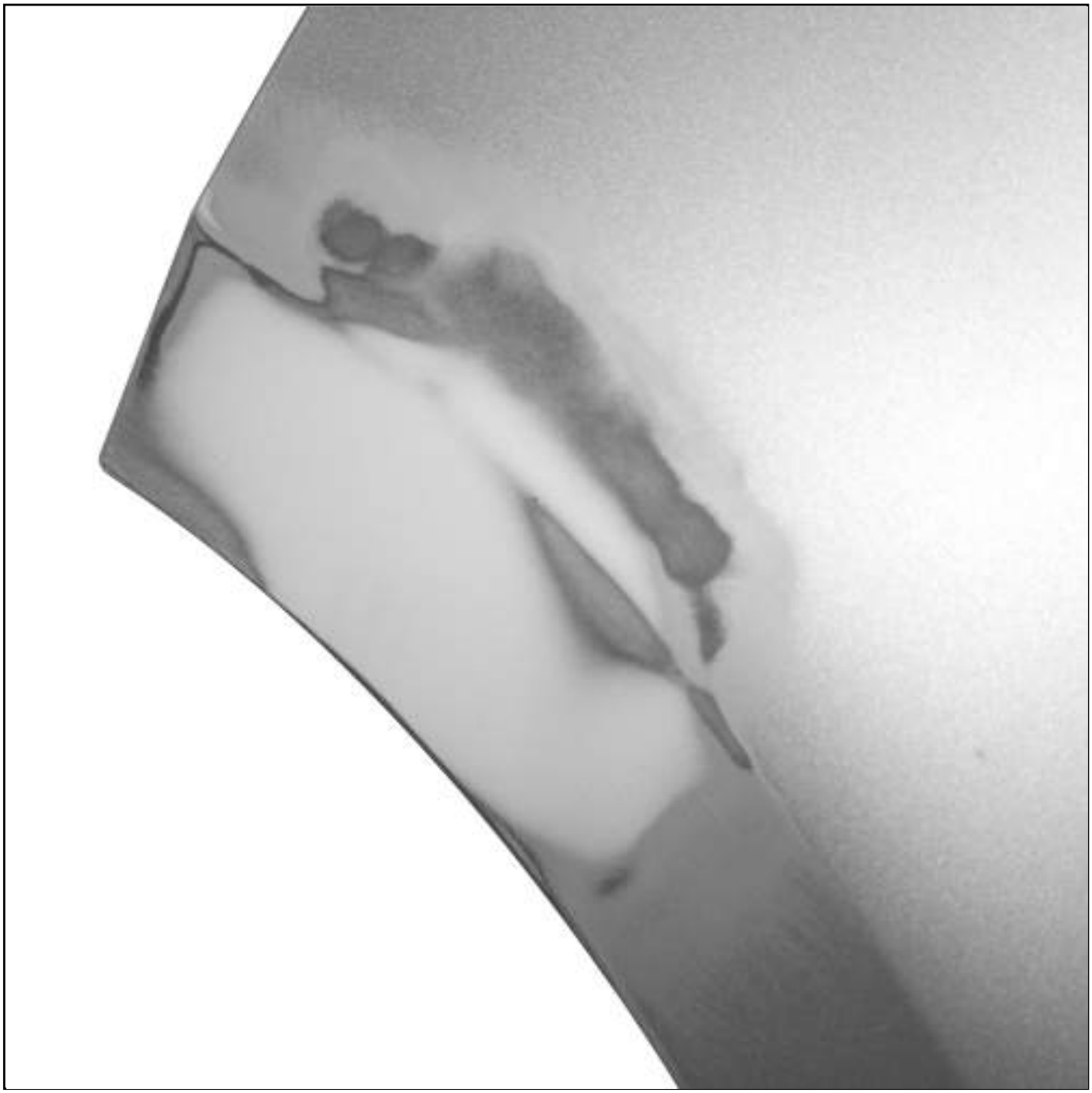
- Surface with a P 80to P 150then finish with a P 240.

- Blow the component and clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNER **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

- Wipe the area with a clean, dry LINT-FREE CLOTH**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

If necessary, apply a finishing mastic(see product technical sheet) **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

Sand the finishing masticwith a P 150then finish with a P 240.



- Follow the paint application procedure according to the material concerned:
  - **Polypropylene / polyethylene bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
  - **ABS bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic).

3- EPOXY RESINE METHOD

Note:

Method apply only on RTM component.

- Open the crack to let a hole of 10 mmwide.

- Chamfering between 30to 40 mmaround the crack using the orbital sander with a P80.

- Sand the paint around the zone to be repaired using the orbital sander with a P 150

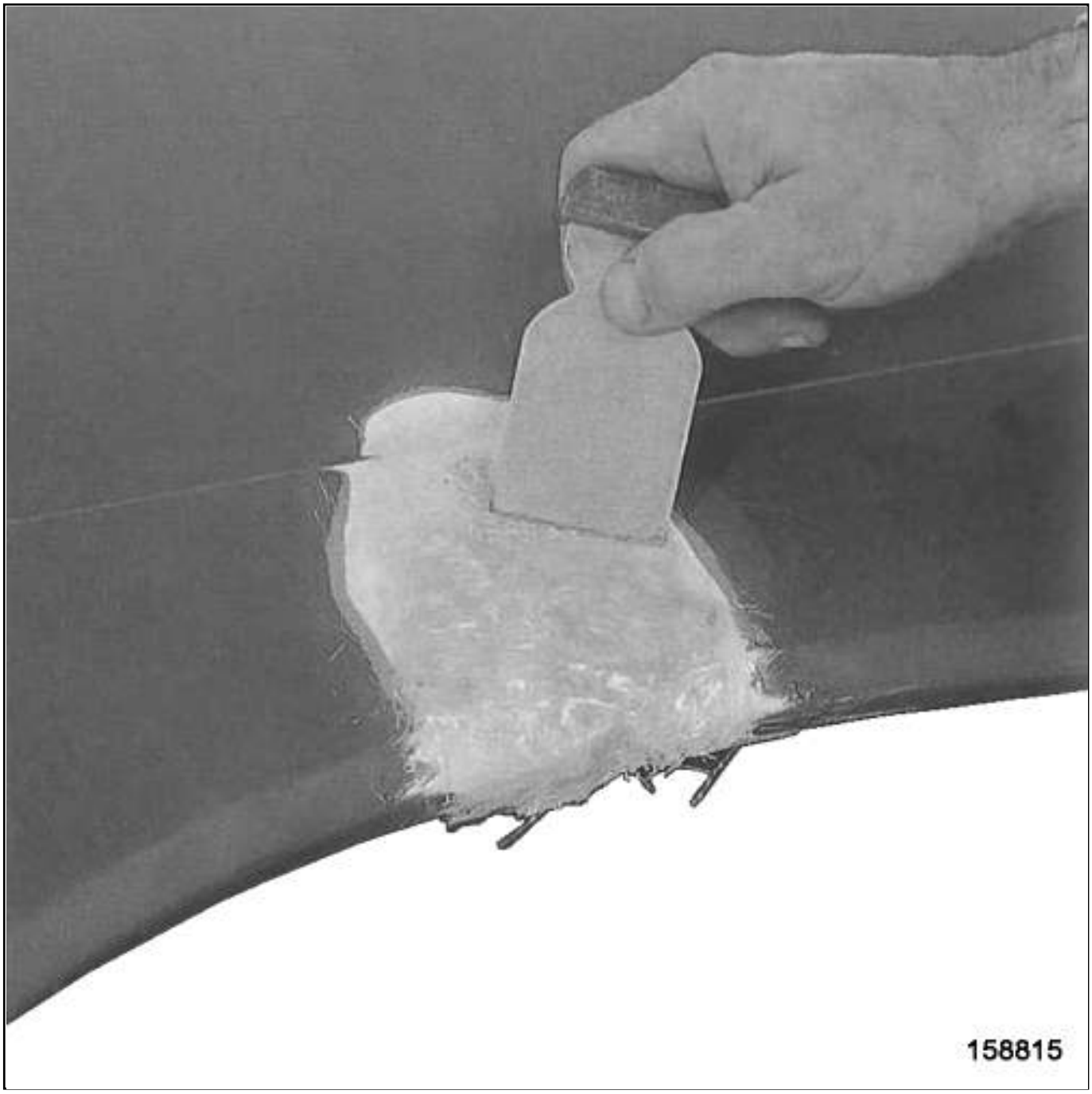
- Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

- Align the borders of the component using a plate pad(local manufactured)and fix them with plate screws.

- Cut 2 strips of materialwith repair length, first of 50mmwide and second of 100 mmwide.

- Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

- Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .



- Fit the strip of materiel.

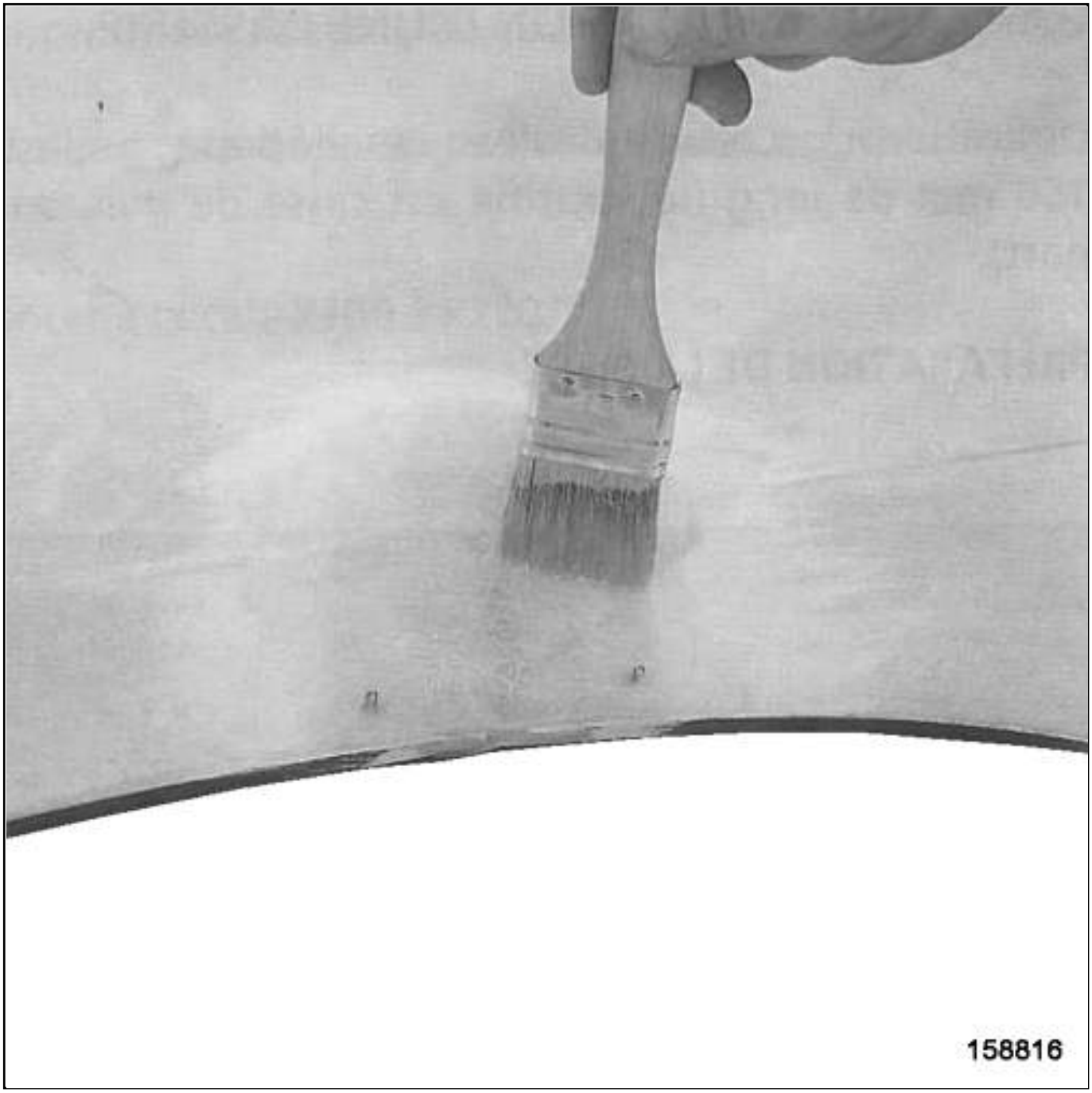
- Soaked the component interior with Epoxy resin.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

- Remove the plate pads.

- Cut a strip covering the chamfer.



- Chamfering the screws holes.

- Fit the strip soaking with resin.

Note:

Pay particular attention at output screw area and at strips junction reinforcement to prevent the air bubbles form.

- Add short fibres with resin(50 % maxi.).
- Apply the mixture using a spatula.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

- Sand using the orbital sander with a P 80then with a P180and P240.
- Apply if necessary a finishing mastic(see product technical sheet). (see **Vehicle: Parts and consumables for the repair**)
- Sand the finishing masticusing a P 150then finish using a P240.

4. PROCEDURE 3

- Repairing a hole on a plastic chassis element.

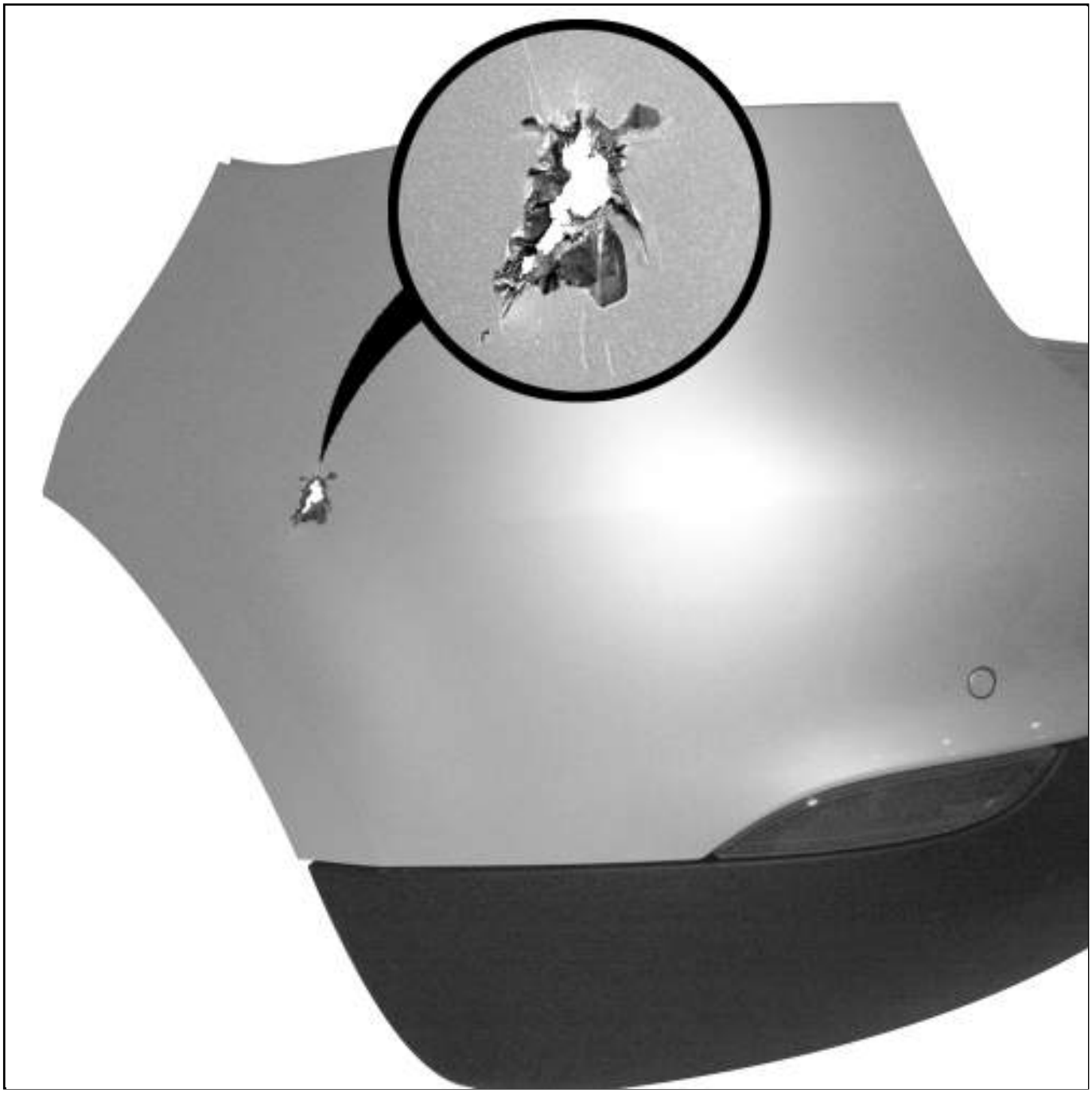
1- BONDING METHOD

Note:

Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .



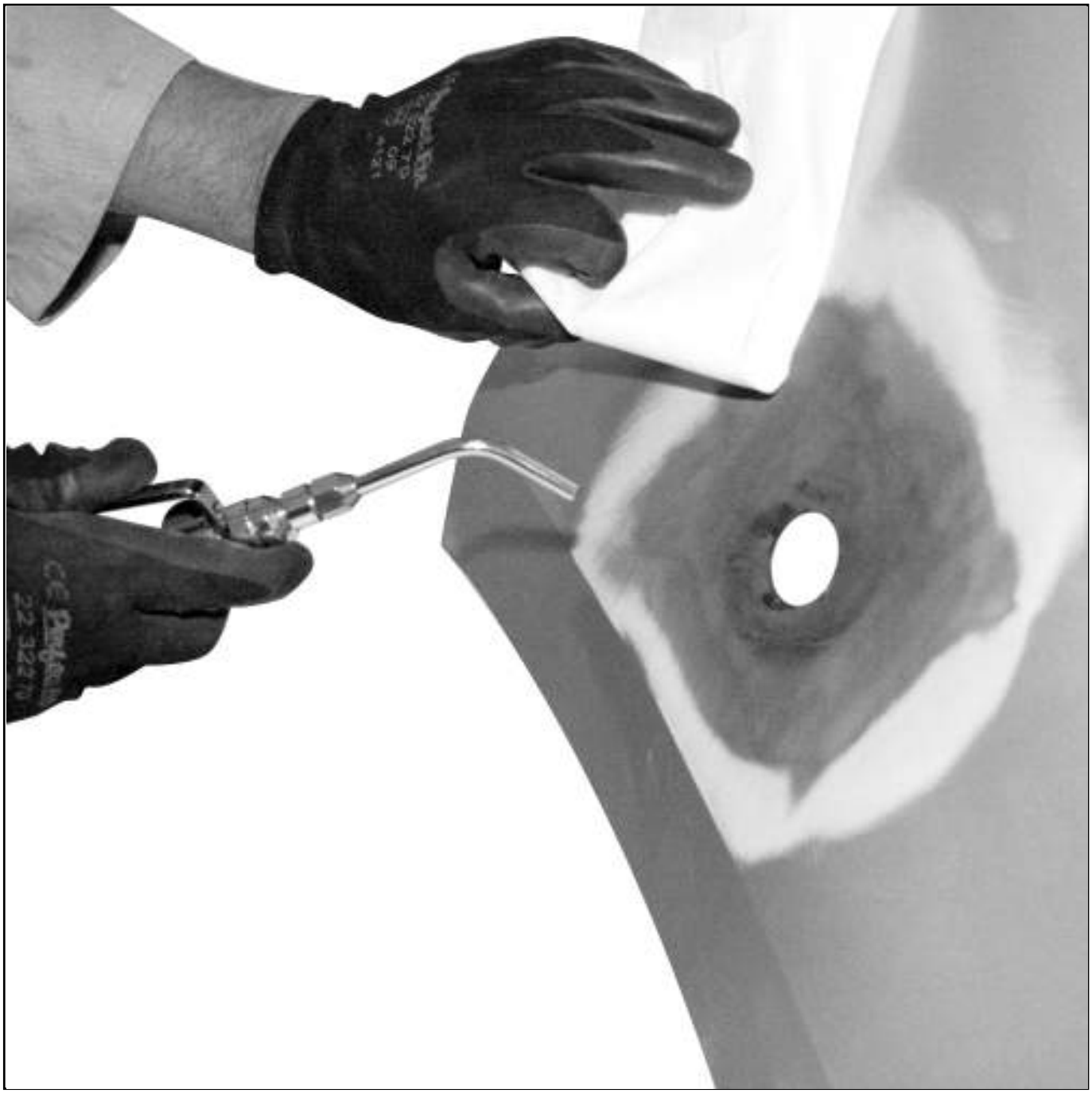
- Wash the component in soapy water and rinse in clean water.

- Clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNERVehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Chamfer on the exterior side using an angle grinder or a belt sander equipped with a P 120 abrasive pad.

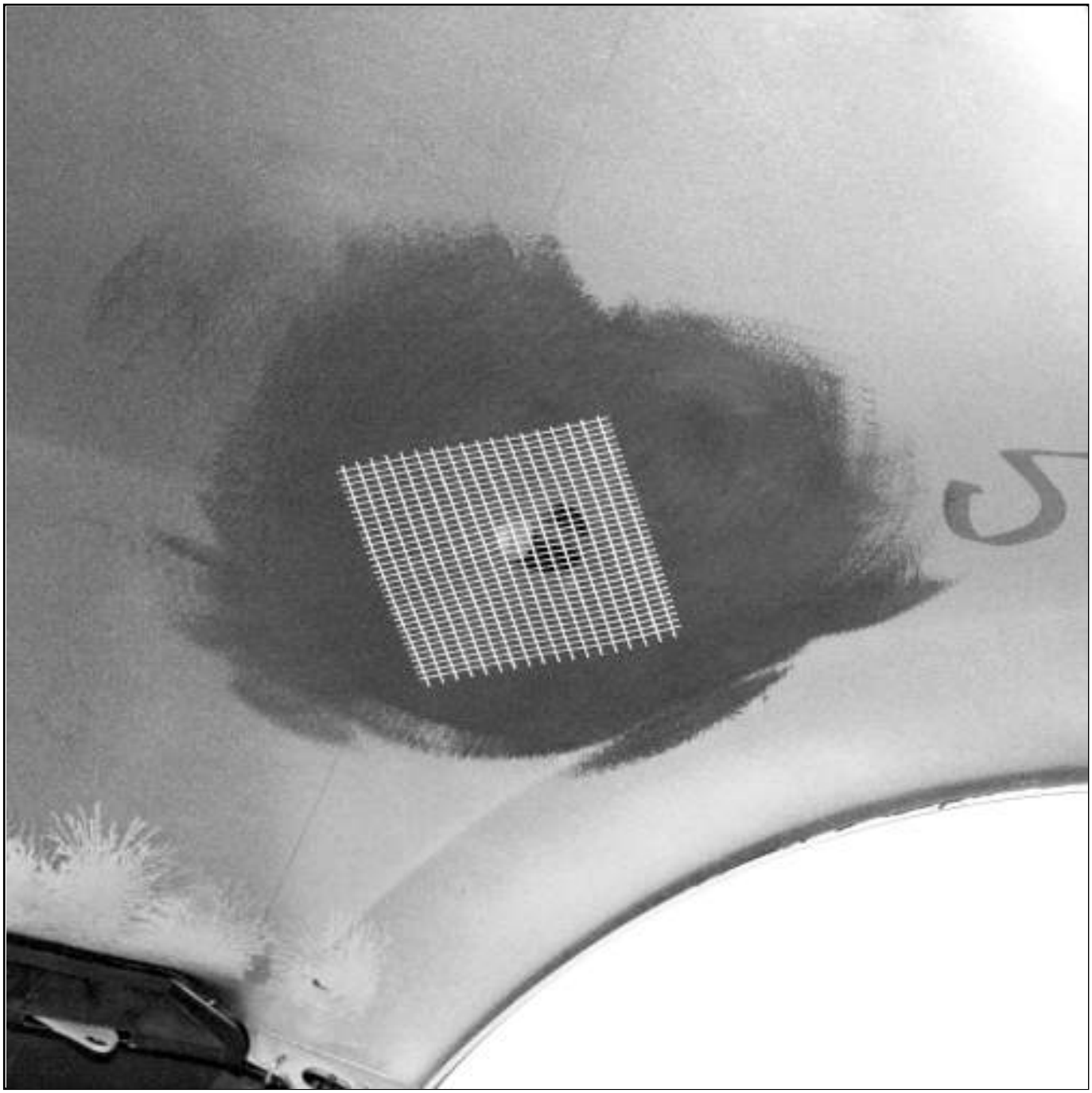
- Surface the interior and exterior areas with the orbital sander using a P 150.



- Blow the component and clean the area to be repaired with the cleaner included in the plastic repair kit box.

- Apply the adhesive primerincluded in the plastic repair kitto the interior and exterior areas.

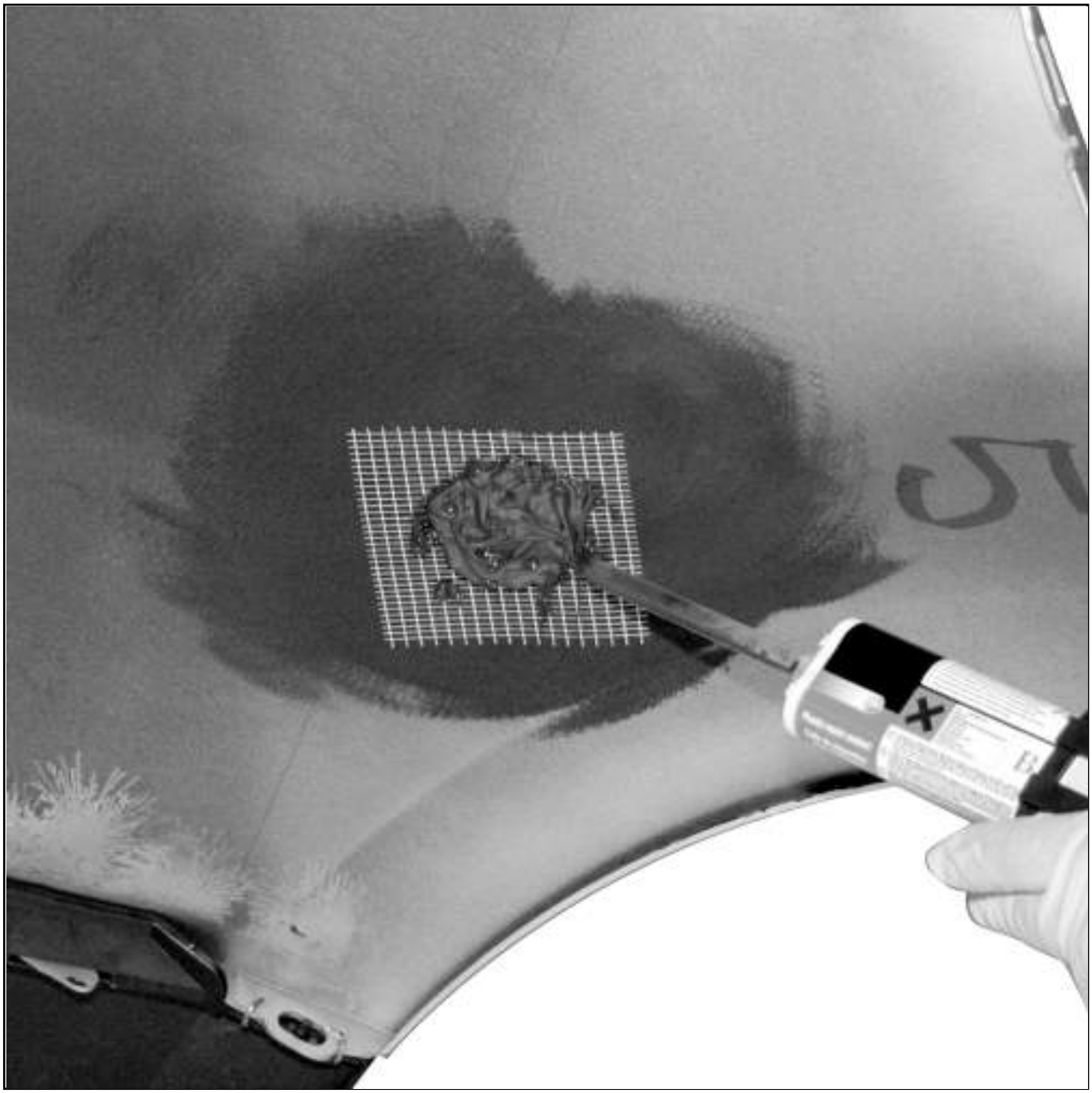
- Leave the adhesive primerto dry (see product technical sheet).



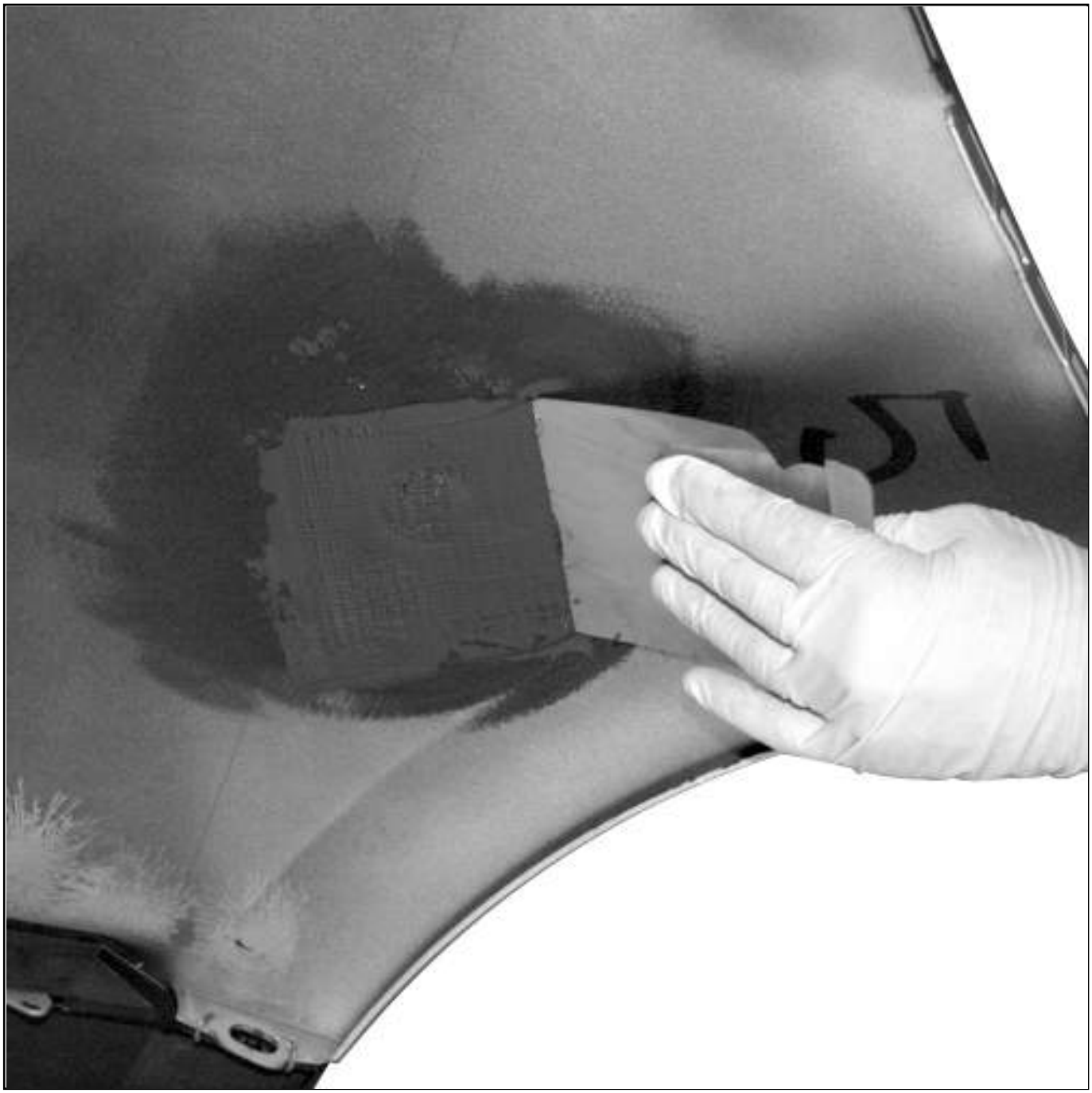
- Adjust a piece of reinforcing film (cloth)suitable for repairing the inside of the component.

- Prepare the bi-component repair mastic(see 50A, General information, Products for plastic material bodywork components: Description) .

- Extrude a narrow bead around the areas to be repaired on the inside of the component and apply reinforcing film (cloth).

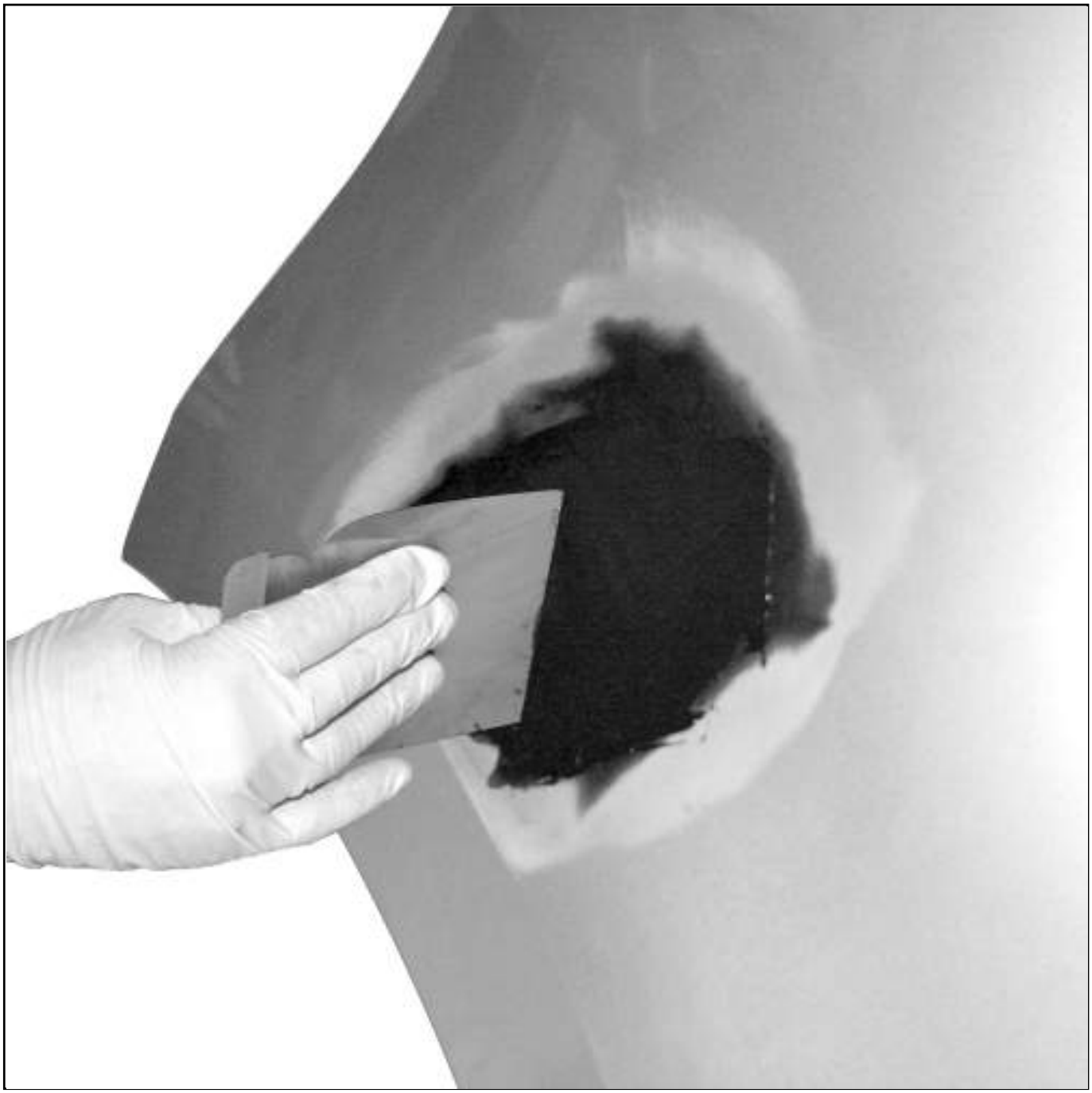


- Extrude a thick bead on the reinforcing film (cloth)at the hole.



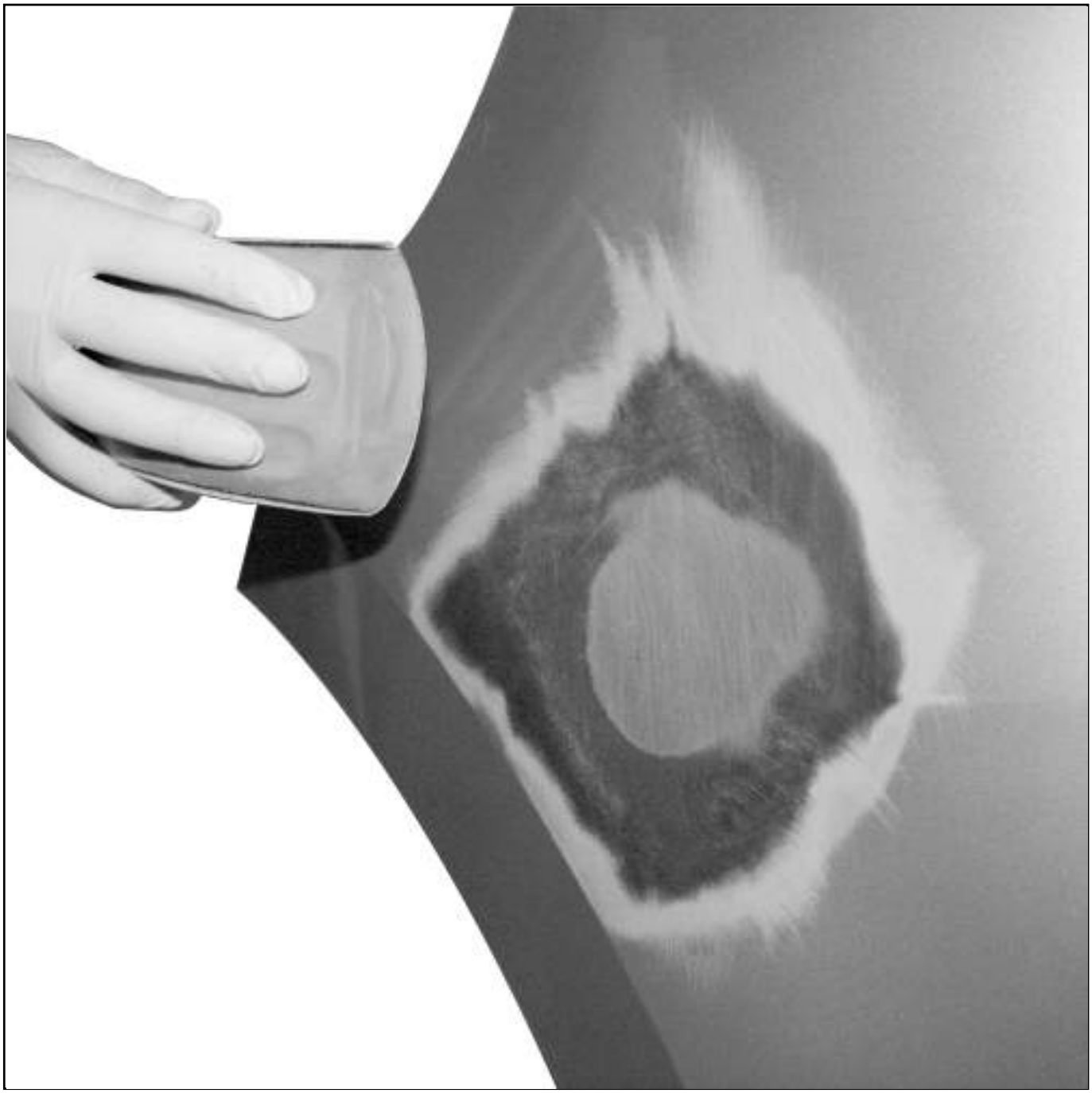
- Smooth using a spatula.

- Extrude a thick bead on the reinforcing film (cloth)at the hole on the exterior.

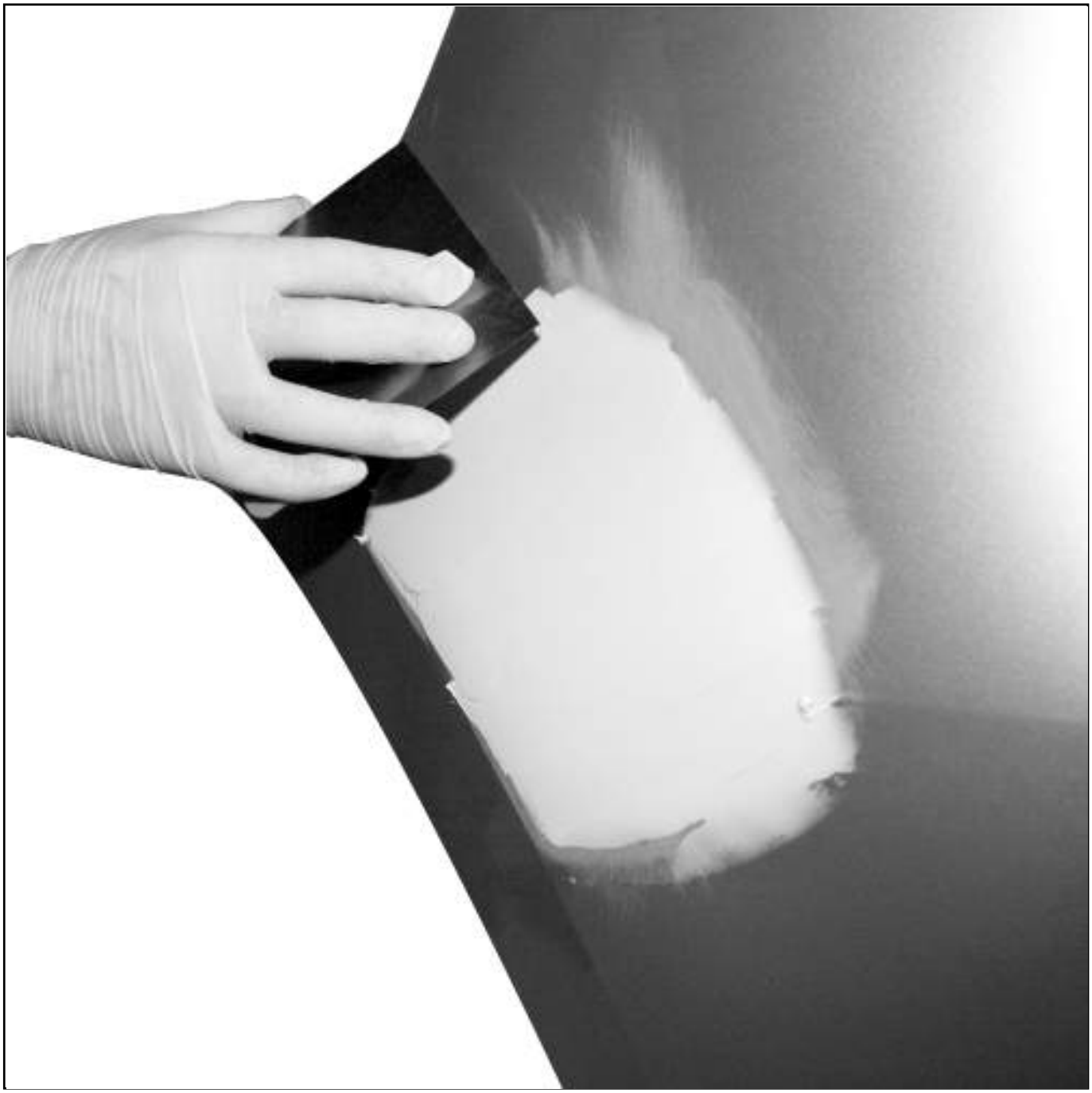


- Smooth using a spatula.

- Leave the bi-component repair masticto dry (see product technical sheet).

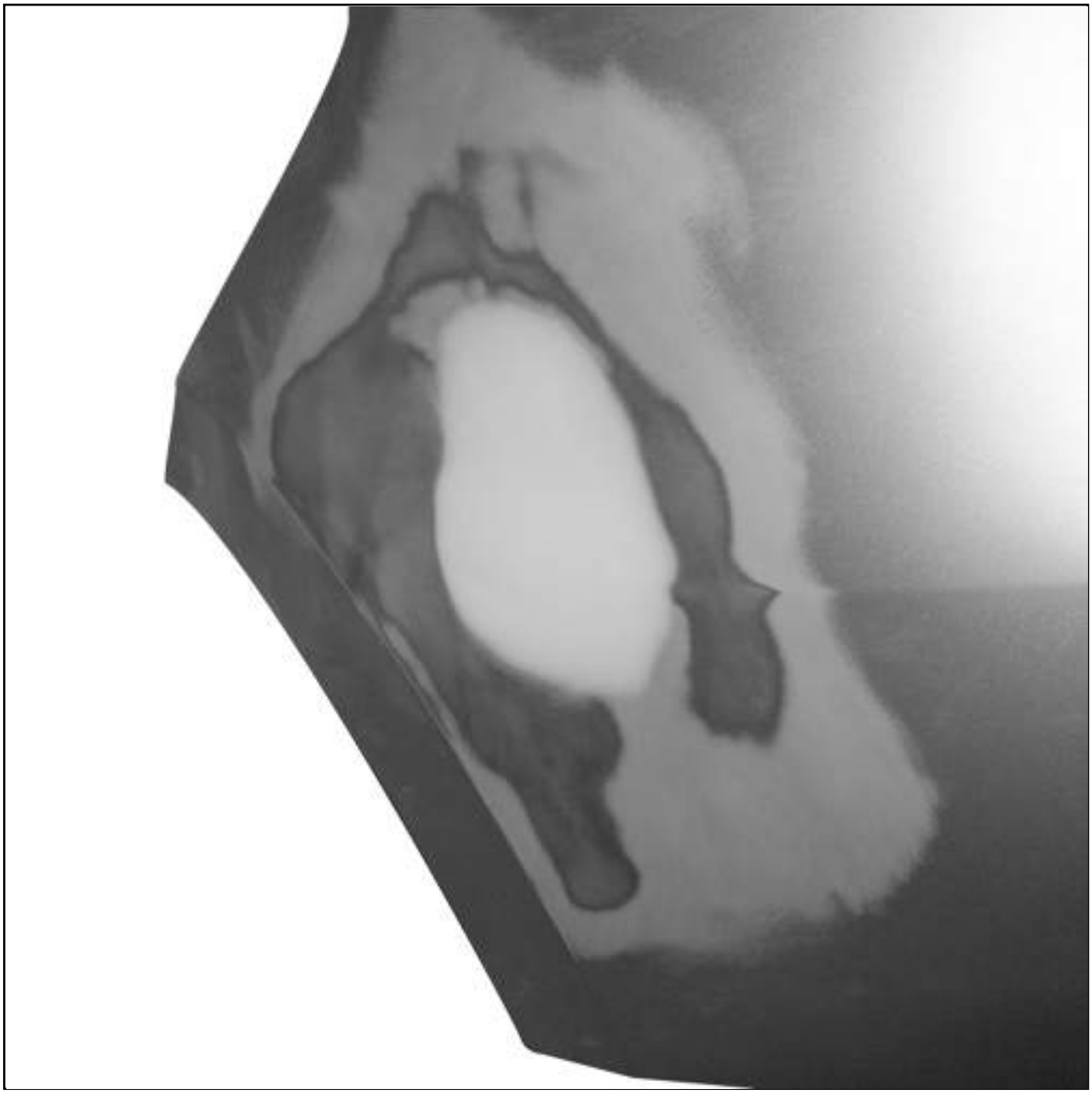


- Surface on the exterior side with a P 150then finish with a P 240.



- If necessary, apply a finishing mastic(see product technical sheet) **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

- Sand the finishing masticwith a P 150then finish with a P 240.



Follow the paint application procedure according to the material concerned:

- **SMC bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
- **Polypropylene / polyethylene bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
- **ABS bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
- **Noryl bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic).

2- WELD METHOD

Note:

Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .

Note:

This repair cannot be carried out on ABS, ASAand Polycarbonateplastics.

- Wash the component in soapy water and rinse in clean water.

- Clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNERVehicle: Parts and consumables for the repair (04B, Consumables - Products).

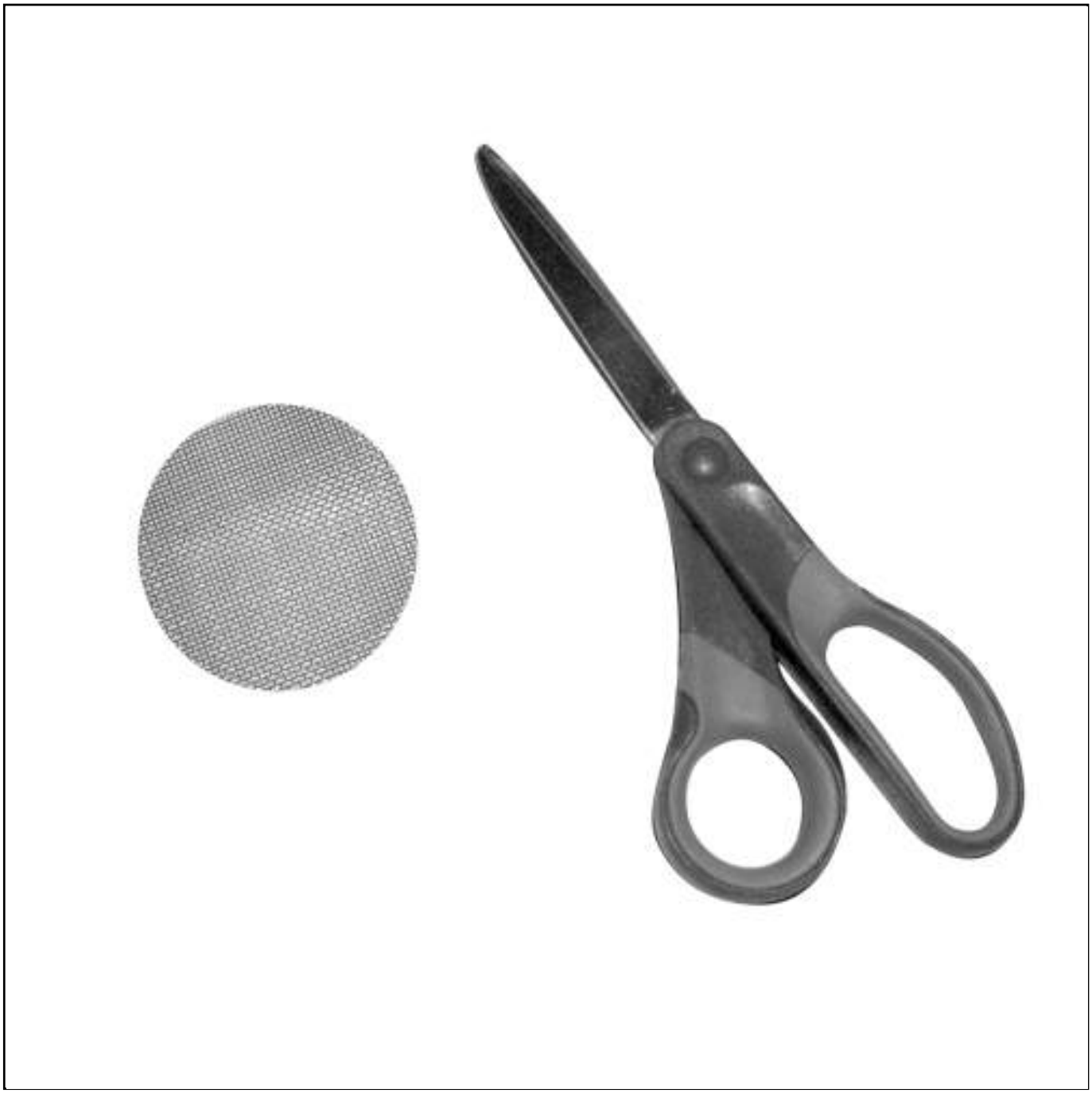
- Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Strip the paint with a P 150 over a radius of 100 mm.

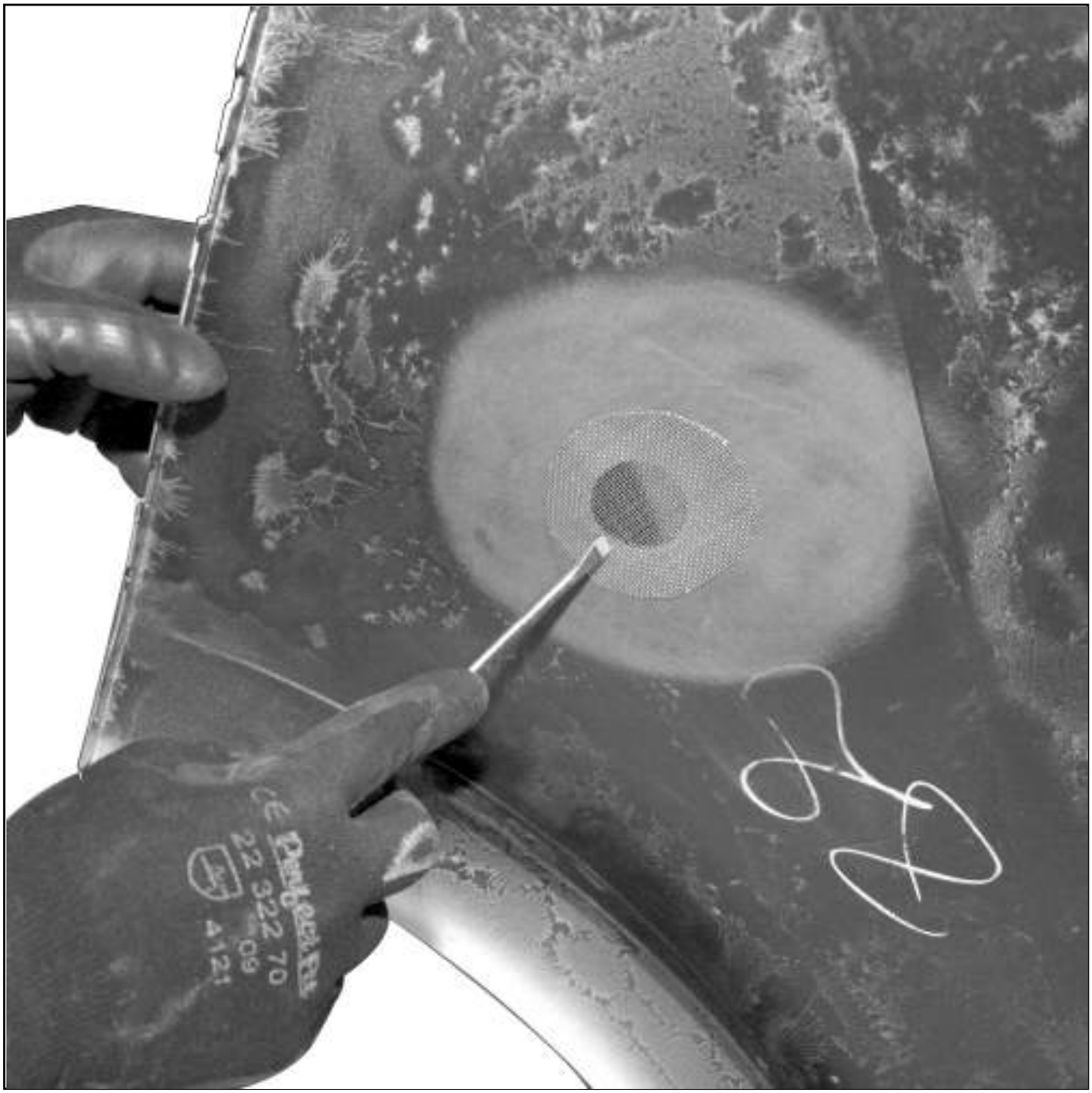
- Blow the component and clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Preheat the soldering iron.



- Cut the stainless steel mesh suitable for the repair.



- Adjust the stainless steel mesh and hold it using a dedicated tool.

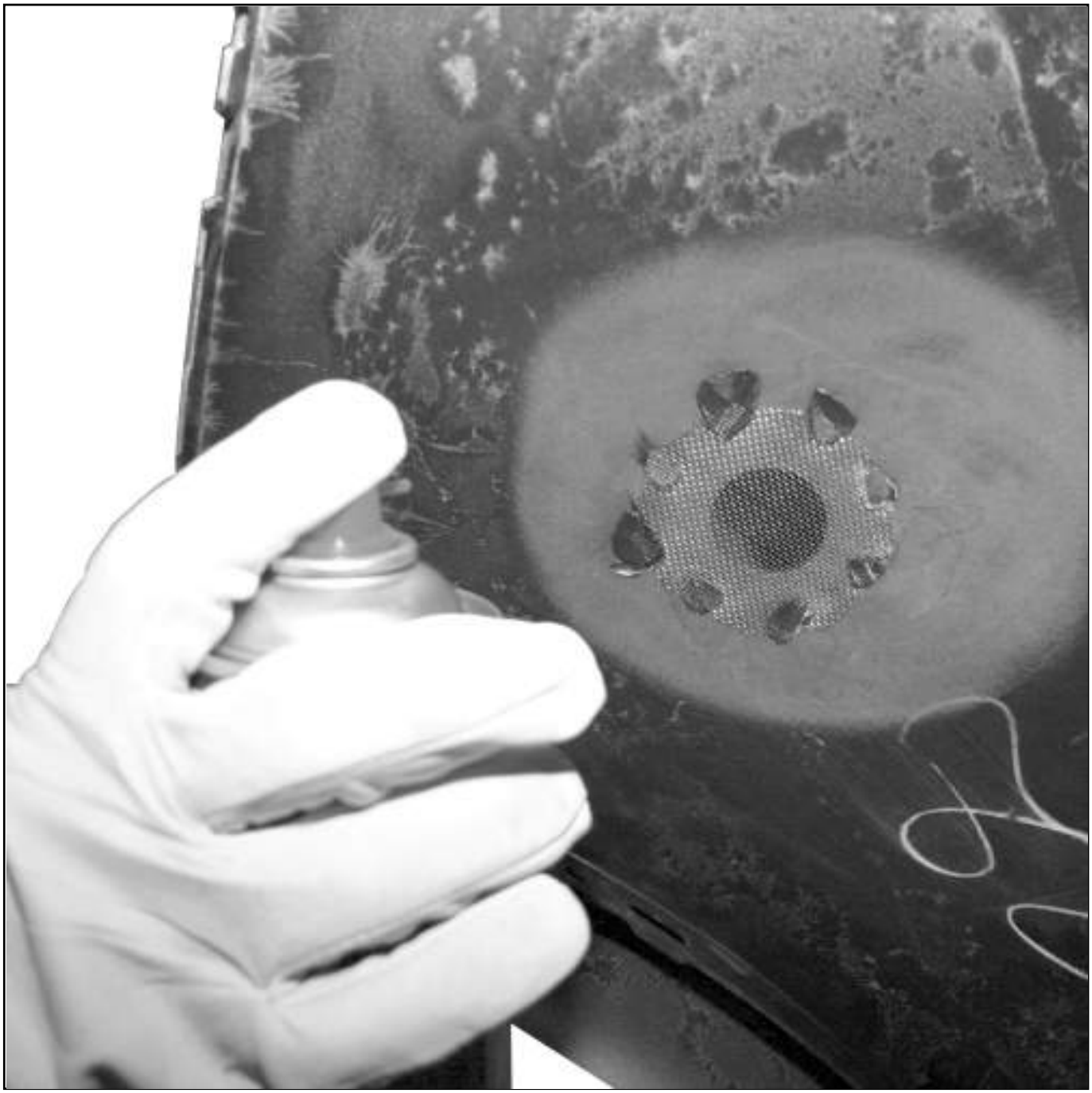
- Spot weld around the edge of the stainless steel mesh frame with the tip of the soldering iron.

Note:

For noryl:

Add material around the edge of the hole by preheating the welding rod with the tip of the soldering iron.

Enclose the stainless steel mesh in the additional material.



- Cool each spot weld, for two seconds, vigorously with the cooler**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

- Enclose the stainless steel frame in the plastic material.

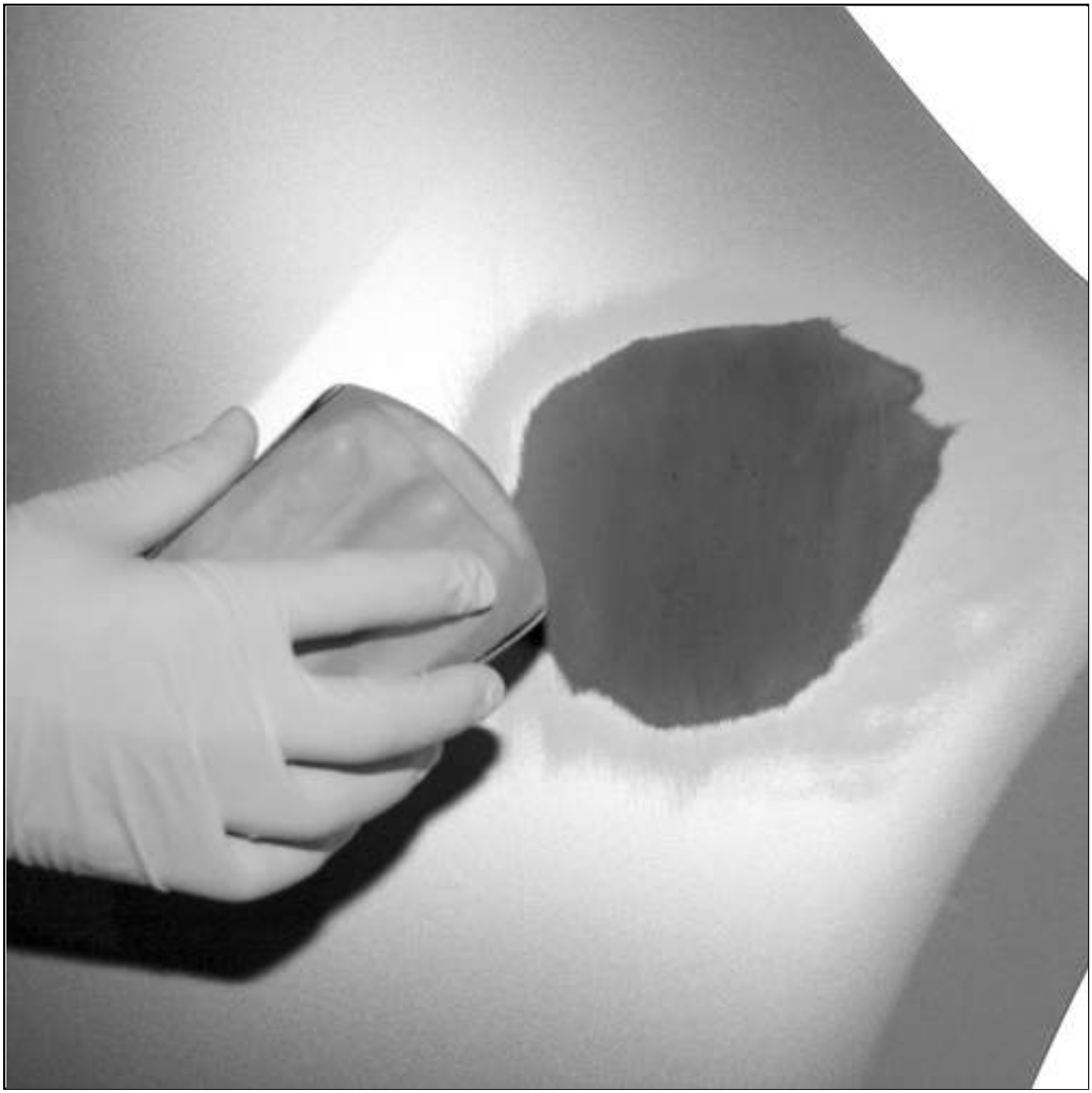
- Cool the whole of the repaired area for two seconds, vigorously with the cooler**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

- Add material by preheating the welding rod with the tip of the soldering iron.

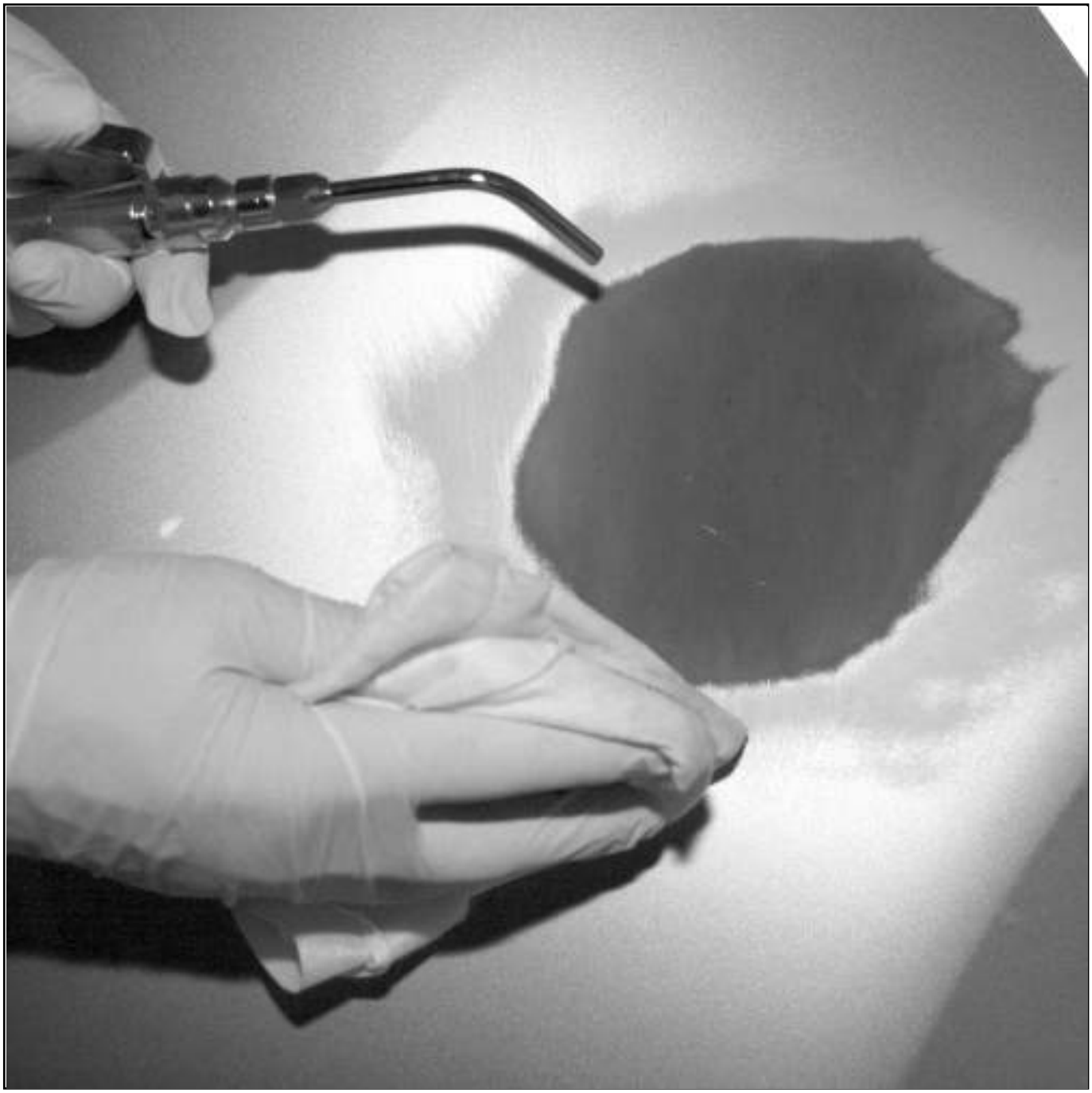
- Cool the whole of the repaired area for two seconds, vigorously with the coolerVehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Add material to the exterior by preheating the welding rod with the tip of the soldering iron.

- Cool the whole of the repaired area for two seconds, vigorously with the cooler[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).

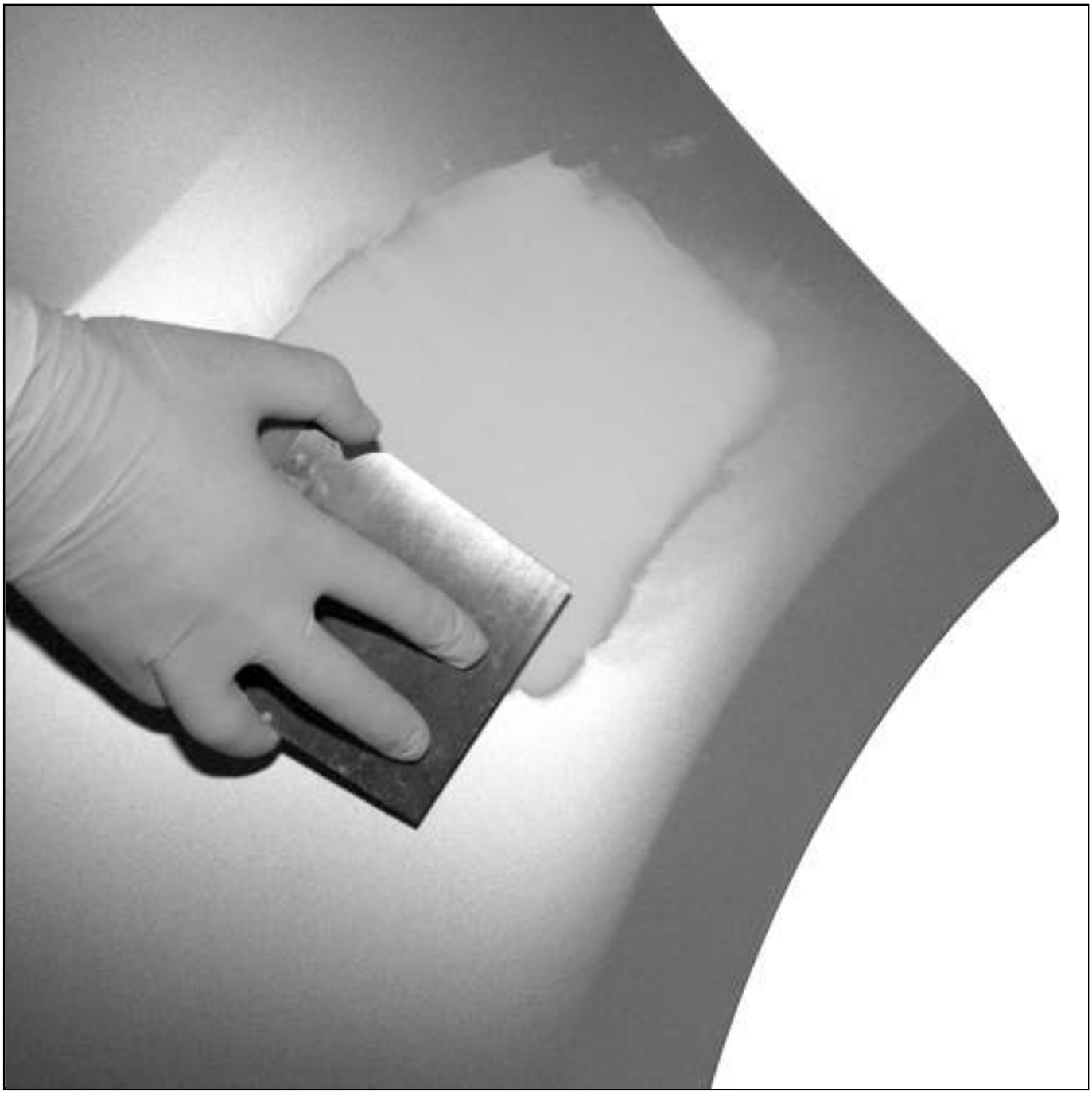


- Surface with a P 80to P 150then finish with a P 240.



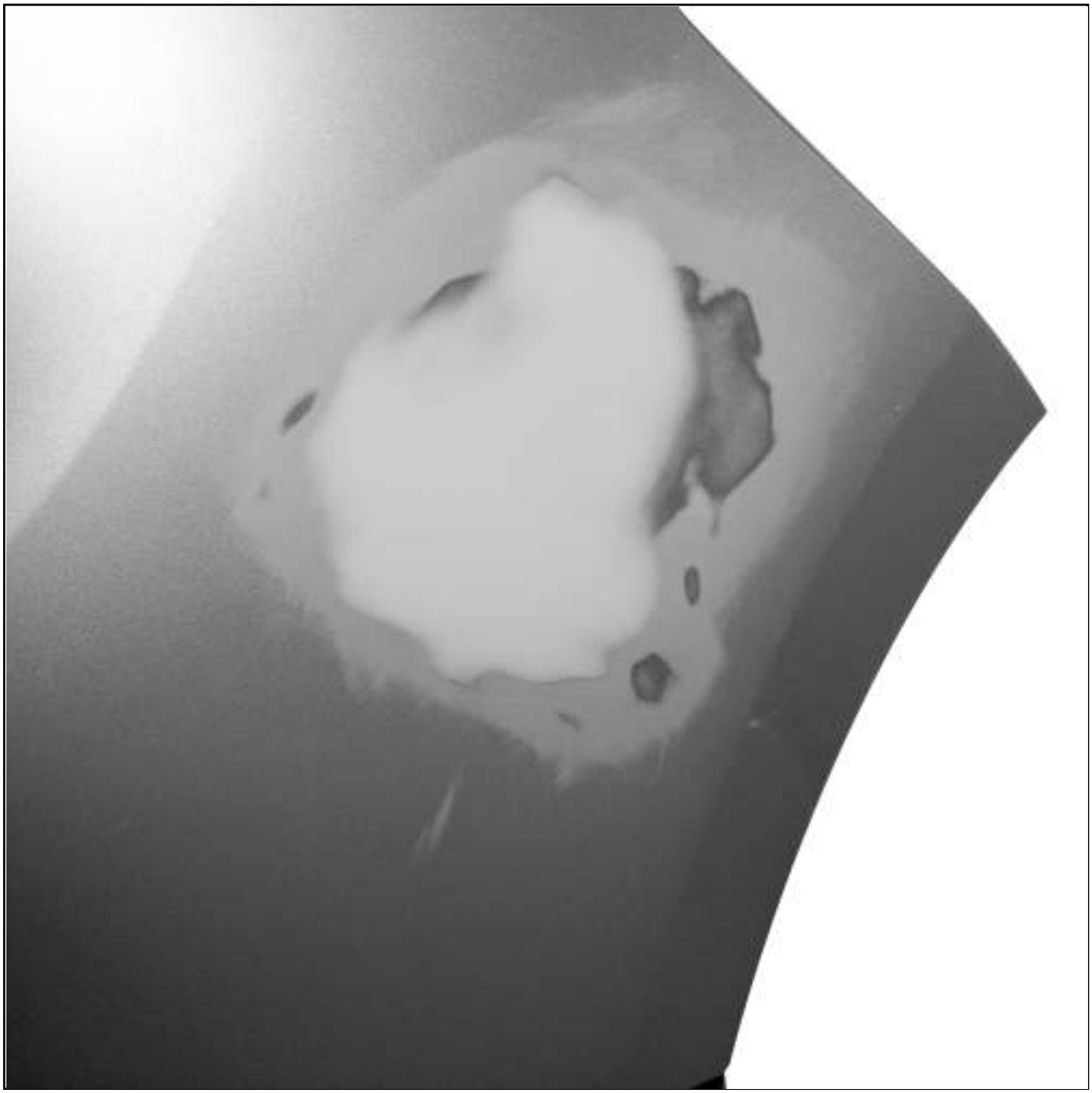
Blow the component and clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).



If necessary, apply a finishing mastic(see product technical sheet) **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

Sand the finishing masticwith a P 150then finish with a P 240.

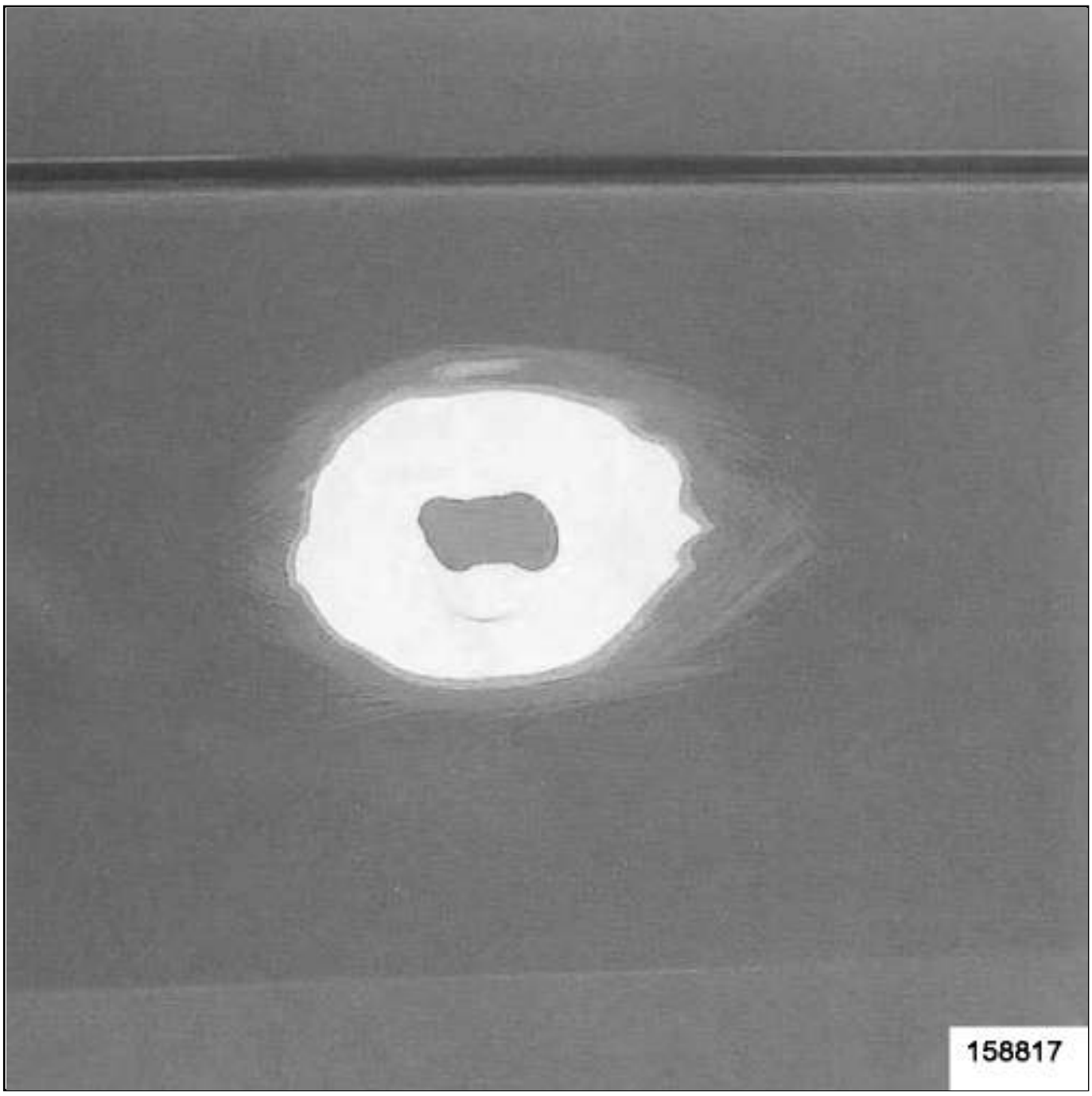


Follow the paint application procedure according to the material concerned:

- **Polypropylene / polyethylene bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
- **Noryl bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic).

Note:

Method apply only on RTM component.



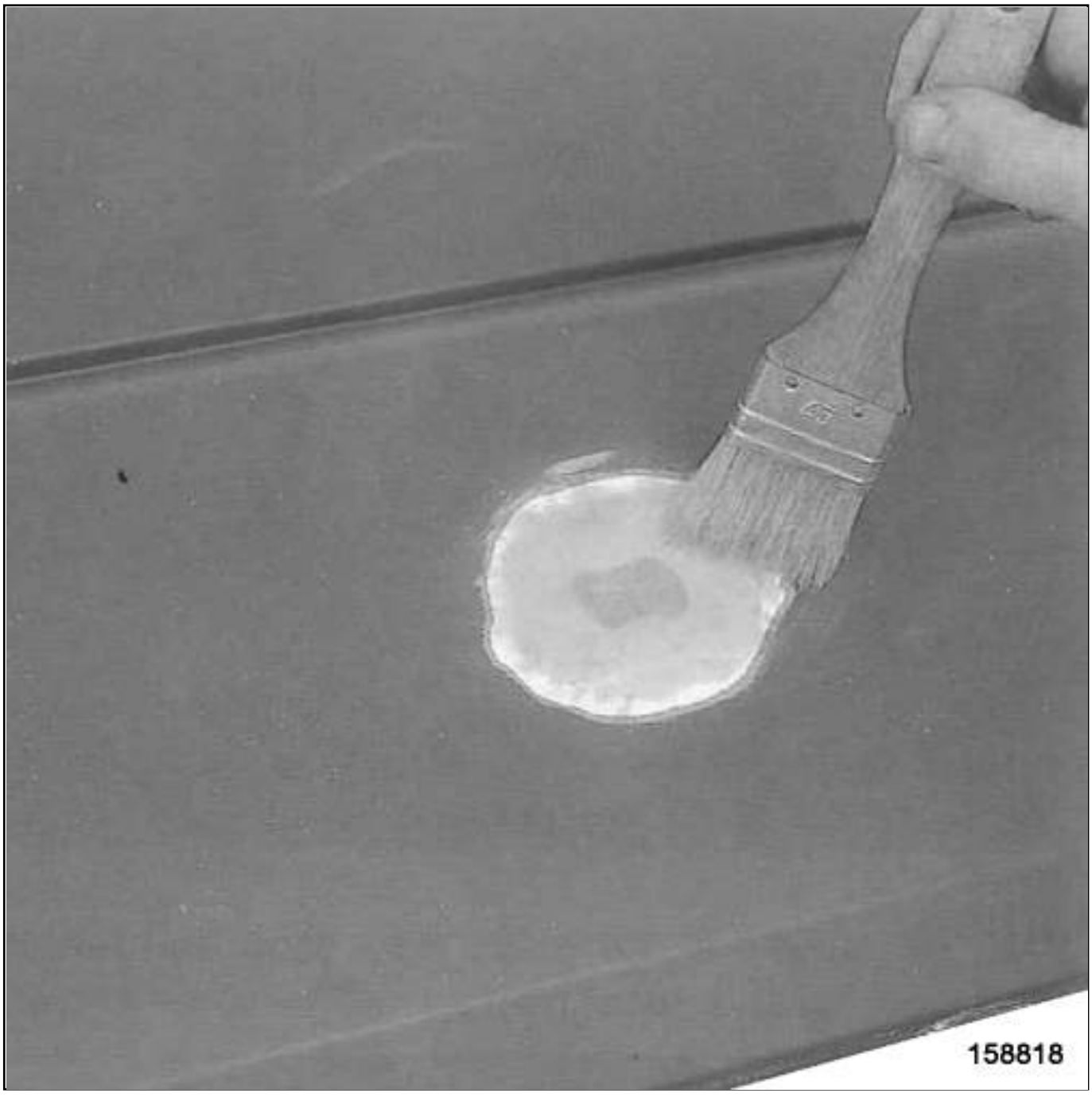
Chamfering around a radius between 30to 40 mmusing the orbital sander with a P80.

Sand the paint around the zone to be repaired using the orbital sander with a P 150

Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

Cut a piece of materielrecovering the chamfering.

Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .



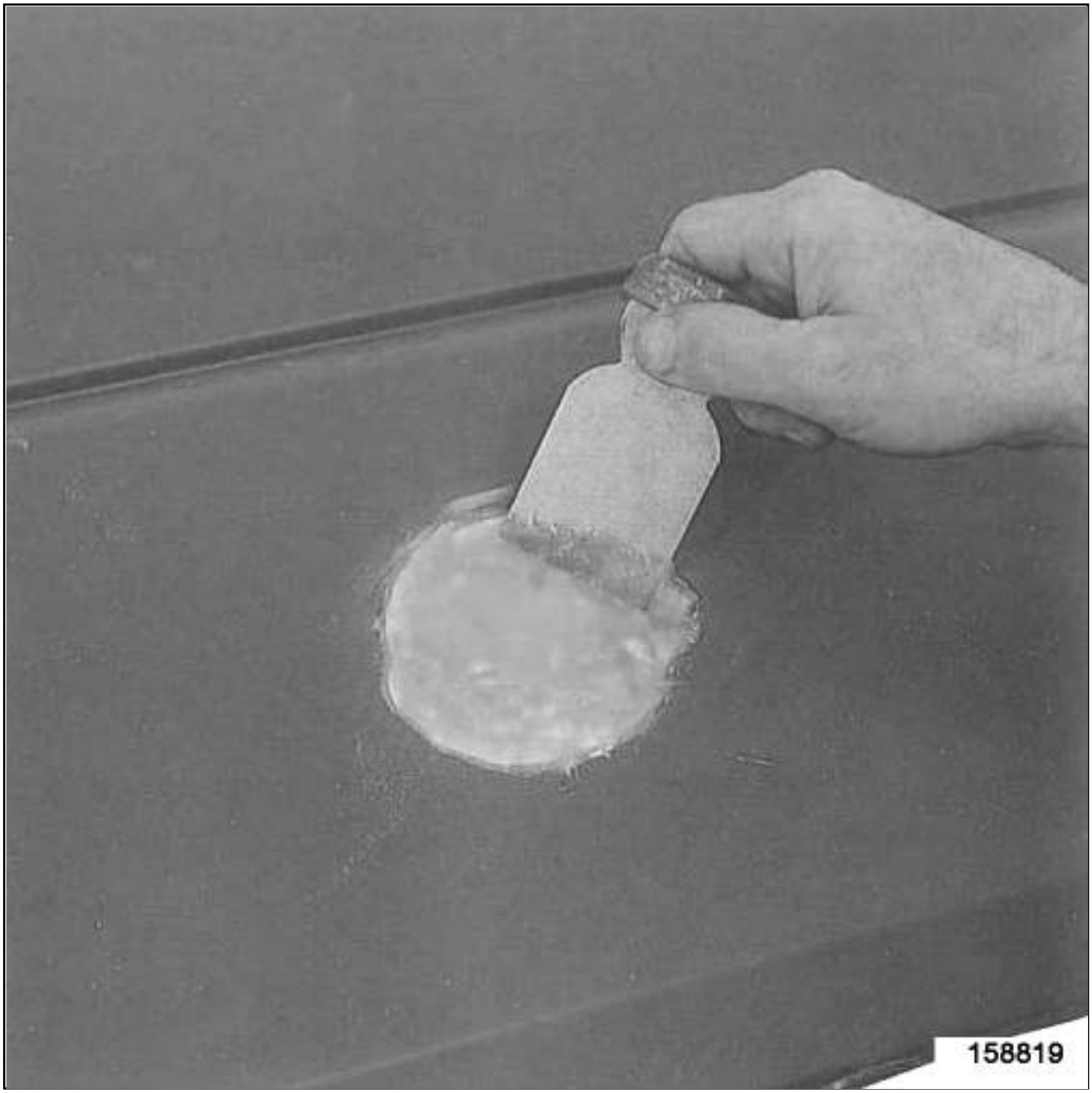
- Wet the chamfer with Epoxy resin.

- Position the reinforcement a poket.

- Soak the reinforcement with Epoxy resin.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).



- Prepare the Epoxy resin (see 50A, General information, Products for plastic material bodywork components: Description) .

- Add short fibres with resin and well mix.

- Fill the pocket with mixture.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

Sand using the orbital sander with a P 80then with a P180and P240.

Apply if necessary a finishing mastic(see product technical sheet). (see **Vehicle: Parts and consumables for the repair**)

Sand the finishing masticusing a P 150then finish using a P240.

5. PROCEDURE 4

Repairing a mounting bracket on a plastic chassis element

1- BONDING METHOD

Note:

Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .

Chamfer the two sections of the mounting bracket on both sides using a grinder with an angular member .

Blast and clean the inside and outside of the component with the cleanerincluded in the Plastic repair kit box.

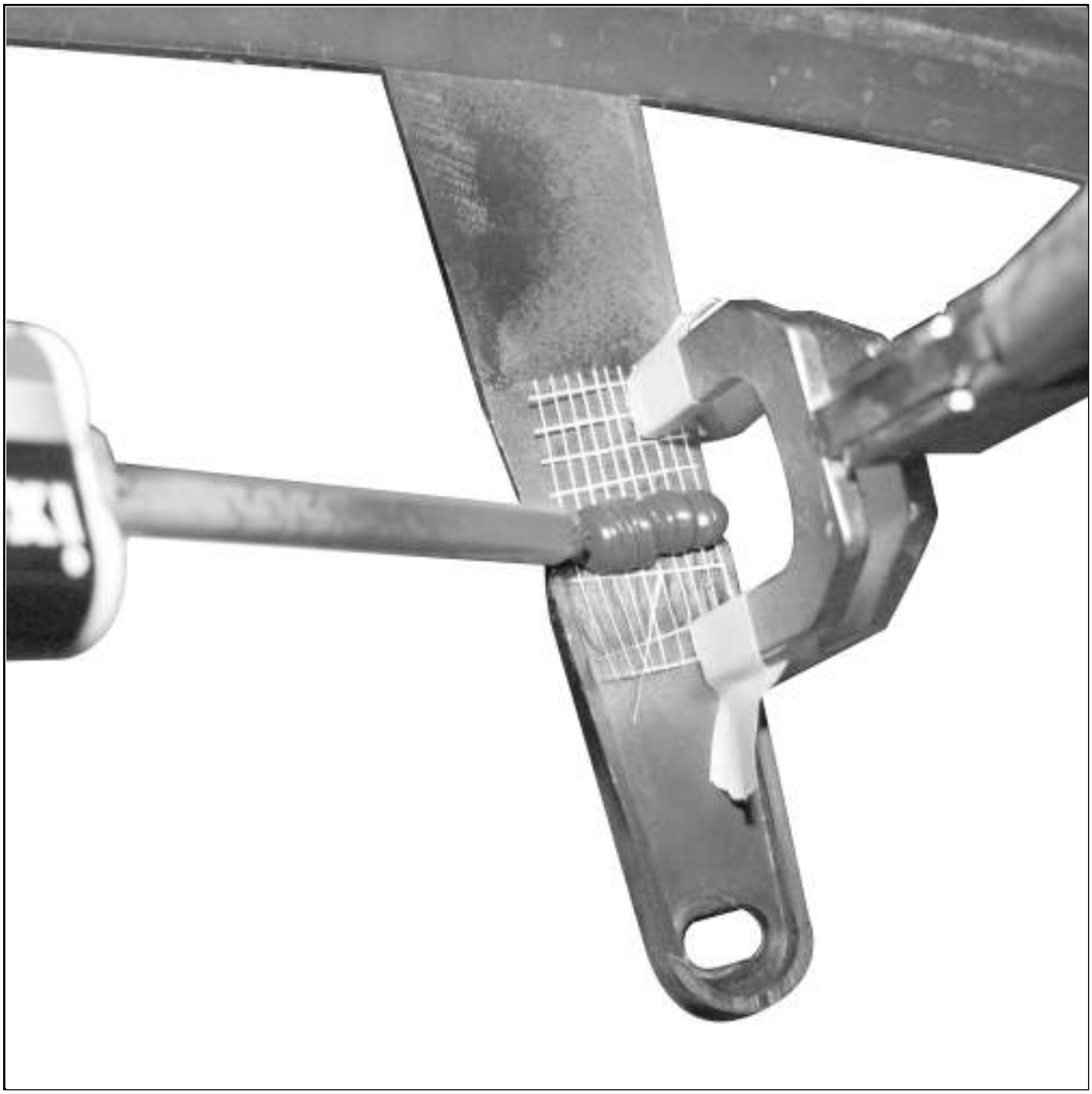
Apply the adhesive primerincluded in the Plastic repair kitbox to the inside and outside of the component.

Leave the adhesive primer to dry (see product technical sheet).

Adjust a piece of reinforcing film (cloth) adapted to repairing the internal and external faces.

Prepare the bi-component repair mastic (see 50A, General information, Products for plastic material bodywork components: Description) .

Maintain pressure on the two parts with pliers.



- Extrude bi-component repair masticbetween the two parts.
- Smooth the bi-component repair masticon the internal and external faces.
- Leave the bi-component repair masticto dry (see product technical sheet).

- Surface the exterior side with a P 150then finish with a P 240.
- Retouch the paintwork if necessary.

2- WELDING METHOD

Note:

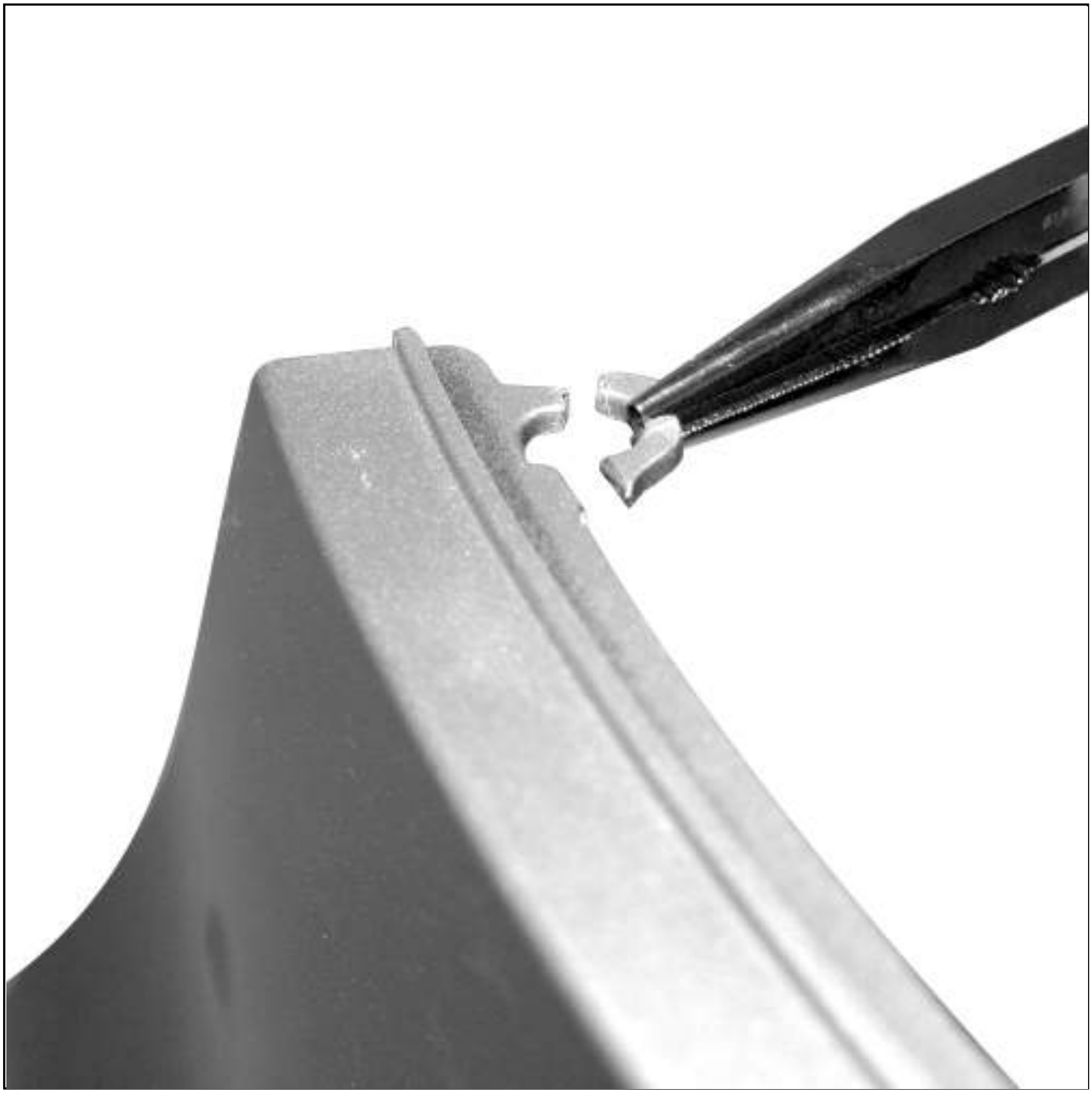
Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .

Note:

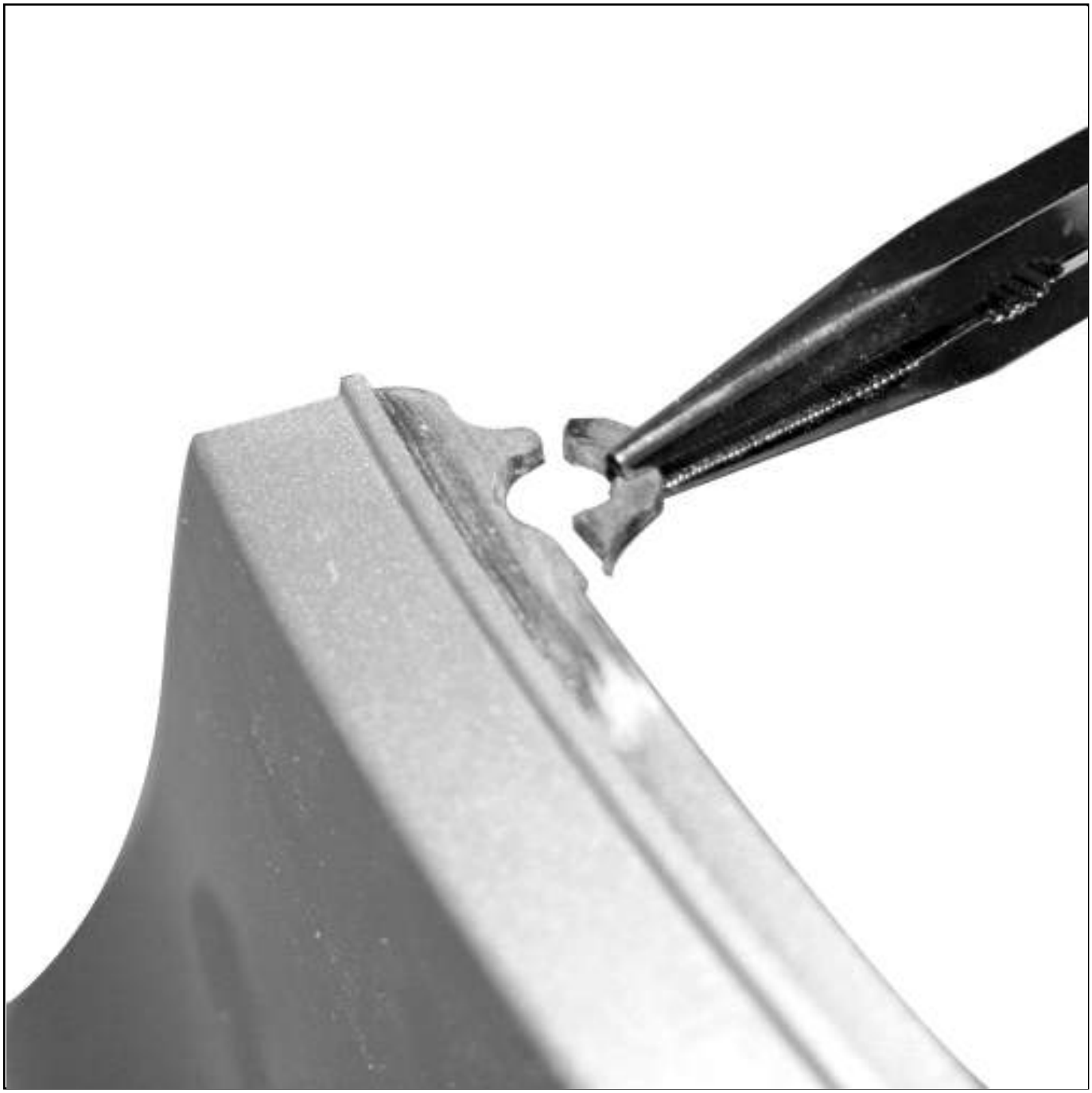
This repair cannot be carried out on ABS, ASAand Polycarbonateplastics.



Wash the component in soapy water and rinse in clean water.

Clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNERVehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).



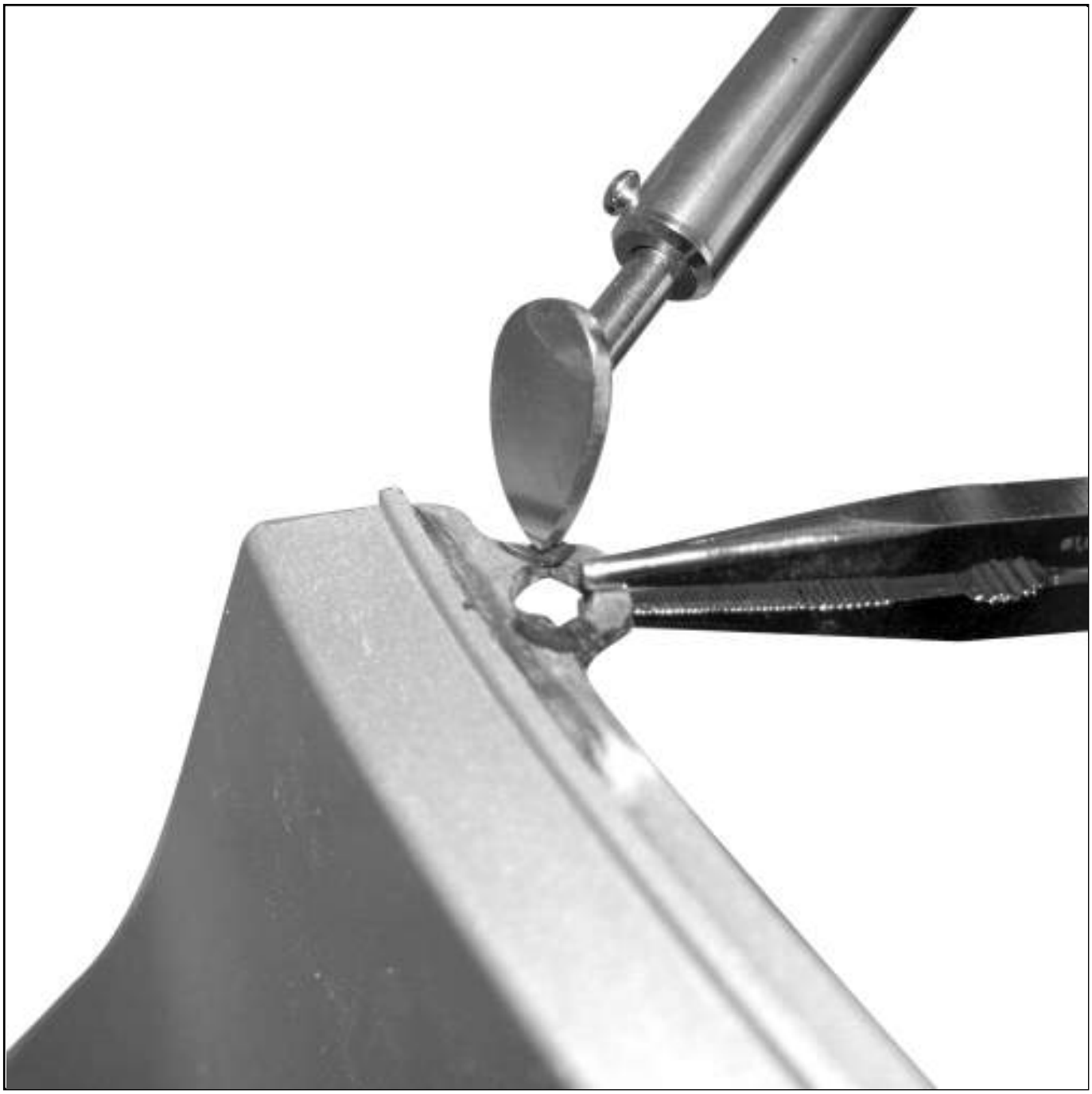
- Strip the paint with P 150on the repair area.

- Blow the component and clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).

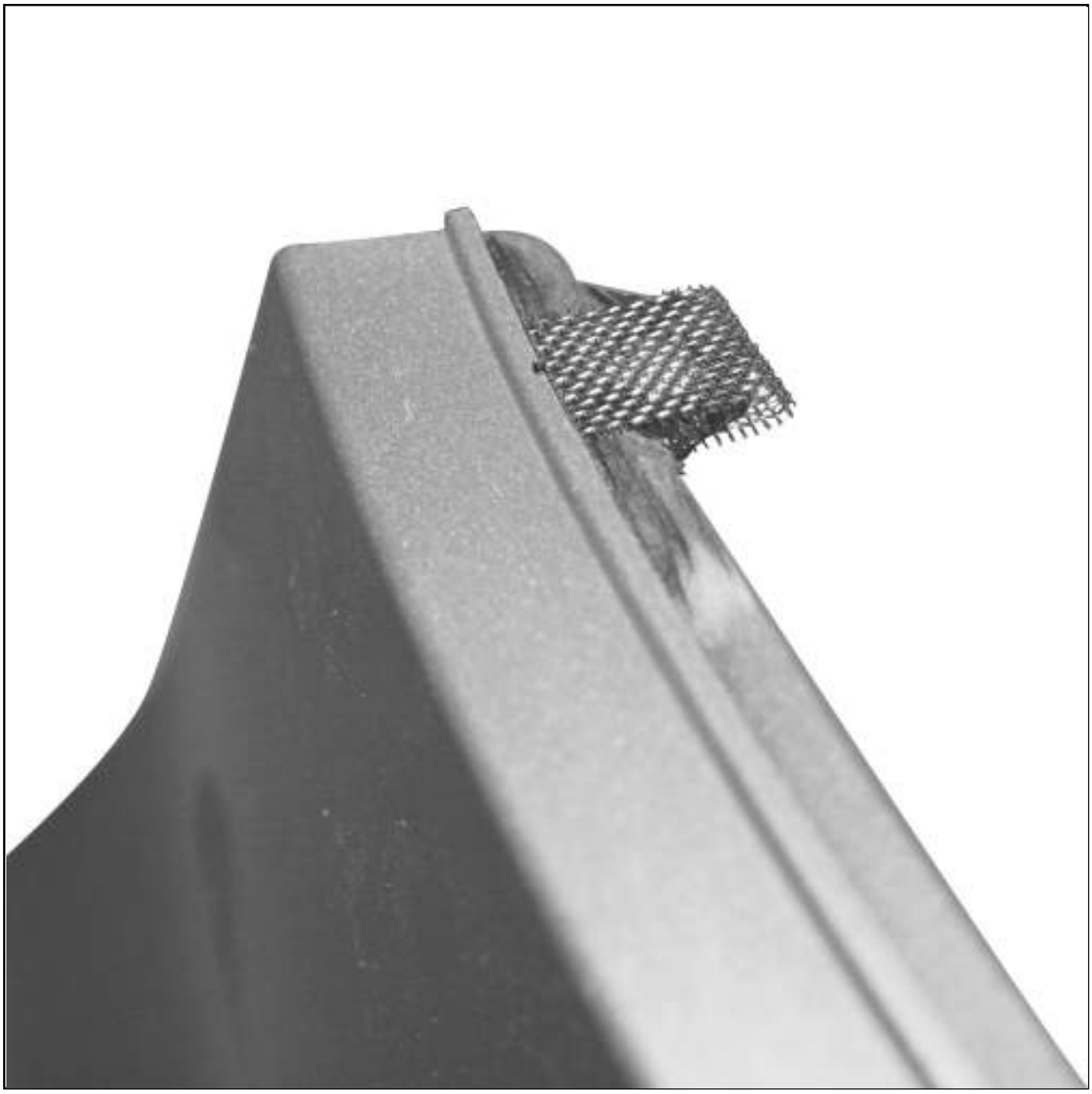
Preheat the soldering iron.

Cut the stainless steel mesh according to the shape of the support.



Spot-weld with the tip of the soldering iron on the ends in order to hold the mounting bracket.

Cool each spot weld, for two seconds, vigorously with the cooler[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).



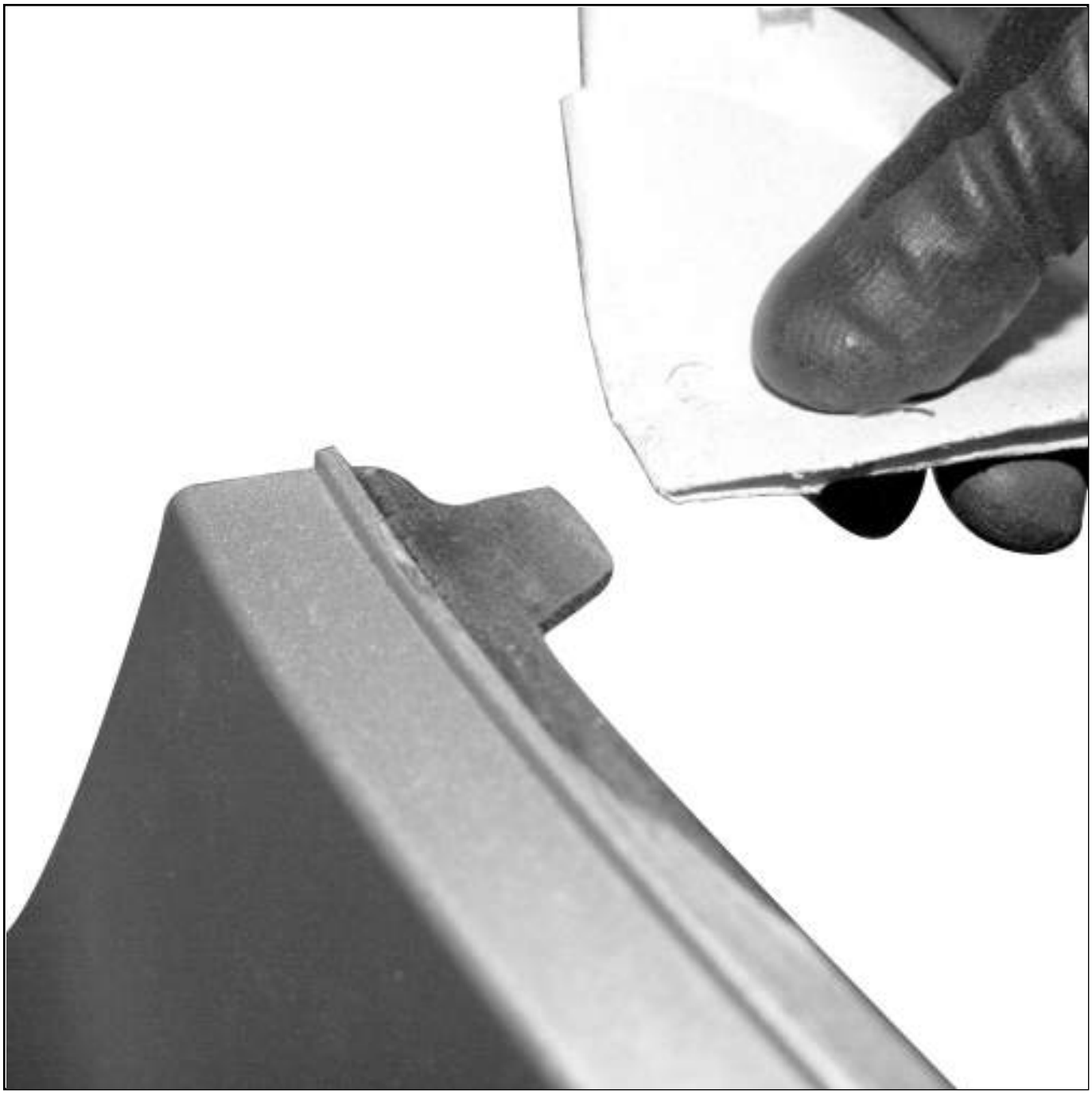
Position the stainless steel mesh and hold it using a dedicated tool.

Enclose the stainless steel frame in the plastic material.

Cool the whole of the repaired area for two seconds, vigorously with the cooler Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Add material by preheating the welding rod with the tip of the soldering iron.

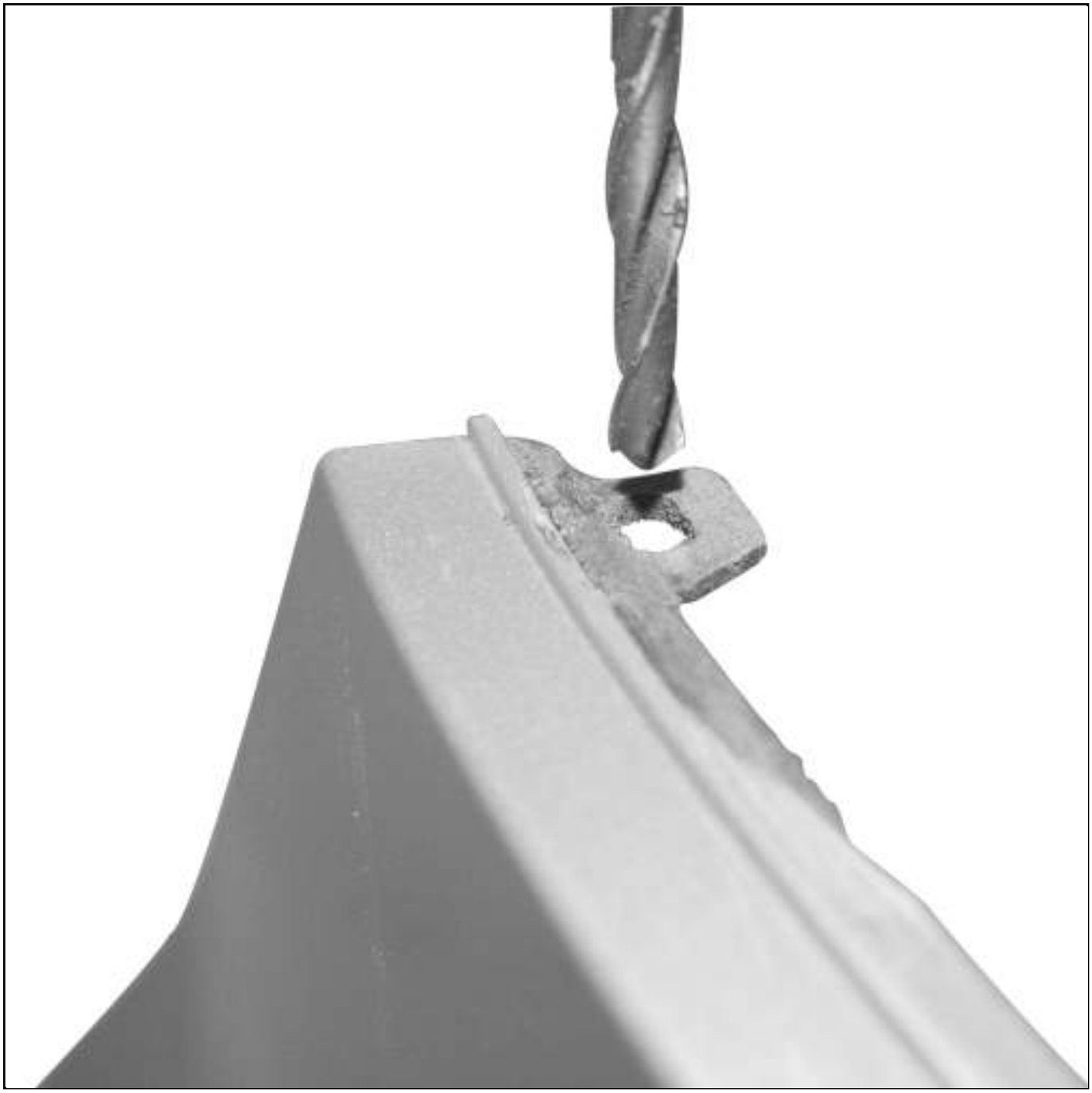
Cool the whole of the repaired area for two seconds, vigorously with the cooler**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).



Surface with a P 80to P 150then finish with a P 240.

Blow the component and clean the area to be repaired with a LINT-FREE CLOTHsoaked in

ANTISTATIC THINNER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).



Adjust the shape of the part to return it to its original appearance.

Retouch the paintwork if necessary.

6. PROCEDURE 5

Partial replacement of an element by cuting.

Note:

Method apply only on RTM component.

Note:

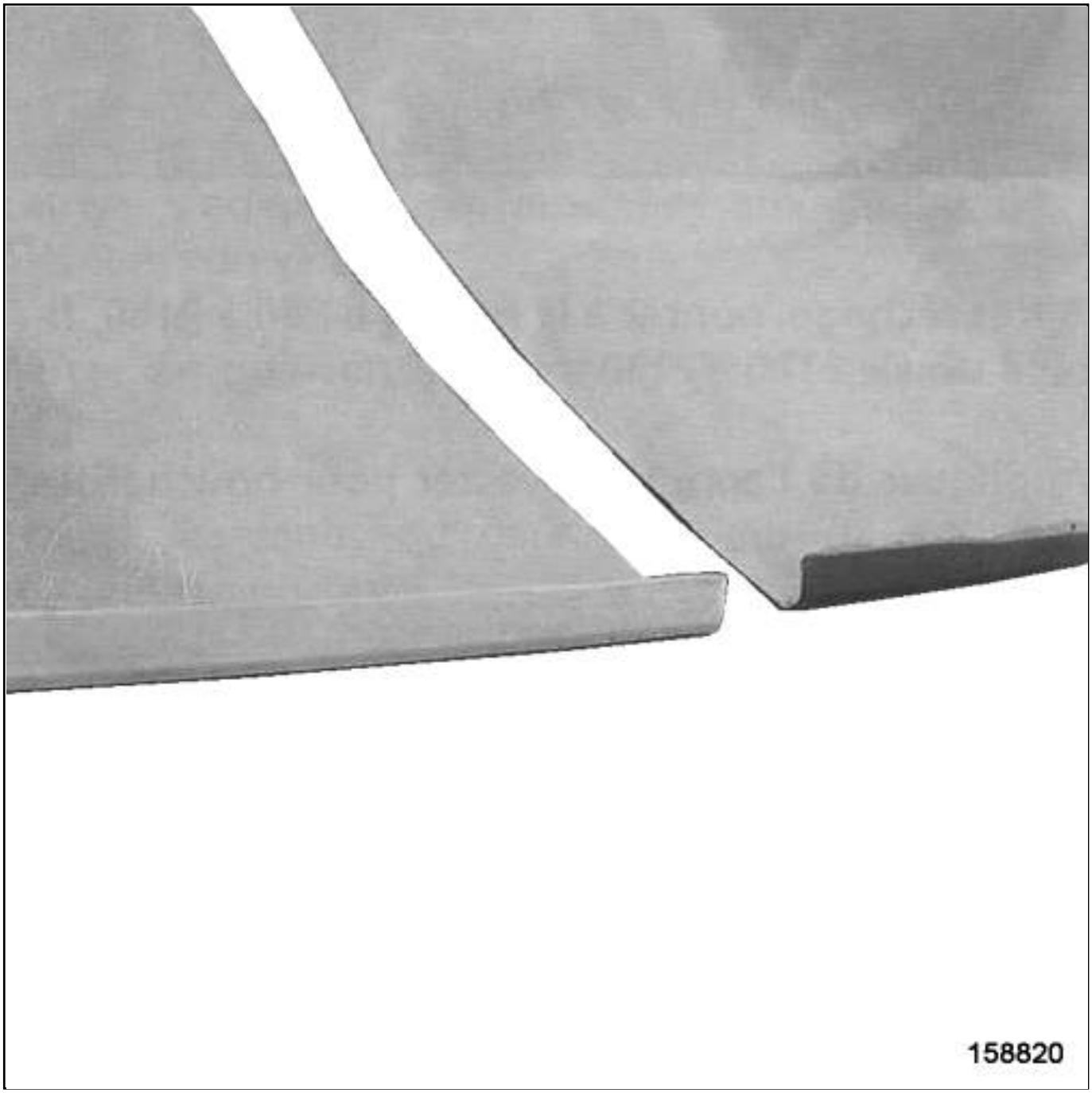
The components are manufactured by the method referred to as "contact" .

The reparation is performed by the interne face of the component.

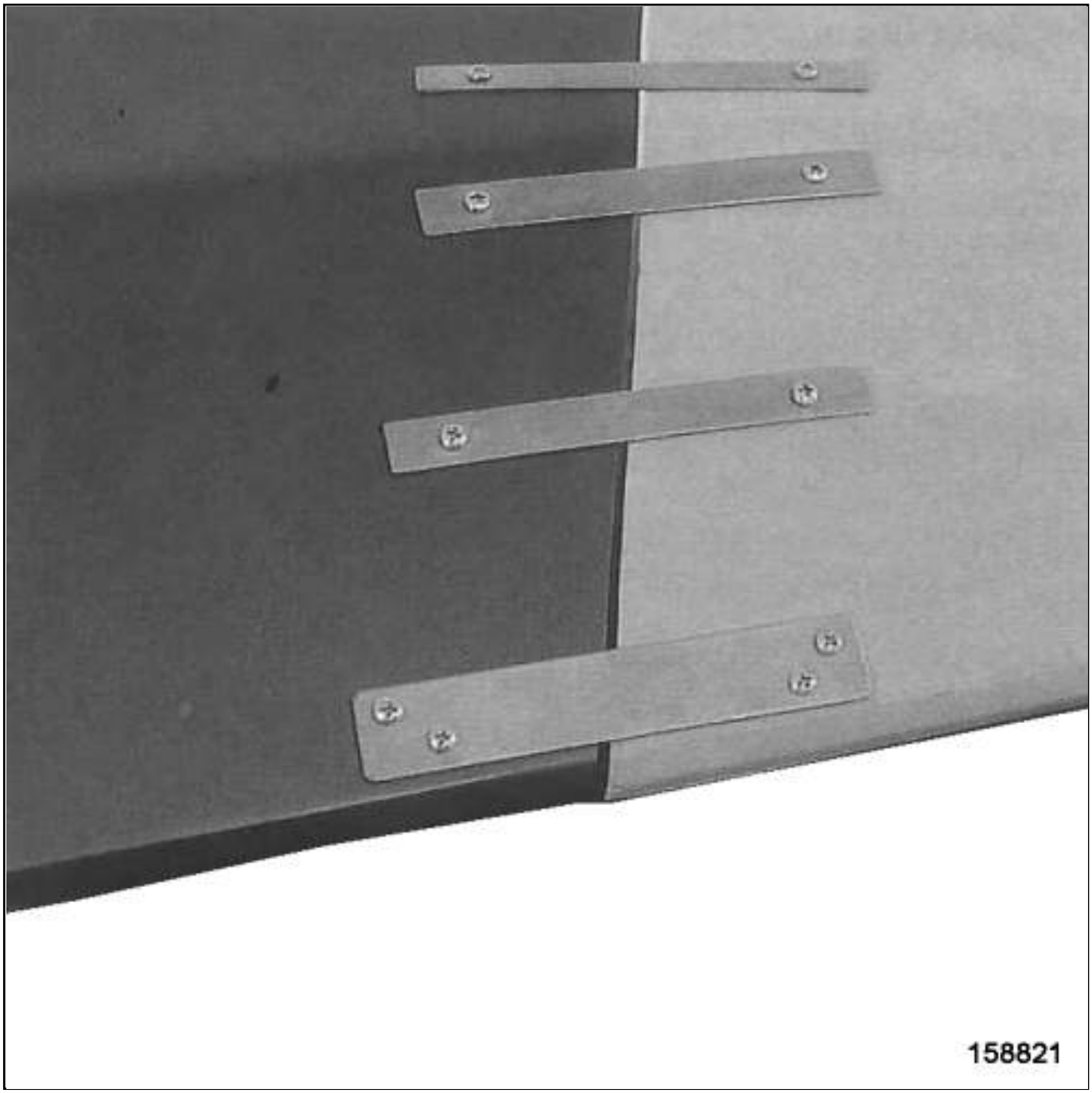
Cut the damaged component beyond the cracks.

Cut and adjust the new component.

Prepare a space from 5to 10mm between the two components.



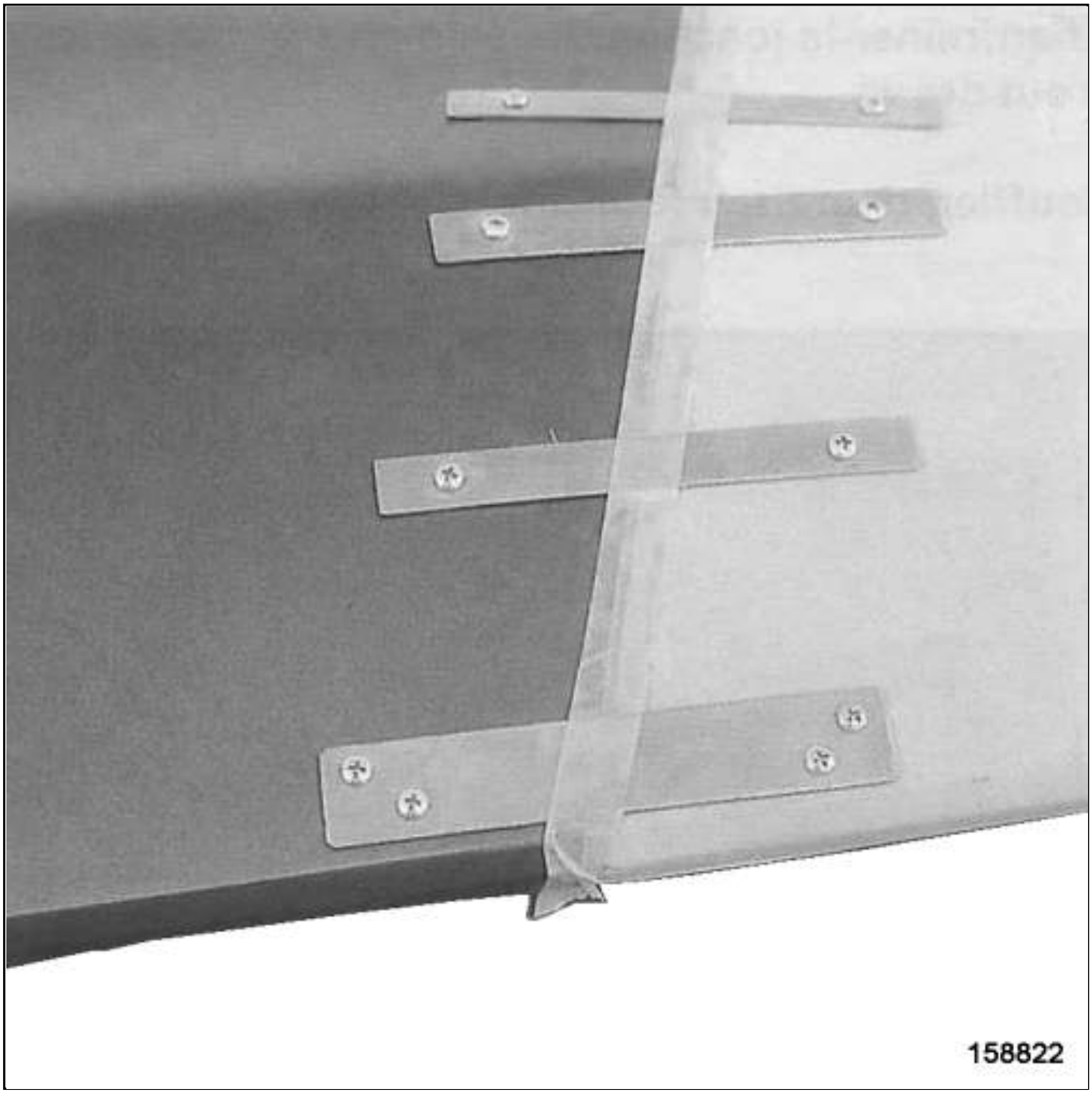
Chamfering the interne face of components on 100 mmwide.



- Position the new component.

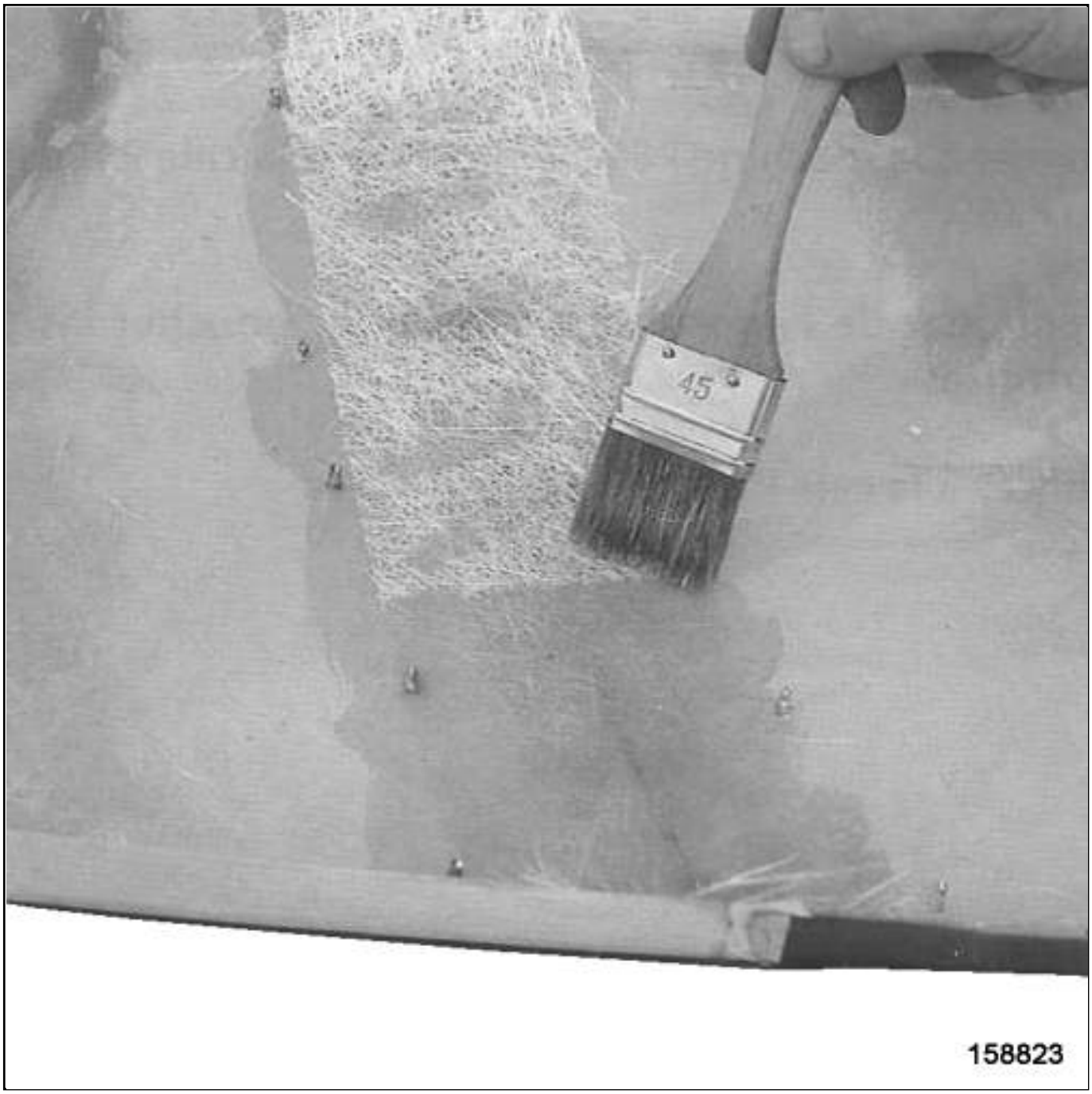
- Hold the new component by the externe face using a plate pad(local manufactured)and fix them with plate screws.

- Check the clearance and the flush fitting.



- Bond a masking tape on externe face on all reparation length.
- Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).
- Cut a piece of materielrecovering the reparation assembly.
- Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components:

Description) .



Put the material strip by soaking with resin.

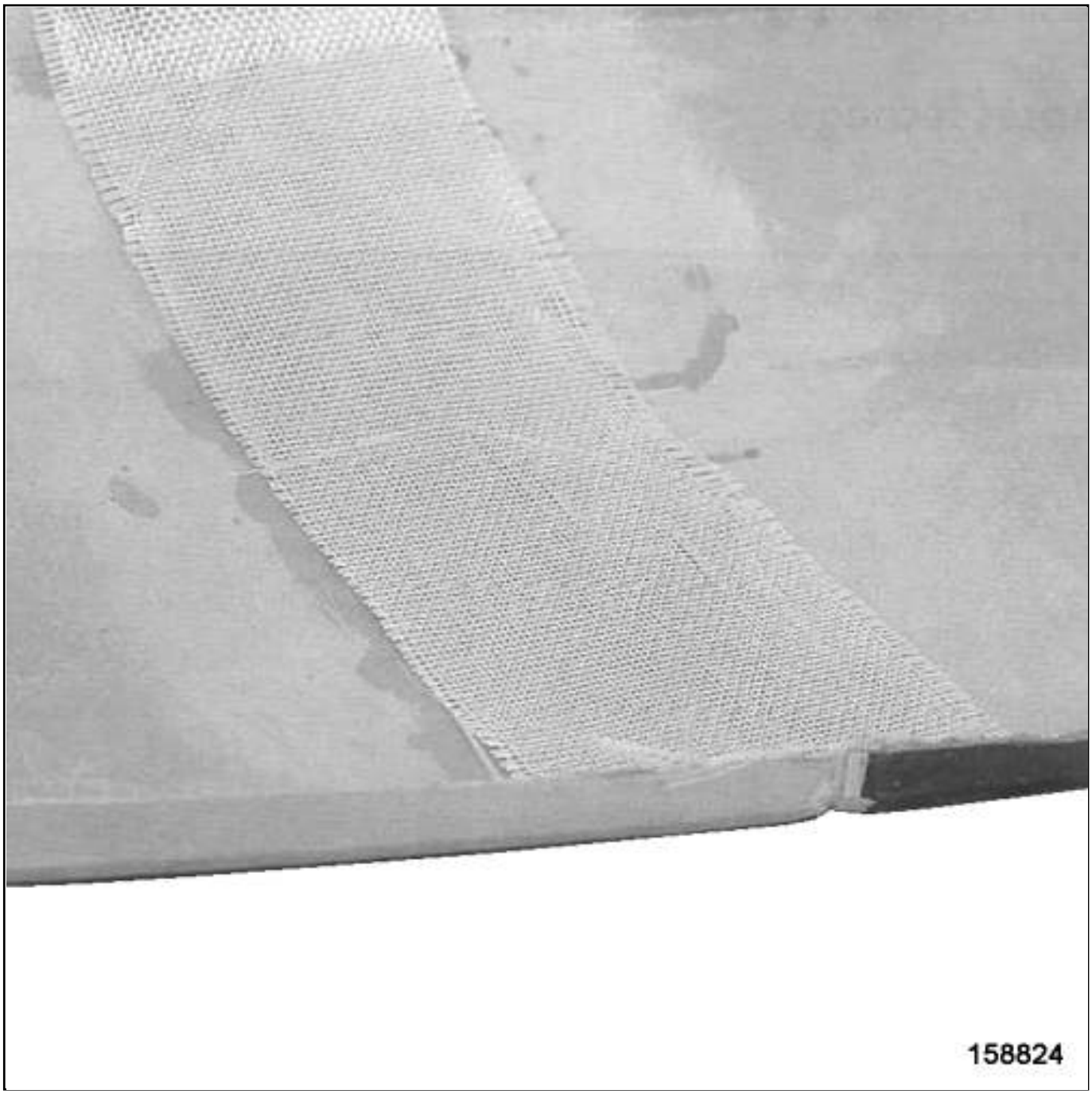
Note:

Pay particular attention at output screw area and at strips junction reinforcement to prevent the air bubbles form.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

Remove the pads.



Prepare the reinforcement strips(material, cloth)by cuting then in a growing order 10 to 15 mm

Note:

According with the component width, the reinforcement strips number is variable, the purpose is to conserve the characteristic similar to the original.

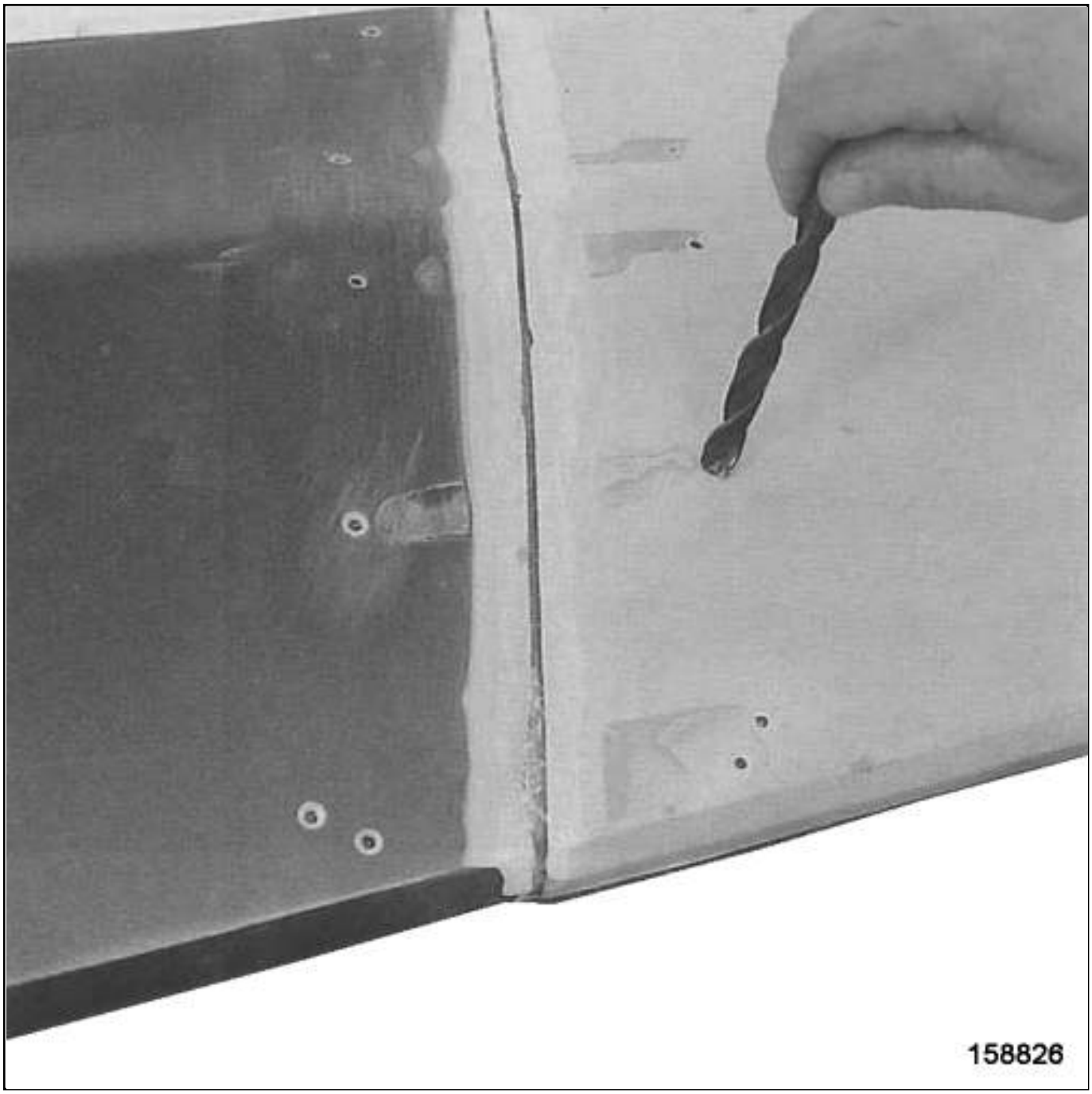
- Sand the zone to be repaired using the orbital sander with a P 40
- Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).
- Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .

Put the material strip by soaking with resin.

Pass the spiked roller.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).



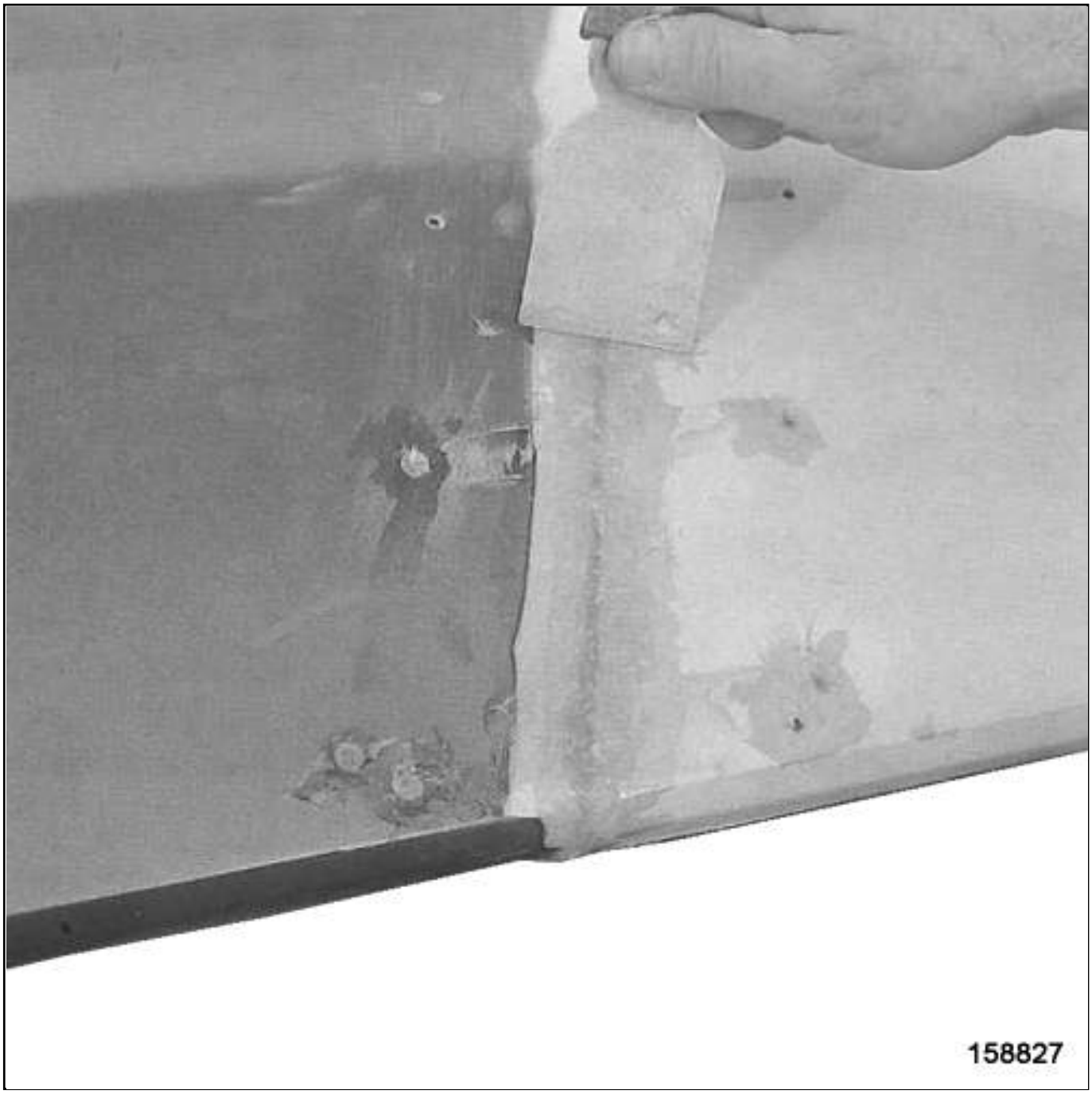
Chamfering the components junction.

Countersink the screws holes.

Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .

Add short fibres with resin and well mix.



Fill the chamfer and the holes using a spatula.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

Apply if necessary a finishing mastic(see product technical sheet). (see **Vehicle: Parts and consumables for the repair**)

Sand the finishing masticusing a P 150then finish using a P240.

7. PROCEDURE 6

Partial replacement of an element by cuting with patcht drilling.

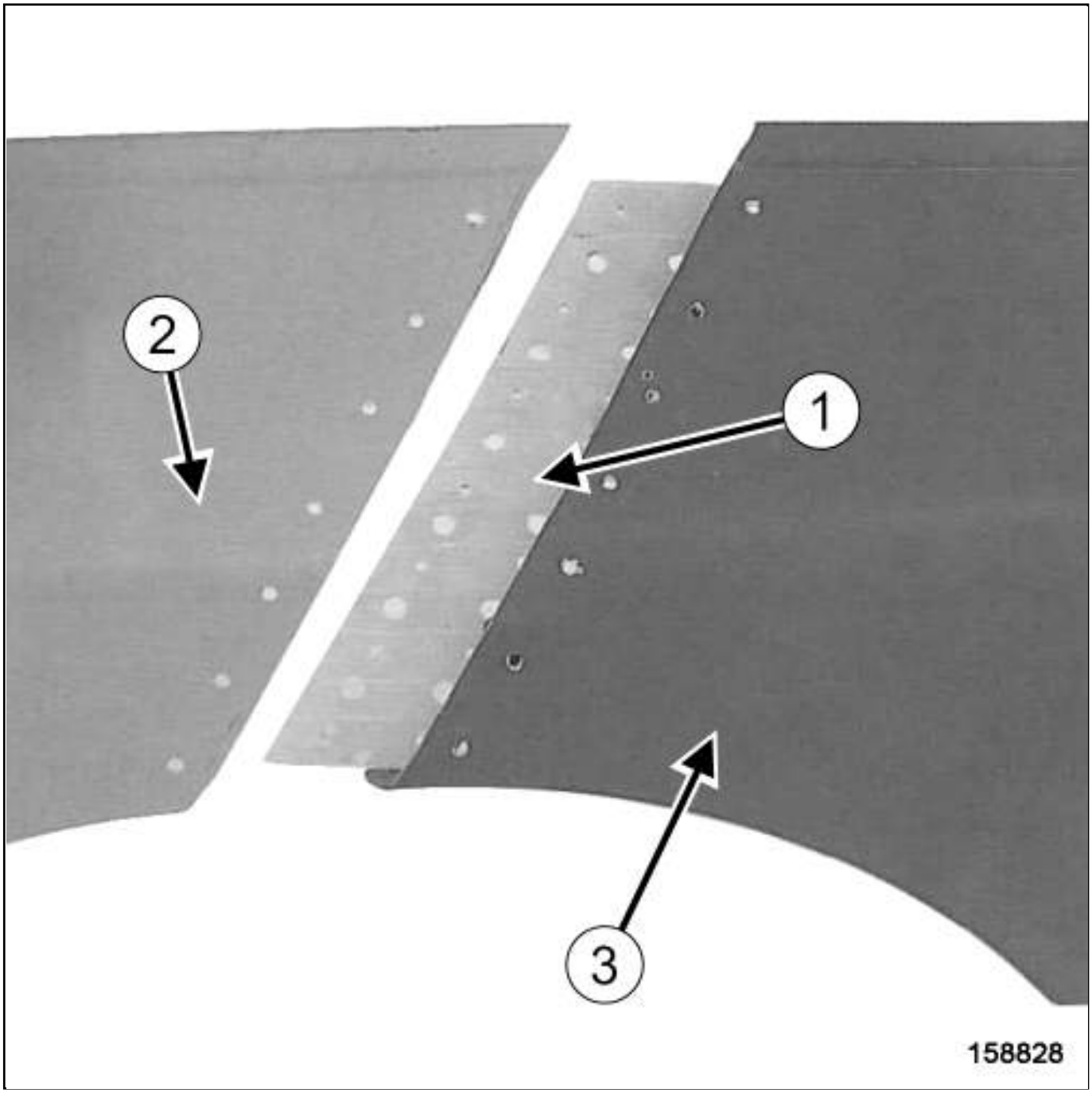
Note:

Method apply only on RTM component.

Note:

The components are manufactured by the method referred to as "contact" .

The reparation is performed by the interne face of the component.



- Cut the damaged component for facilitate the patcht drilling.
- Cut and adjust the new component.

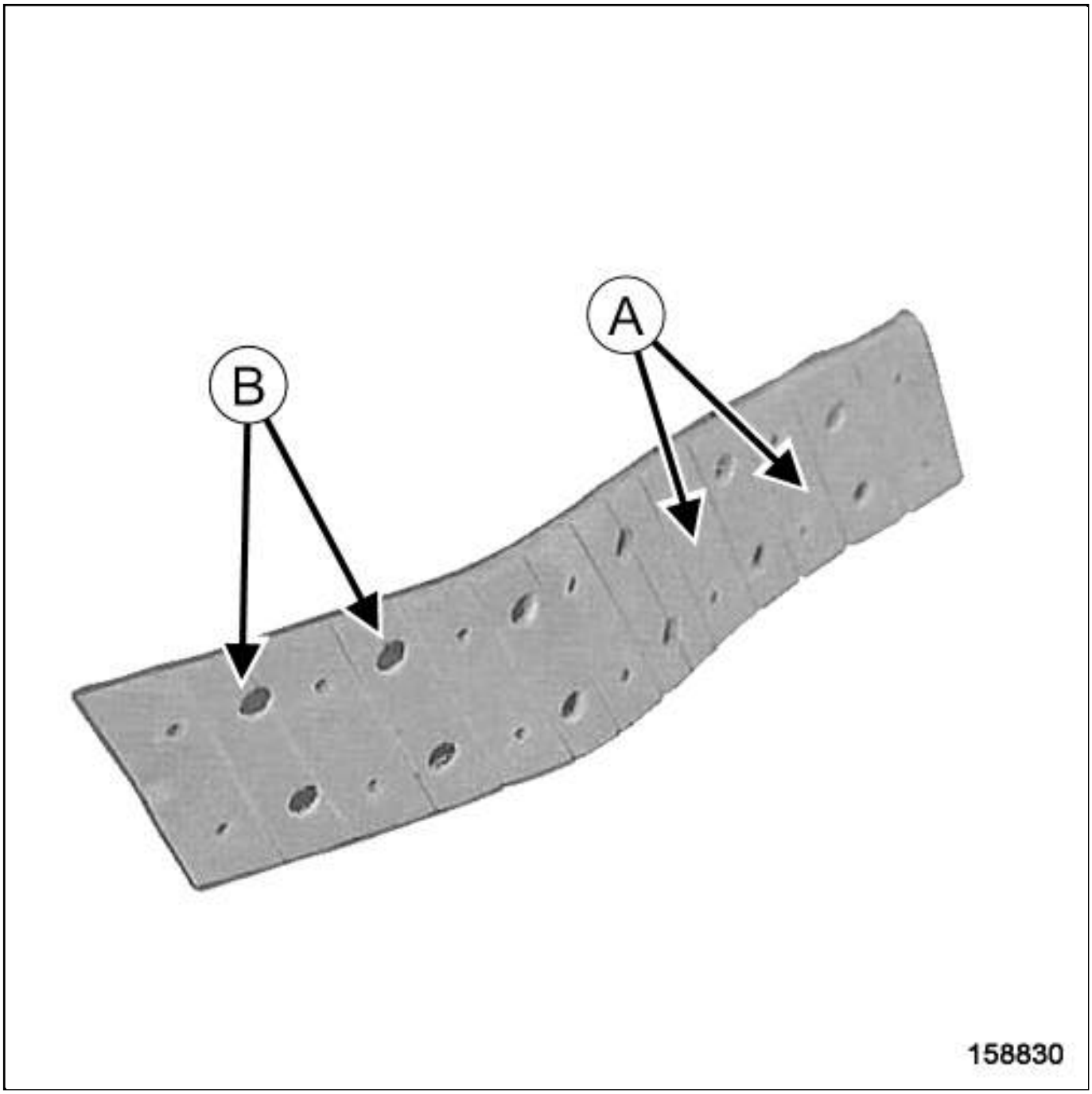
- Drill the component on the vehicle.
- Temporary fit on the vehicle the patch drilling with plate screws.
- Position the new comonent on the vehicle.

Fit on the vehicle the patch drilling with plate screws.

If necessary hold the new components with locking pliers.

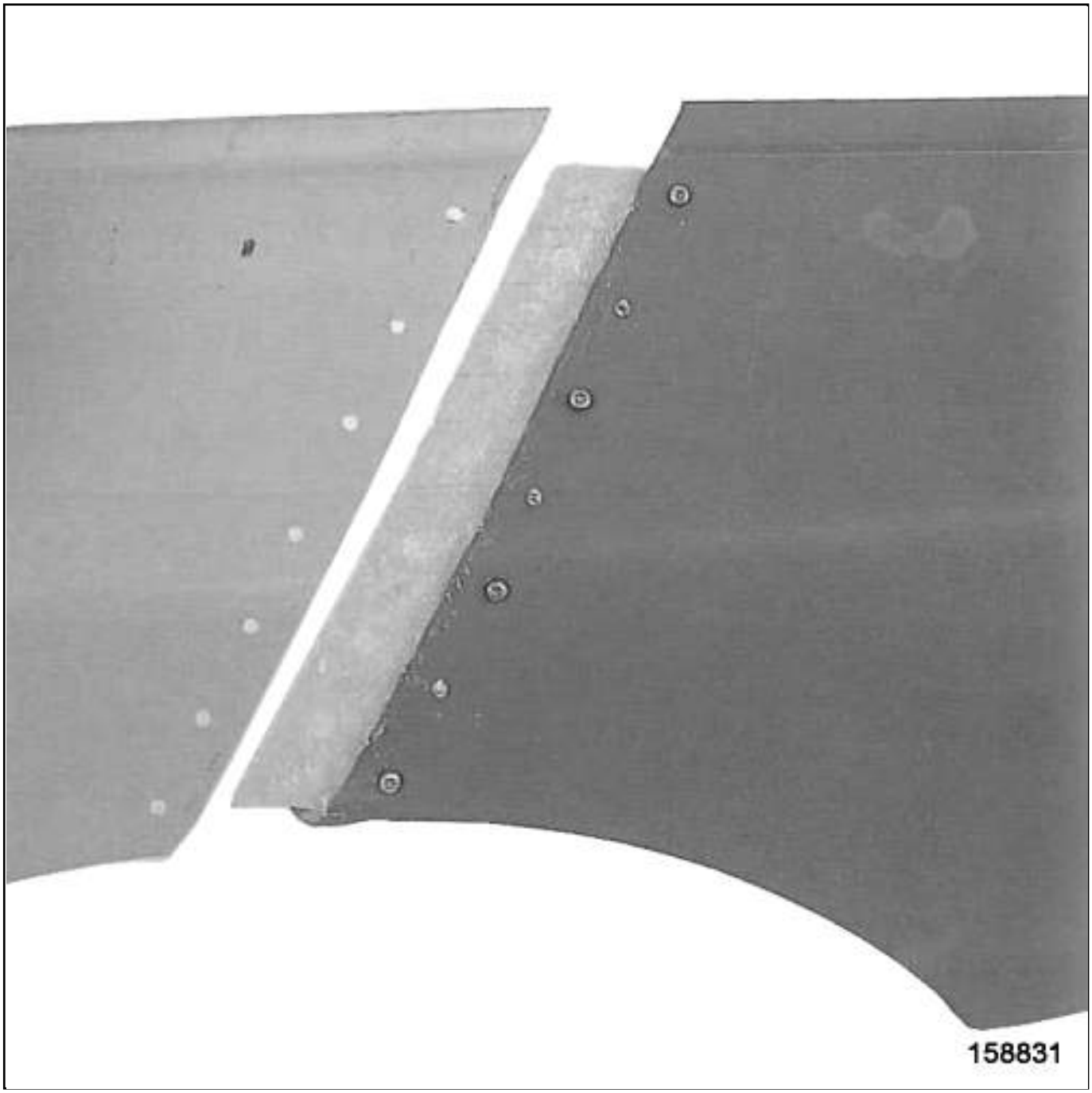
Check the new component position.

Remove all components.

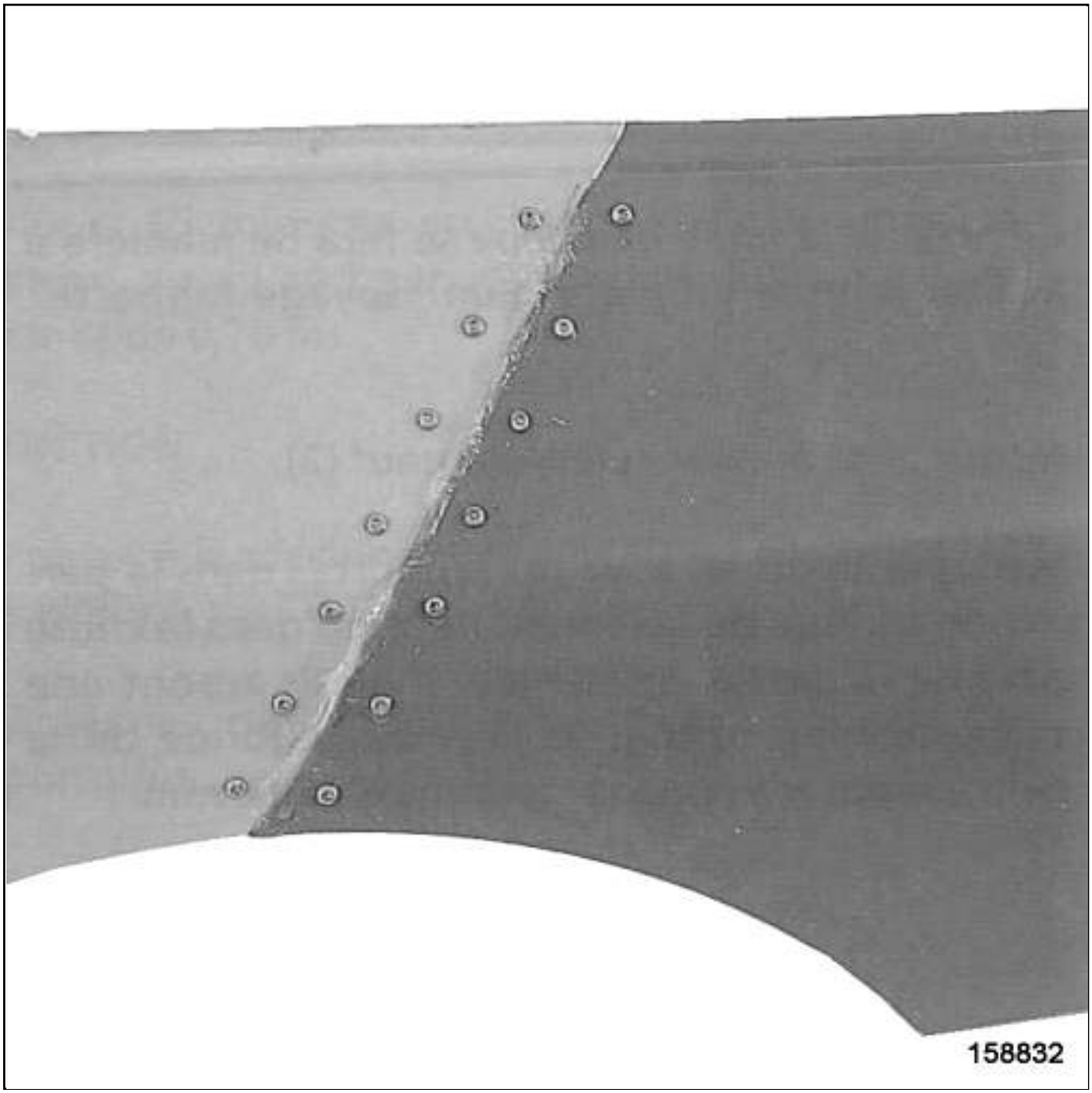


Do the grooves(A) , in the intern al side of patch drilling for adjust to the curve of component on the vehicle.

- Drill the holes(B) with a 8 mmdiameter.
- Countersink the holes fron external side.
- Sand the zone to be repaired using the orbital sander with a P 40
- Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).
- Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .



Band the half way of patcht drillingand fit on the component on the vehicle using plate screws.



Band the second half way of patcht drilling.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

Remove the plate screws.

Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

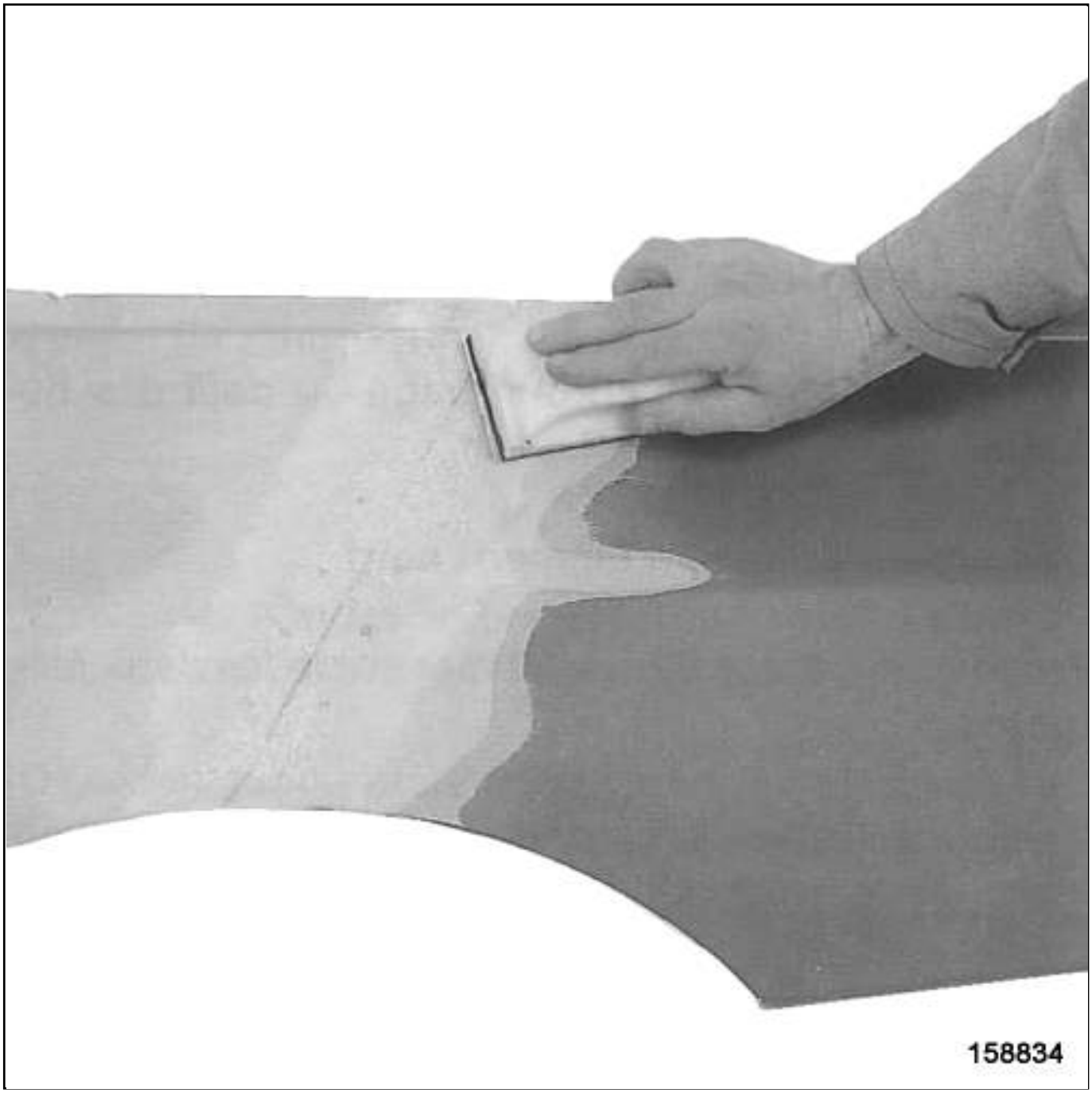
Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .

Apply the reinforcement by soaking of resin.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

- Sand the zone to be repaired using the orbital sander with a P 40
- Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).
- Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .
- Add short fibres with resin and well mix.
- Apply the mixture on reparation zone.



Sand using the orbital sander with a P 80then with a P180and P240.

Apply if necessary a finishing mastic(see product technical sheet). (see **Vehicle: Parts and consumables for the repair**)

Sand the finishing masticusing a P 150then finish using a P240.

XSL version : 3.02 du 22/07/11

POLYCARBONATE BODYWORK COMPONENT : PAINT PREPARATION AND RANGE

Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Note:

Before using the products, consult the manufacturer's technical sheet.

Note:

Never apply pre-treatment primer or primer filler on this type of material.

Steps	Description	Special notes
1	Sand using the orbital sander until the clearcoat disapeared	P180
2	Rub the sanding guide on the repair area	Black colour
3	Sand using the orbital sander the repair area until the guide disapeared	P240
4	Rub the sanding guide on the repair area	Black colour
5	Sand using the orbital sander the repair area until the guide disapeared	P320
6	Rub the sanding guide on the repair area	Black colour
7	Sand using the orbital sander the repair area until the guide disapeared	P400
8	Rub the sanding guide on the repair area	Black colour
9	Sand using the orbital sander the repair area until the guide disapeared	P500
10	Rub the sanding guide on the repair area	Black colour
11	Sand using the orbital sander the repair area until the guide disapeared	P800

12	Rub the sanding guide on the repair area	Black colour
13	Sand using the orbital sander the repair area until the guide disapeared	P1000
14	Rub the sanding guide on the repair area	Black colour
15	Sand using the orbital sander the repair area until the guide disapeared	P2000
16	Rub the sanding guide on the repair area	Black colour
17	Sand using the orbital sander the repair area until the guide disapeared	P 4000
18	Degrease	Lint-free cloth soaked in antistatic thinner**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).
19	Use a little polishing liquid on the foam plate	Polishing liquid
20	Polish until the product has disappeared	
21	Degrease	Lint-free cloth soaked in antistatic thinner**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).
22	Apply adhesive primer	See FT product
23	Removesolvent/dry	
24	Apply anti-scratch varnish	See FT product

XSL version : 3.02 du 22/07/11

POLYPROPYLENE / POLYETHYLENE BODYWORK COMPONENT: PREPARATION AND PAINT RANGE

Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Note:

Before using the products, consult the manufacturer's technical sheet.

Note:

Never apply pre-treatment primer or primer filler on this type of material.

1. PRE PRIMED PARTS

Note:

The bumpers for Mégane III are supplied by the Parts Department with paint colour 676 (Pearl Black).

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Smooth	Grey adhesive pad soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Rub with an adhesive pad	
7	Apply the paint finishing	

2. NON PRE-PRIMED PARTS

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
3	Dry	30 minutes at 60˚C
4	Smooth	Grey adhesive pad soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
5	Wipe / blow	
6	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
7	Apply an adherence promoter	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
8	Remove solvent	
9	Apply a bi-component primer (according to the PRODUCT TECHNICAL SHEET for the adhesion promoter)	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Remove solvent / dry	
11	Sand	P400-P500 dry / P400-P500 with water
12	Wipe / blow	

13	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
14	Rub with an adhesive pad	
15	Apply the finishing paint	

3. REPAIRED COMPONENTS

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
3	Sand the defect	P240 / orbital sander (mid-speed)
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
6	Apply and sand polyester mastic if necessary	Plastic material bodywork component: Repair (Technical Note 662A, 50A, General information)
7	Wipe / blow	
8	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
9	Apply an adherence promoter	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Remove solvent	
11	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
12	Remove solvent / dry	
13	Sand	P400-P500 dry / P400-P500 with water
14	Wipe / blow	

15	Degrease	Lint-free cloth soaked in antistatic thinner[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).
16	Rub with an adhesive pad	
17	Apply the finishing paint	

POWER ASSISTED STEERING CIRCUIT : CHECK

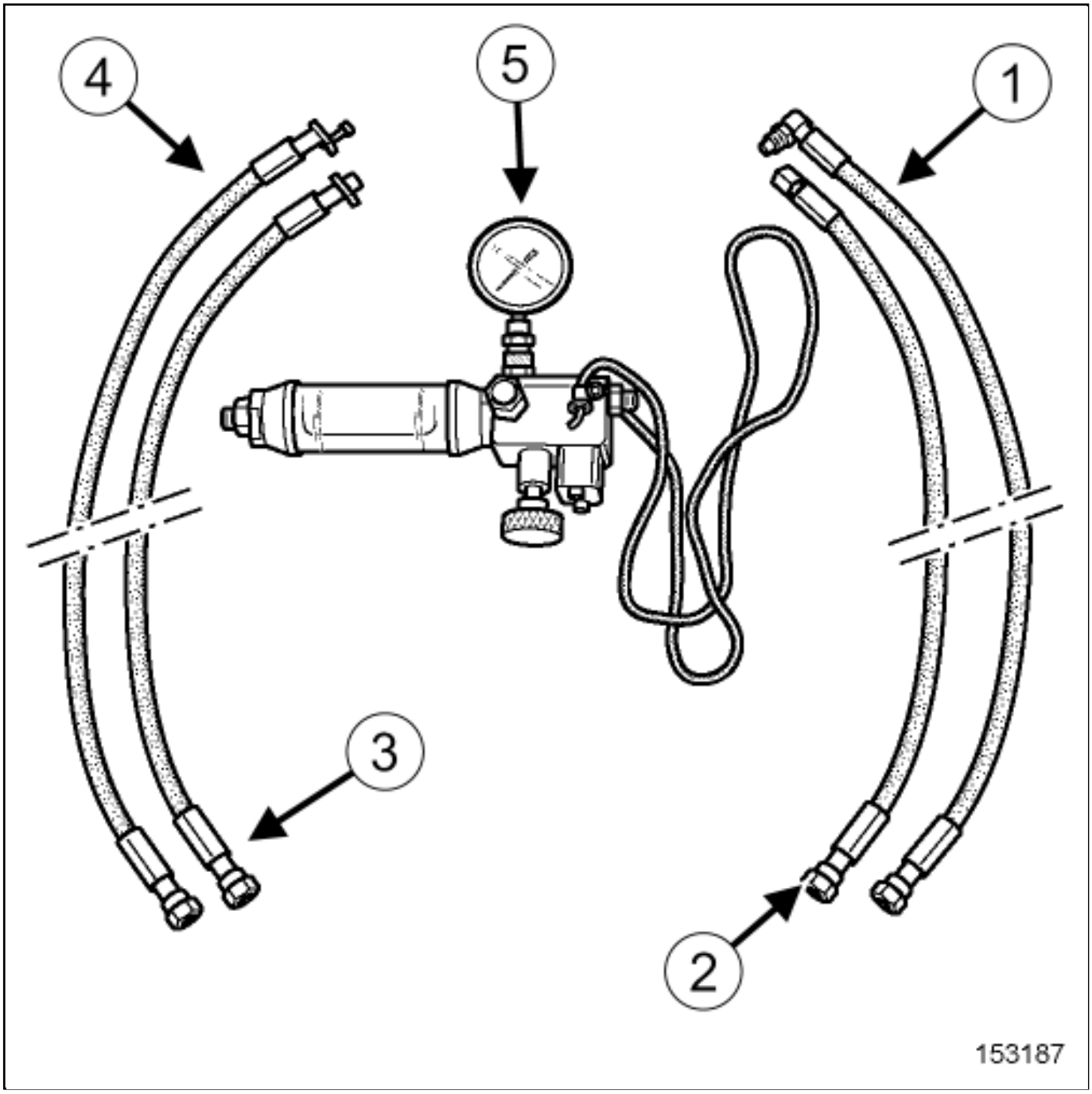
Note, one or more warnings are present in this procedure

Special tooling required	
Pipe clamps.	Ms. 583
Diagnostic tool of the power assisted steering	

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

TOOL DIR. 1928



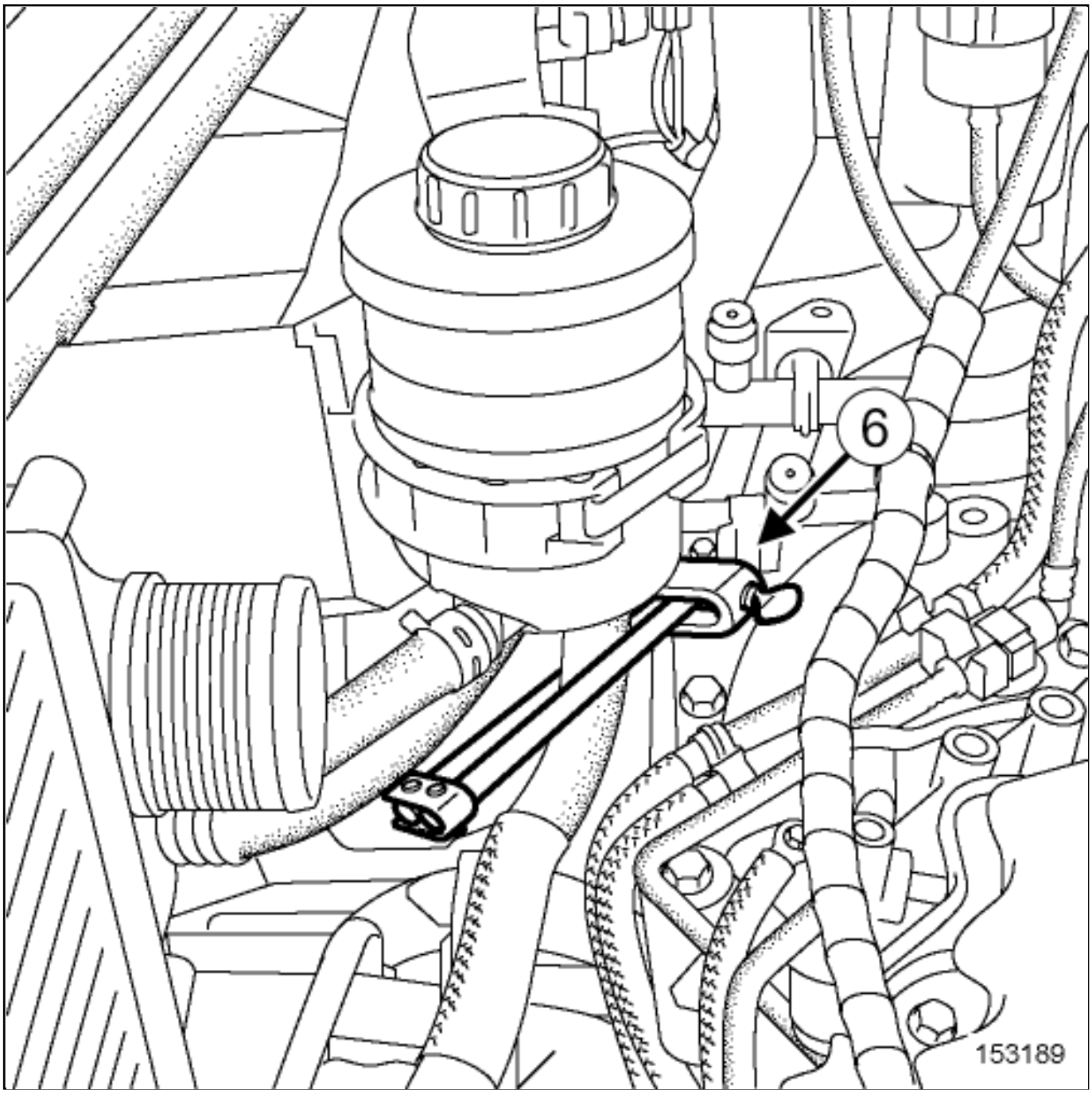
- Components of tool Diagnostic tool of the power assisted steering :
  - control pipe between the pump assisted steering and the tool(1) ,
  - control pipe between the tool and the power assisted steering pump high pressure pipe(2) ,
  - control pipe between the pump assisted steering assembly and the tool(3) ,
  - control pipe between the tool and the power assisted steering pump assembly high pressure pipe(4) ,
  - pressure gauge(5) .

CHECK

- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).
- Open the bonnet.
- Straighten the wheels.

Remove:

- the front left-hand wheel**Wheel: Removal - Refitting** ,
- the front left-hand wheel arch liner(see **Front wheel arch liner: Removal - Refitting**) .



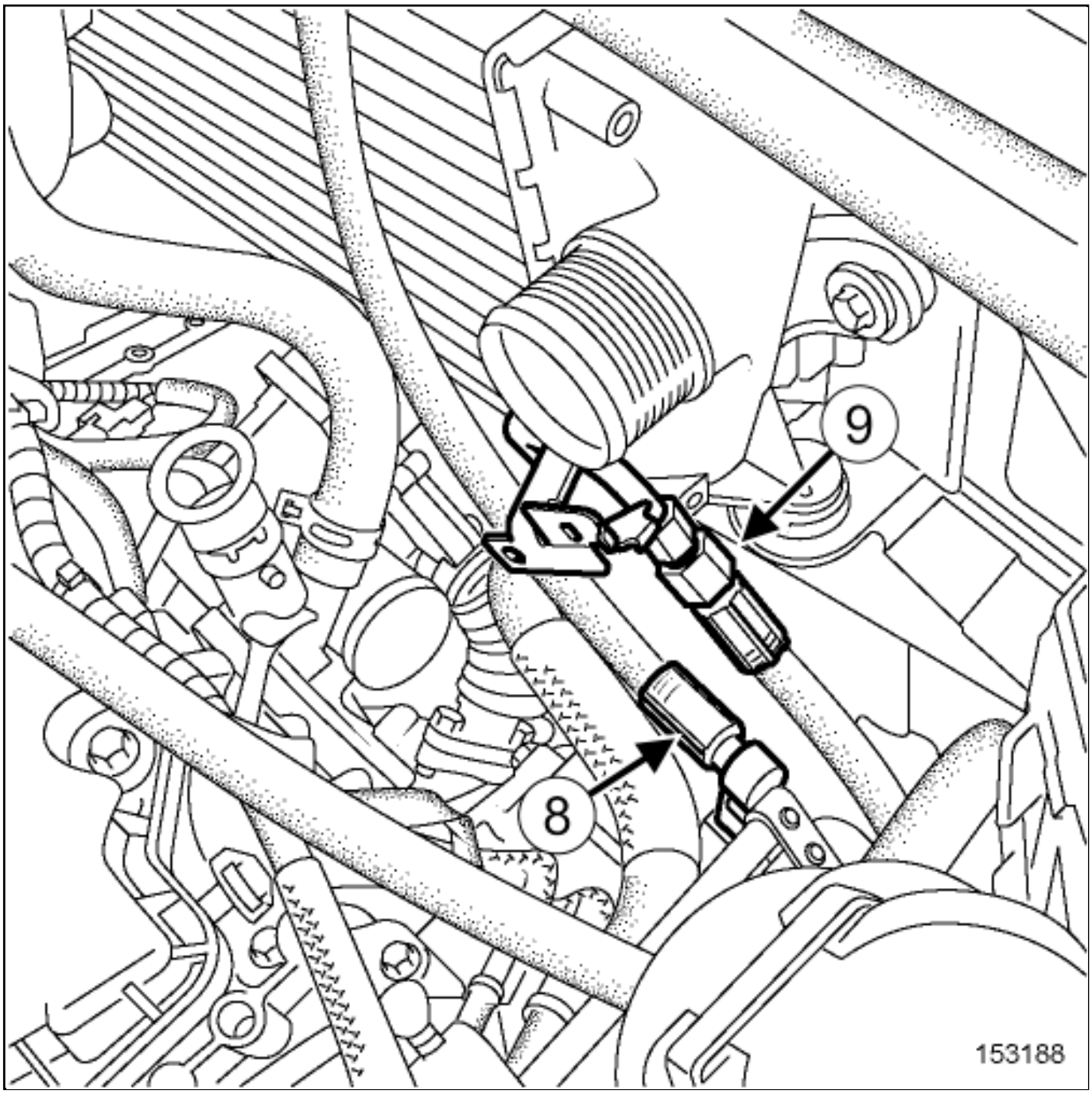
Fit the toolPipe clamps.(**Ms. 583**) (**6**) on the power-assisted steering low pressure pipe.

- Remove the power assisted steering pump high pressure pipe(7) .

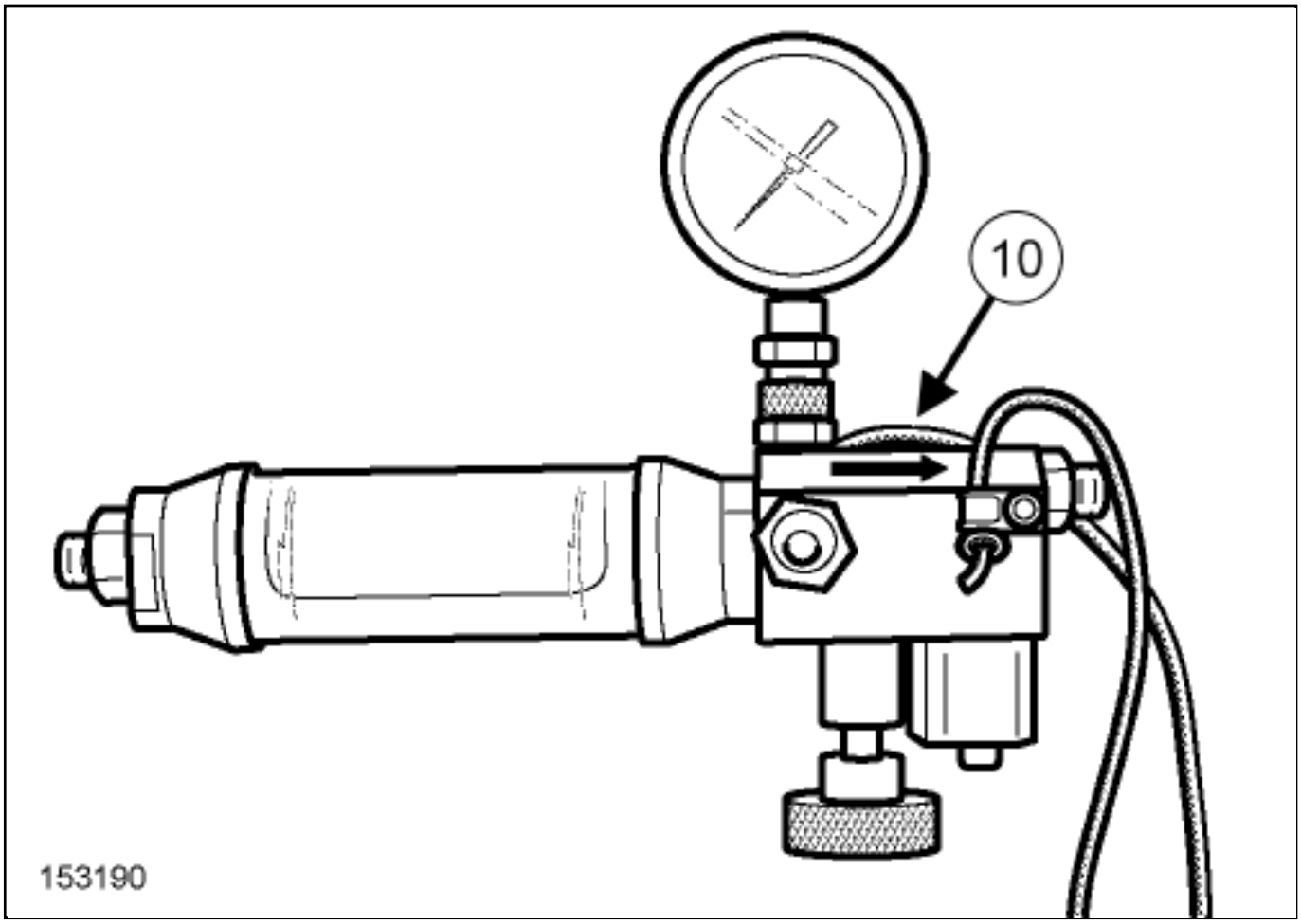
Note:

If the vehicle is equipped with a power-assisted steering pump assembly, take the pipe of the toolDiagnostic tool of the power assisted steering equipped with the green color ring.

If the vehicle is equipped with a power-assisted steering pump, take the pipe of the tool Diagnostic tool of the power assisted steering equipped with the red color ring.



- Connect the toolDiagnostic tool of the power assisted steering between the power-assisted steering pump outlet(8) and the high pressure pipe(9) .



- Take care to the direction of fitting, follow the arrow(10) .

- Remove the toolPipe clamps.(Ms. 583) from the low pressure pipe.

Note:

Check that the thumb wheel of the tool is opened.

- Start the engine.

- Check for leaks from the toolDiagnostic tool of the power assisted steering .

Bleed the power-assisted steering circuit(see 36B, Power assisted steering, Power-assisted steering circuit: Bleeding) .

Check that the hydraulic pressure of the power-assisted steering circuit increases by turning the wheels to one side, then to the other side.

Note:

This operation requires two people.

Put the power steering system in pressure by turning the thumb wheel of the toolDiagnostic tool of the power assisted steering .

Note:

Do not leave the closed circuit (thumb wheel of the tool screwed profoundly) more than some seconds to avoid damaging the pump.

If the pressure reaches 75 Bar ± 5, the power-assisted steering pump is correct.

Stop the engine.

Fit the toolPipe clamps.(Ms. 583) on the power-assisted steering low pressure pipe.

Disconnect the tool Diagnostic tool of the power assisted steering between the power-assisted steering pump outlet and the high pressure pipe.

Refit the power assisted steering pump high pressure pipe.

Remove the toolPipe clamps.(Ms. 583) from the low pressure pipe.

Start the engine.

Check for leaks from the power-assisted steering pump.

Bleed the power-assisted steering circuit(see 36B, Power assisted steering, Power-assisted steering circuit: Bleeding) .

H4B, PAS PUMP ASSEMBLY TYPE 1(GEP01) AND (GEP01)

Refit:

- the front left-hand wheel arch liner(see **Front wheel arch liner: Removal - Refitting**) ,
- the front left-hand wheelWheel: Removal - Refitting .

Close the bonnet.

POWER-ASSISTED STEERING ASSEMBLY: EXPLODED VIEW

Equipment required
Diagnostic tool

LEFT-HAND DRIVE, PAS PUMP ASSEMBLY TYPE 1 (GEP01)

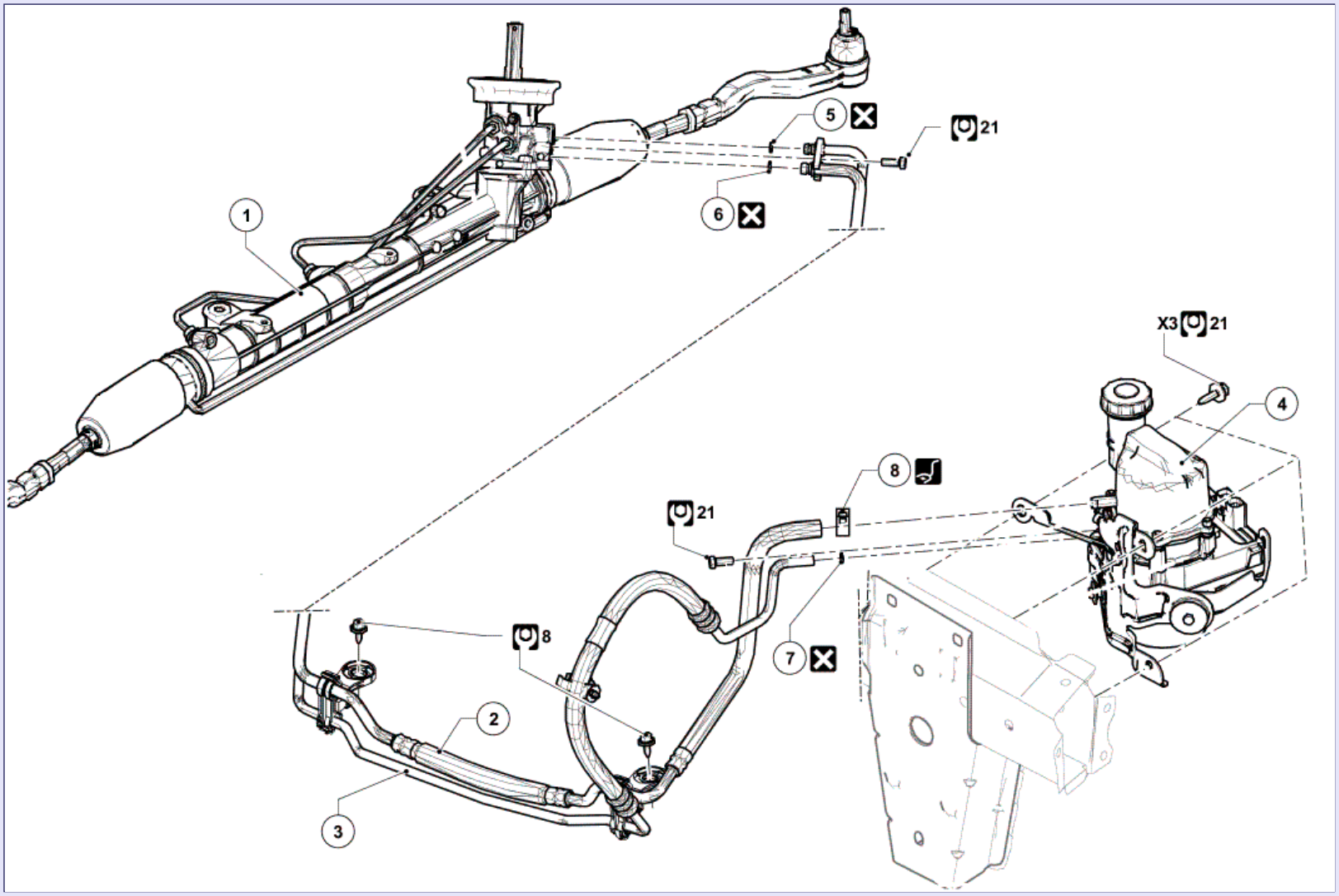


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

PAS PUMP ASSEMBLY TYPE 1(GEP01)

Marks	Designations	Informations
1	Steering box	Steering assembly: Exploded view
2	Power-assisted steering pipe between steering box and reservoir	Position the vehicle on a two-post lift Vehicle: Towing and lifting
3	Power-assisted steering high pressure pipe	Position the vehicle on a two-post lift Vehicle: Towing and lifting
4	Power-assisted steering pump assembly	Position the vehicle on a two-post lift Vehicle: Towing and lifting Disconnect the battery Battery: Removal - Refitting (see 36B, Power assisted steering, Power-assisted steering circuit: Bleeding) ❑ Apply the after repair procedure using the Diagnostic tool Diagnostic tool : Use : -Computer concerned by the after repair procedure: ■"Power-assisted steering computer" -Component affected by the after repair procedure: ■"Power-assisted steering pump assembly"
5	O-ring	
6	O-ring	
7	O-ring	
8	Hose clip	Mot. 1448

K9K, MECA PUMP POWER STEE 1(GPM01)

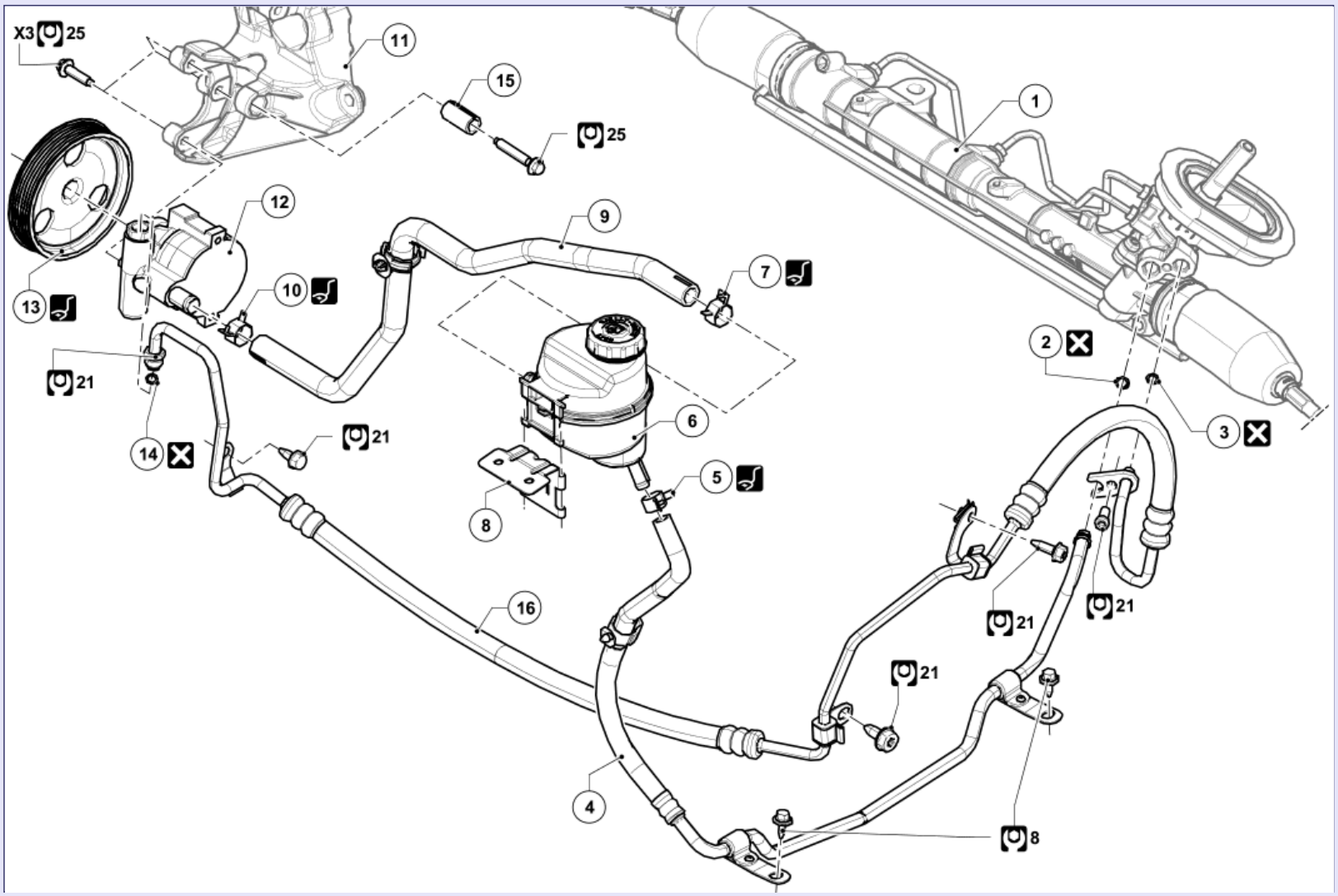


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Steering box	Steering assembly: Exploded view
2	O-ring	
3	O-ring	
4	Power-assisted steering pipe between steering box and reservoir	Position the vehicle on a two-post liftVehicle: Towing and lifting
5	Hose clip	Mot. 1448
6	Power-assisted steering fluid reservoir	(see 36B, Power assisted steering, Power-assisted steering circuit: Bleeding)
7	Hose clip	Mot. 1448
8	Power-assisted steering fluid reservoir mounting	
9	Power-assisted steering pipe between reservoir and pump	Position the vehicle on a two-post liftVehicle: Towing and lifting

10	Hose clip	Mot. 1448
11	Multifunction support	Multifunction support: Removal - Refitting
12	Power-assisted steering pump	Position the vehicle on a two-post lift Vehicle: Towing and lifting Disconnect the battery Battery: Removal - Refitting
13	Power-assisted steering pump pulley	(see 36B, Power assisted steering, Power-assisted steering pump pulley: Removal - Refitting) Dir. 2012
14	O-ring	
15	Spacer	
16	Power-assisted steering high pressure pipe	Position the vehicle on a two-post lift Vehicle: Towing and lifting

POWER-ASSISTED STEERING CIRCUIT: BLEEDING

Note, one or more warnings are present in this procedure

BLEEDING

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Raise the vehicle until the front wheels are lifted off the ground.
- Fill the power-assisted steering reservoir.
- Start the vehicle.
- Top up the power-assisted steering fluid.

CAUTION

To avoid damaging the power-assisted steering system, do not keep the steering at full lock.

- Repeat the following operation three times:
  - turn the steering wheel to the left to lock the steering,
  - turn the steering wheel to the right to lock the steering.
- Top up the power-assisted steering fluid.

CAUTION

The level must be between the "MIN" and "MAX" markings on the reservoir.

POWER ASSISTED STEERING CIRCUIT : CHECK

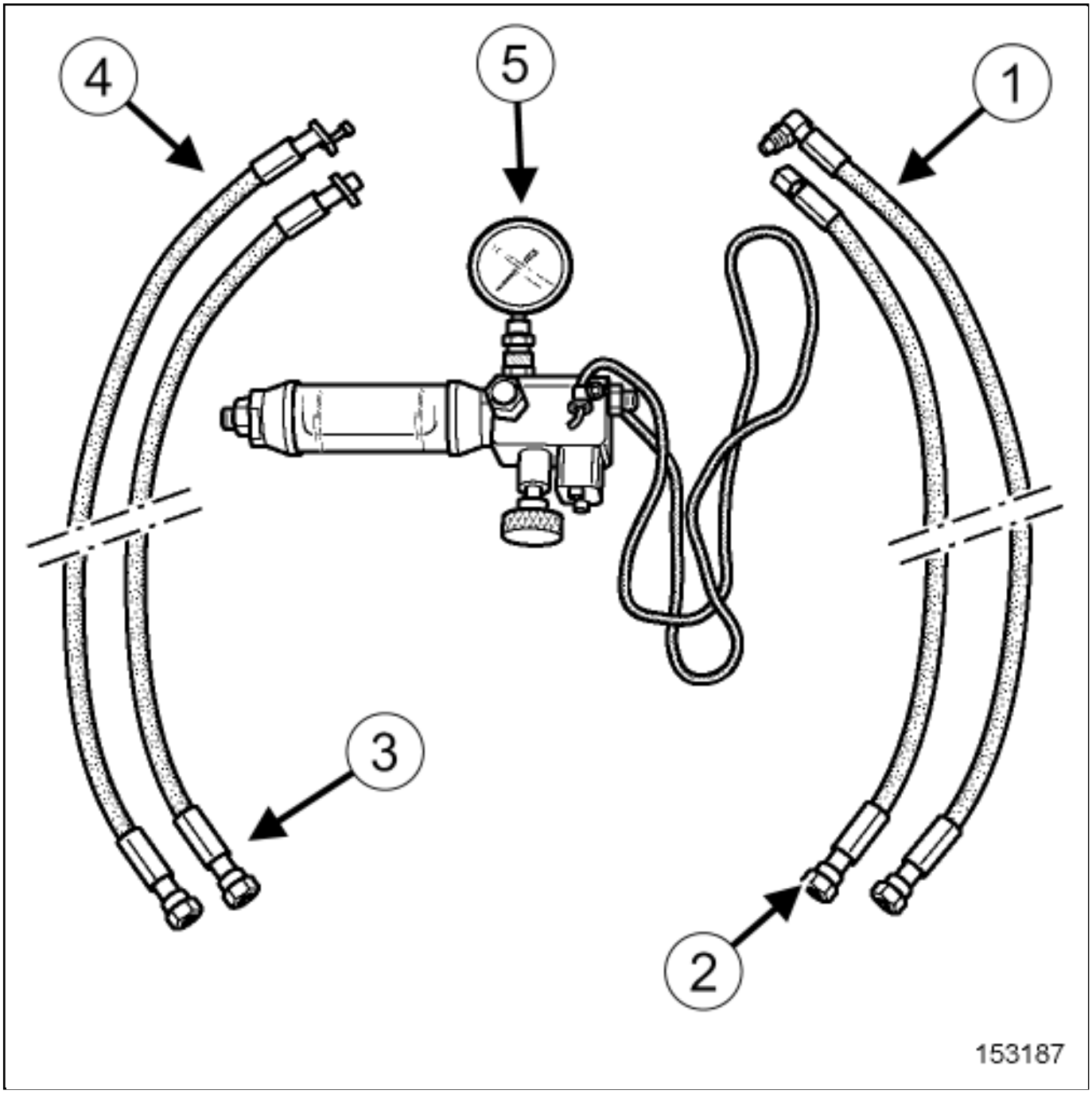
Note, one or more warnings are present in this procedure

Special tooling required	
Pipe clamps.	Ms. 583
Diagnostic tool of the power assisted steering	

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

TOOL DIR. 1928



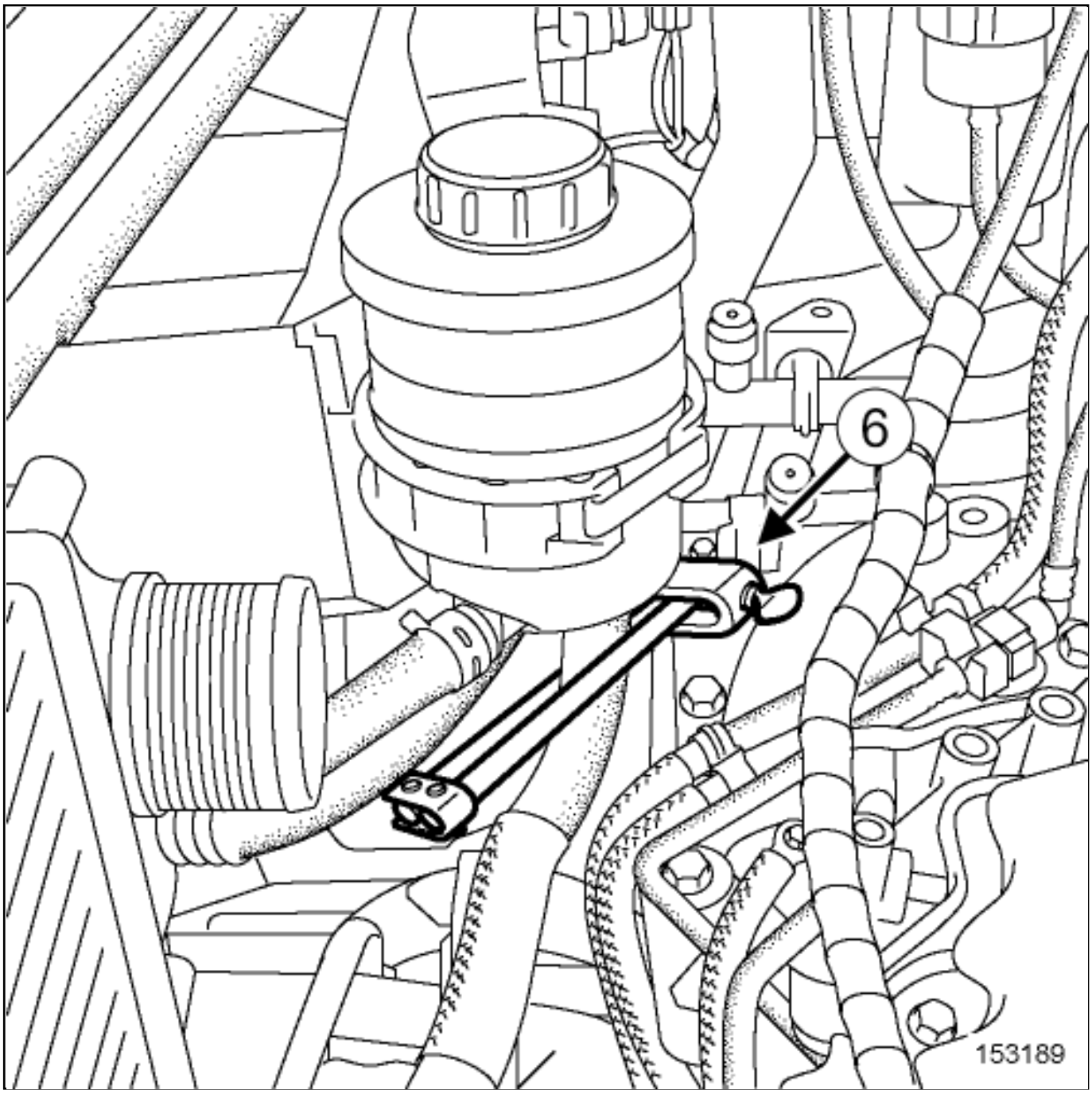
- Components of tool Diagnostic tool of the power assisted steering :
  - control pipe between the pump assisted steering and the tool(1) ,
  - control pipe between the tool and the power assisted steering pump high pressure pipe(2) ,
  - control pipe between the pump assisted steering assembly and the tool(3) ,
  - control pipe between the tool and the power assisted steering pump assembly high pressure pipe(4) ,
  - pressure gauge(5) .

CHECK

- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).
- Open the bonnet.
- Straighten the wheels.

Remove:

- the front left-hand wheel**Wheel: Removal - Refitting** ,
- the front left-hand wheel arch liner(see **Front wheel arch liner: Removal - Refitting**) .



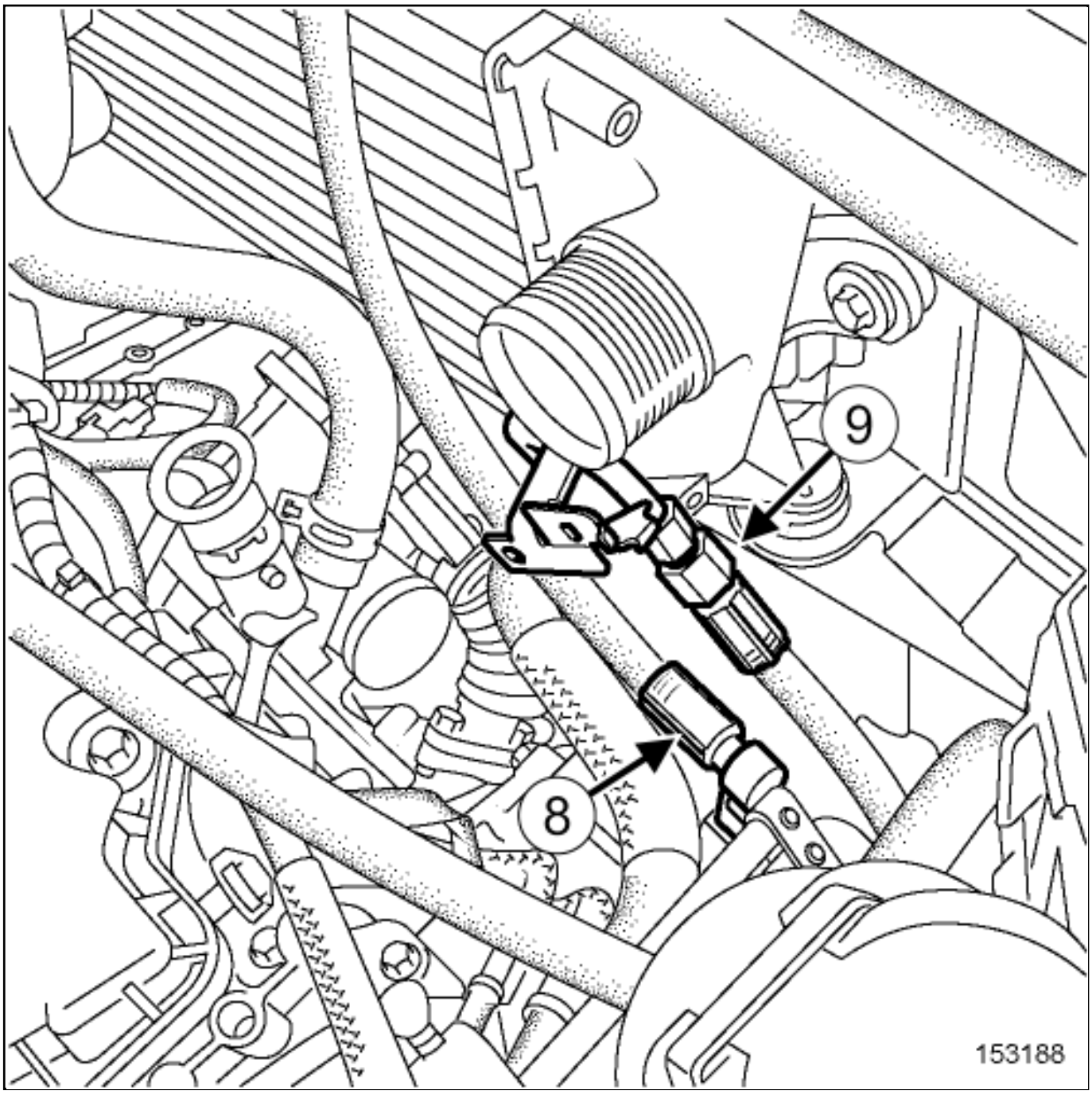
Fit the toolPipe clamps.(**Ms. 583**) (**6**) on the power-assisted steering low pressure pipe.

- Remove the power assisted steering pump high pressure pipe(7) .

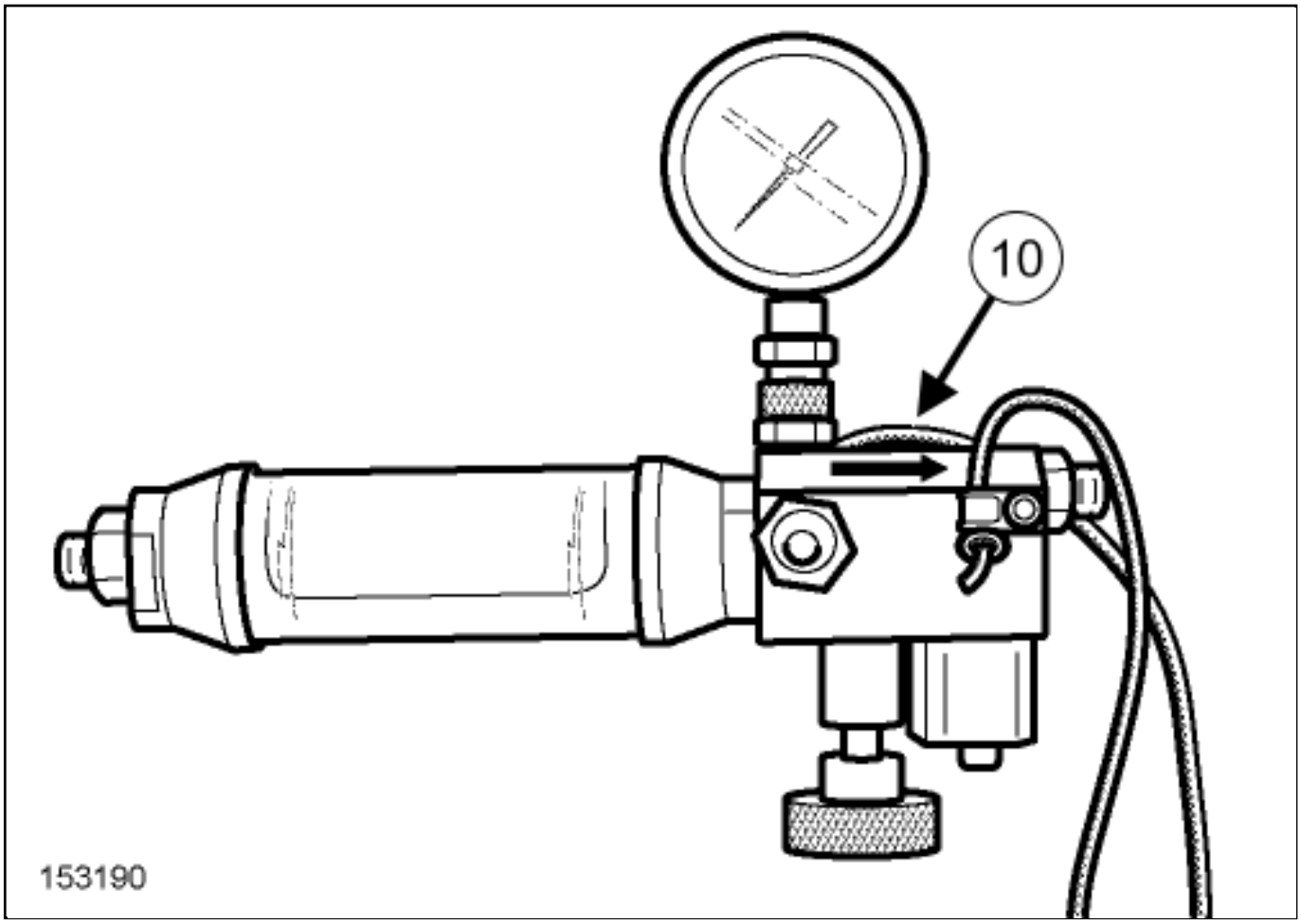
Note:

If the vehicle is equipped with a power-assisted steering pump assembly, take the pipe of the toolDiagnostic tool of the power assisted steering equipped with the green color ring.

If the vehicle is equipped with a power-assisted steering pump, take the pipe of the tool Diagnostic tool of the power assisted steering equipped with the red color ring.



- Connect the toolDiagnostic tool of the power assisted steering between the power-assisted steering pump outlet(8) and the high pressure pipe(9) .



- Take care to the direction of fitting, follow the arrow(10) .

- Remove the toolPipe clamps.(Ms. 583) from the low pressure pipe.

Note:

Check that the thumb wheel of the tool is opened.

- Start the engine.

- Check for leaks from the toolDiagnostic tool of the power assisted steering .

Bleed the power-assisted steering circuit(see 36B, Power assisted steering, Power-assisted steering circuit: Bleeding) .

Check that the hydraulic pressure of the power-assisted steering circuit increases by turning the wheels to one side, then to the other side.

Note:

This operation requires two people.

Put the power steering system in pressure by turning the thumb wheel of the toolDiagnostic tool of the power assisted steering .

Note:

Do not leave the closed circuit (thumb wheel of the tool screwed profoundly) more than some seconds to avoid damaging the pump.

If the pressure reaches 75 Bar ± 5, the power-assisted steering pump is correct.

Stop the engine.

Fit the toolPipe clamps.(Ms. 583) on the power-assisted steering low pressure pipe.

Disconnect the tool Diagnostic tool of the power assisted steering between the power-assisted steering pump outlet and the high pressure pipe.

Refit the power assisted steering pump high pressure pipe.

Remove the toolPipe clamps.(Ms. 583) from the low pressure pipe.

Start the engine.

Check for leaks from the power-assisted steering pump.

Bleed the power-assisted steering circuit(see 36B, Power assisted steering, Power-assisted steering circuit: Bleeding) .

H4B, PAS PUMP ASSEMBLY TYPE 1(GEP01) AND (GEP01)

Refit:

- the front left-hand wheel arch liner(see **Front wheel arch liner: Removal - Refitting**) ,
- the front left-hand wheelWheel: Removal - Refitting .

Close the bonnet.

POWER-ASSISTED STEERING PUMP PULLEY: REMOVAL - REFITTING

Special tooling required	
Tool for refitting the power-assisted steering pump pulley.	Dir. 2012

Equipment required
sliding two-claw extractor

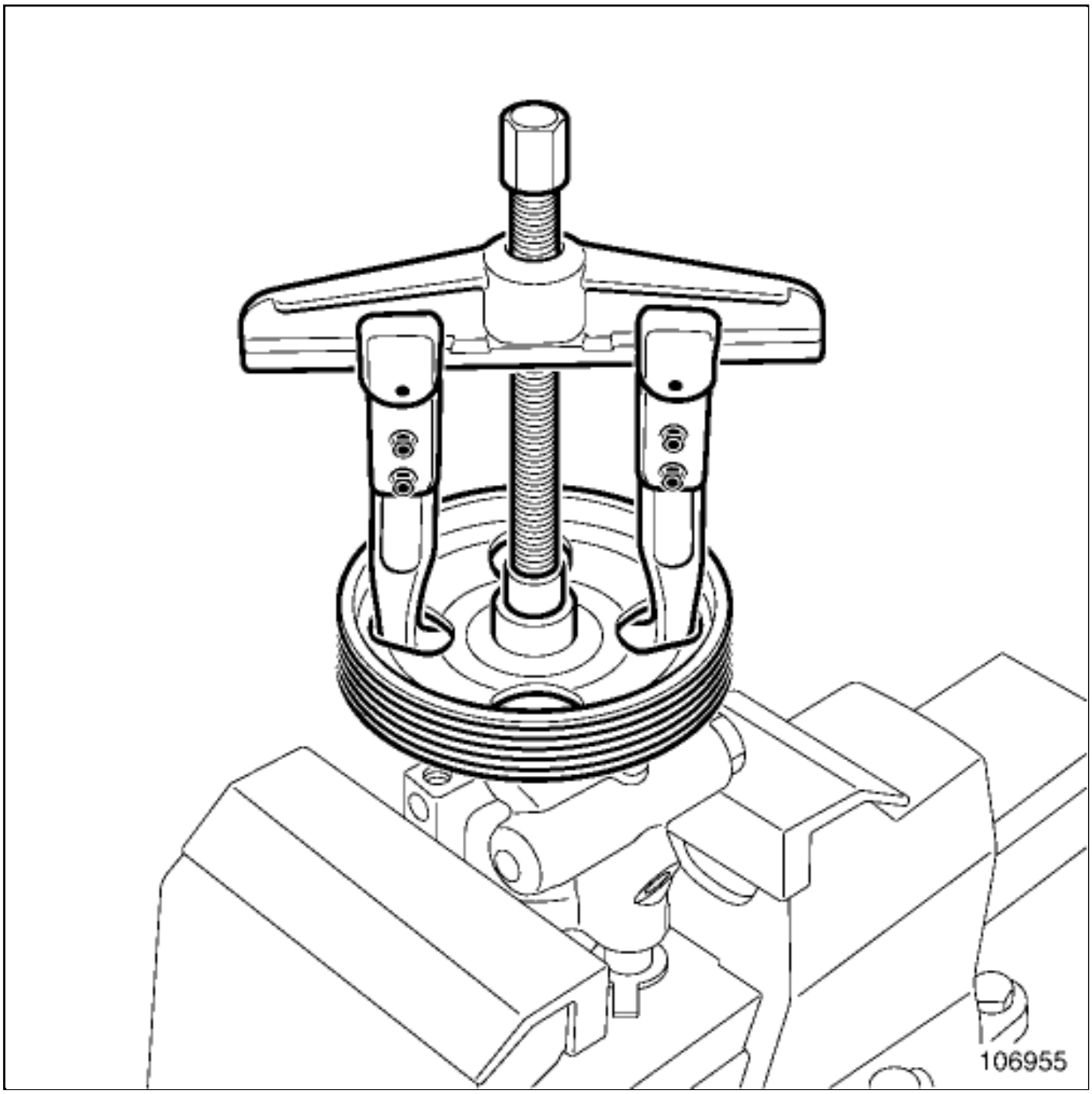
Location and specifications (tightening torques, parts always to be replaced, etc.)(see 36B, Power assisted steering , Power-assisted steering assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting
- Disconnect the batteryBattery: Removal - Refitting .
- Remove:
  - the accessories beltAccessories belt - Crankshaft accessories pulley : Removal - Refitting ,
  - the power-assisted steering pump(see 36B, Power assisted steering, Power-assisted steering assembly: Exploded view) .

2. REMOVAL OPERATION



- Put the power-assisted steering pump in a vice with pads to prevent marking it.

- Remove the pulley using the sliding two-claw extractorwith a ring which has an outer diameter of 13 mm after having measured the dimension in relation to the end of the shaft.

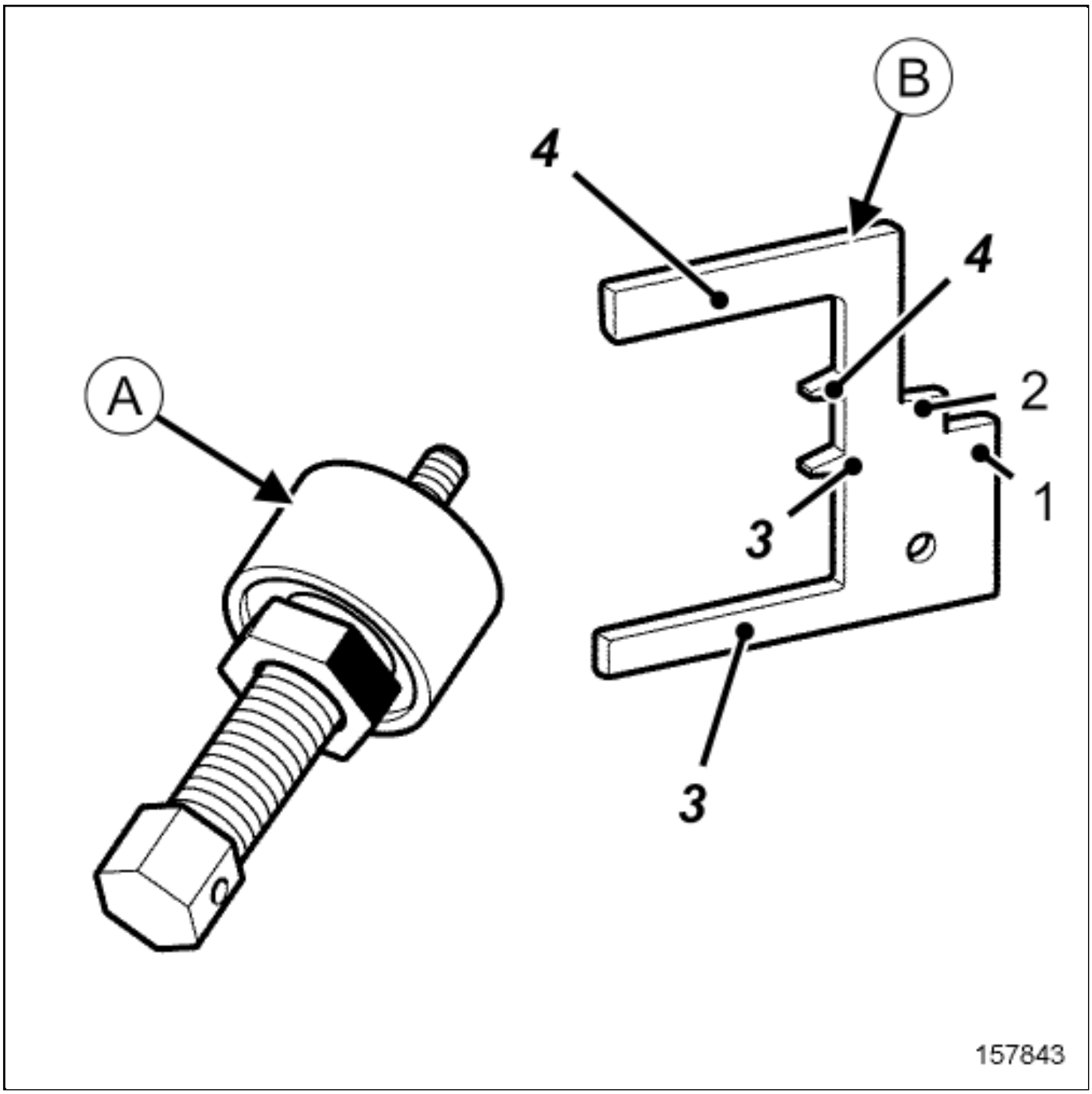
REFITTING

1. REFITTING PREPARATION OPERATION

- Liberally grease the threading and the pad on the pump pulley.

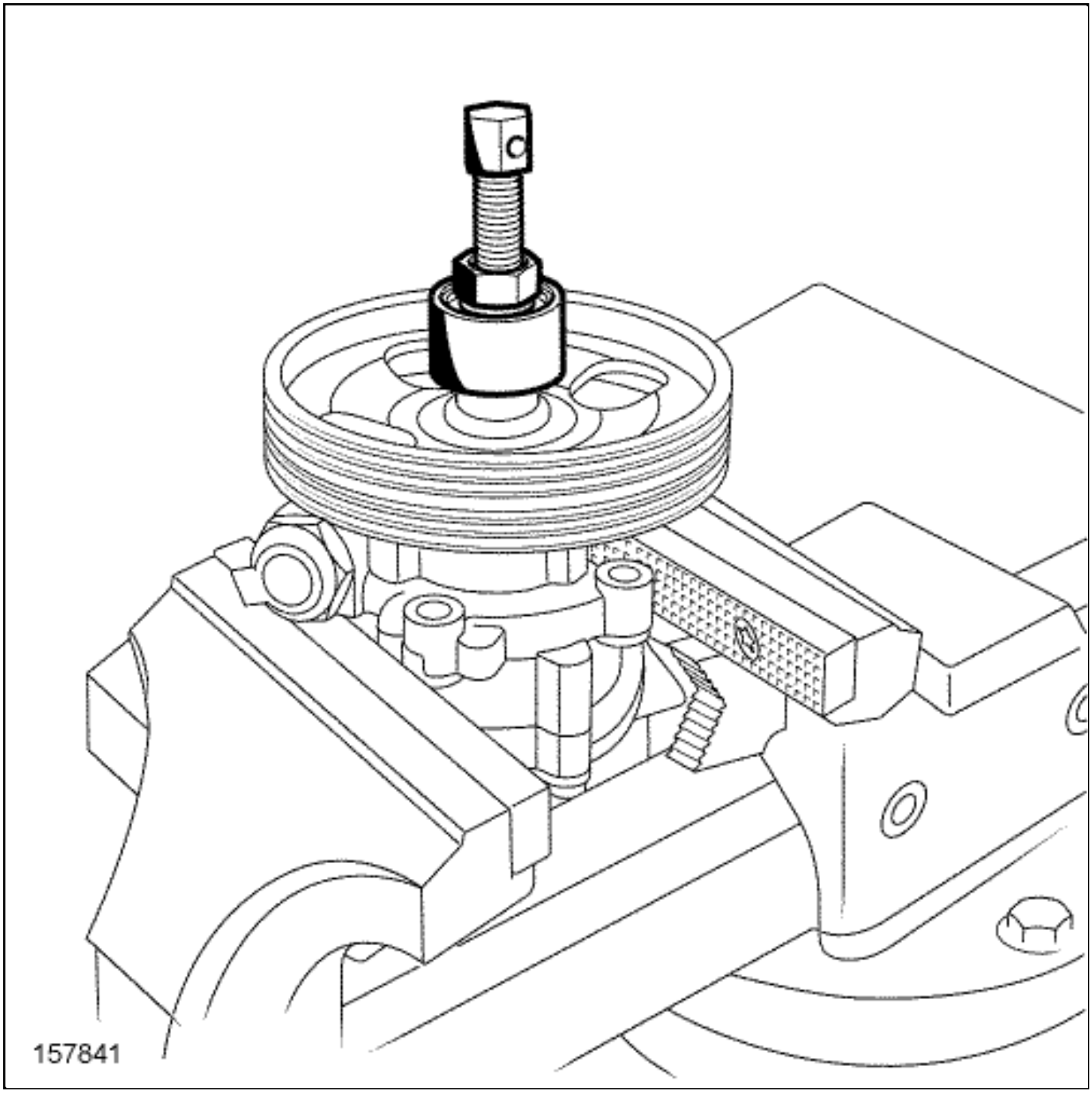
2. REFITTING OPERATION

COMPOSITION OF THE TOOL DIR.2012

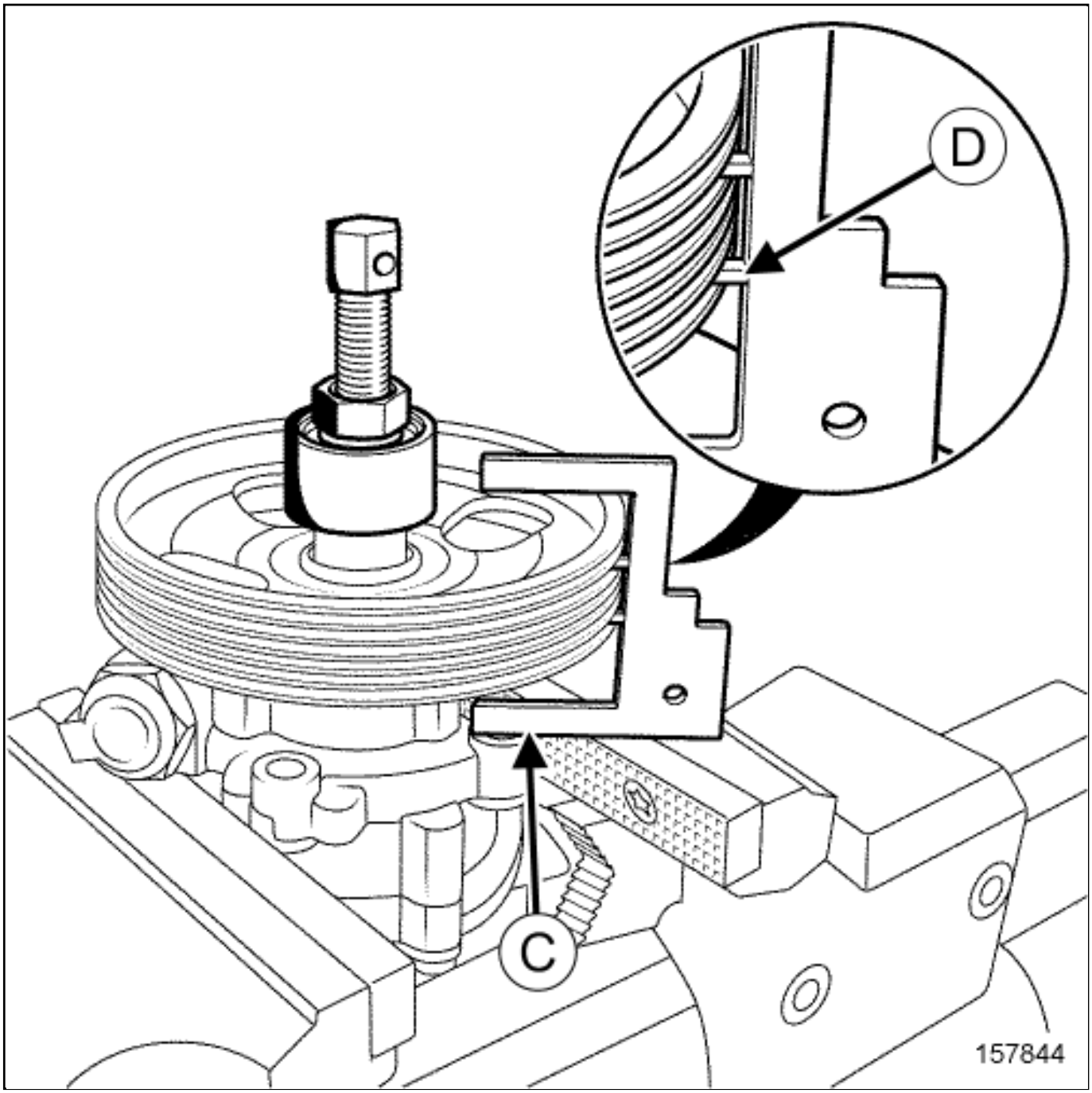


(A) Fitting tool

(B) Calibration tool



- Finger tighten the pulley on the power-assisted pump using the fitting toolTool for refitting the power-assisted steering pump pulley.(Dir. 2012) (A) .



Adjust the position of the pulley using the marks engraved on the calibration tool(B) , observing the distance between the fitting face(C) and the first groove(D) of the pulley.

Engraved marks to be used for the following pulleys types:

- pulleys with 6or 7grooves: the face 3and the tooth 3of the calibration tool,
- pulleys with 5grooves: the face 4and the tooth 4of the calibration tool.

3. FINAL OPERATION

Before refitting the belt, clean all of the pulley grooves with a brush to remove any deposits.

Refit:

- the power-assisted steering pump (see 36B, Power assisted steering, Power-assisted steering assembly: Exploded view) ,
- the accessories belt Accessories belt - Crankshaft accessories pulley : Removal - Refitting .

Connect the battery Battery: Removal - Refitting .

PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**(see 01D, Mechanical introduction, Vehicle: Precautions for the repair)** .

1. GENERAL INFORMATION

All information contained in these manuals is intended exclusively for automotive industry professionals.

The documentation is intended to cover all vehicles in theRENAULTrange throughout the world, but may not cover equipment designed for use in specific countries.

The procedures and fault finding procedures recommended and described in this manual have been designed by automotive industry repair professionals.

1- GENERAL RECOMMENDATIONS

Observe basic principles of vehicle repair.

The quality of repair depends first and foremost on the care exercised by the person in carrying it out.

To ensure good repair:

- protect the sensitive areas of the vehicle (seats, steering wheel, wings, etc.),
- unless otherwise indicated, all repairs must be done with the ignition off,
- when welding on the vehicle, it is advisable to remove or disconnect components near the repair area that could be affected by the heat,
- use recommended professional products and original parts,
- observe the tightening torques,
- replace roll pins, self-locking or bonded nuts or bolts every time they are removed,
- take care with electrical and electronic components which cannot withstand excess voltage and improper handling; replace any electrical and electronic components which have experienced a voltage drop,
- make sure that the connectors are correctly clipped,
- do not pull on the wiring,

To ensure good repair:

- check for the sealing plugs on the connectors,
- do not just replace parts one after the other, carry out detailed fault finding beforehand,
- carry out a final check before returning the vehicle to the customer (set the clock, check the alarm operation, check the lights and indicators etc.),
- clean and degrease the sections to be bonded (threads, stub axle splines) to ensure proper adherence.
- Desactivate the start and stop mode for all interventions requiring the bonnet opening.

Protect the accessories and timing belts, the electrical accessories (starter, blanking cover, electric power assisted steering pump) and the mating face to prevent diesel fuel spilling onto the clutch friction plate.

The design quality of our vehicles demands that nothing is left to chance in making a good repair, and it is essential to refit parts or components exactly as they were originally (for instance: heat shields, wiring routing, pipe routing, particularly in the area of the orange high-voltage wirings).

Do not blow away dust (brakes, etc.), vacuum them up or clean the component with a cleaning agent (such as a brake cleaning product).

Use professional products and apply them with care, for example do not apply too much sealing paste to the sealing surface.

Exhaust gases (petrol and diesel) are pollutants. Operate engines or self-contained heaters with care and always use exhaust gas extractors.

Ensure that there is no risk of a short circuit occurring when the electrical connections are reconnected (e.g. charger, converter, traction battery and 12V battery, etc.). Some points need greasing, others do not, therefore particular attention should be paid during refitting operations to ensure that they work properly under all conditions.

2- SPECIAL TOOLING - EASE OF USE

The repair procedures have been designed using special tools; they must therefore be carried out using these tools to ensure a high degree of working safety and quality of repair.

The equipment we have approved has undergone careful research and testing, and must be used and maintained with care.

3- RELIABILITY - UPDATING

New repair procedures are constantly being developed in the interests of repair quality, either with new products (emission control, injection, electronics, etc.), or in fault finding. Be sure to consult the Workshop Repair Manuals or Technical Notes or fault finding summaries before any servicing operation.

Since vehicle specifications are subject to change during their commercial life, it is essential to check whether there are any updated Technical Notes when seeking information.

4- SAFETY

Operations on certain equipment and certain parts (for instance: spring-shock absorber assembly, electric traction reduction gearing, brake system, ABS, airbag, etc.) require particular attention to be paid to safety, cleanliness and care.

The safety symbol used in this manual indicates that special attention must be paid to the procedure or the tightening torque values.

Working safely:

- use suitable tools which are in good condition (use of "multi-purpose" tools, such as adjustable pliers, etc., should be avoided wherever possible),
- use supports and adopt a correct posture when performing heavy work or raising loads,
- make sure that the procedure used is not dangerous,
- do not wear any jewellery or other small objects during an operation,
- use personal protection (gloves, safety glasses, work shoes, masks, skin barrier creams, etc.),
- always follow the safety instructions associated with the operation to be performed,
- do not smoke when working on vehicles,
- use smoke extractors (welding, exhaust gases, etc.),
- do not use harmful products in unventilated rooms,
- do not overstrain yourself or attempt inappropriate work operations,
- use axle stands when working under a vehicle raised on a jack,
- do not ingest any chemicals (brake fluid, coolant, etc.),
- do not open the cooling circuit when it is hot and pressurised,
- take care with components that are liable to start up suddenly (engine cooling fan, etc.).

Respecting the environment:

- do not allow waste refrigerants to escape into the atmosphere,
- do not dispose of waste vehicle fluids (oil, brake fluid, etc.) in drains,
- do not burn discarded products (tyres, etc.).

5- CONCLUSION

The procedures contained in this document merit your attention. Please read them carefully in order to reduce the risk of injury, and avoid using incorrect procedures that could damage the vehicle or make it dangerous in use.

Following the recommended procedures will help you to provide a quality of service which will ensure the vehicles achieve the highest levels of performance and reliability.

Maintenance and repair operations must be carried out under the proper conditions to ensure that our vehicles run safely and reliably.

XSL version : 3.02 du 22/07/11

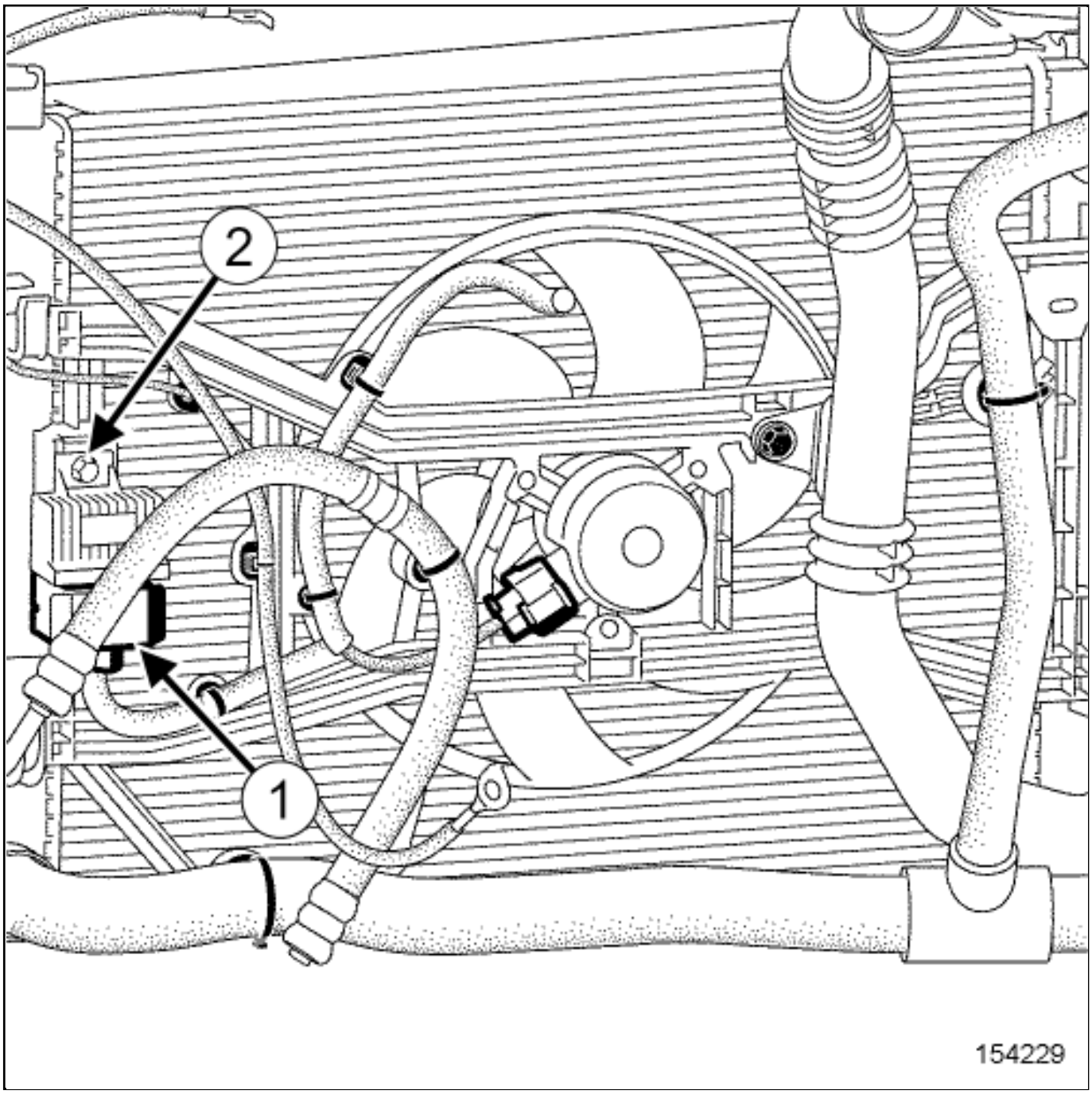
PRE-POSTHEATING UNIT: REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove:
  - the engine undertray bolts,
  - the engine undertray.

2. REMOVAL OPERATION



- Disconnect the pre-postheating unit connector(1) .

- Remove:
  - the bolt(2) from the pre-postheating unit,
  - the pre-postheating unit.

REFITTING

1. REFITTING OPERATION

- Refit:

- the pre-postheating unit,
- the pre-postheating unit bolt.

Tighten to torque the pre-postheating unit bolt8 N.m.

Connect the pre-postheating unit connector.

2. FINAL OPERATION

Refit:

- the engine undertray bolts,
- the engine undertray.

Connect the battery**Battery: Removal - Refitting** .

PRESSURE AT END OF COMPRESSION: CHECK

Special tooling required	
Flexible end piece for taking end of compression pressure measurements.	

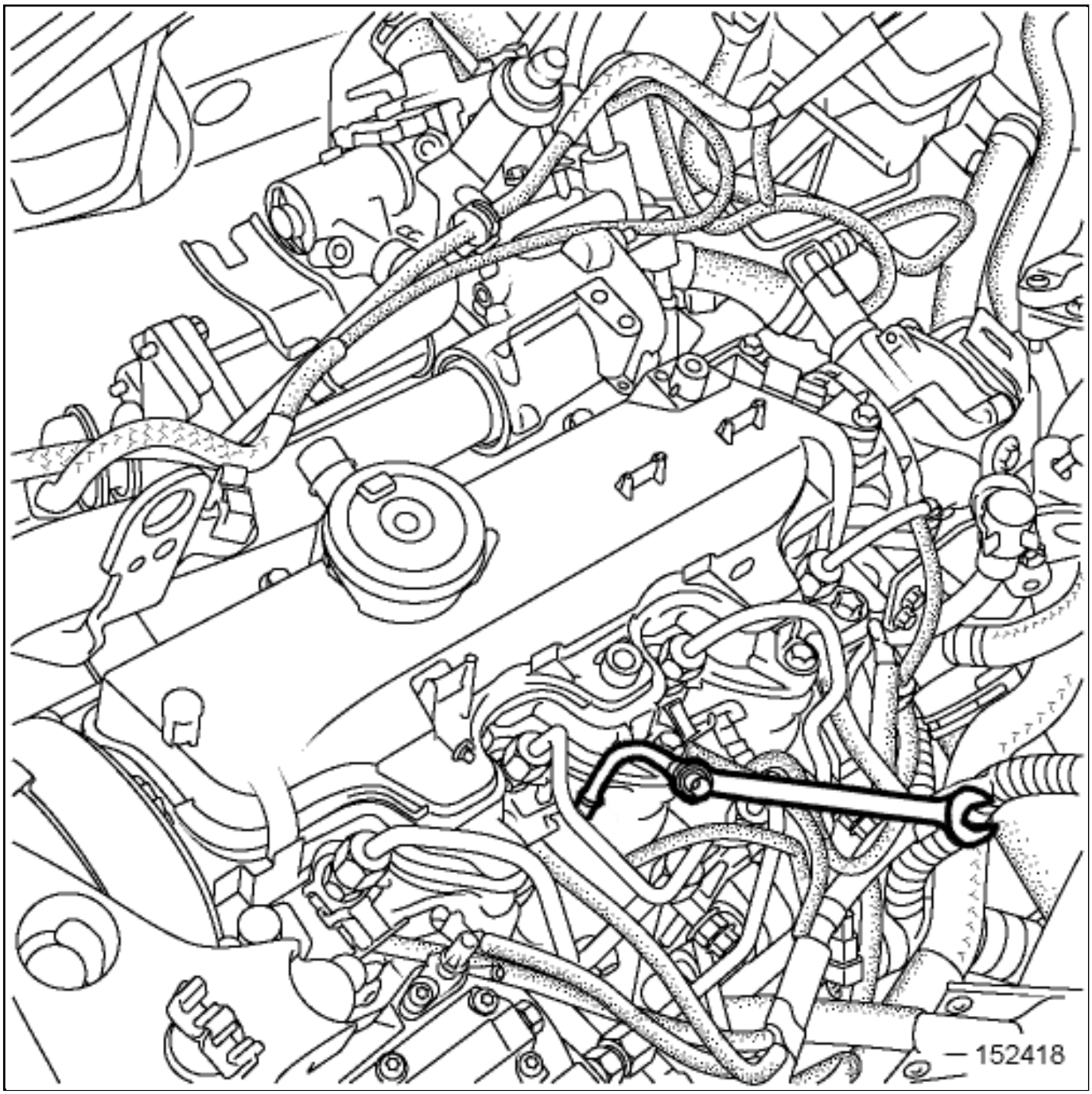
Equipment required
Diagnostic tool
diesel compression gauge
self-contained starter

CHECK

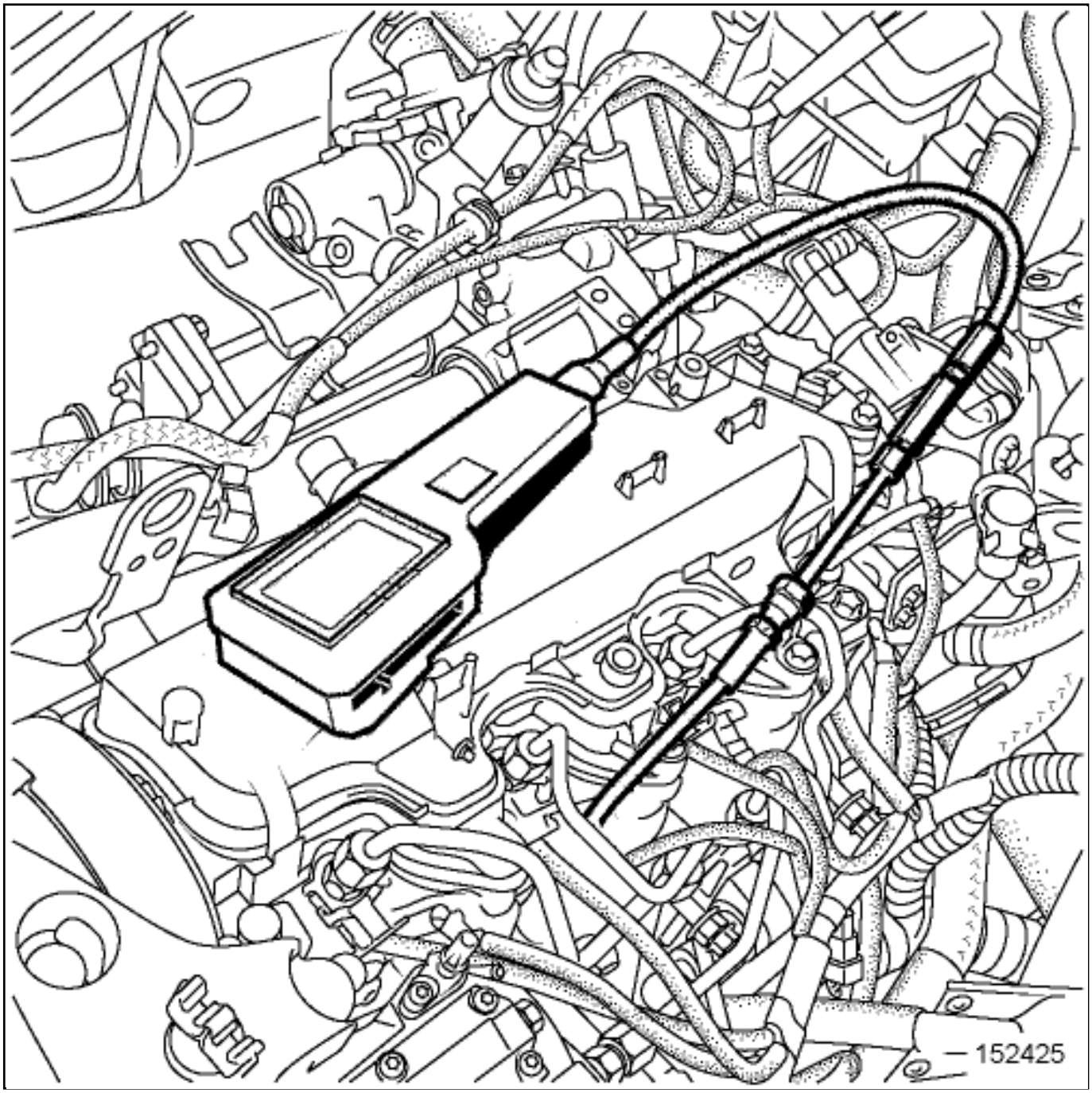
1. PREPARATION OPERATION FOR CHECK

- Remove the preheater plugs Heater plugs: Removal - Refitting .

2. TEST OPERATION



- Use an open-jawed spanner to moderately tighten:
  - the hose end piece toolFlexible end piece for taking end of compression pressure measurements. ,
  - the adapter of the diesel compression gaugeon the toolFlexible end piece for taking end of compression pressure measurements. .



- Moderately tighten the unions of the diesel compression gaugeusing an open-jawed spanner.

- Connect the self-contained starter.

- Force the vehicle's + after ignition feed.

- Connect the Diagnostic tool.

- Run the following commands with the Diagnostic tool:
  - RZ003: "ADAPTATIF MOTOR",
  - VP036: "FUEL SUPPLY INHIBITION".

Operate the starter for 15 suntil the needle of the diesel compression gaugestabilises to obtain the maximum value.

Make progress with the diagram sheet.

Carry out the same procedure for the other cylinders.

Check that the cylinder compression values are all approximately equal.

Note:

The pressure value after compression must be at least 18 bar.

Run the command VP037 "STOP FUEL SUPPLY INHIBITION".

Disconnect:

- the Diagnostic tool,
- the self-contained starter.

Undo:

- the diesel compression gaugeon the hose end piece toolFlexible end piece for taking end of compression pressure measurements. ,
- the flexible end piece toolFlexible end piece for taking end of compression pressure measurements. using an open-jawed spanner.

Remove the flexible end piece toolFlexible end piece for taking end of compression pressure measurements. which was fitted in place of one of the removed plugs.

3. FINAL OPERATION

Proceed in the reverse order to removal.

PRESSURE SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

parts always to be replaced:
Tyre valve

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 35B, Tyre pressure monitor, Tyre pressure monitor: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

2
1
3
4
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No.	Description
1	pressure sensor
2	pressure sensor bolt
3	tyre valve
4	type valve cap

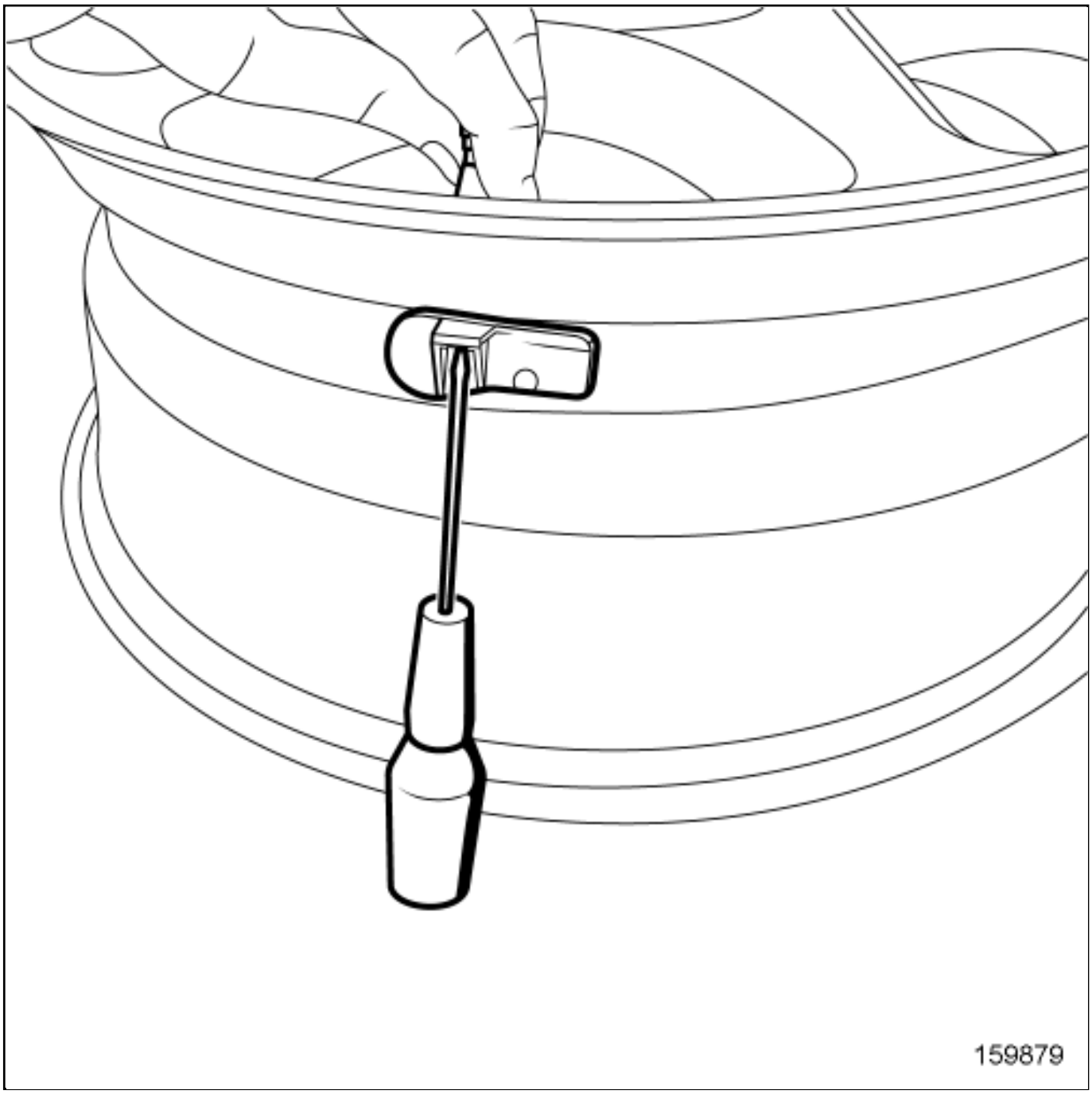
REMOVAL

1. REMOVAL PREPARATION OPERATION

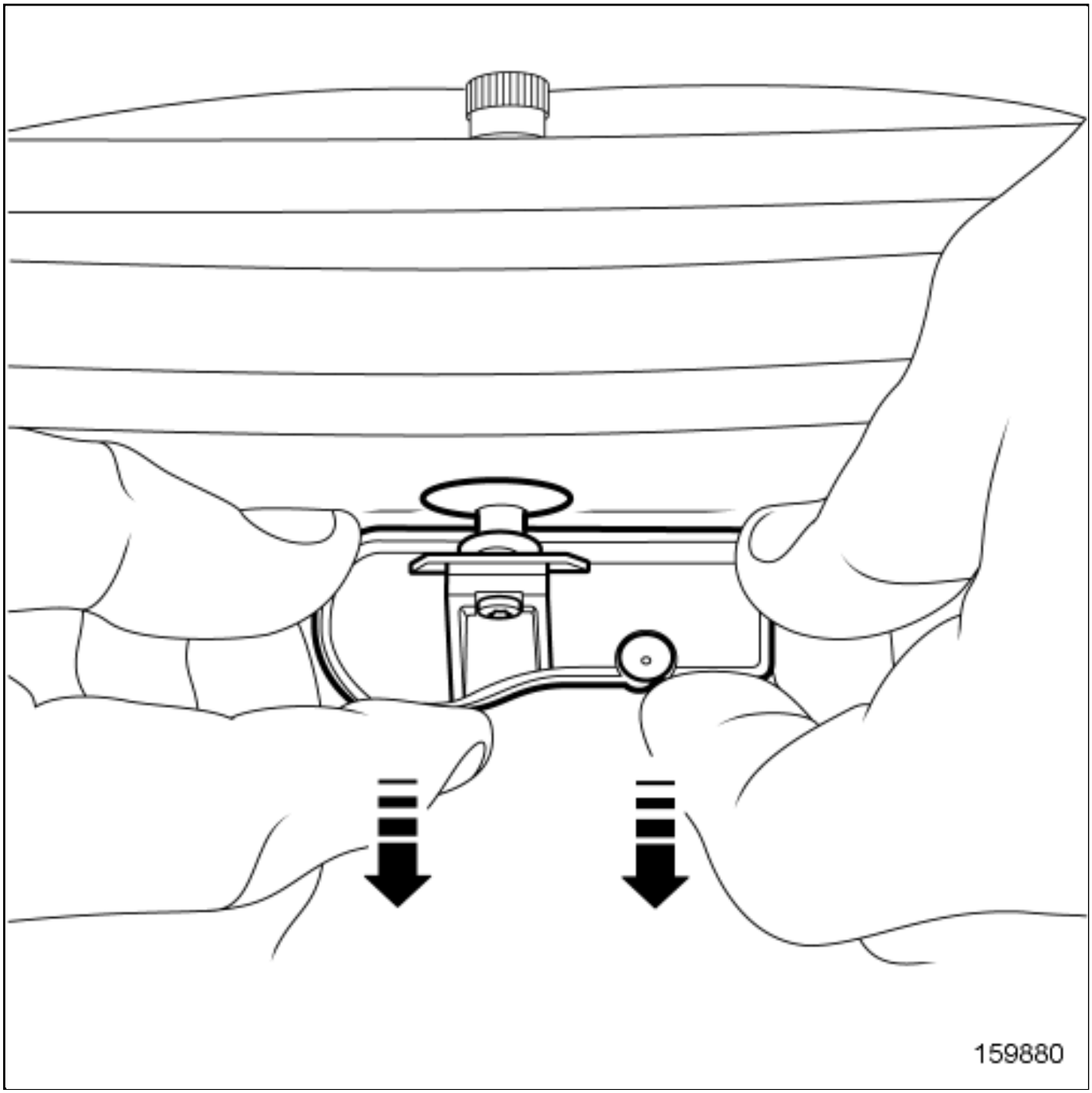
- Position the vehicle on a two-post lift **Vehicle: Towing and lifting** .

- Remove:
  - the wheels **Wheel: Removal - Refitting** ,
  - the tyres **Tyres: Removal - Refitting** .

2. REMOVAL OPERATION



- Remove the pressure sensor mounting bolt using a screwdriver as shown in the picture.



- Carefully remove by pulling the pressure sensor as shown in the picture.
- Remove the tyre valve.

REFITTING

1. REFITTING PREPARATION OPERATION

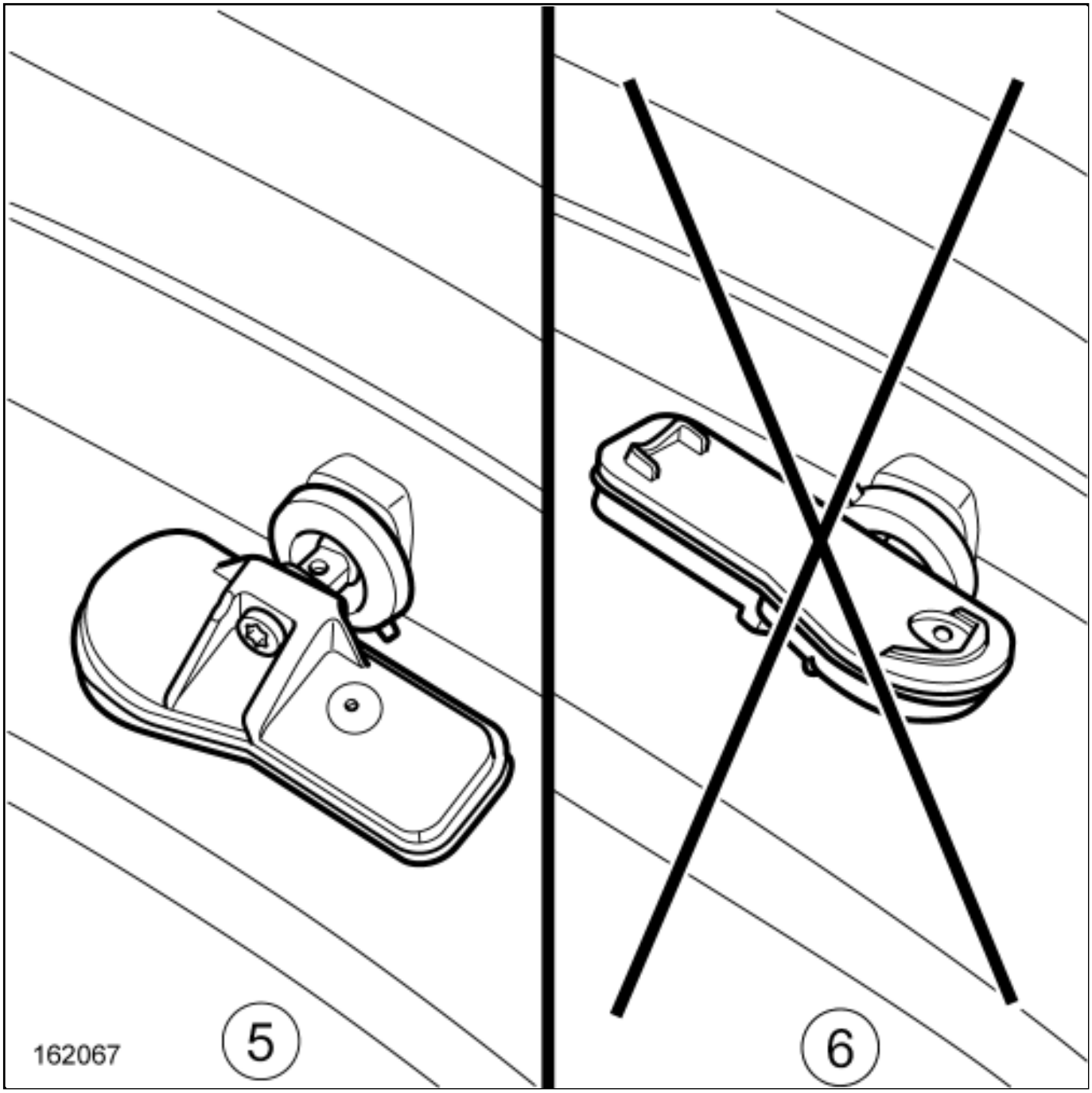
- Always replace the pressure sensor bolt.

parts always to be replaced: Tyre valve

2. REFITTING OPERATION

Refit:

- the tyre valve,
- the pressure sensor.

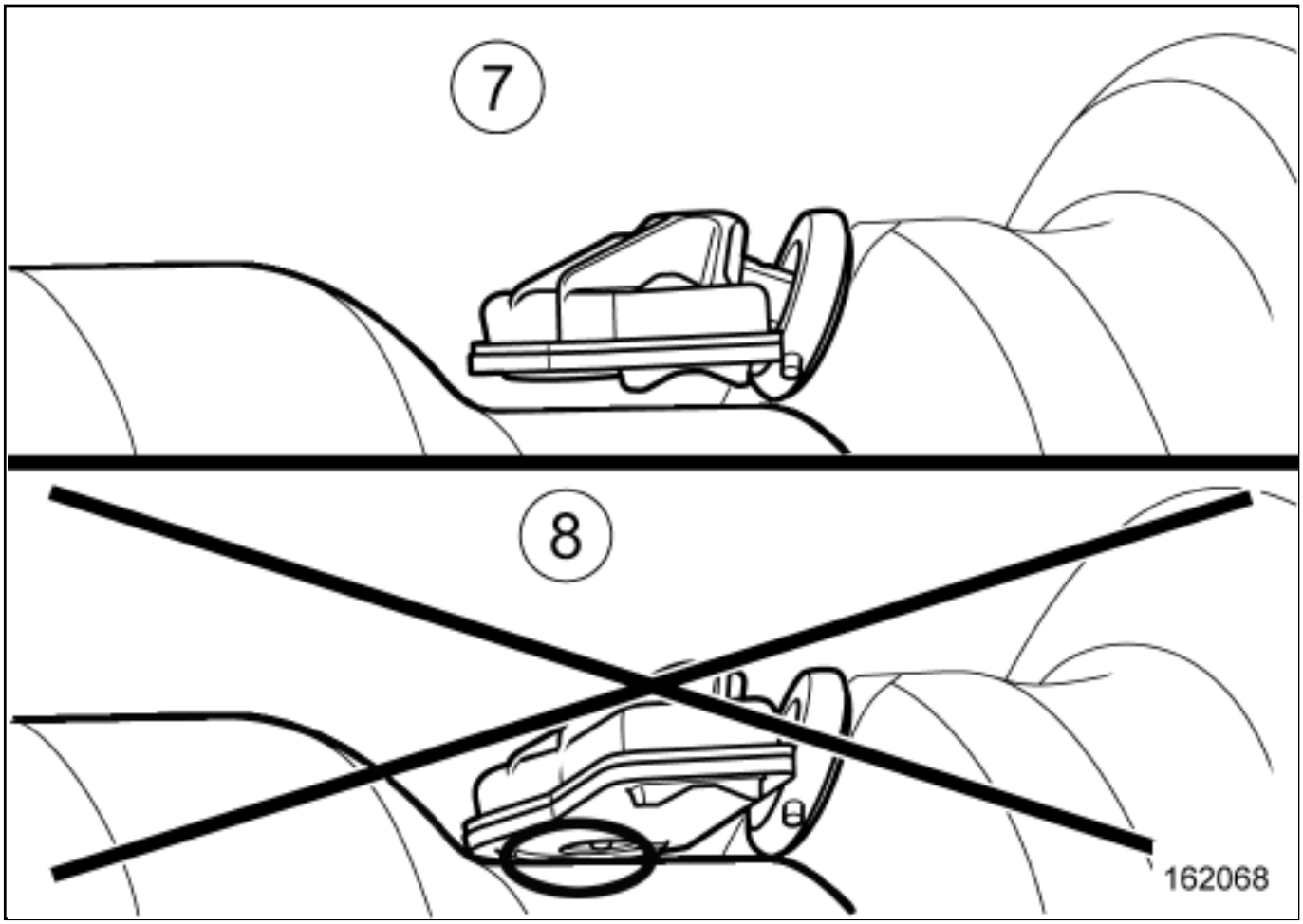


Make sure that the sensor is correctly positioned on the wheel rim:

- correctly fitted(5) .
- incorrectly fitted(6) ,

Note:

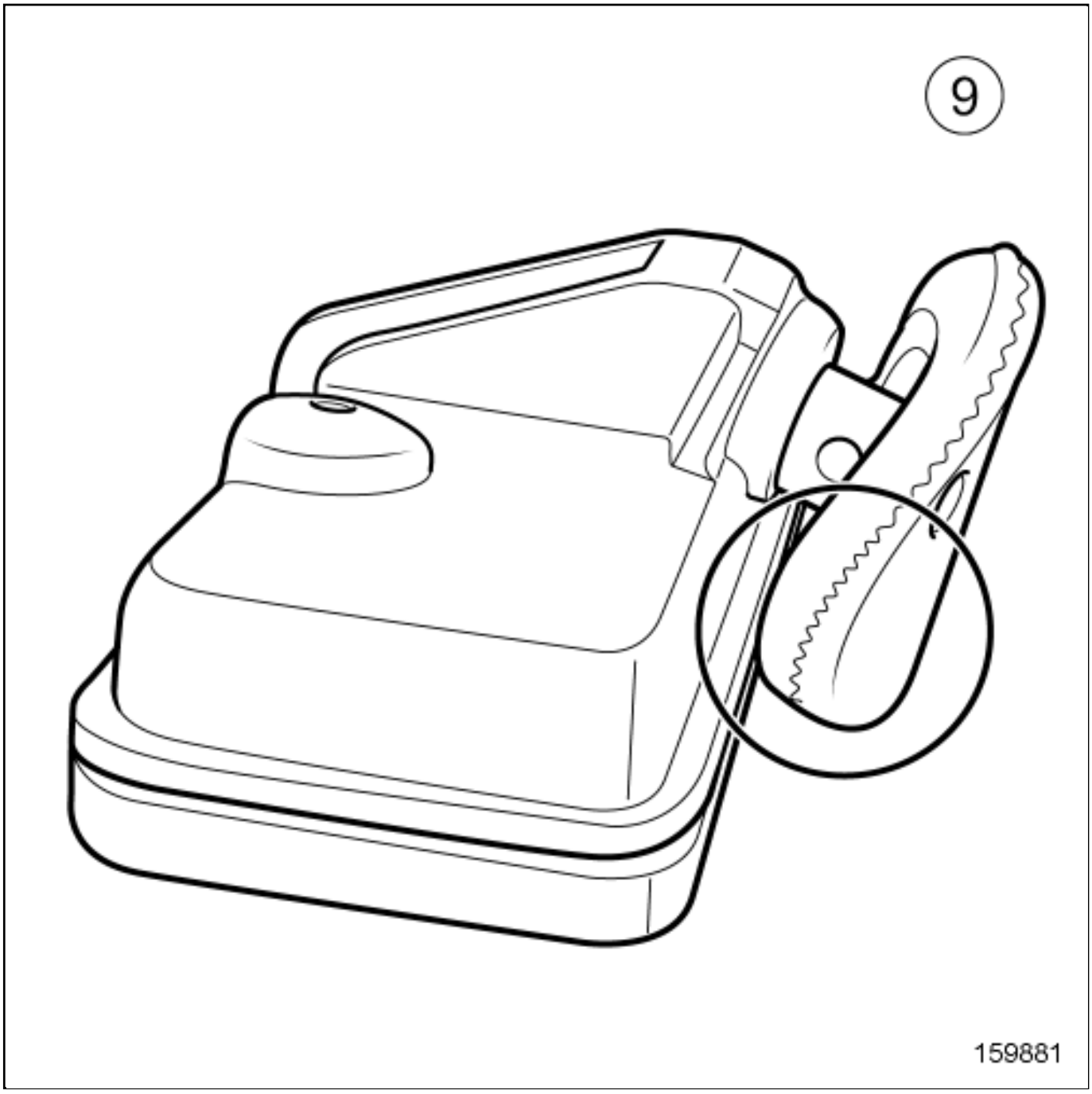
Position the pressure sensor so you can see the mounting bolt from above.



- Make sure that the sensor is correctly positioned on the wheel rim:
  - correctly fitted(7) ,
  - incorrectly fitted(8) .

Note:

There is no contact between the pressure sensor and the wheel rim.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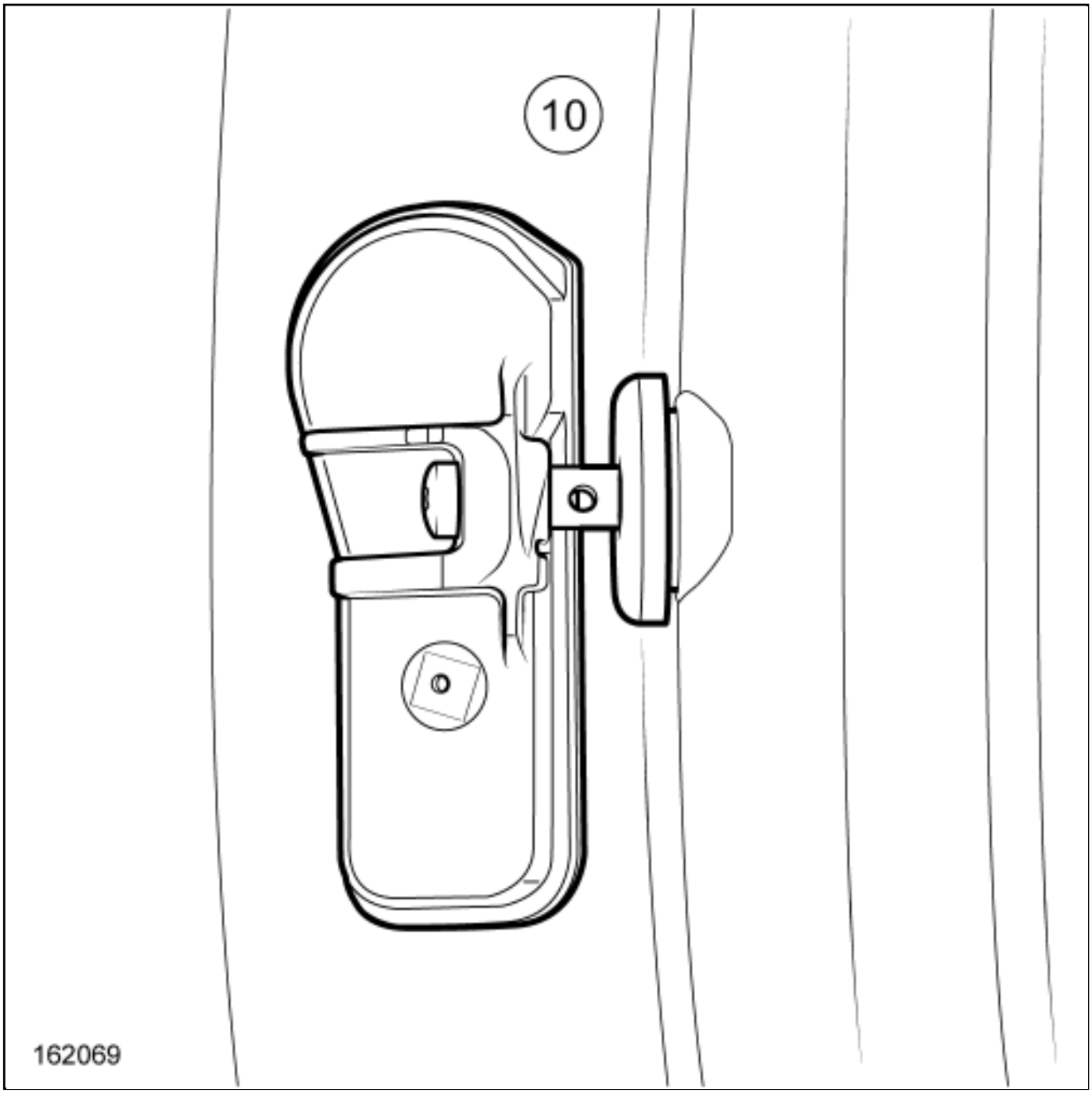


Make sure that the sensor is correctly positioned on the wheel rim:

- incorrectly fitted(9) ,
- correctly fitted(10) .

Check that the cup is completely pressed around the wheel hole.

Refit the pressure sensor bolt.

Torque tighten the pressure sensor bolt1.4 N.m .

3. FINAL OPERATION

Proceed in the reverse order to removal.

1- WHEN REPLACING THE PRESSURE SENSOR

Adjust the tyres to the recommended pressure(see **Tyre pressure: Identification**) .

Apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the after repair procedure:

"UCH"

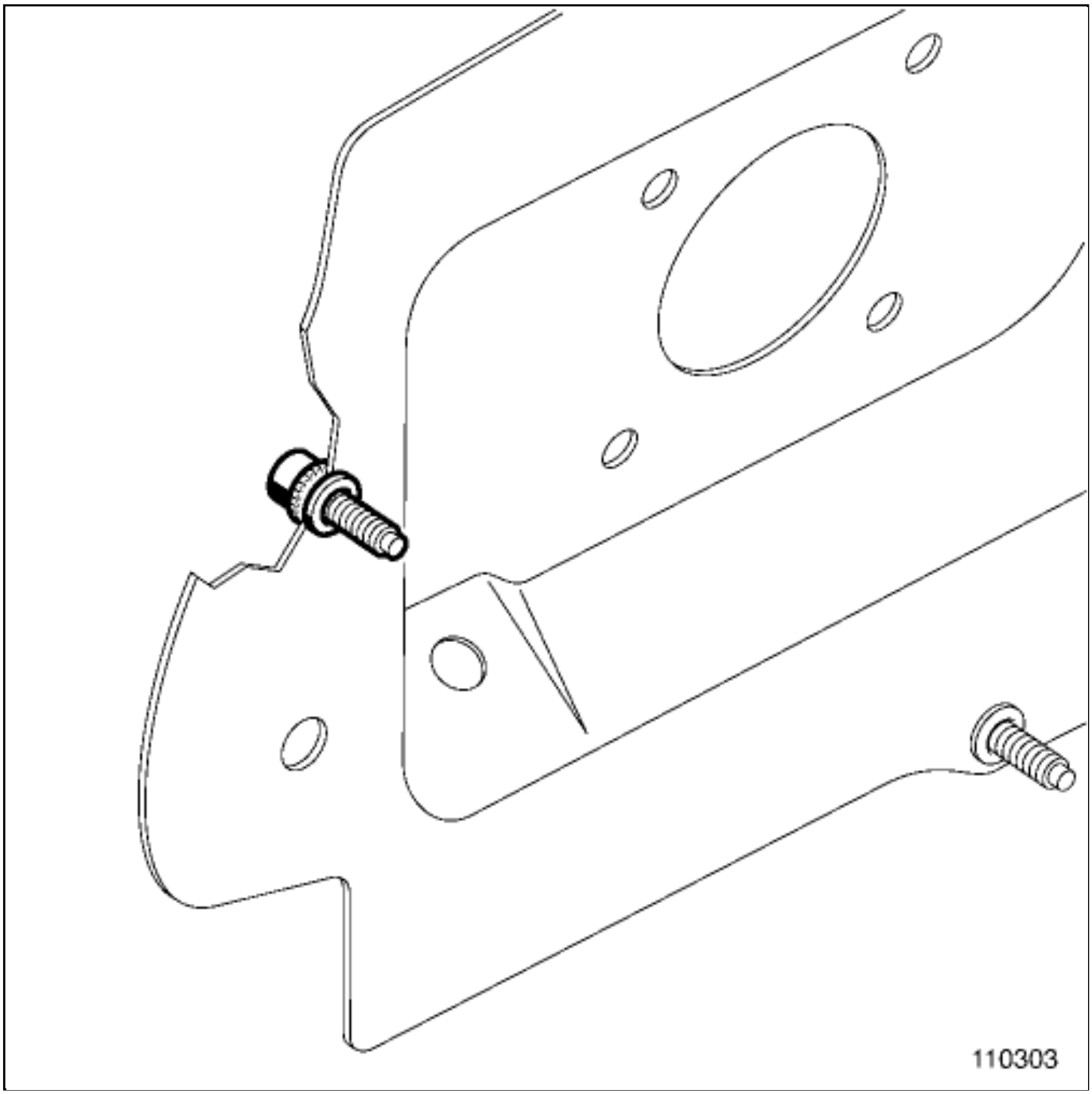
-Component affected by the after repair procedure:

"Pressure sensor"

PRODUCTS AND EQUIPMENT FOR BOLTED ASSEMBLY

1. NUTS AND STUDS TO BE CRIMPED

Use when a thread on a bodywork component is damaged or when fitted on a new part.



- Advantages:
  - Fitting before or after painting.

- Disadvantages:
  - The support has to be drilled.

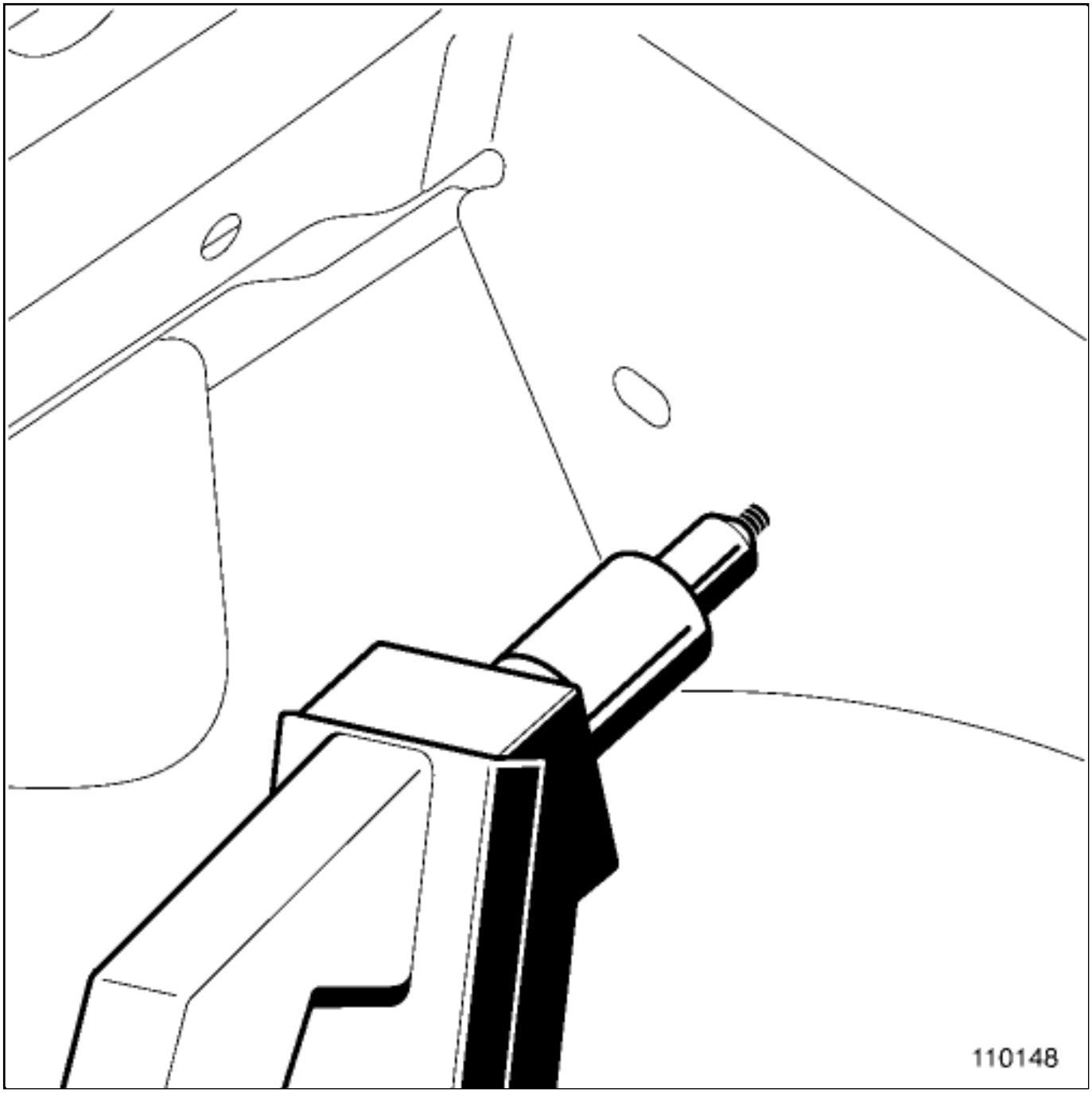
- For nuts, M10thread maximum.

Operator protection:

- obligatory hand protection,
- obligatory eye protection.

2. NUTS AND STUDS TO BE WELDED

Use for welding studs on new components or the vehicle structure.



Advantages:

- Allows fitting on all steel panel supports.

Disadvantages:

- The support has to be stripped.
- Operation to be carried out before painting.

Operator protection:

- obligatory hand protection,
- obligatory eye protection.

3. STUDS FOR RIVETING

Use when a thread on a bodywork component is damaged or when fitted on a new part.

Advantages:

- Fitting before or after painting.

Disadvantages:

- The support has to be drilled.
- Only for non-coated threads.

Operator protection:

- obligatory hand protection,
- obligatory eye protection.

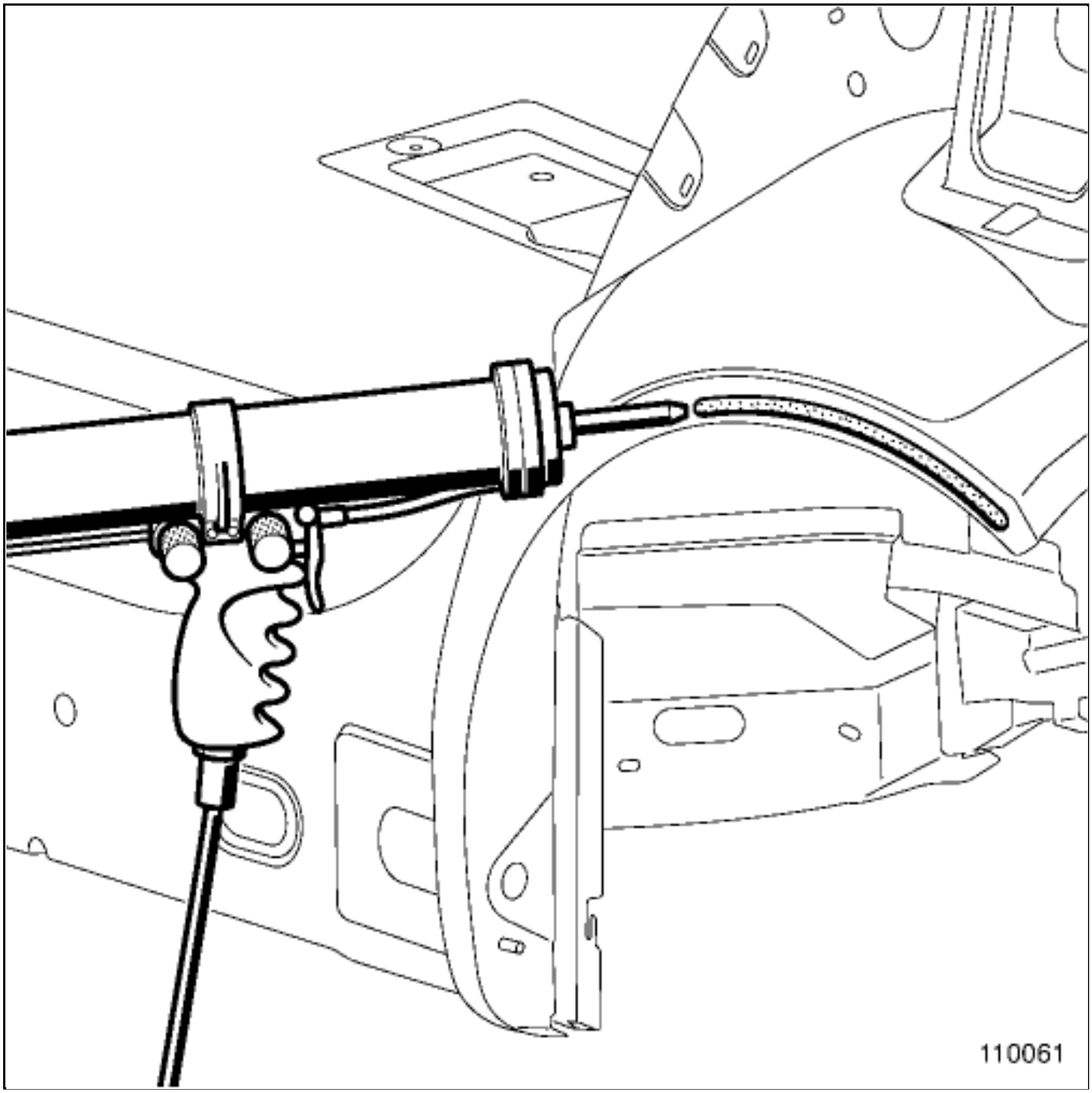
PRODUCTS AND EQUIPMENT FOR BONDED ASSEMBLY

1. RIGID GLUING

1- STANDARD RIGID ADHESIVE

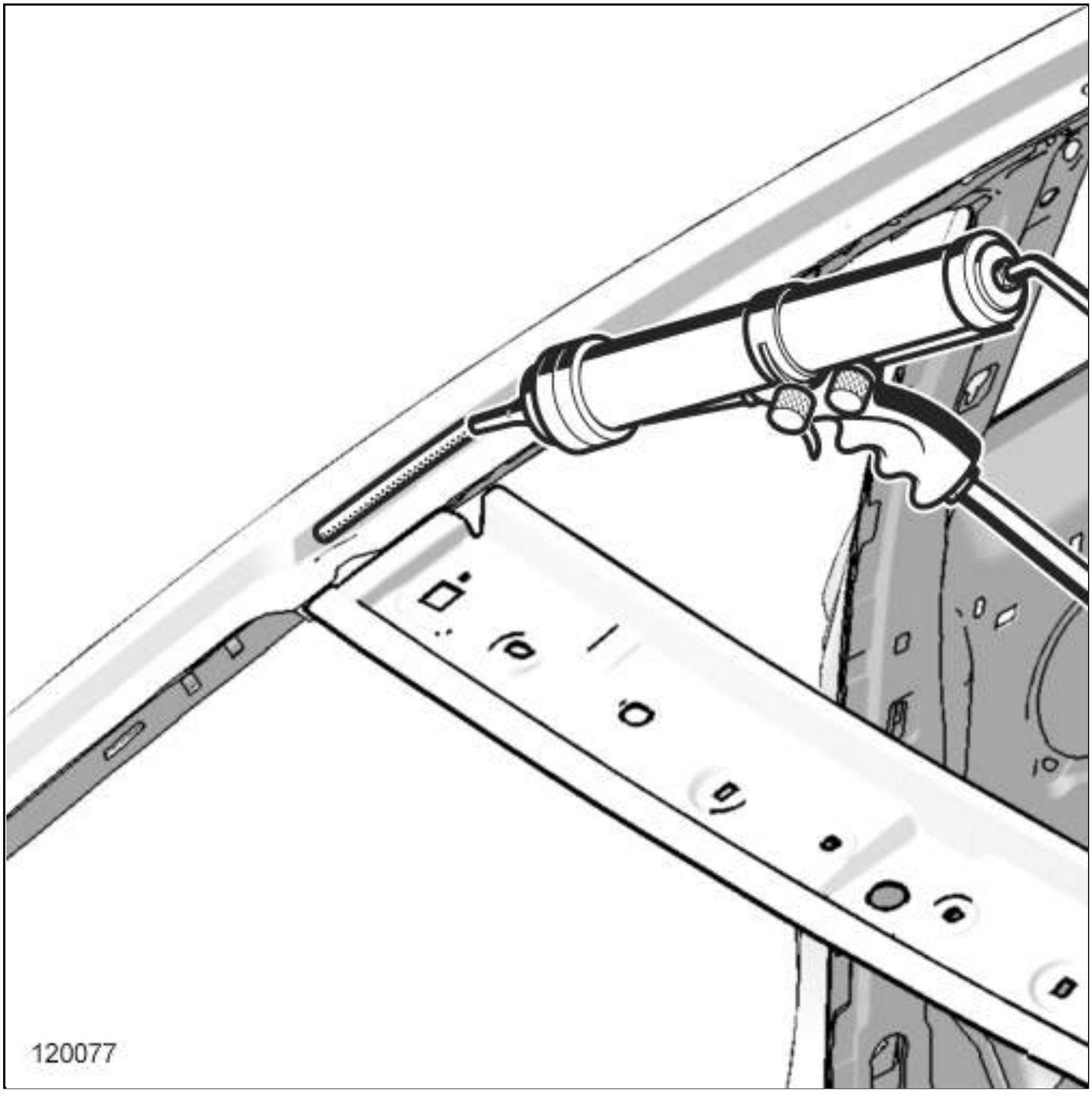
Used to bond components to the structure.

Use also for crimping a door panel or wing.



2- HIGH PERFORMANCE RIGID ADHESIVE

Used for bonding a roof in place of the laser weld.



Advantages:

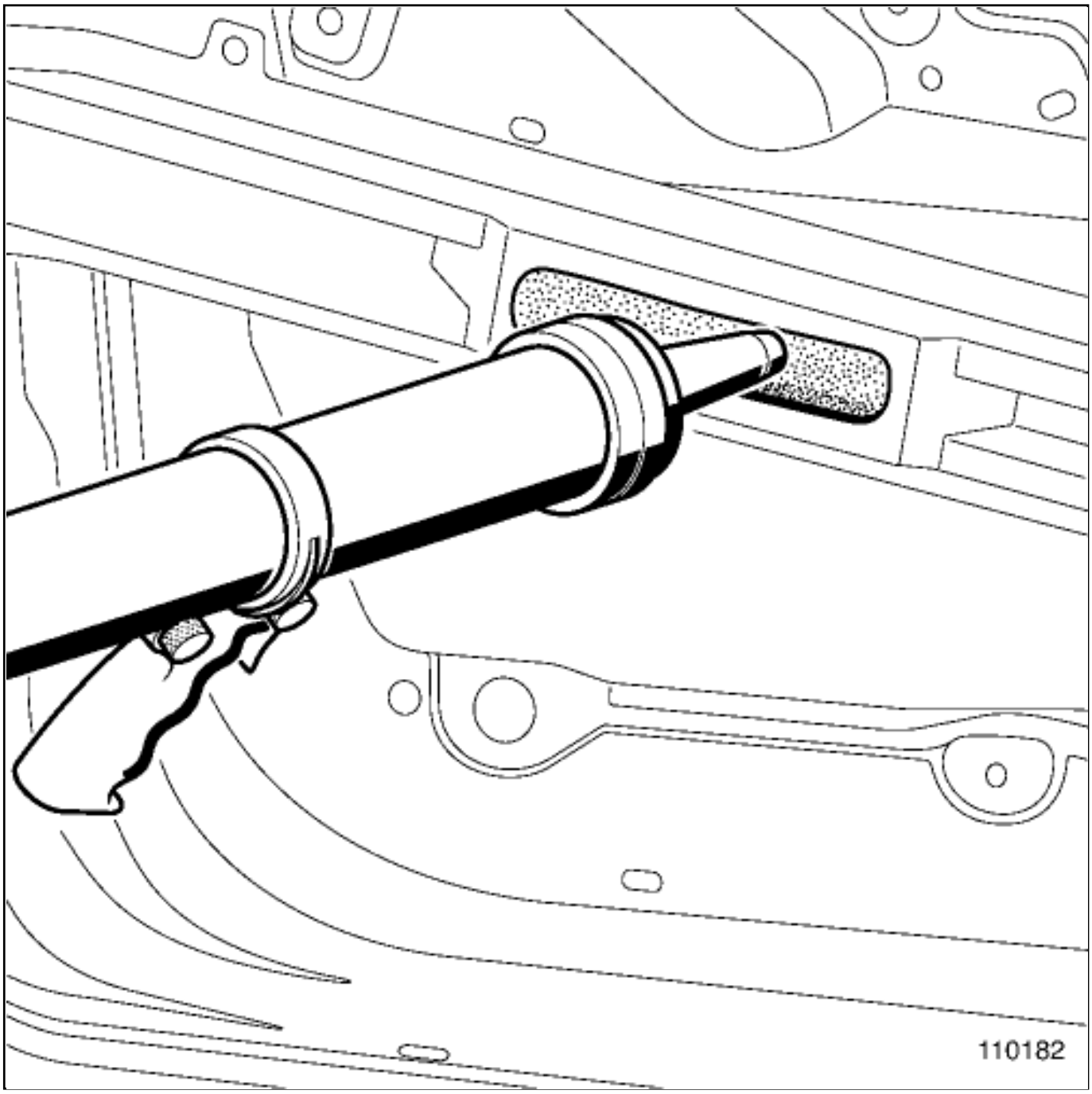
- Rigid assembly and good sealing.
- Rapid drying.
- Can be applied on an untreated sheet.

Disadvantage:

- The mating surface must be clean, or it will become unstuck in time.

2. FLEXIBLE ADHESIVE

Use for positioning a part in place in relation to the structure, the adhesive serves as a shock absorber.



Advantages:

- Flexible assembly and good sealing.
- Rapid drying.

Disadvantage:

- The mating surface must be prepared, or it will become unstuck in time.

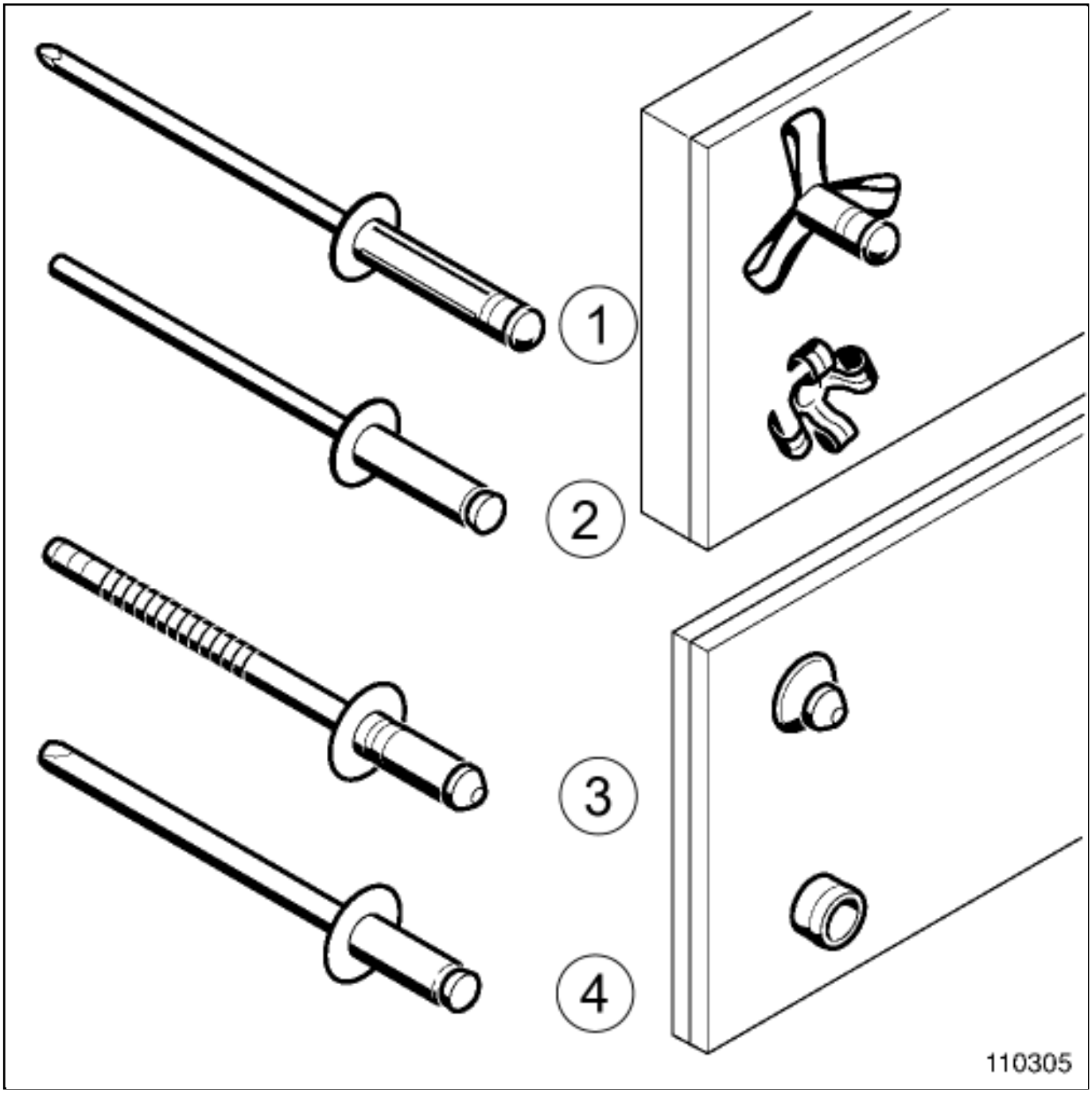
XSL version : 3.02 du 22/07/11

PRODUCTS AND EQUIPMENT FOR RIVETED ASSEMBLY

1. VARIOUS RIVETS USED FOR REPAIRS

1- CHOICE OF TYPE OF RIVET

The choice of the type of rivet depends on the material and the thickness of components to be assembled, and the mechanical properties desired for the assembly.



(1) This aluminium expansion rivet of ∅ 4 mmis used for fixing fragile components such as plastics or plastic panels; it is fitted with a standard riveting gun.

(2) This flanged rivet of ∅ 4 mmis used for fixing fragile components such as plastics or plastic sheets; it is fitted with a standard riveting gun.

(3) This watertight rivet of ∅ 4.8 mmor ∅ 6.4 mmis used for assembling components, and is equivalent to a weld (only for a panel width of < 1 mm); it is fitted using a pneumatic riveting gun or a "two-handed" riveting gun.

(4) This aluminium rivet/steel rod of ∅ 4.8 mmor ∅ 6.4 mmis used for assembling aluminium components, and is fitted with a pneumatic riveting gun or a "2-handed" riveting gun.

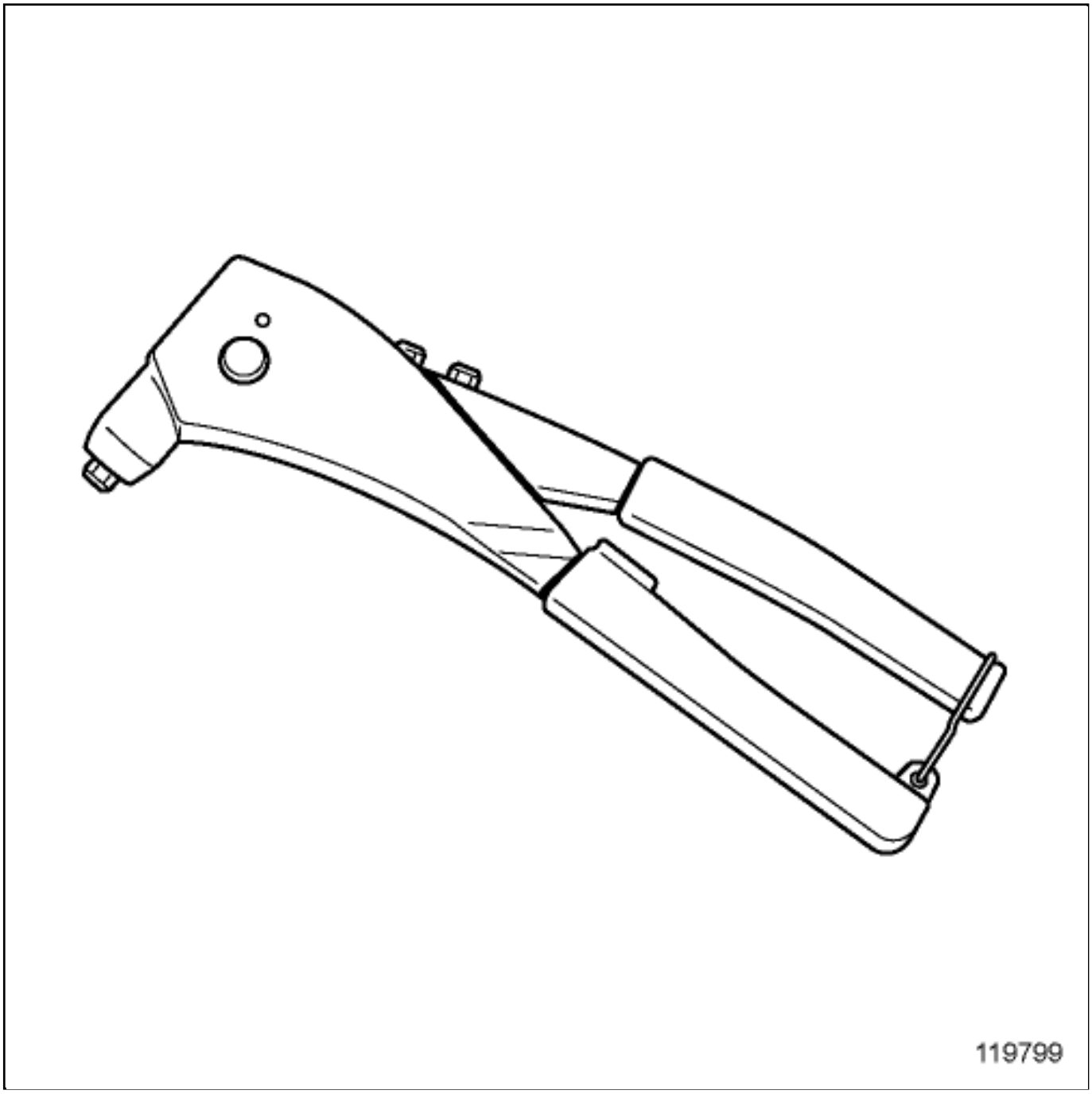
2- DRILLING HOLE DIAMETER

For rivet types(3) and (4) refer to the table below.

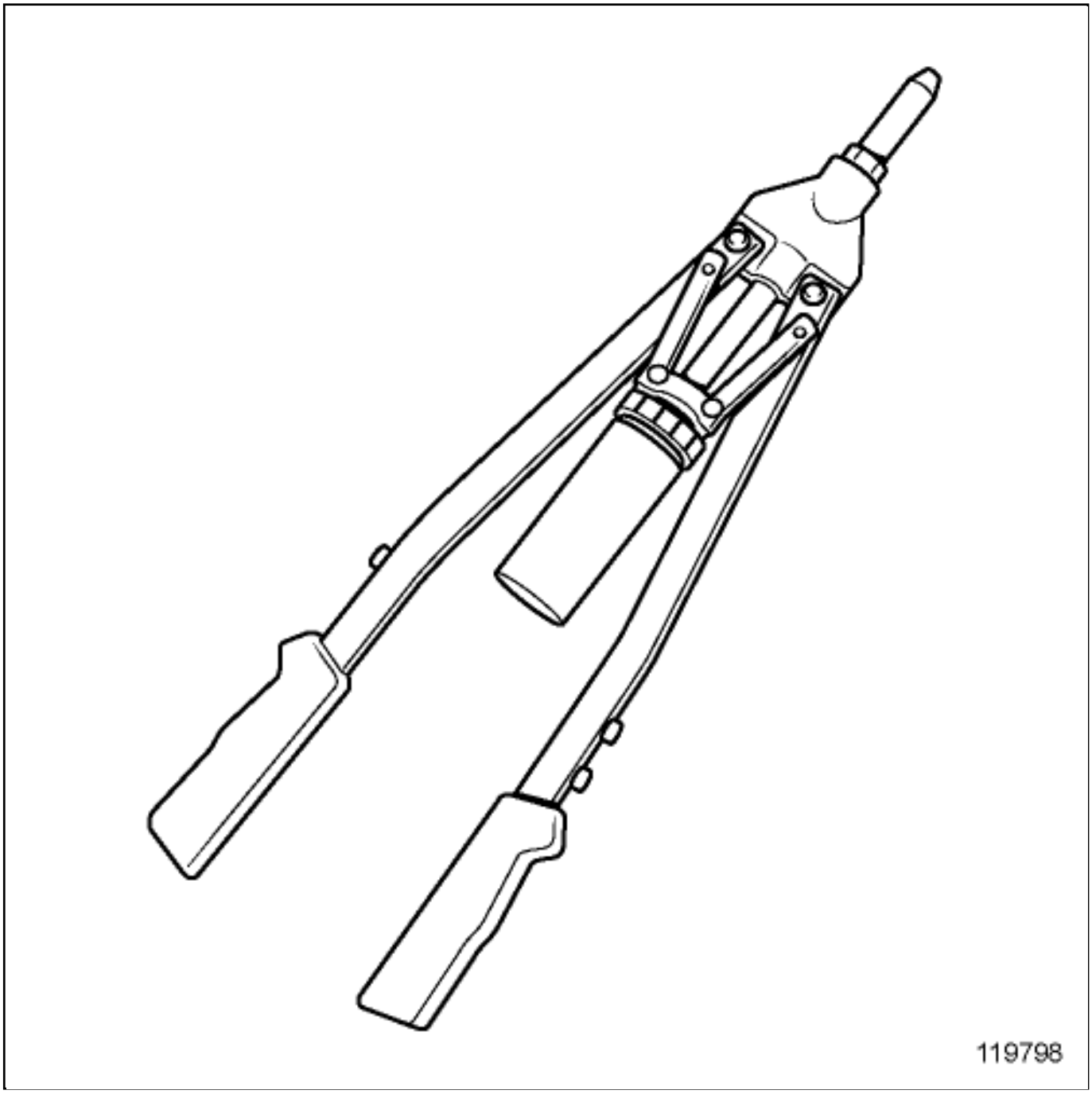
∅ rivet (mm)	Thickness when crimped (mm)	Shaft length (mm)	∅ drilling hole
4 (standard riveting gun)	0.5 - 3.0	6	4.1 to 4.5
	2.0 - 5.0	8	
	4.0 - 6.5	10	
	6.5 - 8.5	12	
4.8 ("2-handed" riveting gun)	0.5 - 2.5	6	4.9 to 5.1
	1.0 - 4.5	8	
	3.0 - 6.0	10	
	4.5 - 8.0	12	
6.4 (pneumatic riveting gun)	0.5 - 6.0	12	6.6 to 7.7
	6.0 - 13.0	20	

3- TYPE OF RIVETING GUN

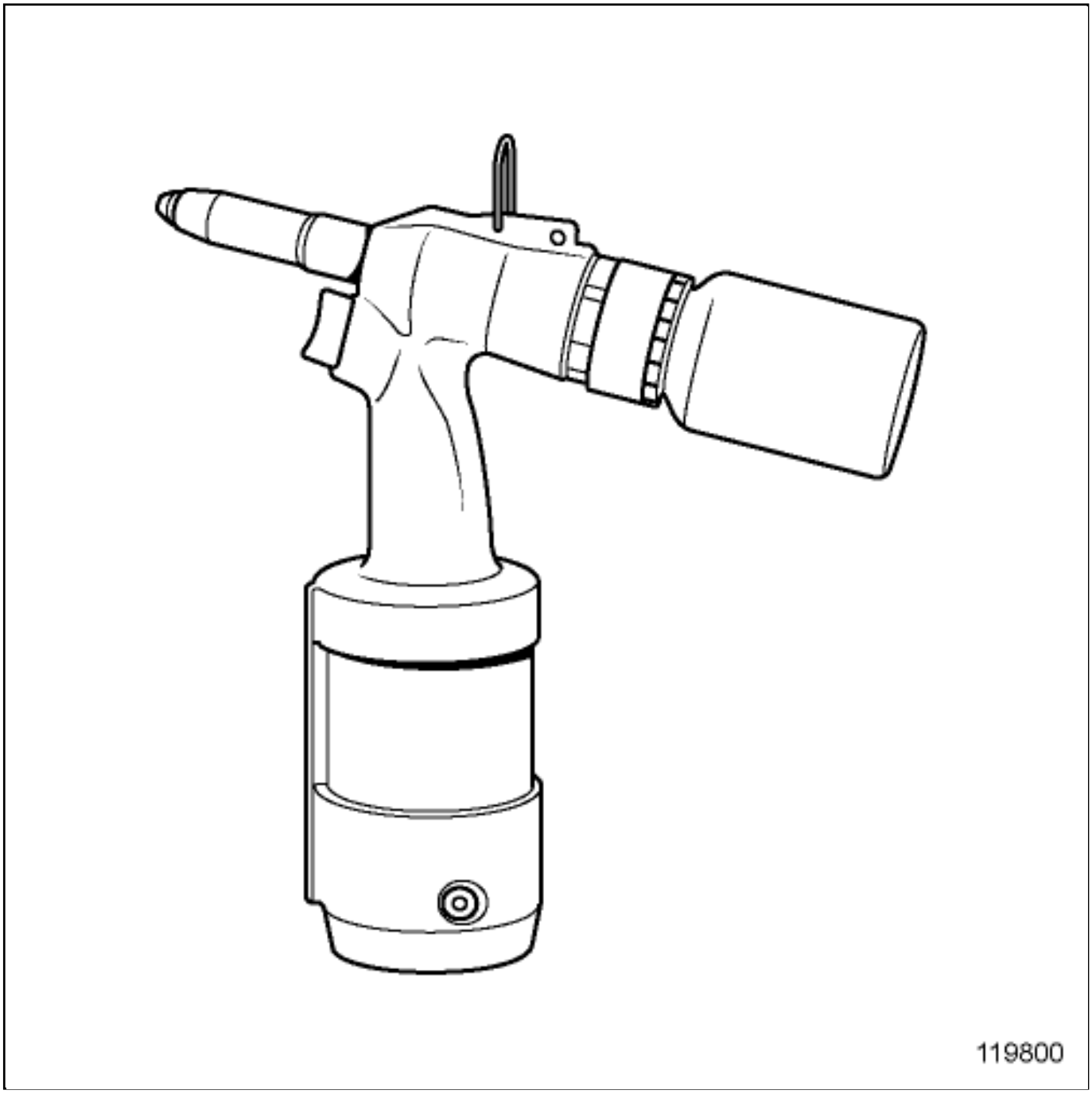
STANDARD RIVETING GUN



"2-HANDED" RIVETING GUN



PNEUMATIC RIVETING GUN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PRODUCTS FOR PLASTIC MATERIAL BODYWORK COMPONENTS: DESCRIPTION

1. REPAIRING BY BONDING

Used to repair deep scratches, fractures, holes and mounting brackets.

- Use on thermoplasticand thermosettingmaterials:
  - Polypropylene (PP) ,
  - Polypropylene/polyethylene (PP / PE) ,
  - Polypropylene / EPDM (PP / EPDM),
  - POLYCARBONATE ,
  - ABS ,
  - ASA ,
  - Composite materials .

1- COMPOSITION OF THE PLASTIC ADHESIVE KIT:

- Plastic repair kit**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):
  - Cleaner,
  - Bi-component repair mastic,
  - Bonding primer,
  - Primer rubber application pad,
  - Self-mixing nozzles,
  - Reinforcing film.

2- PREPARING THE KIT:

Place the cartridges in the nozzle.

Extrude 20 mmof bead in order to obtain a homogenous mixture of the product before application.

3- GUN:

Plastic repair gunVehicle: Parts and consumables for the repair (04B, Consumables - Products).

2. WELDING REPAIR

Used to repair fractures, holes and mounting brackets.

Suited to repairing complex geometry areas.

- Use on thermoplasticmaterials:
  - Polypropylene (PP) ,
  - Polypropylene / Polyethylene (PP / PE),
  - Polypropylene / EPDM (PP / EPDM),
  - POLYCARBONATE ,
  - ABS ,
  - ASA ,
  - Noryl .

1- COMPOSITION OF THE PLASTIC WELD KIT:

- Welding repair kit**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):
  - Soldering iron,
  - rod,
  - 18/10 stainless steel mesh,
  - soldering iron support,
  - cooling,
  - brush (wooden handle).

3. EPOXY RESIN REPAIR

Used to repair scratches, cracks, openings and to do remplacement partiel of element

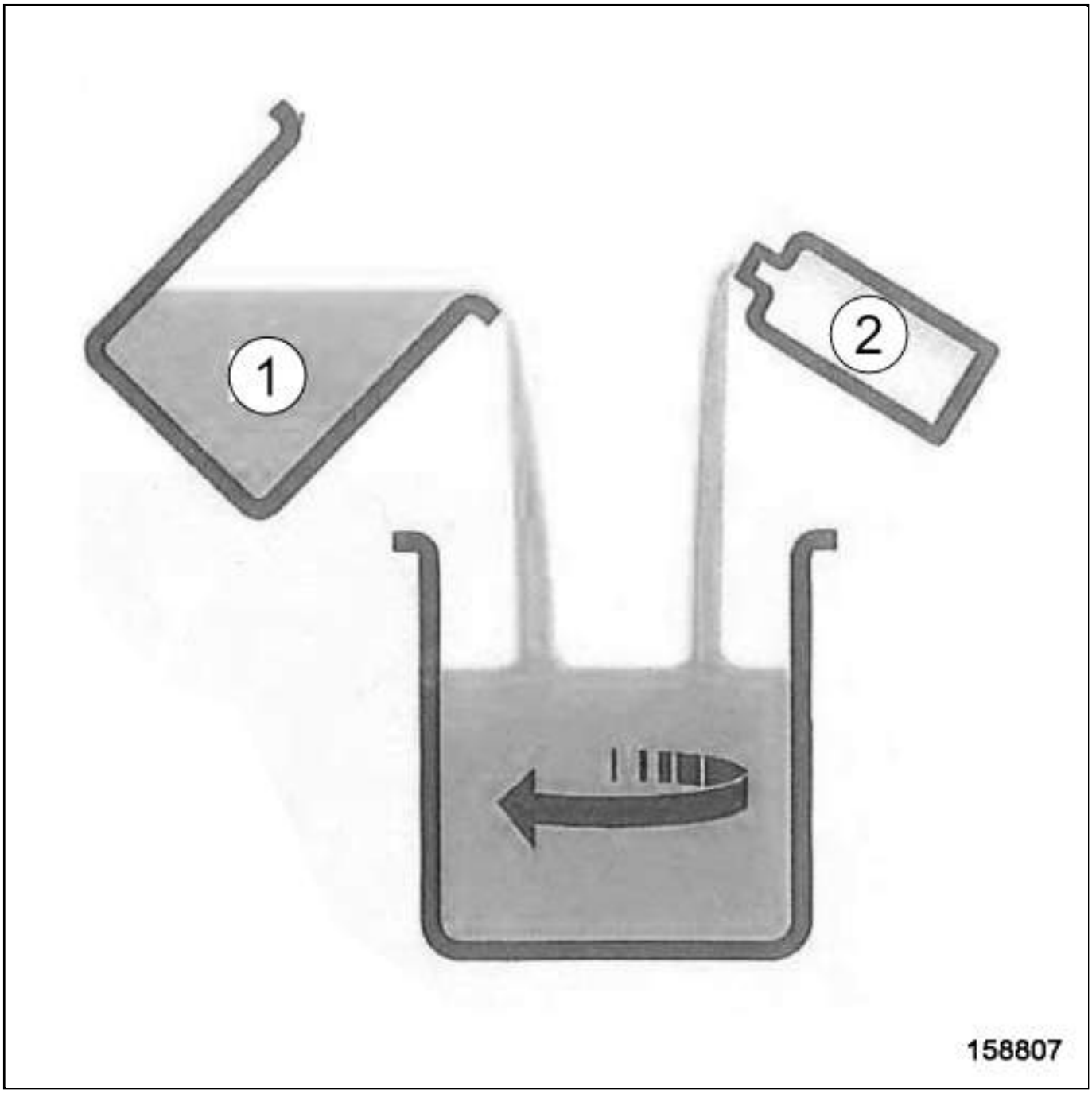
Used on thermosettingmaterials

Transfert Molding Resine(RTM)

1- CONTENT OF RESIN EPOXY KIT

- Resin epoxy kit**Vehicle: Precautions for the repair** :
  - Resin
  - Hardnener
  - Glass cloth
  - Glass mat
  - Short fibres

2- KIT PREPARATION



A resin pot(1) (166g) for 1 bottle of hardner.

If necessary add shots fibres (50% maxi).

The mixture has a 15 to 20 minat 20° C.

Don't use under 20° C.

4. FINISHING MASTIC

Used to repair slight scratches and to ensure the finish of bonding/weld repairs**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- Polypropylene (PP) ,
- Polypropylene/polyethylene (PP / PE) ,
- Polypropylene / EPDM (PP / EPDM),
- POLYCARBONATE ,
- ABS ,
- ASA ,
- Noryl ,
- Composite materials .

PRODUCTS FOR PREPARING AND BONDING WINDOWS: DESCRIPTION

Note, one or more warnings are present in this procedure

Note:

Never mix the products when carrying out any adhesive bonding process.

You must only use products contained in the selected bonding kit.

The expiry date on the packaging of the bonding kit must be respected.

1. BONDING KIT

1- BASICPAC

ADHESIVE KIT(high modulus adhesive, Non-conducting**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- an additional cartridge + nozzle**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products),
- a 310 mlcartridge,
- a sachet of glass cleaner or activator including two wipes: one of which is wet and the other dry,
- a tube of primer,
- a pair of gloves,
- a preparation nozzle for the cartridge,
- an application nozzle for the cement bead.

2- S-P KIT

S-P KIT ADHESIVE KIT(high modulus adhesive, non-conducting**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- an additional cartridge of S-P KIT + nozzle**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products),
- a 310 mlcartridge,
- a sachet of glass cleaner or activator including two wipes: one of which is wet and the other dry,
- a 10 mltube of primer,
- a pair of gloves,
- a preparation nozzle for the cartridge,
- an application nozzle for the cement bead.

3- BIPAC EVOLUTION

BIPAC EVOLUTION ADHESIVE KIT(high modulus adhesive, non-conducting**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- two 225 mlcartridges: adhesive and accelerator,
- a mixer,
- a sachet of glass cleaner or activator including two wipes: one of which is wet and the other dry,
- a 10 mltube of primer (green and red marking),
- a pair of gloves,
- an application nozzle for the cement bead.

2. CLEANER

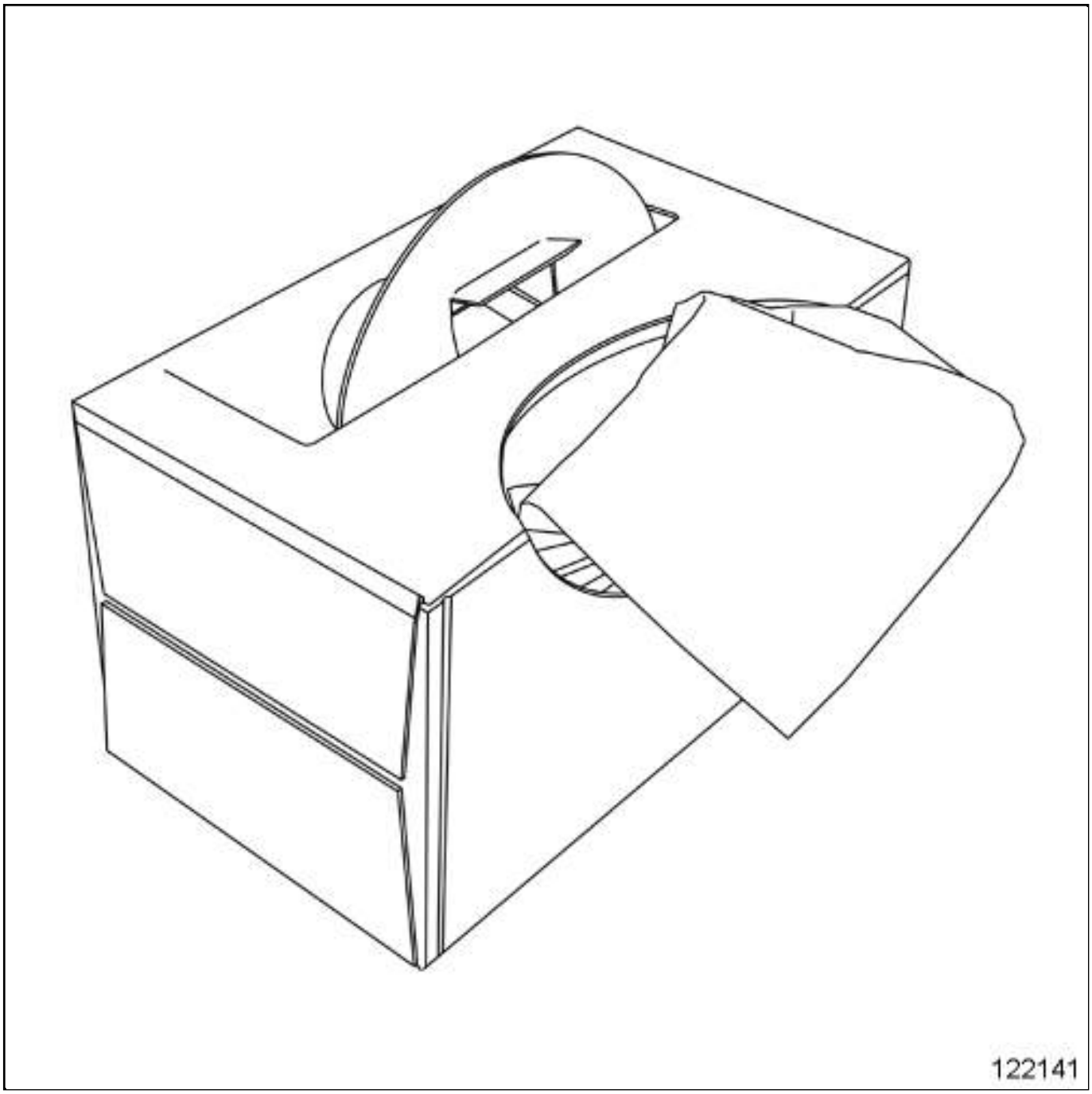
1- HEPTANE

Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Heptane is a very volatile solvent and allows optimal cleaning of the area surrounding the bond.

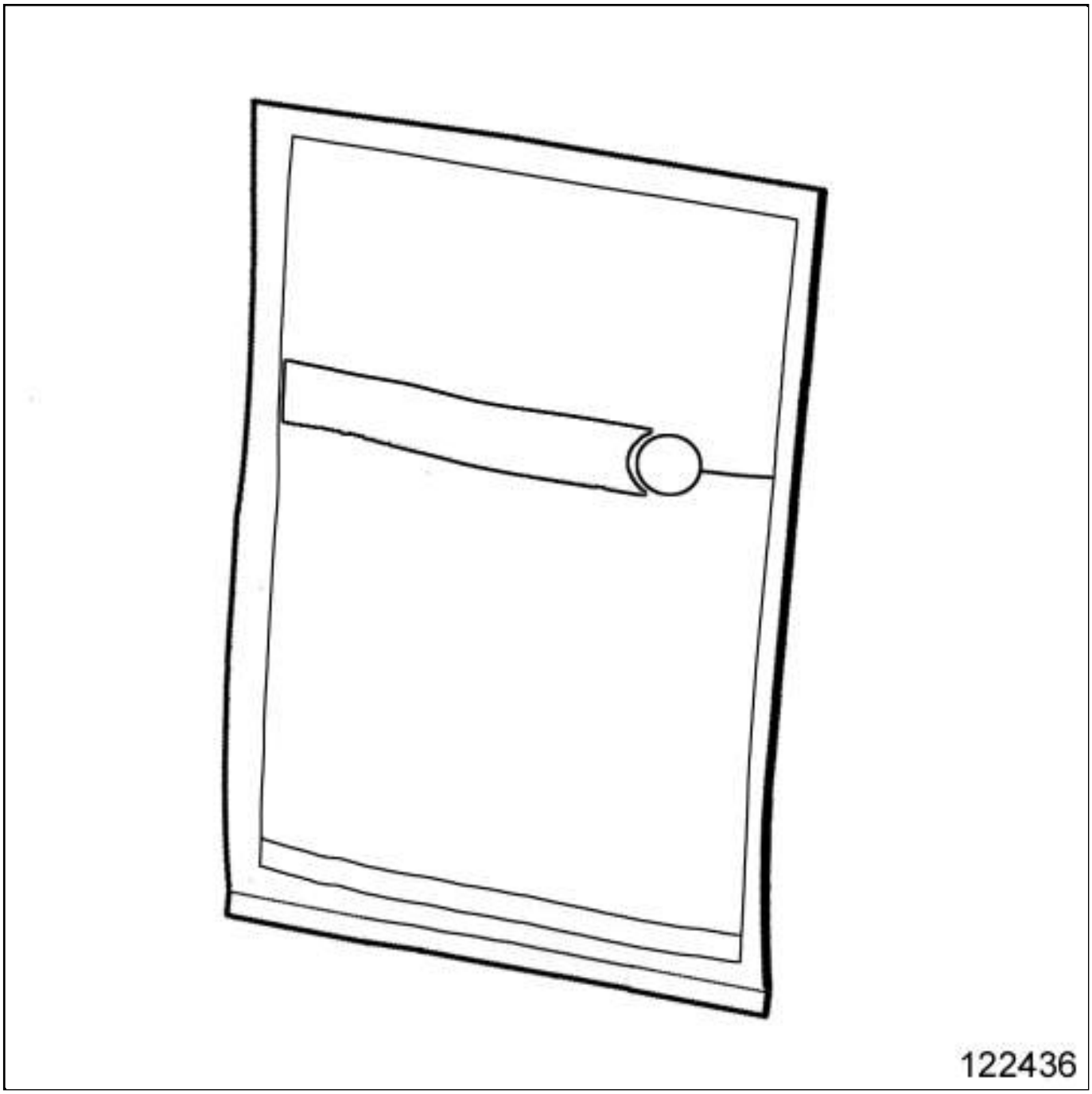
It evaporates quickly.

2- LINT-FREE CLOTH



Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

3- GLASS CLEANER OR ACTIVATOR



Most new windows from the Parts Department have already been primed when they are supplied.

This primed area shows the bonding path.

The glass cleaner or activator reactivates this primer and promotes adhesion.

Note:

It is essential to clean this product containing active ingredients with a dry wipe before applying the primer (green and red marking) contained in the bonding kit.

3. PRIMER

1- PRIMER (EXCEPT POLYCARBONATE)

It ensures that the cement bead adheres to different mountings.

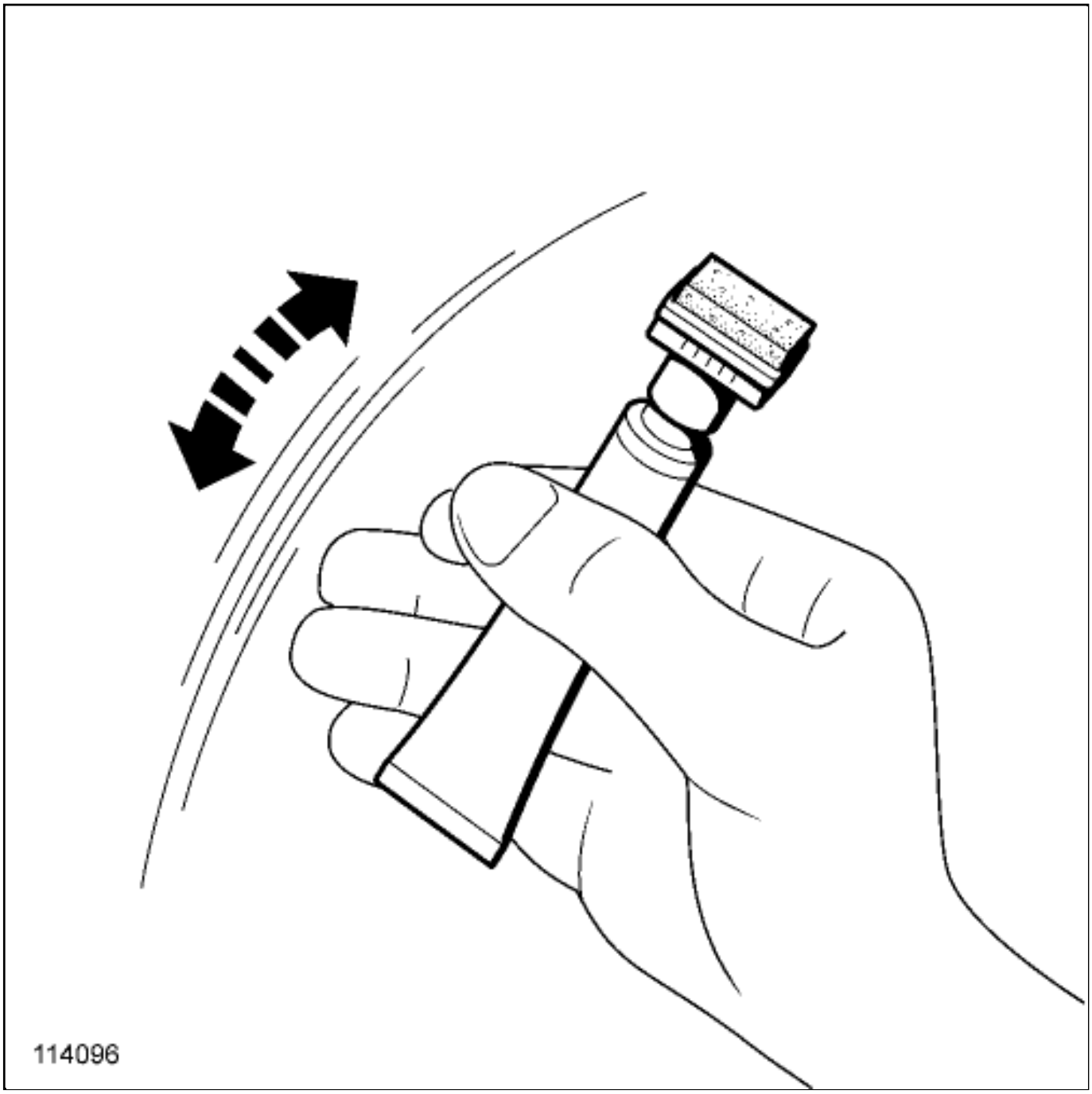
It also protects the cement bead from ultraviolet rays which can damage the molecular structure of the cement bead and reduce its resistance.

PRIMER (GREEN AND RED)

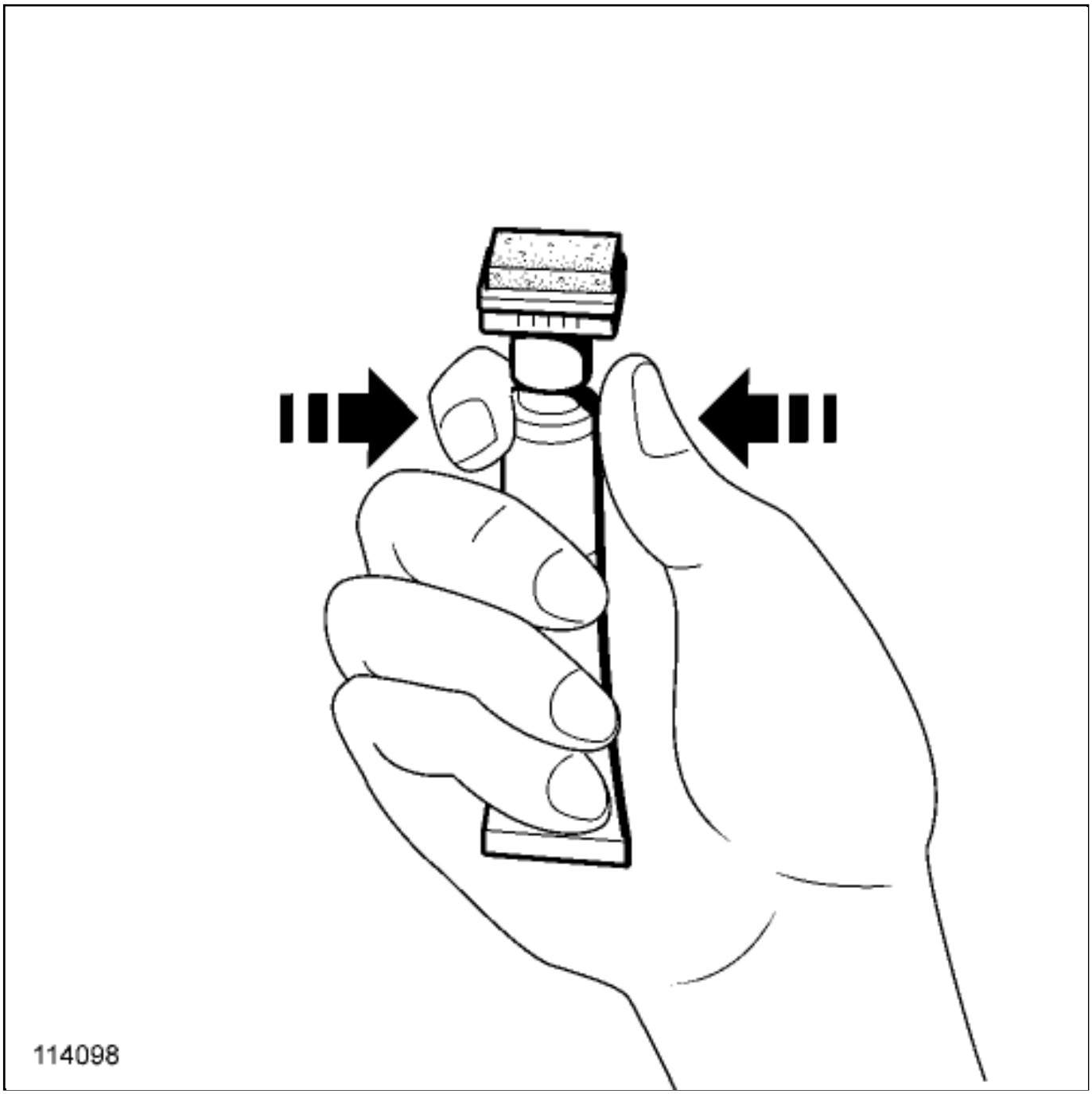
CAUTION

In order not to stain the windows, immediately clean any product which has spilt onto the area outside the bonding area.

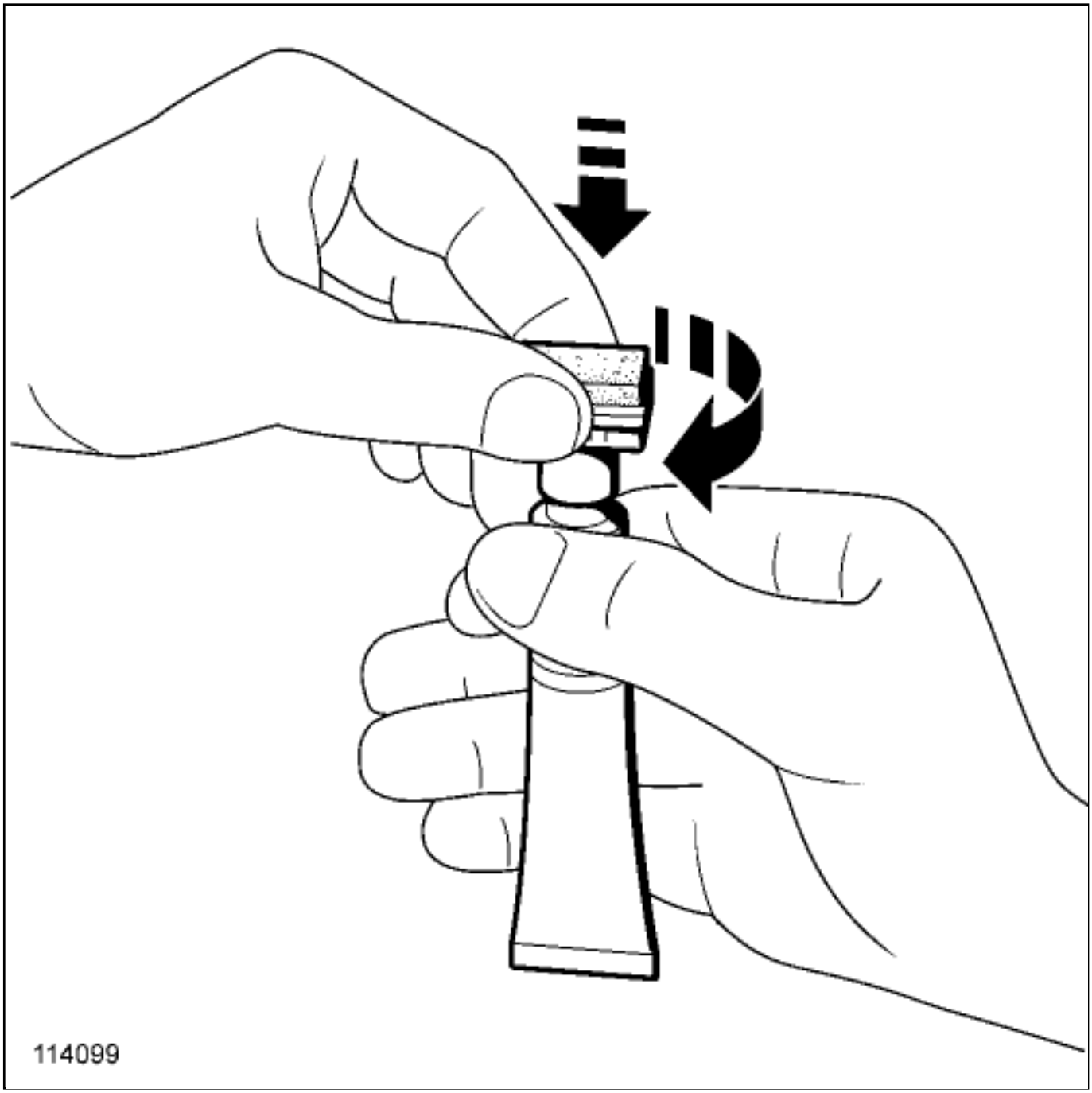
4. USING THE TUBE OF PRIMER



Shake the tube for approximately 1 minuteso that the product is uniform.



Hold the neck of the tube with the applicator pad facing upwards.



Screw the applicator pad on properly so that the tube is well sealed.

Soak the applicator pad before application.

CAUTION

In order not to stain the windows, immediately clean any product which has spilt onto the area outside the bonding area.

Never apply the cement bead onto wet primer.

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XSL version : 3.02 du 22/07/11

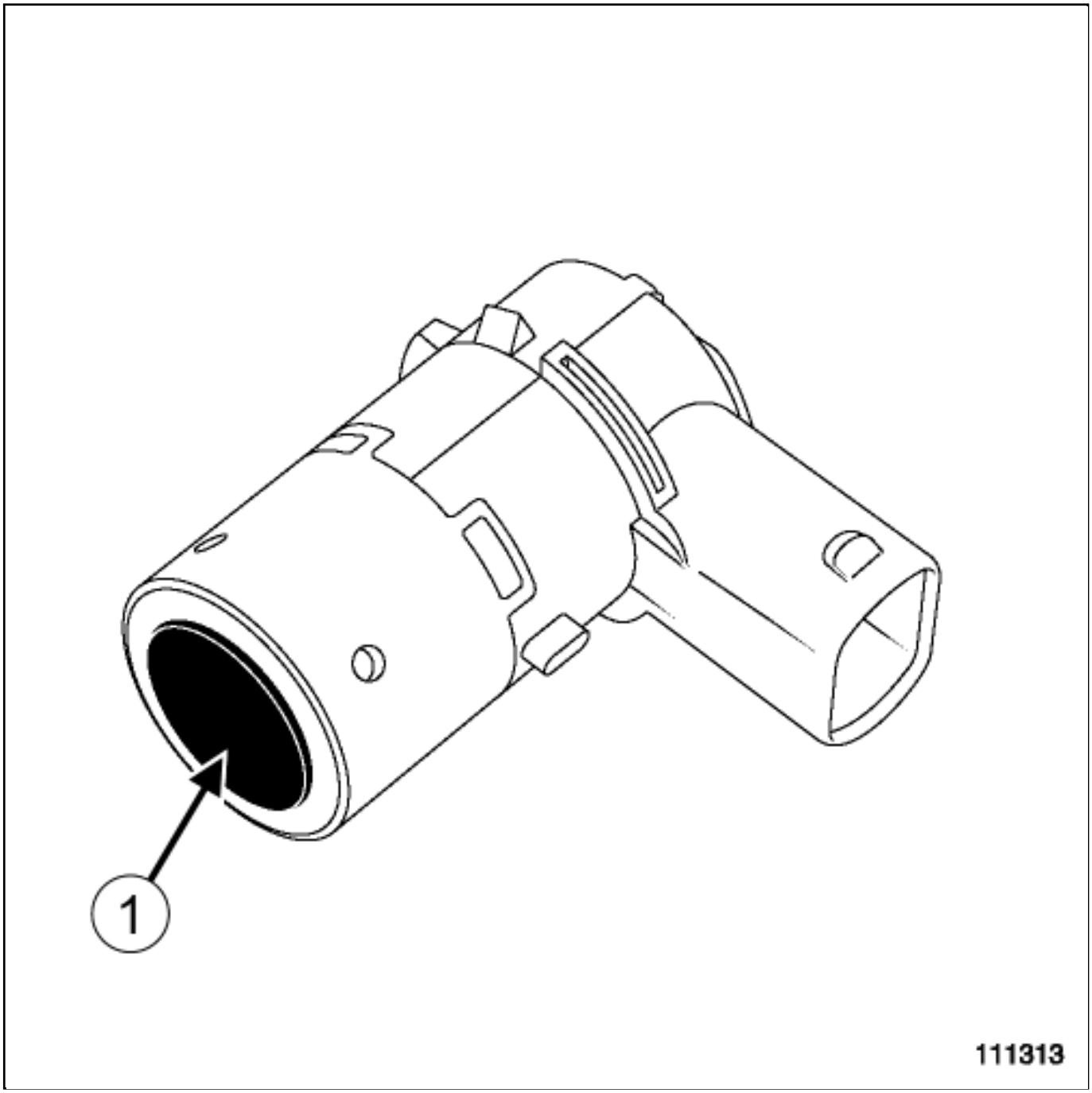
PROXIMITY SENSOR: PREPARATION AND PAINT RANGE

Note, one or more warnings are present in this procedure

CAUTION

The proximity sensors are fragile. Handle with care as the external part cannot withstand impacts.

When drying the bumper and/or proximity radars, the temperature must not exceed 60˚C .



The radar detects using a highly sensitive membrane(1) .

The sensitivity of the membrane may be affected by an unsuitable coating.

The radar will then detect false information or nothing at all.

1. PAINTING

Only proximity radars sold and prepared in the Parts Departmentcan be painted.

Paint the proximity radars and the bumper separately.

Put masking tape on the part of the proximity radar which must not be painted.

For proximity radars which are supplied unassembled, paint the proximity radar only and assemble the unit after drying.

Apply the product range for painting on polypropylene(see 95A, Paint application range for plastic, Polypropylene / polyethylene bodywork component: Preparation and paint range) .

If retouching the paintwork on the bumper, mask or remove the proximity radars.

The proximity radars must not be painted several times.

2. MALFUNCTION

Faults leading to proximity radar malfunctioning:

- excessive run or paint thickness on the membrane,
- run in the peripheral section of the membrane's neck,
- damage to the membrane,
- deformed bumper changing the alignment of the proximity radars.

RADIO: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

1- THE RADIO SYSTEM COMPRISES:

- a radio
- a radio aerial
- front speakers
- rear speakers
- a radio control satellite
- an "hands-free" microphone

2. LOCATION OF COMPONENTS

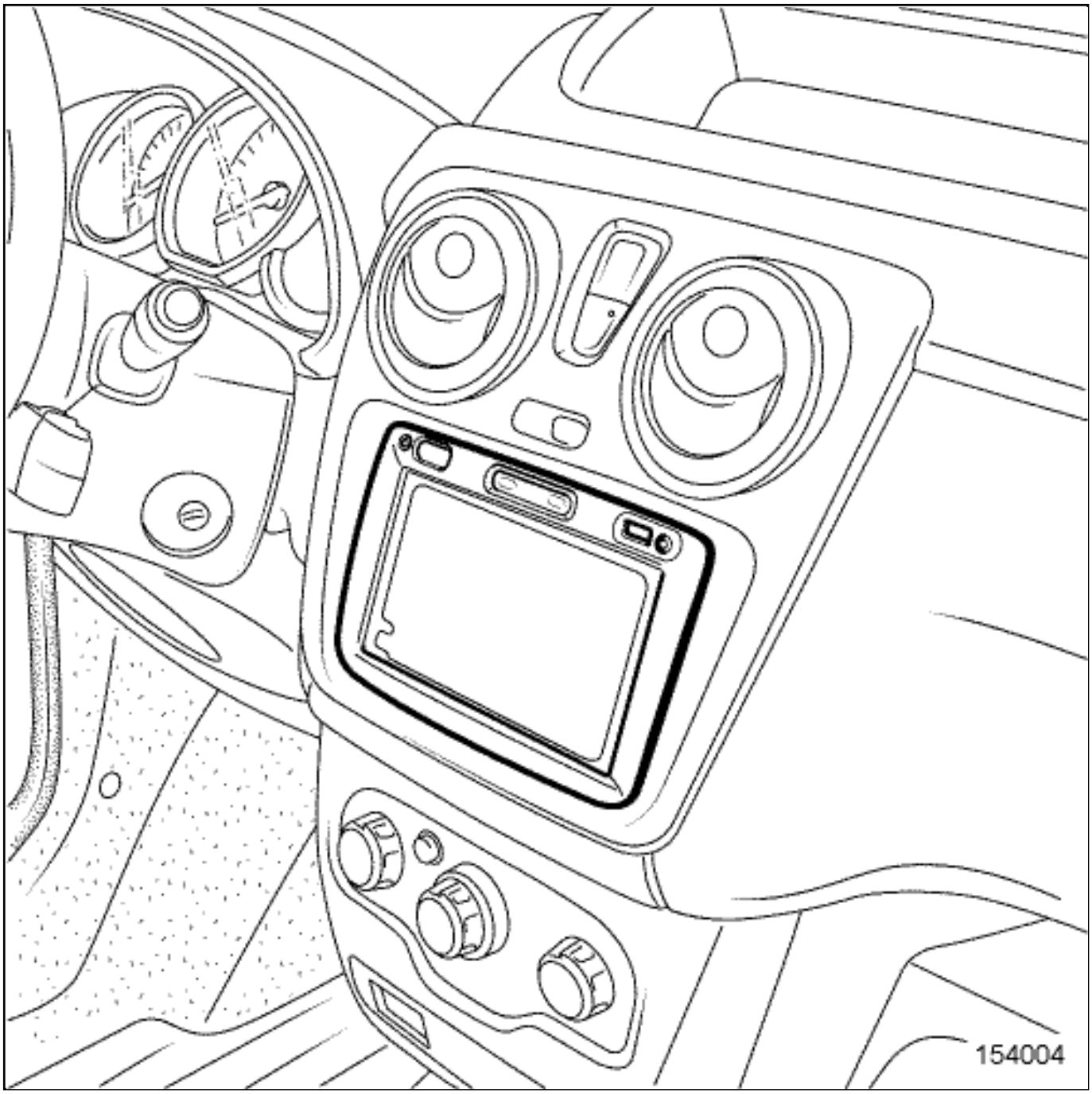
CAUTION

To prevent damaging the navigation system, wait 1 minuteafter switching off the + after ignition feed.

CAUTION

- To ensure correct operation:
  - do not pinch the aerial cable,
  - do not bend the aerial cable,
  - do not force the aerial cable when refitting.

1- RADIO



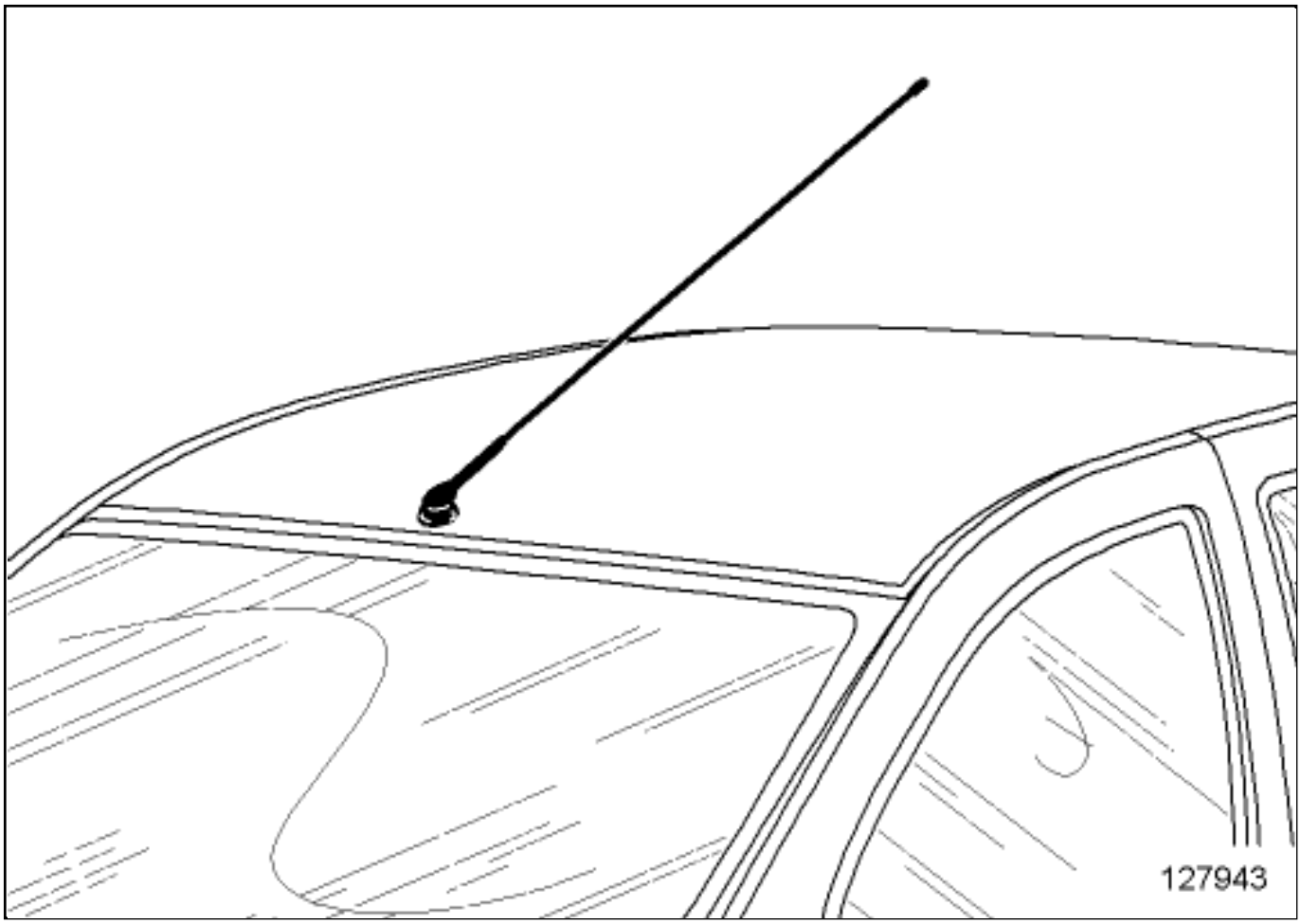
RADIO 45A(Radio 45A)

Apply the before / after repair procedure using the Diagnostic toolDiagnostic tool : Use :

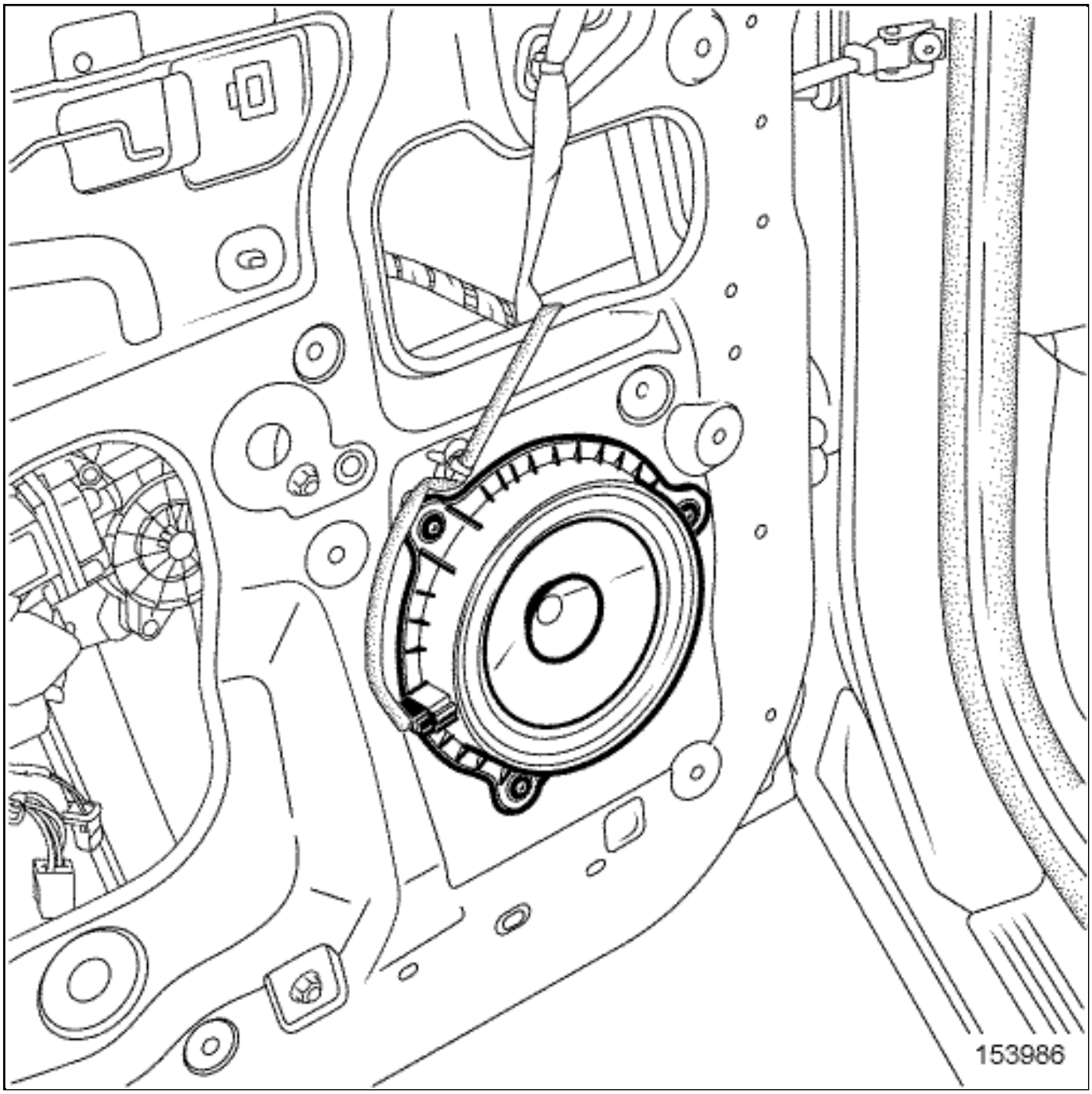
-Computer concerned by the Before / After repair procedure:

■"Radionavigation" .

2- RADIO AERIAL

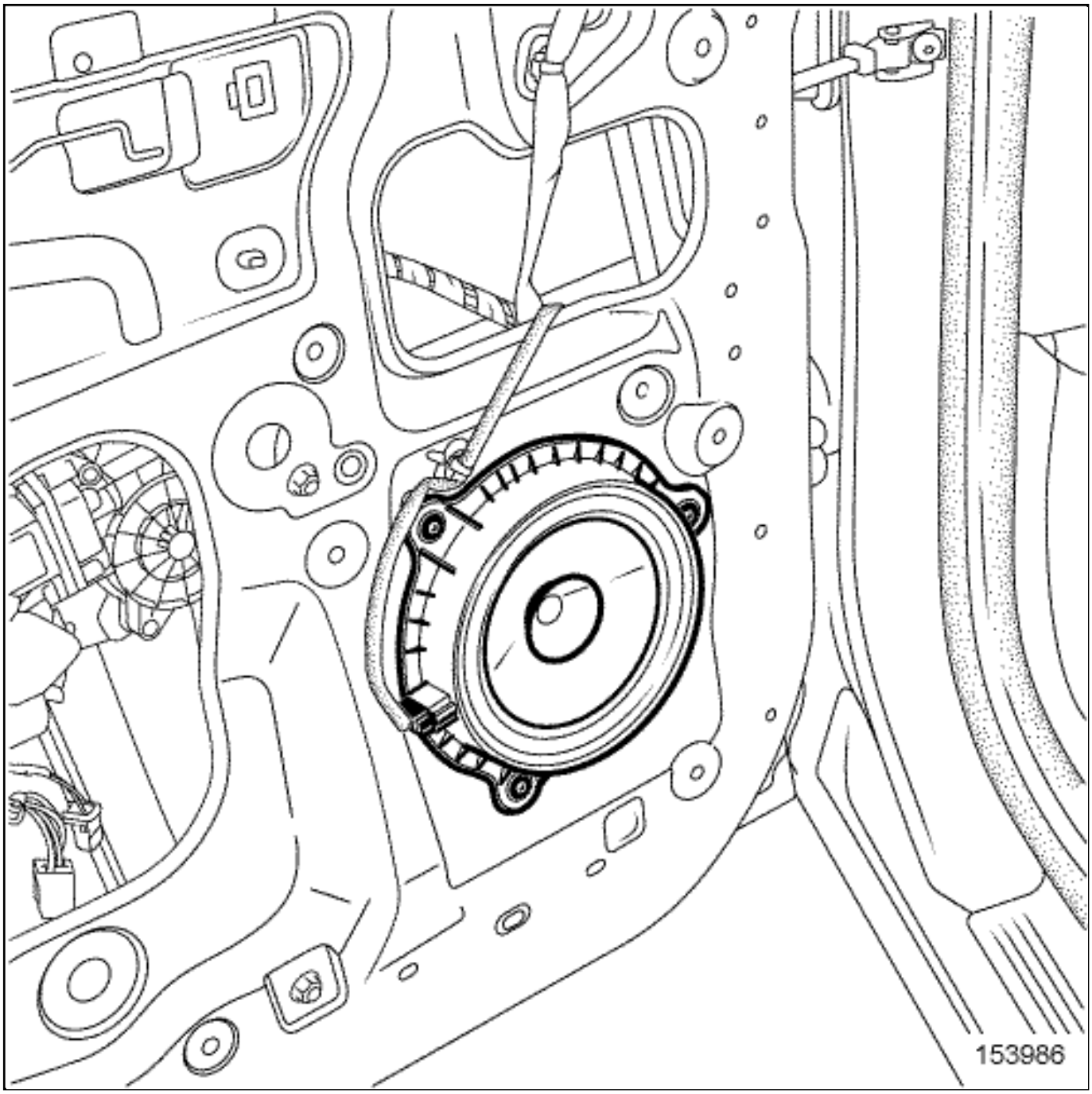


3- FRONT SPEAKERS



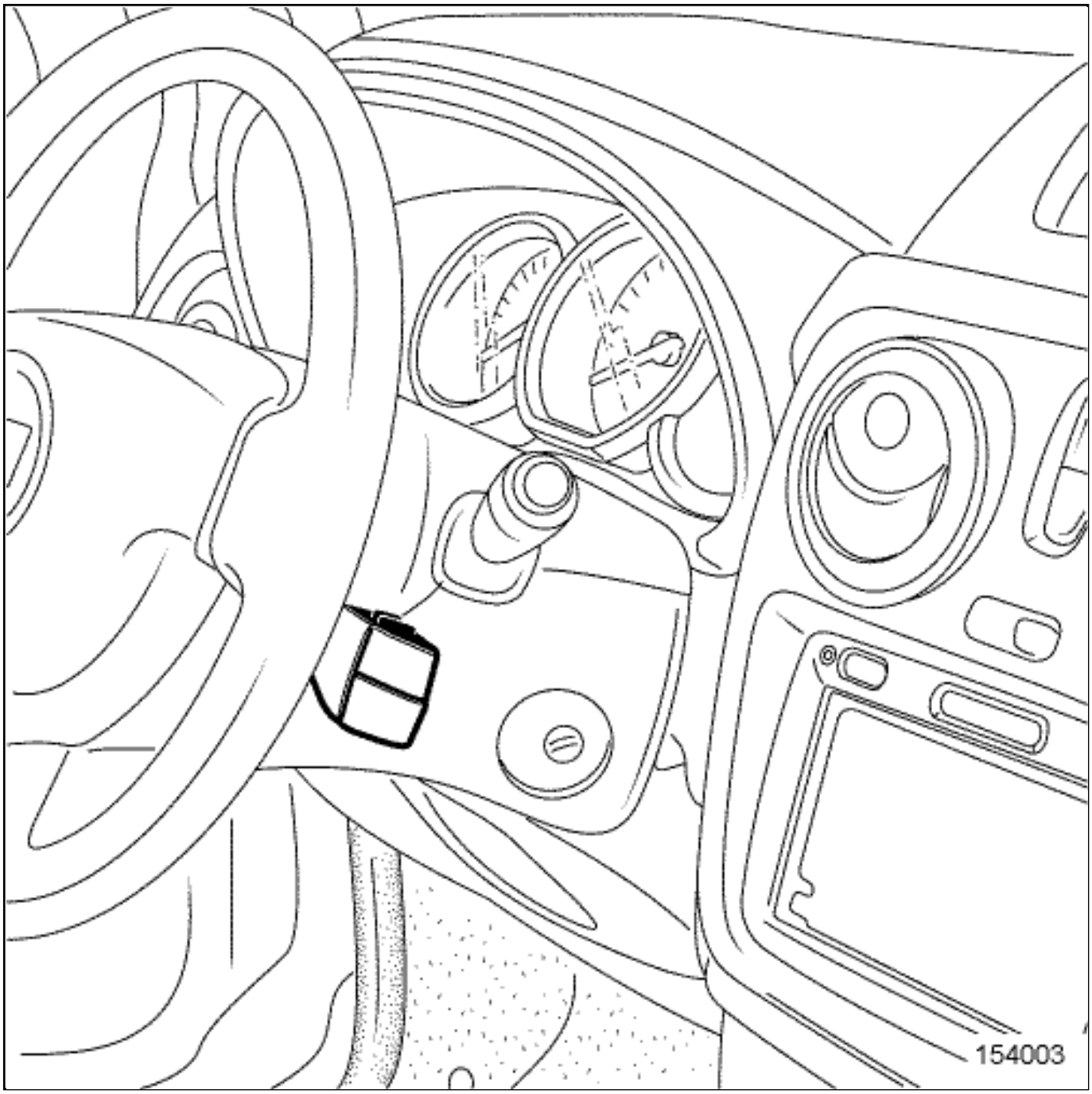
Front side opening element assembly on the passenger compartment side: Exploded view

4- REAR SPEAKERS

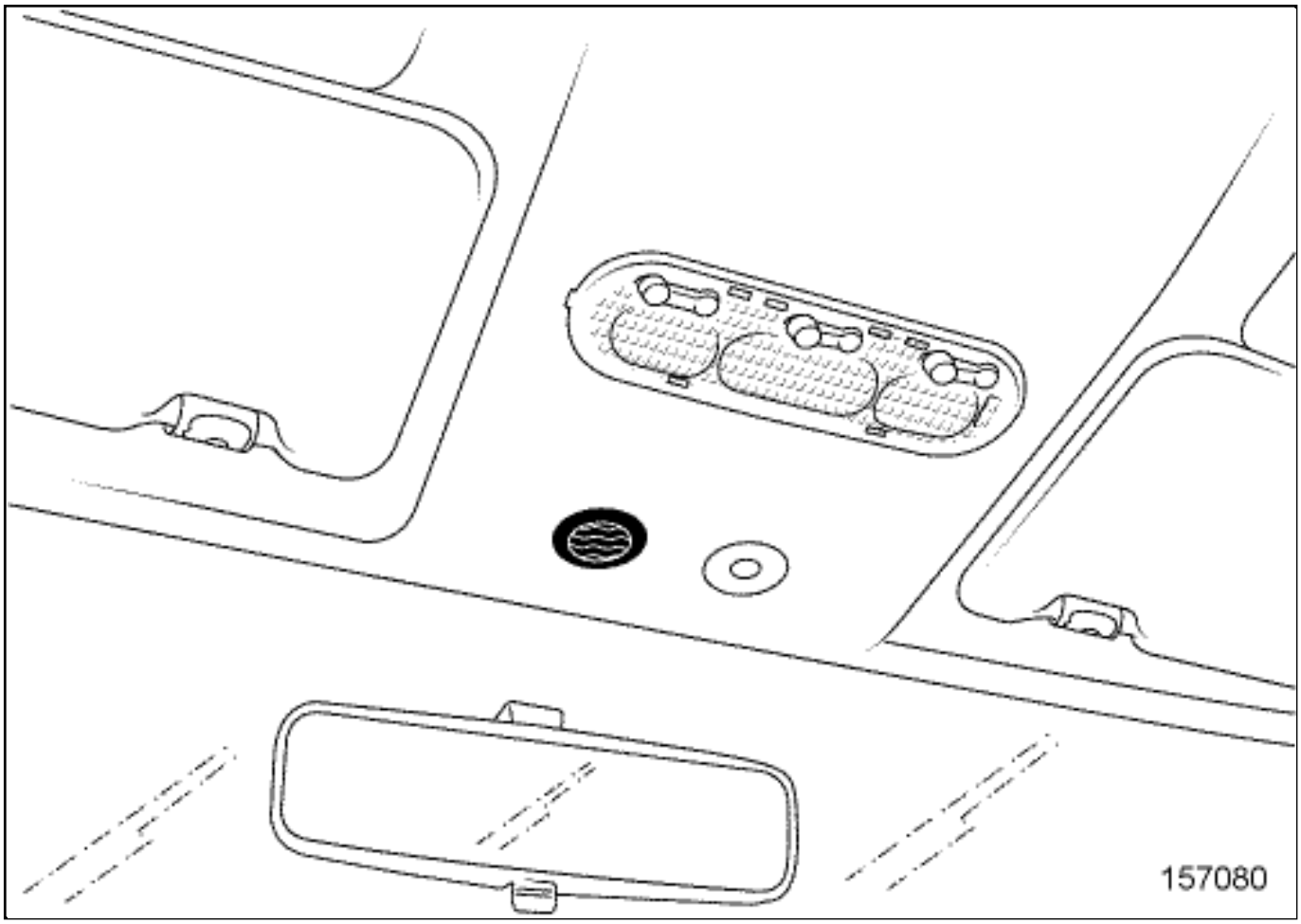


Rear side opening element assembly on the passenger compartment side: Exploded view

5- RADIO CONTROL SATELLITE



6- "HANDS- FREE" MICROPHONE



Apply the before / after repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the Before / After repair procedure:

"Car phone computer" .

Repair-30x04x06x14-02x51-1-27-1.xml

XSL version : 3.02 du 22/07/11

REAR AXLE ASSEMBLY: EXPLODED VIEW

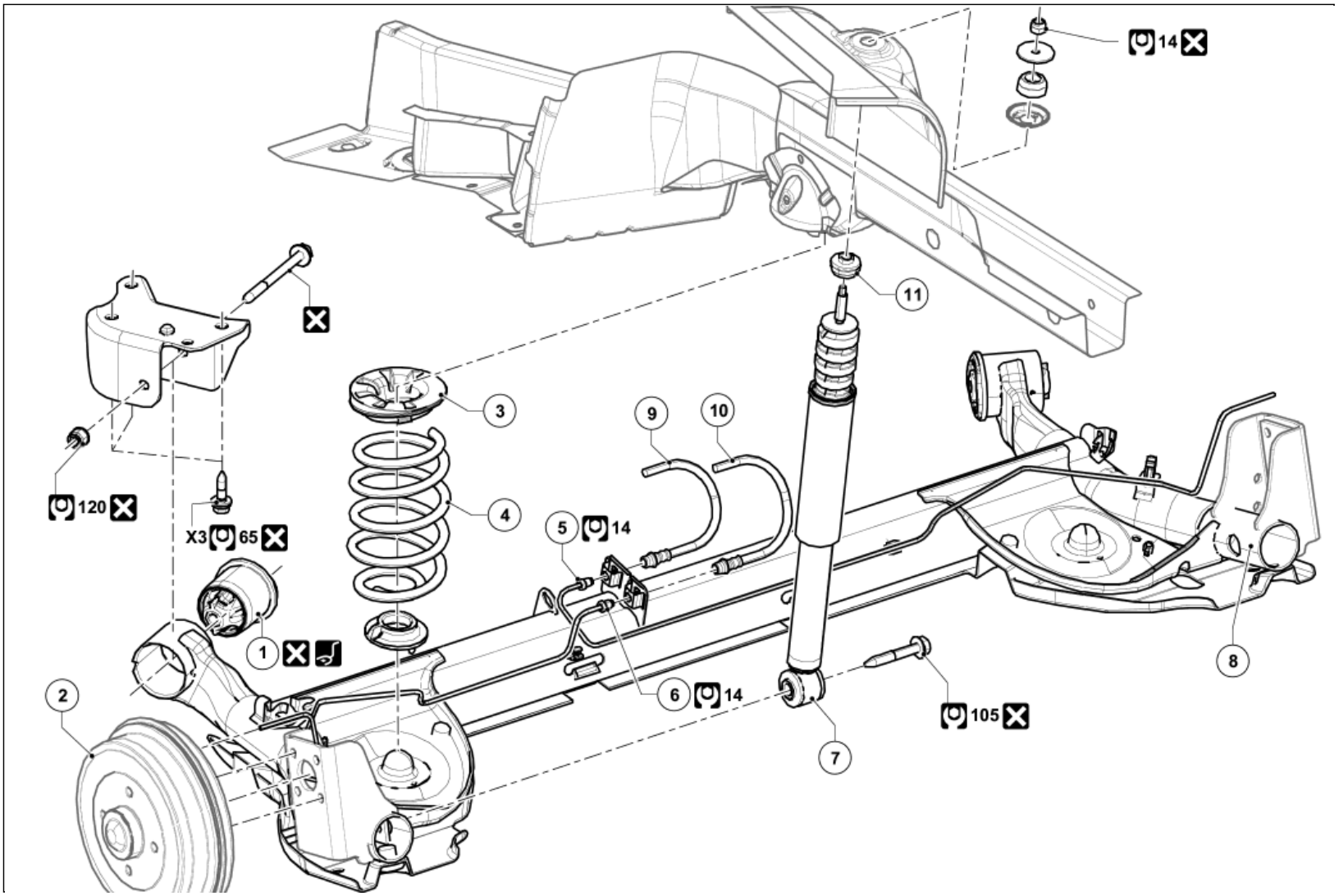


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Rear axle rubber bearing	(see 33A, Rear axle components, Rear axle rubber bearing: Removal - Refitting) Tar. 1838
2	Rear brake drum	(see 33A, Rear axle components, Rear drum brake assembly)
3	Upper spring support	
4	Spring	
5	Rigid brake pipe	(see 33A, Rear axle components, Rigid brake pipe: Removal - Refitting)
6	Rigid brake pipe	(see 33A, Rear axle components, Rigid brake pipe: Removal - Refitting)
7	Rear shock absorber	(see 33A, Rear axle components, Shock absorber: Removal - Refitting)
8	Rear axle	
9	Brake hose	
10	Brake hose	
11	Rear filter unit	(see 33A, Rear axle components, Shock absorber: Removal - Refitting)

REAR AXLE COMPONENTS: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Do not press on the brake pedal during work on the brake system.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

In case of incorrect handling, the brake fluid can cause serious injury and damage. Follow the manufacturer's instructions for brake fluid.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Clean around the braking system with brake cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

3. GENERAL RECOMMENDATIONS

1- BRAKING

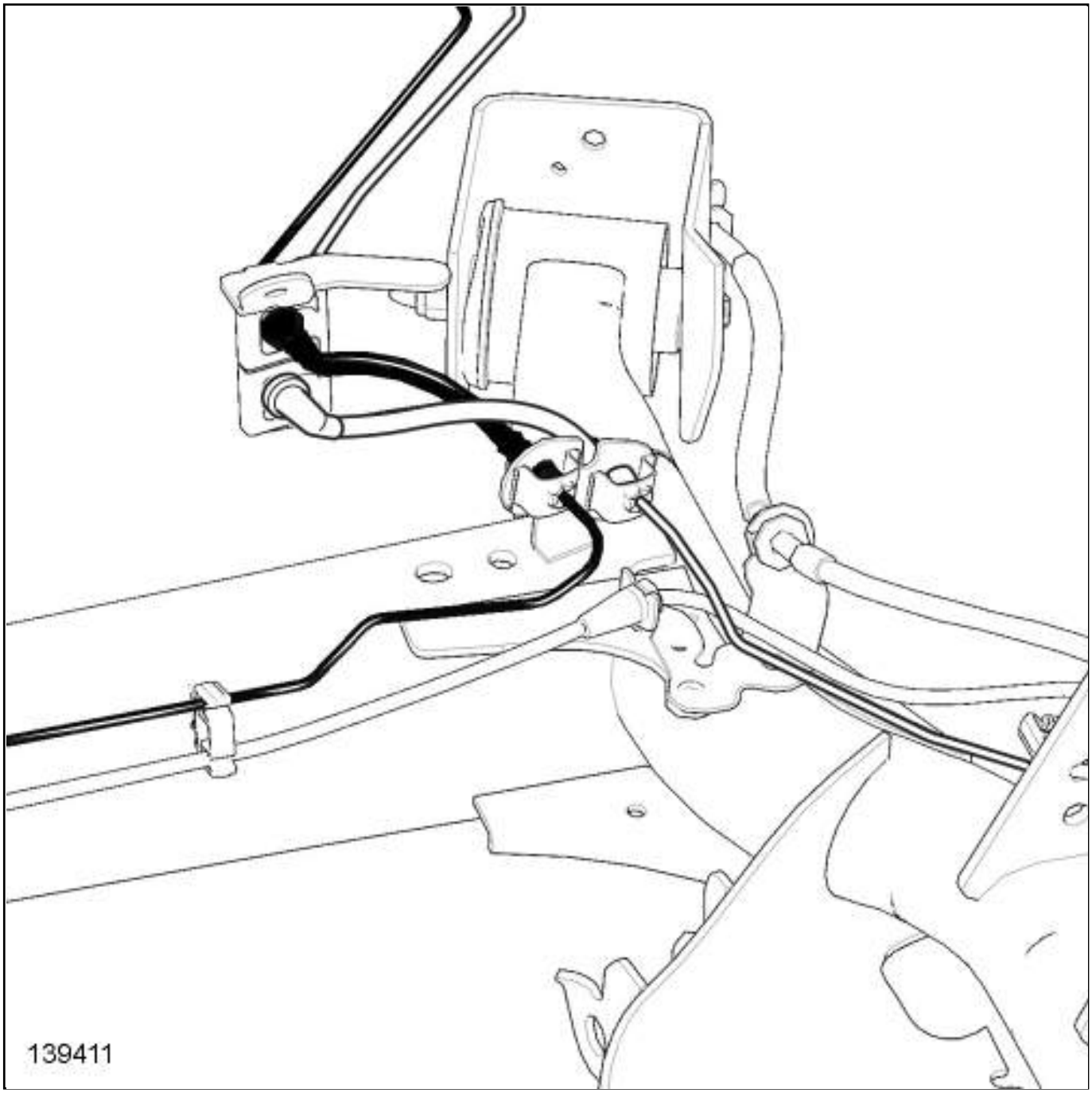
When replacing brake pads, be sure to replace the pads on the opposite side.

When replacing a disc, always replace the disc on the opposite side.

When replacing brake discs, you must replace the brake pads.

CAUTION

To avoid damaging the parking brake cable protectors and causing premature wear of the system, do not handle the cables with a tool.



WARNING

To ensure that the ABS and ESP systems operate correctly, check that the underbody brake pipes are clipped in place and are not crossed.

WARNING

In order not to disrupt the ESP system and cause an accident, do not swap the connection of the brake pipes and hoses.

CAUTION

- In order not to damage the brake hose:
  - do not tension the hose,
  - do not twist the hose,
  - check that there is no contact with the surrounding components.

WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

It is essential to replace the rigid brake pipe clips.

WARNING

To avoid brake imbalance, both drums must be of the same diameter. Regrinding one drum necessitates regrinding of the opposite drum.

2- BEARING, STUB AXLE CARRIER

It is essential to check the condition of the bearing surface and the stub-axle carrier before refitting the bearing.

CAUTION

To ensure that the wheel speed sensor works properly, do not mark the sensor target on the bearing.

Use surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean:

- the inner surface of the new bearing, in contact with the rear stub-axle,
- the rear stub-axle surface in contact with the new bearing.

3- SUSPENSION SPRING

When replacing the spring, make sure it is positioned the right way round.

When replacing a spring, always replace the spring on the opposite side.

During assembly and removing operations, the surface and the protection paint must not be damaged.

There must be no impacts during operations. Any handling hooks and tightening or positioning clamps should be equipped with rubber or plastic in order to avoid damage on the springs.

It is recommended to replace springs if:

- the paint is damaged,
- there are dents on the spring.

CAUTION

To prevent the suspension spring from prematurely breaking, do not damage the anti-corrosion protection.

4- REAR AXLE

CAUTION

To prevent any damage, do not use the rear axle as support for the lifting system.

CAUTION

To prevent the components of the rear axle from deteriorating (rubber bushes, brake hoses, etc.) do not remove the two shock absorbers at the same time. Proceed one side at a time.

Repair-13x02x05x10-02x60-1-4-1.xml

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REAR AXLE RUBBER BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Tool for removing and refitting rear axle rubber bushes	Tar. 1838

- Location and specifications (tightening torques, parts always to be replaced, etc.):
  - (see 33A, Rear axle components, Rear axle assembly: Exploded view) ,
  - (see 33A, Rear axle components, Rear drum brake assembly) ,
  - (see 33A, Rear axle components, Rear hub carrier assembly: Exploded view) .

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 33A, Rear axle components, Rear axle components: Precautions for the repair) ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

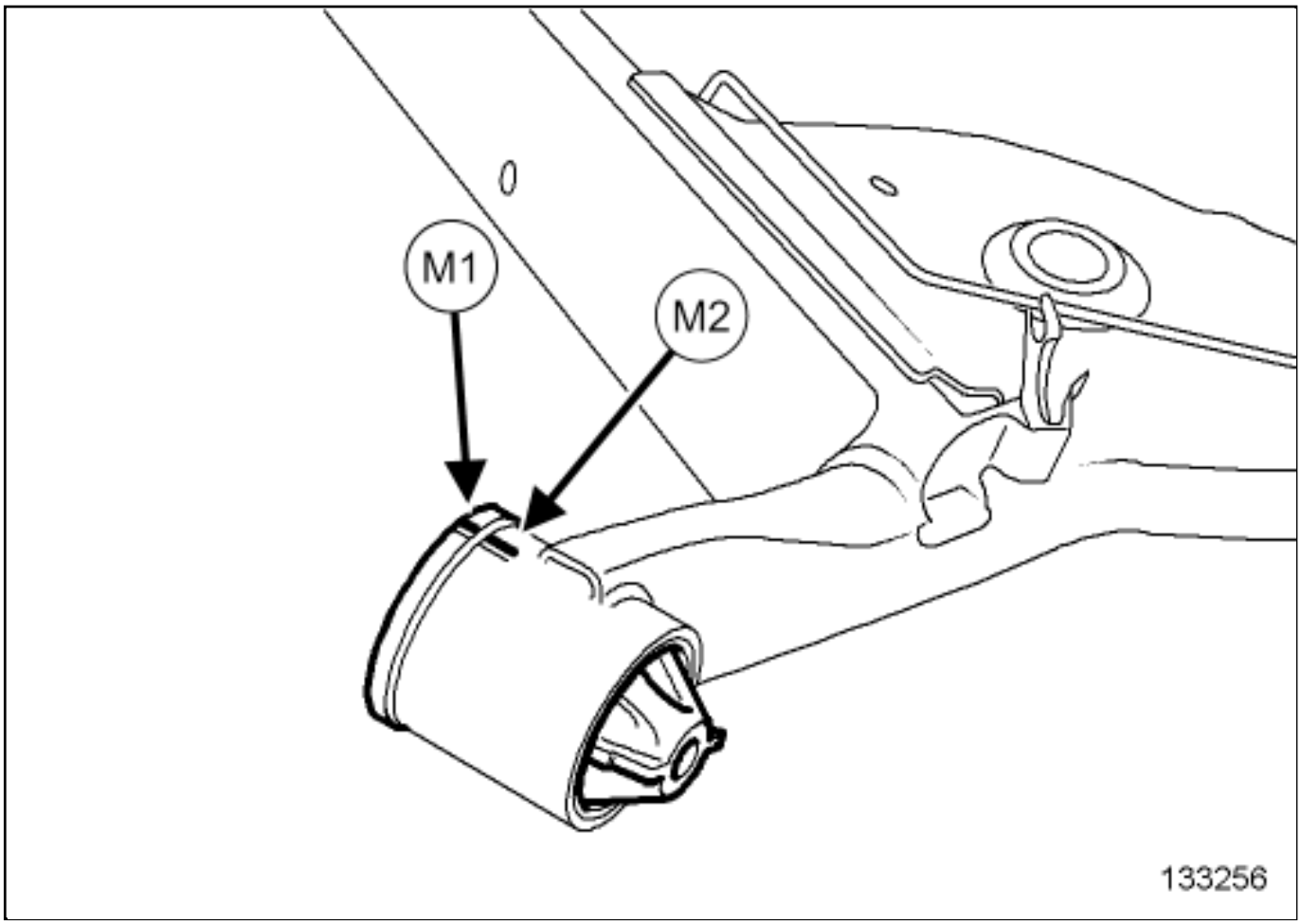
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the rear wheelsWheel: Removal - Refitting .
  - the rear brake drums(see 33A, Rear axle components, Rear drum brake assembly) .
  - the complete rear axle(see 33A, Rear axle components, Rear axle assembly: Exploded view) .

2. REMOVAL OPERATION

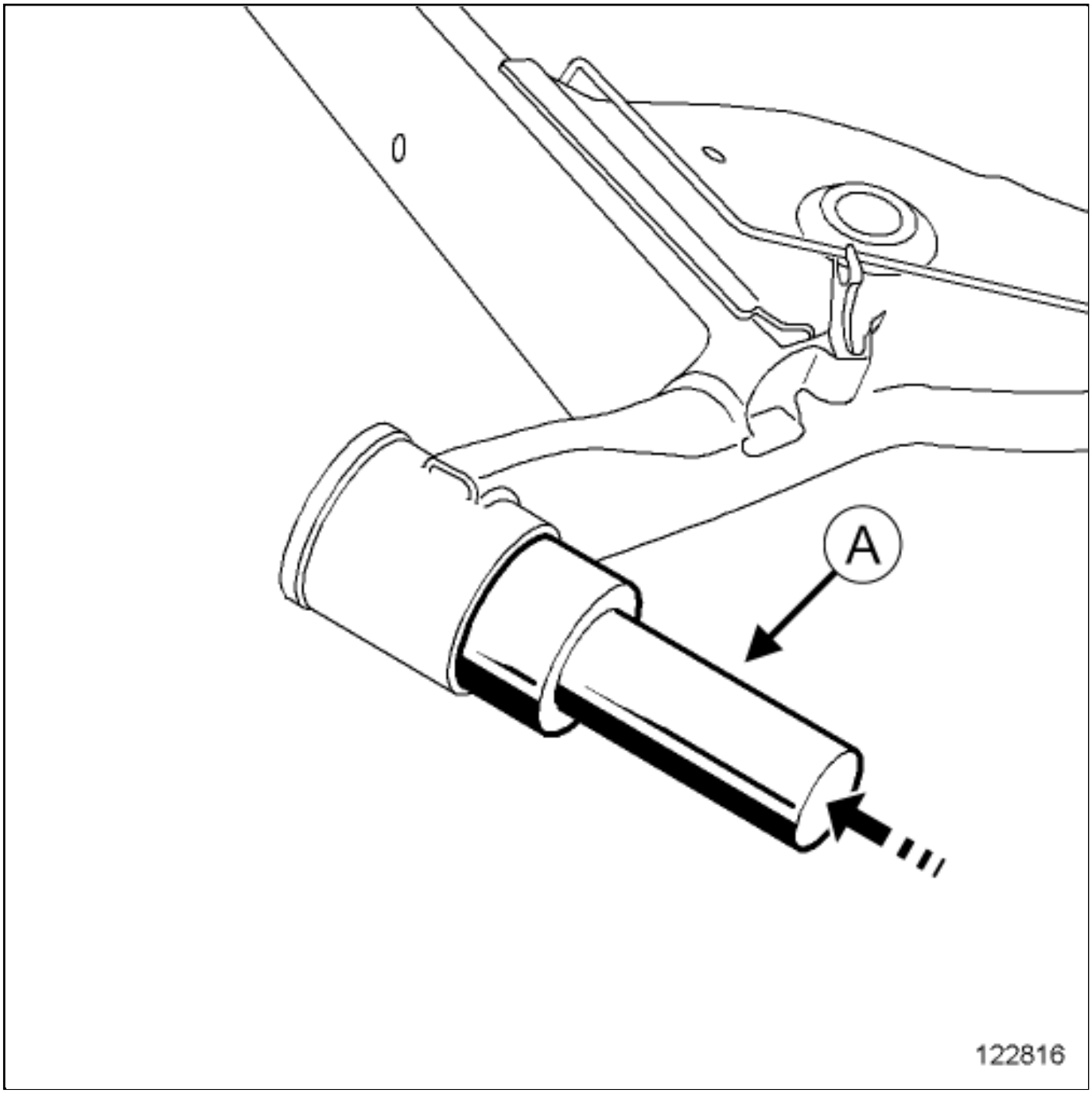


Before removing the rear rubber bearing, mark the position of the rubber bearing in the bore of the rear axle arm bushing:

- make marks(**M1**) and (**M2**) on the rear axle arm bushing and on the rubber bearing,
- copy the mark(**M1**) from the used rubber bearing onto the new one.

Note:

These marks are necessary to ensure correct refitting, and to avoid premature wear of the rubber bearings and good road holding for the vehicle.



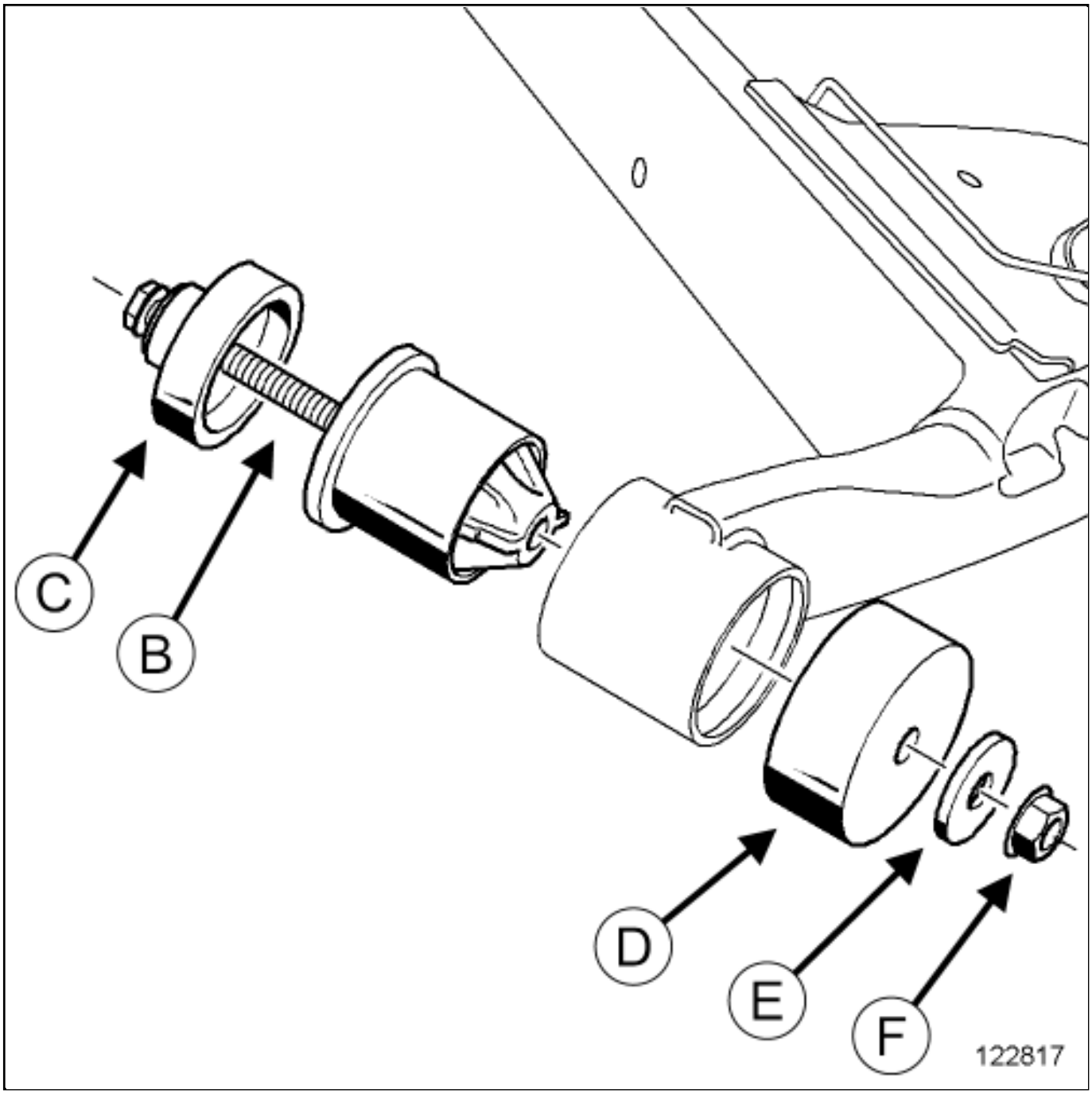
- Fit the joint castor(A) of theTool for removing and refitting rear axle rubber bushes(Tar. 1838) .

- Remove the rubber bearing from the rear axle by hitting with a hammer on the bush castor(A) of the tool Tool for removing and refitting rear axle rubber bushes(Tar. 1838) .

REFITTING

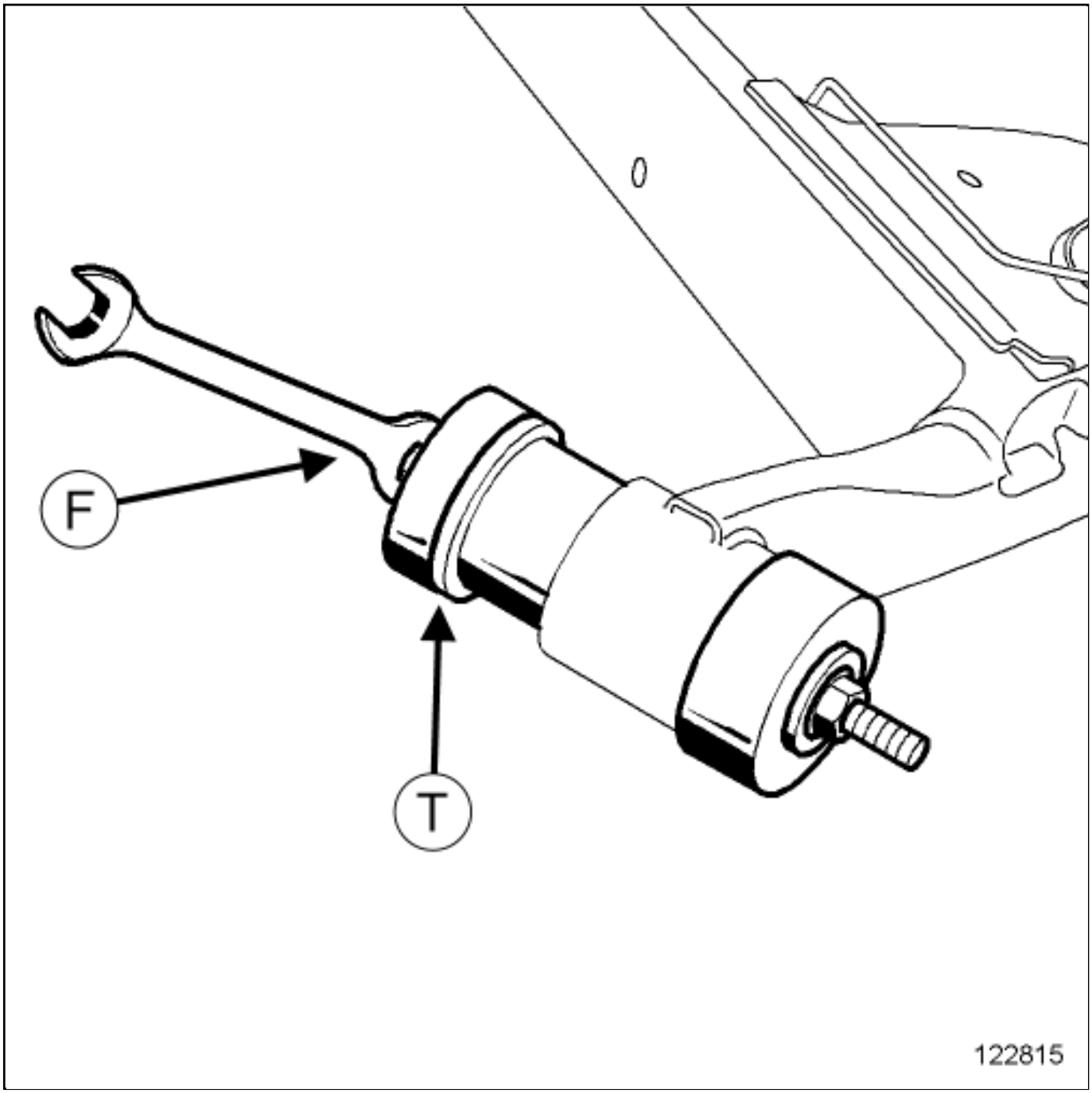
1. REFITTING OPERATION

Position the rubber bearing in the bore of the rear axle arm bushing so that the marks(M1) and (M2) are aligned.



To refit the rear axle rubber bearings use:

- the threaded rod(B) ,
- the cover(C) ,
- the cover(D) ,
- the anti-friction washer(E) ,
- the nut(F) , of theTool for removing and refitting rear axle rubber bushes(Tar. 1838)



- Position the Tool for removing and refitting rear axle rubber bushes(Tar. 1838) used for refitting.

- Tighten the nut (F) of the toolTool for removing and refitting rear axle rubber bushes(Tar. 1838) until the rubber bearing face(T) is set right up against the rear axle arm bushing.

- Check that the marks(M1) and (M2) are correctly aligned.

- Remove the toolTool for removing and refitting rear axle rubber bushes(Tar. 1838) .

2. FINAL OPERATION

- Refit:
  - the complete rear axle (see 33A, Rear axle components, Rear axle assembly: Exploded view),
  - the rear brake drums (see 33A, Rear axle components, Rear drum brake assembly).

- Refit the rear wheels Wheel: Removal - Refitting.

- Check the geometry of the axle assemblies Axle assemblies: Check.

- Bleed the brake circuit Braking circuit: Bleed.

REAR AXLE

Note, one or more warnings are present in this procedure

1. WHEEL ALIGNMENT SYMBOL MEANINGS

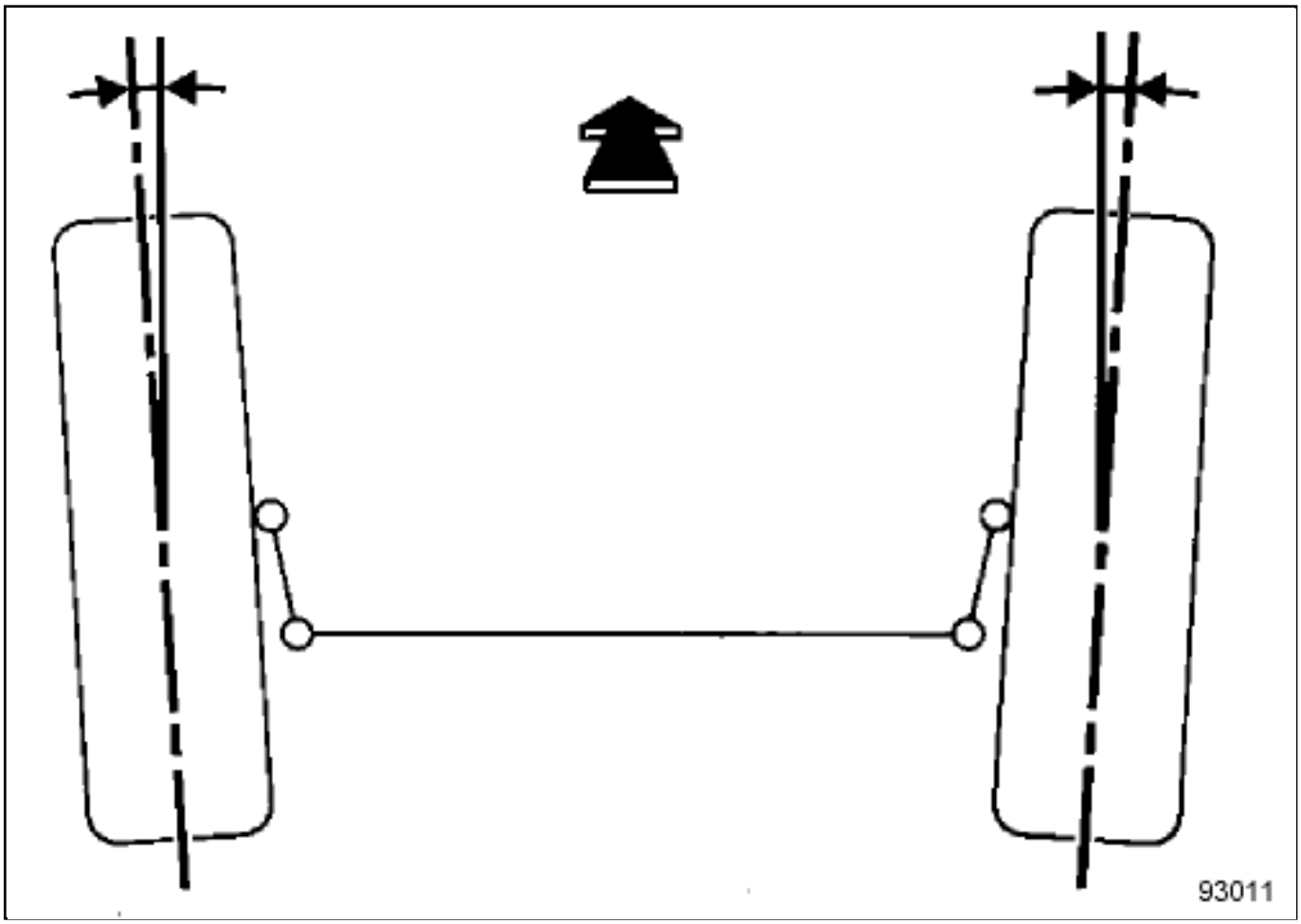
CAUTION

Symbols used by RENAULT:

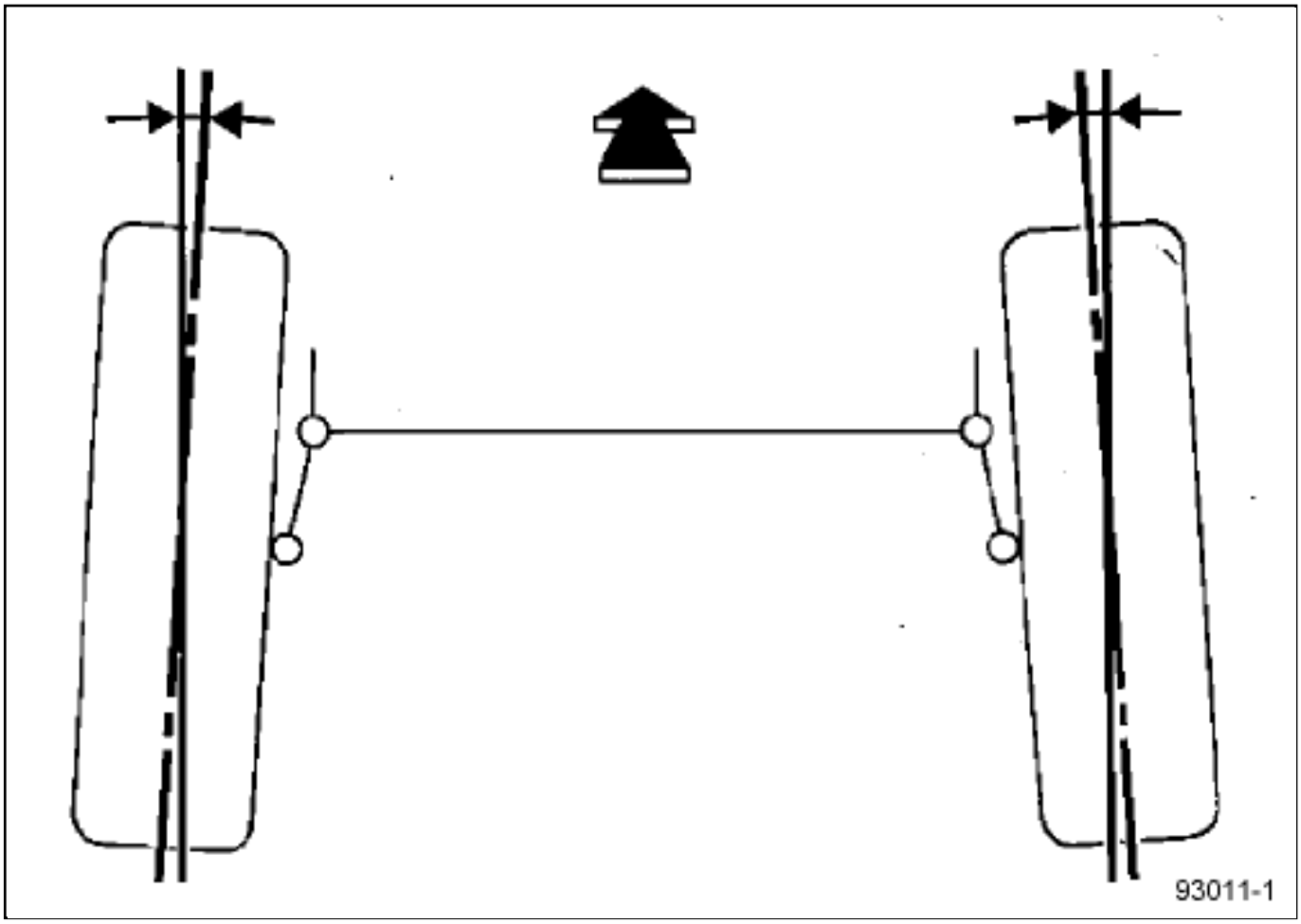
- toe-out: -,

- toe-in: +.

TOE-OUT: MINUS SIGN

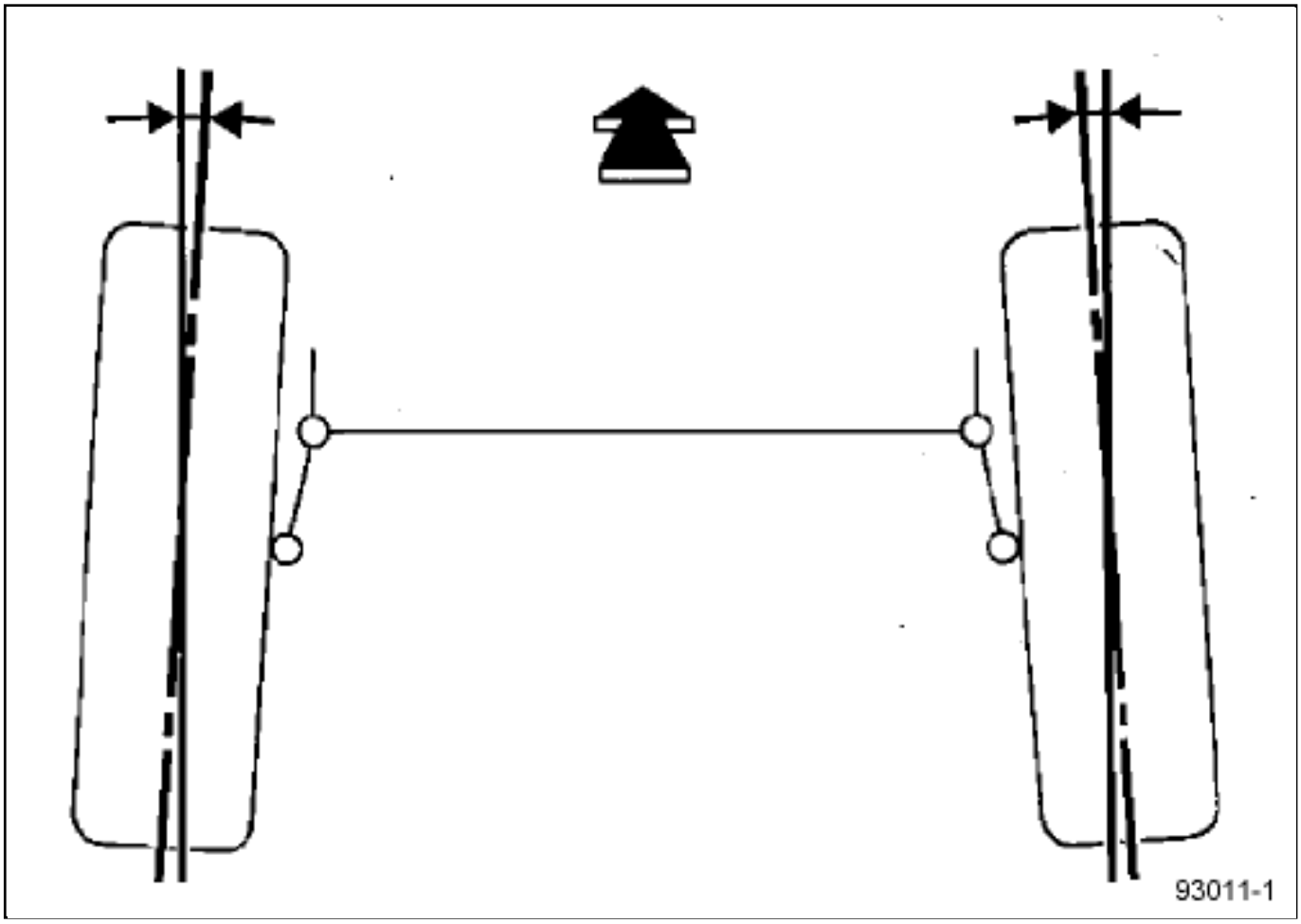


TOE-IN: PLUS SIGN



2. WHEEL ALIGNMENT

Not adjustable.



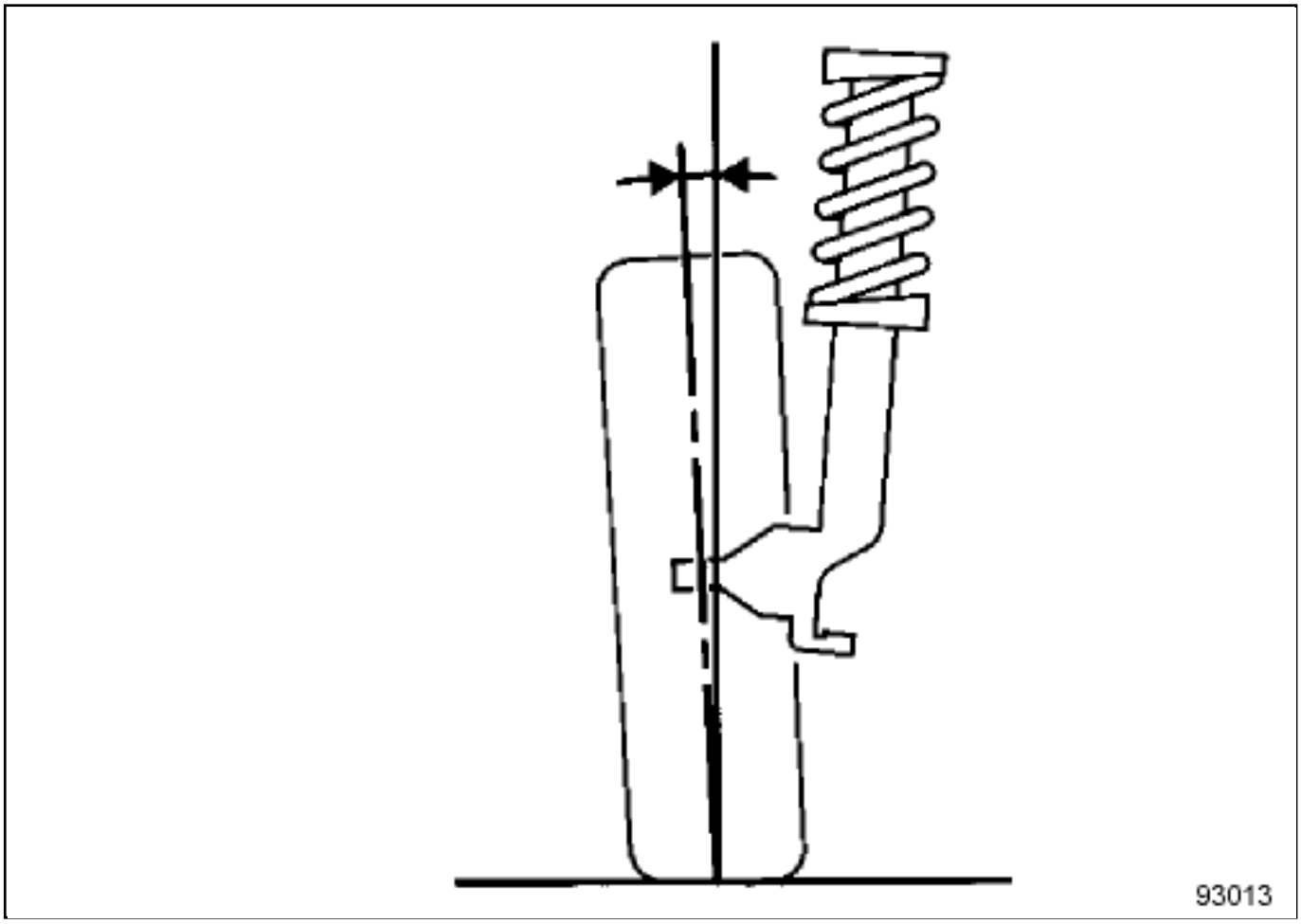
For vehicles made in Europe		
Value (for two wheels)	**Tolerance**	**Position of vehicle**
+0˚24'	+26'	Vehicle in running order
	-26'	

For vehicles made in Mercosur		
Value (for two wheels)	**Tolerance**	**Position of vehicle**
+0˚20'	+22'	Vehicle in running order
	-22'	

For vehicles made in Russia		
Value (for two wheels)	**Tolerance**	**Position of vehicle**
+0˚17'	+22'	Vehicle in running order
	-22'	

3. CAMBER

Not adjustable.



For vehicles made in Europe		
Value	**Tolerance**	**Position of vehicle**
-0˚55'	+24'	Vehicle in running order
	-24'	

For vehicles made in Mercosur		
Value	**Tolerance**	**Position of vehicle**
-0˚58'	+24'	Vehicle in running order
	-24'	

For vehicles made in Russia		
Value	**Tolerance**	**Position of vehicle**
-0˚64'	+24'	Vehicle in running order
	-24'	

REAR BENCH SEAT ASSEMBLY: EXPLODED VIEW

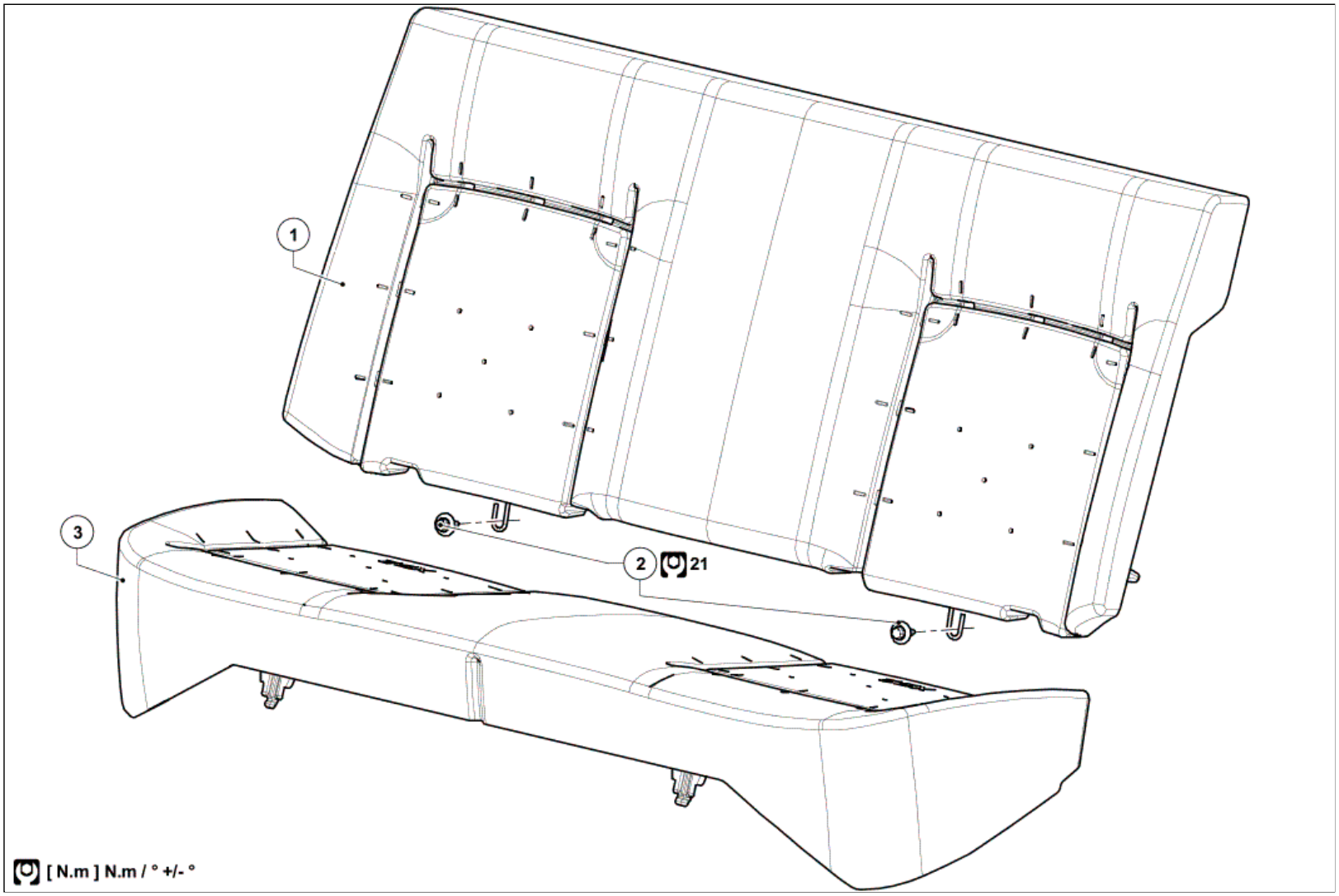


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Rear bench seatback foam	
2	Bolt of rear bench seat on the body	
3	Rear bench seat base foam	

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XSL version : 3.02 du 22/07/11

REAR BRAKE CYLINDER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
pedal press

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 33A, Rear axle components, Rear drum brake assembly) and(see 33A, Rear axle components, Rear hub carrier assembly: Exploded view) .

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair.
  - Brake circuit: Precautions for the repair ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Release the parking brake.
- Remove the rear wheelWheel: Removal - Refitting .

2. REMOVAL OPERATION

- Position a pedal presson the brake pedal to limit the outflow of brake fluid.

Undo the brake pipe union on the rear brake cylinder (prepare for the outflow of brake fluid)(see 33A, Rear axle components, Rear drum brake assembly) .

Fit a cap on the brake pipe union.

Remove (see 33A, Rear axle components, Rear drum brake assembly) :

- the brake drum,
- the side retaining springs while holding the connecting rod in contact with the brake back-plate,
- the upper return spring using brake shoe pliers.

Detach the pin from the spring of the wear compensation system on the leading shoe.

Separate the shoes.

Remove (see 33A, Rear axle components, Rear drum brake assembly) :

- the rear brake cylinder bolt(s) on the brake back-plate.
- the rear brake cylinder.

REFITTING

Proceed in the reverse order to removal.

Bleed the brake circuitBraking circuit: Bleed .

Adjust the rear brake linings by repeatedly depressing the brake pedal.

REAR BRAKE DRUM: DESCRIPTION

Equipment required
sliding calliper

1. PREPARATION OPERATION FOR CHECK

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

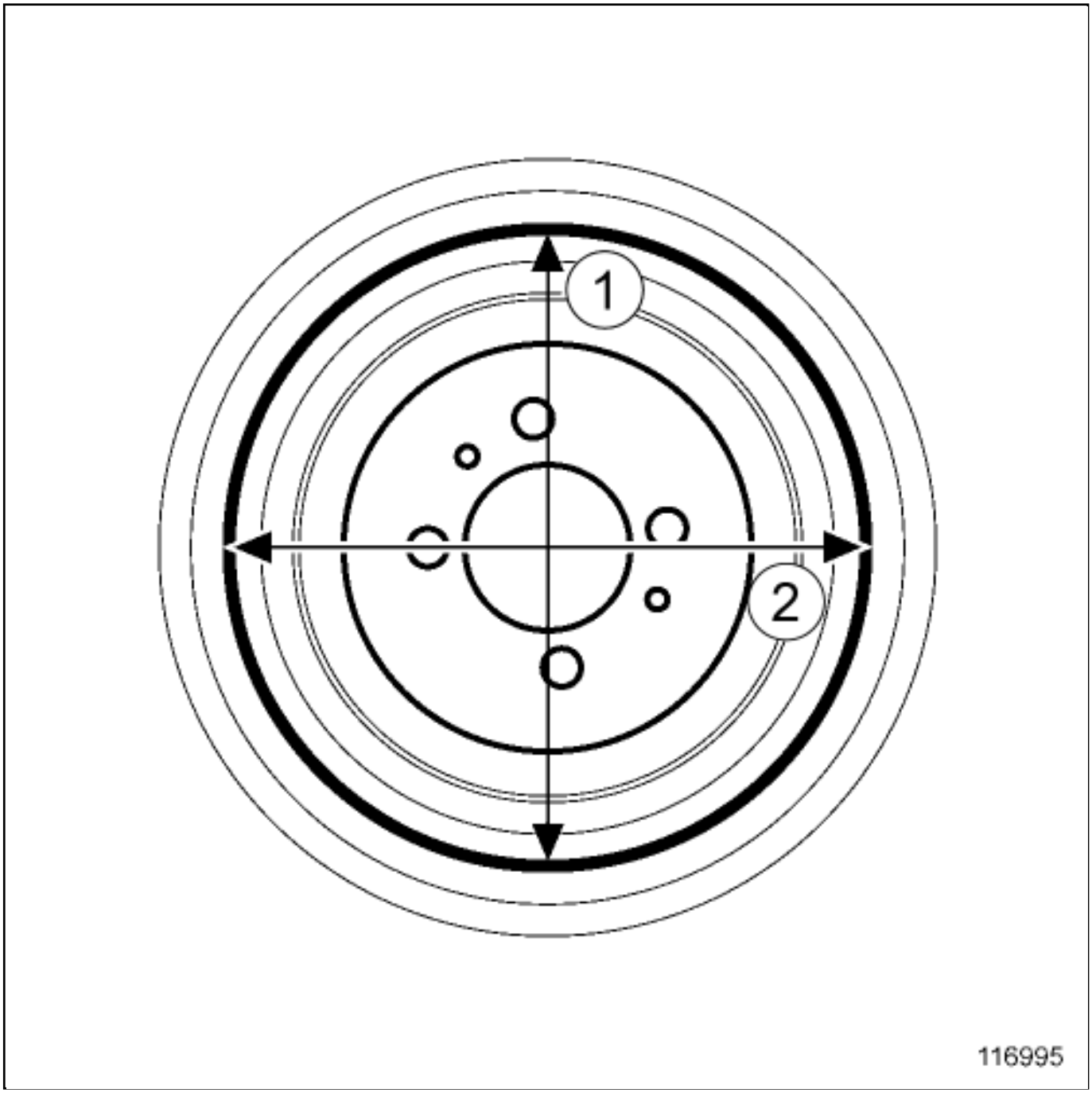
Remove the wheel in question Wheel: Removal - Refitting .

Remove the brake drum concerned (see 33A, Rear axle components, Rear drum brake assembly) .

2. TEST OPERATION

Note:

To check the internal diameter of the drum, use a sliding calliper type tool for drums.



Position the sliding calliperto measure the internal diameters of the brake drum.

Measure the interior diameters of the brake drum on the perpendicular axes(1) and (2) .

Compare the values with those recommended by the manufacturer**Brake: Specifications** .

3. FINAL OPERATION

Replace the rear drums if necessary**(see 33A, Rear axle components, Rear drum brake assembly)** .

Refit the rear wheel concerned **Wheel: Removal - Refitting** .

REAR BRAKE LINING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 33A, Rear axle components, Rear drum brake assembly) and(see 33A, Rear axle components, Rear hub carrier assembly: Exploded view) .

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair.
  - Brake circuit: Precautions for the repair ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

Note:

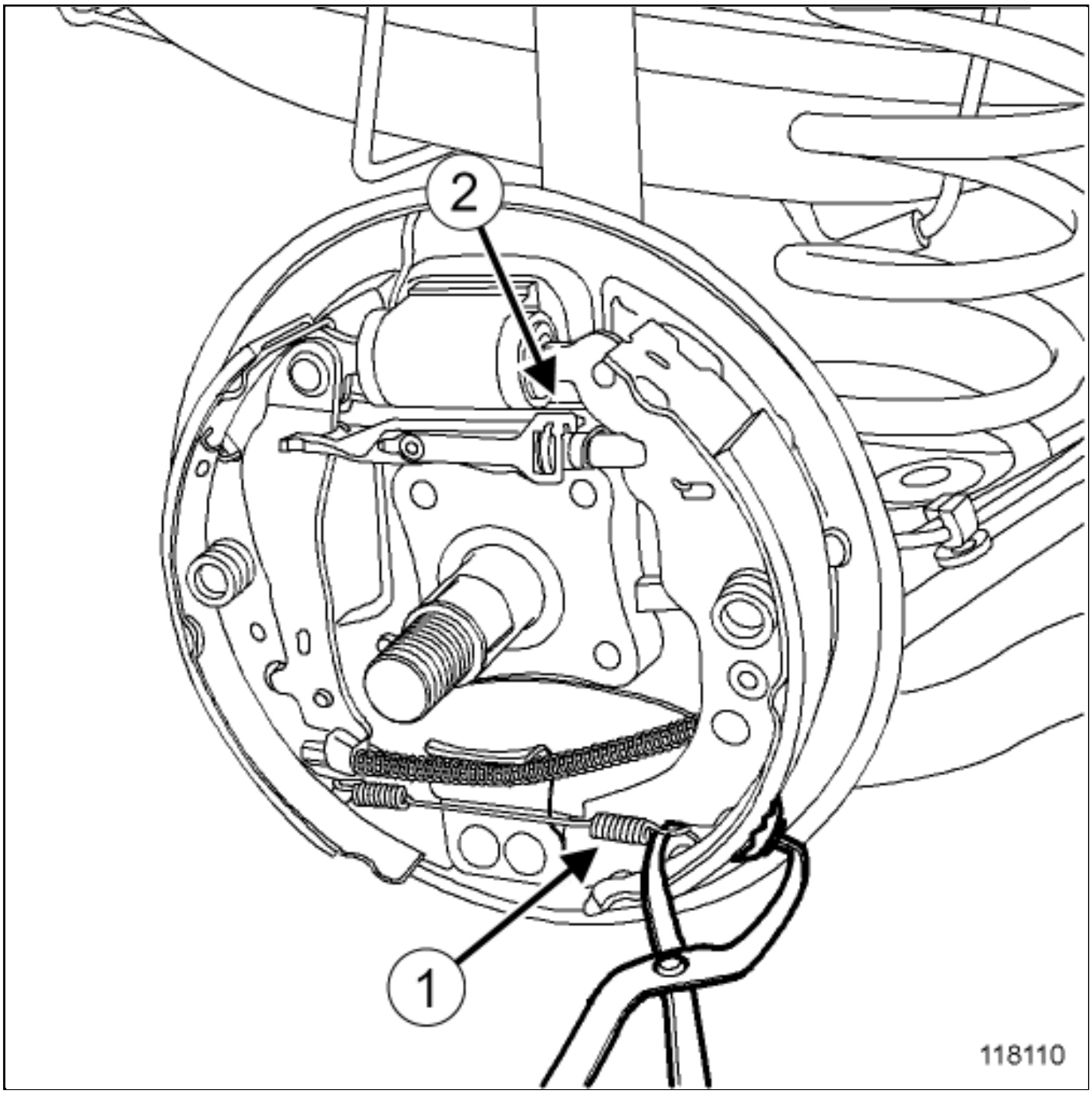
Replace all of the brake pads on one axle at the same time. Never mix brake pads of different brands or quality.

REMOVAL

1. REMOVAL PREPARATION OPERATION

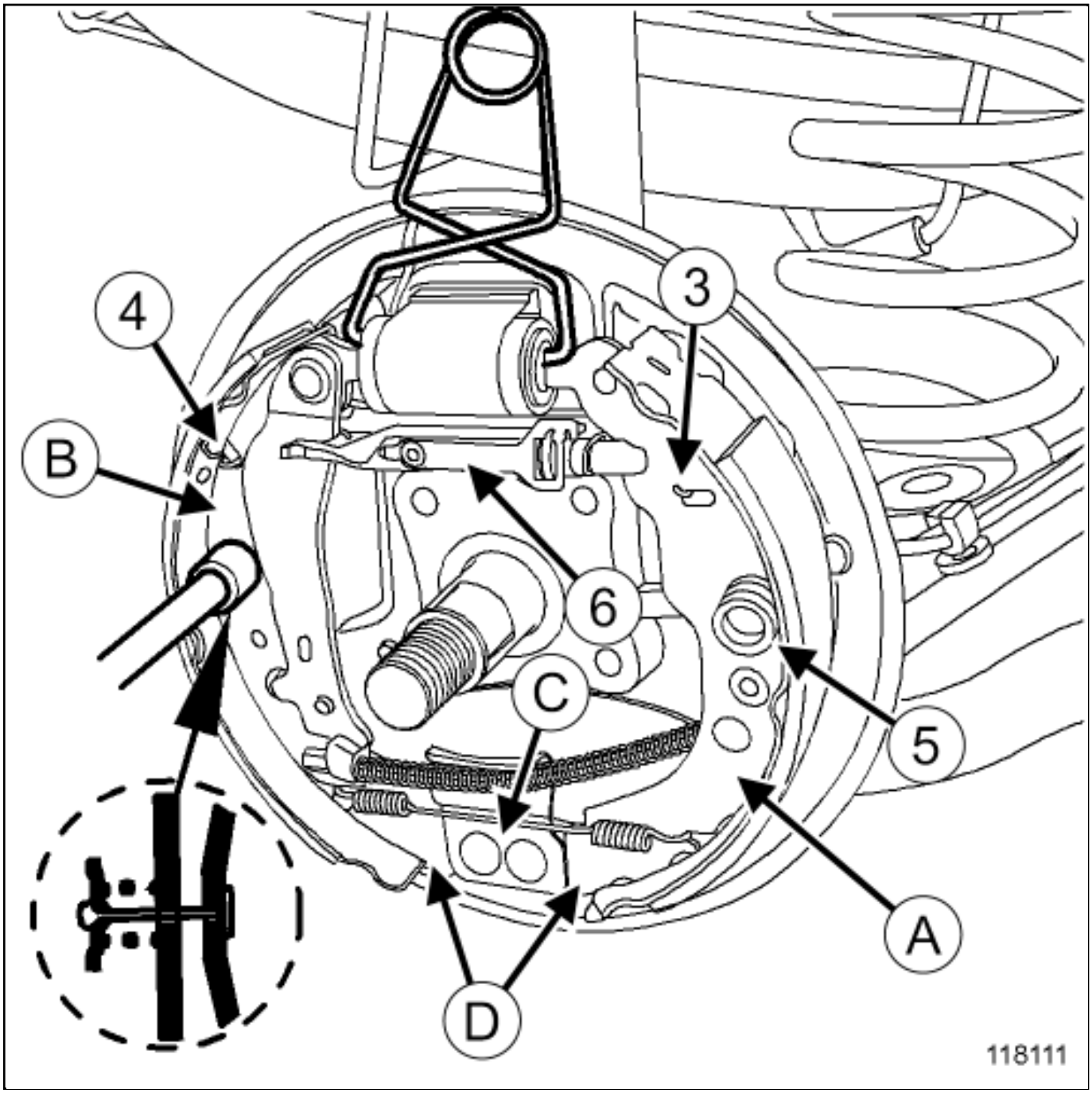
- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Release the parking brake.
- Remove:
  - the rear wheelWheel: Removal - Refitting ,
  - the brake drum(see 33A, Rear axle components, Rear drum brake assembly) .

2. REMOVAL OPERATION



Remove:

- the lower spring(1) ,
- the upper spring(2) .



Place pliers on the slave cylinder pistons.

Remove:

- the spring(3) on the incremented automatic compensation system,
- the retaining spring(4) from the trailing shoe linkage,
- the side retaining springs(5) while holding the connecting rod in contact with the brake back-plate,
- the linkage(6) .

Alternately remove each shoe base(D) from the fixed bridge piece(C) .

Remove:

- the leading shoe(A) ,
- the trailing shoe(B) .

- Uncouple the parking brake cable from the parking brake lever.

REFITTING

1. REFITTING PREPARATION OPERATION

- Remove any dust from the brake drums and back-plates using Brake cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Lightly grease the support linkage thread.

Note:

The brake mechanism components are different on the left and right-hand sides, so it is important not to confuse them.

On the left-hand brake: the bolt has a right-hand thread.

On the right-hand brake: the bolt has a left-hand thread.

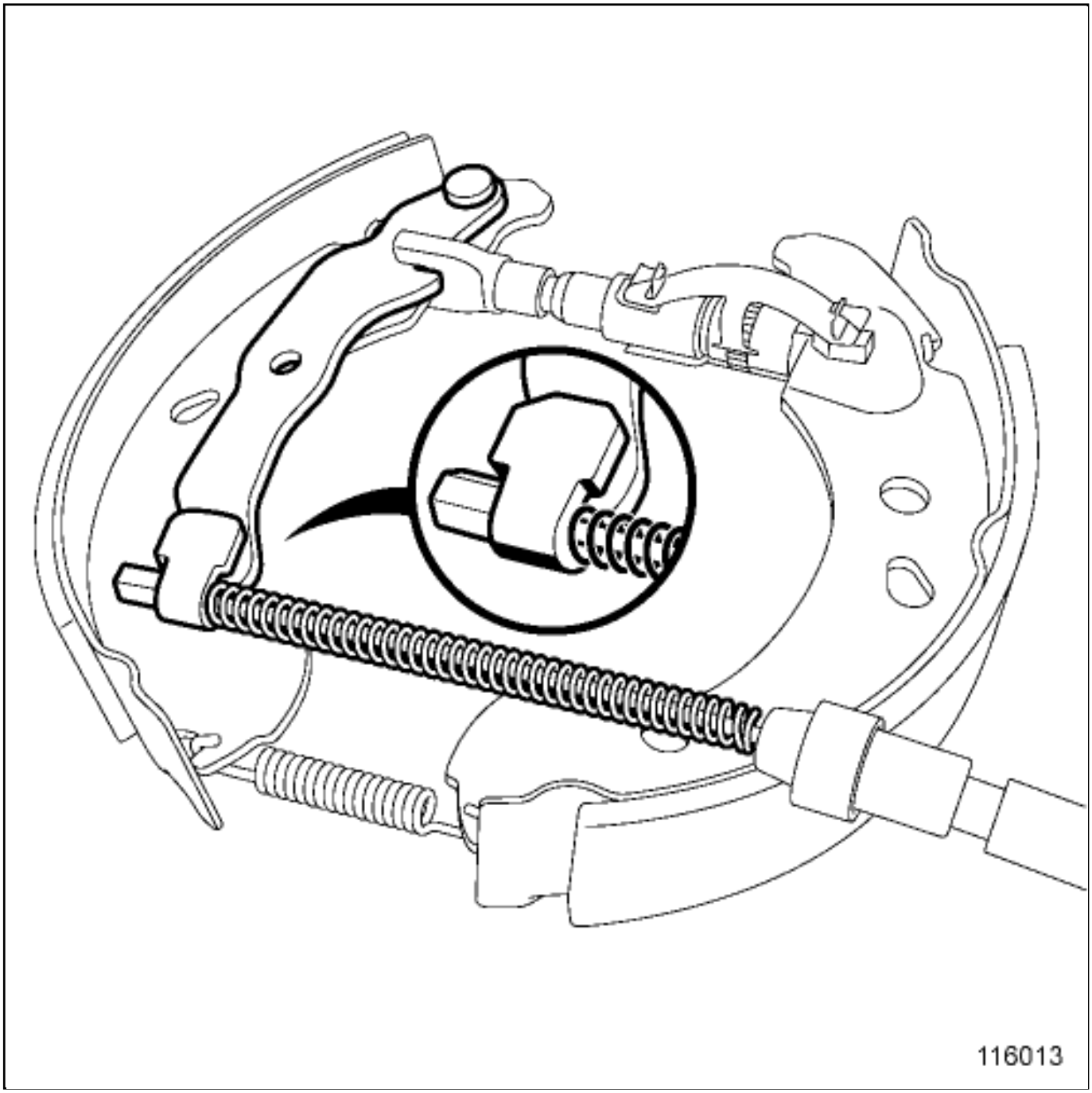
2. REFITTING OPERATION

- Refit:
  - the linkage to the trailing shoe while holding it together with its spring,
  - the incremented automatic compensation system spring to the linkage,
  - the parking brake cable to the parking brake lever,
  - the leading shoe,
  - the incremented automatic compensation system spring to the leading shoe.

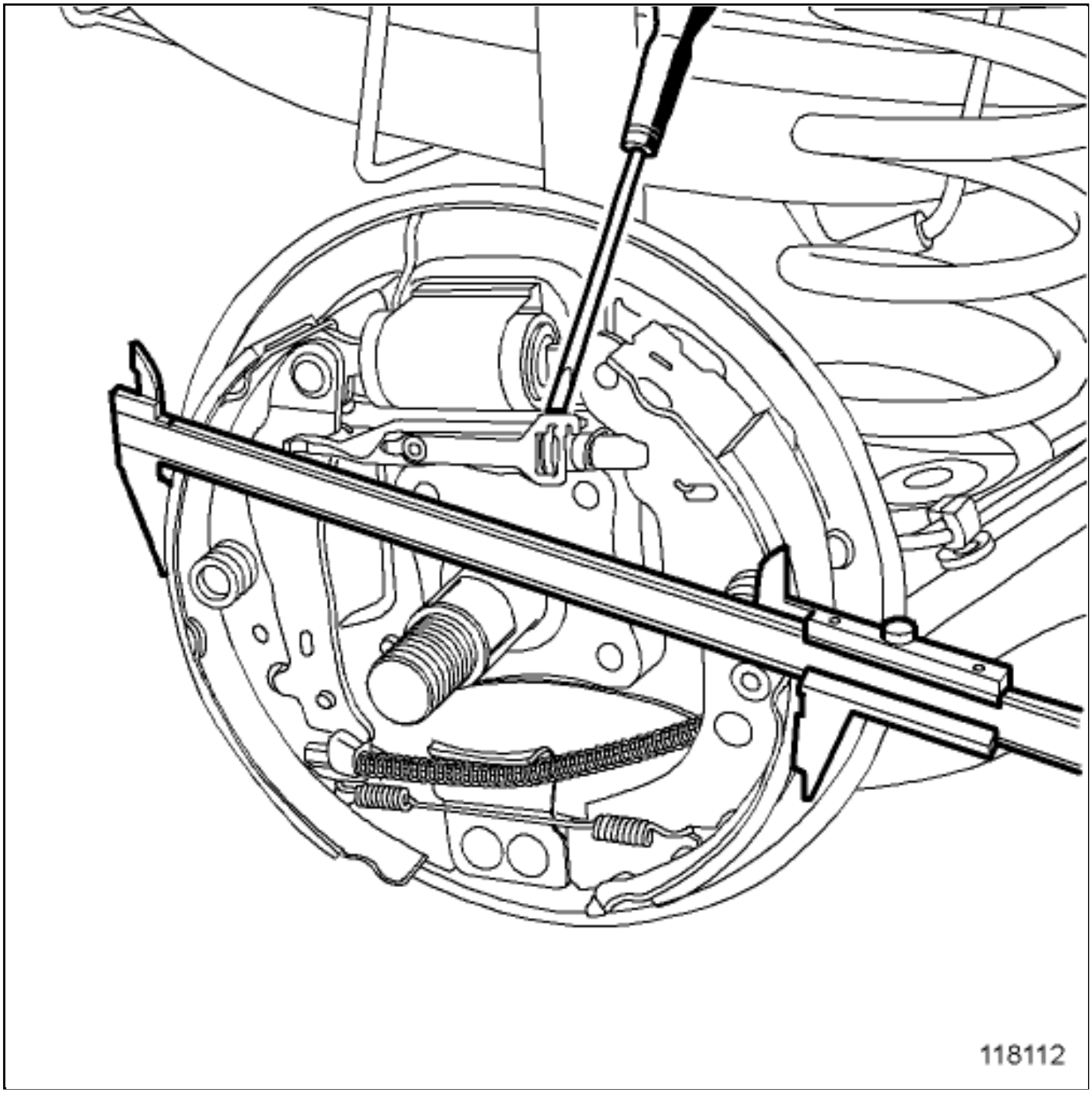
- Fit the leading shoe/trailing shoe assembly to the back-plate.

- Refit:
  - the upper spring,
  - the lower spring,
  - the side retaining springs while holding the connecting rod in contact with the brake back-plate.

- Remove the pliers from the slave cylinder pistons.



- Check that the parking brake cable is correctly positioned on the parking brake lever.



- Using a screwdriver, adjust the diameter of the shoes with the linkage to obtain a diameter of 202.5 mm ± 0.1.

- Carry out the same adjustment on the other side.

- Adjust the handbrake if the lever stops between the first and second positions of the parking brake lever's travelParking brake lever: Adjustment .

3. FINAL OPERATION

Refit:

- the brake drum **(see 33A, Rear axle components, Rear drum brake assembly)** ,
- the rear wheel **Wheel: Removal - Refitting** .

Adjust the brake linings by depressing the brake pedal repeatedly.

Check that the incremented compensation system is working properly (characteristic "click" from the drums when the brake pedal is repeatedly depressed).

REAR CENTRE SEAT BELT: REMOVAL - REFITTING

Tightening torques	
rear centre seat belt guide bolt	21 N.m
rear centre seat belt bolt	21 N.m

Location and specifications (tightening torques, parts always replaced, etc.)Rear bench seat assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

L52(L52)

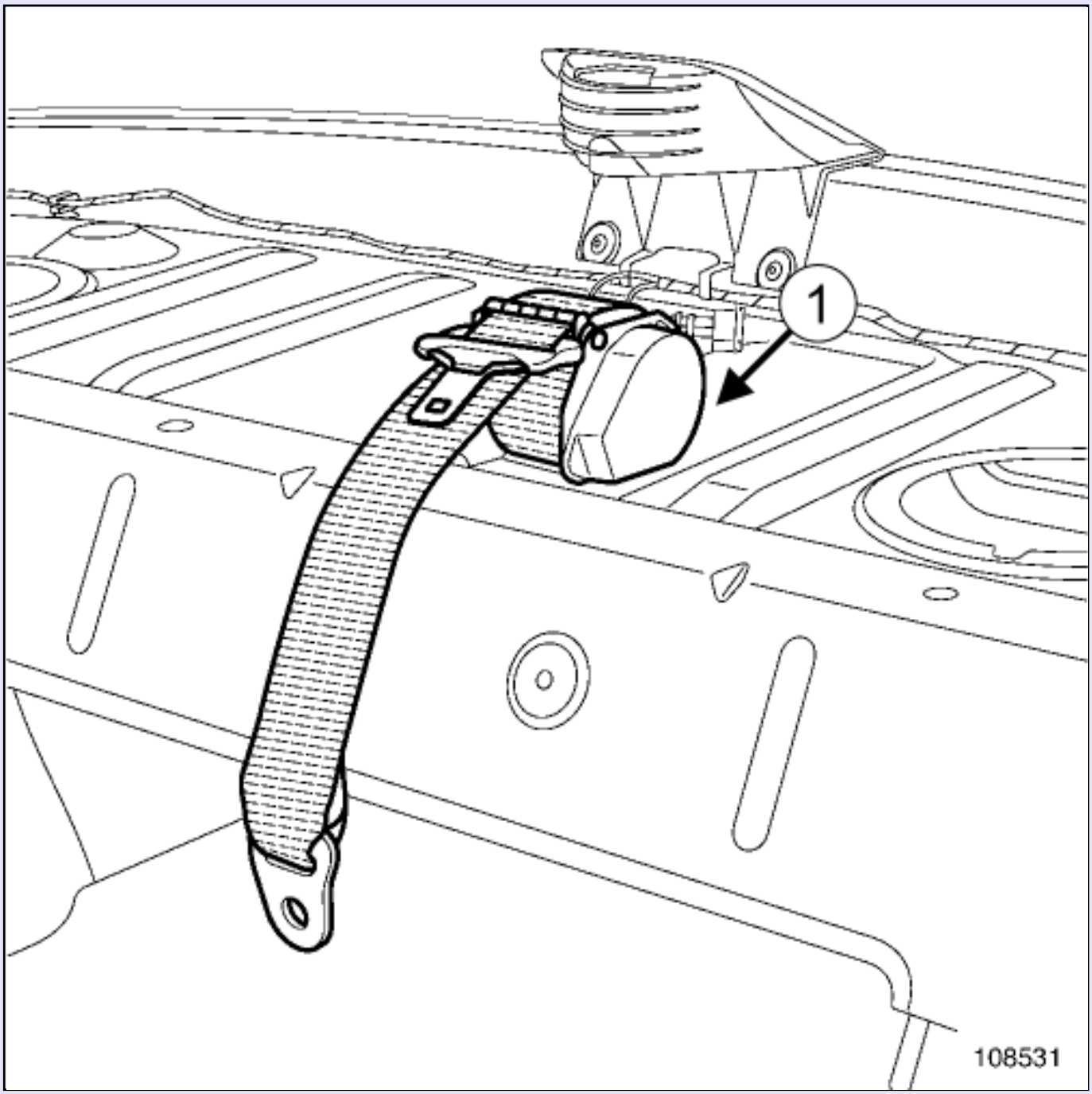
Remove:

- the single unit rear bench seat baseRear bench seat assembly: Exploded view ,
- the 1/3 or 2/3 rear bench seatback or the single unit rear bench seatbackRear bench seat assembly: Exploded view ,
- the rear parcel shelf trimInterior body side trim assembly: Exploded view .

B52(B52)

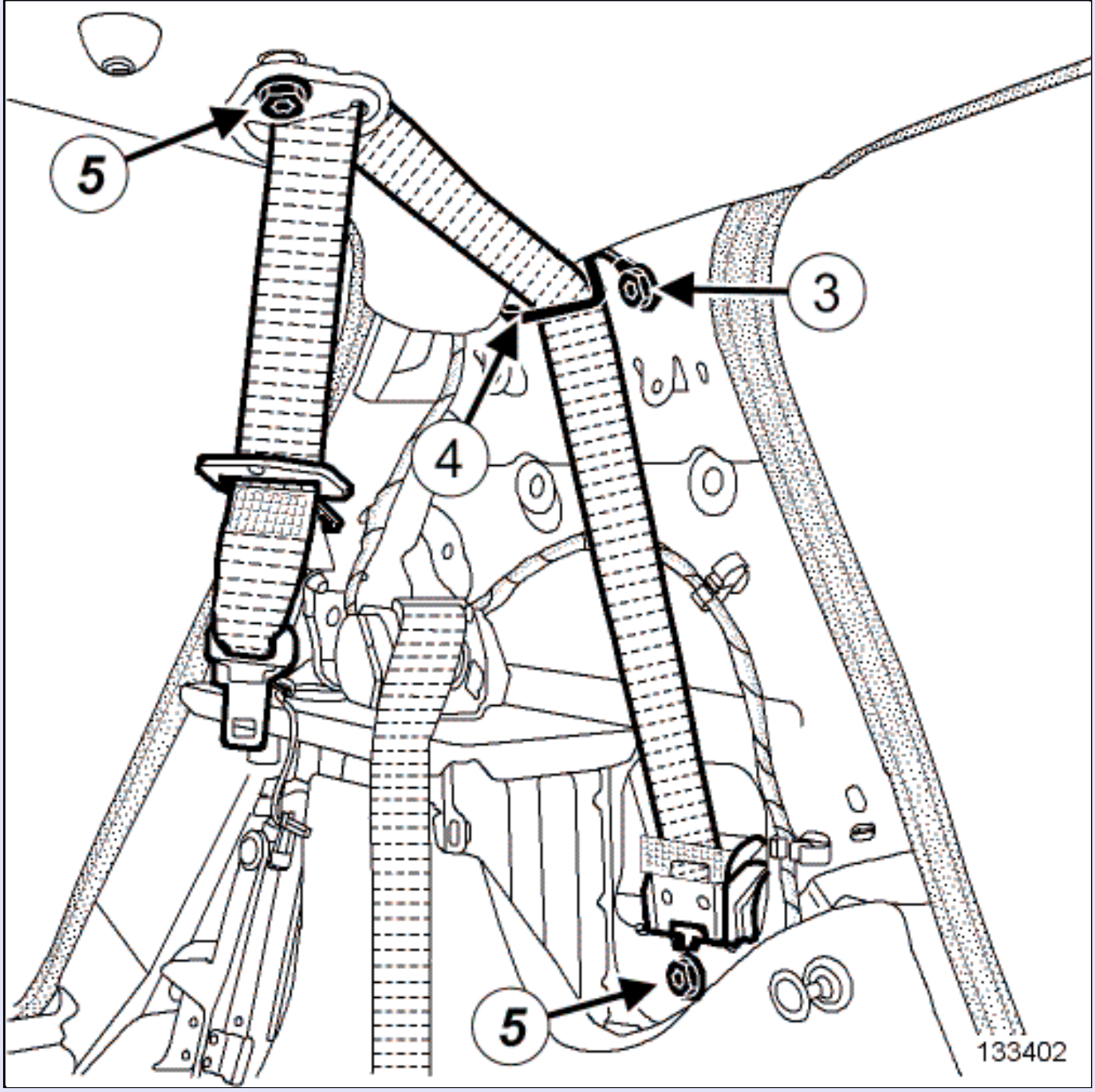
Remove the rear quarter panel trimInterior body side trim assembly: Exploded view .

2. REMOVAL OPERATION



Remove:

- the rear centre seat belt inertia reel bolt(1) ,
- the rear centre seat belt.



Remove:

- the rear centre seat belt guide bolt(3) ,
- the rear centre seat belt guide(4) ,
- the rear centre seat belt bolts(5) ,
- the rear centre seat belt.

REFITTING

1. REFITTING PREPARATION OPERATION

Coat the threads of the rear centre seat belt bolts with HIGH STRENGTH THREAD LOCK Vehicle: Parts and consumables for the repair .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.
- Torque tighten the rear centre seat belt bolt21 N.m.

B52(B52)

Note:

Check that the seat belt is not twisted between the inertia reel and the rear centre seat belt return mechanism.

- Torque tighten the rear centre seat belt guide bolt21 N.m.

3. CHECKING AFTER REPAIR

- Check for correct operation by unrolling the rear centre seat belt by 300 mm and letting it return twice.
- Check that the rear centre seat belt locks correctly by pulling the rear side seat belt strap with increasing speed 200 to 300 mm maximum until the inertia reel locks.

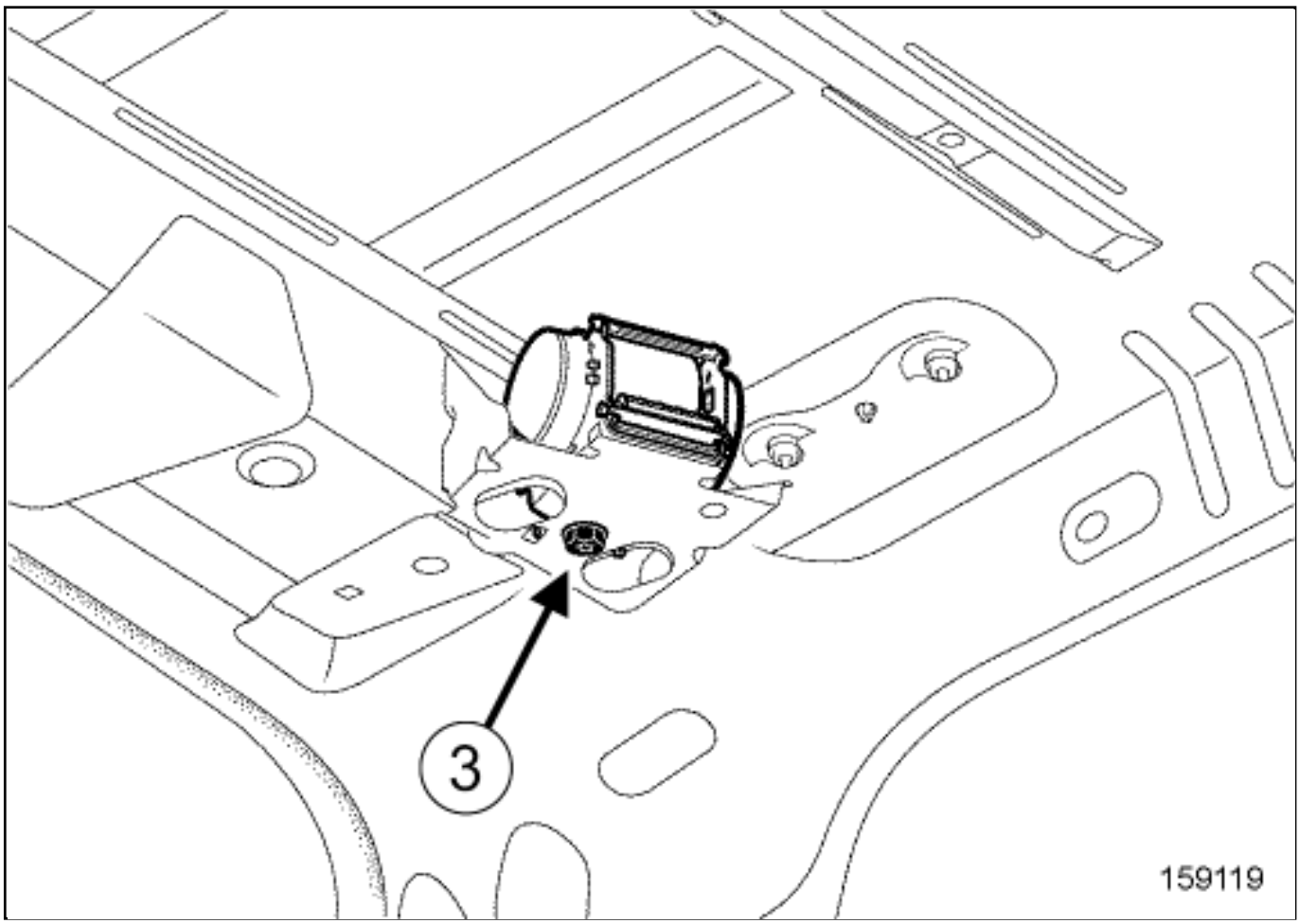
REAR CENTRE SEAT BELT: REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the headlining Roof trim assembly: Exploded view .

2. REMOVAL OPERATION



- Remove:
  - the rear centre seat belt inertia reel bolt(3) ,
  - the rear centre seat belt.

REFITTING

1. REFITTING PREPARATION OPERATION

- Coat the threads of the rear centre seat belt bolts with HIGH STRENGTH THREAD LOCK**Vehicle: Parts and consumables for the repair** .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Torque tighten the rear centre seat belt inertia reel bolt21 N.m.

3. CHECKING AFTER REPAIR

- Check for correct operation by unrolling the rear side seat belt by 300 mm and letting it return twice.

- Check that the rear side seat belt locks correctly by pulling the rear side seat belt strap with increasing speed 200 to 300 mm maximum until the inertia reel locks.

REAR DRUM BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair **(see 33A, Rear axle components, Rear axle components: Precautions for the repair)** .

- Location and specifications (tightening torques, parts always to be replaced, etc.) **(see 33A, Rear axle components, Rear hub carrier assembly: Exploded view)** and **(see 33A, Rear axle components, Rear drum brake assembly)** .

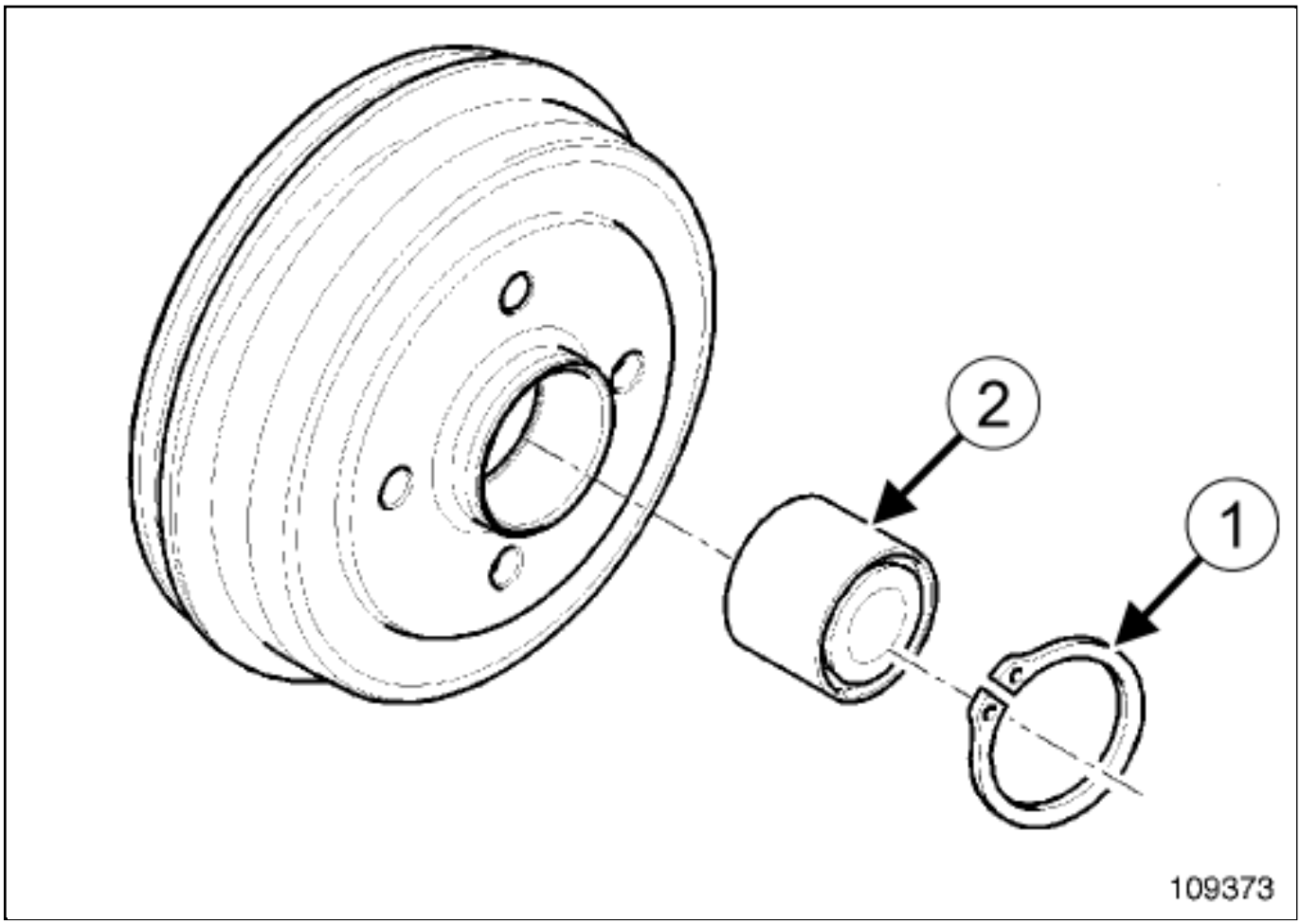
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .

- Remove the following from the side concerned:
  - the rear wheel Wheel: Removal - Refitting ,
  - the rear brake drum (see 33A, Rear axle components, Rear drum brake assembly) .

2. OPERATION FOR REMOVAL OF PART CONCERNED



- Extract the bearing retaining circlip from the drum(1) .

1- BEARING, DIAMETER 52 MM

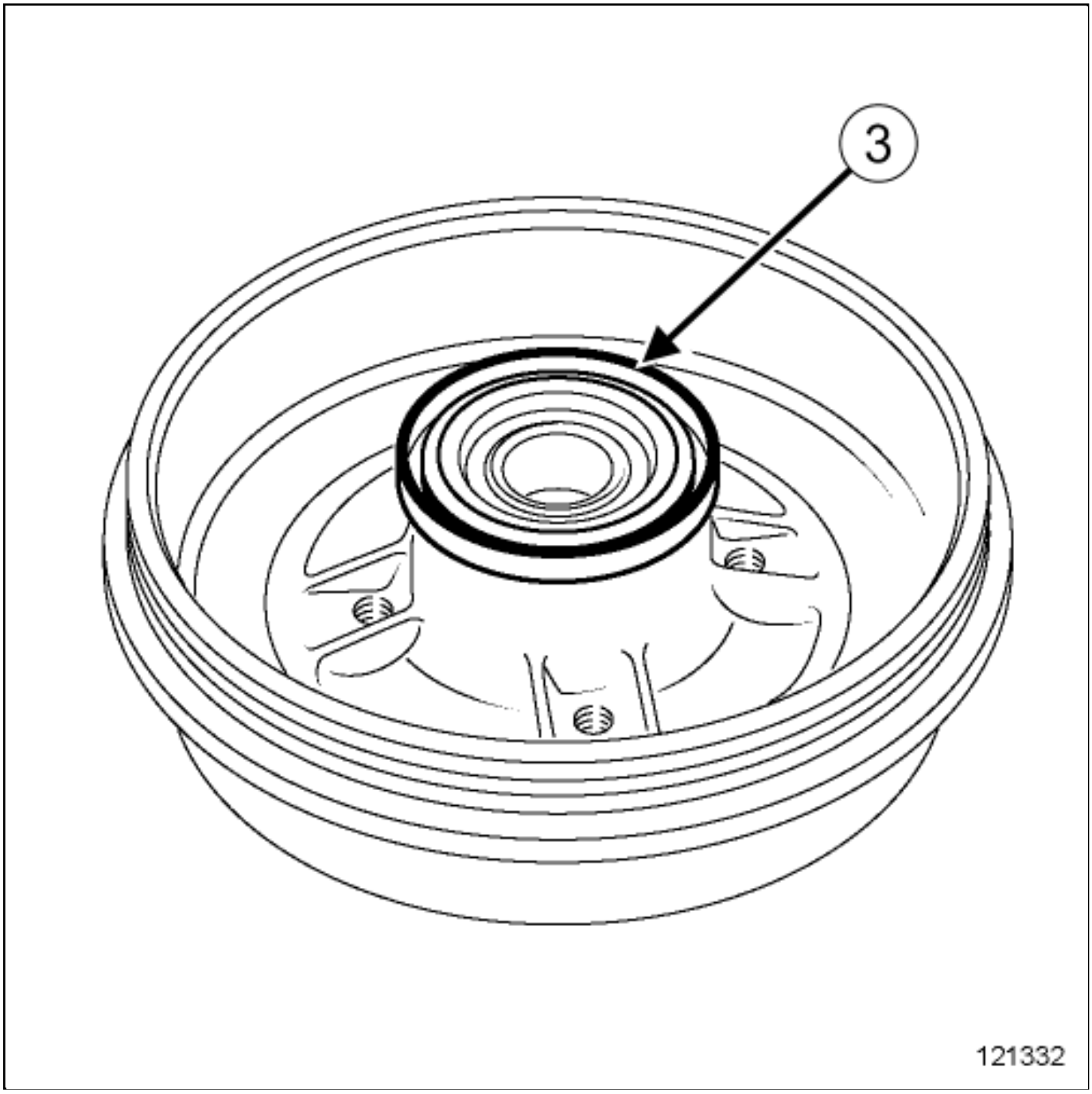
- Remove the bearing(2) using a tube with an outer diameter of 49 mmand a press applying pressure to the bearing internal bush.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use SURFACE CLEANERVehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean:
  - the internal and external surfaces of the new bearing in contact with the drum and the stub axle,
  - the drum surfaces in contact with the bearing,
  - the stub-axle surfaces in contact with the bearing.

- Always check the condition of the following components:
  - bore of the drum in contact with the bearing,
  - the stub axle.



Note:

Take care not to press the ABS target(3) when refitting the bearing.

- Replace all faulty components.

2. REFITTING OPERATION FOR PART CONCERNED

CAUTION

Do not press the bearing's internal bush so as to avoid damaging the bearing (very high shrink-fitting force).

Note:

Check that the tube is pressing against the outer bush of the bearing.

1- BEARING, DIAMETER 52 MM

- Refit the bearing so it rests on the shoulder using a tube with an outer diameter of 50 mmand a press.

- Refit the circlip(1) .

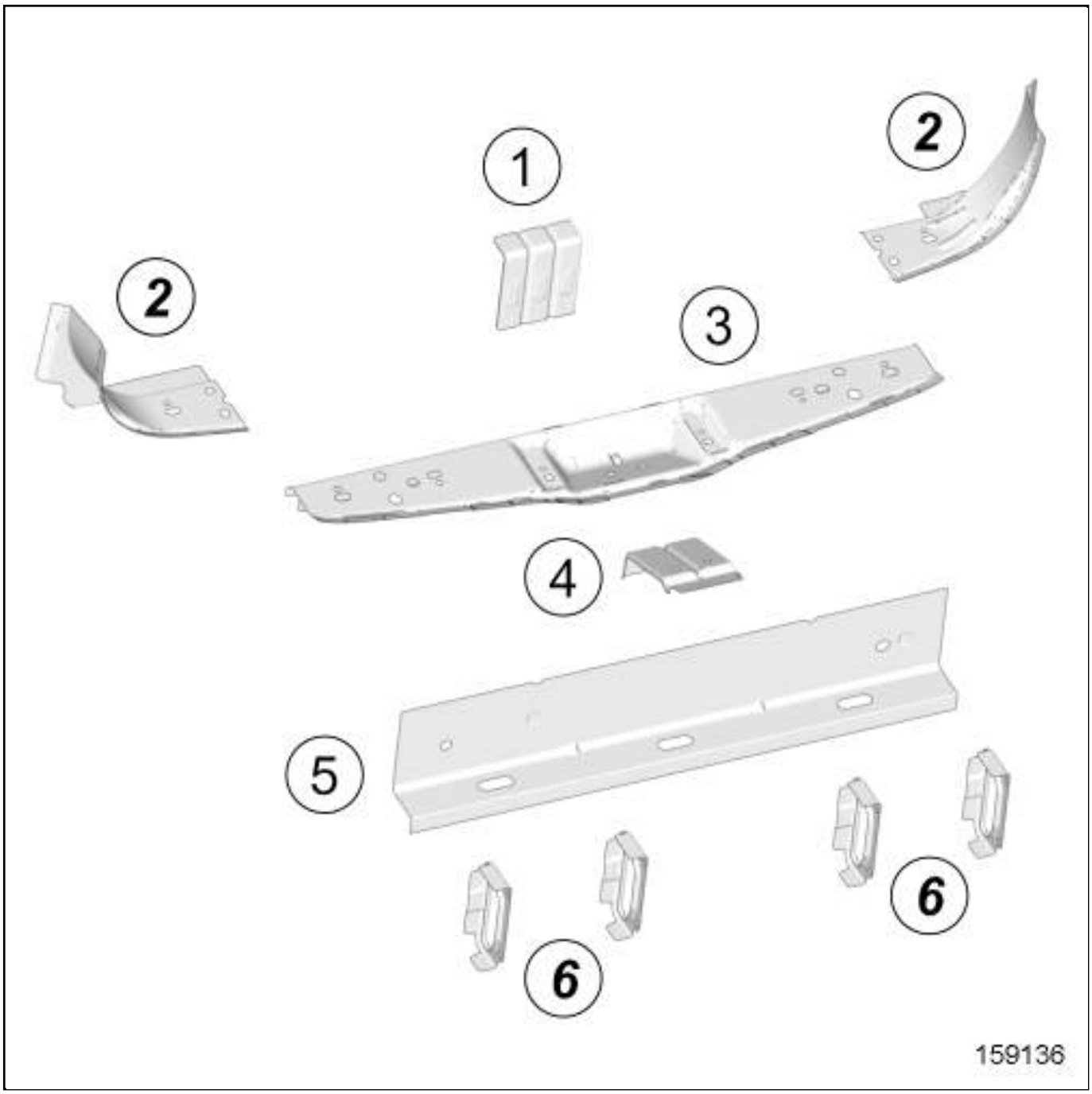
3. FINAL OPERATION

- Proceed in the reverse order to removal.

REAR END PANEL LINING: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Rear floor centre mounting bridge piece	1.2
(2)	Rear end panel lining, side section	0.8
(3)	Rear end panel lining, upper section	0.8
(4)	Boot lid striker panel reinforcement	1.5
(5)	Rear floor rear cross member	1.2
(6)	Rear floor rear cross member reinforcement	1.2

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

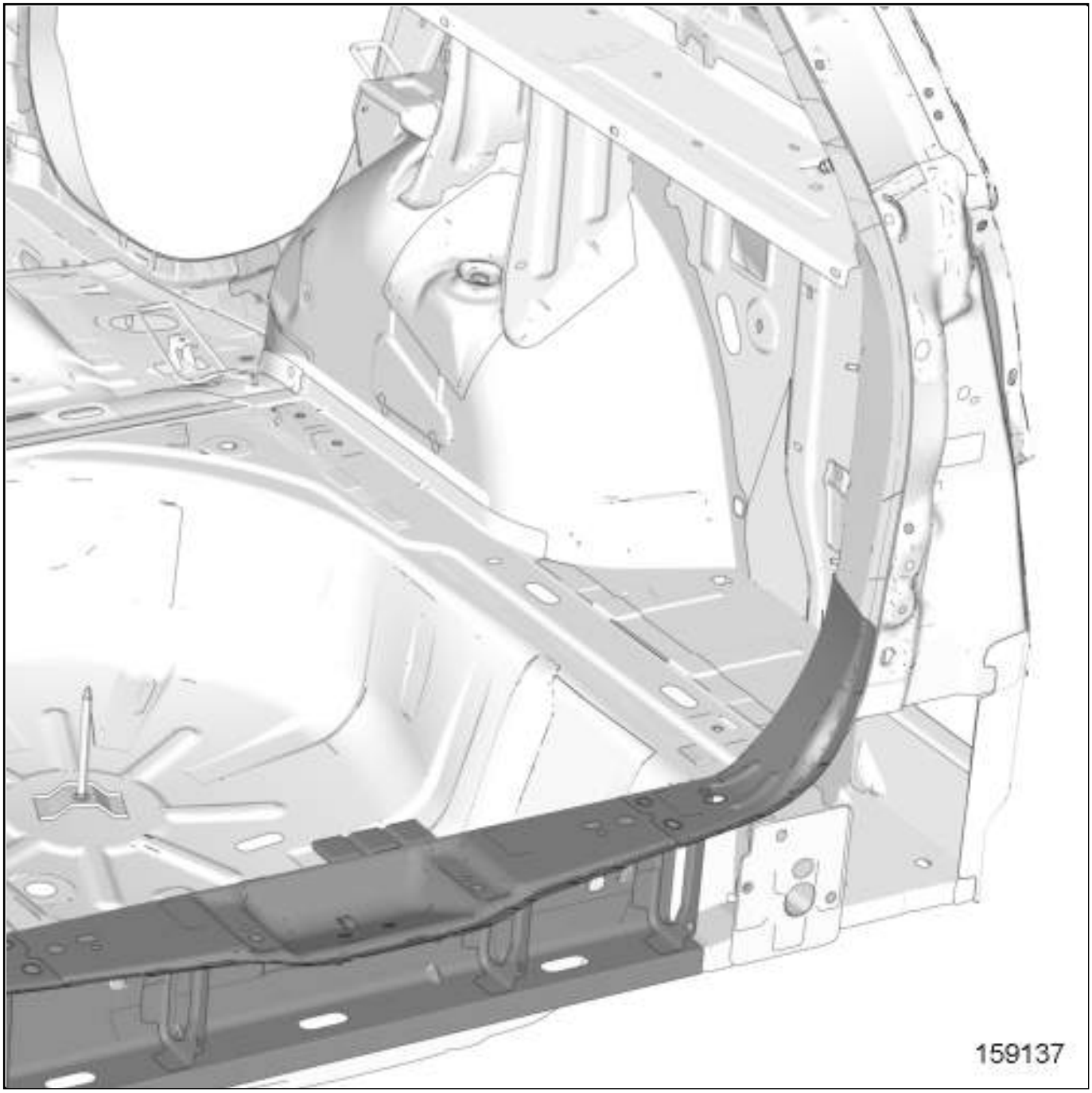
Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld areaEarths on body: List and location of components .

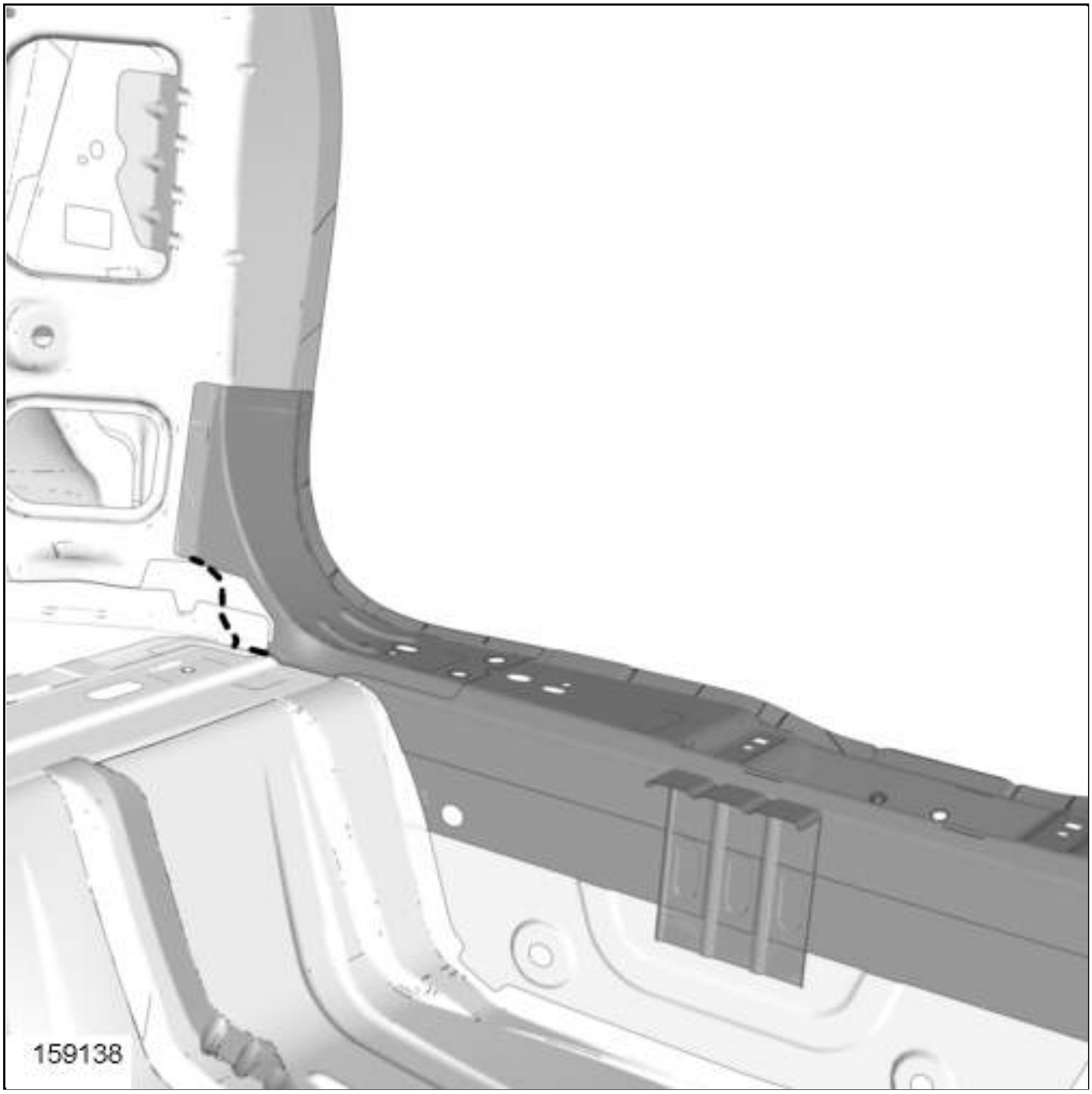
1- COMPLETE REPLACEMENT

1)PART IN POSITION

EXTERNAL VIEW



INTERNAL VIEW


159138

REAR END PANEL: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

No.	Description	Thickness (mm)
(1)	Rear end panel	0.8

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

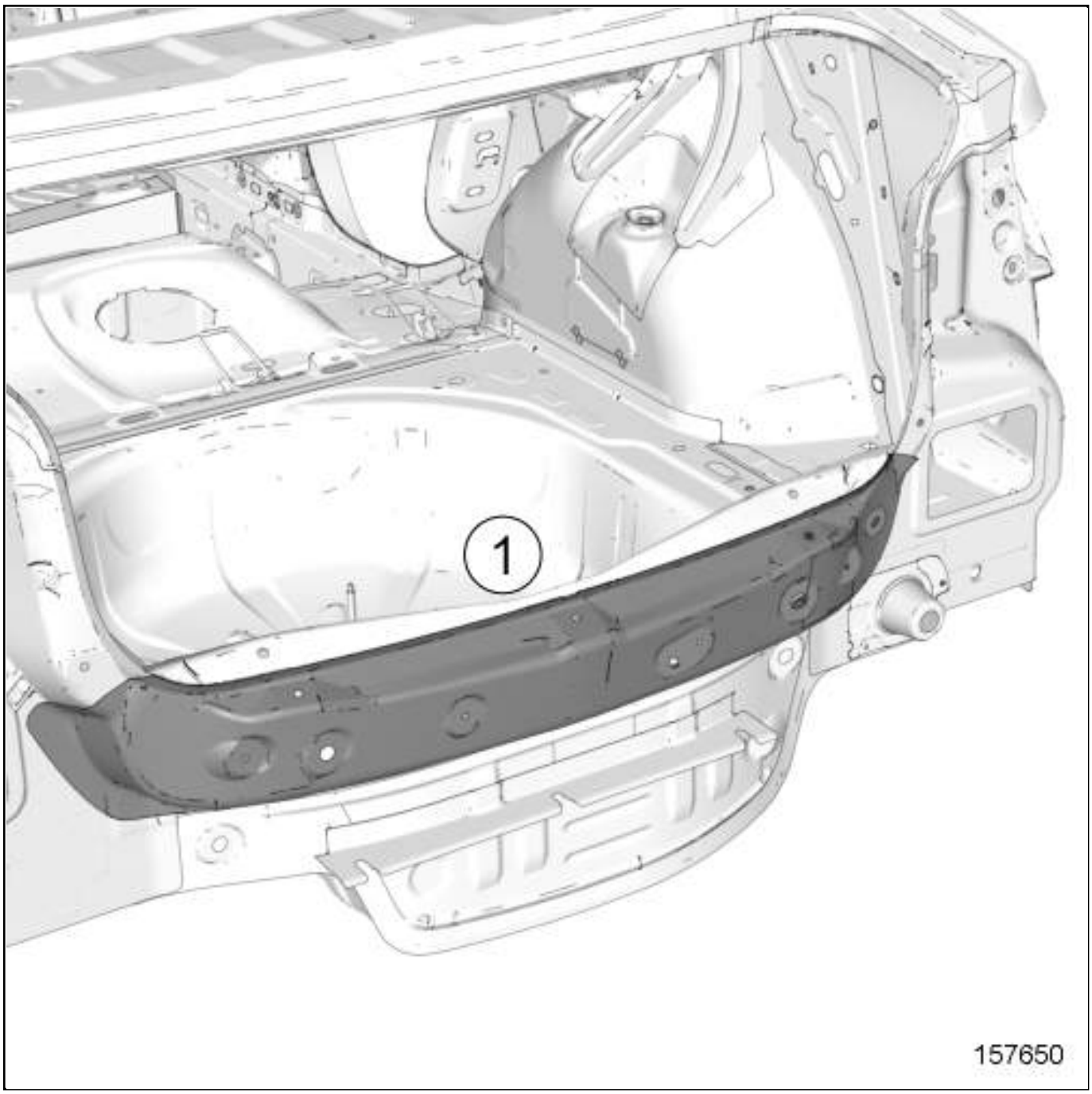
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT

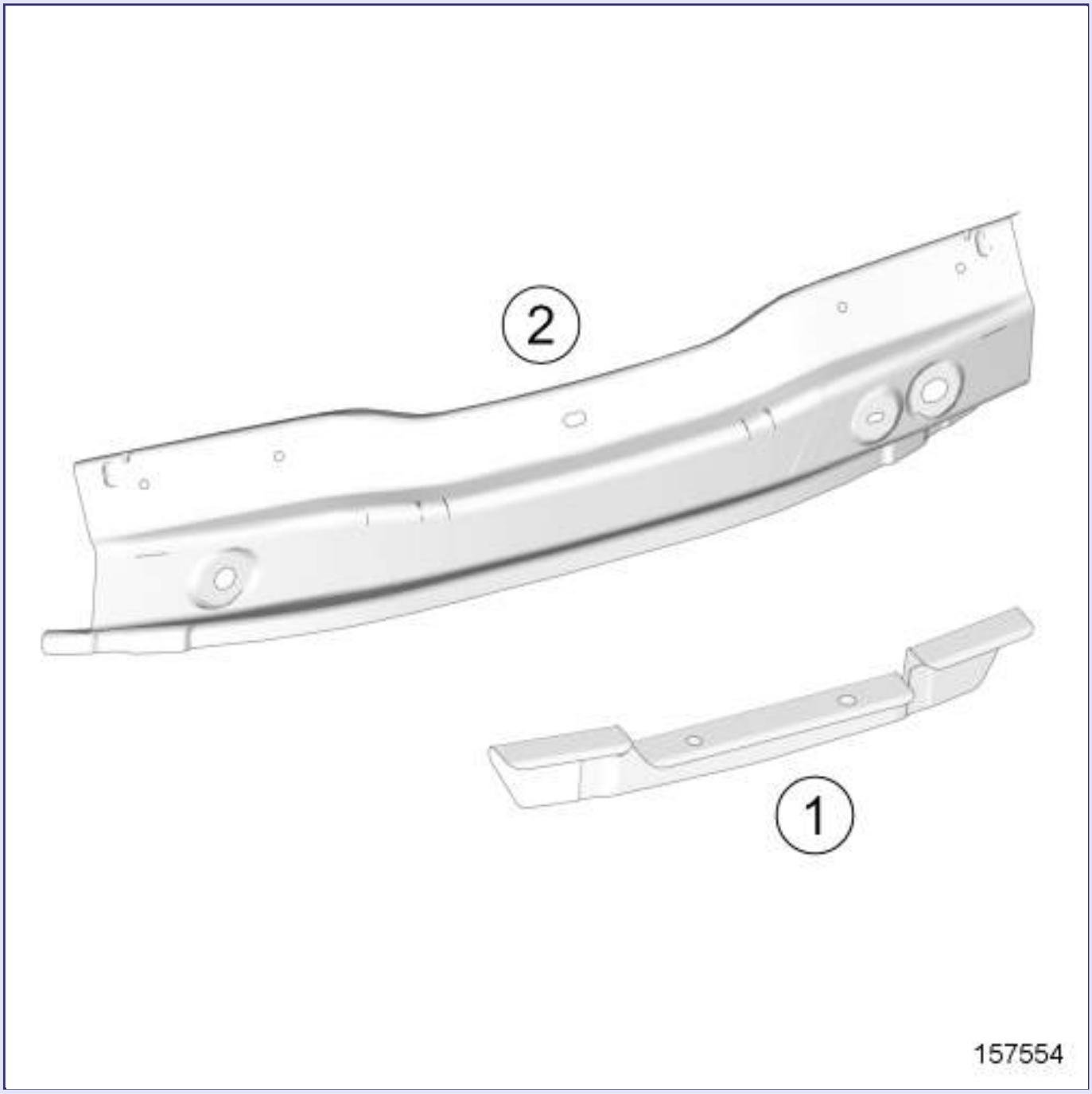
1)PART IN POSITION


1
157650

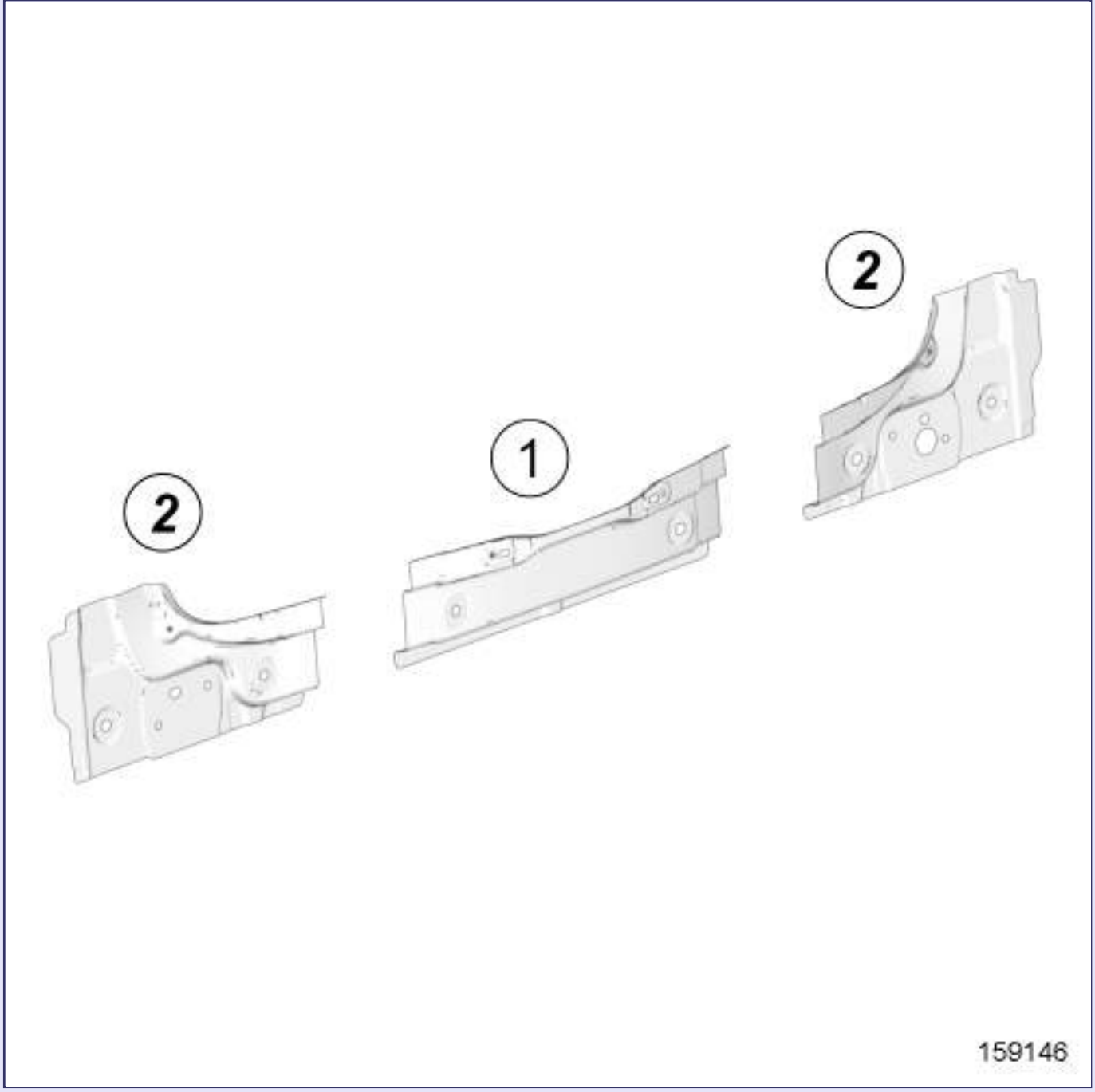
REAR END PANEL: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Rear bumper central mounting support	1.0
(2)	Rear end panel	0.8



No.	Description	Thickness (mm)
(1)	Rear end panel, centre section	1.0
(2)	Rear end panel, side section	1.3

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

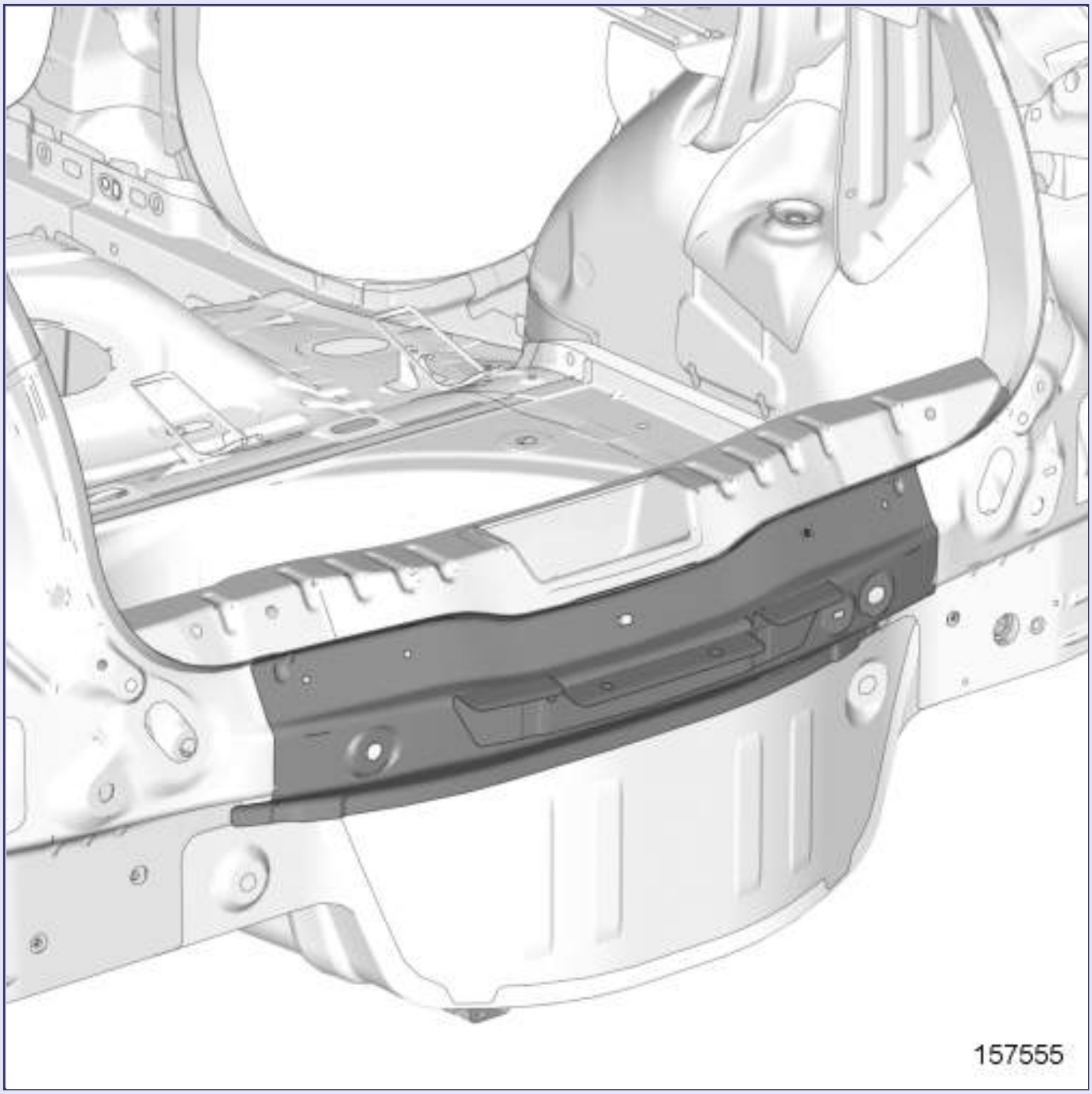
To avoid damaging the vehicle's electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

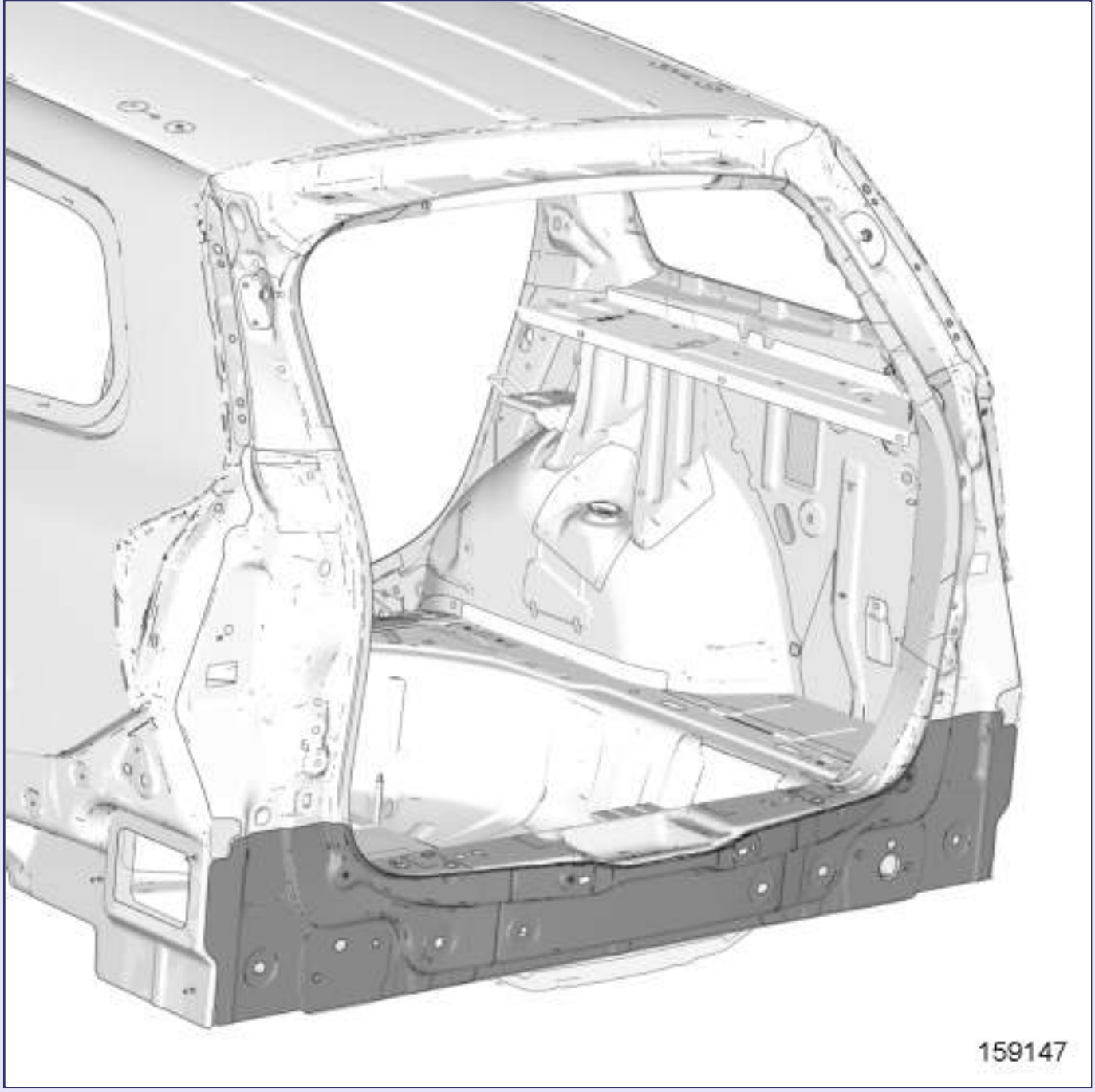
Locate the earths located near to the weld areaEarths on body: List and location of components .

1- COMPLETE REPLACEMENT

1)PART IN POSITION



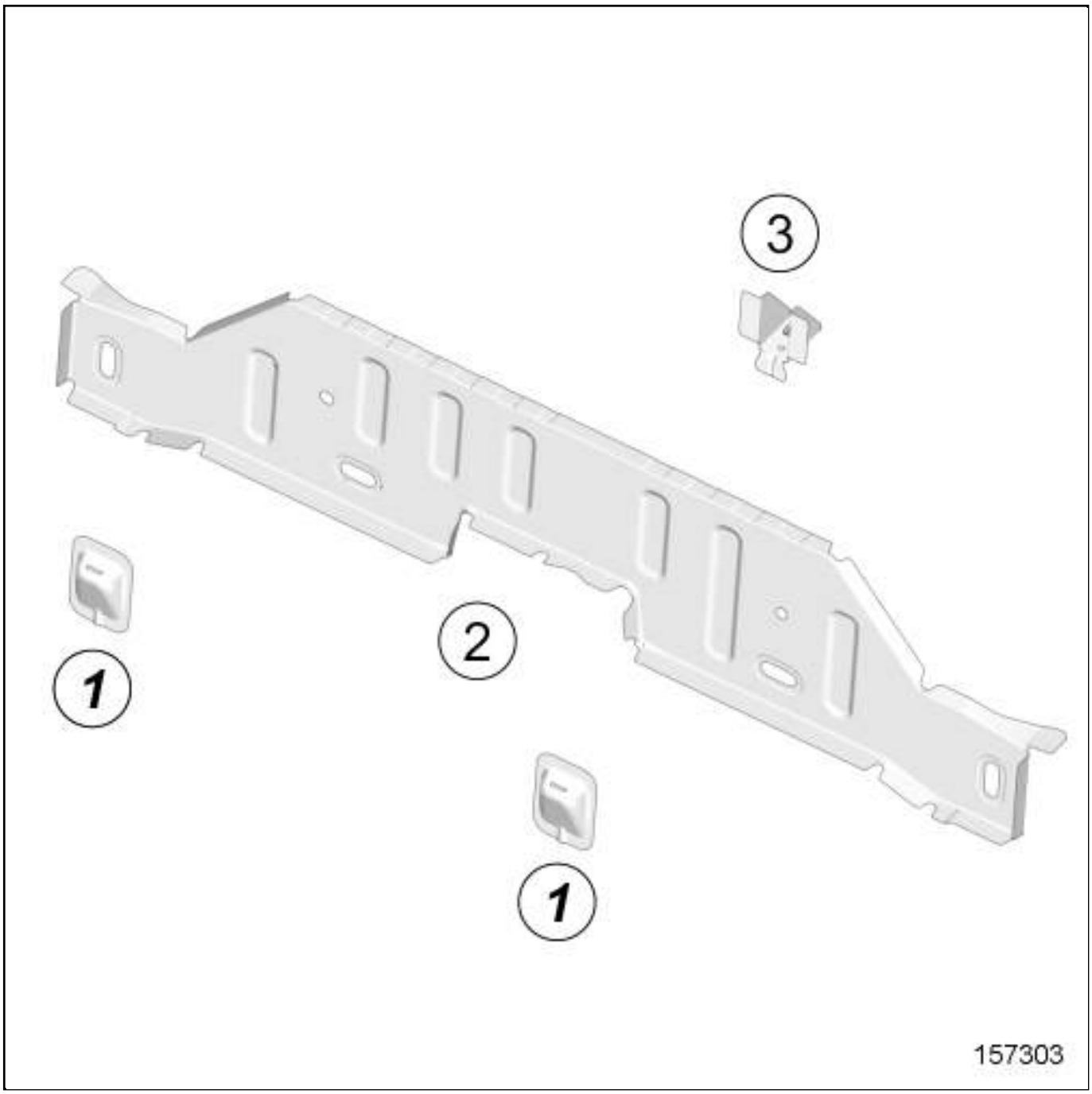
K52(K52)


159147

REAR FLOOR FRONT CROSS MEMBER: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

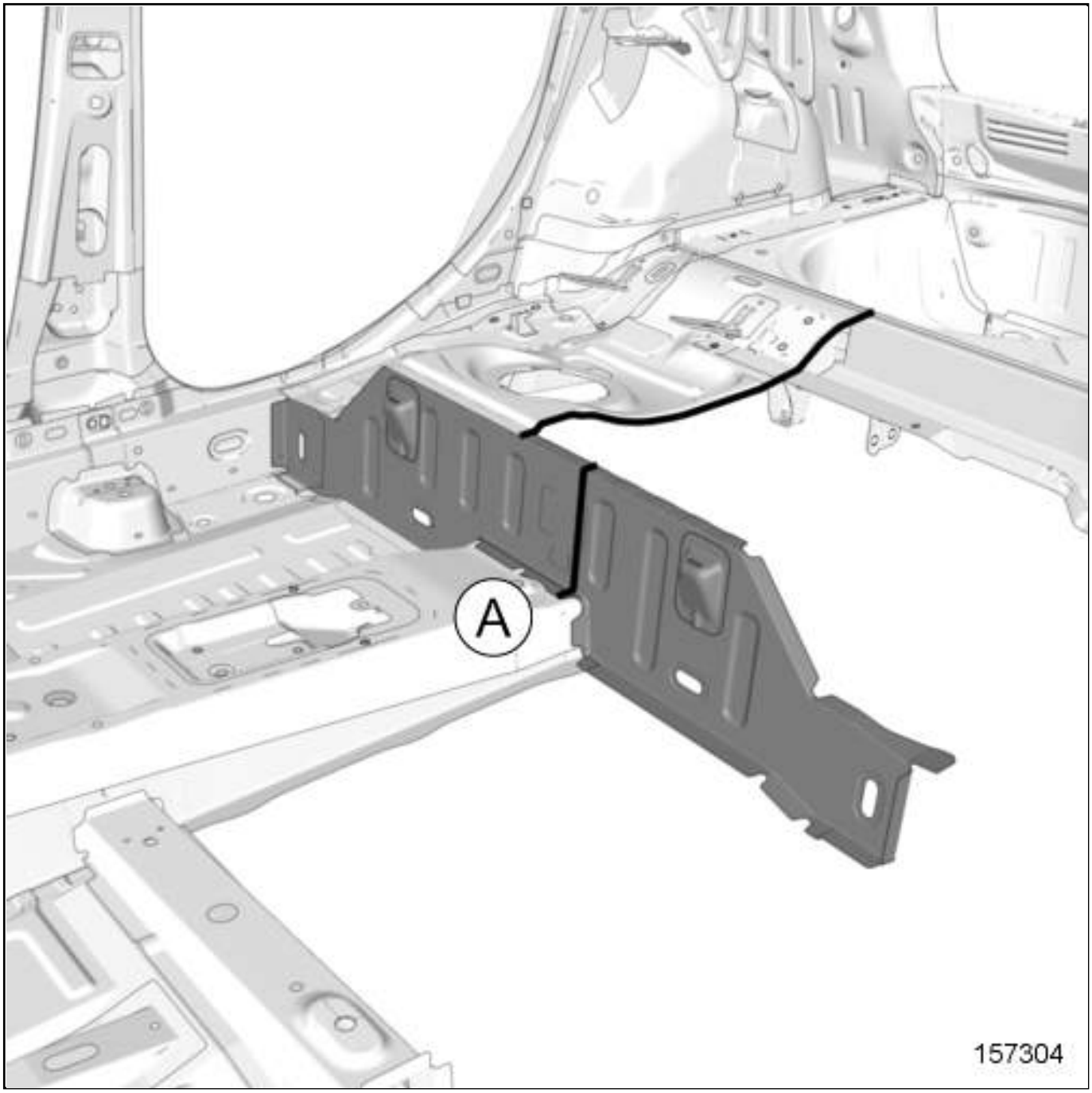


No.	Description	Thickness (mm)
(1)	Attachment support for second row seat	0.95
(2)	Rear floor front cross member	1.2
(3)	Front support reinforcement for retaining the fuel tank on the body	1.5

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- partial replacement along cut A.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

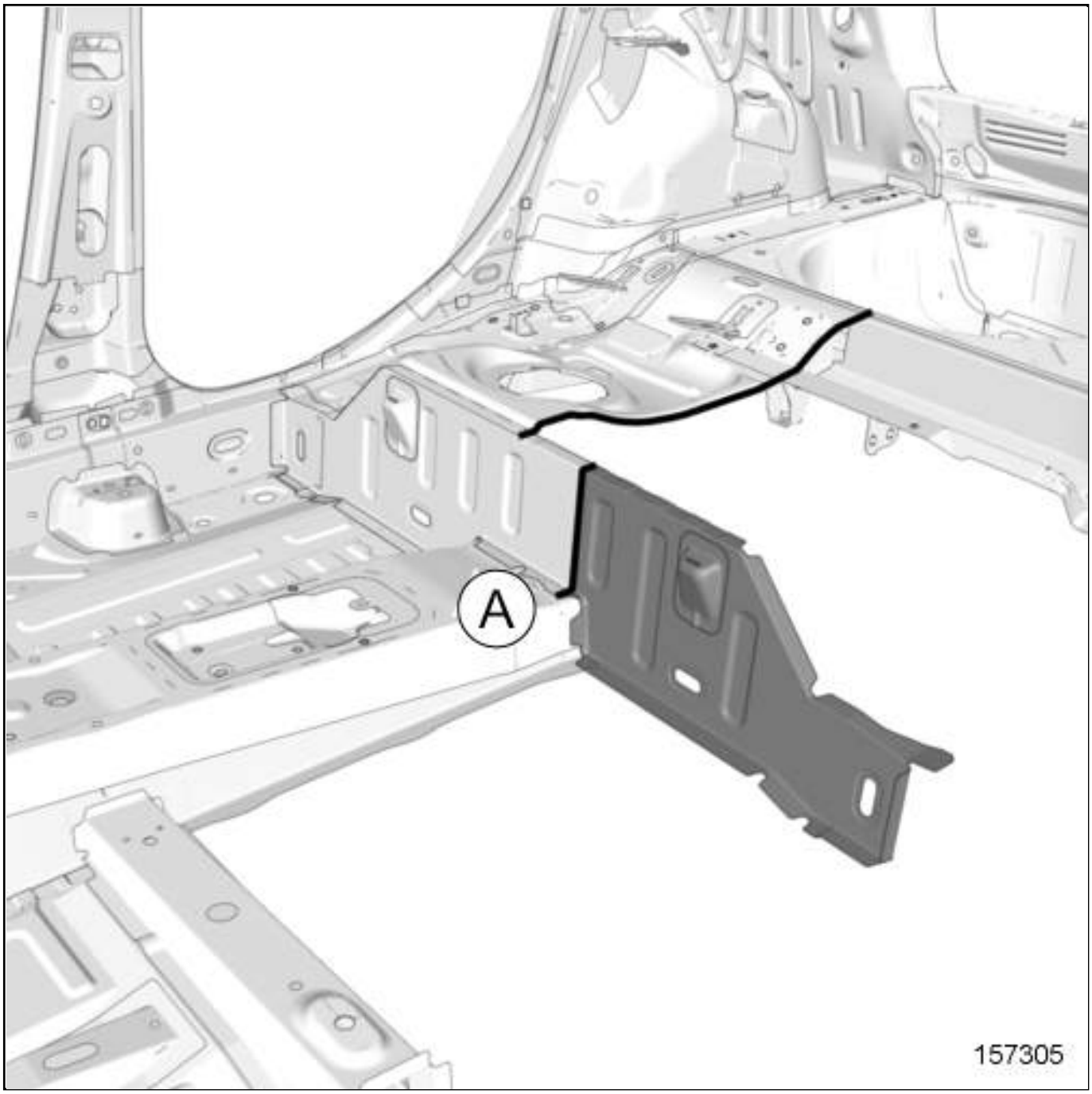
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

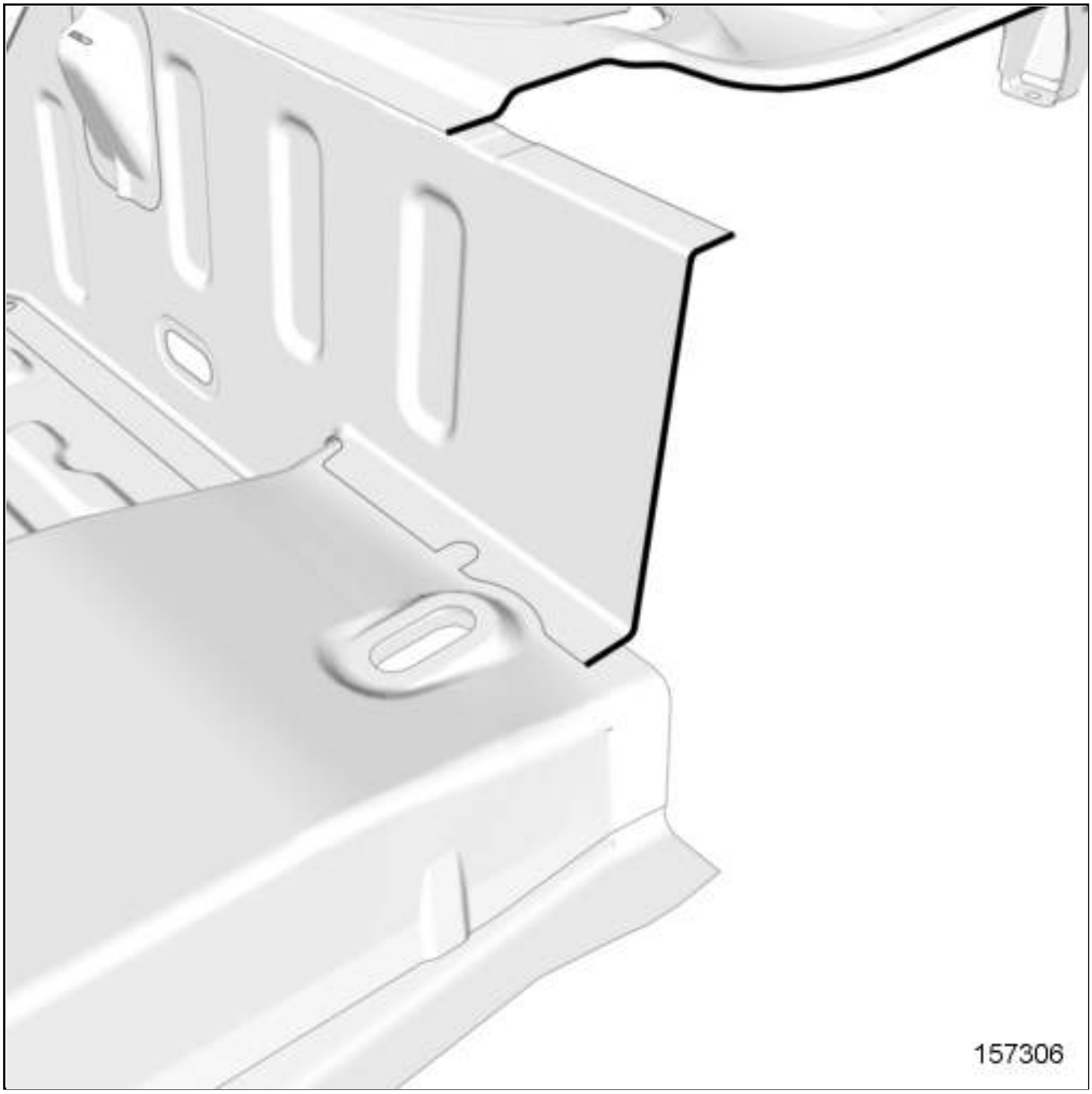
Locate the earths located near to the weld area Earths on body: List and location of components .

1- PARTIAL REPLACEMENT ALONG CUT A

1)PART IN POSITION



DETAILED VIEW A


157306

REAR FLOOR, FRONT SECTION: REPLACEMENT

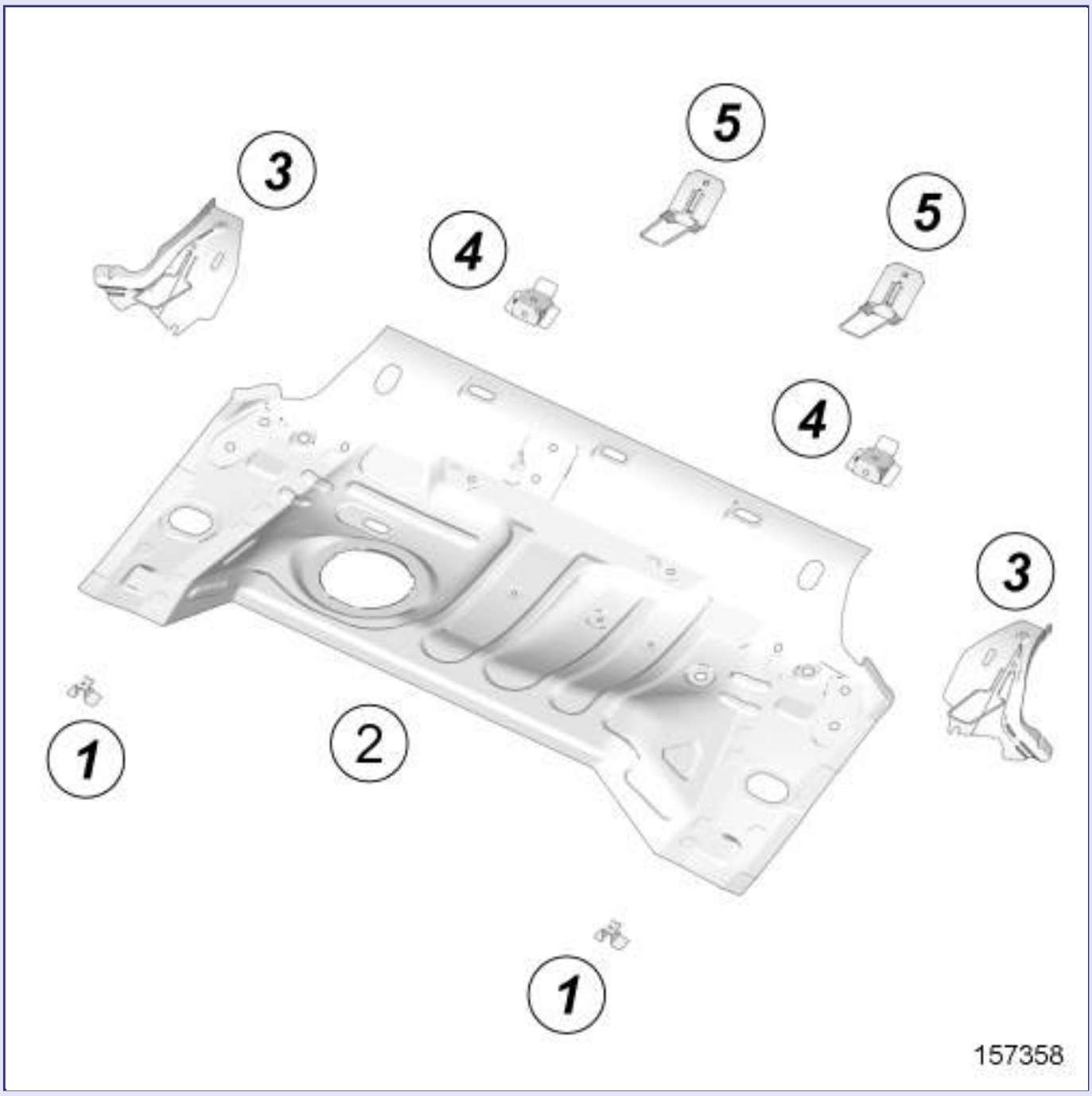
Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

No.	Description	Thickness (mm)
(1)	Impact retaining component under second row seat	1.95
(2)	Rear floor, front section	0.65

(3)	Rear floor, front section side reinforcement	1.8
(4)	Child seat mounting reinforcement	1.8

L52(L52)



No.	Description	Thickness (mm)

(1)	Impact retaining component under second row seat	1.95
(2)	Rear floor, front section	0.65
(3)	Rear floor, front section side reinforcement	1.8
(4)	Rear seat seatback mounting support	0.95
(5)	Child seat mounting reinforcement	1.8

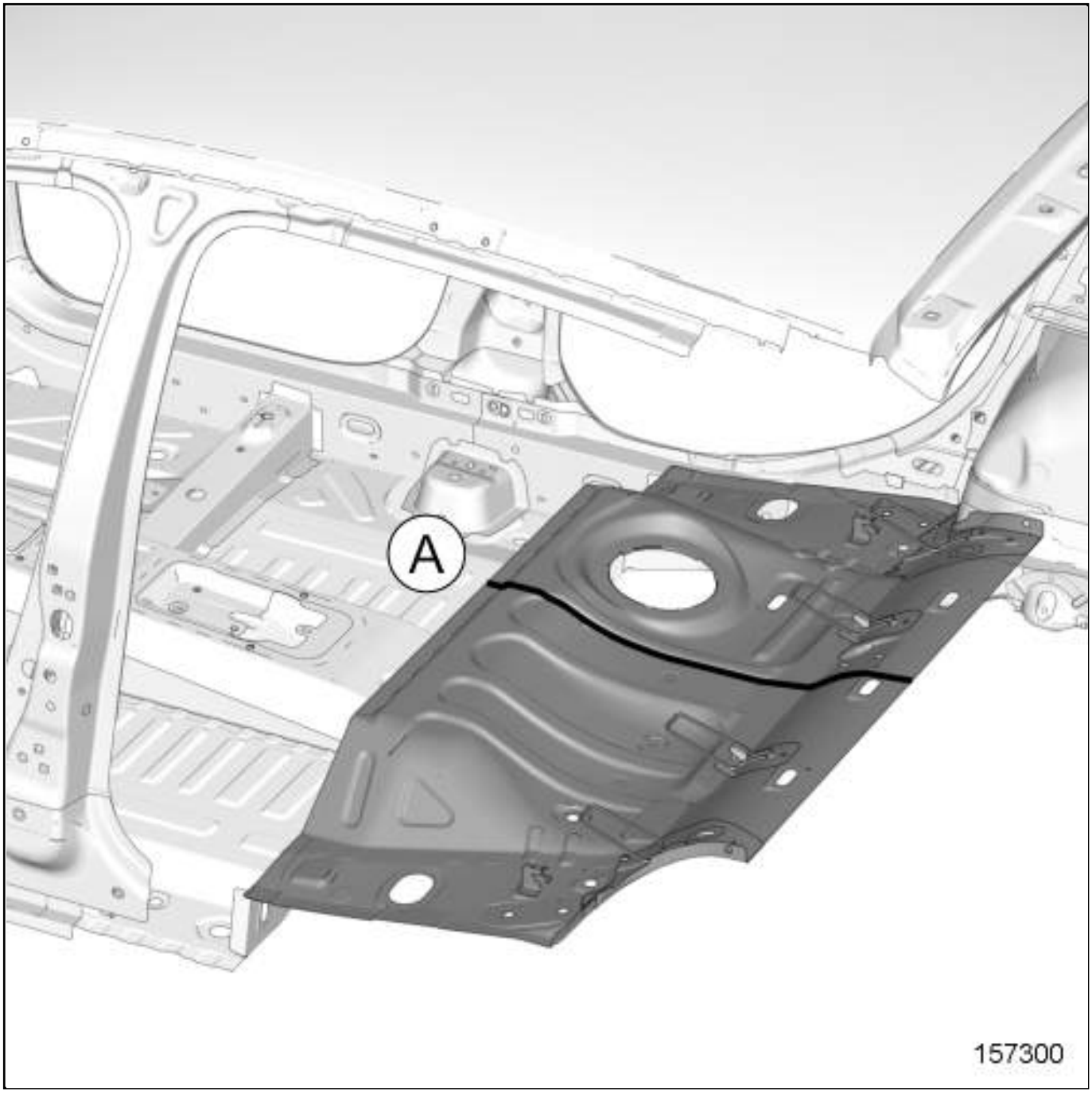
K52(K52)

No.	Description	Thickness (mm)
(1)	Impact retaining component under second row seat	1.95
(2)	Rear floor, front section	0.65
(3)	Rear floor, front section side reinforcement	1.8
(4)	Child seat mounting reinforcement	1.8

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement along cut A.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

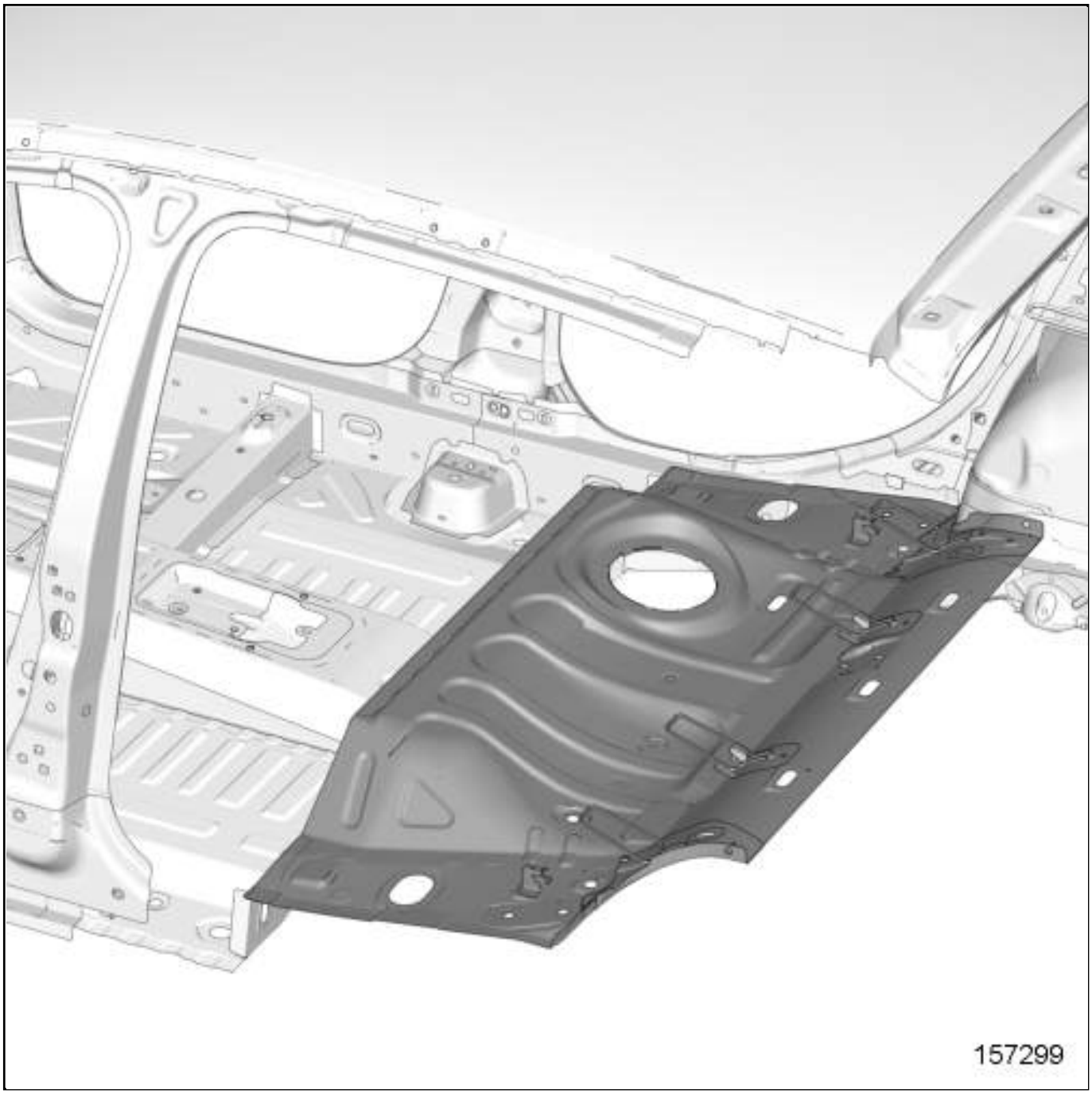
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

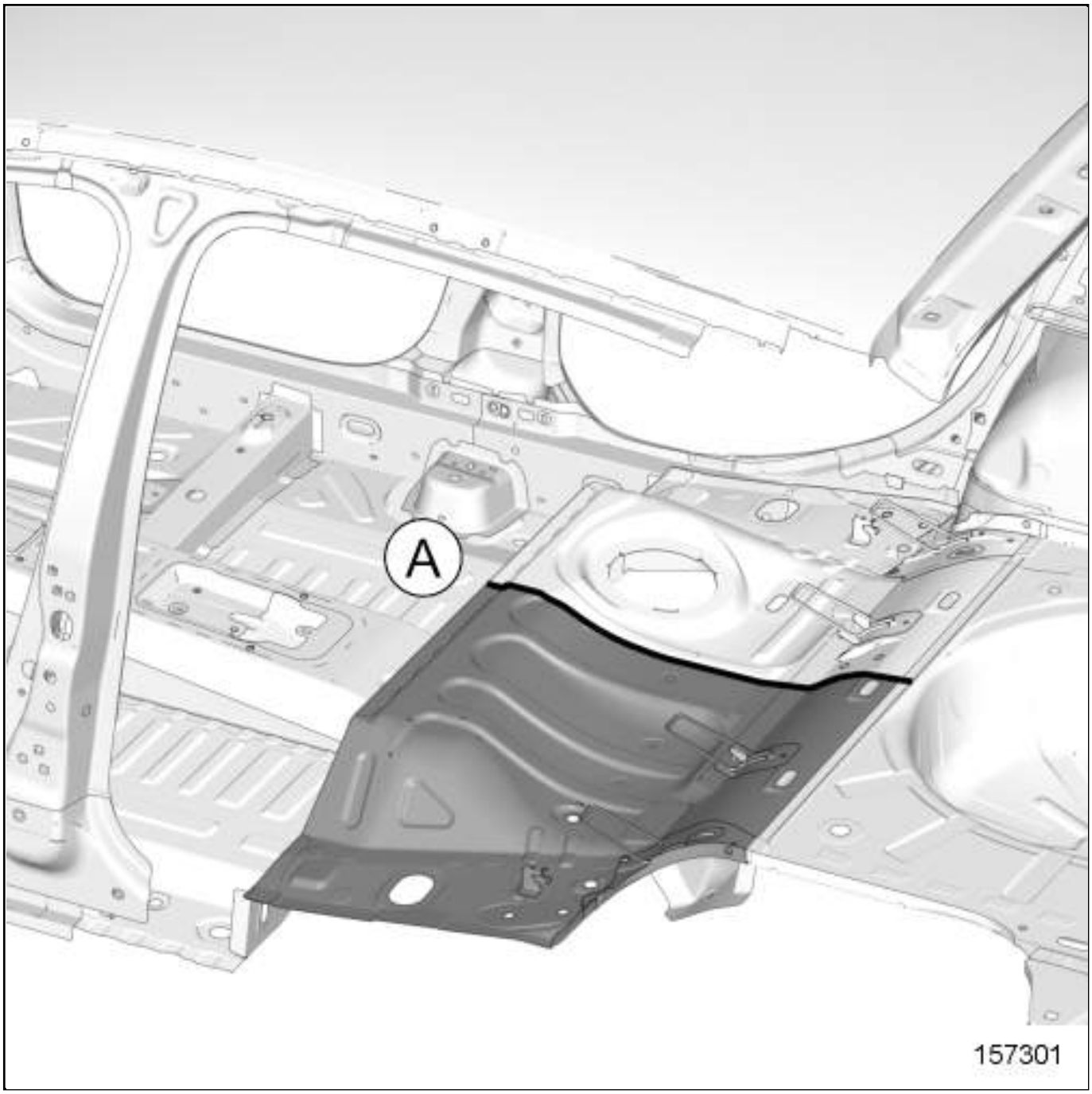
1- COMPLETE REPLACEMENT

1)PART IN POSITION

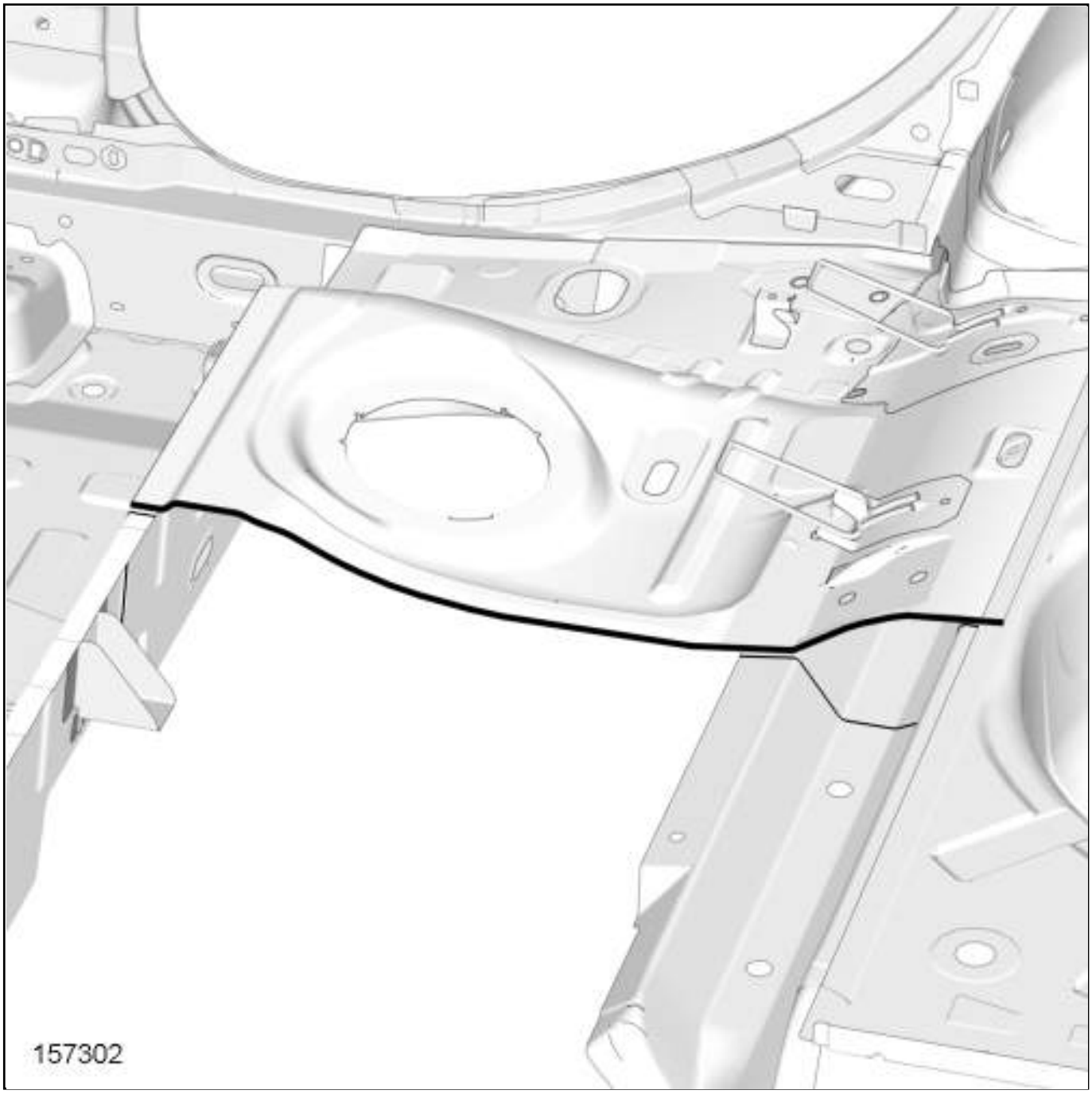


2- PARTIAL REPLACEMENT ALONG CUT A

1)PART IN POSITION



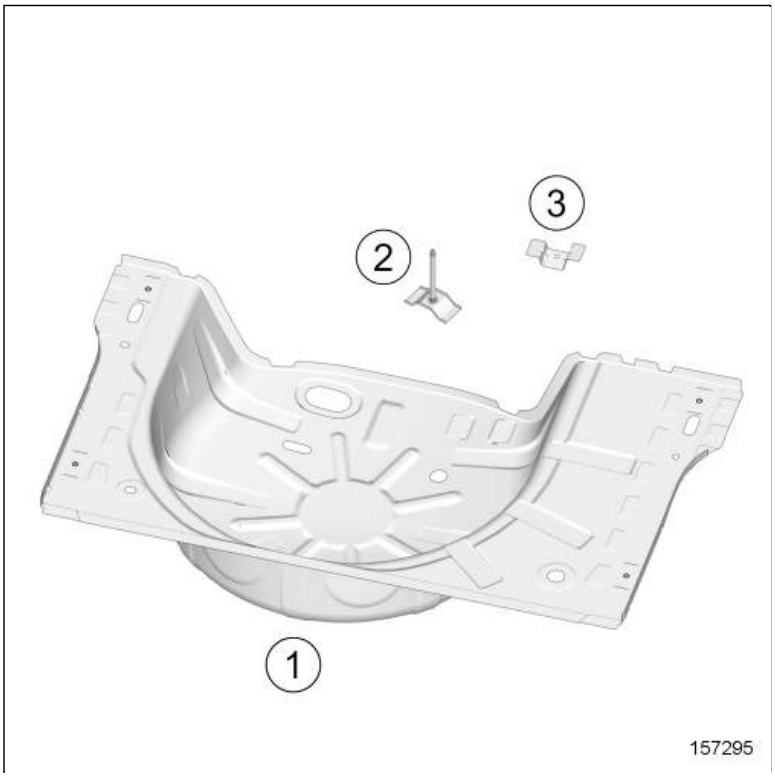
DETAILED VIEW A


157302

REAR FLOOR, REAR SECTION: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

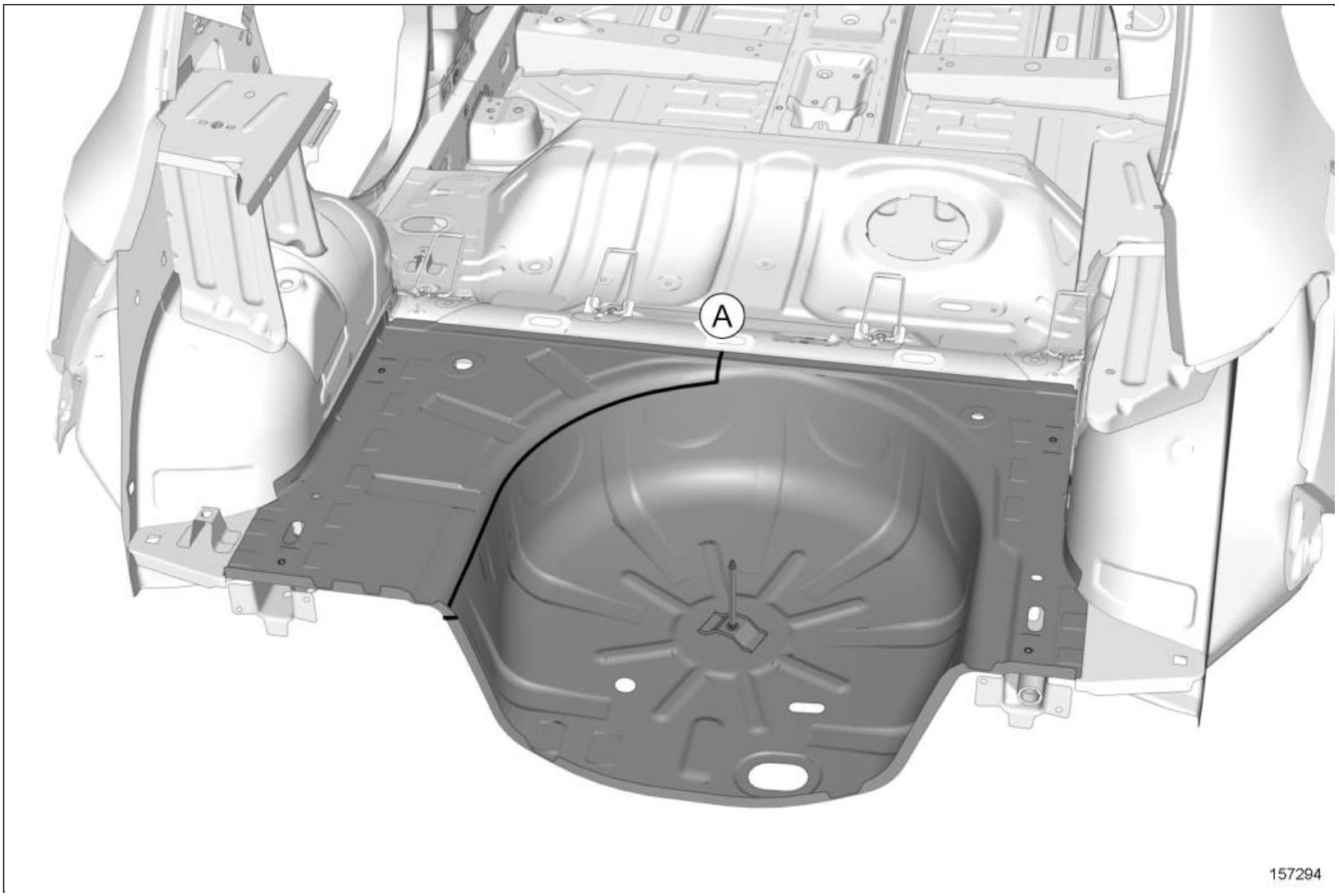


No.	Description	Thickness (mm)
(1)	Rear floor, rear section	0.7
(2)	Emergency spare wheel compartment rear reinforcement	1.2
(3)	Rear bumper centre mounting support	1.2

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement along cut A.



CAUTION
If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

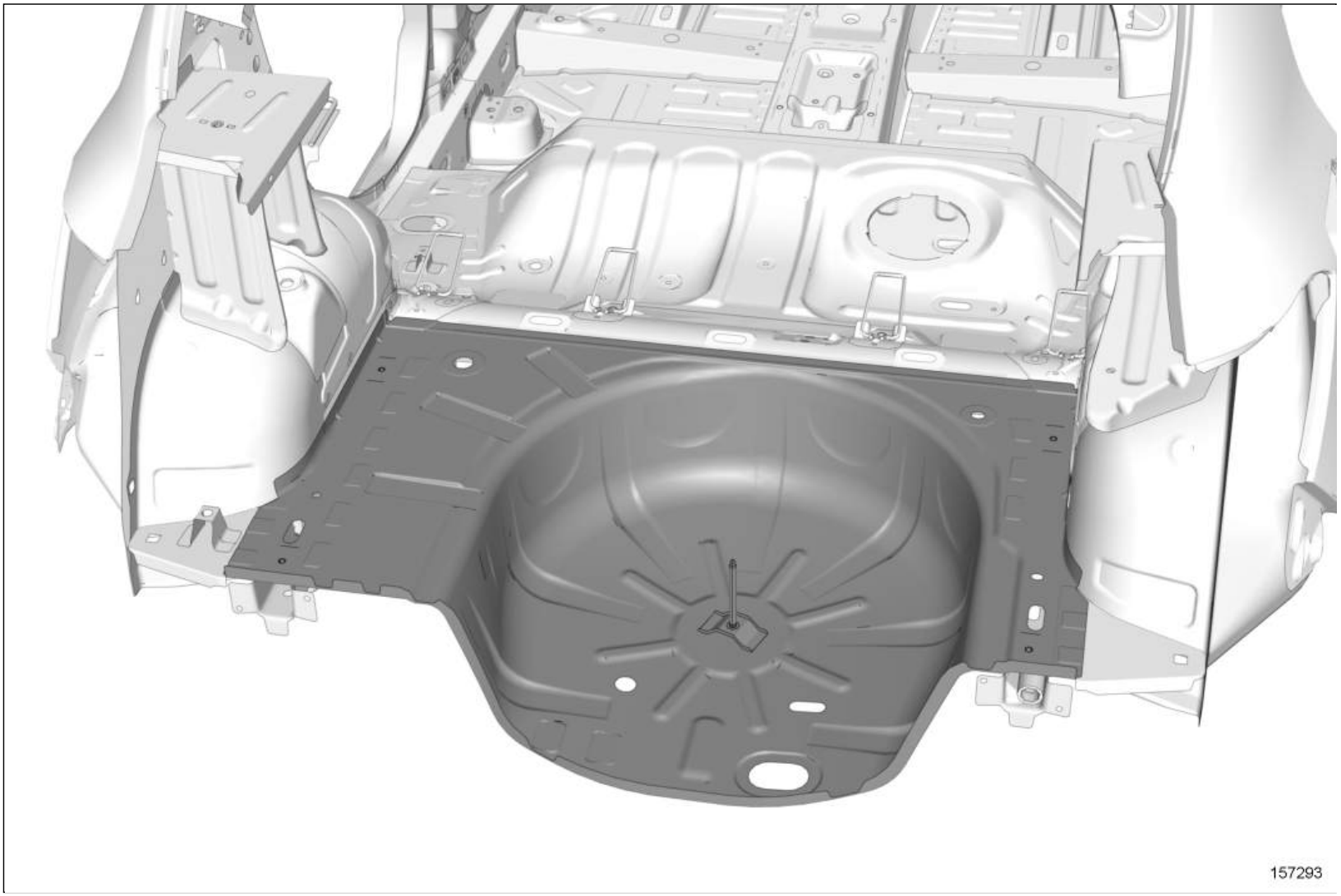
CAUTION
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

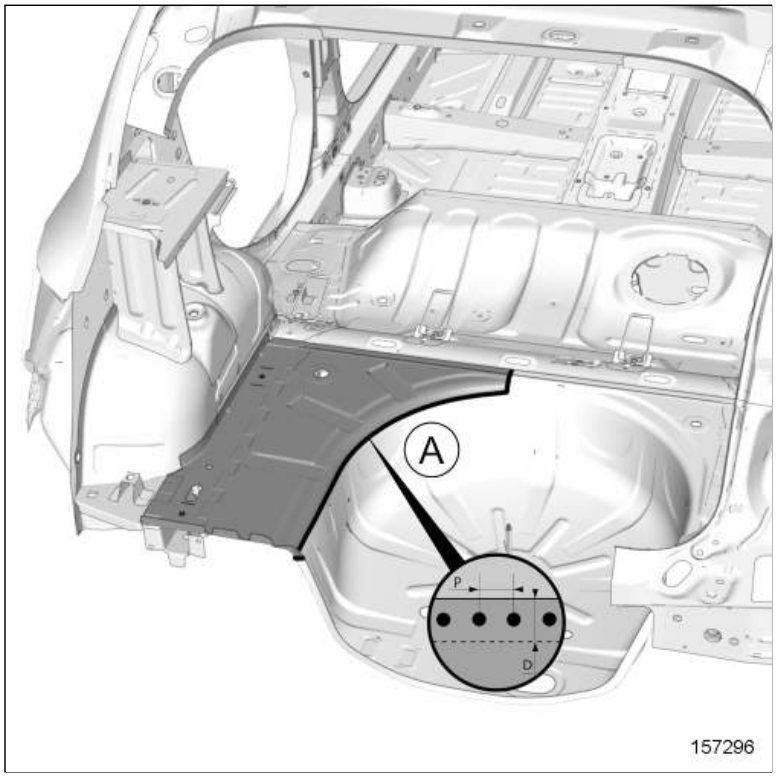
1- COMPLETE REPLACEMENT

1)PART IN POSITION



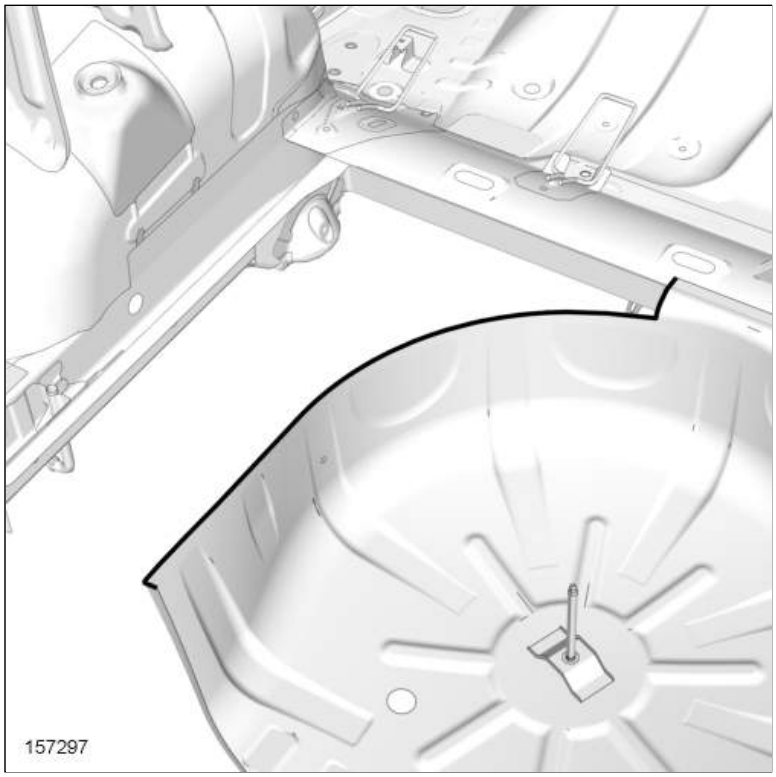
2- PARTIAL REPLACEMENT ALONG CUT A

1)PART IN POSITION



Make a superimposed connection at(A) Partial replacement connections by overlapping: Description .

DETAILED VIEW A

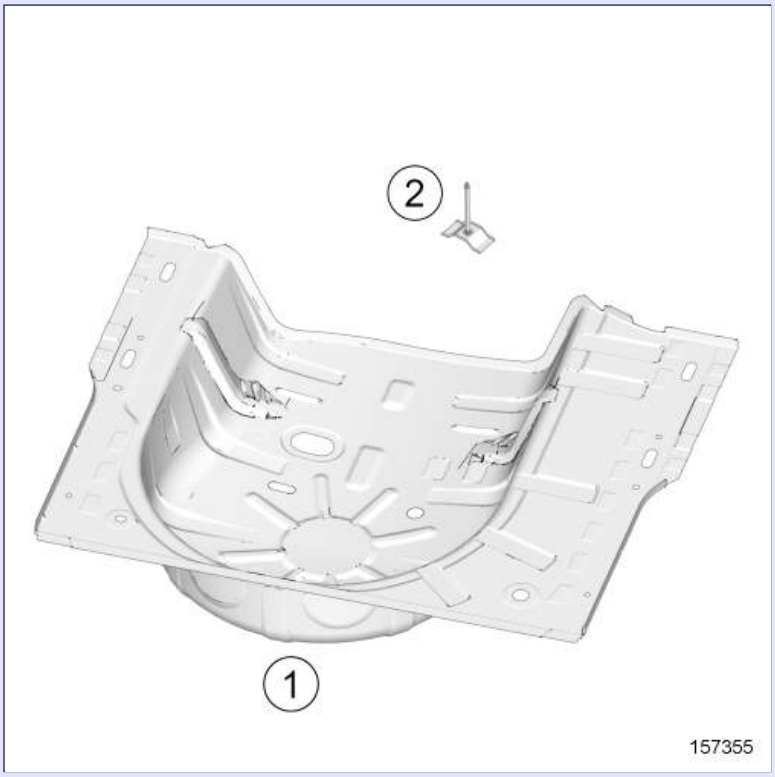


REAR FLOOR, REAR SECTION: REPLACEMENT

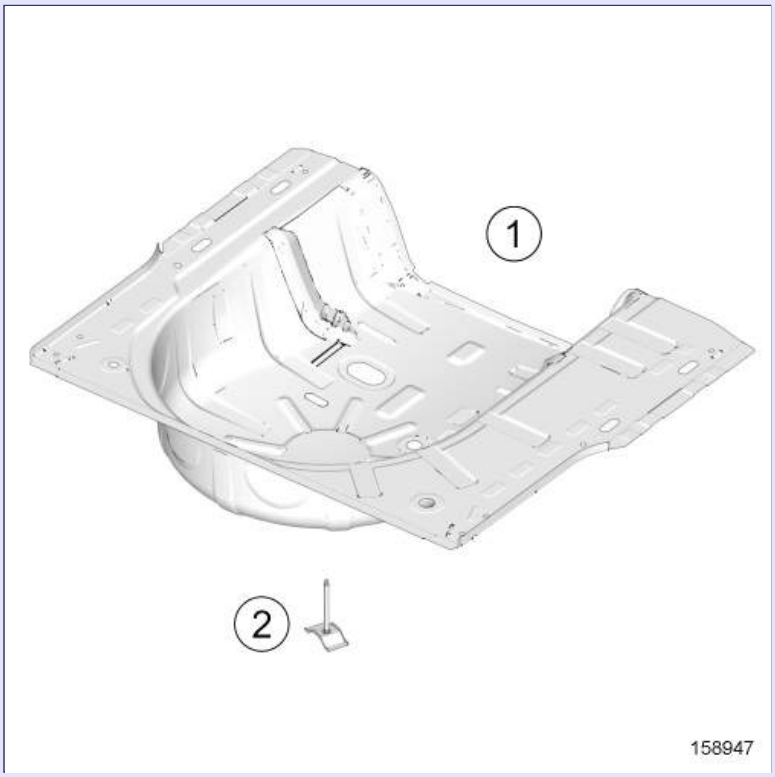
Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

L52(L52)



K52(K52)

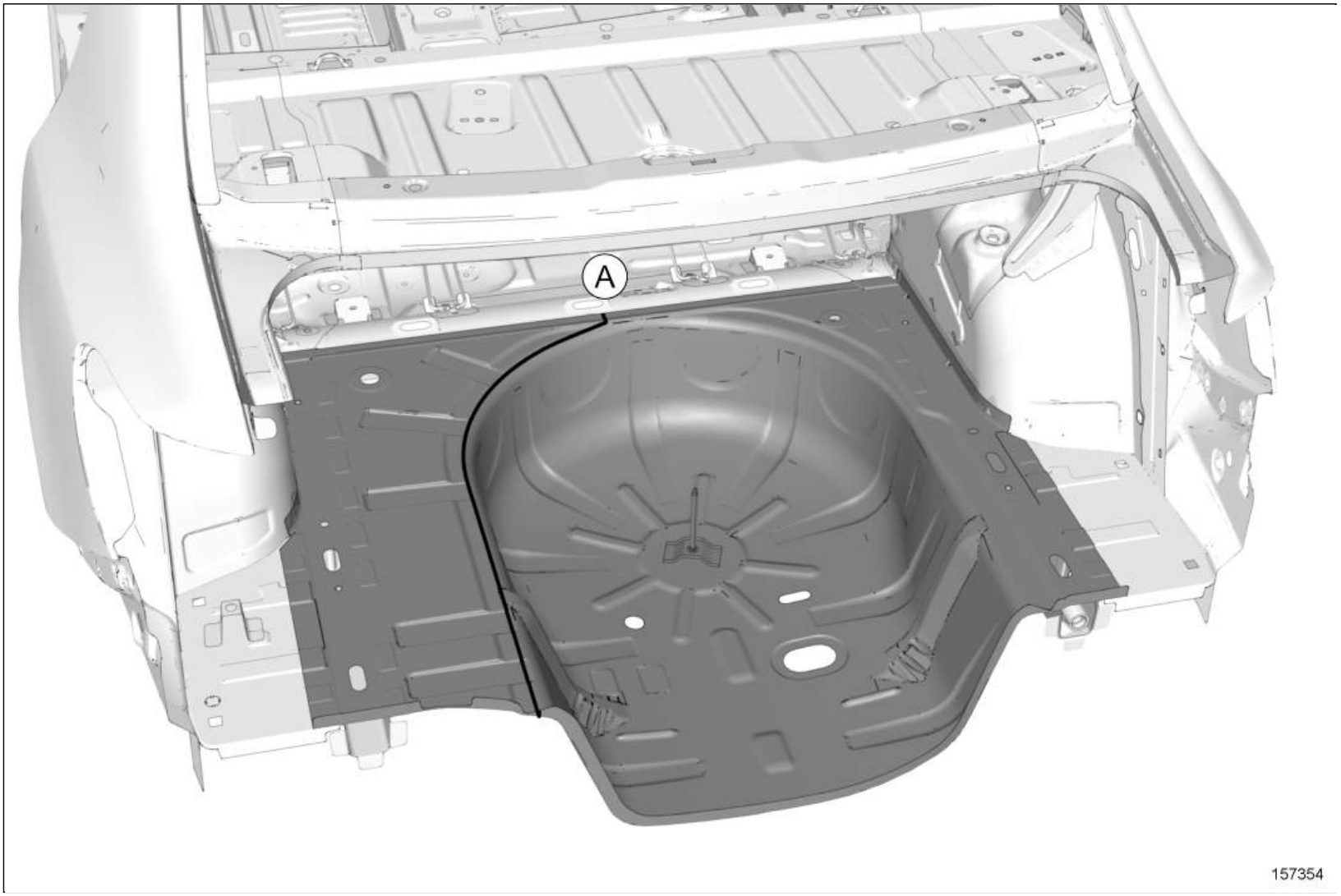


No.	Description	Thickness (mm)
(1)	Rear floor, rear section	0.7
(2)	Emergency spare wheel compartment rear reinforcement	1.2

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement along cut A.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

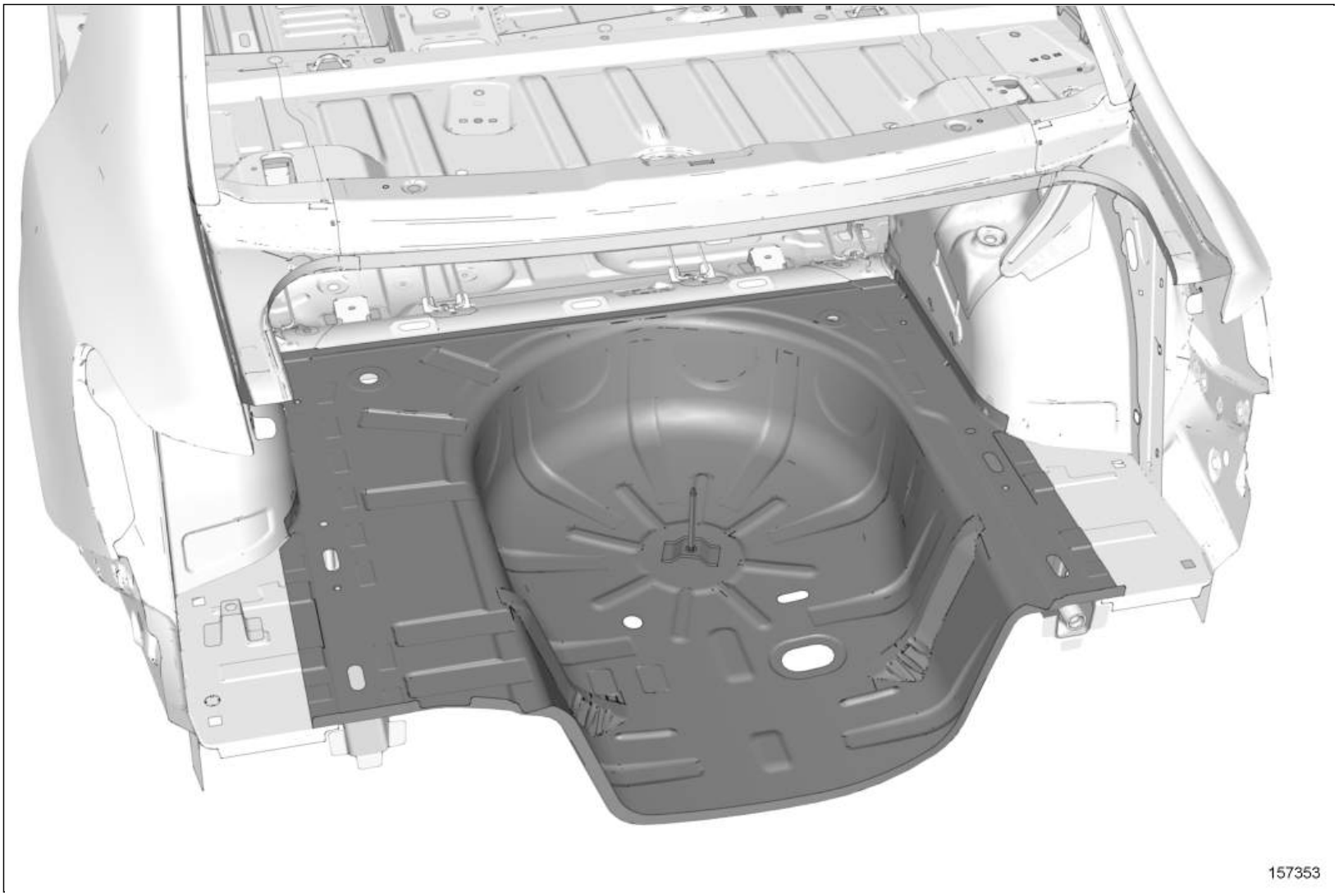
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT

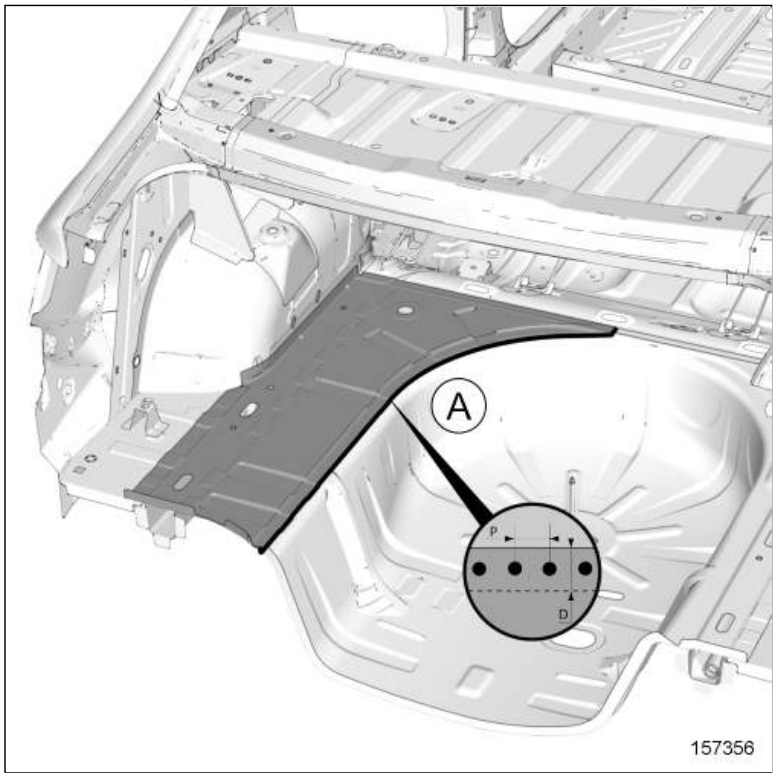
1)PART IN POSITION



157353

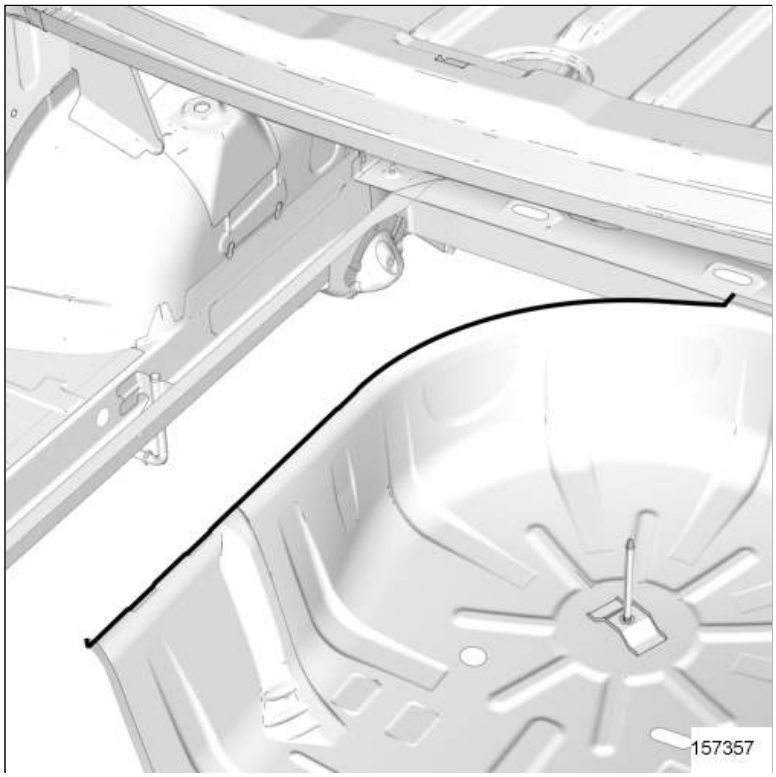
2- PARTIAL REPLACEMENT ALONG CUT A

1)PART IN POSITION



Make a superimposed connection at(A) Partial replacement connections by overlapping: Description .

DETAILED VIEW A



REAR HUB CARRIER ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 33A, Rear axle components, Rear axle components: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

B52(B52) AND (L52)

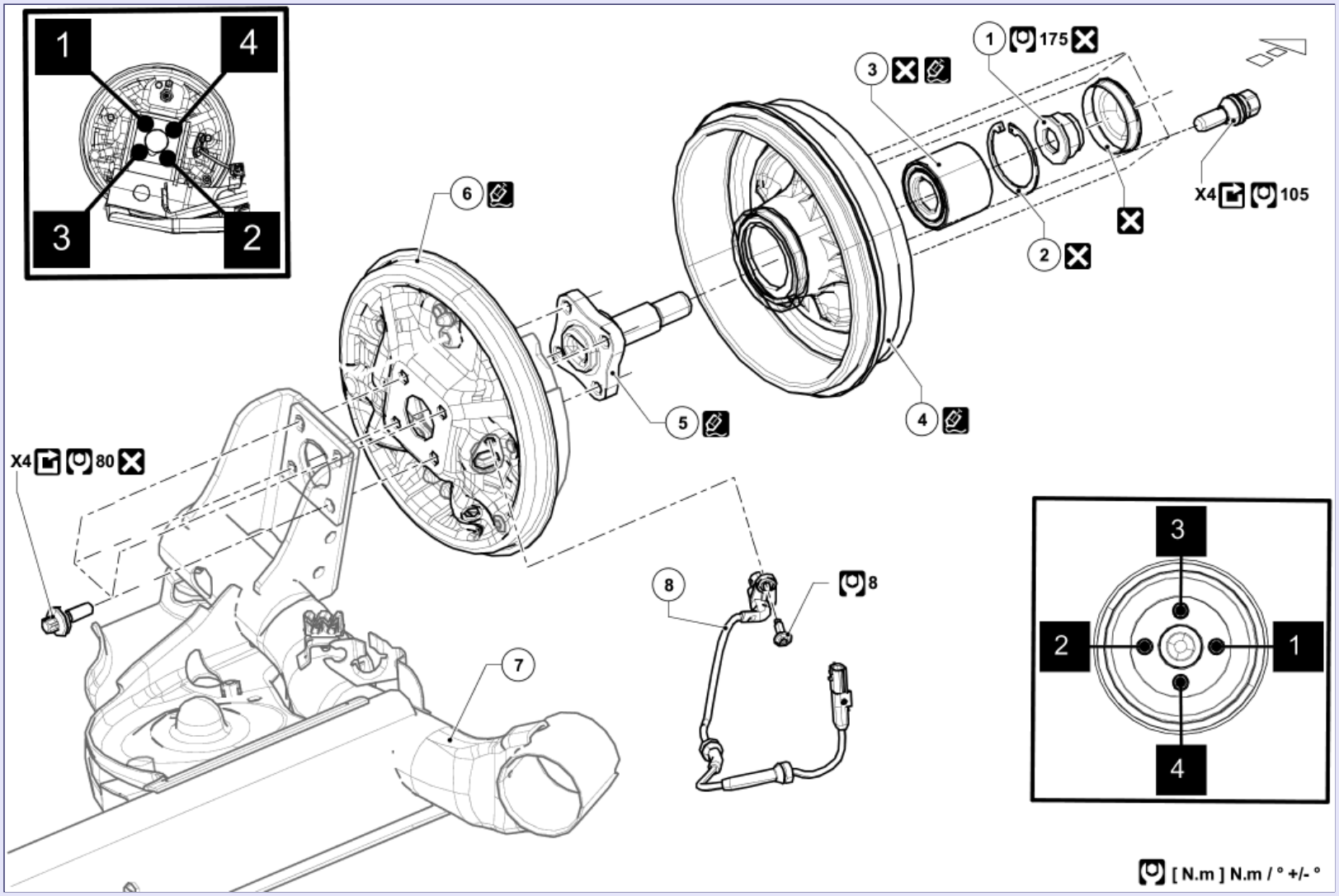


Illustration key: Description **Legend .**

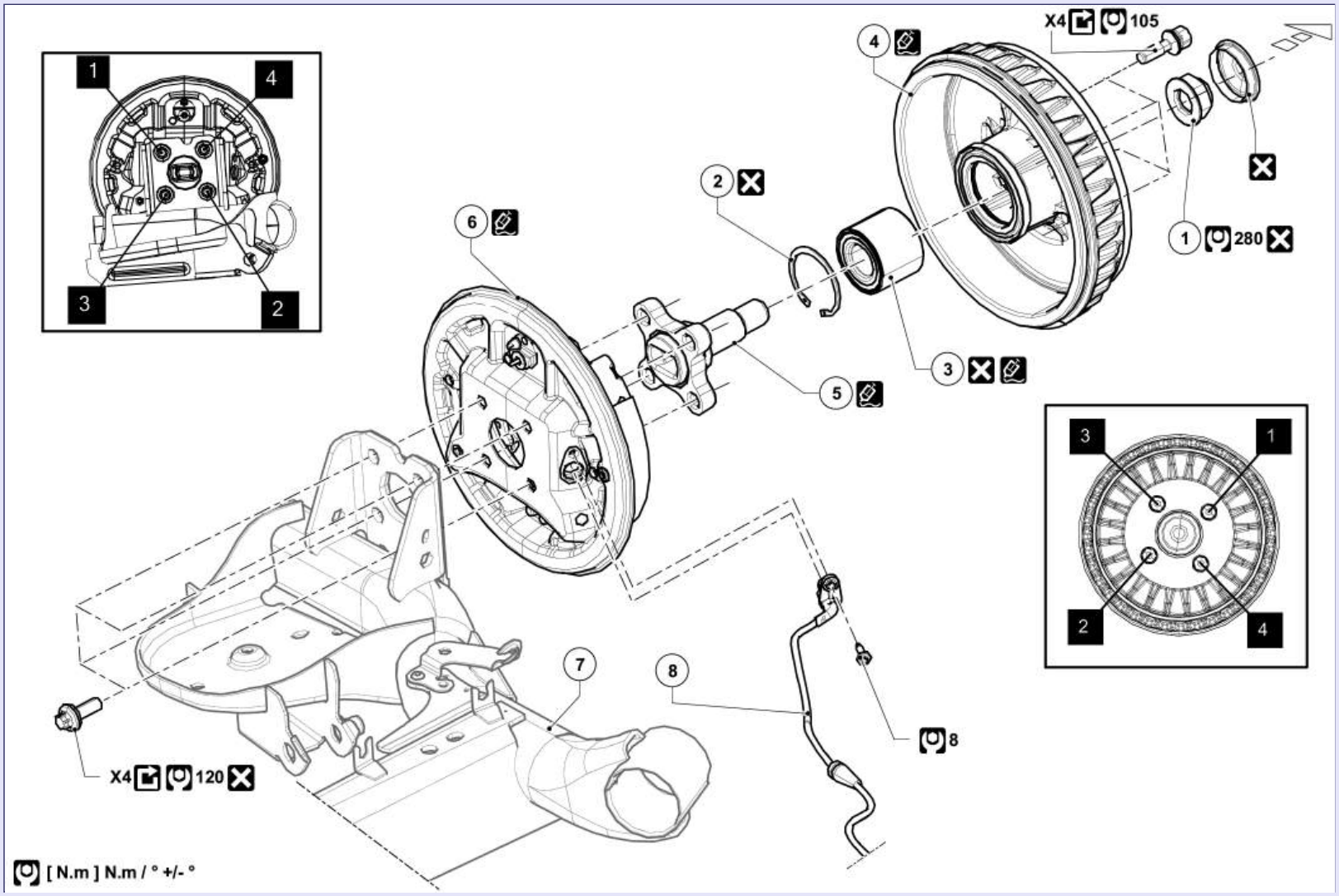


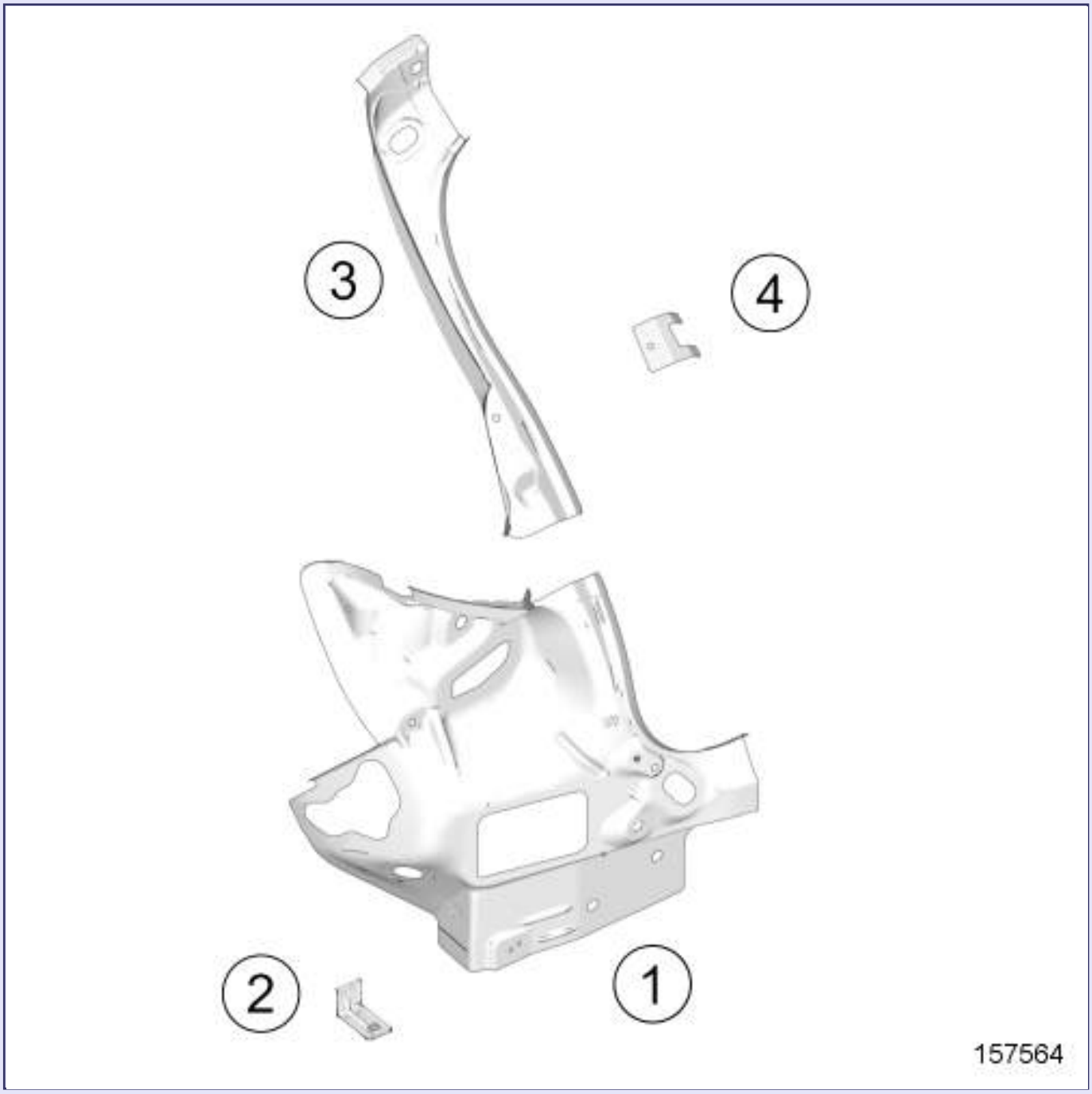
Illustration key: Description **Legend .**

Marks	Designations	Informations
1	Rear stub-axle nut	
2	The bearing circlip	(see 33A, Rear axle components, Rear drum bearing: Removal - Refitting)
3	Rear hub carrier bearing	(see 33A, Rear axle components, Rear drum bearing: Removal - Refitting) SURFACE CLEANER Vehicle: Parts and consumables for the repair
4	Rear brake drum	(see 33A, Rear axle components, Rear drum brake assembly) SURFACE CLEANER Vehicle: Parts and consumables for the repair
5	Rear stub axle carrier	SURFACE CLEANER Vehicle: Parts and consumables for the repair Position the vehicle on a two-post liftVehicle: Towing and lifting
6	Brake back plate	SURFACE CLEANER Vehicle: Parts and consumables for the repair Position the vehicle on a two-post liftVehicle: Towing and lifting
7	Rear axle	(see 33A, Rear axle components, Rear axle assembly: Exploded view)
8	Rear wheel speed sensor	Rear wheel speed sensor: Removal - Refitting

REAR LIGHT MOUNTING: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



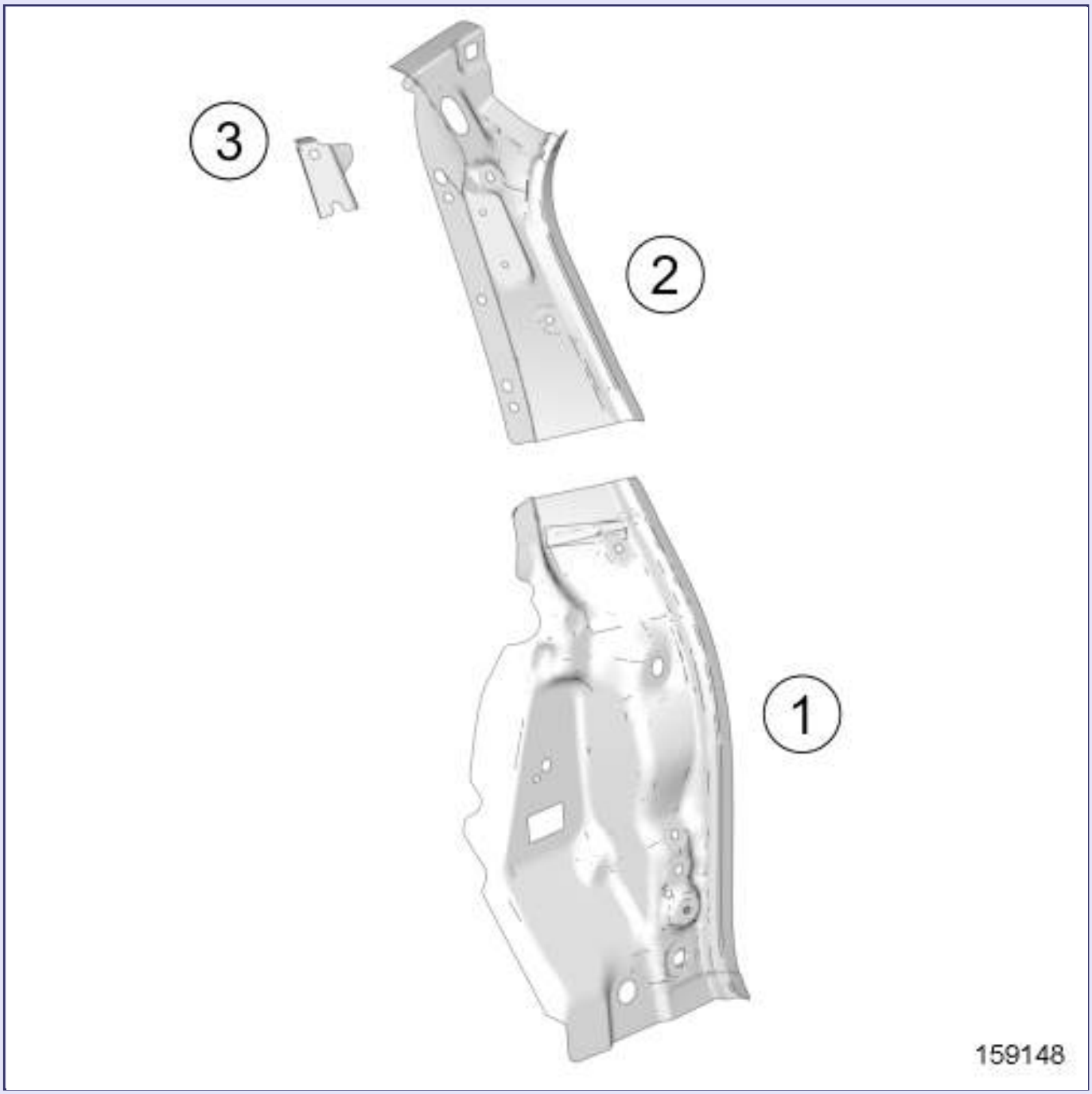
No.	Description	Thickness (mm)
(1)	Rear light mounting	0.80
(2)	Bumper side mounting support	0.95

(3)	Upper side rear rain channel	0.7
(4)	Strut mounting reinforcement	2.0

L52(L52)

No.	Description	Thickness (mm)
(1)	Rear light mounting	0.80

K52(K52)



No.	Description	Thickness (mm)
(1)	Rear light mounting	0.9
(2)	Upper side rear rain channel	0.8
(3)	Strut mounting reinforcement	2.0

2. IN THE EVENT OF REPLACEMENT

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

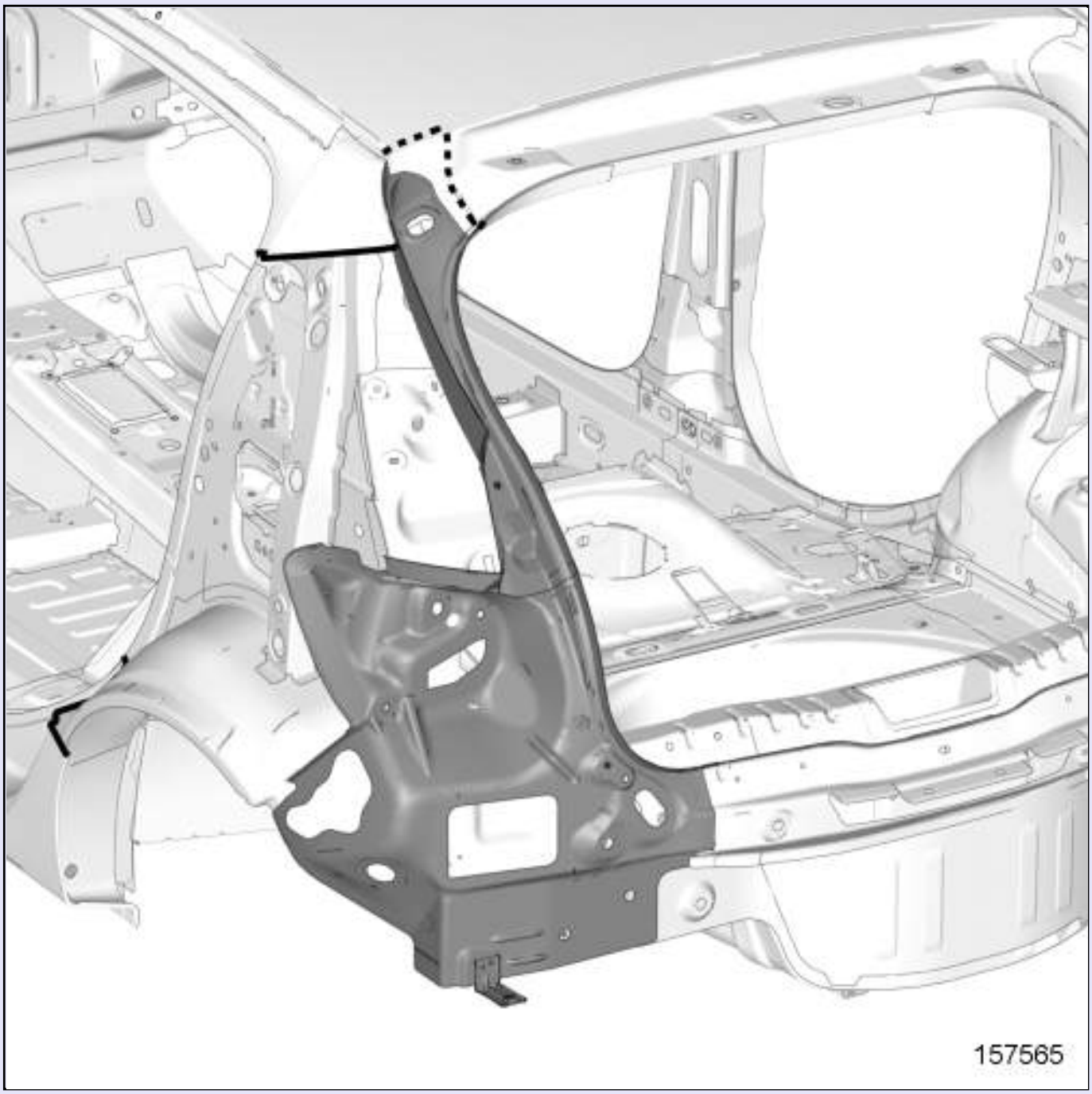
Locate the earths located near to the weld areaEarths on body: List and location of components .

The options for replacing this part are as follows:

- complete replacement,
- partial replacement.

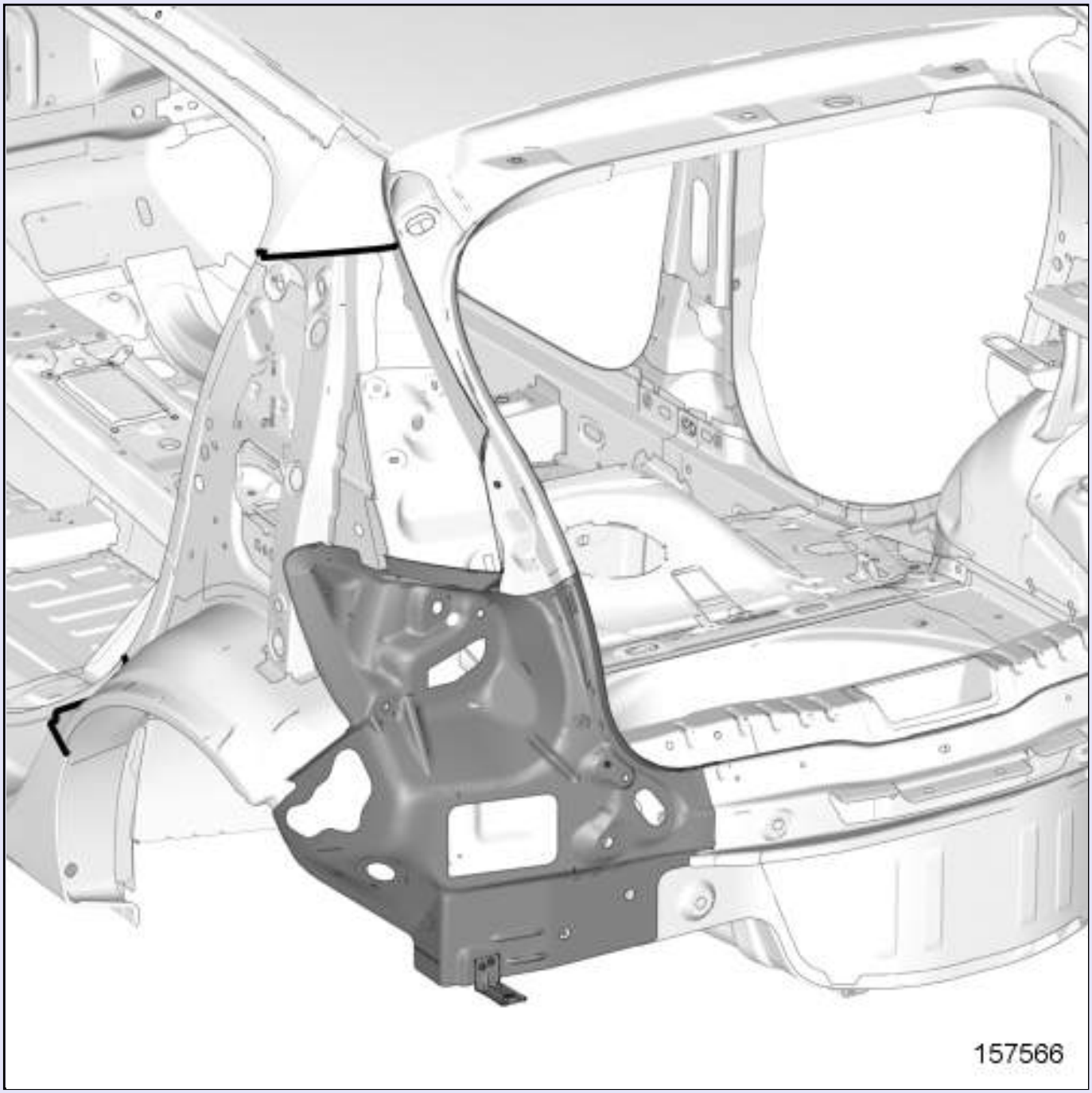
1- COMPLETE REPLACEMENT

1)PART IN POSITION



2- PARTIAL REPLACEMENT

1)PART IN POSITION

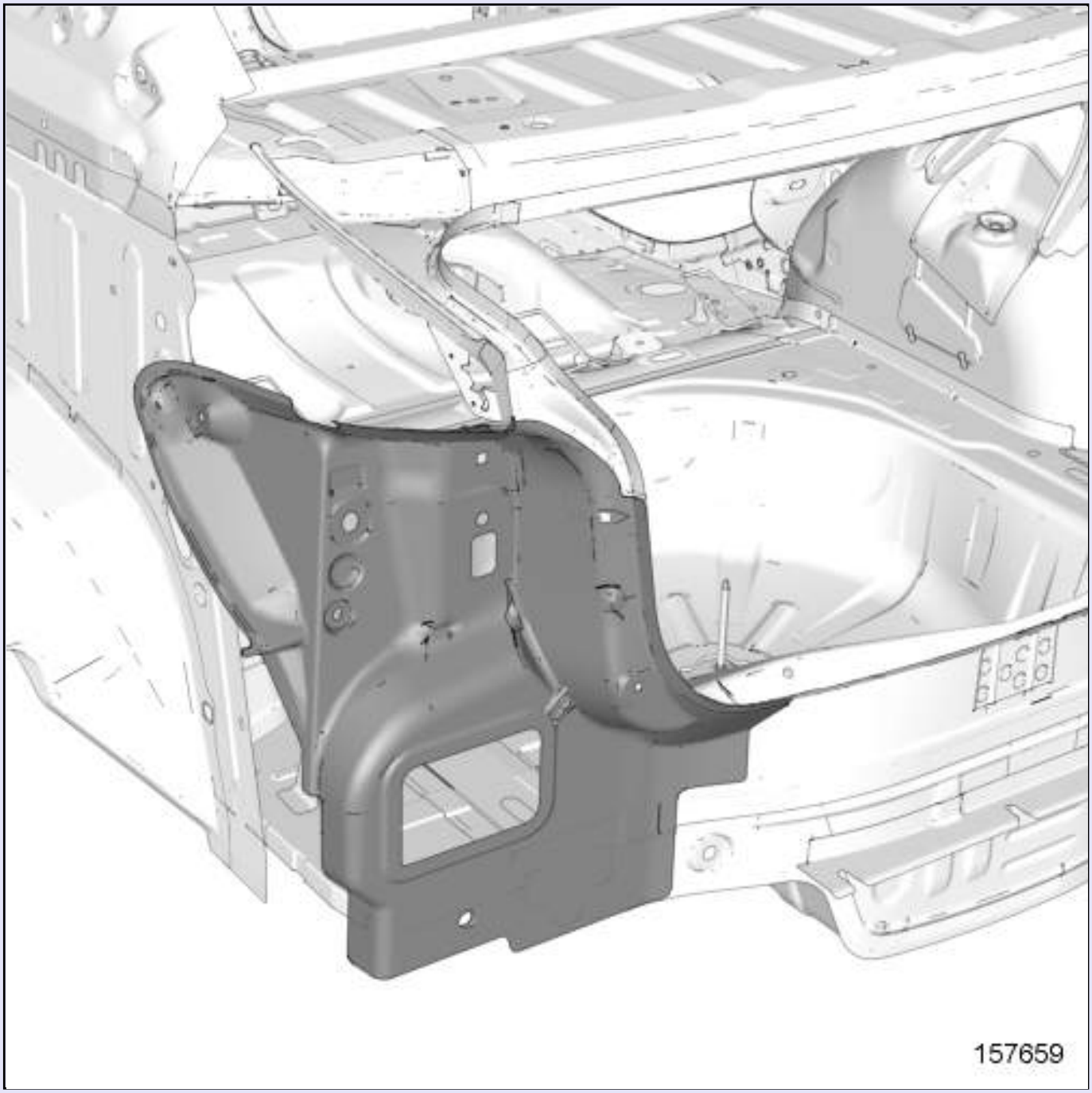


L52(L52)

- There is only one way of replacing this part:
  - complete replacement.

1- COMPLETE REPLACEMENT

1)PART IN POSITION



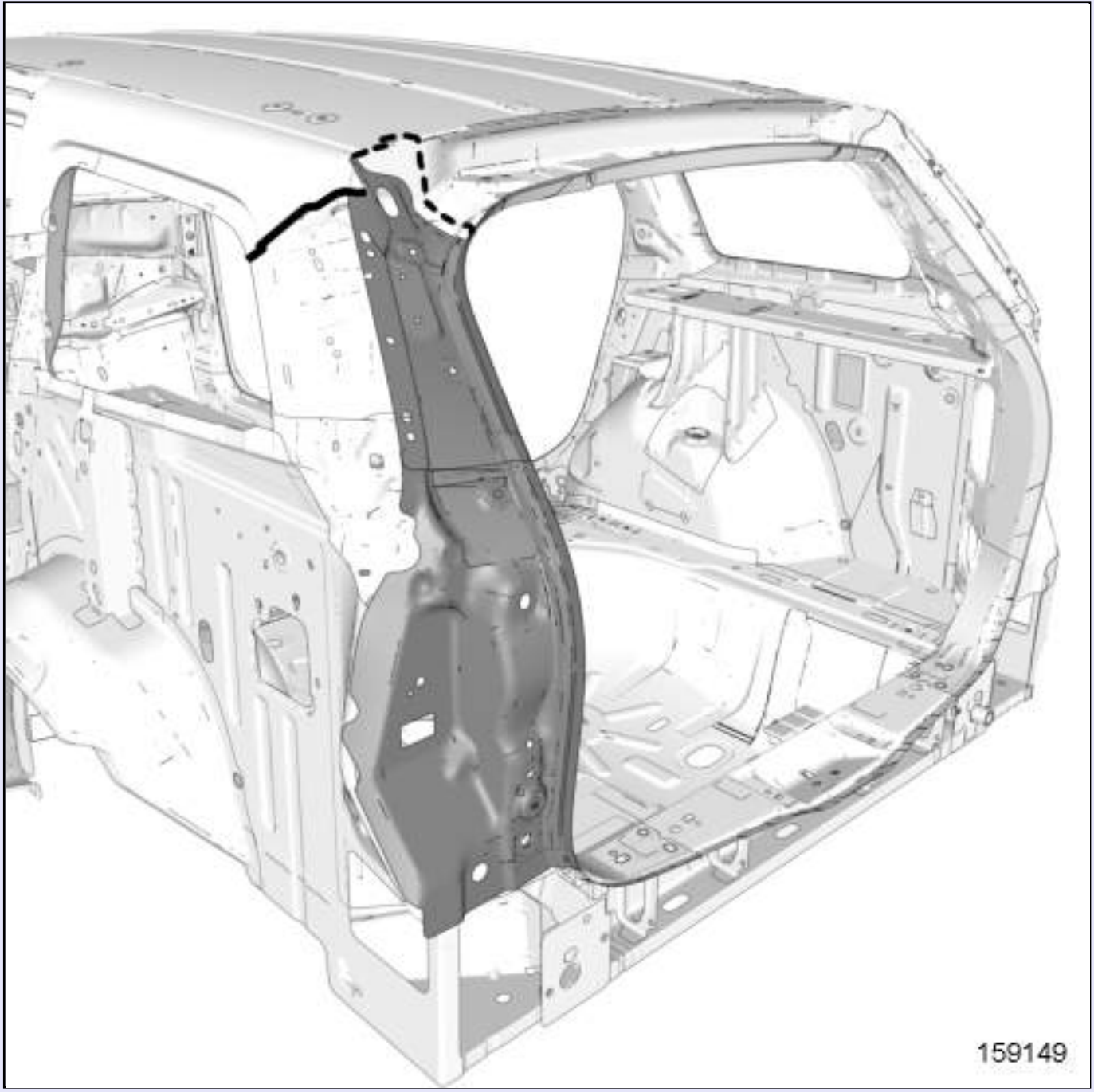
K52(K52)

☐ The options for replacing this part are as follows:

- complete replacement,
- partial replacement.

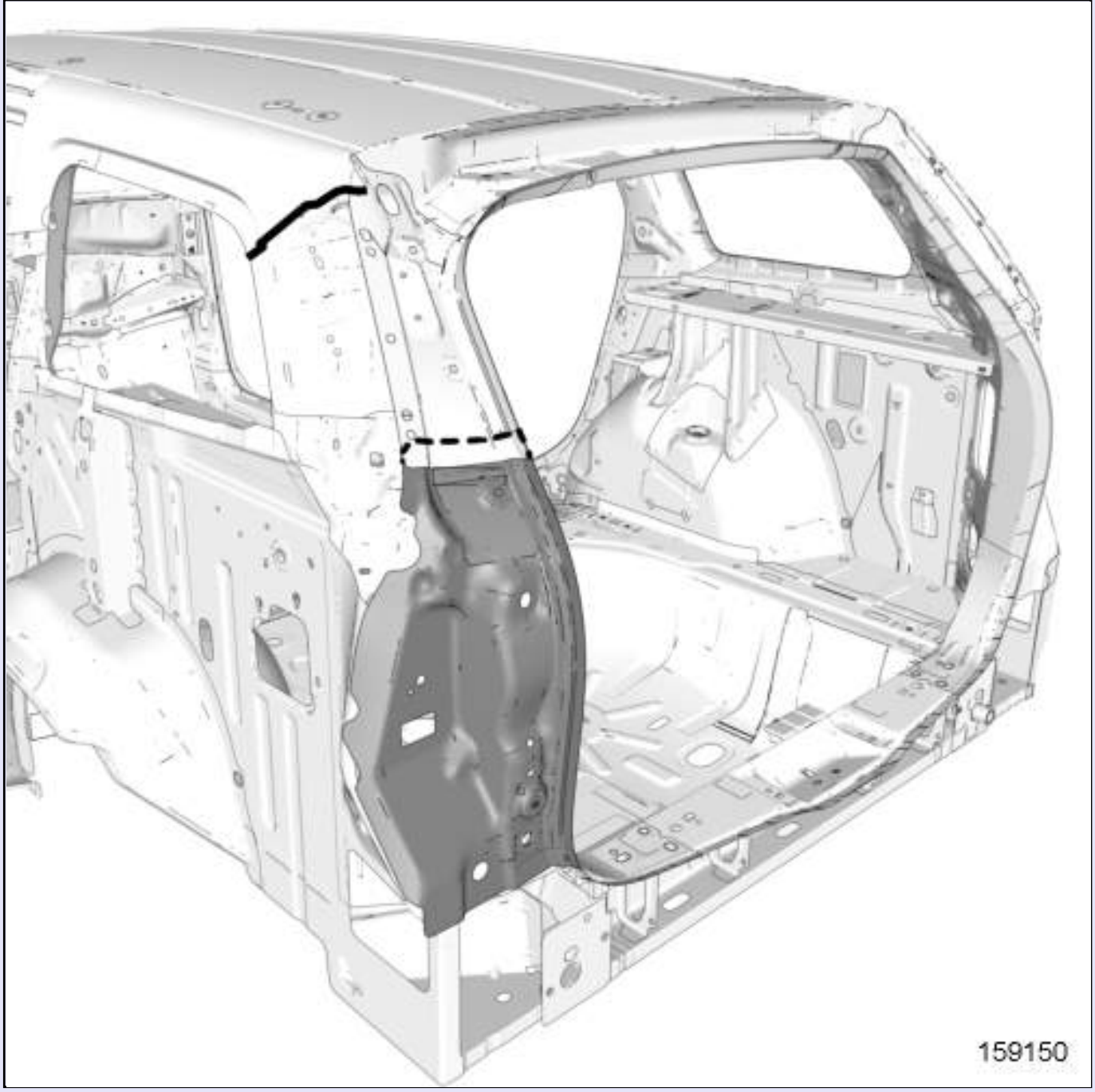
1- COMPLETE REPLACEMENT

1)PART IN POSITION



2- PARTIAL REPLACEMENT

1)PART IN POSITION

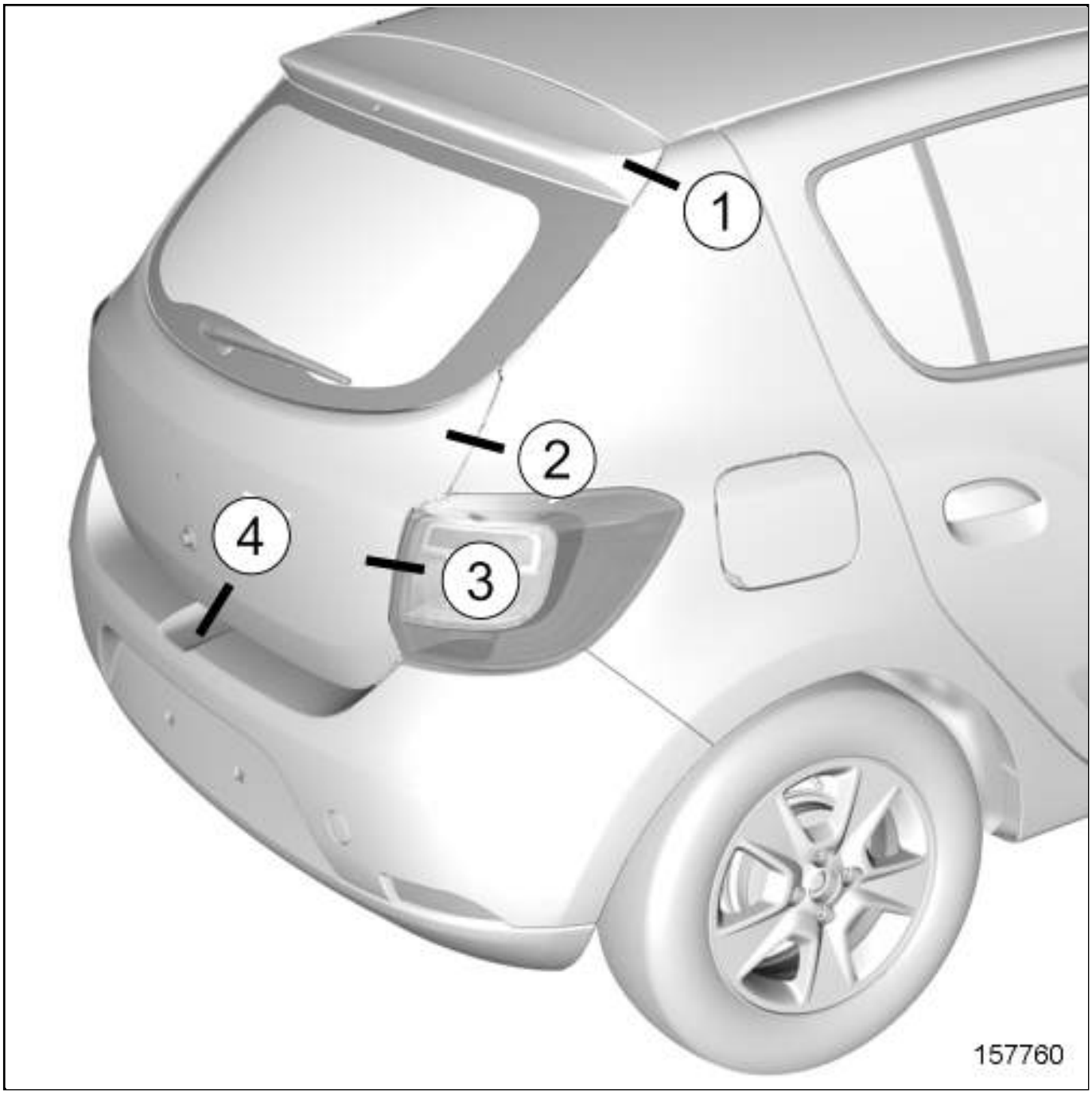

159150

REAR OPENING ELEMENT: ADJUSTMENT

Location and specifications (tightening torques, parts always to be replaced, etc.)Rear opening element mechanism assembly: Exploded view .

ADJUSTMENT VALUES

- For all information about tailgate adjustment valuesVehicle panel gaps: Adjustment value .

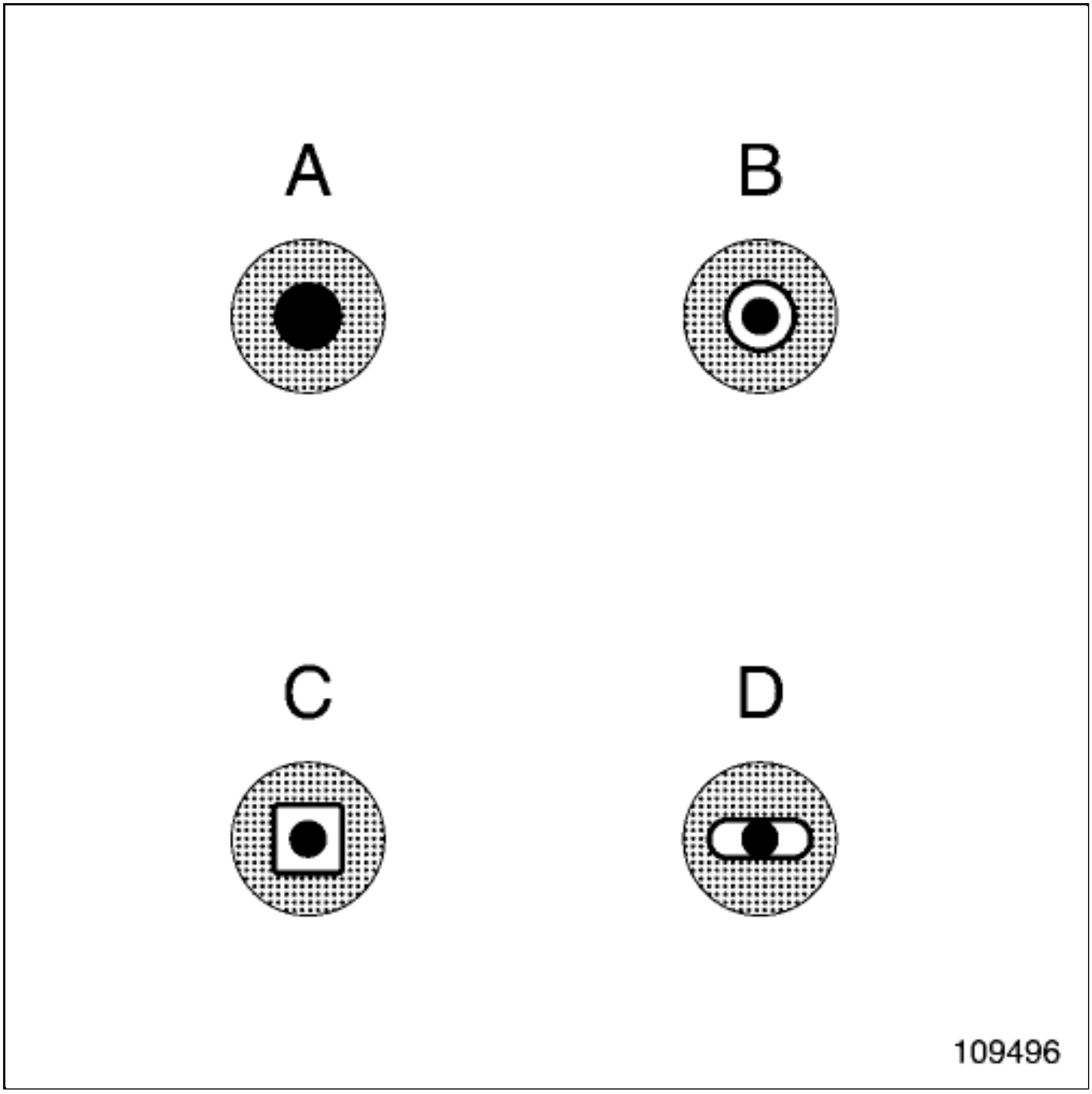


- Observe the adjustment sequence(1) , (2) , (3) and (4) .

ADJUSTMENT

There are three options for adjusting the tailgate:

- using the tailgate bolts,
- using the tailgate hinge nuts,
- using the rear end panel striker plate.



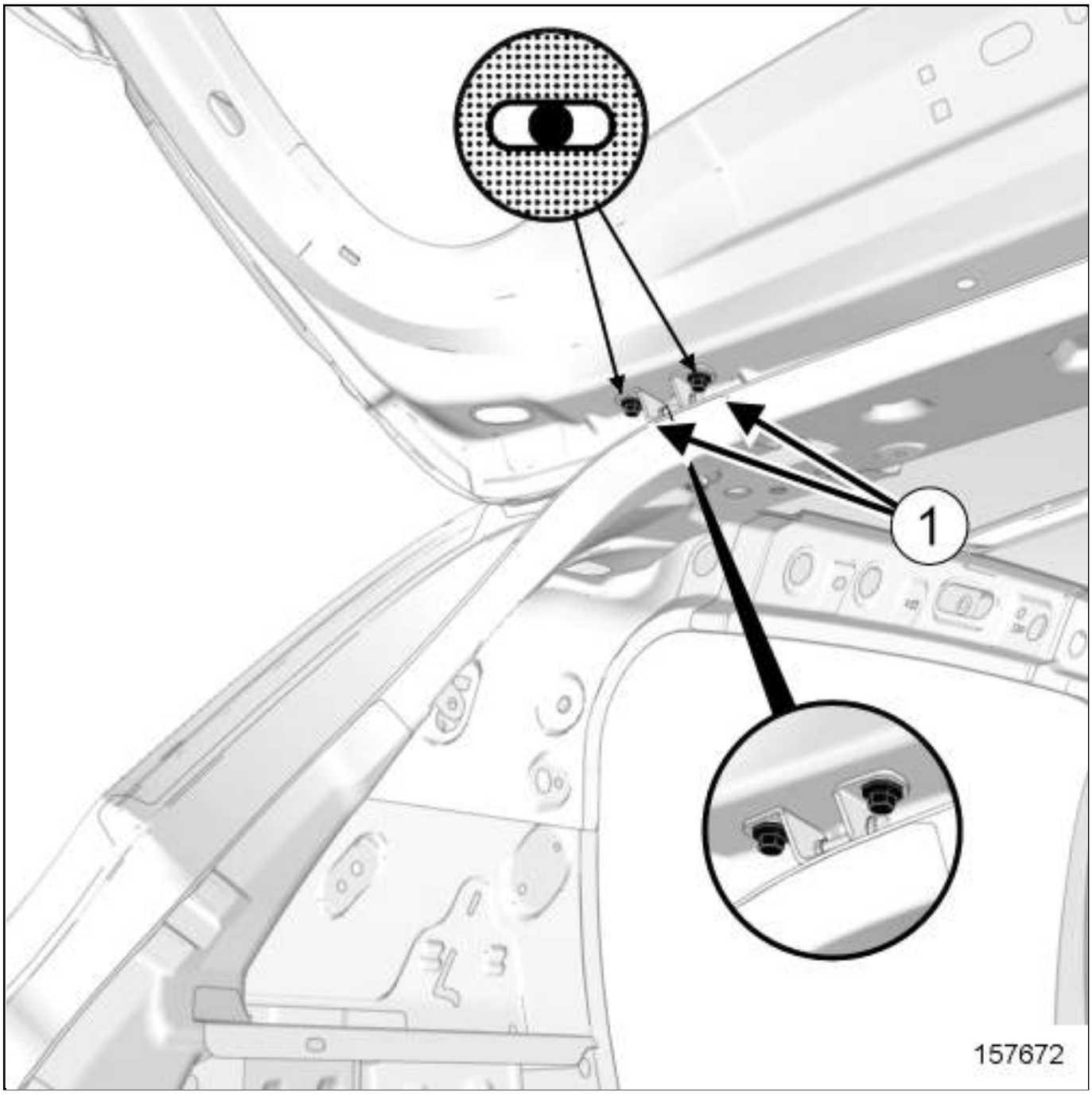
Symbols A, B, C and D show the adjustment options.

The black dot in the centre represents the body of the bolt.

The grey section represents the component to be adjusted.

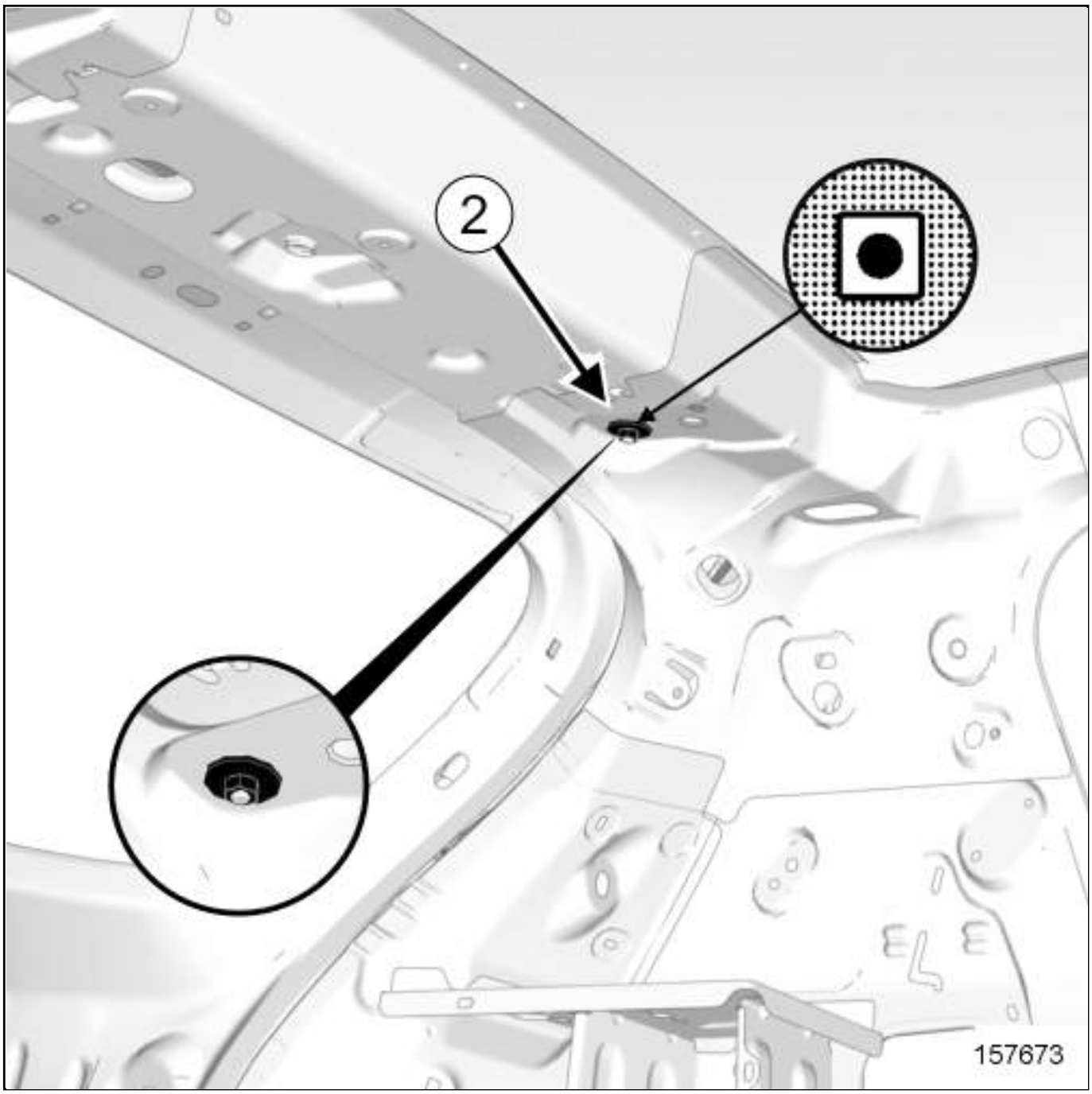
The white section represents the adjustment area.

1. ADJUSTMENT USING THE TAILGATE BOLTS



- Undo the tailgate bolts(1) on each side of the vehicle.
- Adjust the tailgate panel gaps.
- Tighten the tailgate bolts.

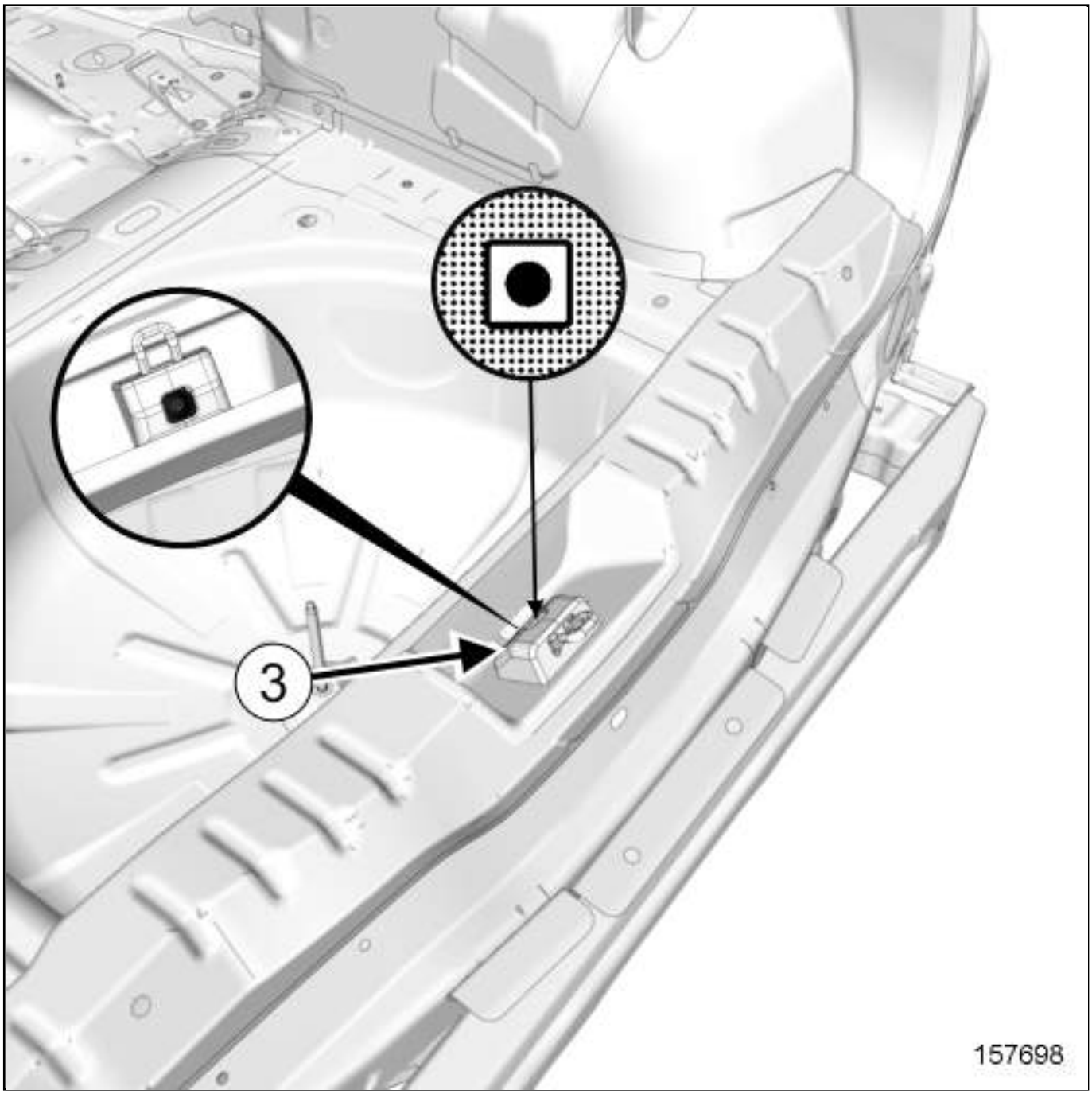
2. ADJUSTMENT USING THE HINGE NUTS



- Partially remove the headlining Roof trim assembly: Exploded view .
- Undo the hinge nut(2) on each side of the vehicle.
- Adjust the tailgate panel gaps.

- Tighten the tailgate hinge nuts.
- Refit the headlining Roof trim assembly: Exploded view .

3. ADJUSTMENT USING THE REAR END PANEL STRIKER PLATE



Undo the striker plate bolt(3) .

Adjust the tailgate panel gaps.

Tighten the striker plate bolt.

Repair-40x10x25x01-01x67-1-6-1.xml

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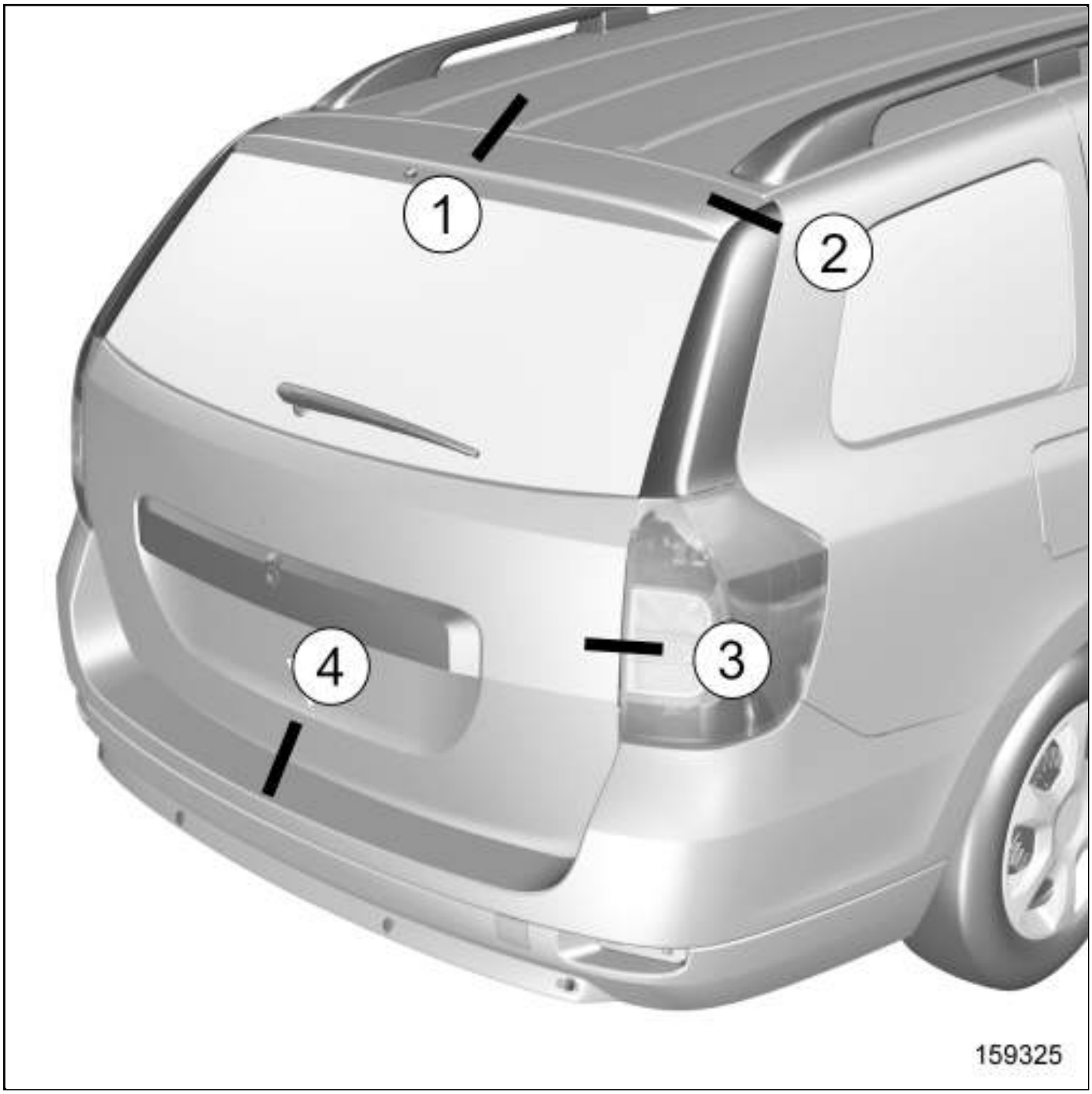
REAR OPENING ELEMENT: ADJUSTMENT

Location and specifications (tightening torques, parts always to be replaced, etc.)Rear opening element mechanism assembly: Exploded view .

ADJUSTMENT VALUES

- For all information about tailgate adjustment valuesVehicle panel gaps: Adjustment value .

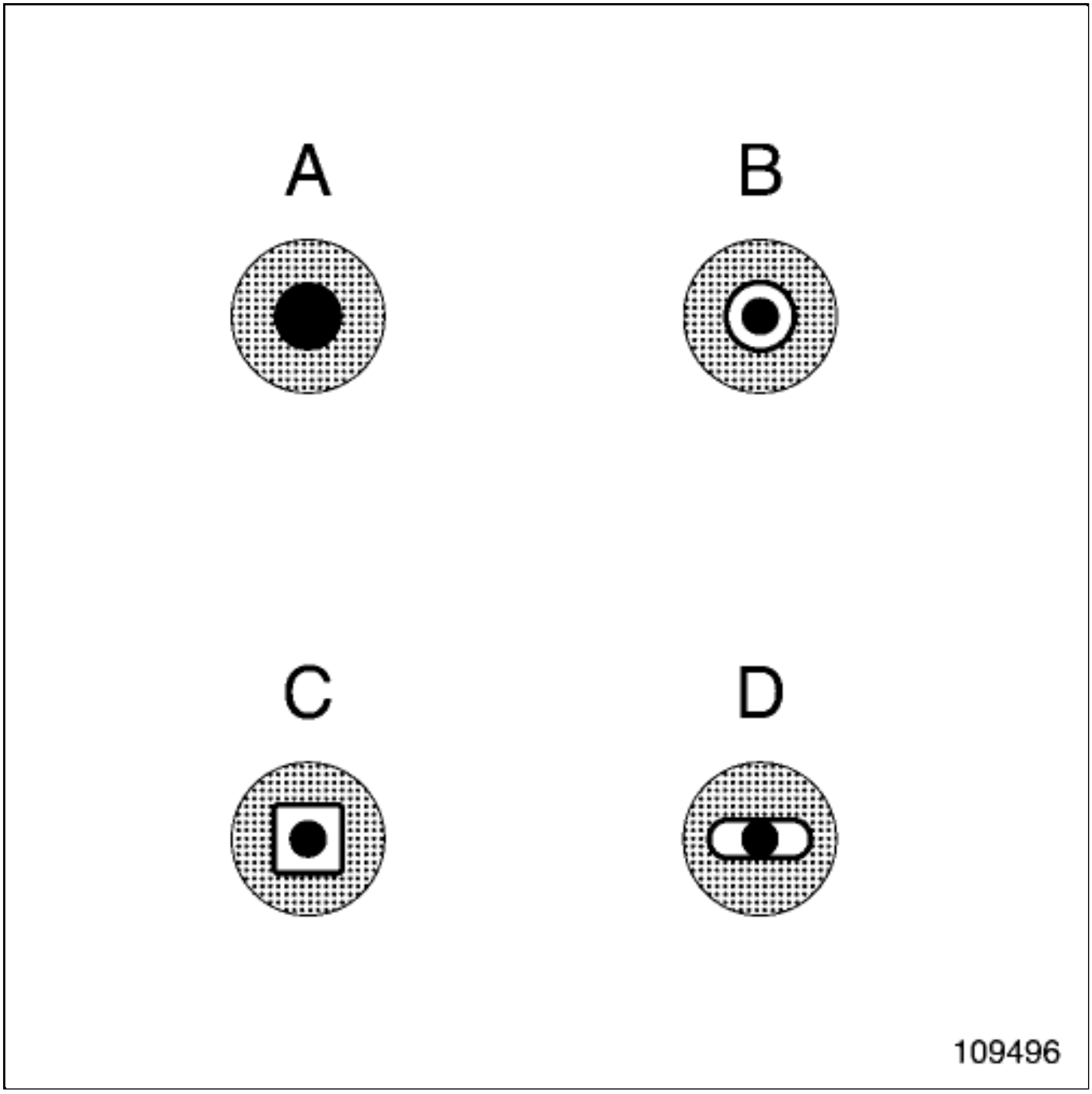


- Observe the adjustment sequence(1) , (2) , (3) and (4) .

ADJUSTMENT

There are three options for adjusting the tailgate:

- using the tailgate bolts,
- using the tailgate hinge nuts,
- using the rear end panel striker plate.



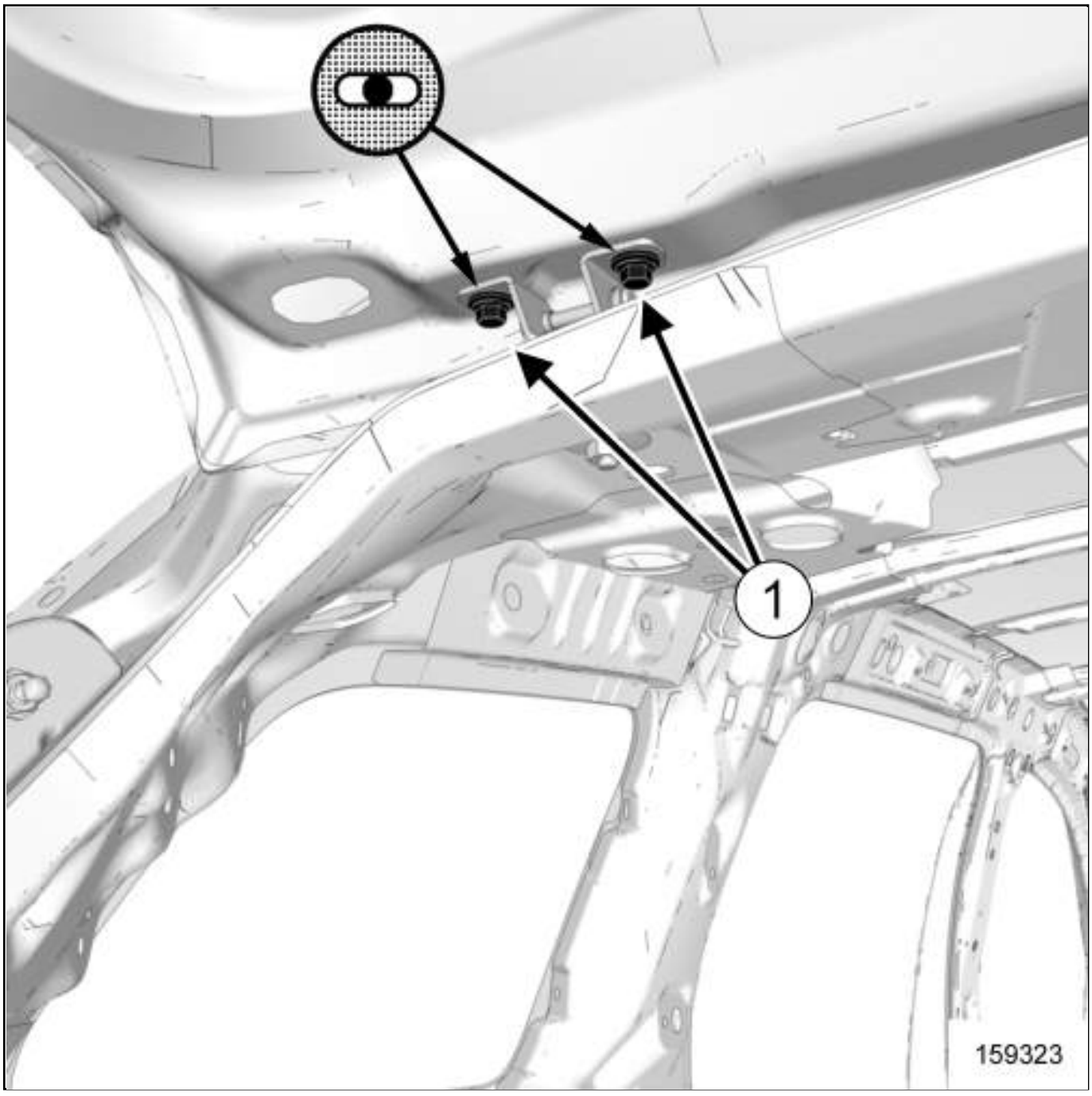
Symbols A, B, C and D show the adjustment options.

The black dot in the centre represents the body of the bolt.

The grey section represents the component to be adjusted.

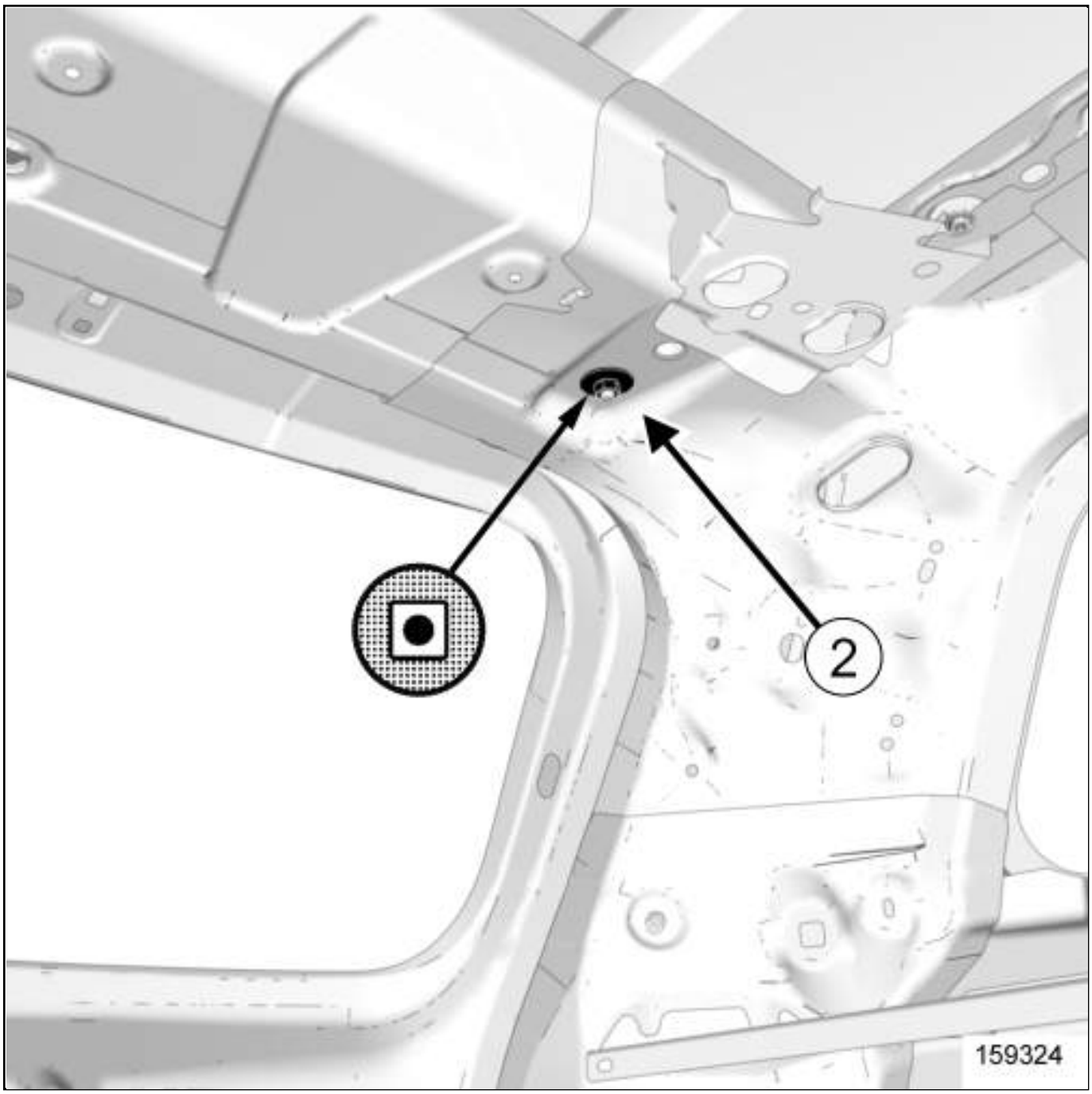
The white section represents the adjustment area.

1. ADJUSTMENT USING THE TAILGATE BOLTS



- Undo the tailgate bolts(1) on each side of the vehicle.
- Adjust the tailgate panel gaps.
- Tighten the tailgate bolts.

2. ADJUSTMENT USING THE HINGE NUTS

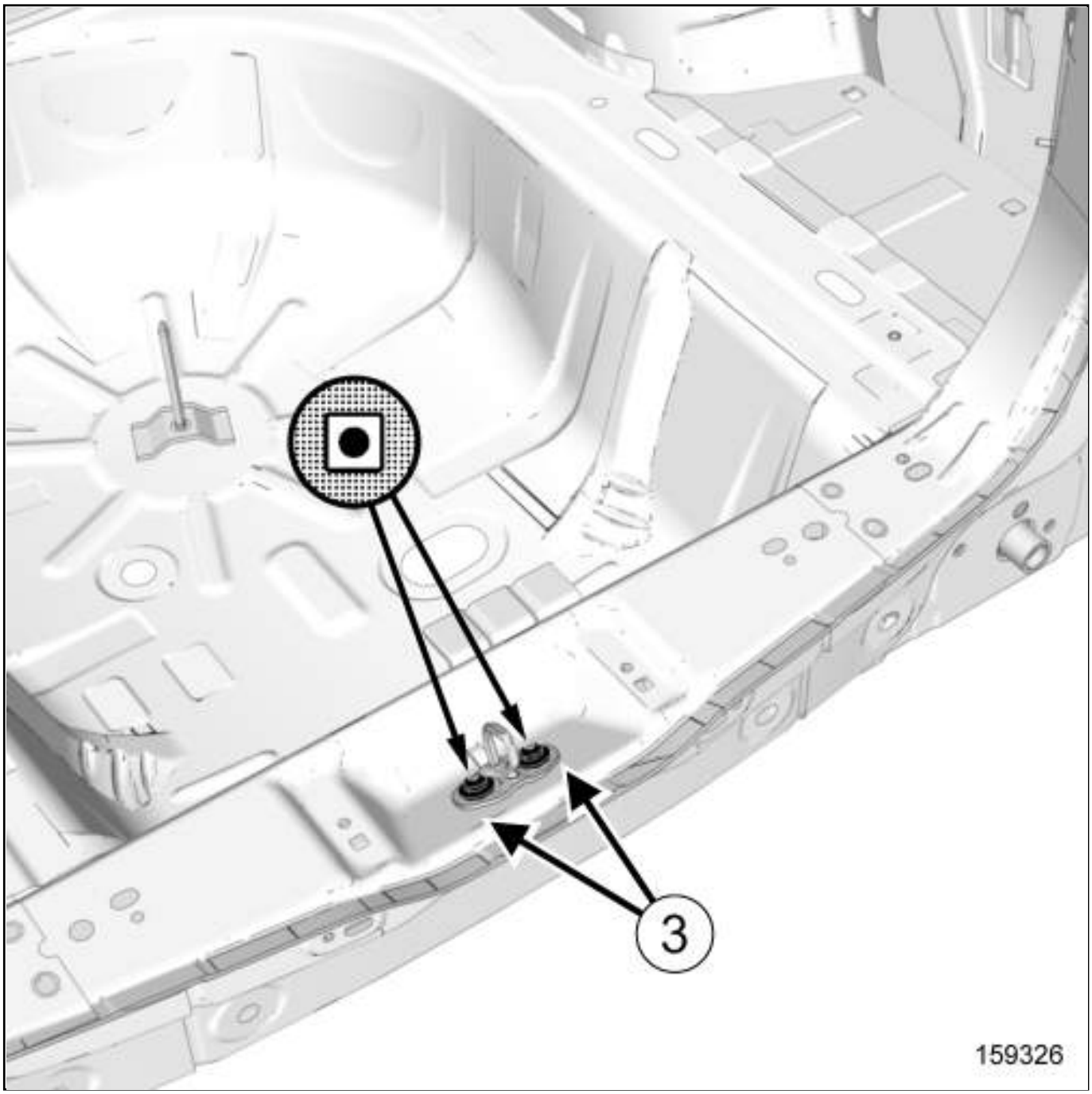


- Partially remove the headlining Roof trim assembly: Exploded view .
- Undo the hinge nut(2) on each side of the vehicle.
- Adjust the tailgate panel gaps.

Tighten the tailgate hinge nuts.

Refit the headlining Roof trim assembly: Exploded view .

3. ADJUSTMENT USING THE REAR END PANEL STRIKER PLATE



Remove the rear opening element sill.

Undo the striker plate bolts(3) .

Adjust the tailgate panel gaps.

Tighten the striker plate bolts.

Refit the rear opening element sill.

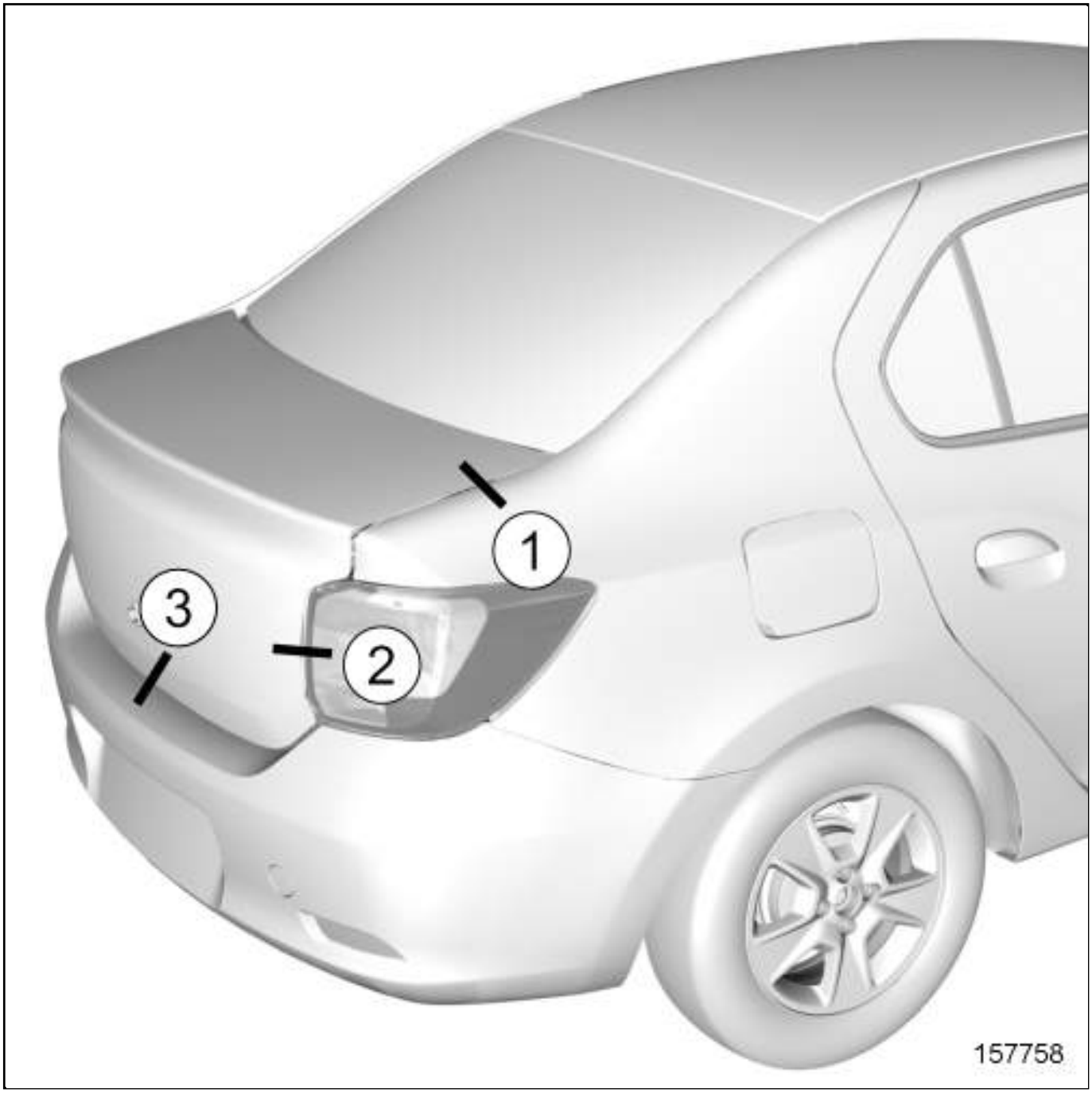
REAR OPENING ELEMENT: ADJUSTMENT

Location and specifications (tightening torques, parts always to be replaced, etc.)Rear opening element mechanism assembly: Exploded view .

ADJUSTMENT VALUES

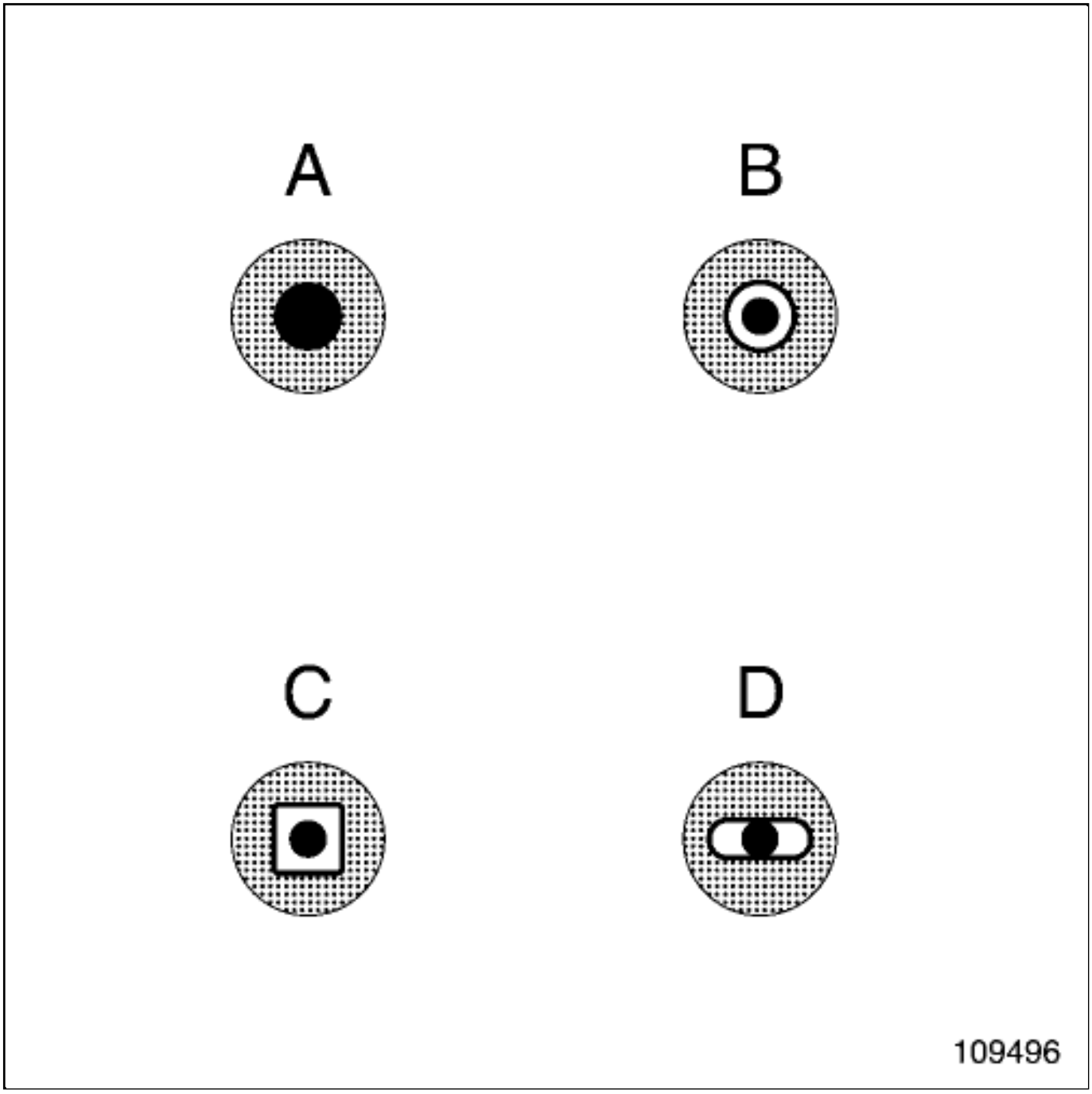
- For all information about tailgate adjustment valuesVehicle panel gaps: Adjustment value .

ADJUSTMENT



- Observe the adjustment sequence(1) , (2) and (3) .

- There are three options for adjusting the tailgate:
  - using the tailgate bolts,
  - using the tailgate hinge nuts,
  - using the rear end panel striker plate.



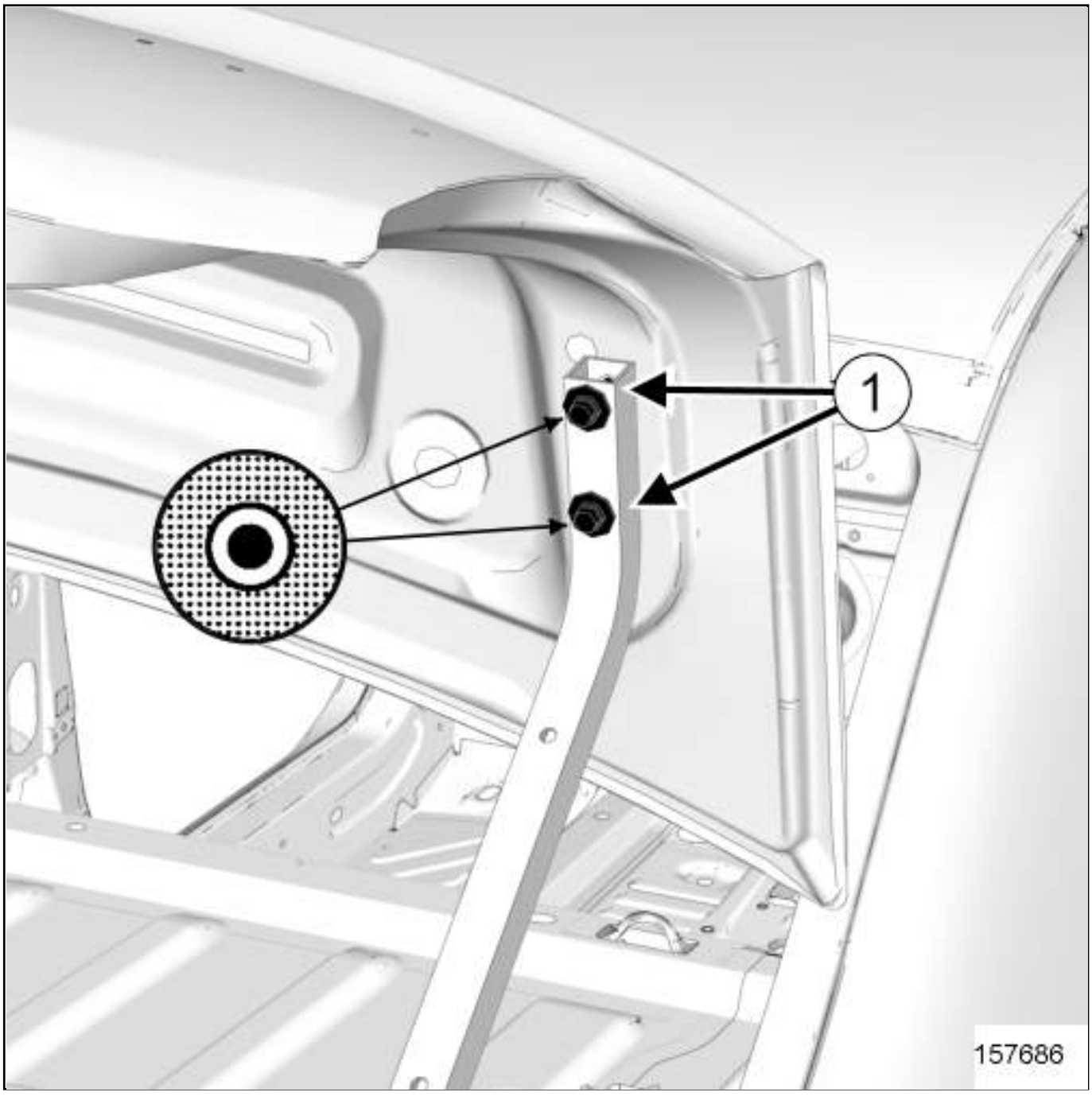
- Symbols A, B, C and D show the adjustment options.

The black dot in the centre represents the body of the bolt.

The grey section represents the component to be adjusted.

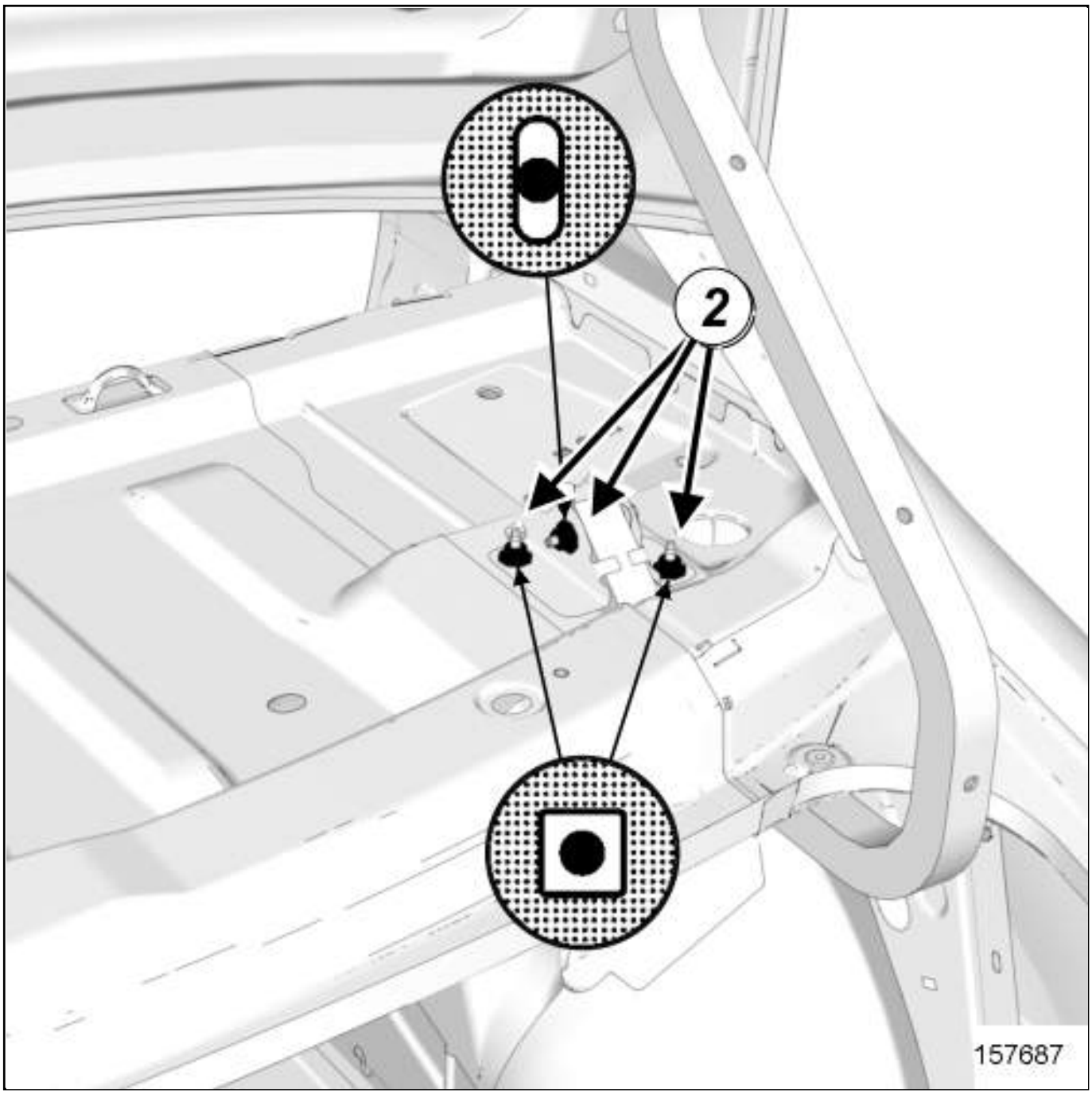
The white section represents the adjustment area.

1. ADJUSTMENT USING THE TAILGATE BOLTS



- Undo the tailgate bolts(1) on each side of the vehicle.
- Adjust the tailgate panel gaps.
- Tighten the tailgate bolts.

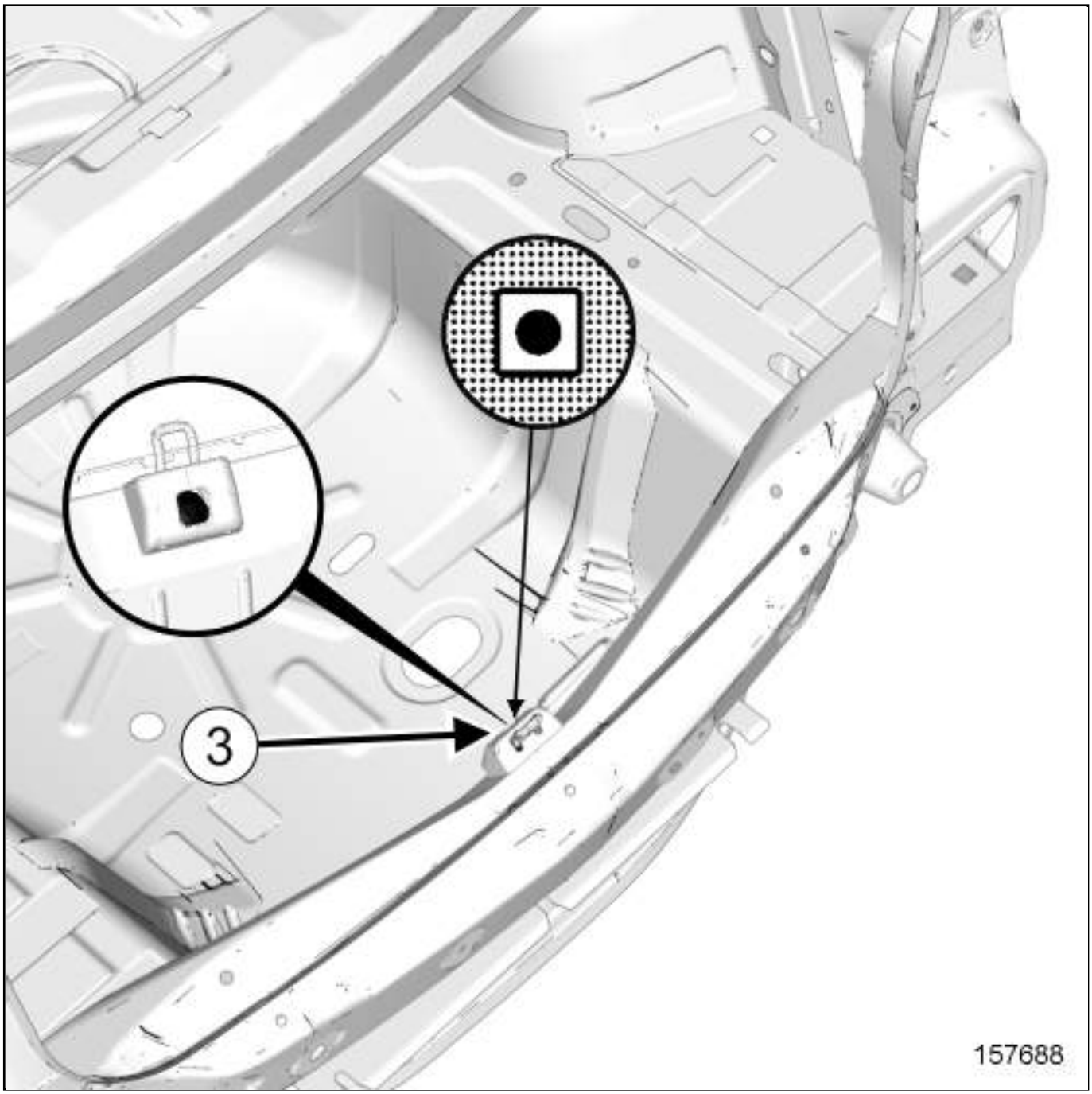
2. ADJUSTMENT USING THE HINGE NUTS



- Remove the rear parcel shelf trim.
- Undo the hinge nuts(2) on each side of the vehicle.
- Adjust the tailgate panel gaps.

- Tighten the tailgate hinge nuts.
- Refit the rear parcel shelf trim.

3. REAR END PANEL STRIKER PLATE ADJUSTMENT



Undo the striker plate bolt(3) .

Adjust the tailgate panel gaps.

Tighten the striker plate bolt.

Repair-40x10x25x01-01x67-1-7-1.xml

XSL version : 3.02 du 22/07/11

REAR OPENING ELEMENT ASSEMBLY ON THE PASSENGER COMPARTMENT SIDE: EXPLODED VIEW

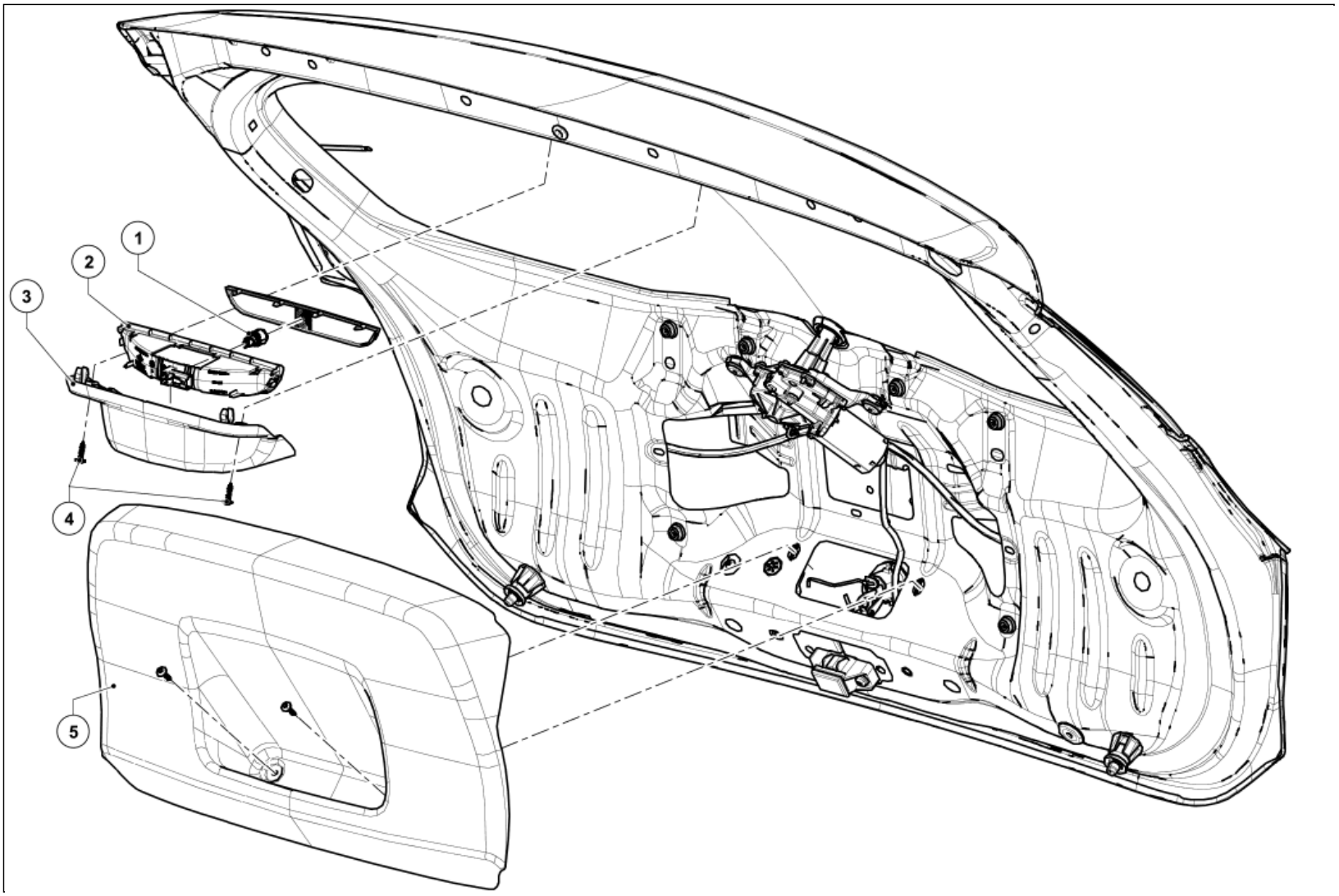


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Bulb	
2	High level brake light	
3	High level brake light cover	
4	High level brake light bolt	
5	Tailgate trim	

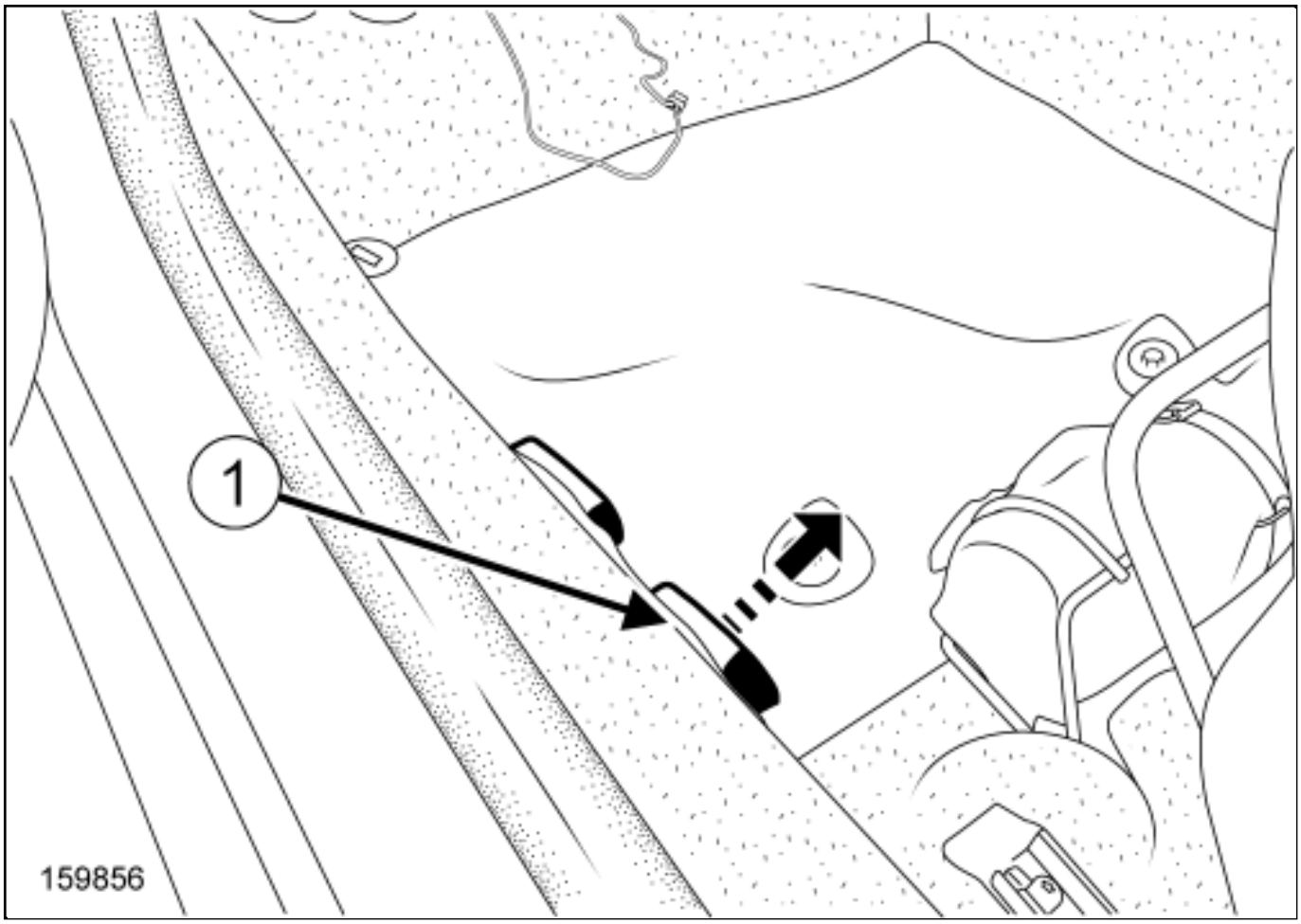
Repair-70x04x01-02x50-1-4-1.xml

XSL version : 3.02 du 22/07/11

REAR OPENING ELEMENT INTERIOR OPENING CONTROL CABLE: REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

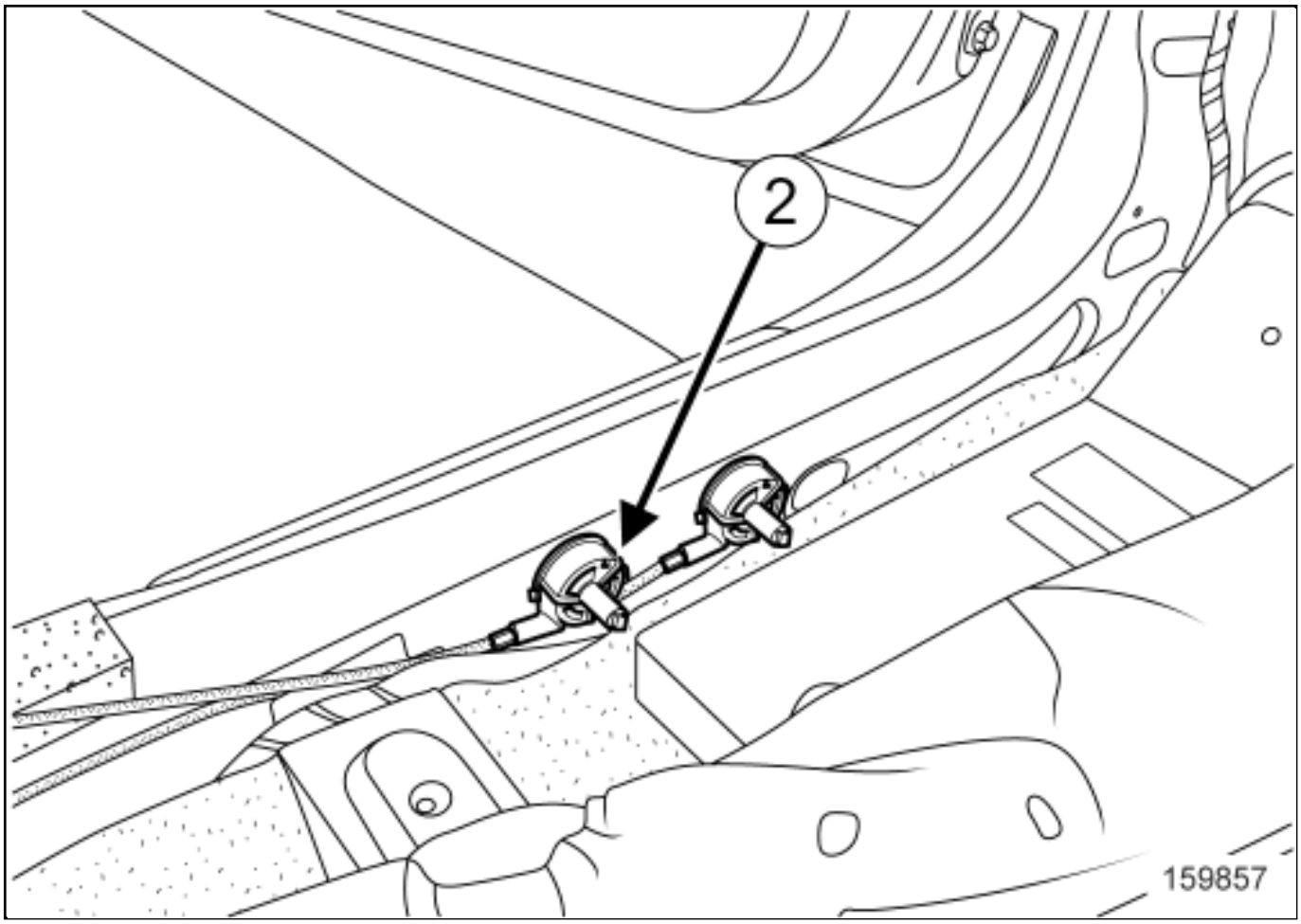


- Remove the fuel flap opening control(1) .

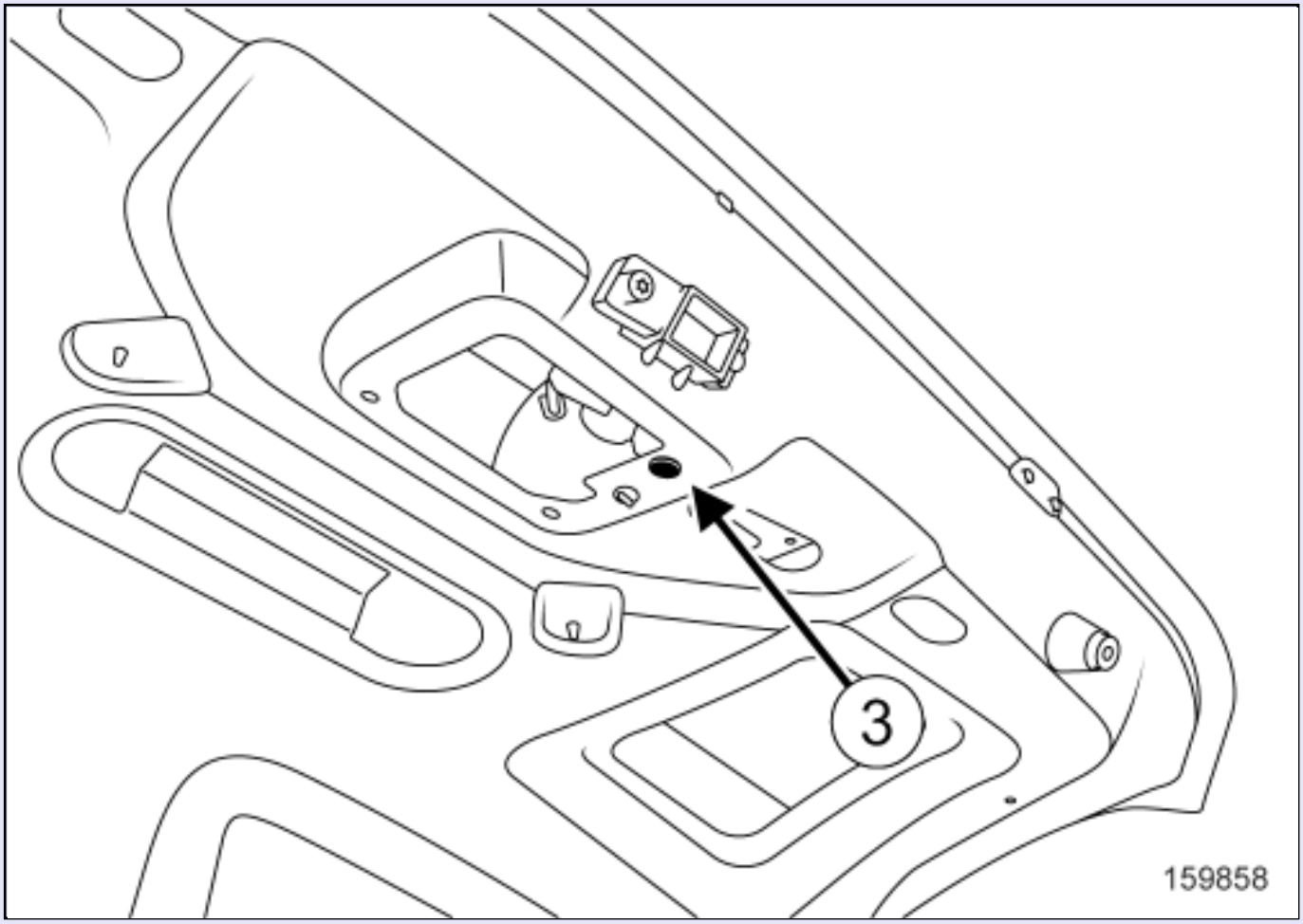
- Remove:
  - the left side doors seals partially.

- Remove:
  - the B-pillar upper trim Interior body side trim assembly: Exploded view ,
  - the B-pillar lower trim Interior body side trim assembly: Exploded view .
  - the rear bench seat base Rear bench seat assembly: Exploded view ,
  - the rear bench seatback Rear bench seat assembly: Exploded view ,
  - the C-pillar lower trim Interior body side trim assembly: Exploded view
  - the rear parcel shelf trim Interior body side trim assembly: Exploded view

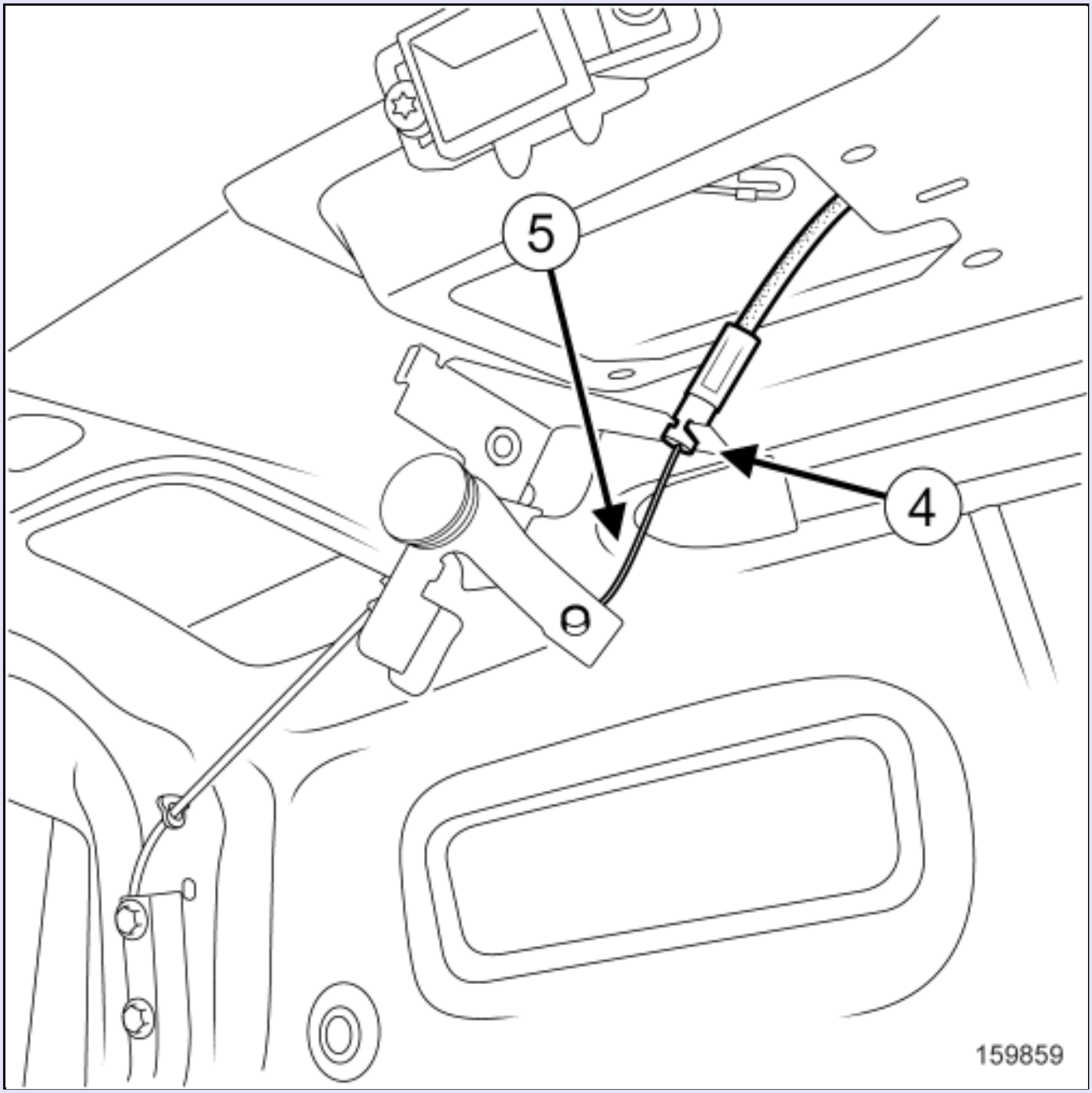
2. REMOVAL OPERATION



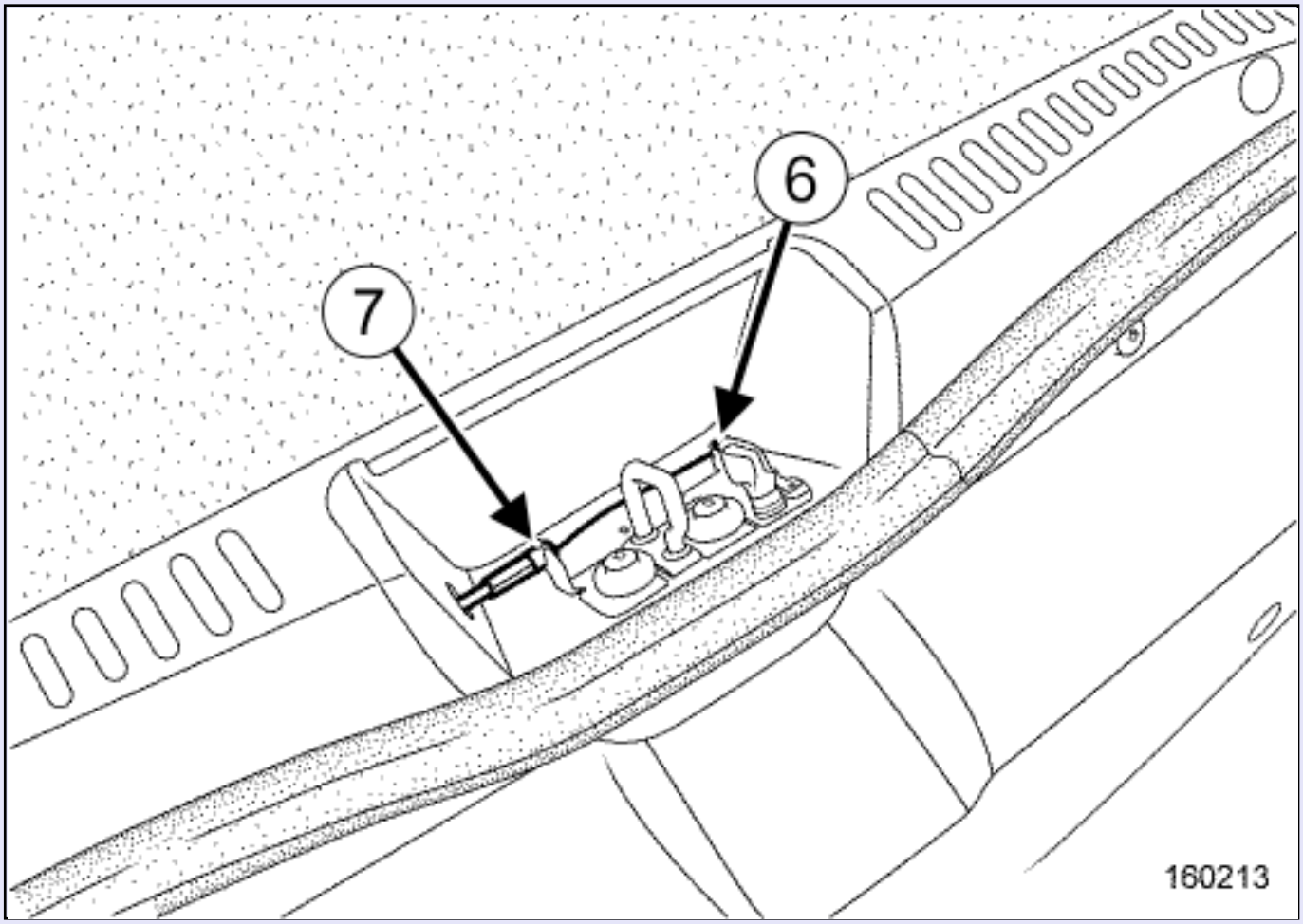
- Remove the bolt(2) .



- Remove the bolt(3) .
- Remove the support.



❑ Extract the locking mechanism cable(4) from the rear opening element interior opening control cable (5) .



- Extract the locking mechanism cable(6) from the rear opening element interior opening control cable (7) .

- Note the rear opening element interior opening control cable routing.

- Remove the the rear opening element interior opening control cable.

REFITTING

1. REFITTING OPERATION

-

Proceed in the reverse order to removal.

Carry out a function test.

REAR OPENING ELEMENT LOCKING ASSEMBLY: EXPLODED VIEW

B52(B52)

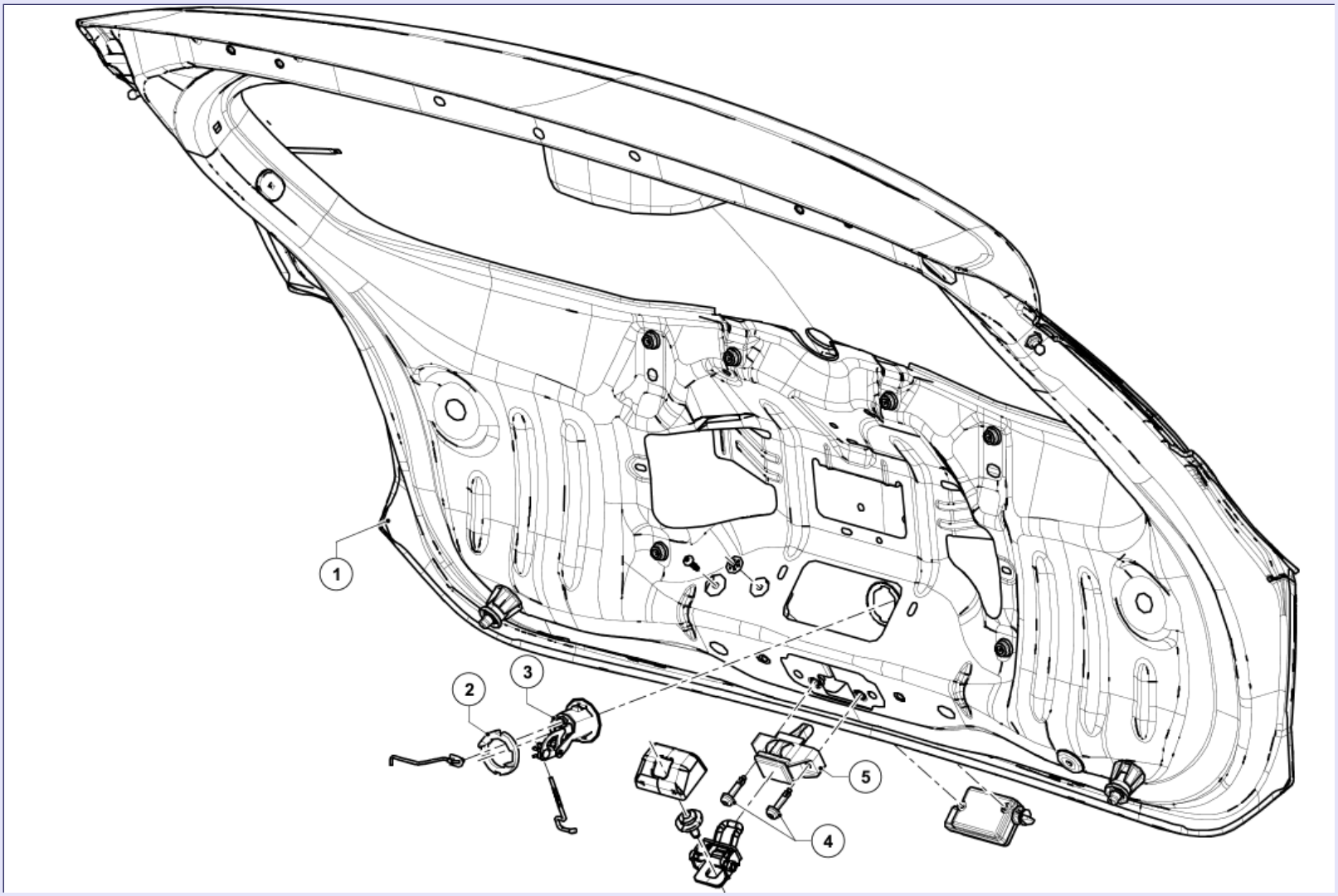


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Rear opening element	
2	Boot lid lock barrel nut	
3	Boot lid lock barrel	
4	Boot lid lock bolt	
5	Boot lid lock	

L52(L52)

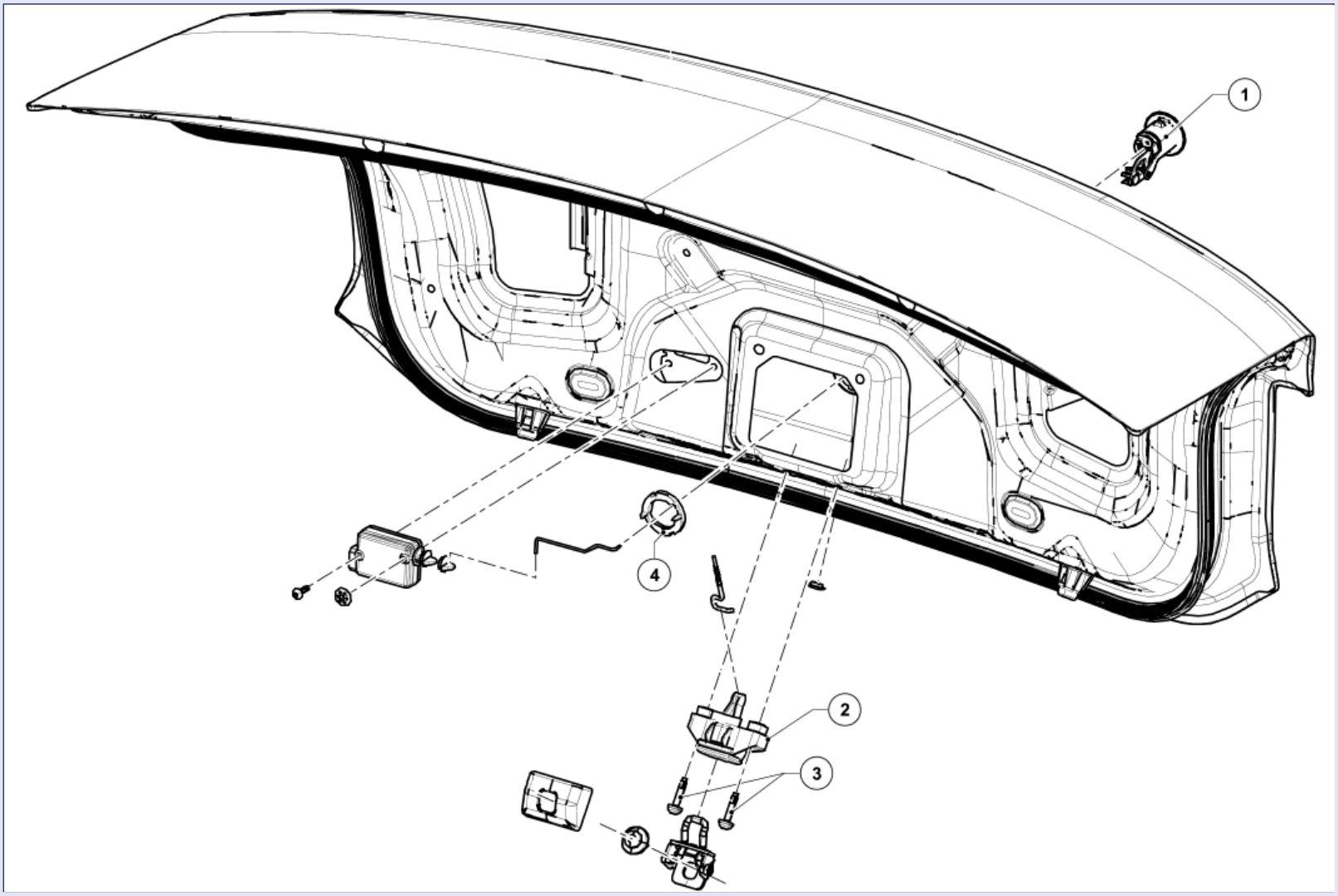


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Boot lid lock barrel	
2	Boot lid lock	
3	Boot lid lock bolt	
4	Boot lid lock barrel nut	

1.

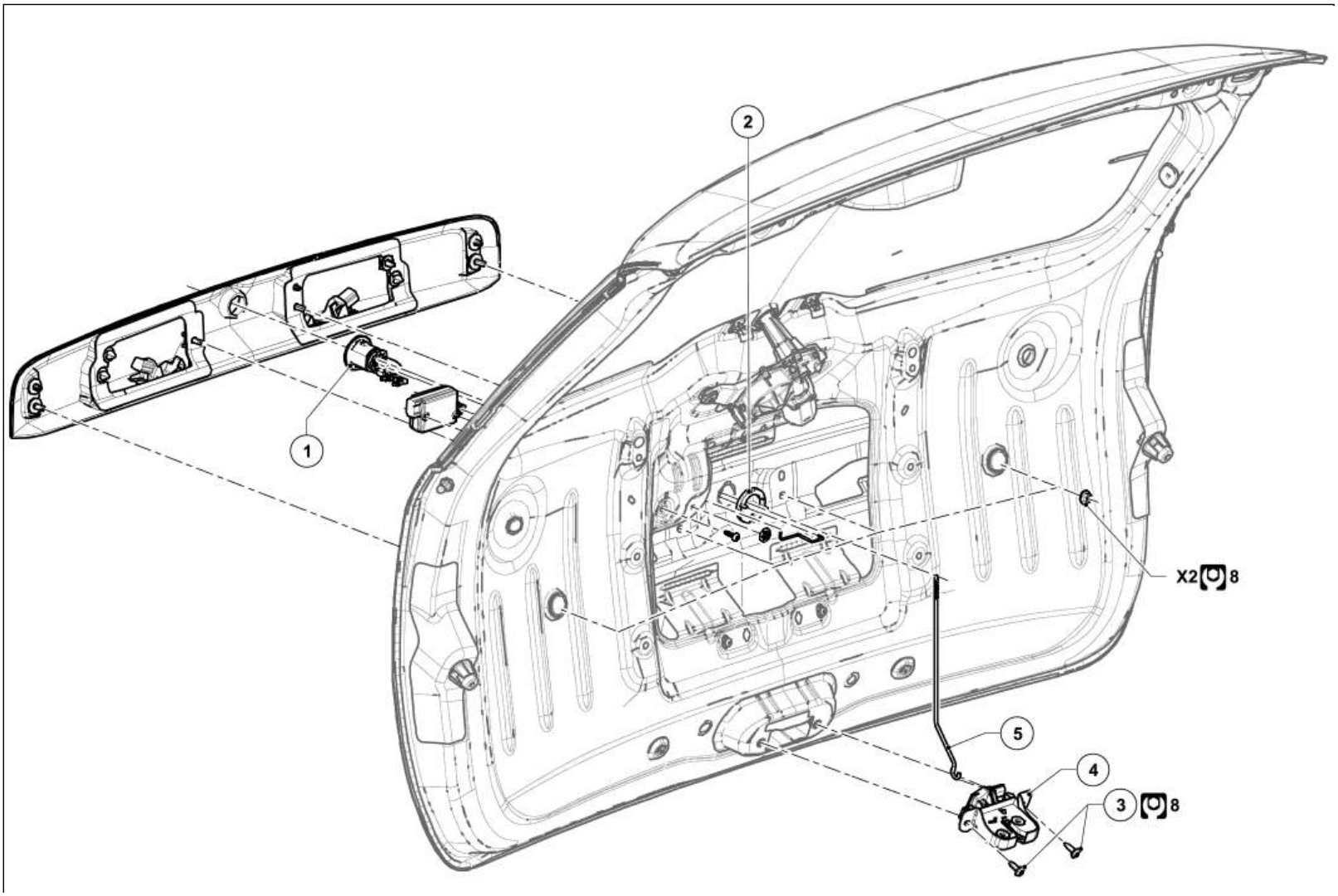


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Boot lid lock barrel	
2	Boot lid lock barrel nut	
3	Boot lid lock bolt	
4	Boot lid lock	
5	Rod opening control of trunk lid	

REAR OPENING ELEMENT MECHANISM ASSEMBLY: EXPLODED VIEW

L52(L52)

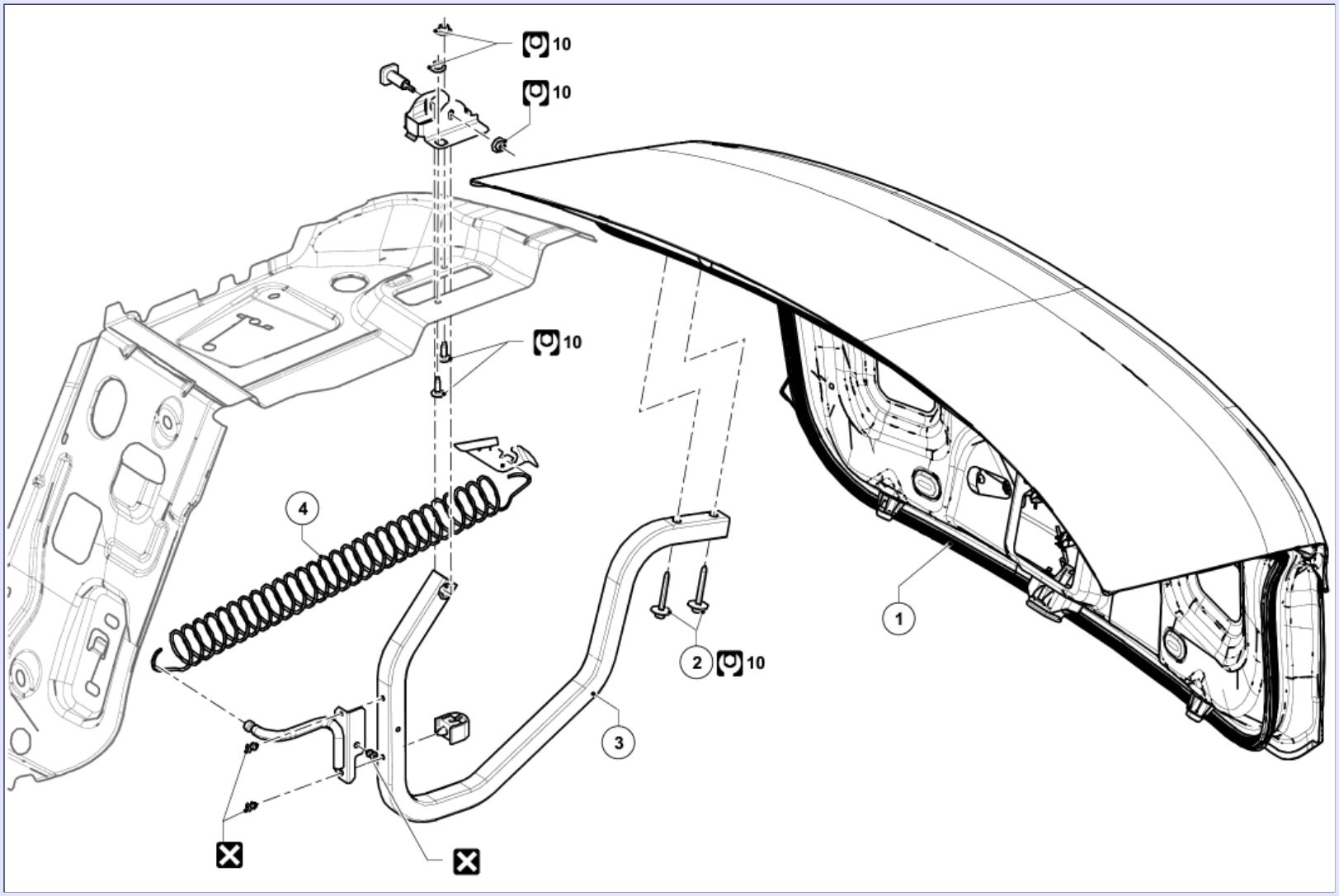


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Rear opening element	Rear opening element: Removal - Refitting
2	Bolt of boot lid mechanism	
3	Boot lid mechanism	
4	Boot lid strut	

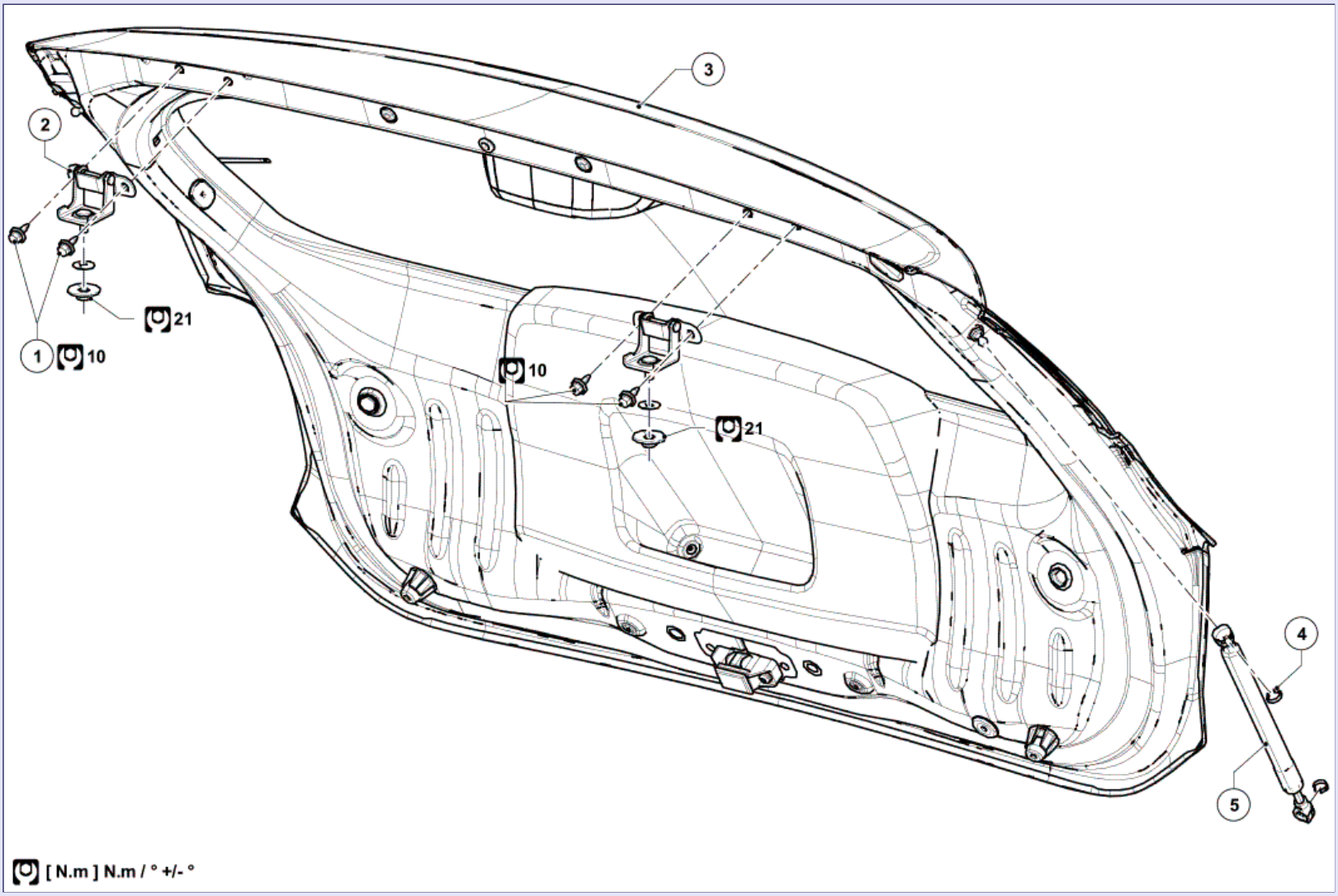


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Bolt of boot lid mechanism	
2	Boot lid mechanism	
3	Tailgate	Rear opening element: Removal - Refitting
4	Retaining clip of boot lid strut	
5	Boot lid strut	

REAR OPENING ELEMENT: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)Rear opening element mechanism assembly: Exploded view .

1. REMOVAL WITHOUT THE HINGES

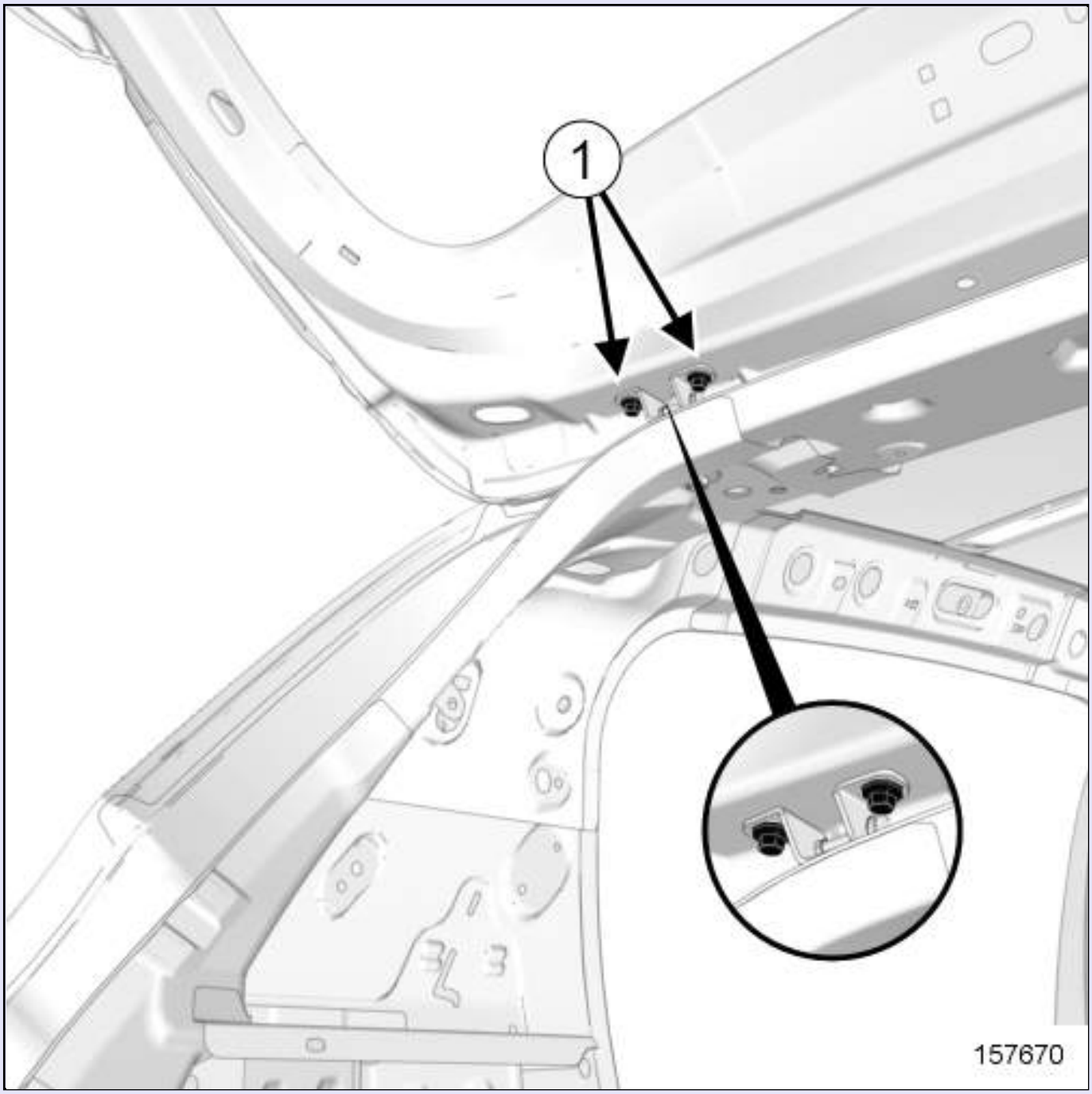
1- REMOVAL PREPARATION OPERATION

- Remove the tailgate trimRear opening element assembly on the passenger compartment side: Exploded view .

- Disconnect the following connectors :
  - the rear screen wiper motor,
  - the high level brake light,
  - the tailgate lock,
  - the heated rear screen,
  - the number plate lights.

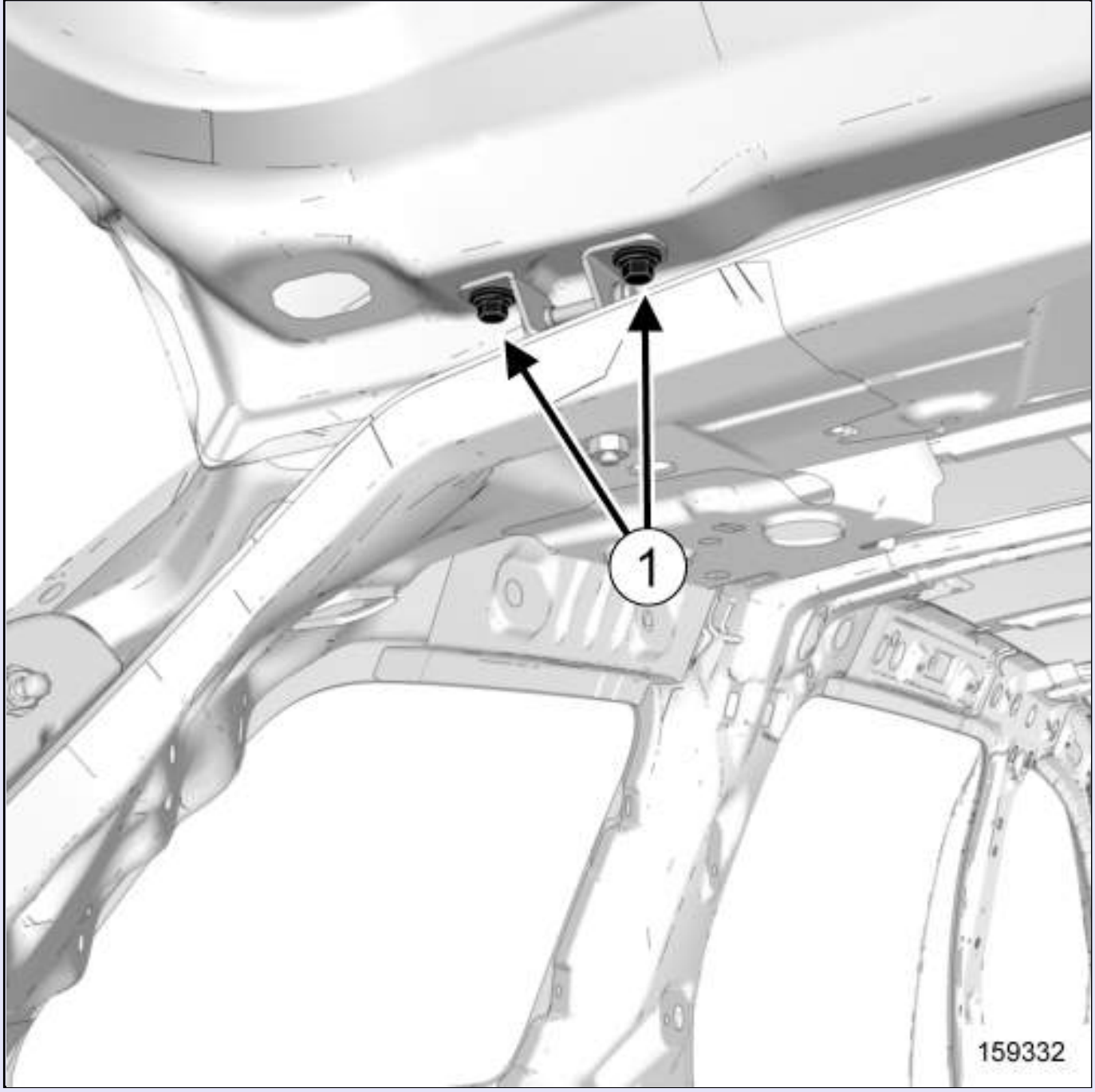
- Remove:
  - the tailgate wiring,
  - the tailgate washer jet tube,
  - the tailgate gas strutsRear opening element mechanism assembly: Exploded view .

2- REMOVAL OPERATION



Remove:

- the tailgate bolts(1) on each side of the vehicle,
- the tailgate (this operation requires two people).



Remove:

- the tailgate bolts(1) on each side of the vehicle,
- the tailgate (this operation requires two people).

2. REFITTING WITHOUT HINGES

Proceed in the reverse order to removal.

Adjust the gaps and flush fittings of the tailgate(see 48A, Non-side opening elements, Rear opening element: Adjustment) (see 48A,Non-side opening elements, Rear opening element: Adjustment) .

3. REMOVAL WITH HINGES

1- REMOVAL PREPARATION OPERATION

Remove:

- the headlining partially Roof trim assembly: Exploded view ,

- the tailgate trim Rear opening element assembly on the passenger compartment side: Exploded view .

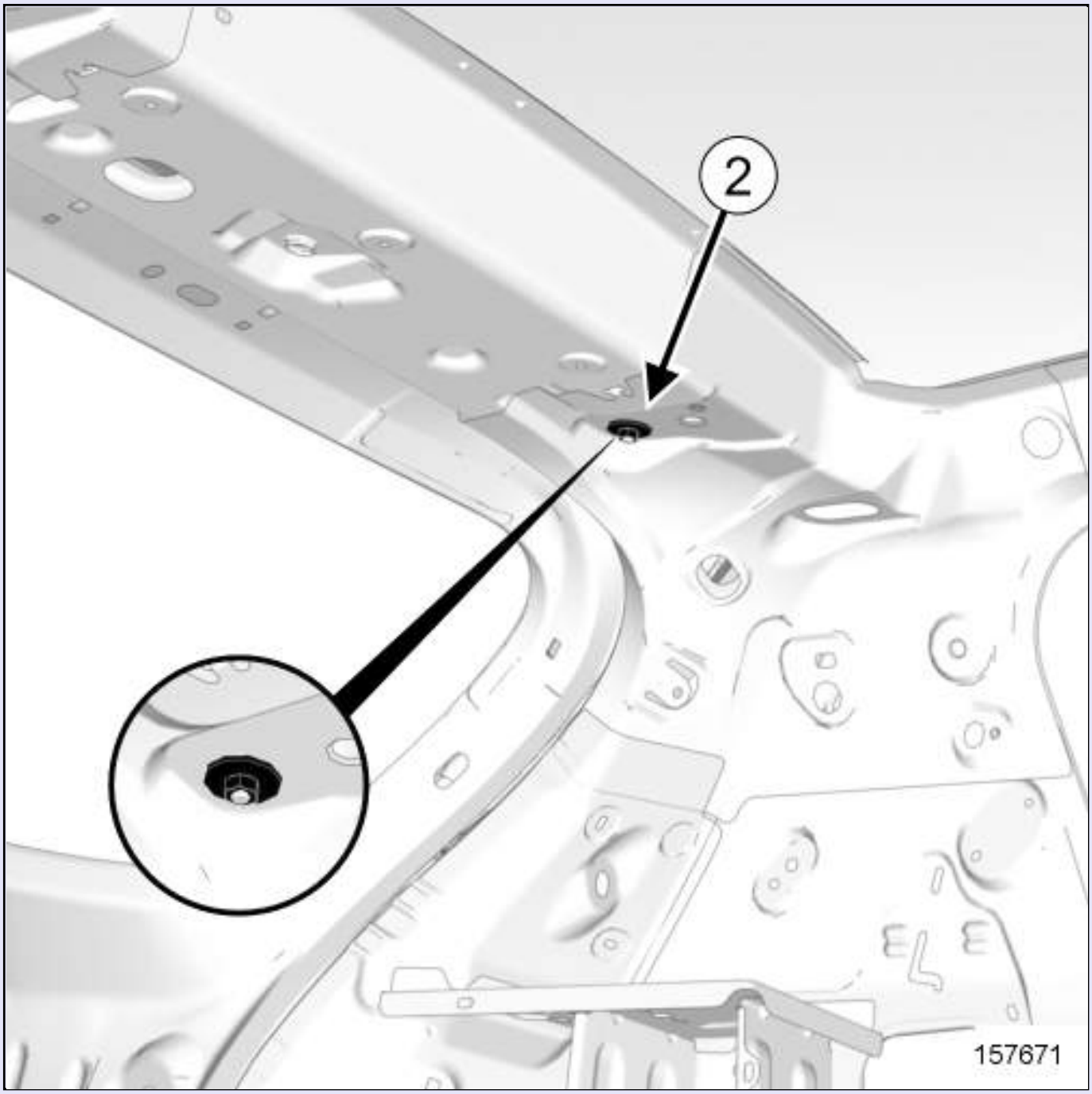
Disconnect the following connectors :

- the rear screen wiper motor,
- the high level brake light,
- the tailgate lock,
- the heated rear screen,
- the number plate lights.

Remove:

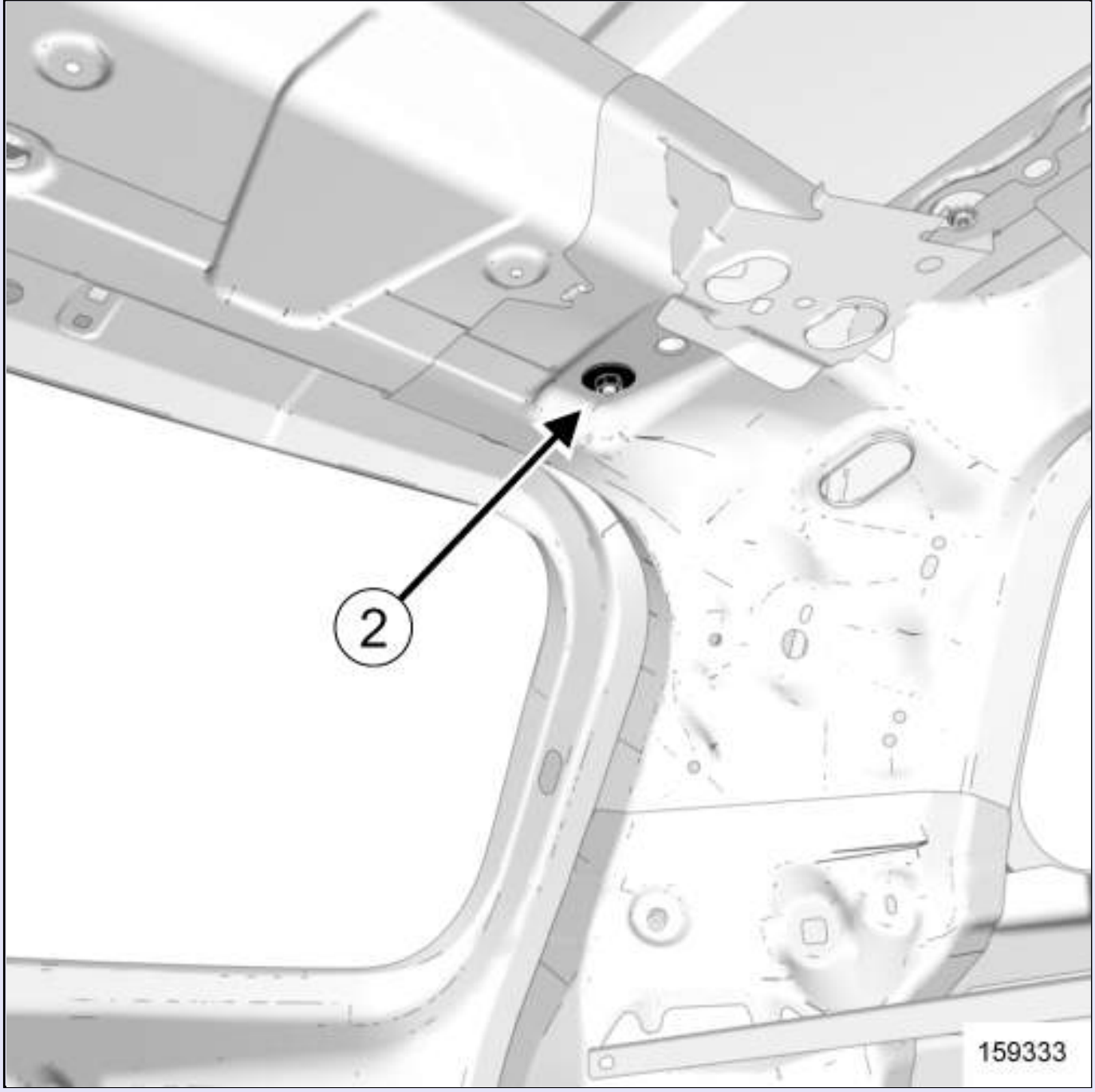
- the tailgate wiring,
- the tailgate washer jet tube,
- the tailgate gas struts Rear opening element mechanism assembly: Exploded view .

2- REMOVAL OPERATION



Remove:

- the tailgate hinge nut(2) on each side of the vehicle,
- the tailgate (this operation requires two people).



Remove:

- the tailgate hinge nut(2) on each side of the vehicle,
- the tailgate (this operation requires two people).

4. REFITTING WITH HINGES

Proceed in the reverse order to removal.

Adjust the tailgate panel gaps(see 48A, Non-side opening elements, Rear opening element: Adjustment) (see 48A, Non-side opening elements, Rear opening element: Adjustment) .

REAR OPENING ELEMENT: REMOVAL - REFITTING

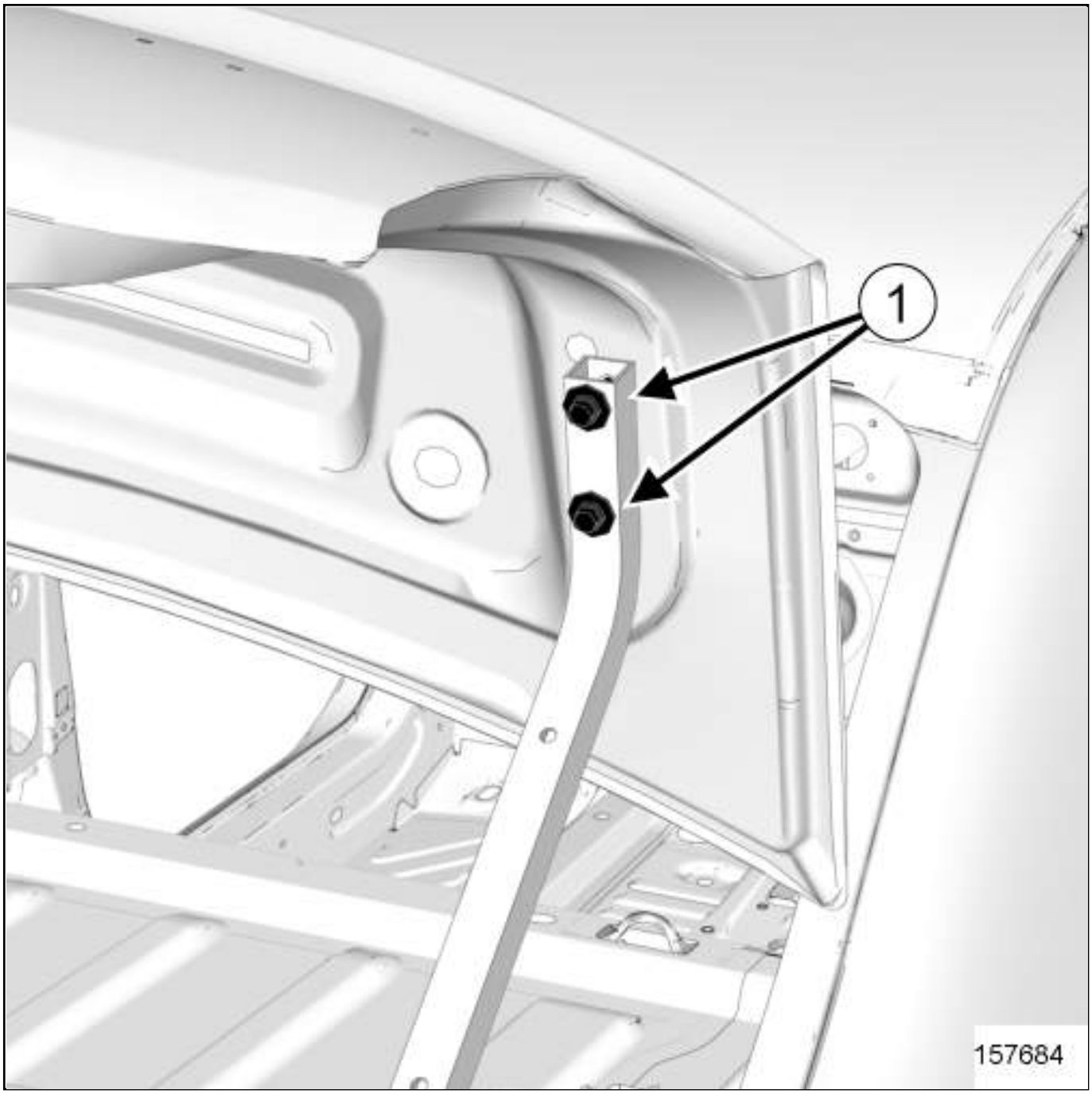
Location and specifications (tightening torques, parts always to be replaced, etc.)Rear opening element mechanism assembly: Exploded view .

1. REMOVAL WITHOUT THE HINGES

1- REMOVAL PREPARATION OPERATION

- Remove the boot lid wiring harness (depending on equipment level).

2- REMOVAL OPERATION



- Remove:
  - the bolts(1) on each side of the vehicle,
  - the boot lid (this operation requires two people).

2. REFITTING WITHOUT HINGES

- Proceed in the reverse order to removal.

- Adjust the panel gaps and flush fittings of the boot lid(see 48A, Non-side opening elements, Rear opening element: Adjustment) .

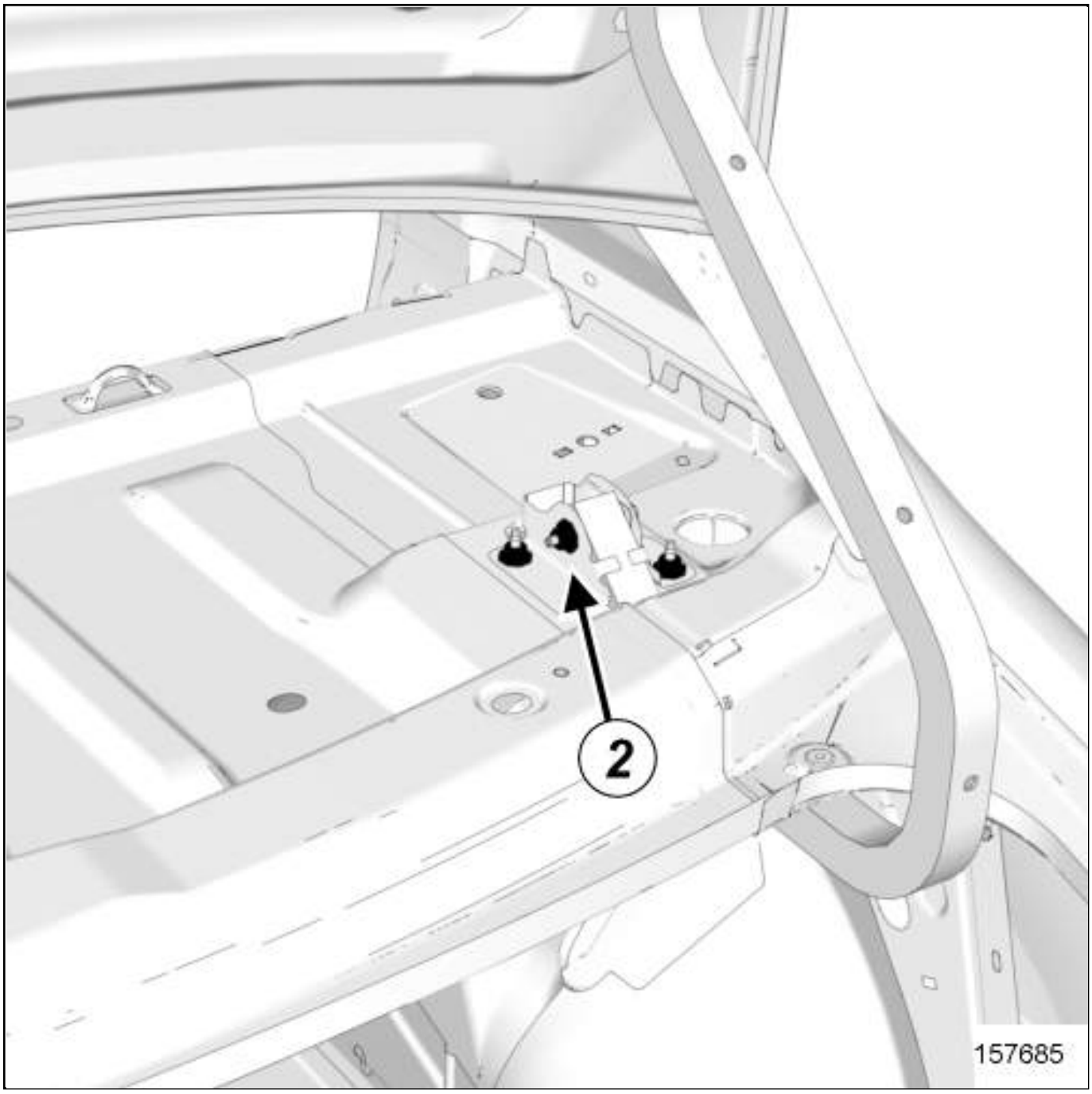
3. REMOVAL WITH HINGES

1- REMOVAL PREPARATION OPERATION

Remove:

- the boot lid wiring harness (depending on equipment level),
- the boot lid strut Rear opening element mechanism assembly: Exploded view ,
- the rear parcel shelf trim.

2- REMOVAL OPERATION



Remove:

- the boot lid hinge mountings(2) on each side of the vehicle,
- the boot lid (this operation requires two people).

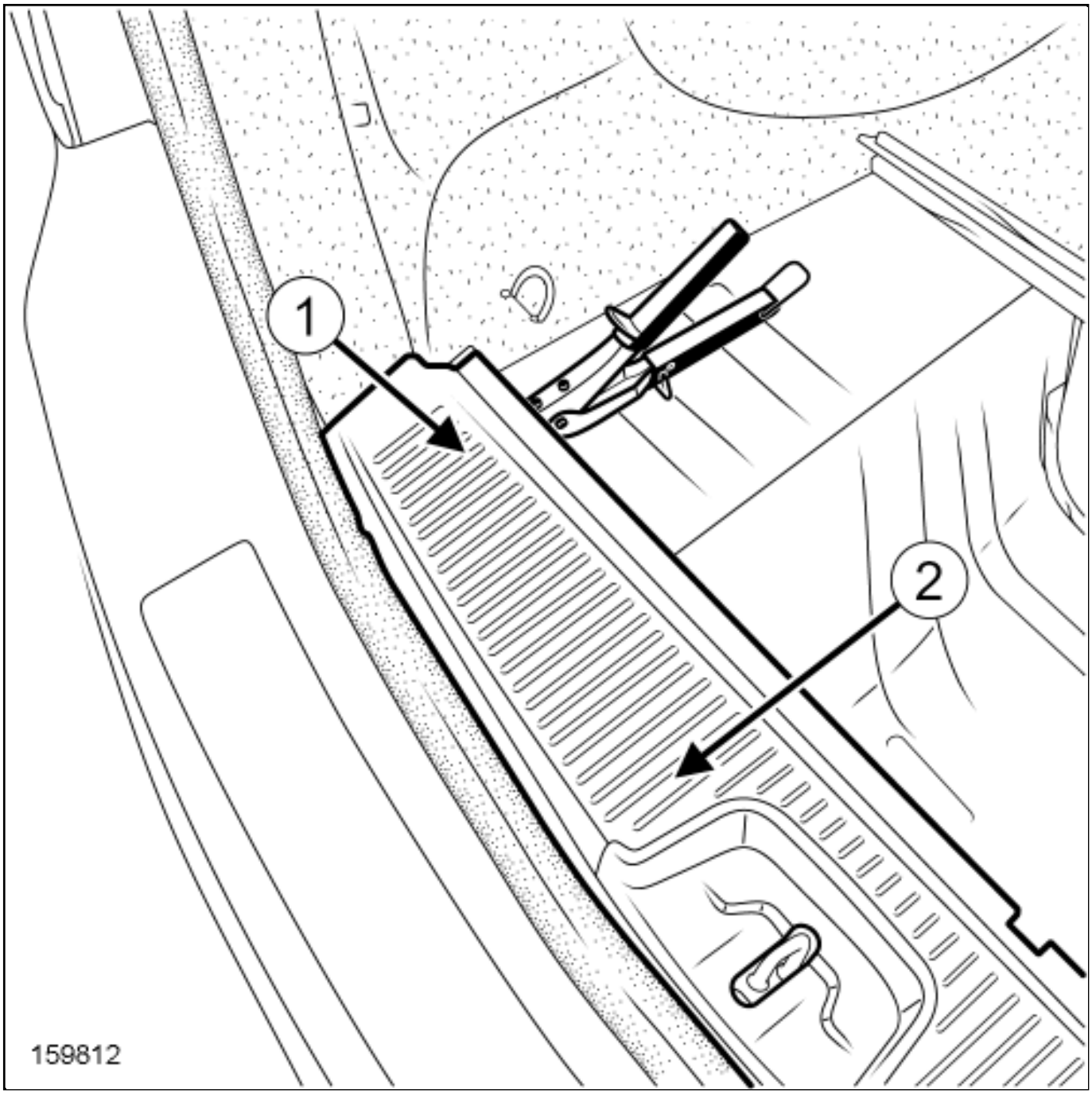
4. REFITTING WITH HINGES

Proceed in the reverse order to removal.

Adjust the panel gaps and flush fittings of the boot lid(see 48A, Non-side opening elements, Rear opening element: Adjustment) .

REAR OPENING ELEMENT SILL: REMOVAL - REFITTING

REMOVAL



- Unclip the rear opening element sill at(1) .

- Remove the rear opening element sill(2) .

REFITTING

- parts always to be replaced: Rear opening element sill clips.

- Proceed in the reverse order to removal.

REAR QUARTER PANEL WINDOW: REMOVAL - REFITTING

parts always to be replaced:

Windscreen adjusting shim

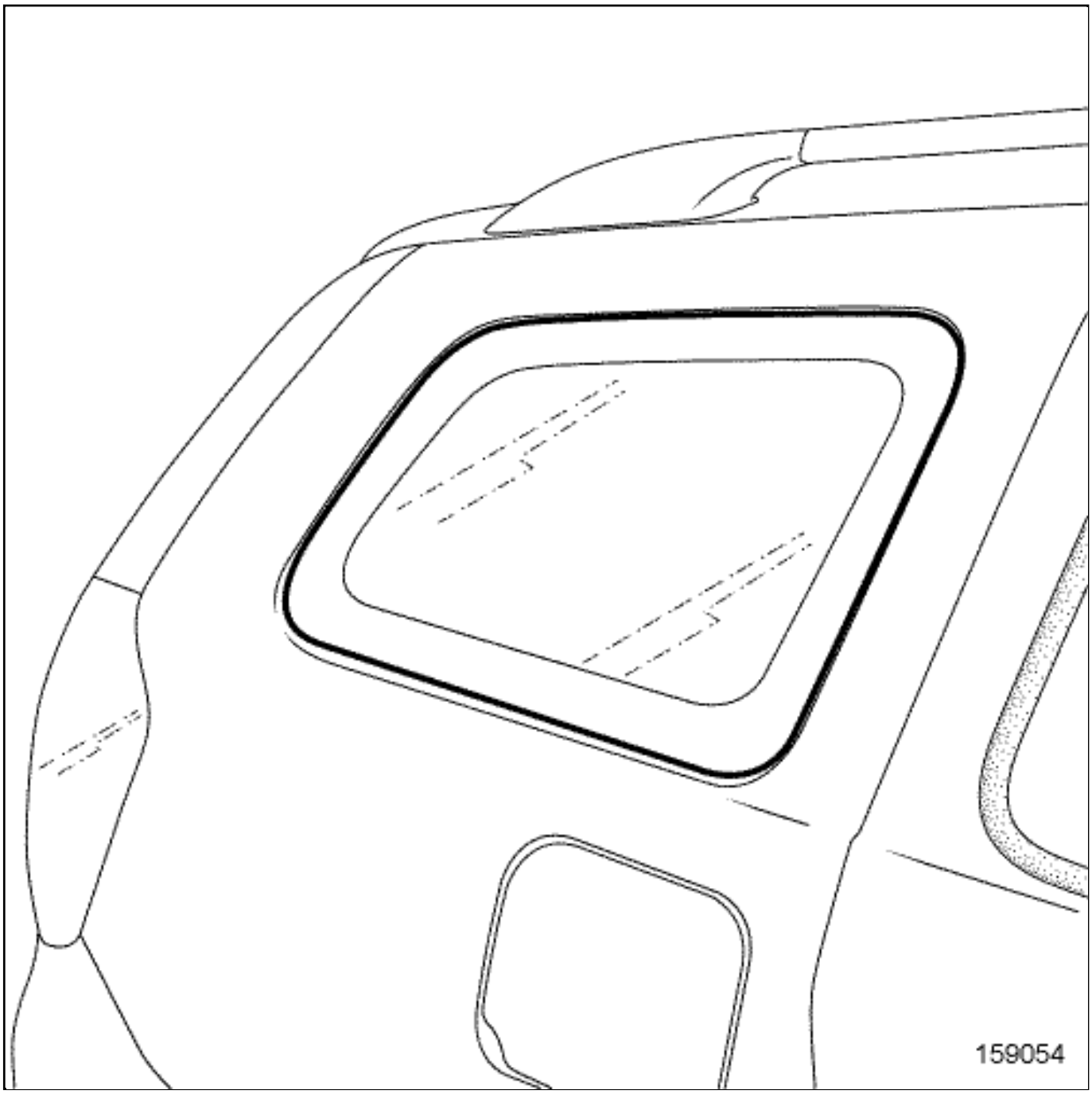
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the rear parcel shelf.

- Remove Interior body side trim assembly: Exploded view :
  - the C-pillar lower trim,
  - the rear side parcel shelf trim,
  - the rear pillar upper trim,
  - the C-pillar upper trim.

2. REMOVAL OPERATION



- Protect the edges of the rear quarter panel window using masking tape.
- Cut the cement bead (see Technical Note 0560A).

REFITTING

1. REFITTING PREPARATIONS OPERATION

- Always replace the stops.

-

parts always to be replaced: **Windscreen adjusting shim** .

- For preparation and bonding (see Technical Note 0560A).

2. REFITTING OPERATION

- Bond the rear quarter panel window.
- Equal out the clearances and shut lines.
- Remove the tabs from the stops when the adhesive has dried.
- Proceed in the reverse order to removal.

REAR SCREEN: REMOVAL - REFITTING

parts always to be replaced:
Rear screen adjusting shim

REMOVAL

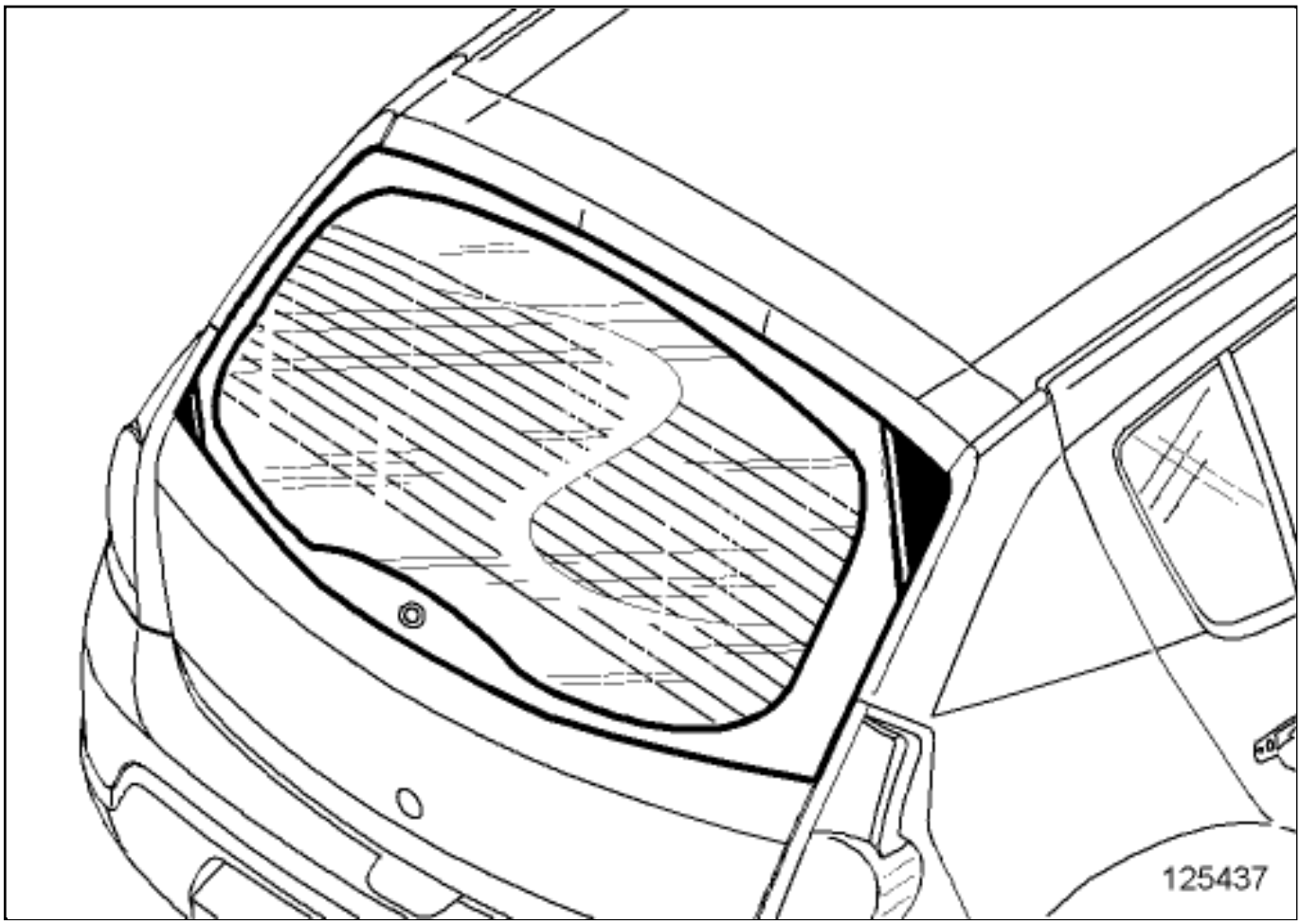
1. REMOVAL PREPARATION OPERATION

- Remove:
  - the tailgate trim Rear opening element assembly on the passenger compartment side: Exploded view ,
  - the rear screen wiper arm Wipers/washing assembly : Exploded view ,
  - the rear screen wiper motor Wipers/washing assembly : Exploded view .

- Remove the high level brake light Rear signals - lighting assembly: Exploded view .

- Disconnect the heated rear screen wiring harness.

2. REMOVAL OPERATION



- Protect the edges of the rear screen using masking tape.
- Cut the cement bead (see Technical Note 0560A).
- Remove the rear screen window (this operation requires two people).

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: Rear screen adjusting shim

- Refit the rear screen wiper motor Wipers/washing assembly : Exploded view to act as a guide for positioning the rear screen.
- For preparation and bonding (see Technical Note 0560A).

2. REFITTING OPERATION

- Bond the rear screen (two people are required for this operation).
- Equal out the clearances and shut lines.
- Remove the tabs from the stops once the adhesive has dried.

3. FINAL OPERATION

- Connect the heated rear screen wiring harness connectors.
- Refit the high level brake light **Rear opening element assembly on the passenger compartment side: Exploded view** .
- Refit:
  - the rear screen wiper arm **Wipers/washing assembly : Exploded view** ,
  - the tailgate trim **Rear opening element assembly on the passenger compartment side: Exploded view** .

REAR SCREEN: REMOVAL - REFITTING

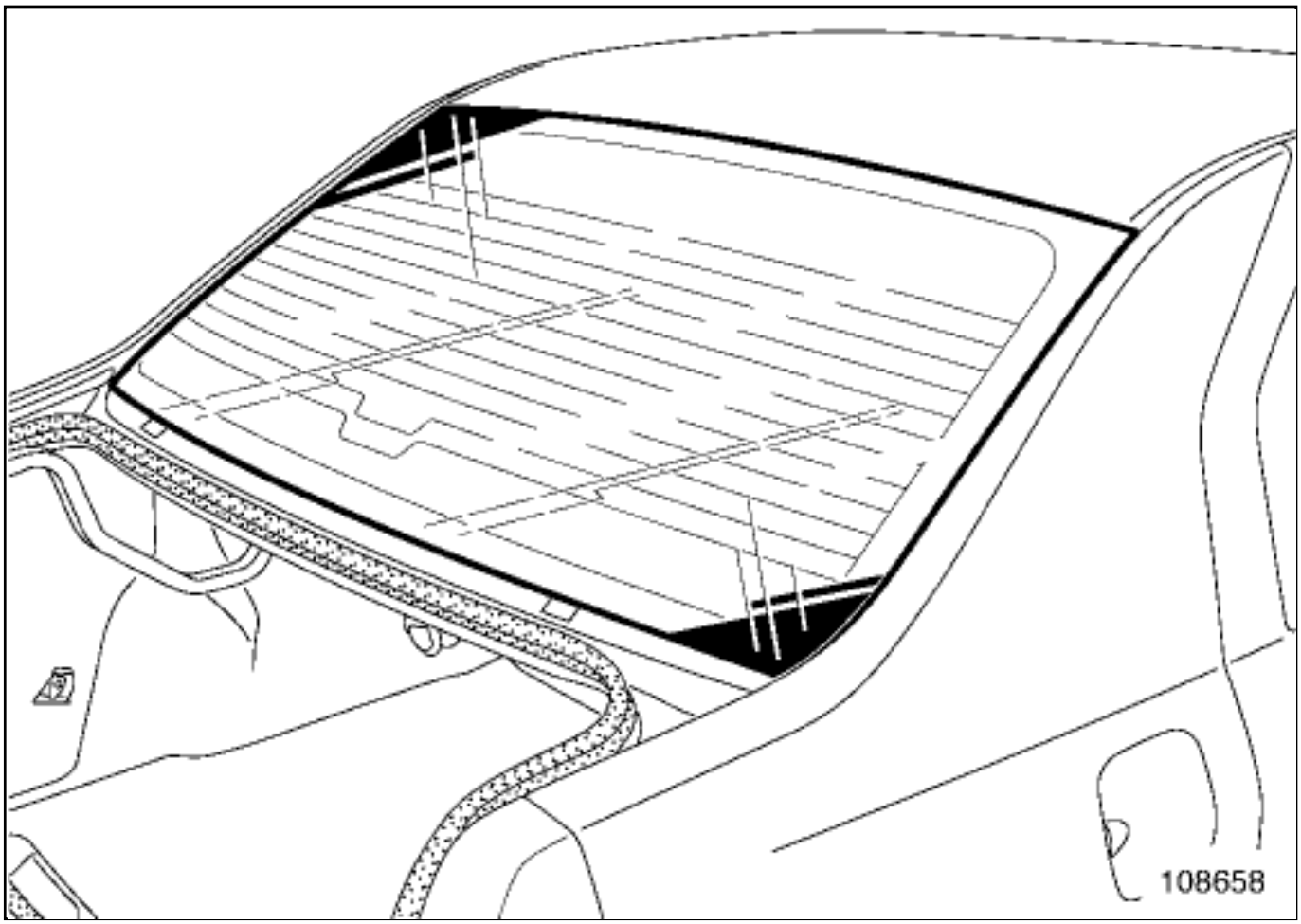
parts always to be replaced:
Rear screen adjusting shim

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the C-pillar lower trims Interior body side trim assembly: Exploded view .
- Disconnect the rear screen de-icer connectors.
- Remove:
  - the rear quarter panel trims Interior body side trim assembly: Exploded view ,
  - the rear parcel shelf lining,
  - the brake lights Rear signals - lighting assembly: Exploded view .
- Protect the edge of the rear screen window with masking tape.

2. REMOVAL OPERATION



- Cut the cement bead (see Technical Note 0560A) (this operation requires two people).
- Remove the rear screen (this operation requires two people).

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: Rear screen adjusting shim

- For preparation and bonding (see Technical Note 0560A).

2. REFITTING OPERATION

- Bond the rear screen (this operation requires two people).

- Equal out the clearances and shut lines.

3. FINAL OPERATION

- Remove the masking tape.

- Refit:
  - the brake lights **Rear signals - lighting assembly: Exploded view** ,
  - the rear parcel shelf lining,
  - the rear quarter panel trims **Interior body side trim assembly: Exploded view** ,

- Connect the rear screen de-icer connectors.

- Refit the C-pillar lower trims **Interior body side trim assembly: Exploded view** .

REAR SEAT BELT BUCKLE: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always replaced, etc.)Rear bench seat assembly: Exploded view .

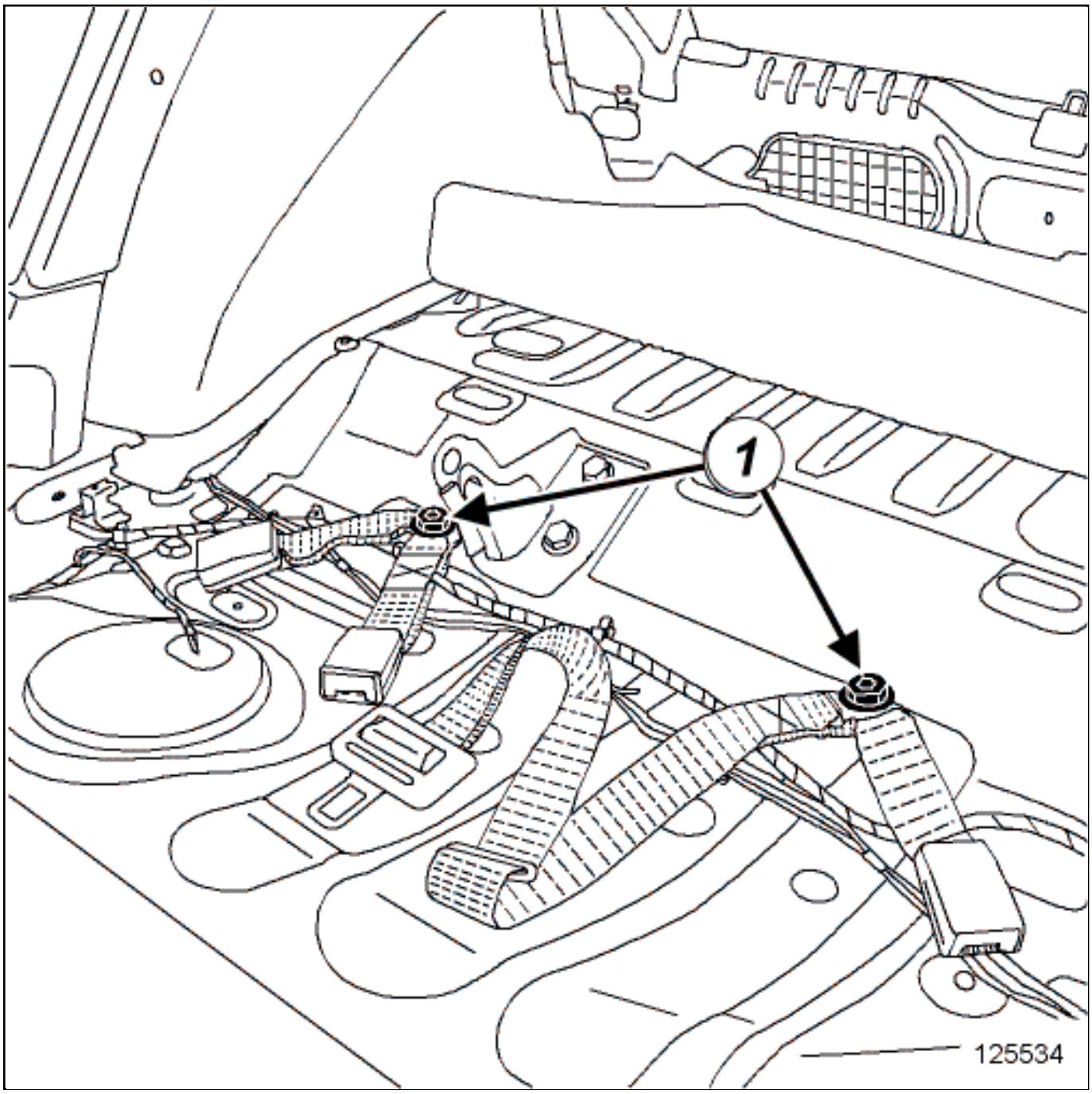
REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove Rear bench seat assembly: Exploded view :

- the single unit rear bench seat base,
- the 1/3 and 2/3 rear bench seatback or the single unit rear bench seatback.

2. REMOVAL OPERATION



- Remove:
  - the bolts(1) ,
  - the rear seat belt buckles.

REFITTING

1. REFITTING PREPARATION OPERATION

- Coat the threads of the rear seat belt buckle bolts with HIGH STRENGTH THREAD LOCK Vehicle: Parts and consumables for the repair .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.
- Torque tighten the rear seat belt buckle bolts21 N.m.

REAR SECTION OF THE VEHICLE: SEALING CHECK

Note:

Before any operation, check the water outlet openings. Clean any residue which has accumulated (for example: dead leaves, twigs, etc.) and check that water flows out correctly.

Note:

To check the sealing of the rear opening element windows(see 60A, General information, Windows: Sealing check) .

Note:

When checking the sealing of the rear section of the vehicle, the interior or exterior trims must be partially removed to facilitate the sealing check (see MR for the vehicle concerned).

Note:

The list of the joint areas dealt with here is general. Additional zones may exist depending on the layout of each vehicle (see MR for the vehicle concerned).

1. PREPARATION OPERATION FOR CHECKING THE SEALING

1- CONDITIONS TO RESPECT BEFORE CHECKING THE SEALING

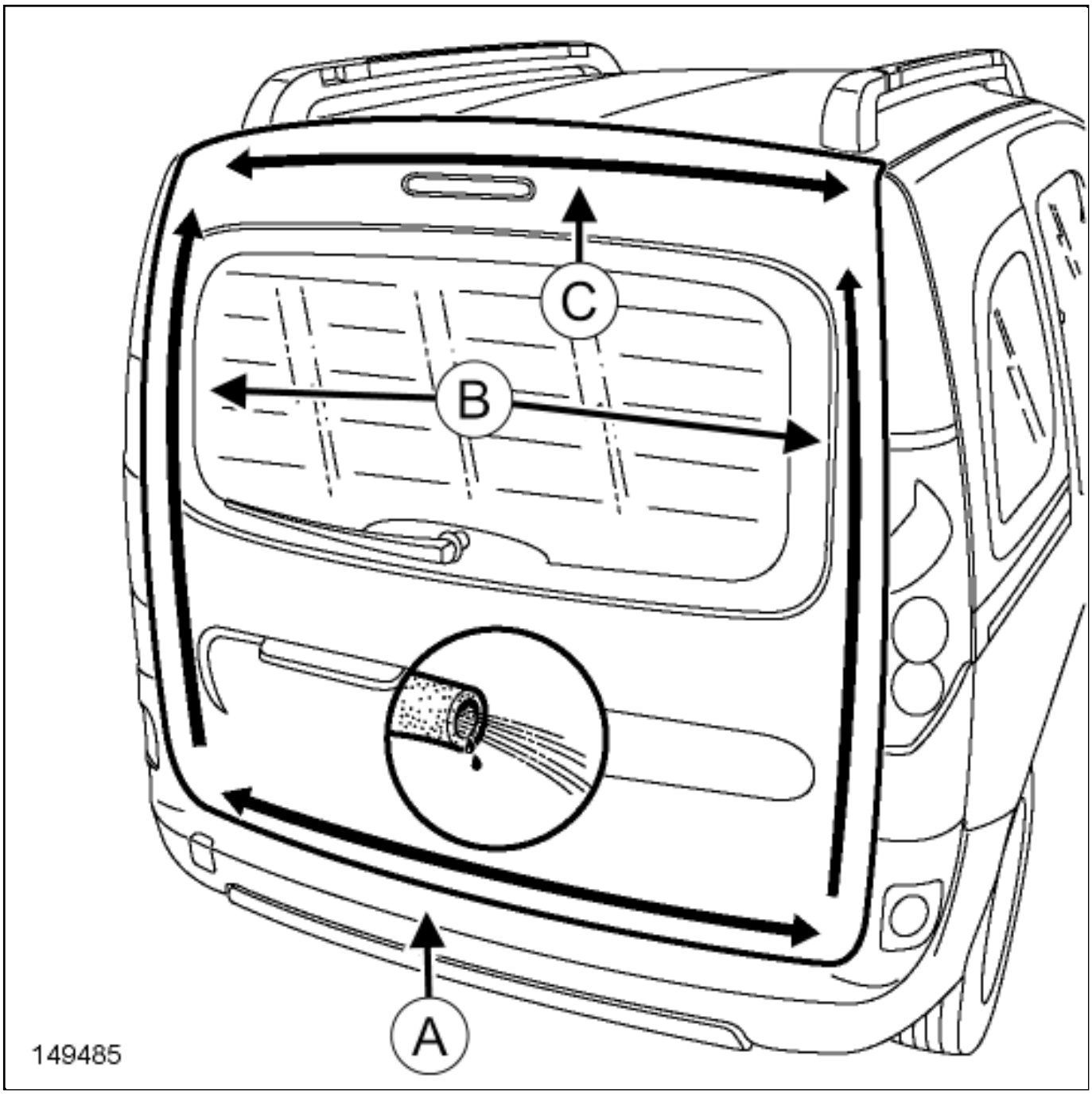
- Position the vehicle on a level washing area(see 60A, General information, Vehicle sealing: General information) .
- Check that all the opening elements are closed(see 60A, General information, Vehicle sealing: General information) .
- Prepare the equipment to perform the operation(see 60A, General information, Sealing tools: Use) ,(see

60A, General information, Sealing tools: Description) and(see 60A, General information, Vehicle sealing: General information) .

- Adjust the flow of the water jet(see 60A, General information, Sealing tools: Use) .

2. OPERATION FOR CHECKING THE SEALING

1- REAR OPENING ELEMENT SEAL



- Spray the lower section(A) of the opening element by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle (see 60A, General information, Vehicle sealing: General information) .

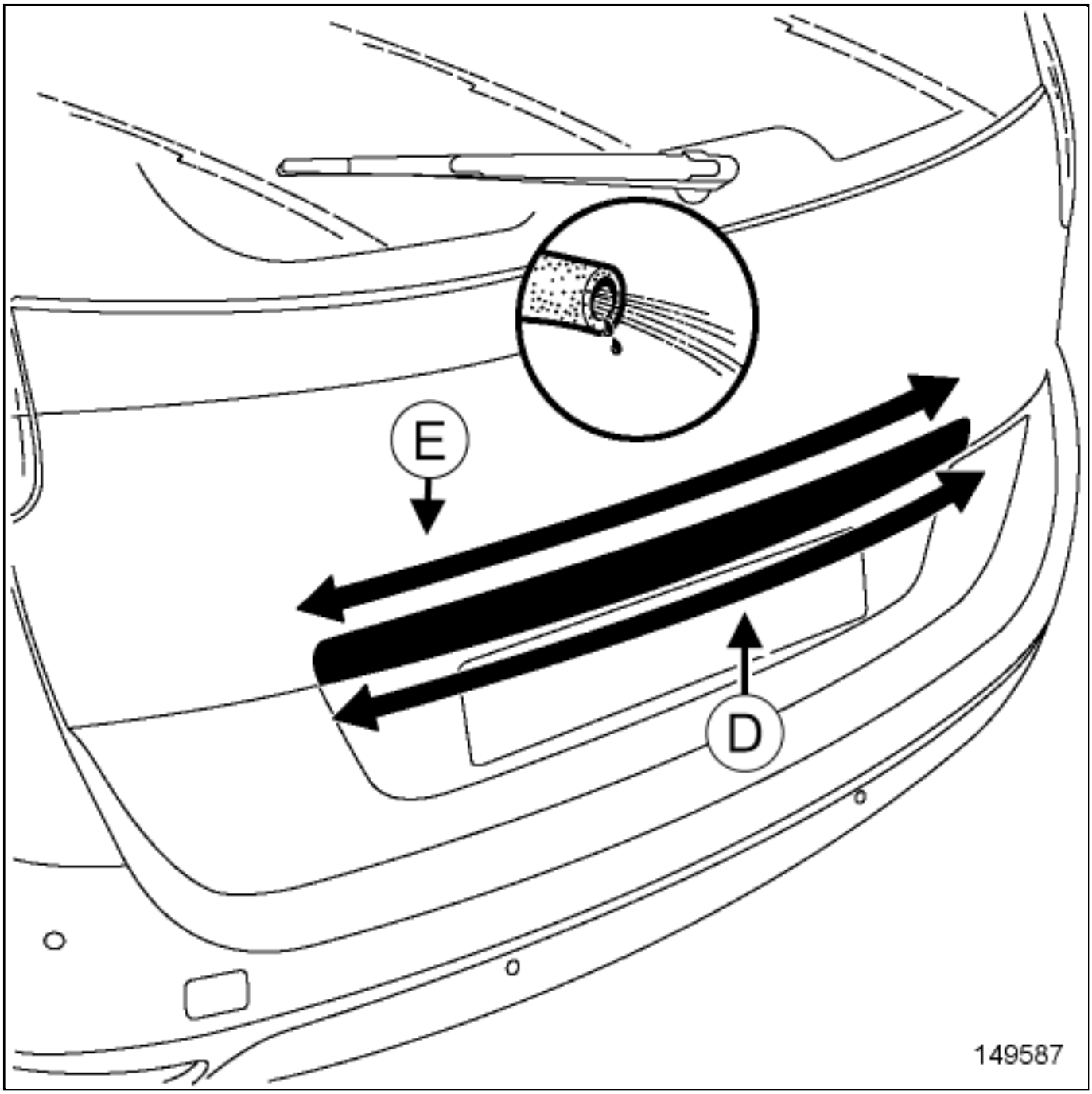
- Spray the vertical sections(B) of the rear opening element gradually from the bottom upwards to the upper section.

- Visually inspect for the presence of water inside the vehicle (see 60A, General information, Vehicle sealing: General information) .

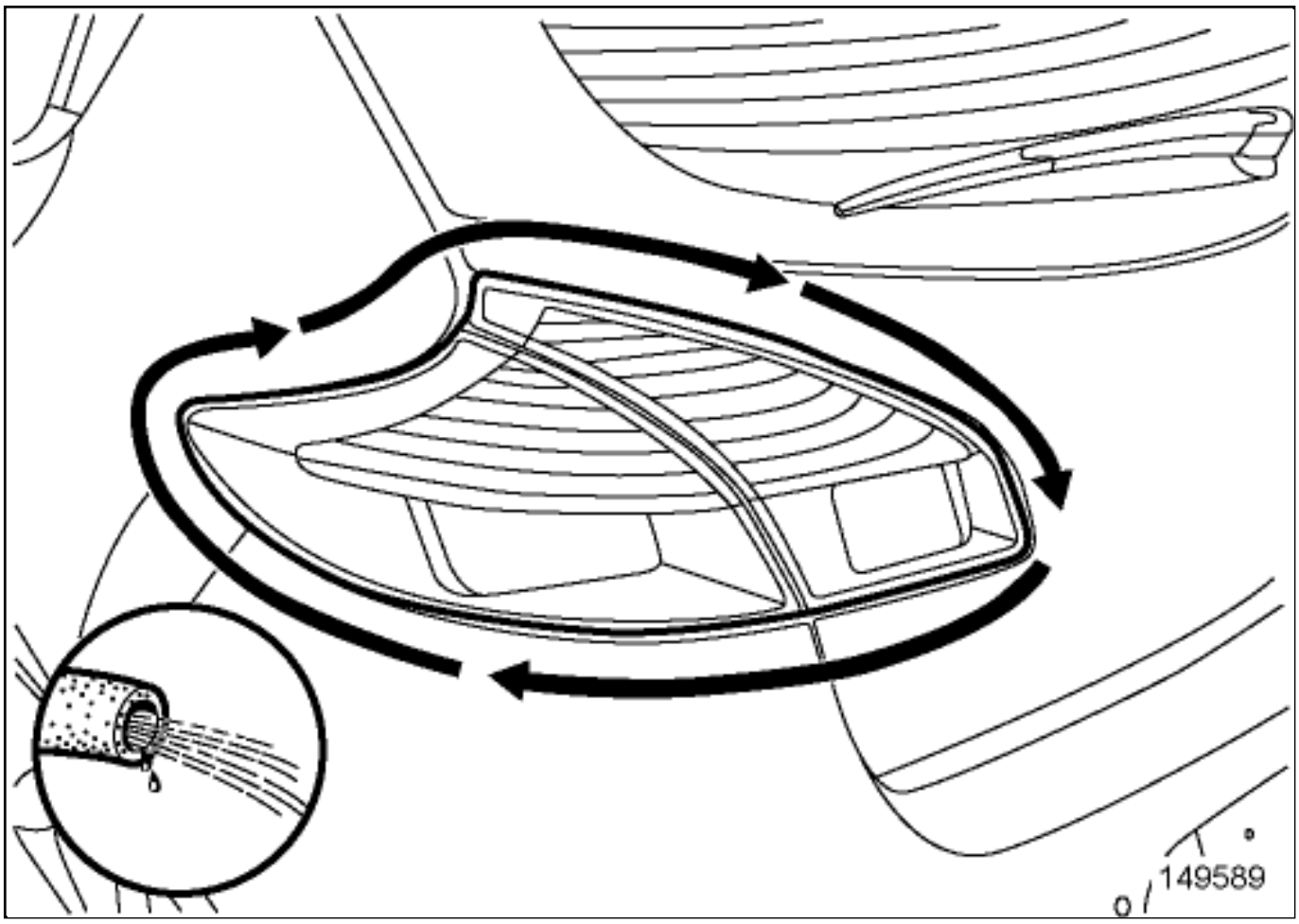
- Spray the upper section(C) of the rear opening element by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle (see 60A, General information, Vehicle sealing: General information) .

2- REAR OPENING ELEMENT STRIP



- Spray the lower section(D) of the rear opening element strip by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the upper section(E) of the rear opening element strip by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .



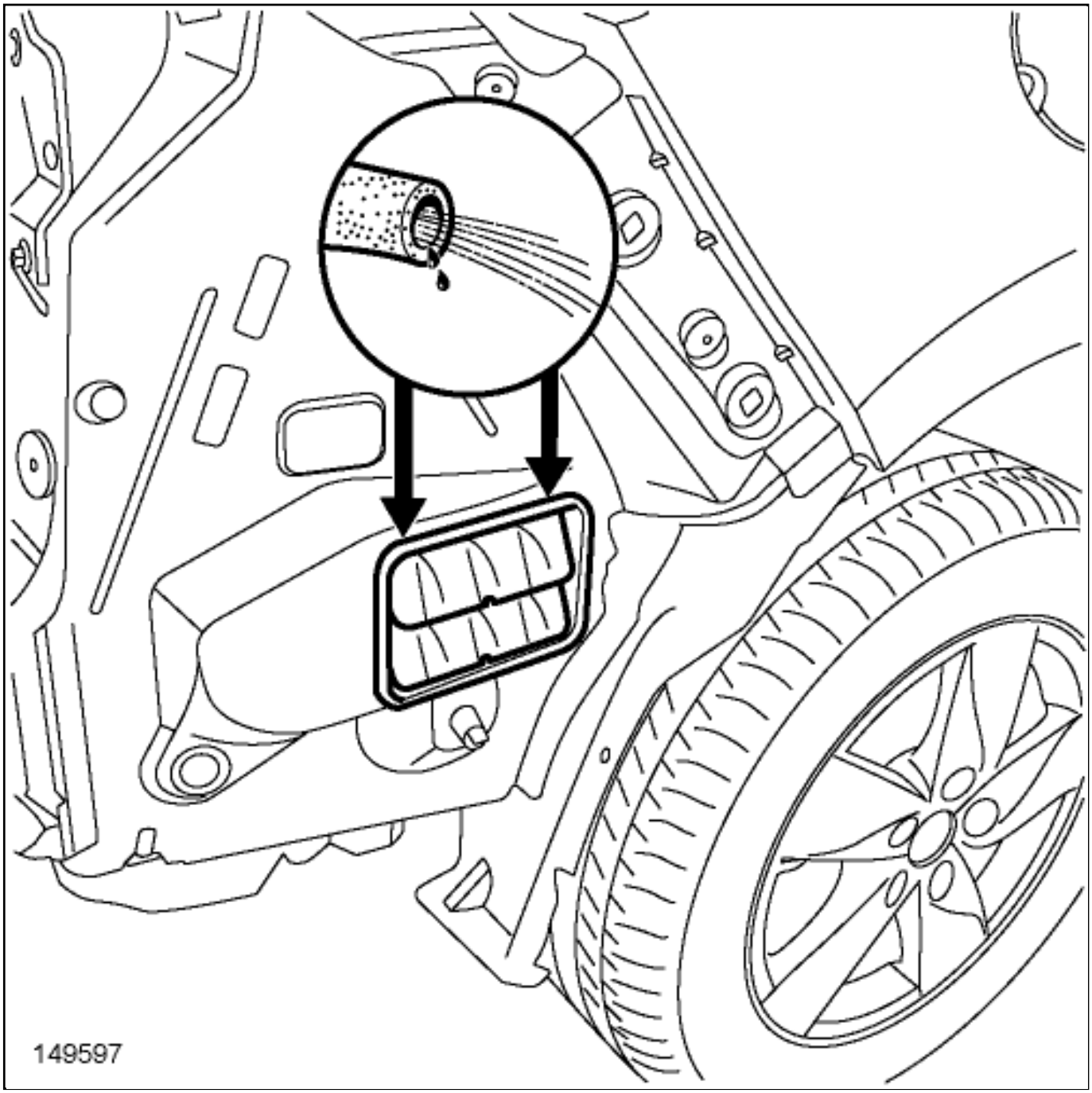
- Spray the rear lights gradually from the bottom upwards by sweeping the zone in a circular manner.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

4- REAR AIR EXTRACTORS

Note:

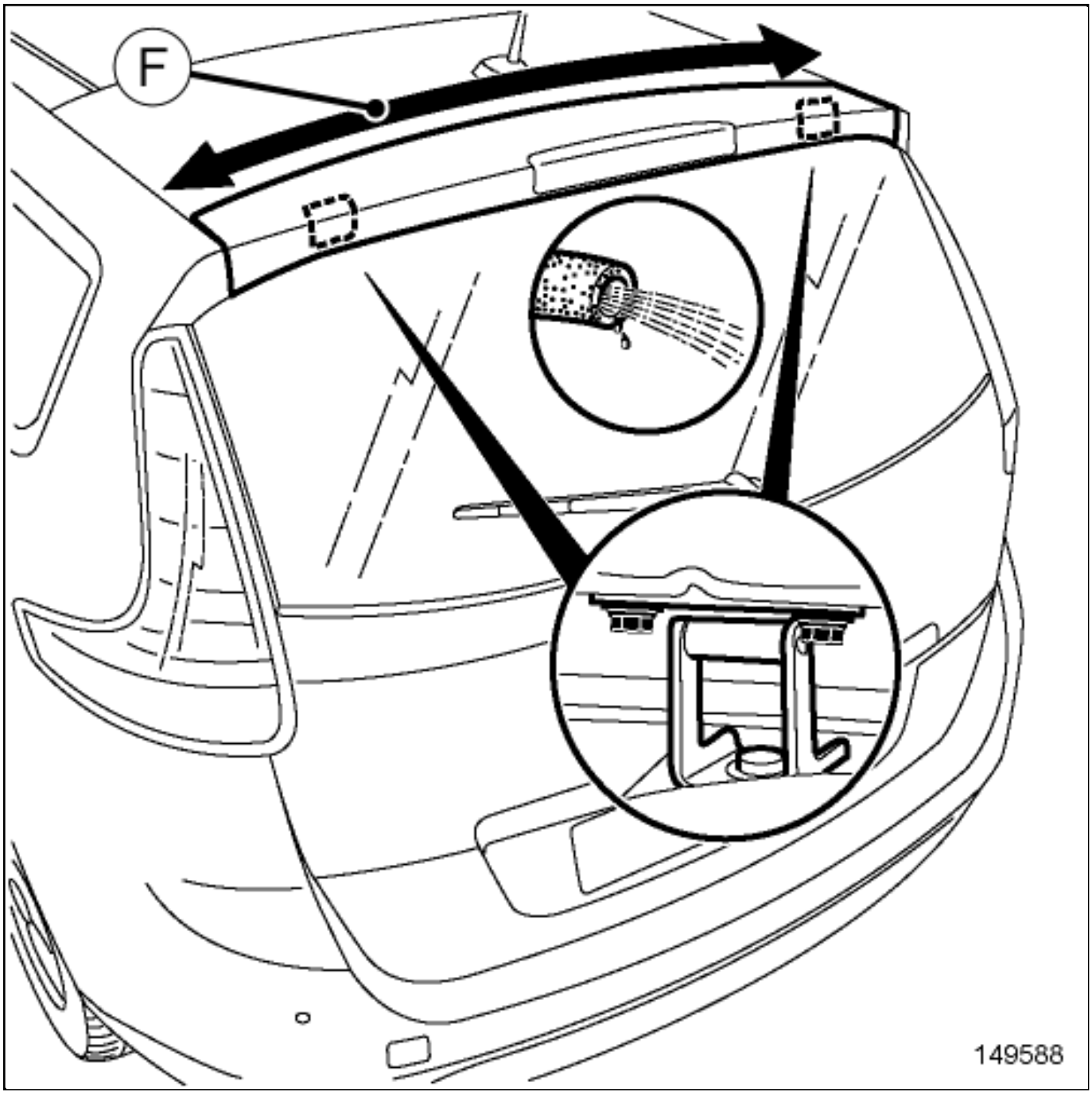
When spraying the rear air extractor, do not spray the central section directly as the flexible membranes may become deformed under the pressure of the water.



- Spray the edge of the rear air extractor by sweeping the zone from the top downwards.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

5- REAR OPENING ELEMENT HINGES



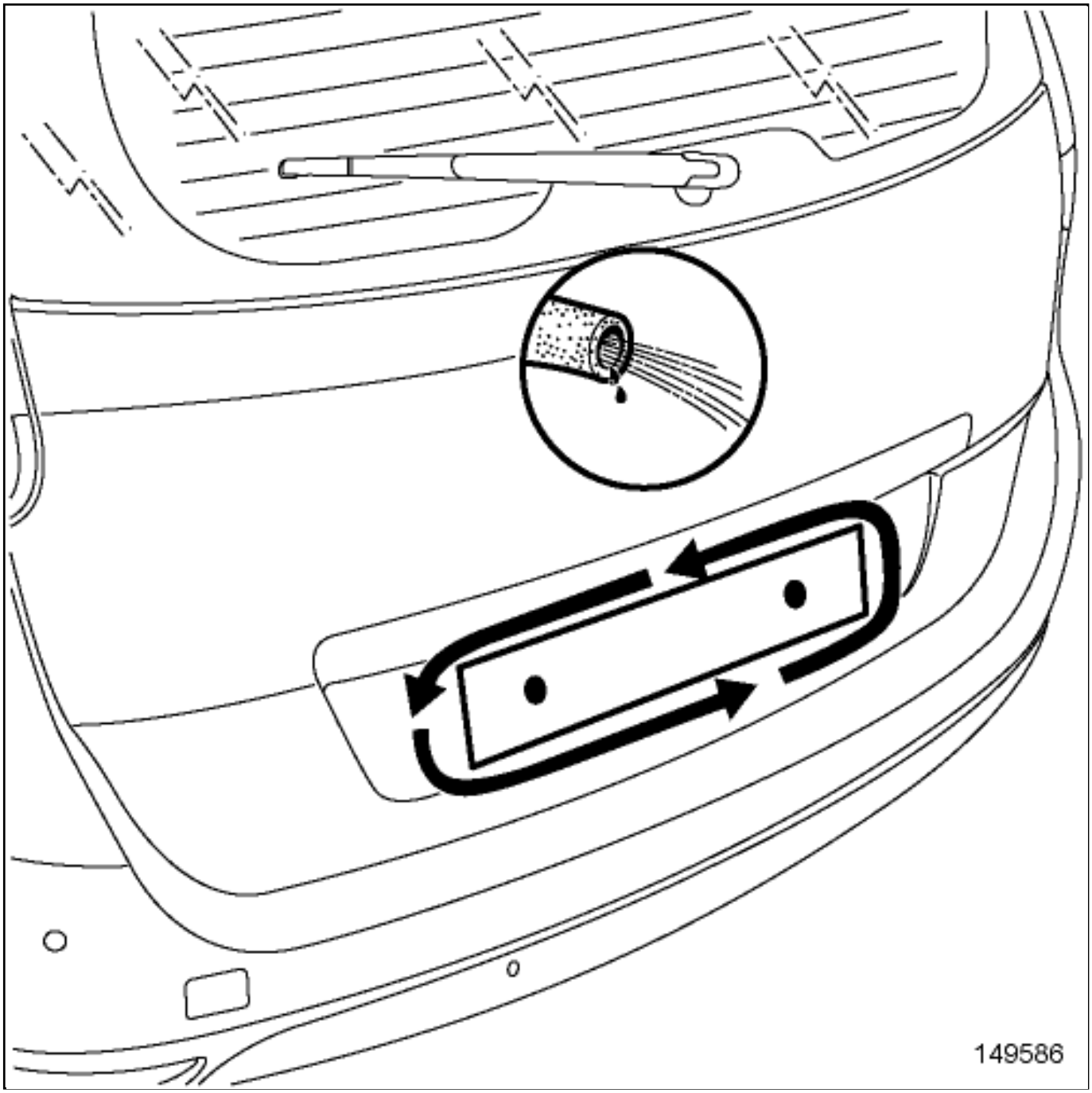
First procedure:

- Spray the upper section(F) of the rear opening element by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

Second procedure:

- Spray the joint area of the rear opening element hinges locally using the hand pressure sprayer(see 60A, General information, Sealing tools: Description) ,(see 60A, General information, Sealing tools: Use) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

6- NUMBER PLATE RIVETS ON REAR OPENING ELEMENT



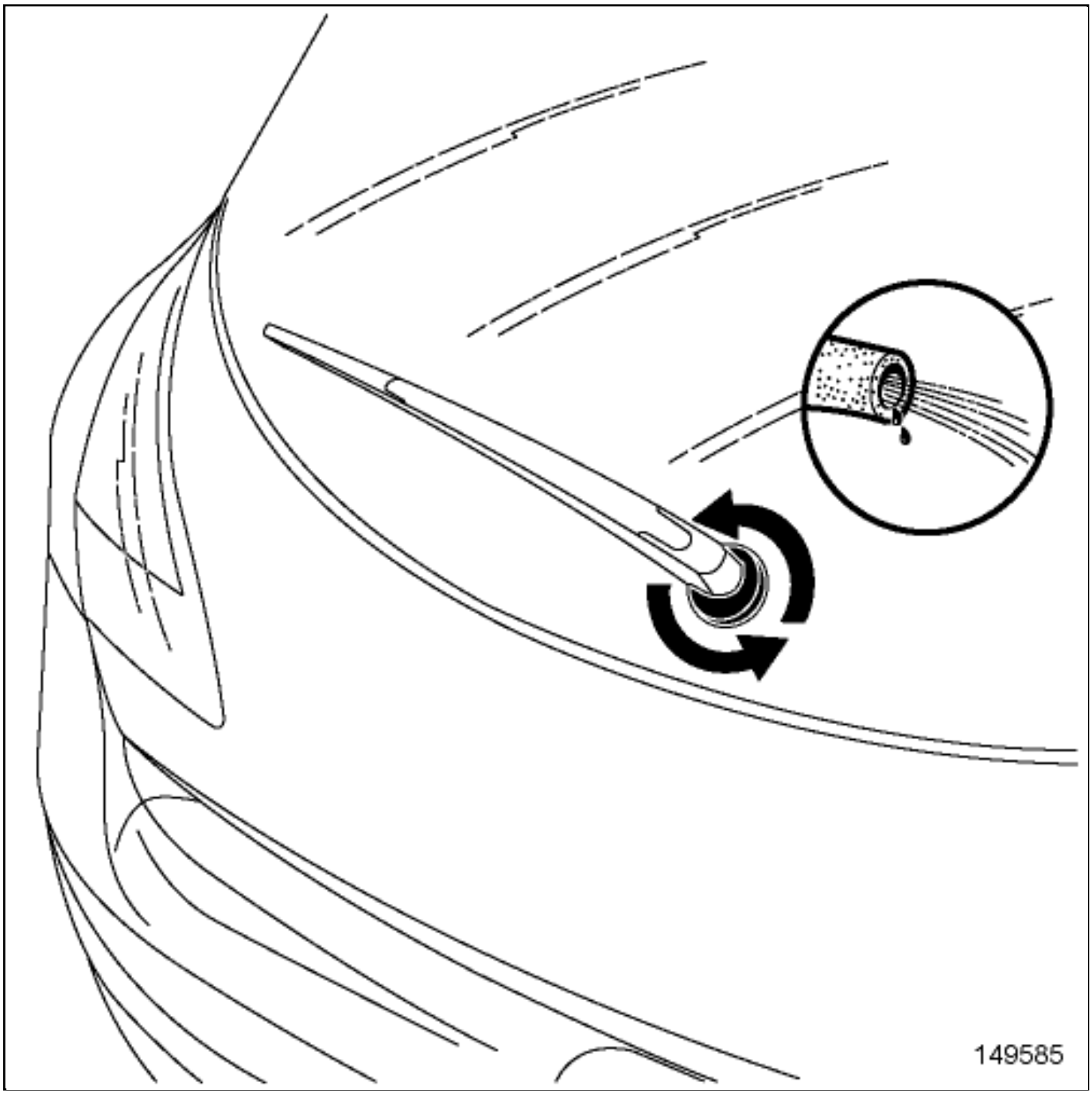
- Spray the edge of the number plate by sweeping the zone in a circular manner.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Spray the rivets of the number plate without moving.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

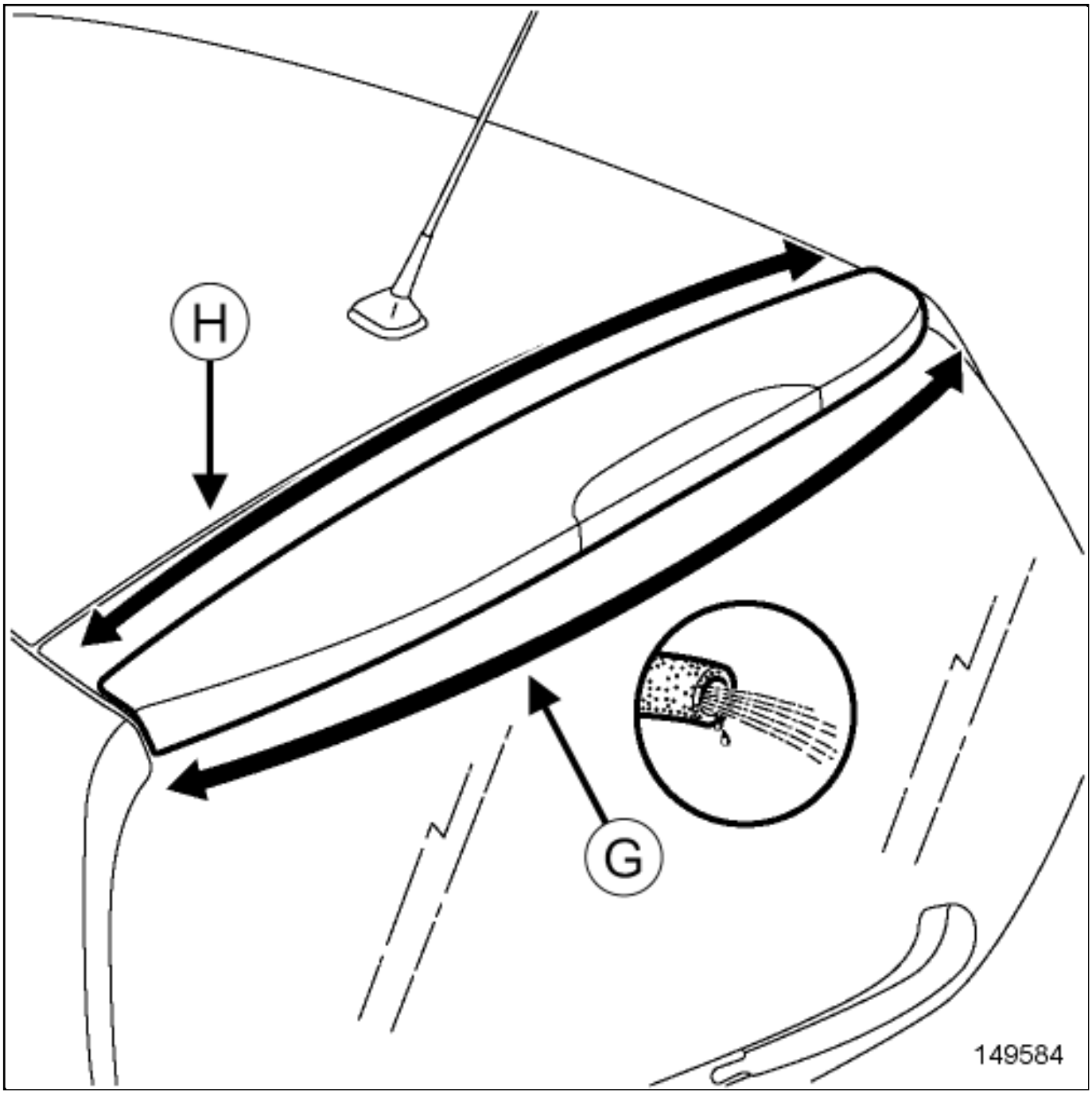
7- REAR WIPER MOTOR SEAL



- Spray the edge of the rear wiper motor seal by sweeping the zone in a circular manner.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

8- REAR AERODYNAMIC COMPONENT



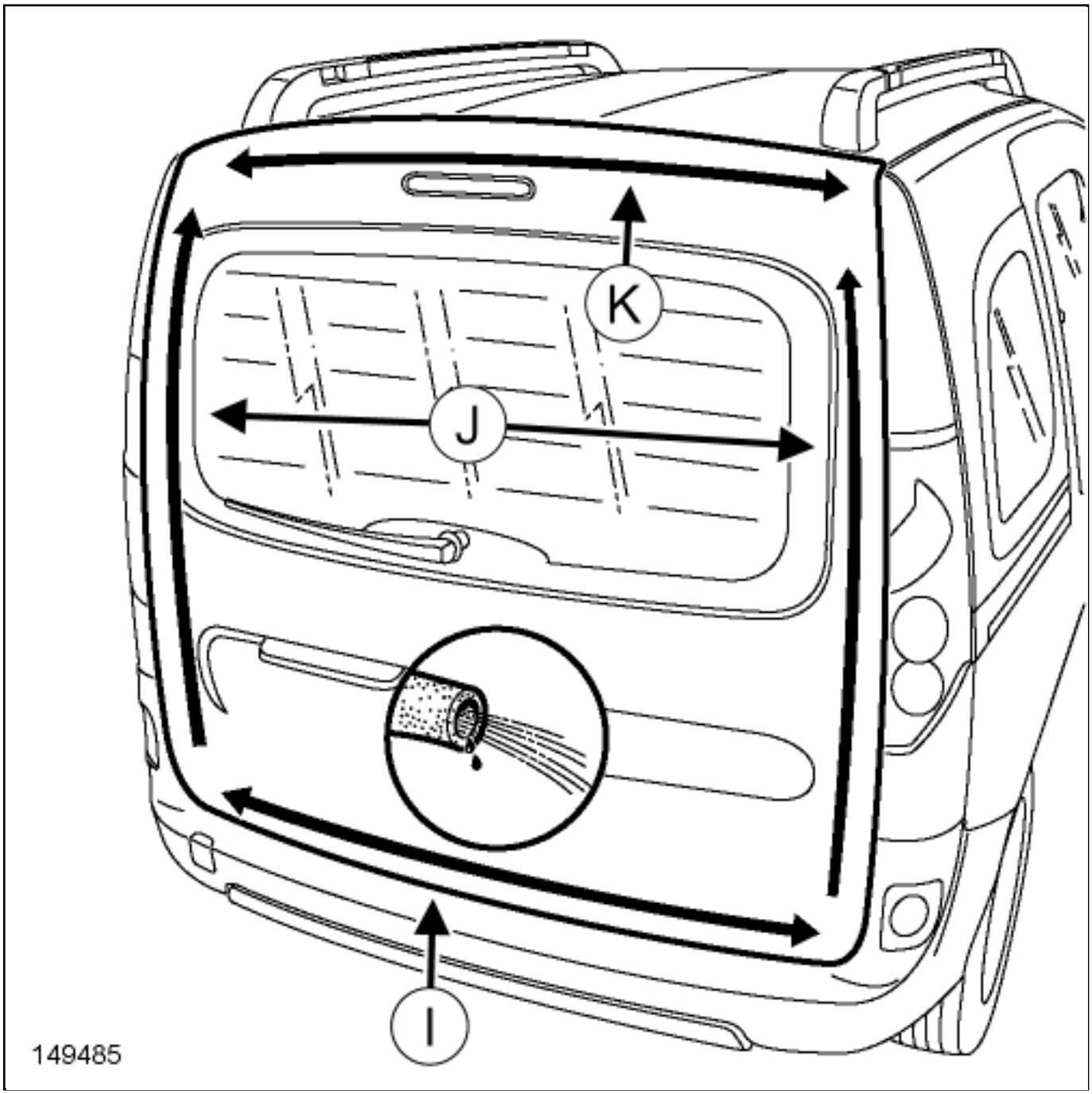
- Spray the lower section(G) of the rear aerodynamic component by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Spray the upper section(H) of the rear aerodynamic component by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

1)FIRST PROCEDURE: REAR OPENING ELEMENT CLOSED



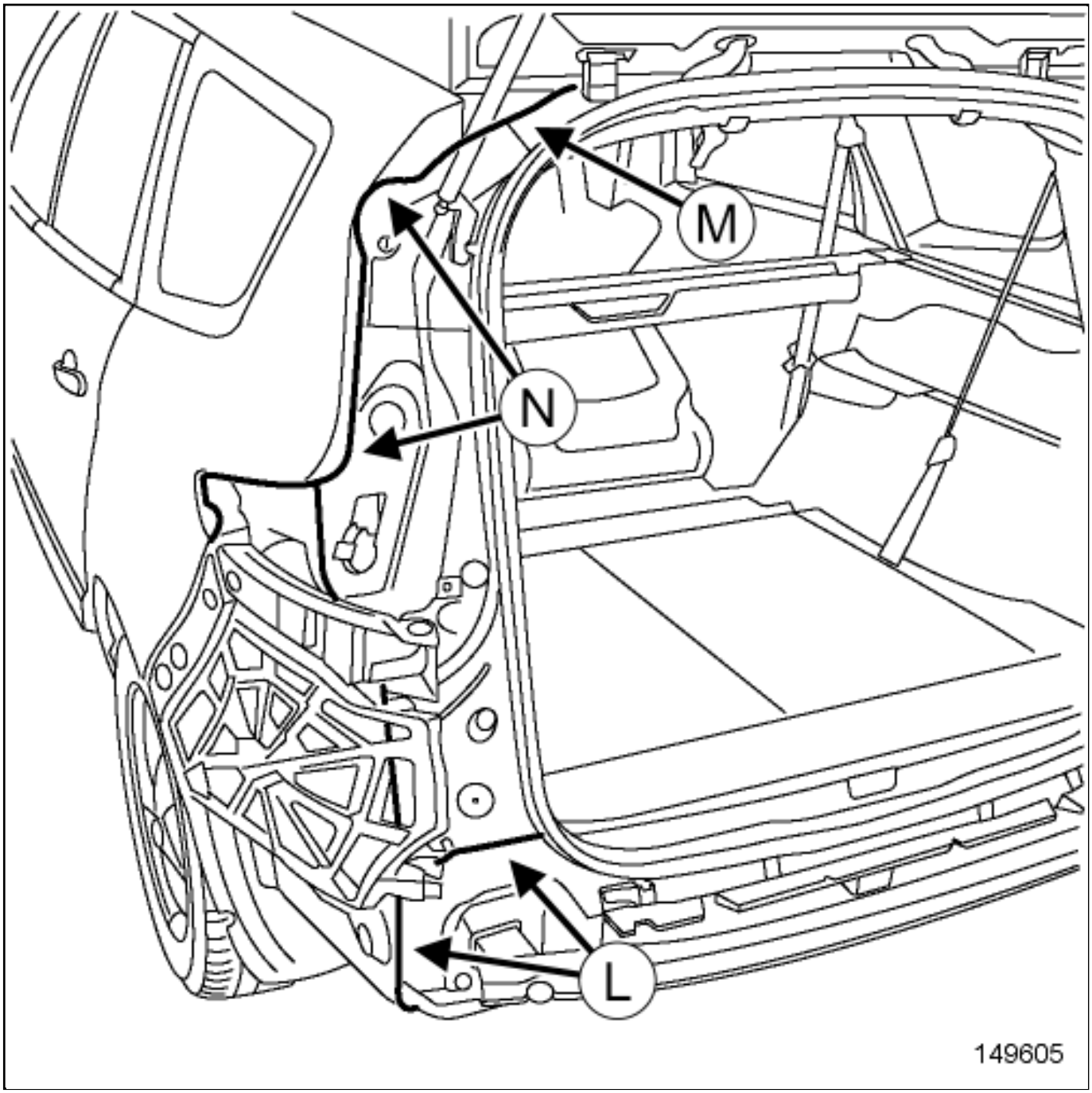
- Spray the lower section(I) of the rear opening element by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the vertical sections(J) of the rear opening element gradually from the bottom upwards to the upper section.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing:

General information) .

- Spray the upper section(K) of the rear opening element by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

2)SECOND PROCEDURE: REAR OPENING ELEMENT OPEN



- Spray the joint area(L) of the rear end panel / rear light mounting locally using the hand pressure sprayer from the bottom upwards(see 60A, General information, Sealing tools: Description) ,(see 60A, General

information, Sealing tools: Use) .

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Spray the joint area(M) of the rear wing panel / rear wing panel rain channel / rear light mounting locally using the hand pressure sprayer from the bottom upwards(see 60A, General information, Sealing tools: Description) ,(see 60A, General information, Sealing tools: Use) .

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Spray the joint area(N) of the rear wing panel rain channel / roof locally using the hand pressure sprayer from the bottom upwards(see 60A, General information, Sealing tools: Description) ,(see 60A, General information, Sealing tools: Use) .

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

10- CHECKING THE SEALING WITH THE TRIM REMOVED

- If the customer complaint could not be reproduced in accordance with the procedure, remove the interior trims (see Body internal trim in the vehicle's repair manual) then repeat the sealing check from step 1; extend the sealing check to the surrounding areas(see 60A, General information, Vehicle sealing: General information) .

REAR SECTION OF THE VEHICLE: SEALING REPAIR

Note:

Before repairing the sealing, check the sealing of the zone concerned(see 60A, General information, Vehicle: Sealing check) .

1. PREPARATION OPERATION FOR REPAIRING THE SEALING

1- CHECK THE POSITION AND ADJUST IF NECESSARY:

- the clearances and flush fitting of the rear opening elementVehicle panel gaps: Adjustment value (01C, Vehicle bodywork specifications),
- rear opening element seals,
- rear opening element stripRear opening element strip: Removal - Refitting (55A, Exterior protections),
- rear lights,
- rear air extractors,
- rear opening element hinges,
- number plate rivets,
- rear wiper motor seal.

Note:

If the seals are dirty, clean them in soapy water(see 60A, General information, Vehicle sealing: General information) .

2- WAS ANY ACTION PERFORMED?

- NO: move on to the next step.
- YES: check the sealing of the zone(see 60A, General information, Rear section of the vehicle: Sealing repair) .

☐ Was water present in the passenger compartment of the vehicle?

- YES: move on to the next step.
- NO: fault resolved.

2. SEALING REPAIR OPERATION

1- REPAIRING THE SEALING OF THE REAR OPENING ELEMENT SEAL

Is water present in the passenger compartment after the rear opening element sealing has been checked?

- NO: move on to the next step.
- YES:
- a) if the rear opening element seal is deformed, replace the rear opening element seal,
- b) if the rear opening element seal shows signs of wear, cuts or cracks, replace the rear opening element seal.

Check the sealing of the rear opening element seal **(see 60A, General information, Rear section of the vehicle: Sealing check)** .

2- REPAIRING THE SEALING OF THE REAR OPENING ELEMENT STRIP

Is water present in the passenger compartment after the rear opening element sealing has been checked?

- NO: move on to the next step.
- YES:
- a) if the rear opening element strip is deformed or cracked, replace the rear opening element strip **Rear opening element strip: Removal - Refitting** (55A, Exterior protections),
- b) if the sealing foam of the rear opening element strip is incorrectly positioned, detached or deformed, replace the rear opening element strip sealing foam **Rear opening element strip: Removal - Refitting** (55A, Exterior protections).

Check the sealing of the rear opening element strip **(see 60A, General information, Rear section of the vehicle: Sealing check)** .

3- REPAIRING THE SEALING OF THE REAR LIGHTS ON THE WING, ON THE REAR OPENING ELEMENT AND THE 3RD BRAKE LIGHT

Is water present in the passenger compartment after the sealing of the rear lights on the wing, on the rear opening element and the 3rd brake light have been checked?

- NO: move on to the next step.
- YES:
- a) if the lights: on the rear wing, rear opening element or 3rd brake light are deformed or cracked, replace the light on the rear wing, on the rear opening element or the 3rd brake light **Rear wing light: Removal - Refitting** (81A, Rear lighting) or **Rear opening element light: Removal - Refitting** (81A, Rear lighting) or **3rd brake light: Removal - Refitting** (81A, Rear lighting),
- b) if the seals of the lights: on the rear wing, rear opening element or 3rd brake light are incorrectly positioned or deformed, replace the light on the rear wing, on the rear opening element or the 3rd brake light **Rear wing light: Removal - Refitting** (81A, Rear lighting) or **Rear opening element light: Removal - Refitting** (81A, Rear lighting) or **3rd brake light: Removal - Refitting** (81A, Rear lighting),
- c) the panelwork is deformed in the contact zone of the lights: on the rear wing, on the rear opening element or the 3rd brake light, flatten the panelwork in the contact zone of the seal for the light on the rear wing, on the rear opening element or the 3rd brake light.

Check the sealing of the rear lights on the wing, on the rear opening element and the 3rd brake light **(see 60A, General information, Rear section of the vehicle: Sealing check)** .

4- REPAIRING THE SEALING OF THE REAR AIR EXTRACTOR

Is water present in the passenger compartment after the sealing of the rear air extractor has been checked?

- NO: move on to the next step.
- YES:
- a) if the rear air extractor is deformed, replace the rear air extractor,
- b) if the rear air extractor is incorrectly positioned, reposition the rear air extractor,
- c) if the panelwork is deformed in the contact zone of the seal of the rear air extractor, flatten the panelwork in the contact zone of the rear air extractor seal.

Check the sealing of the rear air extractor(see 60A, General information, Rear section of the vehicle: Sealing check) .

5- REPAIRING THE SEALING OF THE REAR OPENING ELEMENT HINGES

Is water present in the passenger compartment after the sealing of the rear opening element hinges has been checked?

- NO: move on to the next step.
- YES:
- a) if the panelwork is deformed in the contact zone of the rear opening element hinge, flatten the contact zone of the rear opening element hinge, then apply filler masticAnti-corrosion protection products after assembly: Use (04F, Bodywork products and mountings),
- b) if the sealing mastic is faulty or cracked, apply filler masticAnti-corrosion protection products after assembly: Use (04F, Bodywork products and mountings).

Check the sealing of the rear opening element hinges(see 60A, General information, Rear section of the vehicle: Sealing check) .

6- REPAIRING THE SEALING OF THE NUMBER PLATE RIVETS ON AN OPENING ELEMENT

Is water present in the passenger compartment after the sealing of the number plate rivets on the rear opening element has been checked?

- NO: move on to the next step.
- YES:
- a) if the rivets of the number plate are deformed or poorly crimped, replace the number plate rivetsProducts and equipment for riveted assembly: Use (04F, Bodywork products and mountings).

Check the sealing of the number plate rivets(see 60A, General information, Rear section of the vehicle: Sealing check) .

7- REPAIRING THE SEALING OF THE REAR WIPER MOTOR SEAL

Is water present in the passenger compartment after the rear wiper motor seal has been checked?

- NO: move on to the next step.
- YES:
- a) if the rear wiper motor seal is incorrectly positioned, reposition the rear wiper motor sealRear screen wiper motor: Removal - Refitting (85A, Wiping - Washing),

■ b) if the rear wiper motor seal is deformed or shows signs of wear, cuts or cracks, replace the rear wiper motor seal Rear screen wiper motor: Removal - Refitting (85A, Wiping - Washing).

Check the sealing of the rear wiper motor seal(see 60A, General information, Rear section of the vehicle: Sealing check) .

8- REPAIRING THE SEALING OF THE REAR AERODYNAMIC COMPONENT

Is water present in the passenger compartment after the sealing of the rear aerodynamic component has been checked?

■ NO: move on to the next step.

■ YES:

■ a) if the rear aerodynamic component is deformed or cracked, replace the rear aerodynamic component(see **Luggage compartment lid spoiler: Removal - Refitting**) (56A, Exterior equipment) orTailgate spoiler: Removal - Refitting (56A, Exterior equipment),

■ b) if the sealing foam of the rear aerodynamic component is deformed, torn or detached, replace the sealing foam of the rear aerodynamic component(see **Luggage compartment lid spoiler: Removal - Refitting**) (56A, Exterior equipment) or Tailgate spoiler: Removal - Refitting (56A, Exterior equipment).

Check the sealing of the rear aerodynamic component(see 60A, General information, Rear section of the vehicle: Sealing check) .

9- REPAIRING THE SEALING OF THE MASTIC FILLING OF THE REAR WING PANEL / REAR WING PANEL RAIN CHANNEL / REAR LIGHT MOUNTING / REAR END PANEL AND REAR WING PANEL RAIN CHANNEL / ROOF

Is water present in the passenger compartment after the sealing of the mastic filling of the rear wing panel / rear wing panel rain channel / rear light mounting / rear end panel and rear wing panel rain channel / roof has been checked?

■ NO: fault resolved.

■ YES:

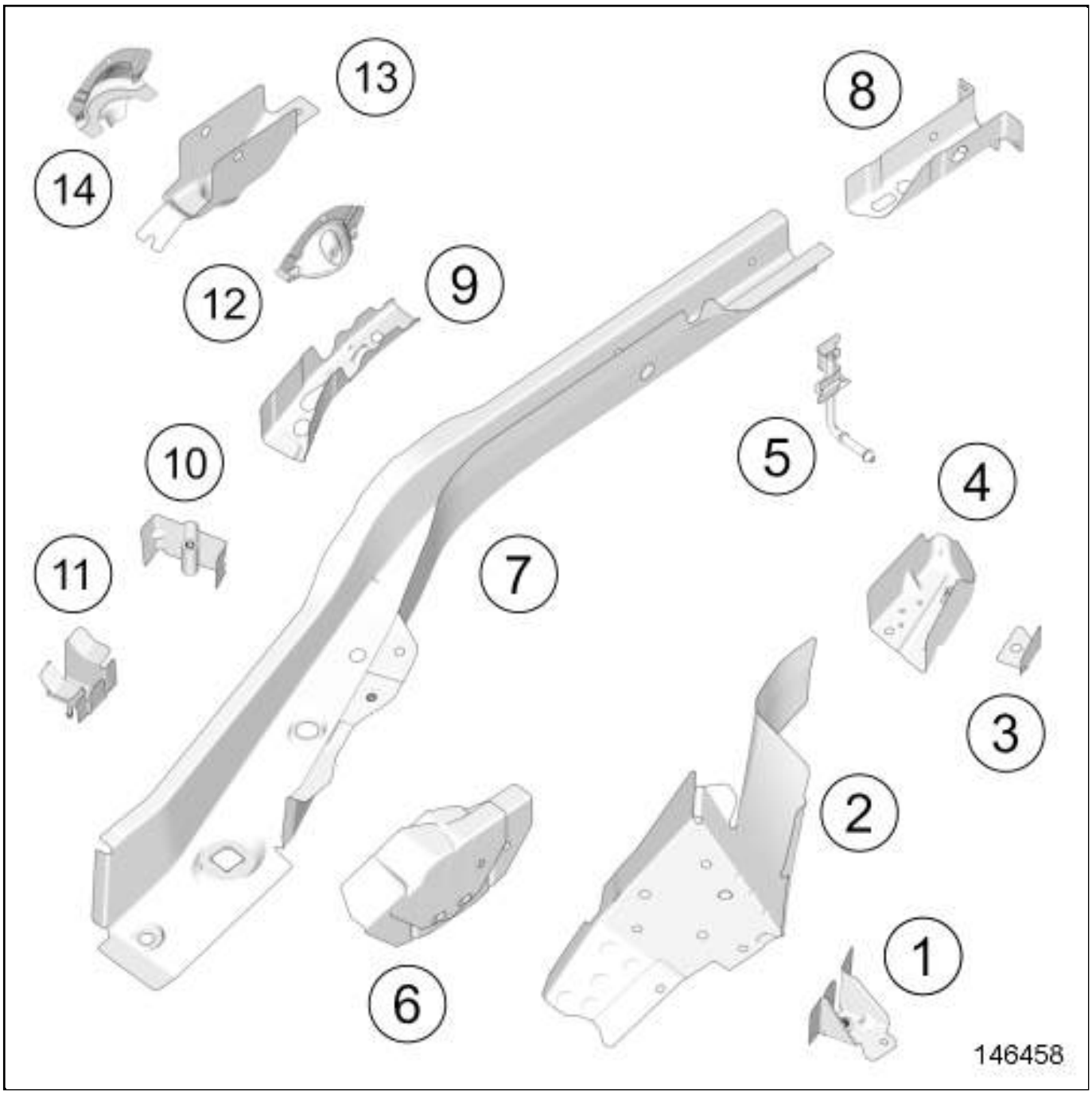
■ a) if the mastic is faulty or incorrectly positioned on the panelwork connections, apply extruded mastic to the panelwork connectionsAnti-corrosion protection products after assembly: Use (04F, Bodywork products and mountings).

Check the sealing of the mastic filling of the rear wing panel / rear wing panel rain channel / rear light mounting / rear end panel and rear wing panel rain channel / roof(see 60A, General information, Rear section of the vehicle: Sealing check) .

REAR SIDE MEMBER ASSEMBLY: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Rear axle mounting reinforcement	3.5
(2)	Rear side cross member	1.9
(3)	Rear axle mounting bracket on body	2.5
(4)	Rear axle assembly mounting unit	1.9
(5)	Exhaust rear support	2
(6)	Rear jacking point reinforcement	2.5
(7)	Rear side member	1.45
(8)	Rear side member reinforcement	2.5
(9)	Side member offset reinforcement	1.4
(10)	Interior reinforcement of rear axle mounting side member	2
(11)	Front support for retaining the fuel tank on the body	1.5
(12)	Rear suspension spring support exterior reinforcement	2
(13)	Rear suspension spring support	2
(14)	Rear suspension spring support interior reinforcement	2

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

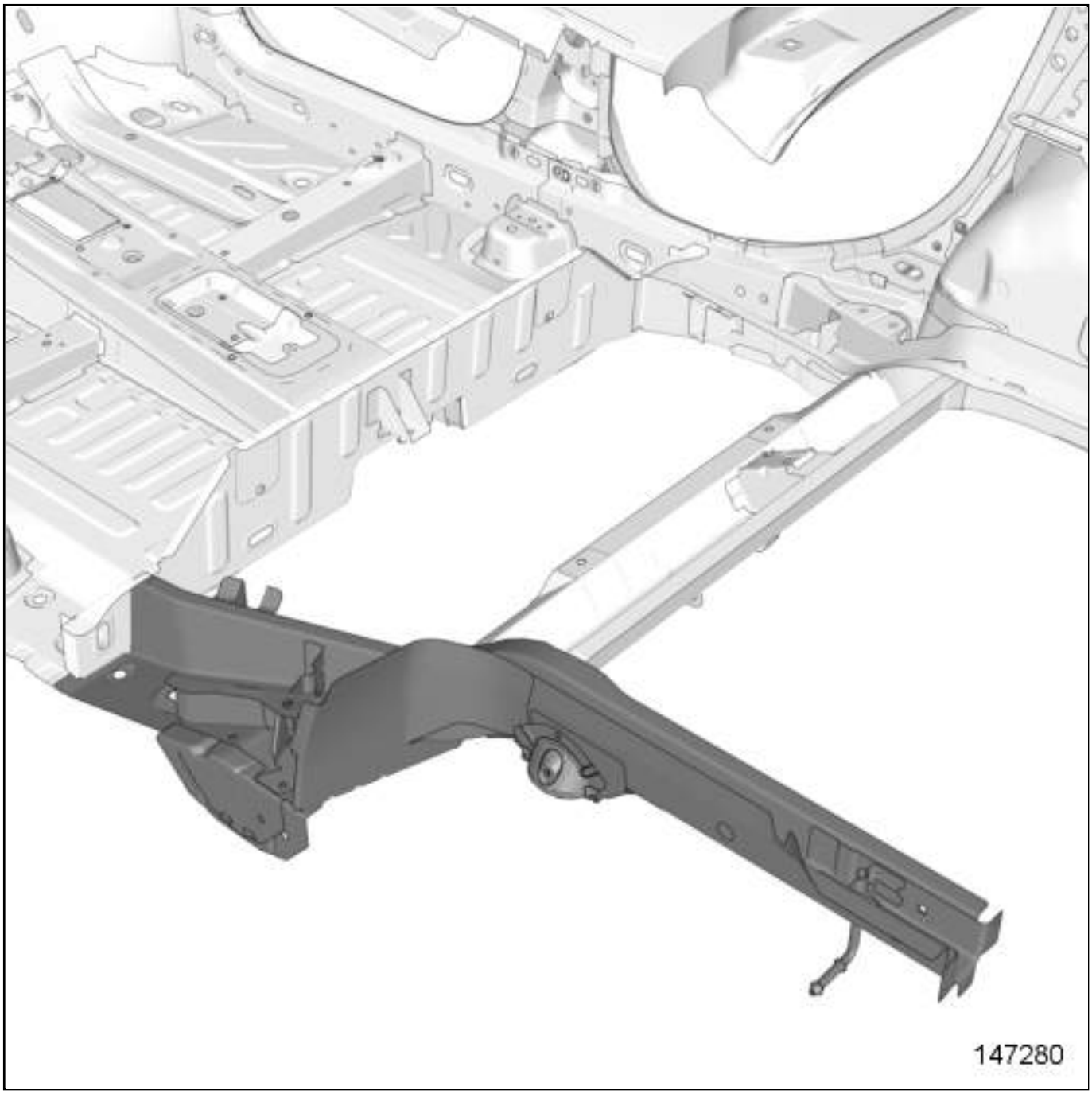
Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT

WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

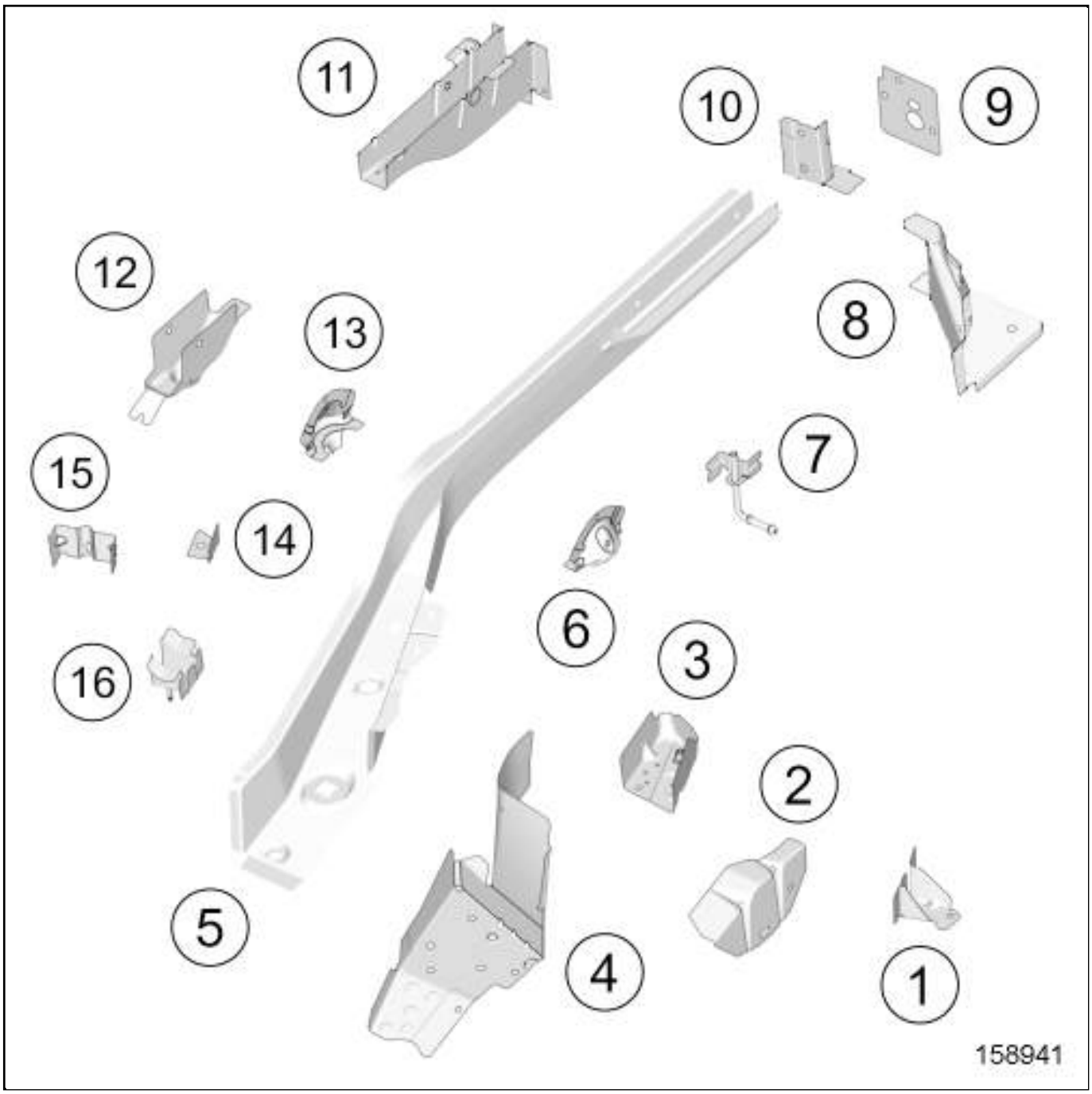
1)PART IN POSITION


147280

REAR SIDE MEMBER ASSEMBLY: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Rear axle mounting reinforcement	3.5
(2)	Rear jacking point reinforcement	2.5
(3)	Rear axle assembly mounting unit	1.9
(4)	Rear side cross member	1.9
(5)	Rear side member	1.45
(6)	Rear suspension spring support exterior reinforcement	2
(7)	Exhaust rear support	2.5
(8)	Rear end pillar closure panel component	1.5
(9)	Rear impact absorber plate	2
(10)	Side section of rear floor rear centre cross member	1.2
(11)	Rear end pillar connection element	1.7
(12)	Rear suspension spring support	2
(13)	Rear suspension spring support interior reinforcement	2
(14)	Rear axle mounting bracket on body	2.5
(15)	Interior reinforcement of rear axle mounting side member	2

(16)	Front support for retaining the fuel tank on the body	1.5

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

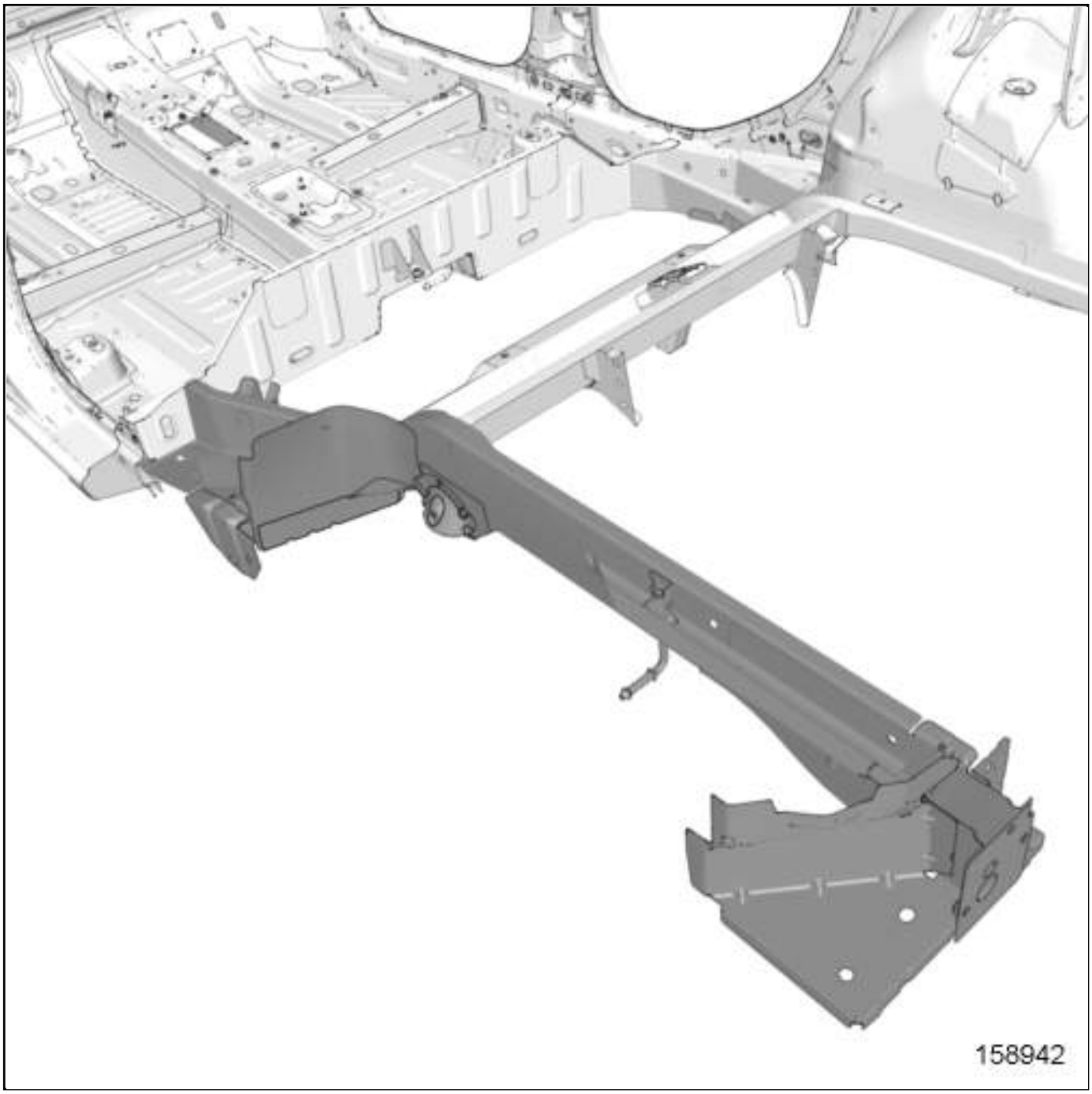
Locate the earths located near to the weld areaEarths on body: List and location of components .

1- COMPLETE REPLACEMENT

WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

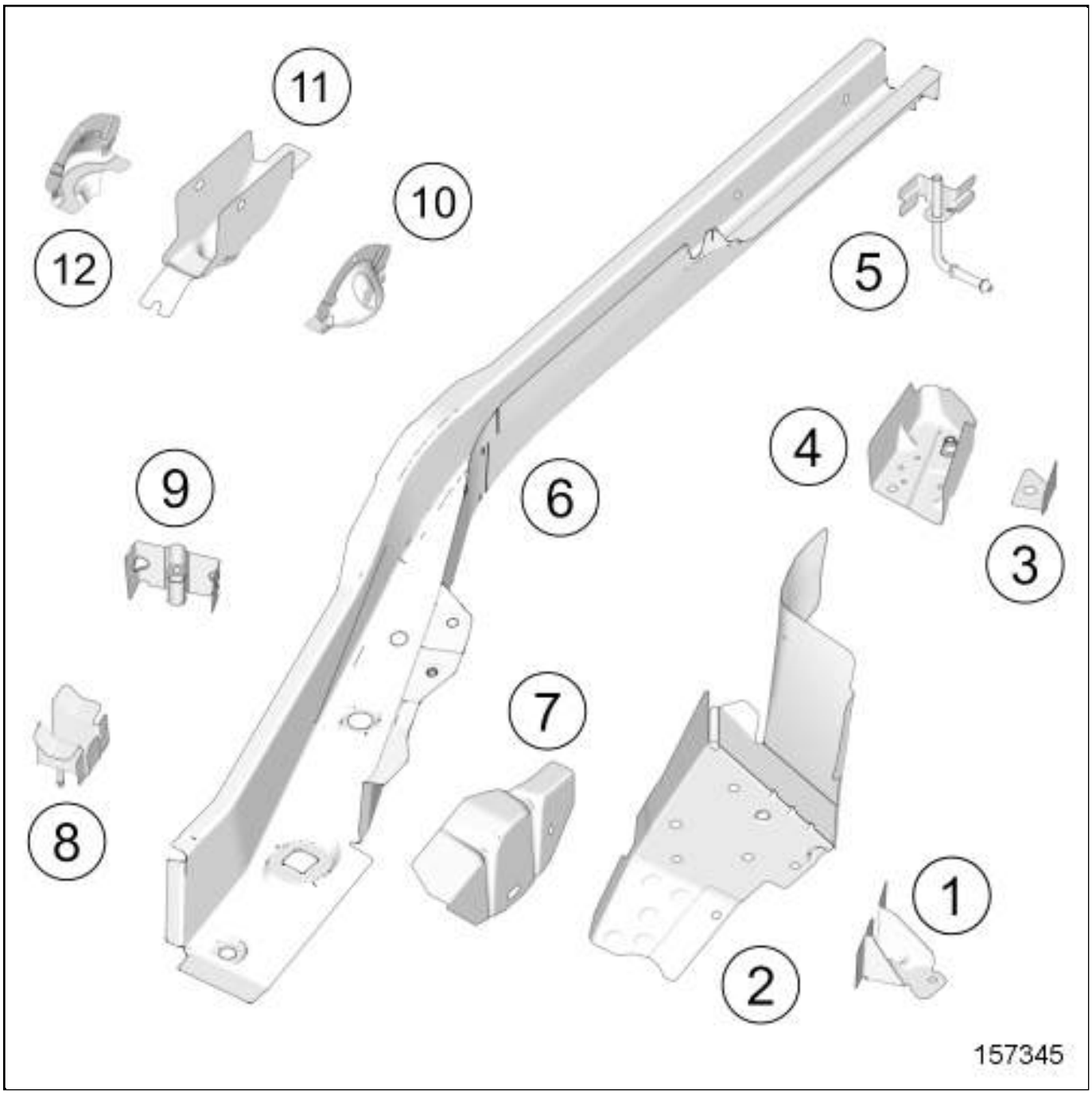
1)PART IN POSITION


158942

REAR SIDE MEMBER ASSEMBLY: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Rear axle mounting reinforcement	3.5
(2)	Rear side cross member	1.9
(3)	Rear axle mounting bracket on body	2.5
(4)	Rear axle assembly mounting unit	1.9
(5)	Exhaust rear support	2.5
(6)	Rear side member	1.45
(7)	Rear jacking point reinforcement	2.5
(8)	Front support for retaining the fuel tank on the body	1.5
(9)	Interior reinforcement of rear axle mounting side member	2
(10)	Rear suspension spring support exterior reinforcement	2
(11)	Rear suspension spring support	2
(12)	Rear suspension spring support interior reinforcement	2

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

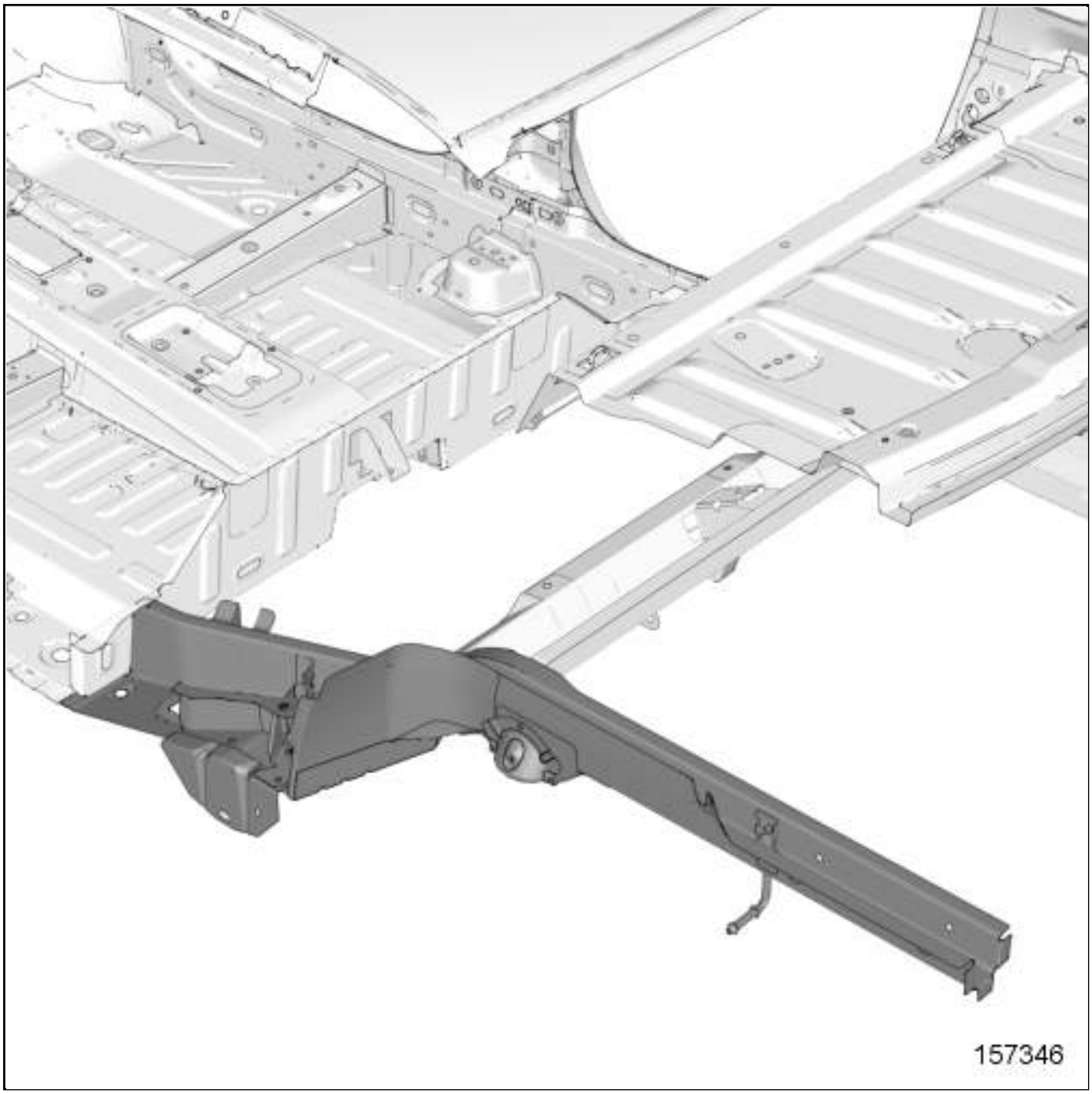
Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT

WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

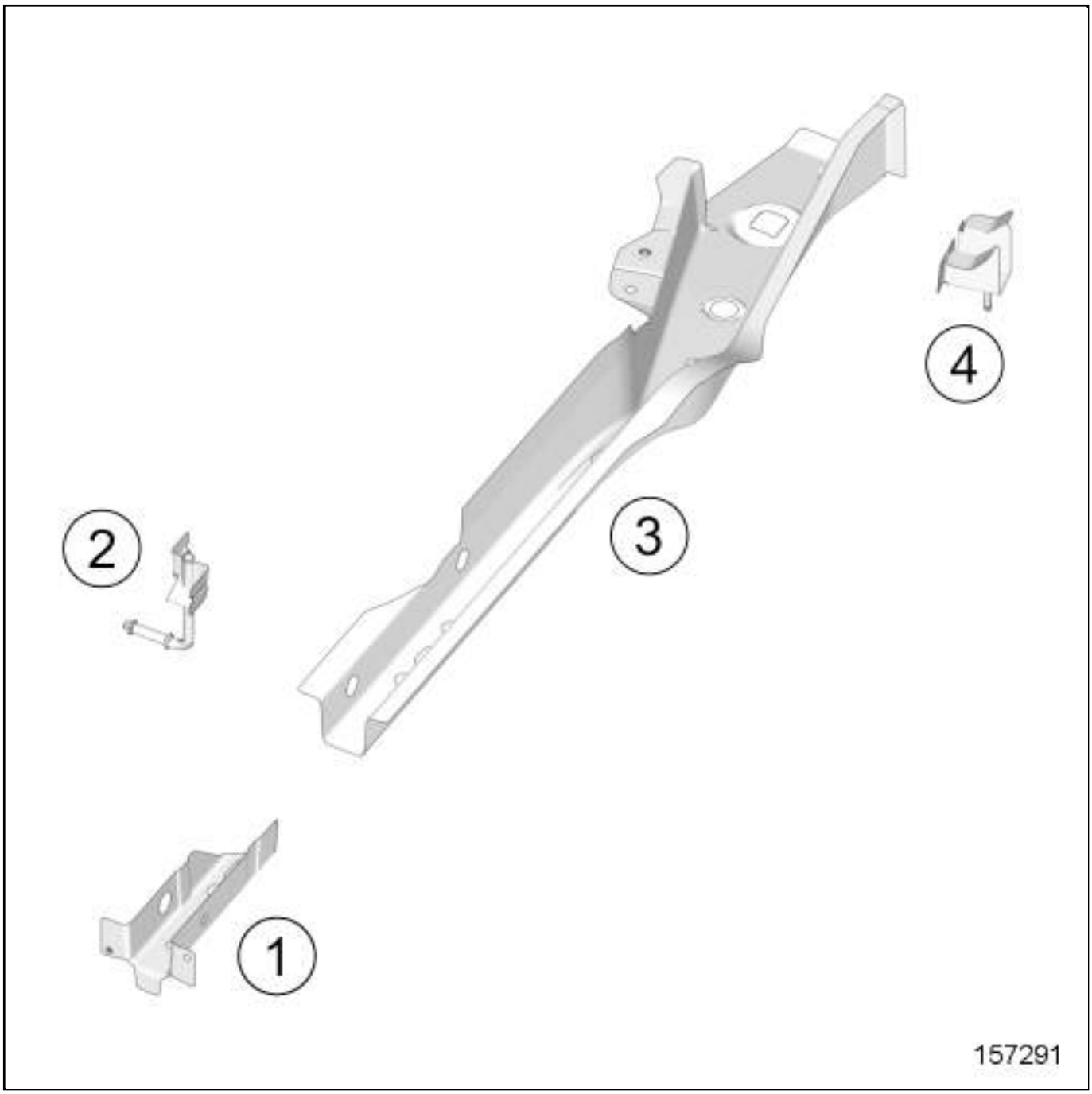
1)PART IN POSITION


157346

REAR SIDE MEMBER: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Rear side member reinforcement	2.5
(2)	Exhaust rear support	2
(3)	Rear side member	1.45
(4)	Front support for retaining the fuel tank on the body	1.5

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- partial replacement along cut A.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

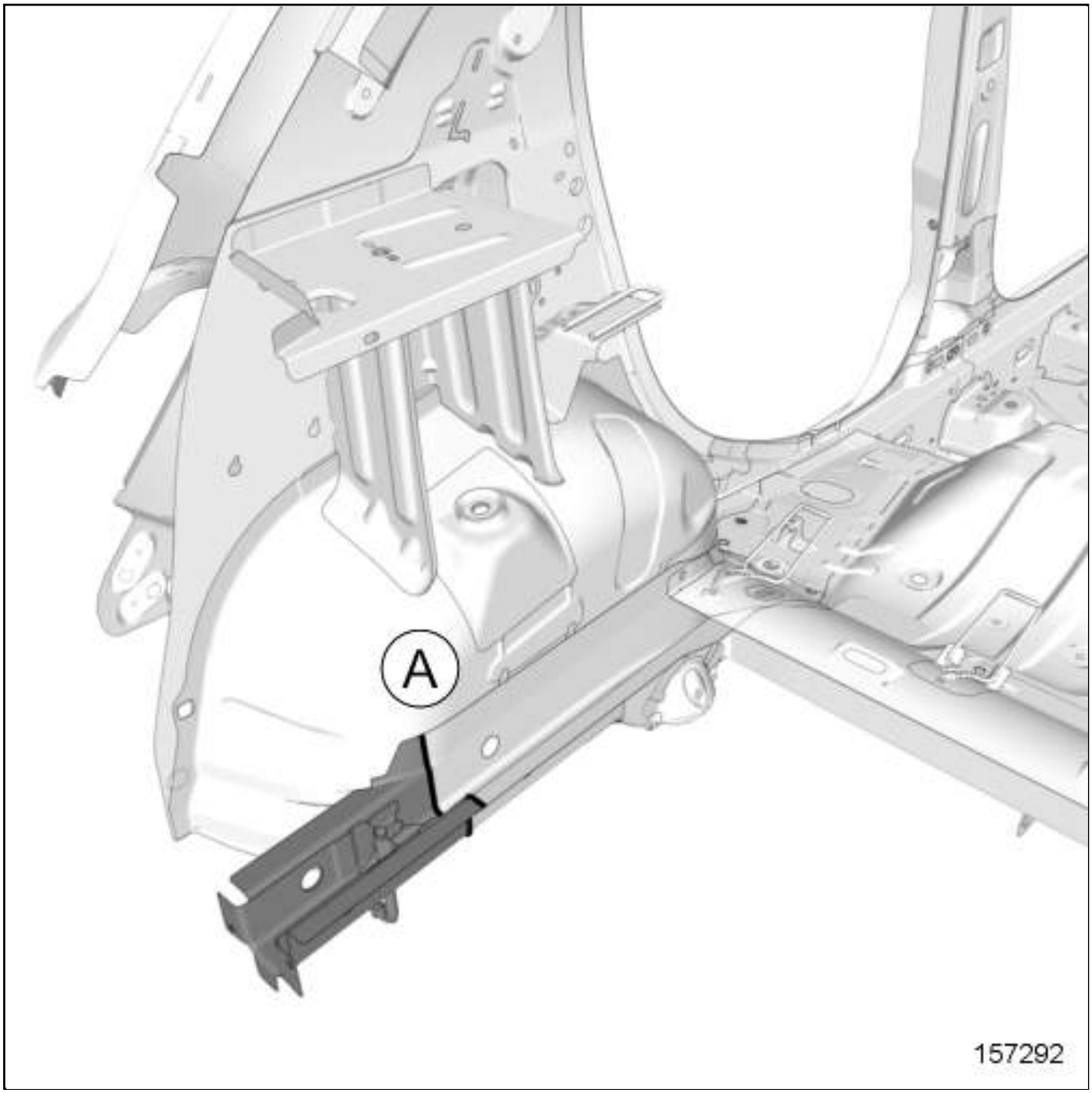
Locate the earths located near to the weld areaEarths on body: List and location of components .

1- PARTIAL REPLACEMENT ALONG CUT A

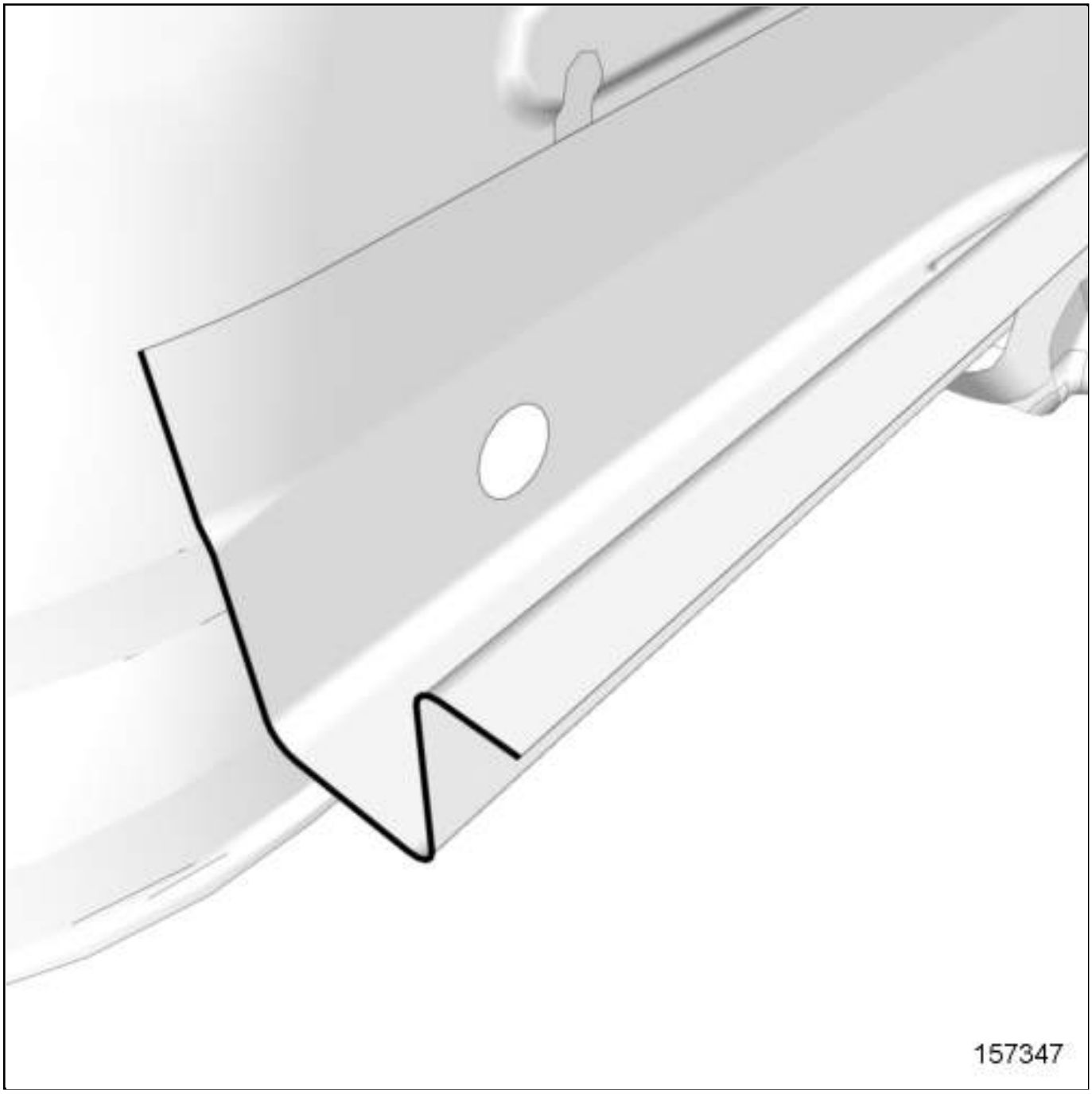
WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1)PART IN POSITION



DETAILED VIEW A

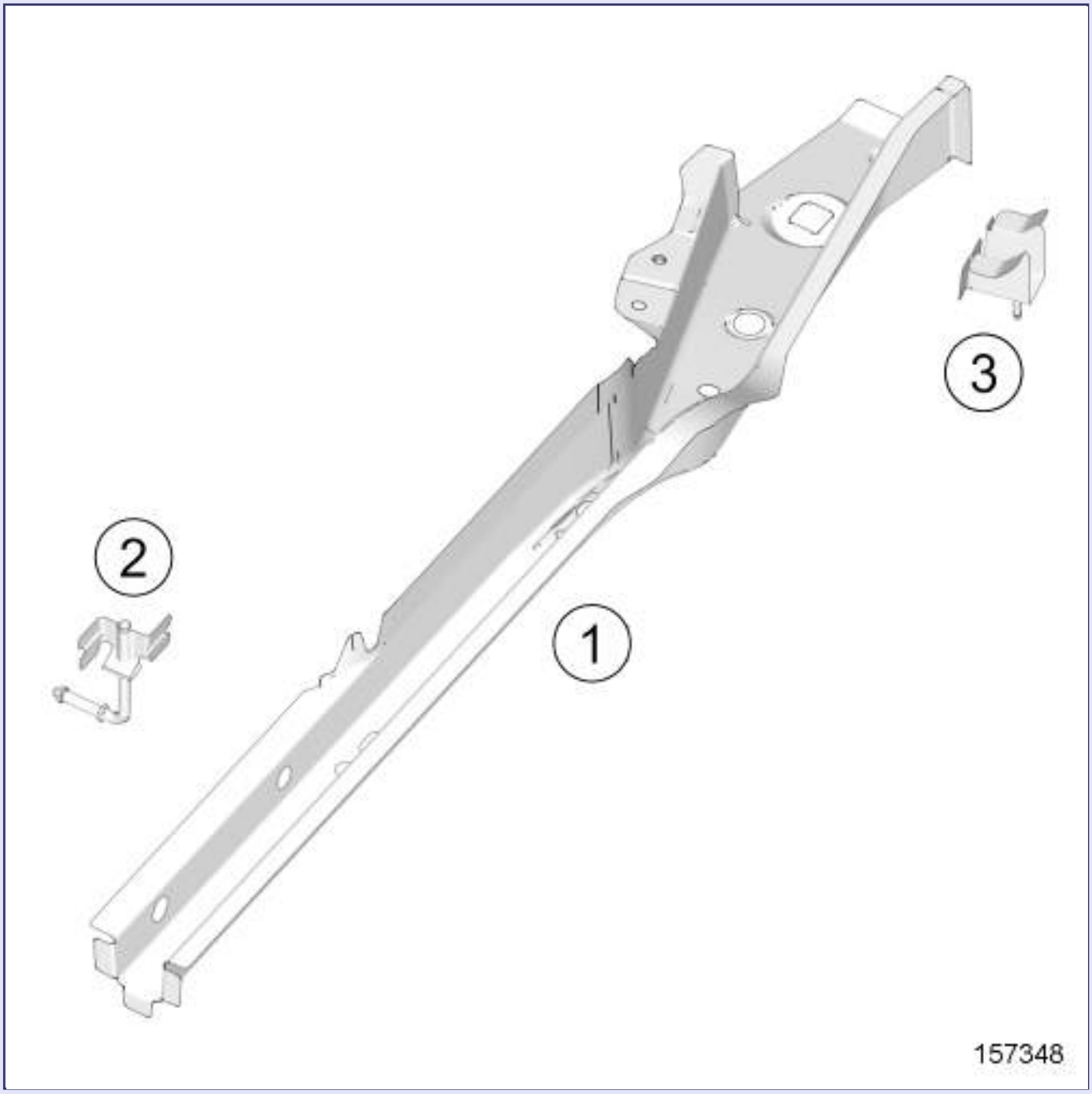

157347

REAR SIDE MEMBER: REPLACEMENT

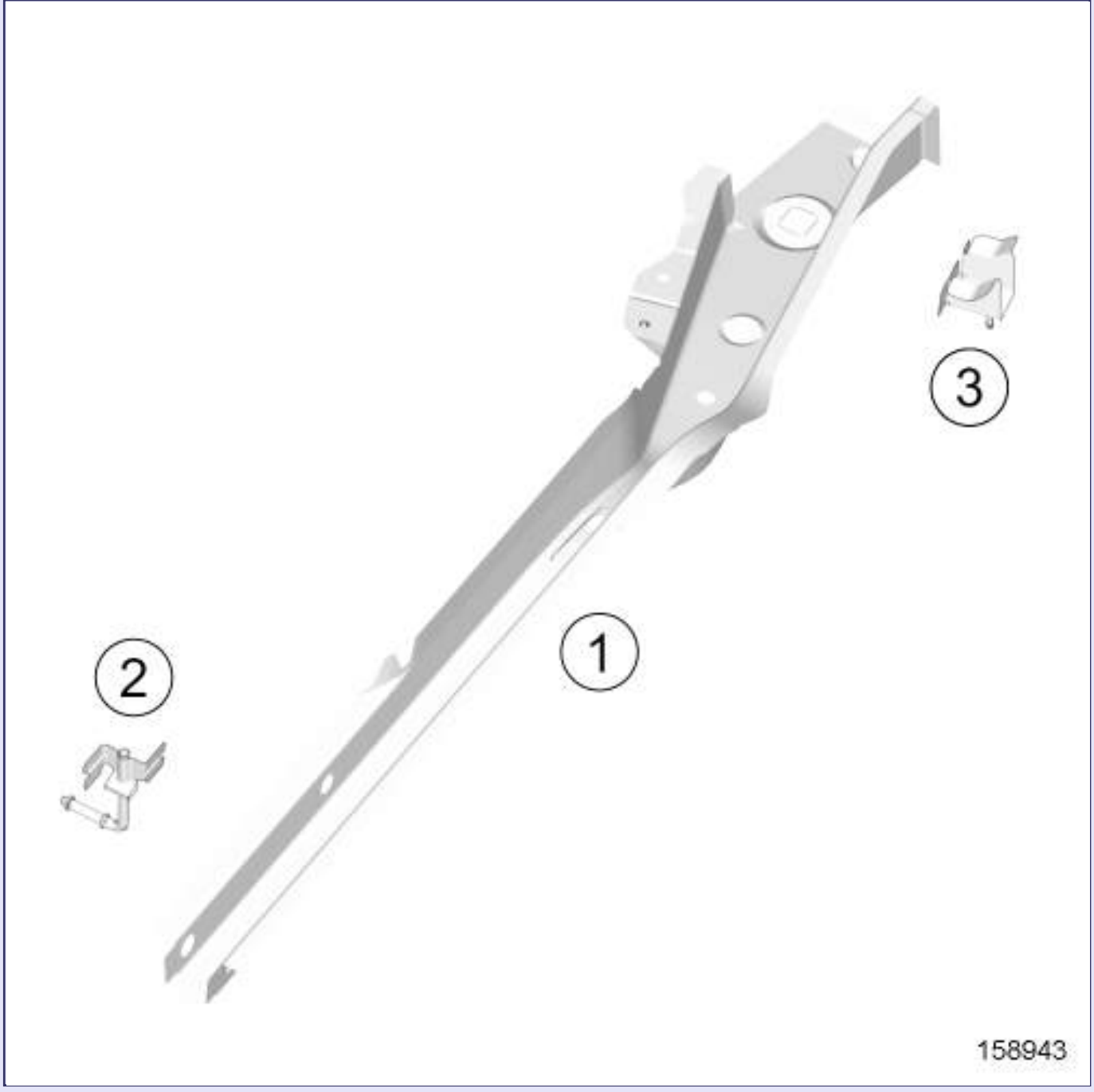
Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

L52(L52)



K52(K52)


3
1
2
158943

No.	Description	Thickness (mm)
(1)	Rear side member	1.45
(2)	Exhaust rear support	2.5
(3)	Front support for retaining the fuel tank on the body	1.5

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- partial replacement along cut A.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

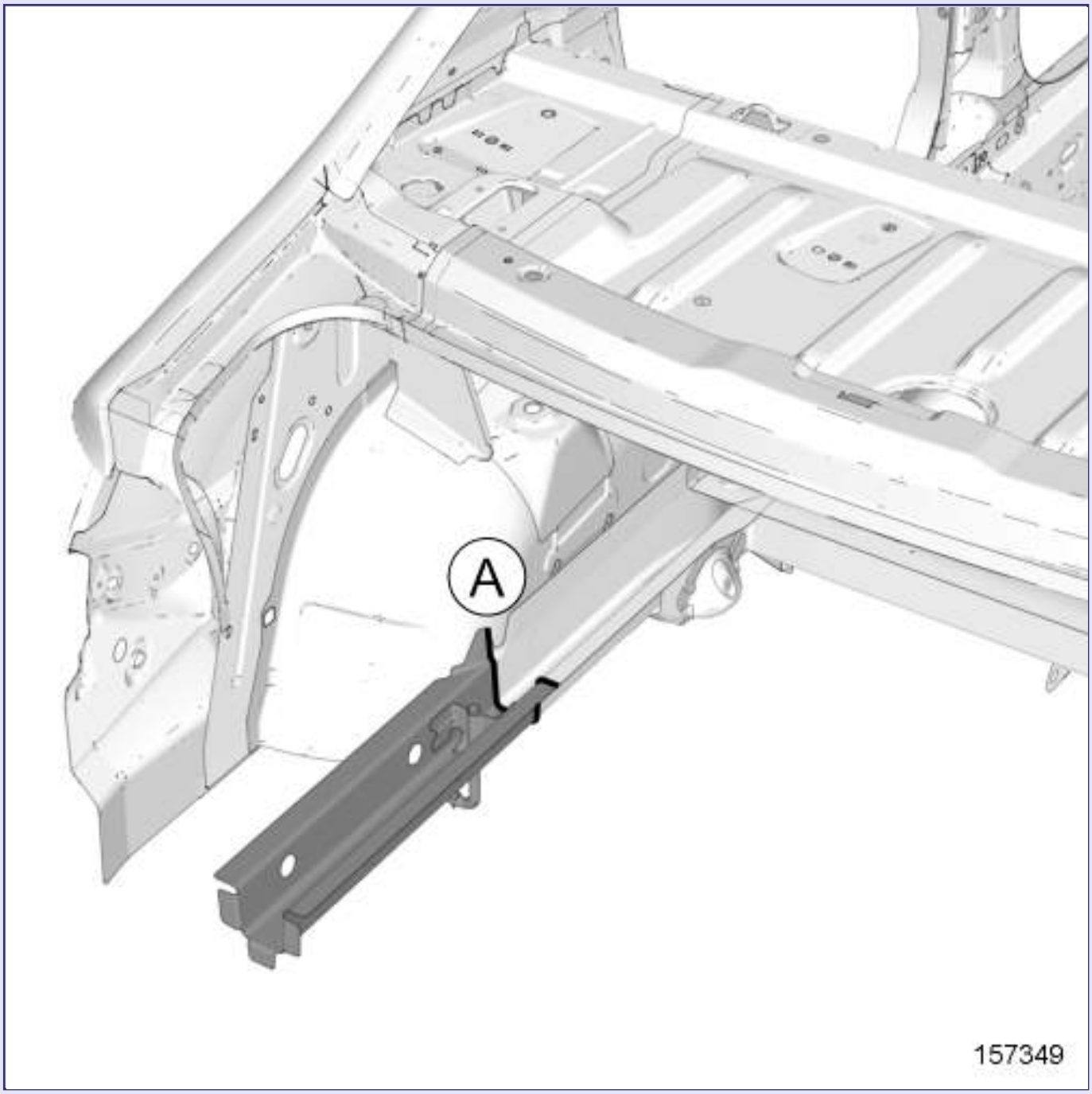
Locate the earths located near to the weld areaEarths on body: List and location of components .

1- PARTIAL REPLACEMENT ALONG CUT A

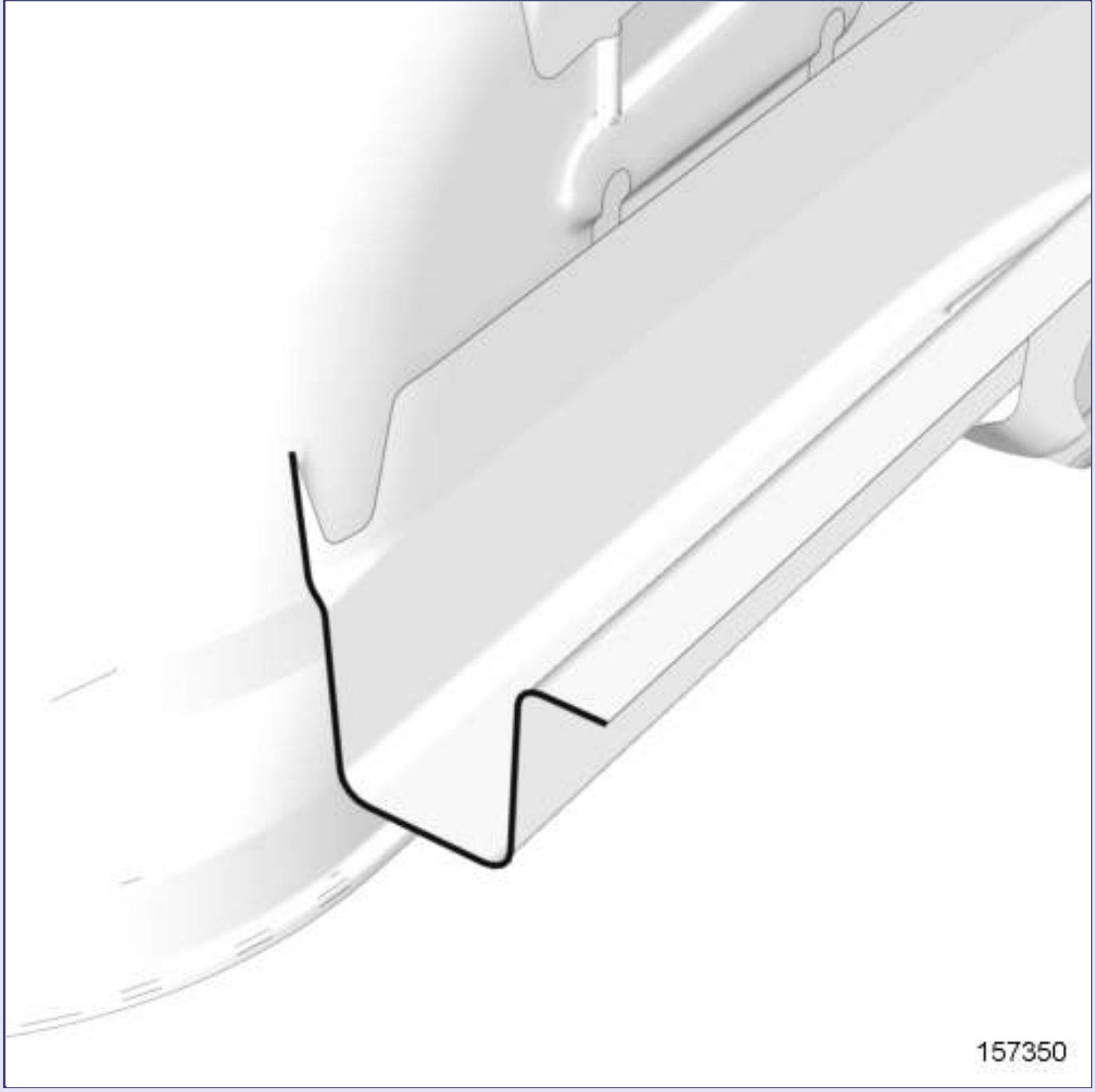
WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

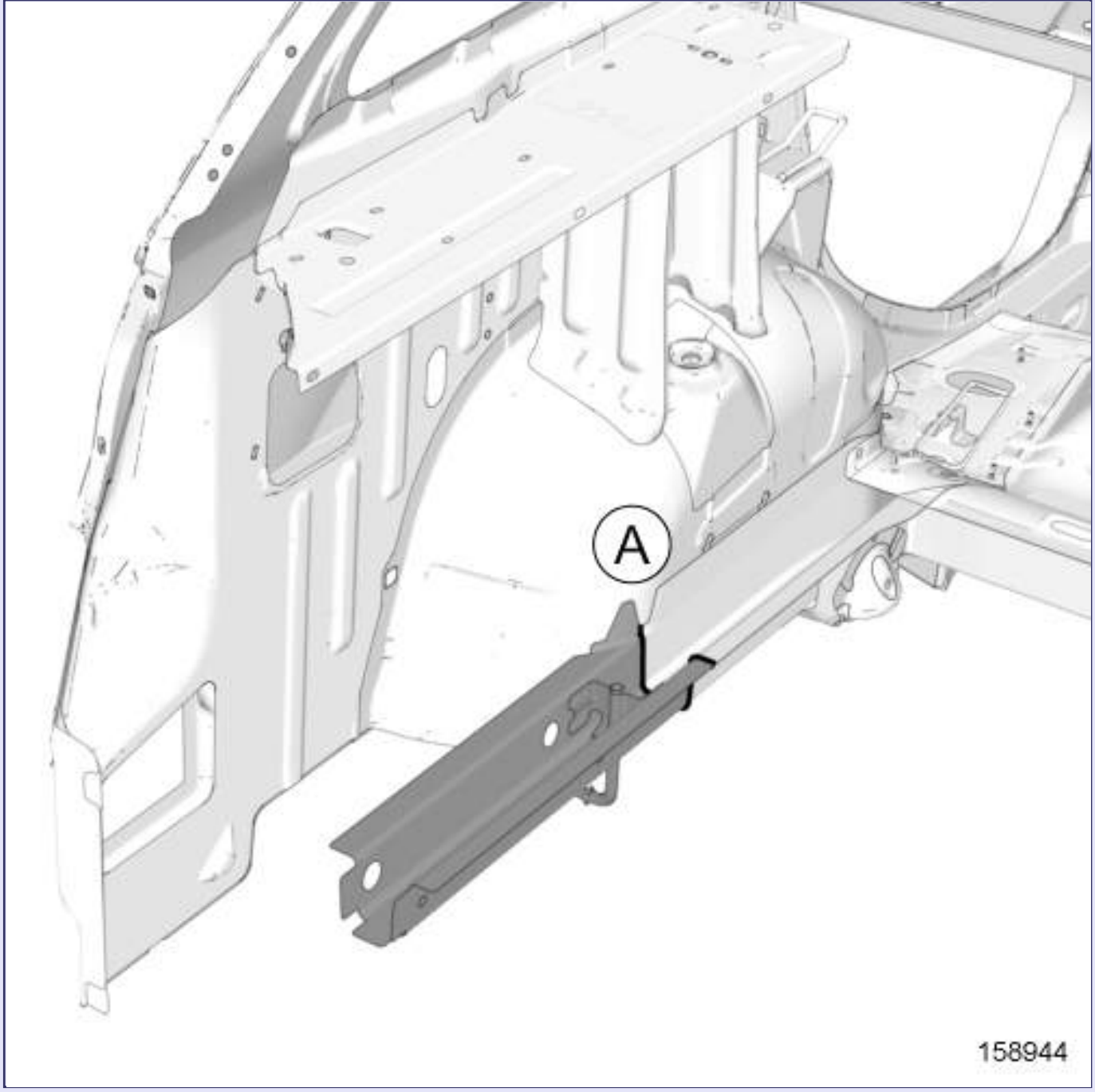
1)PART IN POSITION



DETAILED VIEW A



K52(K52)



DETAILED VIEW A

158945

REAR SIDE OPENING ELEMENT: ADJUSTMENT

Location and specifications (tightening torques, parts always to be replaced, etc.)Rear side opening element box section internal assembly: Exploded view .

ADJUSTMENT VALUES

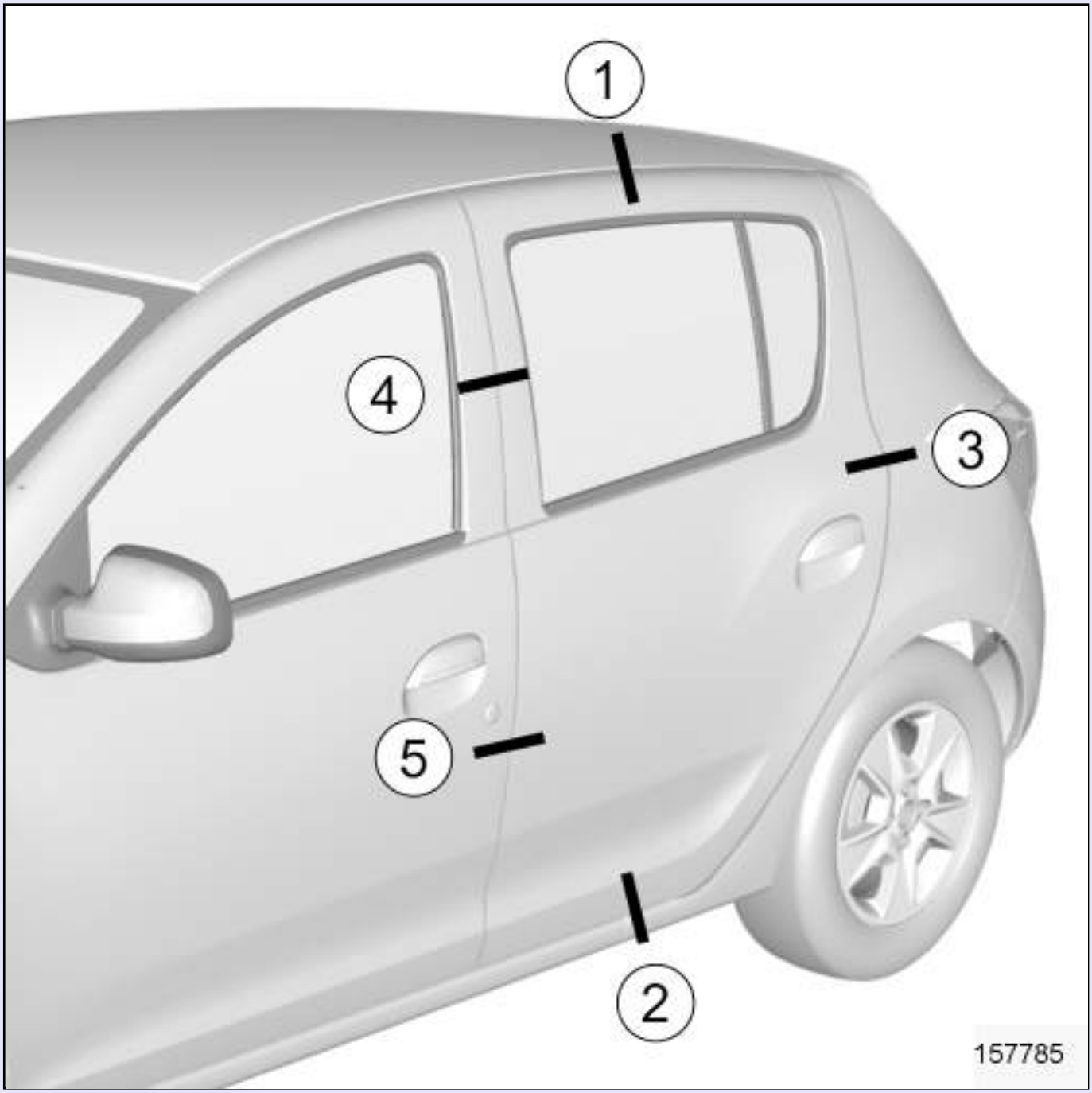
For all information about the rear side opening element adjustment valuesVehicle panel gaps: Adjustment value .

ADJUSTMENT

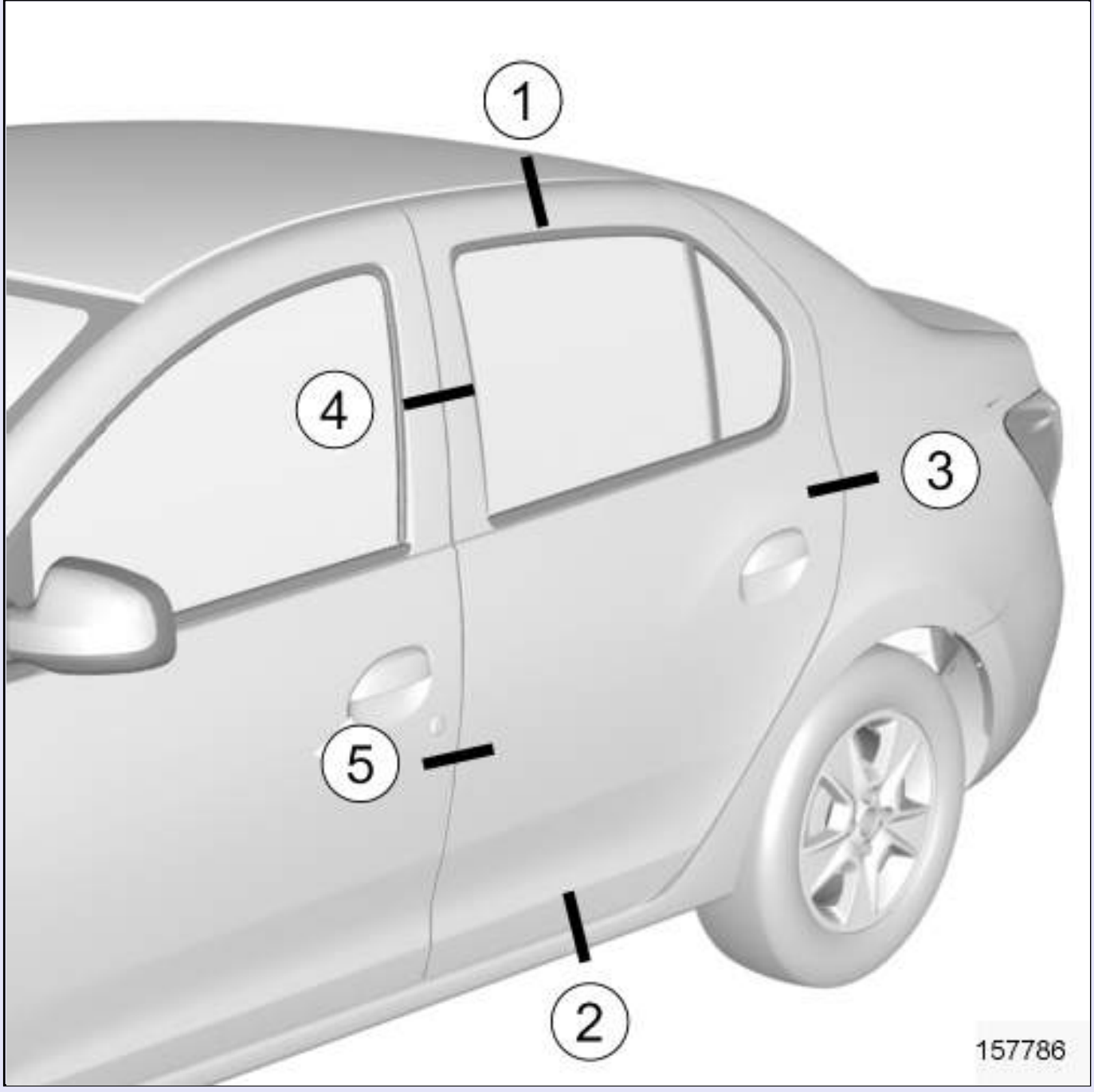
There are two options for adjusting the rear side door:

- using the rear side door mountings,
- using the rear side door striker panel.

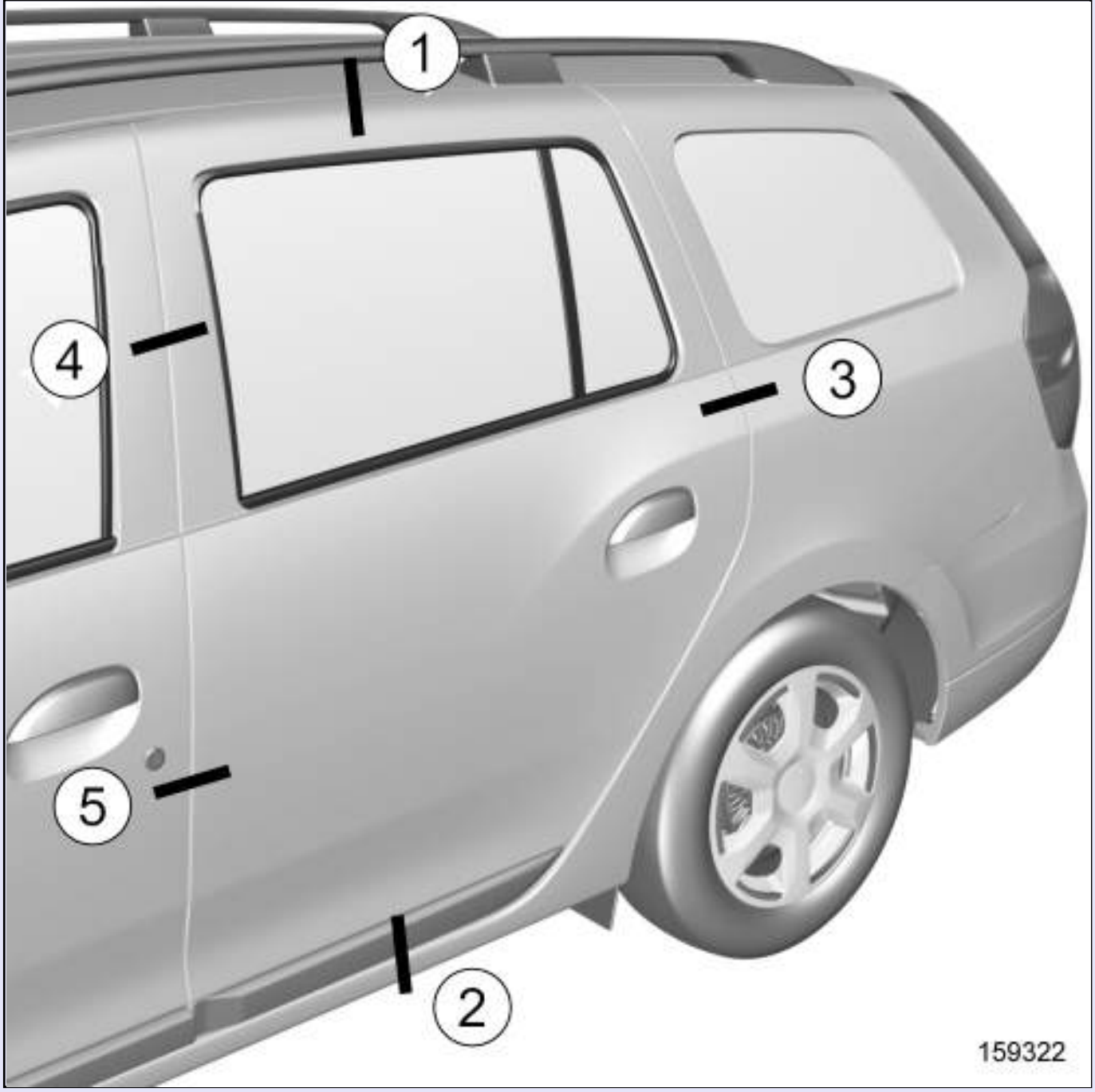
B52(B52)



L52(L52)



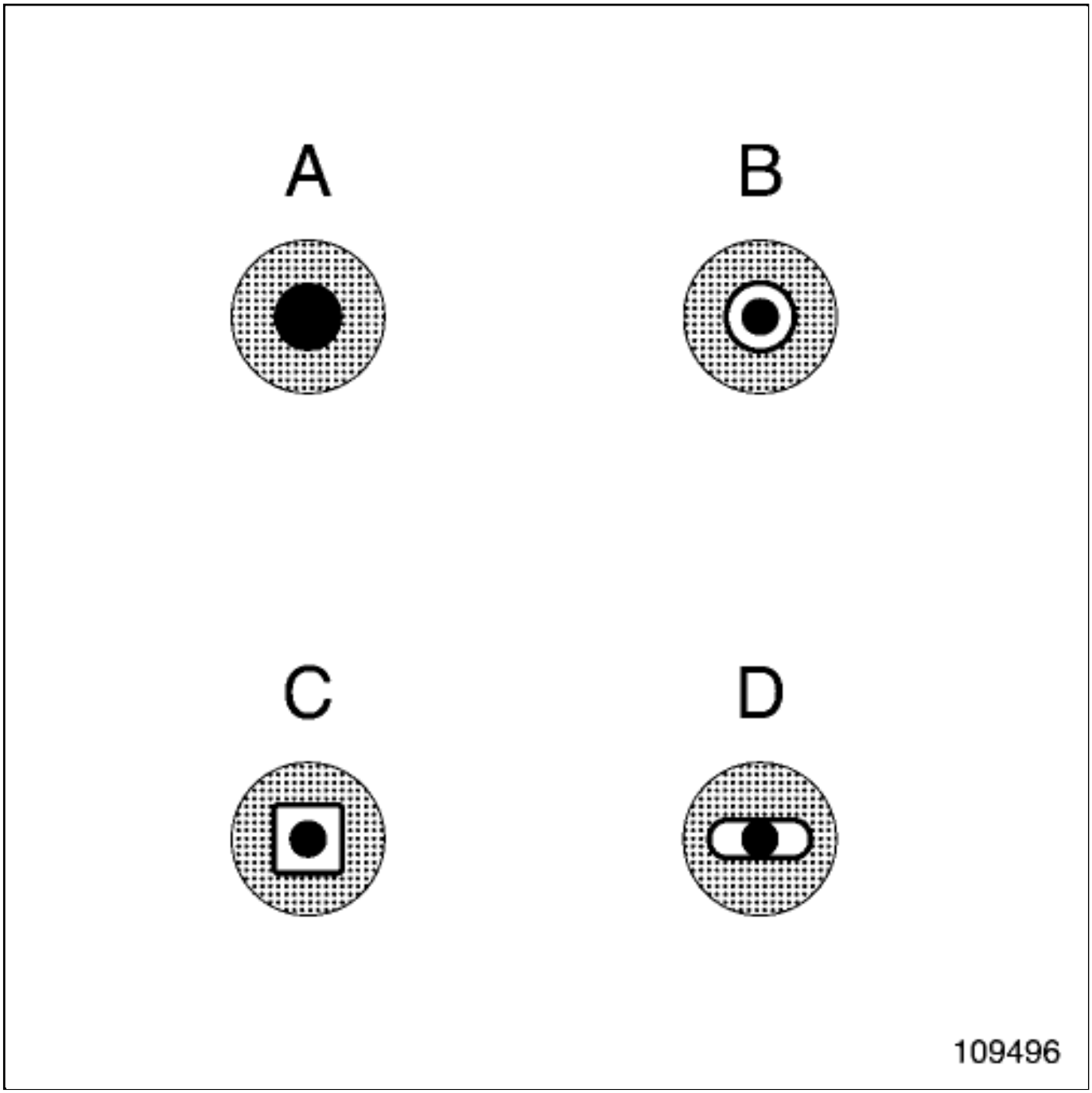
K52(K52)



- Respect the adjustment order of zones(1) , (2) , (3) , (4) and (5) .

Note:

Adjustment of zones (4) and (5) is only valid if the front door is correctly adjusted.



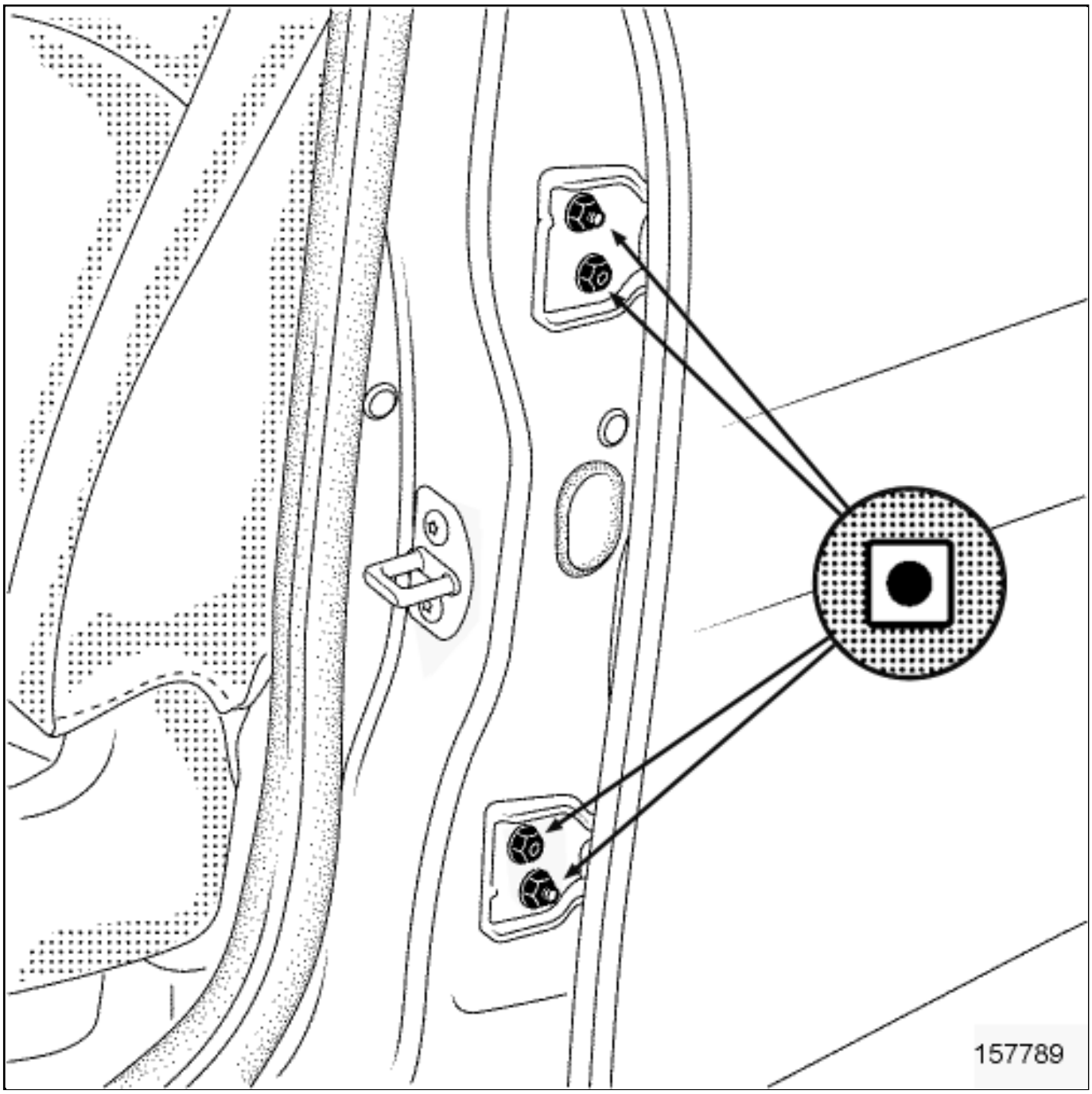
- Symbols A, B, C and D show the adjustment options.

The black dot in the centre represents the body of the bolt.

The grey section represents the component to be adjusted.

The white section represents the adjustment area.

1. HEIGHT AND LENGTH ADJUSTMENT



Loosen Rear side opening element box section internal assembly: Exploded view :

- the rear side door hinge bolts,
- the rear side door hinge nuts.

Note:

Adjustment of zones (4) and (5) is dependent on the adjustment of the front side opening element **(see 47A, Side opening elements, Front side opening element: Adjustment)** .

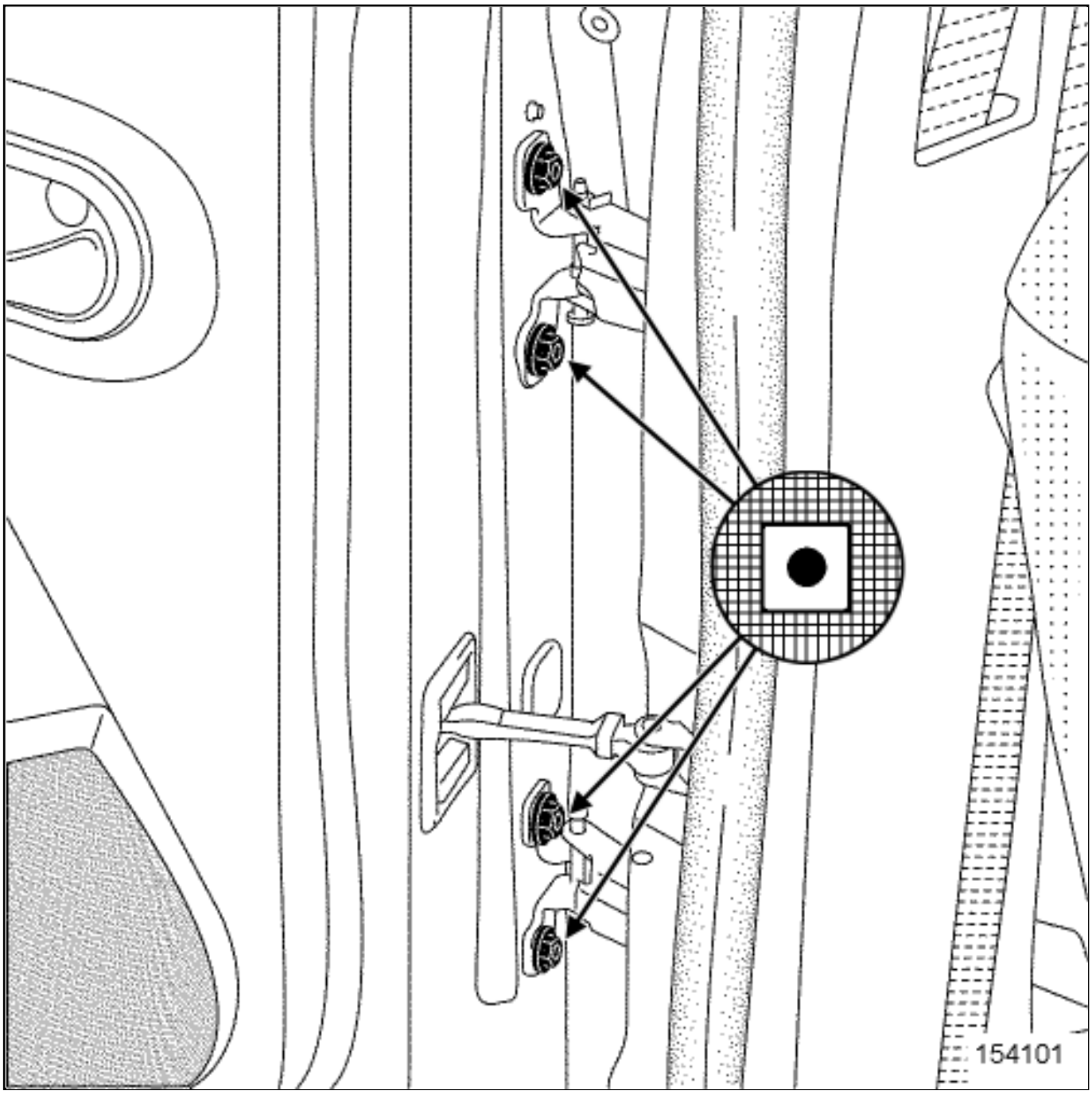
Adjust in the following order:

- the height of zones(1) and (2) ,
- the length of zones(3) , (4) and (5) .

Tighten **Rear side opening element box section internal assembly: Exploded view** :

- the rear side door hinge bolts,
- the rear side door hinge nuts.

2. DEPTH ADJUSTMENT



Loosen the rear side door hinge bolts[Rear side opening element box section internal assembly: Exploded view] .

Note:

The original hinge mounting plates are bonded to the door box section.

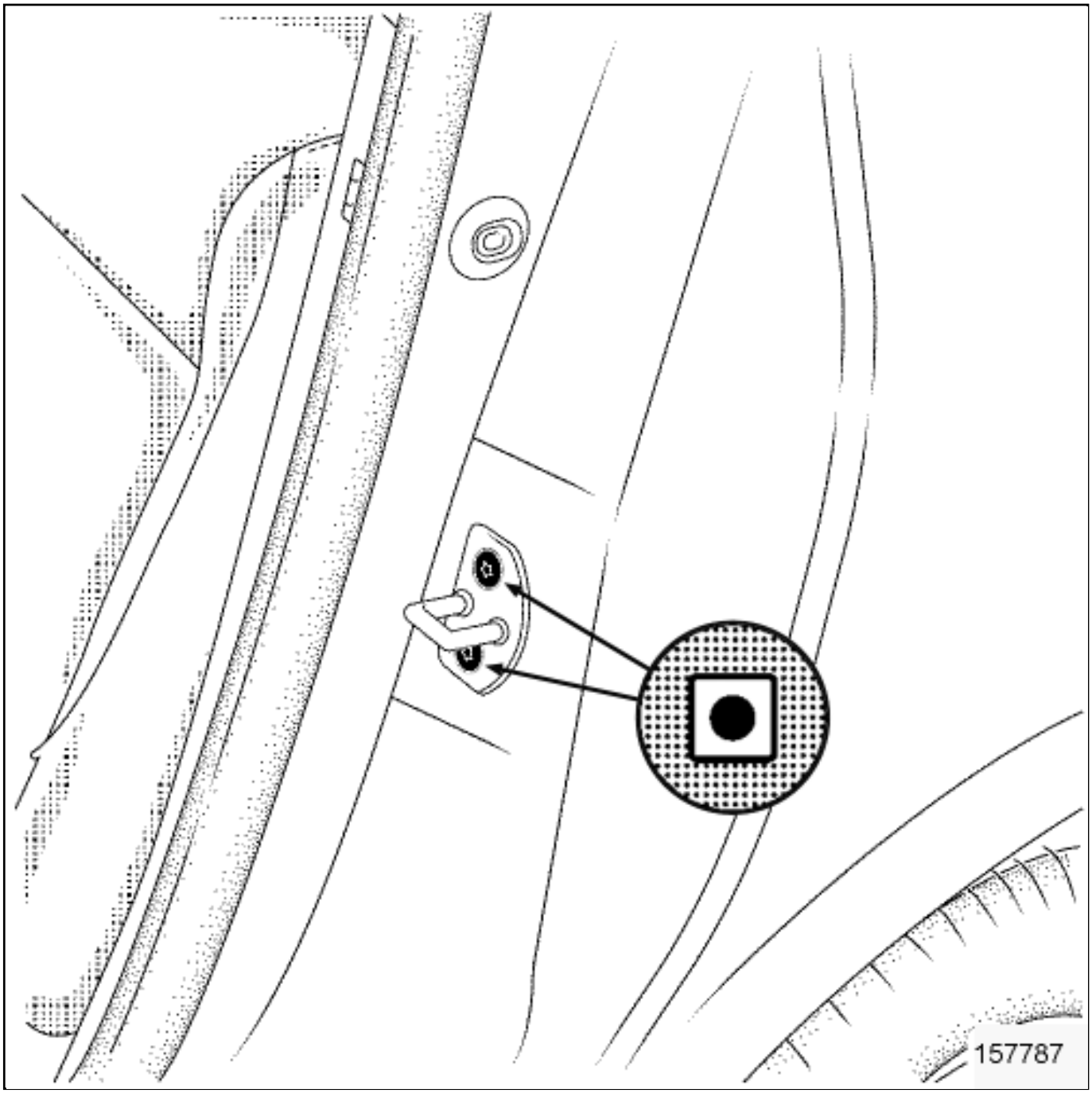
To carry out the adjustment, it is necessary to remove the plate using a wooden block and a hammer.

Note:

Adjustment of zones (4) and (5) is dependent on the adjustment of the front side opening element (see 47A, Side opening elements, Front side opening element: Adjustment) .

Adjust the depth of zones(1) , (2) , (4) and (5) .

- Tighten the rear side door hinge boltsRear side opening element box section internal assembly: Exploded view .



Loosen the striker panel bolts Rear side opening element box section internal assembly: Exploded view .

Adhere to the following adjustment sequence:

- adjust the height of the striker panel in relation to the lock to prevent them touching,
- adjust the depth of zone(3) .

Tighten the striker panel bolts**Rear side opening element box section internal assembly: Exploded view** .

Repair-40x10x04x08-01x67-1-6-1.xml

XSL version : 3.02 du 22/07/11

REAR SIDE OPENING ELEMENT ASSEMBLY ON THE PASSENGER COMPARTMENT SIDE: EXPLODED VIEW

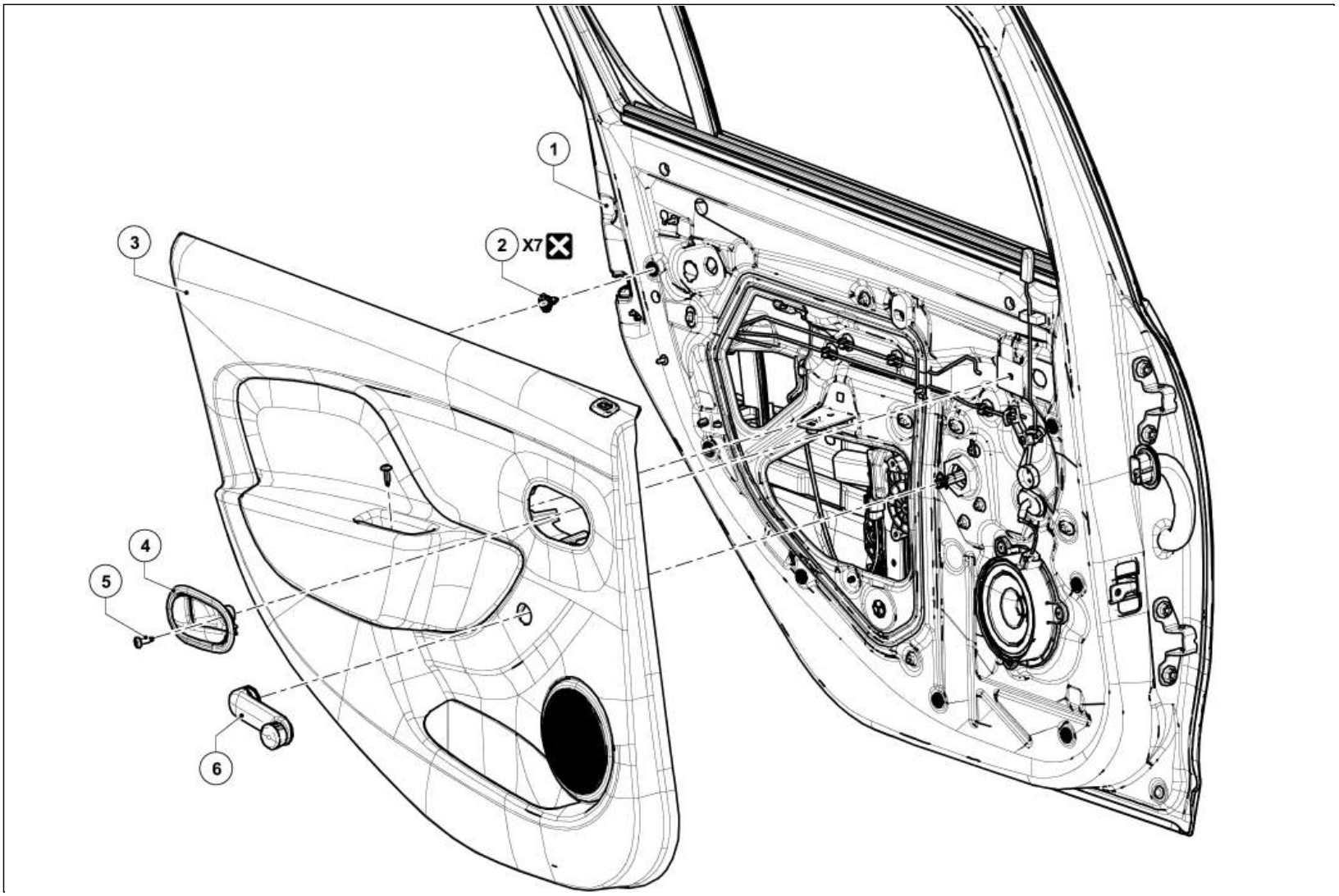


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Rear side opening element	
2	Clips of rear loading door trim	
3	Rear side door trim	
4	Rear side door interior opening control	
5	Bolt of rear loading door interior opening control	
6	Rear side opening element window winder mechanism handle	

Repair-70x03x02x26-02x50-1-3-1.xml

XSL version : 3.02 du 22/07/11

REAR SIDE OPENING ELEMENT BOX SECTION INTERNAL ASSEMBLY: EXPLODED VIEW

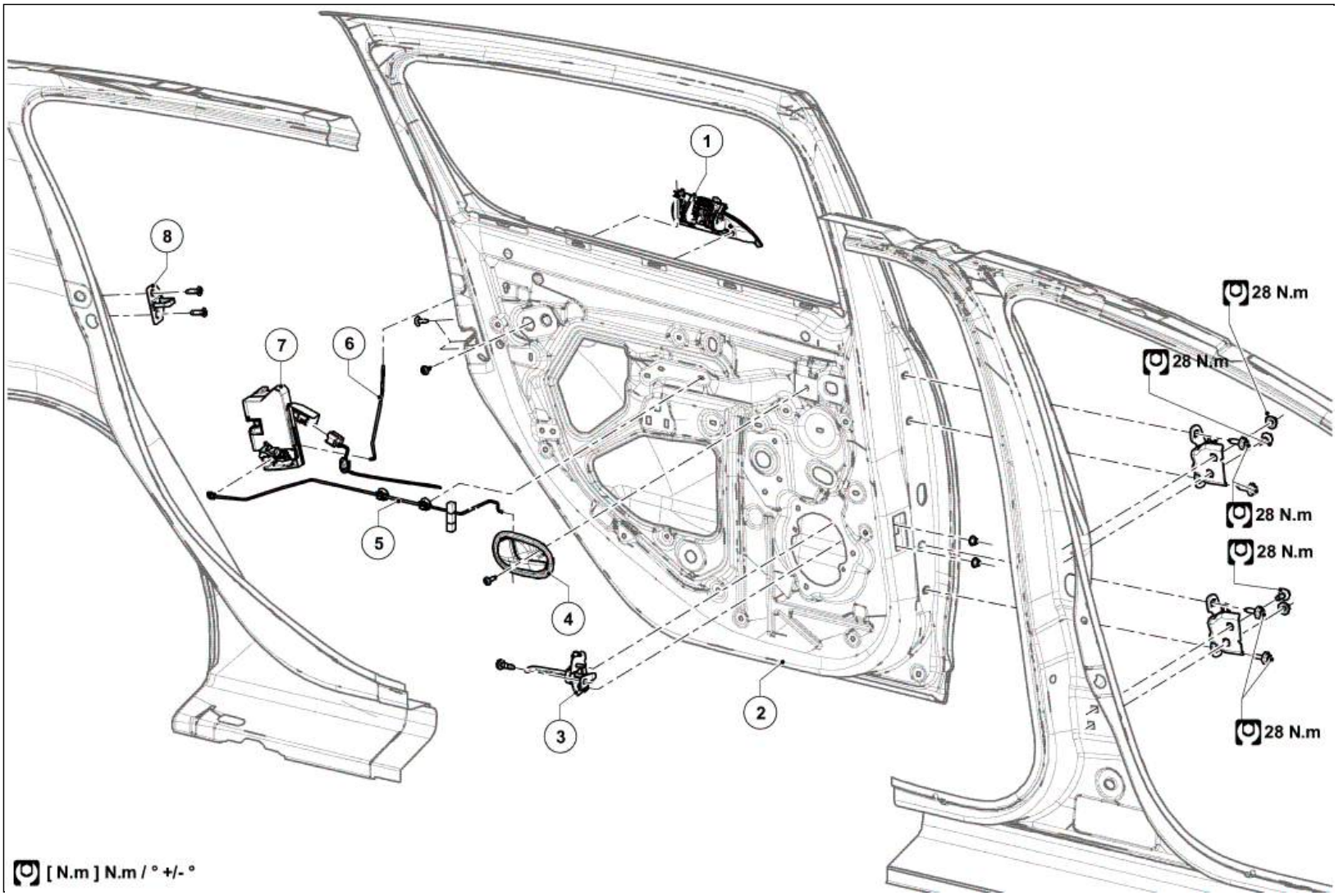


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Rear side door exterior opening control	(see 51A, Side opening element mechanisms, Side opening element exterior handle: Removal - Refitting)
2	Rear side opening element	Rear side opening element: Removal - Refitting
3	Rear side opening element stop	
4	Rear side door interior opening control	
5	Linkage of the rear side door interior handle	
6	Linkage of the rear side door exterior handle	
7	Rear side door lock	(see 51A, Side opening element mechanisms, Rear side opening element lock: Removal - Refitting)
8	Rear side opening element striker plate	

XSL version : 3.02 du 22/07/11

REAR SIDE OPENING ELEMENT LOCK: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 51A, Side opening element mechanisms, Rear side opening element box section internal assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove:
  - the rear side opening element trim Rear side opening element trim: Removal - Refitting ,
  - the side opening element sealing film Side opening element sealing film: Removal - Refitting .

2. REMOVAL OPERATION

- Remove the exterior opening control linkage from the clip on the exterior door handle(see 51A, Side opening element mechanisms, Rear side opening element box section internal assembly: Exploded view) .

- Remove the bolts from the rear side opening element lock(see 51A, Side opening element mechanisms, Rear side opening element box section internal assembly: Exploded view) .

- Disconnect the connector from the rear side opening element lock.

- Remove the "rear side opening element lock - control linkages" assembly.

REFITTING

- Proceed in the reverse order to removal.

- Carry out a function test.

REAR SIDE OPENING ELEMENT: REMOVAL - REFITTING

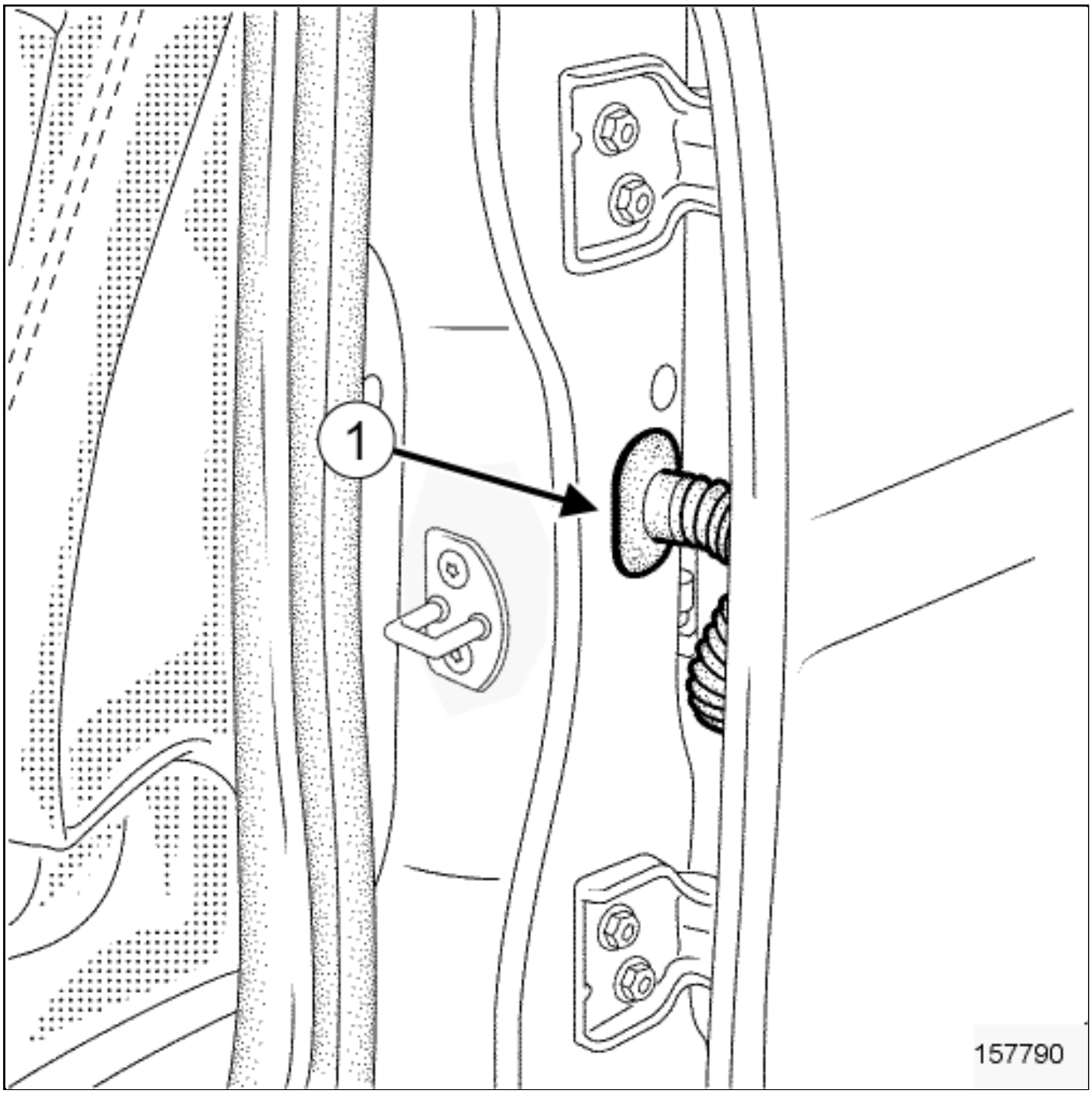
Location and specifications (tightening torques, parts always to be replaced, etc.)**Rear side opening element box section internal assembly: Exploded view** .

This operation can be carried out in two ways:

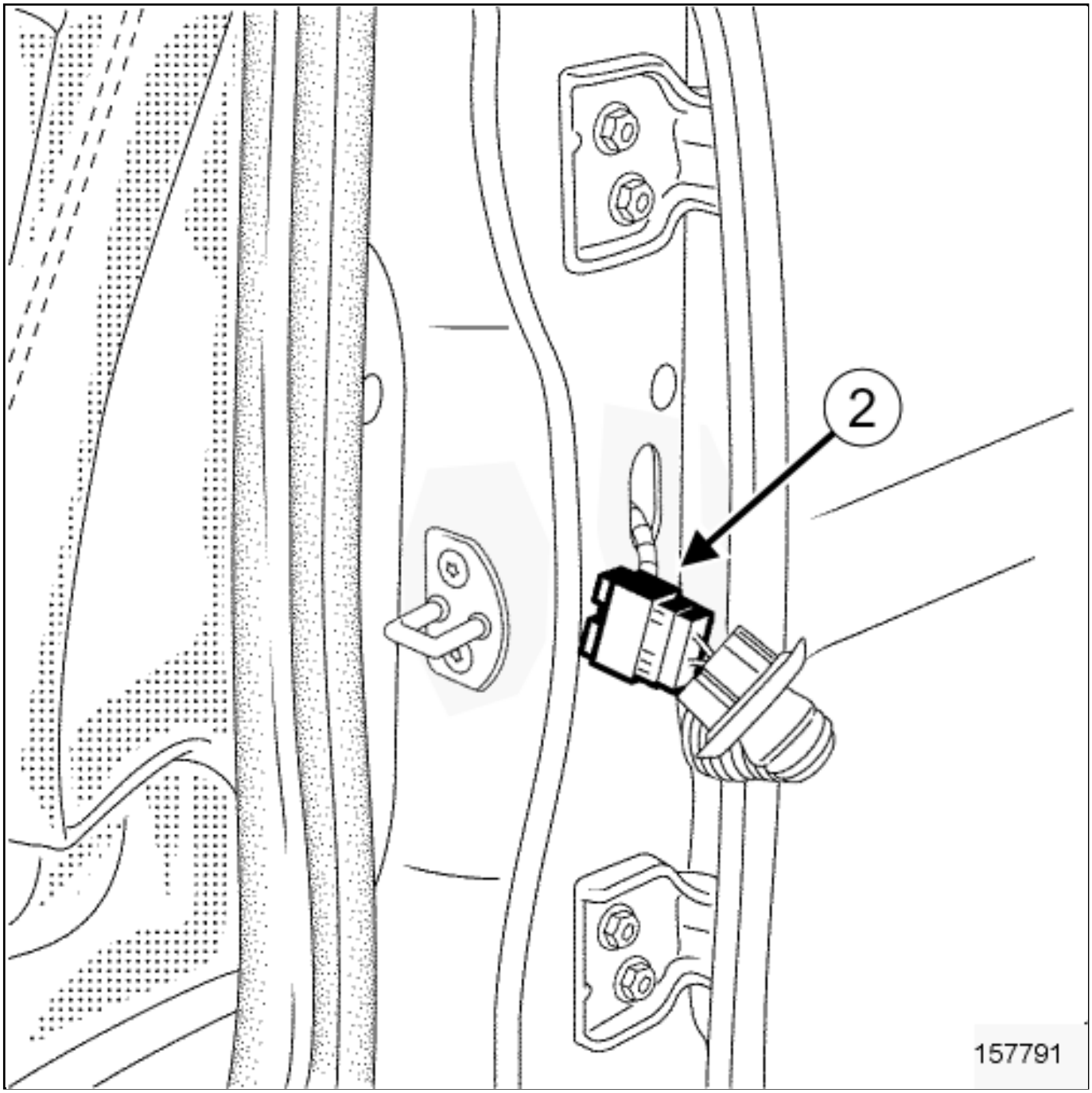
- removal without hinges: used when replacing the door.
- removal with hinges: allows the initial adjustments to be kept.

REMOVAL

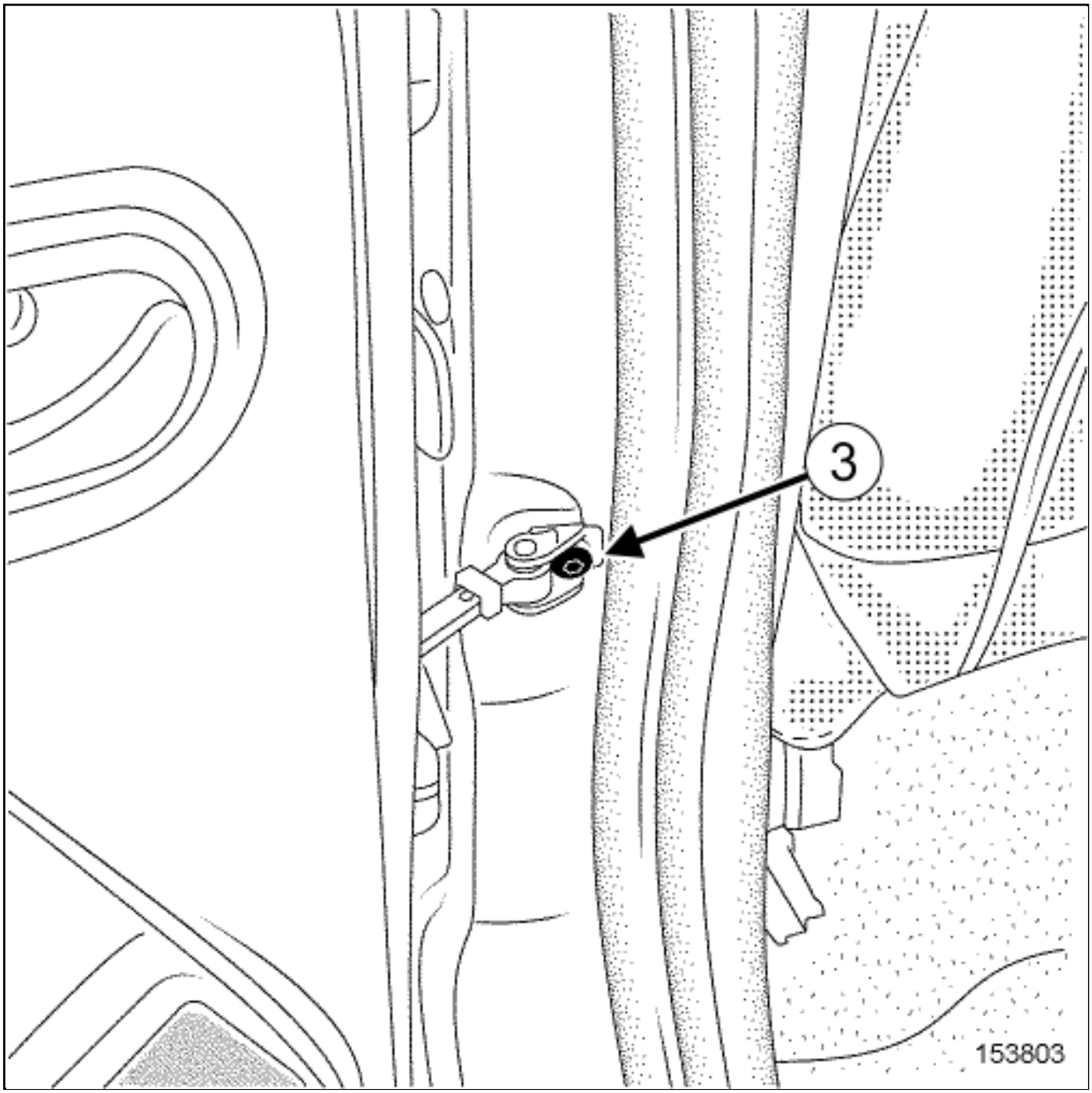
1. REMOVAL PREPARATION OPERATION



- Extract the protector(1) of the rear side door wiring on the B-pilar (depending on the equipment level).



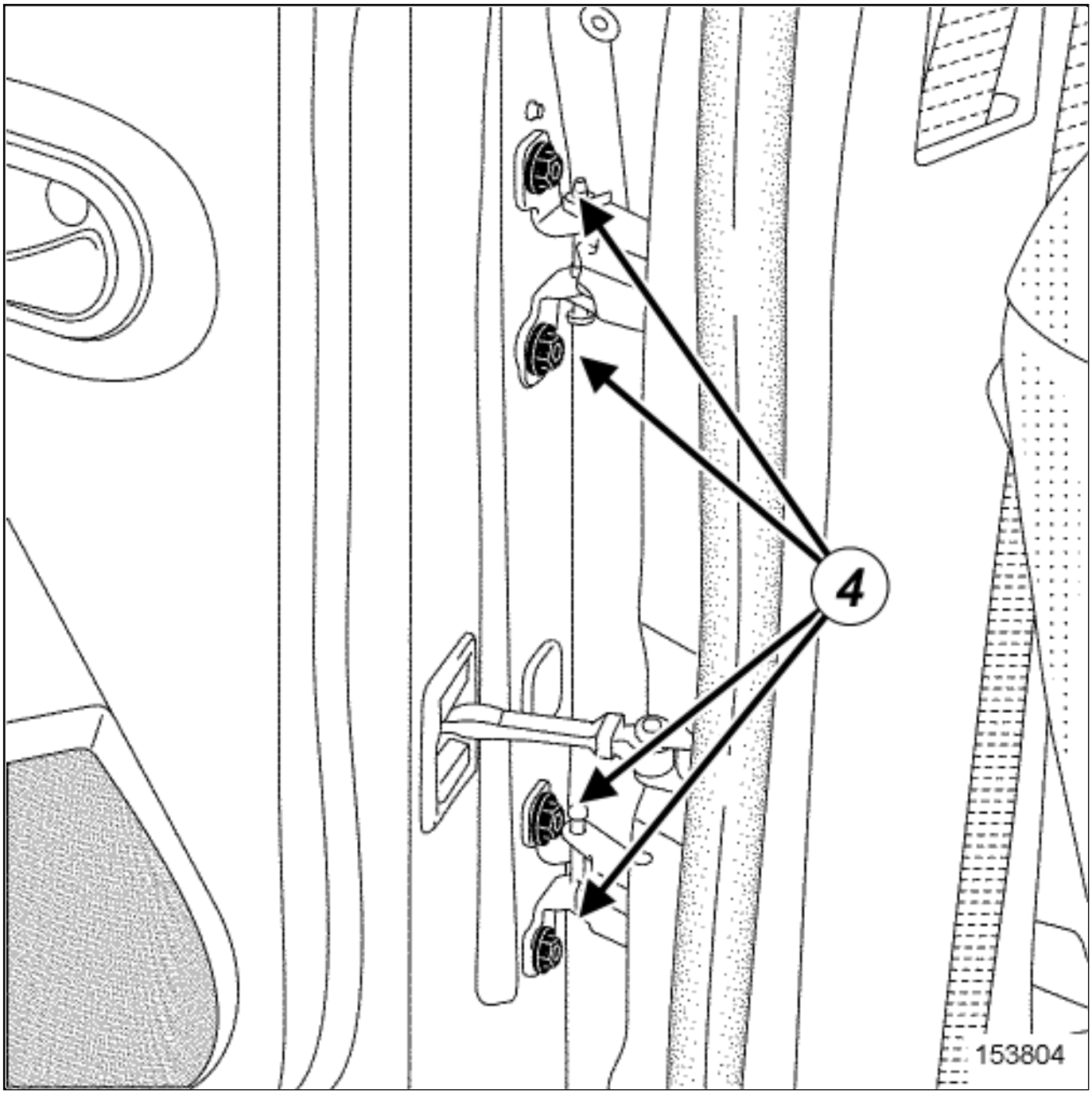
- Disconnect the connector(2) of the rear side door wiring (depending on the equipment level).



- Remove the bolt(3) from the rear side door check strap.
- Move aside the rear side door check strap.

2. REMOVAL OPERATION

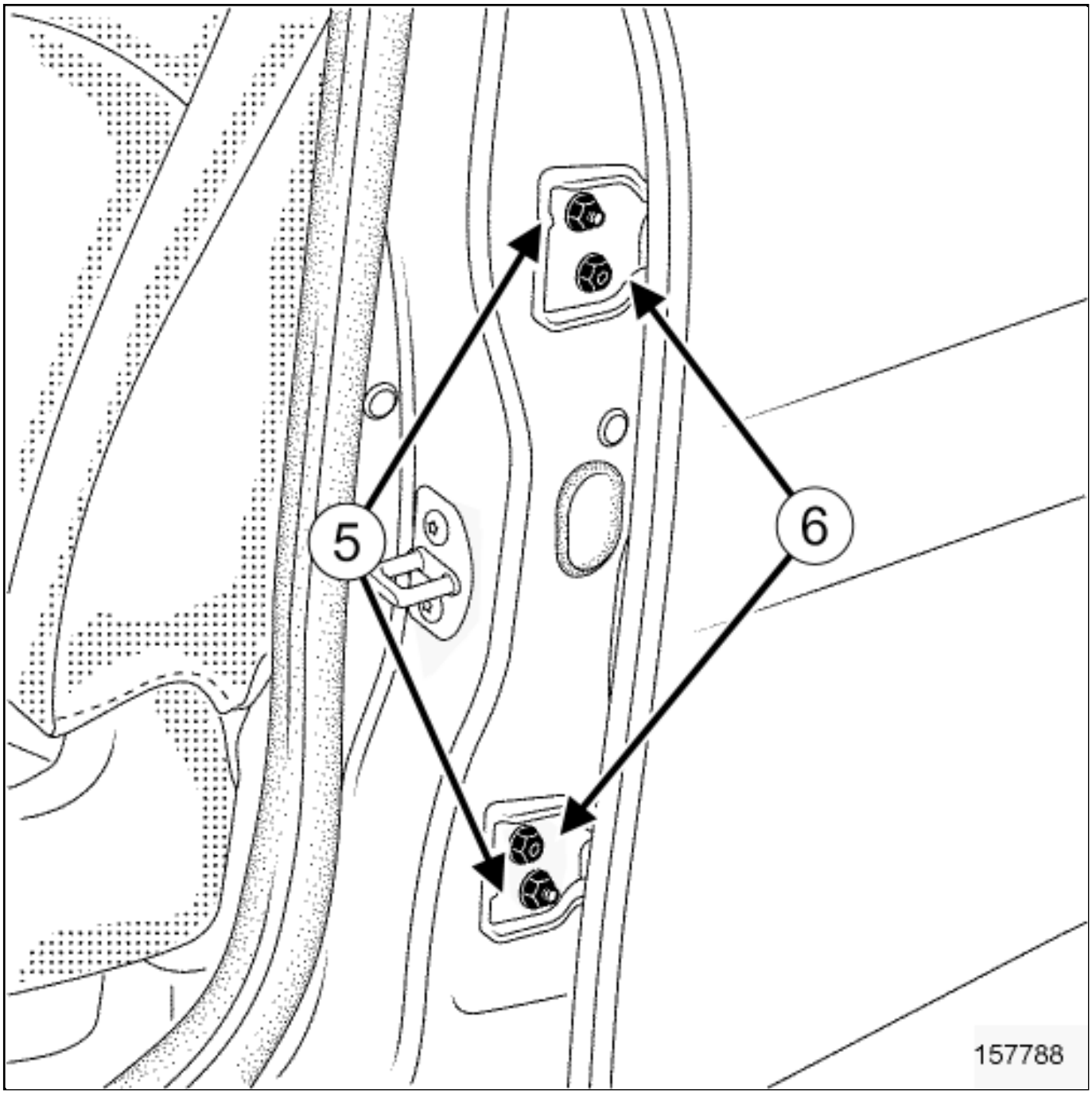
1- REMOVAL WITHOUT HINGES



Remove:

- the rear side door bolts(4) ,
- the rear side door (this operation requires two people).

2- REMOVAL WITH HINGES



Remove:

- the rear side door nuts(**5**) ,
- the rear side door bolts(**6**) ,
- the rear side door (this operation requires two people).

REFITTING

1. REFITTING OPERATION

1- REFITTING WITHOUT HINGES

- Proceed in the reverse order to removal.
- Adjust the rear side door clearances and flush fittings(see 47A, Side opening elements, Rear side opening element: Adjustment) .
- Carry out a function test on all functions.

2- REFITTING WITH HINGES

Note:

Apply a bead of sealing masticVehicle: Parts and consumables for the repair to the door hinges Anti-corrosion protection product before assembly: Use .

- Proceed in the reverse order to removal.
- Adjust the rear side door clearances and flush fittings(see 47A, Side opening elements, Rear side opening element: Adjustment) .
- Carry out a function test on all functions.

REAR SIDE OPENING ELEMENT TRIM: REMOVAL - REFITTING

Special tooling required	
Set of trim removal levers.	Car. 1363

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 72A, Side opening element trim, Rear side opening element assembly on the passenger compartment side: Exploded view) .

REMOVAL

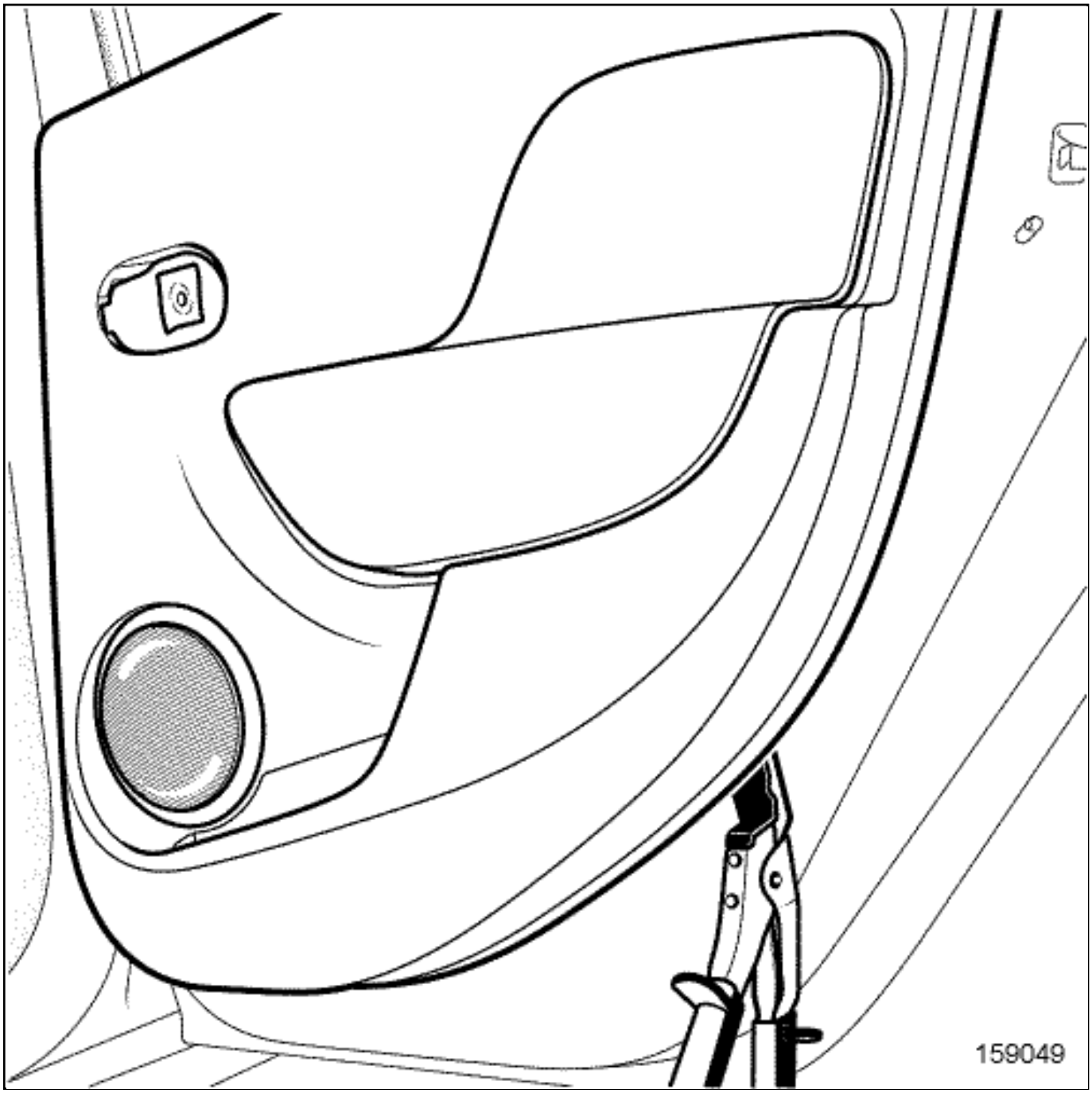
1. REMOVAL PREPARATION OPERATION

Remove (see 72A, Side opening element trim, Rear side opening element assembly on the passenger compartment side: Exploded view) :

- the interior opening control bolt,
- the interior opening control.

2. REMOVAL OPERATION

Remove the rear side opening element trim armrest bolt(see 72A, Side opening element trim, Rear side opening element assembly on the passenger compartment side: Exploded view) .



- Remove the rear side opening element trim using a pair of unclipping pliers.

REFITTING

1. REFITTING PREPARATION OPERATION

- Check the condition of the clips and replace them if necessary.

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

REAR SIDE SEAT BELT: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always replaced, etc.)Rear bench seat assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

- the single unit rear bench seat baseRear bench seat assembly: Exploded view ,
- the rear side seat belt lower bolt,
- the 1/3 or 2/3 rear bench seatback or the single unit rear bench seatbackRear bench seat assembly: Exploded view .

B52(B52)

Remove the rear quarter panel trimInterior body side trim assembly: Exploded view .

L52(L52)

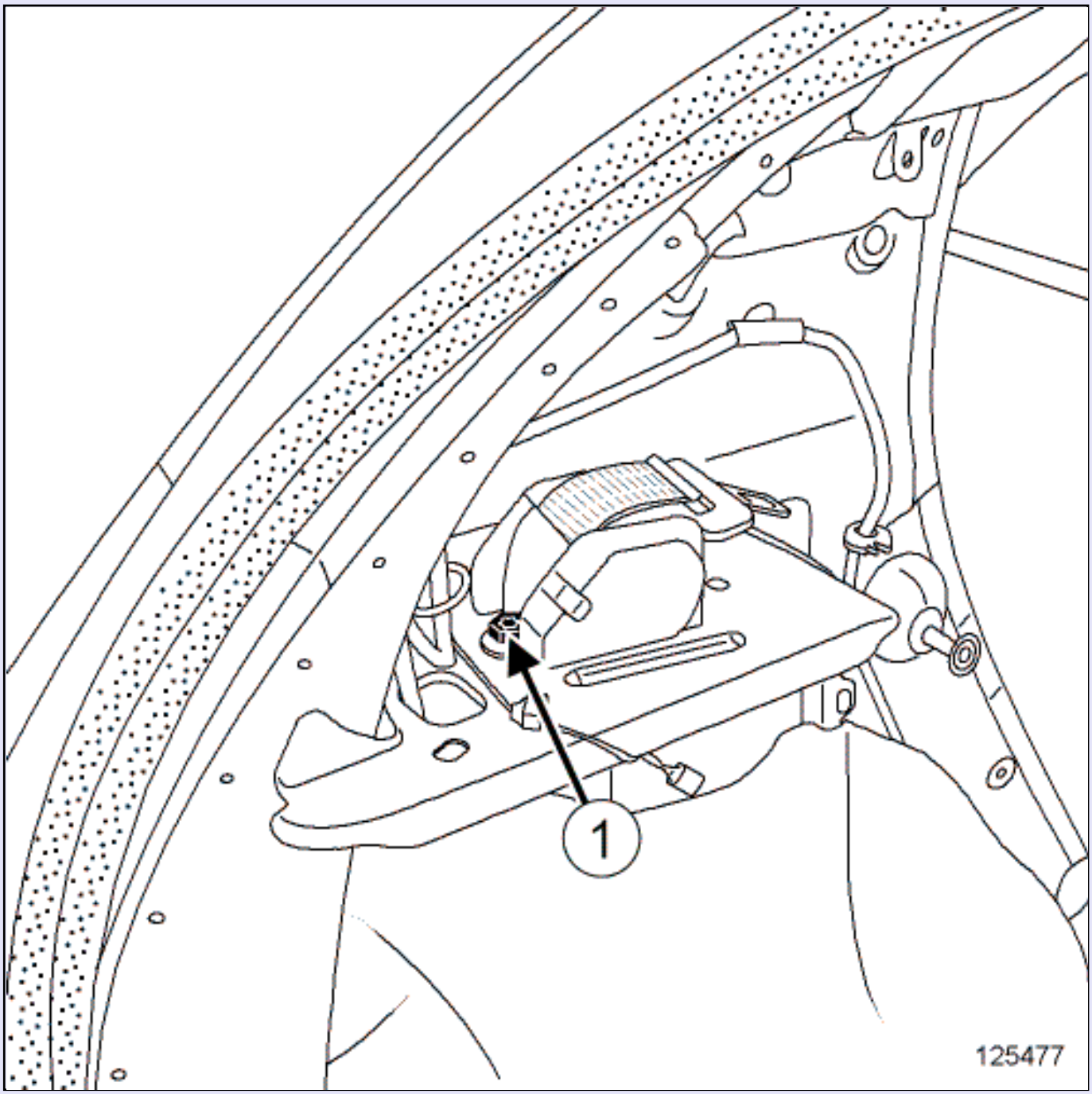
Remove the rear parcel shelf trimInterior body side trim assembly: Exploded view .

K52(K52)

Remove Interior body side trim assembly: Exploded view :

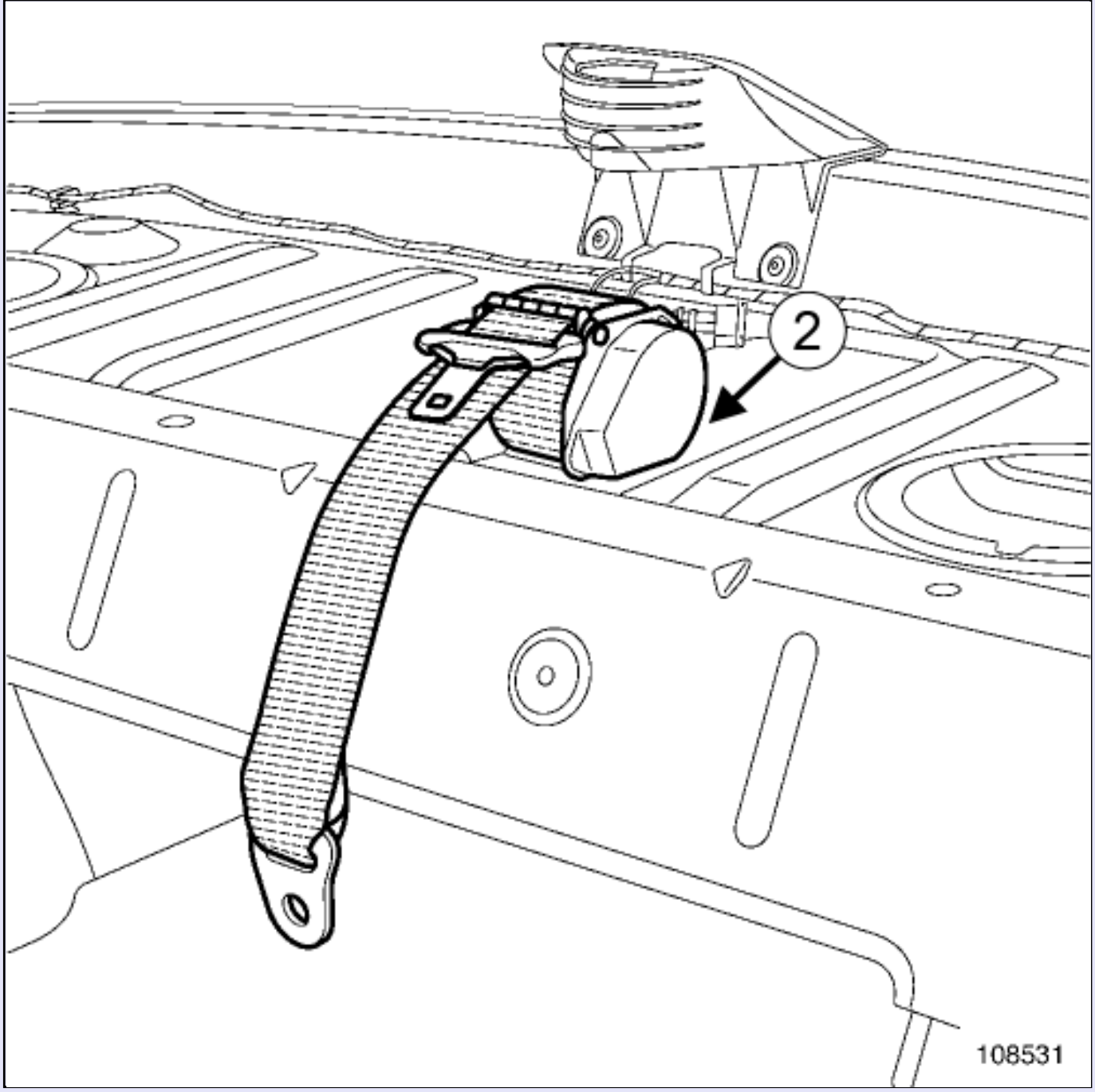
- the rear parcel shelf,
- the rear parcel shelf trim.

2. REMOVAL OPERATION



Remove:

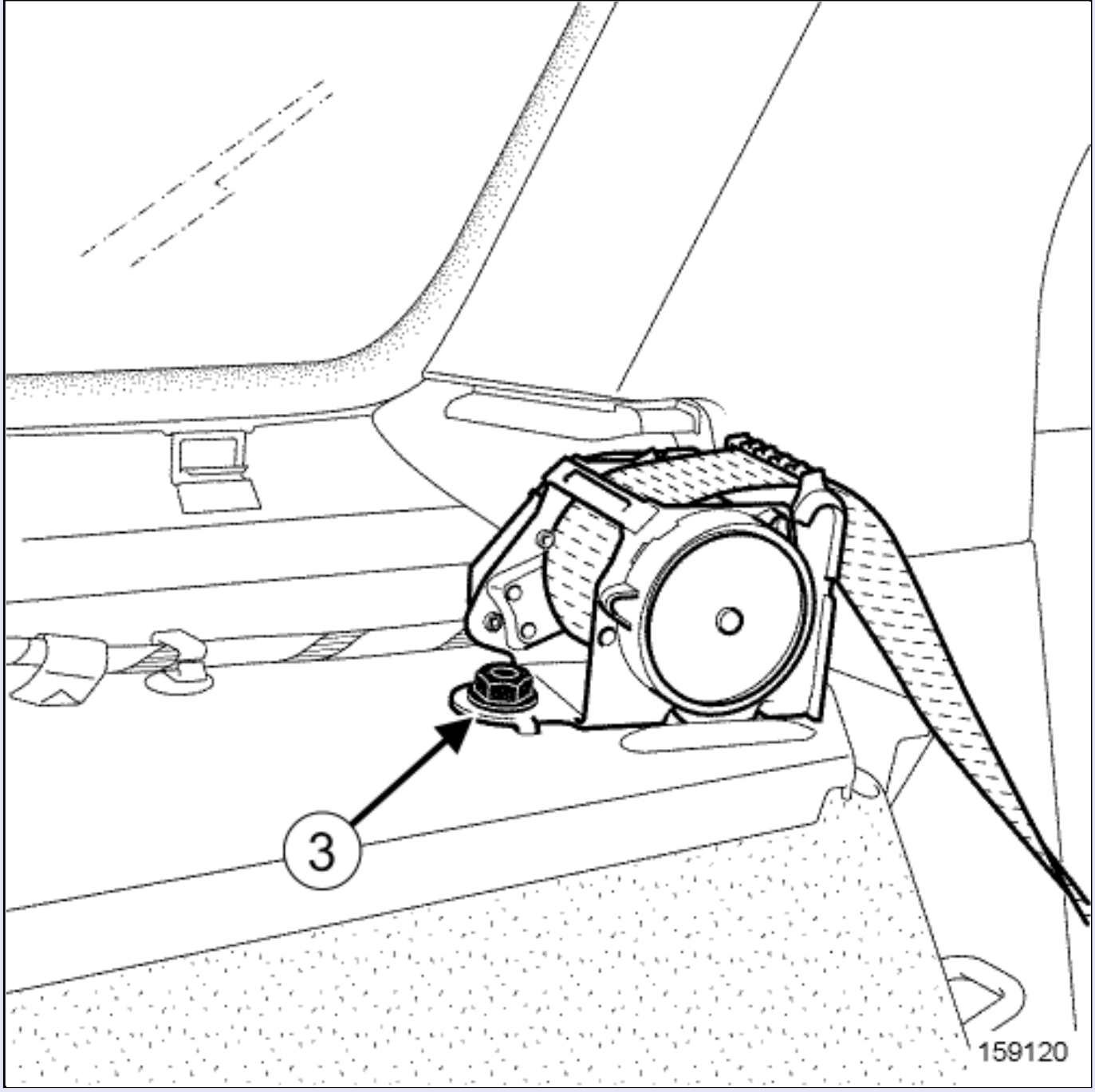
- the rear seat belt upper bolt(1) ,
- the rear seat belt.



Remove:

- the rear seat belt upper bolt(2) ,
- the rear seat belt.

K52(K52)



- Remove:
  - the rear seat belt upper bolt(3) ,
  - the rear seat belt.

REFITTING

1. REFITTING PREPARATION OPERATION

- Coat the threads of the rear side seat belt bolts with HIGH STRENGTH THREAD LOCK Vehicle: Parts and consumables for the repair .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.
- Torque tighten the rear seat belt bolt21 N.m.

3. CHECKING AFTER REPAIR

- Check for correct operation by unrolling the rear side seat belt by 300 mm and letting it return twice.
- Check that the rear side seat belt locks correctly by pulling the rear side seat belt strap with increasing speed 200 to 300 mm maximum until the inertia reel locks.

REAR SIDE WINDOW MECHANISM ASSEMBLY: EXPLODED VIEW

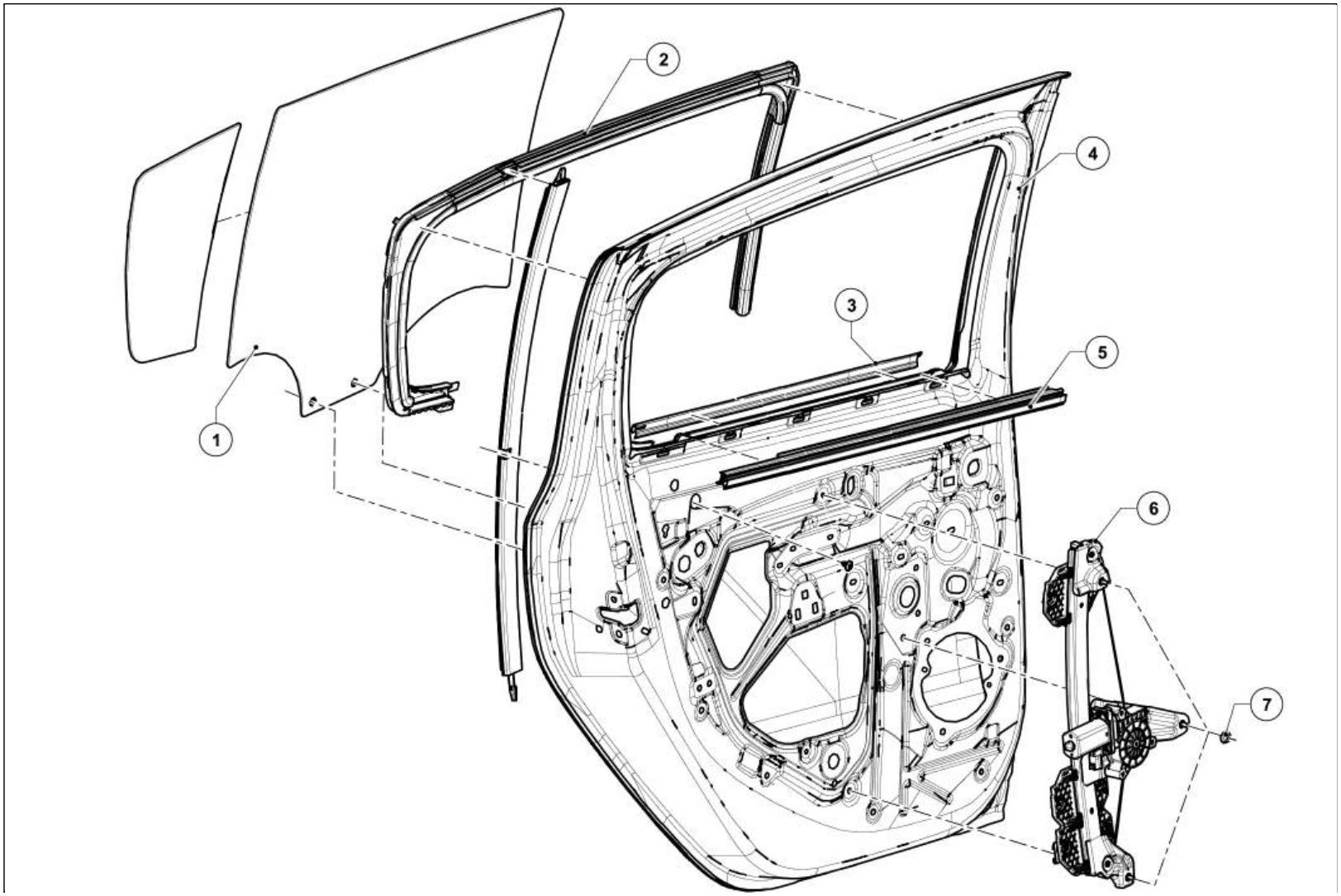


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Rear side door sliding window	
2	Glass run channel of rear side opening element	
3	Exterior weatherstrip of rear side opening element window	
4	Rear side opening element	
5	Interior weatherstrip of rear side opening element window	
6	Rear side opening element window winder mechanism	
7	Nuts of rear side opening element window winder mechanism	

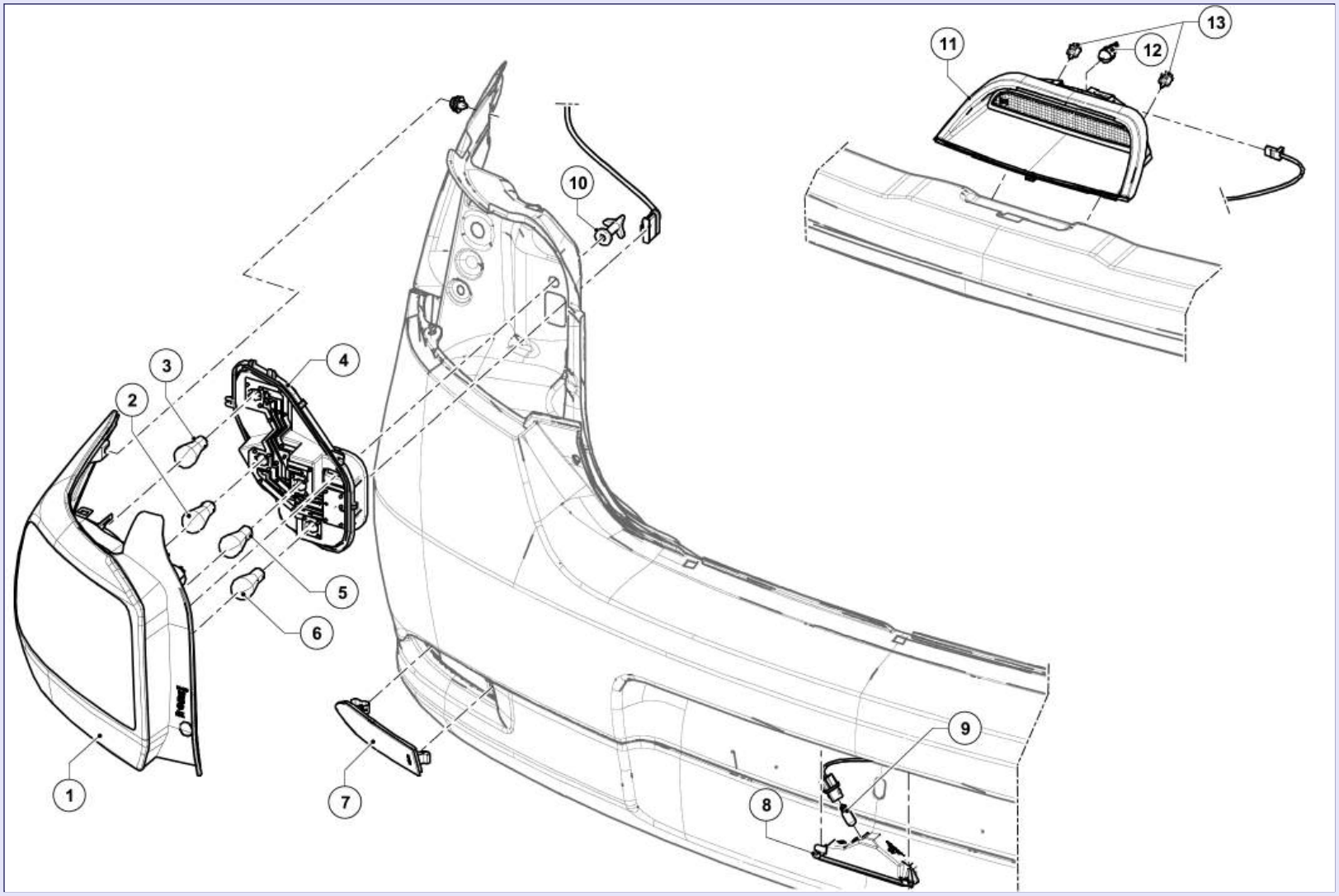


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Rear light	
2	Direction indicator bulb	
3	Brake light and side light bulb	
4	Plate rear light	
5	Reverse bulb	
6	Fog light bulb	
7	Reflectors	
8	Number plate light	
9	Number plate light bulb	
10	Rear light nut	

11	3rd brake light	
12	3rd brake light bulb	
13	Bolt	

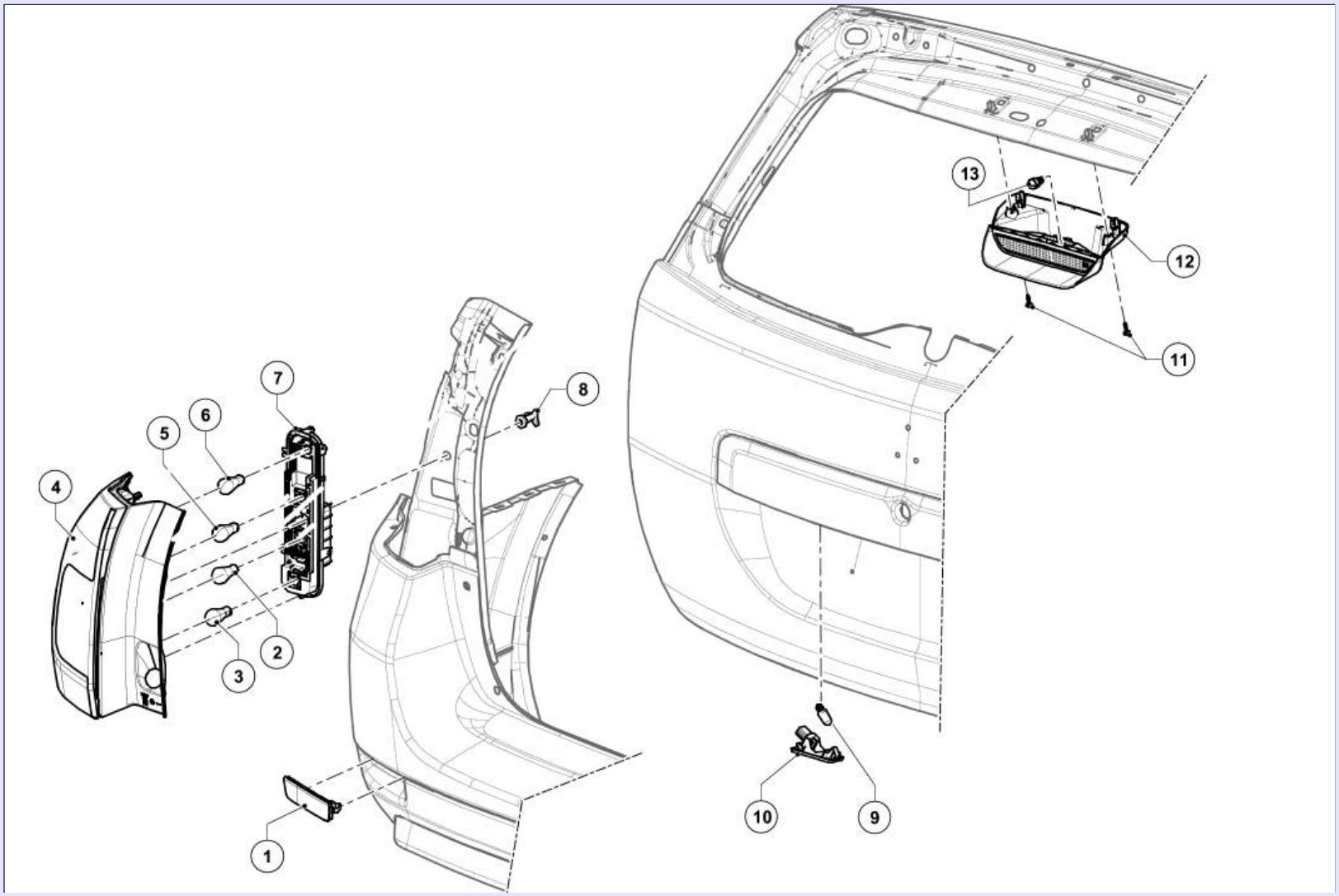


Illustration key: Description **Legend .**

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Reflectors	
2	Reverse bulb	
3	Fog light bulb	
4	Rear light	
5	Direction indicator bulb	
6	Brake light and side light bulb	
7	Plate rear light	
8	Rear light nut	
9	Number plate light bulb	
10	Number plate light	

11	Bolt	
12	3rd brake light	
13	3rd brake light bulb	

XSL version : 3.02 du 22/07/11

REAR WHEEL SPEED SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Location and specifications (tightening torques, parts always to be replaced, etc.)Rear hub carrier assembly: Exploded view .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 38C, Anti-lock braking system, ABS: List and location of components)** .

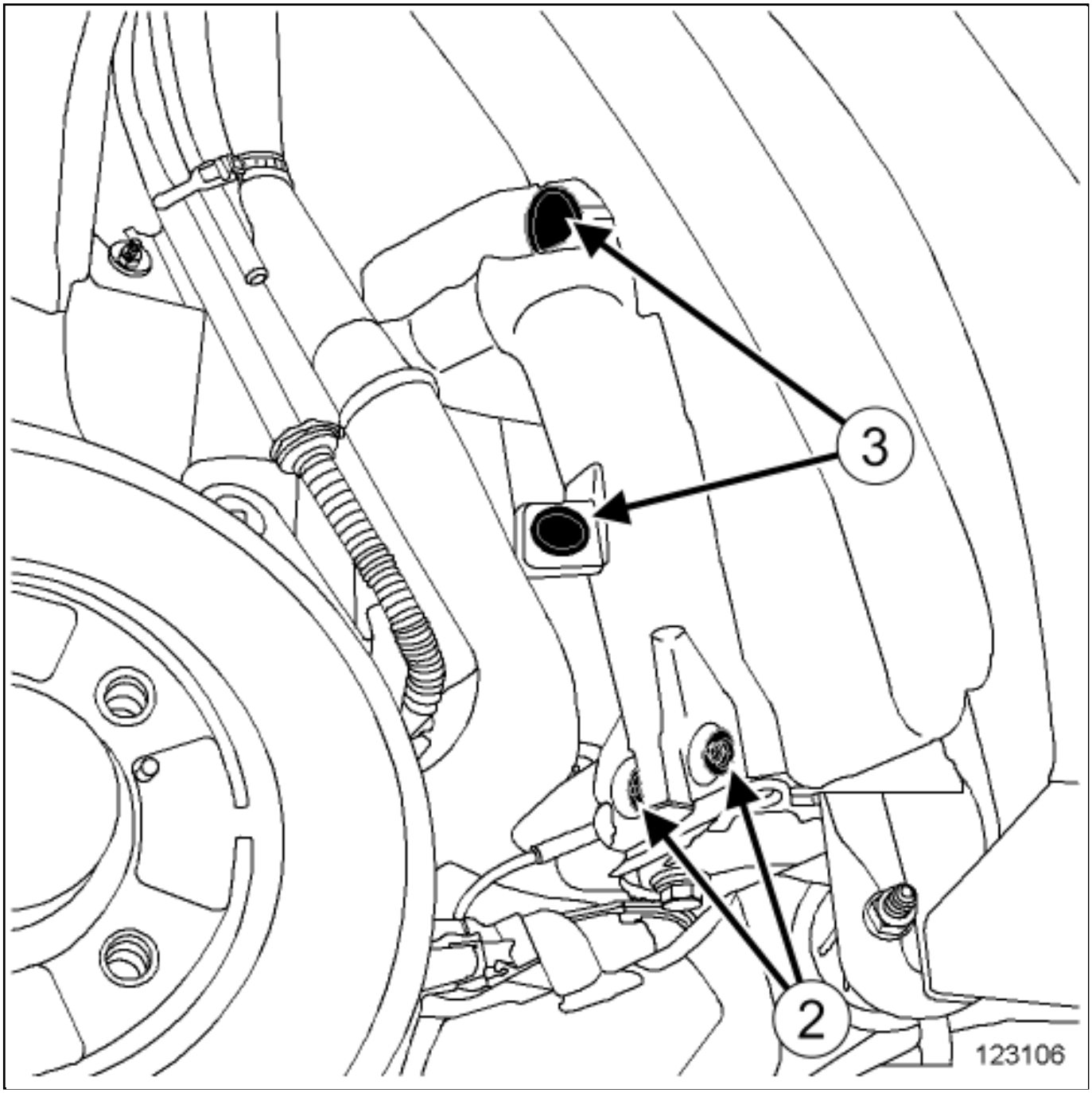
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).
- Remove the rear wheelWheel: Removal - Refitting .

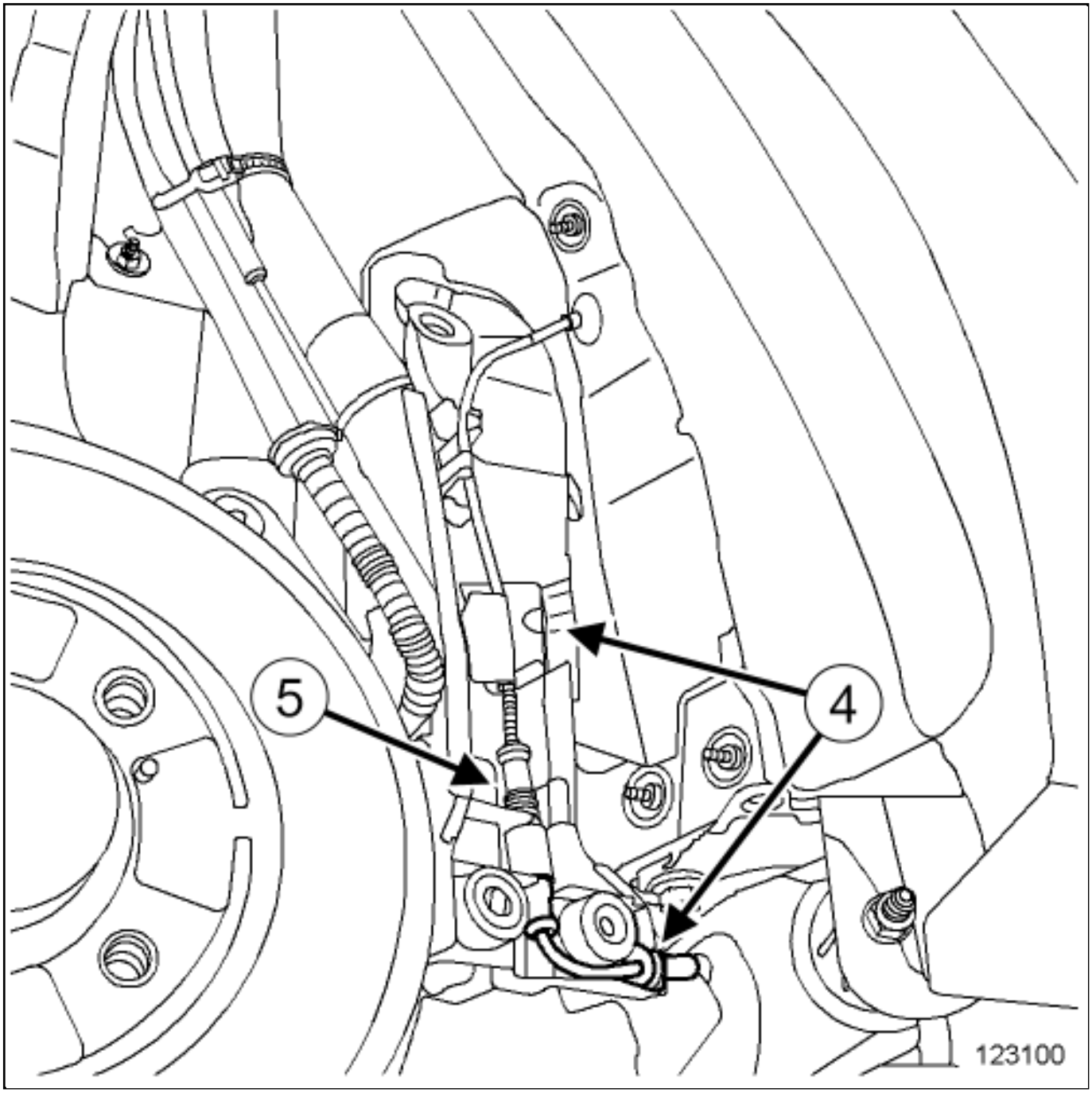
2. REMOVAL OPERATION

- Remove the wheel speed sensor boltRear hub carrier assembly: Exploded view .
- Unclip the wheel speed sensors from the rear axle.



Remove:

- the nuts(2) from the rear wheel speed sensor protective screen,
- the clips(3) from the rear wheel speed sensor protective screen.



- Pull away and slightly fold down the rear wheel speed sensor protective screen.
- Detach the rear wheel speed sensor at(4) .
- Disconnect the wheel speed sensor connector(5) on the rear ABS wiring.
- Remove the rear wheel speed sensor[Rear hub carrier assembly: Exploded view] .

REFITTING

1. REFITTING OPERATION

CAUTION

- To avoid damaging the wheel speed sensor cable:
  - Do not tension the cable,
  - Do not twist the cable,
  - Check that there is no contact with the surrounding components,
  - Do not use tools that may damage the cable.

Proceed in the reverse order to removal.

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XSL version : 3.02 du 22/07/11

REAR WING PANEL: REPLACEMENT

Note, one or more warnings are present in this procedure

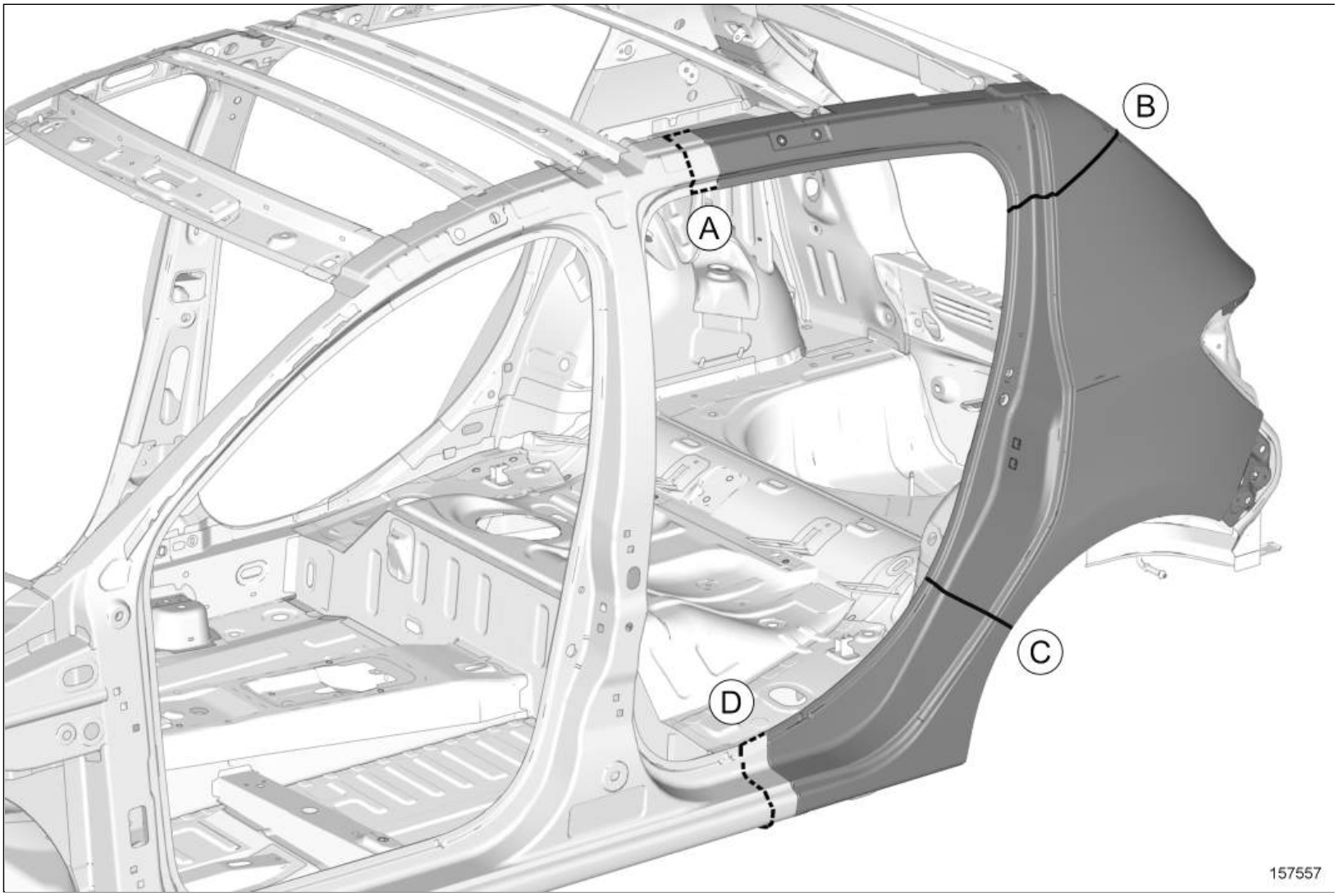
1. COMPOSITION OF THE SPARE PART

No.	Description	Thickness (mm)
(1)	Rear wing panel	0.65
(2)	Rear door striker panel reinforcement	1.2
(3)	Roof bar mounting reinforcement	0.95

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement A-D,
- partial replacement B-D,
- partial replacement B-C.



CAUTION
If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

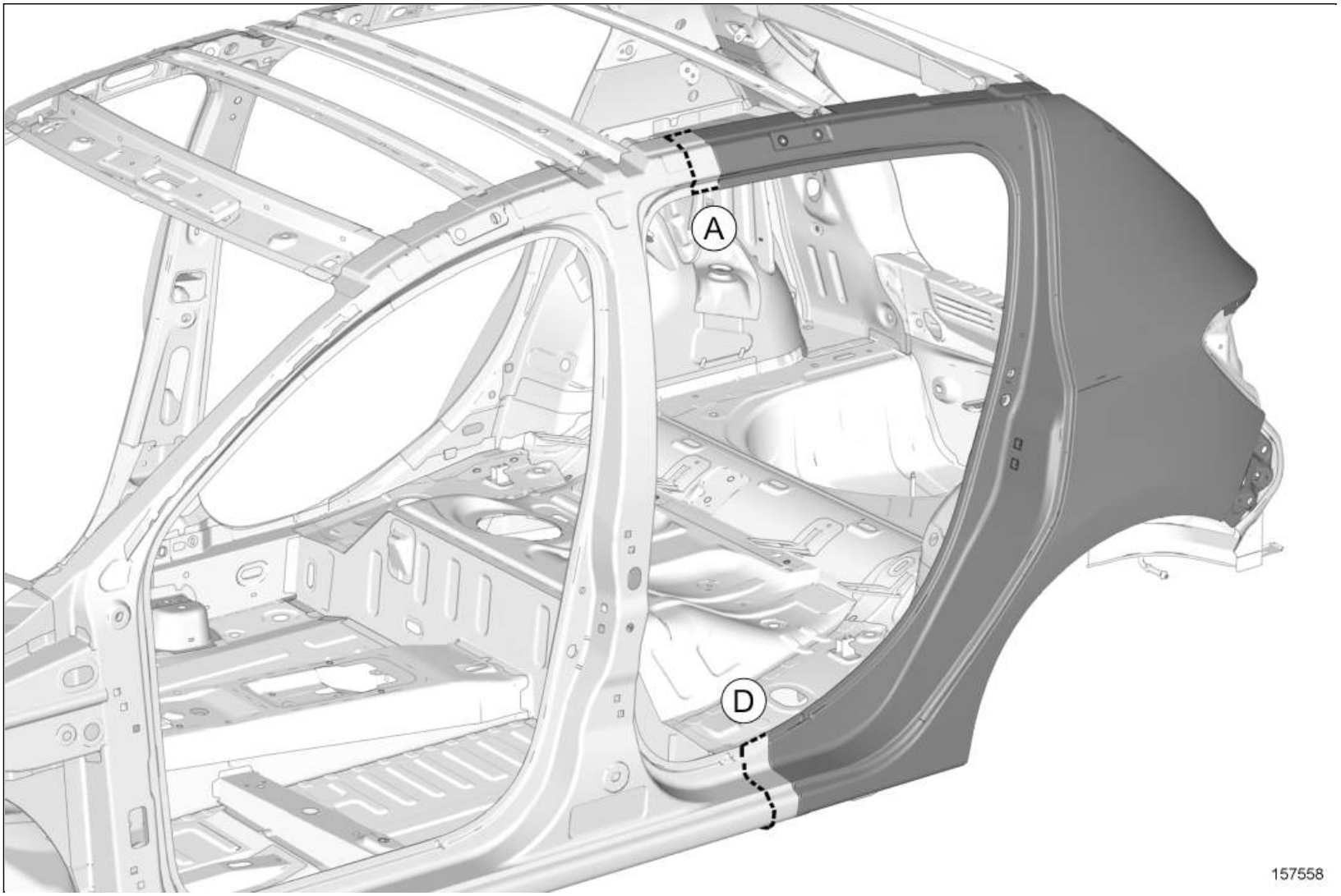
CAUTION
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT A-D

1)PART IN POSITION

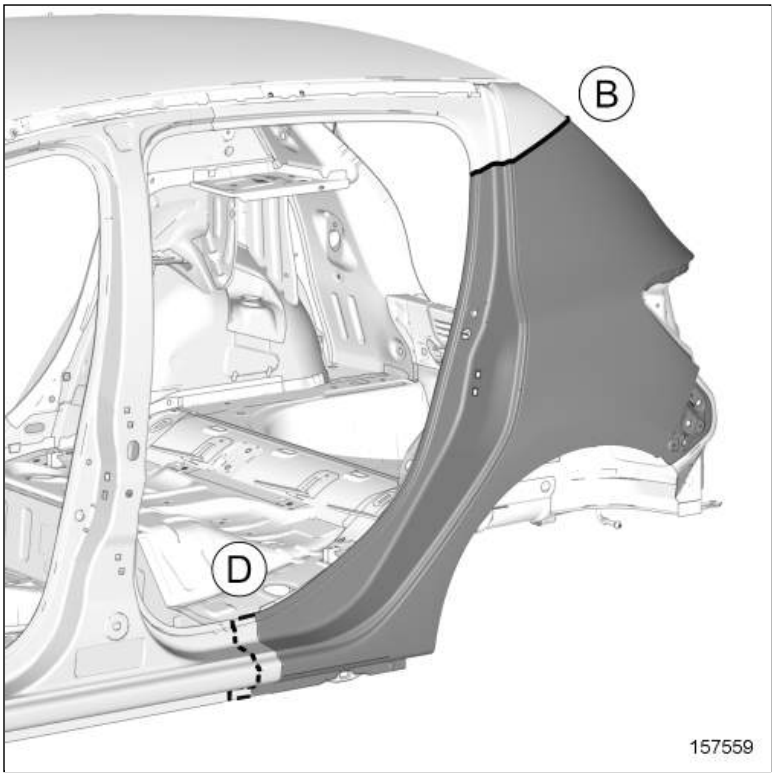


2)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURES TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

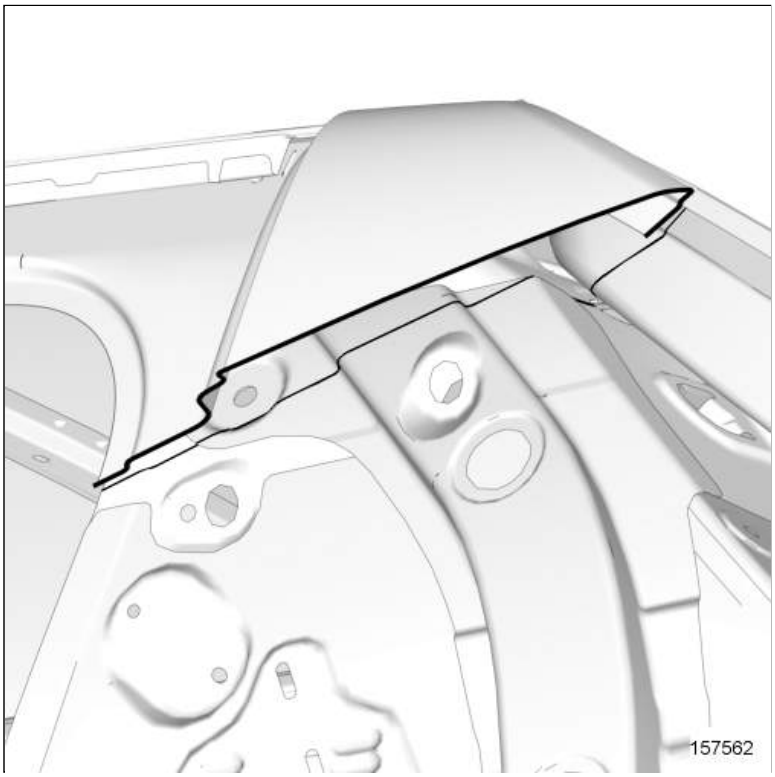
Remove the roof Roof: Replacement .

2- PARTIAL REPLACEMENT B-D

1)PART IN POSITION

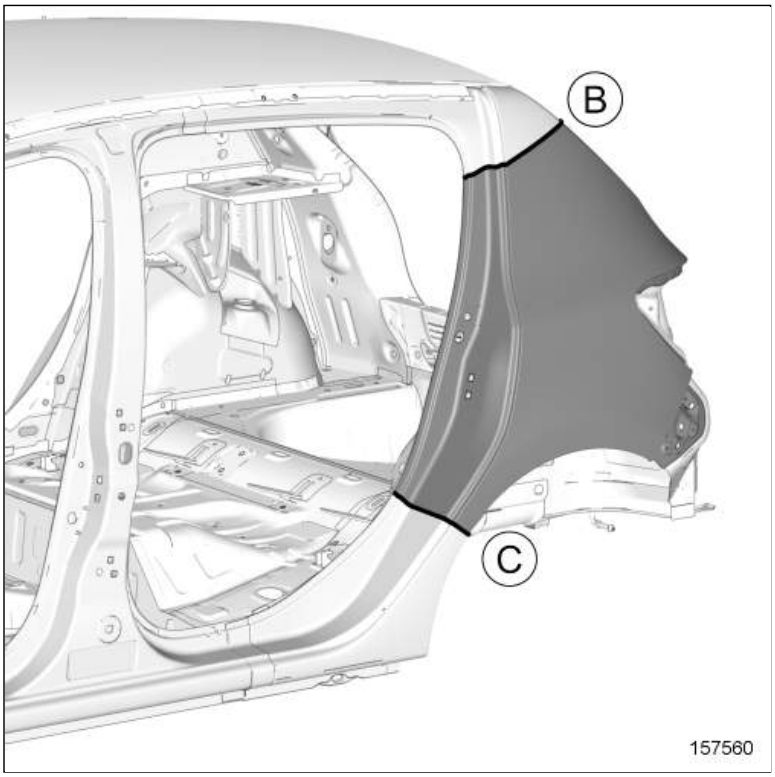


DETAILED VIEW B

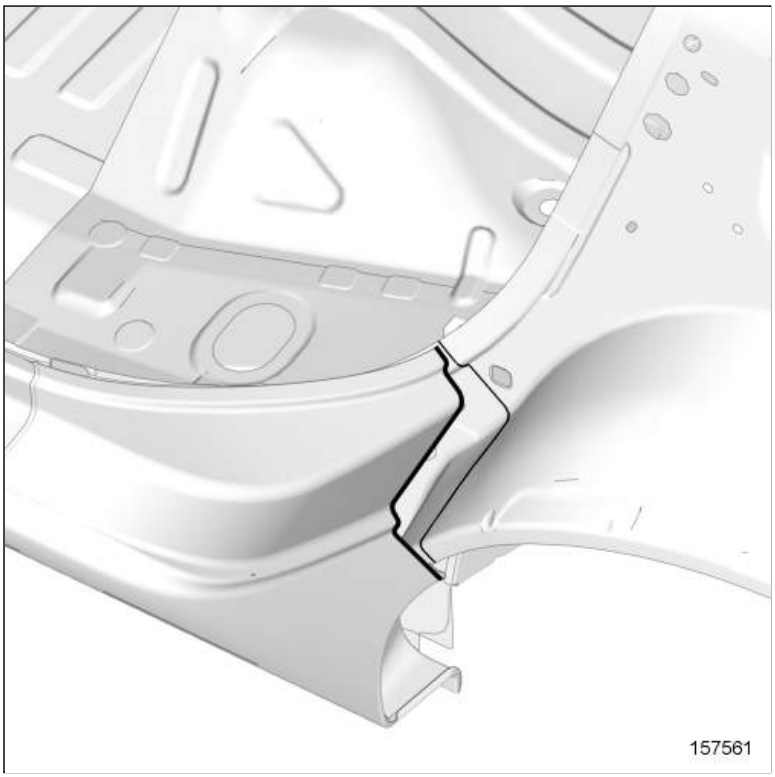


3- PARTIAL REPLACEMENT B-C

1)PART IN POSITION



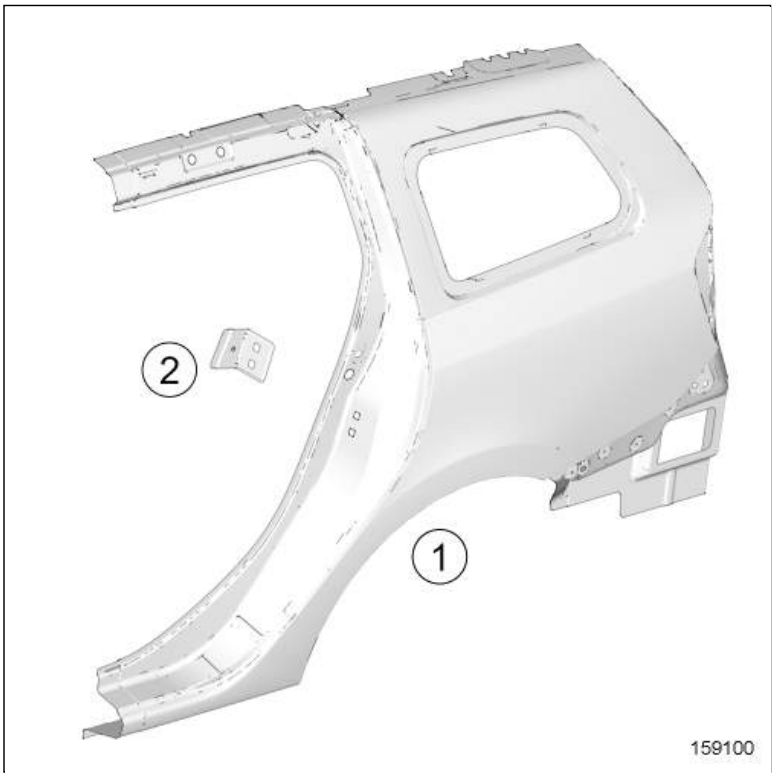
DETAILED VIEW C



REAR WING PANEL: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

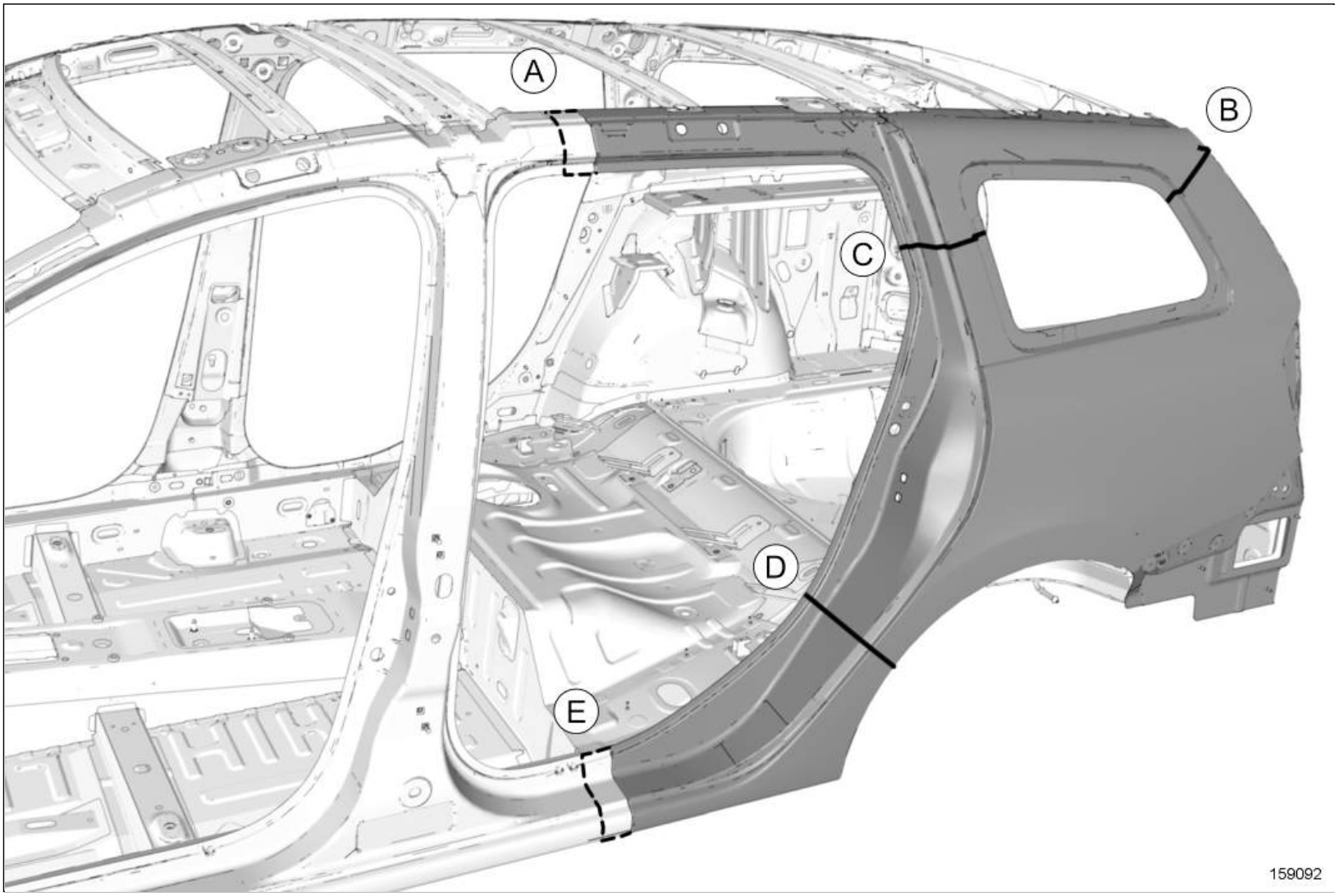


No.	Description	Thickness (mm)
(1)	Rear wing panel	0.65
(2)	Rear door striker panel reinforcement	1.2

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement A-E,
- partial replacement B-C-E,
- partial replacement B-C-D.



CAUTION
If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

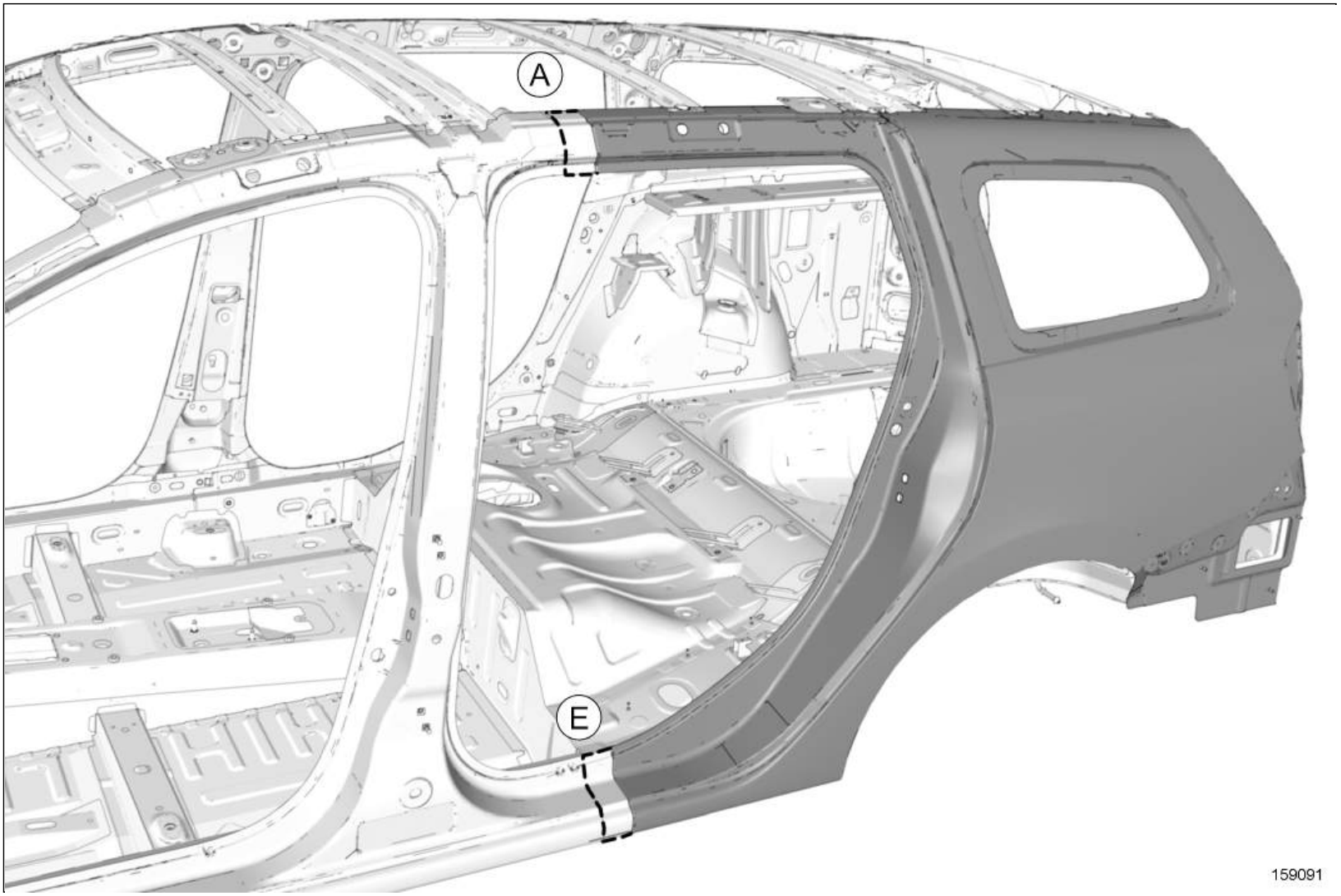
CAUTION
To avoid damaging the vehicle's electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT A-E

1)PART IN POSITION

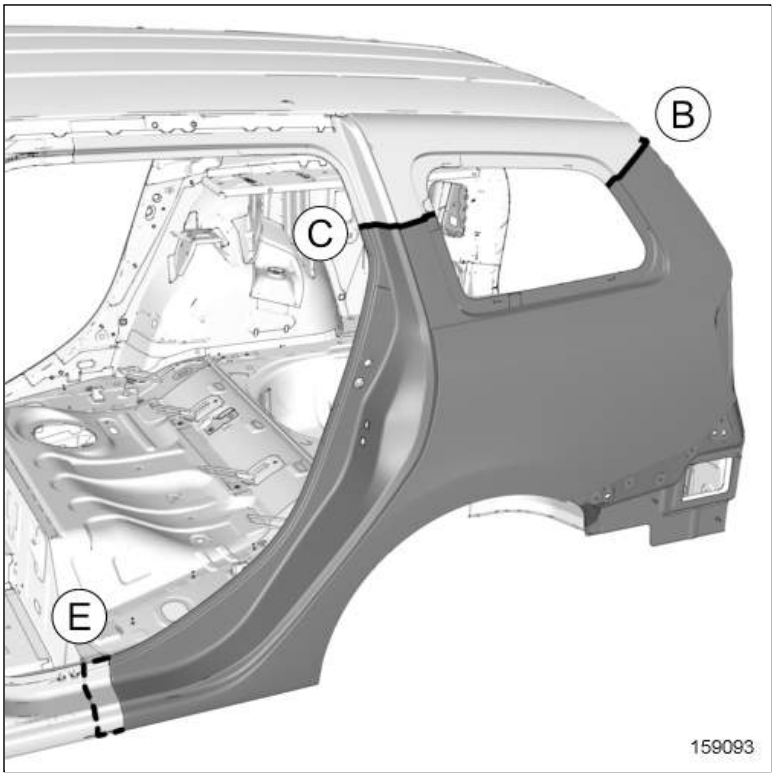


2)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURES TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

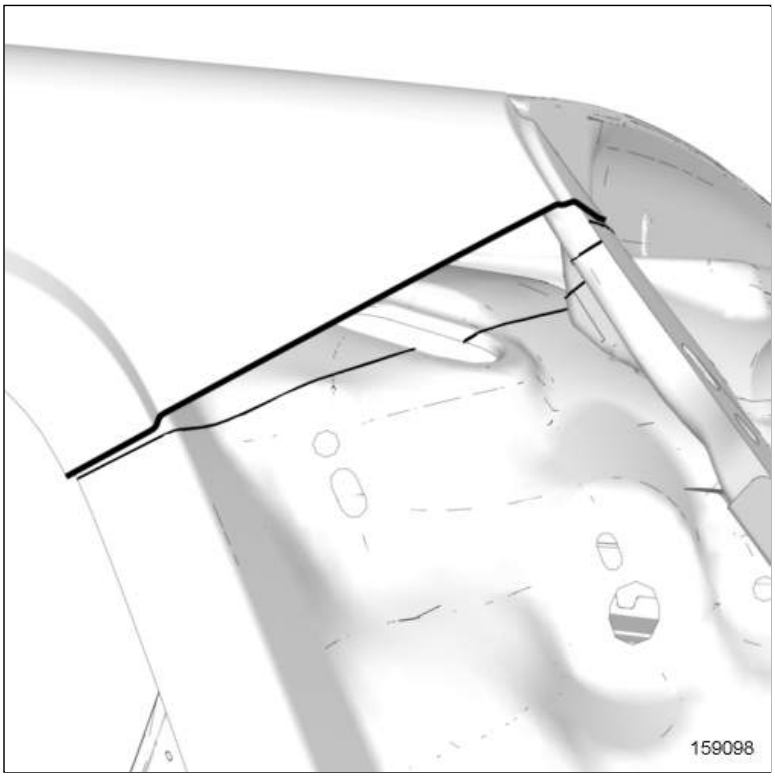
Remove the roof**Roof: Replacement** .

2- PARTIAL REPLACEMENT B-C-E

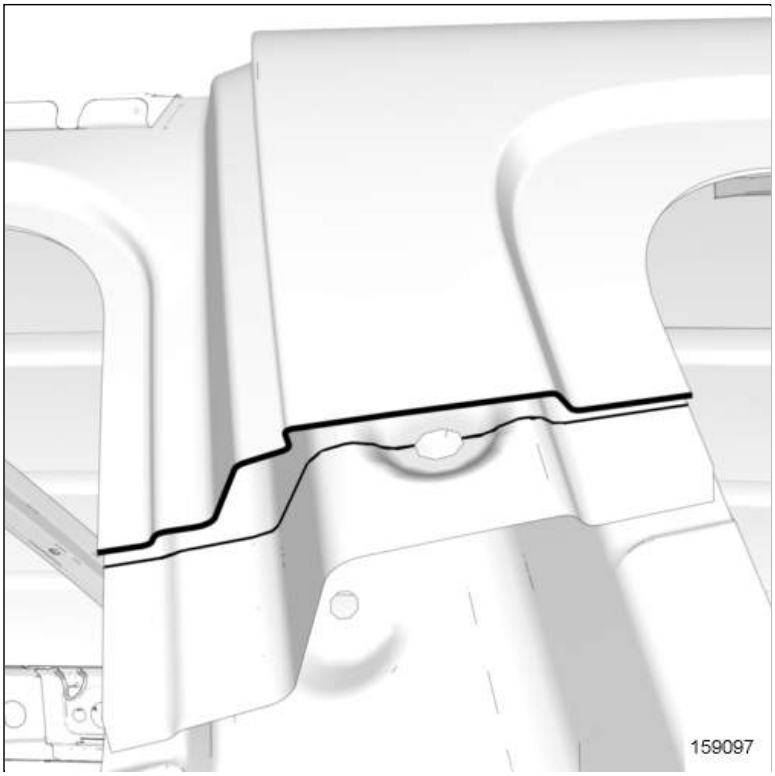
1)PART IN POSITION



DETAILED VIEW B

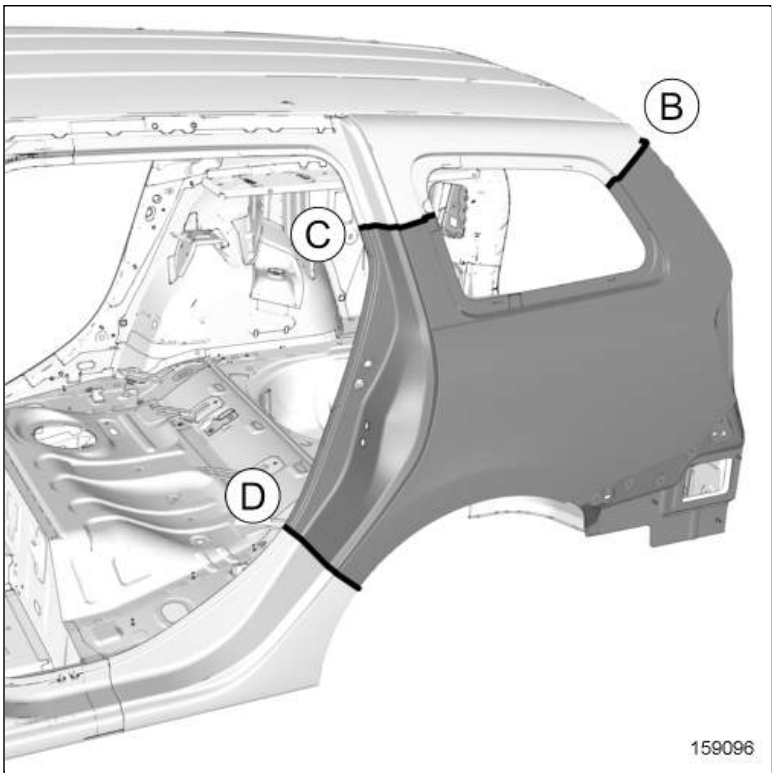


DETAILED VIEW C

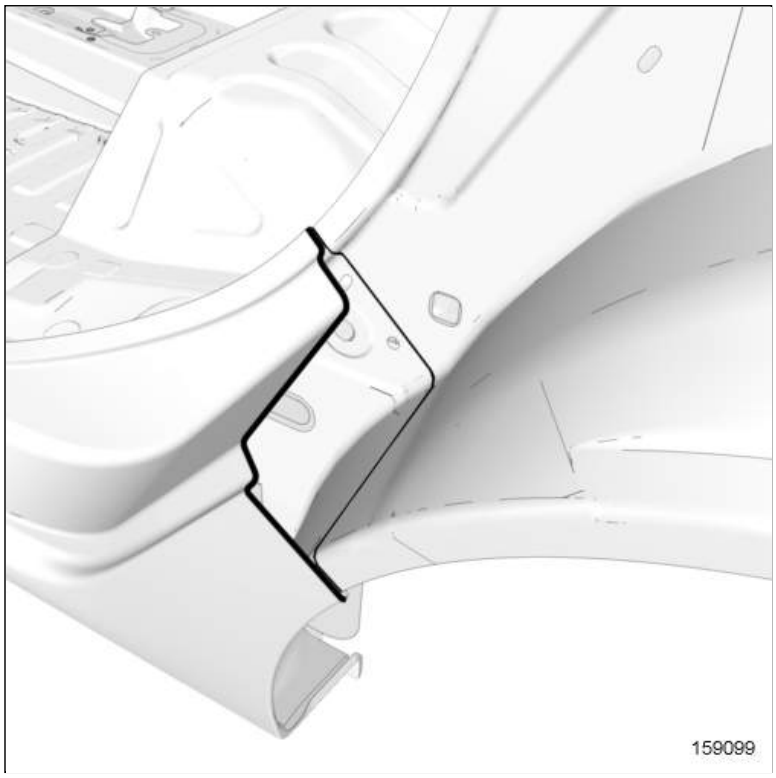


3- PARTIAL REPLACEMENT B-C-D

1)PART IN POSITION



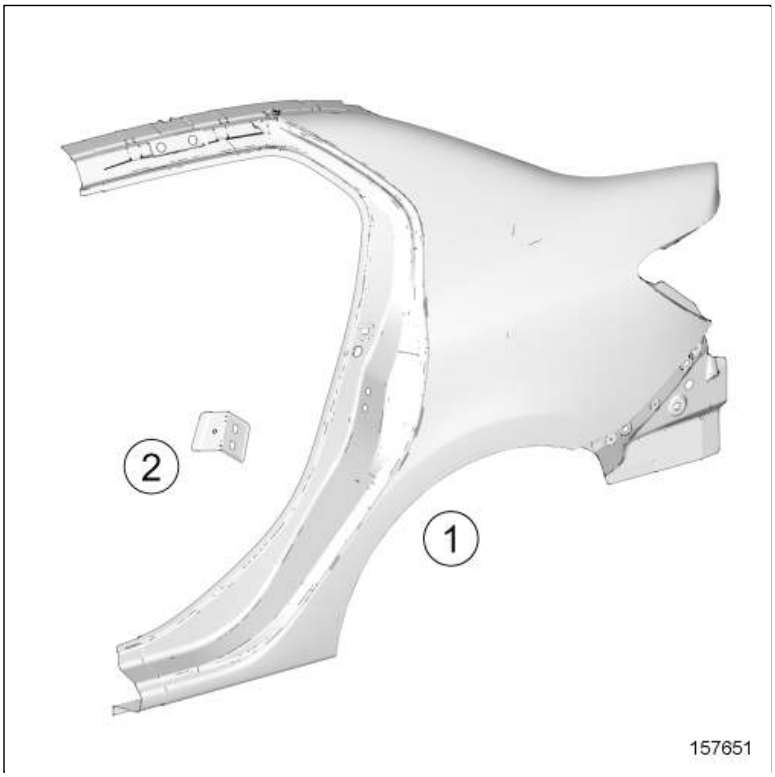
DETAILED VIEW D


159099

REAR WING PANEL: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

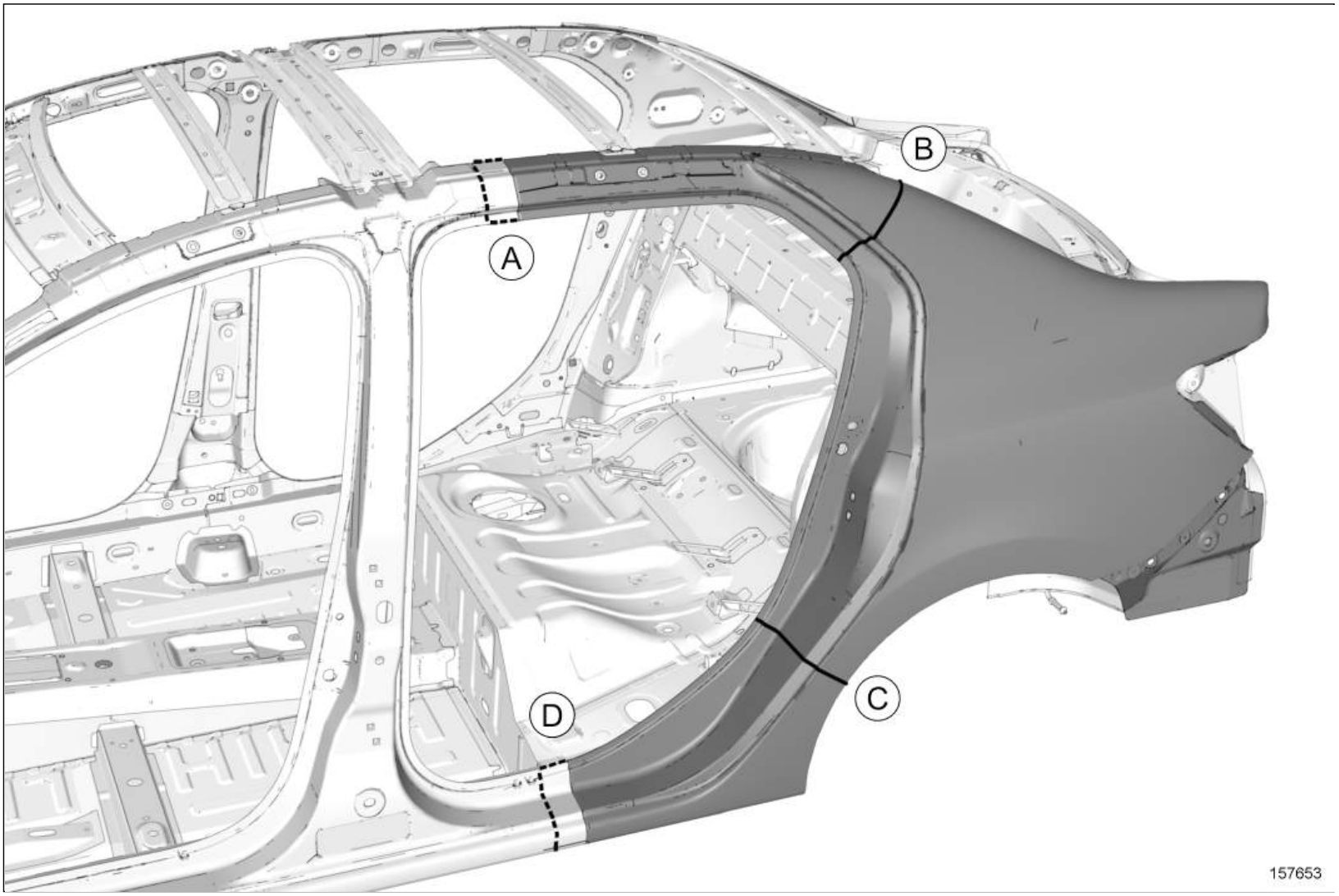


No.	Description	Thickness (mm)
(1)	Rear wing panel	0.65
(2)	Rear door striker panel reinforcement	1.2

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement A-D,
- partial replacement B-D,
- partial replacement B-C.



CAUTION
If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

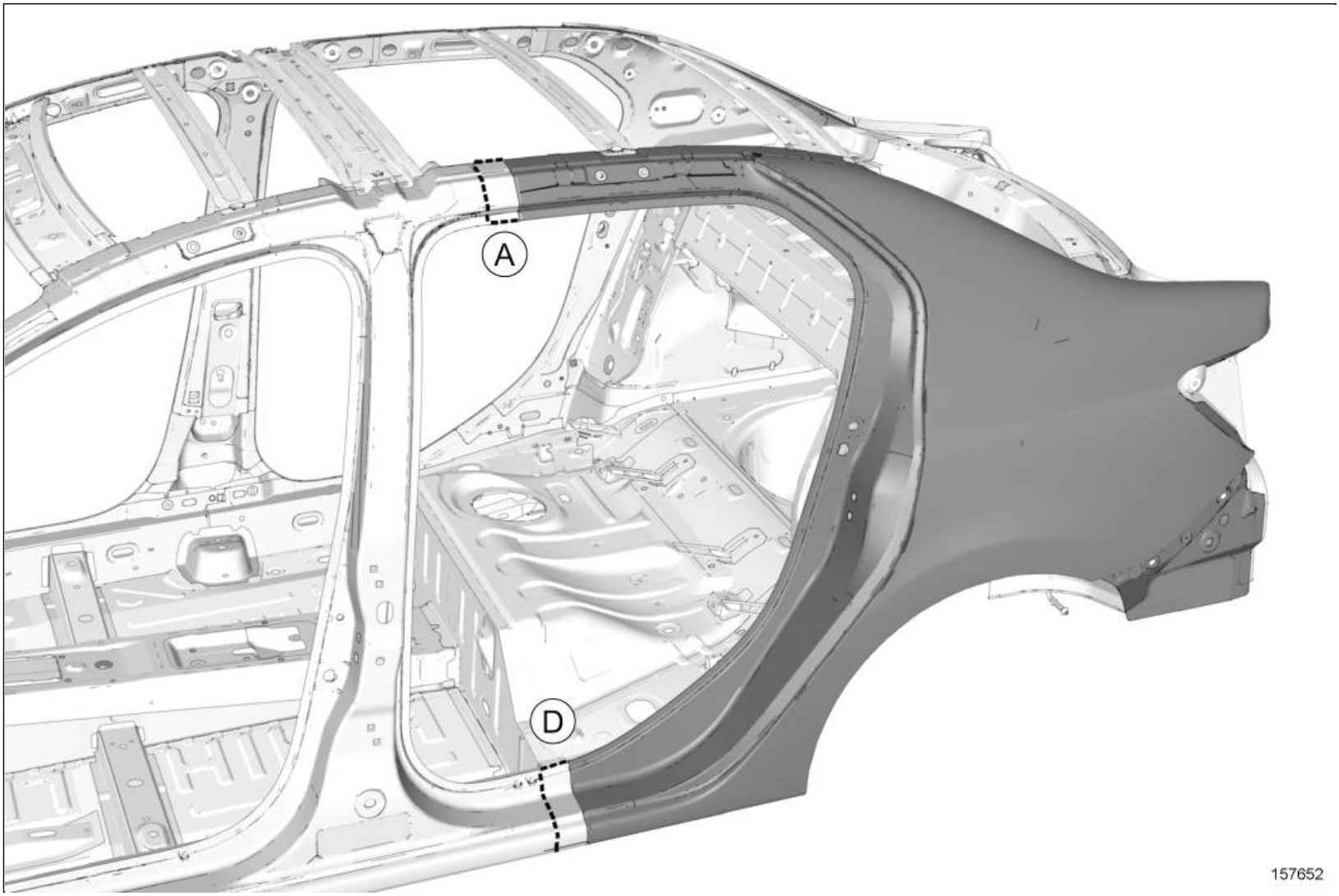
CAUTION
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT A-D

1)PART IN POSITION

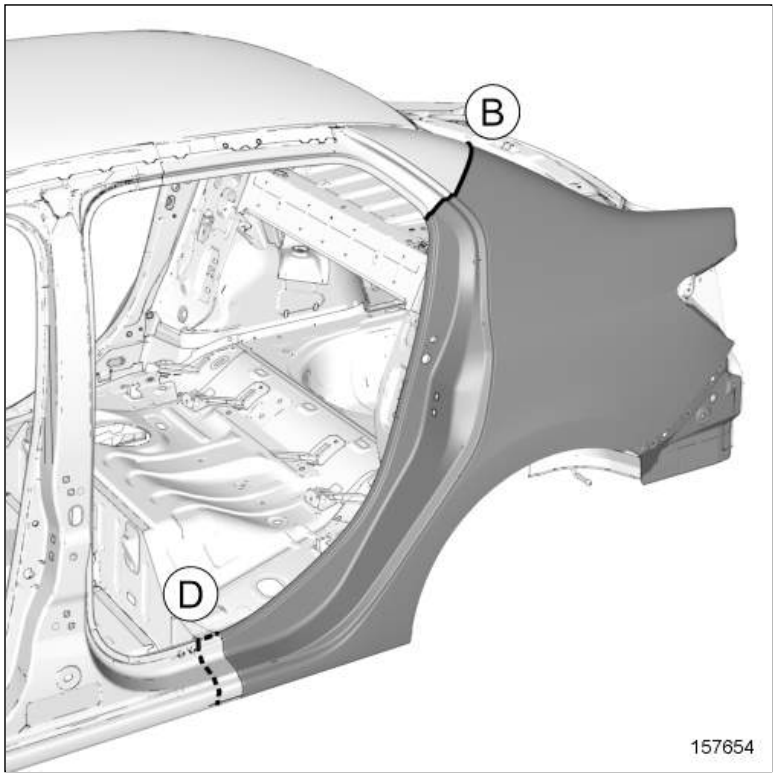


2)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURES TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

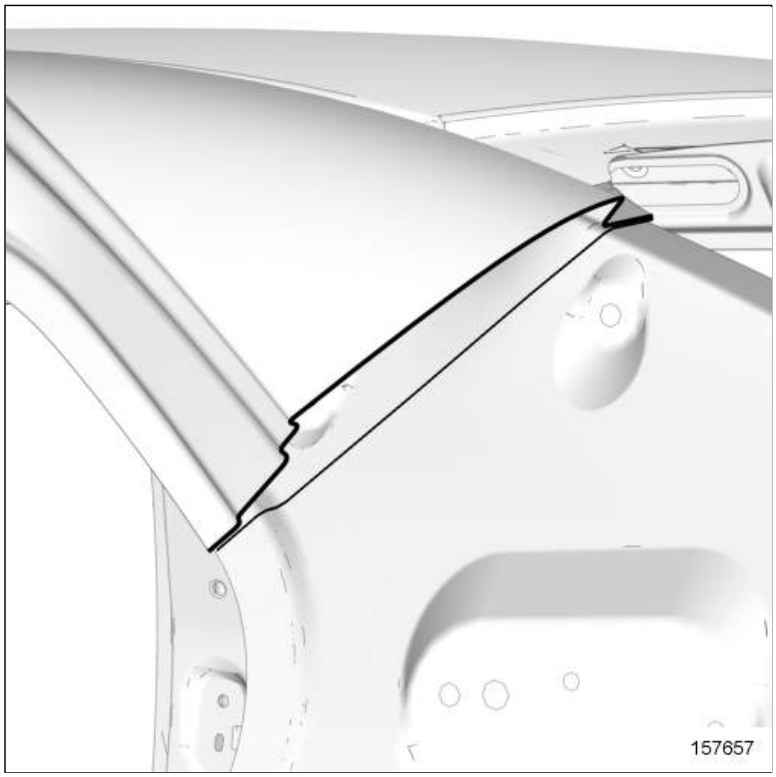
Remove the roof Roof: Replacement .

2- PARTIAL REPLACEMENT B-D

1)PART IN POSITION

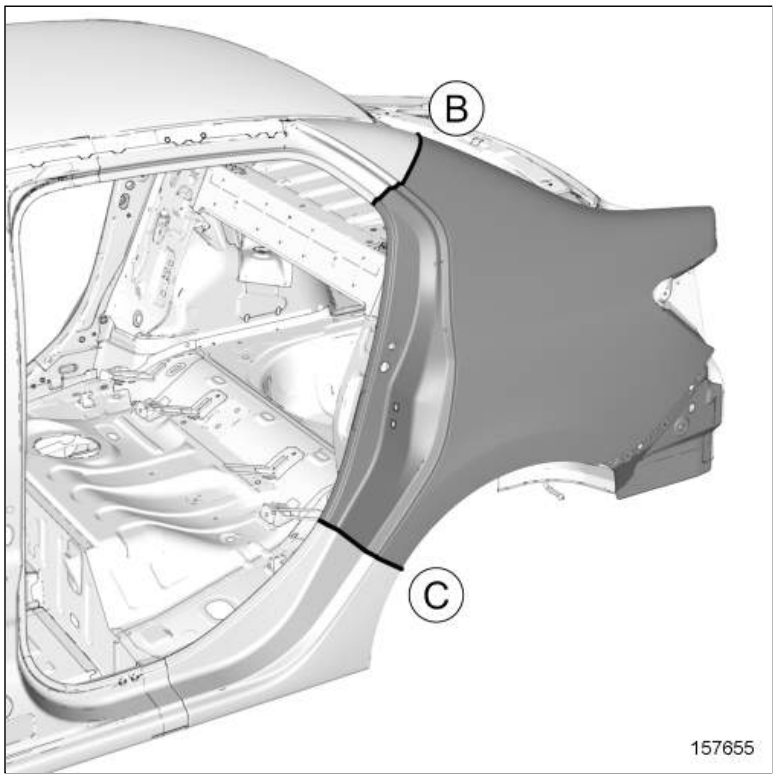


DETAILED VIEW B

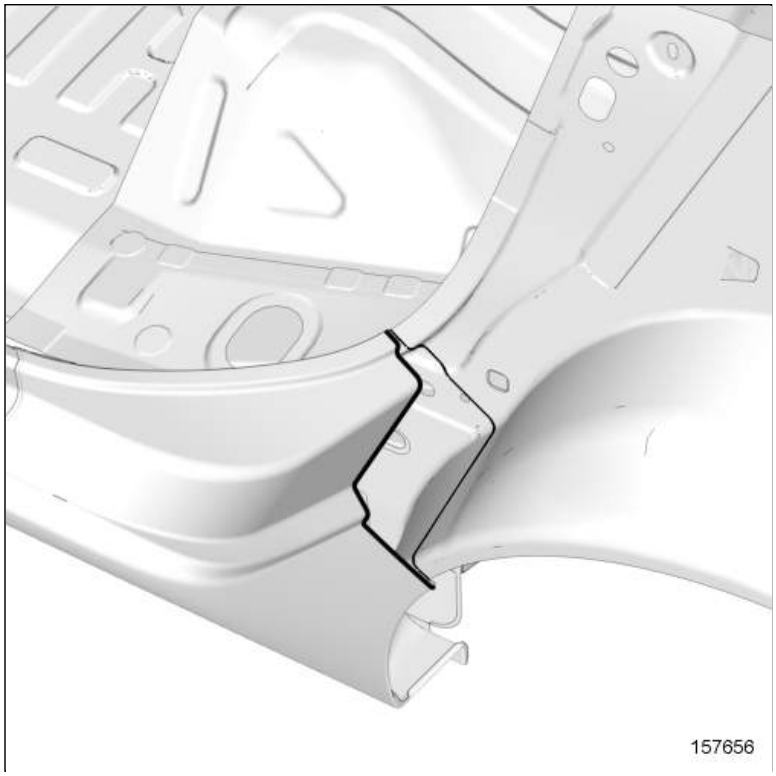


3- PARTIAL REPLACEMENT B-C

1)PART IN POSITION



DETAILED VIEW C



RECIRCULATION CONTROL CABLE: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the dashboardDashboard assembly: Exploded view .
- Turn the air recirculation switch to the air recirculation position.

2. REMOVAL OPERATION

- From control panel, remove(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :
  - the sheath stop clip,
  - the sheath stop by moving it from its housing.
- Extract the recirculation control cable from the control panel.
- Unclip the cable sleeve stop from the distribution unit(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .
- Extract the end of the air recirculation control cable.
- Remove the recirculation cable(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REFITTING

- Proceed in the reverse order to removal.
- Check that the air recirculation flap is in the recirculation position.
- Check that the recirculation control can move along its whole stroke.

REFRIGERANT CIRCUIT: CHECK

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 62A, Air conditioning, Air conditioning: Precautions for the repair) ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

Note:

After any work on air conditioning circuit leaks on the Laguna II, Vel Satis and Espace IV, check that filling fault DF033 Refrigerant is not present, using the Diagnostic tool. If it is present, clear it. The compressor cannot operate until the fault is cleared.

- There are several types of detector:
  - electronic detectors,
  - trace detectors.

Note:

To carry out an after repair check, use the procedure for the electronic detector (1). To carry out a more thorough check for leaks, use a trace detector (2).

Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

1. REFRIGERANT CIRCUIT SEALING CHECKING OPERATION

1- ELECTRONIC DETECTORS

CAUTION

Consult the device's operating manual to avoid incorrect use.

- Switch on the electronic detector.
- Start the engine.
- Let the air conditioning system run for 15 minutes.
- Switch off the engine.
- Check the sealing of the refrigerant circuit using the electronic trace detector (follow the trace of the circuit as closely as possible, to limit variations due to other gases).

Note:

If replacing a defective part (see 62A, Air conditioning).

REFRIGERANT CIRCUIT: CHECK

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair **(see 62A, Air conditioning, Air conditioning: Precautions for the repair)** .

Note:

After any work involving leaks on the air conditioning circuit on the Laguna II, Vel Satis and Espace IV, make sure there are no " Refrigerant DF033" fill faults using the Diagnostic tool . If one appears, clear it. The compressor cannot operate until the fault is cleared.

There are several types of detector:

- electronic detectors,
- trace detectors.

Note:

For a check after repair use the electronic detector method (1). If you need to do a more precise leak test, use the tracer method (2).

Check that the air conditioning system is operating correctly **(see 62A, Air conditioning, Air conditioning: Check)** .

1. REFRIGERANT CIRCUIT SEALING CHECKING OPERATION

1- ELECTRONIC DETECTORS:

CAUTION
Consult the device's operating manual to avoid incorrect use.

- Switch on the electronic detector.
- Start the engine.
- Let the air conditioning system run for 15 minutes.
- Switch off the engine.
- Check the sealing of the refrigerant circuit using the electronic trace detector (follow the trace of the circuit as closely as possible, to limit variations due to other gases).

Note:

When replacing a defective part (see MR Vehicle mechanical systems, 62A, Air conditioning).

2- TRACE DETECTORS

CAUTION
Consult the device's operating manual to avoid incorrect use.

CAUTION
To avoid damaging the cold loop components (corrosions, etc.), do not use dye if the traces reveal that some product has already been injected.

- Check for dye on the cold loop components with the ultraviolet light.
- Inject the dye.
- Start the engine.
- Let the air conditioning system run for 15 minutes.

- Switch off the engine.

- Check the refrigerant circuit sealing by scanning the circuit with the ultraviolet light.

Note:

When replacing a defective part (see MR Vehicle mechanical systems, 62A, Air conditioning).

- Affix a label (supplied with the dye capsule), to indicate that dye has been used (as close as possible to the filler valves).

REFRIGERANT CIRCUIT: DRAINING - FILLING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
refrigerant charging station

WARNING

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair **(see 62A, Air conditioning, Air conditioning: Precautions for the repair)** .

1. FLUID

- In the past, R12refrigerant was used (see R12/R134A conversion) (Technical Note 2494A, 62A, Air conditioning) and (see R12/R134A conversion) (Technical Note 2422A, 62A, Air conditioning). This has been withdrawn from use and replaced by R134arefrigerant, which is less hazardous.

- A summary table gives the quantities of refrigerant in the system according to the vehicle and engine types **(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair)**

2. OIL

- The cold loop contains a special oil to lubricate the compressor.

- It is essential to fill up with the same quantity of oil as was drained.

- When replacing a component, top up the oil with the volume required for the component replaced **(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair)** (Technical Note 6001A, 62A, Air conditioning).

- When replacing a compressor and one or more of the various air conditioning circuit components, the quantity of oil in the compressor is sufficient to lubricate the entire circuit. Do not add oil.

CAUTION

Lubricants are not mutually compatible: always observe the type and quantity of oil recommended for each compressor even when topping up as this could damage the cold loop components.

Always close the oil cans again after use to keep moisture out and never use oil contained in a can that has been open for a long time (viscous appearance).

3. RECOVERING REFRIGERANT FLUID

CAUTION

Consult the device's operating manual to avoid incorrect use.

Note:

- If the air conditioning circuit is fitted with a single filler valve, some filling equipment only requires the use of the high pressure pipe (refer to the filling station instructions).
- Depending on the situation, run the system for a few minutes before recovering the coolant to improve drainage.

Note:

These procedures must be followed in order to avoid:

- gas escaping when the circuit is opened,
- environmental damage through the release of gas into the atmosphere when the circuit is opened or when a vacuum is created.

When draining or checking the refrigerant fill load, three scenarios are to be taken into account:

- the engine and air conditioning are working (scenario A),
- the engine is working but not the air conditioning (scenario B),
- neither the engine nor the air conditioning are working (scenario C).

Scenario A:

- run the air conditioning until the cooling fan has been triggered twice,
- Switch off the engine,
- drain for the first time (note down the original value),
- wait 15 minutes,

- check that the relative pressure is no more than 0 bar,
- start the drain cycles again if the relative pressure is above 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill + 35 gor - 100 g.

Scenario B:

- run the engine until the cooling fan is triggered twice,
- Switch off the engine,
- drain for the first time (note down the value),
- wait 15 minutes,
- run the engine until the cooling fan is triggered twice,
- Switch off the engine,
- drain for the second time (note down the value),
- start the drain cycles again if the relative pressure is above 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill + 35 gor - 100 g.

Scenario C:

- drain for the first time (note down the value),
- wait 2 hours,
- start the drain cycles again if the relative pressure is above 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill + 35 gor - 100 g.

4. CREATION OF A VACUUM

A good vacuum must be created before filling, otherwise the AC will not operate correctly.

There are two scenarios to consider:

- vacuum created immediately after discharge (scenario A),
- the vacuum will be created after a delay of several hours or days (scenario B).

Scenario A:

- creation of a vacuum takes 20 minutes.

Scenario B:

- creation of a vacuum takes 45 minutesto eliminate any trace of moisture.

Test the seal once the vacuum has been created (some stations do this automatically).

5. FILLING

CAUTION

Consult the device's operating manual to avoid incorrect use.

Note:

After any work involving leaks on the air conditioning circuit on the Laguna II, Vel Satis and Espace IV, make sure there are no " Refrigerant DF033" fill faults using the Diagnostic tool . If one appears, clear it. The compressor cannot operate until the fault is cleared.

Top up the oil according to the type and quantity of oil recommended and for the type of work carried out (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) and Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Carry out the fill-up (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .
- Empty the pipes on the refrigerant charging station.

Note:

To carry out the check correctly, hold the tip of the sensing tool as close as possible to the connecting pipe.

- Check there are no leaks using the electronic detector (see 62A, Air conditioning, Refrigerant circuit: Check) (see 62A, Air conditioning, Refrigerant circuit: Check) .
- Check that the system is working correctly (see 62A, Air conditioning, Air conditioning: Check) (see 62A, Air conditioning, Air conditioning: Check) .

REFRIGERANT CIRCUIT: DRAINING - FILLING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
refrigerant charging station

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

WARNING

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair **(see 62A, Air conditioning, Air conditioning: Precautions for the repair)** .

CAUTION

Consult the device's operating manual to avoid incorrect use.

CAUTION

To avoid damaging the cold loop components (corrosions, etc.), do not use dye if the traces reveal that some product has already been injected.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine type **(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair)** .

1. RECOVERING REFRIGERANT FLUID

Note:

- If the air conditioning circuit is fitted with a single filler valve, some filling equipment only requires the use of the high pressure pipe (refer to the filling station instructions).
- Depending on the situation, run the system for a few minutes before recovering the coolant to improve drainage.

Note:

It is essential to follow these procedures to prevent:

- gas escaping when the circuit is opened,

- pollution of the environment through the release of gas into the atmosphere when the circuit is opened or when a vacuum is created.

When draining or checking the refrigerant fill load, three scenarios are to be taken into account:

- the engine is running and the air conditioning is in operation (A),
- the engine is running but the air conditioning is not in operation (B),
- the engine is not running nor is the air conditioning in operation (C).

Scenario A:

- Operate the air conditioning until the cooling fan assembly is triggered twice,
- Switch off the engine,
- drain for the first time (note down the original value),
- wait 15 minutes,
- check that the relative pressure is no more than 0 bar,
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35g or -100g.

Scenario B:

- run the engine until the cooling fan is triggered twice,
- Switch off the engine,
- drain for the first time (note down the value),

- wait 15 minutes,
- run the engine until the cooling fan is triggered twice,
- Switch off the engine,
- drain for the second time (note down the value),
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35gor -100g.

Scenario C:

- drain for the first time (note down the value),
- wait 2 hours,
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35gor -100g.

2. CREATING A VACUUM

It is essential to carry out vacuum extraction correctly before loading, otherwise the air conditioning will not work properly.

There are two scenarios to consider:

- vacuum created immediately after discharge (scenario A),
- vacuum created after an interval of several hours or days (scenario B).

Scenario A:

- creation of a vacuum takes 20 minutes.

Scenario B:

- creation of a vacuum takes 45 minutesto eliminate any trace of moisture.

Test the seal once the vacuum has been created (some stations do this automatically).

3. FILLING

Fill up the refrigerant circuit using the refrigerant charging station.

Top up the oil with the recommended type and volume of oil and refrigerant, depending on the work carried out **(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair)** .

Check there are no leaks using the electronic detector**(see 62A, Air conditioning, Refrigerant circuit: Check)** **(see 62A, Air conditioning, Refrigerant circuit: Check)** .

CAUTION

After injecting dye into the refrigerant, be sure to indicate this on a label (supplied with the dye capsule), and the date of the operation.

Position the label so it is visible near to the cold loop filler valve.

- Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) (see 62A,Air conditioning, Air conditioning: Check) .

REFRIGERANT CIRCUIT PIPE SEAL: CLEANING

Note, one or more warnings are present in this procedure

Equipment required
compressed air nozzle

WARNING

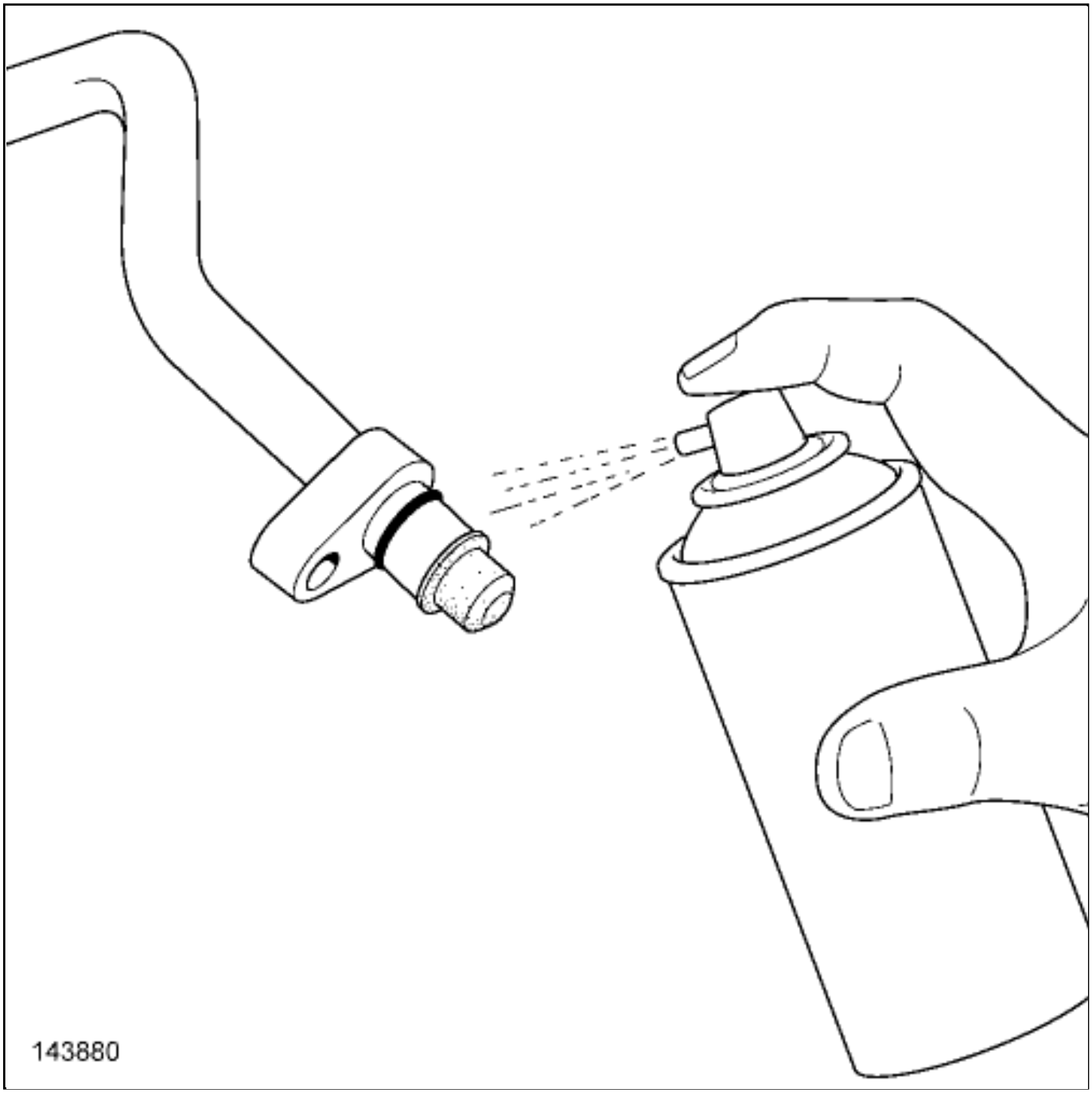
Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

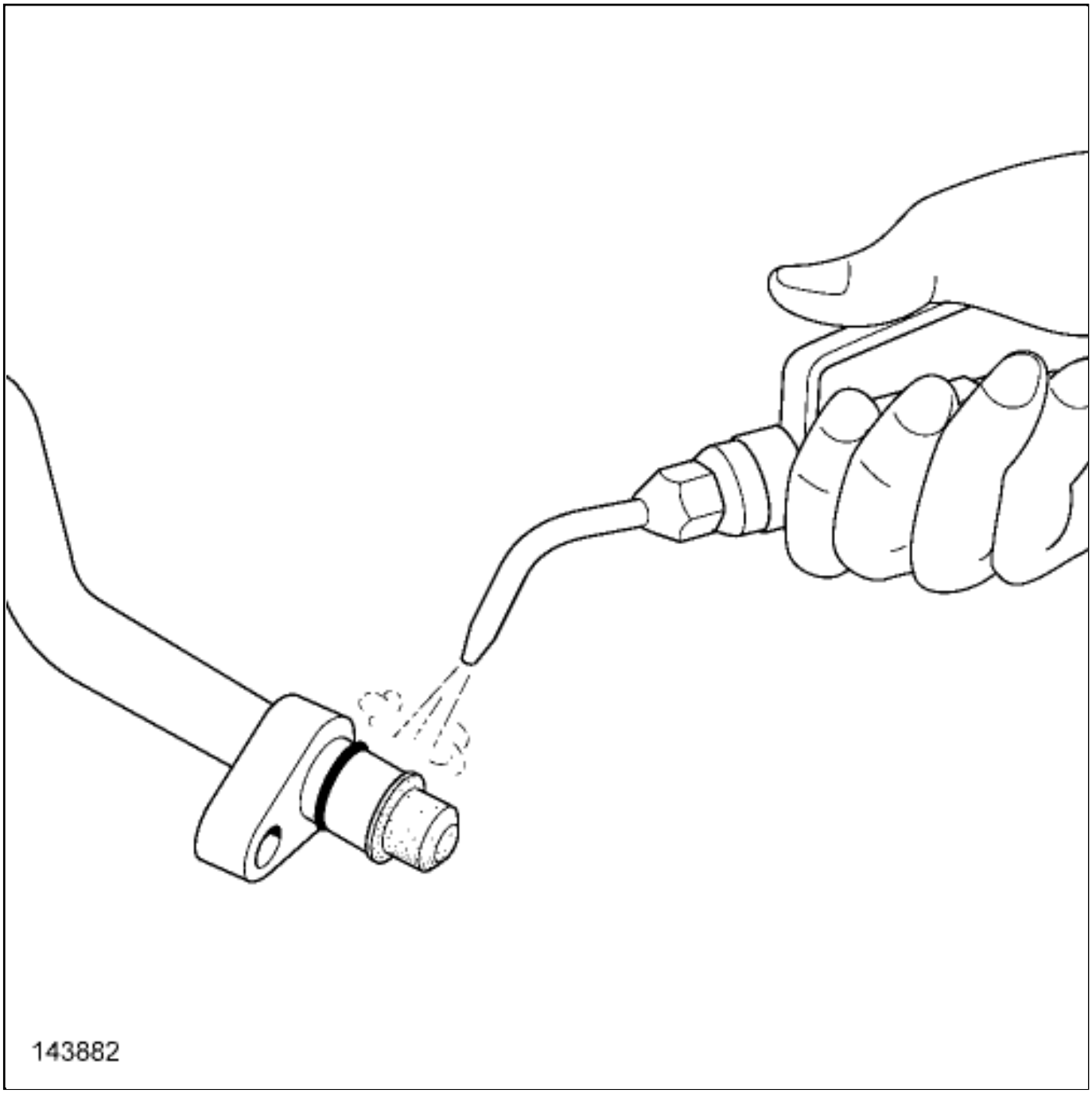
- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - **(see 62A, Air conditioning, Air conditioning: Precautions for the repair)**
  - **Vehicle: Precautions for the repair**

CLEANING

- Insert the blanking plugs.



- Clean the surface and the seals of the connecting pipes using ENGINE CLEANER Vehicle: Parts and consumables for the repair .



- Blow using a compressed air nozzleon the surface and the seals of the connecting pipes.

- Lubricate the surface and the seals of the connecting pipes with air conditioning oil(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

- Remove the blanking plugs.

REFRIGERANT PIPE SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

Equipment required
refrigerant charging station

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 62A, Air conditioning, Air conditioning: Precautions for the repair)
  - Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

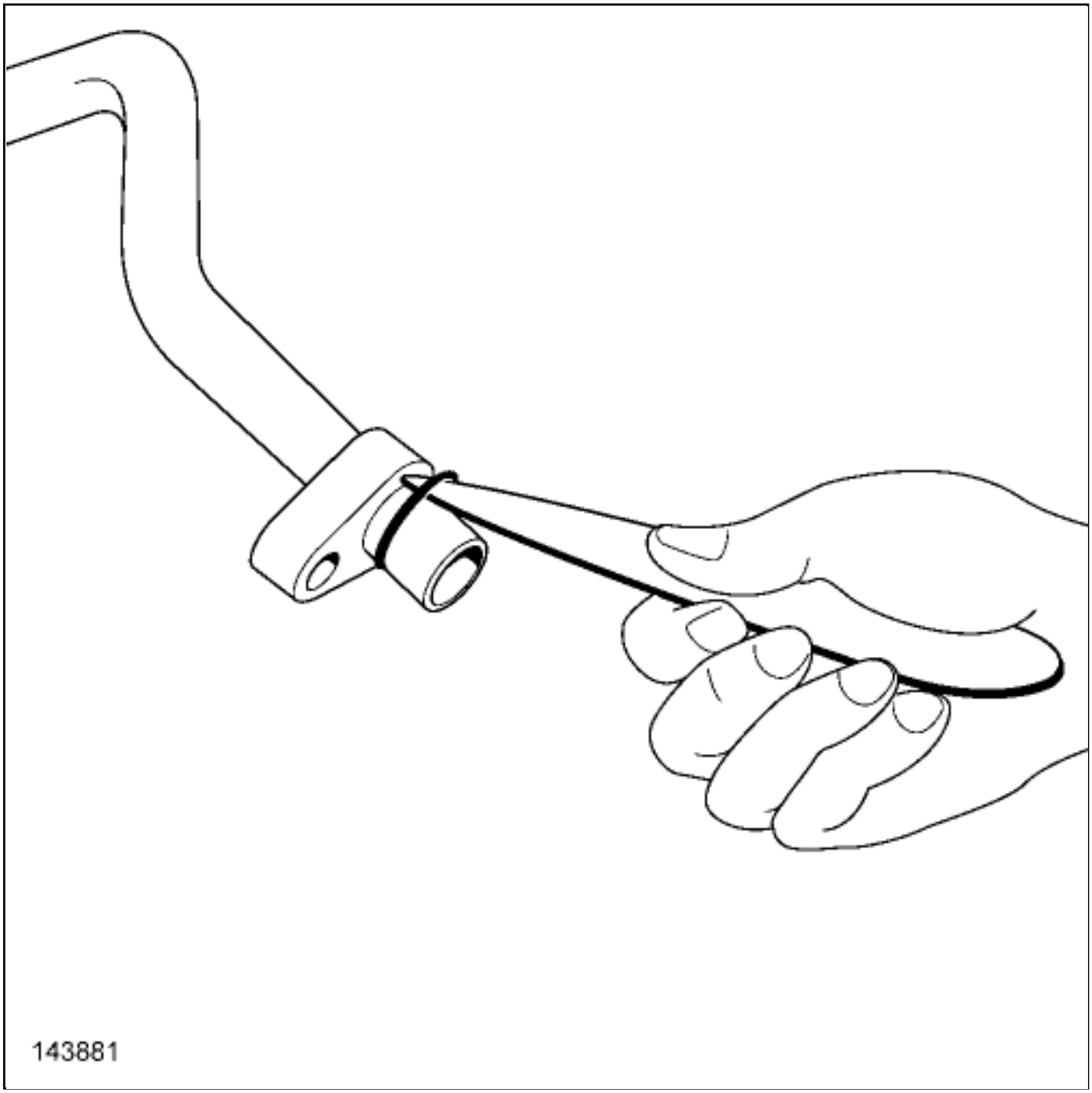
- Drain the refrigerant circuit using the refrigerant charging station(see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) (see 62A,Air conditioning, Refrigerant circuit: Draining - Filling) .

- Disconnect the batteryBattery: Removal - Refitting .

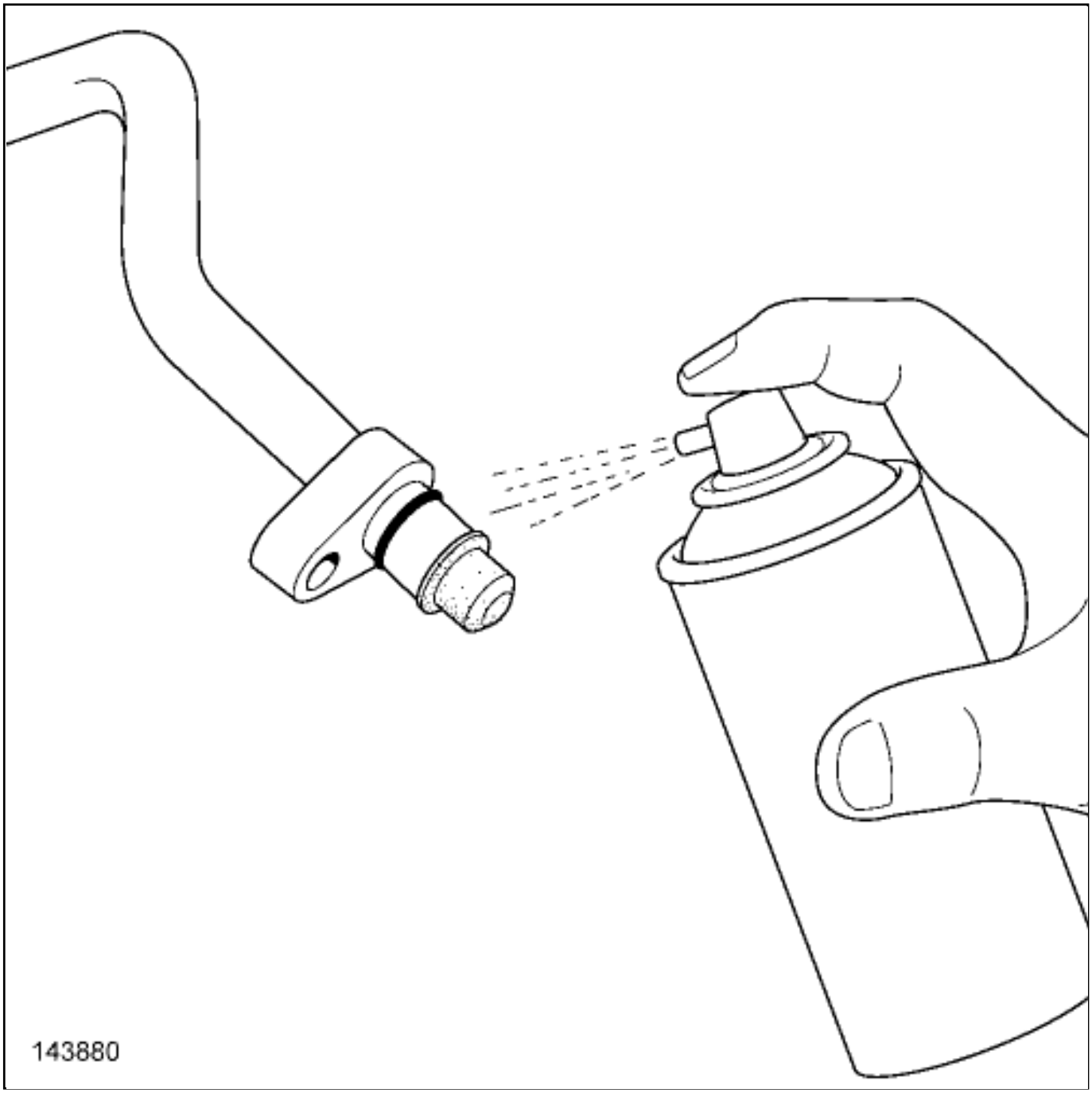
- Remove the connecting pipe concerned:
  - Condenser - evaporator connecting pipe: Removal - Refitting

- Condenser - expansion valve connecting pipe: Removal - Refitting
- Rear condenser - front condenser connecting pipe: Removal - Refitting
- Evaporator - dehydrator reservoir connecting pipe: Removal - Refitting
- Compressor - rear condenser connecting pipe: Removal - Refitting
- Condenser - evaporator connecting pipe: Removal - Refitting
- Compressor - dehydrator reservoir connecting pipe: Removal - Refitting
- Dehydrator reservoir - rear expansion valve connecting pipe: Removal - Refitting
- (see **Main expansion valve - additional expansion valve pipe: Removal - Refitting**)
- Expansion valve - intermediate pipe connecting pipe at the expansion valve outlet: Removal - Refitting
- Dehydrator reservoir - expansion valve connecting pipe: Removal - Refitting
- Daqui em diante Condenser - dehydrator reservoir connecting pipe: Removal - Refitting
- Expansion valve - compressor connecting pipe: Removal - Refitting
- Expansion valve - rear expansion valve connecting pipe: Removal - Refitting
- Rear expansion valve - compressor connecting pipe: Removal - Refitting
- Compressor - condenser connecting pipe: Removal - Refitting
- Compressor - intermediate pipe connecting pipe: Removal - Refitting

2. OPERATION FOR REMOVAL OF PART CONCERNED



- Remove the seal from the connecting pipe using the toolSet of trim removal levers.(Car. 1363) .
- Fit blanking plugs.



- Clean the surface of the pipe(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

- Refit the seal on the connecting pipe.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine types **(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair)** .

Connect the battery **Battery: Removal - Refitting** .

Perform the following operations:

- refill the refrigerant circuit using the refrigerant charging station **(see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) (see 62A,Air conditioning, Refrigerant circuit: Draining - Filling)** ,
- check for leaks **(see 62A, Air conditioning, Refrigerant circuit: Check) (see 62A,Air conditioning, Refrigerant circuit: Check)** .

Check that the air conditioning system is operating correctly **(see 62A, Air conditioning, Air conditioning: Check) (see 62A,Air conditioning, Air conditioning: Check)** .

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REFRIGERANT PRESSURE SENSOR : REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
refrigerant charging station

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair(see 62A, Air conditioning, Air conditioning: Precautions for the repair) .

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).
- Drain the refrigerant circuit using the refrigerant charging station(see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .
- Remove the front bumperFront bumper assembly: Exploded view (55A, Exterior protection).

2. REMOVAL OPERATION

- Remove the pressure sensor(see 62A, Air conditioning, Passenger compartment cooling assembly: Exploded

view) .

REFITTING

1. REFITTING PREPARATION OPERATION

- Clean the seals of the refrigerant circuit pipes(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

REMOVING THE VEHICLE PROTECTION: DESCRIPTION

Note, one or more warnings are present in this procedure

1. PROTECTIVE GEAR

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

2. EQUIPMENT, PRODUCTS AND TOOLS NECESSARY FOR REMOVING THE PROTECTION FROM A VEHICLE PROTECTED BY COPOLYMER

Description	Part numbers
Step ladder for roof (very high vehicle)	77 11 221 082
Protection remover N6	77 11 230 195
Cleaning glove or sponge	77 11 419 556
Pressure spray	77 11 221 515
Drying accelerator AS29	77 11 228 949
High pressure cleaner	

3. PROCEDURE FOR REMOVING COPOLYMER PROTECTION

Note:

Carry out the operation for removing the vehicle protection in a well-ventilated washing area.

Note:

Before using the products, consult the manufacturer's technical sheet.

Dilute the vehicle protection remover N6by 15%with water.

Spray the product on the whole surface of the vehicle.

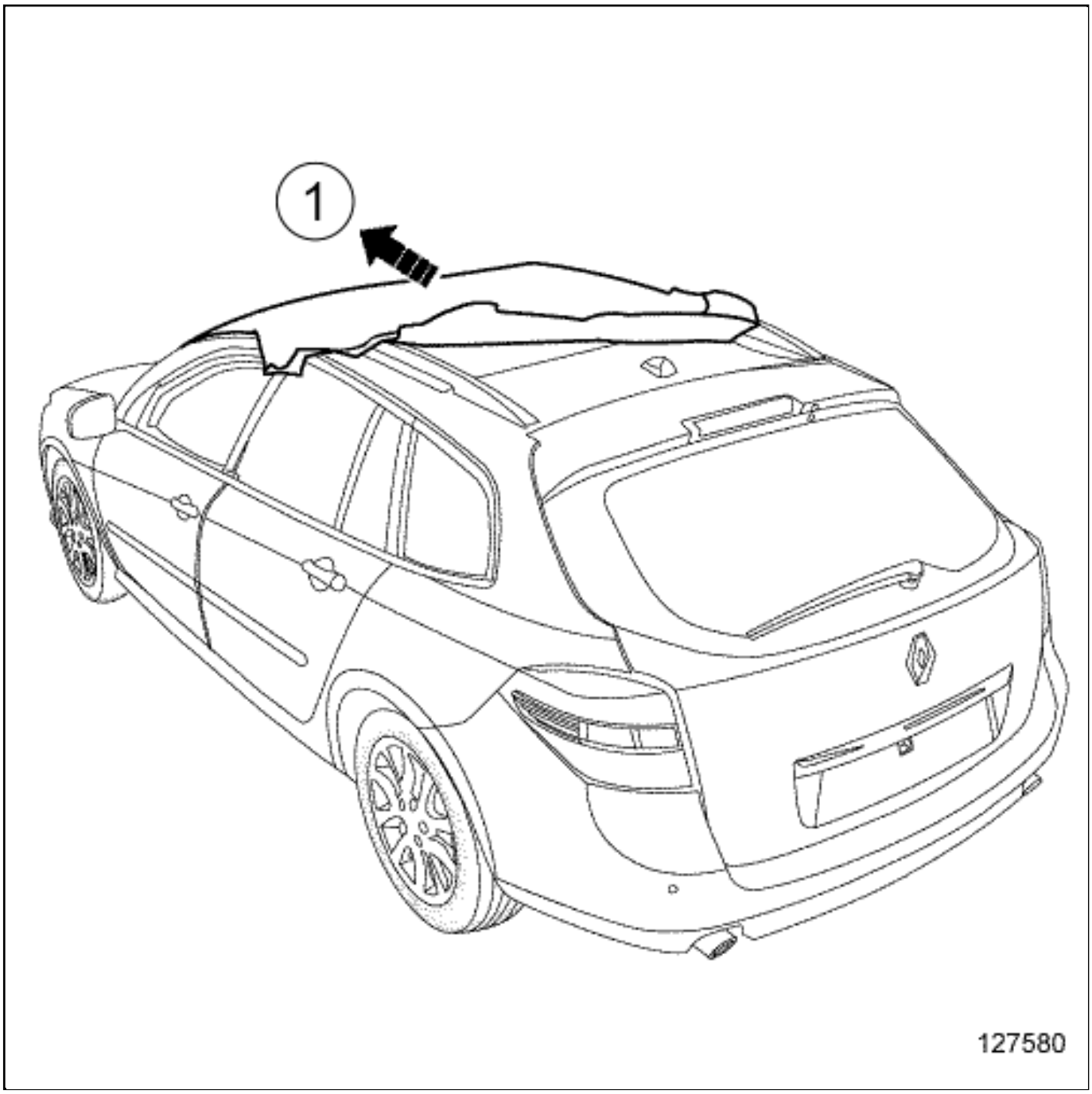
Leave the product to work (15 minutes maximum) without letting it dry.

Spray the product on the whole surface of the vehicle a second time and then wash with a sponge.

Rinse the vehicle well with clean water.

Finish by a finishing rinse with the drying accelerator AS29.

4. PROCEDURE FOR REMOVING THE PROTECTIVE FILM



Spray the film beforehand if the temperature of the bodywork is greater than 40˚C.

Lift the protective film at(1) and roll it on itself.

Clean the dust residues with soapy water.

Expose the component to an infrared type heat source at 60˚C for 10 minutes if there are any traces under the film. Perform this operation in a paint workshop.

5. PROCEDURE FOR REMOVING THE PROTECTIVE FOAM

Detach the protective foam starting with one corner, and remove the adhesive tape and the foam.

Clean any traces of residual adhesive using a lint-free cloth soaked in heptane.

REPLACING A NON-REMOVABLE COMPONENT: DESCRIPTION

1. INTRODUCTION

All the procedures described in this document ensure the quality of repairs, including the mechanical functioning of joints which are different to the originals.

Time calculations for the repairs are based on the use of these tools and procedures.

1- REPLACEMENTS REQUIRING PARTIAL CUTTING

For safety reasons, it is not recommended to:

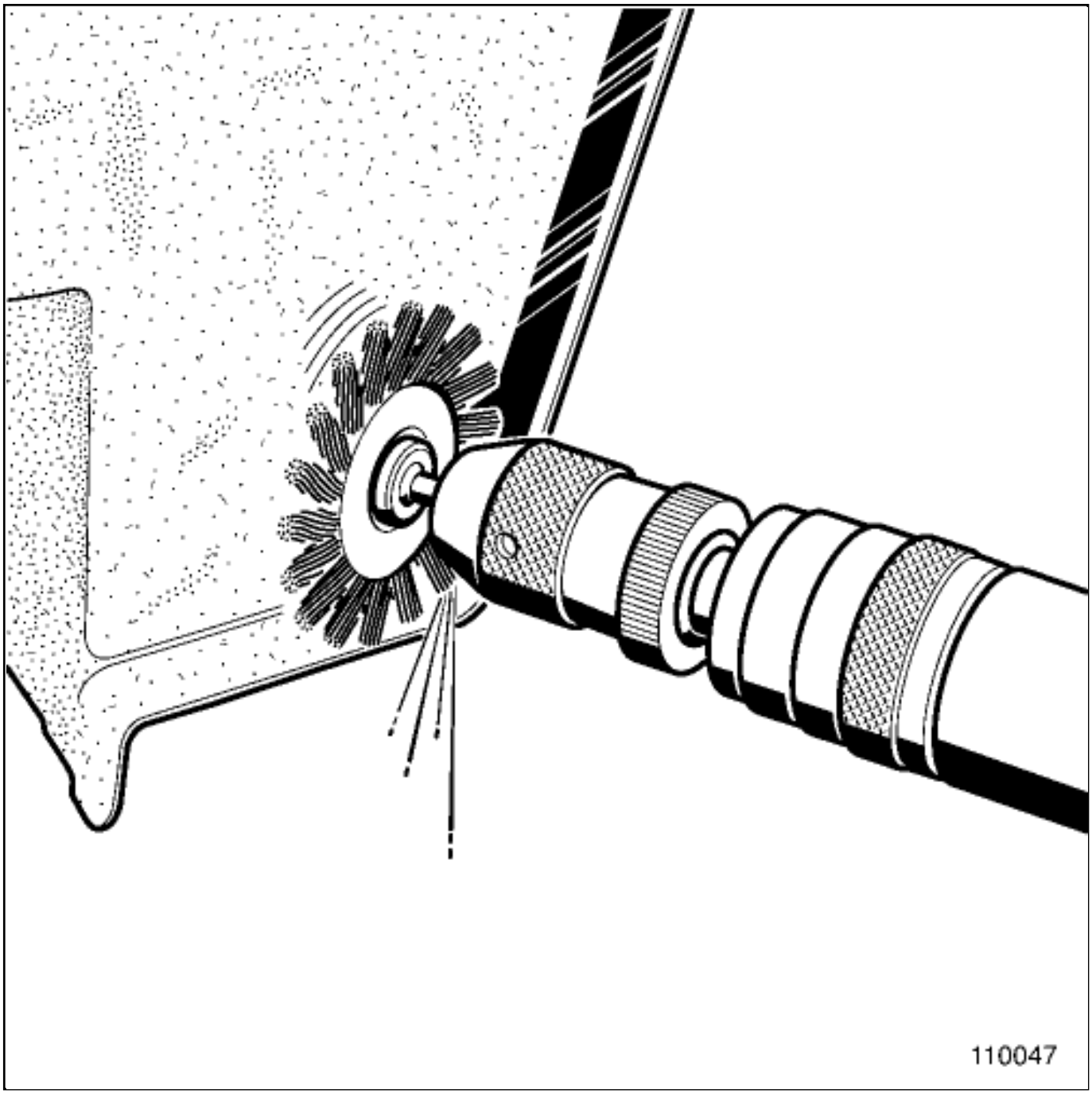
- cut and re-weld in close proximity to a reinforcement or a fatigued area (e.g.: engine and transmission assembly mounting, shock absorber mounting, seat belt mounting point),
- cut and re-weld edge to edge a structural component and its linings using the same line. Offset the cut lines by a few centimetres to distribute the weld stresses and the crumple zones,
- braze the side members, cross members or any other part of the structure.

Cutting positions indicated in the procedures which do not have any special features are given for information only. They may be adjusted according to deformities caused by impacts, unless there is a specific indication given in the vehicle's MR.

The operation times are calculated in relation to the position of these cuts and it is advisable to follow them. If the operator opts for a different cutting area, the time stated for the operation may vary.

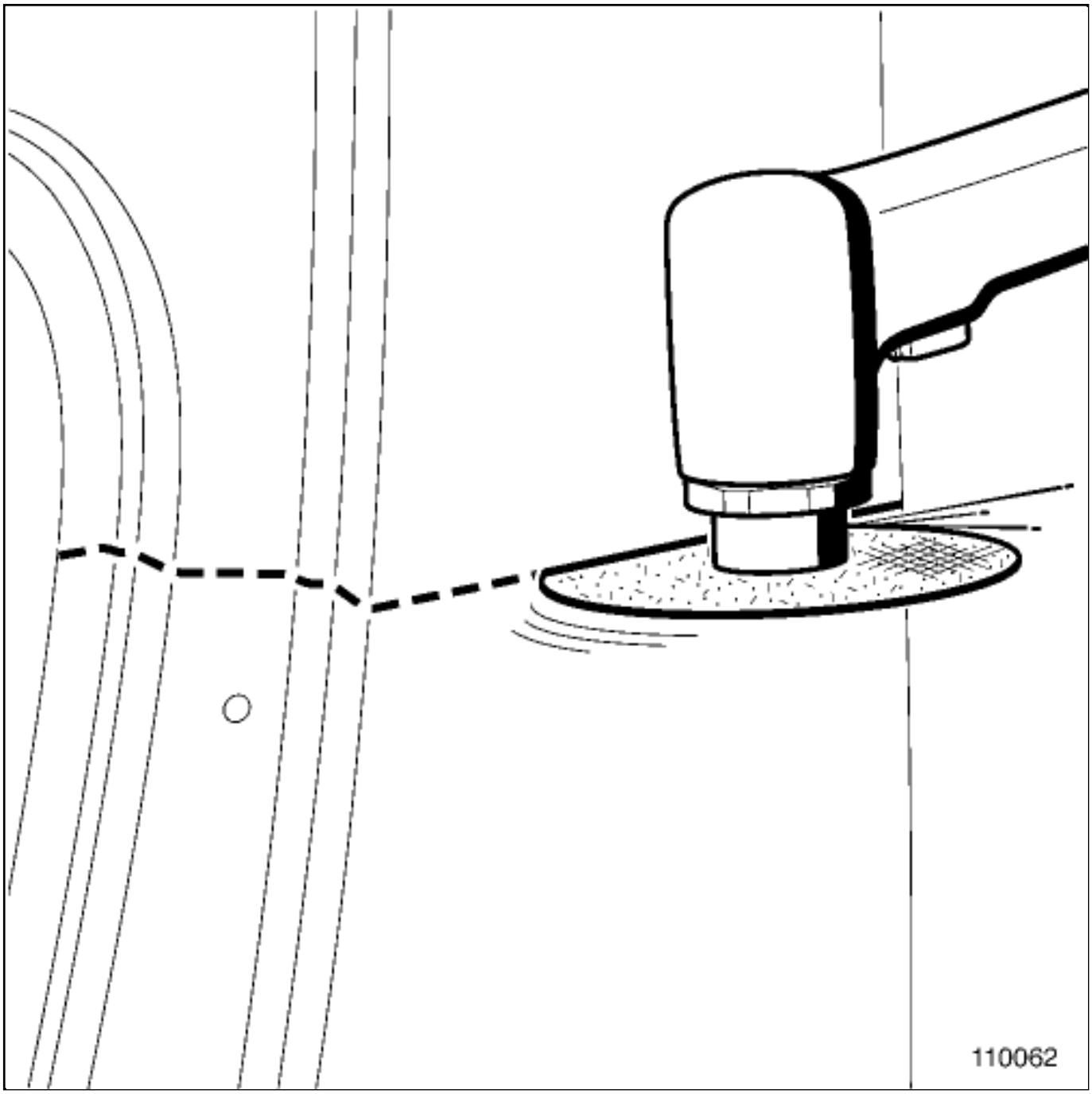
2. DISASSEMBLY

1- SCOURING



Clean the joint lines to reveal the spot welds, if covered by anti-grit mastic or paint sealing mastic(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use) .

2- CUTTING

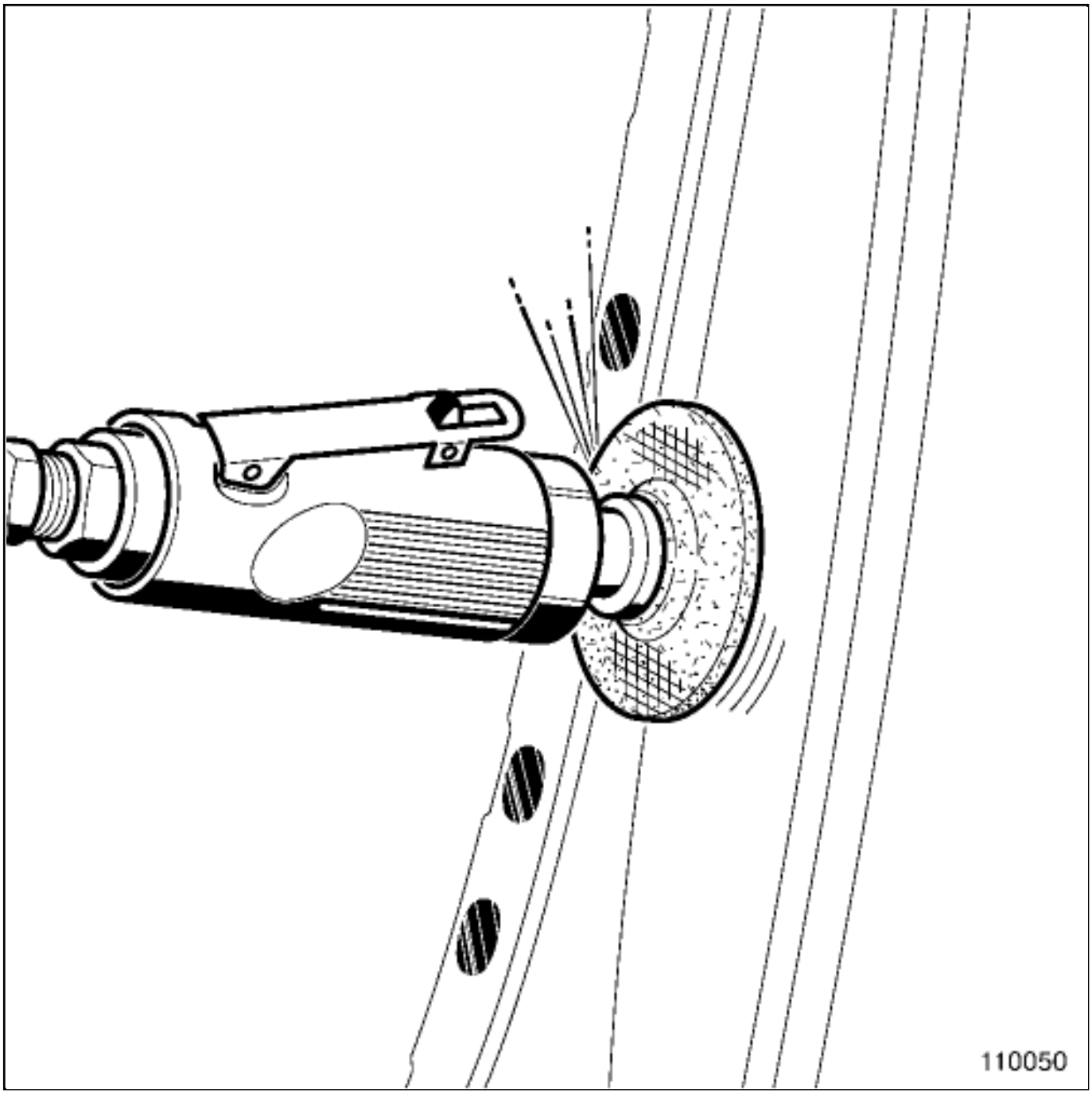


For partial replacements, the position of the cut lines on the damaged part is chosen with the following requirements in mind:

- obtain a non-deformed area with sufficient space to ensure coverage of 50 mm by the new part,
- avoid areas where there is a significant risk of deformation when butt welding,
- choose straight, shaped or ribbed parts,
- choose a place where the internal face is accessible for anti-corrosion protection of the hollow section,
- find an area with sufficient space to allow overlapping cuts.

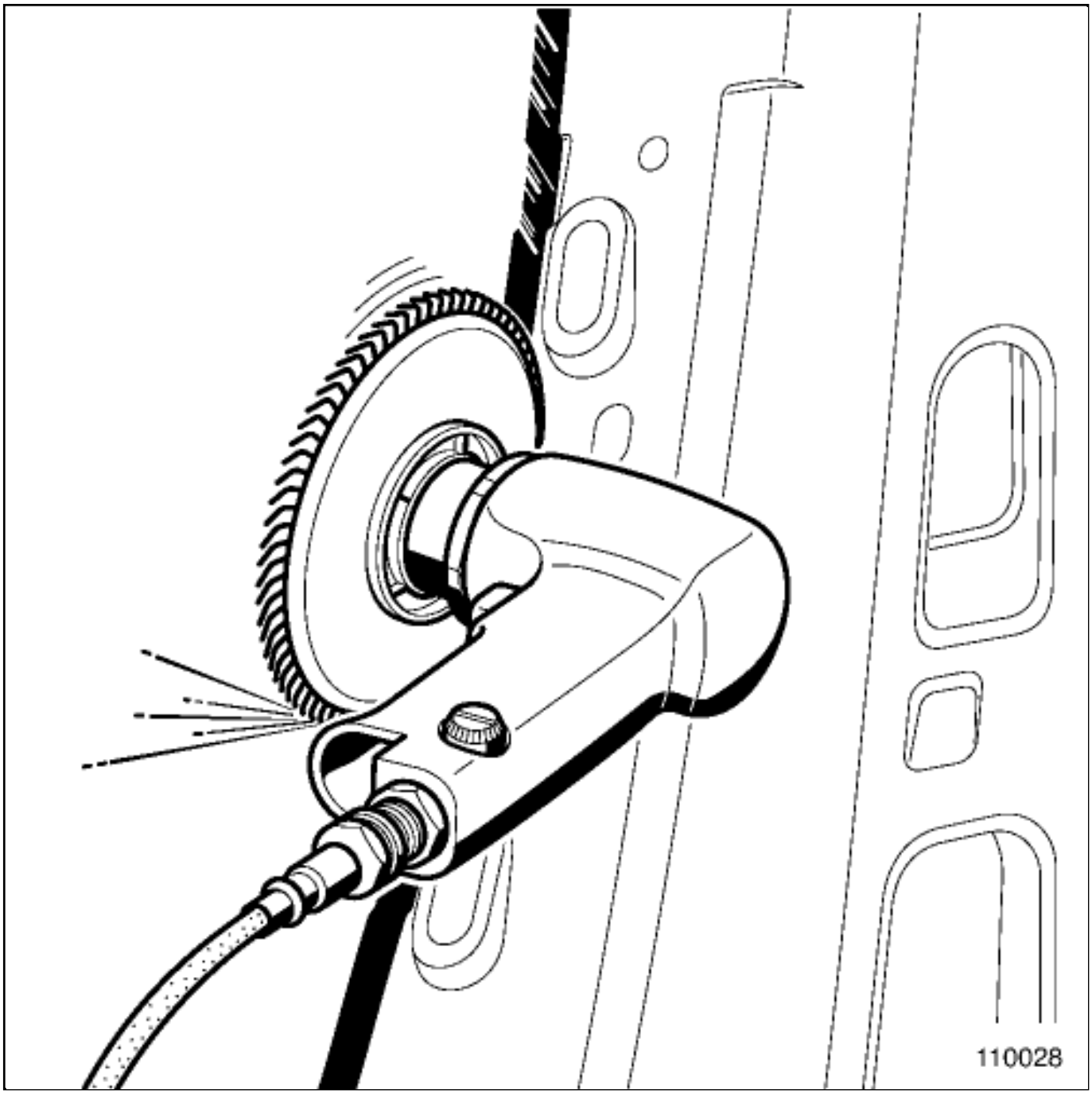
(see 05B, Equipment and Tools, Tools for cutting a structural component: Use) .

3- UNPICKING



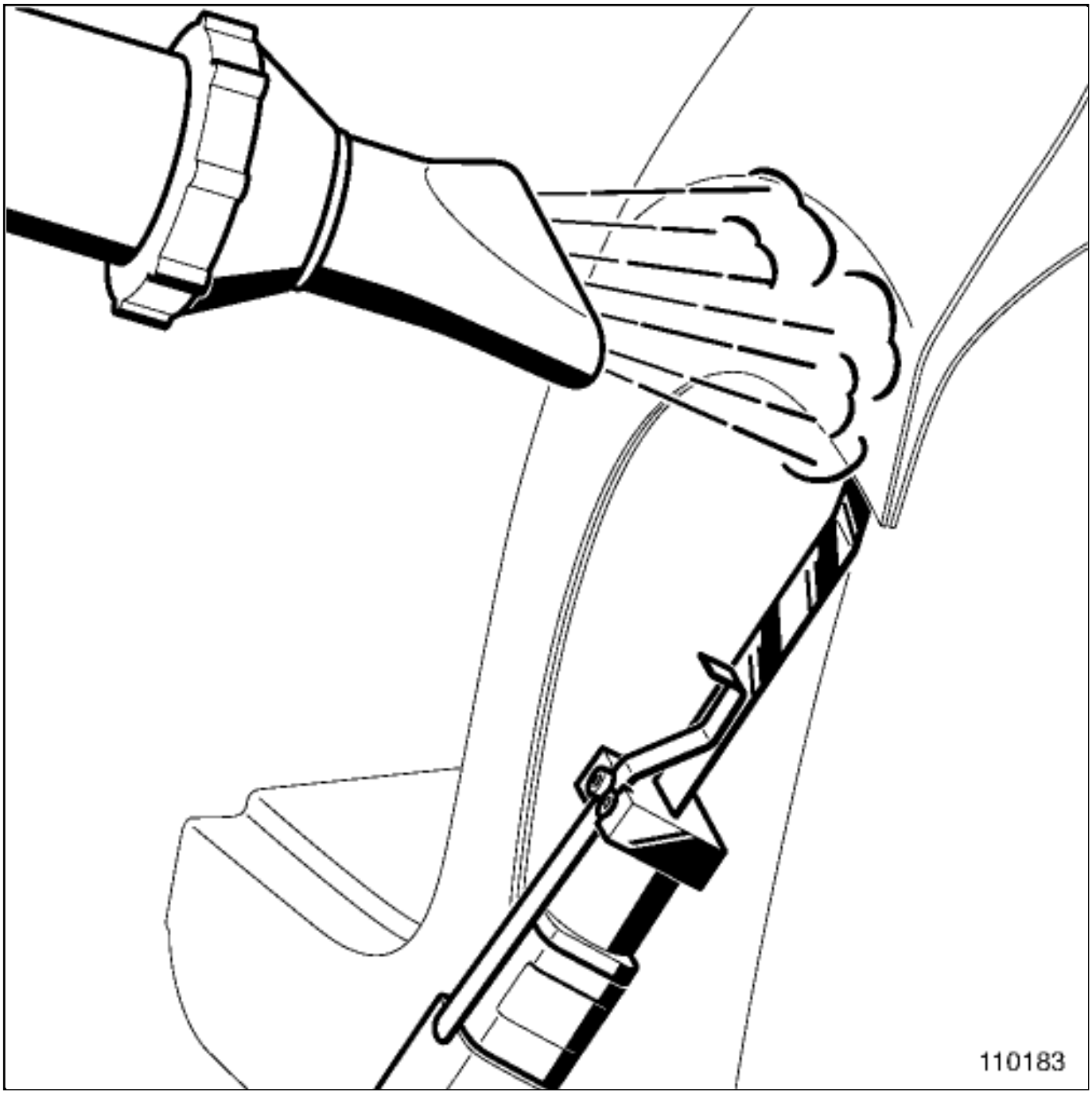
Unpick the spots using the most suitable tool according to the access, taking care to avoid damaging the retained support panel(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use) .

4- GRINDING

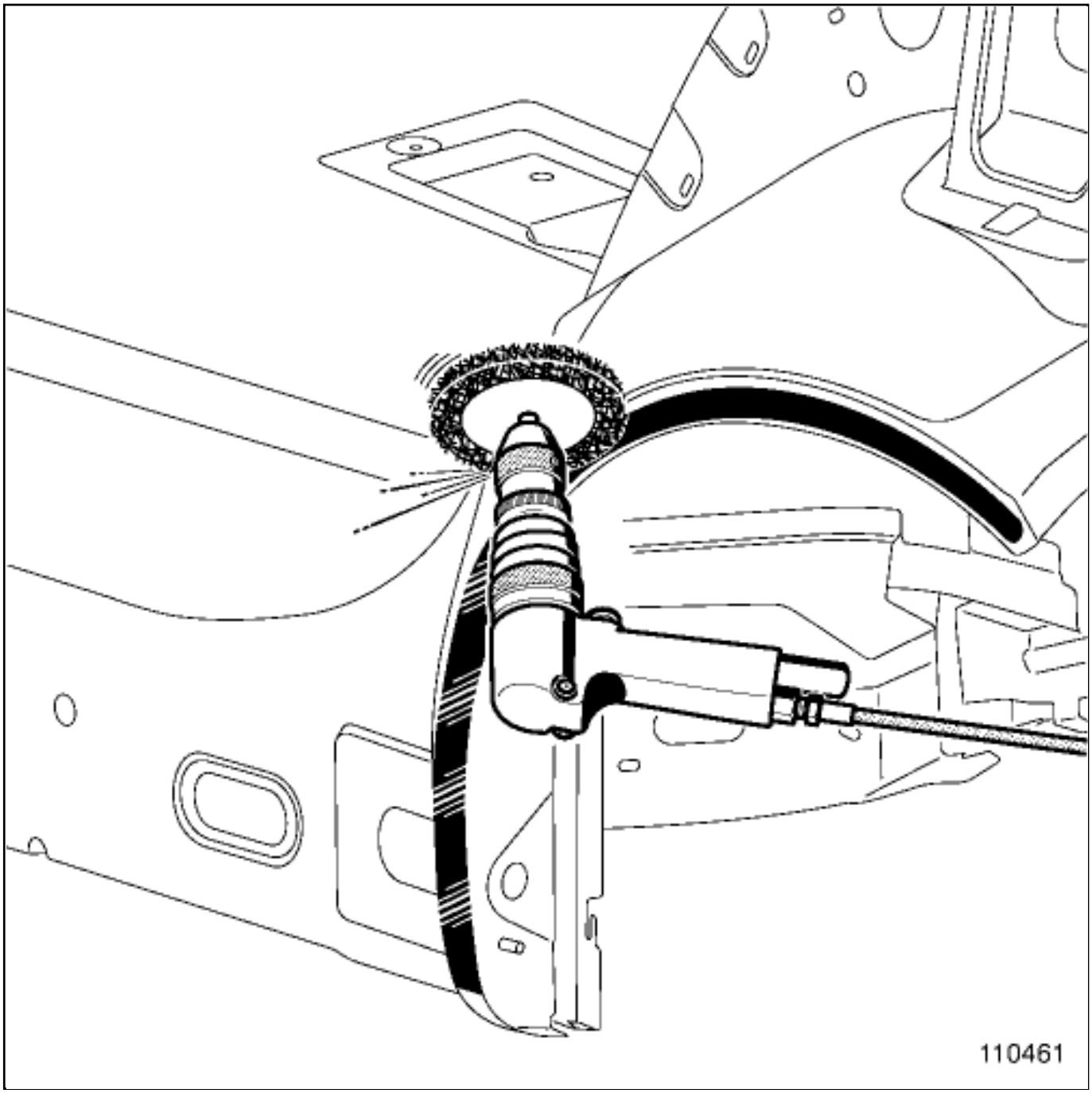


After removing damaged parts, grind the welding residue on the remaining support panels. Scour the weld joint interfaces(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use) .

1)SPECIAL FEATURE OF BONDED ASSEMBLIES



Heat the joint face using a paint burner, sliding a metal blade into the joint until it detaches.



Scour the cement bead residue left on the retained support panels(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use) .

3. PREPARATION BEFORE ASSEMBLY

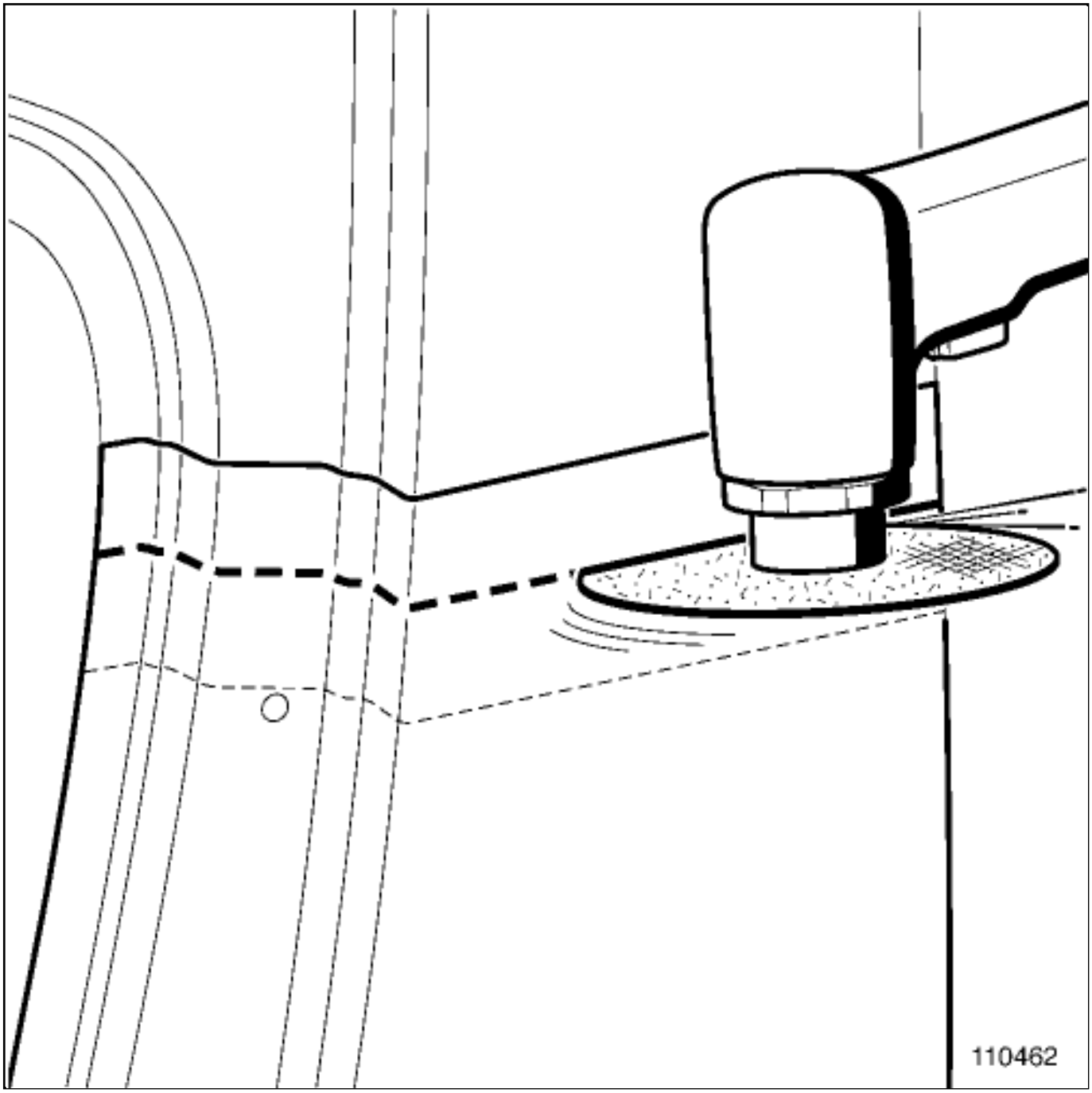
According to the different joint types, carry out the following operations in order, if necessary:

1- ADJUSTING

Position and adjust the new part on the vehicle.

Fix the new part using locking pliers.(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use) .

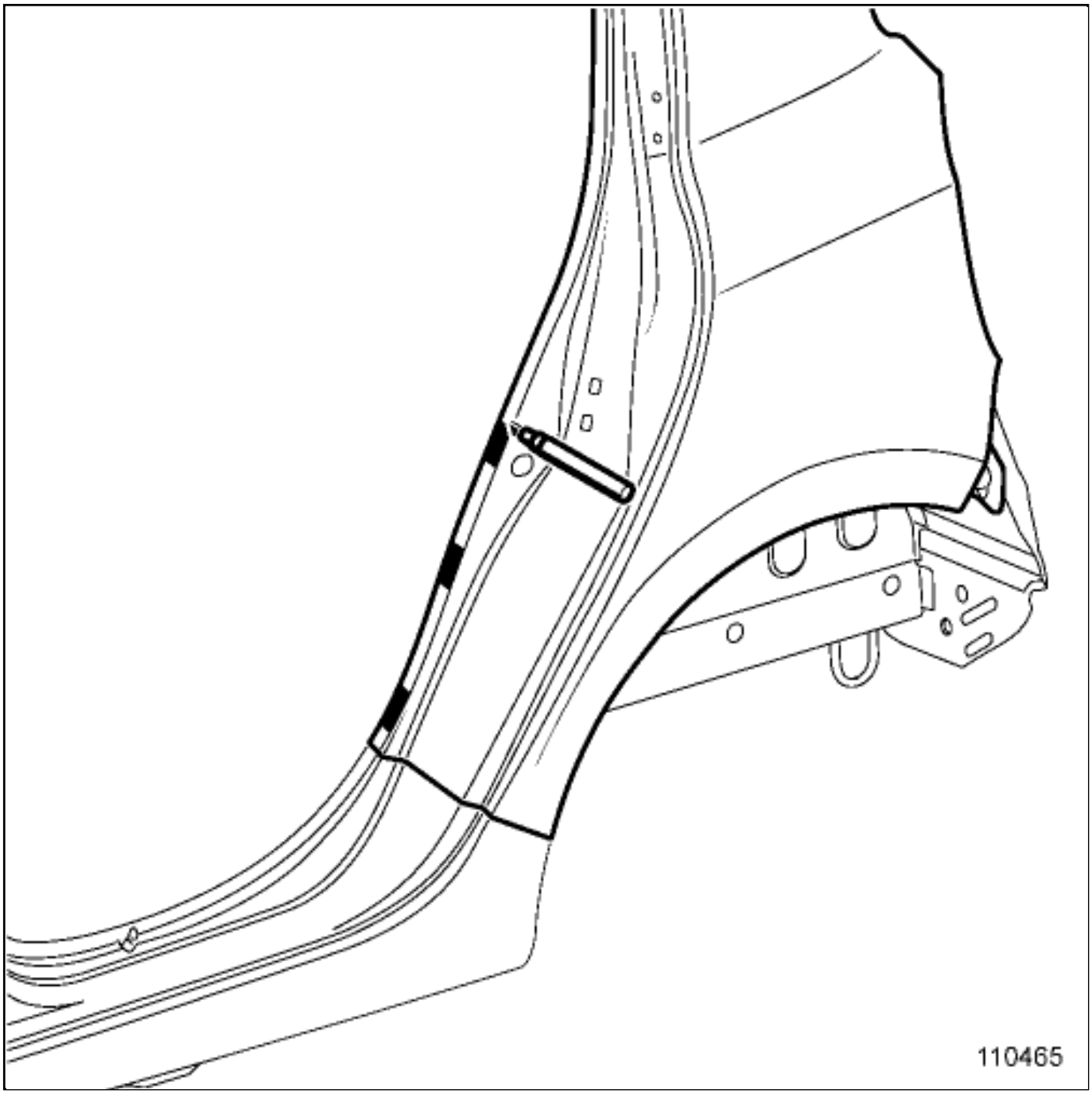
For partial replacements, use the new part to cover the part on the vehicle by 50 mm.



Cut the two overlapping parts simultaneously.

Remove the new part then take off the residual section of panel left on the vehicle.

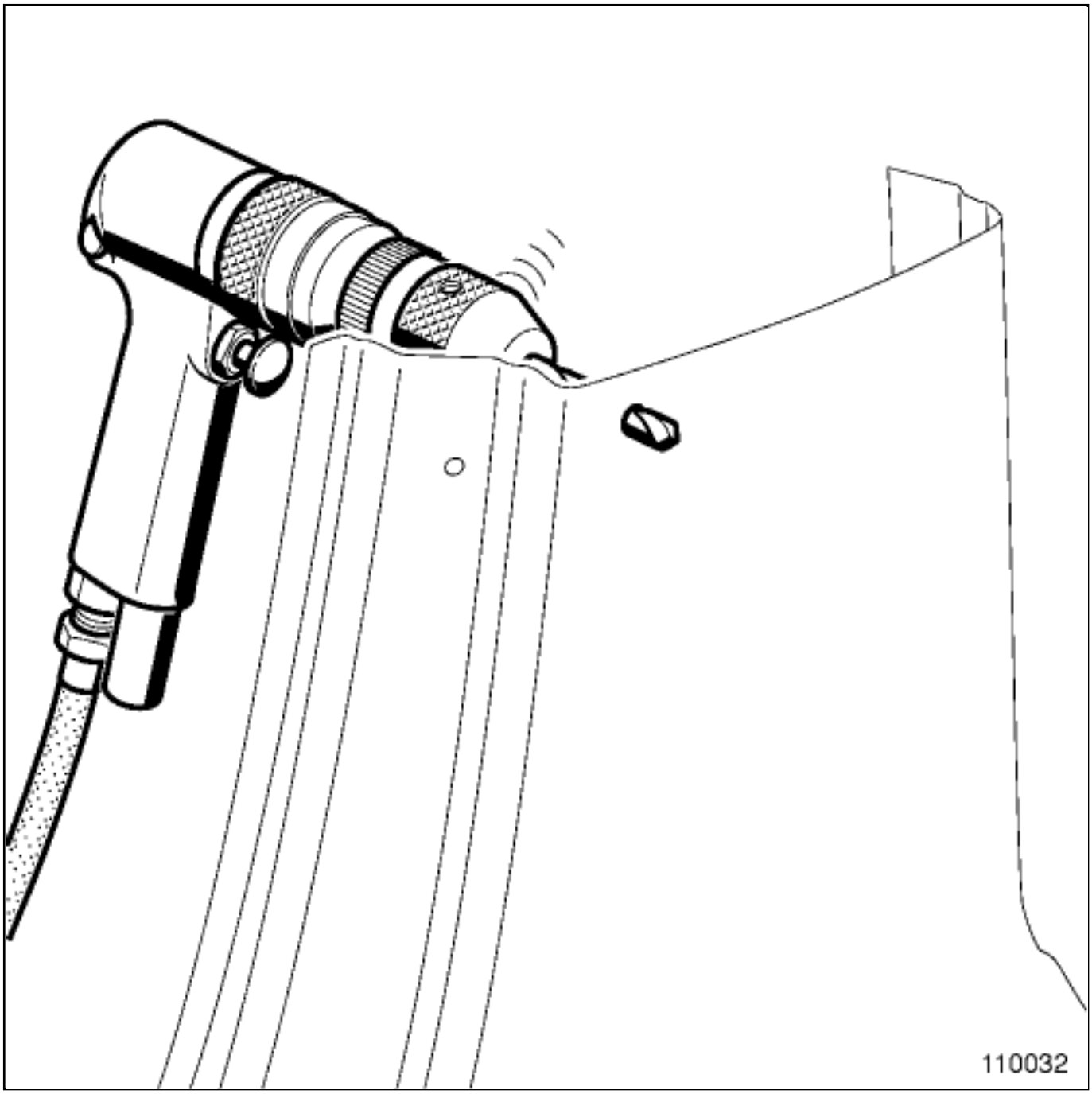
2- MARKING AND IDENTIFYING THE REPLACEMENT PART



Using an indelible marker pen, mark the internal face:

- of the plug weld points weld joint areas.
- the bonding areas.

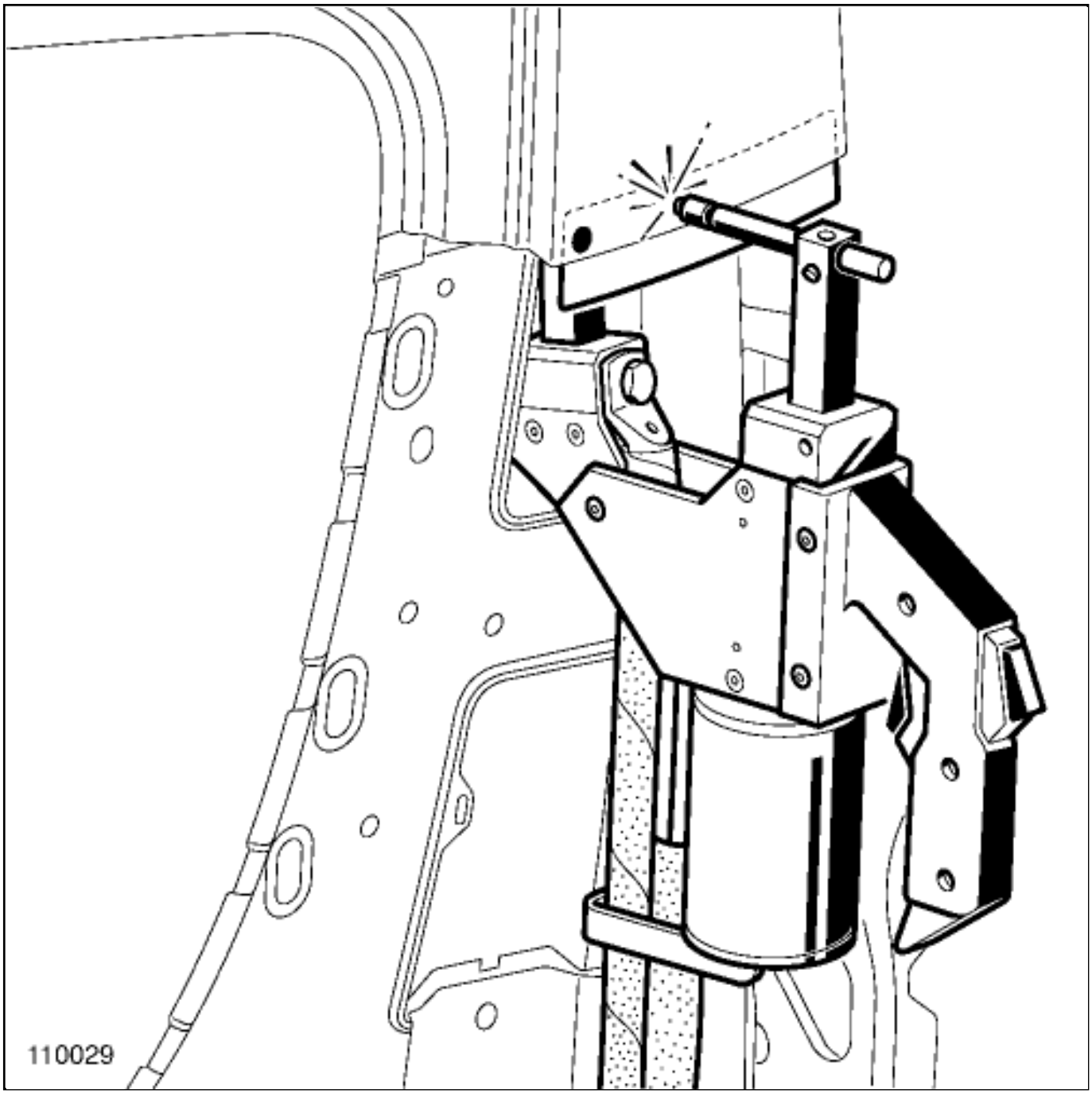
3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART



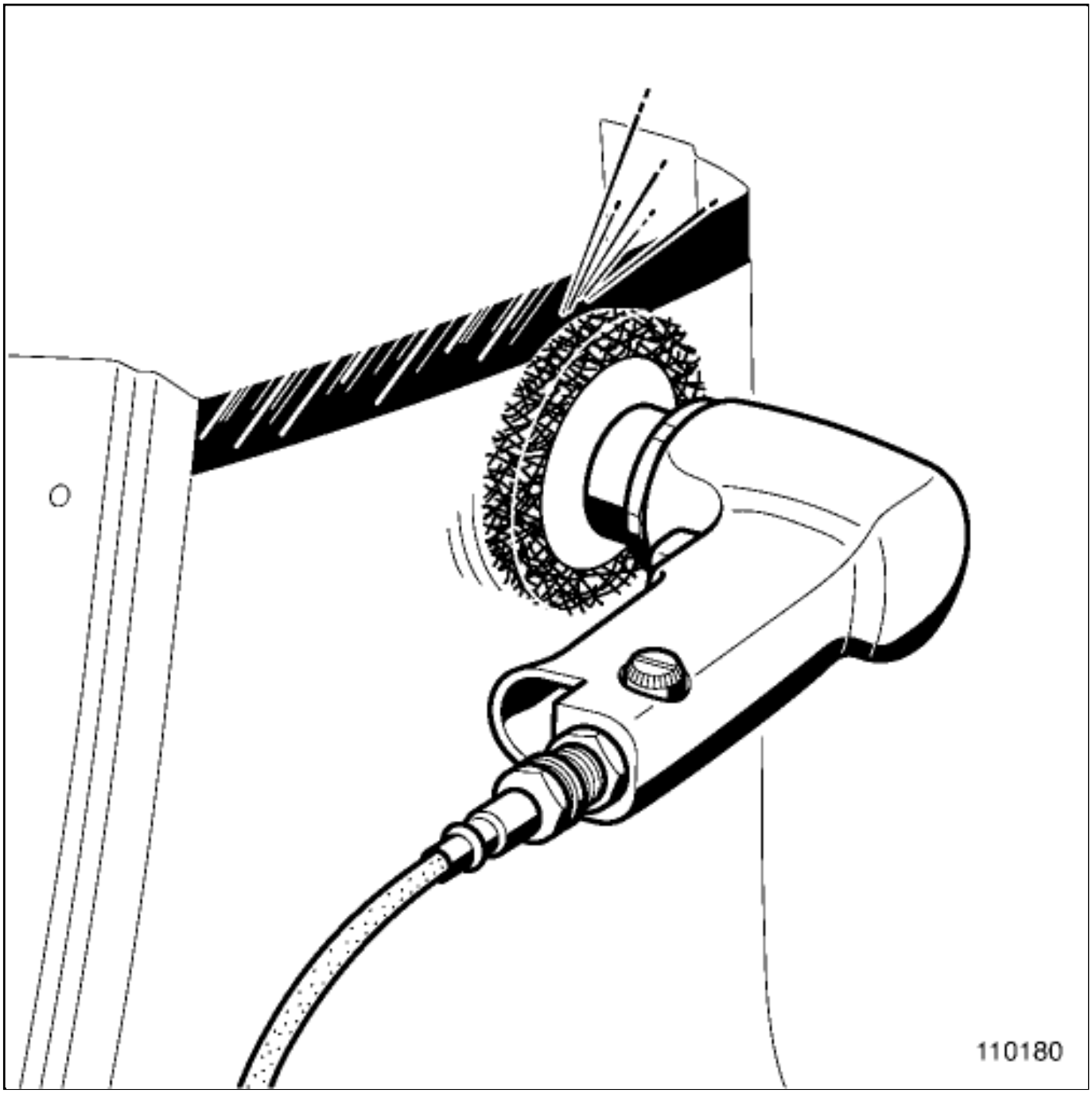
From the part's internal face:

- carry out the drilling operation for the plug welds and the riveting,
- clean the bonding zones without scouring.
- scour the electrical resistance welded connections.

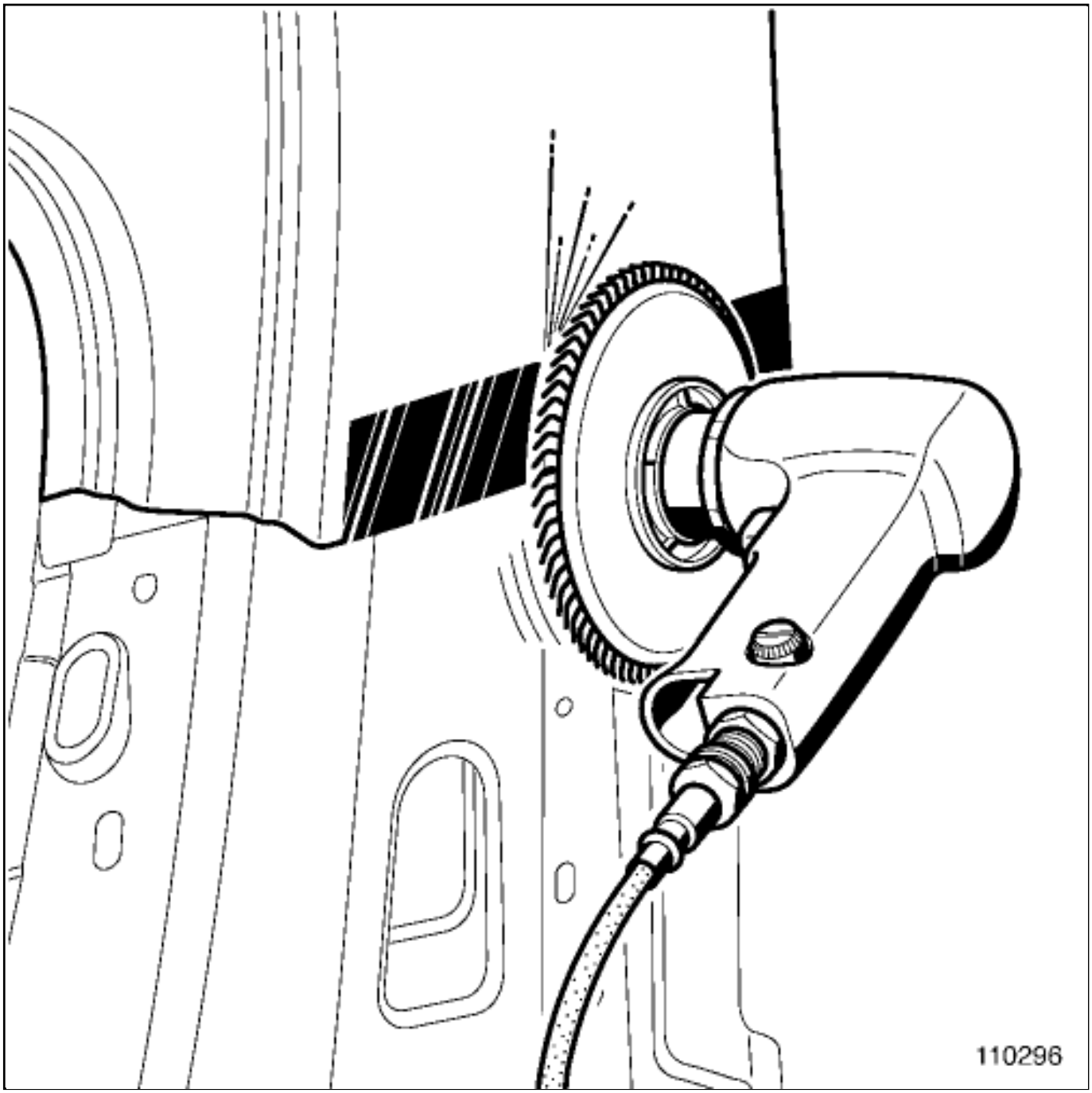
From the replacement part cut off, recover a metal strip measuring approximately 40 mmin width with a length which is adapted to the patched drilling area.



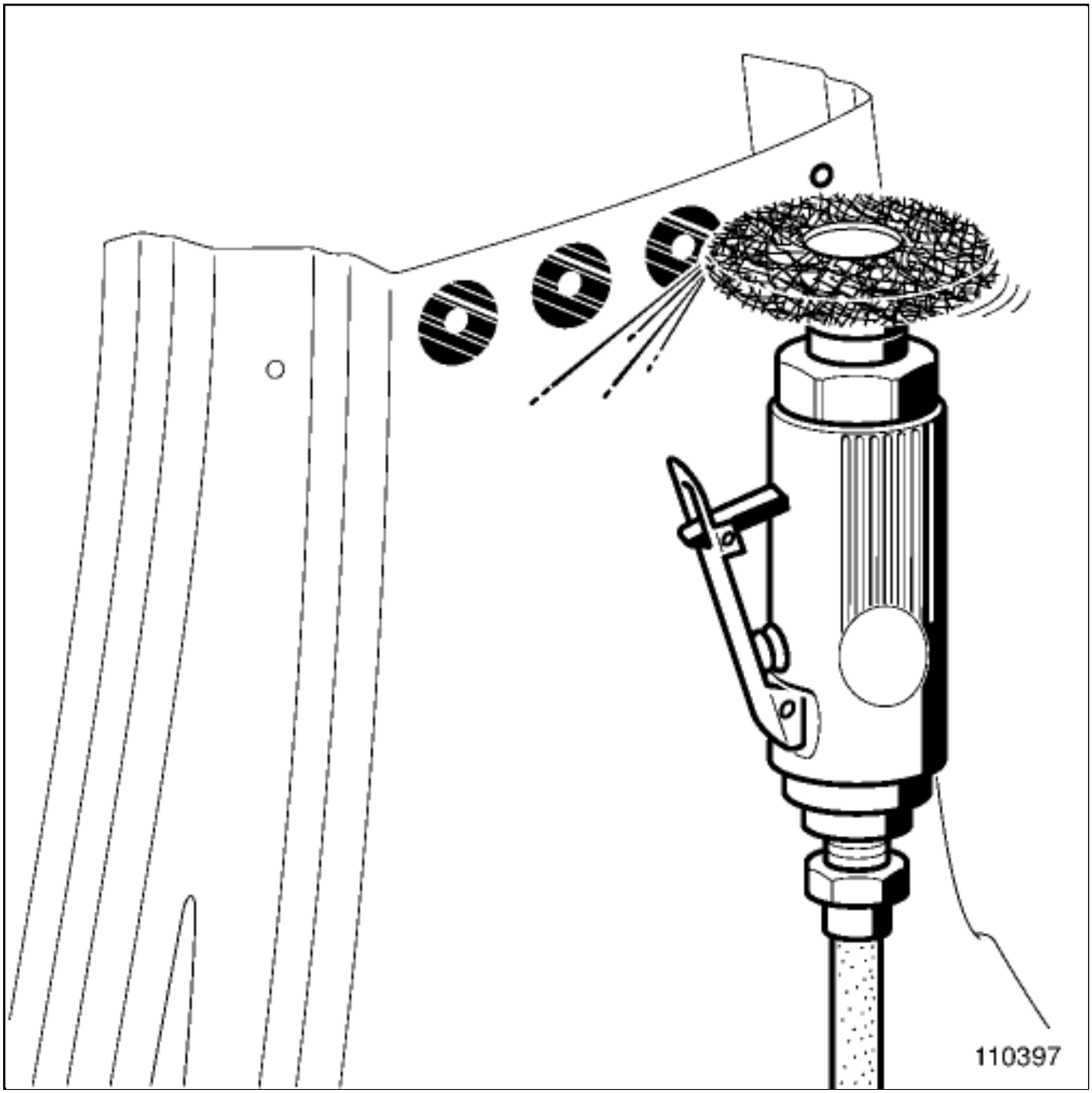
Weld this metal strip to the vehicle to carry out the patched drilling.



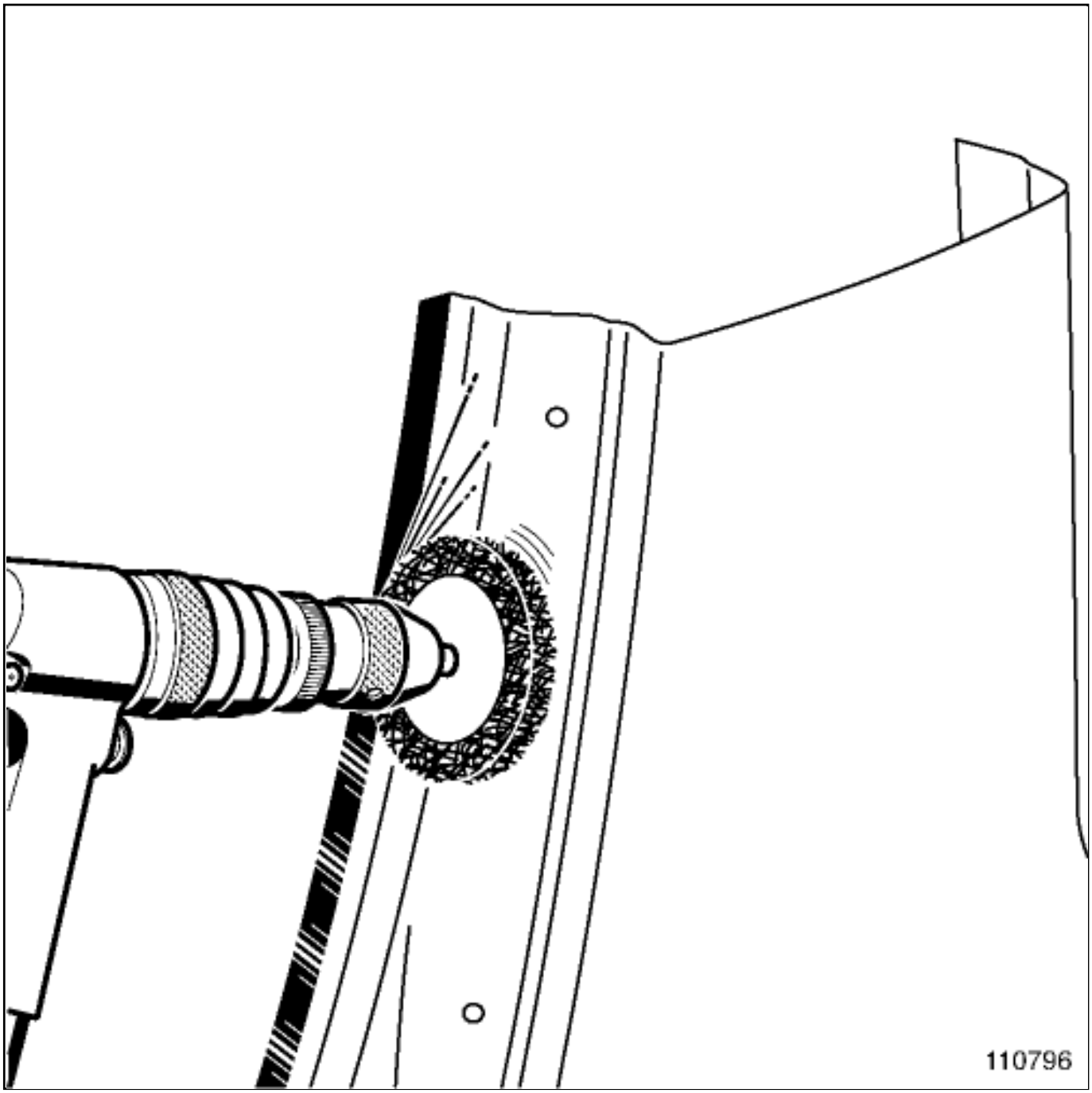
Scour the external joint faces depending on the type of weld.



Scour the weld edges of the partial cuts.



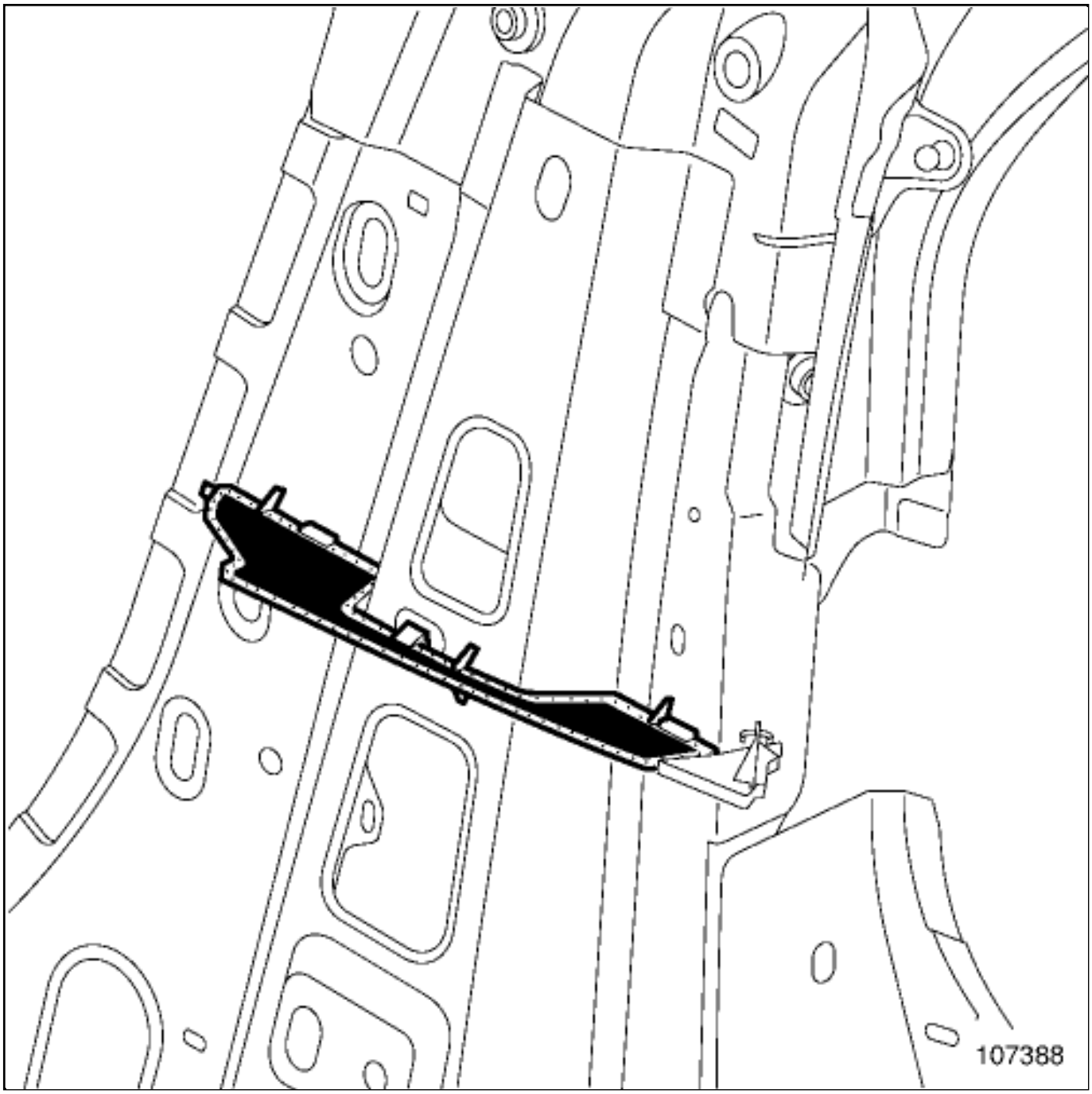
Deburr the edge of the plug weld holes.



Scour the faces of the resistance welded joints.

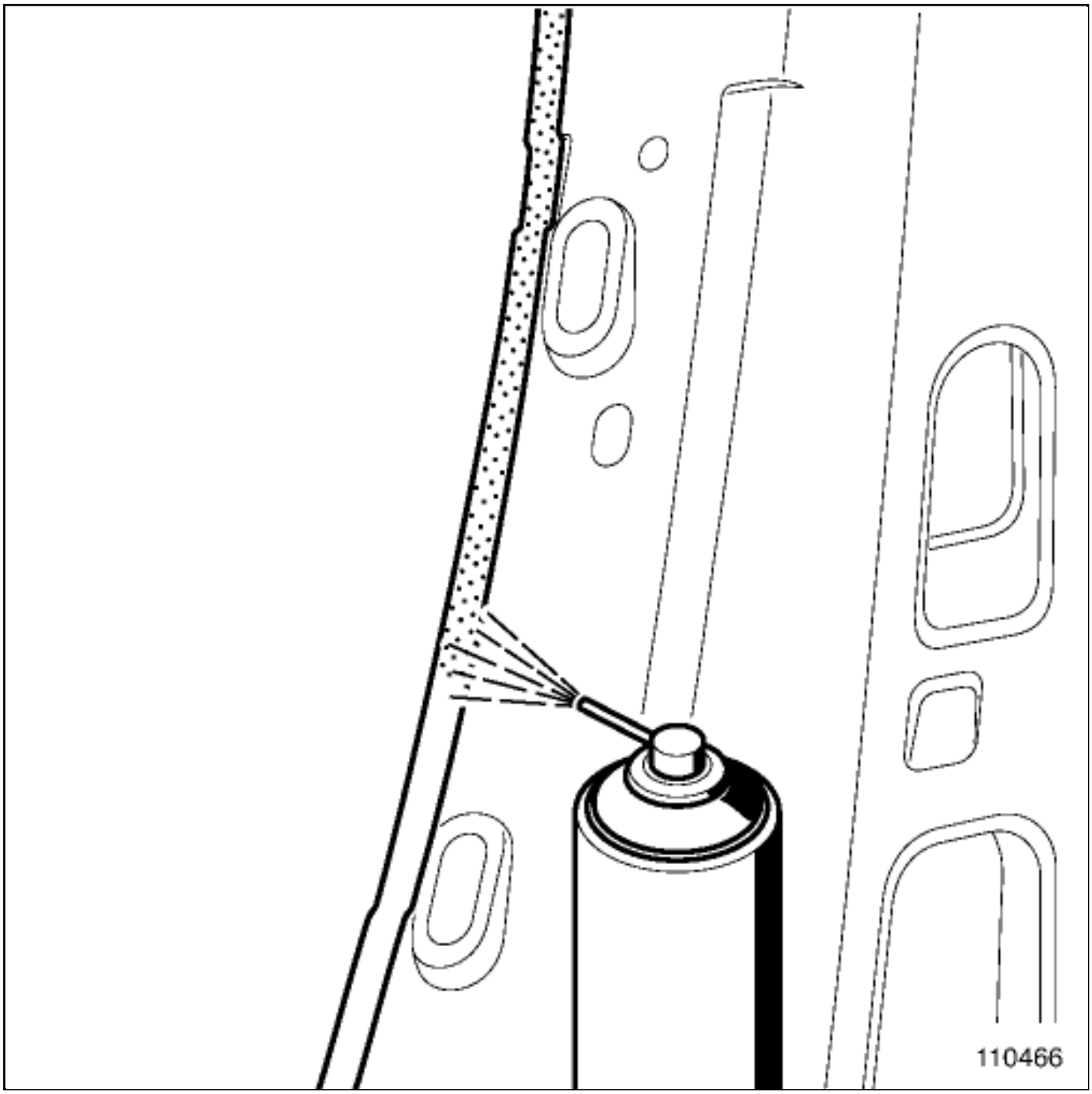
Scour the faces of the butt welded joints(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use) .

4- FITTING ACOUSTIC PROTECTION BEFORE ASSEMBLY



Fit the acoustic inserts(see 40J, Protective devices , Structural acoustic protection: Description) .

5- APPLYING THE ANTICORROSION PROTECTION BEFORE ASSEMBLY



Concerns only joint interfaces (on the vehicle and on the new part).

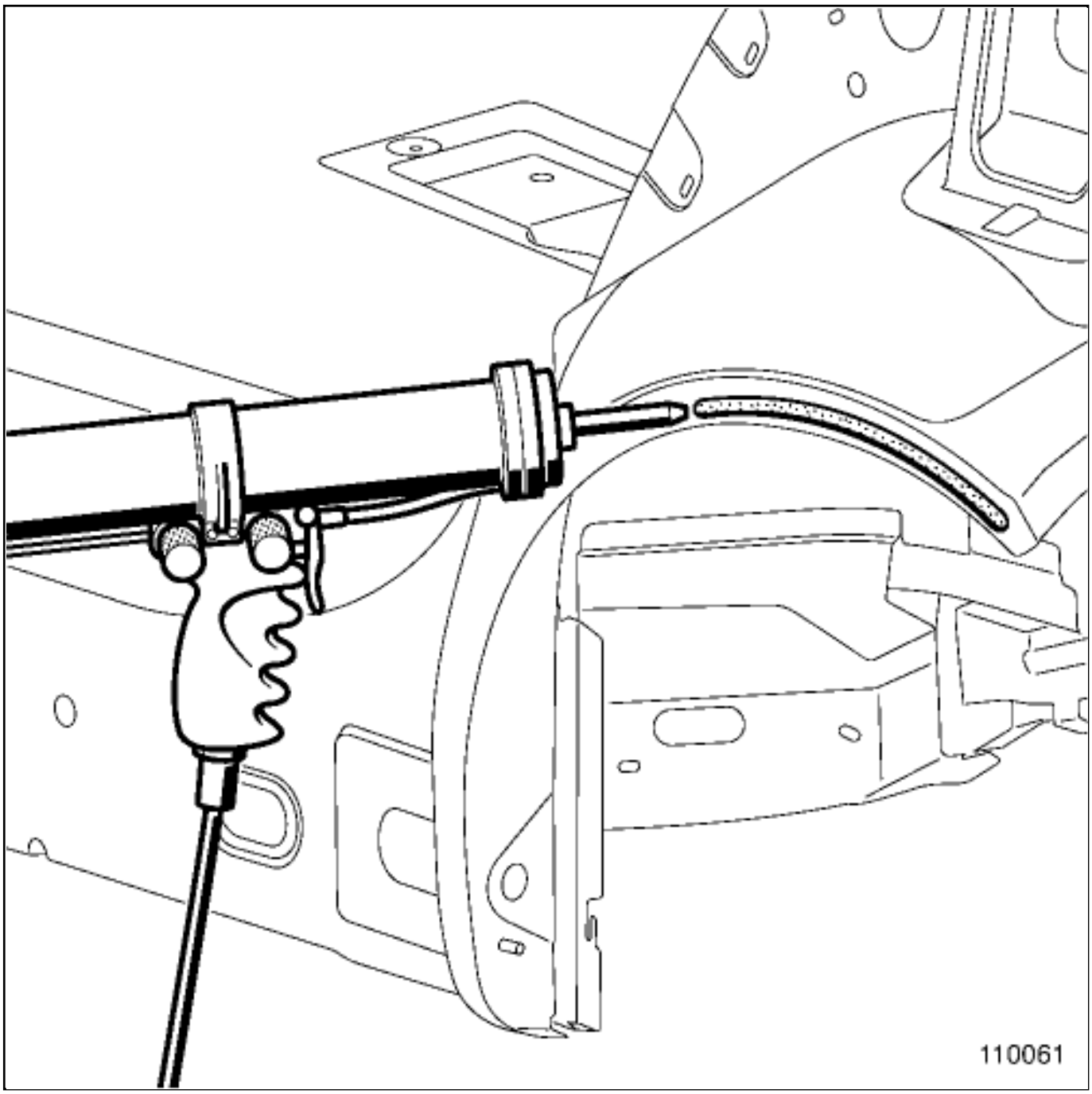
Depending on the locations, apply in order:

- spray products,
- pad or brush products,
- extruded products.

(see 40J, Protective devices , Anti-corrosion protection of joints before welding: Description) .

4. ASSEMBLY

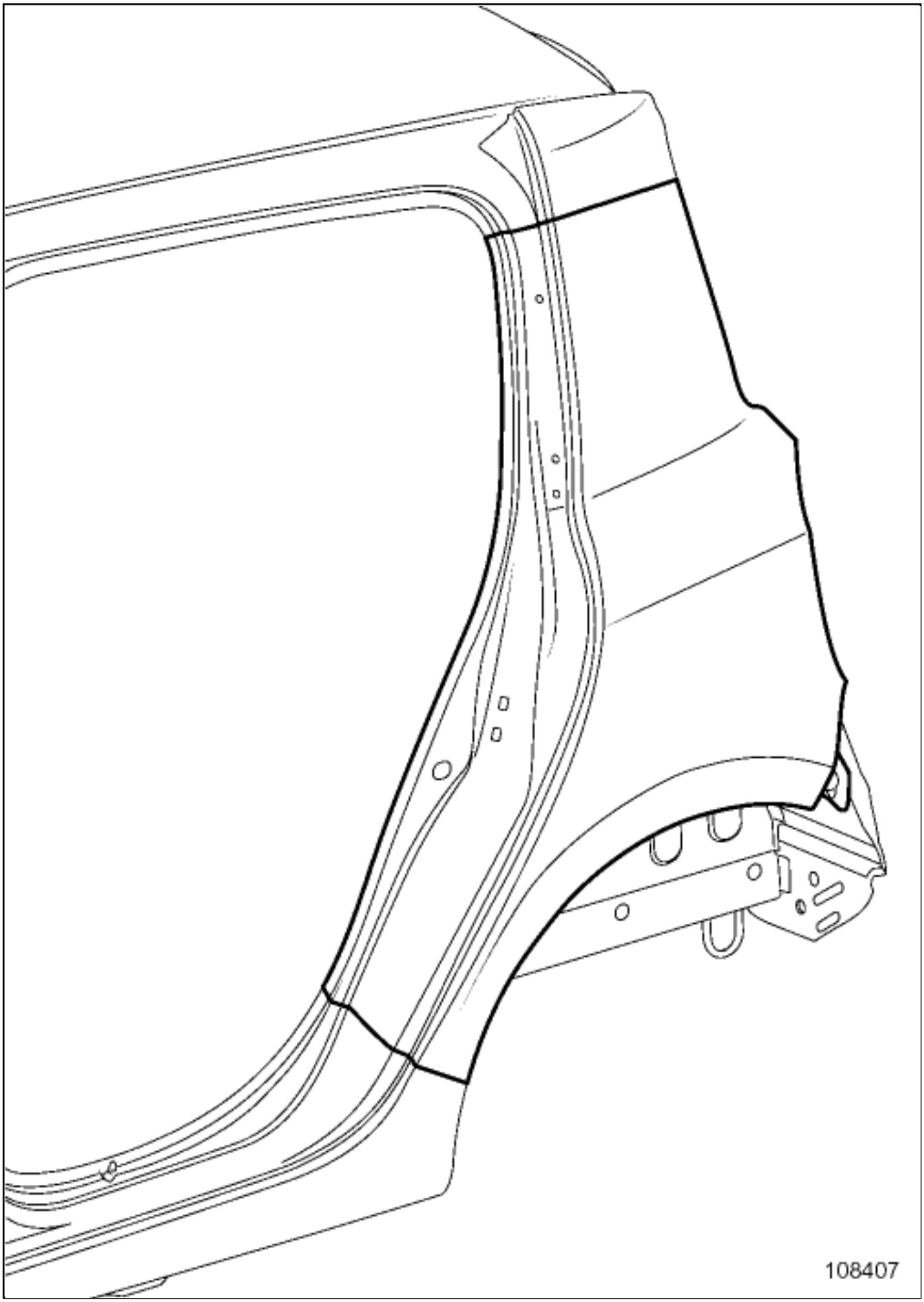
1- APPLICATION OF THE BONDING PRODUCTS



(see 40F, Bonded connections, Connections by rigid bonding: Description) .

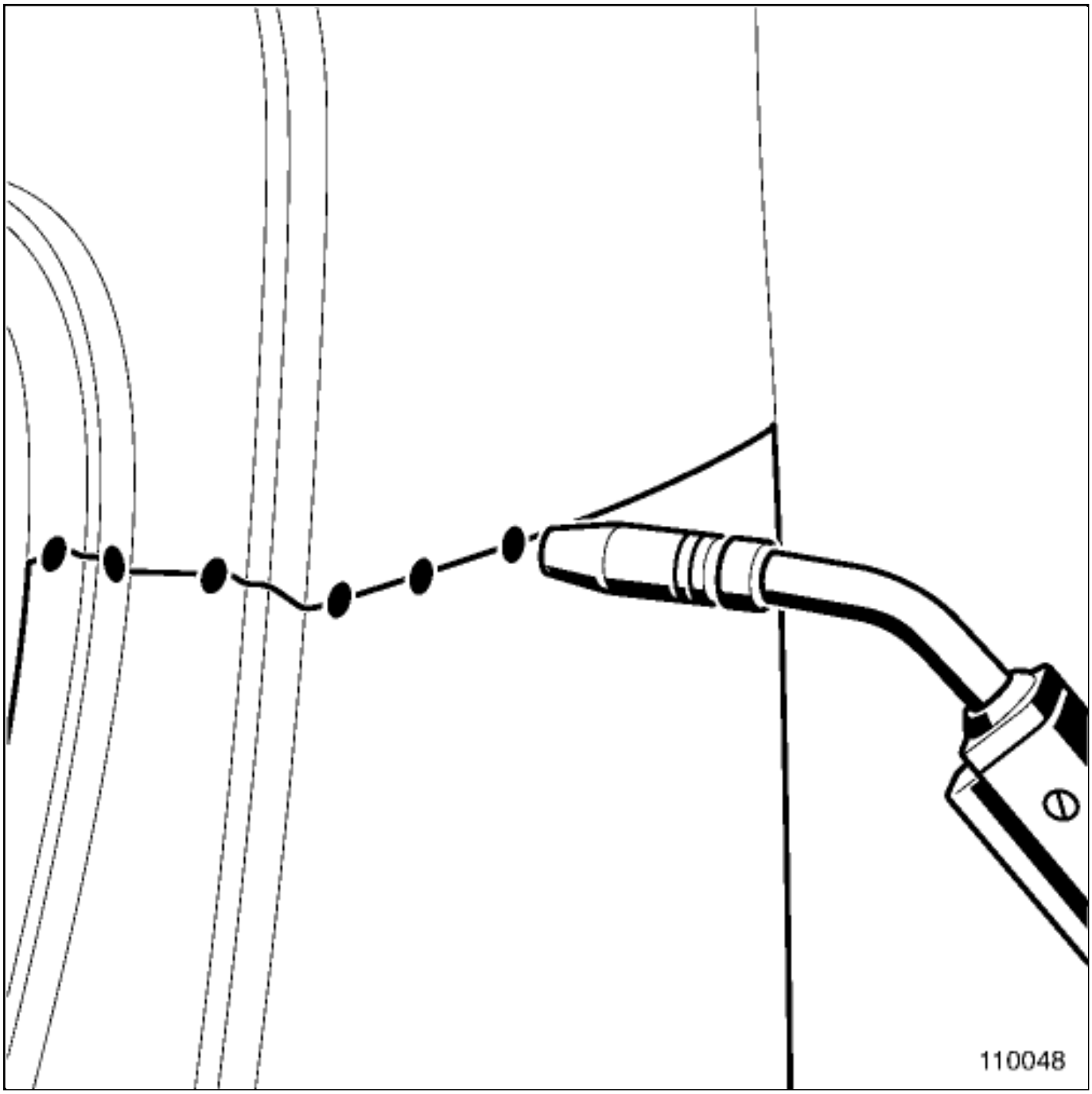
(see 40F, Bonded connections, Connections by soft bonding: Description) .

2- FITTING AND ADJUSTING THE REPLACED PARTS

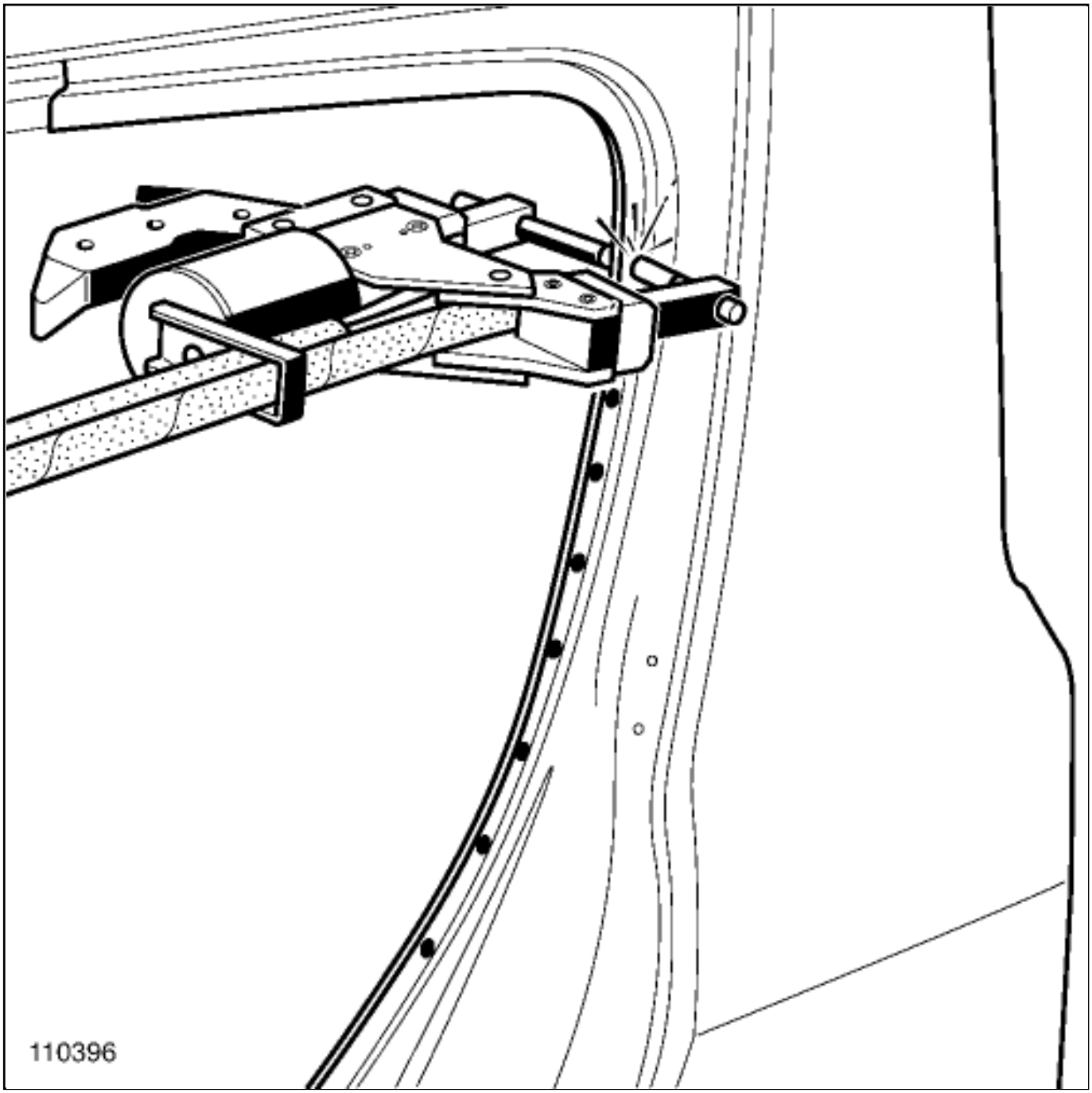

108407

Position and adjust the new part on the vehicle. Fix using locking pliers.(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use) .

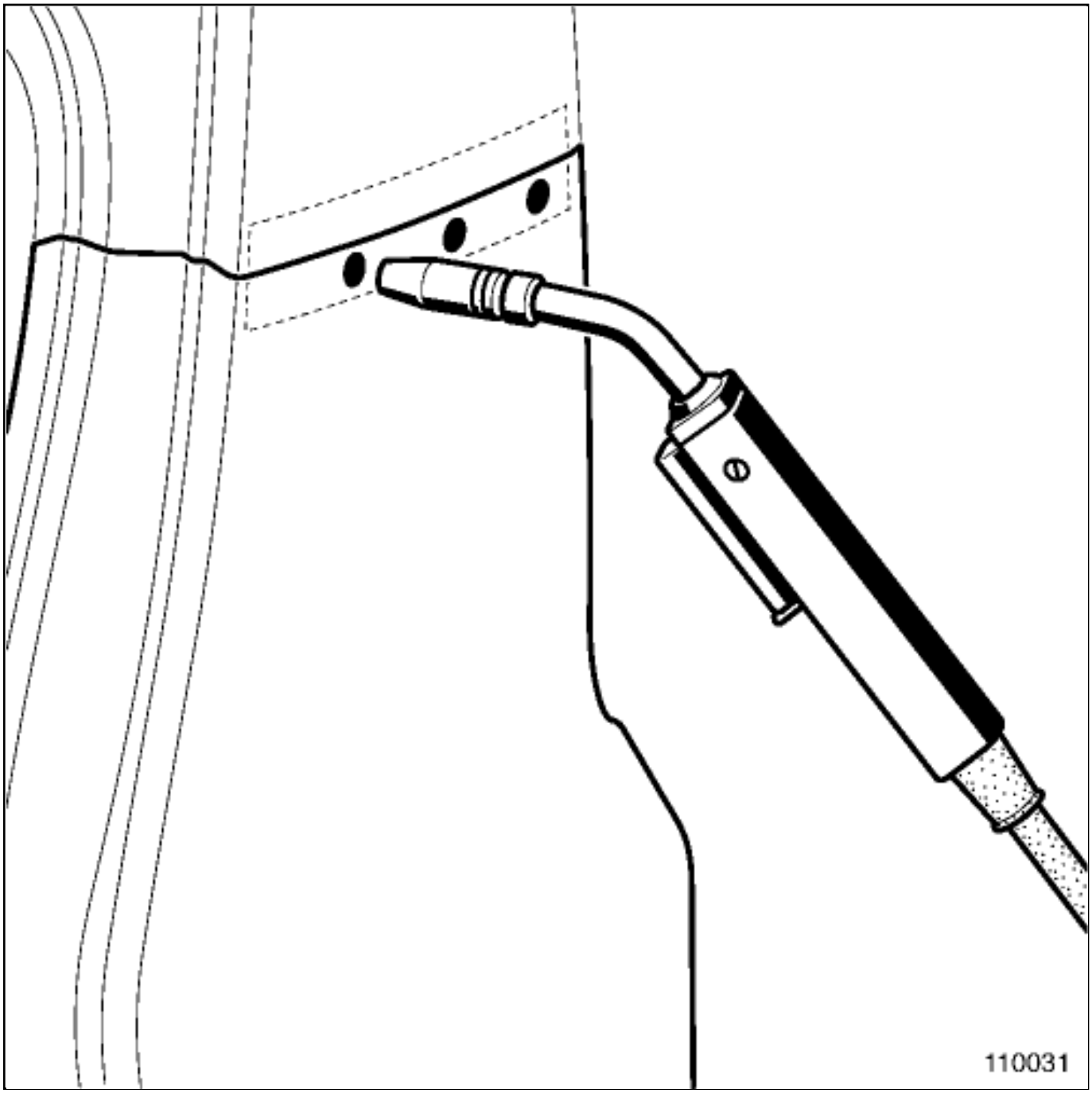
3- CARRYING OUT THE WELDING



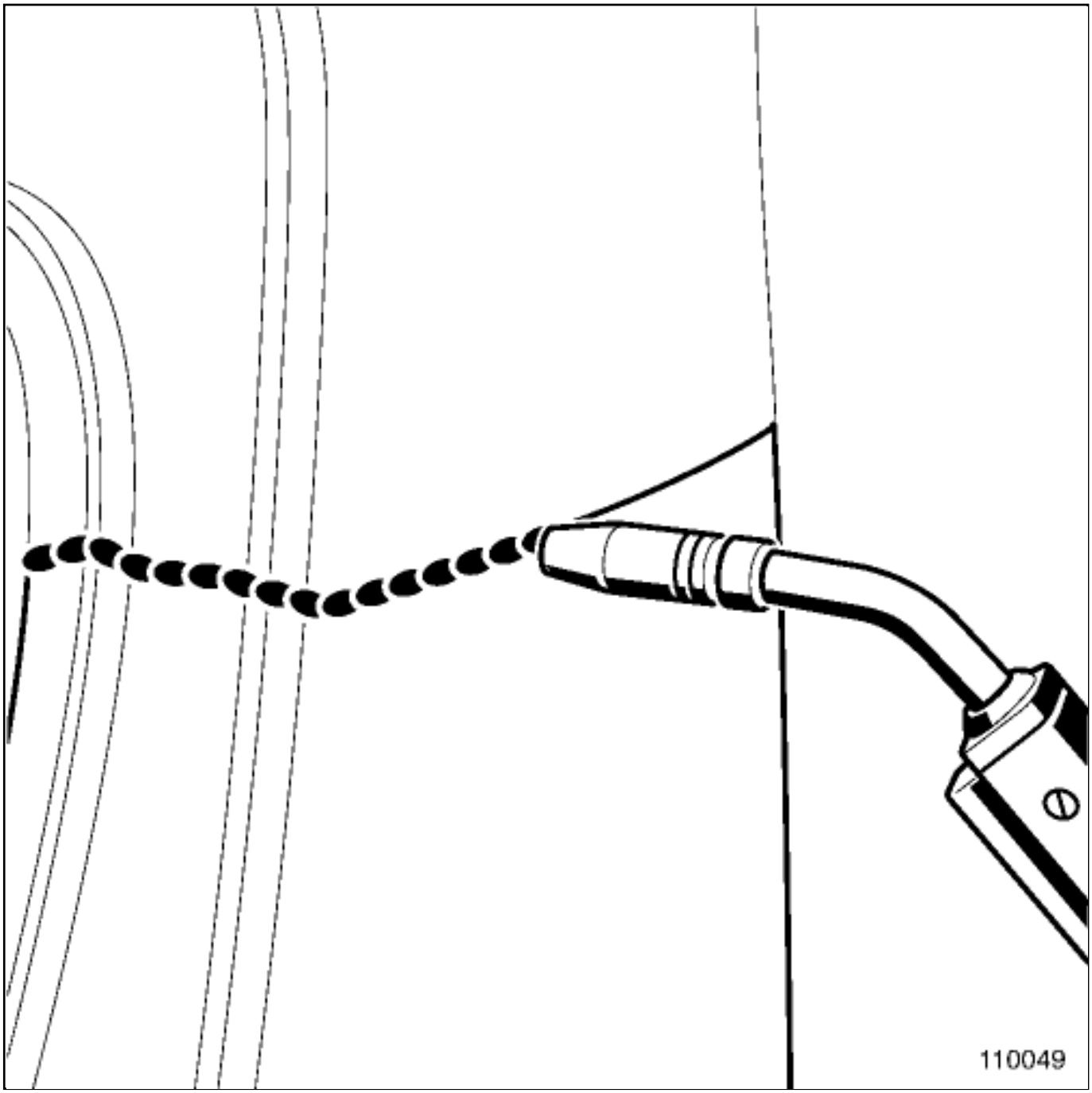
Carry out the securing points on the butt welding lines.



Do the SER points.

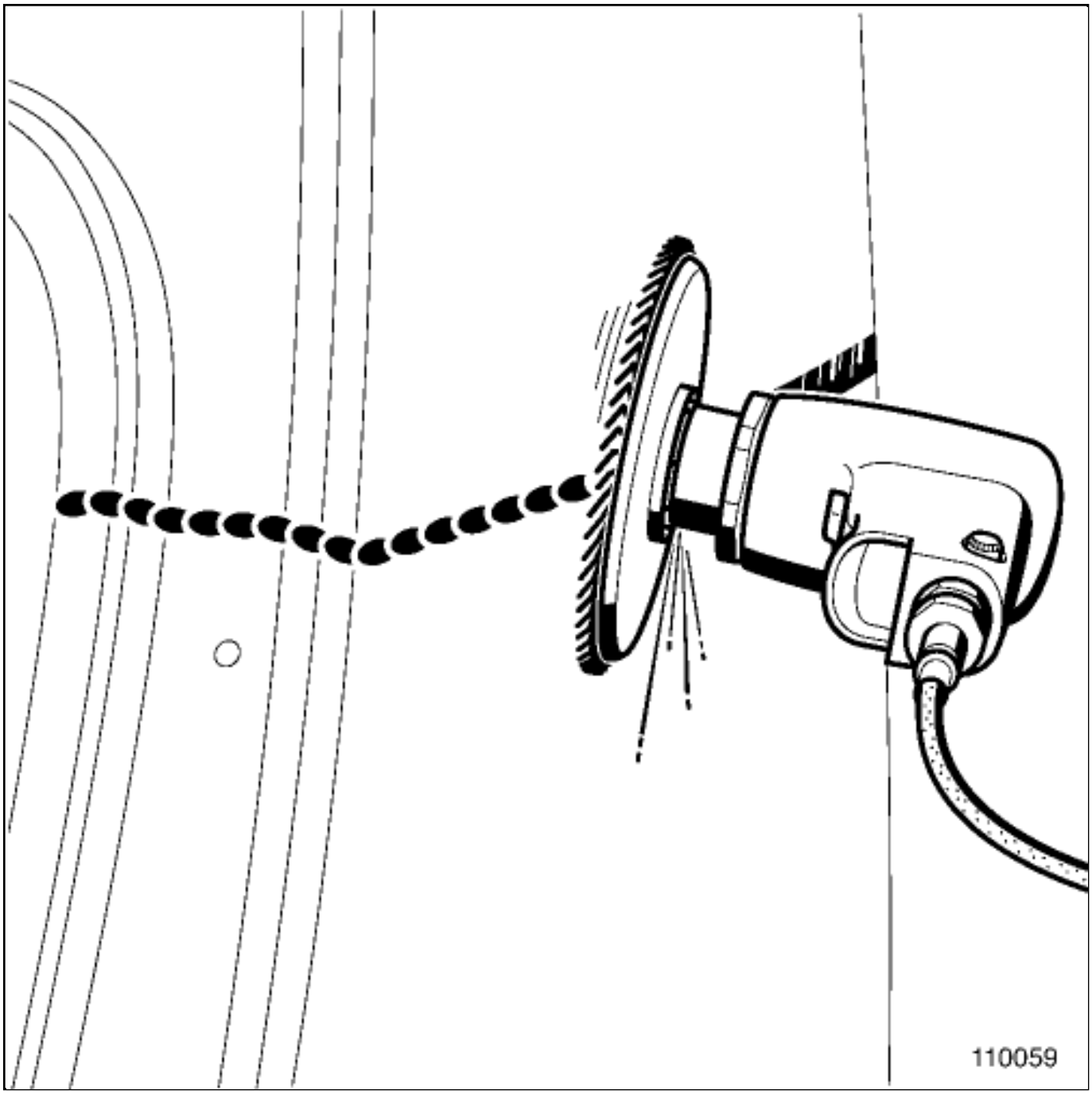


Do the plug welds.



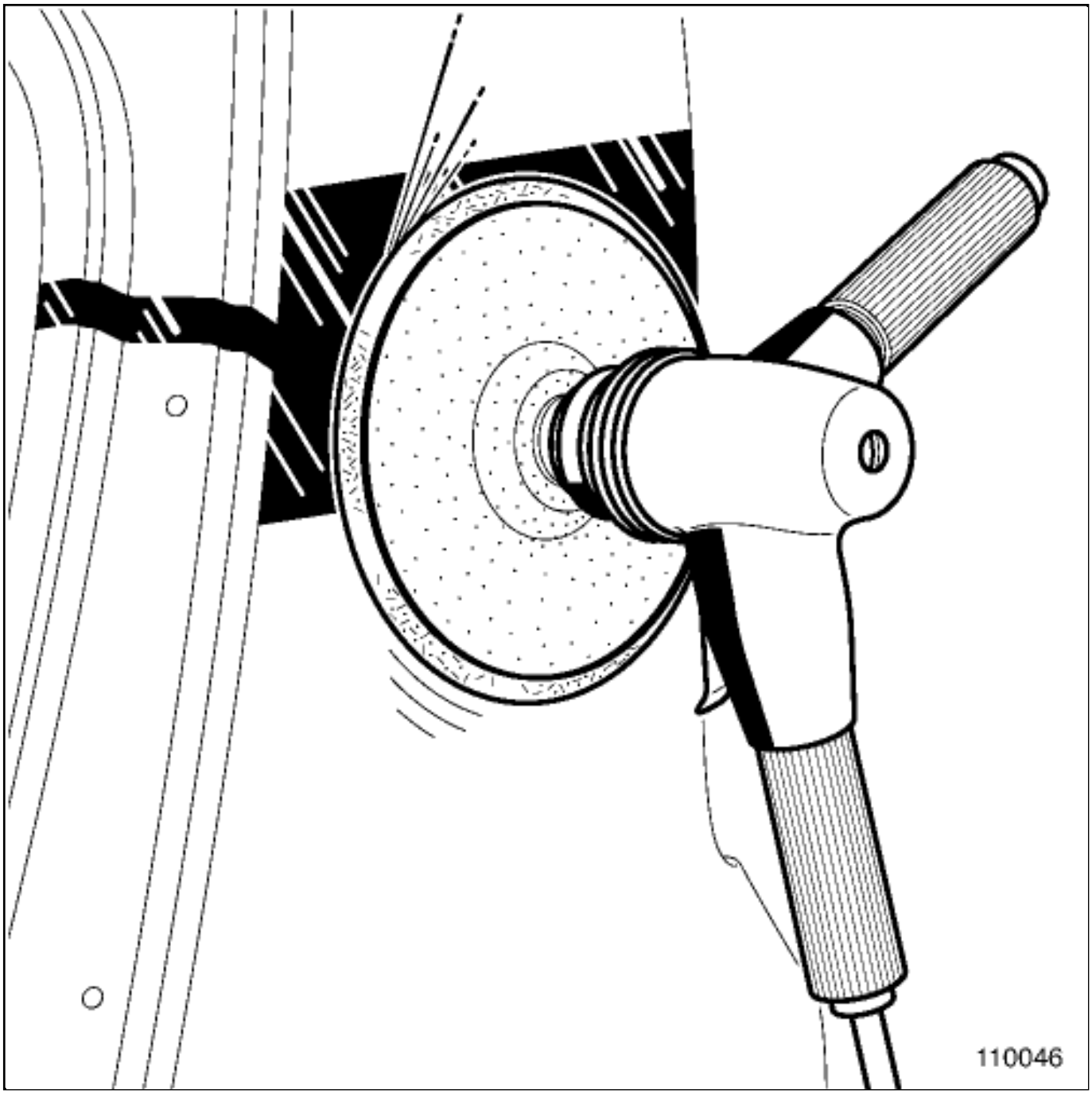
Carry out the butt welding using a bead of chain weld.

4- GRINDING THE WELDS

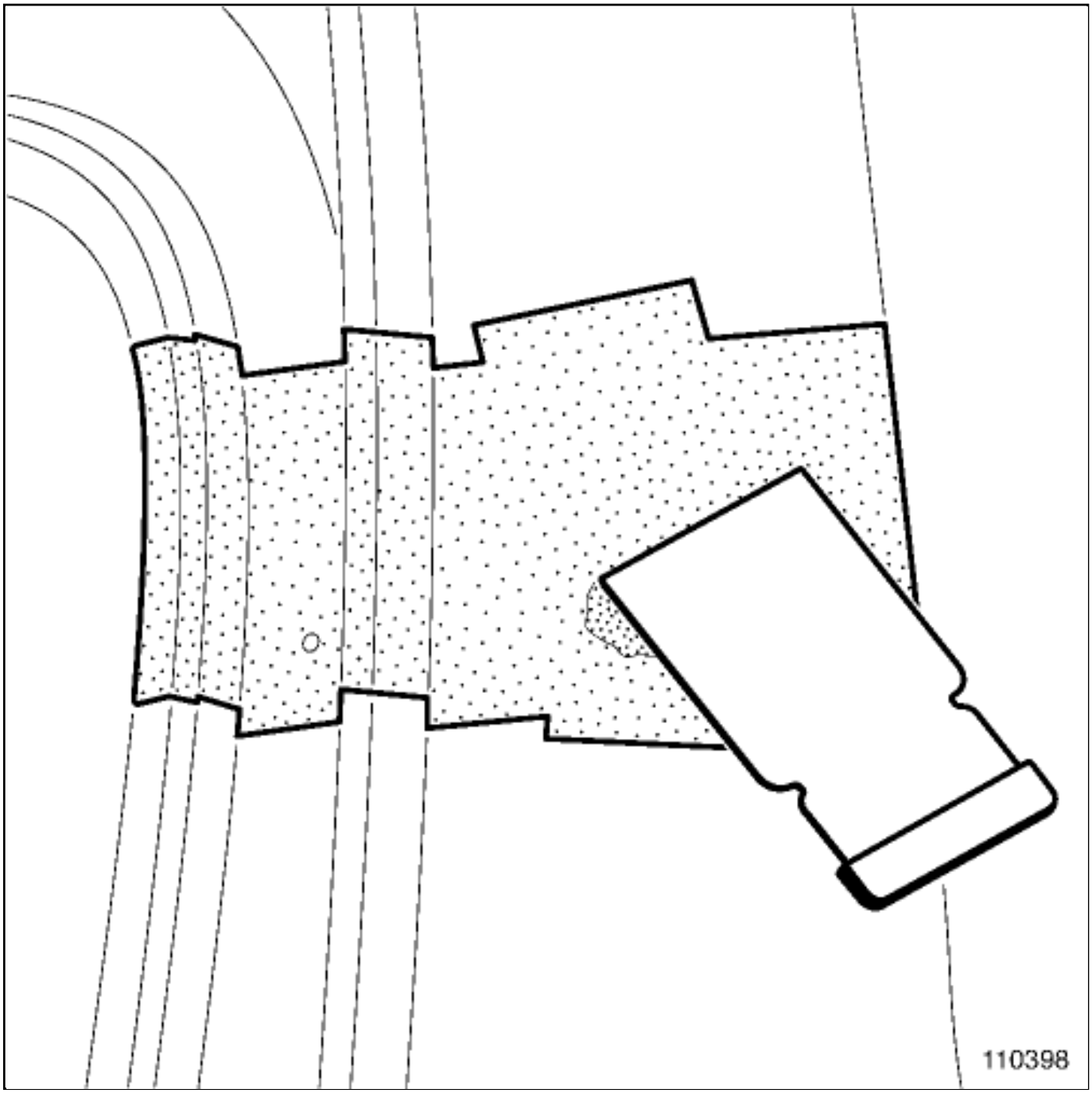


Level off the weld beads and the plug welds(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use) .

5- SHAPE FINISHING



Scour the areas which will receive sealant to provide adherence.



On the visible parts, finish with a coat of sealant on both sides.

Surface finish using a sander fitted with a P120(see 04F, Bodywork products and mountings, Panelwork finishing products: Use) dry disc.

REVERSE GEAR SHAFT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 21A, Manual gearbox , Manual gearbox: Precautions for the repair)** .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the gearbox**Manual gearbox: Removal - Refitting** .

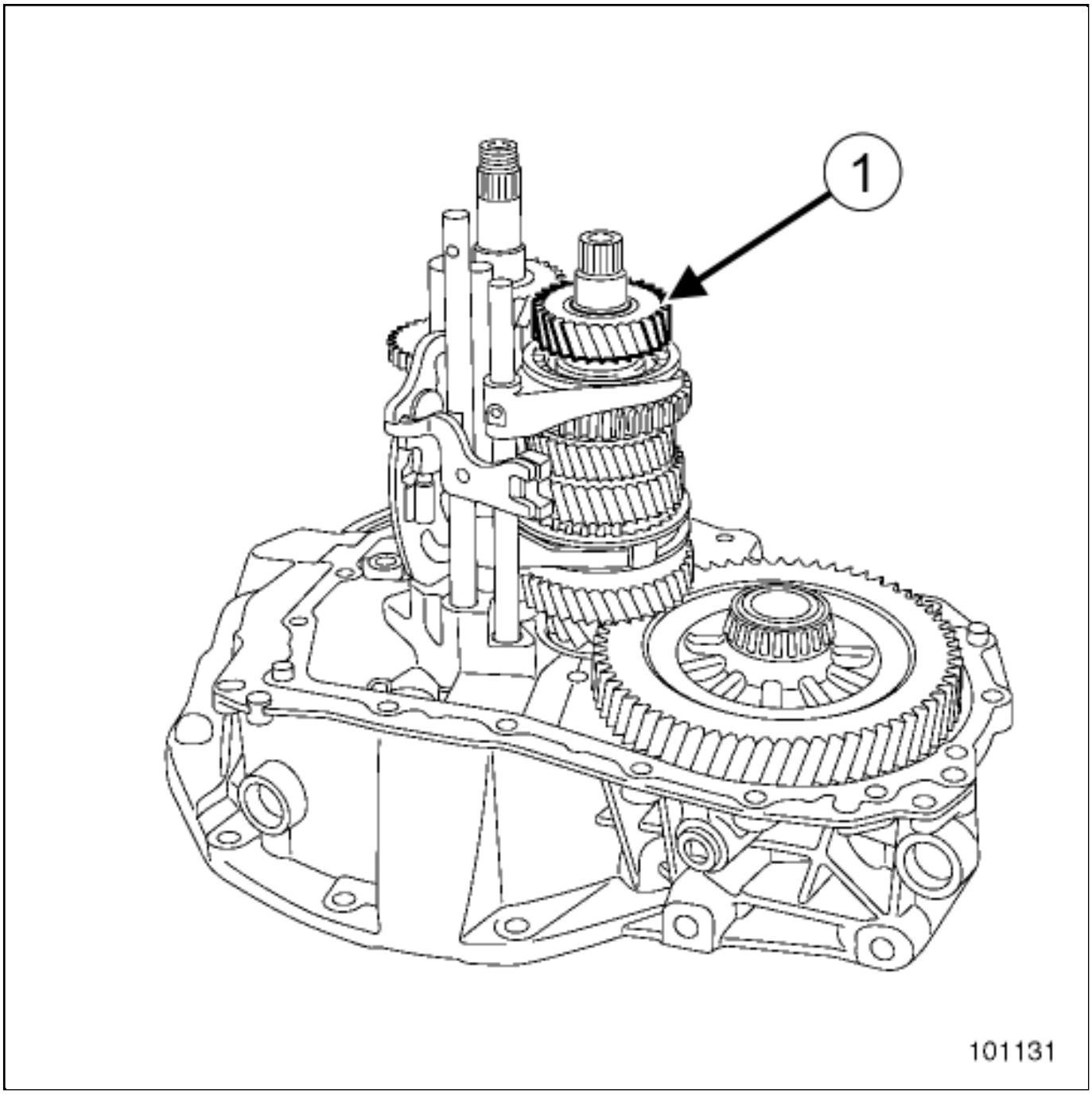
- Position the gearbox on the component support**(see 21A, Manual gearbox , Gearbox support equipment: Use)** .

- Remove:
  - the fifth gear housing**5th gear housing: Removal - Refitting** ,
  - the fifth gear synchroniser and pinions**5th gear sprockets and synchronisers: Removal - Refitting** ,
  - the mechanism housing**(see 21A, Manual gearbox , Mechanism housing: Removal - Refitting)** .

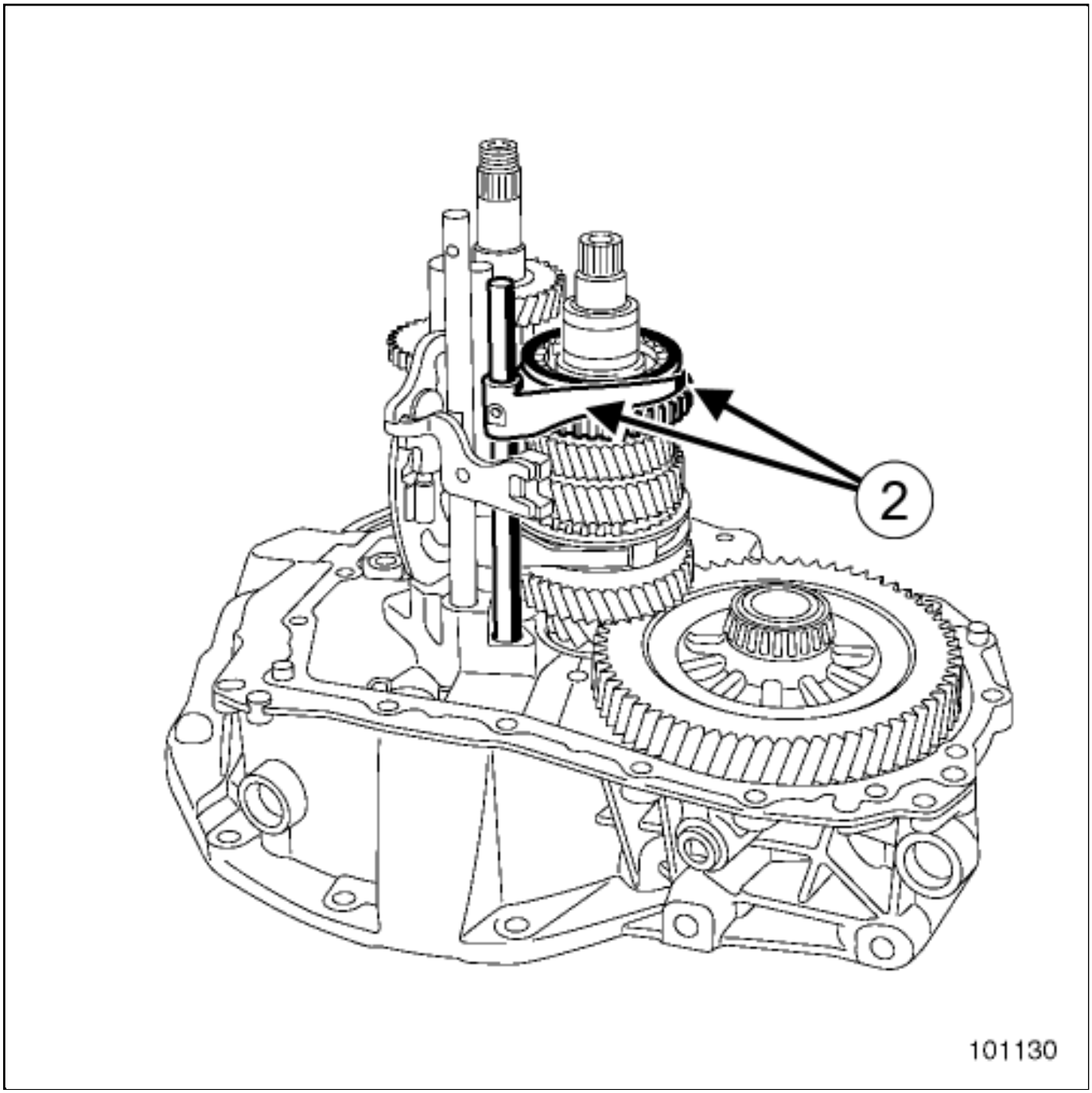
- Remove:
  - the tapered bearings,
  - the adjusting washer.

2. OPERATION FOR REMOVAL OF PART CONCERNED

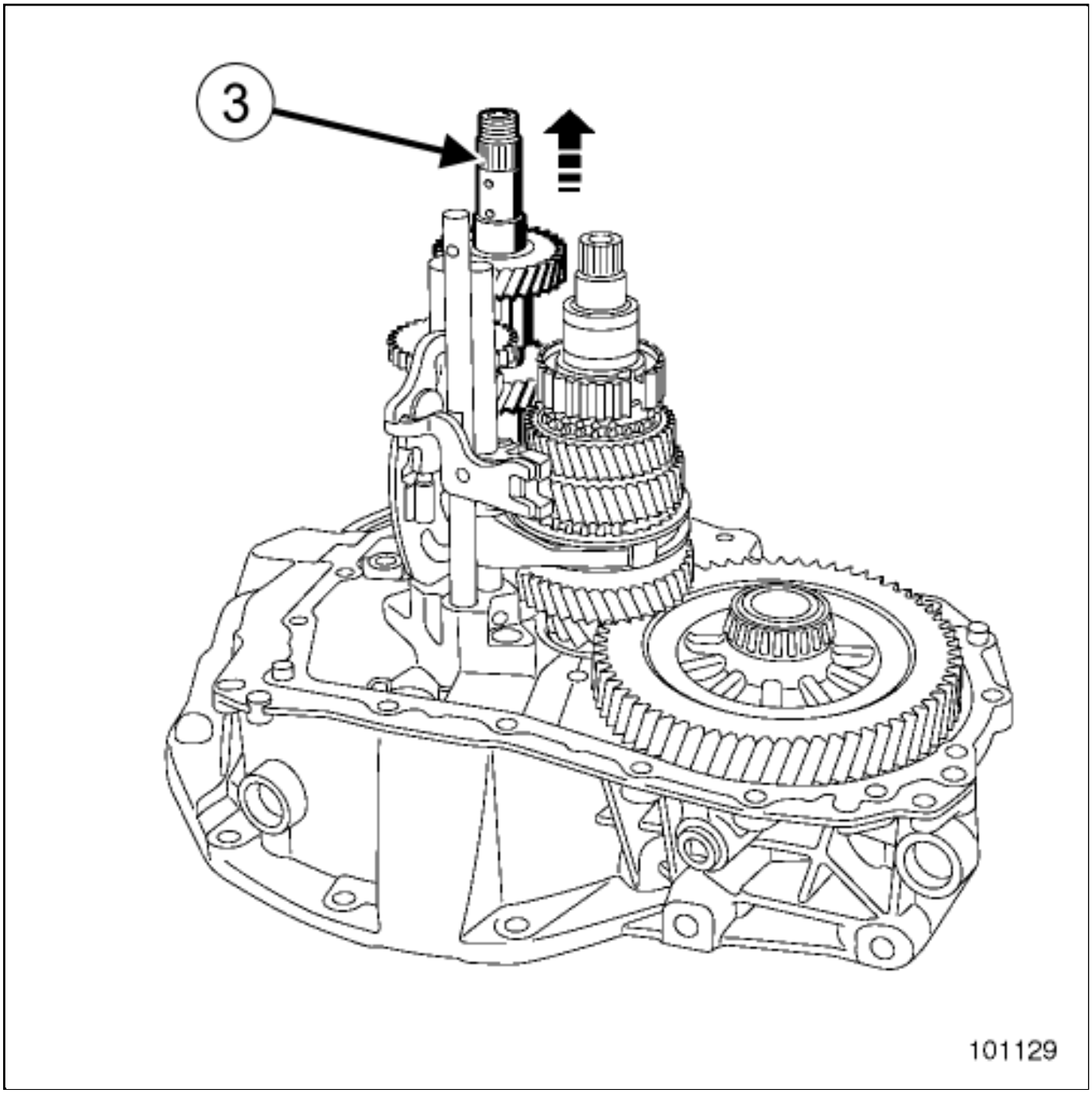
1- CLOSED DIFFERENTIAL GEARBOX



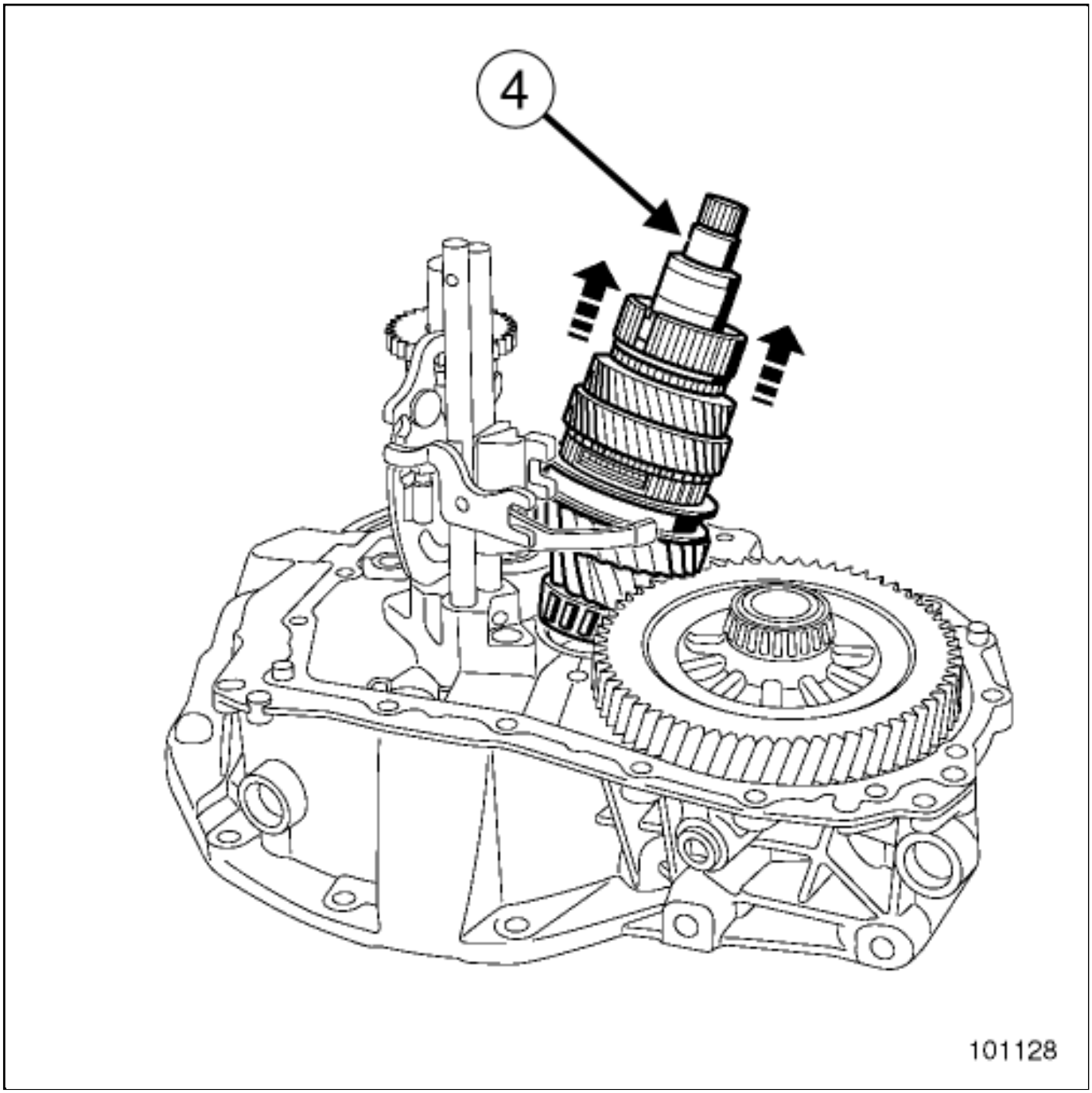
- Remove the fourth gear pinion(1) .



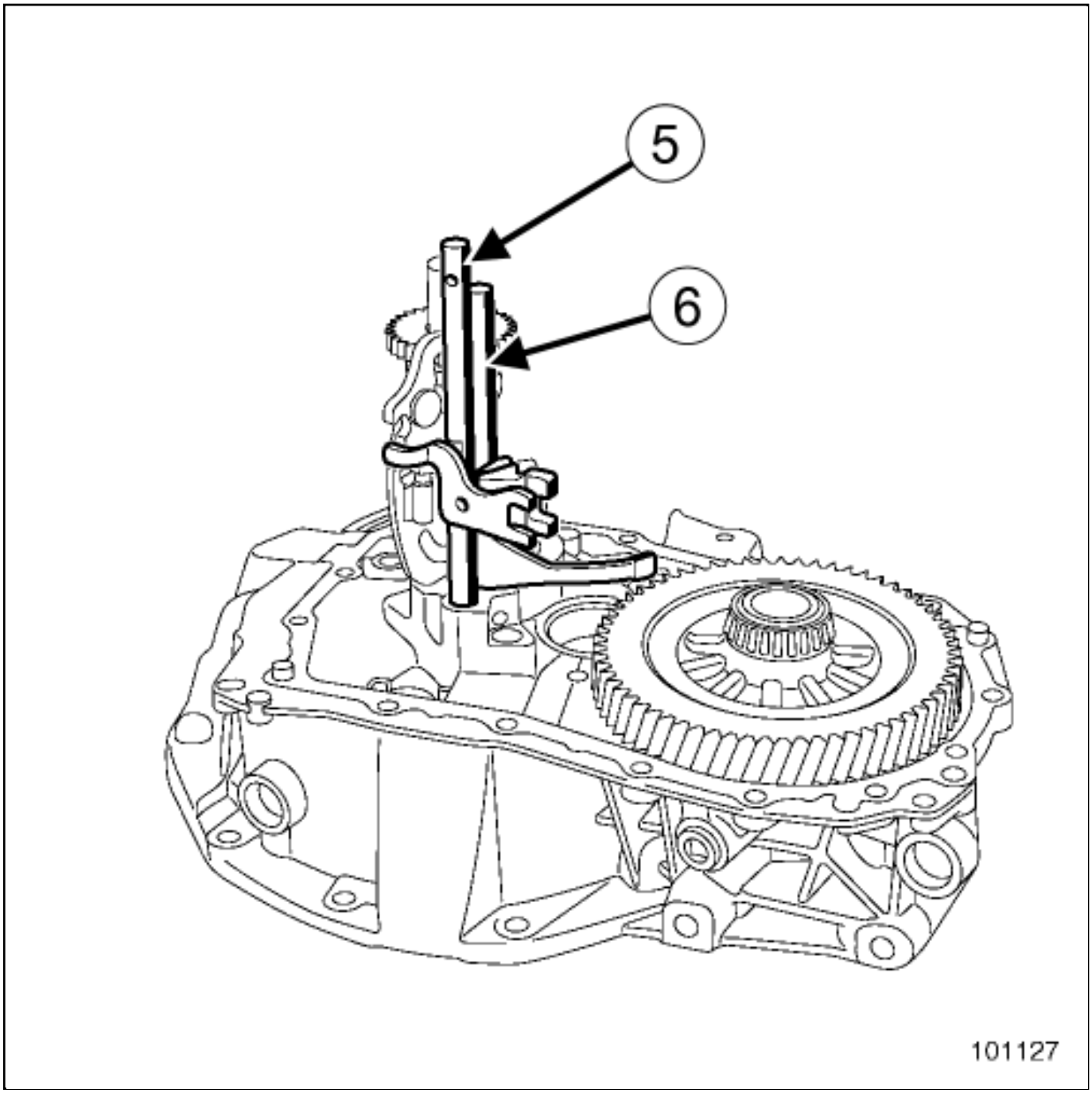
- Remove the third-fourth gear "shaft - fork and selector rod" assembly(2) by lifting the input shaft slightly.



- Remove the input shaft(3) .

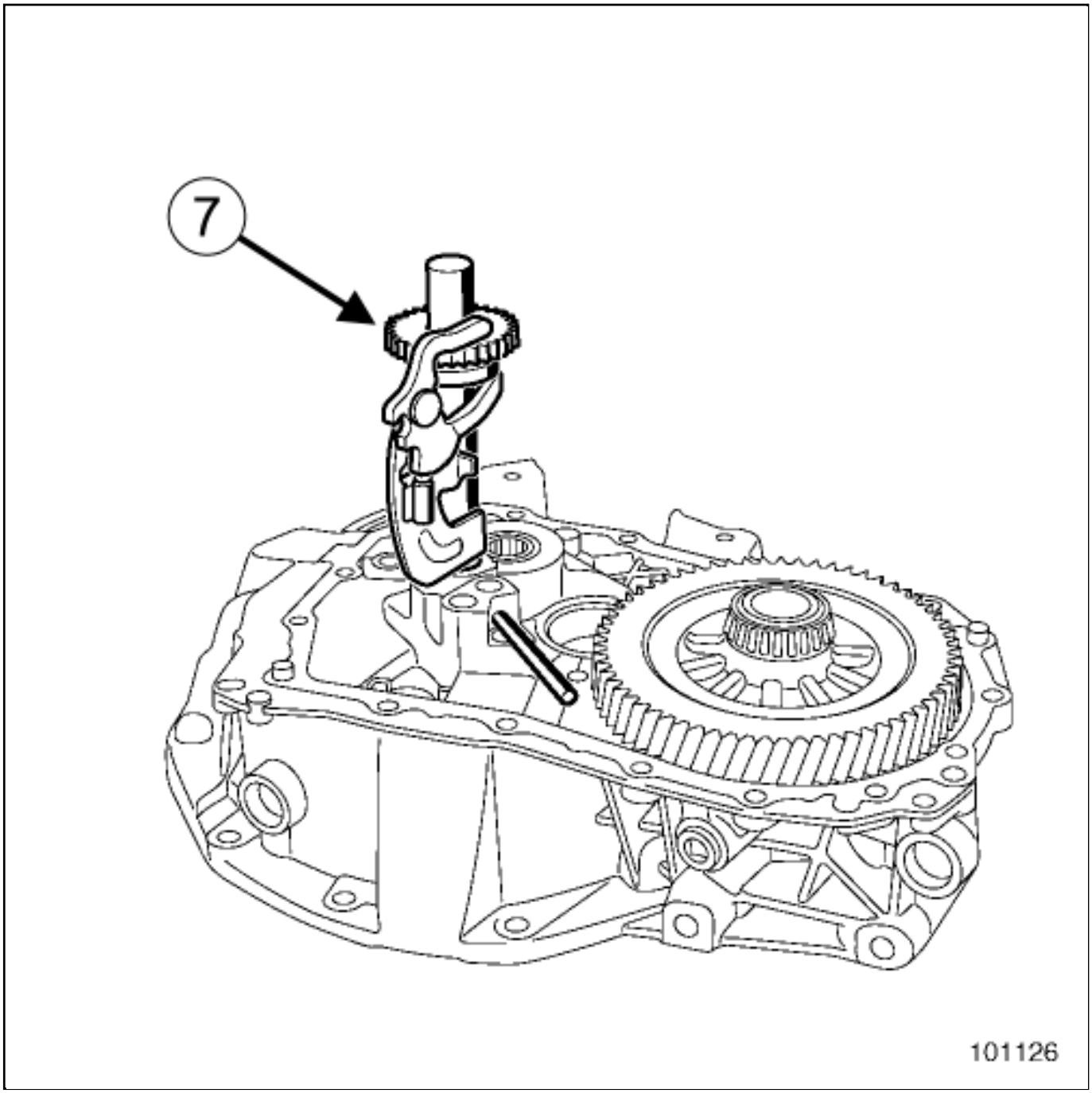


- Remove the output shaft(4) .



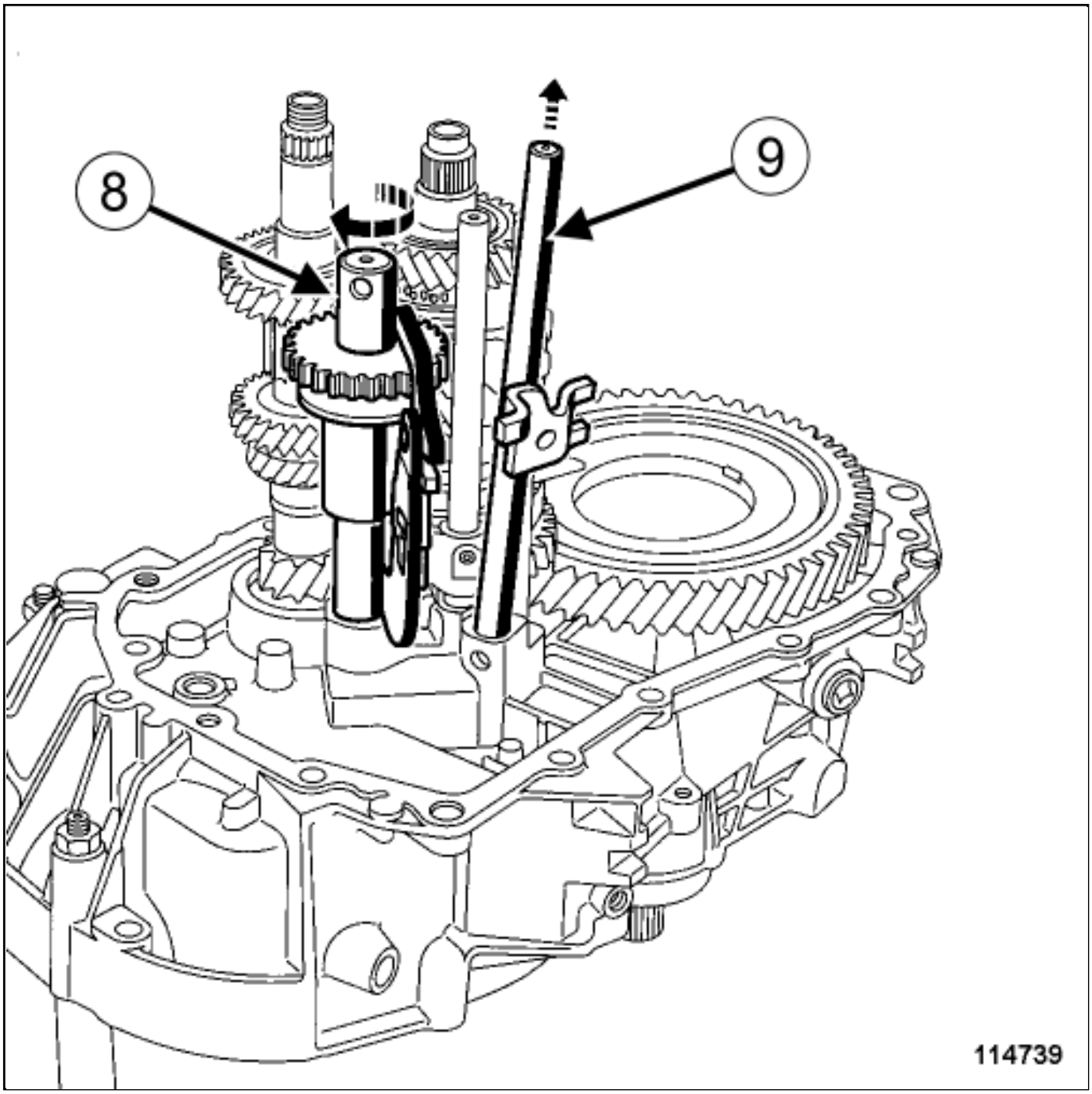
Remove:

- the first-second gear shaft and fork(**5**) ,
- the fifth gear shaft(**6**) .

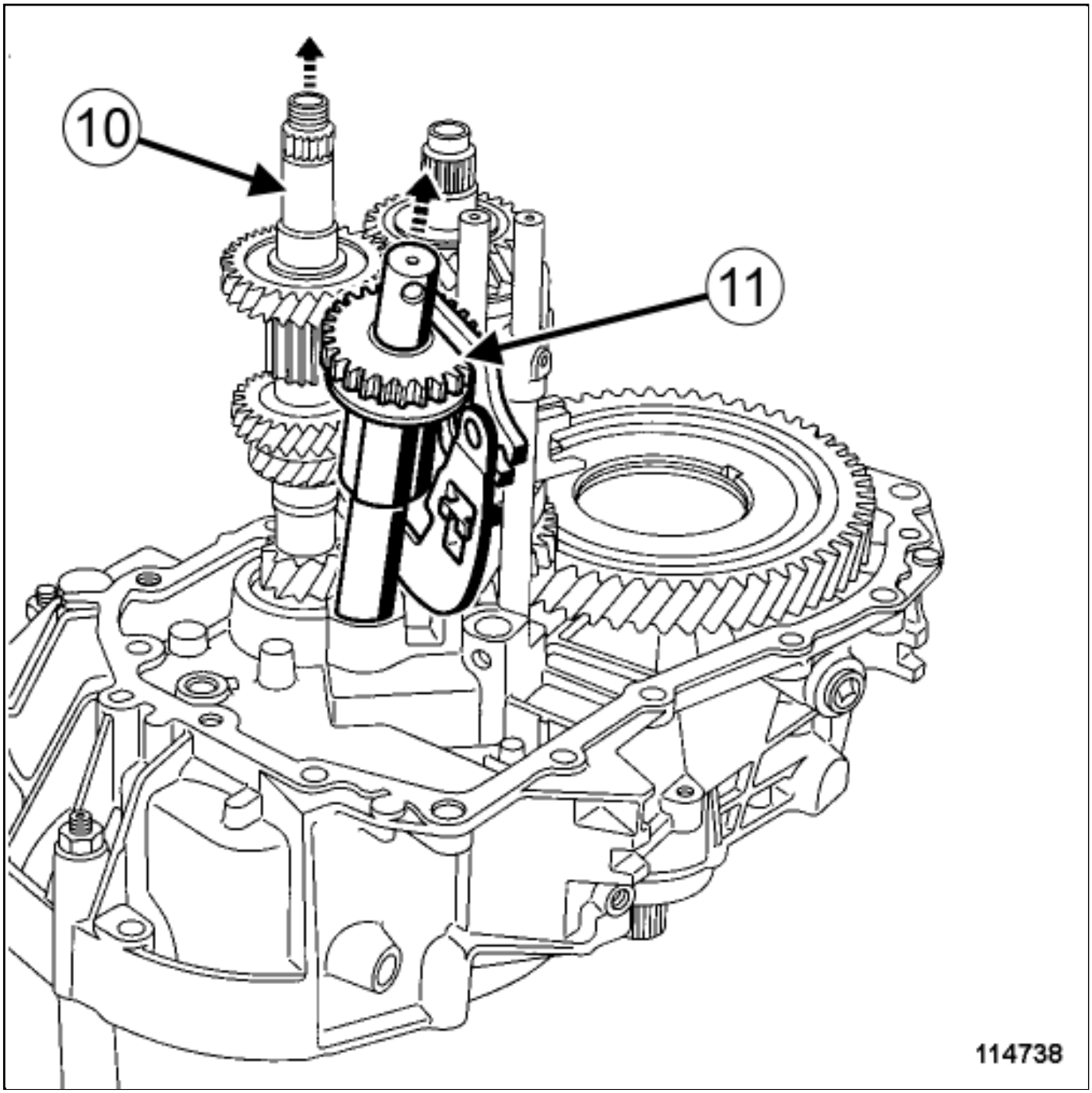


- Unpin the reverse gear assembly.
- Remove the reverse gear assembly(7) .

2- OPEN DIFFERENTIAL GEARBOX



- Turn the reverse gear shaft(8) in the direction of the arrow.
- Remove the fifth gear shaft(9) .



- Lift the input shaft slightly(10) .

- Remove the reverse gear shaft(11) .

REFITTING

1. REFITTING PREPARATION OPERATION

Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean:

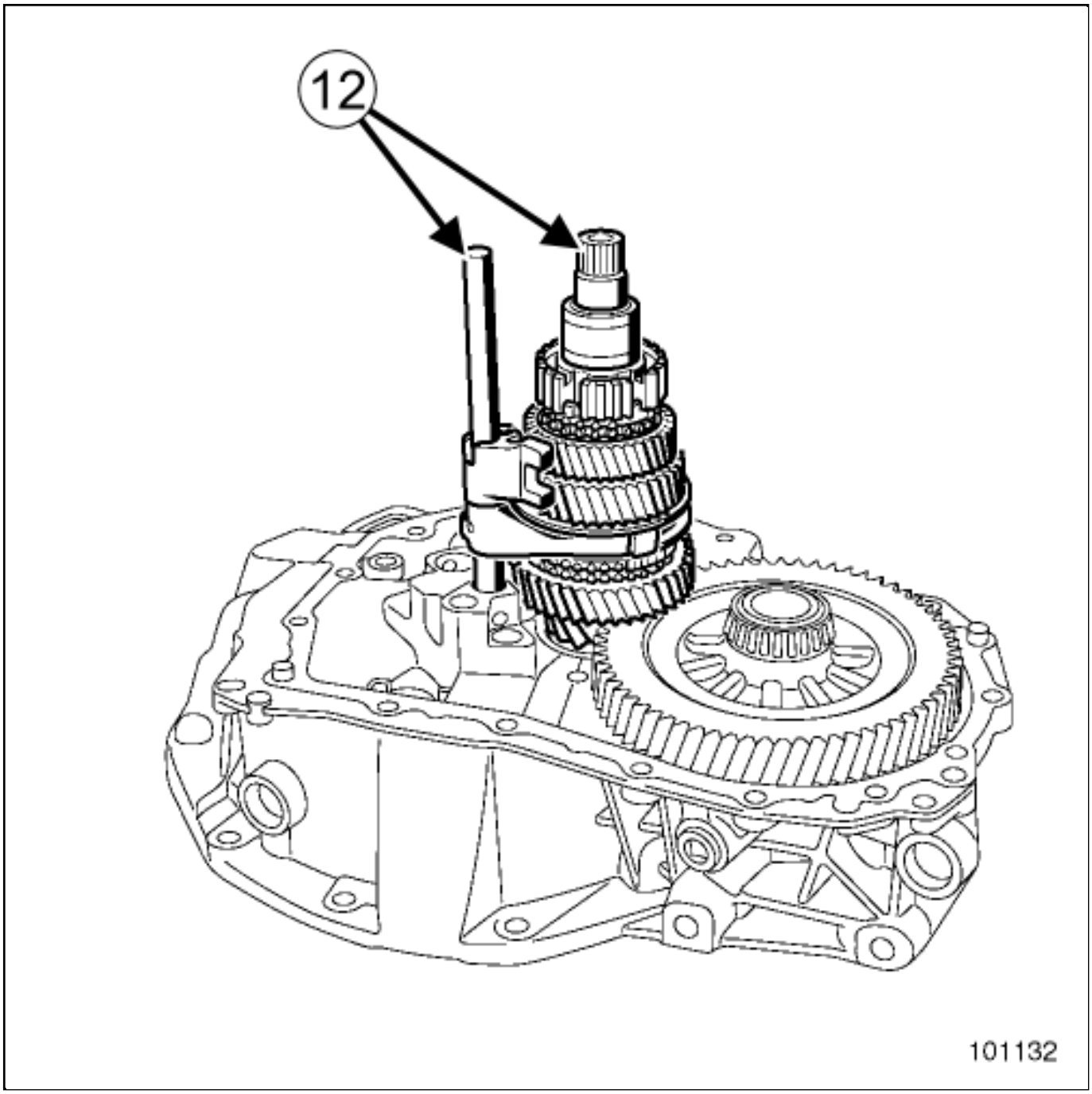
- the shafts,
- the shaft mating surfaces,
- the mechanism housing.

Parts always to be replaced:

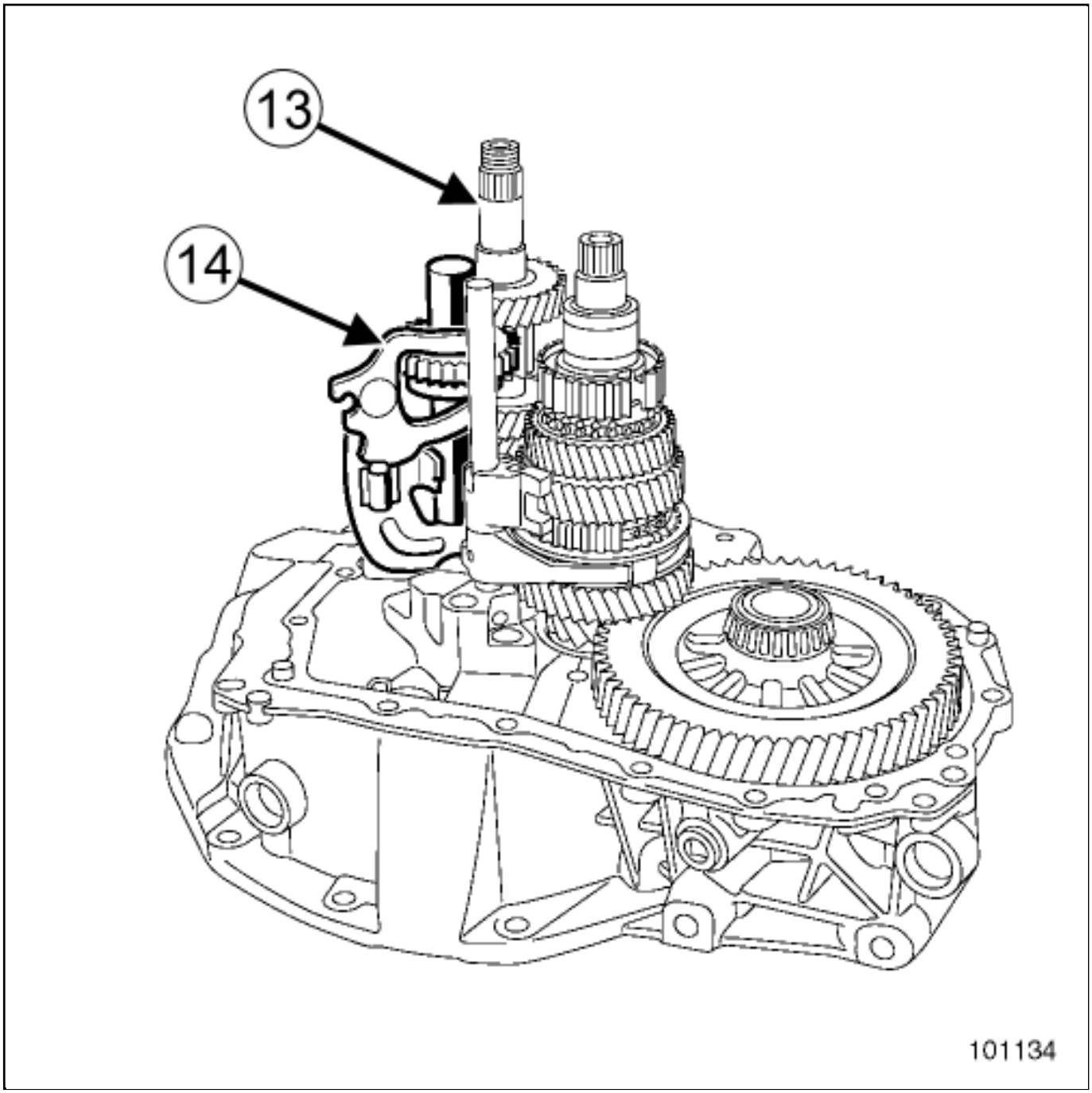
- the lip seals,
- the O-rings,
- the clutch thrust bearing guide,
- the gear lock rings,
- the roll pins,
- the input and output shaft bearing circlips,
- the selector rod hub springs,
- the hydraulic clutch slave cylinder (if fitted),
- the magnet.

2. REFITTING OPERATION FOR PART CONCERNED

1- CLOSED DIFFERENTIAL GEARBOX

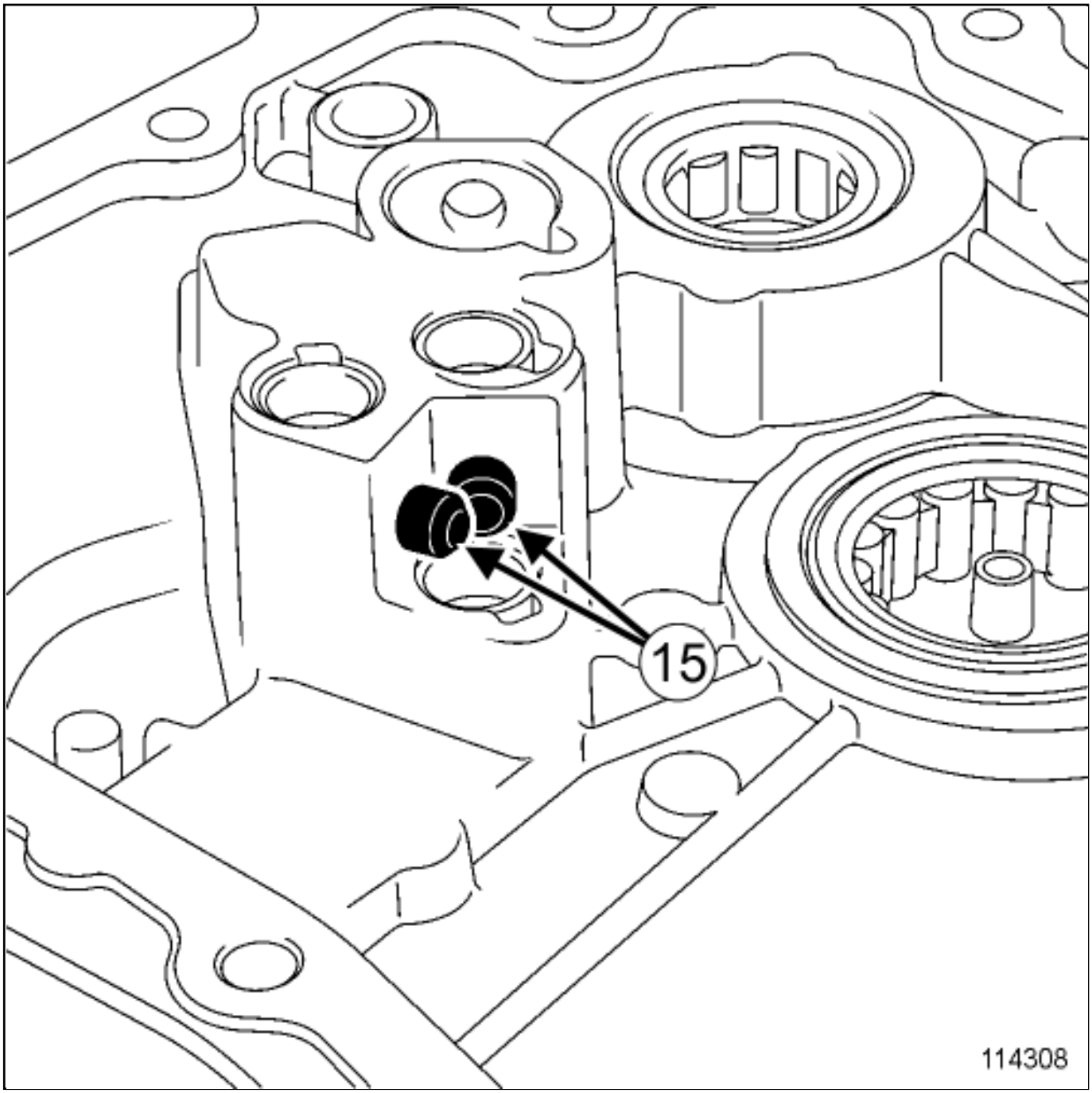


Refit the output shaft equipped with the first-second" gear fork(12)

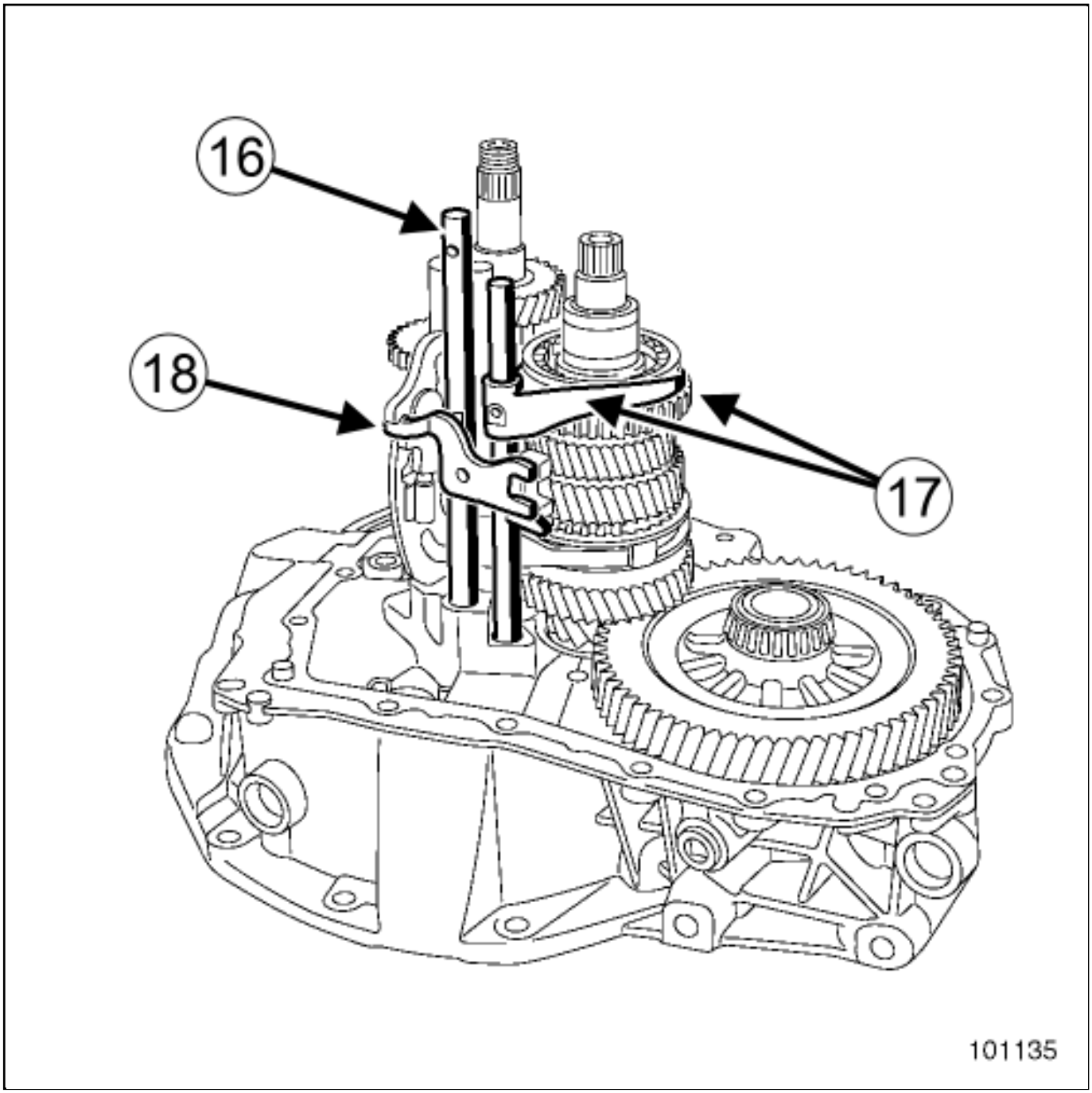


Refit:

- the input shaft(**13**) ,
- the reverse gear assembly(**14**) .

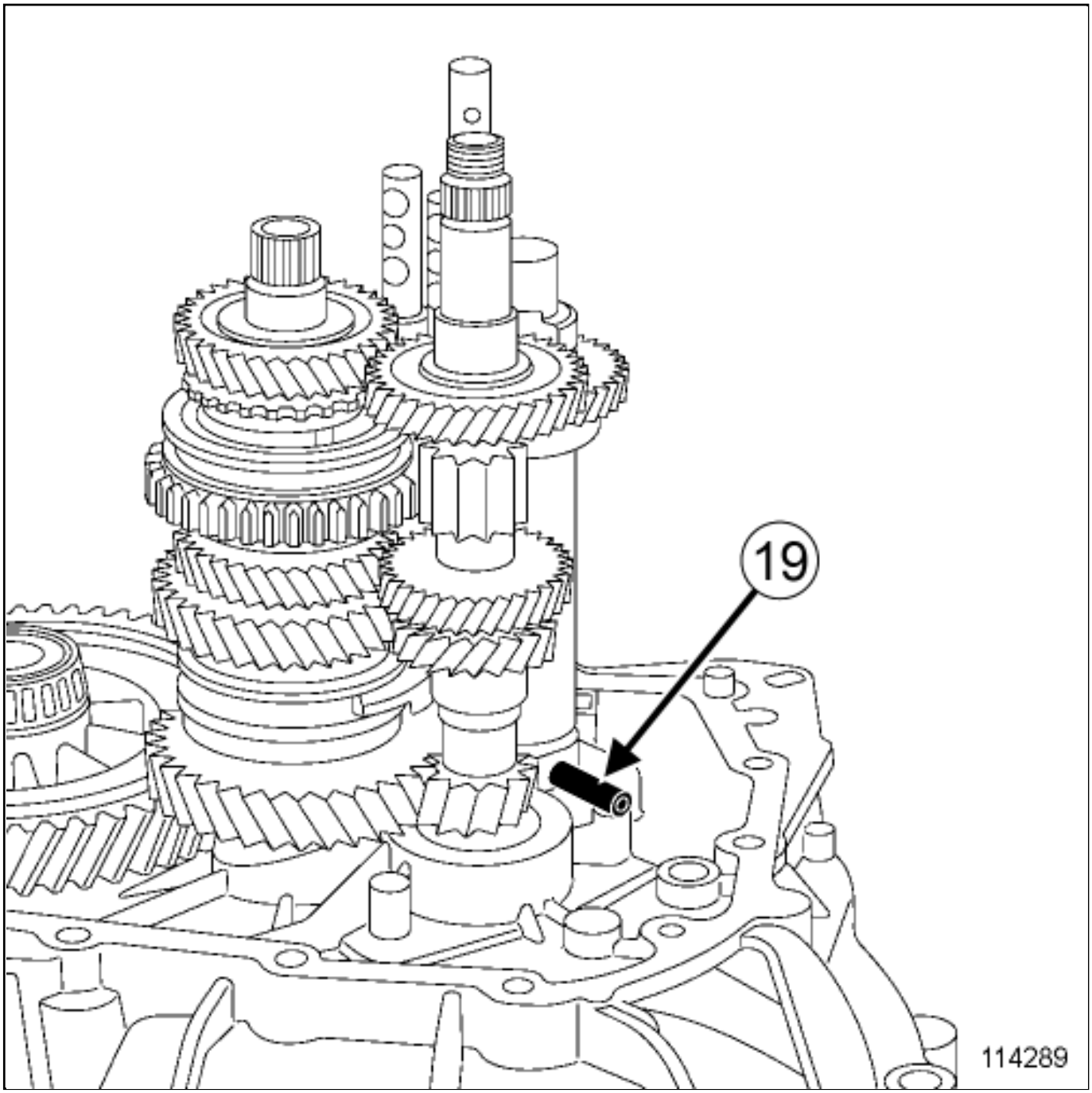


Refit the inhibitor shafts(15) .

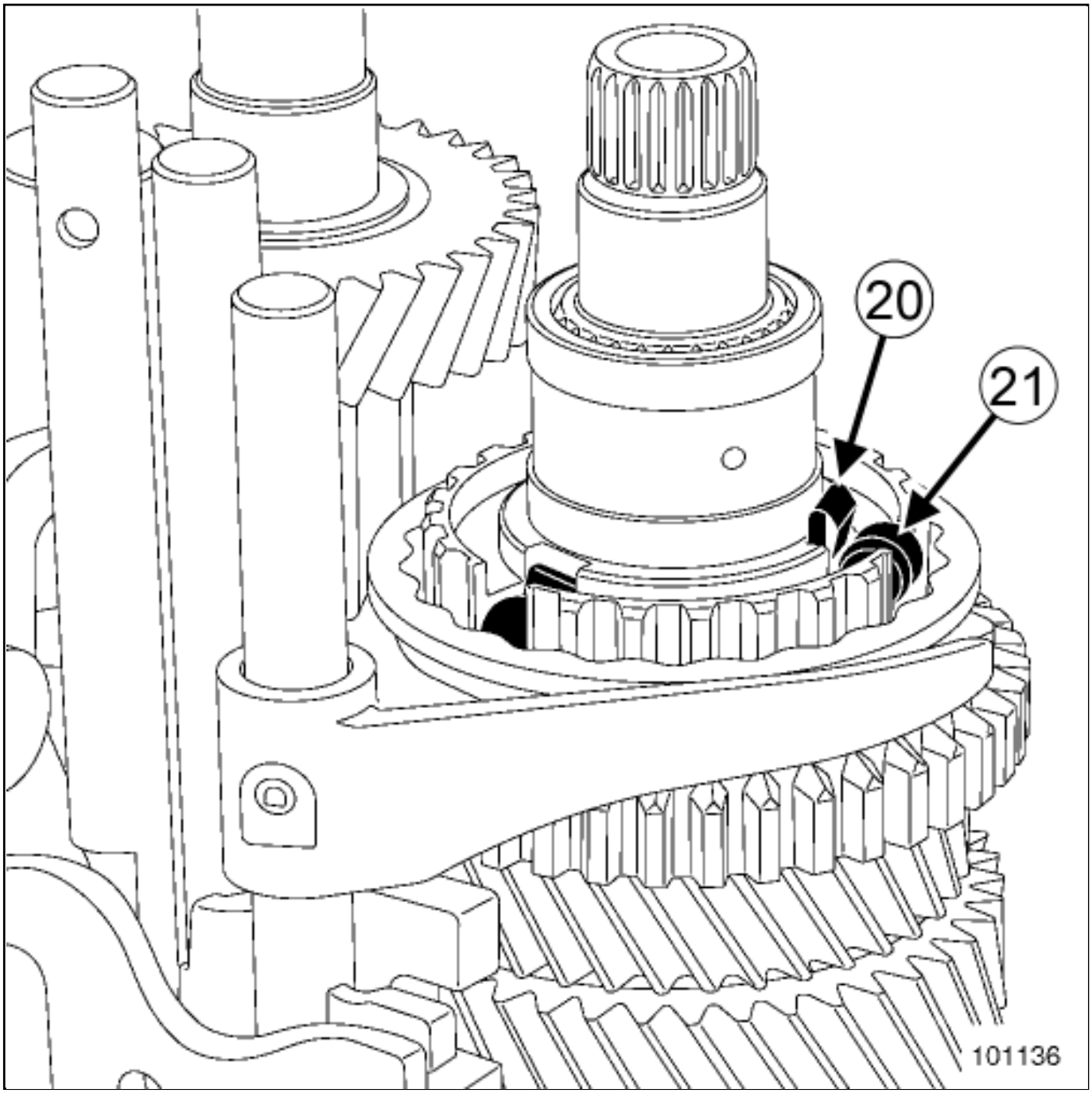


Refit:

- the fifth gear shaft(16) ,
- the third-fourth gear "selector rod - fork" assembly(17) ,
- turn the reverse gear shaft to position the fifth gear fork in the reverse gear shaft recess(18) .



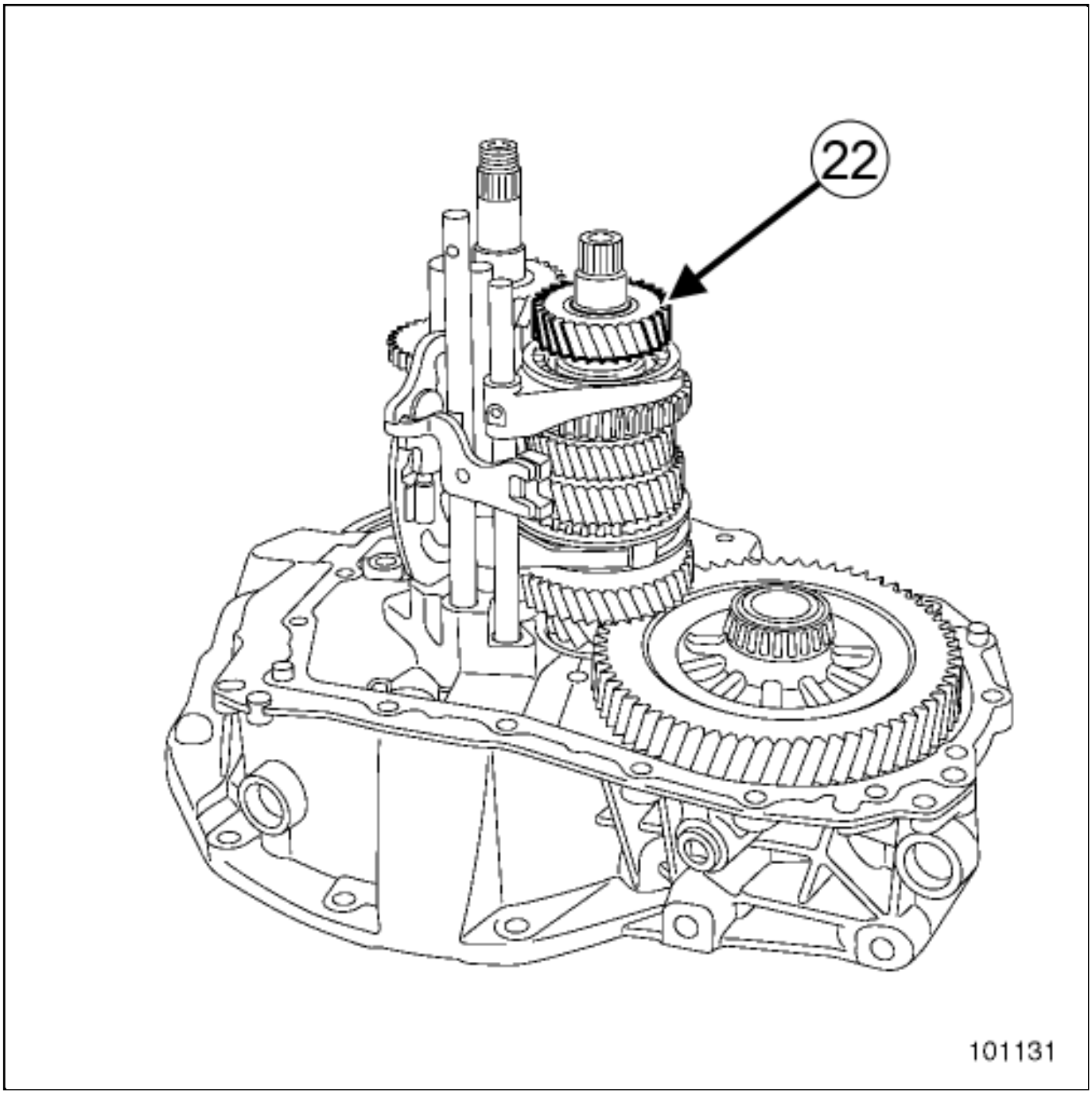
Pin the reverse gear shaft(19) .



Engage third gear.

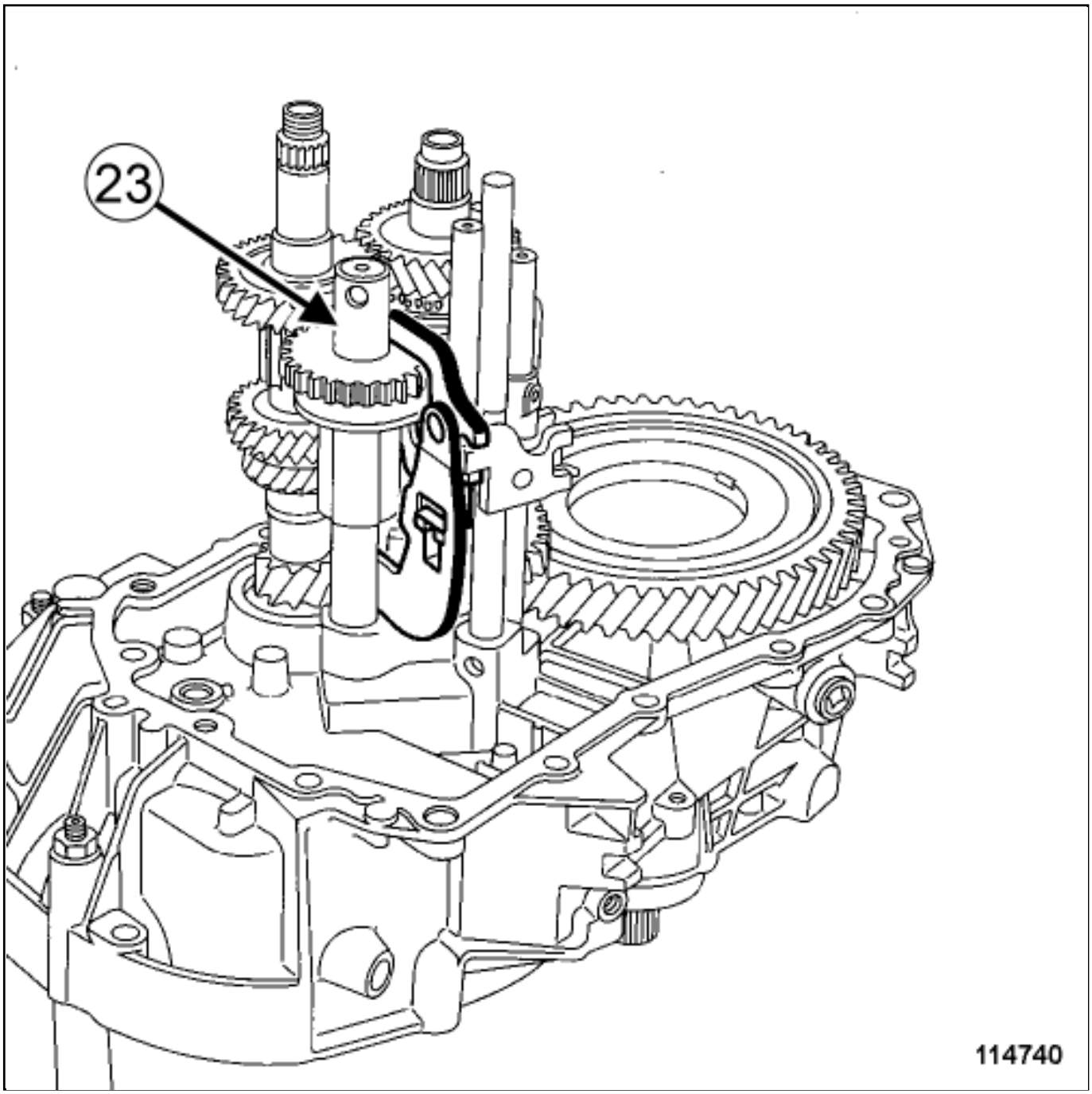
Insert:

- the springs(**20**) ,
- the rollers(**21**) .

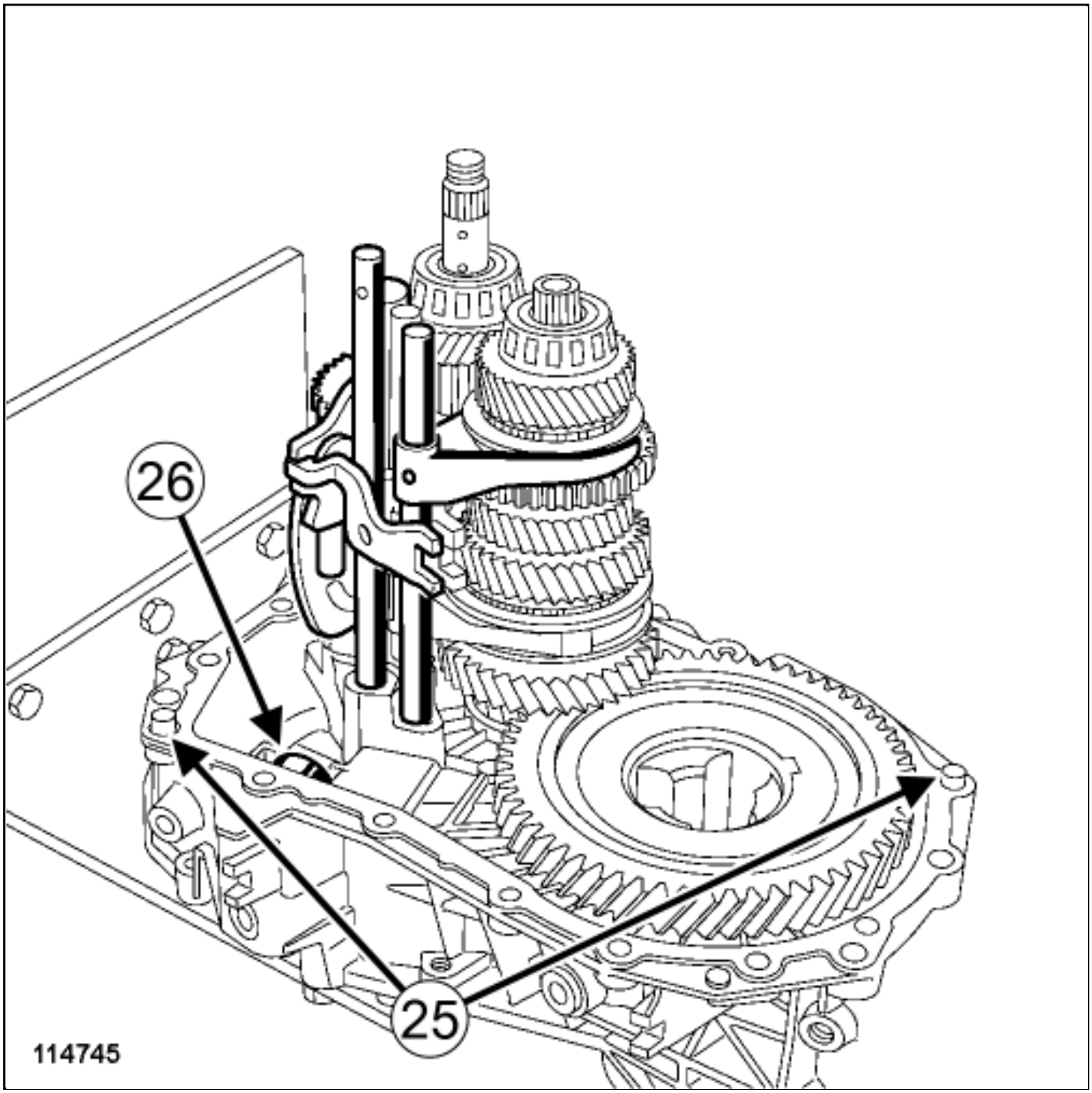


Refit:

- the fourth gear pinion(**22**) with its synchroniser,
- the setting washer,
- the output shaft bearing.



Refit the reverse gear shaft(23) by lifting the input shaft.



Be sure to fit:

- of the centring dowels(**25**) ,
- of the magnet(**26**) .

Refit:

- the adjusting washer,
- the tapered bearings.

Refit:

- the mechanism housing (see 21A, Manual gearbox , Mechanism housing: Removal - Refitting) ,
- the fifth gear synchroniser and pinions 5th gear sprockets and synchronisers: Removal - Refitting ,
- the fifth gear housing 5th gear housing: Removal - Refitting .

Remove the gearbox from the component support (see 21A, Manual gearbox , Gearbox support equipment: Use) .

Refit the gearbox Manual gearbox: Removal - Refitting .

REVERSE GEAR SWITCH: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Socket for removing/refitting reverse gear switch	Bvi. 1934

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair** .

REMOVAL

1. REMOVAL PREPARATION OPERATION

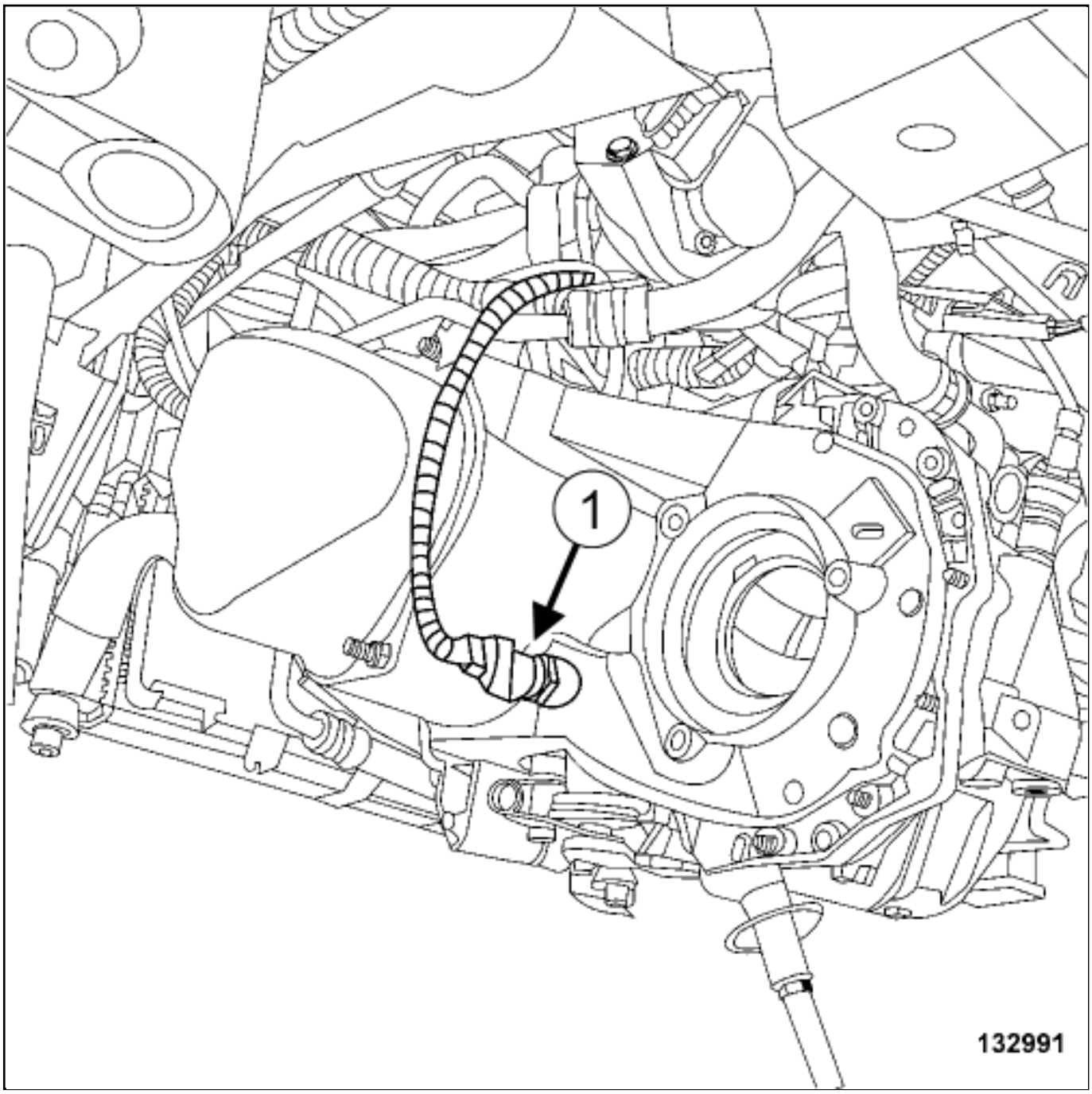
- Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .

- Remove:
  - the front left-hand wheel**Wheel: Removal - Refitting** ,
  - the front left-hand wheel arch side liner**Exterior body front trim assembly: Exploded view** .

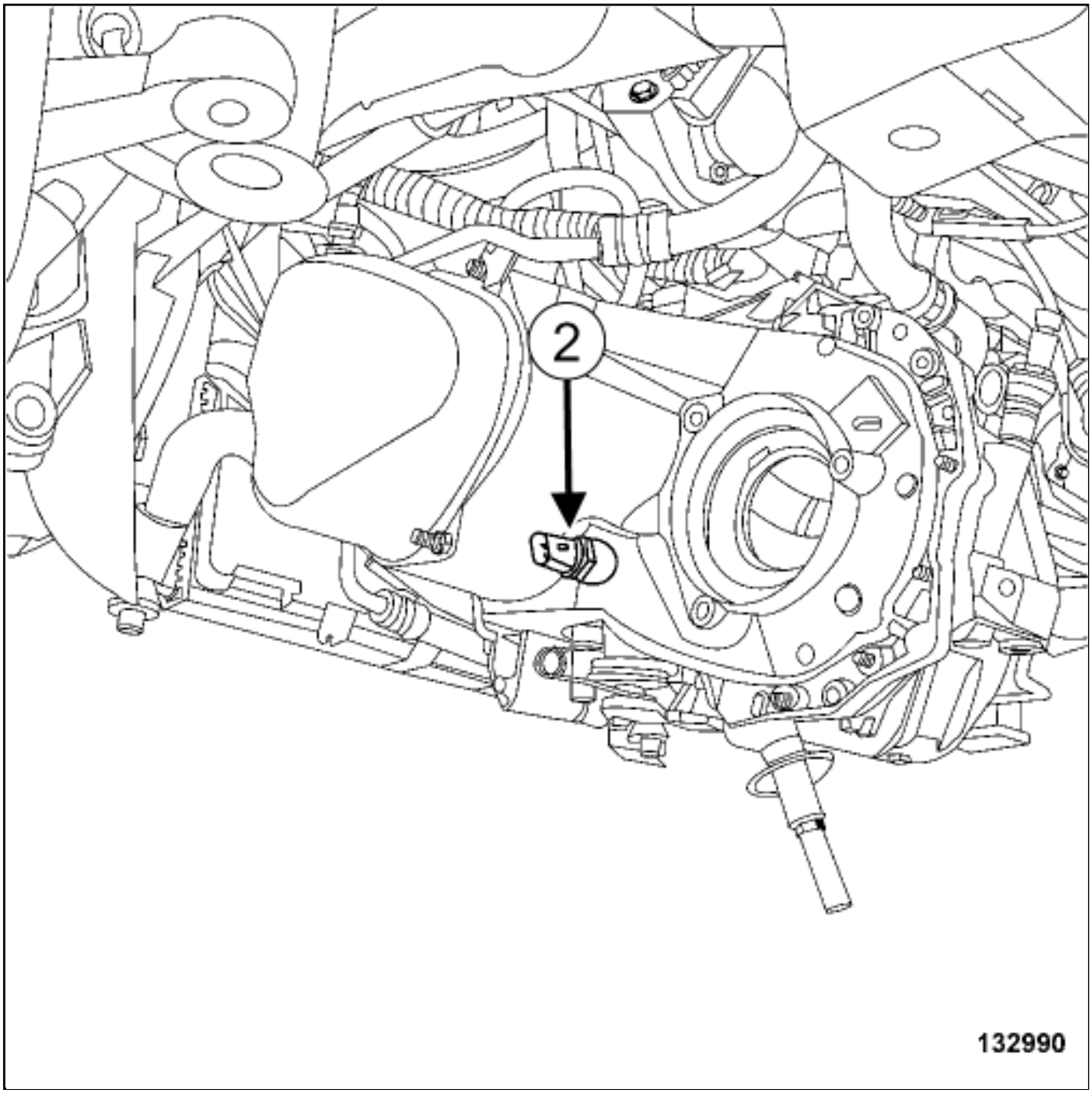
- Remove the engine undertray.

- Drain the gearbox**(see 21A, Manual gearbox , Manual gearbox oils: Draining - Filling)** .

2. REMOVAL OPERATION



- Disconnect the connector(1) from the reverse gear switch.



❑ Remove the reverse gear switch(2) using the Socket for removing/refitting reverse gear switch(Bvi. 1934) .

Note:

Seal the housing of the reverse gear switch while replacing the part.

REFITTING

1. REFITTING OPERATION

- Apply some silicone adhesive sealant Vehicle: Parts and consumables for the repair to the threading of the reverse gear switch.
- Refit the reverse gear switch using theSocket for removing/refitting reverse gear switch(Bvi. 1934) .
- Torque tighten the reverse gear switch23 N.m.
- Connect the reverse gear switch connector.

2. FINAL OPERATION

- Fill the gearbox(see 21A, Manual gearbox , Manual gearbox oils: Draining - Filling) .
- Proceed in the reverse order to removal.

RIGID BRAKE PIPE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
pedal press

parts always to be replaced:
rigid brake pipe clip

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 33A, Rear axle components, Rear axle components: Precautions for the repair) ,
- Brake circuit: Precautions for the repair ,
- Vehicle: Precautions for the repair .

CAUTION

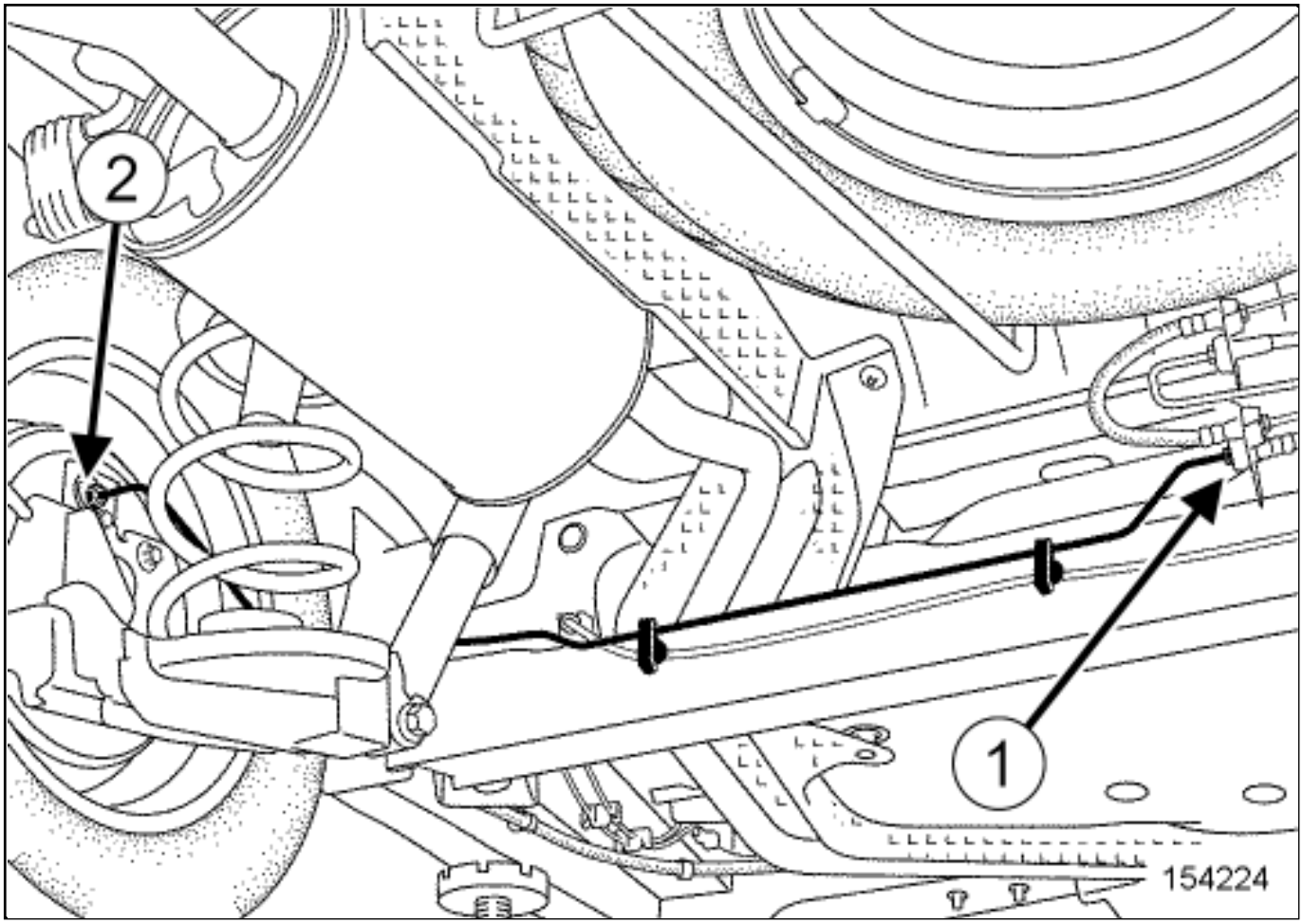
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Fit the pedal pressto the brake pedal to limit the amount of brake fluid running out.
- Remove the rear wheelWheel: Removal - Refitting .

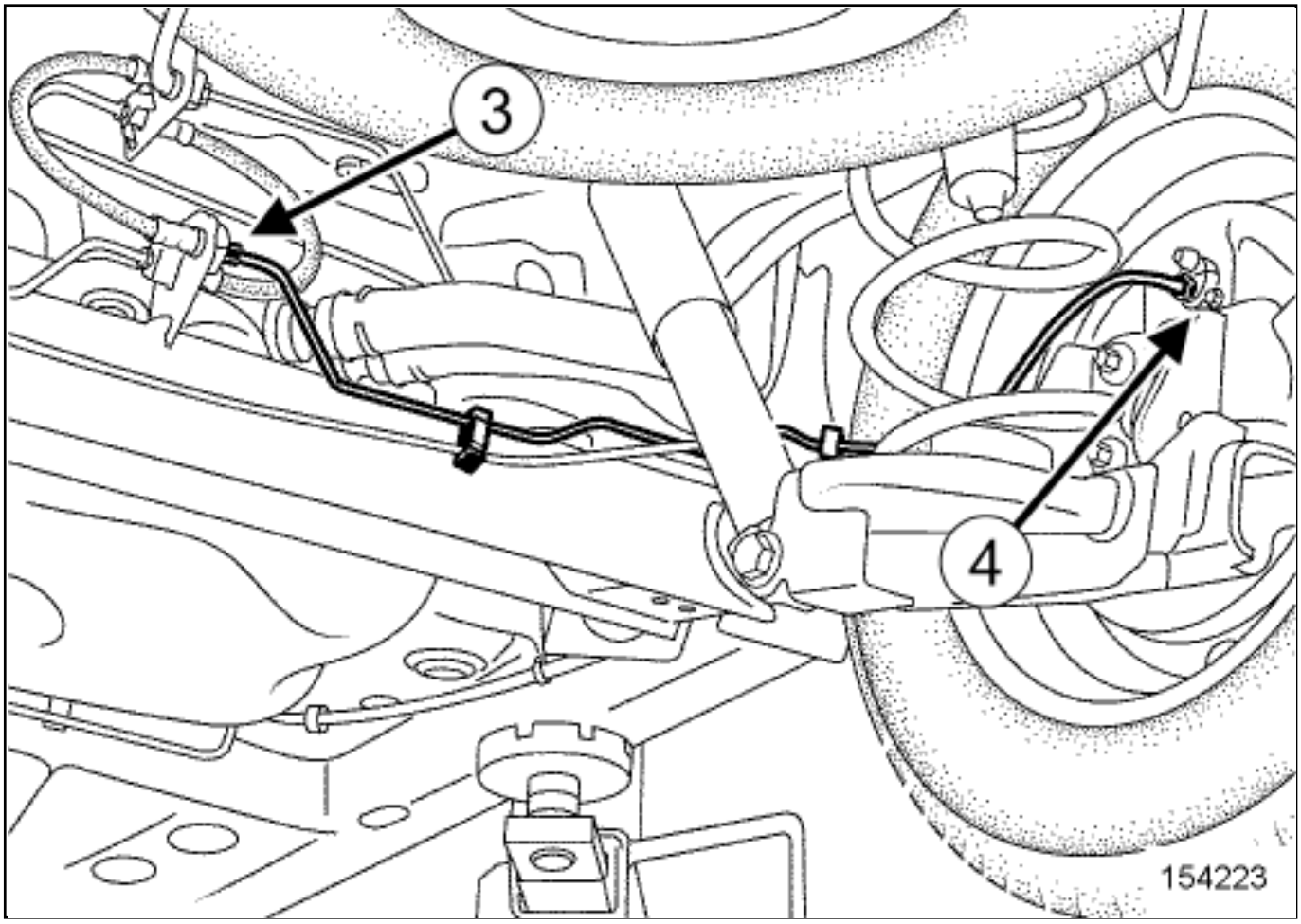
2. REMOVAL OPERATION



- Unscrew:
  - the rigid pipe union on the brake hose(1) ,
  - the rigid brake pipe union on the rear brake cylinder(2) .

- Unclip the rear axle rigid brake pipe.

- Remove the rear left-hand rigid brake pipe.



- Unscrew:
  - the rigid brake pipe union on the rear axle brake hose(3) ,
  - the rigid brake pipe union on the rear brake cylinder(4) .

- Unclip the rear axle rigid brake pipe.

- Remove the rear right-hand rigid brake pipe.

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: rigid brake pipe clip.

2. REFITTING OPERATION

- Refit the rear rigid brake pipes in their original positions.

- Clip the rear rigid brake pipes on the rear axle.

- Fit without tightening:
  - the rigid brake pipe unions on the brake cylinders,
  - the rigid brake pipe unions on the rear brake hoses.

- Torque tighten:
  - the rigid brake pipe unions on the brake cylinders (see 33A, Rear axle components, Rear drum brake assembly) ,
  - the rigid brake pipe unions on the rear brake hoses Brake circuit: Tightening torque .

3. FINAL OPERATION

- Refit the rear wheel Wheel: Removal - Refitting .

- Remove the tool pedal press from the brake pedal to limit the outflow of brake fluid.

- Bleed the brake circuit Braking circuit: Bleed .

RIGID BRAKE PIPE: REPAIR

Note, one or more warnings are present in this procedure

Equipment required
compressed air nozzle

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

This procedure applies to copper pipes diameter 4.7 mm.

Note:

- This procedure does not apply to:
  - hybrid pipes (pipe + hose),
  - pipes with diameters 6 mmand 8 mm.

The tightening torques specified in this method only apply to refitted pipes. In the case of factory-fitted pipes (pipes not refitted), refer to the tightening torque procedure(see 30A, General information, Brake circuit: Tightening torque) .

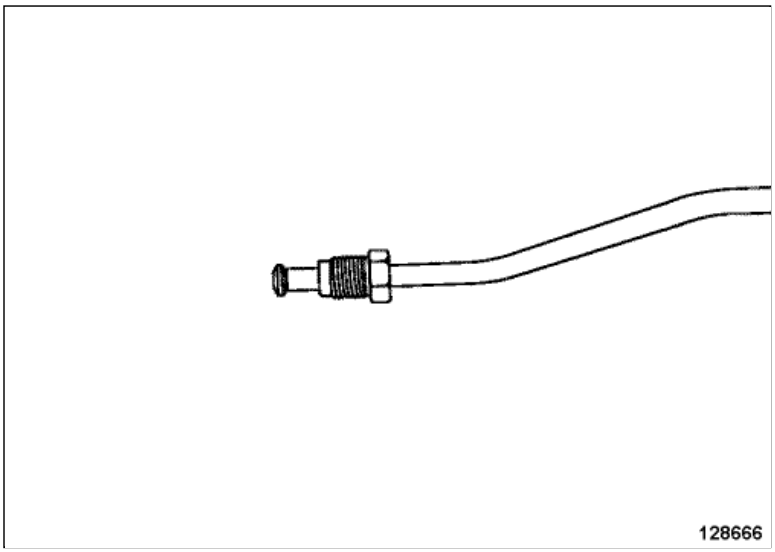
REPAIR

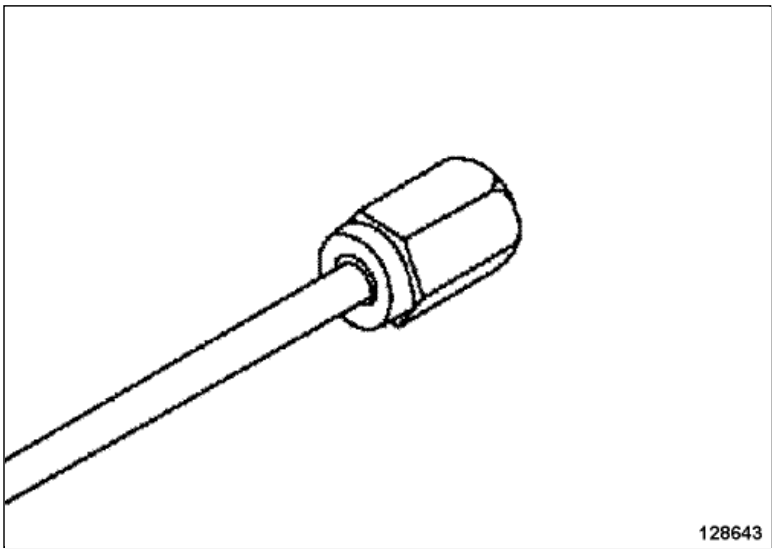
1. PIPE PREPARATION OPERATION

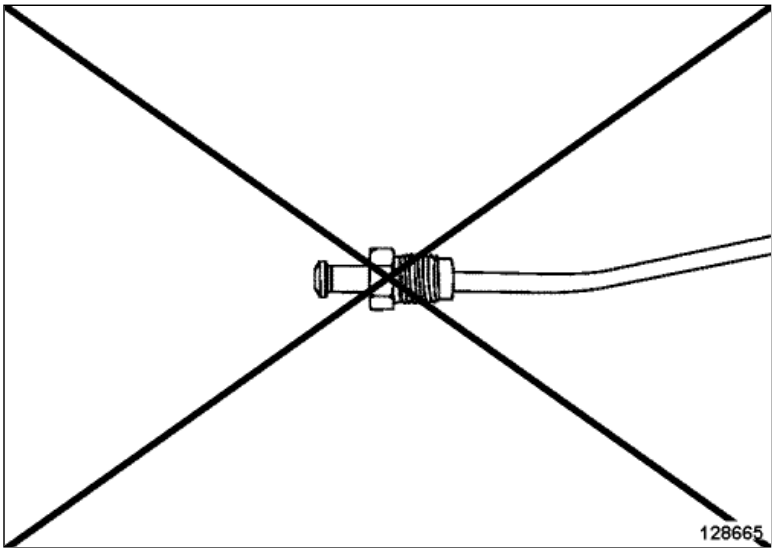
CAUTION

To avoid causing a breakdown in hydraulic brake circuit , do not squash or bend the rigid pipe when cutting.

- Cut the pipe at the desired length using a pipe cutter.







- Put the nuts or bolts on the pipe before forming the rivets.

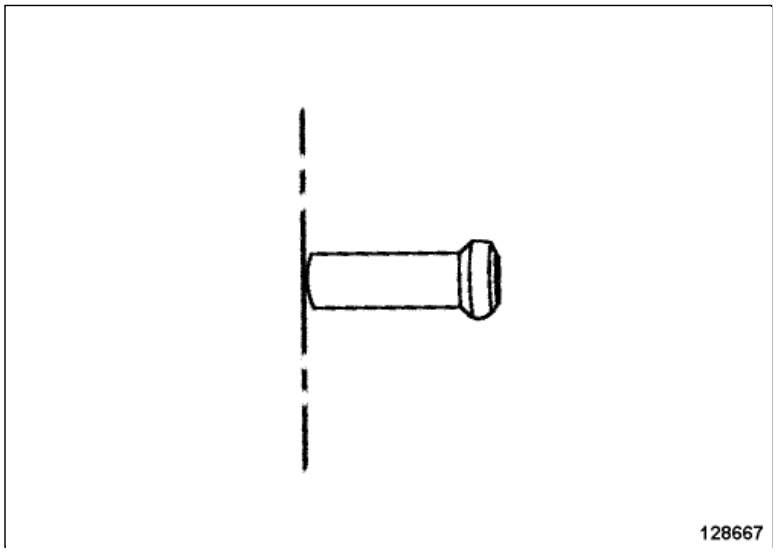
2. MAKING THE RIVETS

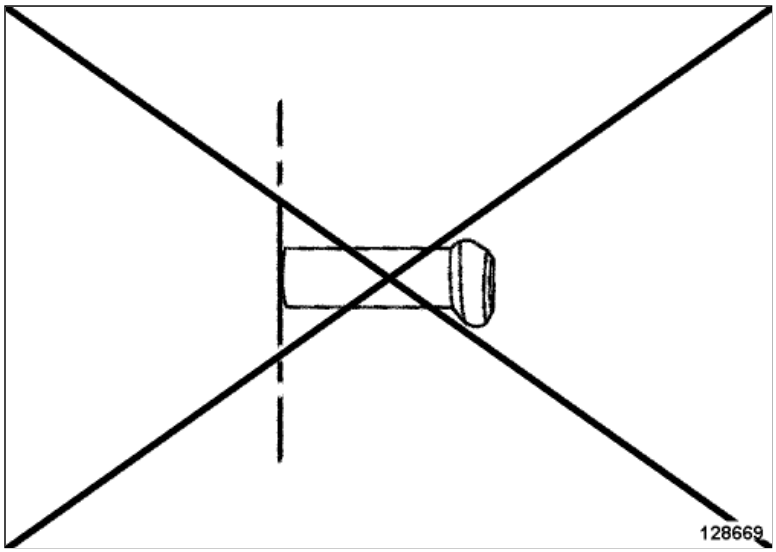
Note:

To make the rivets, fit the rivet press in a vice.

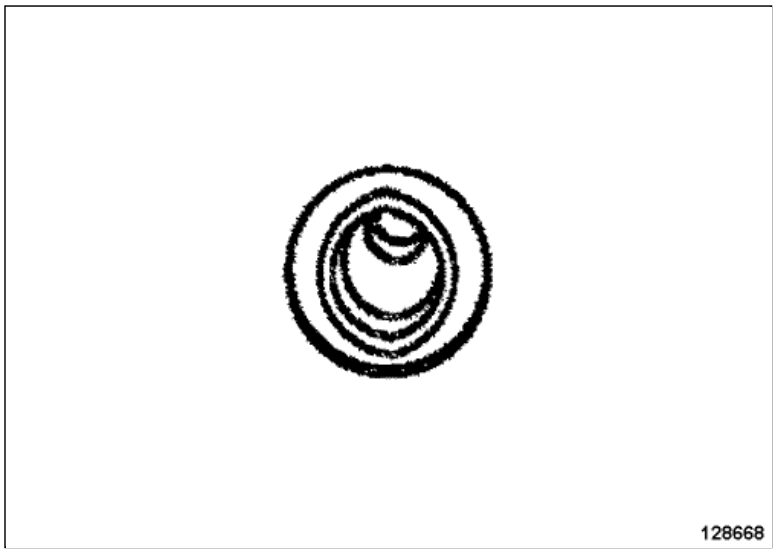
- Fit the pipe in the rivet press.
- Adjust the length of the pipe to be shaped.
- Torque tighten the press end piece (40 N.m).

3. CHECKING THE RIVETS

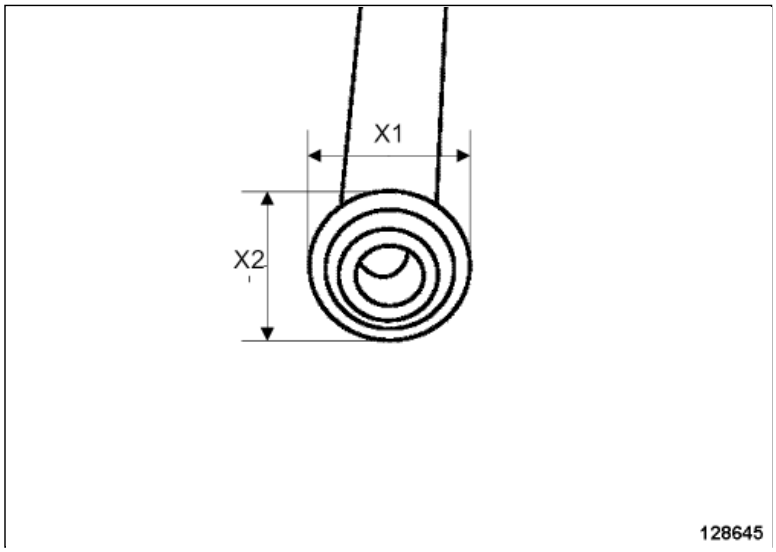




- Visually inspect:
  - the uniformity of the rivets' diameter,
  - the rivet centring in relation to the pipe shaft.



- Visually check that the internal diameter of the pipe is not oval-shaped.



- Check that the diameter of the end panel is not oval shaped using a sliding calliper.

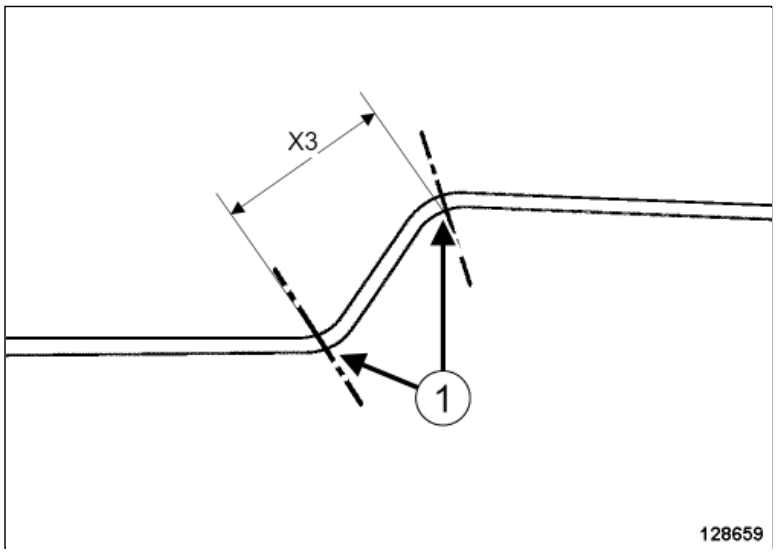
Correct diameter if(X1) = (X2)

4. PREPARATION OF THE PIPE BEFORE BENDING

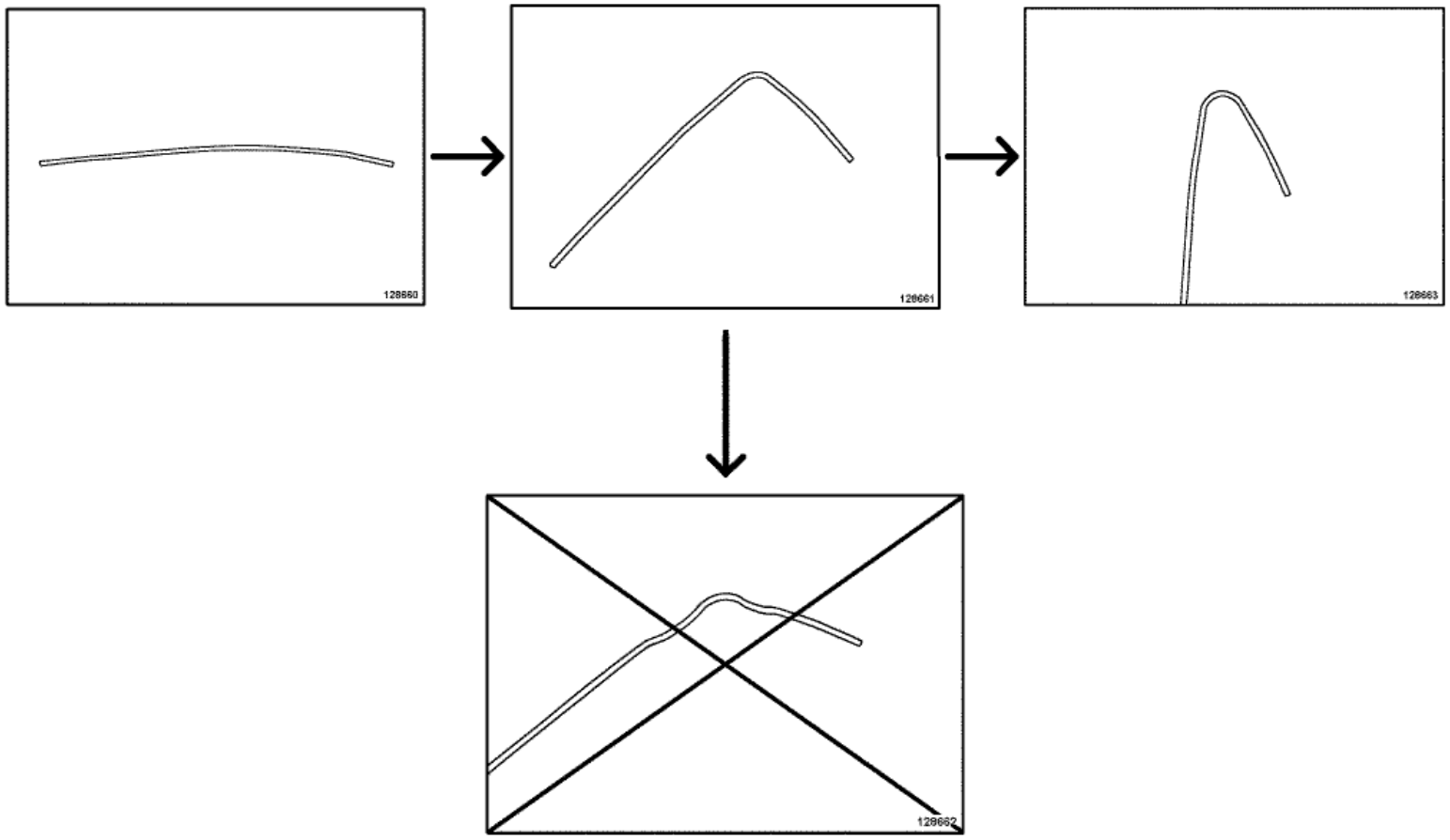
Note:

Impurities may spread inside the pipe while the rivets are being made.

- Blow inside the pipe in both directions using a compressed air nozzle.
- Put plugs on the bolts or nuts at the ends of the pipe.
- Put the original pipe on a flat base plate that is the length of the pipe.



- Measure the dimensions(X3) (in mm) curve after curve, between each curve radius "centre"(1) of the old pipe.



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CAUTION

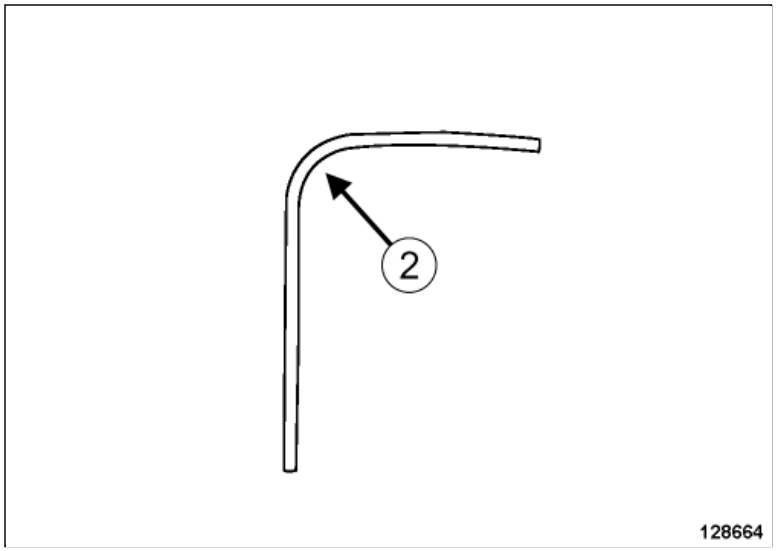
To avoid weakening the pipe, either bend once or bend progressively by increasing the bend (that is, by continually decreasing the curve radius). Do not install a rigid pipe on a vehicle that may have been bended and then unbended alternatively to reach the correct curve radius.

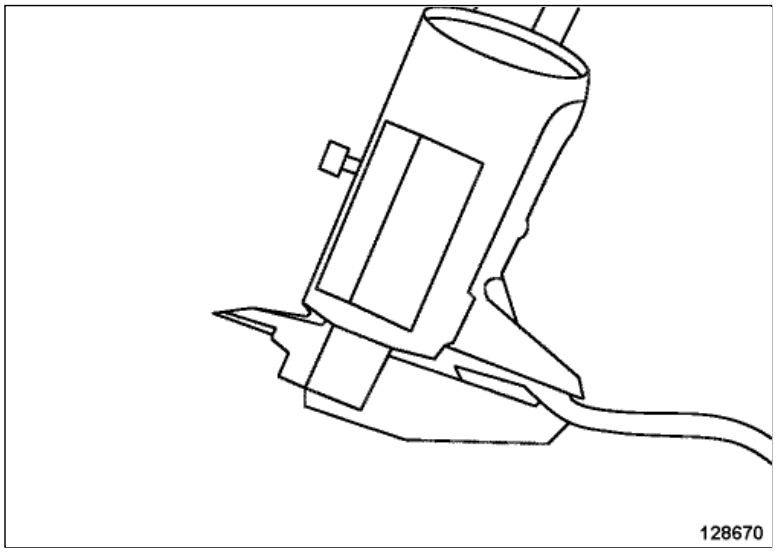
Note:

During the bending operation, the required angle should be passed slightly in order to compensate for material elasticity.

- Shape the pipe using a bender, curve after curve, while respecting the original shape of the pipe.

5. CHECKING BENDING





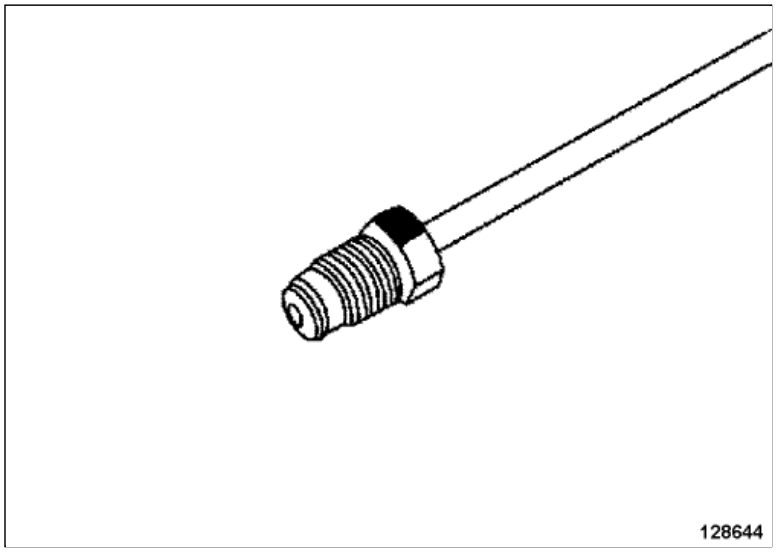
- Check the out-of-roundness of the outer diameter at the centre of the curve radius(2) using a sliding calliper (the out-of-roundness of the outer diameter is correct if it is less than 10% flattening):
  - nominal diameter of the pipe: 4.75 mm,
  - minimum diameter after bending: 4.30 mm.

6. REFITTING THE PIPE

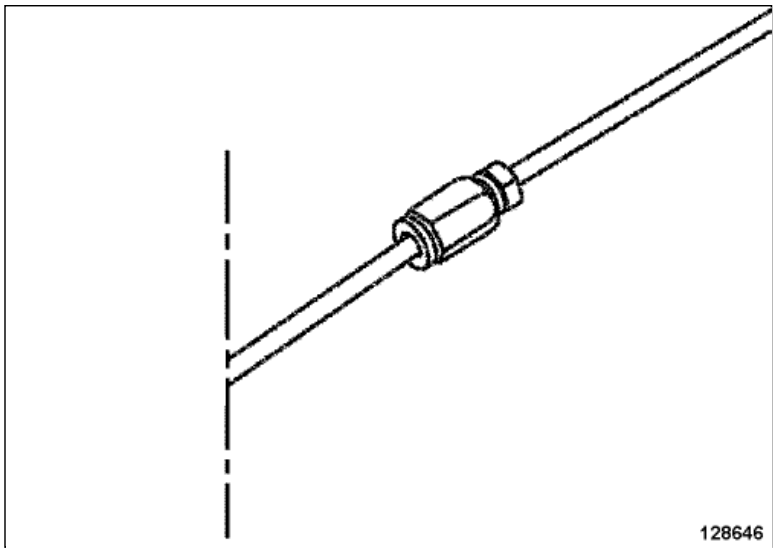
Note:

- When refitting the rigid brake pipe:
  - respect the original routing as much as possible,
  - adjust the pipe routing by hand when fitting inside the clips.

CAUTION
Contact points between the rigid brake pipe and the surrounding components could cause damage to the pipe. In order to avoid these contacts, adjust the pipe routing by hand.



- Torque tighten the brake pipe bolts14 N.m.



- Torque tighten the underbody unions (female/male)10 N.m.

RIM POLYURETHANE BODYWORK COMPONENT: PREPARATION AND PAINT RANGE

Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Note:

Before using the products, consult the manufacturer's technical sheet.

Note:

Never apply pre-treatment primer or primer filler on this type of material.

1. PRE PRIMED PARTS

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products). Wipe with a dry lint-free cloth.
3	Smooth	Grey pad soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products). Wipe with a dry lint-free cloth.
6	Rub with an adhesive pad	
7	Apply the paint finishing	
8	Dry	60 minat 45˚C(in order to avoid deforming the parts).

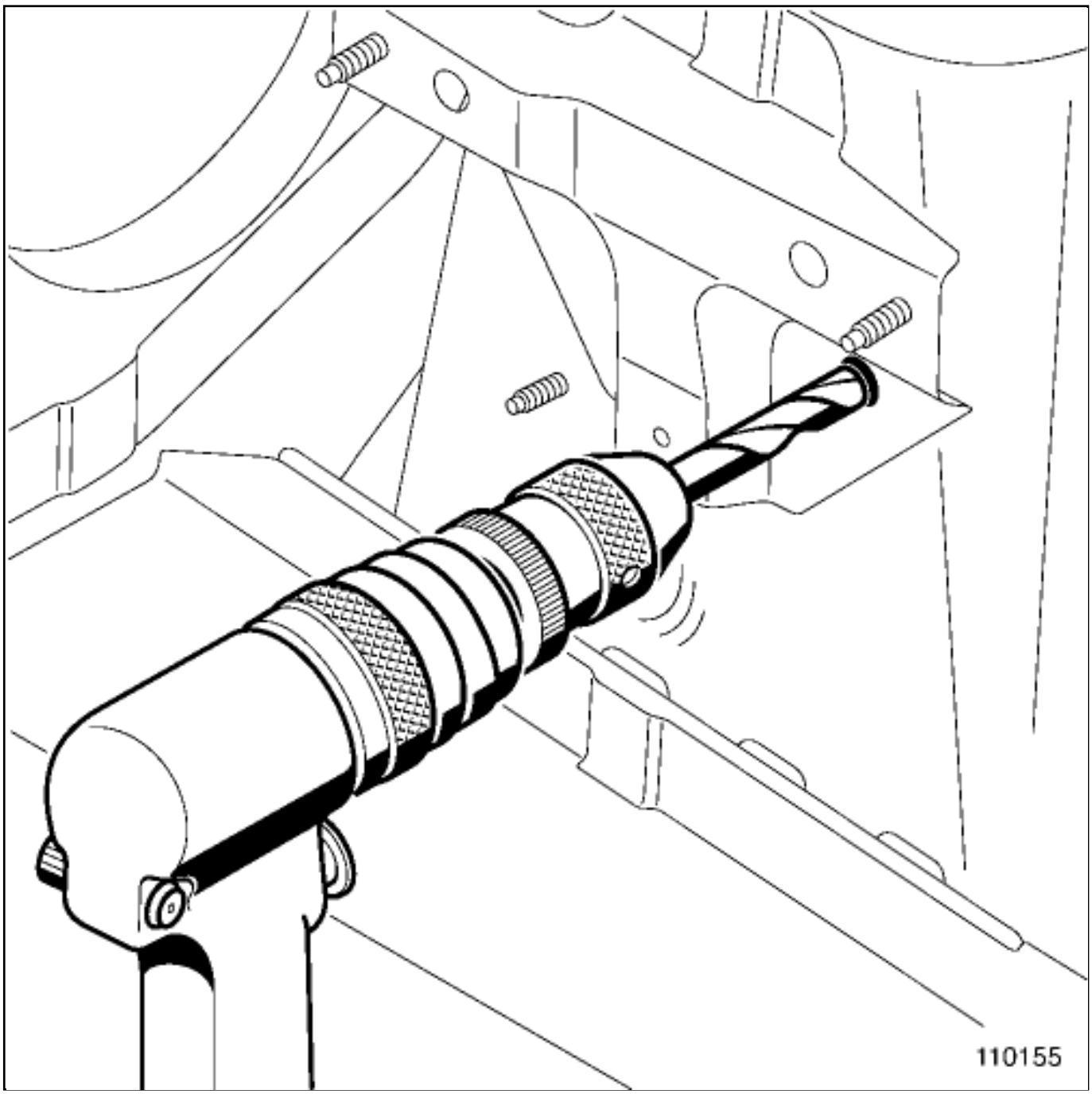
2. NON PRE-PRIMED PART

Steps	Description	Special notes
1	Internal and external washing with soapy water	Internal and external with soapy water. Rinsing in clean water.
2	Wipe / blow	
3	Degrease	Lint-free cloth soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products). Wipe with a dry lint-free cloth.
4	Smooth	Red rubber pad soaked in soapy water. Rinsing in clean water.
5	Wipe / blow	
6	Degrease	Lint-free cloth soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
7	Apply a bi-component primer	Apply wet on wetFortiaprimer or a flexibleLeviaprimer(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
8	Remove solvent / dry	20 minat 45˚C.
9	Sand	Rub down with the P800 abrasive sponge.
10	Degrease	Lint-free cloth soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
11	Eliminating porosities	If porosities, apply a finishing mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and repeat steps 6, 7, 8 and 9.
12	Apply the finishing paint	

13	Dry	60 minat 45˚C(in order to avoid deforming the parts).

RIVETEDCONNECTIONS

1. DISASSEMBLY



Remove the nail from the rivet head if still present.

Drill the rivet head using a drill bit which is slightly bigger than the diameter of the rivet body.

Remove the rivet body to separate the two components.

Remove the component to be replaced.

2. PREPARATION BEFORE ASSEMBLY

1- ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Note:

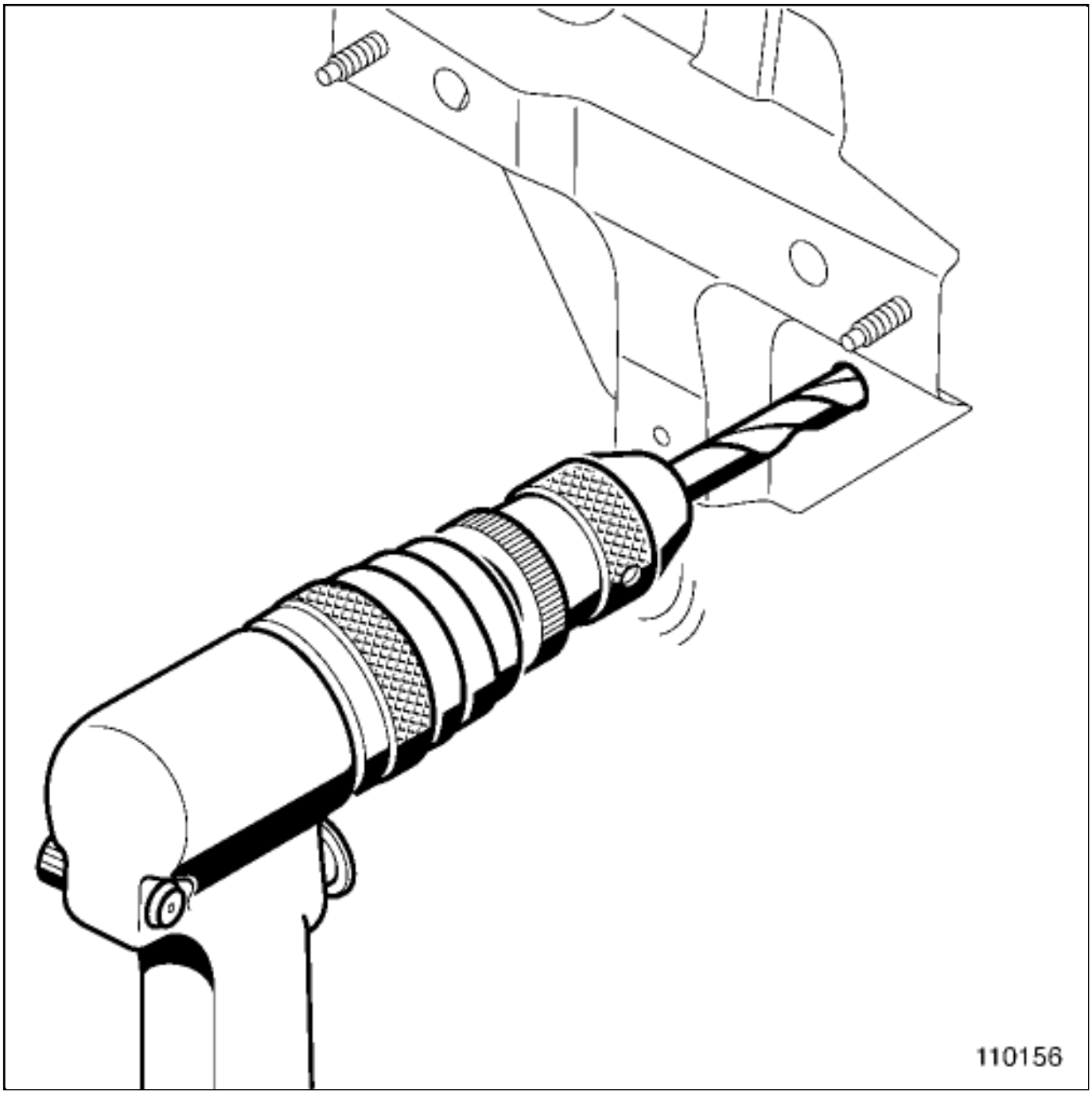
If a spot weld must be replaced with a rivet, simultaneously drill the spare part and the part on the vehicle depending on the diameter of the rivet used (see table below).

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Remove the part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART



Drill or pierce the locations marked previously, in accordance with the table below:

∅ rivet (mm)	4	4.8	6.4
∅ drilling hole (mm)	4.1 to 4.5	4.9 to 5.1	6.6 to 7

4- APPLY THE PROTECTION BEFORE ASSEMBLY

Fit the sound insulation inserts into the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3. ASSEMBLY

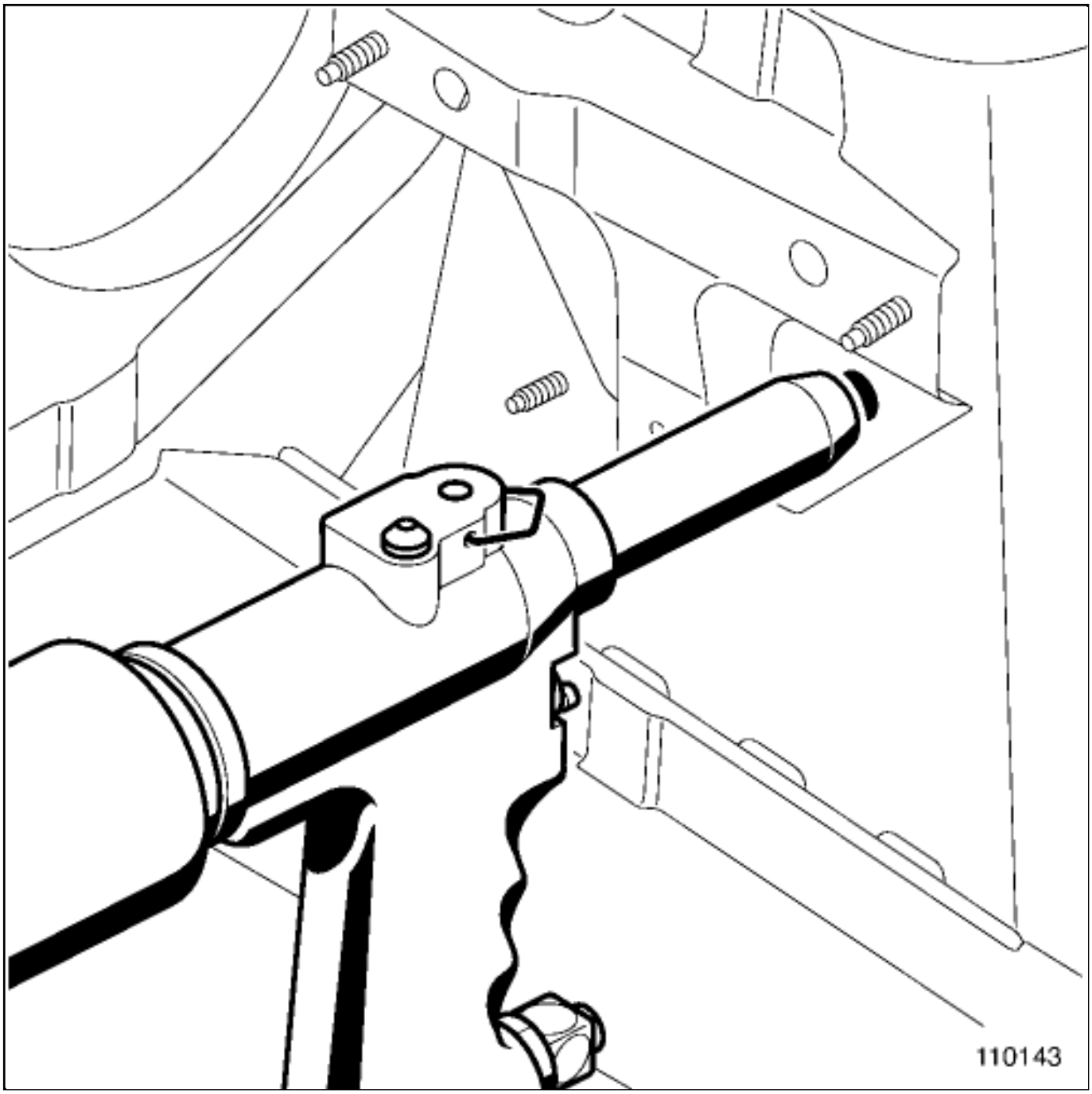
1- FITTING AND ADJUSTING THE REPLACED PARTS

Reassemble the part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- RIVETING



Fit the rivet.

Note:

In all cases, hold the pliers firmly when breaking the nail to avoid damaging the component.

Note:

For riveting three thickness types, check that the components are correctly secured together and that the length of the rivet body is sufficient to ensure they are held.

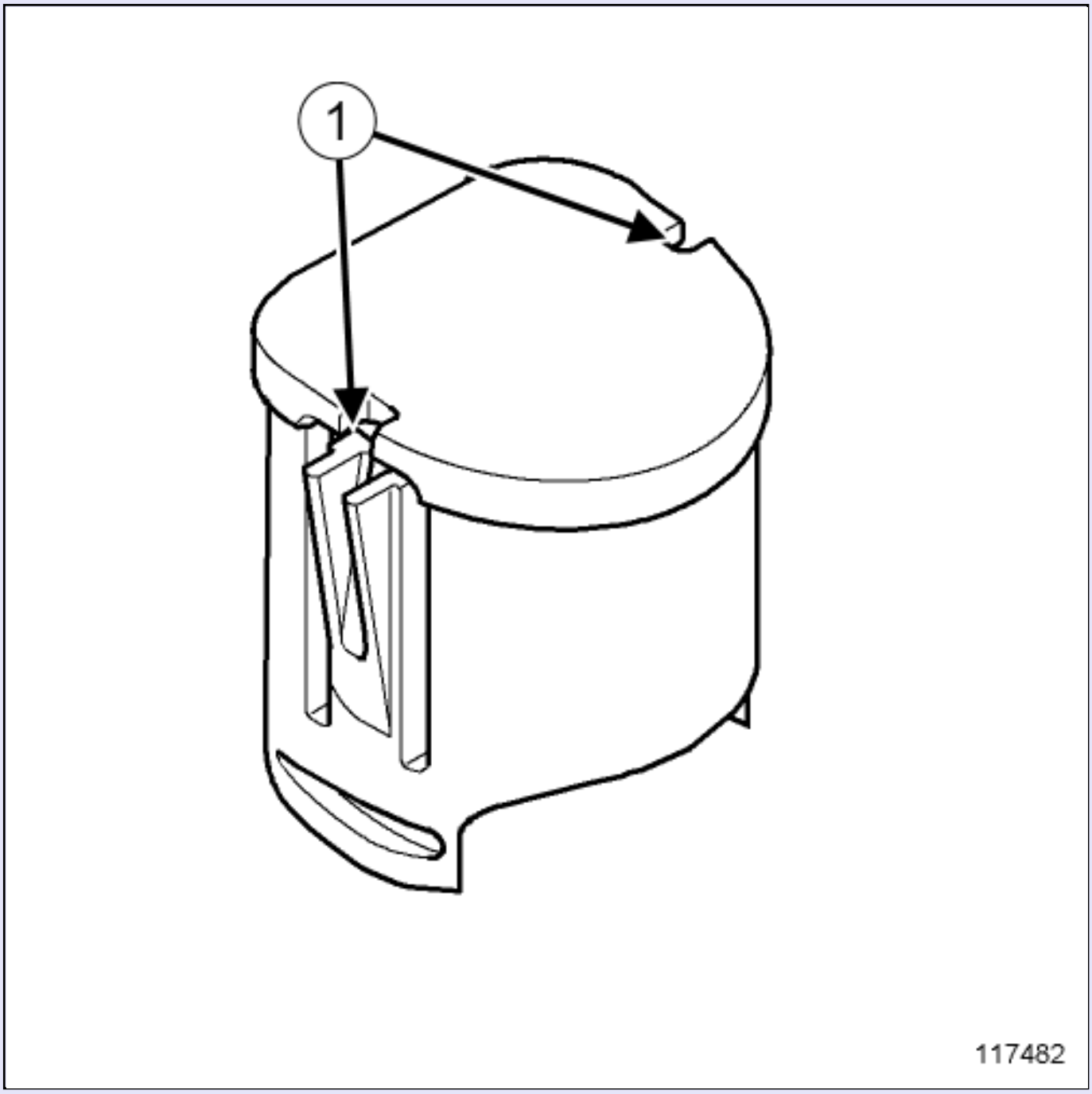
ROOF BAR: REMOVAL - REFITTING

REMOVAL

1. REMOVAL OPERATION

- Unclip (see 56A, Exterior equipment, Exterior body side trim assembly: Exploded view) :
  - the roof bar rear trim,
  - the roof bar front trim.

K52(K52)



- Remove the blanking cover by pressing the clips(1) using a small flat-blade screwdriver.

- Remove the roof bar centre bolt(see 56A, Exterior equipment, Exterior body side trim assembly: Exploded view) .

B52(B52)

- Unclip the blanking cover using a small flat-blade screwdriver(see 56A, Exterior equipment, Exterior body side trim assembly: Exploded view) .

- Remove the roof bar centre nut(see 56A, Exterior equipment, Exterior body side trim assembly: Exploded

view) .

- Remove (see 56A, Exterior equipment, Exterior body side trim assembly: Exploded view) :
  - the roof bar rear bolts,
  - the roof bar front bolts,
  - the roof bar.

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Torque tighten the roof bar bolts8 Nm.

ROOF:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

B52 L52(B52 OR L52)

No.	Description	Thickness (mm)
(1)	Roof	0.70

K52(K52)

No.	Description	Thickness (mm)
(1)	Roof	0.75

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicle's electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

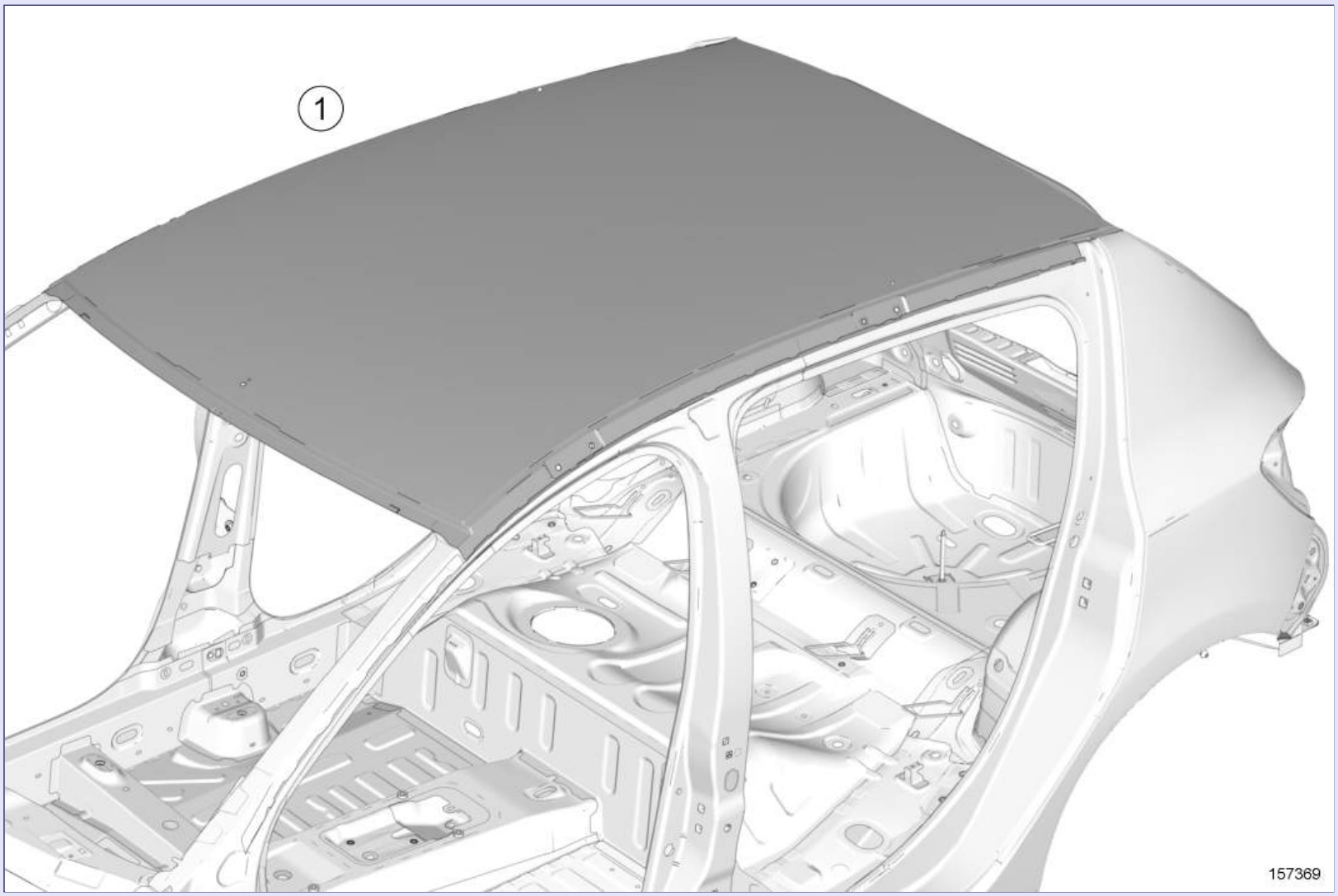
Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

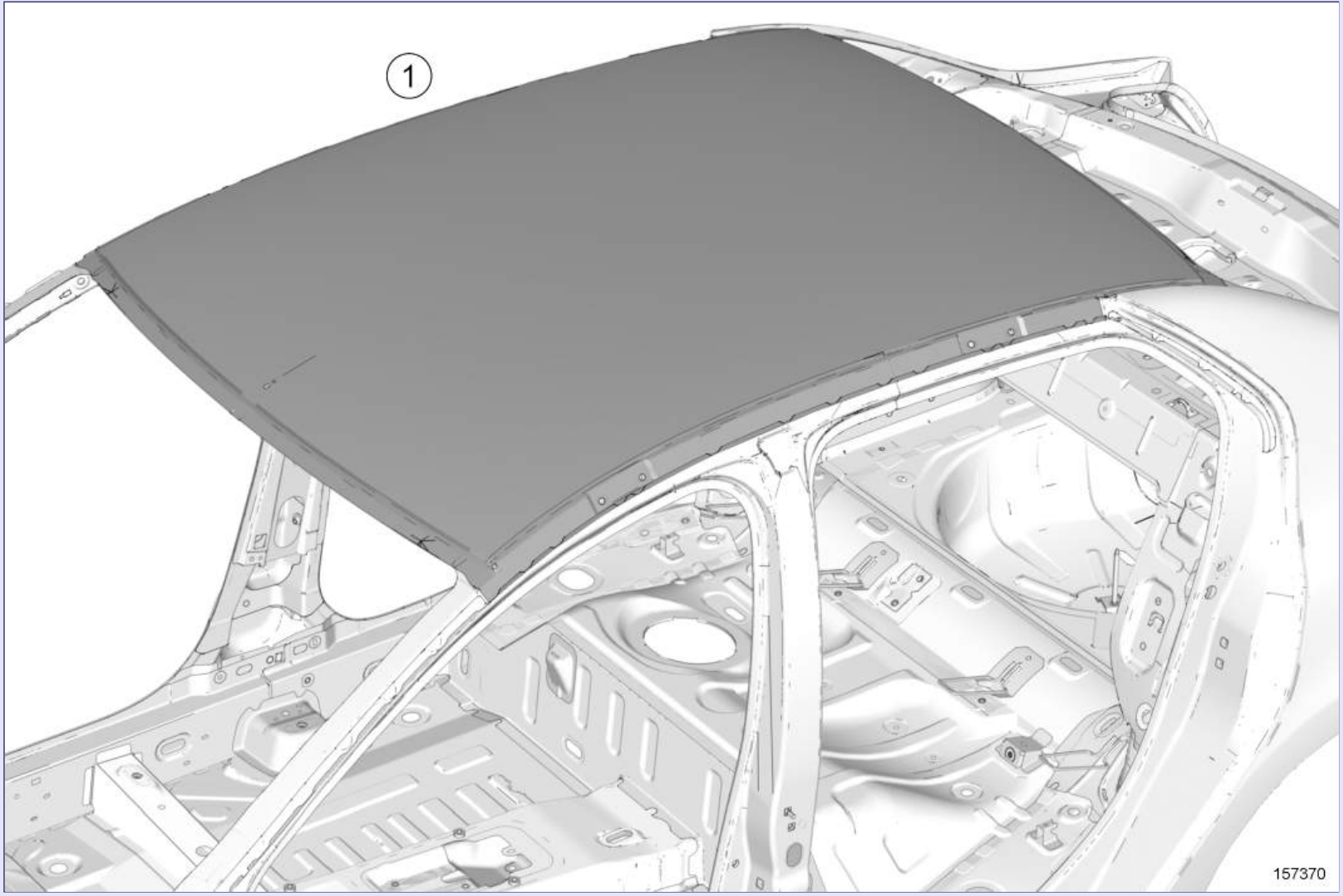
1- COMPLETE REPLACEMENT

1)PART IN POSITION

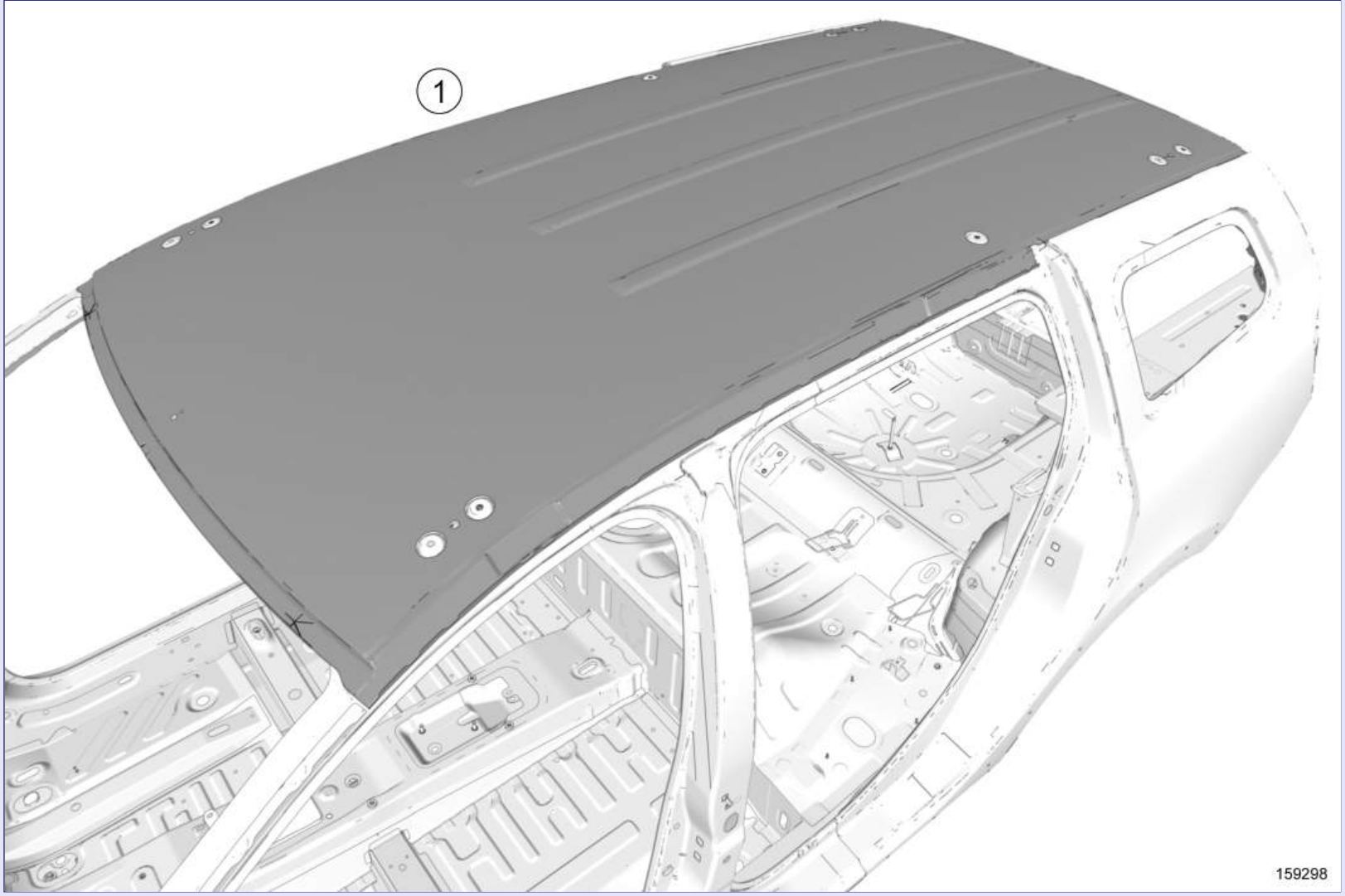
B52(B52)



L52(L52)

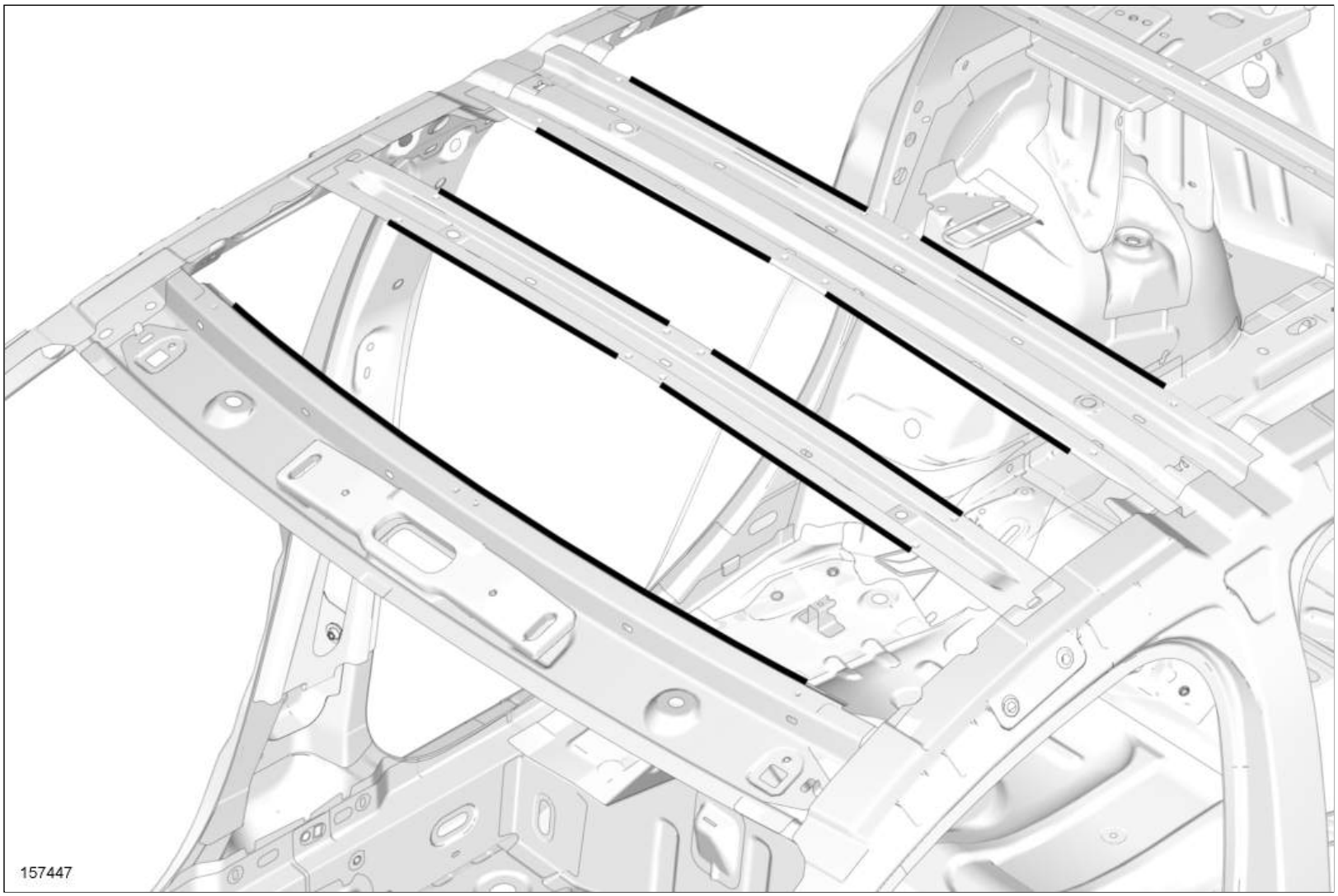


K52(K52)



2)BONDING AREA

FRONT ZONE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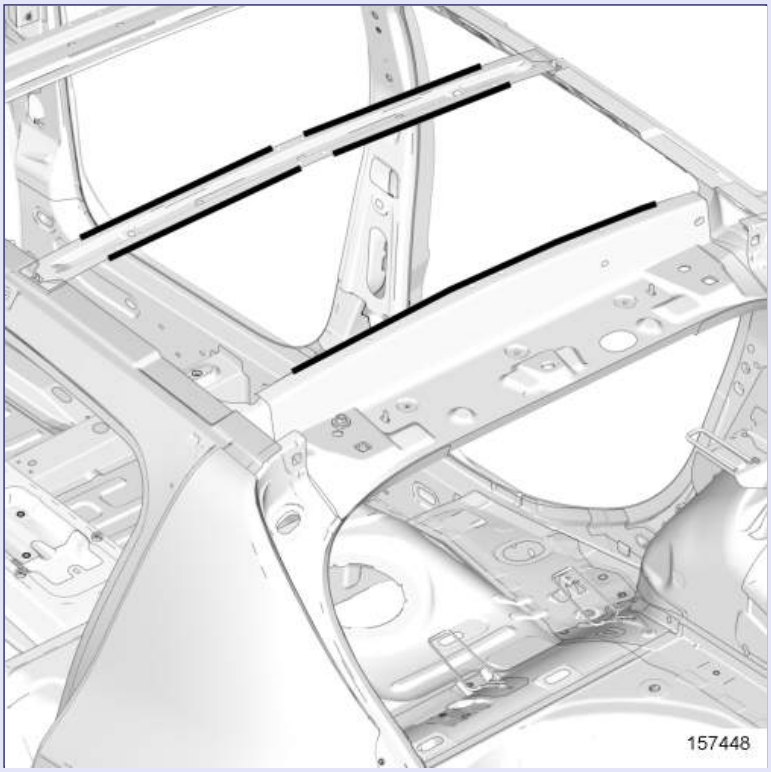
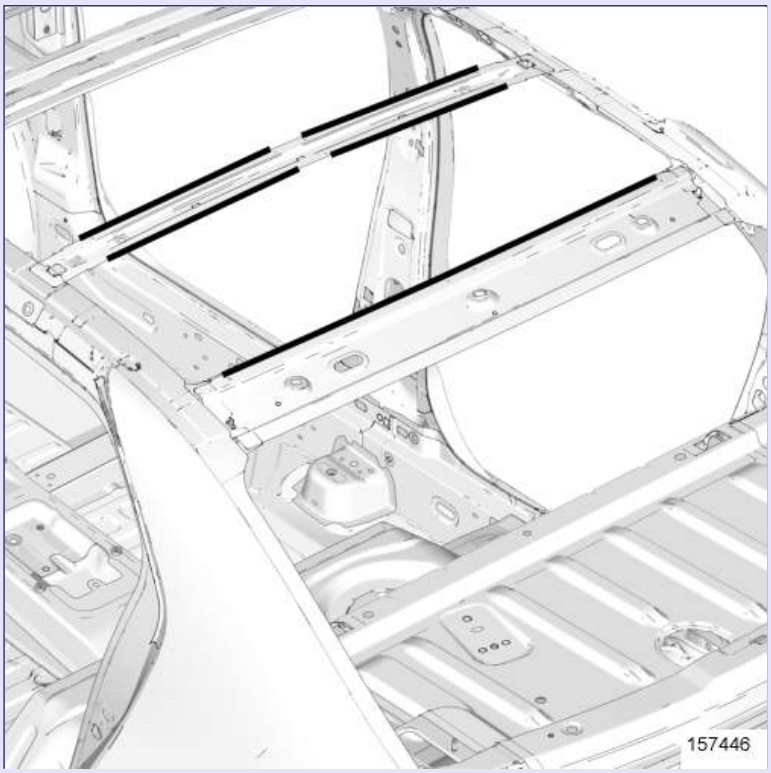
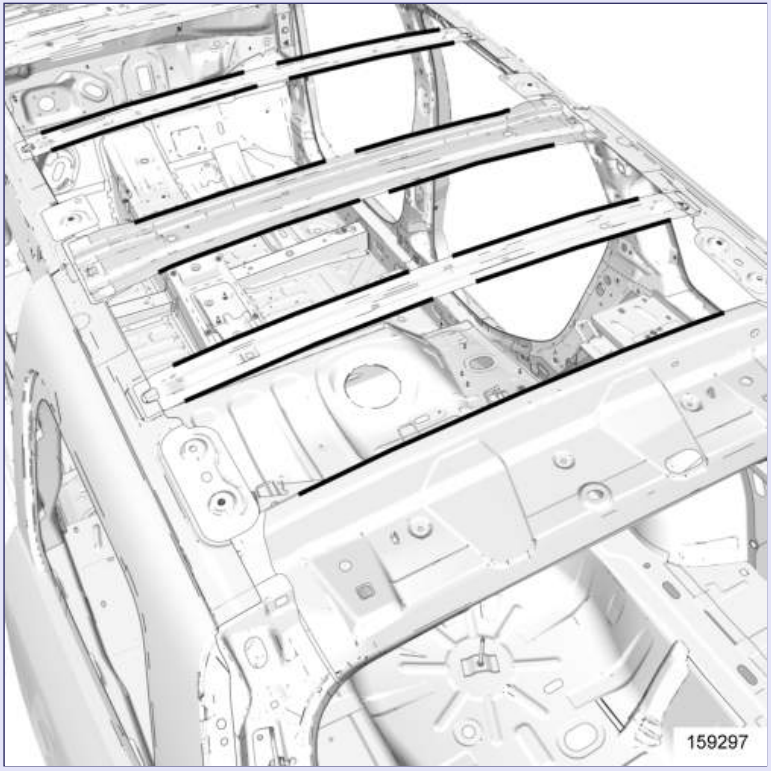
B52(B52) **REAR ZONE**



L52(L52) **REAR ZONE**



K52(K52) **REAR ZONE**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ROOF: SEALING CHECK

Note:

Before any operation, check the water outlet openings. Clean any residue which has accumulated (for example: dead leaves, twigs, etc.) and check that water flows out correctly.

Note:

When checking the sealing of the vehicle roof, the interior trims must be partially removed to facilitate the sealing check (see MR for the vehicle concerned).

Note:

The list of the joint areas dealt with here is general. Additional zones may exist depending on the layout of each vehicle (see MR for the vehicle concerned).

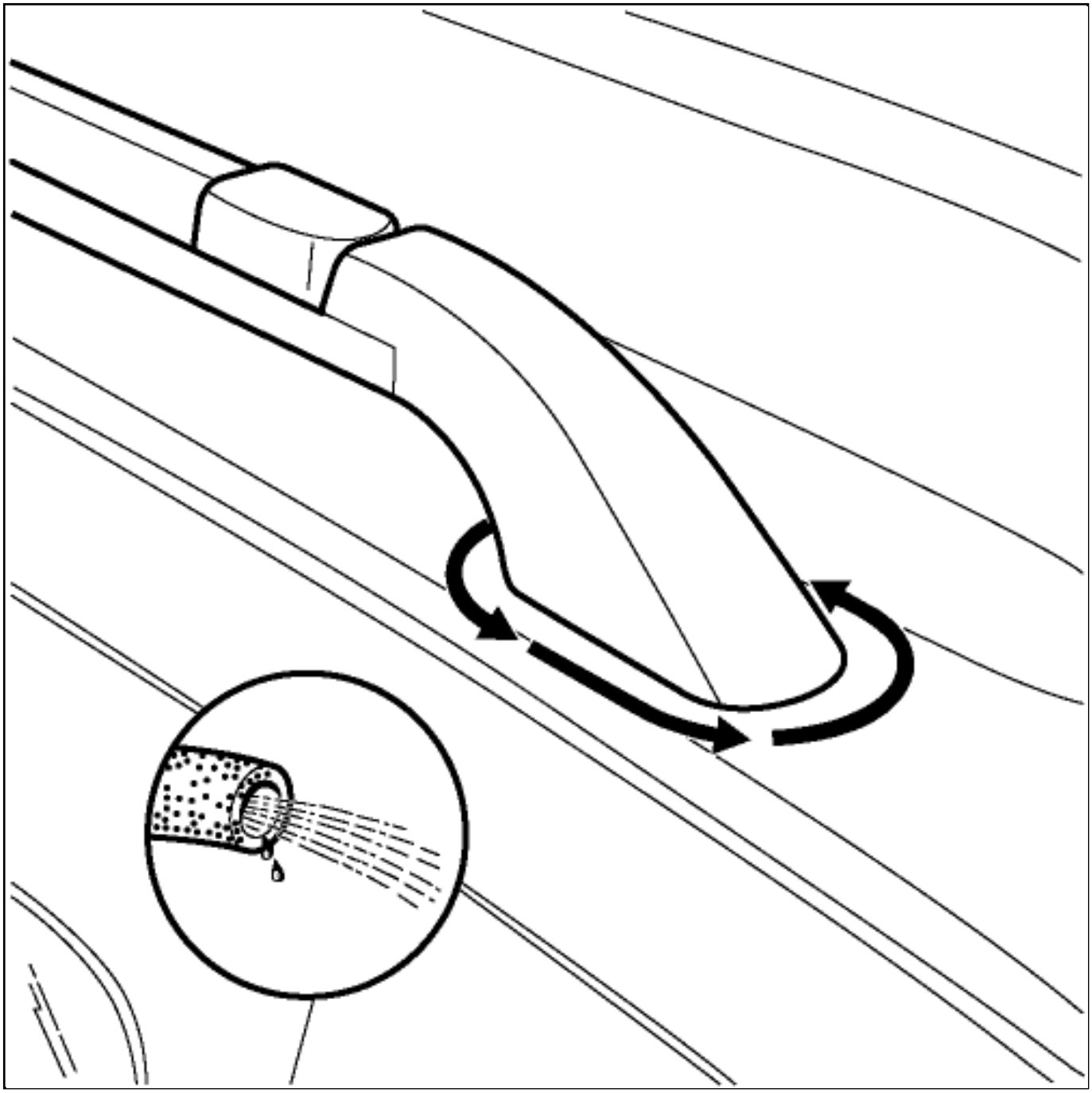
1. PREPARATION OPERATION FOR CHECKING THE SEALING

1- CONDITIONS TO RESPECT BEFORE CHECKING THE SEALING

- Position the vehicle on a level washing area(see 60A, General information, Vehicle sealing: General information) .
- Check that all the opening elements are closed(see 60A, General information, Vehicle sealing: General information) .
- Check the tyre pressures.
- Prepare the equipment to perform the operation(see 60A, General information, Sealing tools: Use) ,(see 60A, General information, Sealing tools: Description) and(see 60A, General information, Vehicle sealing: General information) .
- Adjust the flow of the water jet(see 60A, General information, Sealing tools: Use) .

2. OPERATION FOR CHECKING THE SEALING

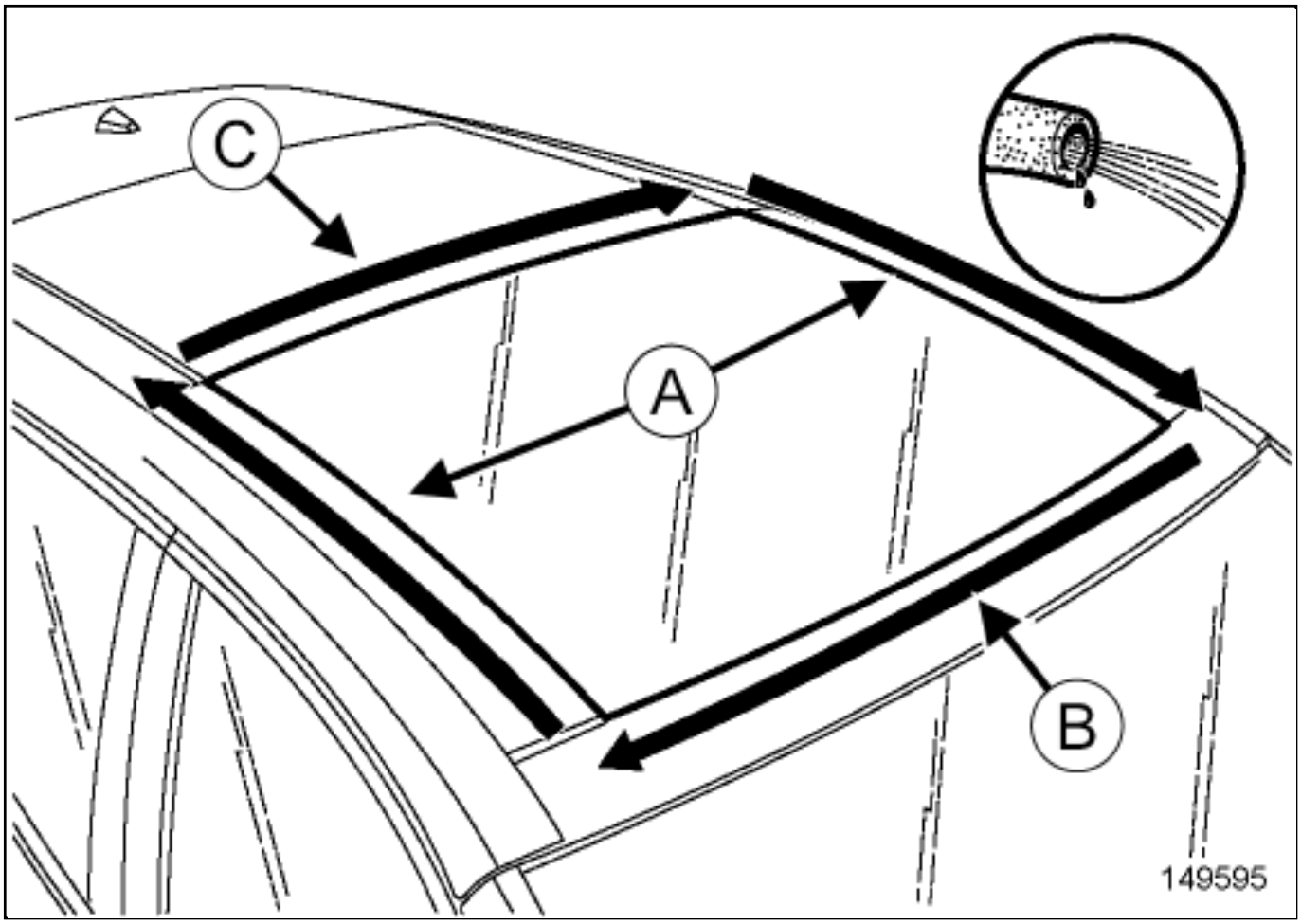
1- ROOF BARS



- Spray the edge of the roof bar sealing plates by sweeping the zone in a circular manner.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

2- SUNROOF MOBILE PANEL



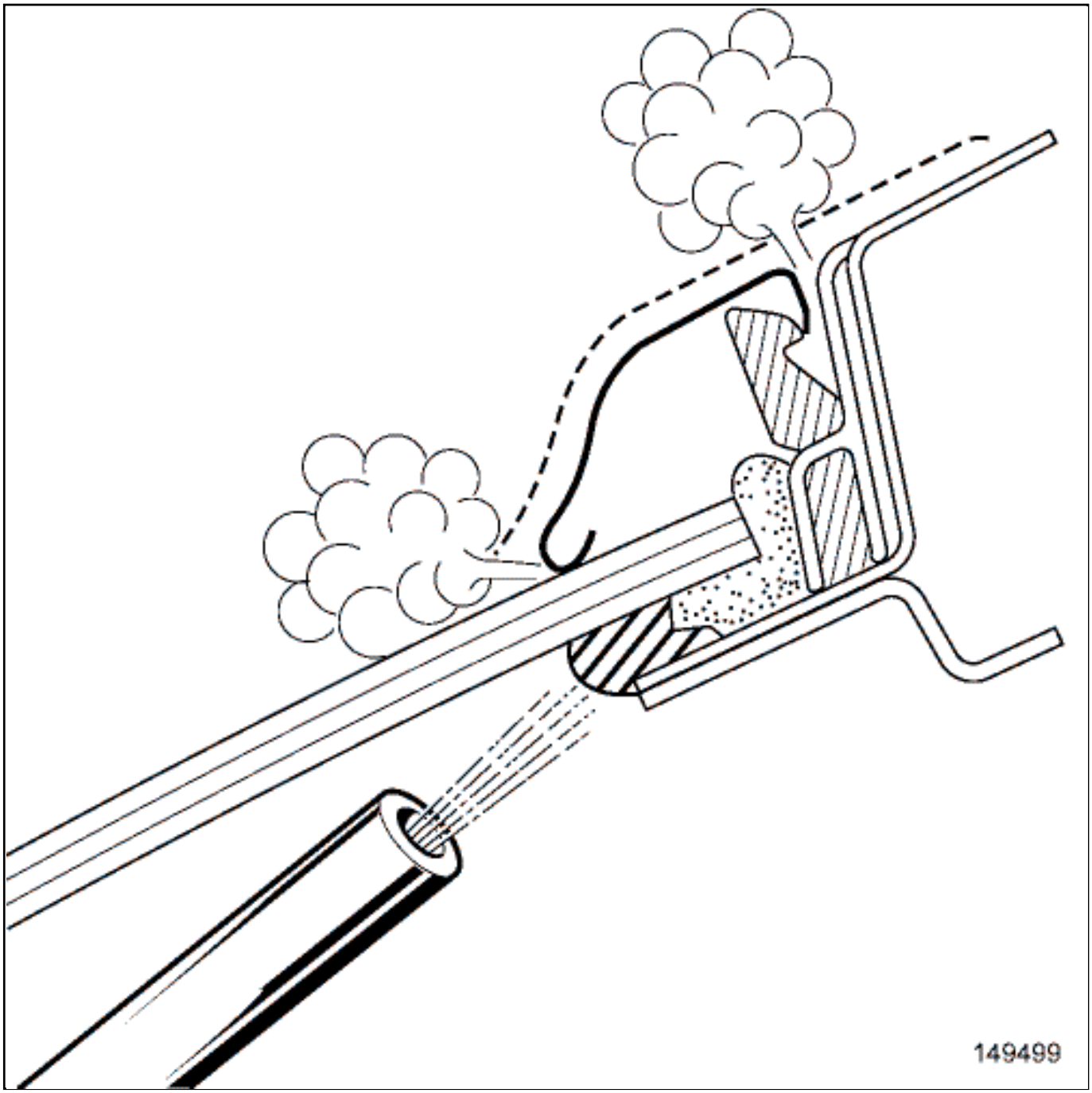
- Spray the sunroof mobile panel by sweeping the side zones(A) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the sunroof mobile panel by sweeping the front zone(B) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the sunroof mobile panel by sweeping the rear zone(C) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

Note:

The method for checking the sealing applies to the front fixed window or the rear fixed window of the vehicle's fixed glass roof.

3- SUNROOF FIXED WINDOW OR FIXED GLASS ROOF WINDOWS

1)FIRST PROCEDURE

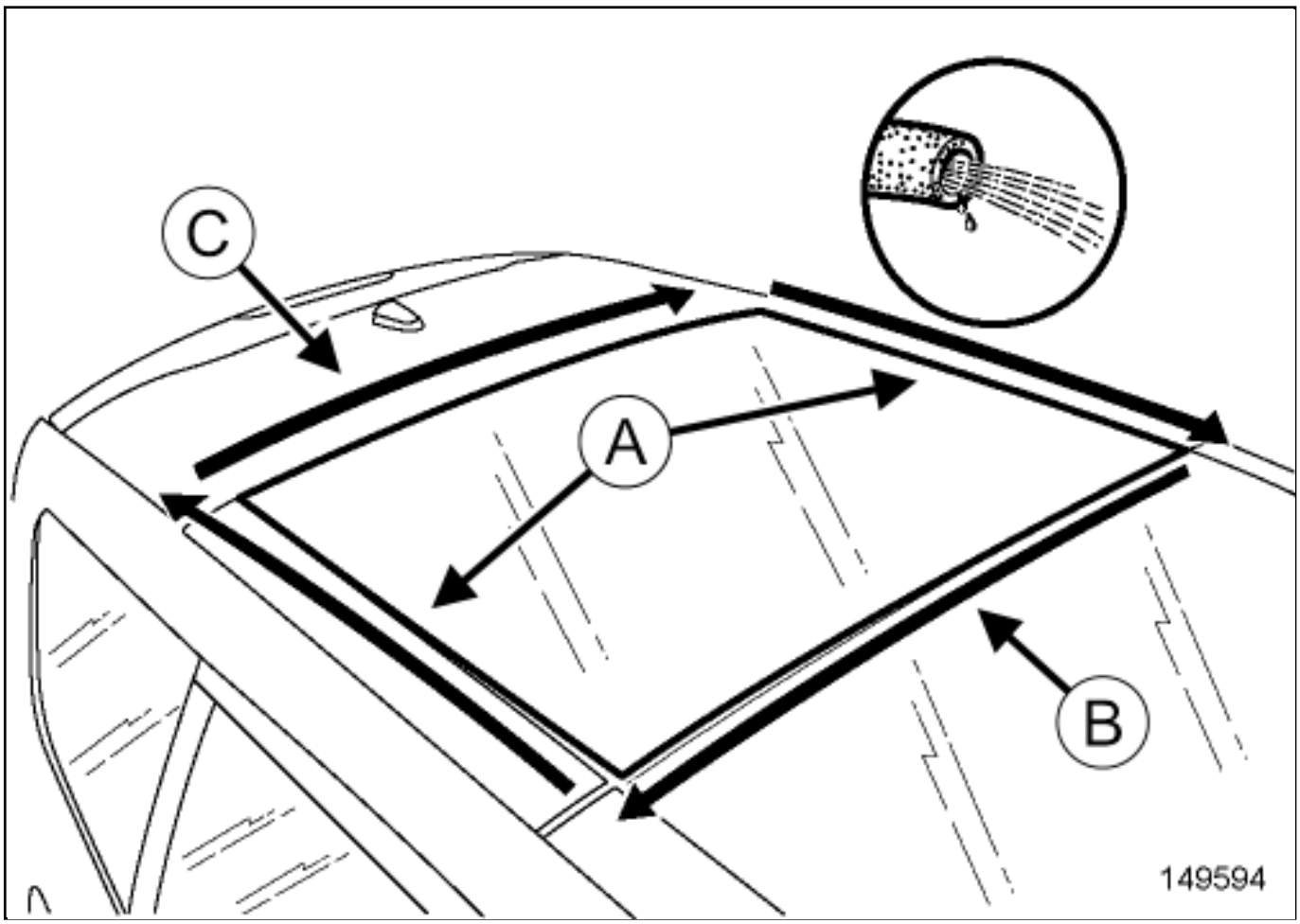


- Wet the edge of the fixed window using soapy water(see 60A, General information, Bodywork sealing products: Description) .

- From inside the vehicle, blow the entire zone using the air gun(see 60A, General information, Sealing tools: Use) .

- Visually check for the presence of bubbles at the edge of the zone.

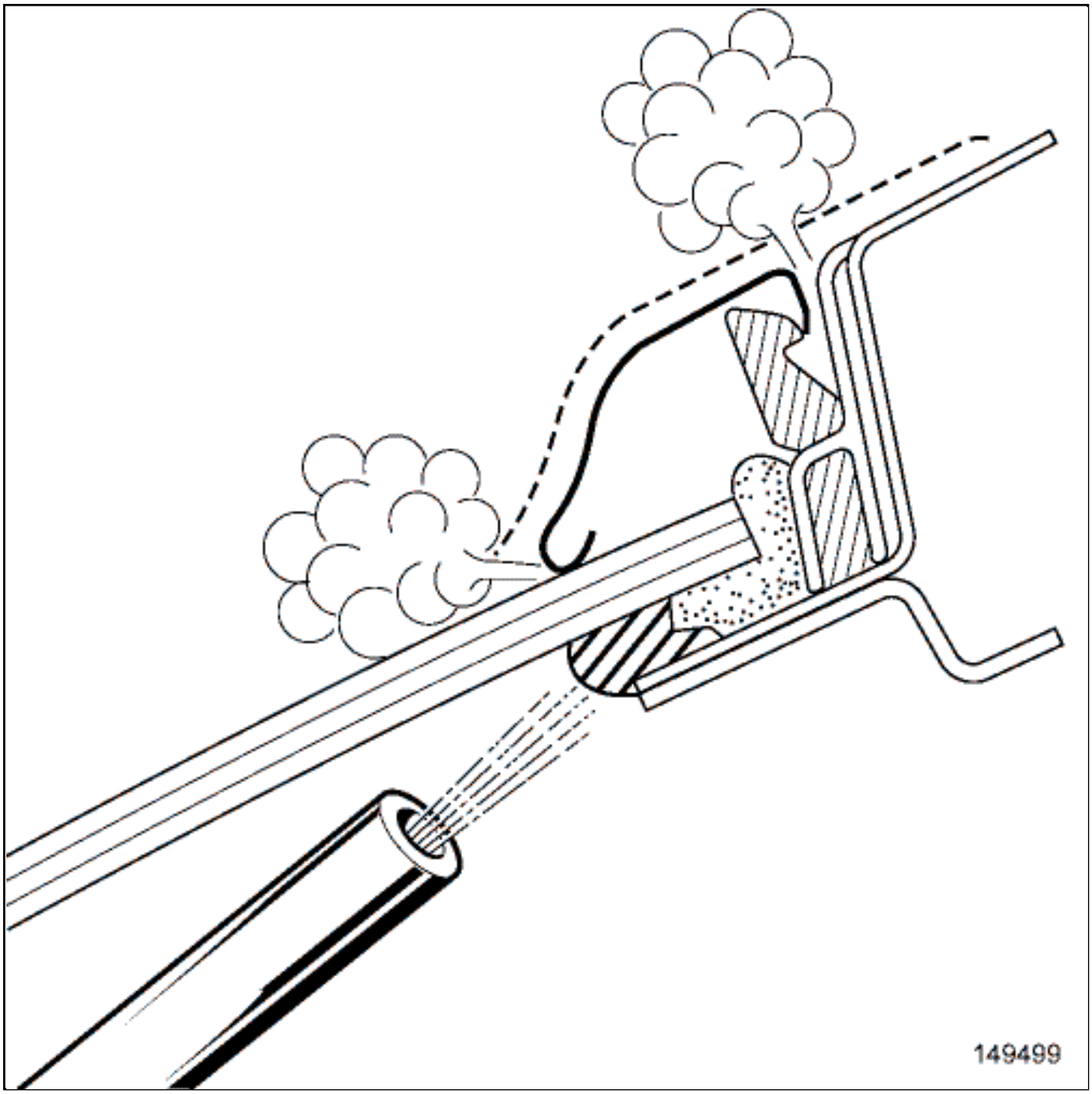
2)SECOND PROCEDURE



- Spray the fixed roof window by sweeping the side zones(A) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the fixed roof window by sweeping the front zone(B) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the fixed roof window by sweeping the rear zone(C) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

4- SUNROOF OR FIXED GLASS ROOF FRAME

1)FIRST PROCEDURE

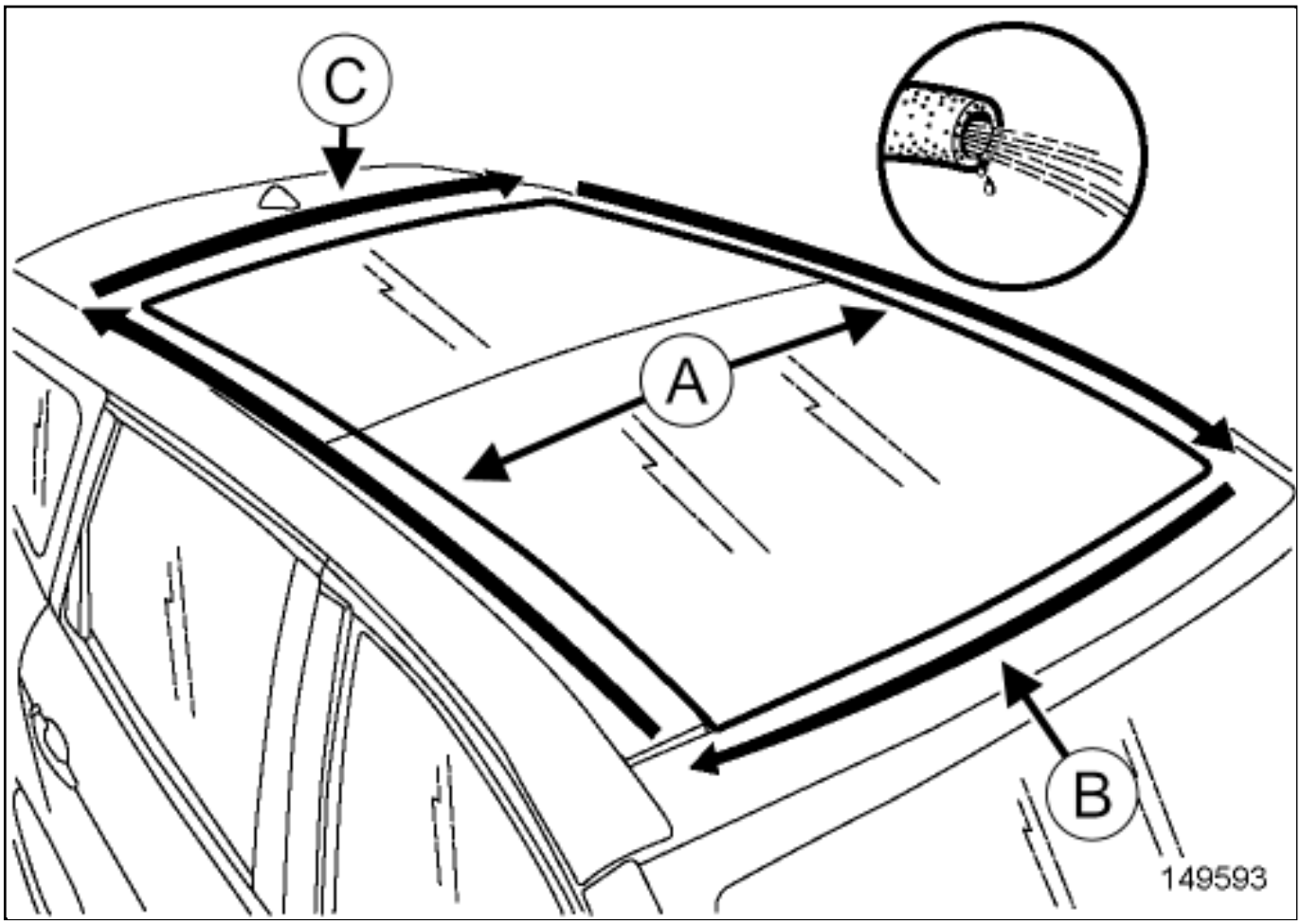


- Wet the edge of the sunroof or fixed glass roof frame using soapy water(see 60A, General information, Bodywork sealing products: Description) .

- From inside the vehicle, blow the entire zone using the air gun(see 60A, General information, Sealing tools: Description) .

- Visually check for the presence of bubbles at the edge of the zone.

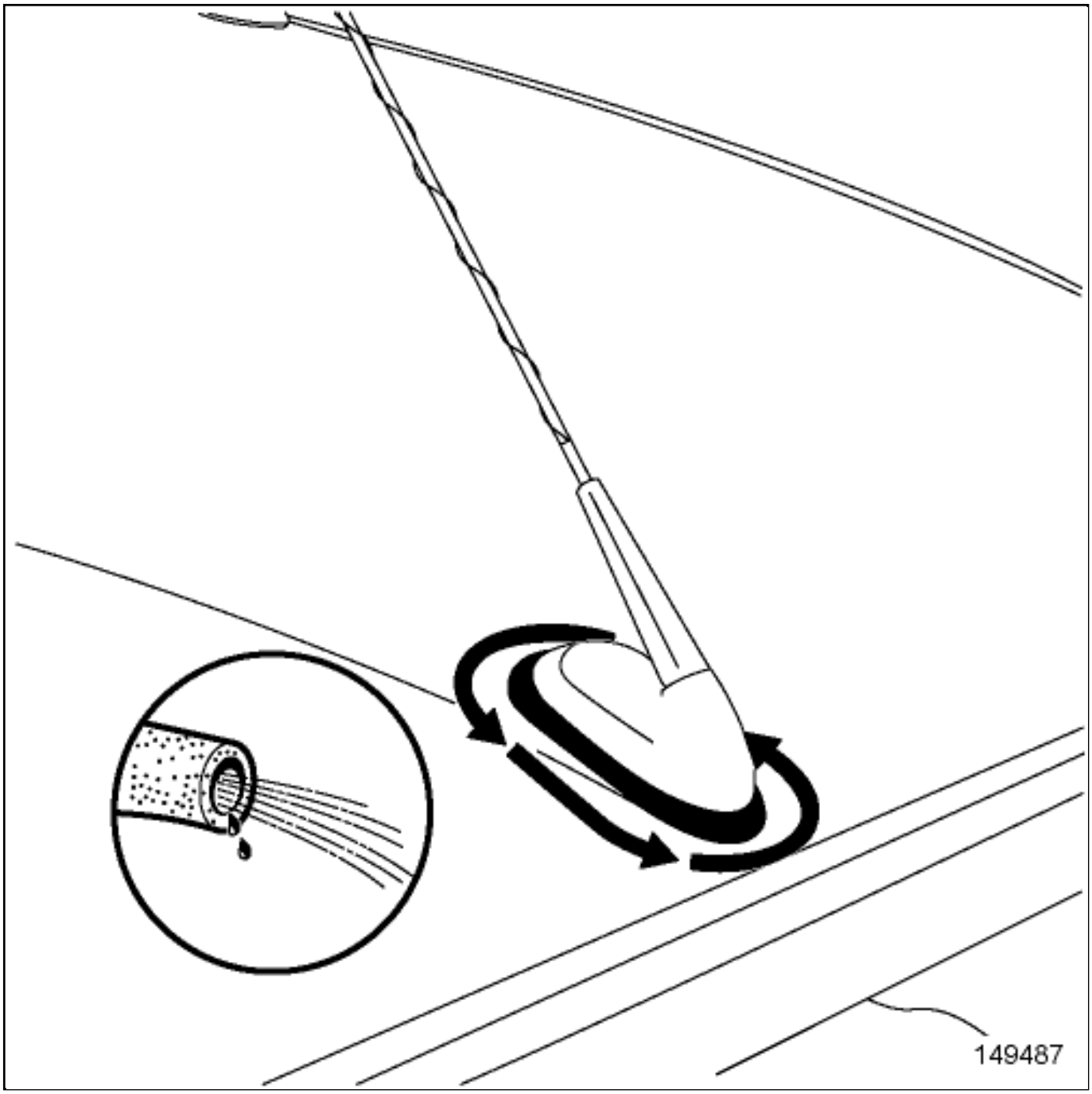
2)SECOND PROCEDURE



- Spray the edge of the sunroof or fixed glass roof frame by sweeping the side zones(A) , the front zone (B) , and the rear zone(C) .

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

5- RADIO AERIAL



- Spray the edge of the radio aerial base by sweeping the zone in a circular manner.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

6- ROOF / SIDE ROOF RAIL MASTIC FILLING

- Spray the mastic filling zone by sweeping from the lowest point to the highest point along the entire length **(see 60A, General information, Vehicle sealing: General information)** .

- Visually inspect for the presence of water inside the vehicle**(see 60A, General information, Vehicle sealing: General information)** .

7- CHECKING THE SEALING WITH THE TRIM REMOVED

- If the customer complaint could not be reproduced in accordance with the procedure, remove the interior trims (see Body internal trim in the vehicle's repair manual) then repeat the sealing check from step 1; extend the sealing check to the surrounding areas**(see 60A, General information, Vehicle: Sealing check)** .

ROOF: SEALING REPAIR

Note:

Before repairing the sealing, check the sealing of the zone concerned (see 60A, General information, Vehicle: Sealing check) .

1. PREPARATION OPERATION FOR REPAIRING THE SEALING

1- CHECK THE POSITION AND ADJUST IF NECESSARY:

- roof bar sealing plates,
- the tyre pressure for vehicles equipped with sunroof,
- the sunroof mobile panel seal Sunroof seal: Removal - Refitting (65A, Opening element sealing),
- the sunroof mobile panel Sunroof mobile panel: Removal - Refitting (52A, Non-side opening element mechanisms),
- the base of the radio aerial,
- the roof / side roof rail mastic filling.

Note:

If the seals are dirty, clean them in soapy water (see 60A, General information, Vehicle sealing: General information) .

2- WAS ANY ACTION PERFORMED?

- NO: move on to the next step.
- YES: check the sealing of the zone (see 60A, General information, Roof: Sealing check) .

☐ Was water present in the passenger compartment of the vehicle?

- YES: move on to the next step.
- NO: fault resolved.

2. SEALING REPAIR OPERATION

1- REPAIRING THE SEALING OF THE ROOF BARS

☐ Is water present in the passenger compartment after checking the sealing of the roof bars?

- NO: move on to the next step.
- YES:
- a) if the roof bar mountings are loosened, tighten the roof bar mountingsRoof bar: Removal - RefittingRoof bar: Removal - Refitting (56A, Exterior equipment),
- b) if the roof bar sealing plates are deformed or cracked, replace the roof bar platesRoof bar: Removal - RefittingRoof bar: Removal - Refitting (56A, Exterior equipment),
- c) if the panelwork is deformed in the roof bar contact area, flatten the contact area then check the plates; replace the plates if necessaryRoof bar: Removal - RefittingRoof bar: Removal - Refitting (56A, Exterior equipment).

Check the sealing of the roof bars(see 60A, General information, Roof: Sealing check) .

2- REPAIRING THE SEALING OF THE SUNROOF MOBILE PANEL

Is water present in the passenger compartment after checking the sealing of the sunroof mobile panel?

- NO: move on to the next step.
- YES:
- a) if the sunroof mobile panel is incorrectly positioned or poorly adjusted, adjust the clearances and flush fitting of the sunroof mobile panelSunroof mobile panel: Removal - Refitting (52A, Non-side opening element mechanisms),
- b) if the sunroof mobile panel seal is deformed, cracked or cut, replace the sunroof mobile panel sealSunroof seal: Removal - Refitting (65A, Opening element sealing).

Check the sealing of the sunroof mobile panel(see 60A, General information, Roof: Sealing check) .

3- REPAIRING THE SEALING OF THE SUNROOF FIXED WINDOW OR FIXED GLASS ROOF WINDOW

Is water present in the passenger compartment after checking the sealing of the sunroof fixed window or fixed glass roof window?

- NO: move on to the next step.
- YES:
- a) if the mastic of the sunroof fixed window or fixed glass roof window is faulty, remove the sunroof fixed window or the fixed glass roof windowSunroof fixed window: Removal - Refitting (54A, Windows),Fixed glass roof front window: Removal - Refitting (54A, Windows),Fixed glass roof: Removal - Refitting (54A, Windows),Fixed glass roof rear window: Removal - Refitting (54A, Windows),
- re-apply the window bonding rangeWindow bonding: Description (Technical Note 0560A, 54A, Windows) or Bonding sunroof operating mechanisms: Description (Technical Note 0560A, 54A, Windows).

Check the sealing of the sunroof fixed window or fixed glass roof window(see 60A, General information, Roof: Sealing check) .

4- REPAIRING THE SEALING OF THE SUNROOF FRAME OR FIXED GLASS ROOF FRAME

Is water present in the passenger compartment after checking the sealing of the sunroof fixed window or fixed glass roof window?

- NO: move on to the next step.
- YES:
- a) if the mastic of the sunroof frame or fixed glass roof frame is faulty, remove the sunroof or fixed glass roof

Sunroof: Removal - Refitting (52A, Non-side opening element mechanisms),Fixed glass roof: Removal - Refitting (52A, Non-side opening element mechanisms),

- reapply the bonding range to the sunroof or fixed glass roofWindow bonding: Description (Technical Note 0560A, 54A, Windows) orBonding sunroof operating mechanisms: Description (Technical Note 0560A, 54A, Windows).

Check the sealing of the sunroof or fixed glass roof(see 60A, General information, Roof: Sealing check) .

5- REPAIRING THE SEALING OF THE RADIO AERIAL

Is water present in the passenger compartment after checking the sealing of the radio aerial?

- NO: move on to the next step.
- YES:
- a) if the radio aerial is loosened, tighten the radio aerial mountingRadio aerial: Removal - Refitting (86A, Radio),
- b) if the radio aerial is deformed, cracked or cut, replace the radio aerialRadio aerial: Removal - Refitting (86A, Radio),
- c) if the panelwork is deformed in the contact area of the radio aerial, flatten the contact zone then check the aerial, replace the radio aerial if necessaryRadio aerial: Removal - Refitting (86A, Radio),
- d) if the radio aerial does not present any faults, apply filler mastic between the aerial and the panelwork, then refit the radio aerialRadio aerial: Removal - Refitting (86A, Radio).

Check the sealing of the radio aerial(see 60A, General information, Roof: Sealing check) .

6- REPAIRING THE MASTIC SEALING OF THE ROOF / SIDE ROOF RAIL

Is water present in the passenger compartment after checking the mastic sealing of the roof / side roof rail?

- NO: Fault resolved.
- YES:
- a) if the roof / side roof rail mastic is faulty or incorrectly positioned, protect the area around the working area using masking tape, apply extruded mastic to the panelwork connectionsAnti-corrosion protection products after assembly: Use (04F, Bodywork products and mountings) and(see 60A, General information, Bodywork sealing products: Description) ,
- apply the paint rangeSteel bodywork component: Preparation and paint range (94A, Paint application range for panels).

Check the mastic sealing of the roof / side roof rail(see 60A, General information, Roof: Sealing check) .

ROOF TRIM ASSEMBLY: EXPLODED VIEW

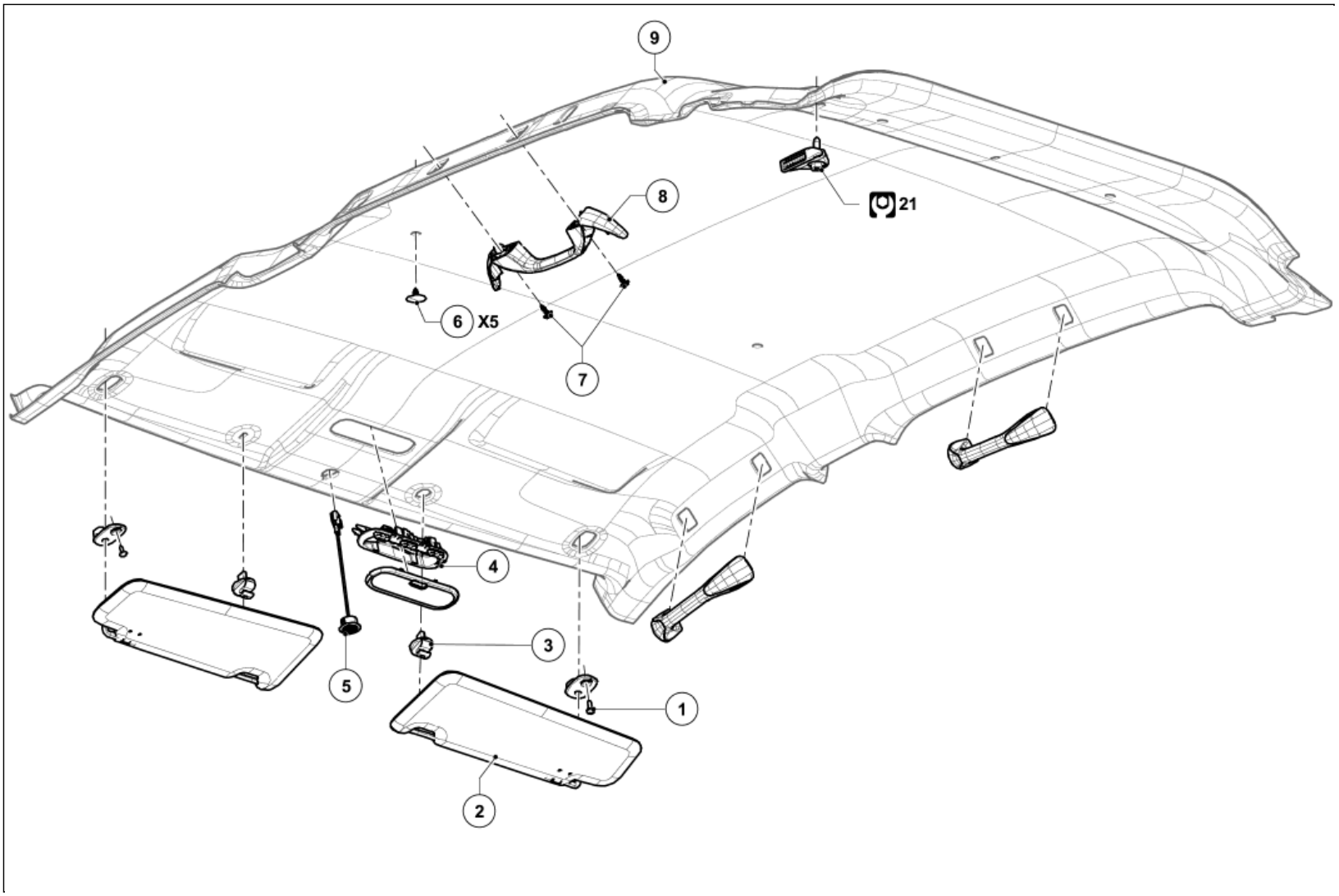


Illustration key: Description

Marks	Designations	Informations
1	Sun visor bolt	
2	Sun visor	
3	Sun visor hook	
4	Courtesy light	
5	"Hands-free" microphone	
6	Headlining clip	
7	Grab handle bolt	
8	Grab handle	
9	Headlining	(see 71A, Body internal trim, Headlining: Removal - Refitting)

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ROTARYSWITCH:ADJUSTMENT

Note, one or more warnings are present in this procedure

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 84A, Control - Signals, Control - Signals: Precautions for repair) ,
  - Vehicle: Precautions for the repair .

This method is used to put the rotary switch in the neutral position.

1. PRELIMINARY CONDITIONS FOR THE ADJUSTMENTS

- The wheels are set straight ahead.
- The rotary switch is refitted on the steering column.
- The steering wheel is removed.

2. ADJUSTMENT

Note:

Certain rotary switch models are equipped with a locking device.

To perform the adjustment, it is essential to unlock the rotary switch when handling.

- Turn the movable part of the rotary switch fully to the left.
- Turn the movable part of the rotary switch fully to the right, counting the number of turns.
- Divide the number of turns counted by 2.
- Turn the movable part of the rotary switch to the left by the number of turns calculated.

- The rotary switch is now within the turn of its neutral position.

Example:

5 turns were counted between the full left and full right position of the rotary switch.

Turn the movable stop of the switch 2.5 turns to the left to find neutral again.

- Continue the rotation until the marks are aligned.

- The switch is now in the neutral position.

ROTARY SWITCH: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Airbag and pretensioners: Precautions for the repair ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

1. REMOVAL PREPARATION OPERATION

Set the wheels straight ahead.

Lock the airbag computer Airbag and pretensioners: Precautions for the repair .

Switch off the ignition.

Disconnect the battery Battery: Removal - Refitting .

Remove:

- the driver's frontal airbag Driver's frontal airbag: Removal - Refitting ,
- the steering wheel Steering assembly: Exploded view .

CAUTION

To prevent damaging the rotary switch, do not turn the mobile section of the rotary switch.

Remove Dashboard assembly: Exploded view :

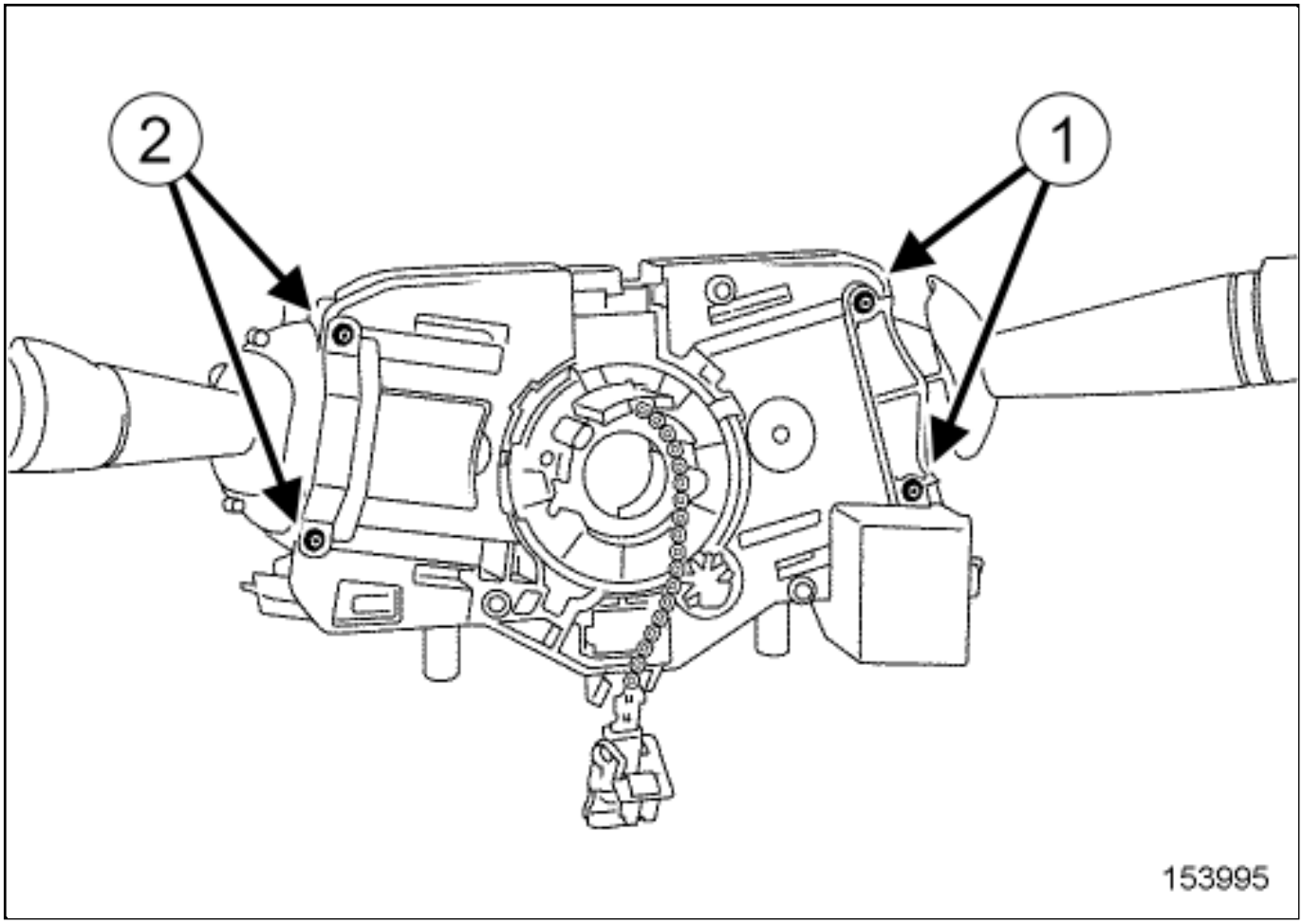
- the upper half-shell,
- the lower half-shell.

Remove the steering wheel control assembly (see 84A, Control - Signals, Steering column switch assembly: Removal - Refitting) .

Note:

Always keep the rotary switch immobilised throughout the removal operation.

2. REMOVAL OPERATION



Remove:

- the bolts(1) from the wiper stalk,
- the bolts(2) from the lighting stalk.

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

To prevent damaging the rotary switch, do not turn the mobile section of the rotary switch.

CAUTION

Incorrect wheel alignment may damage the rotary switch.

- Ensure that the wheels are still straight.

Note:

Always keep the rotary switch immobilised throughout the refitting operation.

Note:

If the rotary switch is being replaced, the new part is supplied ready centred with an adhesive label which will tear off when the wheel is turned for the first time (wheels must be straight when fitting).

2. REFITTING OPERATION

- Proceed in the reverse order to removal.
- Unlock the airbag computerAirbag and pretensioners: Precautions for the repair .
- Switch on the ignition.
- Check the operation of the rotary switch:
  - turn the steering wheel to the left until it stops,
  - turn the steering wheel to the right until it stops,
  - bring the steering wheel back to the central position,
  - check that there are no faults on the instrument panel.

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RULES FOR USING STRUCTURAL BODYWORK TOOLS: DESCRIPTION

Note, one or more warnings are present in this procedure

- The operator will choose the right tool depending on:
  - access to the work area : flat; at an angle; in a corner,
  - the environment where the welding overlap is located : sensitive to splashes or not,
  - the position in the sheet stacking for unpicking : primary or secondary,
  - the type of material for working : mastic, adhesive or sheets.

1. STRIPPING TOOLS

By definition, these tools must remove all paint protections from the body panel without damaging the material.

CAUTION

This is only possible on metal parts. For plastic components, you must be careful not to damage the support (see details in the procedures).

- Functions:
  - In the phase of removing welded components, the idea is to locate the spot welds to be able to unpick them. It is not necessary to strip the components completely.
  - In the pre-assembly phase, the mating surfaces on the vehicle and new part must be stripped to prepared the surfaces for assembly.

2. MACHINING TOOL

By definition these tools are used to remove particles of a material that constitutes the body component, during unwelding, grinding or cutting operations.

Note:

According to the grit used, some of them can also be used for stripping, but do not lose their ability to remove metal particles.

CAUTION

In this case, as for plastic components, you must be careful not to damage the support (see details in the procedures).

For the correct use of these tools with equipment fitted with speed reduction, it is essential to observe the rotating speeds indicated: either on the label on the "consumable tools" themselves (grinders or discs), or in equipment catalogues for "cutting" tools (burrs or drill bits).

RUNNING GEAR REFITTING

Note, one or more warnings are present in this procedure

Essential special tooling	
TDC locating pin.	Mot. 1489
Tool for fitting main bearing shells.	Mot. 1492
Crankshaft bearing centring tool.	Mot. 1493-01
Dial gauge support.	Mot. 251-01
Dial gauge support thrust plate.	Mot. 252-01
Gauge for measuring height of crankpins.	Mot. 1319
Tool for fitting main bearing shells.	Mot. 1492-03
Gauge for measuring height of crankpins.	Mot. 1319-01
Gauge for measuring height of crankpins.	Mot. 1319-01
Tool for fitting G9 con rod bearing shells	Mot. 1914
Tool for fitting F9 / K9 con rod bearing shells	Mot. 1920

Essential equipment
dial gauge
dial gauge support
clip pliers
indelible pencil

parts always to be replaced:
con rod cap bolts
crankshaft bearing bolt

1. RECOMMENDATIONS FOR REPAIR

IMPORTANT

Wear protective gloves during every operation.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Note:

The conrod caps are positioned on the conrod body using the irregularities on the parting line.

Impacts or foreign bodies between the contact surfaces between the caps - con rod body could lead to a breakage of the con rod in the short term.

2. PARTS AND CONSUMABLES FOR THE REPAIR

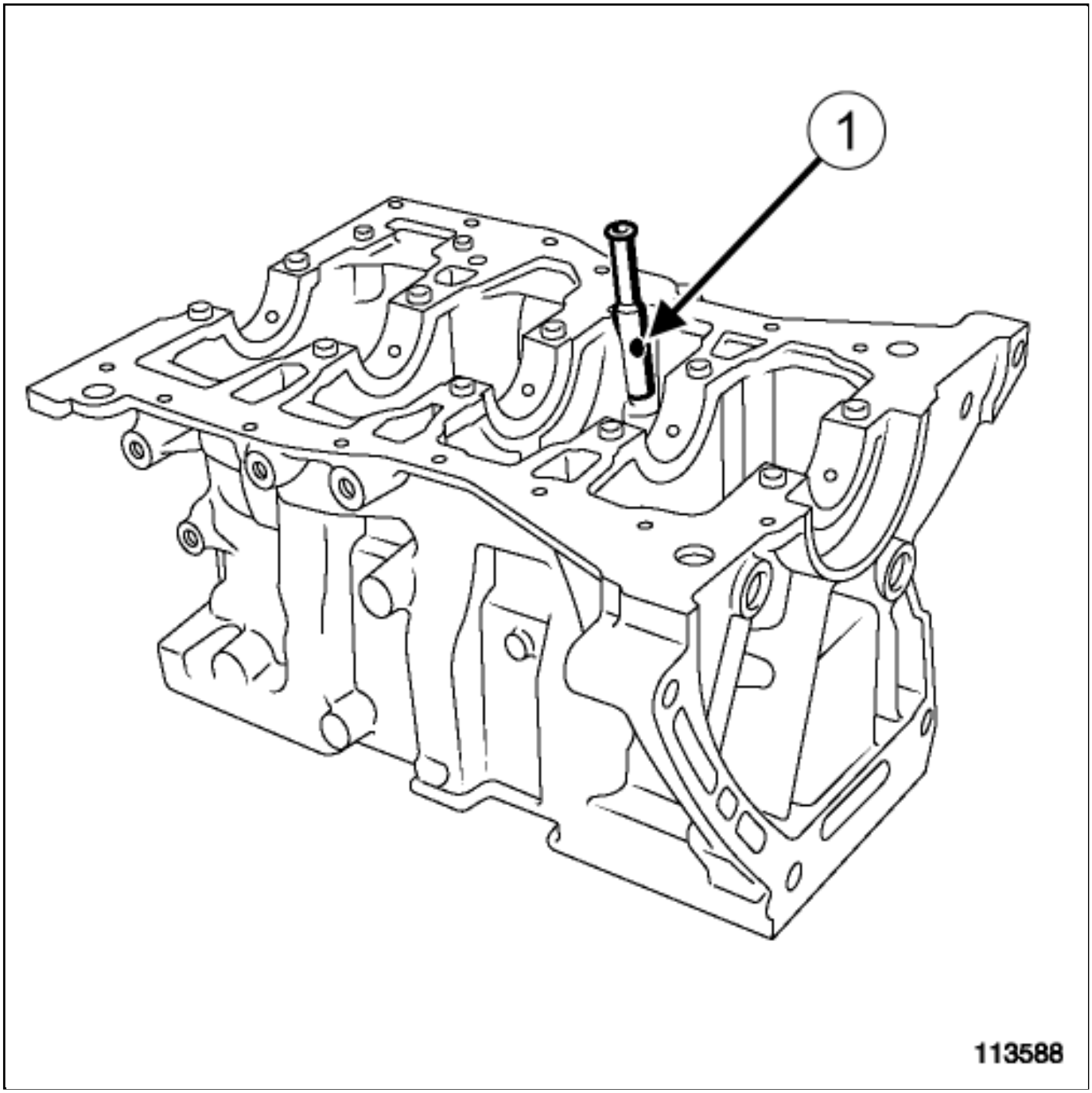
parts always to be replaced: con rod cap bolts

parts always to be replaced: crankshaft bearing bolt

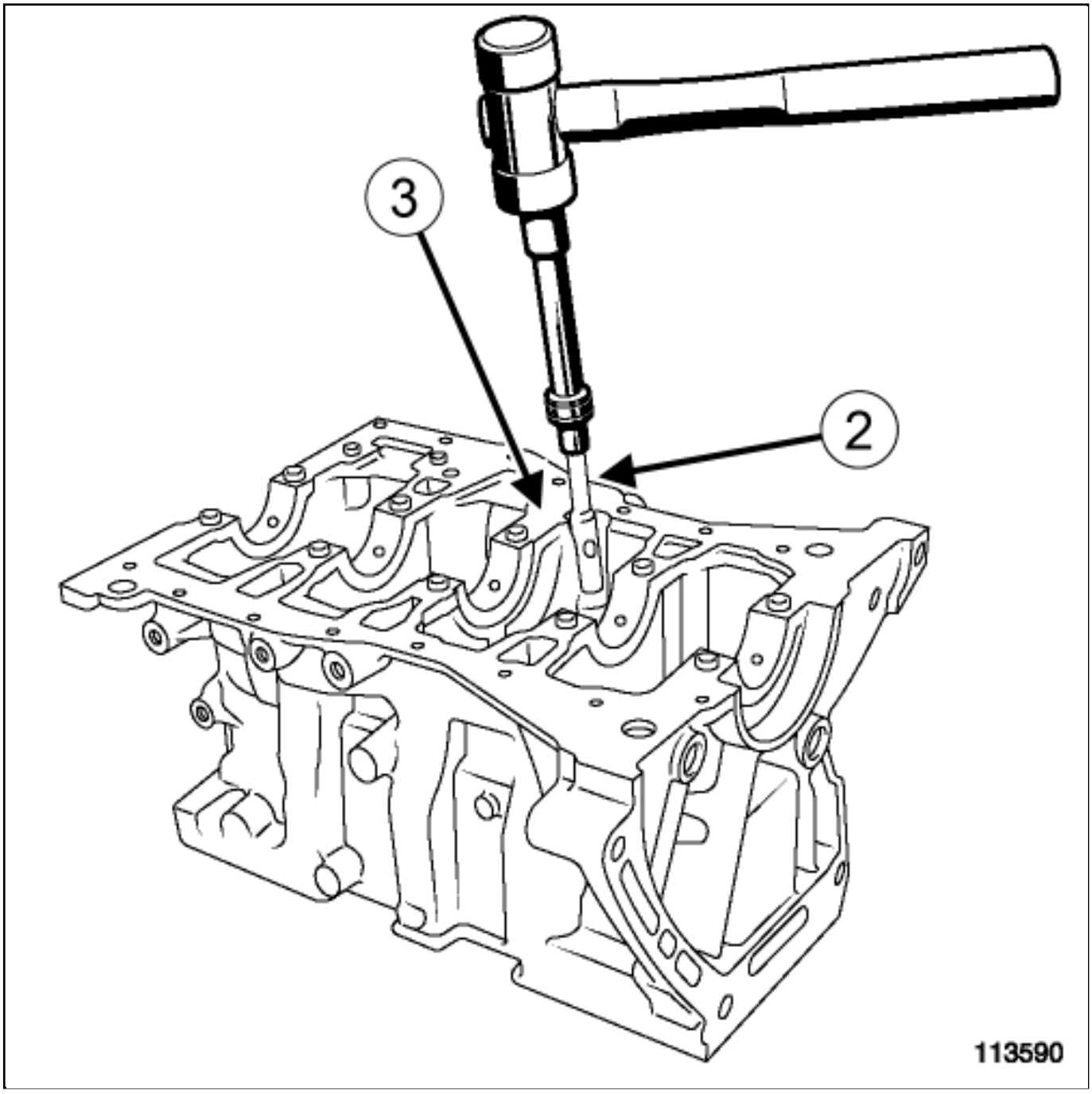
3. EQUIPMENT REQUIRED

- Female torx socket,
- 8 mm hexagon socket,
- Oil can,
- Piston mounting ring,
- Torque/angle wrench,
- Torque wrench,
- Bolt tightening gauge,
- Mallet.

4. REFITTING THE ROTATING PARTS

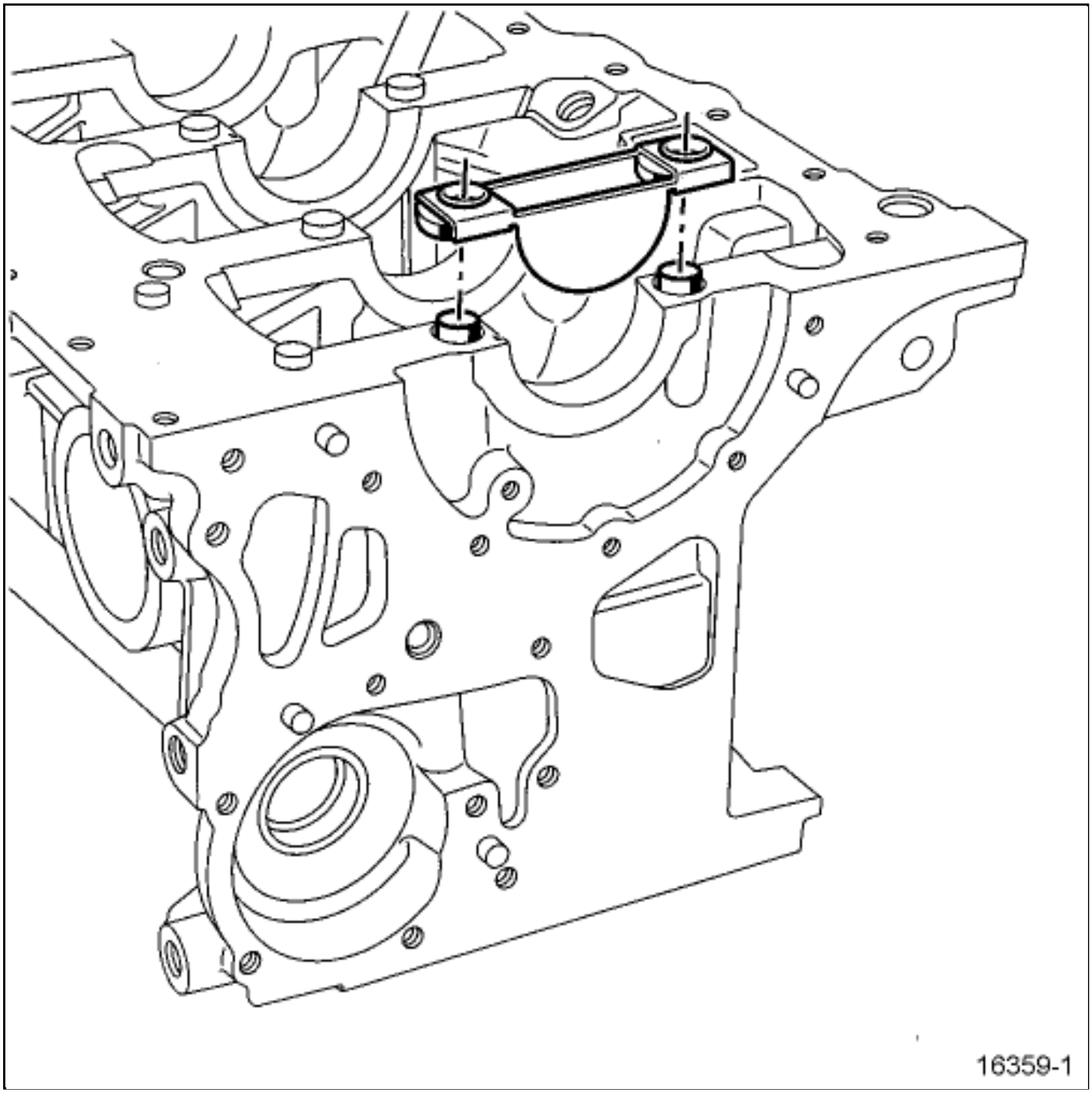


Replace the dipstick guide tube in the cylinder block (if the cylinder block is fitted with one), aligning the orifice(1) of the dipstick guide tube as indicated in the diagram.

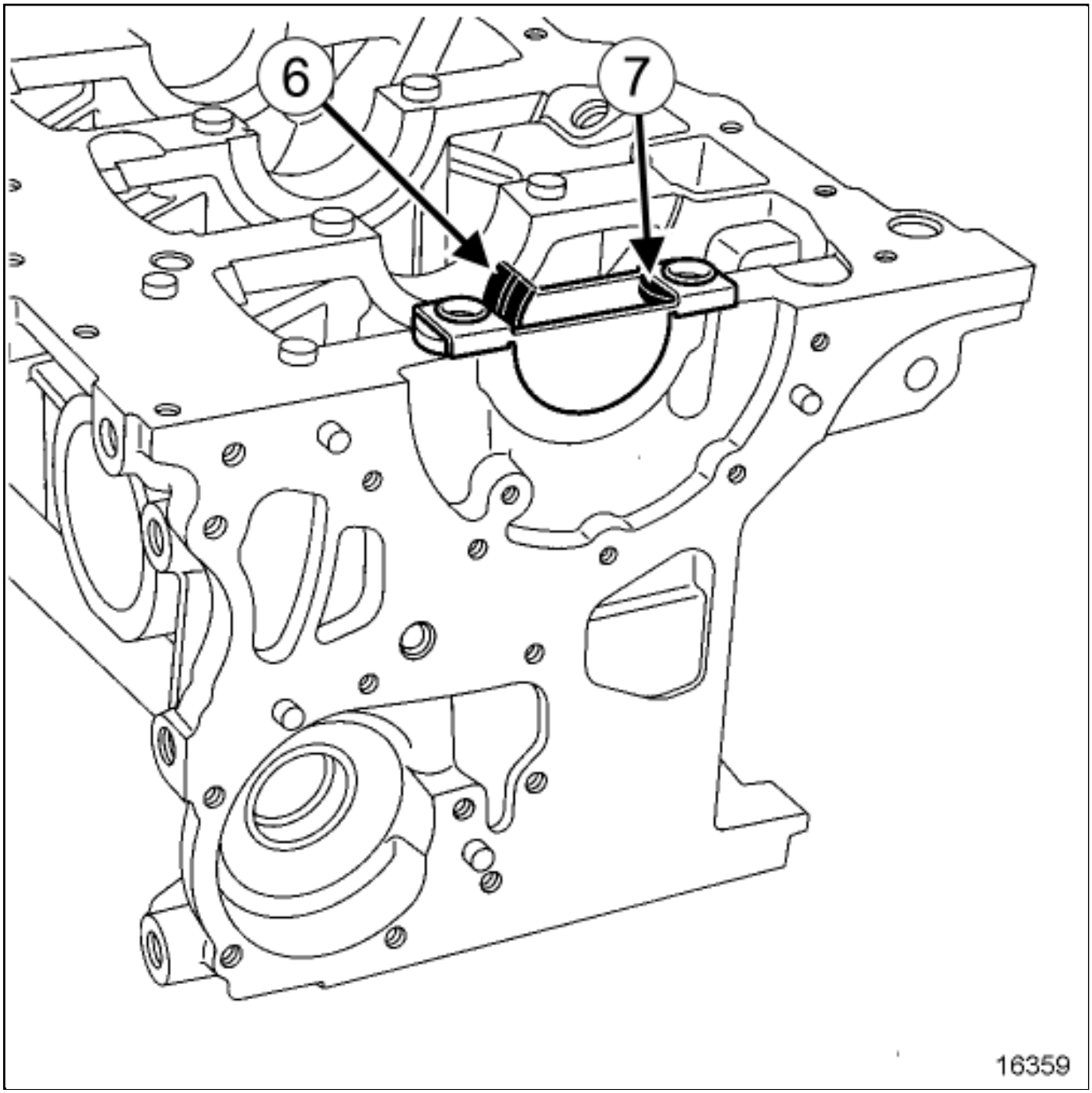


- Insert the dipstick guide using an 8 mmhexagon socket, until the dipstick guide protrudes by 43 mm beyond the end(2) of the cylinder block joint face(3) .

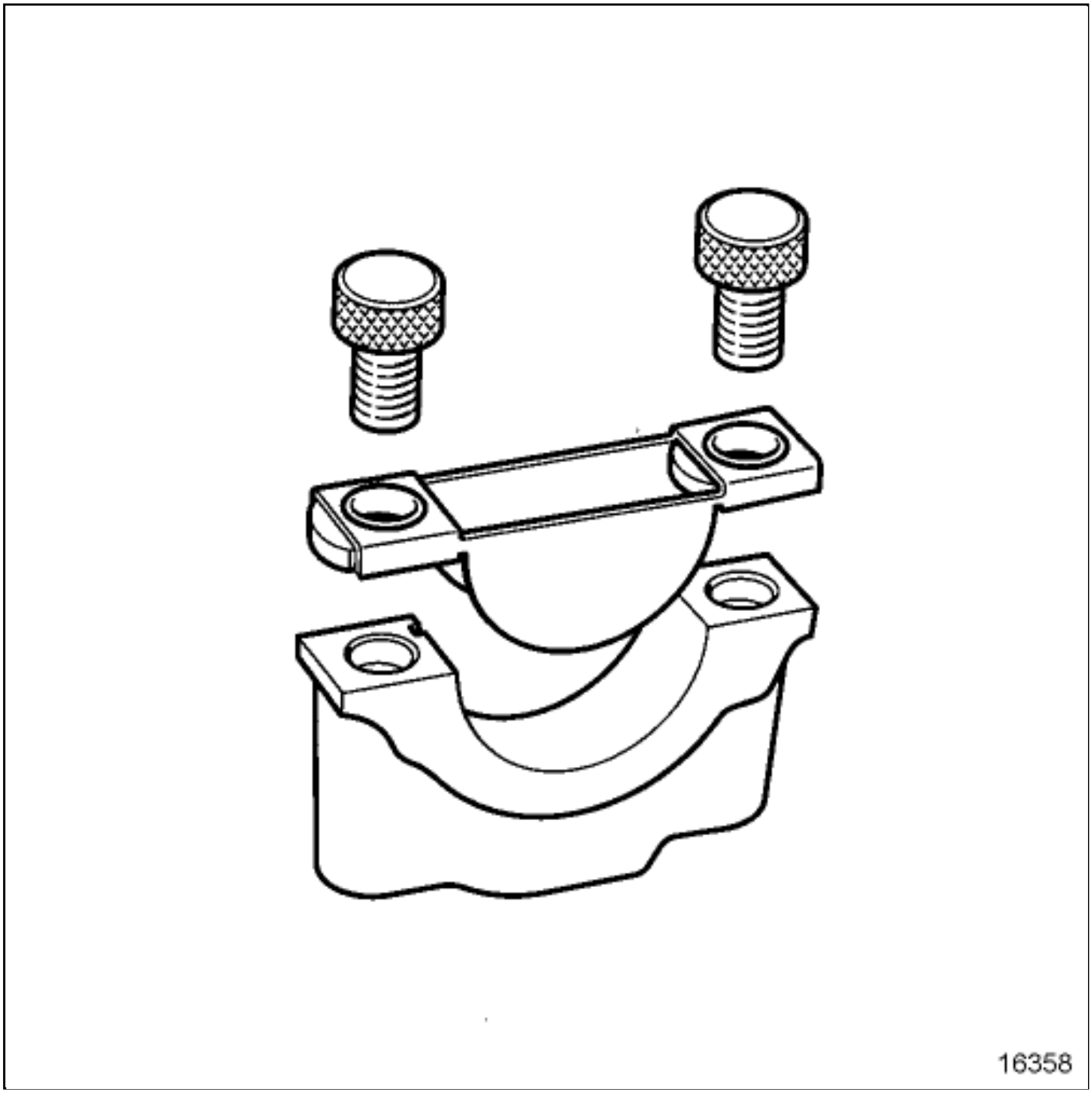
- Ensure that the crankshaft bearing journals are matched up with the crankshaft bearings on the cylinder block (see **Engine peripherals: Specifications**) .



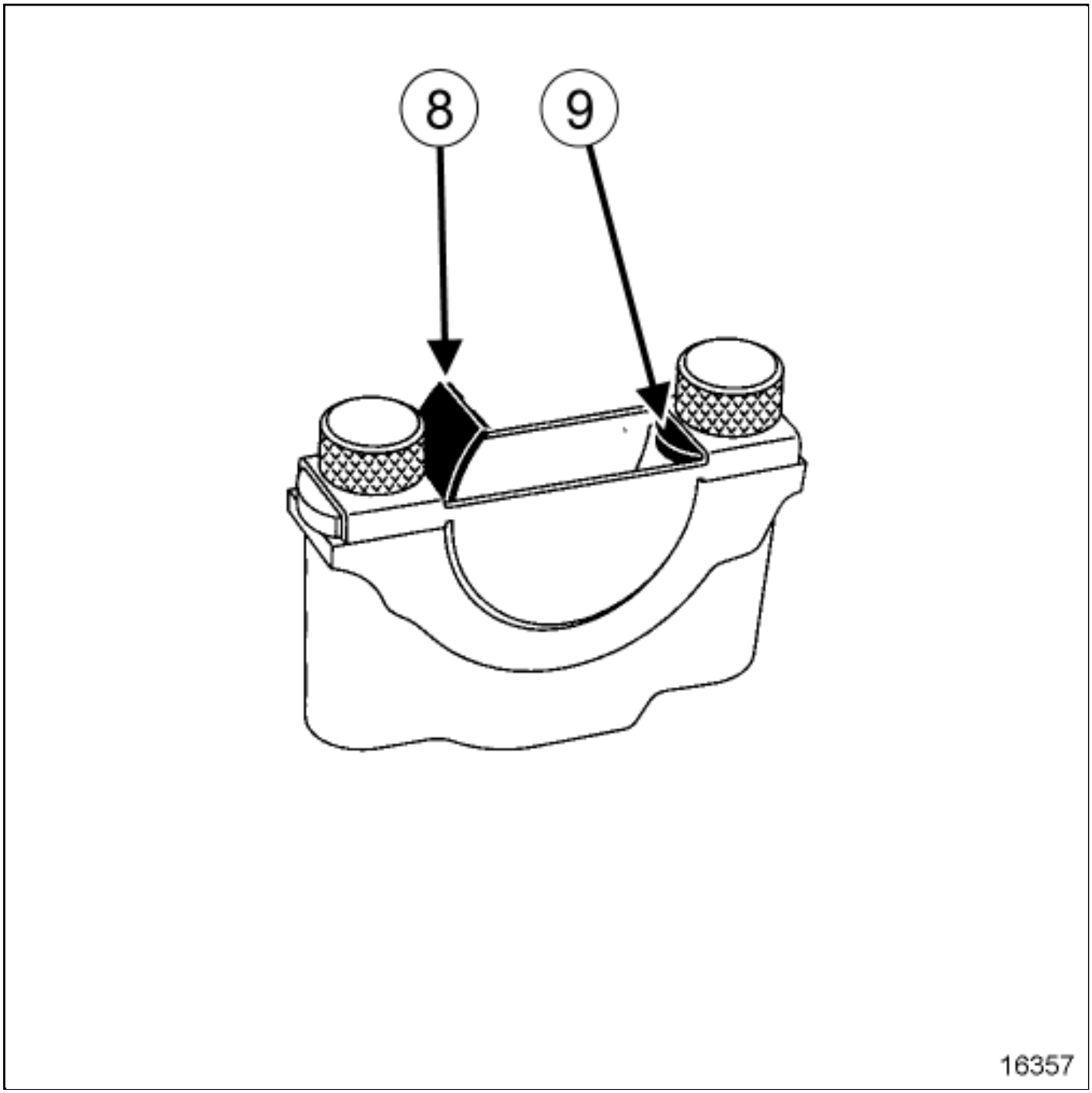
- Position the Crankshaft bearing centring tool.(Mot. 1493-01) on the cylinder block.



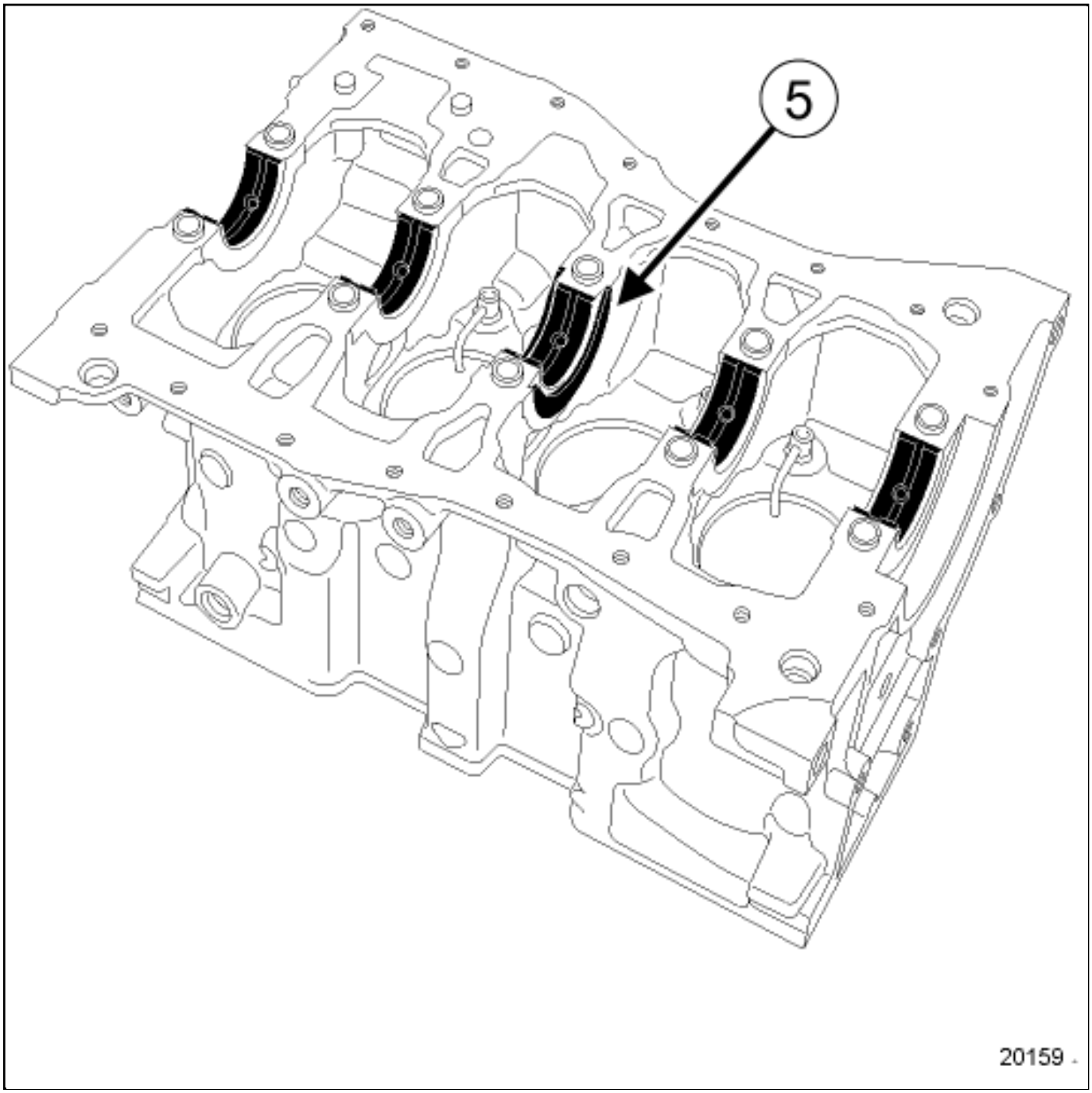
- Place the grooved bearing shell (6) in the Crankshaft bearing centring tool.(Mot. 1493-01) .
- Push on the bearing shell until it is pressed against the stop(7) .
- Repeat this process for other bearing shells.



- Position the Crankshaft bearing centring tool.(Mot. 1493-01) on the crankshaft bearing cap.

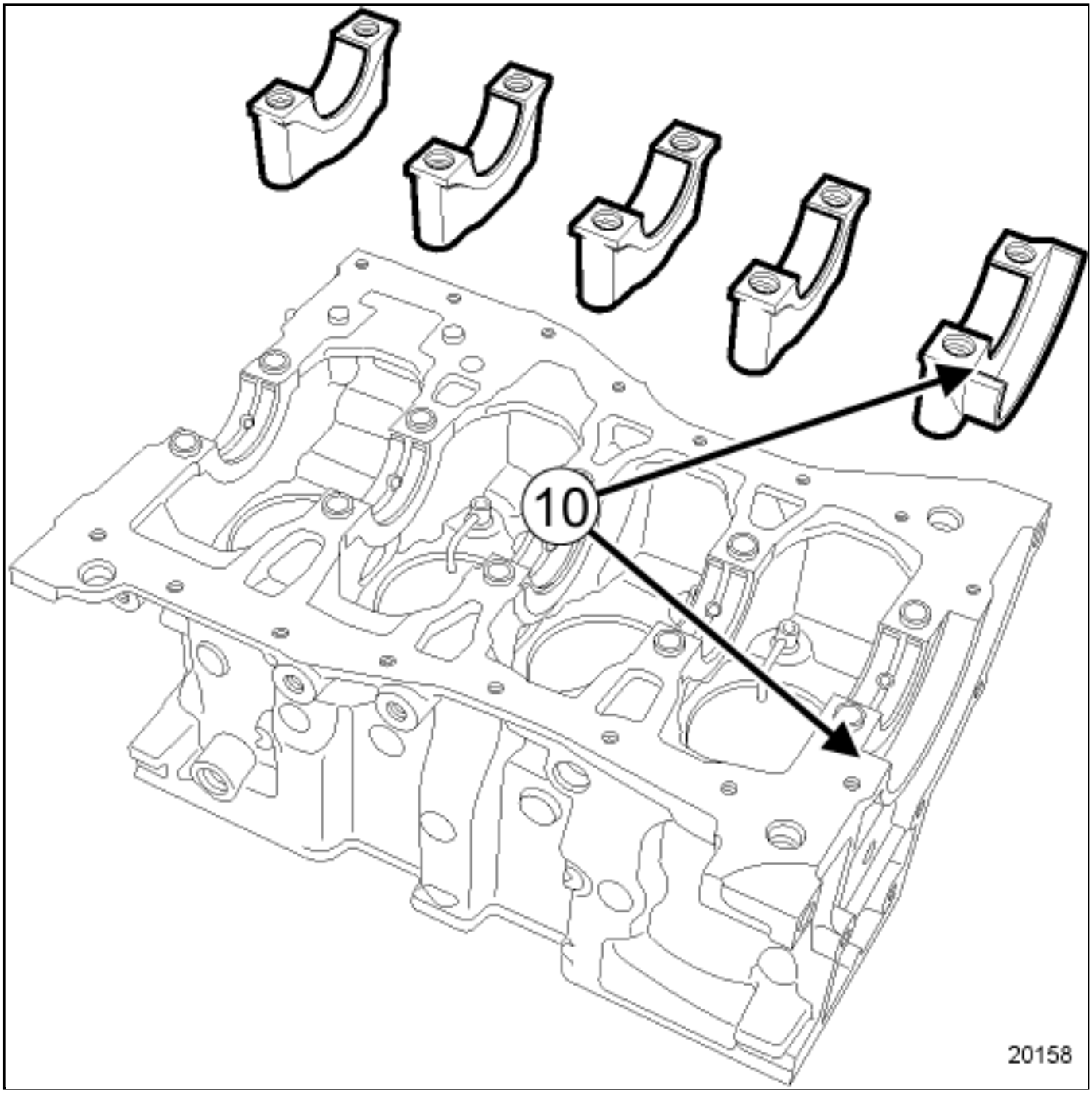


- Place the non-groovedbearing shell (8) in theCrankshaft bearing centring tool.(Mot. 1493-01) .
- Push on the bearing shell until it is pressed against the stop(9) .

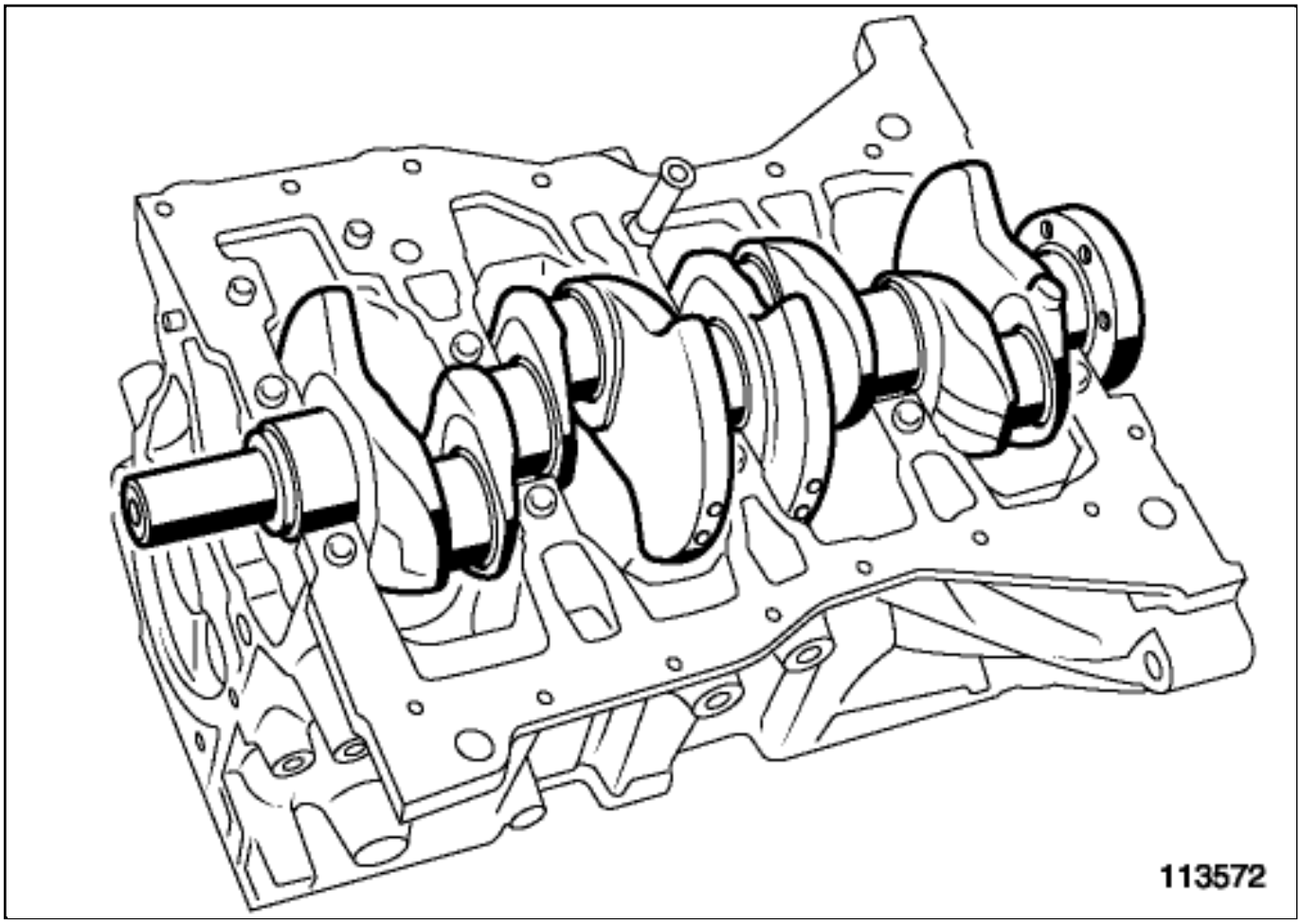


- Refit the crankshaft thrust washers positioning the grooves of the washers on the crankshaft end.

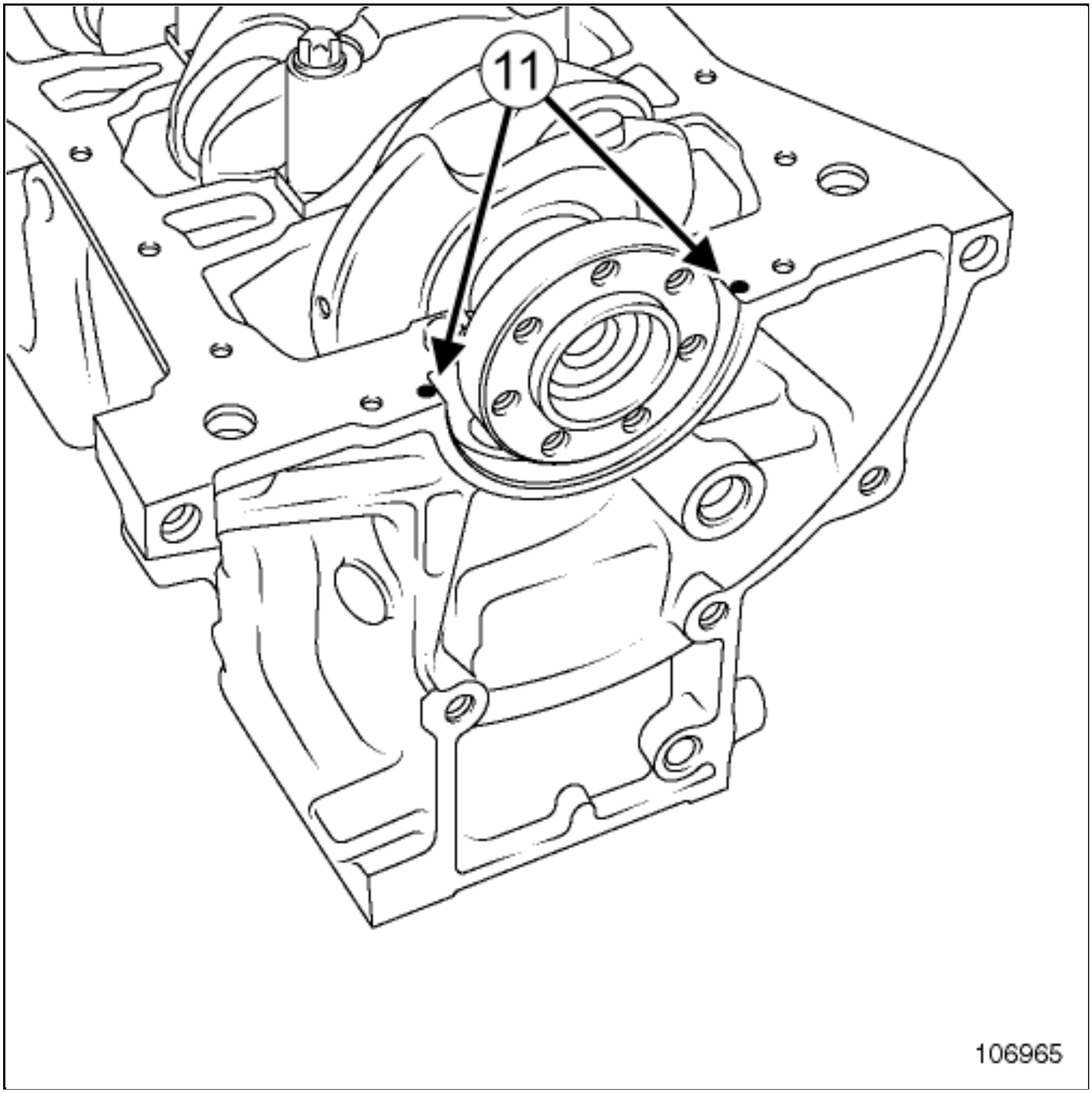
- Oil the crankshaft bearing shells with engine oil (only the side of the bearing that comes in contact with the crankshaft).



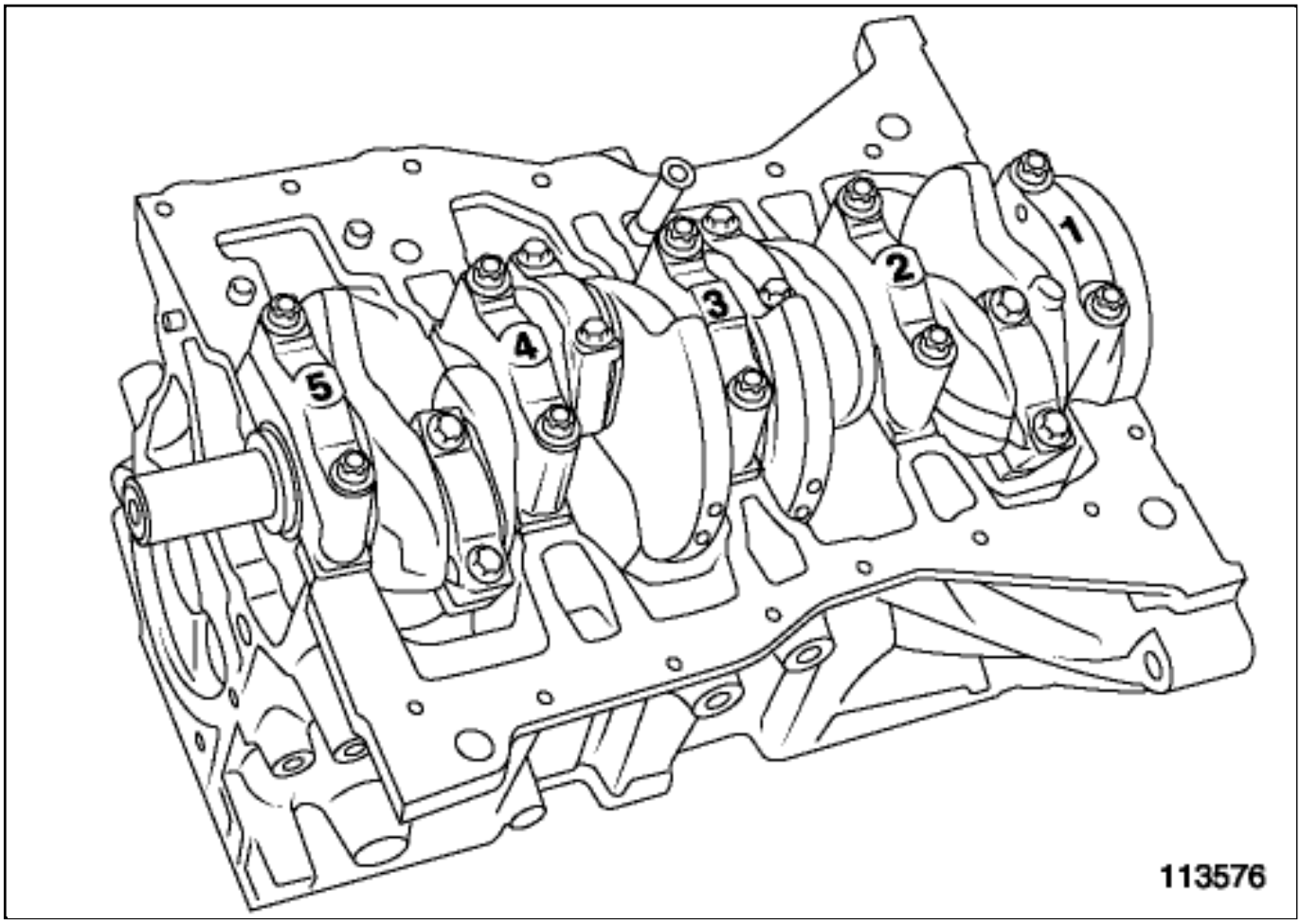
- Degrease the joint faces(10) of the cylinder block and the crankshaft bearing cap no.1 using surface cleaner (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products).



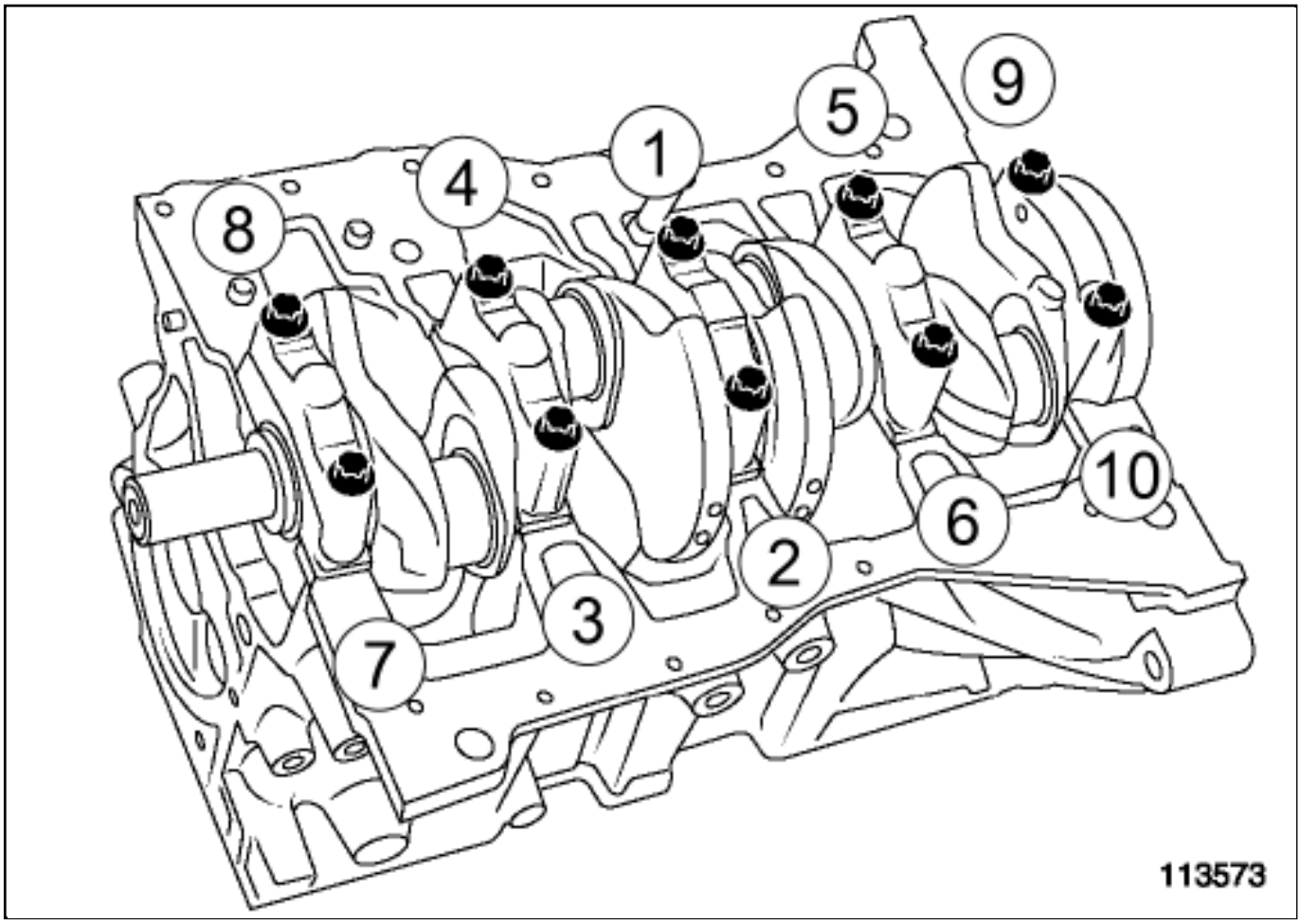
- Refit the crankshaft.



- Apply two drops(11) of resin adhesive(see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products) with a diameter of 4 mmto crankshaft bearing no.1.



- Refit the crankshaft bearing caps, ensuring that they are correctly positioned.



- Refit the new crankshaft bearing cap bolts.

- Torque and angle tighten in order the crankshaft bearing cap bolts25 N.m + 47˚ ± 6˚.

- Check that the crankshaft turns freely, with no resistance.

Note:

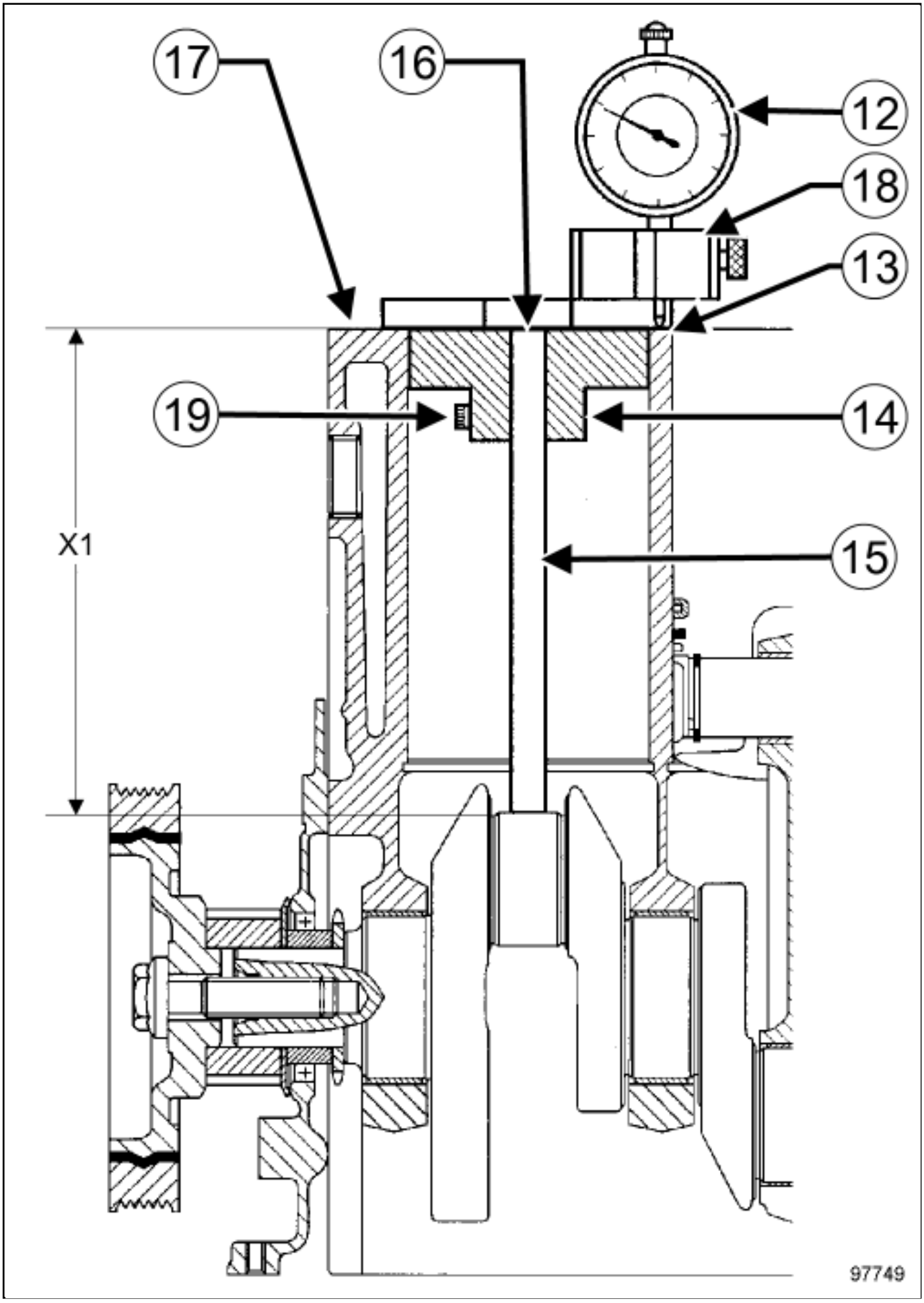
If replacing the conrods, the Parts Department will only supply conrods with a small end diameter of 26 mm.

It is therefore essential to check that the gudgeon pin is 26 mmin diameter.

- It is essential to determine the height of the crankpin(X1) in the event of having to replace the con rods, crankshaft, cylinder block.

The height(X1) represents the distance between the crankpin at TDC and the surface of the seal on the combustion face of the cylinder block.

This measurement enables the piston class to be determined.


17
16
12
18
13
19
14
X1
15
97749

- Measuring the crankpin height for cylinders 1 and 4:

- Insert the appropriate depth gauge of toolGauge for measuring height of crankpins.(Mot. 1319-01) (15) in the dummy piston(14) of the tool,Gauge for measuring height of crankpins.(Mot. 1319-01) lining up the light of the depth gauge opposite the locking bolt(19) .

- Tighten the locking bolt(19) .

- Check that the depth gauge slides freely in the dummy piston.

- Set the crankshaft to Top Dead Centre using theTDC locating pin.(Mot. 1489) .

- Position the dummy piston(14) of theGauge for measuring height of crankpins.(Mot. 1319-01) fitted with the depth gauge in cylinder No. 1.

- Position the depth gauge(15) of the tool,Gauge for measuring height of crankpins.(Mot. 1319-01) pressing on the crankshaft crankpin.

- Place the dial gauge support(18) of the toolGauge for measuring height of crankpins.(Mot. 1319) fitted with a dial gaugeon the dummy piston(14) .

- Calibrate the dial gauge(12) on the cylinder block, setting the mid-point between points(13) and (17) .

- Slide the dial gauge supportto the centre(16) of the depth gauge(15) .

- Measure the protrusion or recess of the depth gauge.

- Note the value.

- Carry out the same procedure for cylinder No. 4.

- Measuring the crankpin height for cylinders 2 and 3:

- Position approximately the crankpin for crankshaft No. 2 at Top Dead Centre.

- Place the dummy piston-depth gauge assembly into cylinder No. 2.

- Place the dial gauge supportfitted with dial gaugein the centre of the depth gauge.

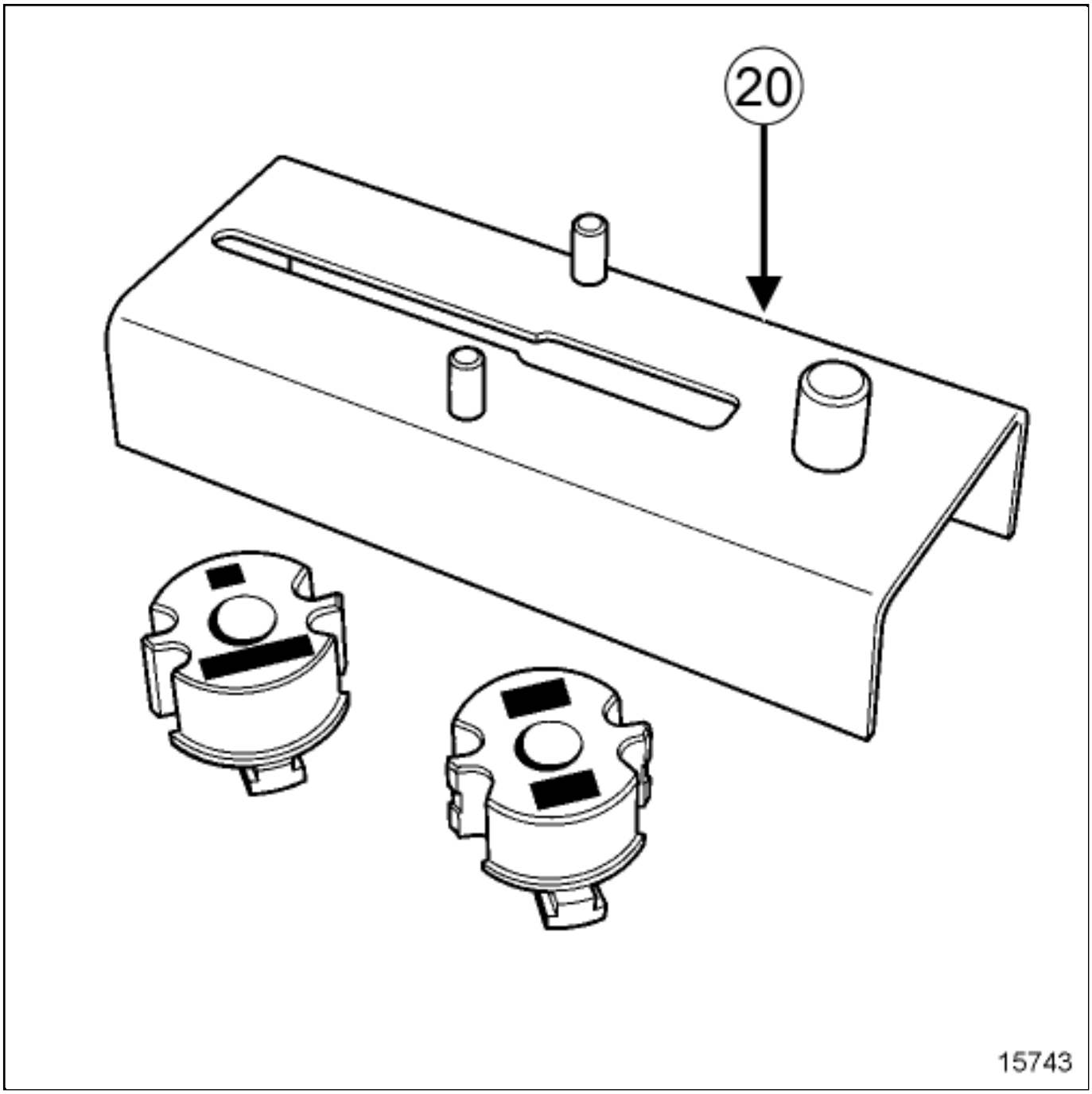
- Gently turn the crankshaft to determine the crankpin top dead centre.

- Calibrate the dial gaugeon the cylinder block(12) , setting the mid-point between points(13) and (17) .

- Slide the dial gauge supportto the centre(16) of the depth gauge(15) .

- Measure the protrusion or recess of the depth gauge.
- Note the value.
- Carry out the same procedure for cylinder No. 3.
- Determine the piston category.
- Add or subtract the values obtained of the length of the depth gauge in order to determine the dimension (X1) .
- For example:
  - length of depth gauge = 153.989 mm,
  - measured protrusion (of the length of the depth gauge beyond the cylinder block) = 0.65 mm,
  - the dimension(X1) = 153.989- 0.65= 153.339 mm(for a recess, the figures must be added).
- Determine the gudgeon pin heightusing the following formulas:
  - For engines fitted with a gudgeon pin of diameter 25 mmuse formula ((X1) - 111.535= height of the gudgeon pin),
  - For engines fitted with a gudgeon pin of diameter 26 mmuse formula ((X1) - 111.576= height of the gudgeon pin).
- Refer to the height classes table for the gudgeon pins in order to choose the correct piston class(see **Engine peripherals: Specifications**) .

1- OPERATION OF FITTING THE CON ROD BEARING SHELLS WITH TOOL MOT. 1492-03 AND TOOL MOT. 1492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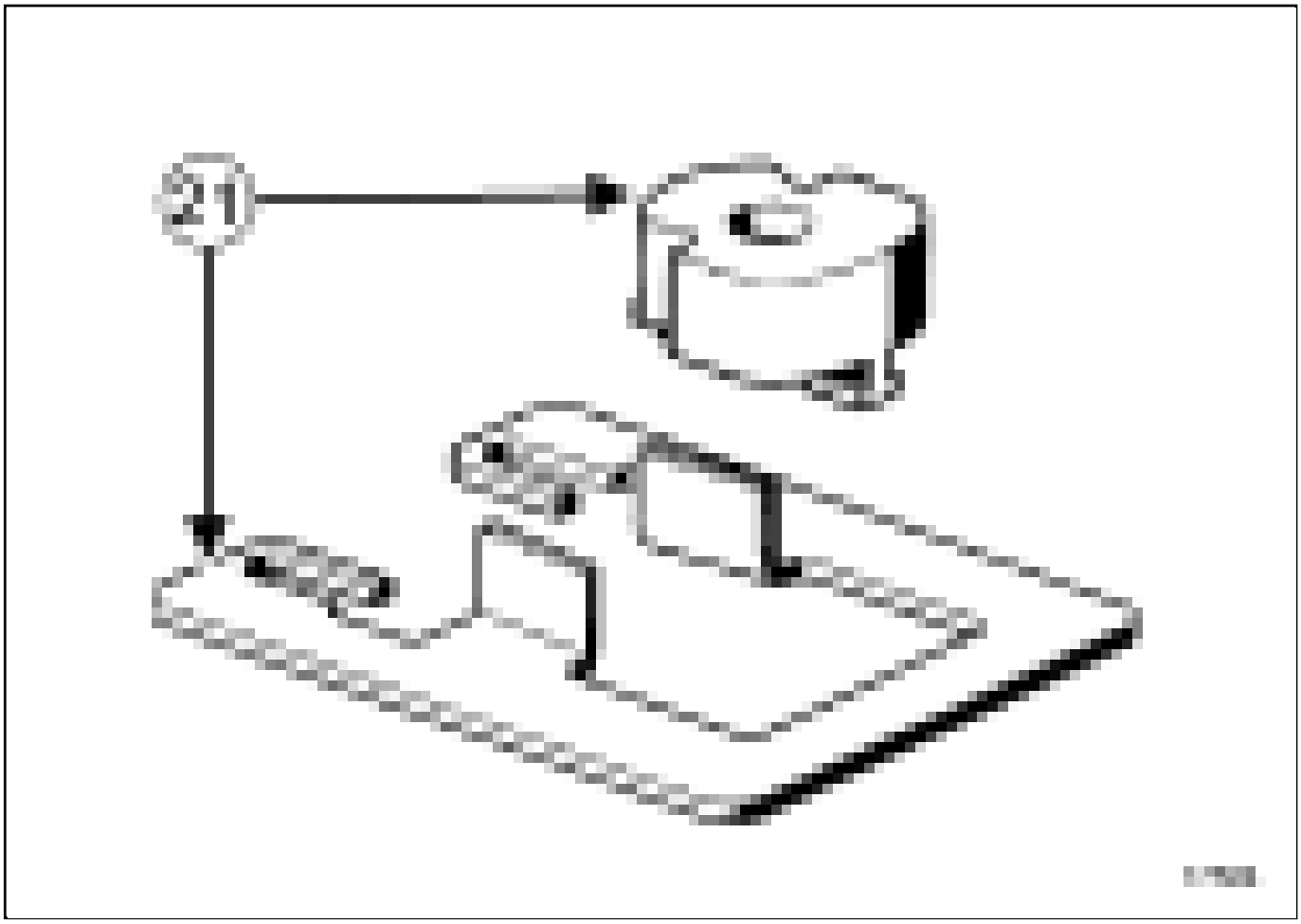
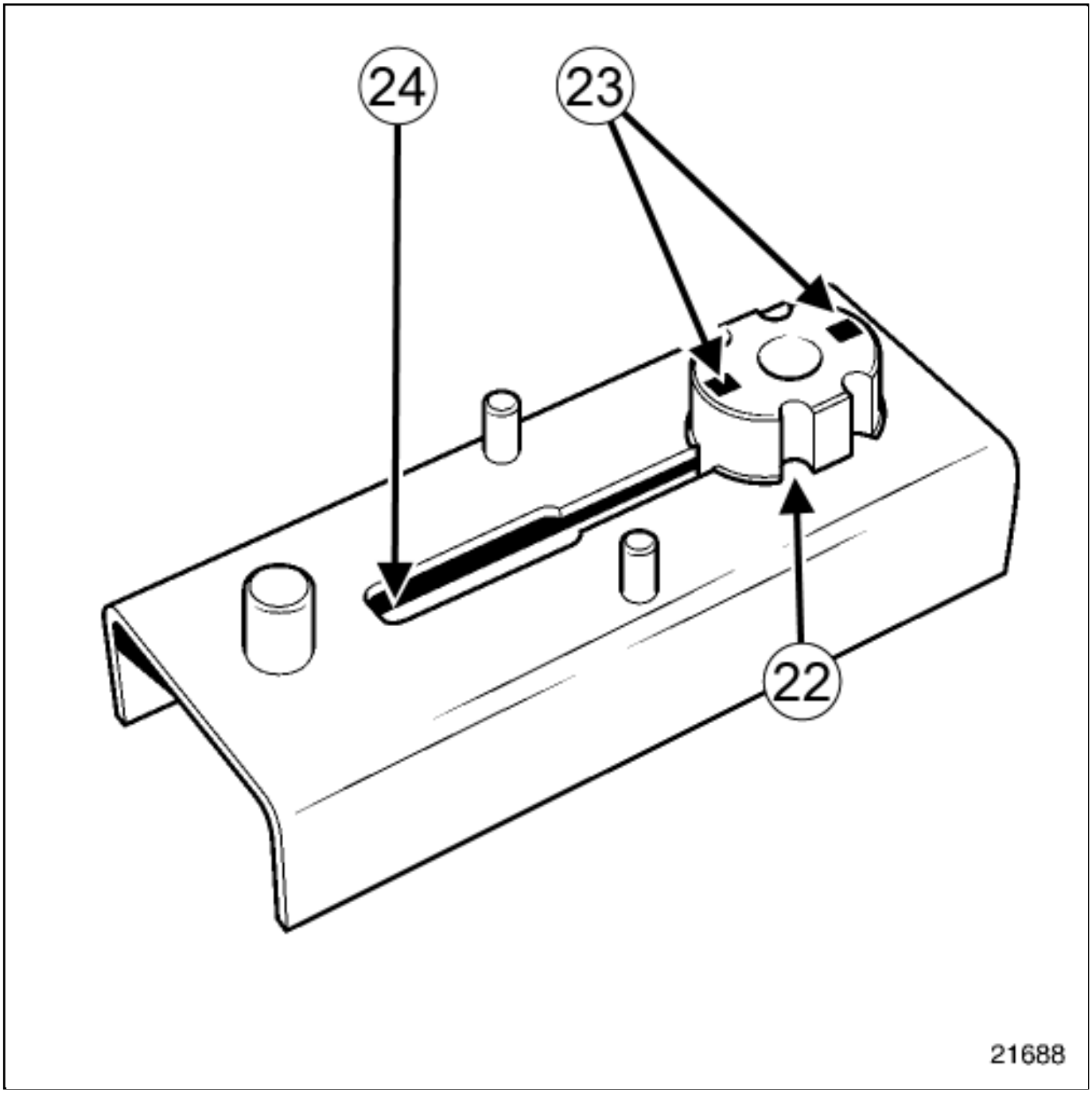


- Fit the con rod bearing shells using theTool for fitting main bearing shells.(Mot. 1492) (20) and Tool for fitting main bearing shells.(Mot. 1492-03) (21) .

- Refitting the con rod bearing shells on the con rod body.

Note:

When replacing con rod bearing shells, the Parts Department only supplies upper con rod bearing shells with a width of 18.625 ± 0.125 mm.

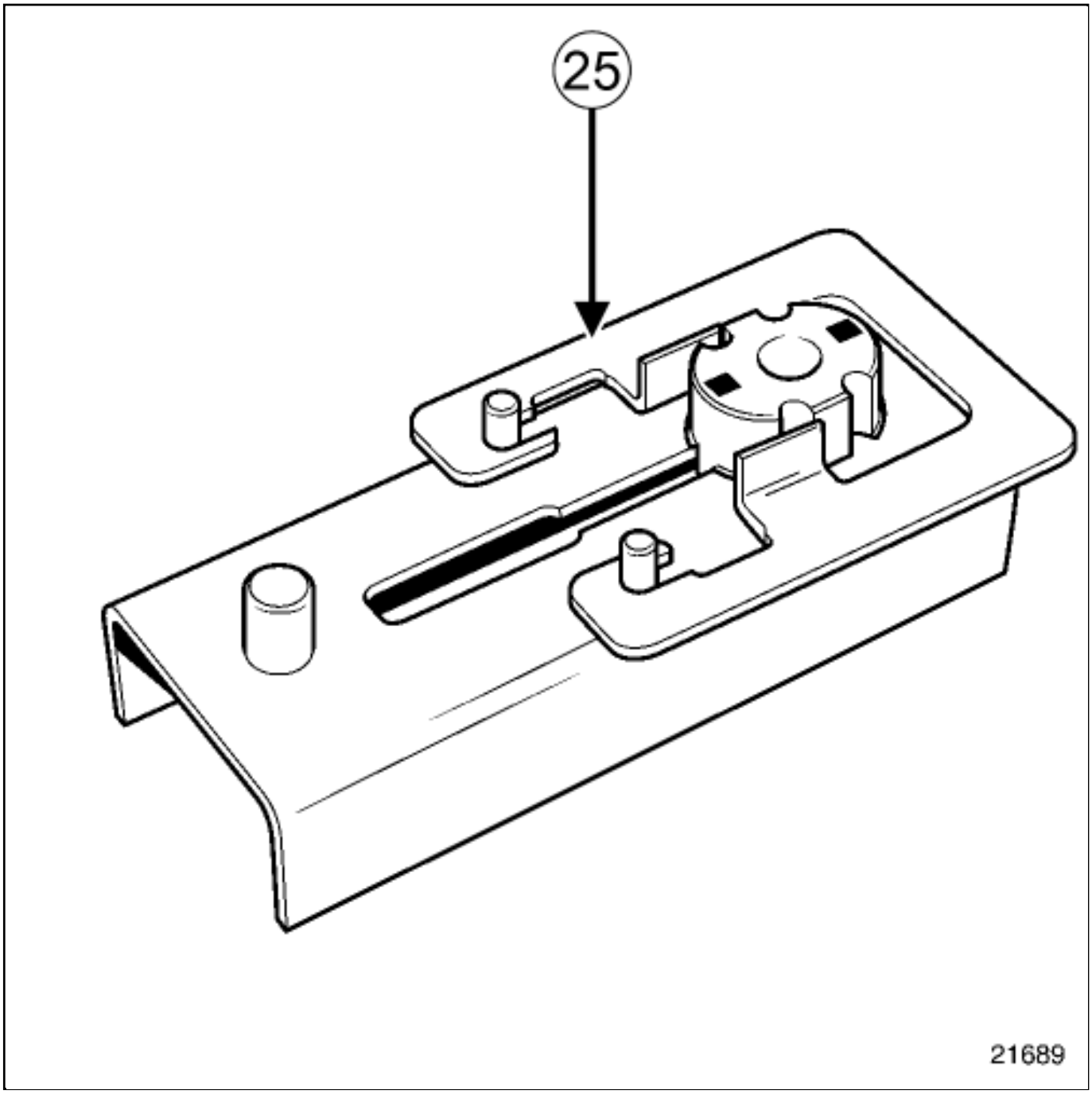


Slide the bearing shell support(22) (by positioning the marking "A" or "B"(23) on the con rod side and depending on the bearing width) of the toolTool for fitting main bearing shells.(Mot. 1492-03) into the groove(24) of the base plate of the toolTool for fitting main bearing shells.(Mot. 1492) .

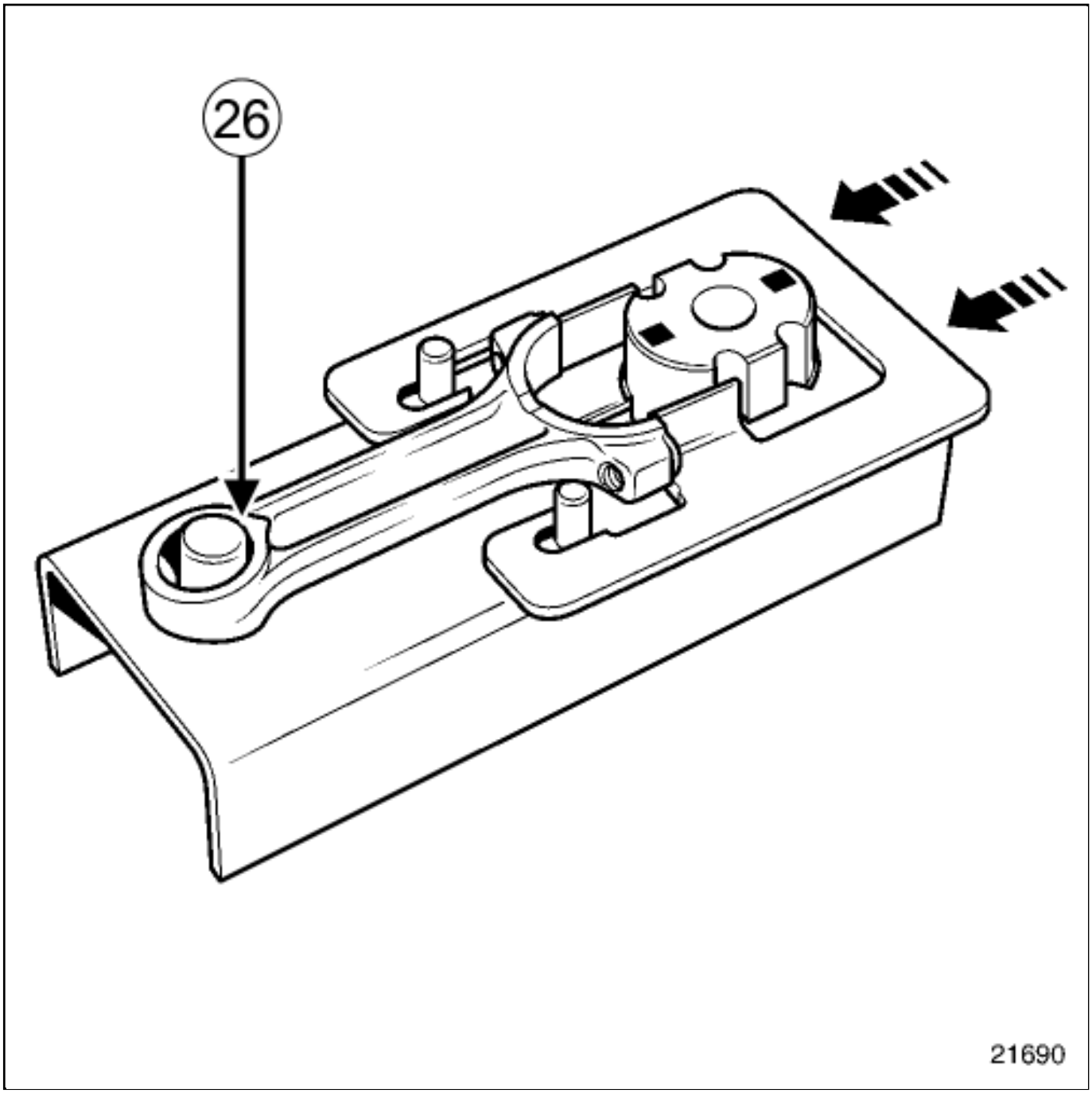
Note:

Position the bearing shell support, by positioning the marking "A" or "B"(23) on the con rod body side if:

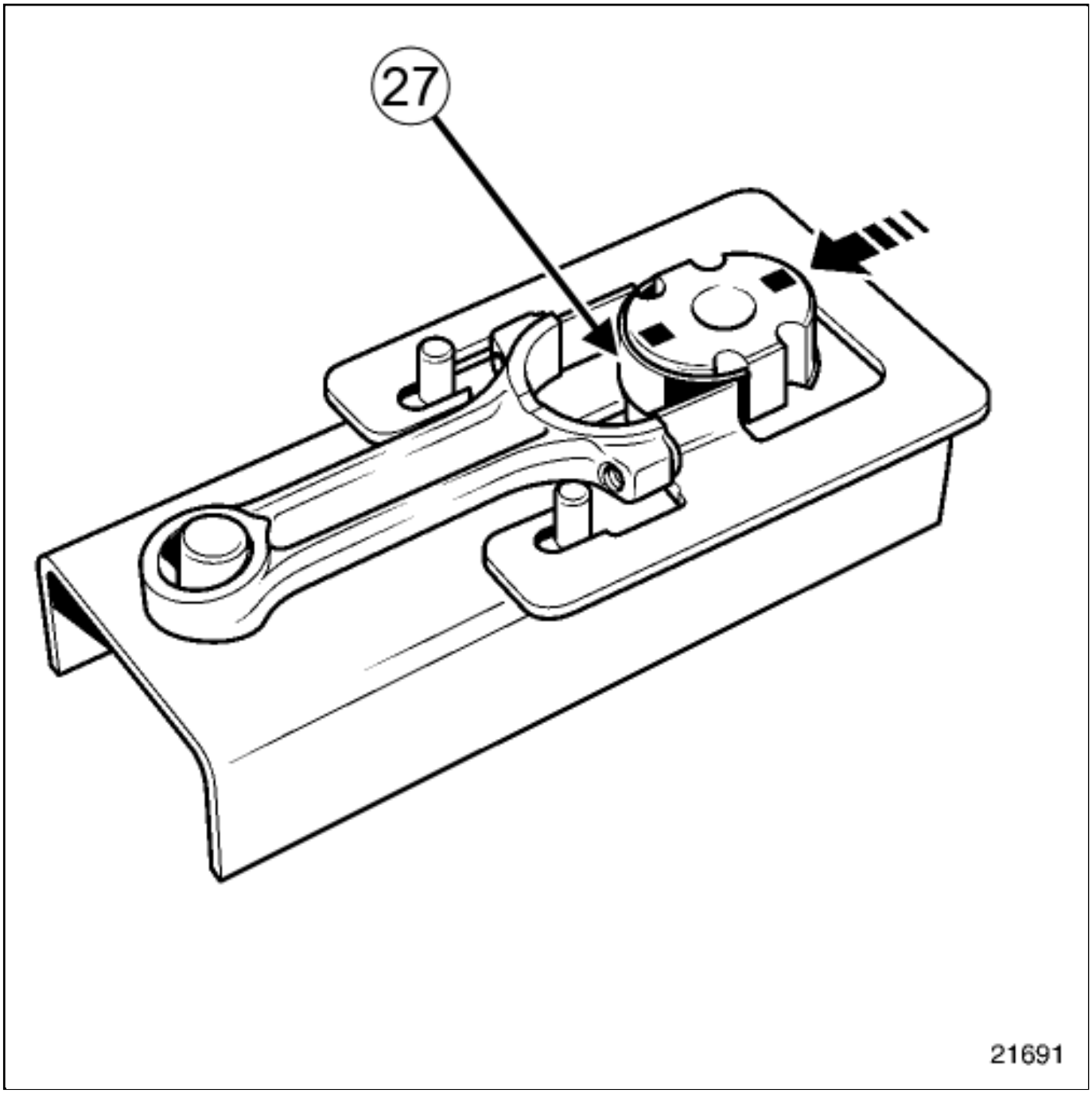
- the bearing shell width is 20.625 mm corresponding to marking "A",
- the bearing width is 18.625 mm corresponding to marking "B".



- Place the rail(25) of theTool for fitting main bearing shells.(Mot. 1492-03) on the base plate.



- Mount the con rod body on the base plate.
- Check that the lower part(26) of the small end is in contact with the centring pin.
- Push the rail (in the direction shown by the arrow) until the rail presses against the big end.

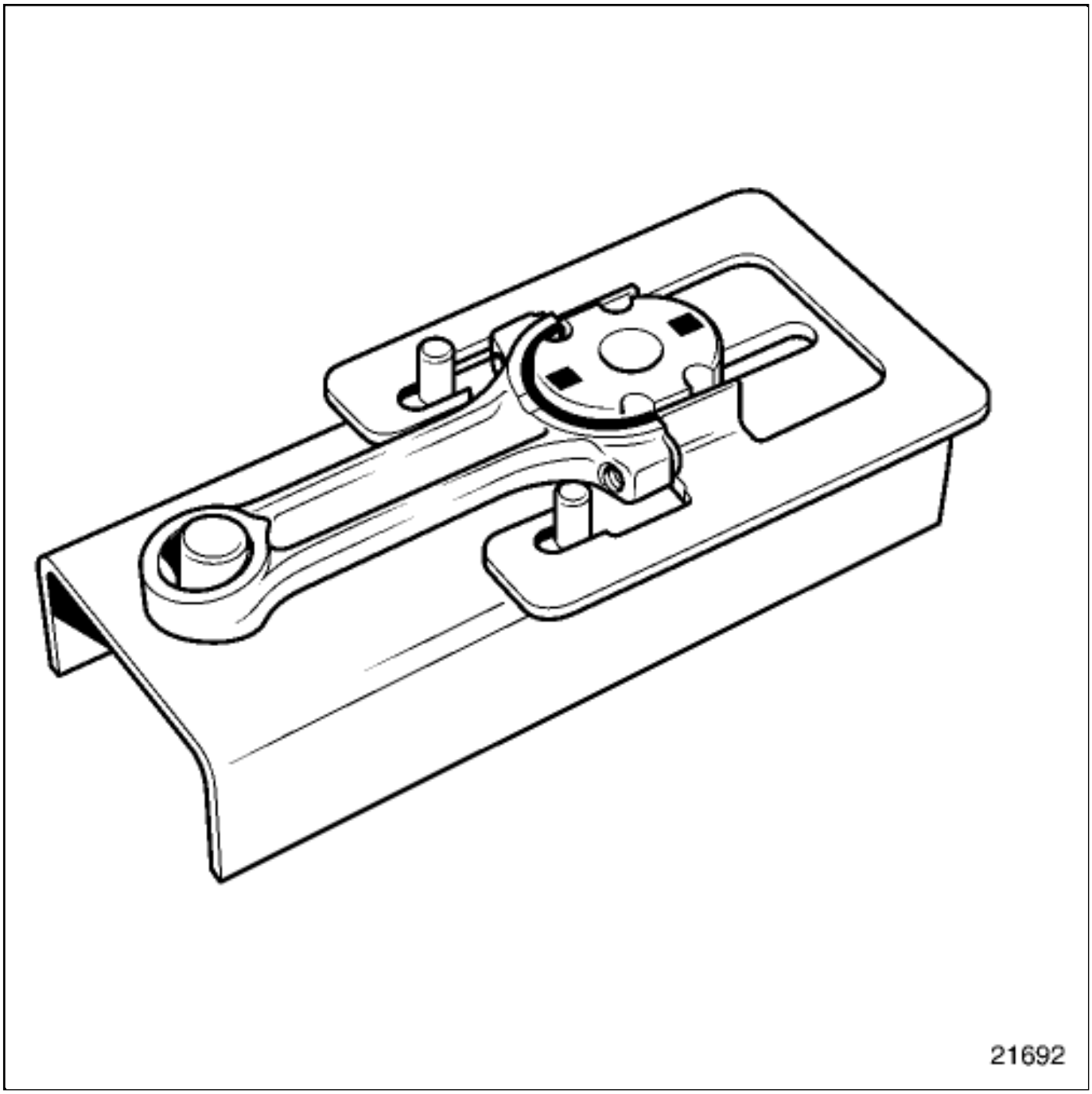


- Place the bearing(27) on the bearing shell support, with the marking "A" or "B", previously positioned on the con rod body side according to the bearing shell width.

Note:

- Position the bearing shell support, by positioning the marking "A" or "B"(23) on the con rod body side if:
  - the bearing shell width is 20.625 mm corresponding to marking "A",
  - the bearing width is 18.625 mm corresponding to marking "B".

- Push the bearing shell support in the direction shown by the arrow.

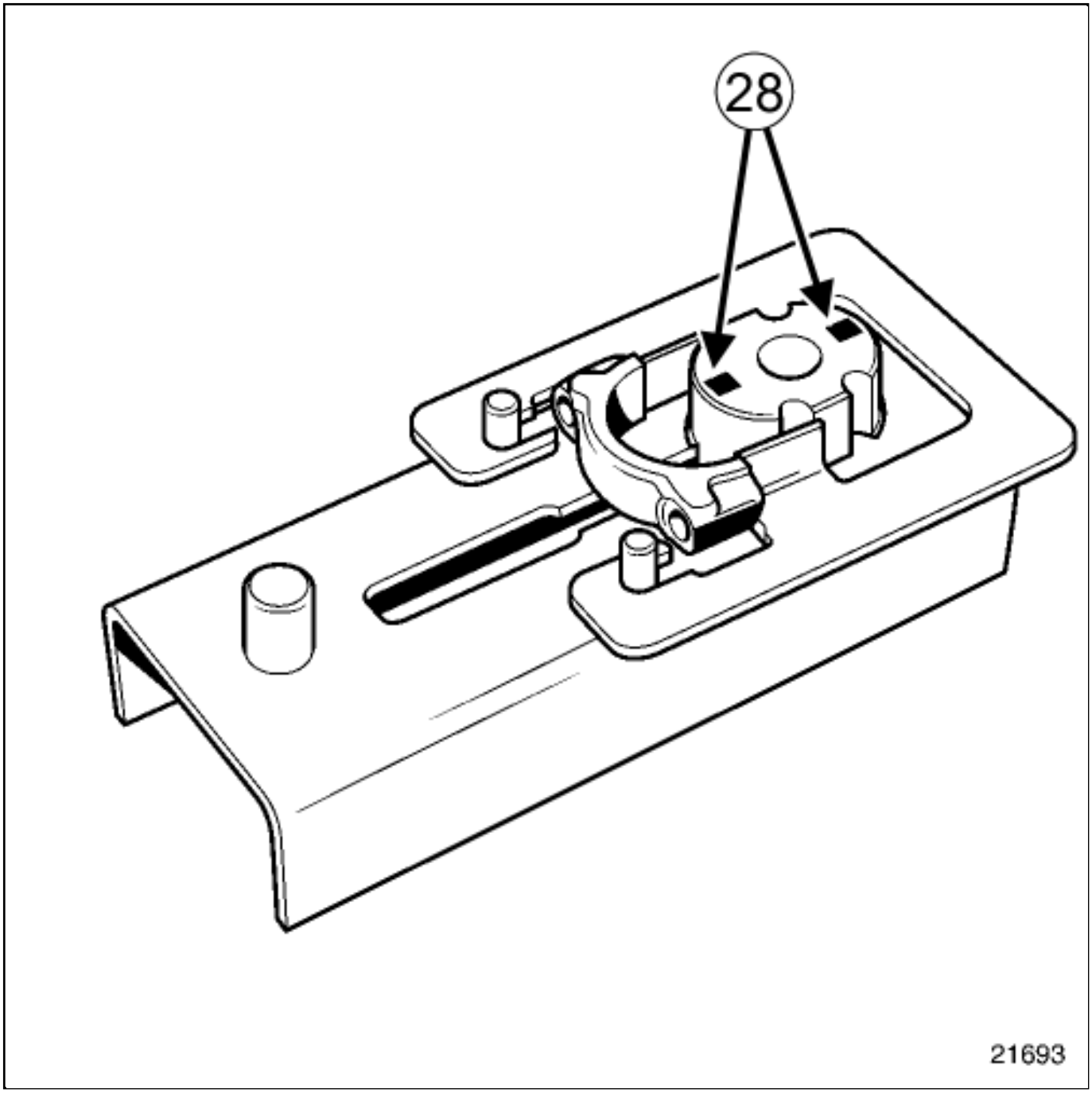


- Bring the bearing shell support to the end of the con rod body base.

- Remove the support shell from the con rod body.

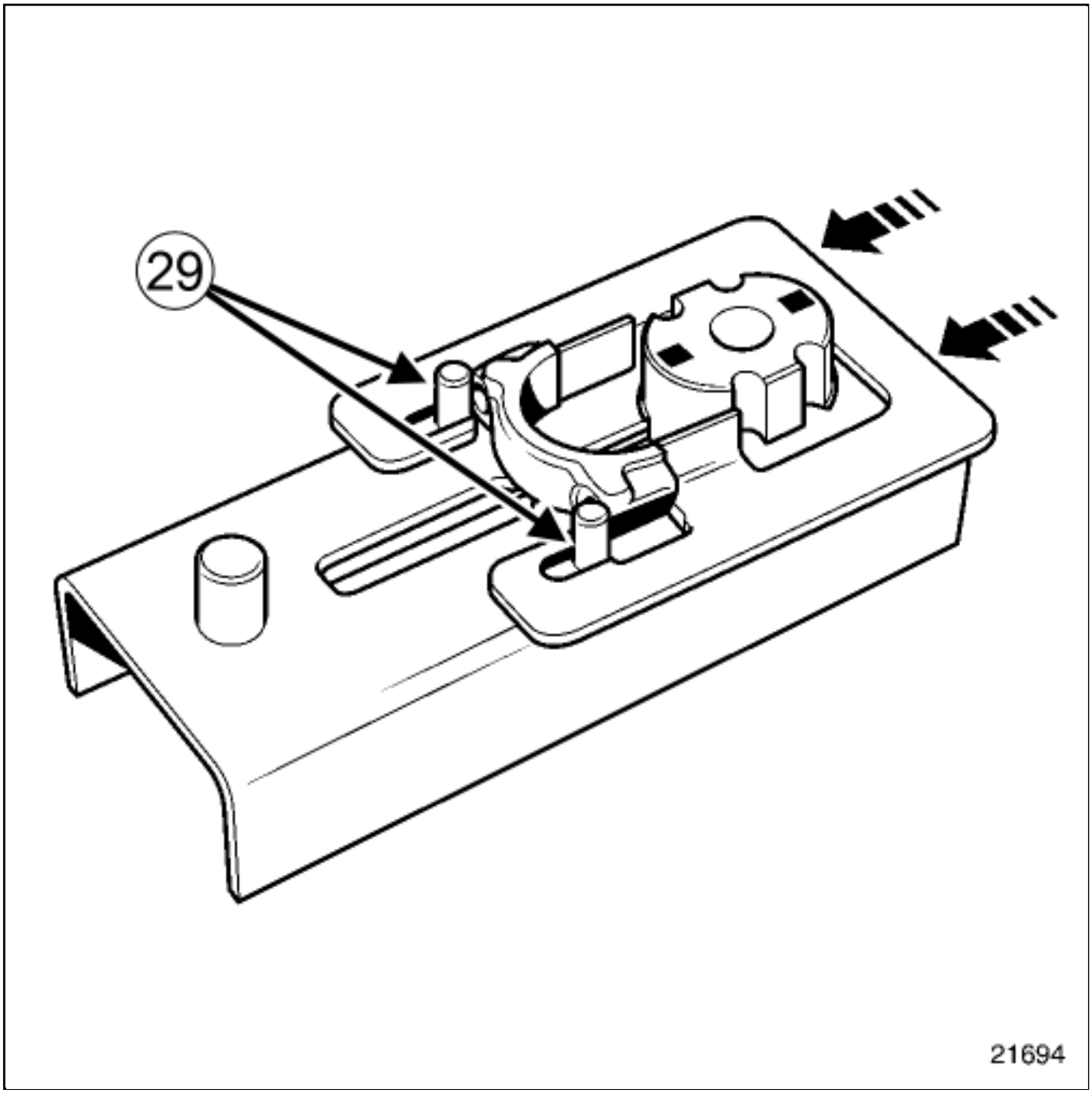
- Repeat the operation for the other con rod bodies.

- Refitting the con rod bearing shells on the con rod cap.

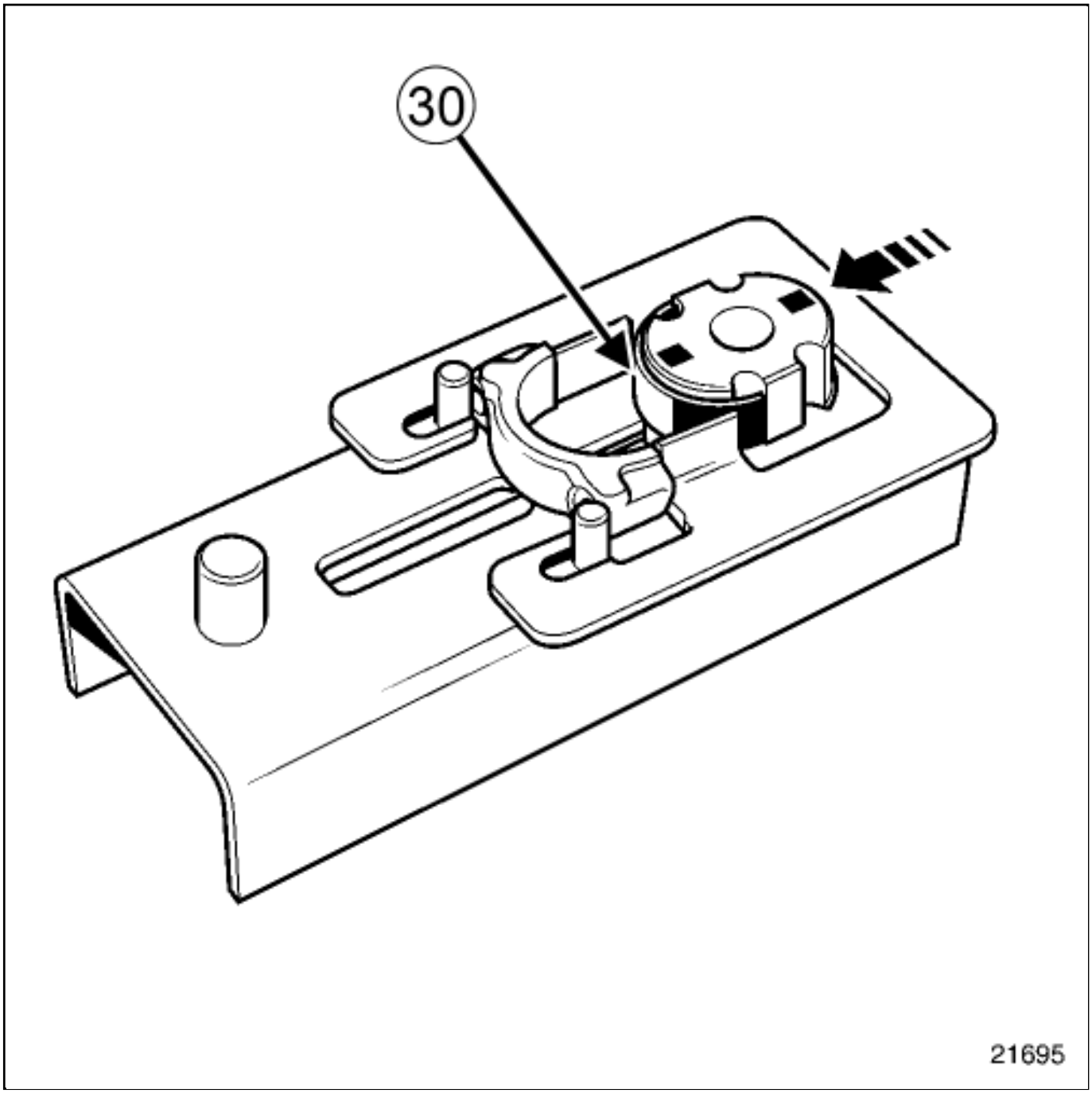


- Position the bearing shell support, aligning the marking "A" or "B"(**28**) on the con rod cap side if:
  - the bearing shell width is 20.625 mm corresponding to marking "A",
  - the bearing shell width is 17.625 mm corresponding to marking "B".

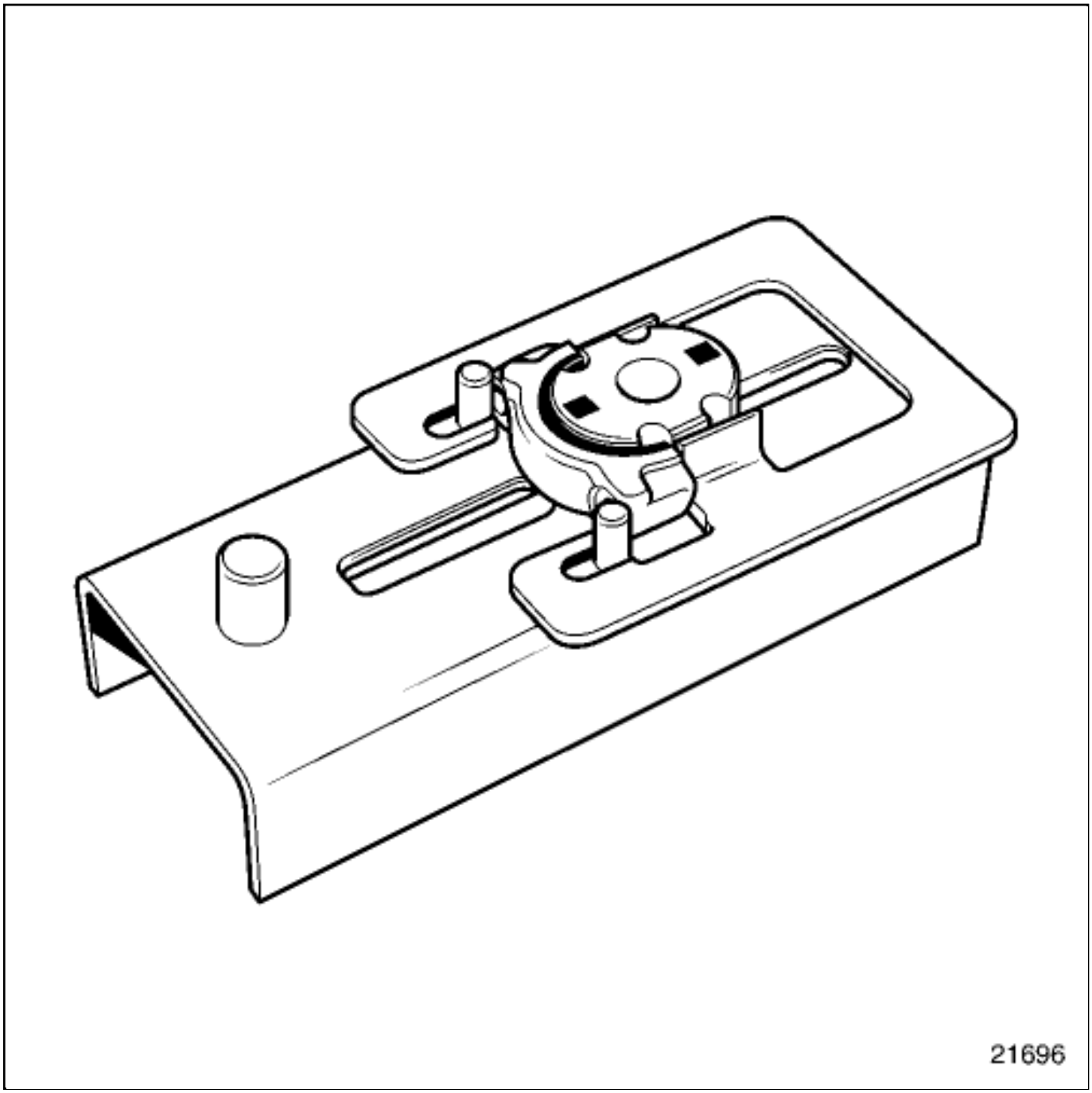
- Mount the con rod cap on the base plate.



❏ Push the rail in the direction shown by the arrow until the con rod cap presses against the pins(29) on the base plate.



- Mount the bearing shell(30) on the bearing shell support.
- Push the bearing shell support in the direction shown by the arrow.



- Bring the bearing shell support to the end of the con rod cap base.

- Remove the bearing shell from the con rod cap.

- Repeat the operation for the other con rod caps.

2- REFITTING CON ROD BEARING SHELLS WITH TOOL MOT. 1920 AND TOOL MOT. 1914

Note:

In the event of re-use, refit the bearing shells according to the marks made during removal.

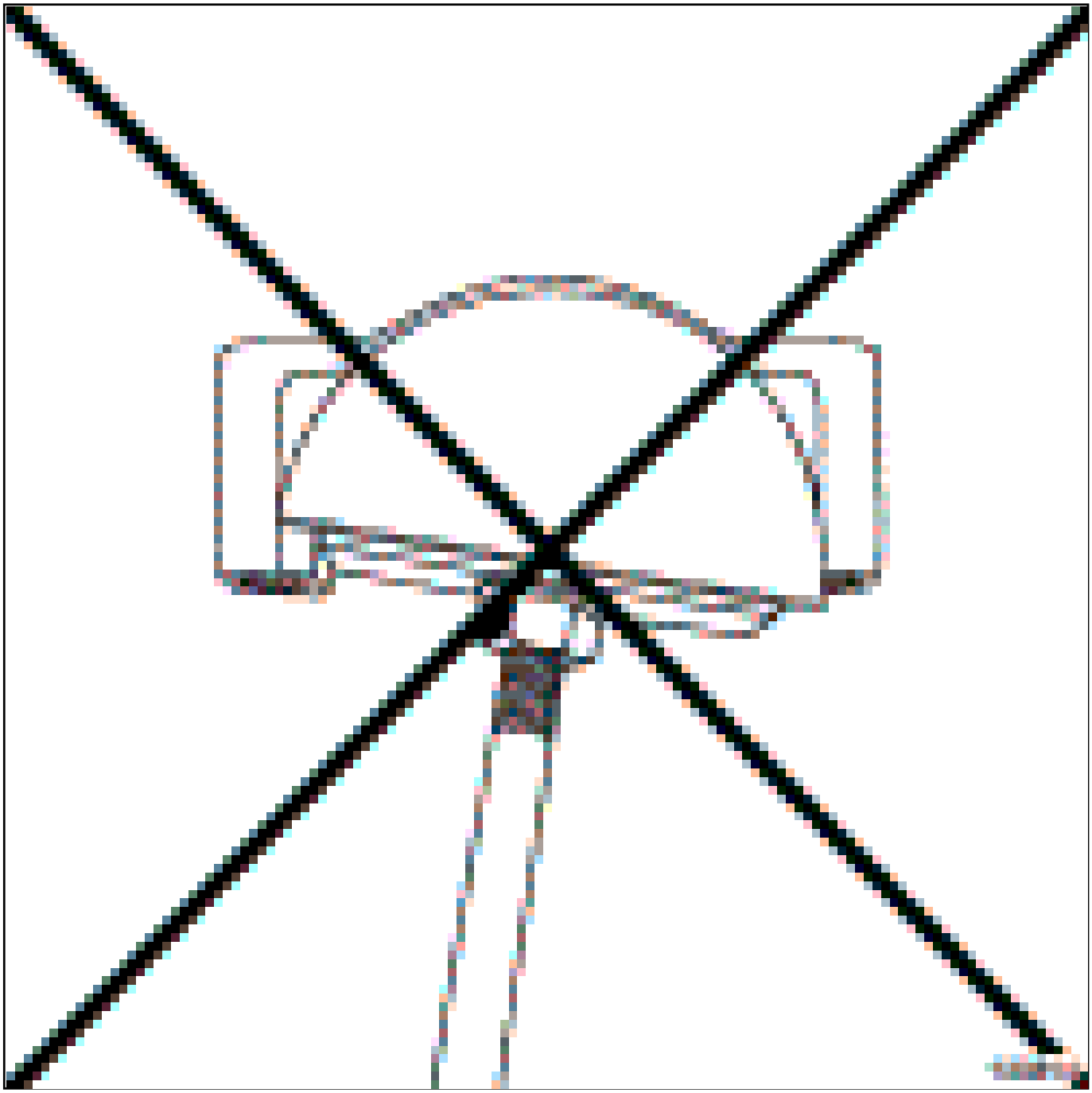
Note:

Always replace con rod bearing shells with a width of 20 mmby con rod bearing shells with a width of 18 mm.

If the set of con rod bearing shells only includes con rod bearing shells which are 18mm wide, only use the head of the toolTool for fitting F9 / K9 con rod bearing shells (Mot. 1920) with the marking " K9K SUP".

- Tighten the section of the toolTool for fitting F9 / K9 con rod bearing shells(Mot. 1920) with the marking " K9K INF" on the threaded sleeve of the toolTool for fitting G9 con rod bearing shells(Mot. 1914) .

- Position the lower con rod bearing shell on the toolTool for fitting F9 / K9 con rod bearing shells(Mot. 1920) .



Note:

The contact surface between the bearing shell and the con rod must be dry and free of grease.

Fit the lower con rod bearing shell on the con rod cap using the toolTool for fitting F9 / K9 con rod bearing shells (Mot. 1920) .

Position each end of the lower bearing shell flush with the con rod cap mating faces.

- Repeat the operation to fit the other lower con rod bearing shells on the con rod caps.

- Remove the tool head with the marking " K9K INF" and fit the head with the marking " K9K SUP".

- Position the upper con rod bearing shell on the toolTool for fitting F9 / K9 con rod bearing shells(**Mot. 1920**) .

- Fit the upper con rod bearing shell on the con rod body using the toolTool for fitting F9 / K9 con rod bearing shells (**Mot. 1920**) .

- Position the upper con rod bearing shell so that the ends do not protrude beyond the con rod body.

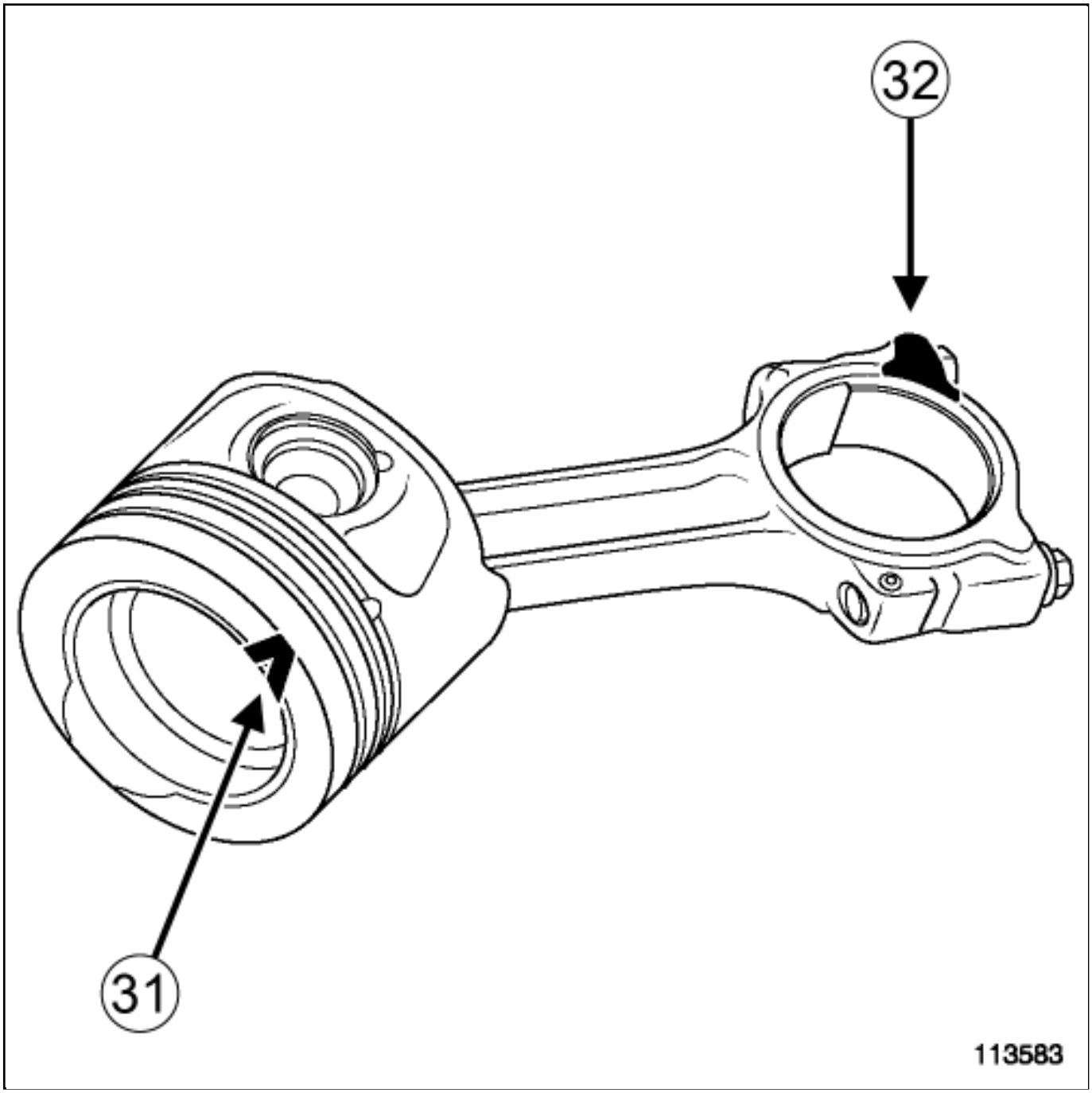
- Repeat the operation to fit the other upper con rod bearing shells on the con rod bodies.

3- PISTON AND CON ROD ASSEMBLY OPERATION

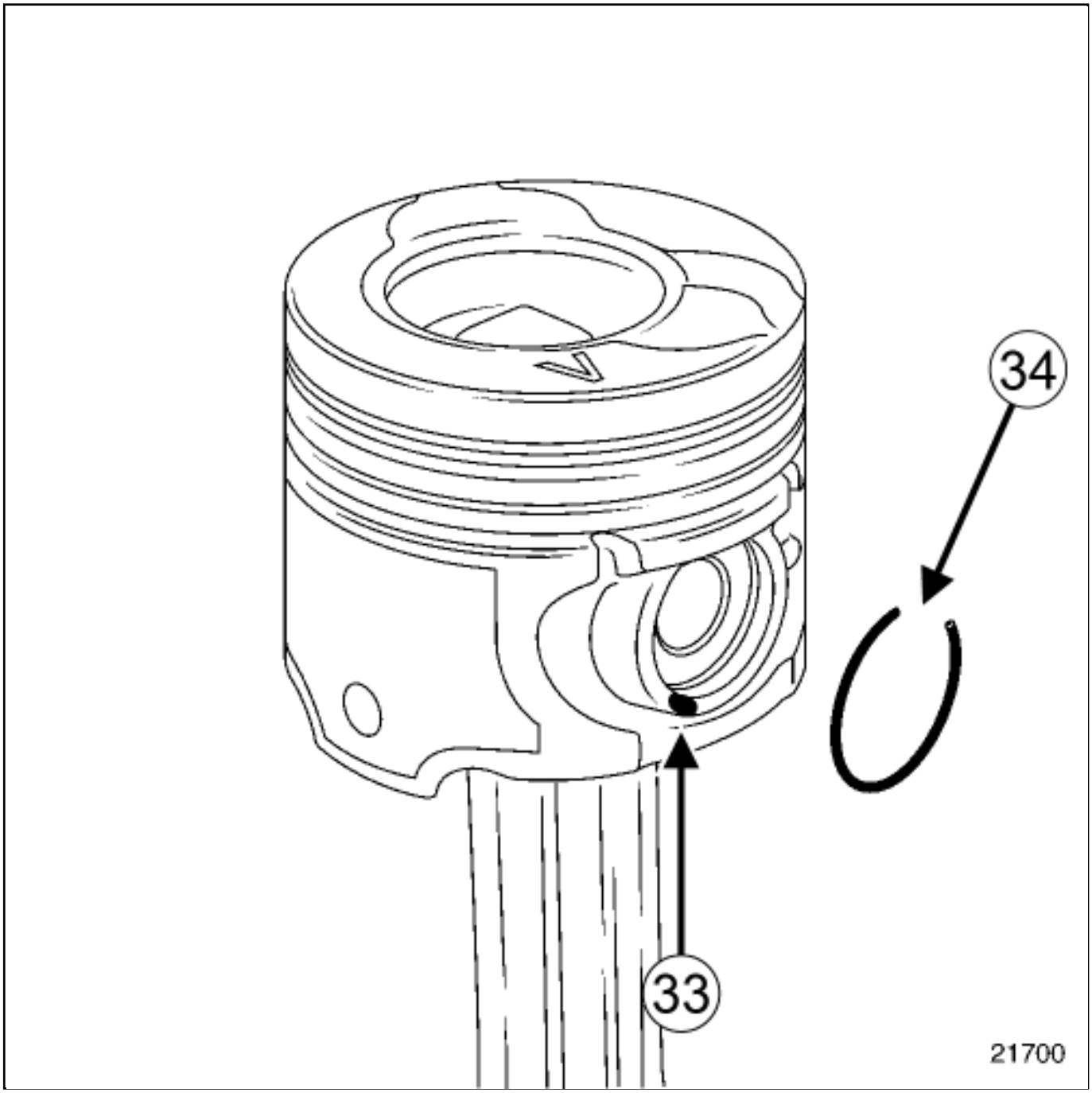
- Use a indelible pencilto mark the gudgeon pin in relation to the piston.

- Lubricate gudgeon pin with engine oil.

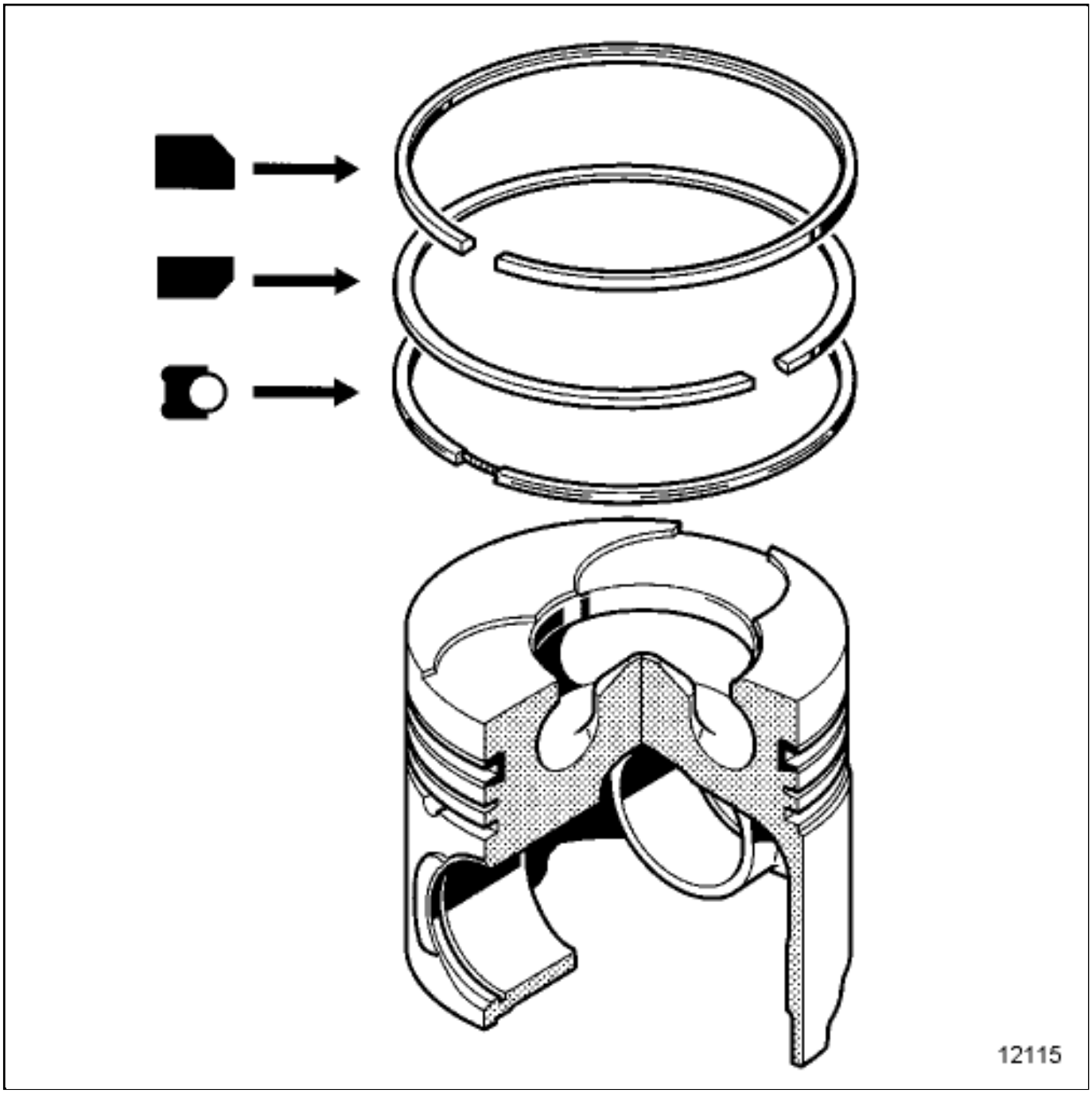
- Check that the gudgeon pin slides and turns freely in the piston.



- Position the mark "V"(31) of the piston and the flat surface(32) of the conrod cap as indicated in the illustration.

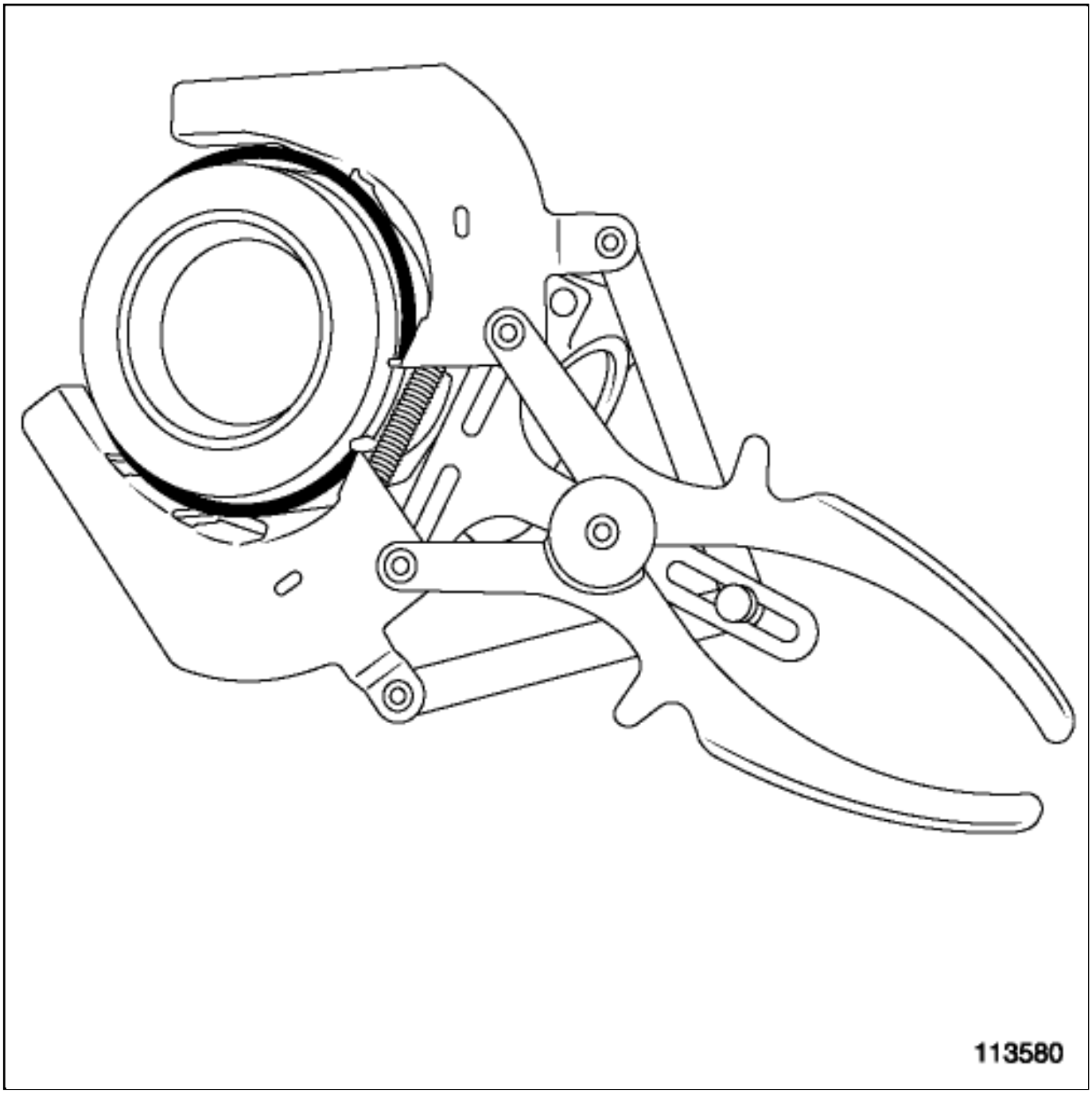


- Refit the circlip of the gudgeon pin, positioning the opening(34) of the circlip opposite the notch(33) .

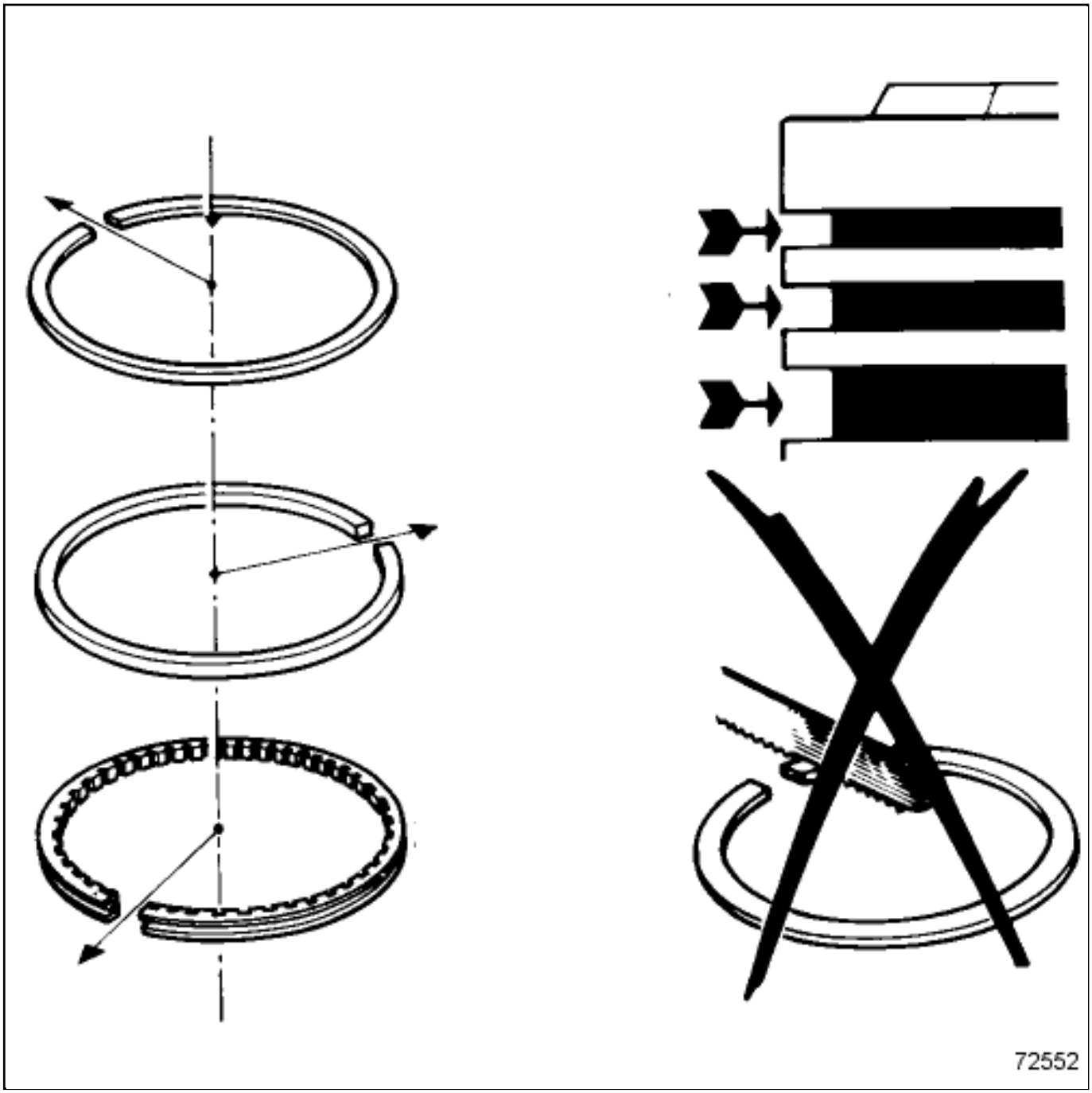


Note:

Respect the piston ring fitting direction, with TOPat the top.

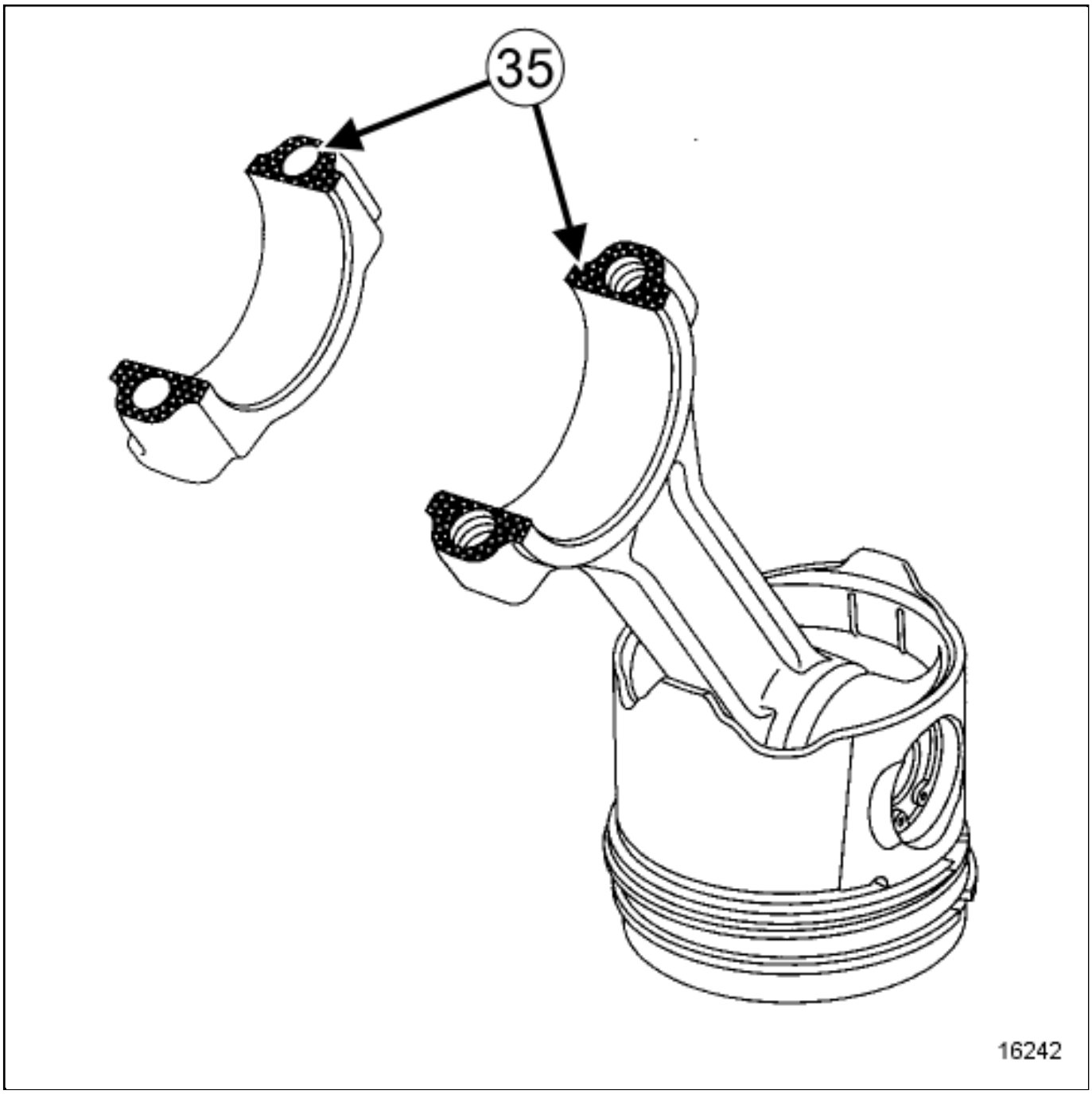


- Refit the piston rings using a clip pliers.



- Close the rings slightly.

5. "PISTON - CON ROD" ASSEMBLY REFITTING OPERATION



Degrease the "con rod body - cap" mating faces(35) using surface cleaner(see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products).

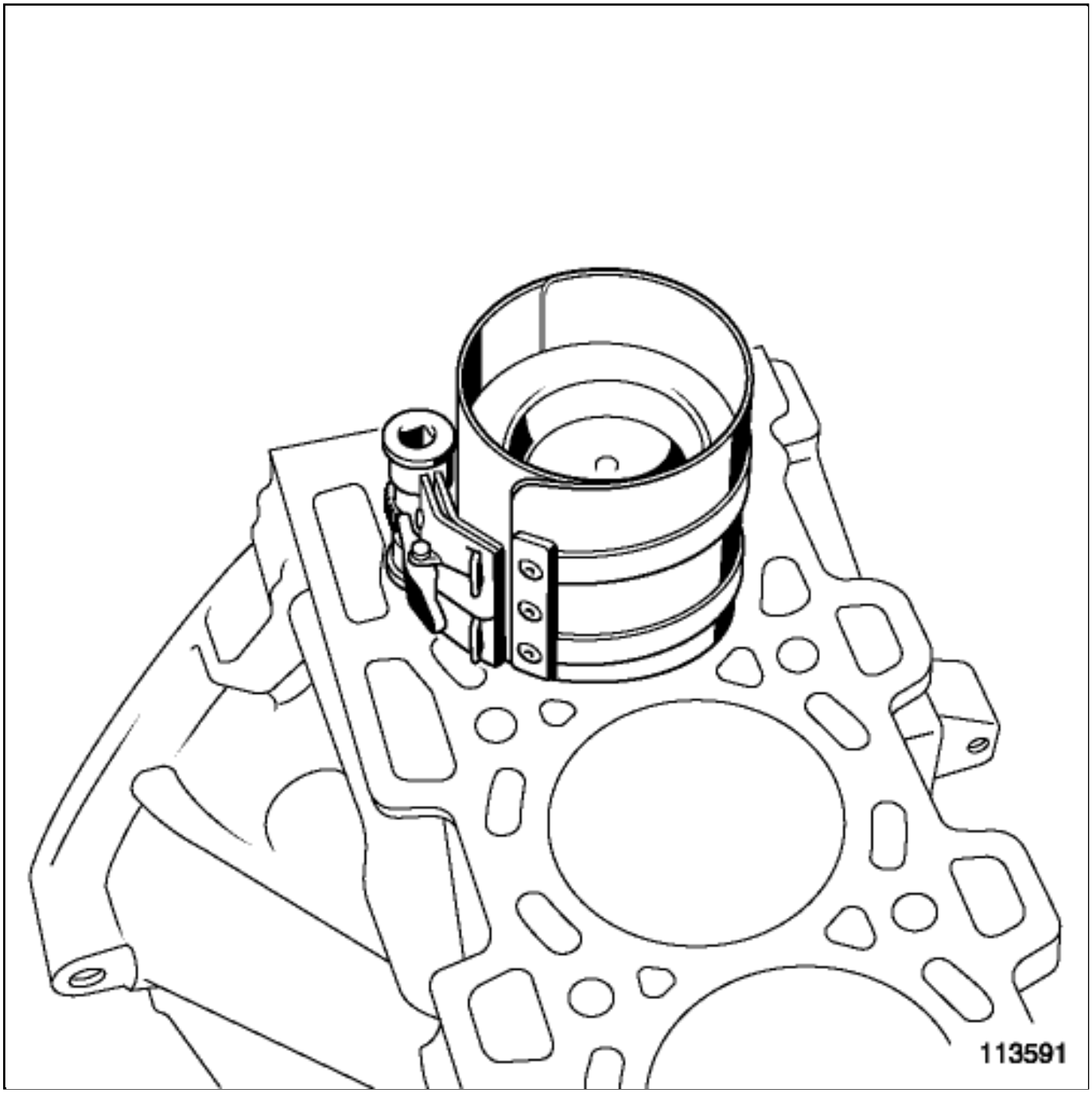
Lubricate with engine oil:

- the cylinder block barrels,
- the piston rings,
- the piston skirts,
- the crankshaft crankpins.

Note:

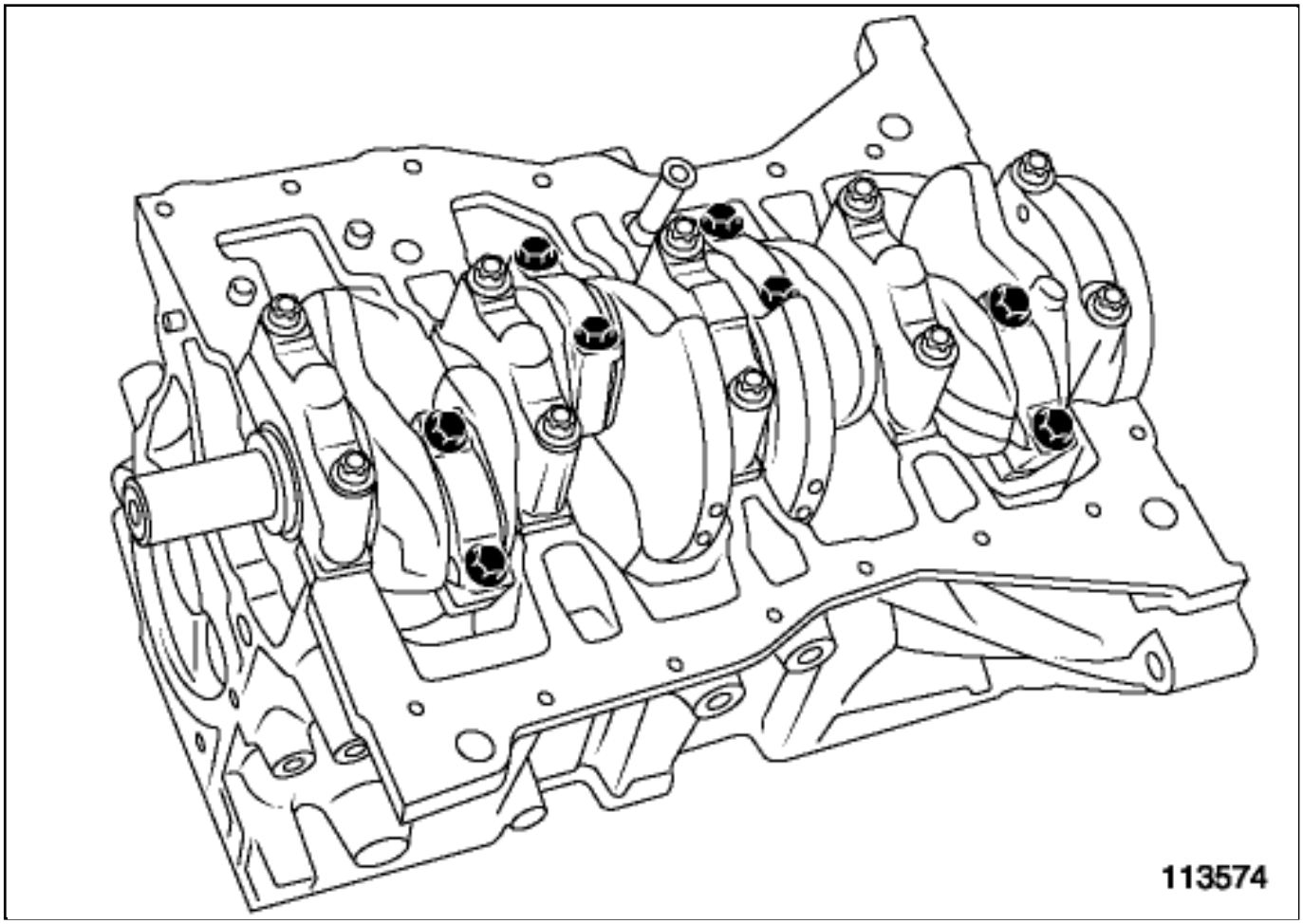
Ensure that the piston matches the cylinder block barrel (No. 1 at flywheel end).

Ensure the con rod-piston orientation, positioning the "V" marking engraved on the piston crown towards the flywheel.



- Refit the "con rod - piston" assembly using a piston assembly ring.

- Mount the conrod heads on the crankshaft crankpins.



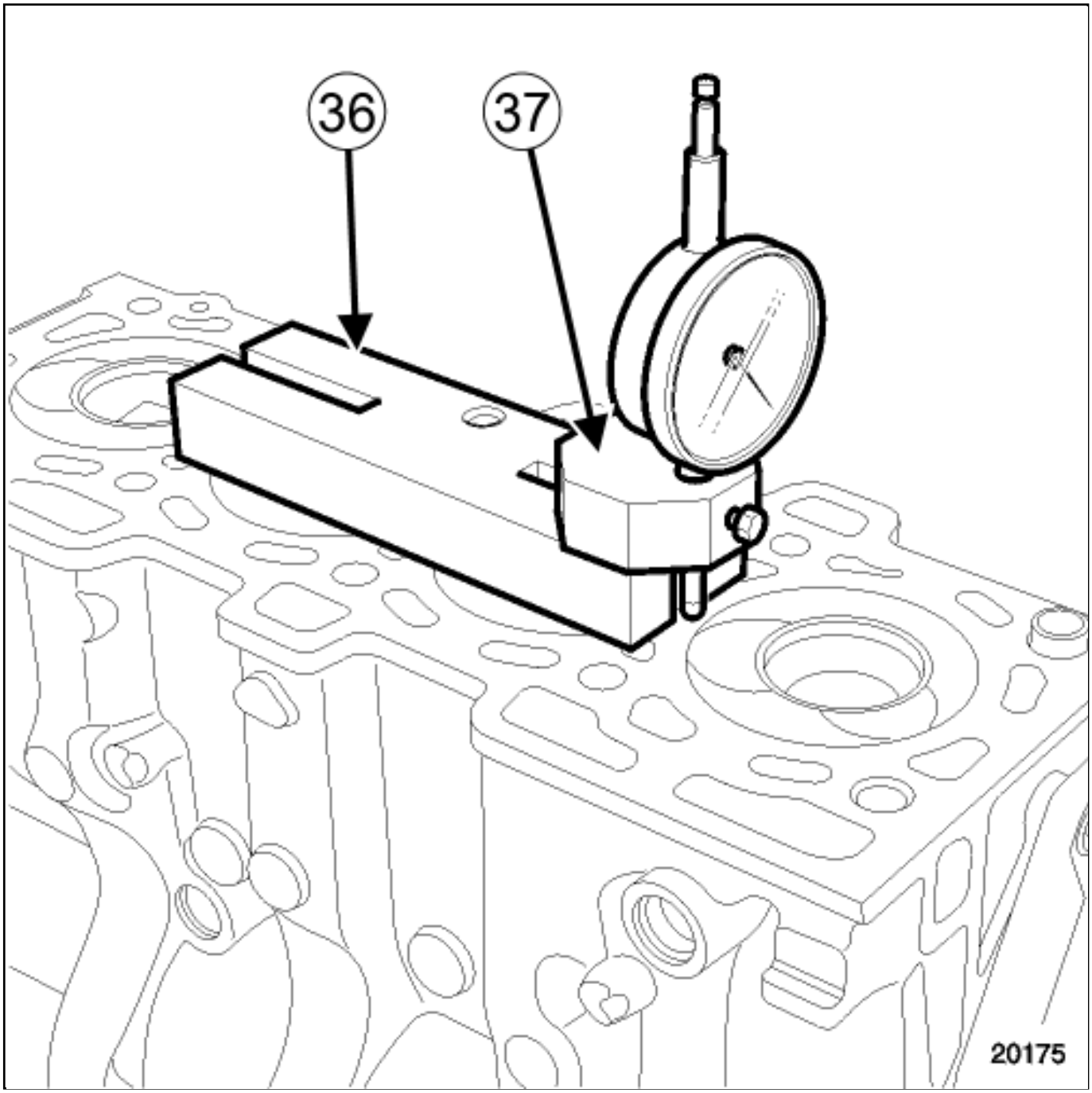
- Refit:
  - the con rod caps, ensuring correct matching,
  - the new conrod cap bolts.

- Torque and angle tighten the conrod cap bolts20 N.m + 45˚ ± 6˚.

- Check that the rotating parts turns freely, with no resistance.

- Clean the piston crowns.

- Set the crankshaft at Top Dead Centre.



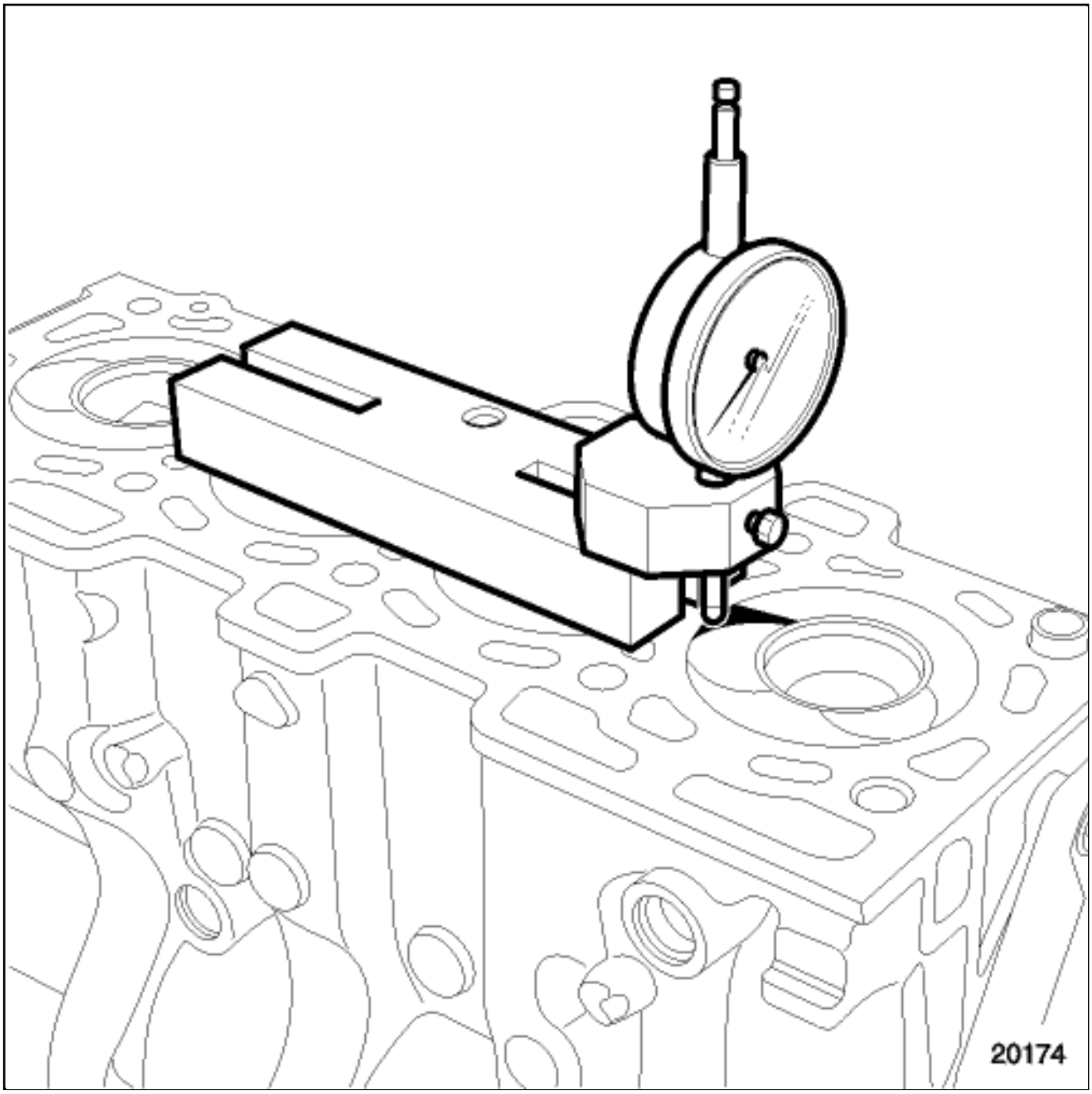
- Mount the contact plate of theDial gauge support thrust plate.(Mot. 252-01) (36) on the cylinder block.

- Fit the dial gauge supportDial gauge support.(Mot. 251-01) (37) equipped with a dial gaugeon the pressure plate.

Note:

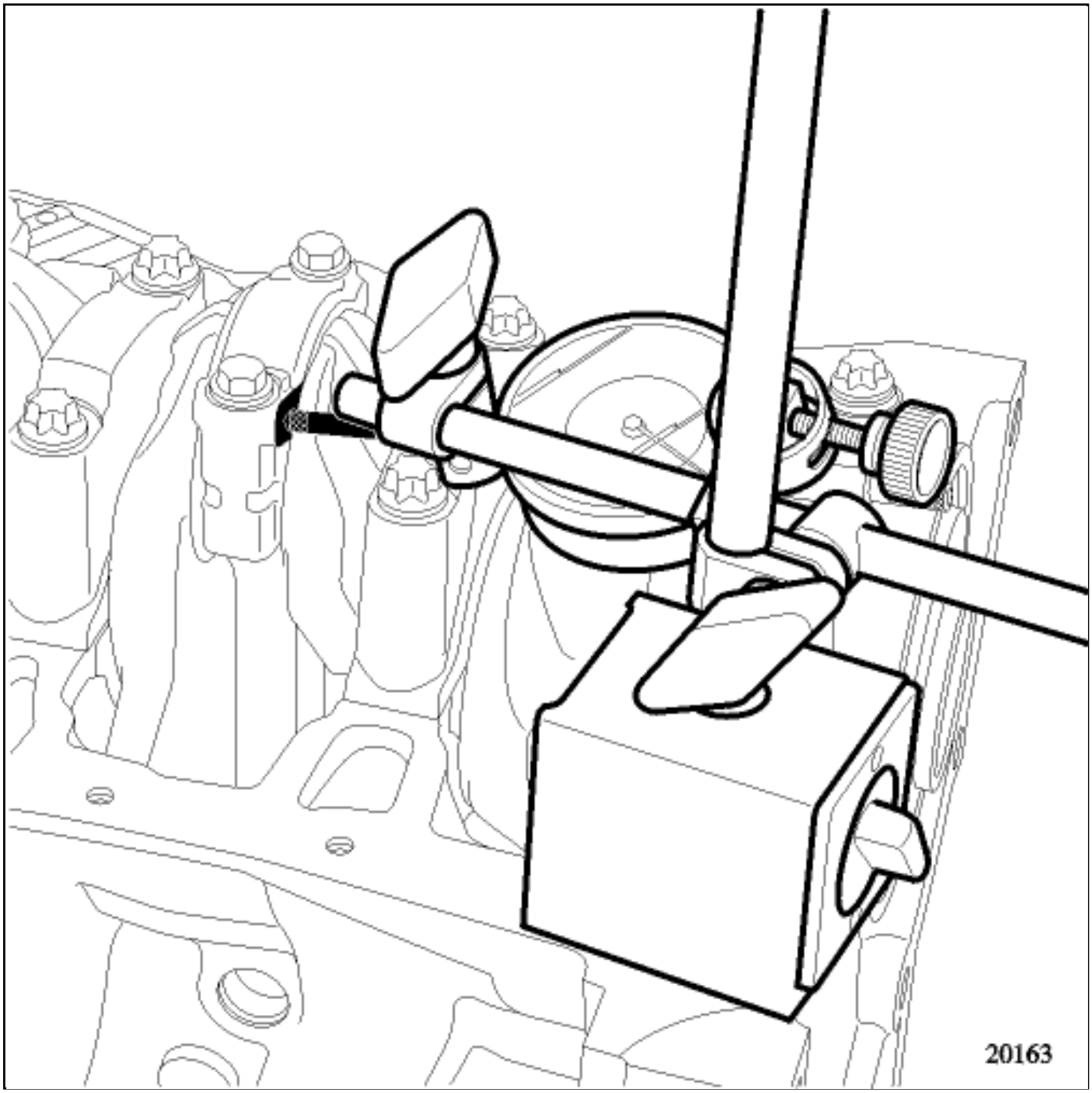
The measurement is taken along the longitudinal axis of the crankshaft to eliminate play caused by the movement of the piston.

- Calibrate the dial gaugeon the cylinder block.



- Measure the piston protrusion (the dial gauge sensor must not be in a valve gap)which must conform to the recommended valueAND (K9K) AND (APL03) K9K, and RENAULT BRAND(I - PISTONS, 7 - Piston protrusion).

- For cylinders No. 2 and No. 3, it is essential to find the Top Dead Centre of the piston before taking the protrusion measurement.



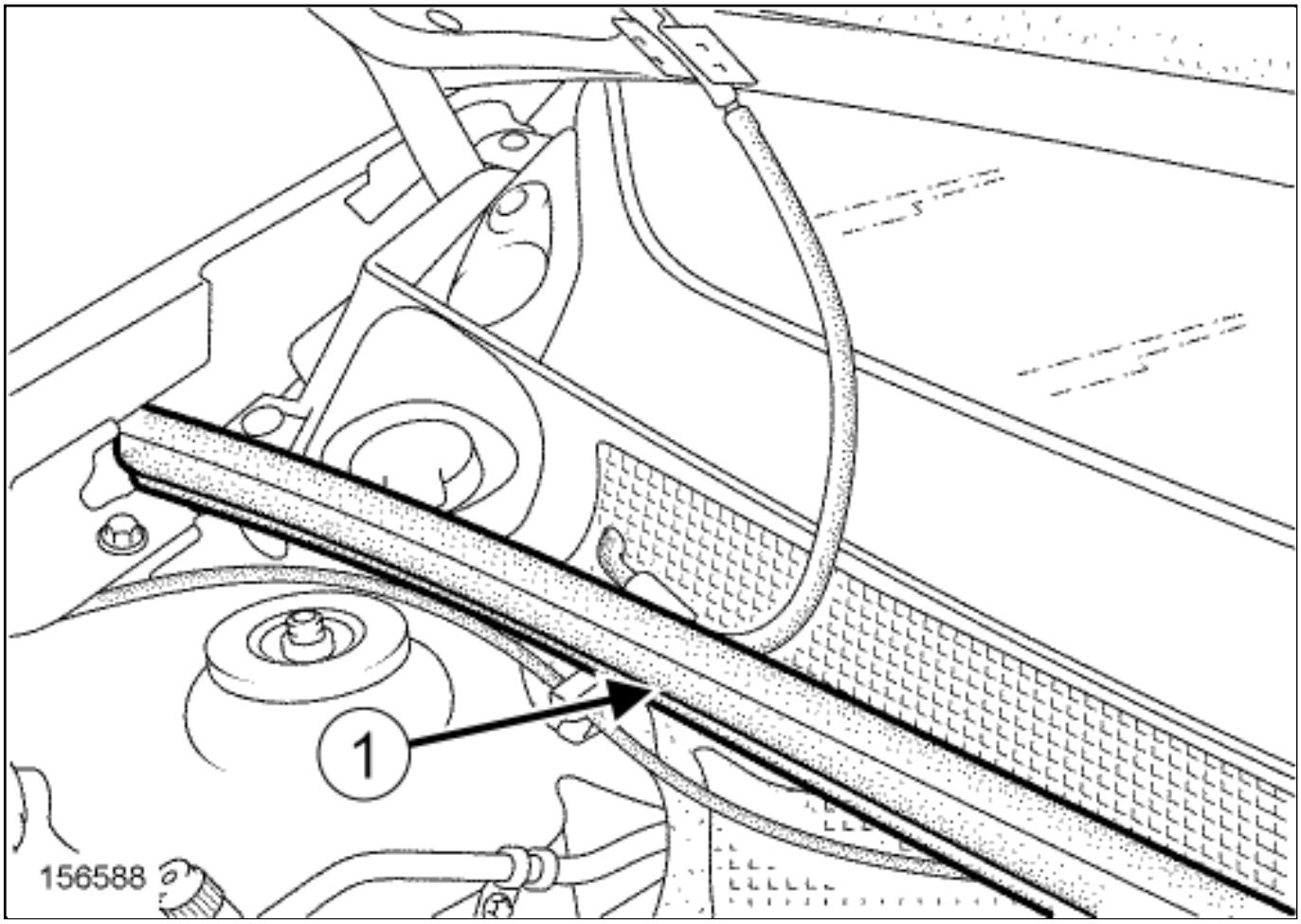
- Check the longitudinal clearance of the big ends, which must be between 0.205 and 0.467 mm.

SCUTTLE PANEL GRILLE: REMOVAL - REFITTING

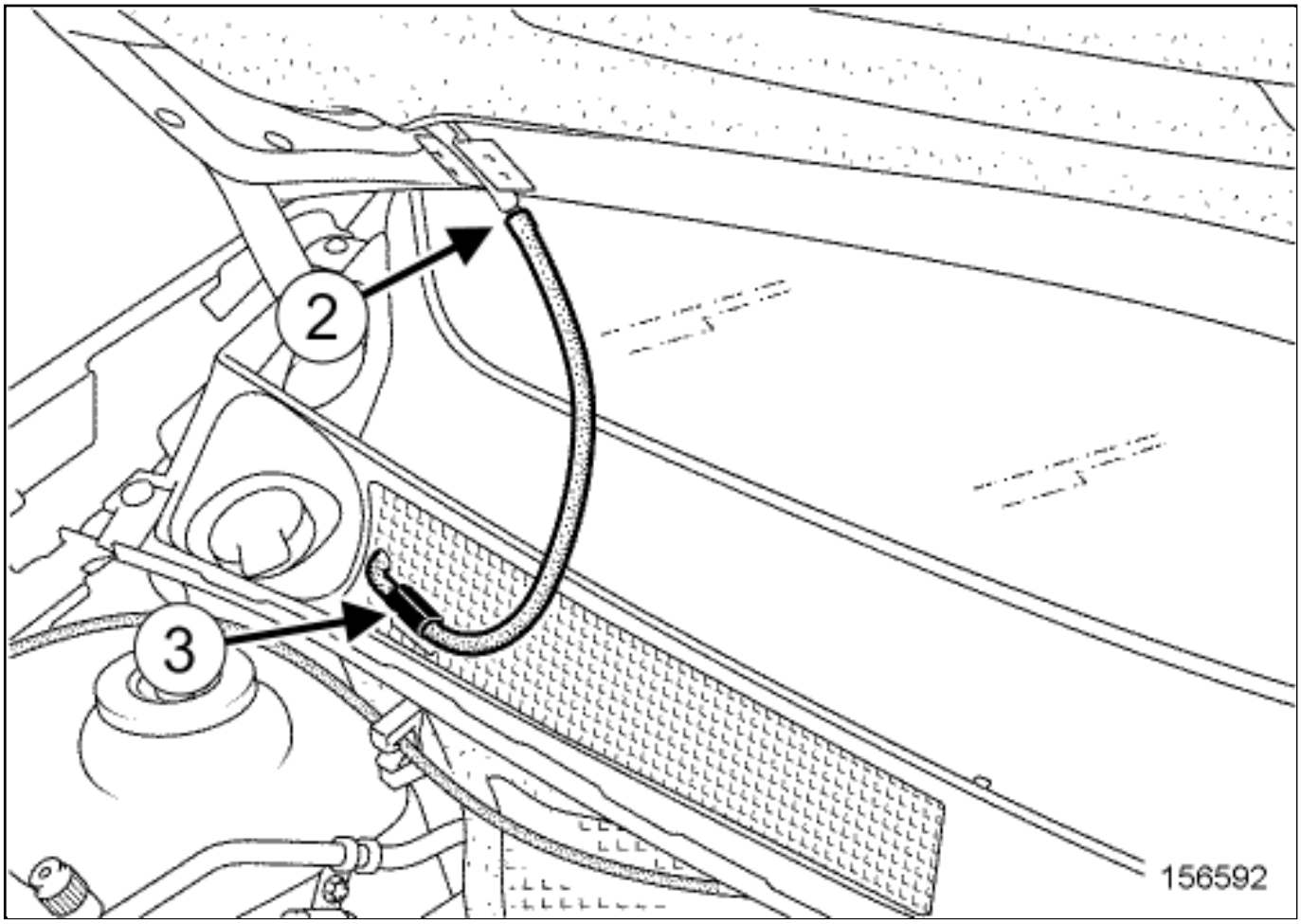
REMOVAL

1. REMOVAL PREPARATION OPERATION

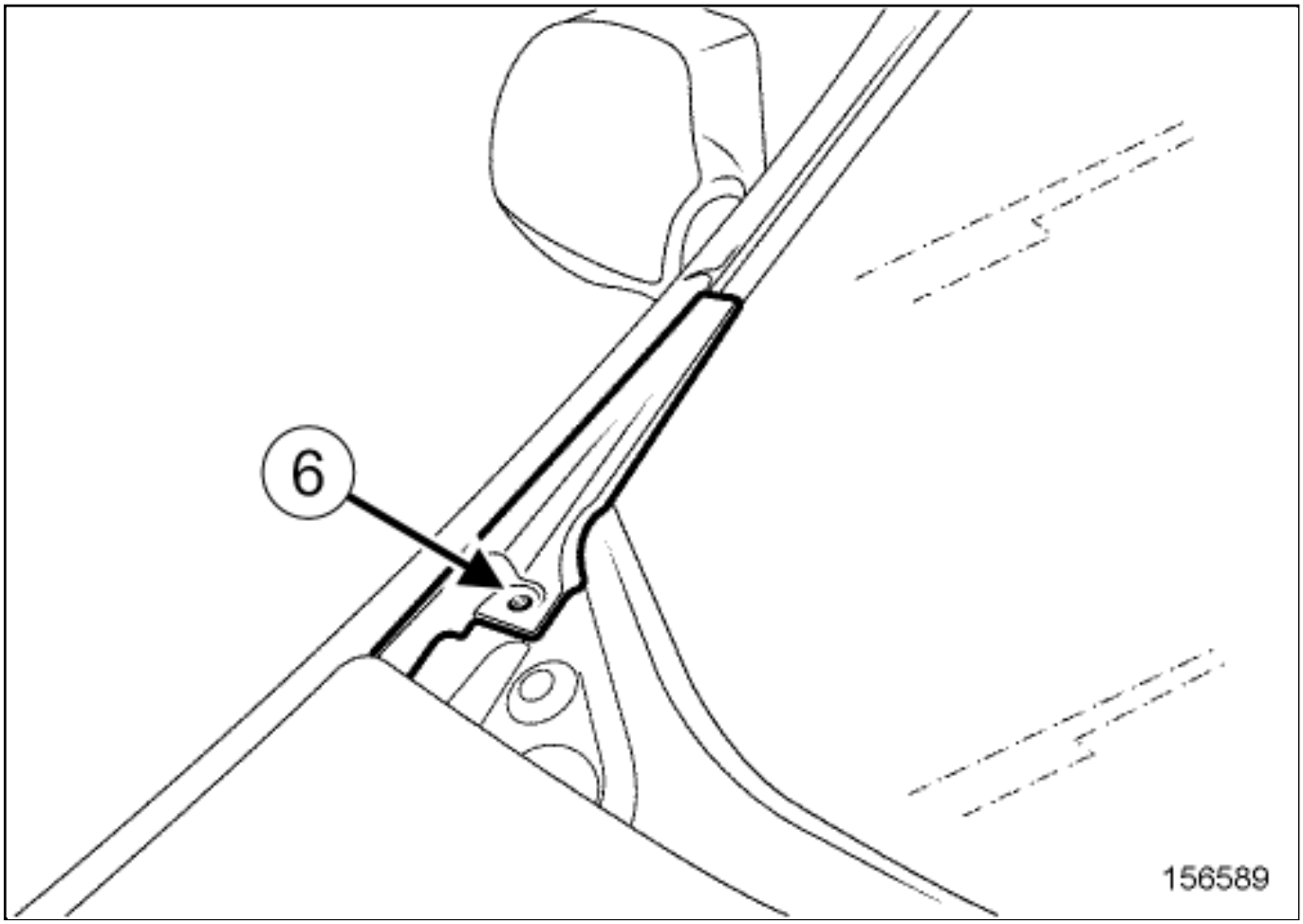
- Remove the windscreen wiper arms(see **Wiping and washing: List and location of components**) .



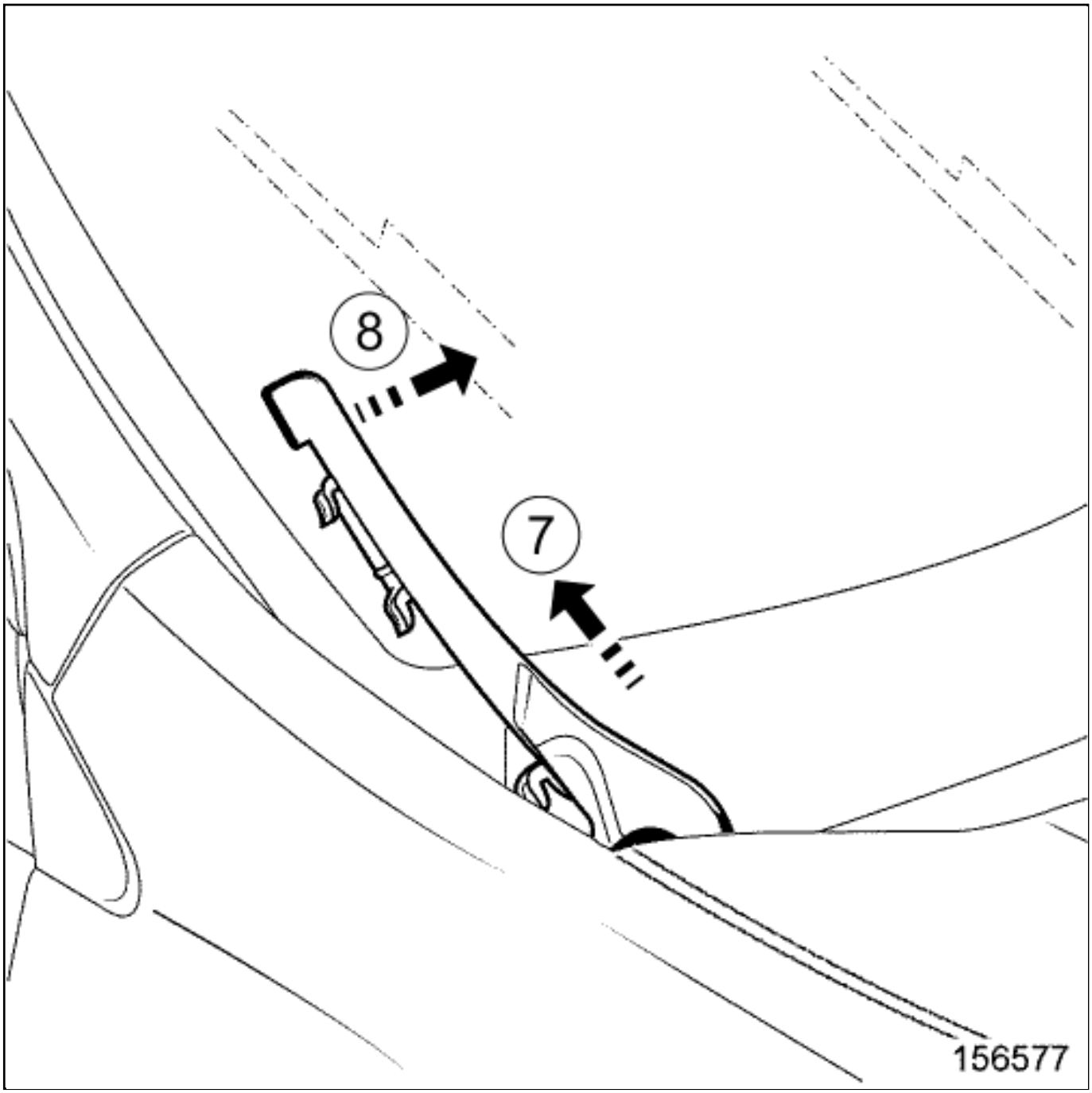
- Remove the engine compartment seal(1) .



- Disconnect the screen washer pipe at(2) .
- Unclip the screen washer pipe at(3) .

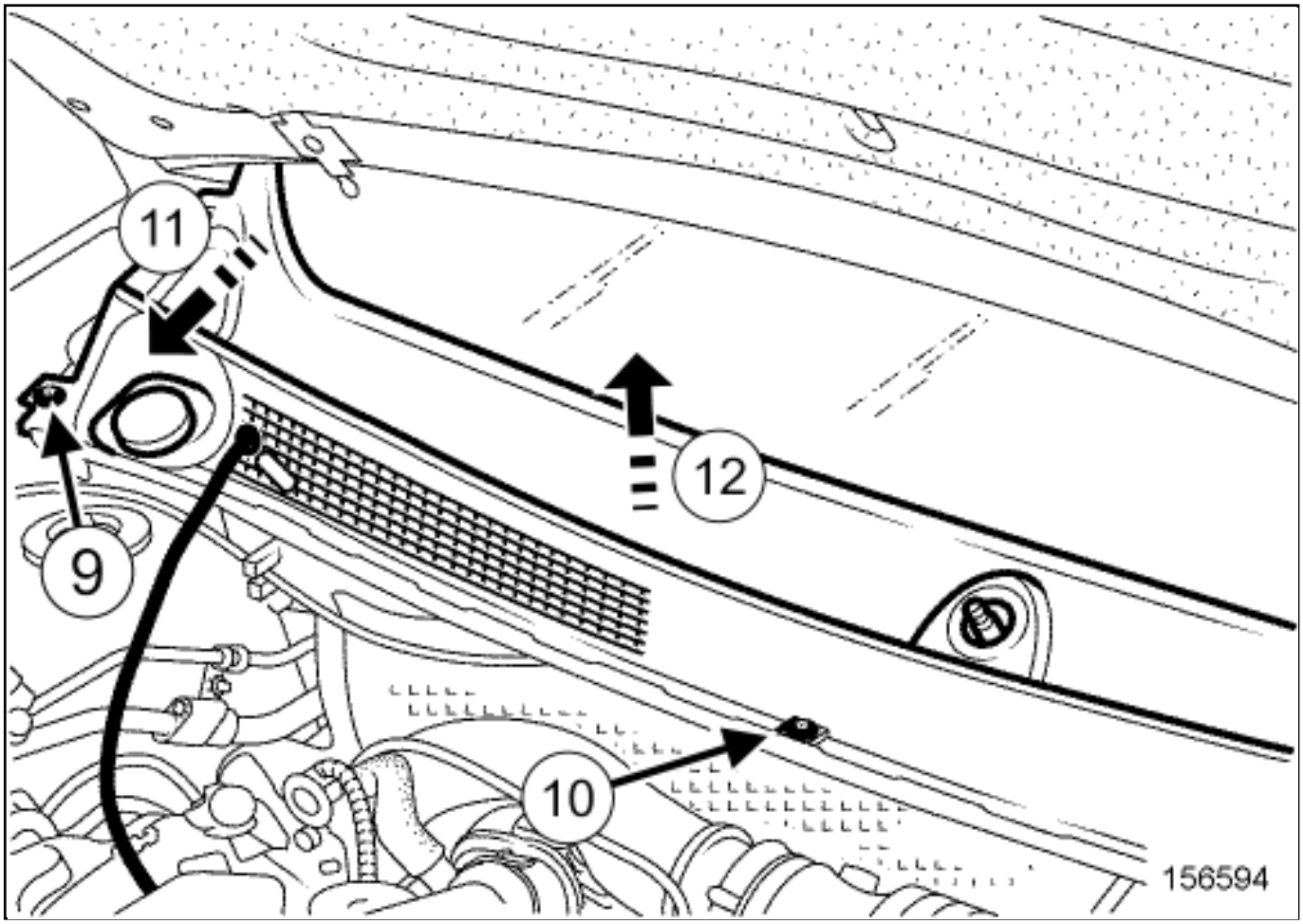


- Remove the windscreen lower side trim bolt(6) .



Remove the windscreen lower side trim by sliding at(7) and pulling at(8) .

2. REMOVAL OPERATION



Remove:

- the clips(9) on both sides of the scuttle panel grille,
- the scuttle panel grille bolt(10) .

Unclip the scuttle panel grille.

Remove the scuttle panel grille following the direction of the arrow(11) and (12) .

REFITTING

Proceed in the reverse order to removal.

Repair-50x07x06x04-01x37-1-27-1.xml

XSL version : 3.02 du 22/07/11

SCUTTLE SIDE PANEL UPPER REINFORCEMENT: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

No.	Description	Thickness (mm)
(1)	Scuttle side panel upper reinforcement	0.95

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

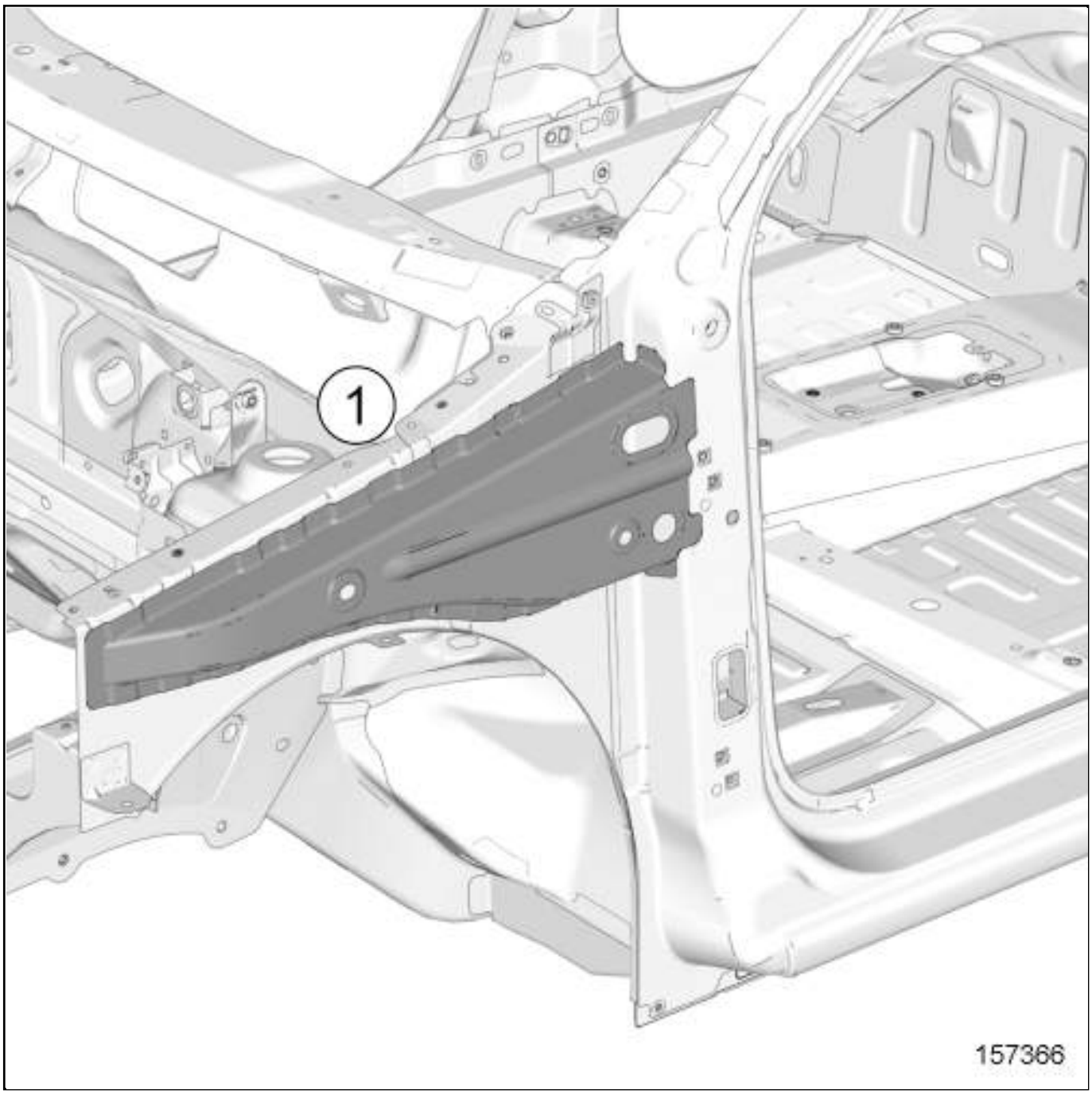
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT

1)PART IN POSITION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SEALINGPRODUCT:DESCRIPTION

Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Operator protection : use extra ventilation source.

Steps	Description	Special notes
1	Remove the mastic from the areas to be repaired	Tools for stripping very thick soft mastic: Use Tools for scraping rigid adhesives and paint: Use
2	Wipe / blow	
3	Sand	P180 - P240 dry
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	If the panel is bare, use cold electro zinc plating	(see 04E, Paint, Anti-corrosion protection by cold electro zinc plating: Description)
7	Application of a pre-treatment primer on bare areas	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
8	Solvent remover	
9	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
10	Apply a bi-component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
11	Apply a sealing mastic	Anti-corrosion protection products after assembly: Use (04F, Products and bodywork mountings))Vehicle: Parts and consumables for the repair (04B, Consumables - Products)

12	Smooth the seal in the visible areas	Bodywork tool 1786

SEALINGTOOLS:DESCRIPTION

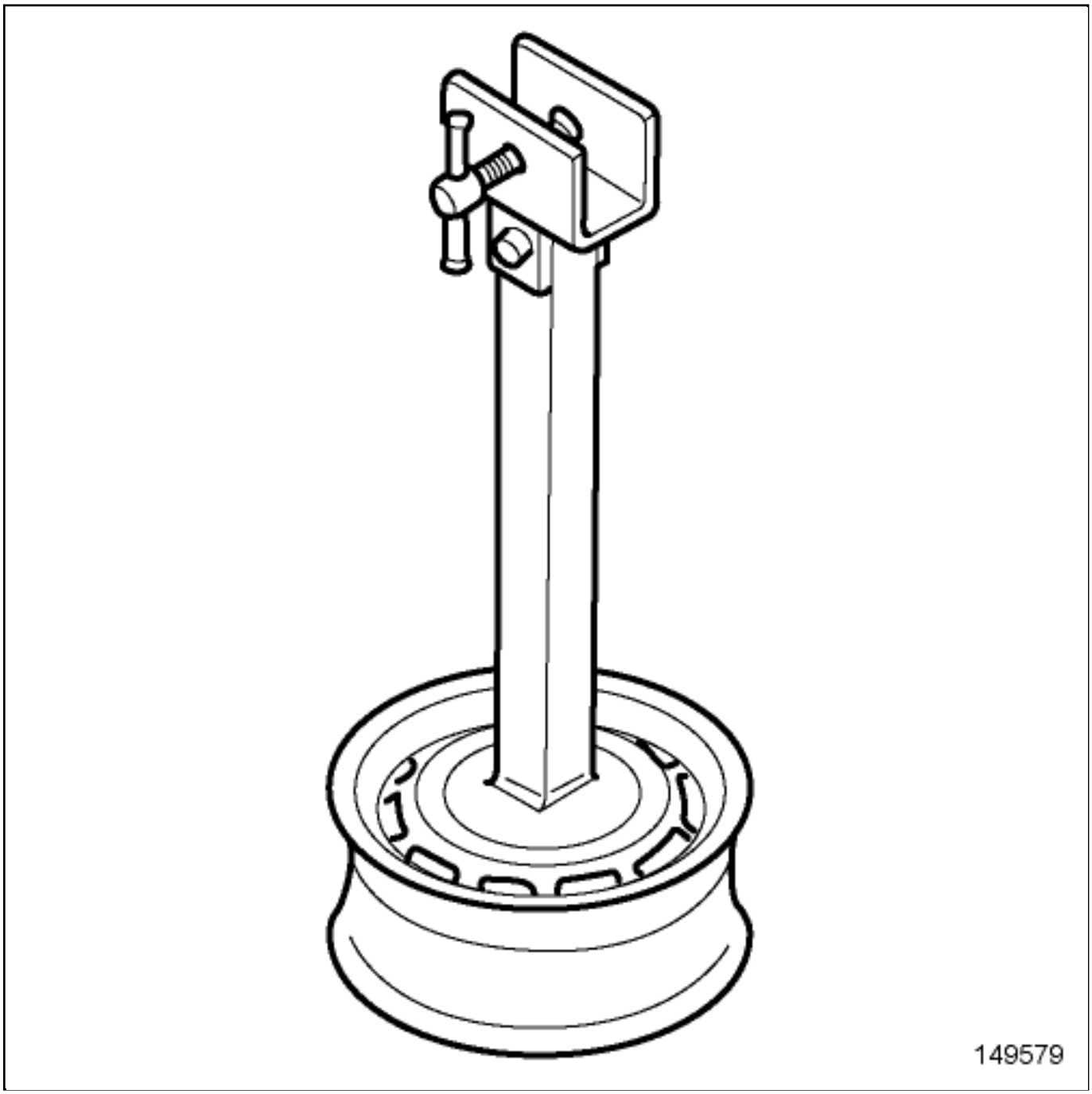
1. EXAMPLES OF TOOLS TO USE

1- SPRAYING TOOLS

1)SPRAY HOSE

The spray hose must have an internal diameter of 14 mm.

2)LOCALLY MANUFACTURED JET SUPPORT



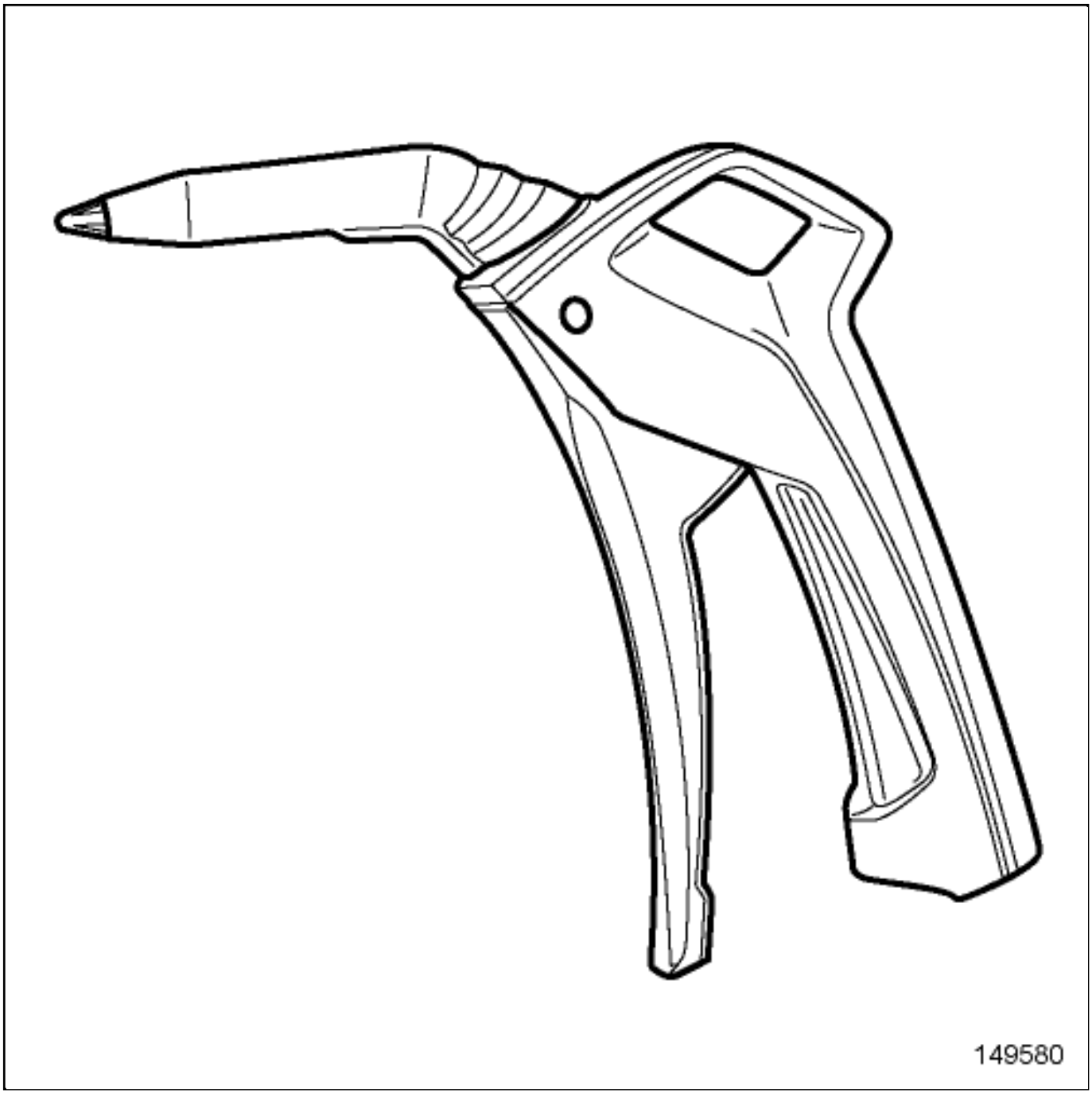
To be used for long sealing tests.

3)HANDPRESSURESPRAYER

To be used on a particular area or to check a small area after the sealing has been repaired.

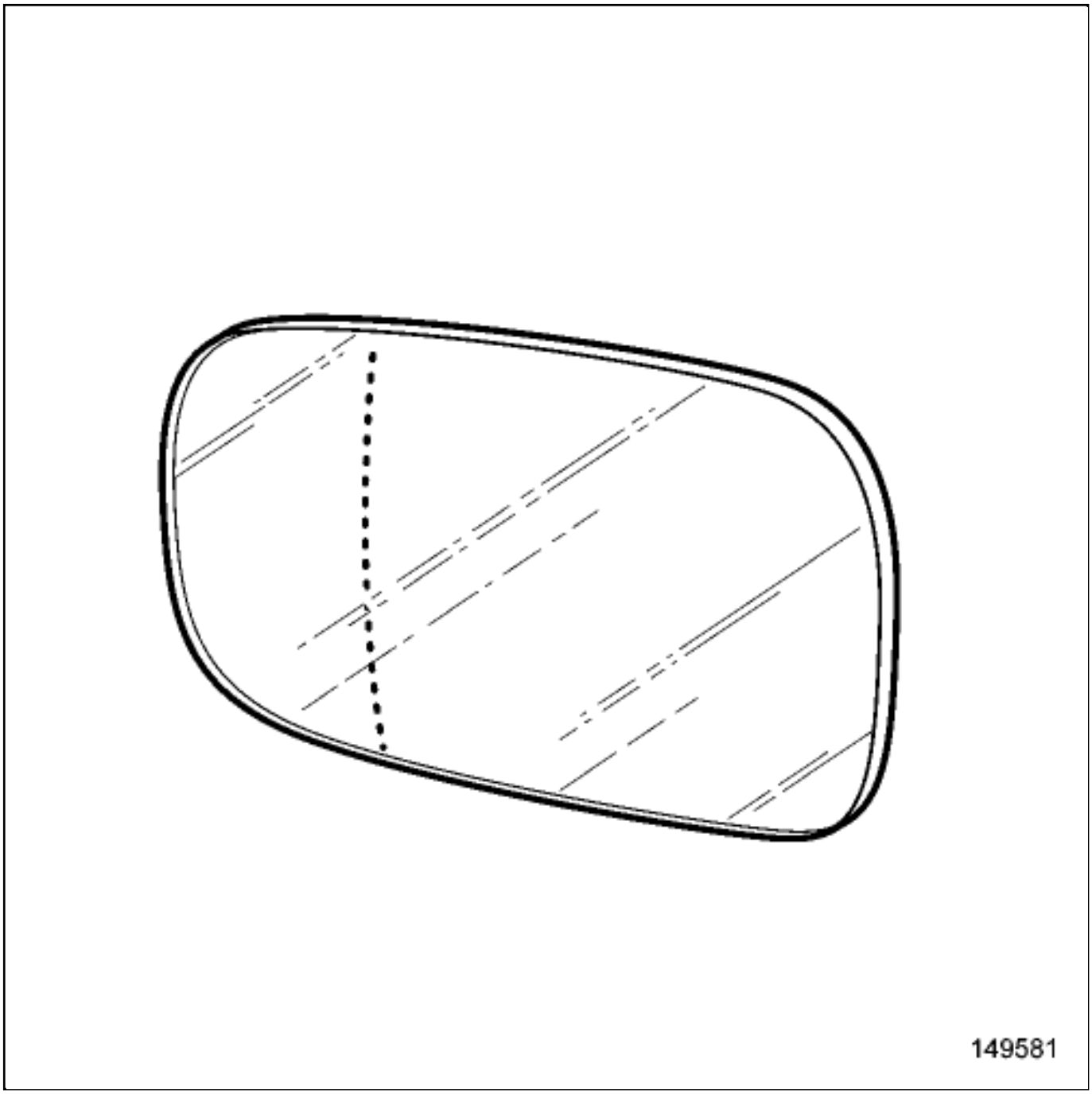
2- WATER INGRESS SEARCH TOOLS

1)AIR JET WITH A COMPRESSED AIR GUN



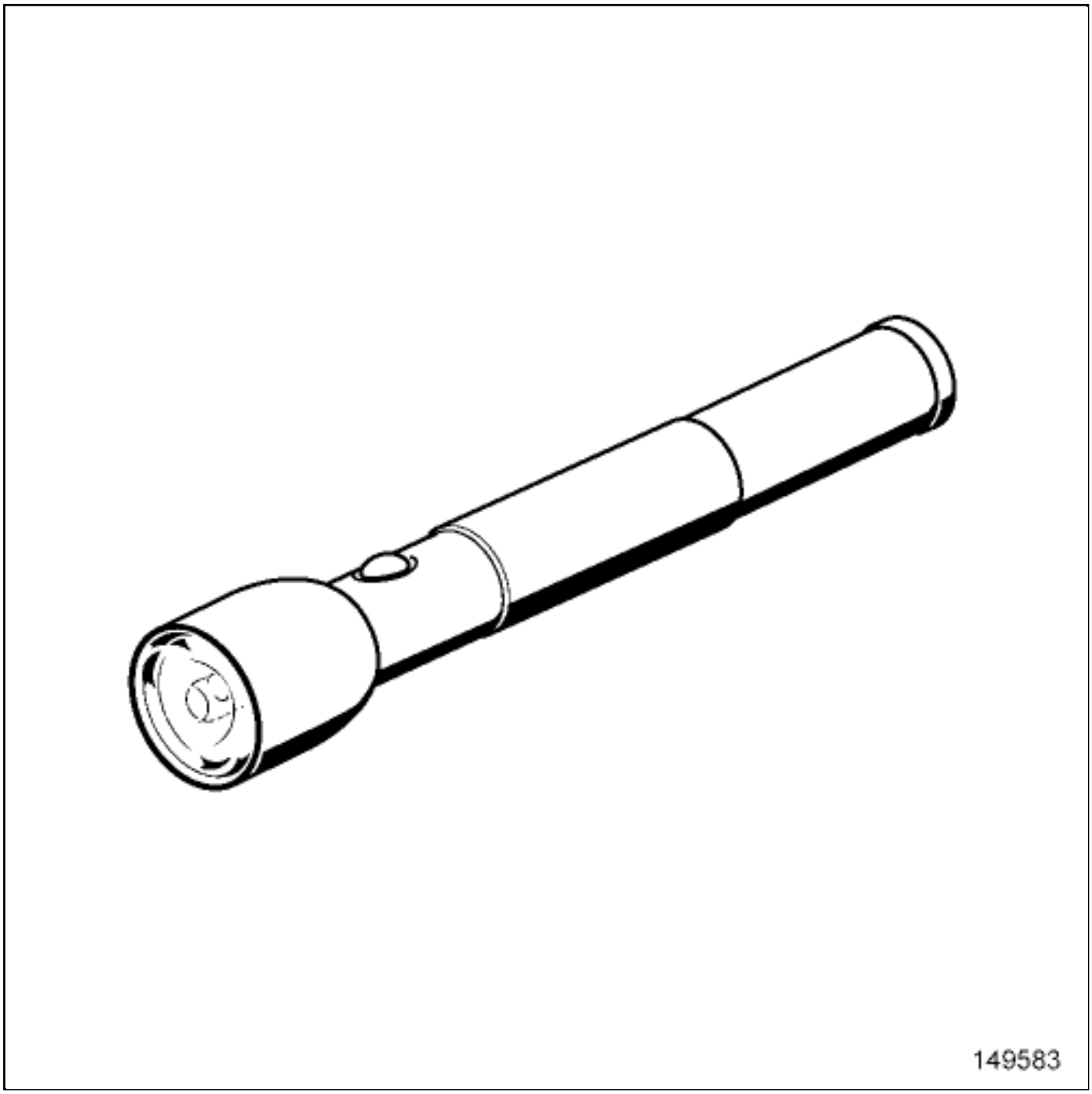
The pressure of the jet must be limited in order not to damage the vehicle component.

2)DOOR MIRROR GLASS



To be used in places which cannot be seen directly.

3)POCKET TORCH OR PEN-SHAPED TORCH



To be used in places with poor light.

3- MASTIC FILLING TOOLS

1)STRIPPING TOOLS

Tools for stripping very thick soft sealantsTools for stripping very thick soft mastic: Use (05B, Equipment and tools).

Tools for stripping rigid adhesives and paintTools for scraping rigid adhesives and paint: Use (05B, Equipment

and tools).

To be used to strip mastic-filled zones.

2)EXTRUSION NOZZLE

Anti-corrosion protection of joints after weldingAnti-corrosion protection of joints after welding: Description (40J, Protection).

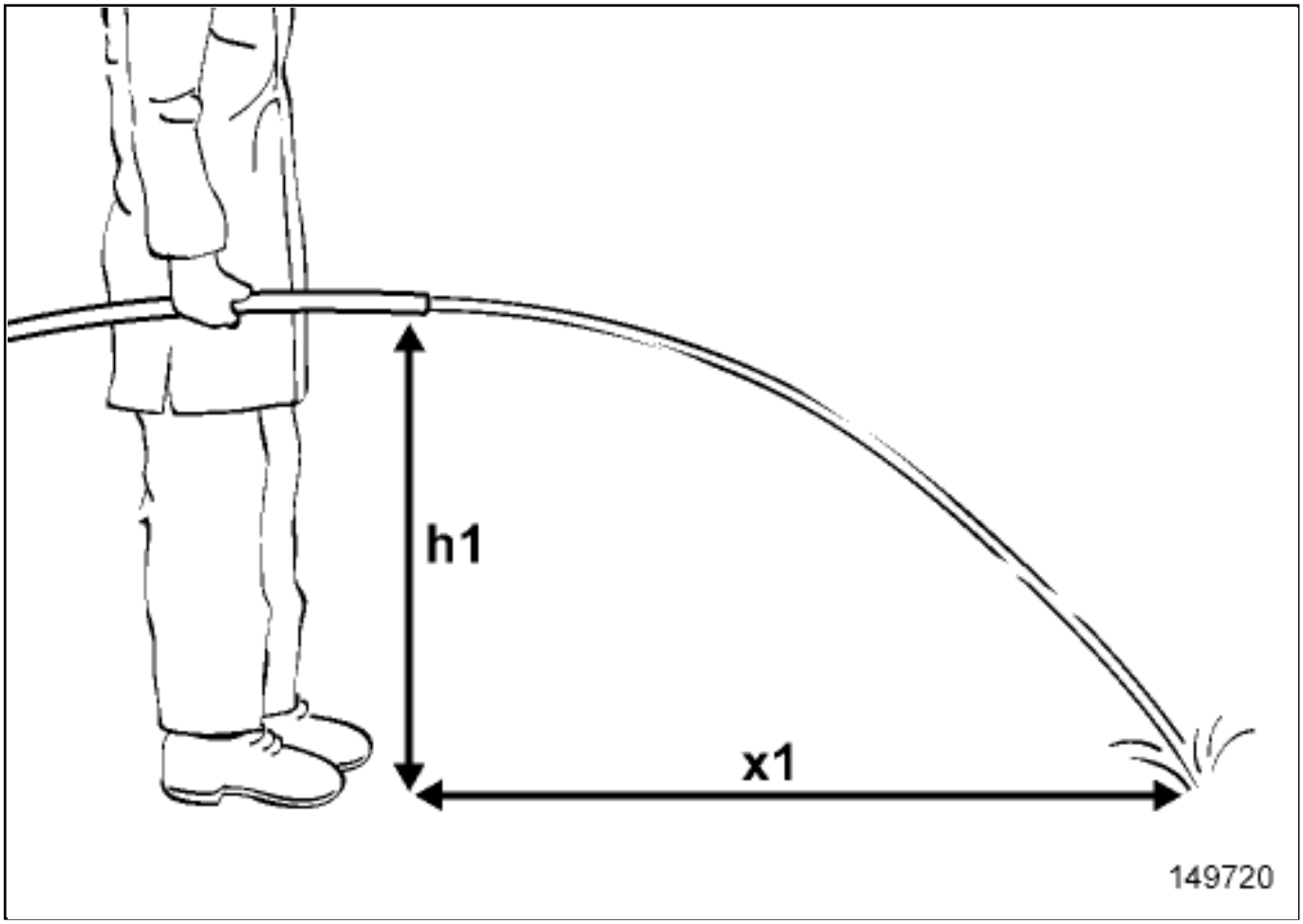
To be used to fill missing mastic.

SEALING TOOLS: USE

1. SPRAYING TOOLS

1- ADJUSTING MODE FOR GARDENER TYPE JET

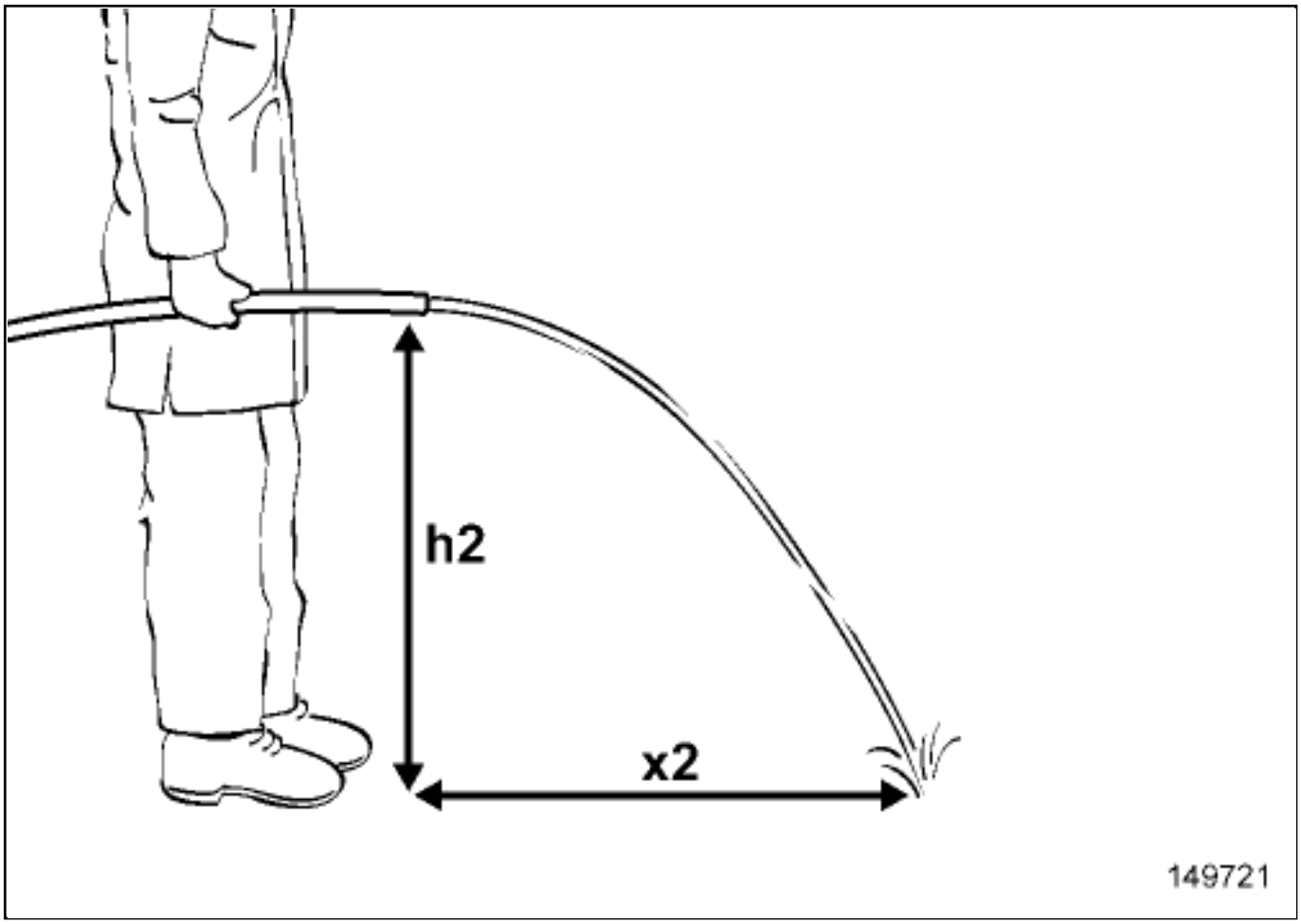
1)VEHICLE WITH STANDARD BODYWORK



Gardener type jet:

- the pipe must be used without an end piece,
- the internal diameter of the pipe should be 14 mm,
- the flow must be equal to 20 l/min, which corresponds to a projection of X1 = 1,20 m from the end of your toes by maintaining the pipe at H1 = 1 m (hip height),
- unless otherwise indicated, the spraying distance should be 75 cm ± 5 cm.

2)VEHICLE WITH COUPÉ CABRIOLET BODY



Note:

Adjustment (B) of the gardener type jet applies to specific zones on coupé cabriolet versions (side windows, retractable roof). For zones common to both coupé cabriolet and standard bodywork versions, the gardener type jet must be adjusted (A).

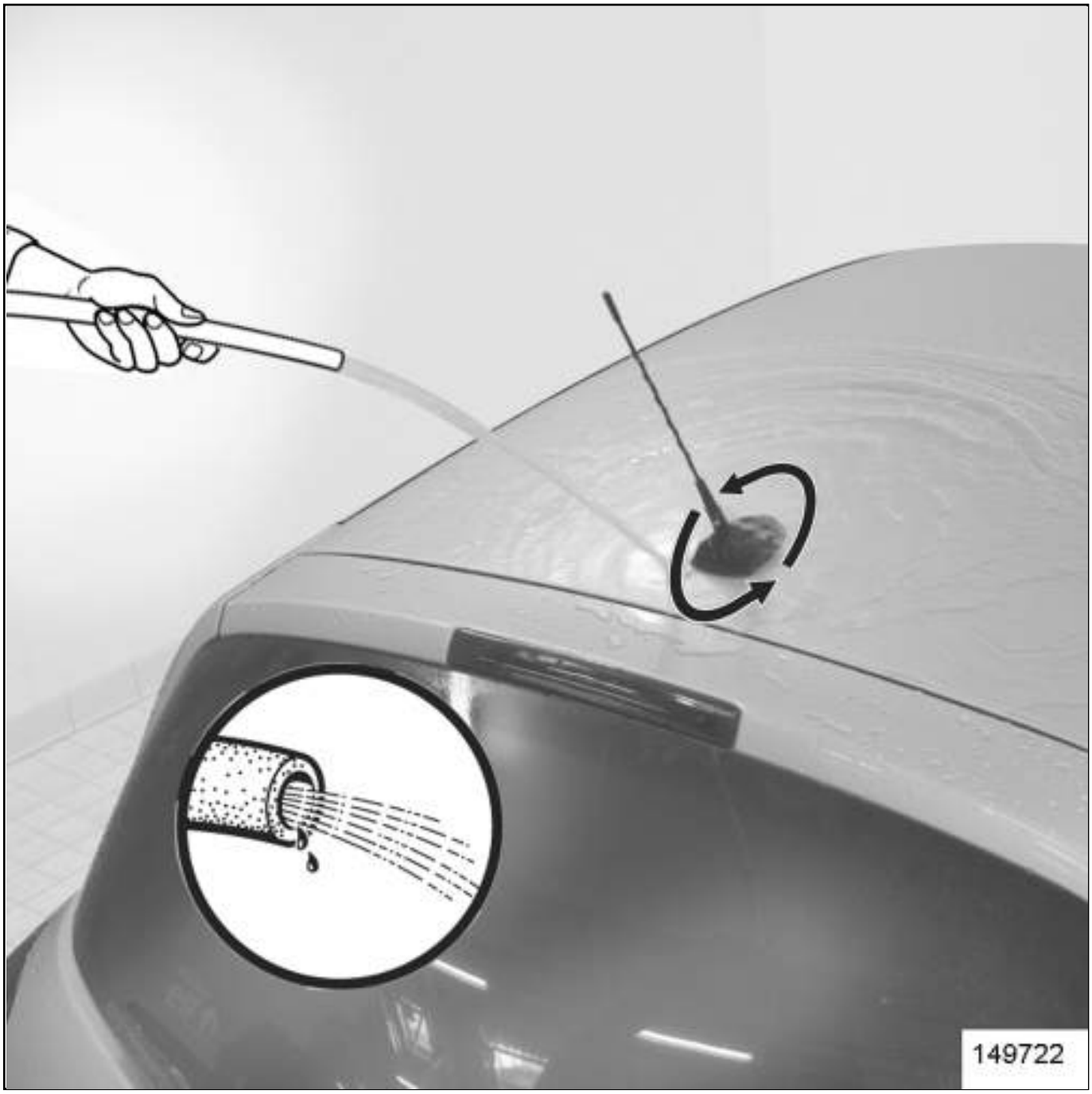
Gardener type jet:

- the pipe must be used without an end piece,
- the internal diameter of the pipe should be 14 mm,
- the flow must be equal to 10 l/min, which corresponds to a projection of X2 = 0,80 m from the end of your toes by maintaining the pipe at H2 = 1 m (hip height),
- unless otherwise indicated, the spraying distance must be 10 cm.

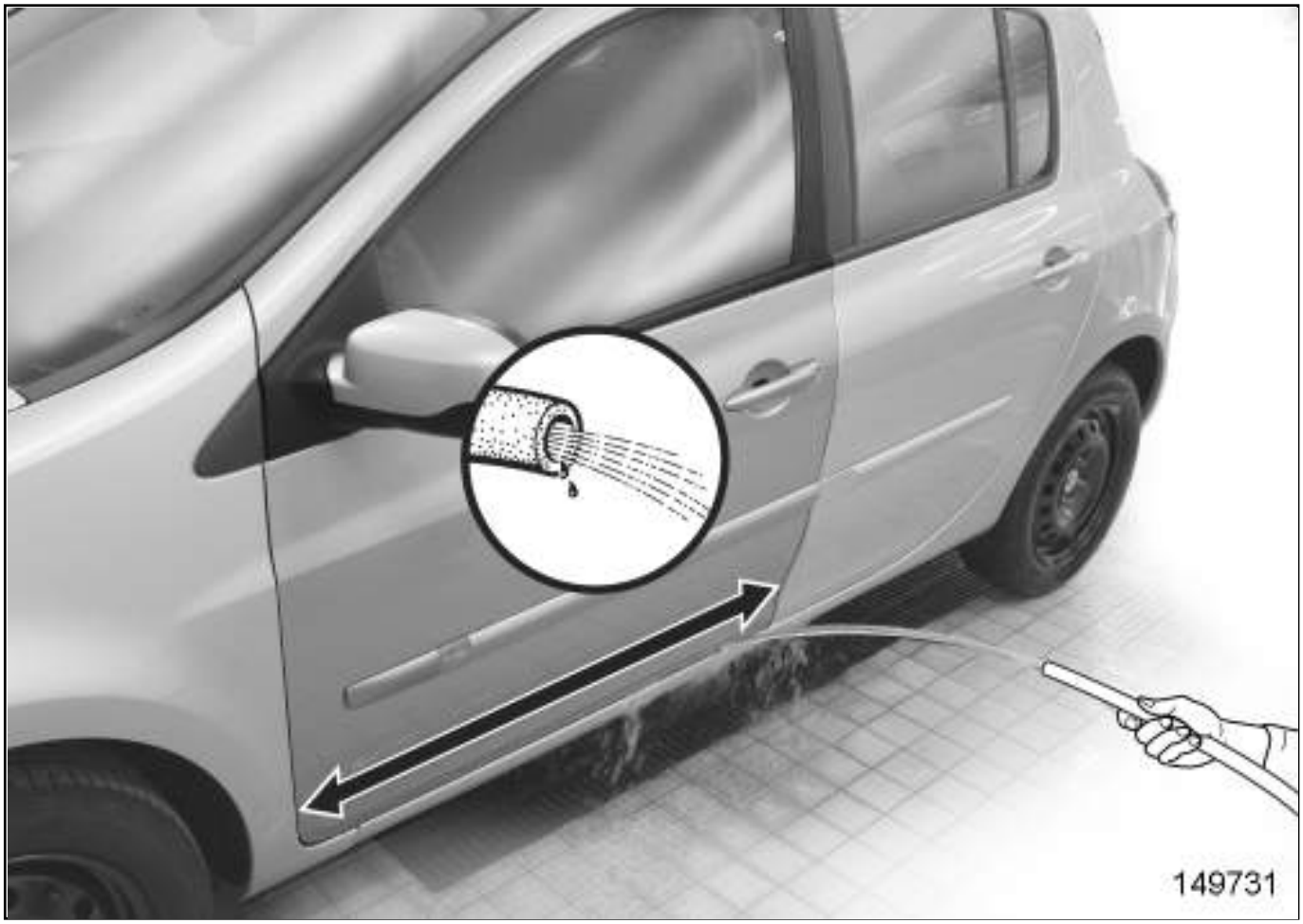
2- INSTRUCTIONS FOR USING THE GARDENER TYPE JET

1)SPRAYING BY SWEEPING

CIRCULAR SWEEPING

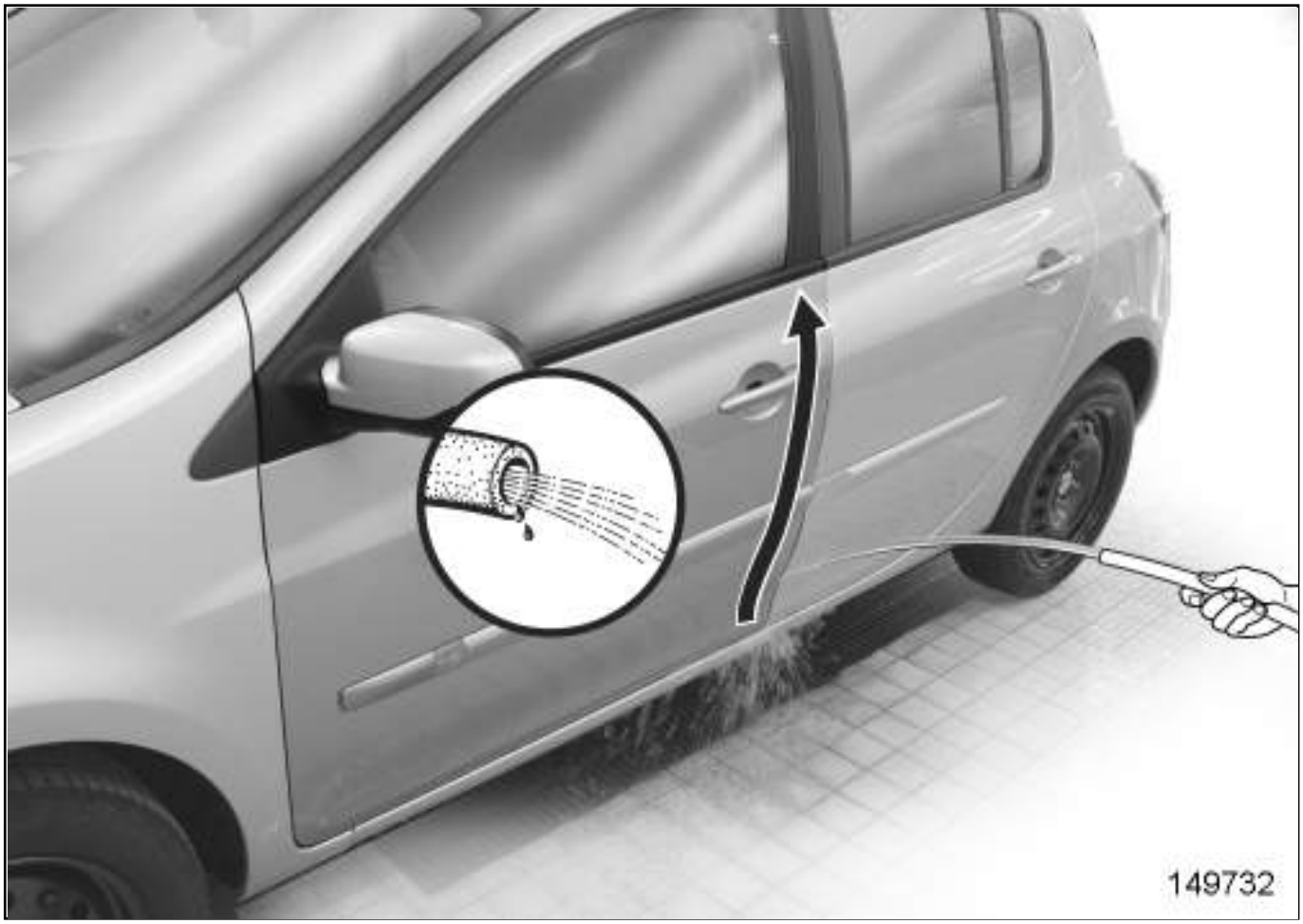


HORIZONTAL SWEEPING



- Minimal spraying duration, 3 minutes,
- number of sweeps, at least 3,
- sweeping speed, 10 cm/s.

VERTICAL SPRAYING



Gradually spray the zone from the bottom upwards for at least 3 minutes.

2)STATIC SPRAYING

- Minimal spraying duration, 30 seconds, without exceeding 40 seconds.

3- INSTRUCTIONS FOR USING THE PRESSURISED SPRAYER

Note:

the use of a pressurised sprayer enables the sealing to be checked in a particular area without having to spray the entire vehicle and enables a zone to be tested after repair.

- Fill the sprayer to 3/4 of its volume,
- close the sprayer,
- pump at least 4 times to pressurise the sprayer (repeat the operation uniformly during use in order to keep the

sprayer under pressure),

- adjust the nozzle to a solid water jet,
- spray at a distance of approximately 20 cm.

2. TOOLS TO AID THE SEARCH

1- INSTRUCTIONS FOR USING THE SPRAYING SUPPORT

Note:

In certain cases, the vehicle may need to be sprayed for a long time. In order to reproduce the infiltration, the use of a spraying support (locally manufactured) prevents the need for the second operator.

- Direct the garden type jet to the sealing check zone,
- immobilise the spray hose on the spraying support,
- leave the jet in the static position on the spraying zone.

2- INSTRUCTIONS FOR USING THE AIR GUN

- Use the air gun to check the sealing in a particular area,
- moderately adjust the pressure of the air jet in order not to damage the internal trim components of the vehicle,
- blow inside the passenger compartment.

3- INSTRUCTIONS FOR USING THE DOOR MIRROR GLASS

- The door mirror glass allows zones which are difficult to reach to be visible,
- direct the door mirror glass in order to view the zone to be checked.

4- INSTRUCTIONS FOR USING THE LIGHT OR PEN-SHAPED TORCH

- The light and pen-shaped torch enable zones which are difficult to access to be viewed,

when the light or pen-shaped torch can be adjusted, adjust the lighting so that it focuses on one point.

3. TOOLS FOR REPAIR

1- INSTRUCTIONS FOR USING THE STRIPPING TOOLS

■

Stripping tools**Tools for stripping very thick soft mastic: Use** (05B, Equipment and tools) and**Tools for scraping rigid adhesives and paint: Use** (05B, Equipment and tools).

2- INSTRUCTIONS FOR USING THE EXTRUSION NOZZLE

■

Extrusion nozzle**Anti-corrosion protection of joints after welding: Description** (40J, Protections).

SHOCK ABSORBER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
component jack

parts always to be replaced:
Rear shock absorber upper nut

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair **(see 33A, Rear axle components, Rear axle components: Precautions for the repair)** .

During removal, note the colours of the springs to ensure the conformity of the parts for refitting.

CAUTION

To avoid any damage to the axle assemblies, the vehicle must not be raised using the front suspension arms for support or under the rear axle.

CAUTION

To prevent any suspension asymmetry, replace both of the shock absorbers on the same axle.

CAUTION

To prevent the components of the rear axle from deteriorating (rubber bushes, brake hoses, etc.) do not remove the two shock absorbers at the same time. Proceed one side at a time.

- Location and specifications (tightening torques, parts always to be replaced, etc.)(see 33A, Rear axle components, Rear axle assembly: Exploded view) .

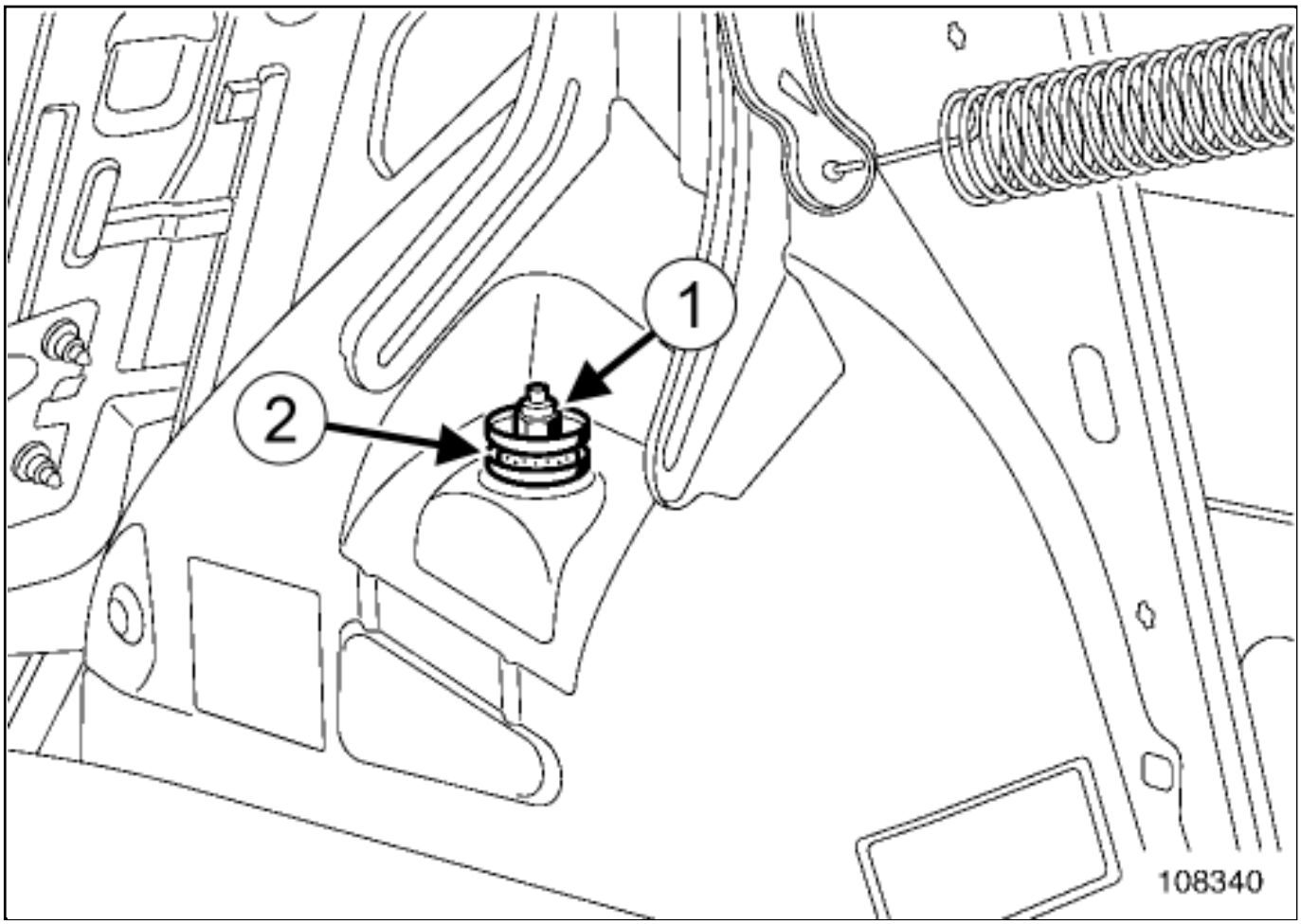
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove the wheel arch interior trim (partially).

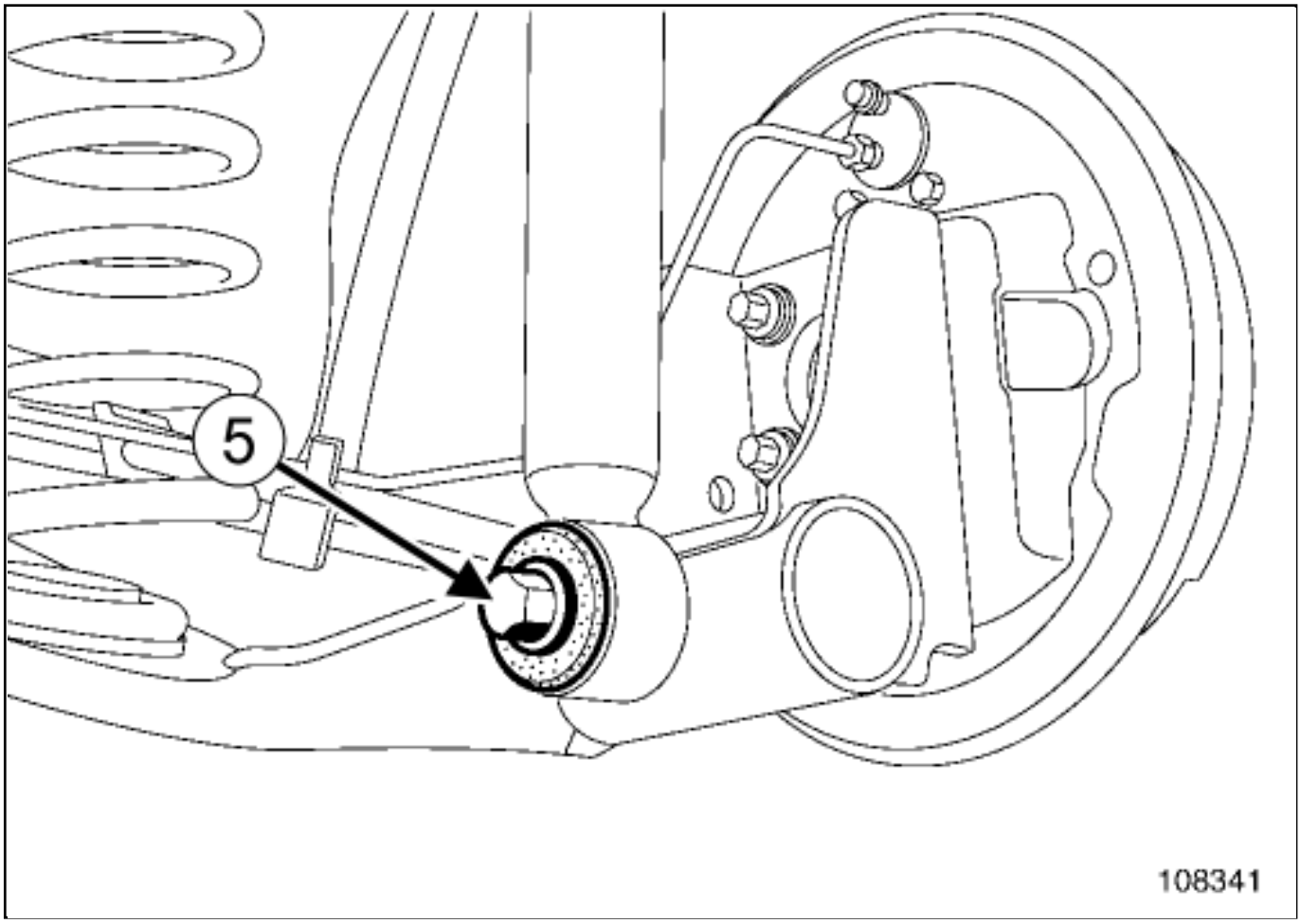
2. REMOVAL OPERATION



- In the luggage compartment, with wheels on the ground, remove:
  - the nut(1) ,
  - the rubber bush(2) .

- Raise the lift.

- Using a block, bring the component jackinto contact under the rear axle, near the shock absorber.



- Remove:
  - the shock absorber lower bolt(5) ,
  - the shock absorber.

REFITTING

1. REFITTING PREPARATION OPERATION

- Always replace the rear shock absorber lower bolt.

-

parts always to be replaced: Rear shock absorber upper nut.

2. REFITTING OPERATION

- Refit:
  - the shock absorber, positioning the shock absorber head in its housing,
  - the shock absorber lower bolt.

- Lower the lift until the wheels touch the ground.
- Align the shock absorber head with the drill hole in the boot.
- Refit:
  - the rubber bush,
  - the new shock absorber upper nut.
- Torque tighten:
  - the shock absorber lower bolt 105 N.m with the wheels on the ground,
  - the shock absorber upper nut 14 N.m whilst holding the bolt head, with the wheels on the ground.
- Repeat these operations on the shock absorber on the opposite side.

3. FINAL OPERATION

- Proceed in the reverse order to removal.

SIDE IMPACT SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:
Side impact sensors

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

WARNING

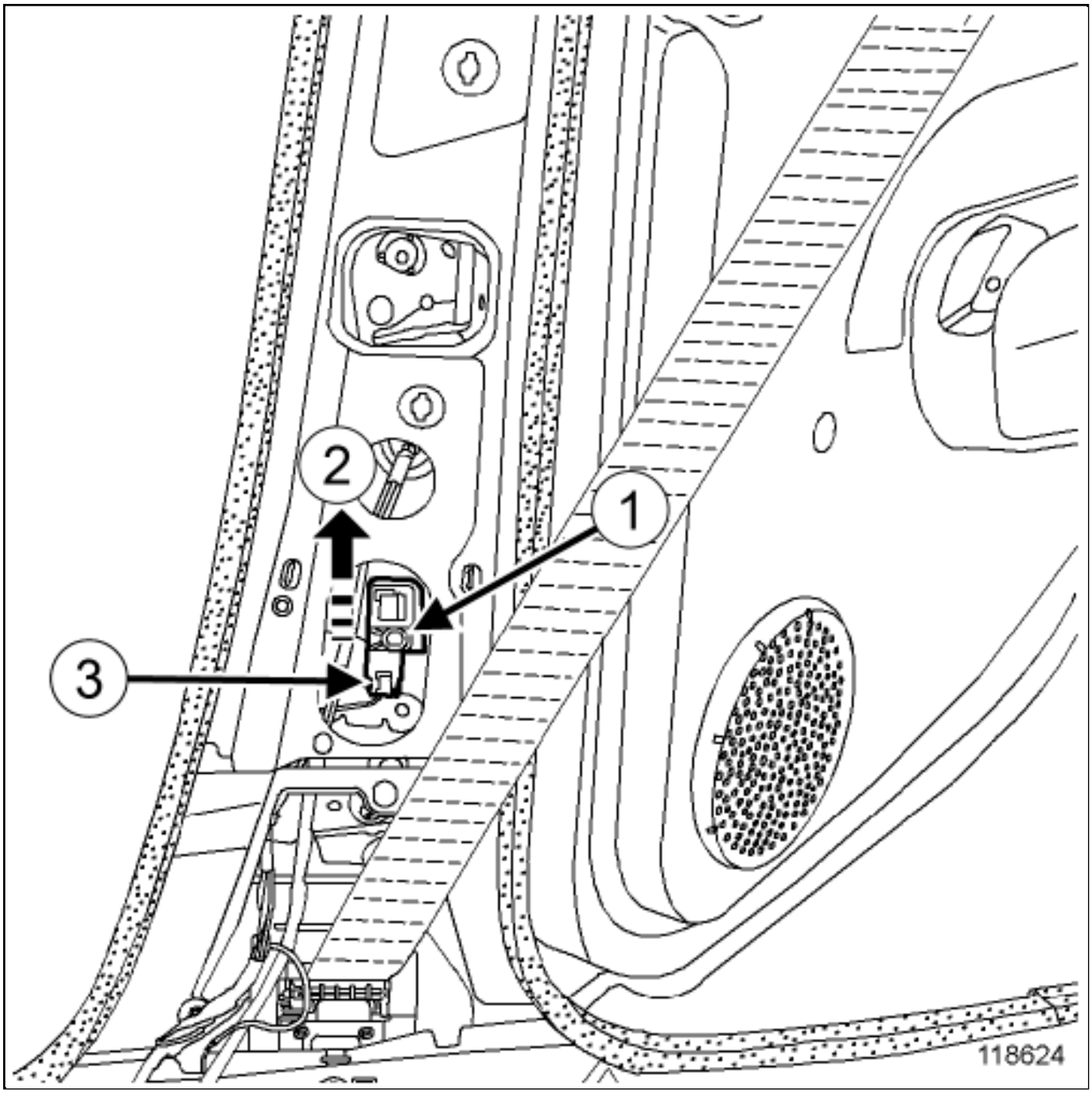
To avoid any risk of triggering when working on or near a pyrotechnic component (airbags or pretensioners), lock the airbag computer using the diagnostic tool.

When this function is activated, all the trigger lines are inhibited and the airbag warning light on the instrument panel lights up continuously (ignition on).

1. REMOVAL PREPARATION OPERATION

- Lock the airbag computer(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .
- Switch off the ignition.
- Disconnect the batteryBattery: Removal - Refitting .
- Remove the B-pillar trimInterior body side trim assembly: Exploded view .

2. REMOVAL OPERATION



- Loosen the side impact sensor bolt(1) by 6 turns.
- Remove the side impact sensor from its housing at(2) .
- Disconnect the connector(3) from the side impact sensor.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Side impact sensors

2. REFITTING OPERATION

- Proceed in the reverse order to removal.
- Torque tighten the side impact sensor bolt8 N.m.

SIDE INDICATOR: REMOVAL - REFITTING

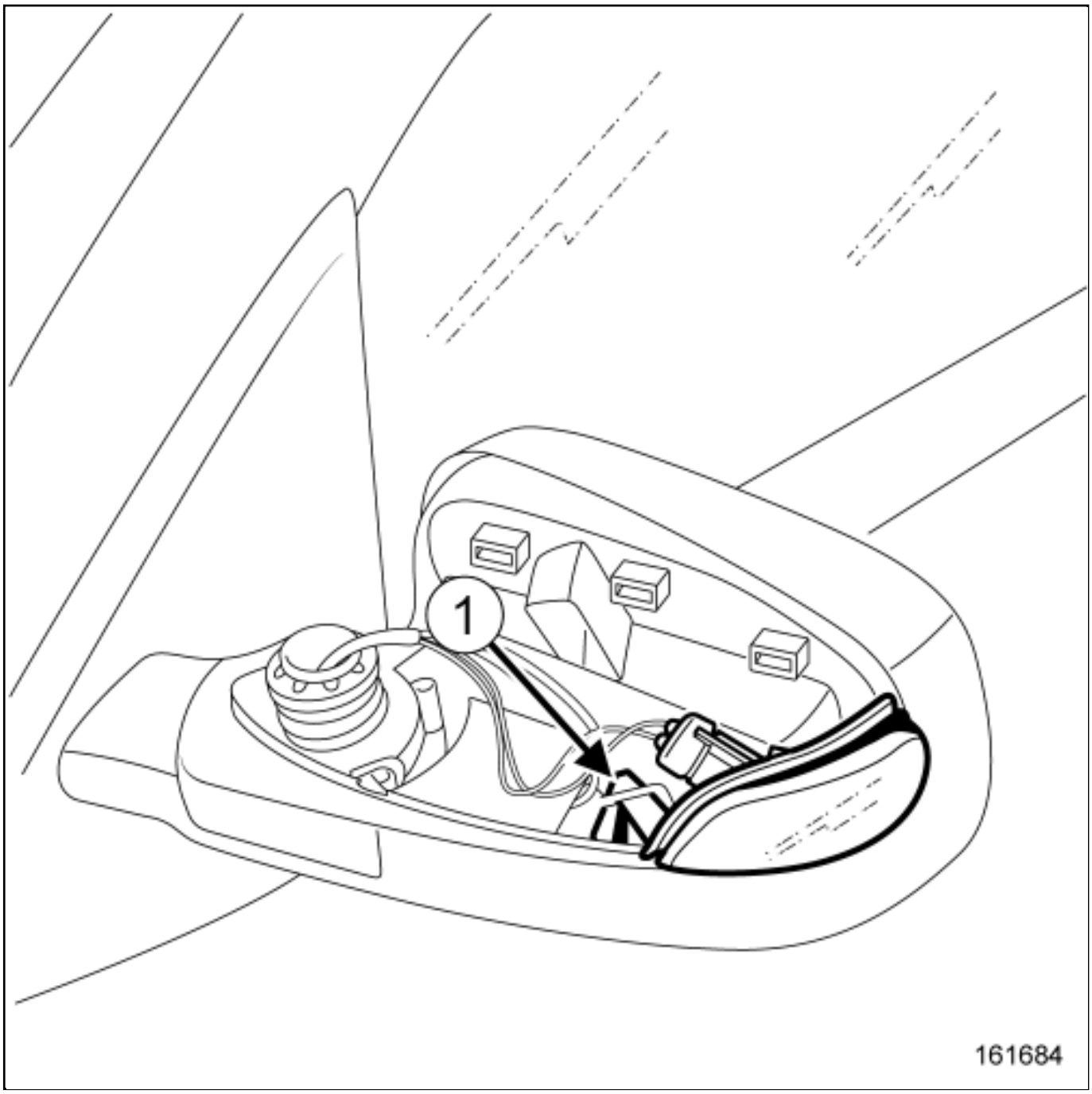
REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

- the door mirror glass Exterior front side opening element assembly: Exploded view (56A, Exterior equipment),
- the door mirror casing Exterior front side opening element assembly: Exploded view (56A, Exterior equipment).

2. REMOVAL OPERATION



- Unclip the side indicator(1) .

- Remove:
  - the side indicator from the bulb holder,
  - the bulb from the bulb holder.

REFITTING

1. REFITTING PREPARATION OPERATION

Note:

If the bulbs are changed, use approved bulbs.

2. REFITTING OPERATION

Refit:

- the bulb onto the side indicator bulb holder,
- the side indicator onto the bulb holder.

Clip the side indicator onto the door mirror.

3. REMOVAL PREPARATION OPERATION

Refit:

- the door mirror casing **Exterior front side opening element assembly: Exploded view** (56A, Exterior equipment).
- the door mirror glass **Exterior front side opening element assembly: Exploded view** (56A, Exterior equipment),

SIDE OPENING ELEMENT EXTERIOR HANDLE: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 51A, Side opening element mechanisms, Front side opening element box section internal assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

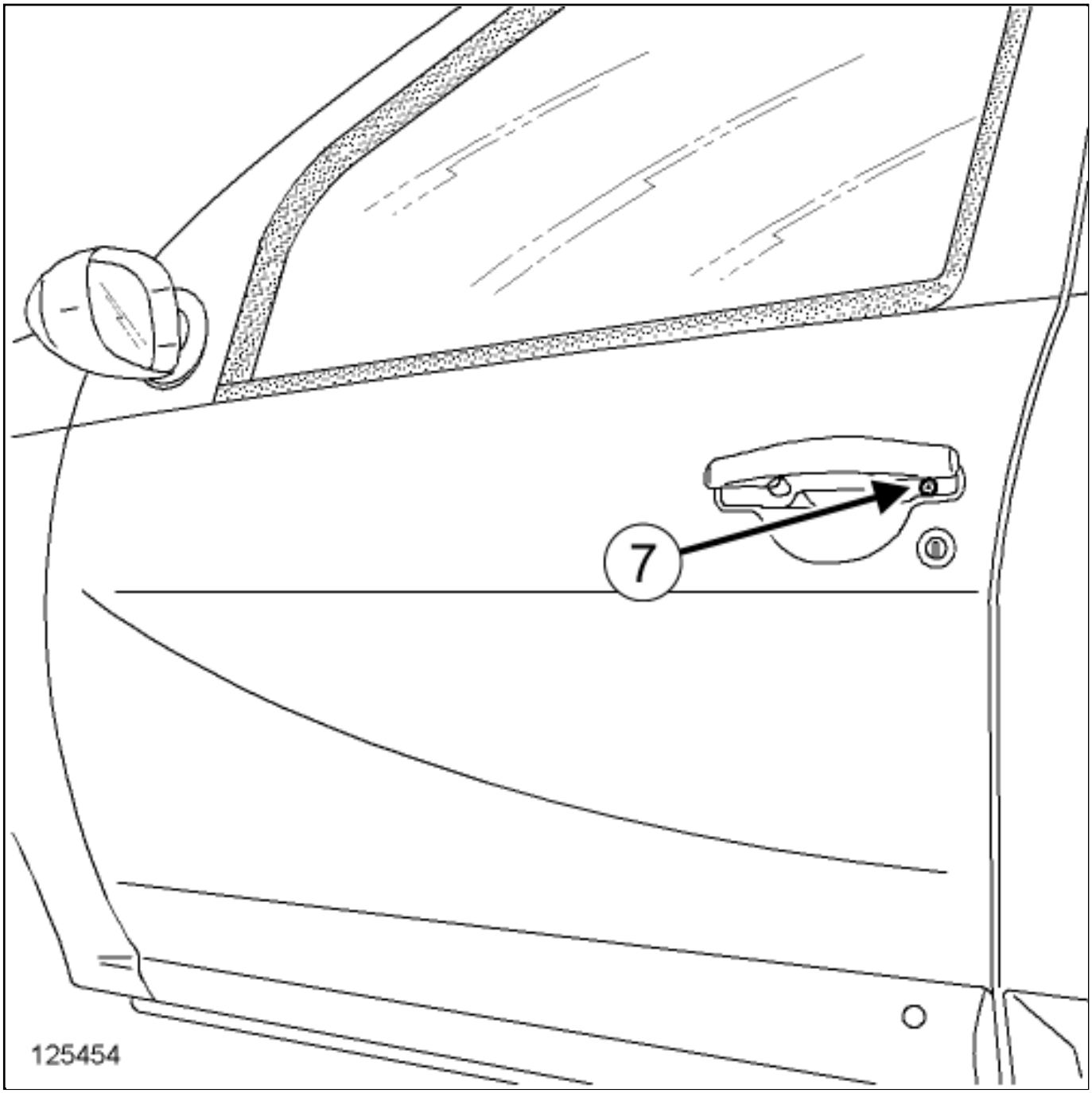
Remove:

- the front side opening element trimFront side opening element trim: Removal - Refitting or the rear side opening element trim Rear side opening element trim: Removal - Refitting
- the side opening element sealing filmSide opening element sealing film: Removal - Refitting .

2. REMOVAL OPERATION

Remove (see 51A, Side opening element mechanisms, Front side opening element box section internal assembly: Exploded view) :

- the exterior opening control linkage from the clip on the exterior door handle,
- the side opening element exterior handle bolt.



Remove:

- the side opening element exterior handle bolt(7) ,
- the side opening element exterior handle.

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.

- Torque tighten the bolts of the side opening element exterior handle4 N.m.

- Carry out a function test.

SIDE OPENING ELEMENT SEALING FILM: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

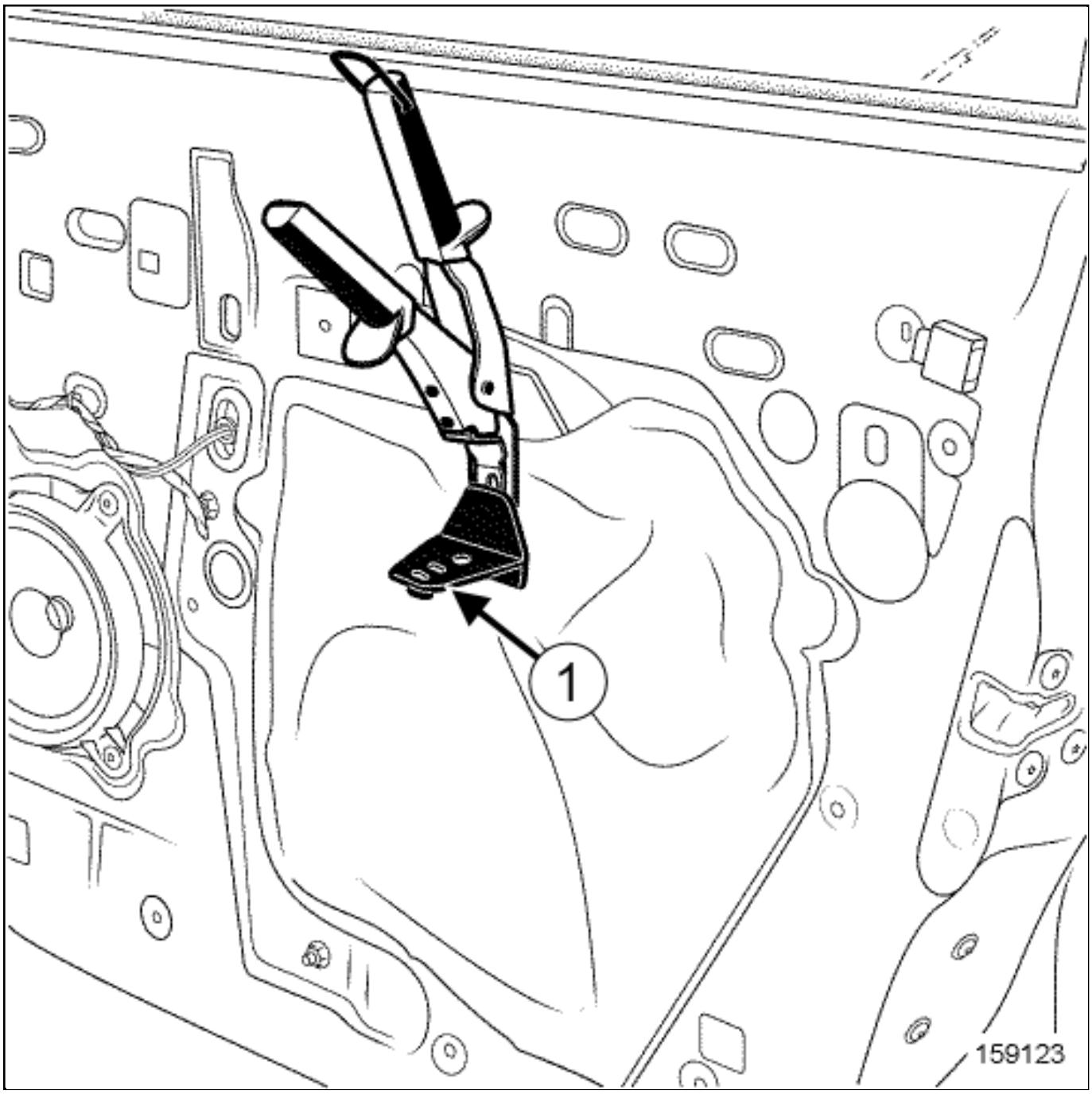
parts always to be replaced:
Door sealing film

REMOVAL

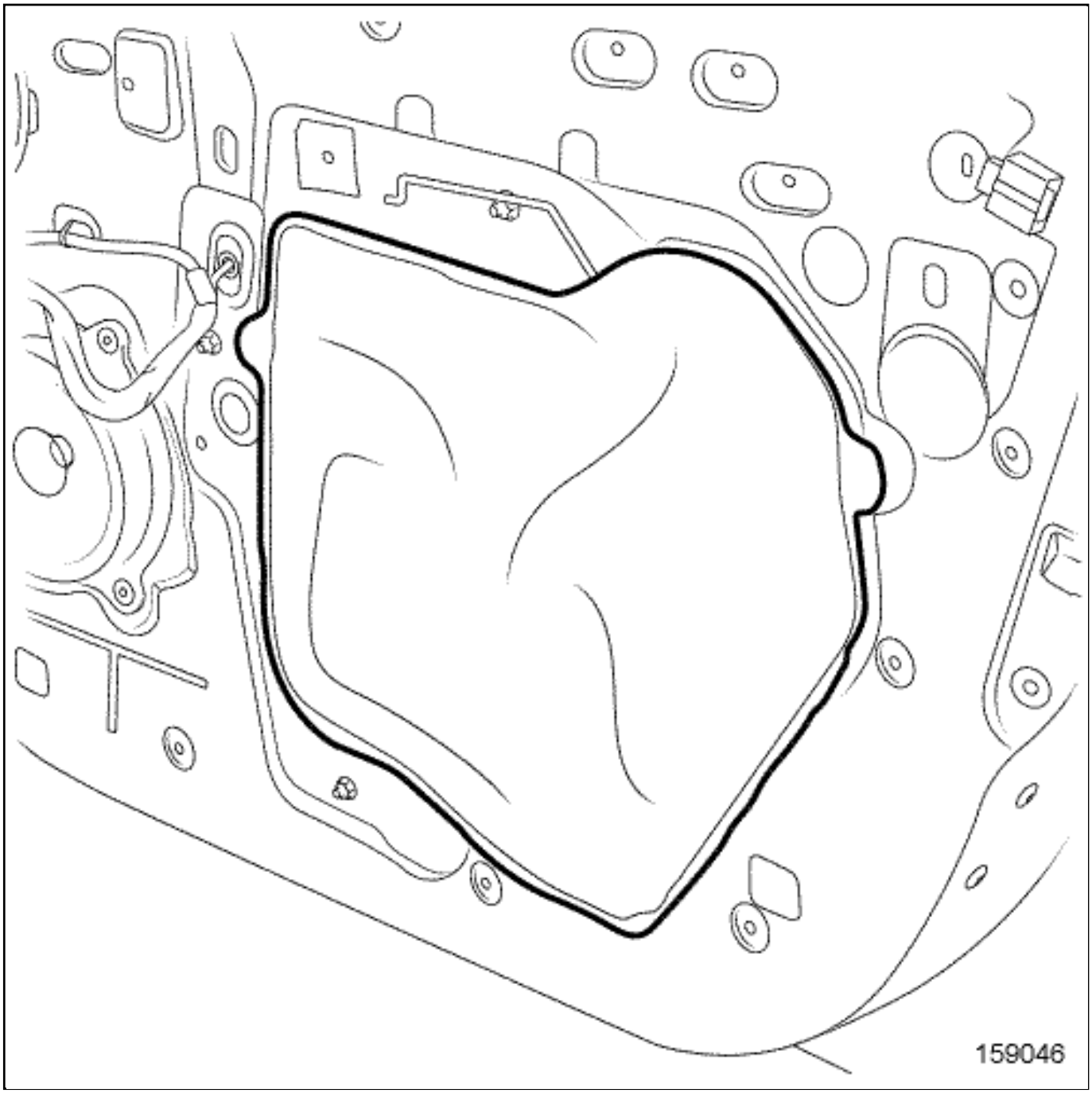
1. REMOVAL PREPARATION OPERATION

- Remove the front side opening element trim(see **Front side opening element trim: Removal - Refitting**) or the rear side opening element trim(see **Rear side opening element trim: Removal - Refitting**) .

2. REMOVAL OPERATION



- Unclip the mounting(1) using the unclipping pliers (depending on equipment level).



- Detach the side opening element sealing film.

- Carefully remove the mastic bead from the door box section around the edges of the door sealing film.

Note:

If the mastic bead offers too much resistance, use a hot air gun set to approximately 100˚C and held approximately 20 cmaway from the door sealing film to ease its removal.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Door sealing film.

Note:

Remove the adhesive residue from the door box section by applying wide masking tape over the bonding area. Pull gently on the masking tape to remove any adhesive residue.

Clean the door box section using a lint-free clothsoaked in heptane(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

CAUTION

To ensure that the sealing film adheres correctly:

- The door must be clean (free of dust, grease and anti-adhesive products), with no trace of impurities and no condensation,
- The area of the door box section where the film is to be applied must be painted completely,
- A temperature of 15°minimum is necessary for surfaces that are to be bonded.

2. REFITTING OPERATION

Remove the paper protecting the mastic bead from the side opening element sealing film.

Note:

Do not touch the mastic bead.

Position the sealing film correctly around its edge without applying any pressure.

Firmly apply the side opening element sealing film around its entire edge.

3. FINAL OPERATION

- Carry out a sealing test (see Technical Note 0653A).

- Proceed in the reverse order to removal.

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XSL version : 3.02 du 22/07/11

SIDE OPENING ELEMENTS: ADJUSTMENT

1. HINGED SIDE DOOR

- Check that the peripheral components are adjusted correctly.

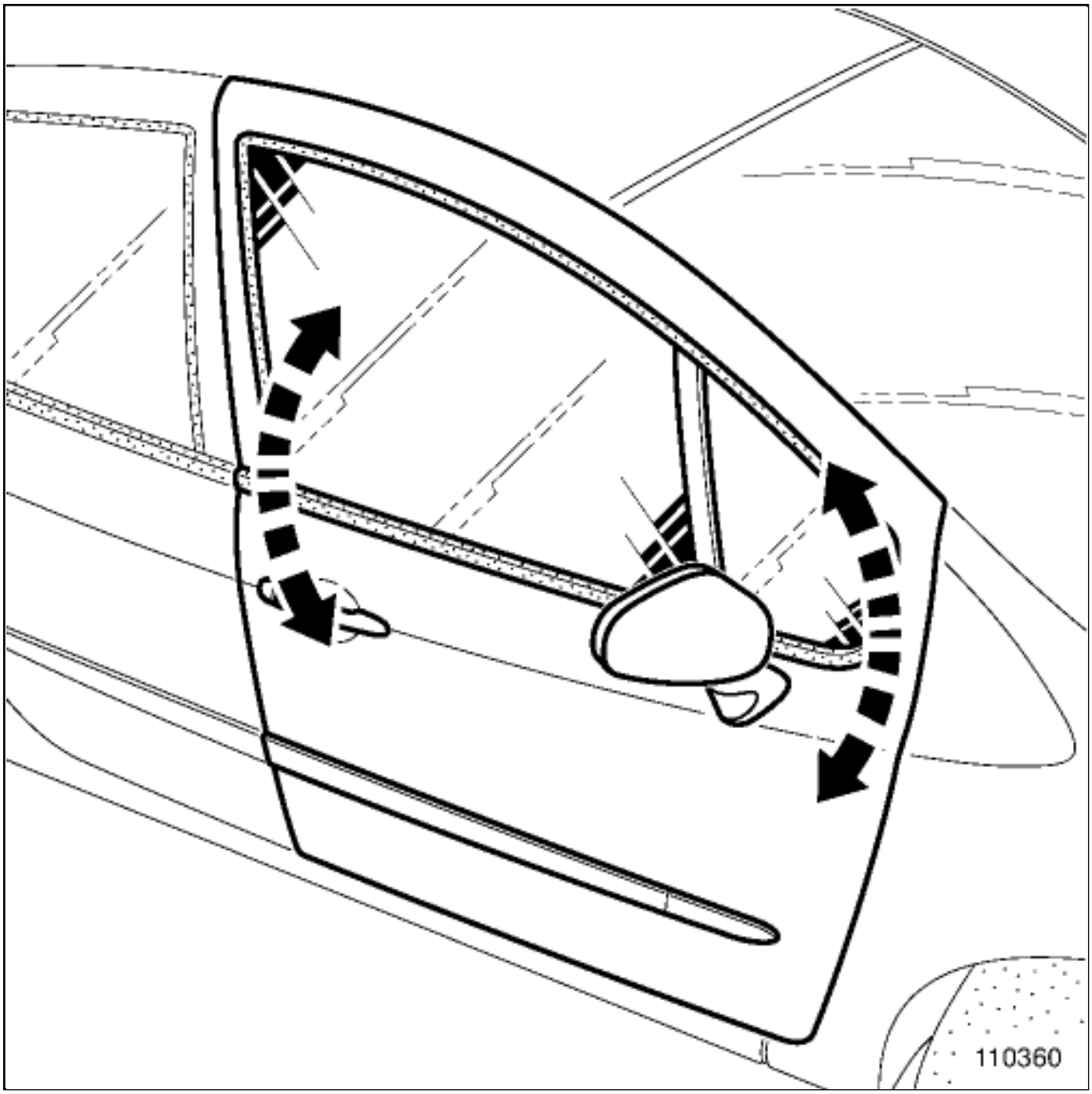
Refit the heavy door fittings (closing system, window winder system).

Before carrying out the adjustments, release the striker panel and fit the hinges, pre-tightening in the middle of the adjustment.

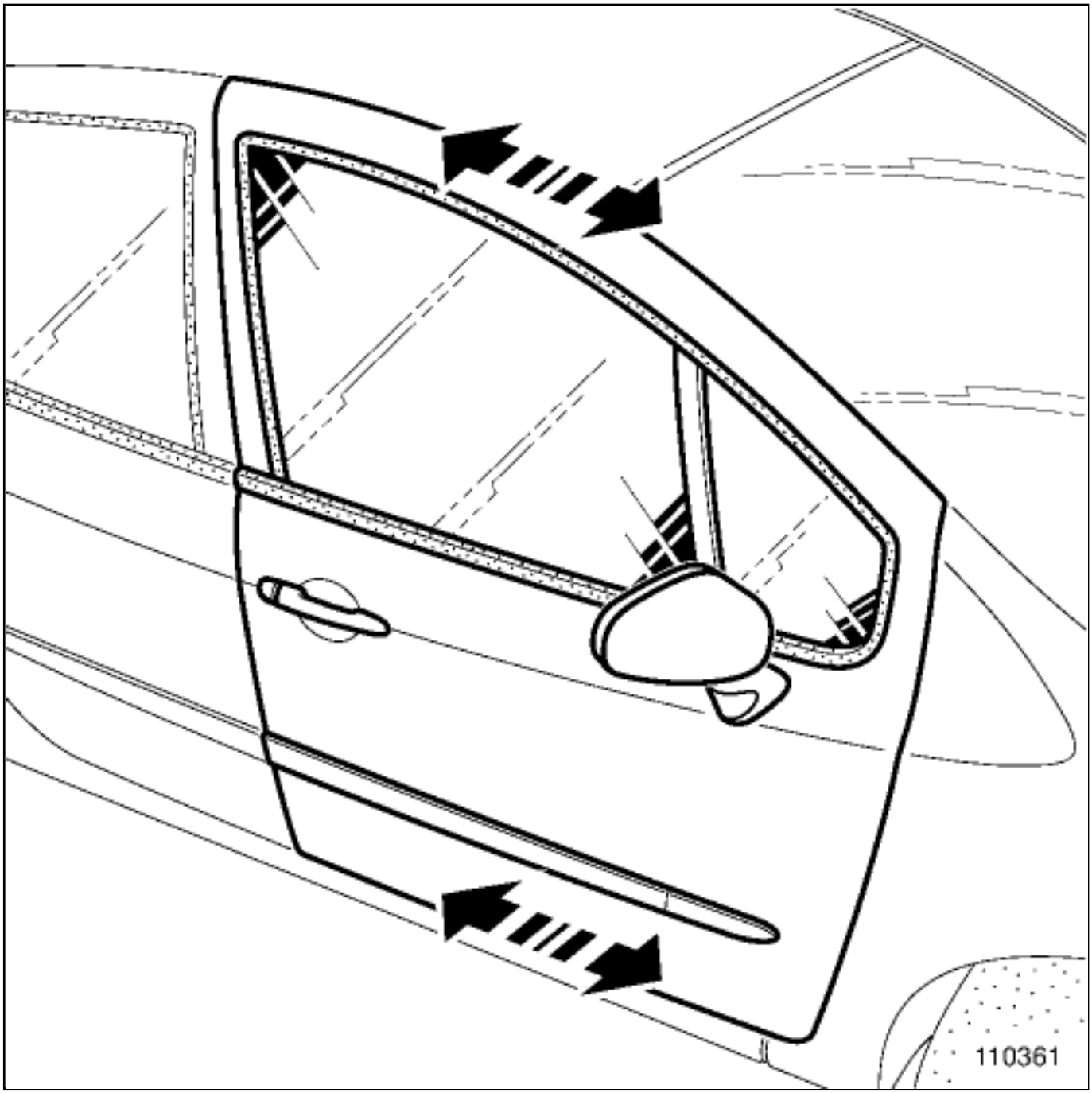
Note:

For information about the adjustment zones, refer to the MR for the vehicle concerned.

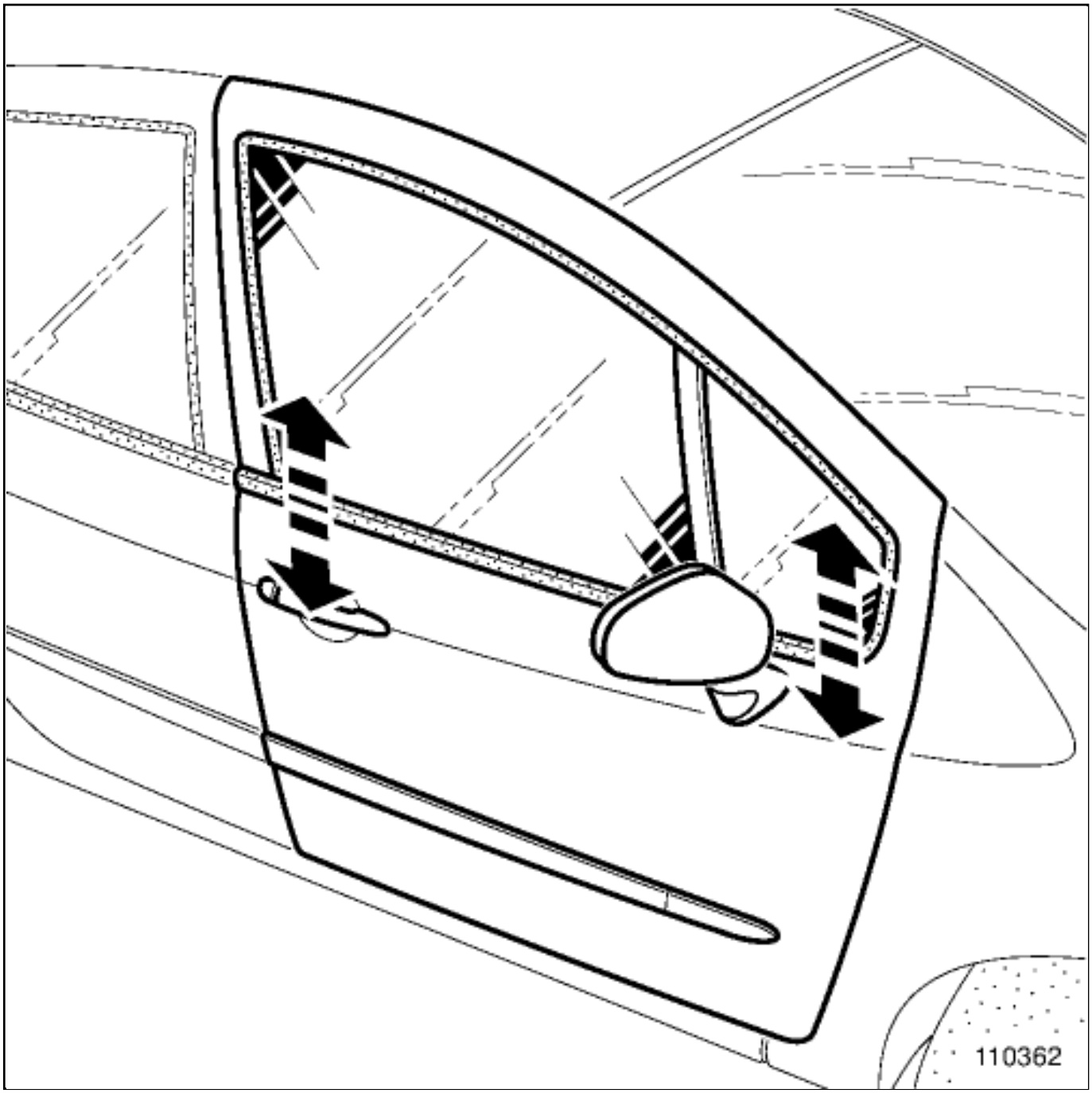
1- ADJUSTMENT CHRONOLOGY



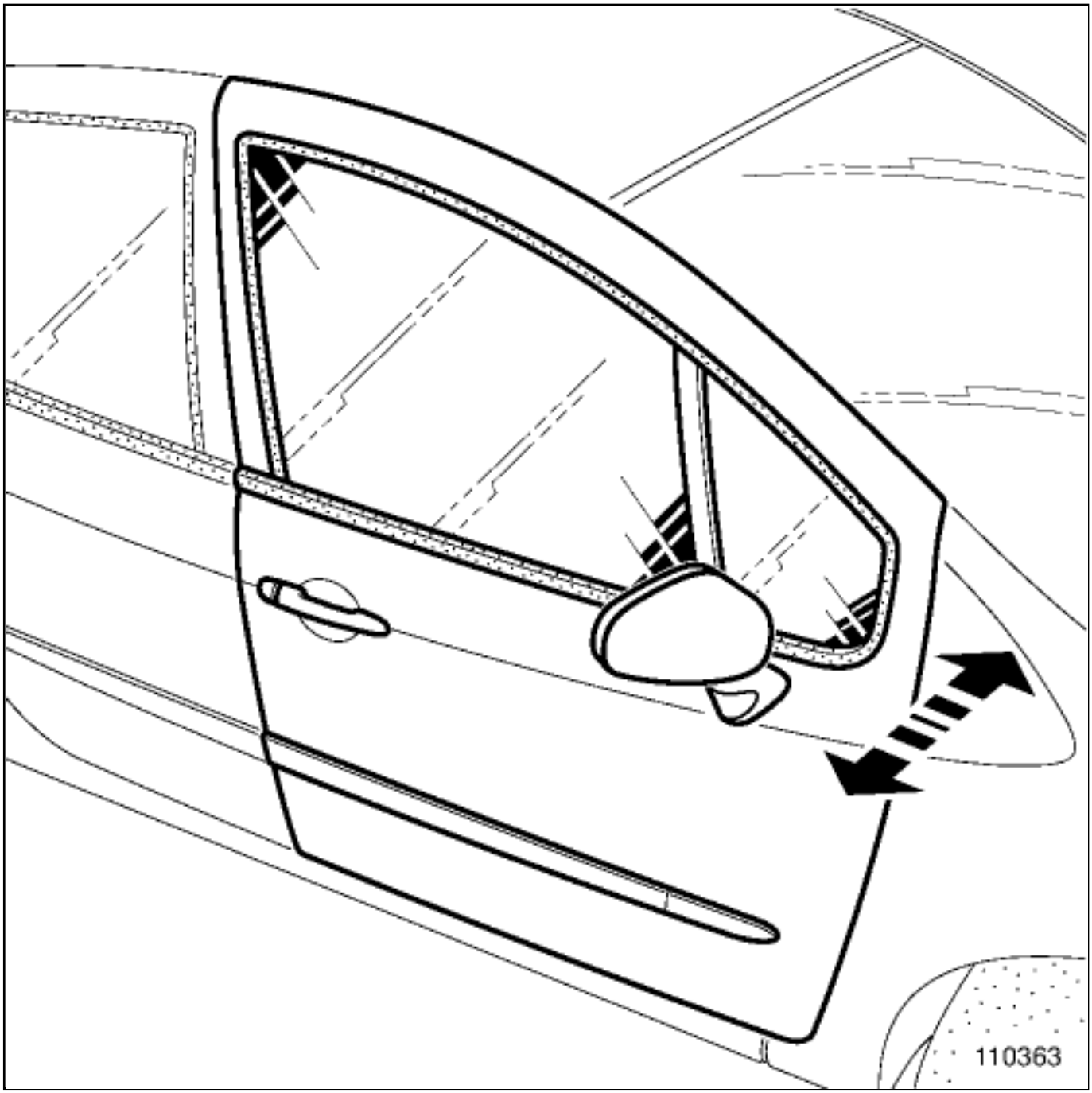
- Adjust the centring of the door.



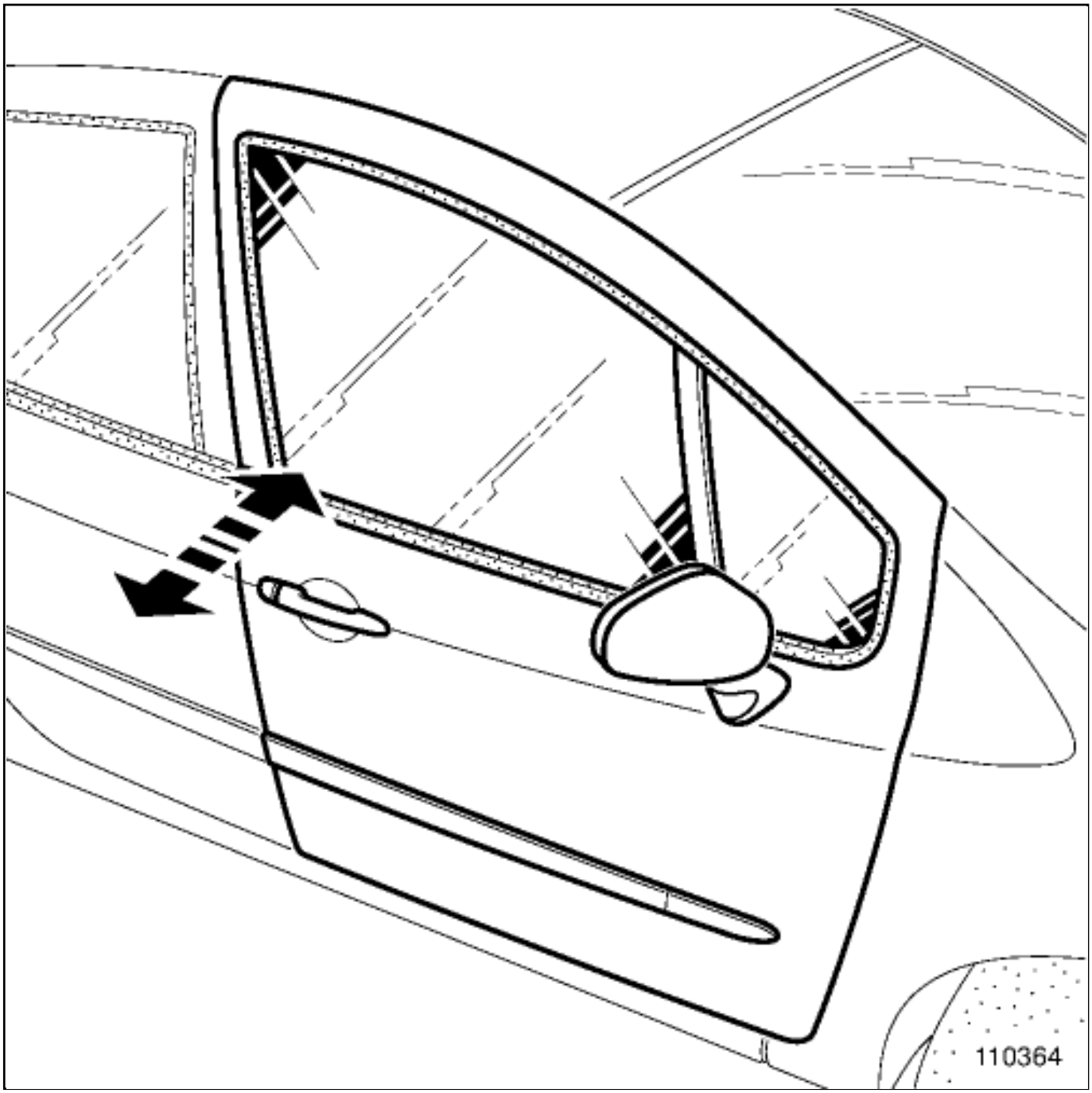
- Adjust the side alignment of the door.



- Adjust the alignment of the door height.



Adjust the front flush fitting of the door.



- Adjust the rear flush fitting of the door, as well as the contact and the closure firmness.
- Check the adjustment and the correct operation then tighten into position.

2. SLIDING SIDE DOOR

Check that the peripheral components are adjusted correctly.

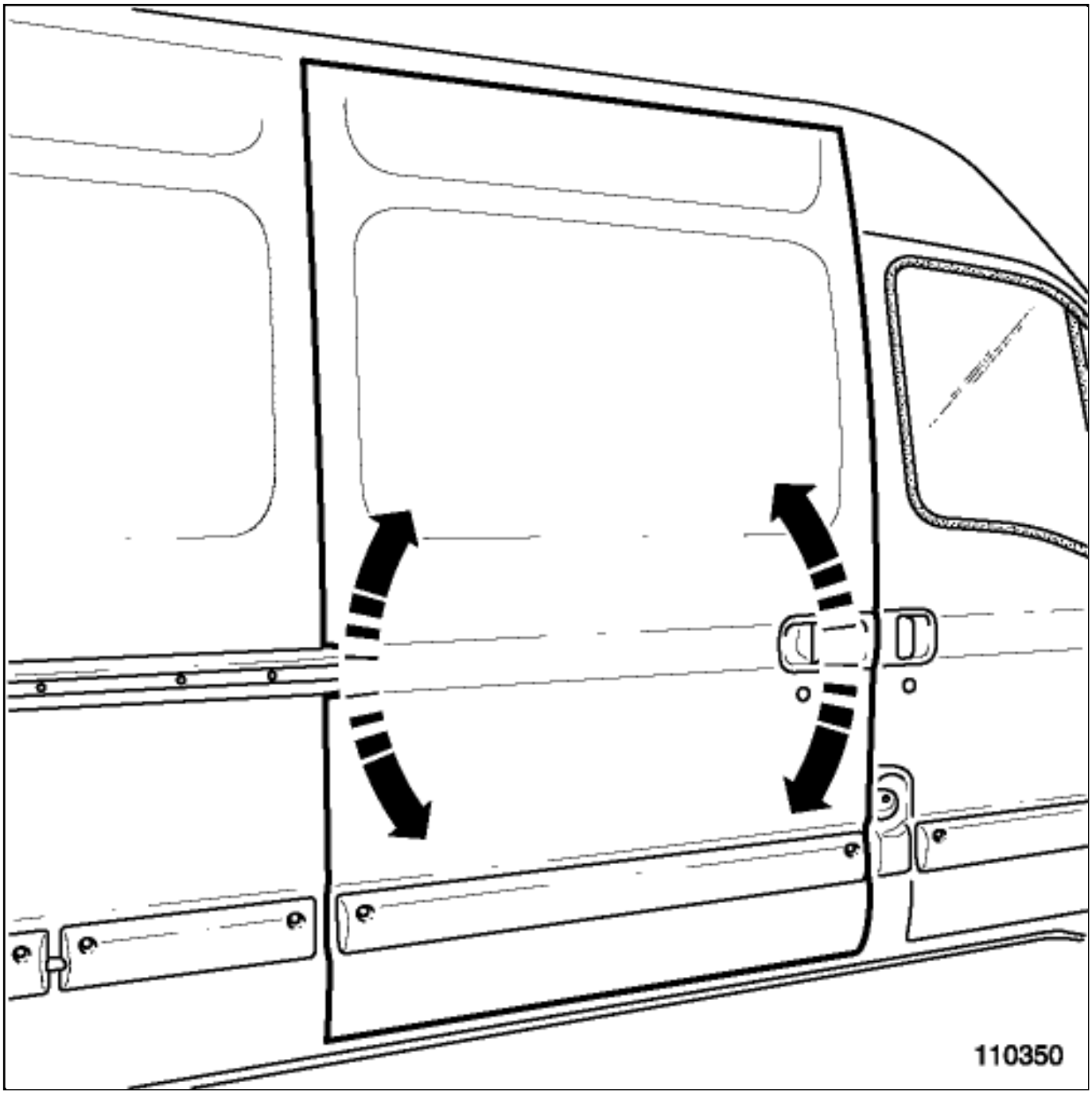
Refit the heavy door fittings (closing system, window winder system).

Before carrying out the adjustments, release the striker panel and fit the hinges, pre-tightening in the middle of the adjustment.

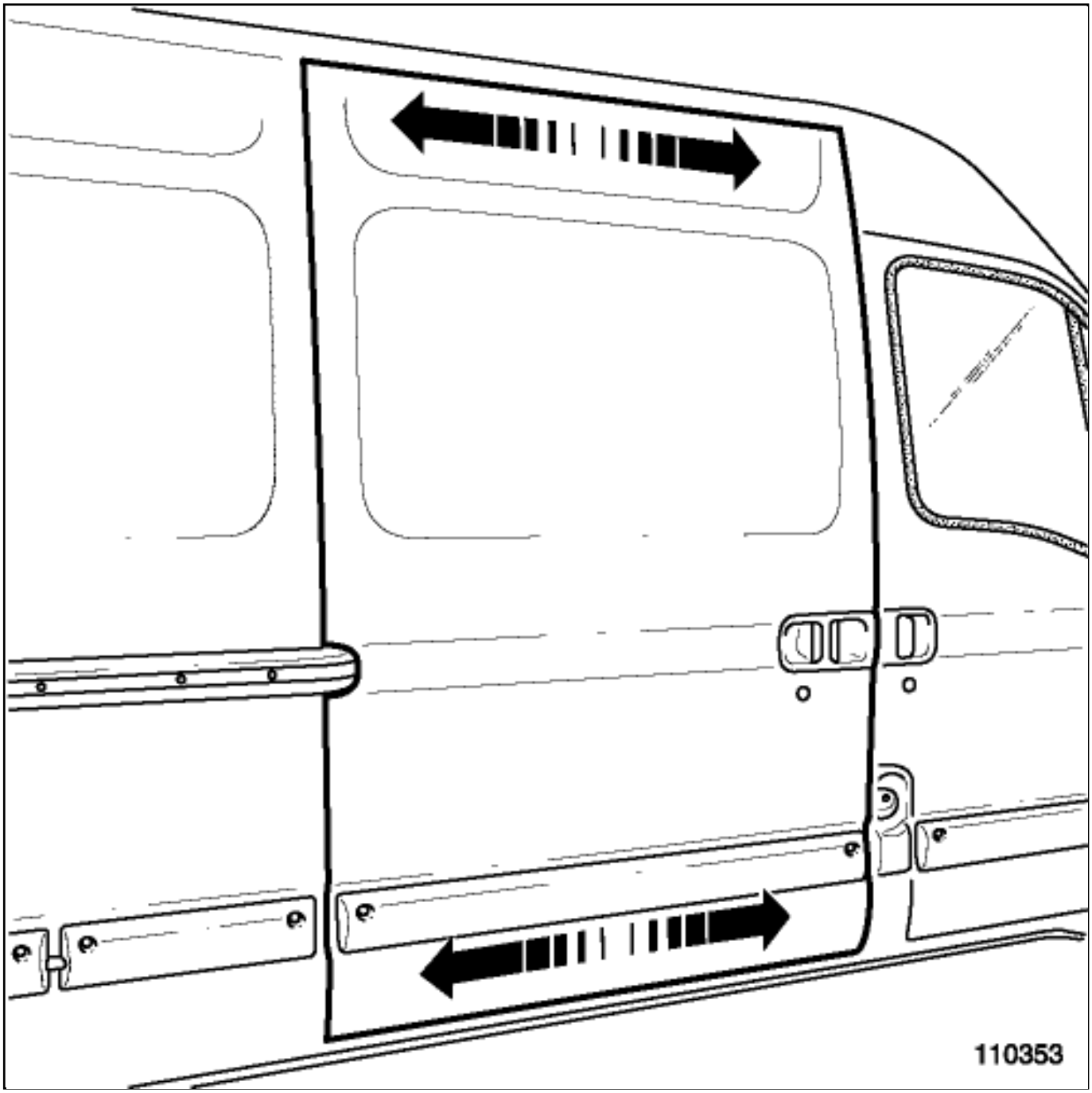
Note:

For information about the adjustment zones, refer to the MR for the vehicle concerned.

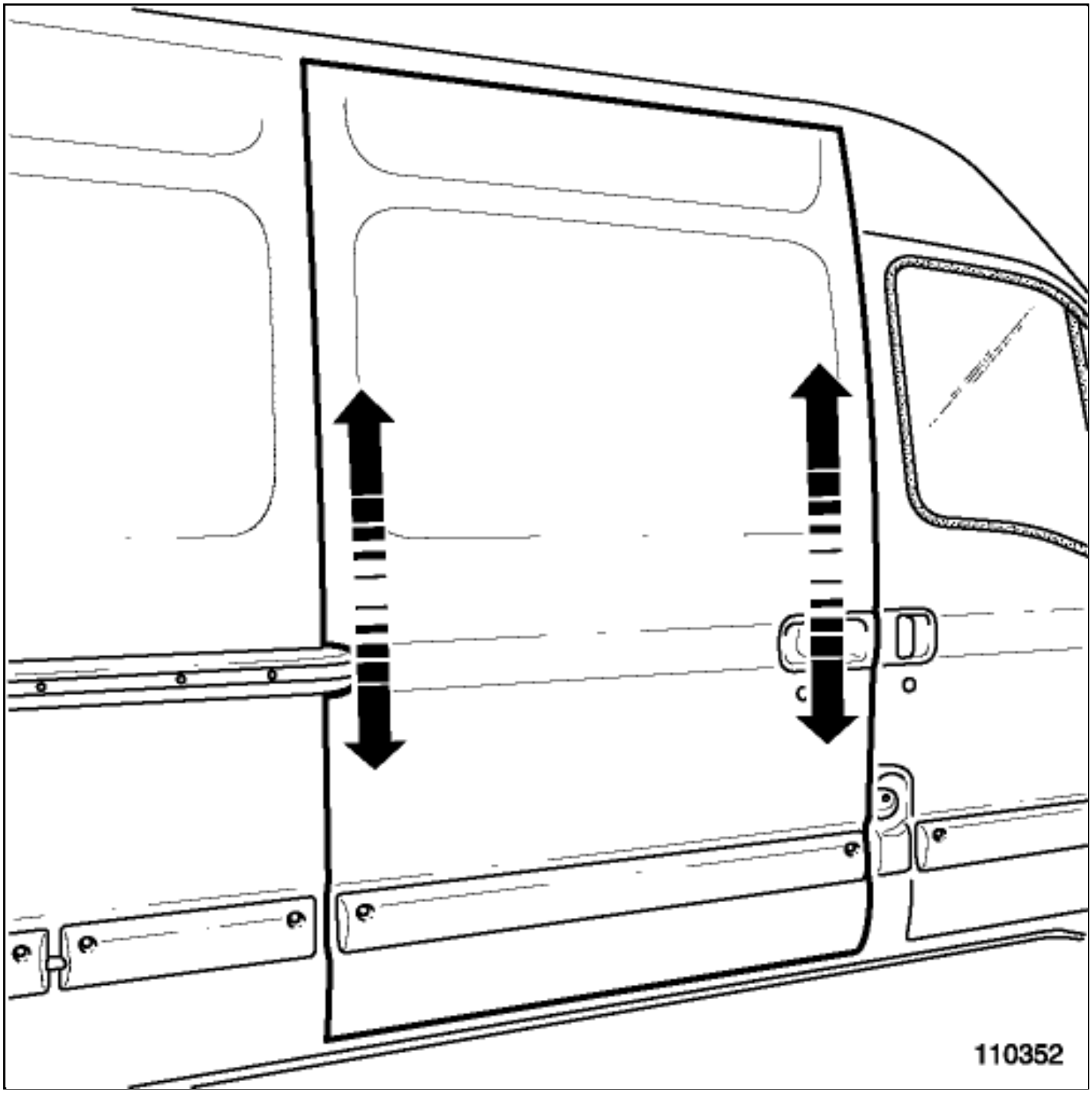
1- ADJUSTMENT CHRONOLOGY



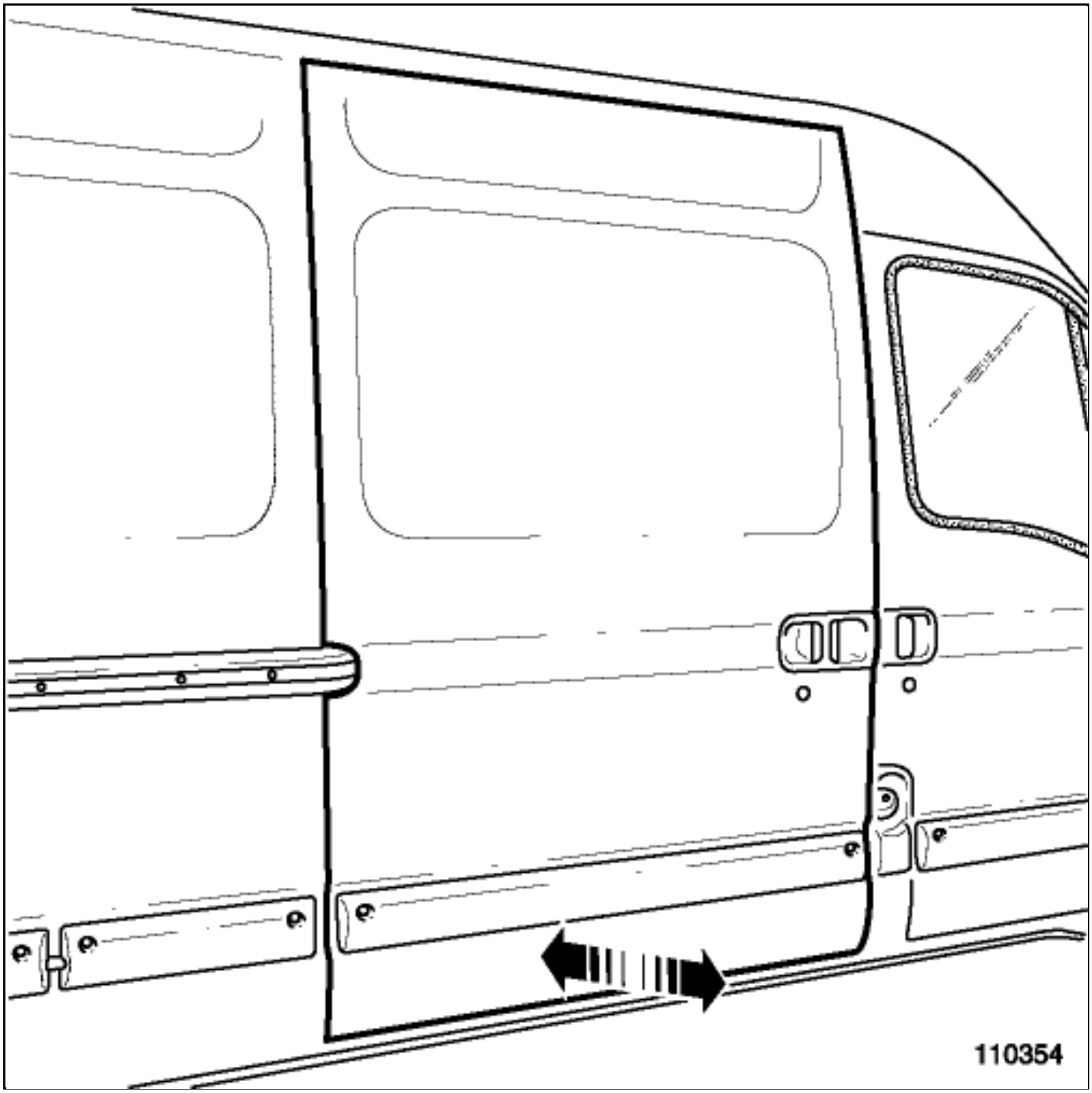
Adjust the centring of the door.



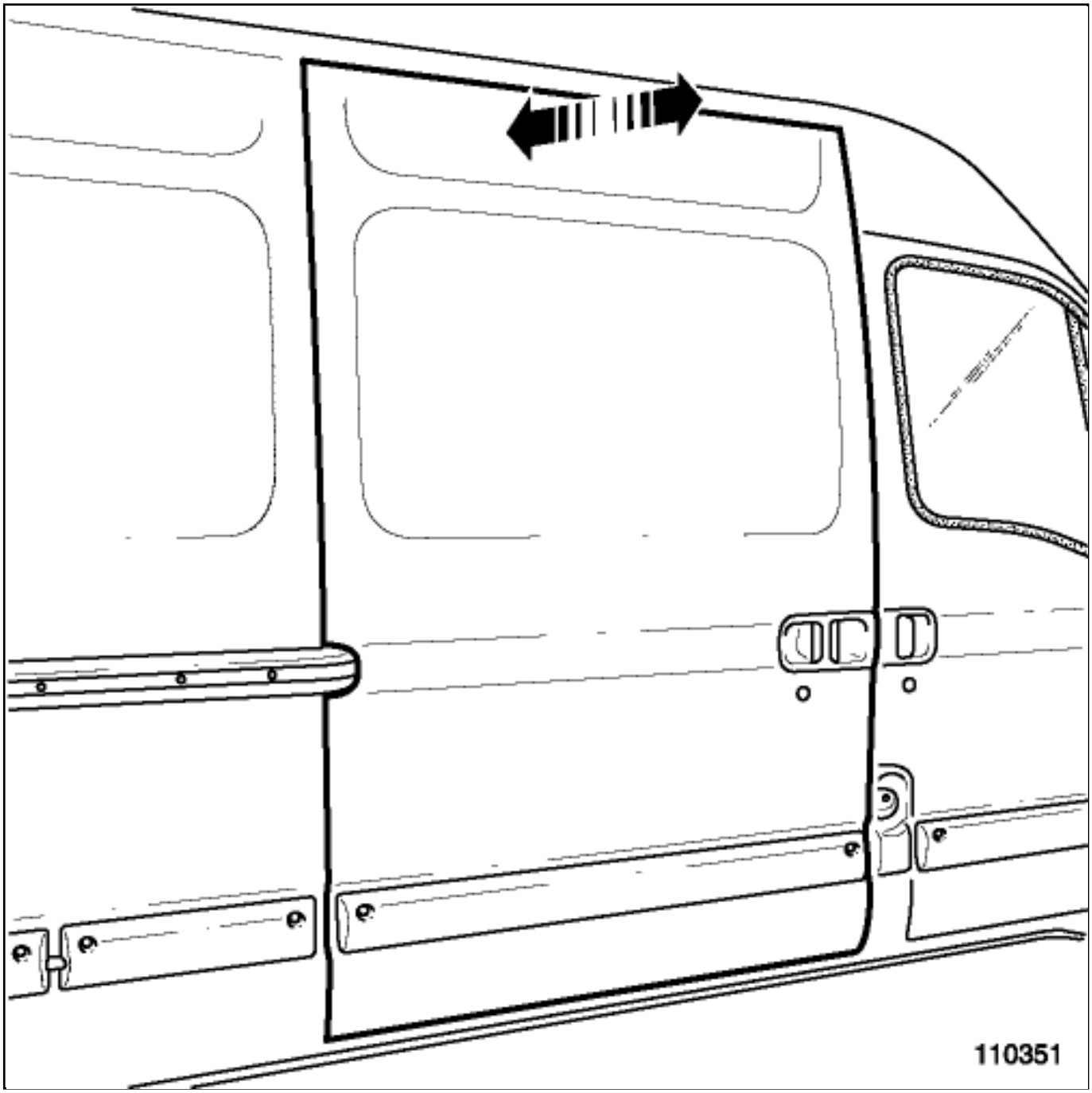
Adjust the side alignment of the door.



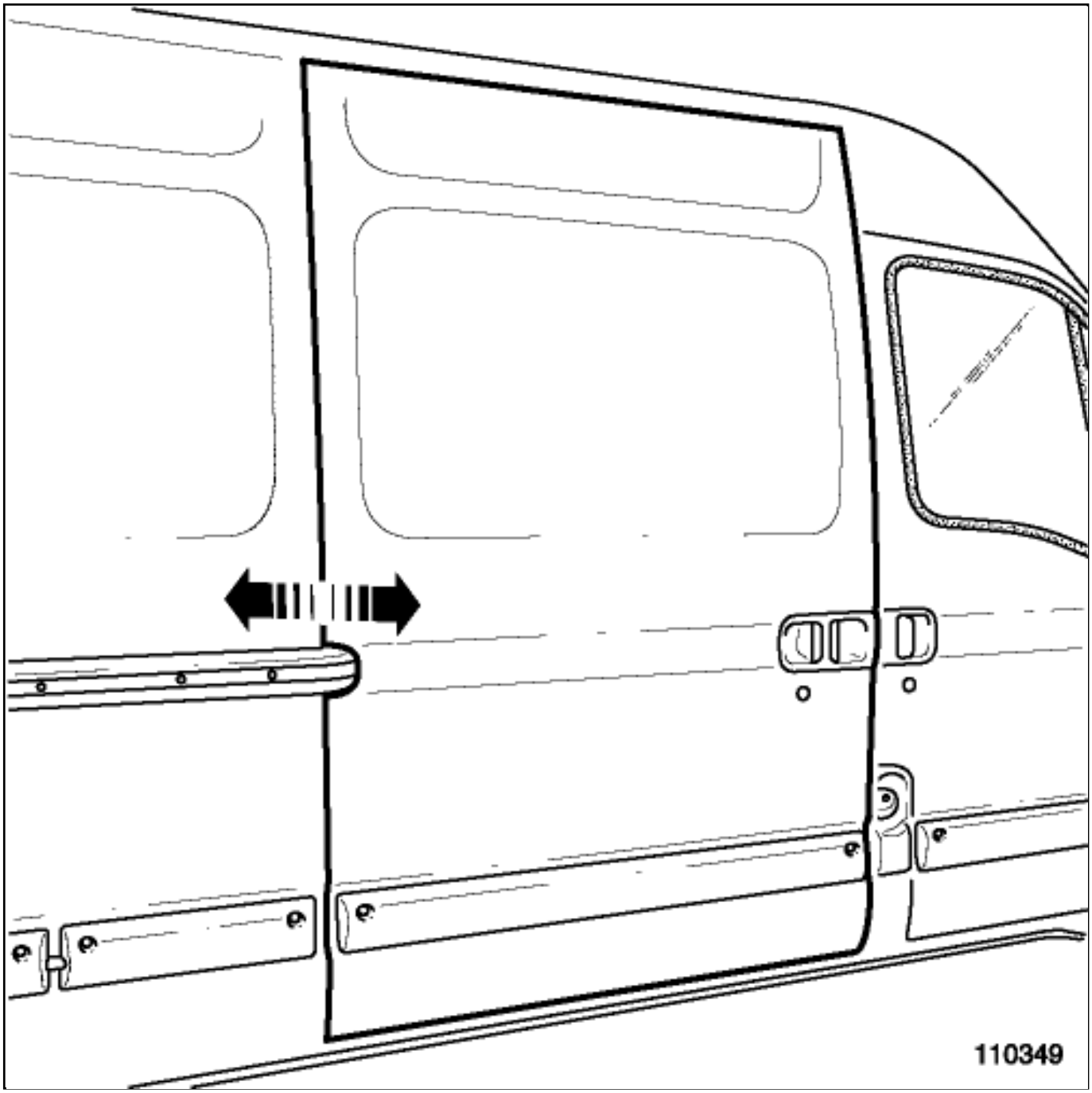
Adjust the alignment of the door height.



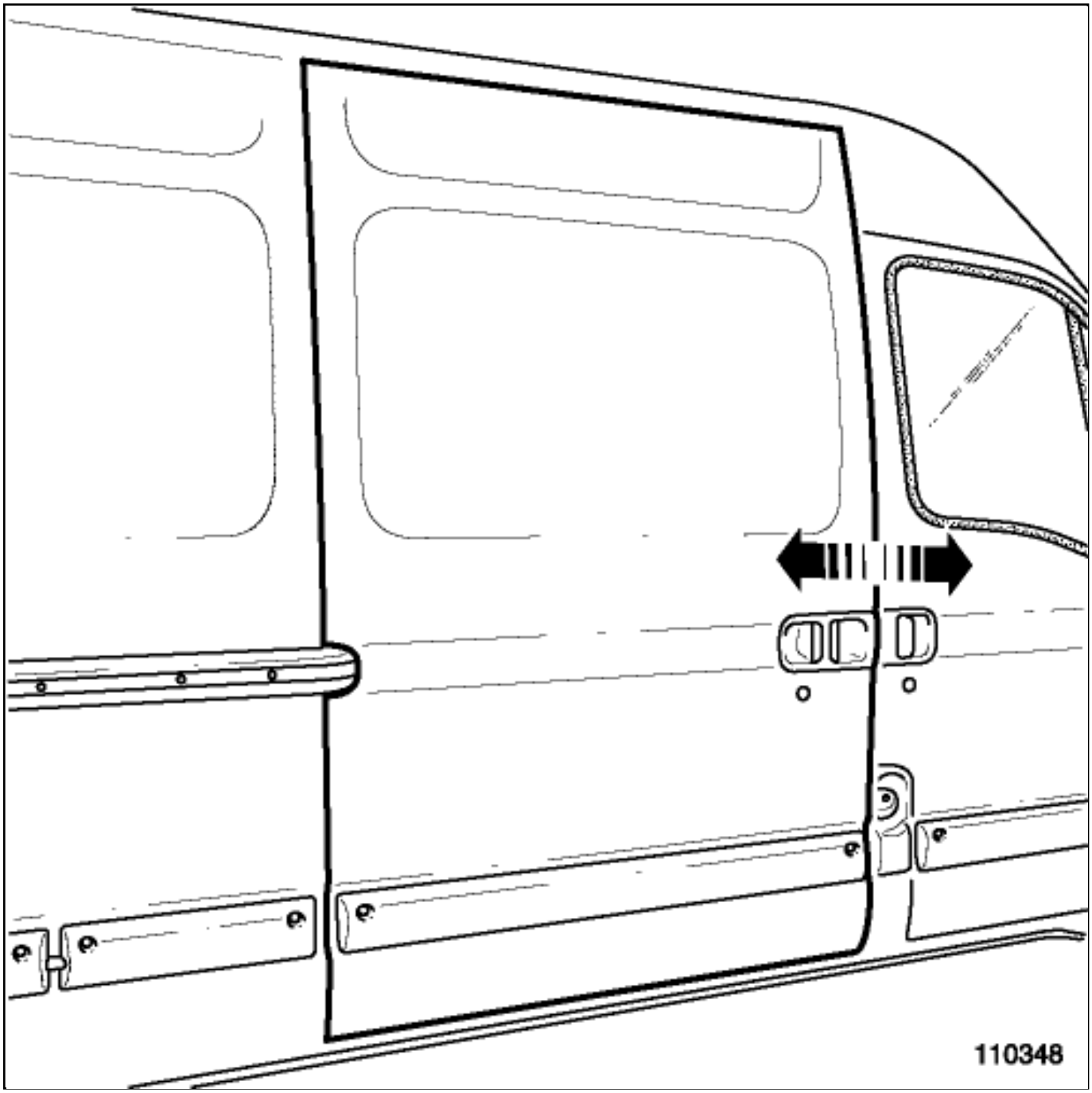
Adjust the flush fitting of the bottom section of the door.



Adjust the flush fitting of the top section of the door.



Adjust the rear flush fitting of the door.



- Adjust the front flush fitting of the door.

- Check the adjustment and the correct operation then tighten into position.

SIDE OPENING ELEMENTS: SEALING CHECK

Note:

Before any operation, check the water outlet openings. Clean any residue which has accumulated (example: dead leaves, twigs, etc.) in order to check that the water flows out correctly.

Note:

To check the sealing of the side opening element windows(see 60A, General information, Windows: Sealing check) .

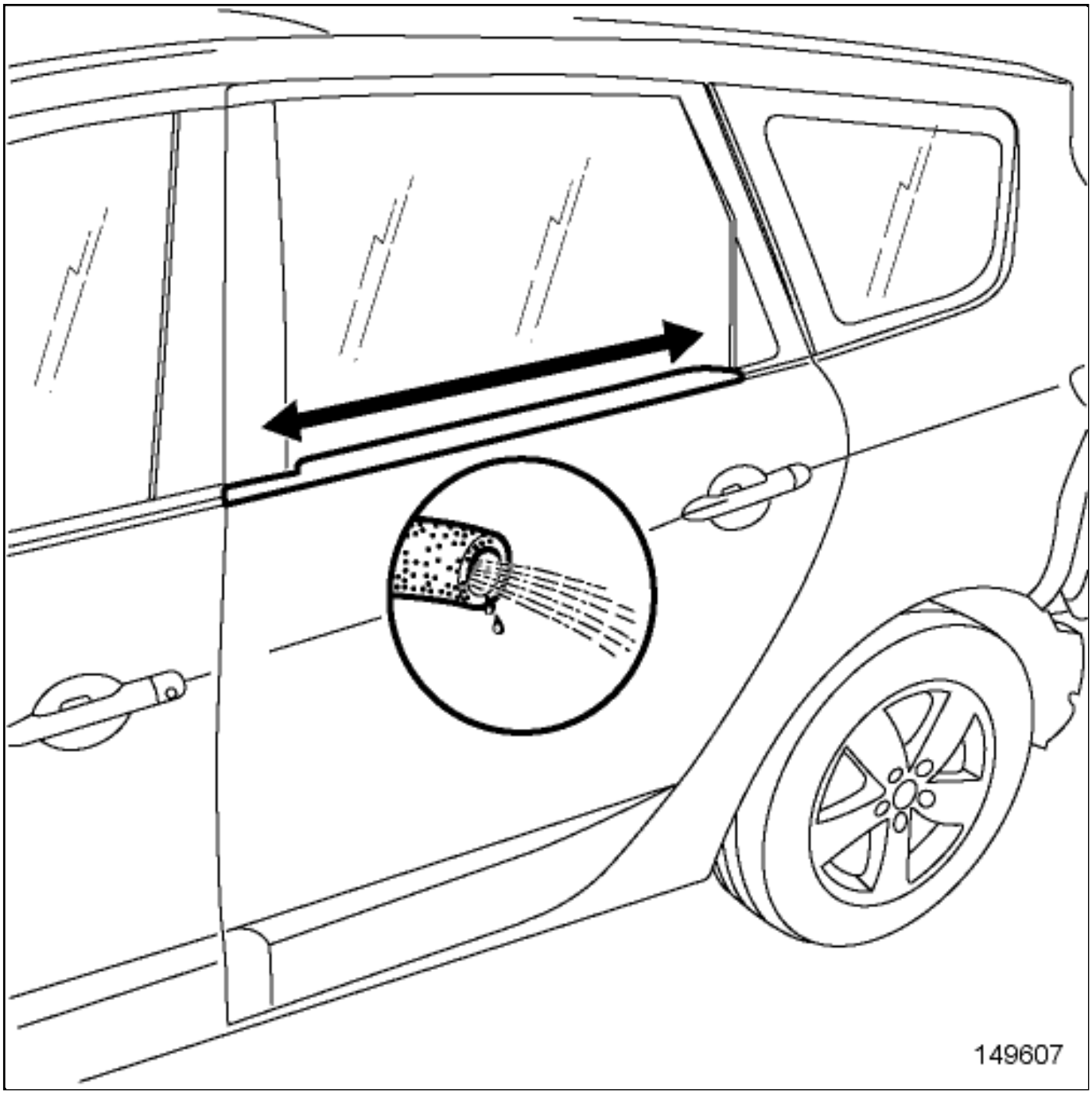
1. PREPARATION OPERATION FOR CHECKING THE SEALING

1- CONDITIONS TO RESPECT BEFORE CHECKING THE SEALING

- Position the vehicle on a level washing area(see 60A, General information, Vehicle sealing: General information) .
- Check that all of the opening elements are closed(see 60A, General information, Vehicle sealing: General information) .
- Prepare the equipment to perform the operation(see 60A, General information, Sealing tools: Use) ,(see 60A, General information, Sealing tools: Description) and(see 60A, General information, Vehicle sealing: General information) .
- Adjust the flow of the water jet(see 60A, General information, Sealing tools: Use) .

2. OPERATION FOR CHECKING THE SEALING

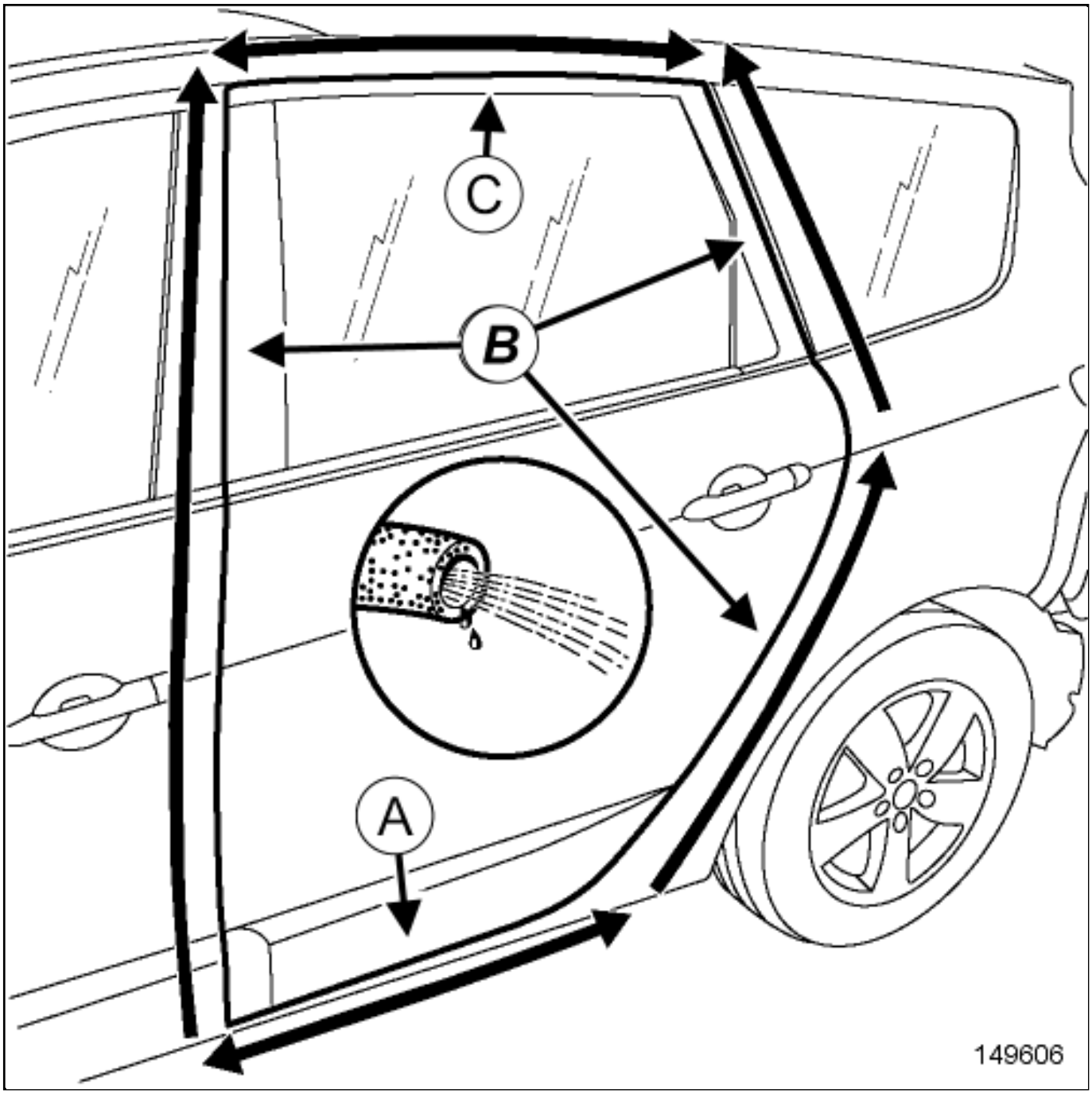
1- SIDE OPENING ELEMENT SEALING FILM OR TRIMS



- Spray the exterior weatherstrip by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

2- SIDE OPENING ELEMENT SEAL



- Spray the low section(A) of the opening element by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Gradually spray the vertical sections(B) of the opening element from the bottom upwards to the upper section.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the upper section(C) of the opening element by sweeping the zone from right to left.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

3- CHECKING THE SEALING WITH THE TRIM REMOVED

If the customer complaint could not be reproduced in accordance with the procedure, remove the interior trims (see Body internal trim in the vehicle's repair manual) then repeat the sealing check from step 1, extend the sealing check to the surrounding areas(see 60A, General information, Vehicle: Sealing check) .

SIDE OPENING ELEMENTS: SEALING REPAIR

Note:

Before repairing the sealing, check the sealing of the zone concerned(see 60A, General information, Vehicle: Sealing check) .

1. PREPARATION OPERATION FOR REPAIRING THE SEALING

1- CHECK AND ADJUST IF NECESSARY:

- the clearances and flush fittingVehicle panel gaps: Adjustment value (01C, Vehicle bodywork specifications),
- the condition and positioning of the exterior weatherstripFront side door exterior weatherstrip: Removal - Refitting (66A, Window sealing) orRear side door exterior weatherstrip: Removal - Refitting (66A, Window sealing),
- the condition and positioning of the side opening element seals.

Note:

If the seals are dirty, clean them in soapy water(see 60A, General information, Vehicle sealing: General information) .

2- WAS ANY ACTION PERFORMED?

- NO: move on to the next step.
- YES: check the sealing of the zone(see 60A, General information, Side opening elements: Sealing check) .

☐ Was water present in the passenger compartment of the vehicle?

- YES: move on to the next step.
- NO: fault resolved.

2. SEALING REPAIR OPERATION

1- REPAIRING THE SEALING OF THE SIDE OPENING ELEMENT SEALING FILM OR TRIM

☐ A) Is water present in the passenger compartment after the sealing of the side opening element trim has been checked?

- NO: move on to the next step.
- YES:
- a) if the side opening element trim is deformed or cracked, replace the side opening element trimFront side door

trim: Removal - Refitting (72A, Side opening elements trim) orRear side door trim: Removal - Refitting (72A, Side opening elements trim) or(see **Sliding side door trim: Removal - Refitting**) (72A, Side opening elements trim),

■ b) if the sealing mastic of the side opening element trim is incorrectly positioned, replace the sealing masticFront side door trim: Removal - Refitting (72A, Side opening elements trim) orRear side door trim: Removal - Refitting (72A, Side opening elements trim) or(see **Sliding side door trim: Removal - Refitting**) (72A, Side opening elements trim) and Vehicle: Parts and consumables for the repair (04B, Consumables - Products),

■ c) if the clips of the side opening element trim are damaged, replace the clipsFront side door trim: Removal - Refitting (72A, Side opening elements trim) orRear side door trim: Removal - Refitting (72A, Side opening elements trim) or (see **Sliding side door trim: Removal - Refitting**) (72A, Side opening elements trim).

❑ Check the sealing of the side opening element trim(see 60A, General information, Side opening elements: Sealing check) .

❑ B) Is water present in the passenger compartment after the side opening element sealing film has been checked?

■ NO: move on to the next step.

■ YES:

■ a) remove the side opening element trimFront side door trim: Removal - Refitting (72A, Side opening elements trim) or Rear side door trim: Removal - Refitting (72A, Side opening elements trim) or(see **Sliding side door trim: Removal - Refitting**) (72A, Side opening elements trim),

■ b) if the sealing film of the side opening element is detached, deformed or torn, replace the sealing filmDoor sealing film: Removal - Refitting (65A, Opening element sealing),

■ c) if the clips of the side opening element trim are damaged, replace the clipsFront side door trim: Removal - Refitting (72A, Side opening elements trim) orRear side door trim: Removal - Refitting (72A, Side opening elements trim) or (see **Sliding side door trim: Removal - Refitting**) (72A, Side opening elements trim),

■ d) if the sealing foam on the door box section is detached, deformed or torn, replace the foamFront side door electric window mechanism: Removal - Refitting (51A, Side opening element mechanisms) orRear side door electric window mechanism: Removal - Refitting (51A, Side opening element mechanisms) or(see **Front side door manual window winder mechanism: Removal - Refitting**) (51A, Side opening element mechanisms) orRear side door manual window winder mechanism: Removal - Refitting (51A, Side opening element mechanisms),

■ e) if the blanking covers of the door box section are detached, reposition the blanking covers, if the blanking covers are deformed, replace the blanking coversFront side door electric window mechanism: Removal - Refitting (51A, Side opening element mechanisms) orRear side door electric window mechanism: Removal - Refitting (51A, Side opening element mechanisms) or(see **Front side door manual window winder mechanism: Removal - Refitting**) (51A, Side opening element mechanisms) orRear side door manual window winder mechanism: Removal - Refitting (51A, Side opening element mechanisms).

❑ Check the sealing of the side opening element sealing film(see 60A, General information, Side opening elements: Sealing check) .

2- REPAIRING THE SEALING OF THE SIDE OPENING ELEMENT SEAL

❑ Is water present in the passenger compartment after the side opening element sealing has been checked?

■ NO: fault resolved.

■ YES:

■ a) if the side opening element seal is deformed, replace the side opening element seal,

■ b) if the side opening element seal shows signs of wear, cuts or cracks, replace the side opening element seal.

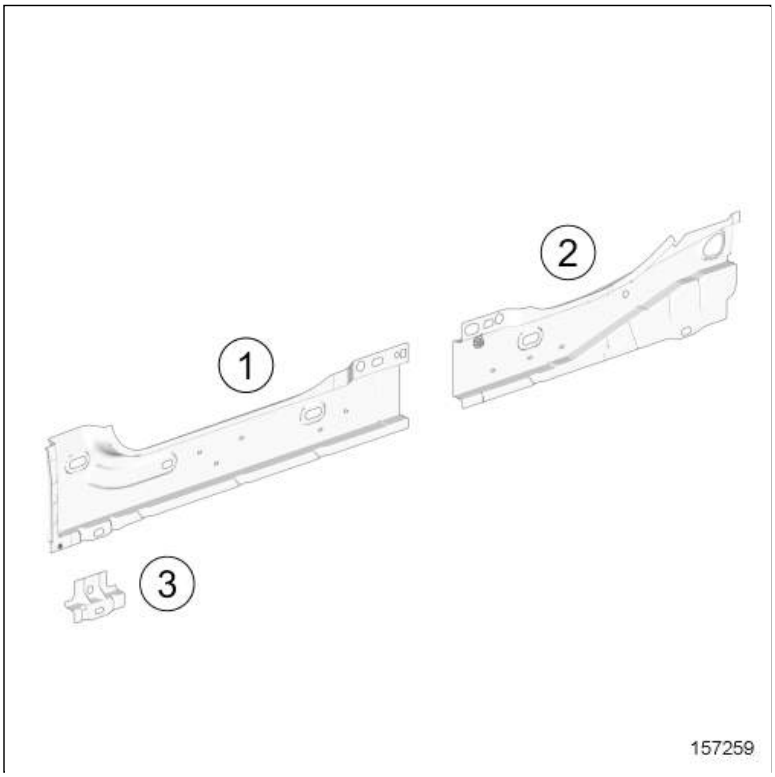
❑ Check the sealing of the side opening element seal(see 60A, General information, Side opening elements: Sealing check) .

XSL version : 3.02 du 22/07/11

SILL PANEL CLOSURE PANEL: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

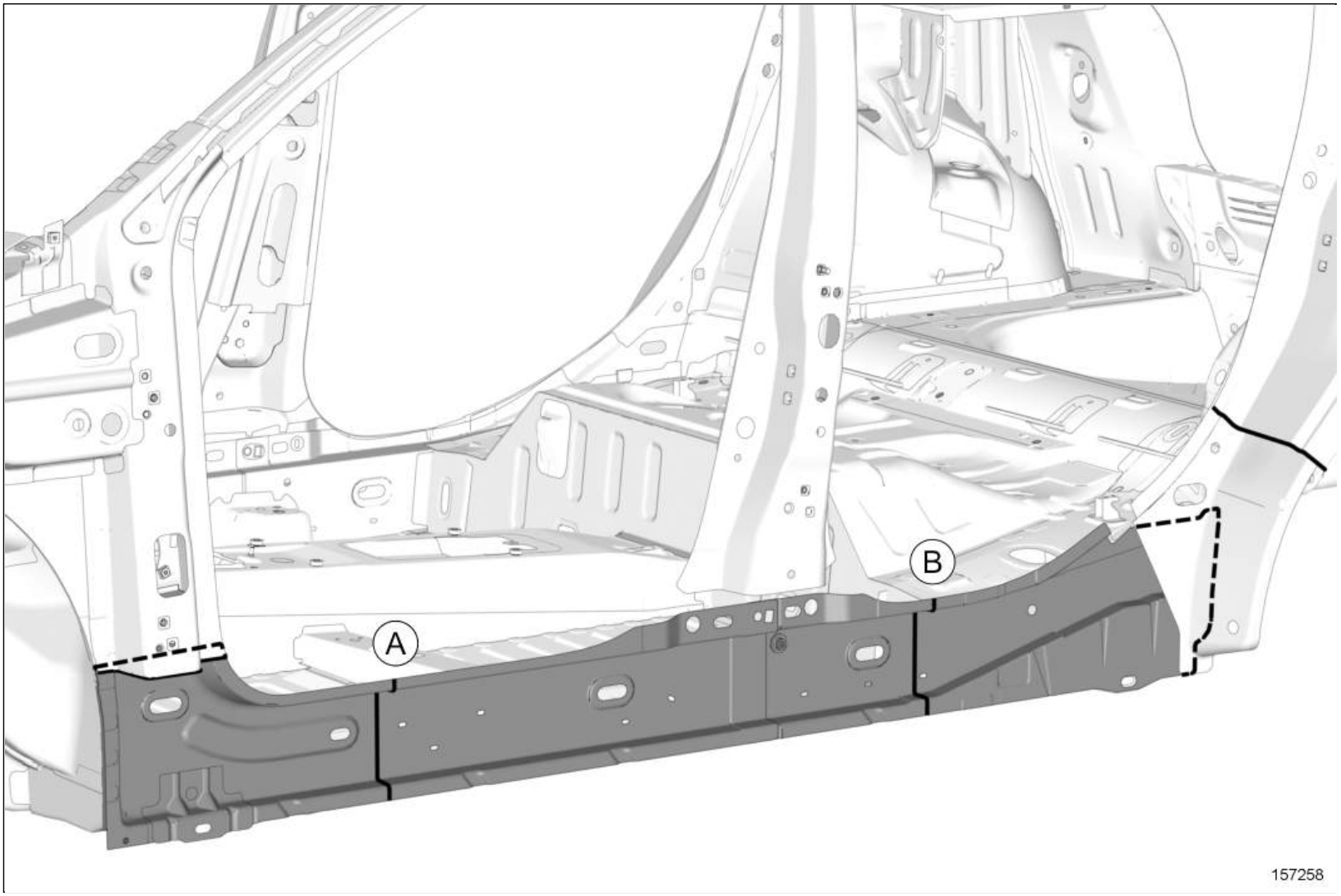


No.	Description	Thickness (mm)
(1)	Sill panel closure panel, front section	1.3
(2)	Sill panel closure panel, rear section	1.3
(3)	Front jacking point reinforcement	2

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement of the front section,
- partial replacement of the rear section.



CAUTION
If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

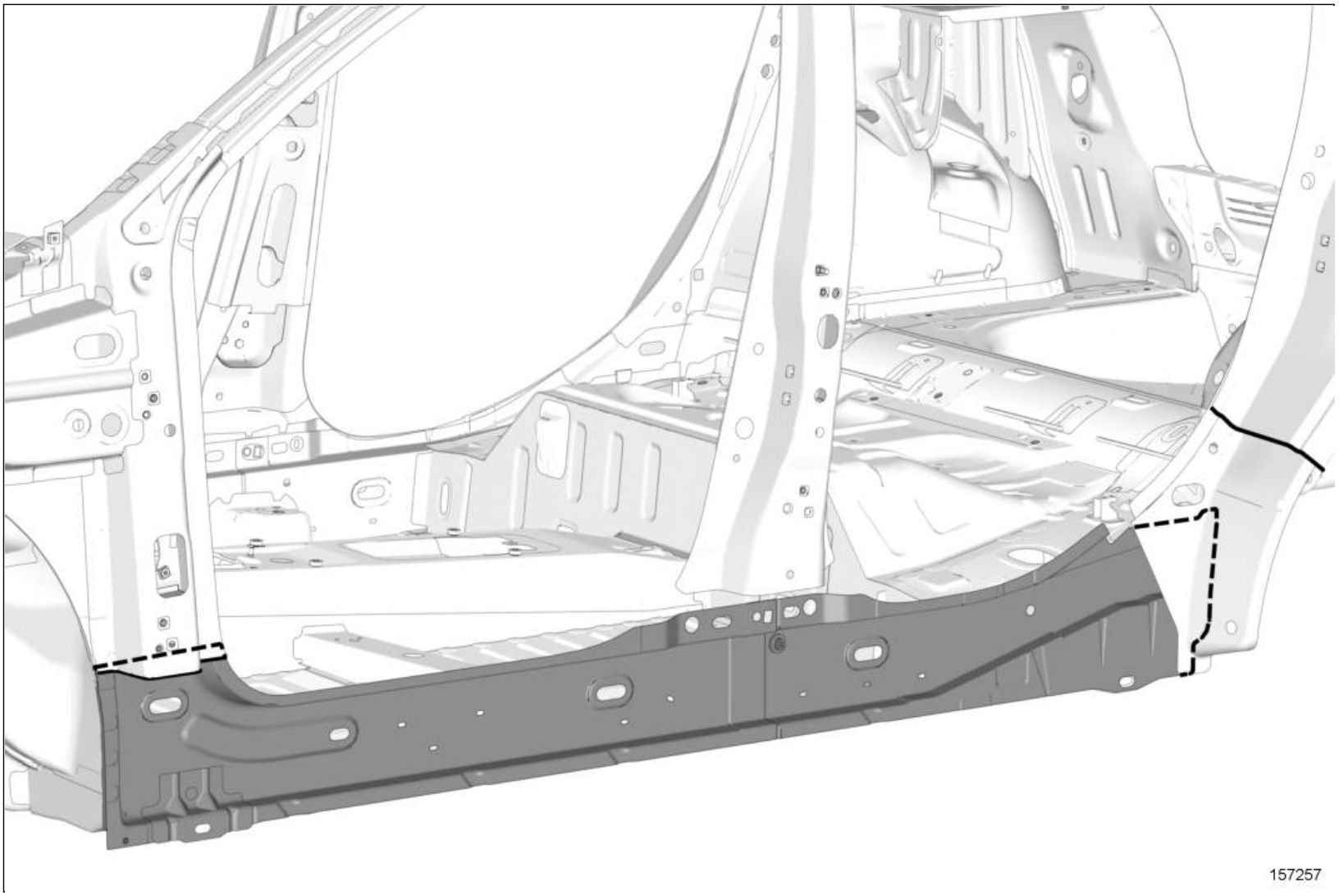
CAUTION
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area Earths on body: List and location of components .

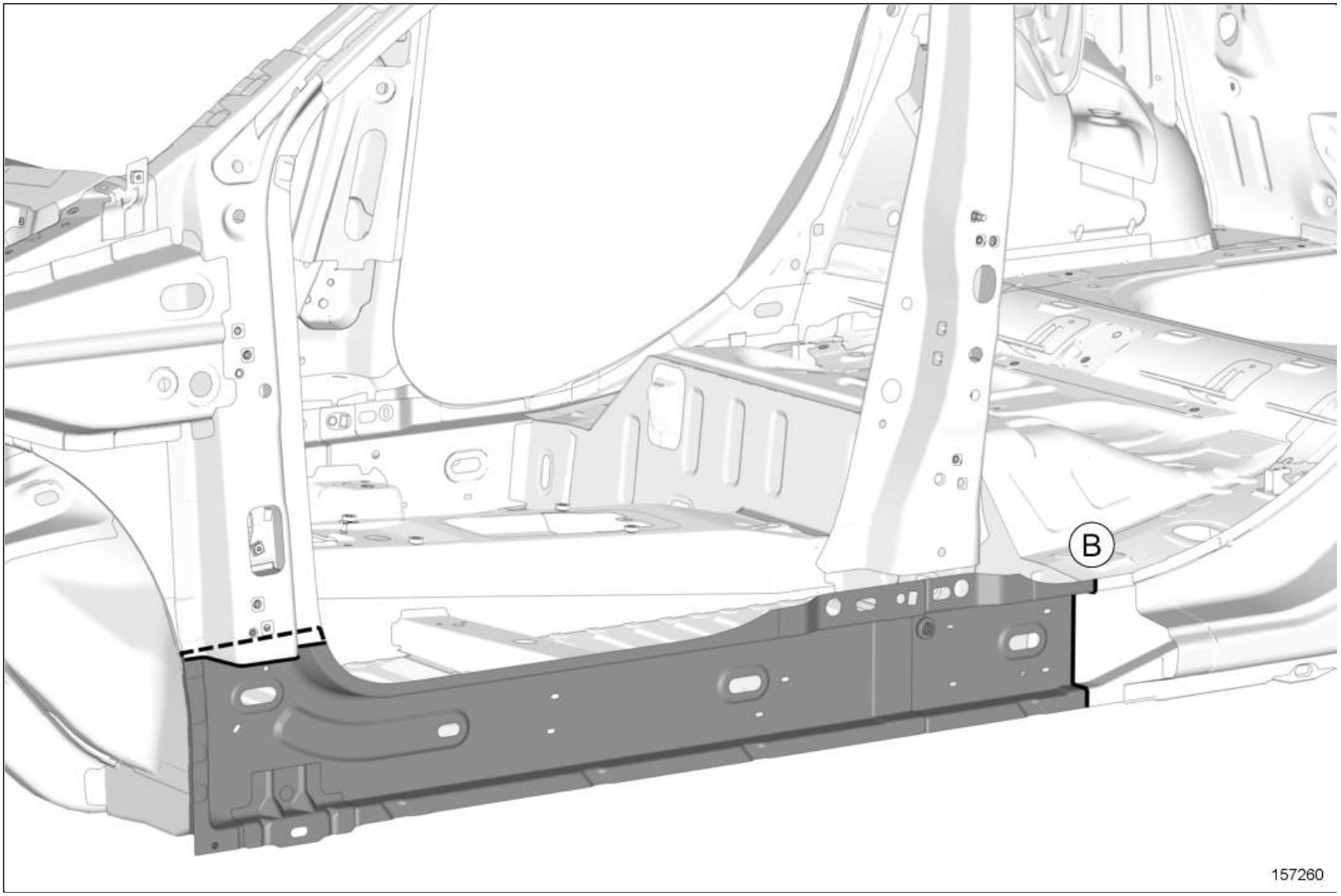
1- COMPLETE REPLACEMENT

1)PART IN POSITION

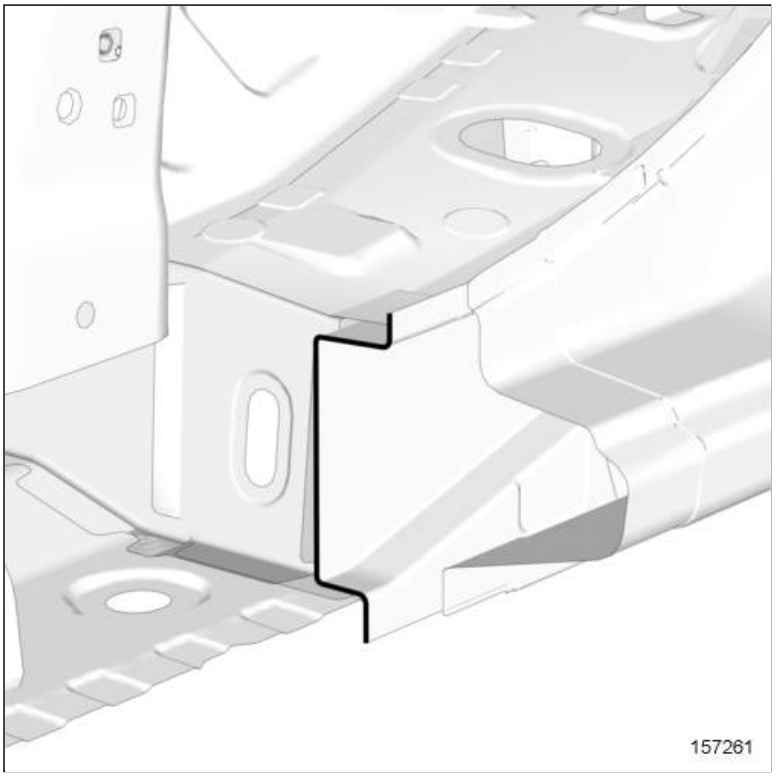


2- PARTIAL REPLACEMENT OF THE FRONT SECTION

1)PART IN POSITION

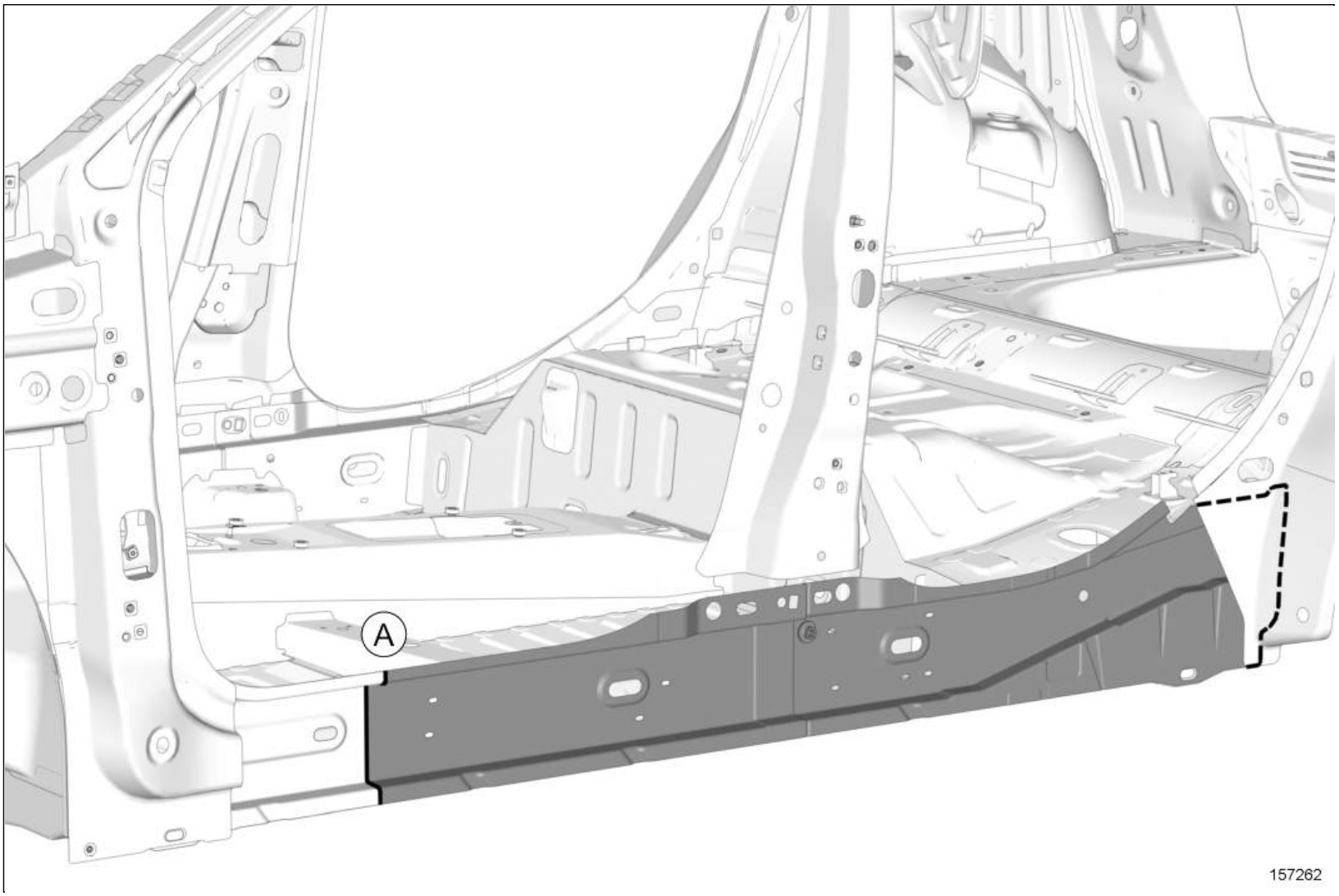


DETAILED VIEW B

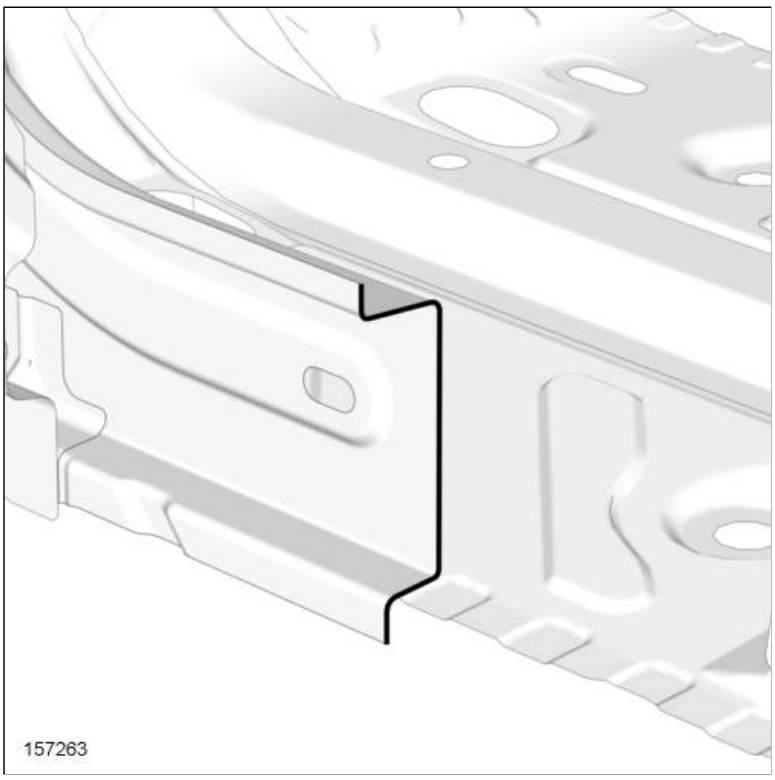


3- PARTIAL REPLACEMENT OF THE REAR SECTION

1)PART IN POSITION



DETAILED VIEW A



XSL version : 3.02 du 22/07/11

SILLPANELREINFORCEMENT:REPLACEMENT

Note, one or more warnings are present in this procedure

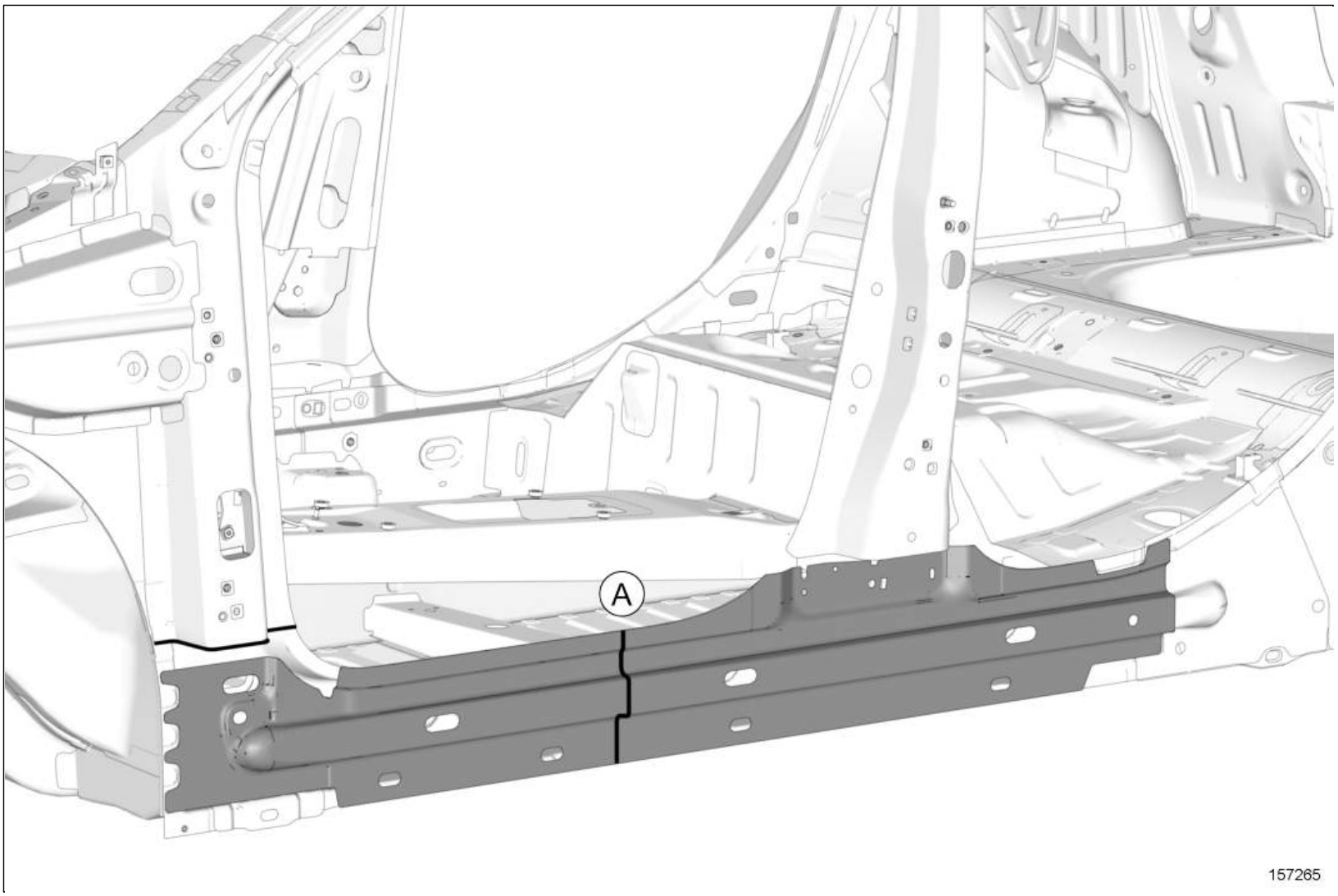
1. COMPOSITION OF THE SPARE PART

No.	Description	Thickness (mm)
(1)	Sill panel reinforcement	1.2

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement,
- partial replacement of the front section.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

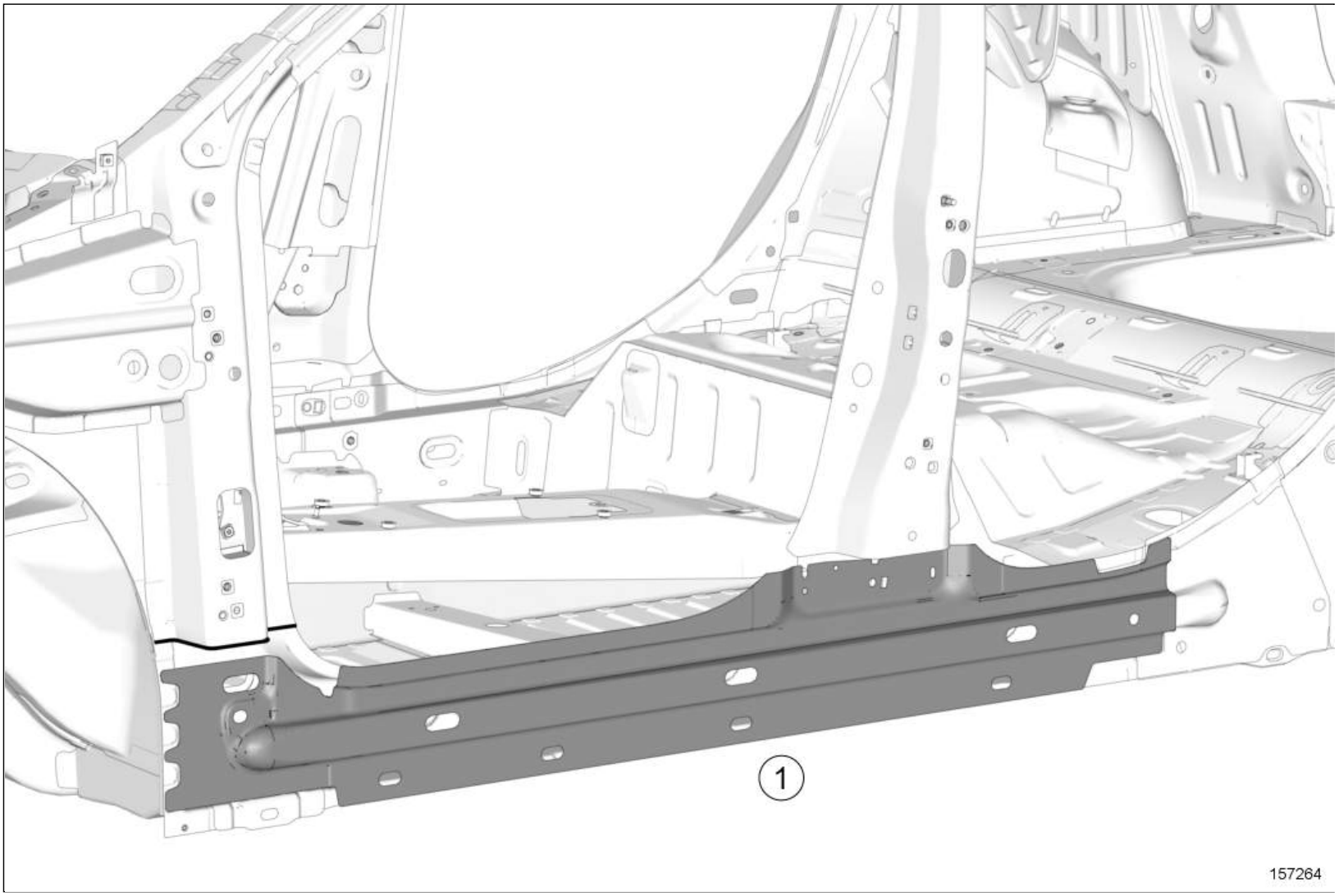
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld areaEarths on body: List and location of components .

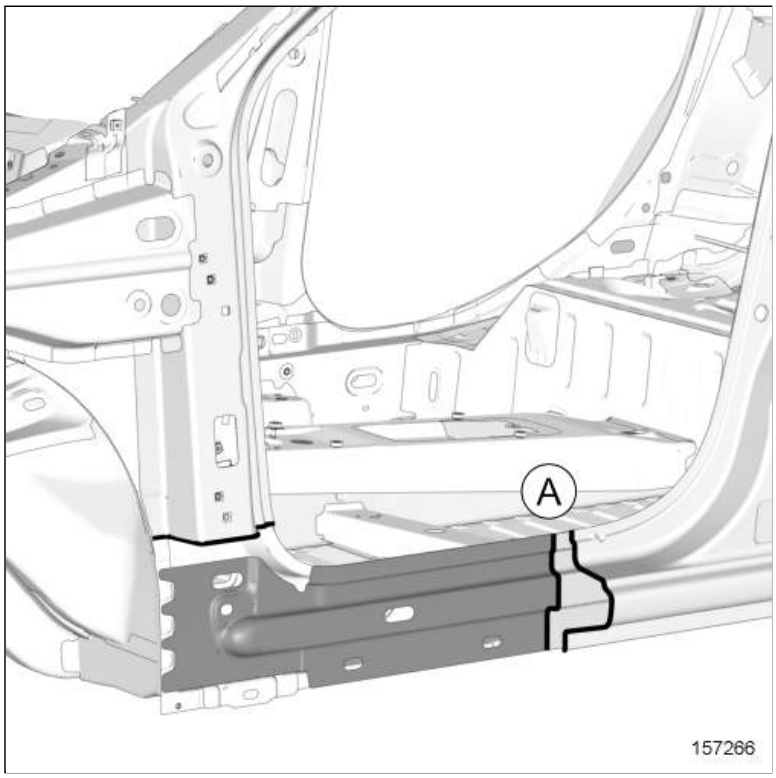
1- COMPLETE REPLACEMENT

1)PART IN POSITION

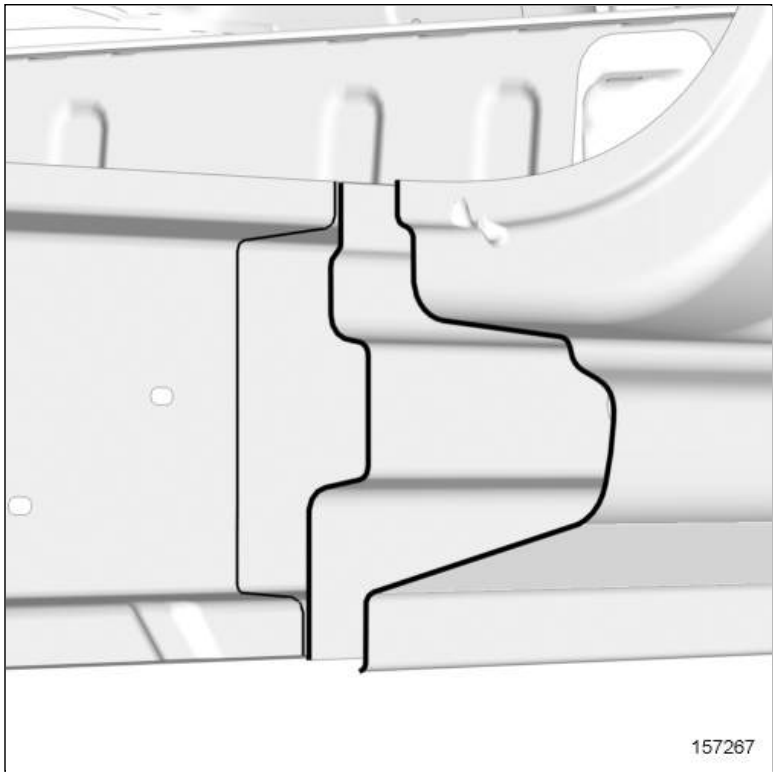


2- PARTIAL REPLACEMENT OF THE FRONT SECTION

1)PART IN POSITION



DETAILED VIEW A



SILLPANEL:REPLACEMENT

Note, one or more warnings are present in this procedure

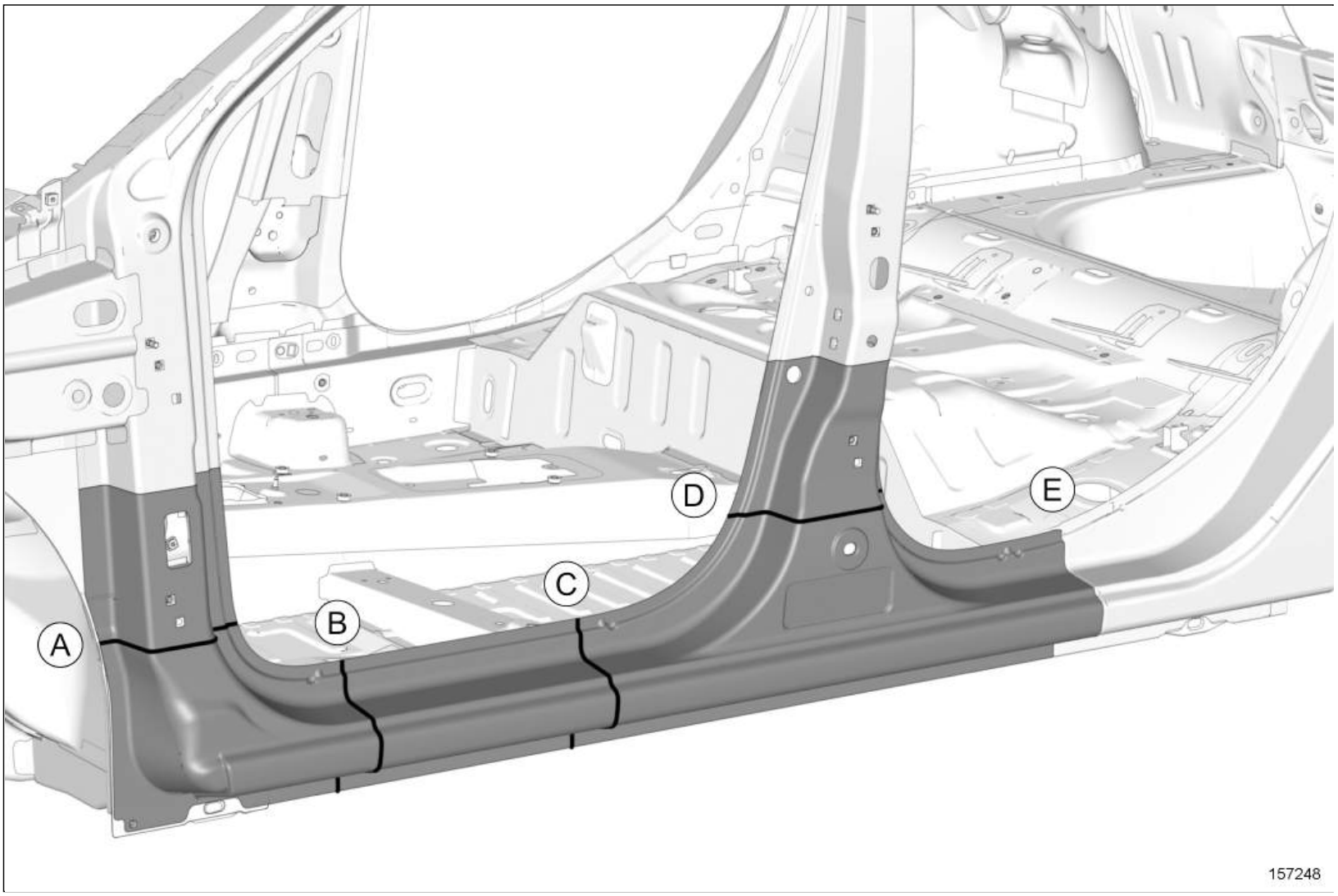
1. COMPOSITION OF THE SPARE PART

No.	Description	Thickness (mm)
(1)	Sill panel	0.75

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement A-D-E,
- front section partial replacement A-C,
- partial replacement under door B-C,
- rear section partial replacement B-D-E.



CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

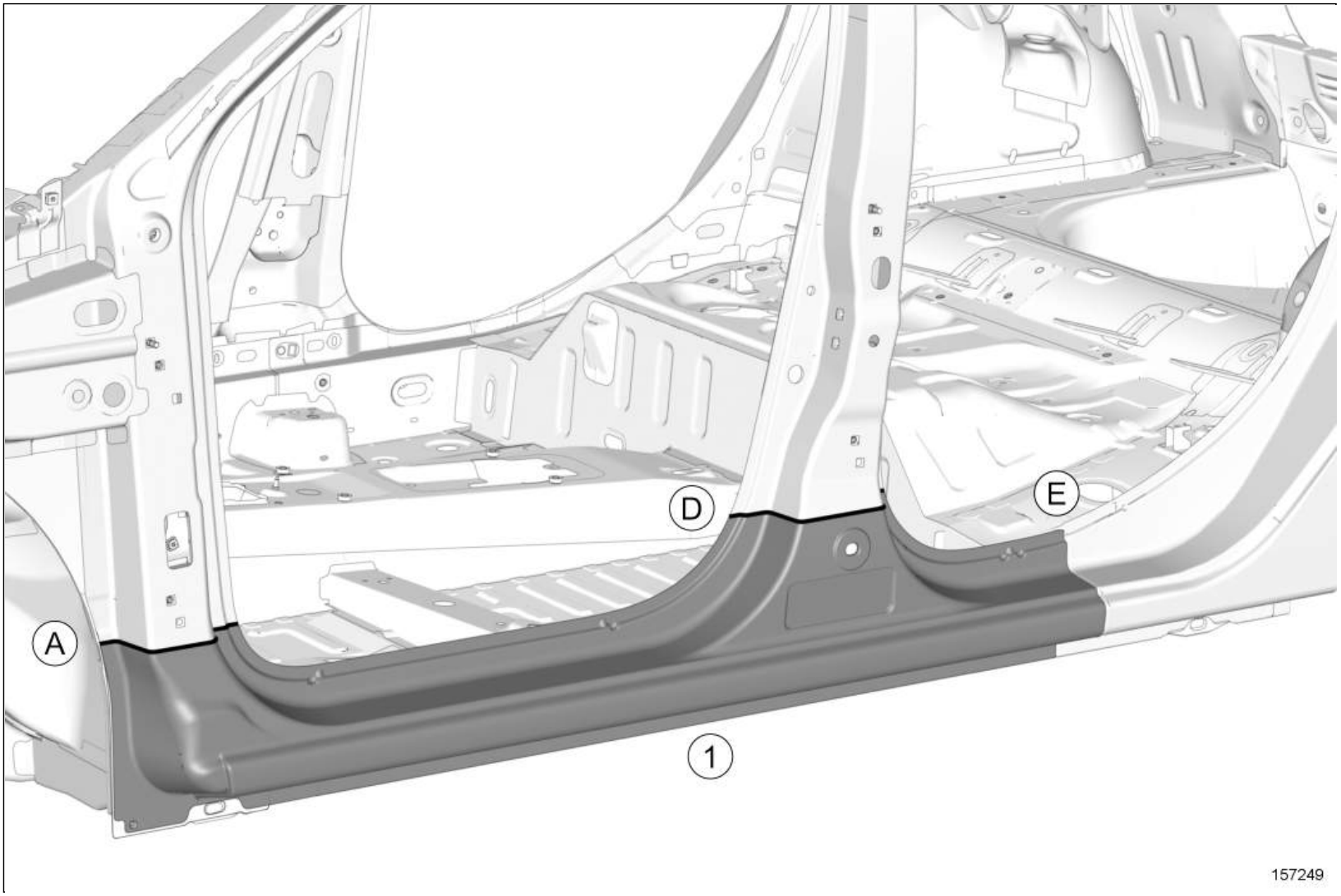
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

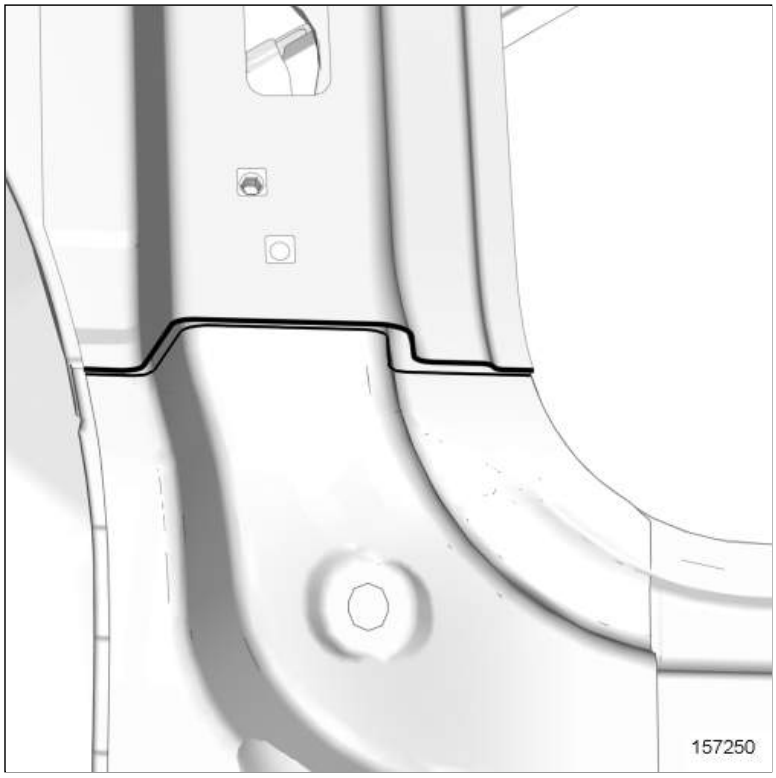
Locate the earths located near to the weld area[Earths on body: List and location of components](#) .

1- COMPLETE REPLACEMENT A-D-E

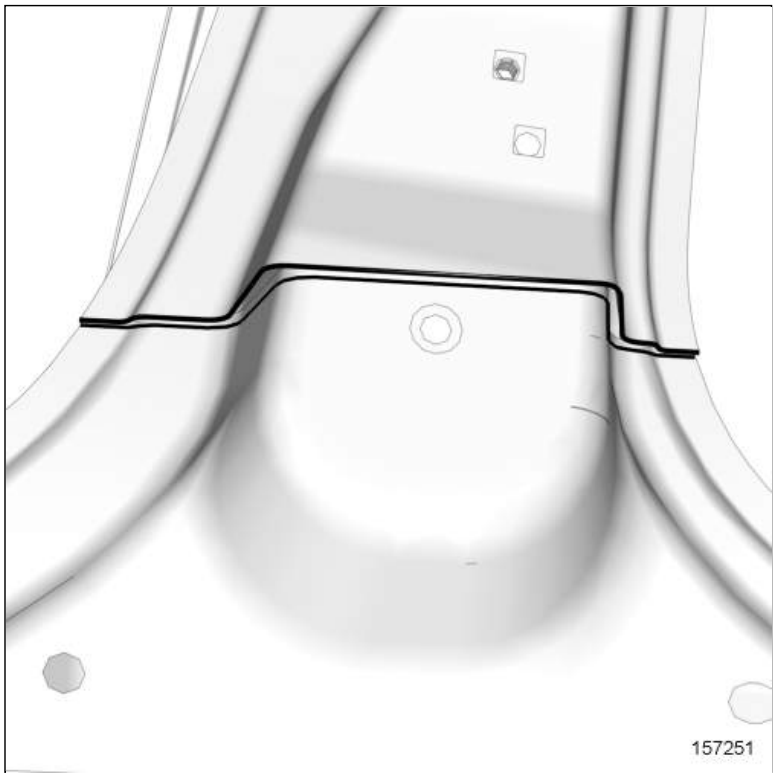
1)PART IN POSITION



DETAILED VIEW A

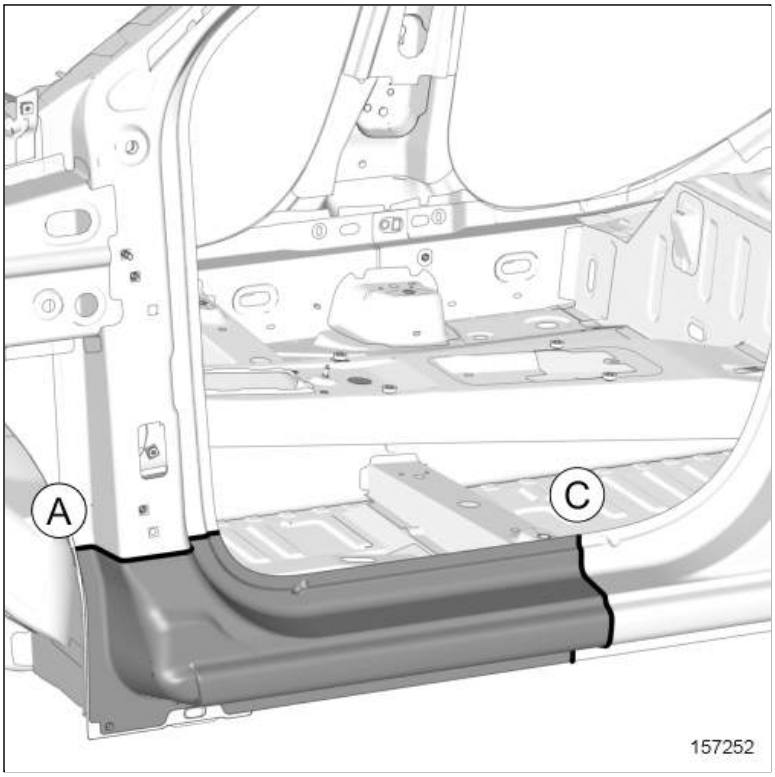


DETAILED VIEW D

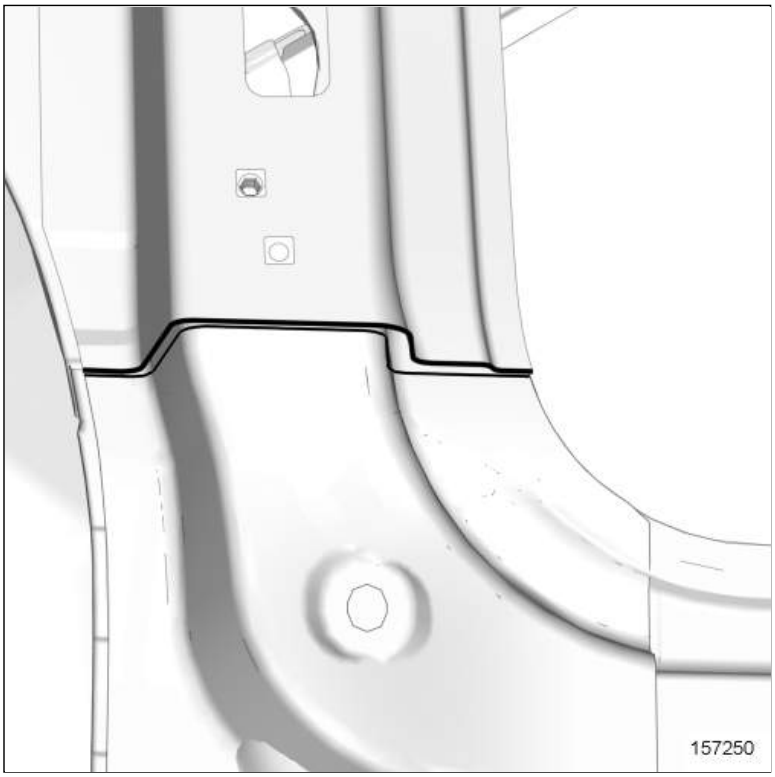


2- FRONT SECTION PARTIAL REPLACEMENT A-C

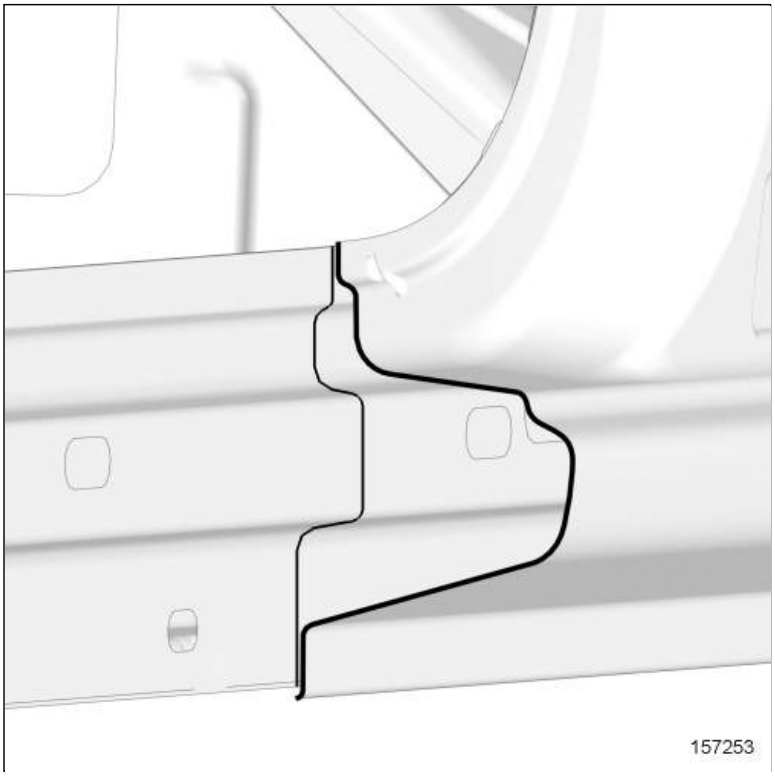
1)PART IN POSITION



DETAILED VIEW A

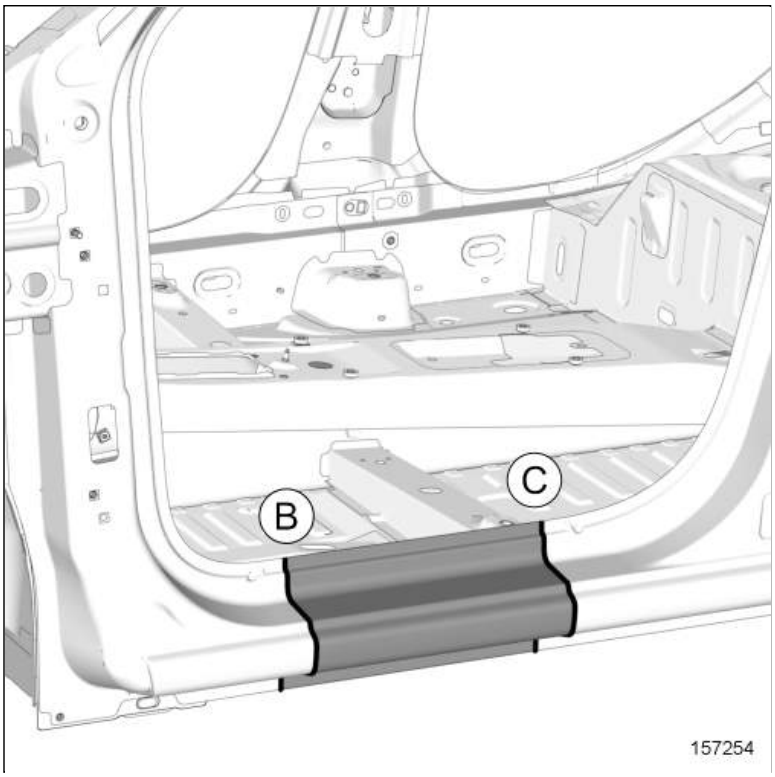


DETAILED VIEW C

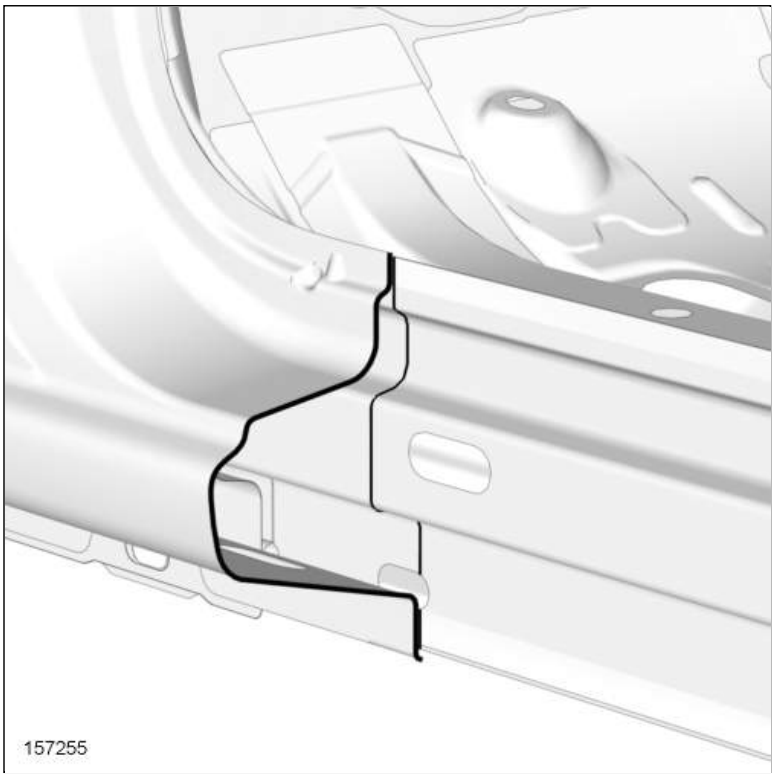


3- PARTIAL REPLACEMENT UNDER DOOR B-C

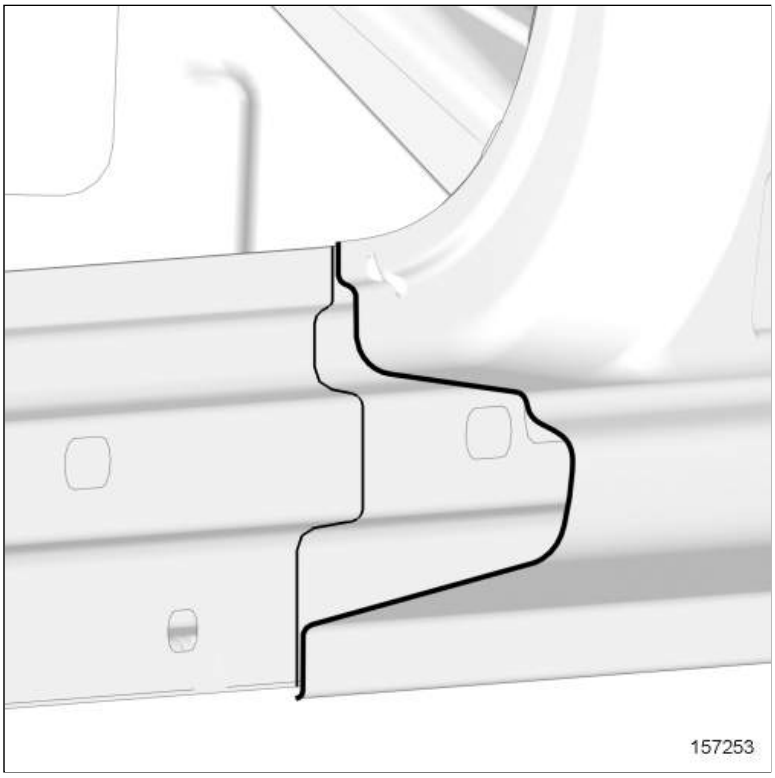
1)PART IN POSITION



DETAILED VIEW B

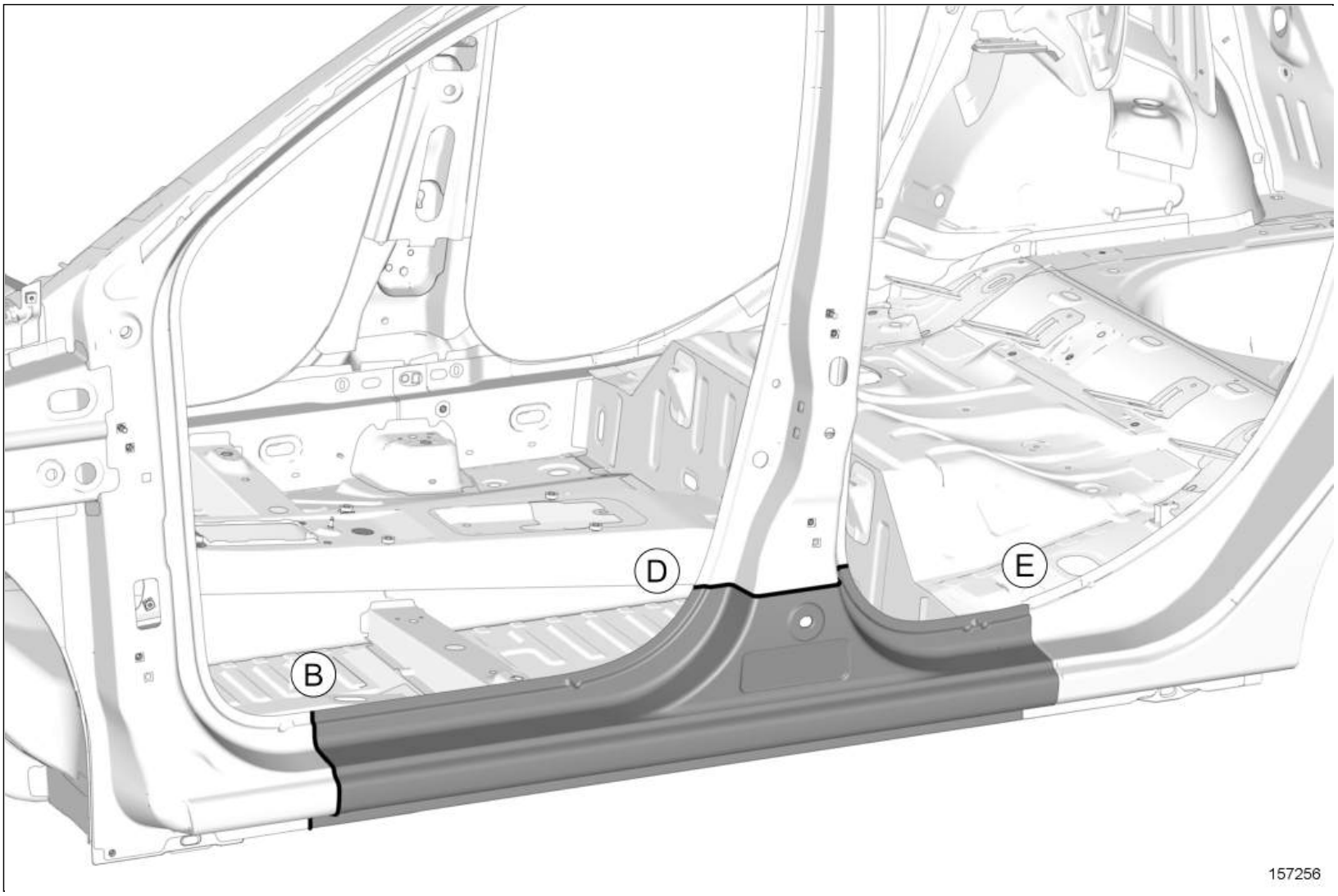


DETAILED VIEW C

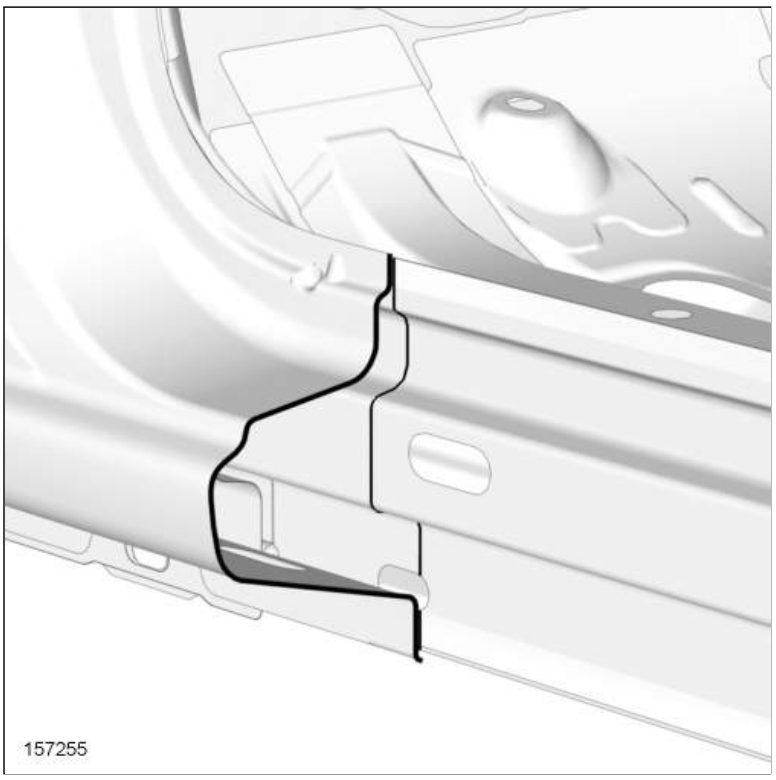


4- REAR SECTION PARTIAL REPLACEMENT B-D-E

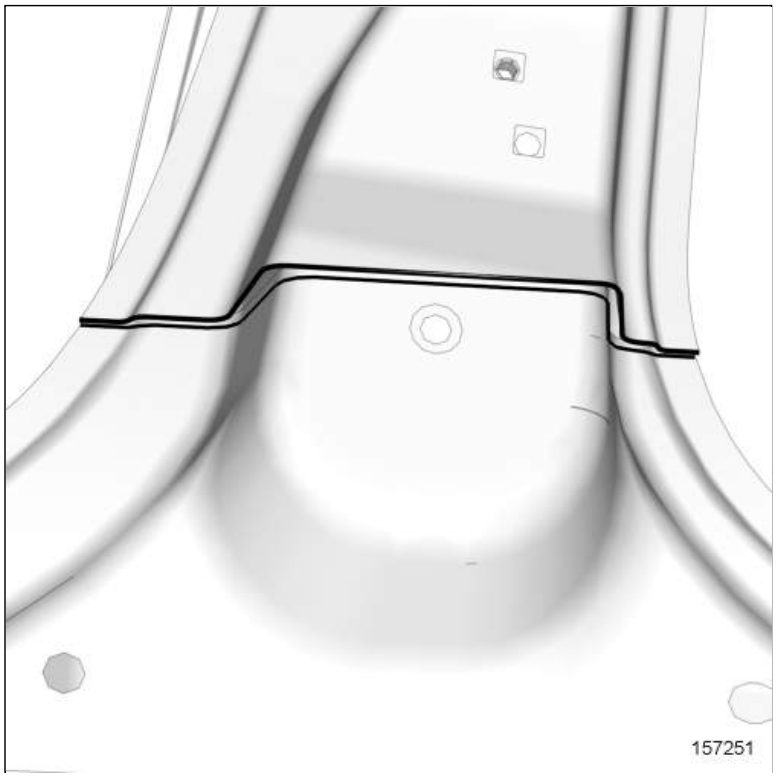
1)PART IN POSITION



DETAILED VIEW B



DETAILED VIEW D


157251

SMC BODYWORK COMPONENT: PREPARATION AND PAINT RANGE

Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Note:

Never apply pre-treatment primer or primer filler on this type of material.

1. PRE PRIMED PARTS

Use extra ventilation source.

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Smooth	Grey adhesive pad soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Apply a bi-component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
7	Remove solvent / dry	
8	Sand	P400 - P500 dry / P400 - P800 with water
9	Wipe / blow	
10	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
11	Blow / rub with the abrasive finishing pad	
12	Apply the finishing paint	

2. COMPONENTS TO BE REPAIRED

Plastic material bodywork component: Repair (Technical Note 662A, 50A, General information).

Repair-40x01x45x06-02x65-1-1-1.xml

XSL version : 3.02 du 22/07/11

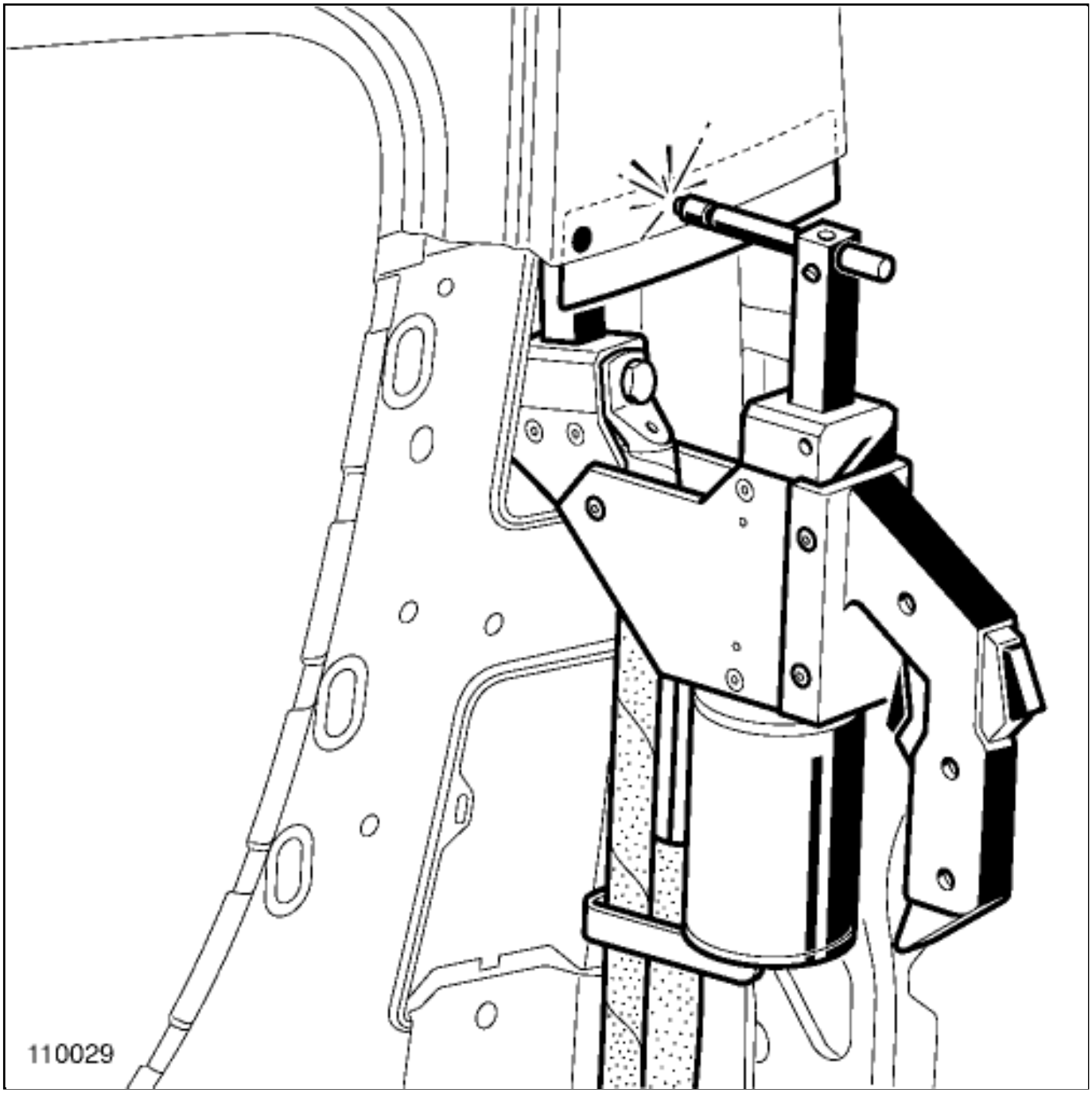
SOLDERED ASSEMBLY EQUIPMENT: USE

1. ELECTRICAL RESISTANCE SPOT WELDING

Used to weld mating faces where both sides are accessible (e.g.: door entries).

Ordinary welders can weld ordinary steel sheets, and some welders are designed for welding very high or ultra high yield (THLE/UHLE) strength sheets.

The welder used for THLE/UHLE sheets must have an effective minimum welding current of 11500 A. The effective clamp tightening pressure must be a minimum of 450 daN.m. When the appliance is fitted with a manual expansion valve, it is possible to reduce the pressure, but the pressure cannot be measured. Only a peeling test will enable you to check whether the welding bead diameter is enough.



Advantage:

- Identical to original welds.

Disadvantage:

- Cannot apply welds over 250 mm from the edge the sheet.

Operator protection:

- obligatory eye protection,
- obligatory hand protection.

Protection in the work area:

- external bodywork protection,
- protection of internal and external window faces,
- protection of interior fittings.

2. ARC WELDING UNDER SHIELDING GAS

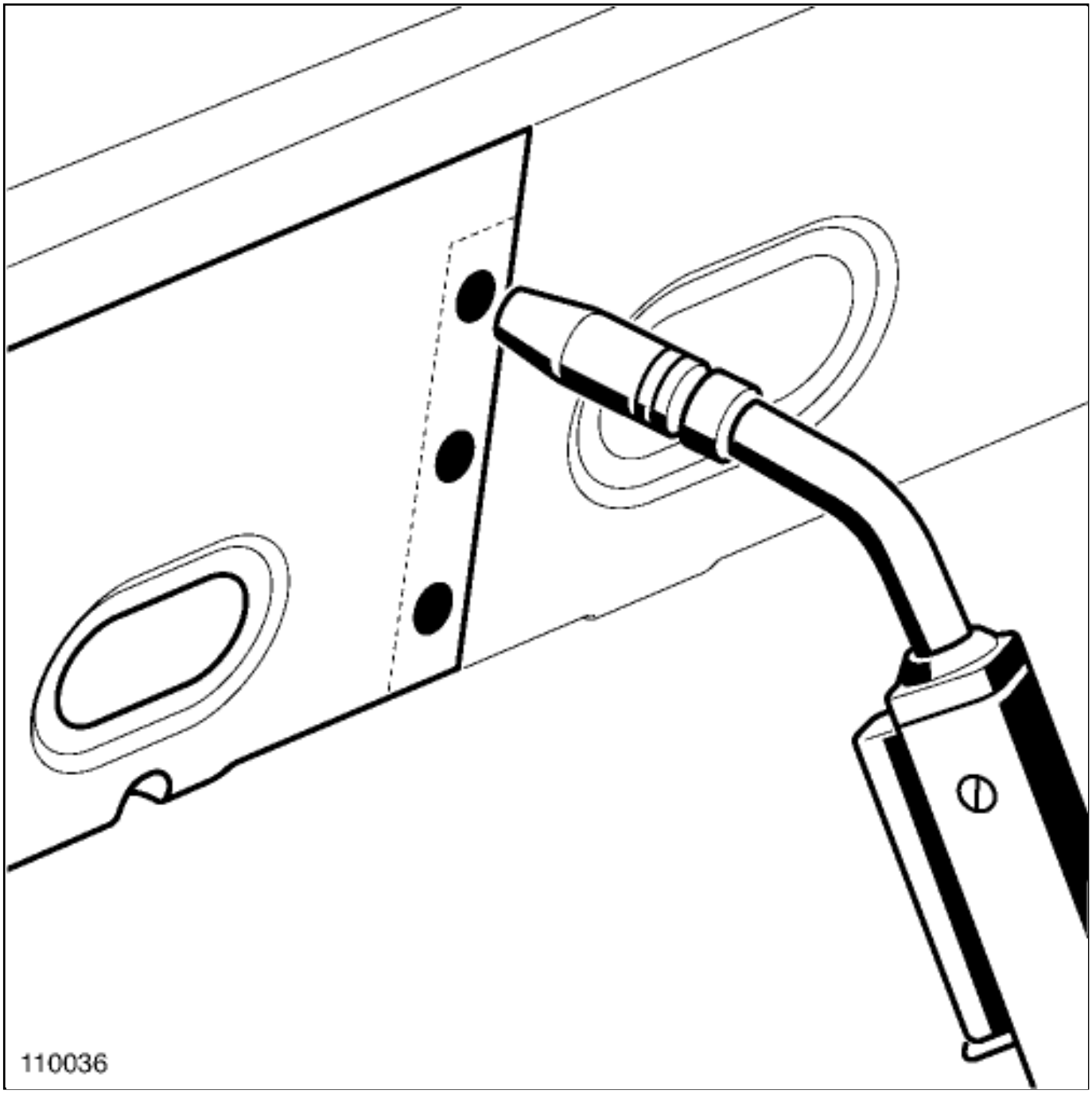
Used for plug welding sheets, for original weld beads as well as continuous welds on edge-to-edge cuts.

The contact tube and the nozzle must be cleaned regularly so that the gas and the wire are free. To do this, use an anti-splash product.

- The welder exists in two versions:
  - MAG = Metal Active Gas. The gas mixture contains more than 5% CO_2.
  - MIG = Metal Inert Gas. The gas mixture contains less than 5% CO_2.

For routine bodywork jobs, the welder can have a minimum welding current of 200 A with a range of use for welding sheets of 0.6 mm to 4 mm, with a wire ∅ 0.6 to 0.8 mm.

PLUG WELDING POINT



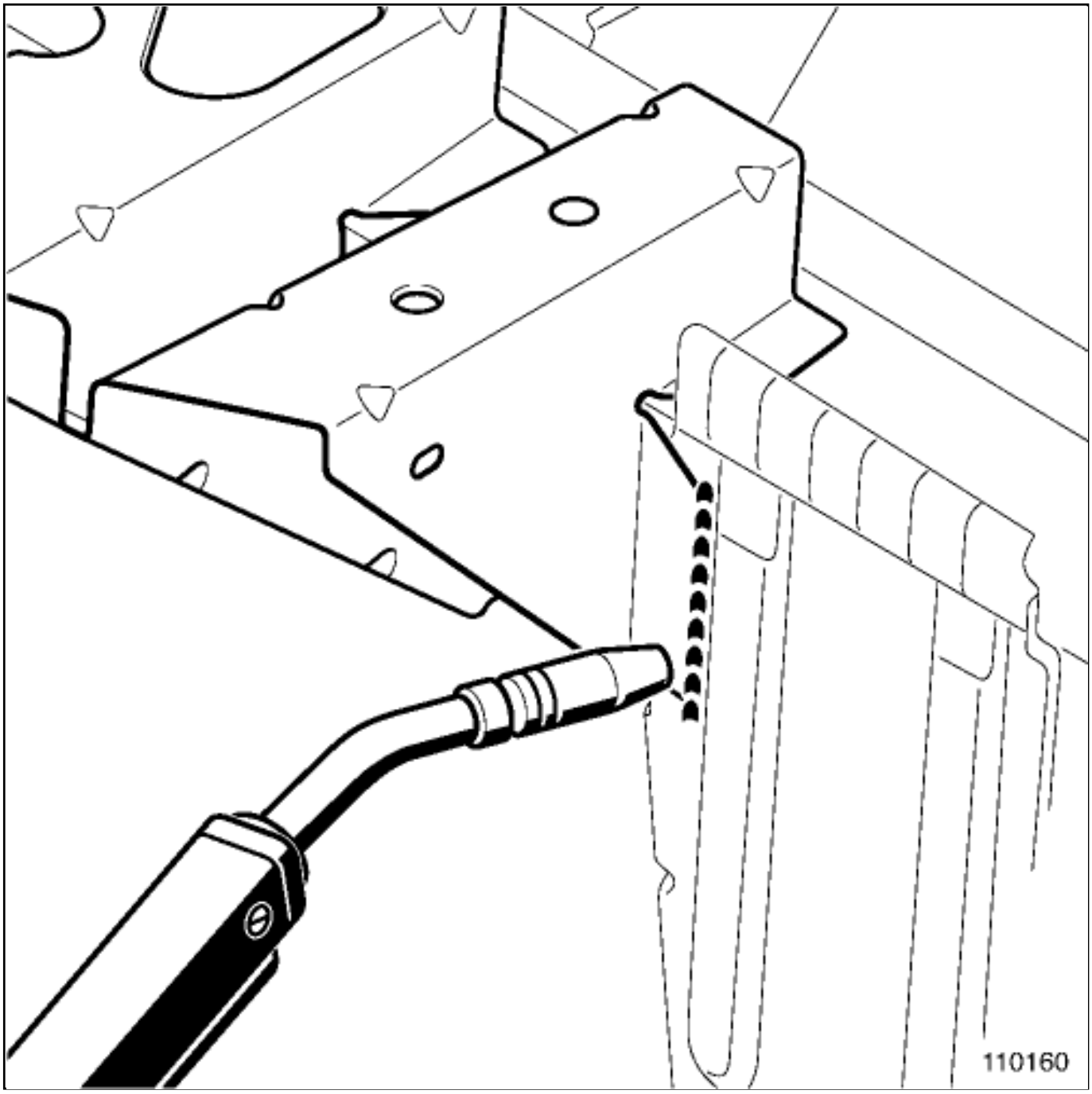
Advantage:

- Allows the making of spot welds throughout the sheet by replacing the original SER points.

Disadvantages:

- Anticorrosion treatment before assembly is very delicate,
- Impossibility of sealing the mating surfaces before welding,
- Requires perfect mating to obtain correct visible points.

ORIGINAL BEAD



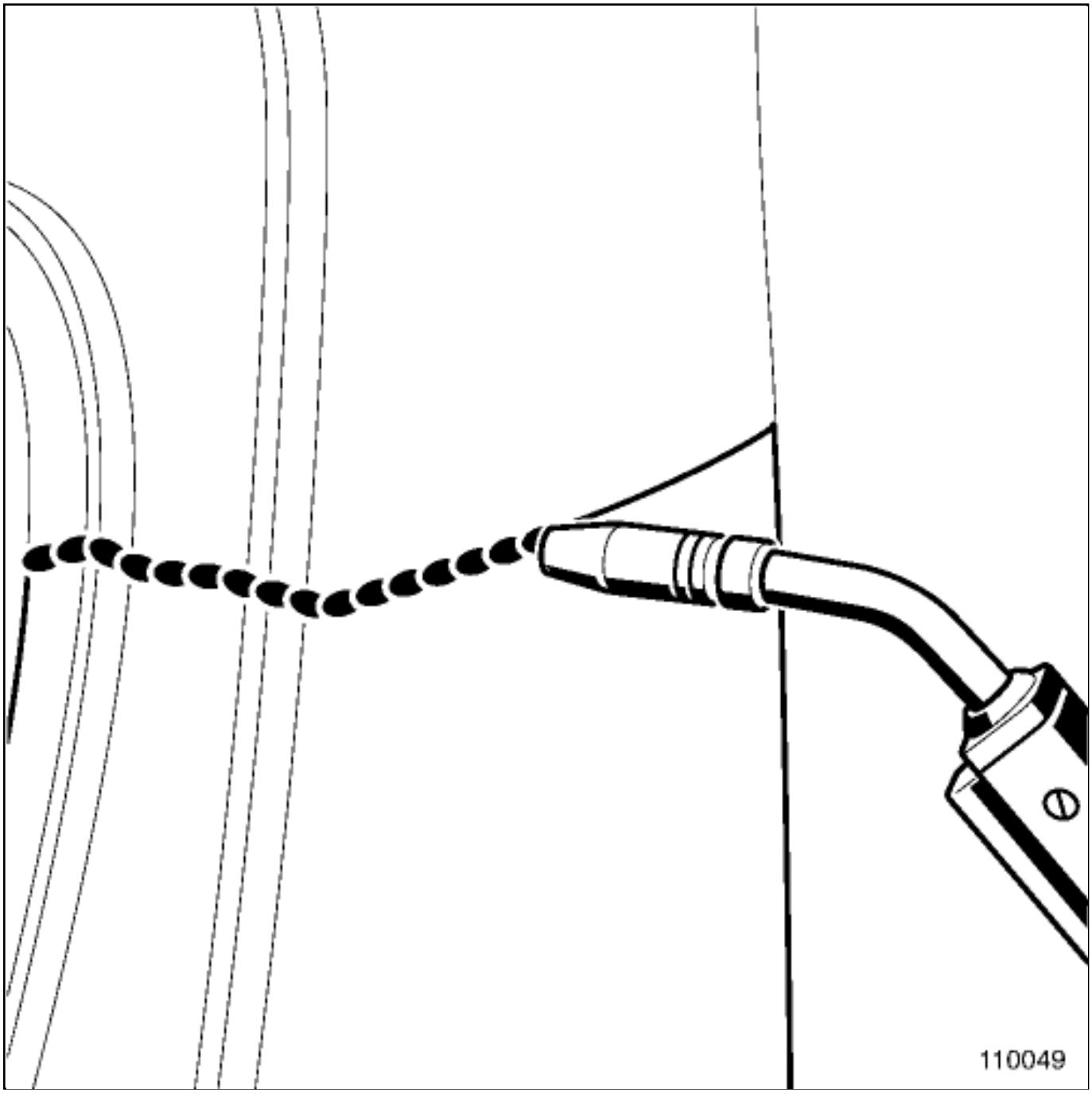
Advantage:

- Identical to original welds.

Disadvantages:

- Anticorrosion treatment before assembly is very delicate,
- Impossibility of sealing the mating surfaces before welding,
- Requires perfect mating to obtain a correct visible bead.

CHAIN BEAD



Advantages:

- Allows edge-to-edge sheet joining.
- Allows the making of spot welds throughout the sheet by replacing the original SER points.

Disadvantages:

- Have to observe the cooling times between each point, otherwise the sheets are liable to become deformed because of the heat,
- Impossibility of anticorrosion treatment before assembly.

Operator protection:

- obligatory eye and face protection,
- obligatory hand protection,
- use extra ventilation source.

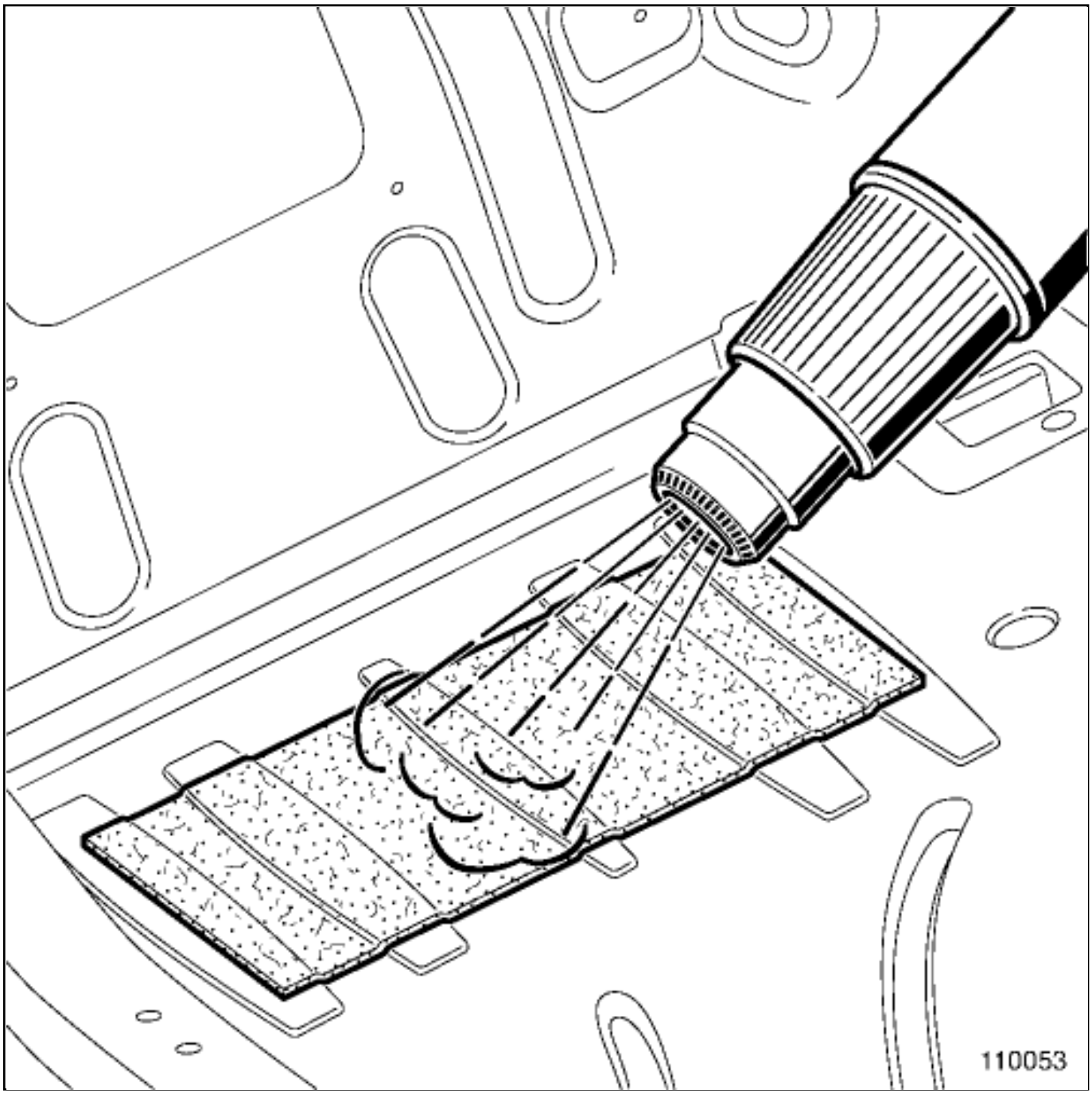
Fire risk danger.

- Protection in the work area:
  - external bodywork protection,
  - protection of internal and external window faces,
  - protection of interior fittings.

SOUNDPROOFINGPRODUCTSAFTERASSEMBLY

1. SOUNDPROOFING PANEL

Self-adhesive bitumen pads which absorb noise caused by vibrations on large panel surfaces.



Advantages:

- Conforms with first assembly.
- Highly efficient for soundproofing large surfaces.

Disadvantages:

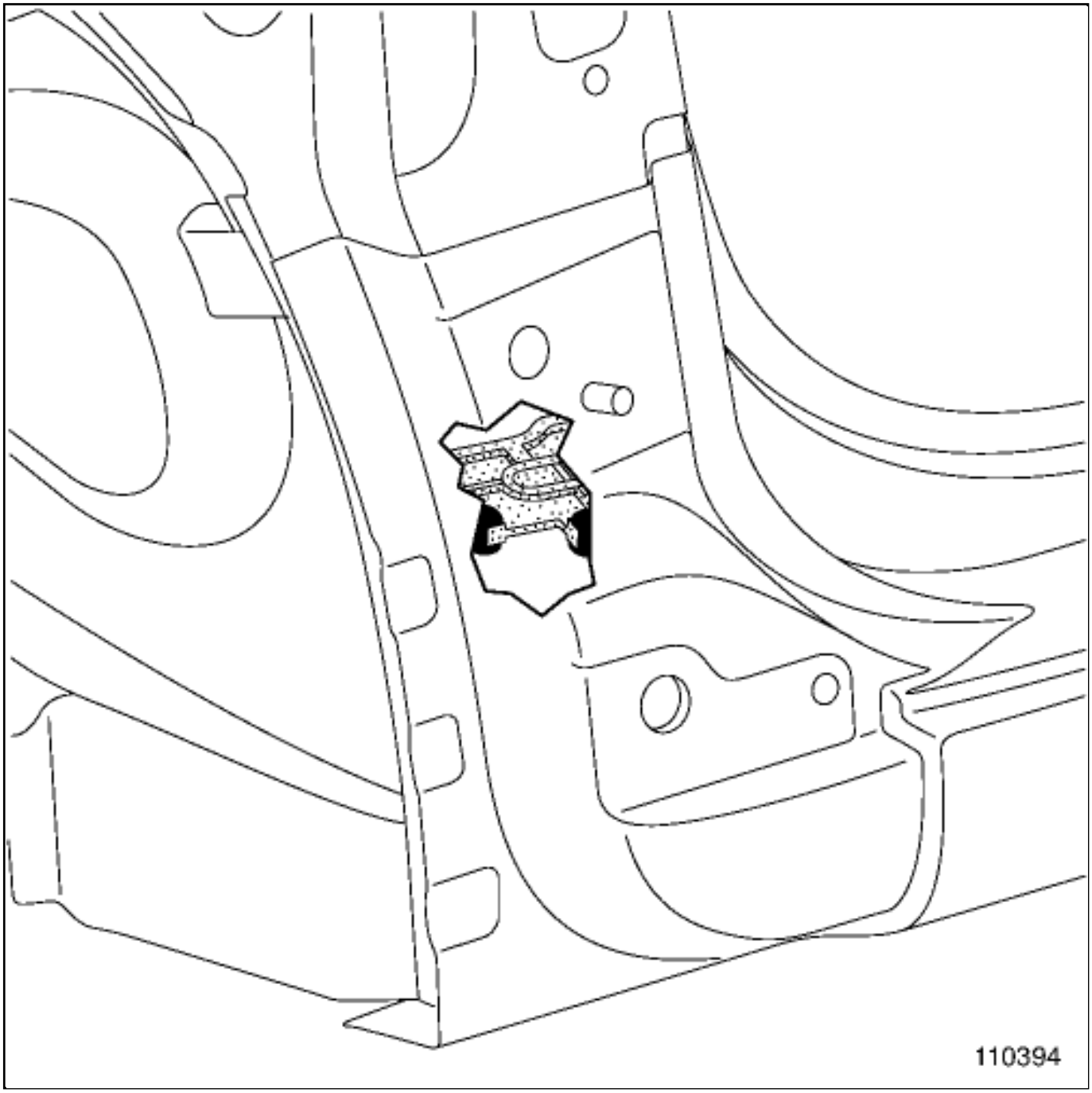
- The obligation of respecting the original position, on pain of amplifying noise.

SOUNDPROOFINGPRODUCTSBEFOREASSEMBLY

1. HOLLOW BODY PART INSERTS

They ensure the soundproofing the hollow sections of the bodywork structure.

Fitting inserts during repairs requires usage of preformed masticthat is positioned on the edge of the insert before the bodywork components are assembled(see 40J, Protective devices , Structural acoustic protection: Description) .



Advantages:

- Allows the refitting of first assembly components (insert) and ensures protection exactly like the original protection.

Disadvantage:

- Impossible to retouch after assembly.

STARTER: REMOVAL - REFITTING

REMOVAL

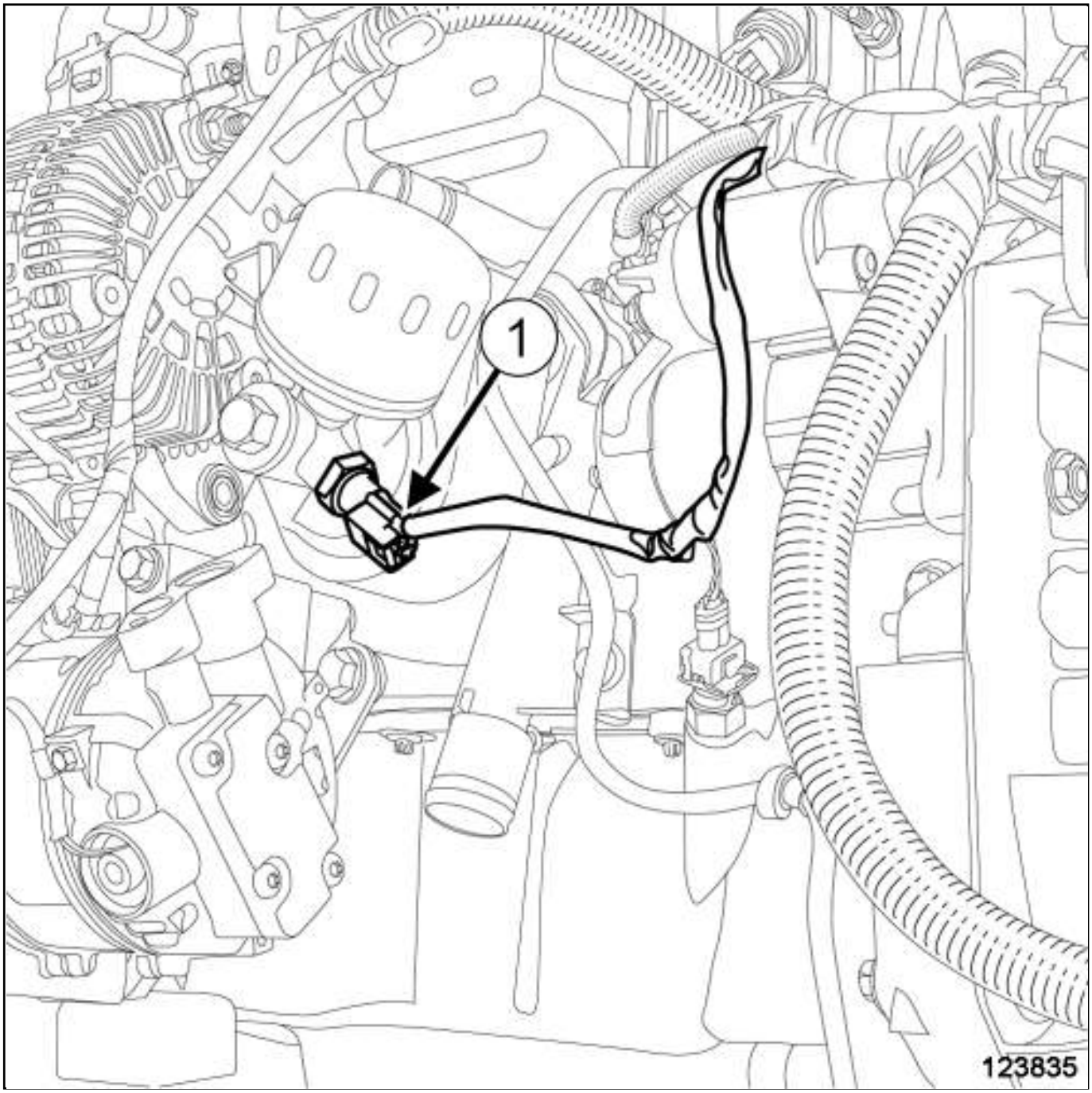
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift **Vehicle: Towing and lifting** .

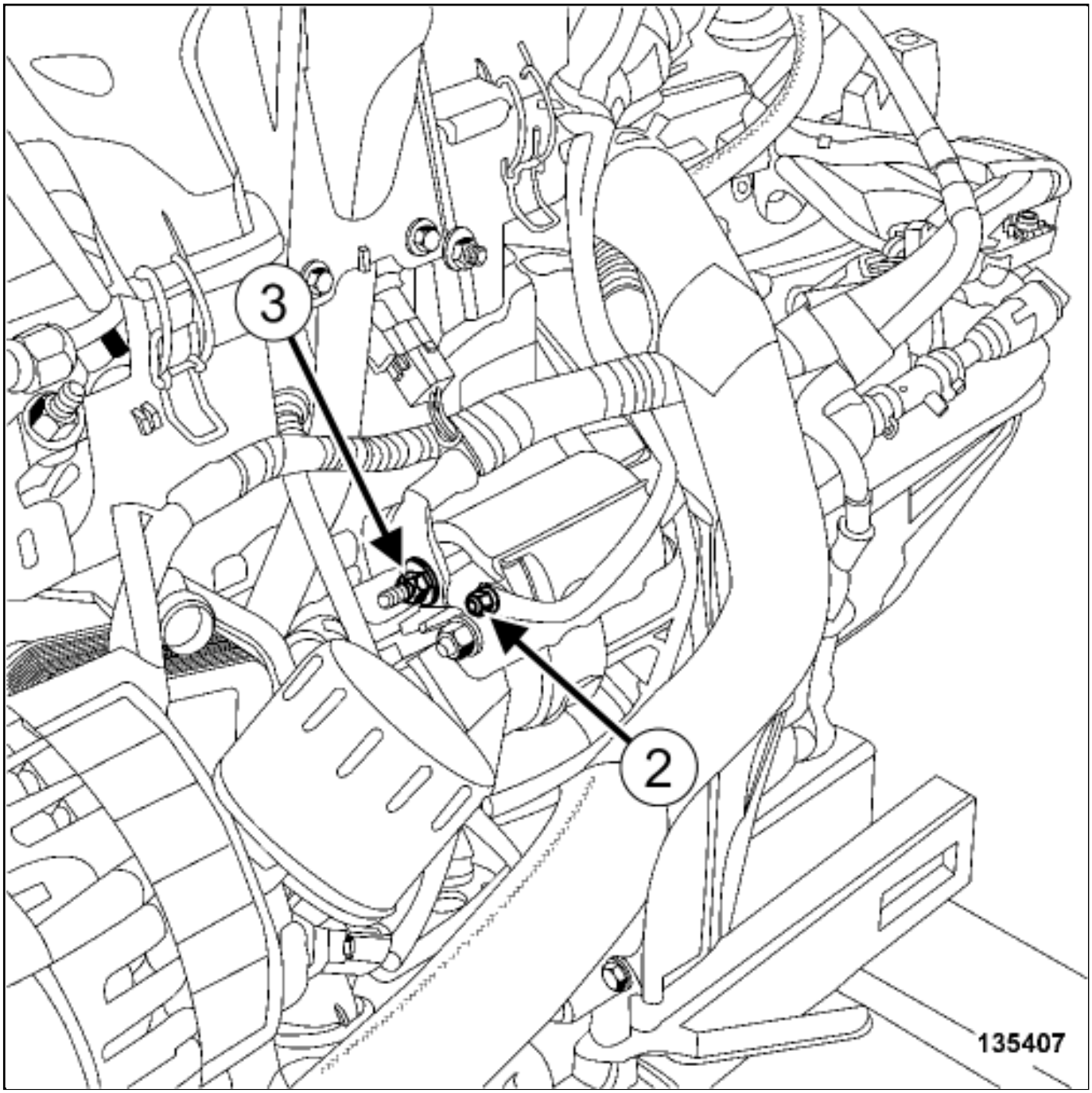
- Remove:
  - the engine undertray bolts,
  - the engine undertray.

- Disconnect the battery **Battery: Removal - Refitting** (80A, Battery).

- Remove the intercooler air outlet pipe **Intercooler air outlet pipe: Removal - Refitting** .

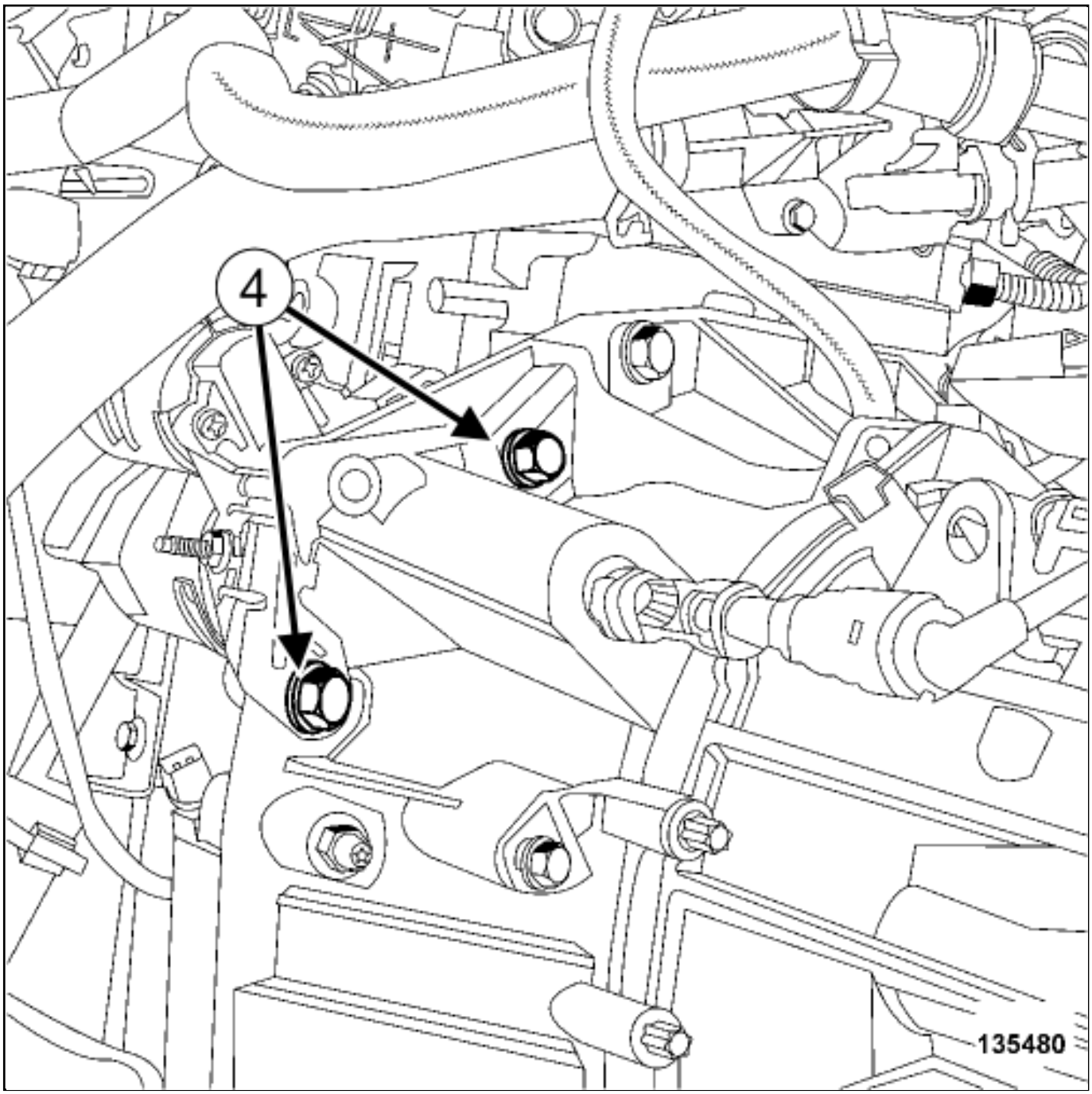


- Disconnect the oil pressure sensor connector(1) .



- Loosen the nut on the starter solenoid(2) .
- Remove the nut of the starter supply terminal(3) .
- Move the starter wiring aside.

2. REMOVAL OPERATION



Remove:

- the starter bolts(4) ,
- the starter.

REFITTING

1. REFITTING PREPARATION OPERATION

Check that the starter centring dowel is in place.

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Torque tighten:

- the starter bolts 44 N.m,
- the starter supply terminal nut 8 N.m,
- the nut on the starter solenoid 5 N.m.

STEEL BODYWORK COMPONENT: PREPARATION AND PAINT RANGE

Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

1. OXIDISED PANELS

Steps	Description	Special notes
1	Strip the oxidised section	Tools for scraping rigid adhesives and paint: Use (40A, General information)
2	Wipe / blow	
3	Sand the complete repair zone and increase the zone by 150to 200 mm	P180-P240 dry
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Carry out a cold electro zinc plating on the bare panel	(see 04E, Paint, Anti-corrosion protection by cold electro zinc plating: Description) (04E, Painting)
7	Rinse carefully in clean water	
8	Masking	Masking paper
9	Apply a pre-treatment primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Remove solvent	
11	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
12	Remove solvent / dry	

13	Sand the primer	P400 to P500dry / P400 to P800with water
14	Sand the whole component	P500 to P600dry / P800 to P1000with water
15	Wipe / blow	
16	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
17	Masking	(see 99A, Special notes on masking, Masking: Description)
18	Blow / rub with the abrasive finishing pad	
19	Apply the finishing paint	

2. REPAIRED COMPONENTS

1- WITH POLYESTER MASTIC

Steps	Description	Special notes
1	Sand the mastic	Panelwork finishing products: Use (40A, General information)
2	Sand the complete repair zone and increase the zone by 150to 200 mm	P240 to P280dry
3	Wipe / Blow	
4	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
5	Masking	Masking paper
6	Apply a pre-treatment primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
7	Remove solvent	
8	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
9	Remove solvent / dry	
10	Sand the primer	P400 to P500dry / P400 to P800with water
11	Sand the whole component	P500 to P600dry / P800 to P1000with water
12	Wipe / blow	

13	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
14	Masking	(see 99A, Special notes on masking, Masking: Description)
15	Blow / rub with the abrasive finishing pad	
16	Apply the finishing paint	

2- WITHOUT POLYESTER MASTIC

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Sand the complete repair zone and increase the zone by 150 to 200 mm	P240 to P280 dry
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Carry out a cold electro zinc plating on the bare panel	(see 04E, Paint, Anti-corrosion protection by cold electro zinc plating: Description) (04E, Painting)
7	Rinse carefully in clean water	
8	Masking	Masking paper
9	Apply a pre-treatment primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Remove solvent	
11	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
12	Removesolvent/dry	

13	Sand the primer	P400 to P500dry / P400 to P800with water
14	Sand the whole component	P500 to P600dry / P800 to P1000with water
15	Wipe / blow	
16	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
17	Masking	(see 99A, Special notes on masking, Masking: Description)
18	Blow / rub with the abrasive finishing pad	
19	Apply the finishing paint	

3. UNKNOWN SUBSTRATES

Note:

Carry out a lifting test with a solvent thinnerVehicle: Parts and consumables for the repair (04B, Consumables - Products)

1- REACTION TO THE TEST

Steps	Description	Special notes
1	Strip the damaged undercoats	Tools for scraping rigid adhesives and paint: Use (40A, General information)
2	(see repaired components)	

Step	Description	Special notes
1	(see new components)	

4. NEW COMPONENTS

Note:

Do not damage the cataphoretic coating.

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Sand the interior of the component	Red pad
4	Sand the exterior of the component	P240 dry
5	Wipe / Blow	
6	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
7	Masking	Masking paper
8	Apply a pre-treatment primer if there was elimination of the cataphoretic coating during sanding	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
9	Remove solvent	
10	Apply a mono or bi component primer on the whole of the component	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
11	Removesolvent/dry	
12	Sand the primer	According to the PRODUCT TECHNICAL SHEET

13	Wipe / blow	
14	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
15	Apply sealing mastic if necessary	Anti-corrosion protection products after assembly: Use (40A, General information) Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
16	Blow / rub with the abrasive finishing pad	
17	Apply the finishing paint	

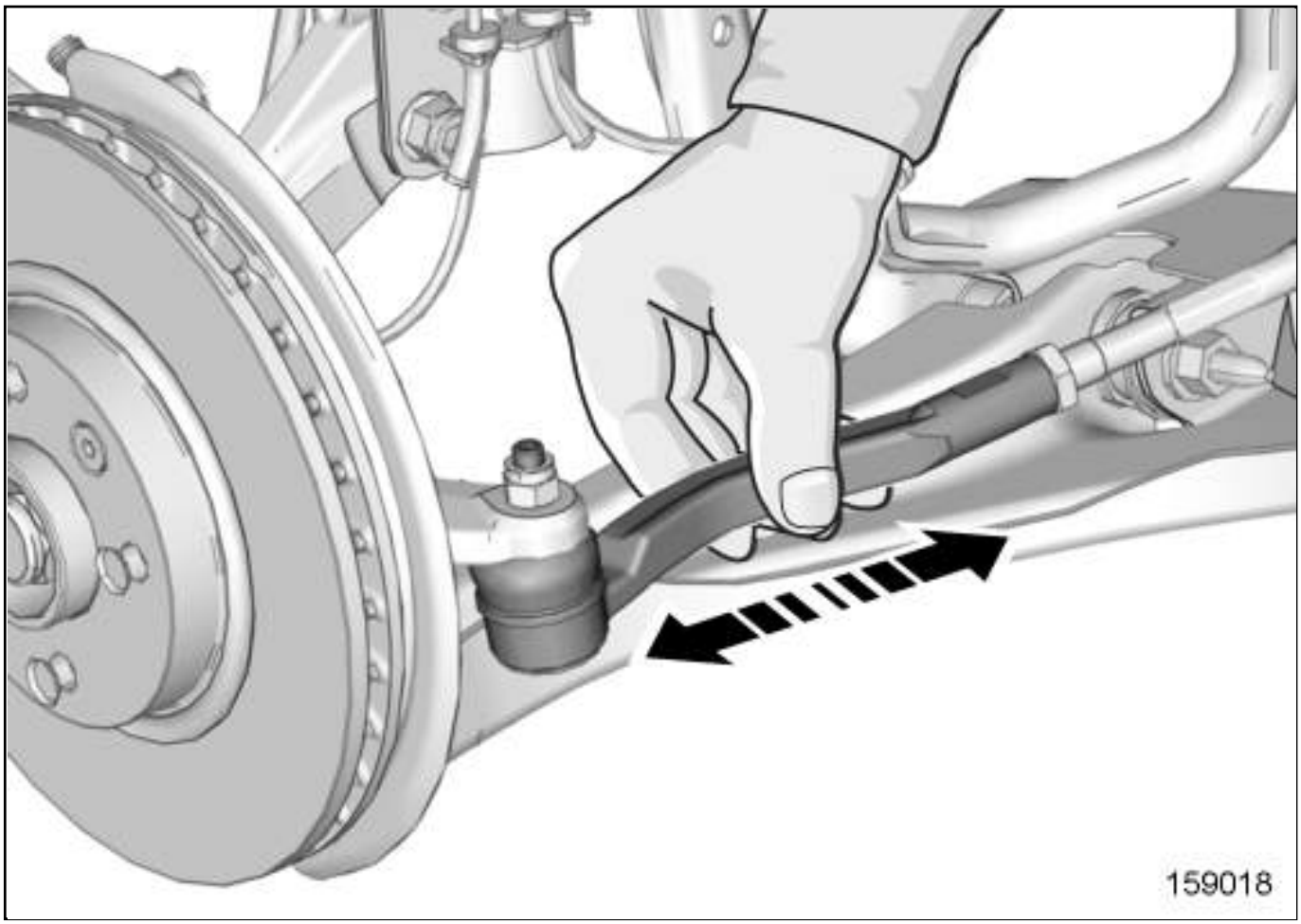
STEERING ASSEMBLY : CHECK

Equipment required
flywheel immobiliser

Note:

This steps are made two sides of the vehicle.

1. STEP NO.1



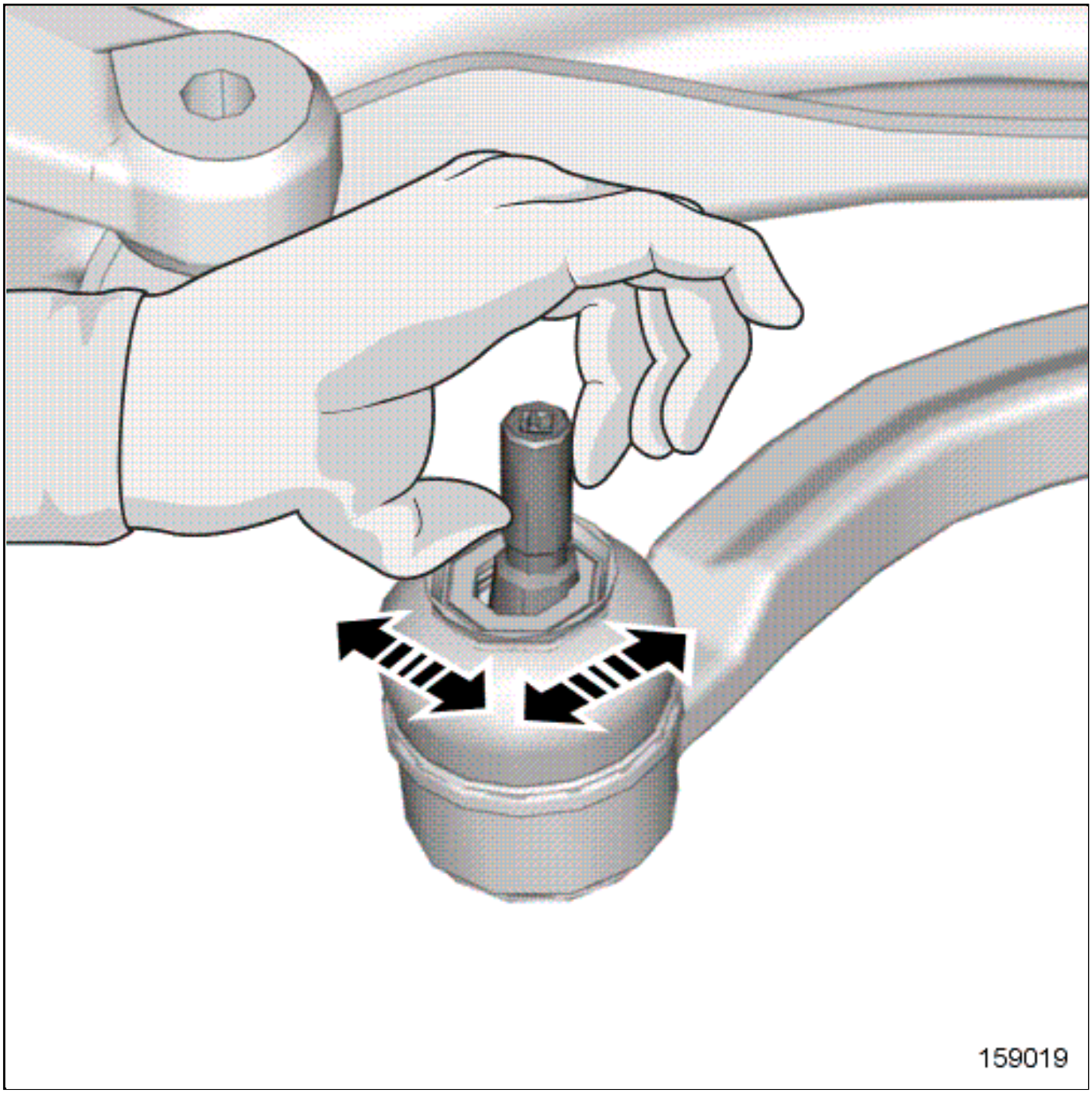
- Center the steering wheel and fit the flywheel immobiliser.
- Remove the wheel.

Control the clearance of the steering by exerting, on the track rod, translational movements at a high frequency in the direction of the arrow.

If a clearance is detected:

- remove the track rod nut,
- remove the gaiter clips,
- move the track rod gaiter to access at the axial ball joint.

2. STEP NO.2

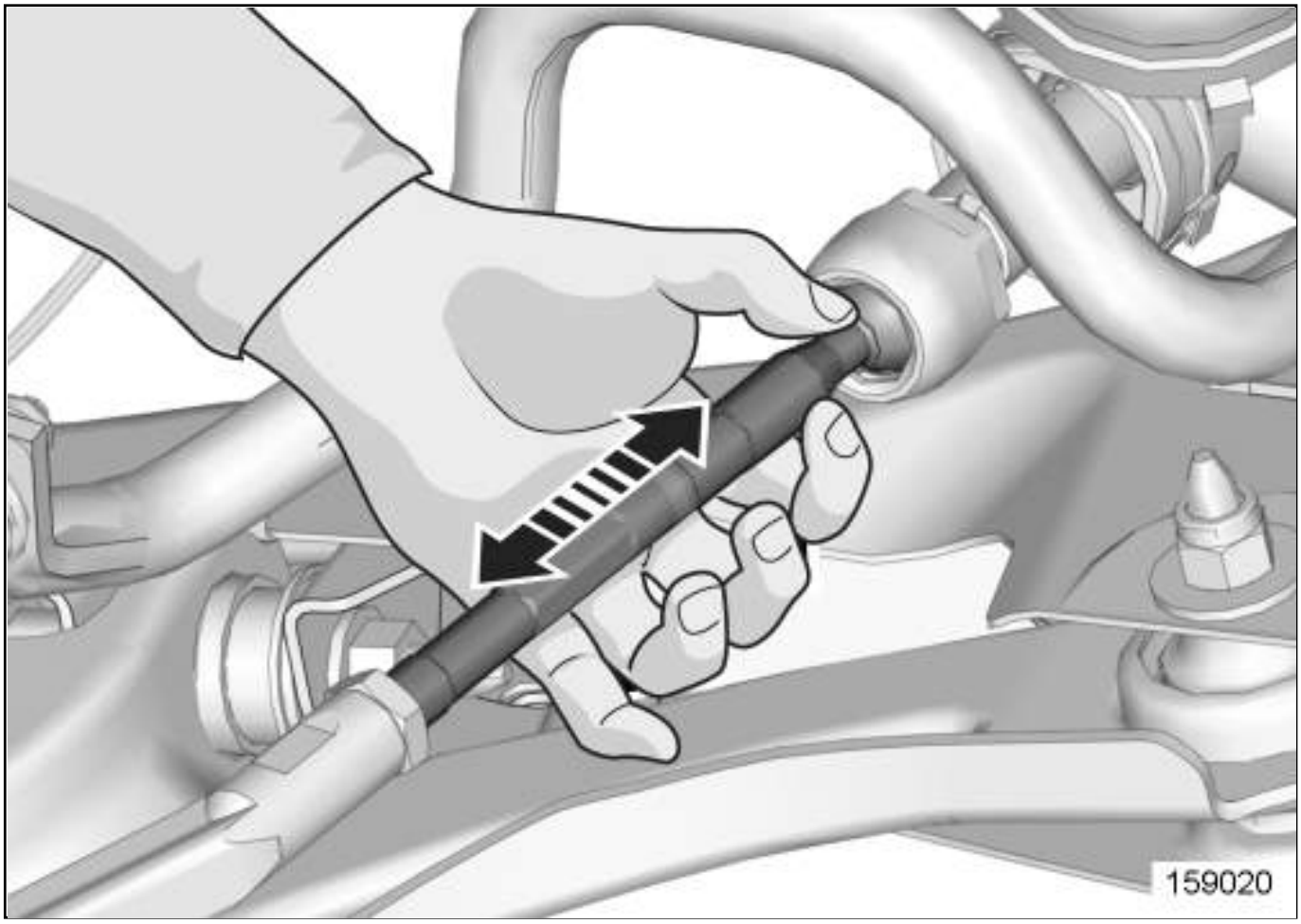


Pinch the ball joint.

Carry out movements in translation along the direction of arrows.

If a clearance in the ball joint is detected, remove the track rod(see 36A, Steering assembly , Track rod: Removal - Refitting) .

3. STEP NO.3



Check the clearance of the axial ball joint:

- fit the thumb in contact with the ball joint,
- tighten the rod in the hand,
- carry out movements in translation along the direction of arrows.

If no clearance is detected:

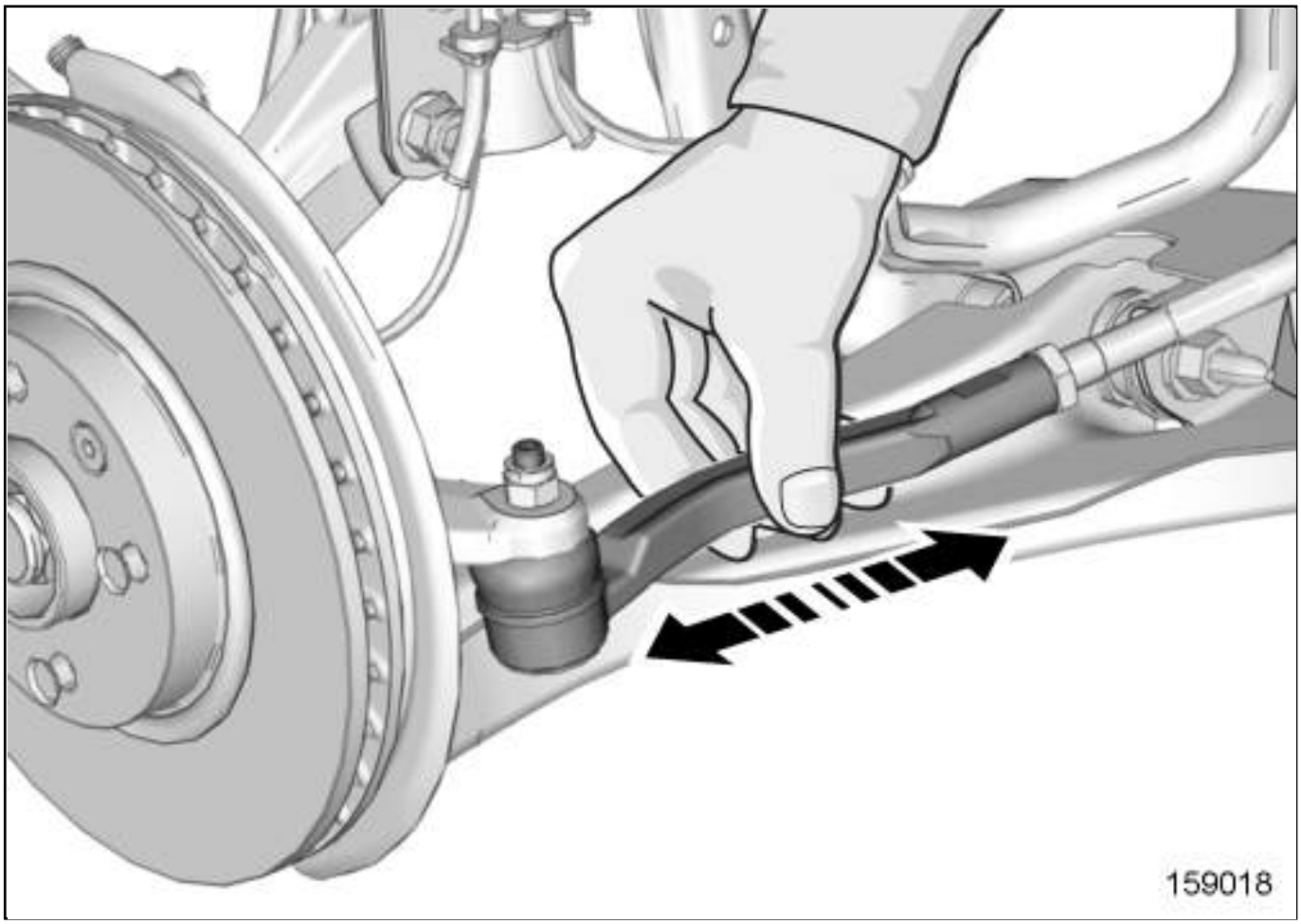
- refit the gaiter,
- refit new clips.

If a clearance in the ball joint are detected:

- replace the track rod axial ball jointAxial ball joint linkage: Removal - Refitting ,
- tighten the wheel alignment adjusting lock nut,

- tighten the track rod nut.

4. STEP NO.4



Control the clearance of the steering by exerting, on the track rod, translational movements at a high frequency in the direction of the arrow.

If a clearance are detected and that the track rod are not replace, replace the track rod.

Check the axle geometry**Axle assemblies: Check** .

STEERING ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 36A, Steering assembly , Steering: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

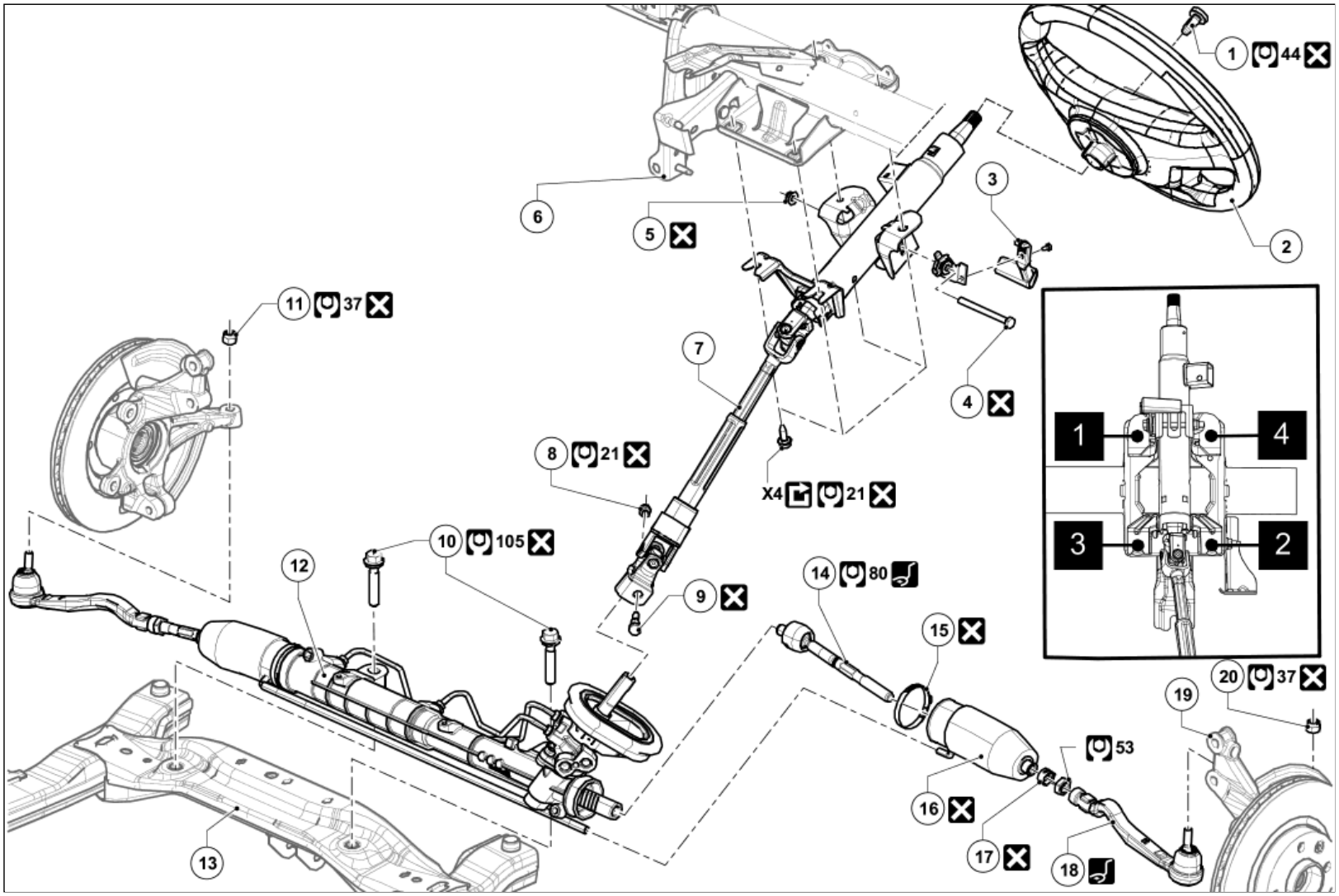


Illustration key: Description Legend .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Steering wheel bolt	
2	Steering wheel	
3	Steering column adjustment handle	
4	Shaft of the steering column adjustment handle	
5	Adjustment handle shaft nut	
6	Dashboard cross member	
7	Steering column	(see 36A, Steering assembly , Steering column: Removal - Refitting)
8	Universal joint nut	
9	Universal joint bolt	
10	Steering box bolts	
11	Track rod end nut	
12	Steering box	
13	Front axle subframe	Front axle assembly: Exploded view
14	Axial ball joint linkage	(see 36A, Steering assembly , Axial ball joint linkage: Removal - Refitting) (Dir. 1923) (Dir. 1306-01)
15	Steering gaiter clip	
16	Steering box gaiter	
17	Steering gaiter rubber clip	
18	Track rod	Ball-joint uncoupling tool : Use (Tav. 476)
19	Front driveshaft hub carrier	Front hub carrier assembly: Exploded view
20	Track rod end nut	

STEERING BOX GAITER: REMOVAL - REFITTING

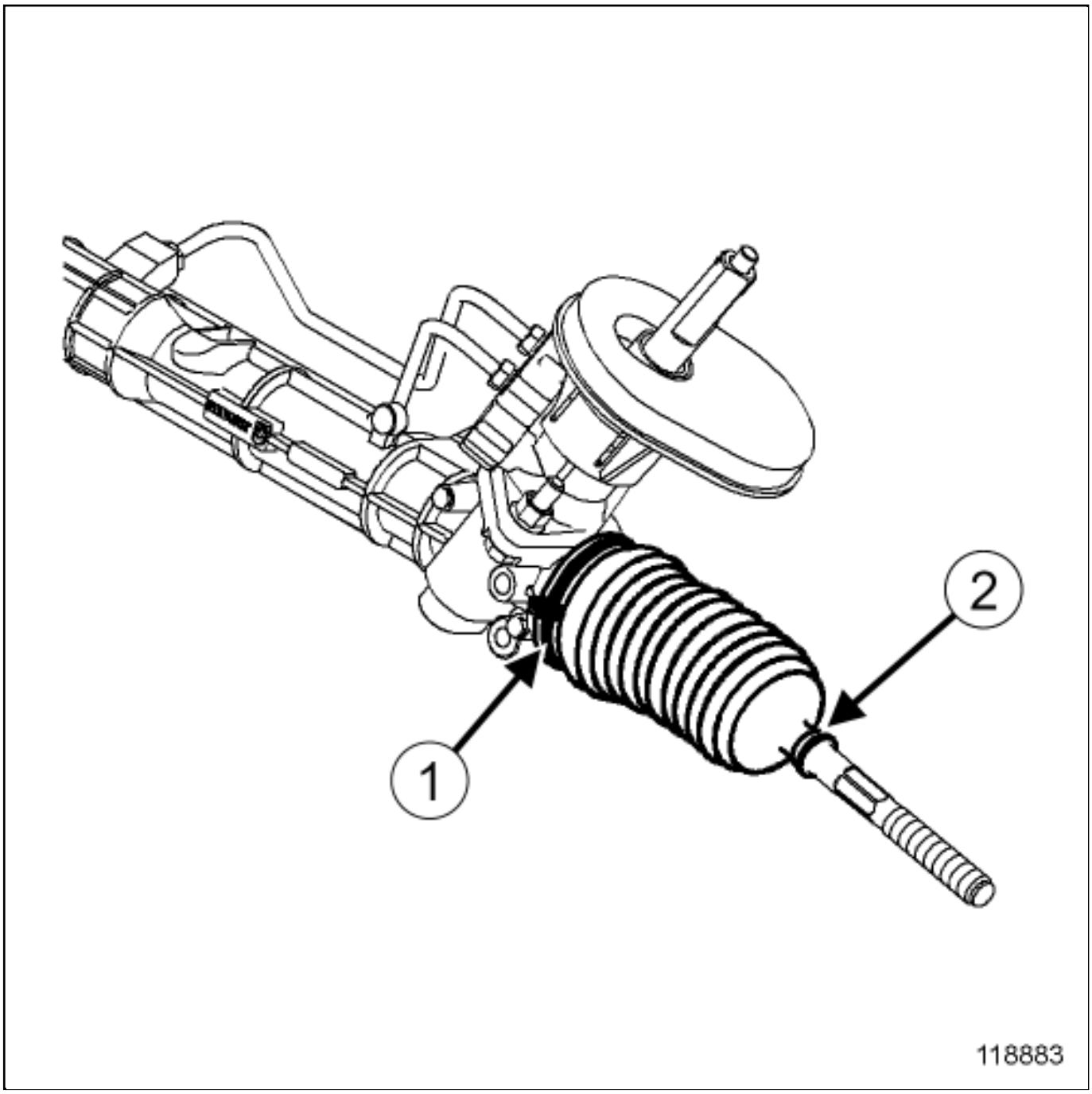
- Location and specifications (tightening torques, parts always to be replaced, etc.)Steering assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the front wheelWheel: Removal - Refitting .
- Remove the track rodSteering assembly: Exploded view .
- Remove the wheel alignment adjustment lock nut.

2. REMOVAL OPERATION



Note:

When removing the steering gaiter, blast the gaiter surfaces with compressed air to eliminate any impurities that could enter the steering box.

- Cut the gaiter retaining clip(1) .
- Remove the gaiter(2) .

REFITTING

1. REFITTING PREPARATION OPERATION

- Always replace:
  - the steering box gaiter,
  - the retaining clip.

- Clean the contact surfaces between the steering box and the gaiter using Surface cleaner Vehicle: Parts and consumables for the repair .

- Use silicone grease Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to coat the mating face of the gaiter on the axial ball joint to prevent the gaiter from twisting.

Note:

Be sure to centre the steering to ensure the air in the gaiters is equalised.

Note:

Be careful not to damage the gaiters: risk of irreversible damage.

2. REFITTING OPERATION

- Refit:
  - the new steering box gaiter,
  - the new retaining clip.

3. FINAL OPERATION

- Check the axle geometry Axle assemblies: Check .

- Refit the wheel alignment adjustment lock nut.

- Refit the track rod Steering assembly: Exploded view .

- Refit the front wheel Wheel: Removal - Refitting .

- If necessary, adjust the geometry of the axle assemblies**Front axle system: Adjustment** .

STEERING COLUMN: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 36A, Steering assembly, Steering assembly: Exploded view) .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

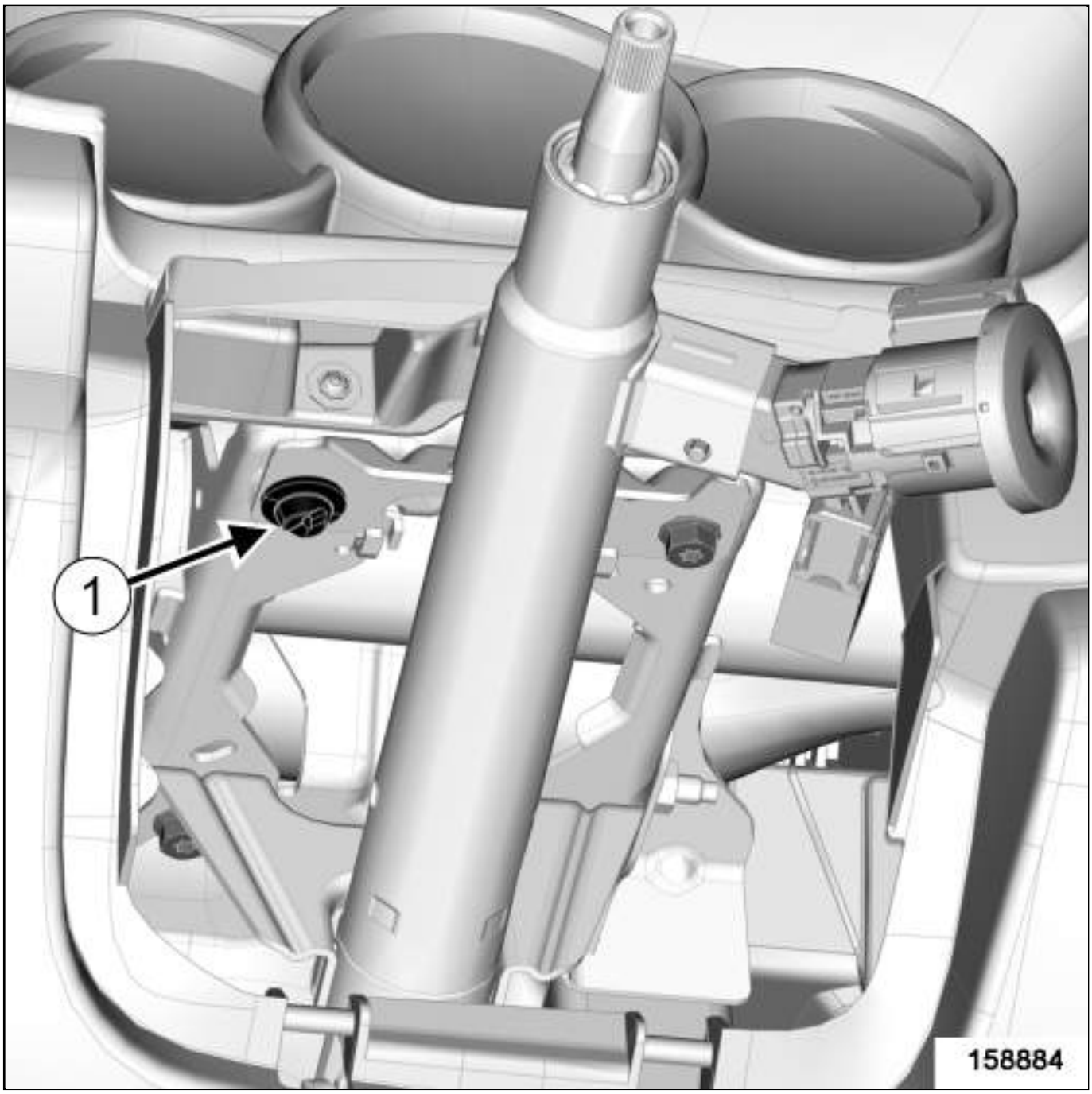
- (see 36A, Steering assembly , Steering: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Apply the procedure for deactivating the safety systemsAirbag and pretensioners: Precautions for the repair .
- Set the wheels straight ahead.
- Disconnect the batteryBattery: Removal - Refitting .
- Remove:
  - the driver's front airbagDriver's frontal airbag: Removal - Refitting ,
  - the steering wheel(see 36A, Steering assembly , Steering assembly: Exploded view) ,
  - the steering column switch assemblySteering column switch assembly: Removal - Refitting ,
  - the steering wheel coverDashboard assembly: Exploded view .
- Disconnect the ignition switch connector.

2. REMOVAL OPERATION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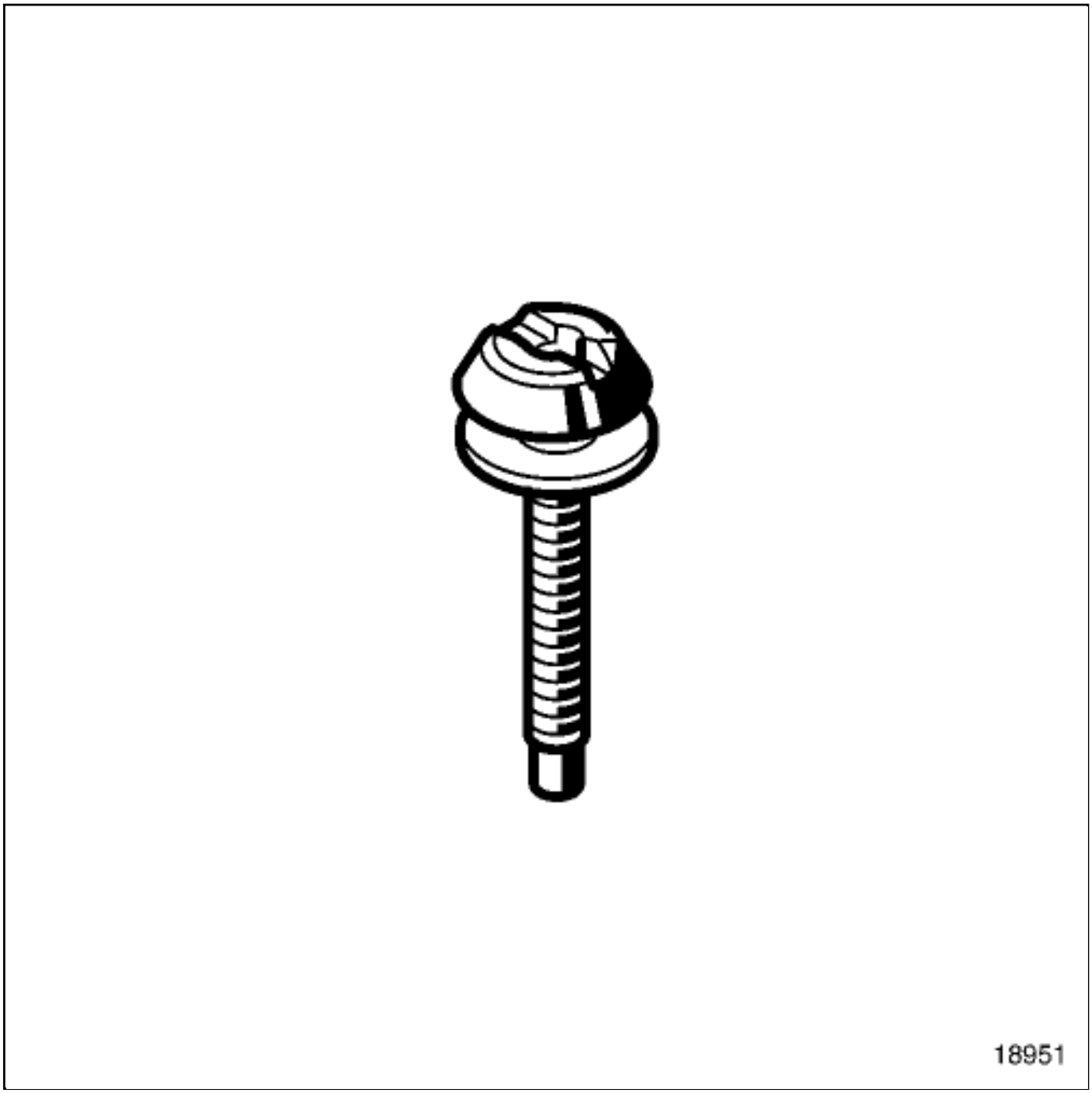


Note:

The mounting bolt(1) is an anti-theft bolt type.

Remove the anti-theft bolt using a chisel and a hammer.

Remove:

- the steering column(see 36A, Steering assembly , Steering assembly: Exploded view) ,
- the ignition switch.

REFITTING

Proceed in the reverse order to removal.

Note:

Check that the secured locking system of the connectors is correctly engaged.

Note:

Torque tighten the new anti-theft bolt using a flat-blade screwdriver bit.

Check:

- the alignment of the rotary switch **Rotary switch: Adjustment** .
- that the steering wheel is properly aligned.

Apply the after repair procedure using the Diagnostic tool **Diagnostic tool : Use** :

-Computer concerned by the after repair procedure:

- "ABS-ESP computer" .

-Component hosted, concerned by the after repair procedure:

- "Steering wheel angle sensor"

Apply the procedure for activating the safety systems **Airbag and pretensioners: Precautions for the repair** .

STEERING COLUMN SWITCH ASSEMBLY: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Airbag and pretensioners: Precautions for the repair ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

1. REMOVAL PREPARATION OPERATION

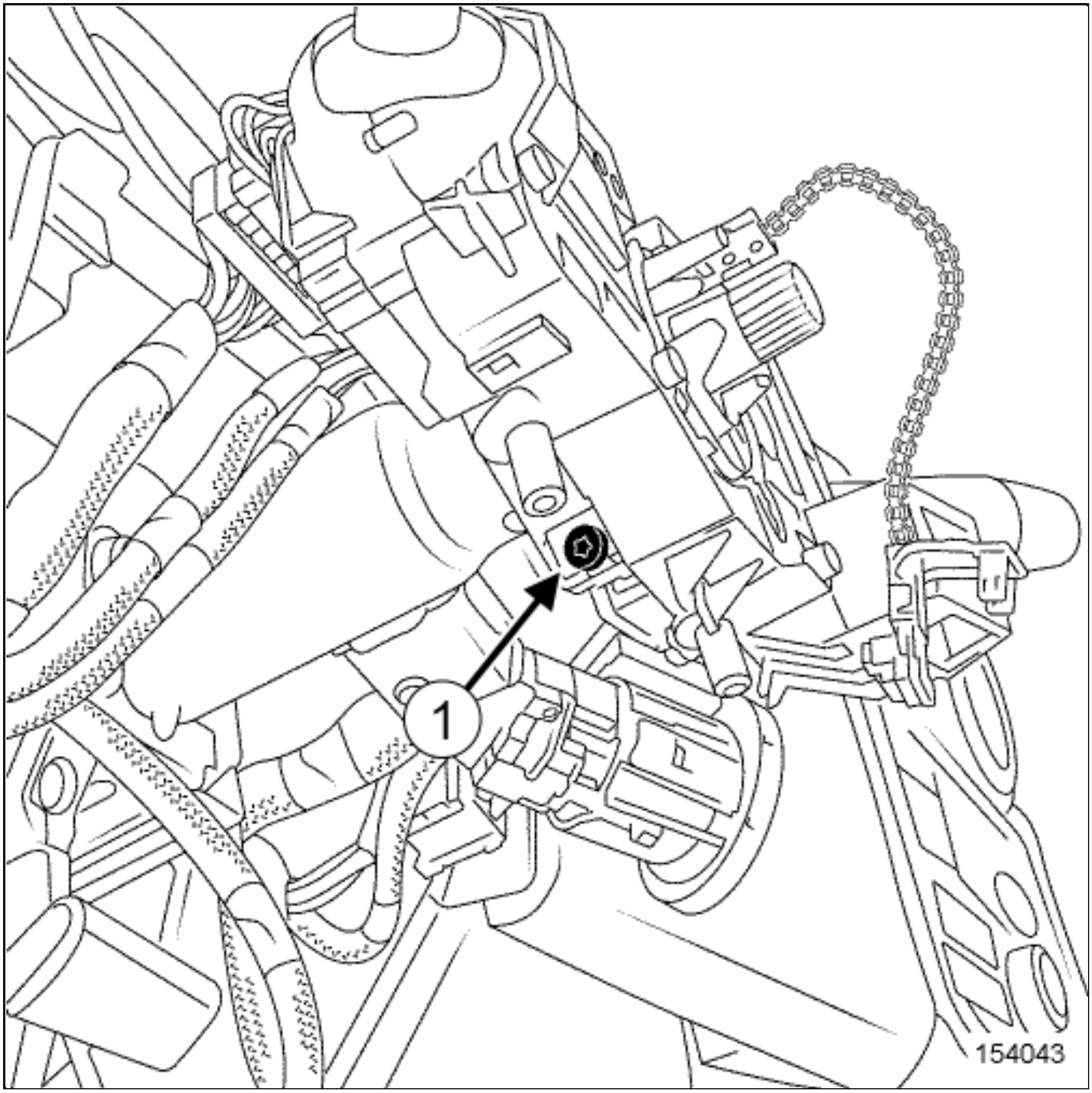
- Set the wheels straight ahead.
- Lock the airbag computer Airbag and pretensioners: Precautions for the repair .
- Switch off the ignition.
- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the driver's frontal airbag Driver's frontal airbag: Removal - Refitting ,
  - the steering wheel Steering wheel: Removal - Refitting .

CAUTION

To prevent damaging the rotary switch, do not turn the mobile section of the rotary switch.

- Remove Dashboard assembly: Exploded view :
  - the upper half-shell,
  - the lower half-shell.

2. REMOVAL OPERATION



- Loosen the bolts(1) securing the rotary switch.

- Tap the head of a screwdriver to unlock the cone and release the steering column assembly.

Note:

Before removing the assembly, it is essential to mark the position of the rotary switch by immobilising the rotary switch rotor with adhesive tape.

Note:

Always keep the rotary switch immobilised throughout the removal operation.

- Partially remove the steering column switch assembly to disconnect its connectors.
- Remove the steering wheel control assembly.

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

To prevent damaging the rotary switch, do not turn the mobile section of the rotary switch.

CAUTION

Incorrect wheel alignment may damage the rotary switch.

- Ensure that the wheels are still straight.

Note:

Always keep the rotary switch immobilised throughout the refitting operation.

Note:

If the rotary switch is being replaced, the new part is supplied ready centred with an adhesive label which will tear off when the wheel is turned for the first time (wheels must be straight when fitting).

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

- Unlock the airbag computer **Airbag and pretensioners: Precautions for the repair** .

- Switch on the ignition.

- Check the operation of the rotary switch:
  - turn the steering wheel to the left until it stops,
  - turn the steering wheel to the right until it stops,
  - bring the steering wheel back to the central position,
  - check that there are no faults on the instrument panel.

STEERING: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTION TO BE FOLLOWED DURING THE OPERATION

WARNING

Wear cut-resistant gloves during the operation.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Use a cover to protect any chassis elements that may be contaminated with power-assisted steering fluid.

2- INSTRUCTION TO BE FOLLOWED DURING THE OPERATION

Clean around the power-assisted steering system using BRAKE CLEANER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

3. JOB GROUP RECOMMENDATIONS

To ensure correct operation and performance of the system, do not attempt to repair any components other than those supplied in After-Sales.

To ensure the quality of the repair, only use the tooling recommended by the manufacturer.

1- POWER ASSISTED STEERING CIRCUIT:

1)POWER-ASSISTED STEERING FLUID

Only use the fluid recommended by the manufacturer, in order to ensure correct system performance Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

2)BLANKING PLUGS

To prevent impurities from entering the power assisted steering circuit, use blanking plugs on the various dismantled parts.

2- SEALS

To ensure a sound power-assisted steering circuit seal, replace the power-assisted steering pipe seals each time a pipe is removed.

3- STEERING COLUMN

CAUTION

In order not to damage the steering wheel or steering column, the steering wheel-column foolproofing devices must be aligned.

Do not rest the steering column on the adjustment handle.

Do not handle the steering column by the adjustment handle or by the wiring.

Manoeuvre the "steering column - intermediate shaft" assembly by holding each section (one hand on the column and the other on the intermediate shaft). If the steering column is not handled correctly, there is a risk that the steering column or intermediate shaft could fall, which could destroy the system.

Always replace the steering column if it is dropped or in the event of an impact.

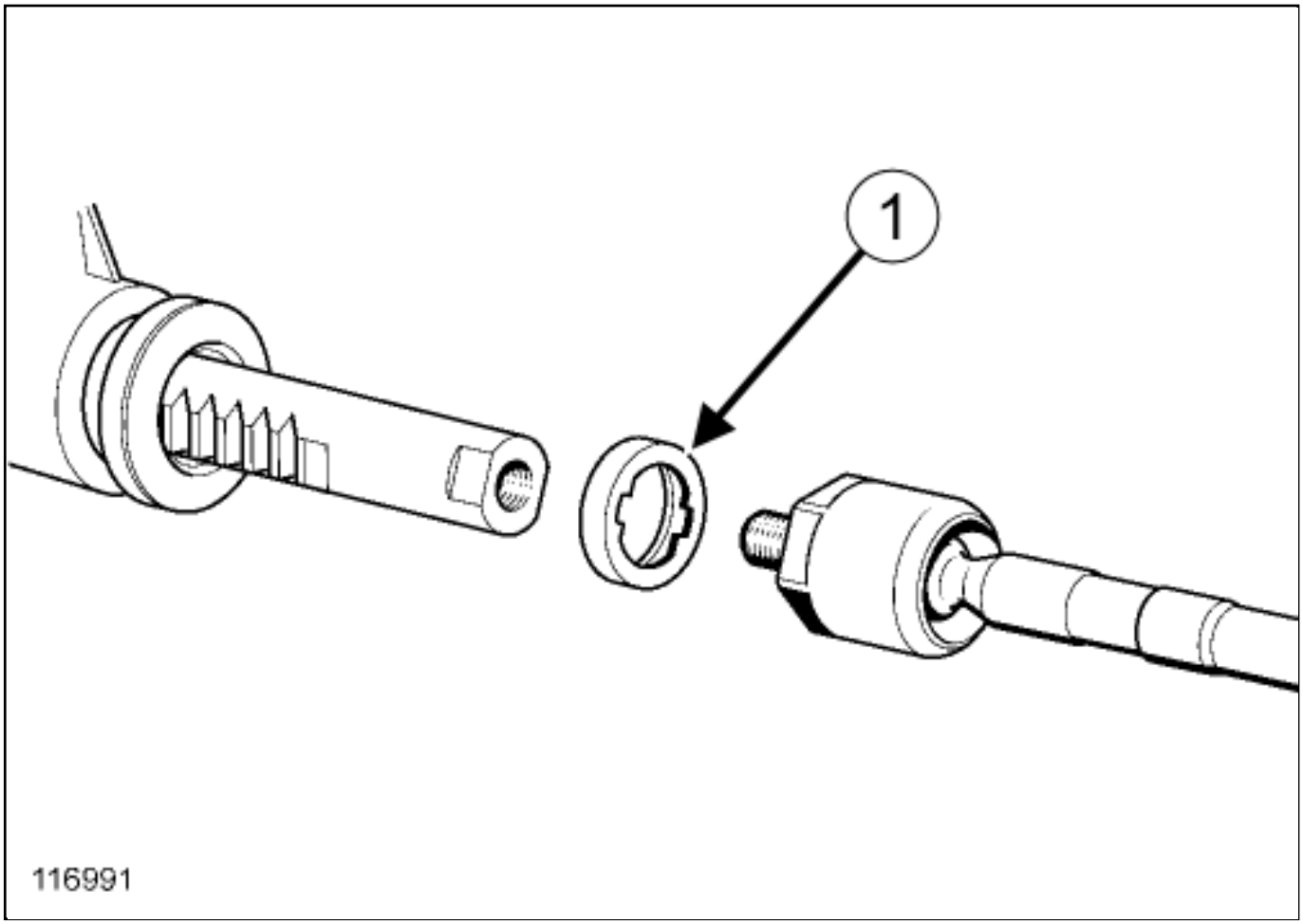
4- STEERING BOX

The steering box should not be carried by the gaiters or pipes, as this may damage them.

When the vehicle is positioned with the wheels suspended, the steering rack must not be subjected to violent movements from lock to lock.

Risks: Damage to the teeth of the steering rack and pinion may cause a safety riskrelating to the steering unexpectedly locking.

5- AXIAL BALL JOINT



The axial ball joint limiters(1) are colour coded for foolproofing purposes. When removing or replacing the axial ball joint, check that the limiter with the correct colour code is refitted.

6- POWER-ASSISTED STEERING PUMP

Do not run the engine without steering fluid in the circuit.

7- PUMP ASSEMBLY

Do not run the engine without steering fluid in the circuit.

8- WIRING HARNESSES

Ensure that the electrical wiring is clean and correctly routed.

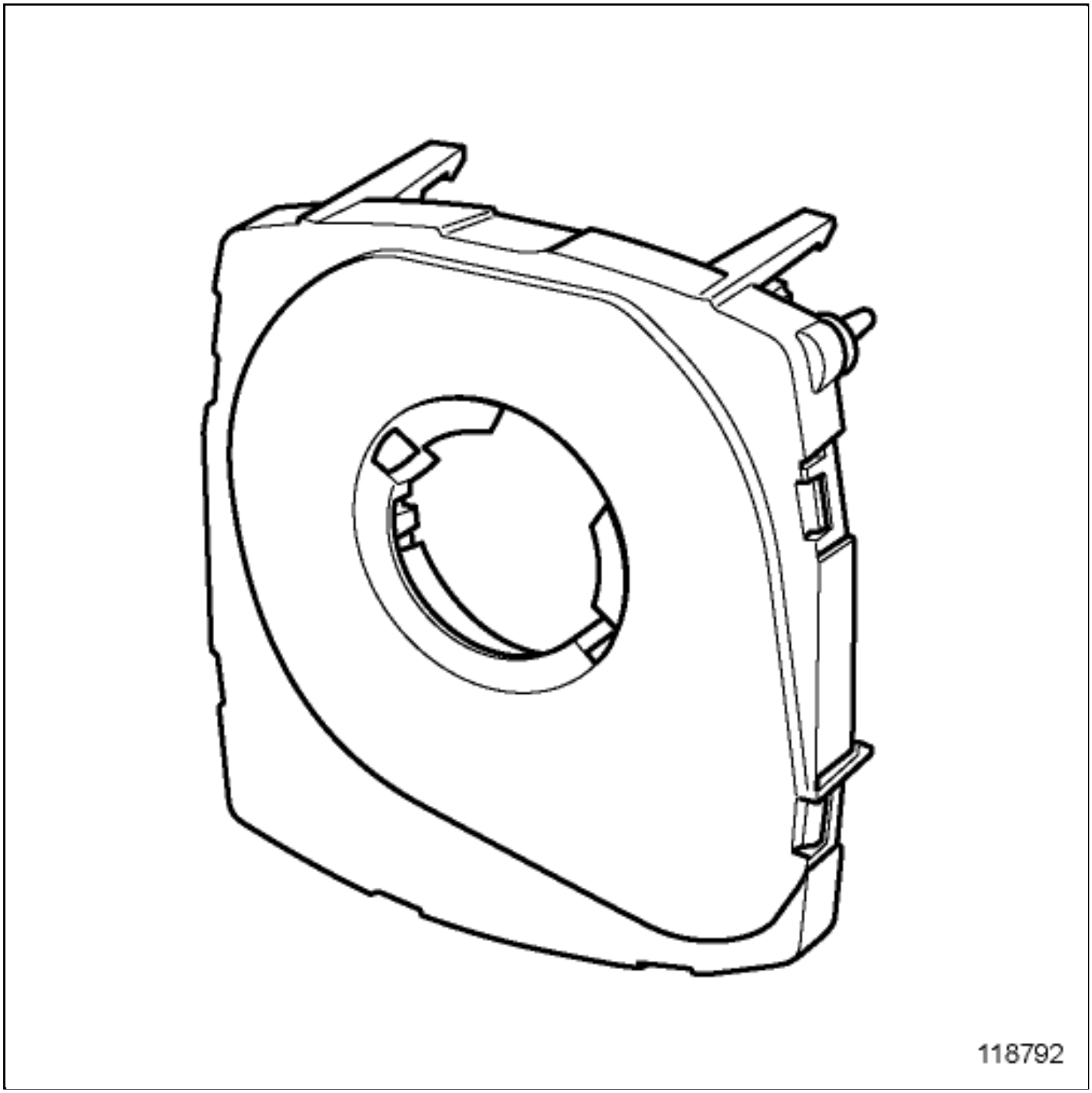
STEERING WHEEL ANGLE SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

The ESP uses a steering wheel angle sensor to measure the trajectory selected by the driver.

This signal is interpreted as a driver command.



This sensor is located on the steering column and is clipped onto the rotary switch assembly.

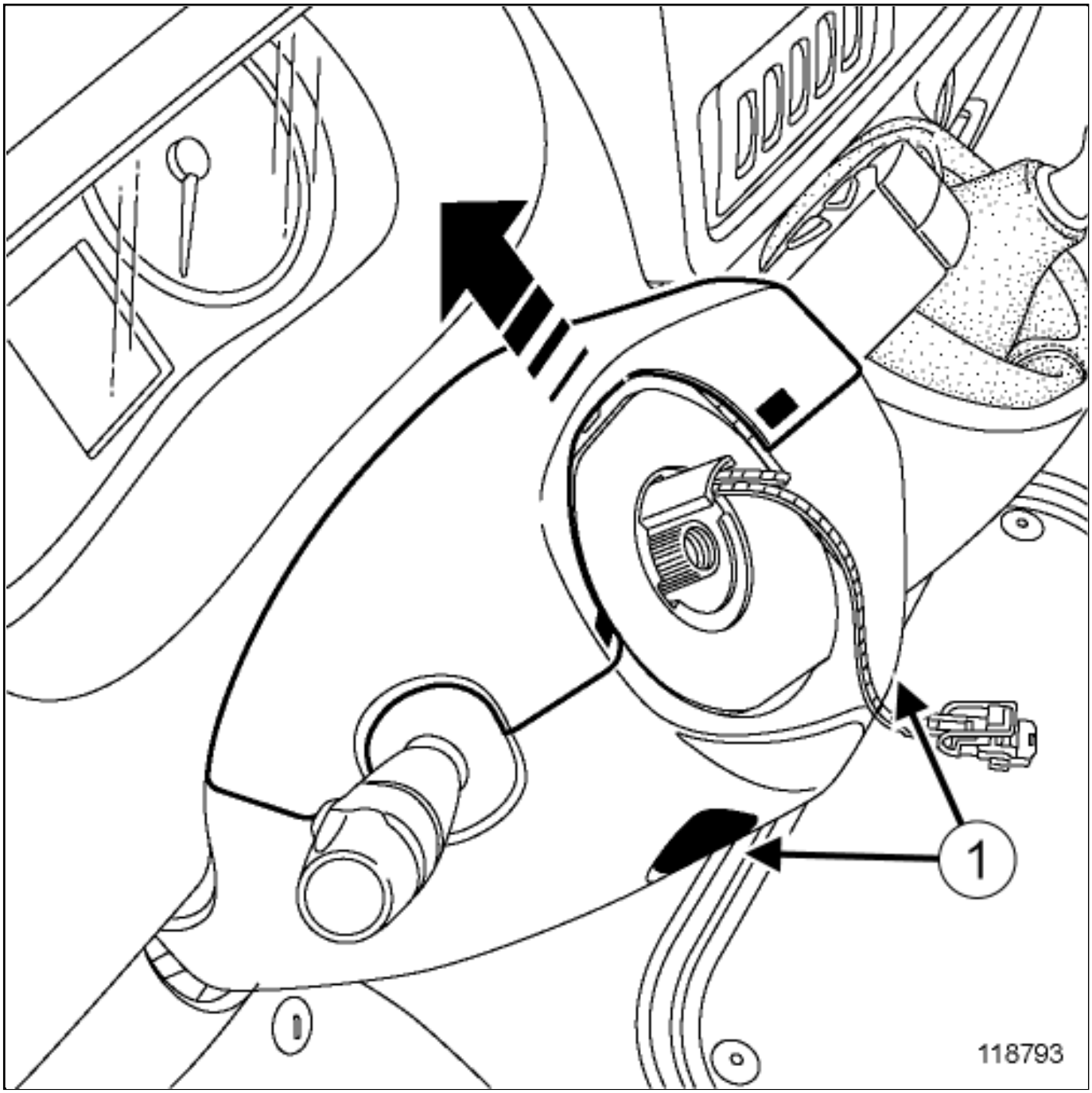
WARNING

Never handle the pyrotechnic systems (pretensioners or airbags) near to a source of heat or naked flame - they may be triggered.

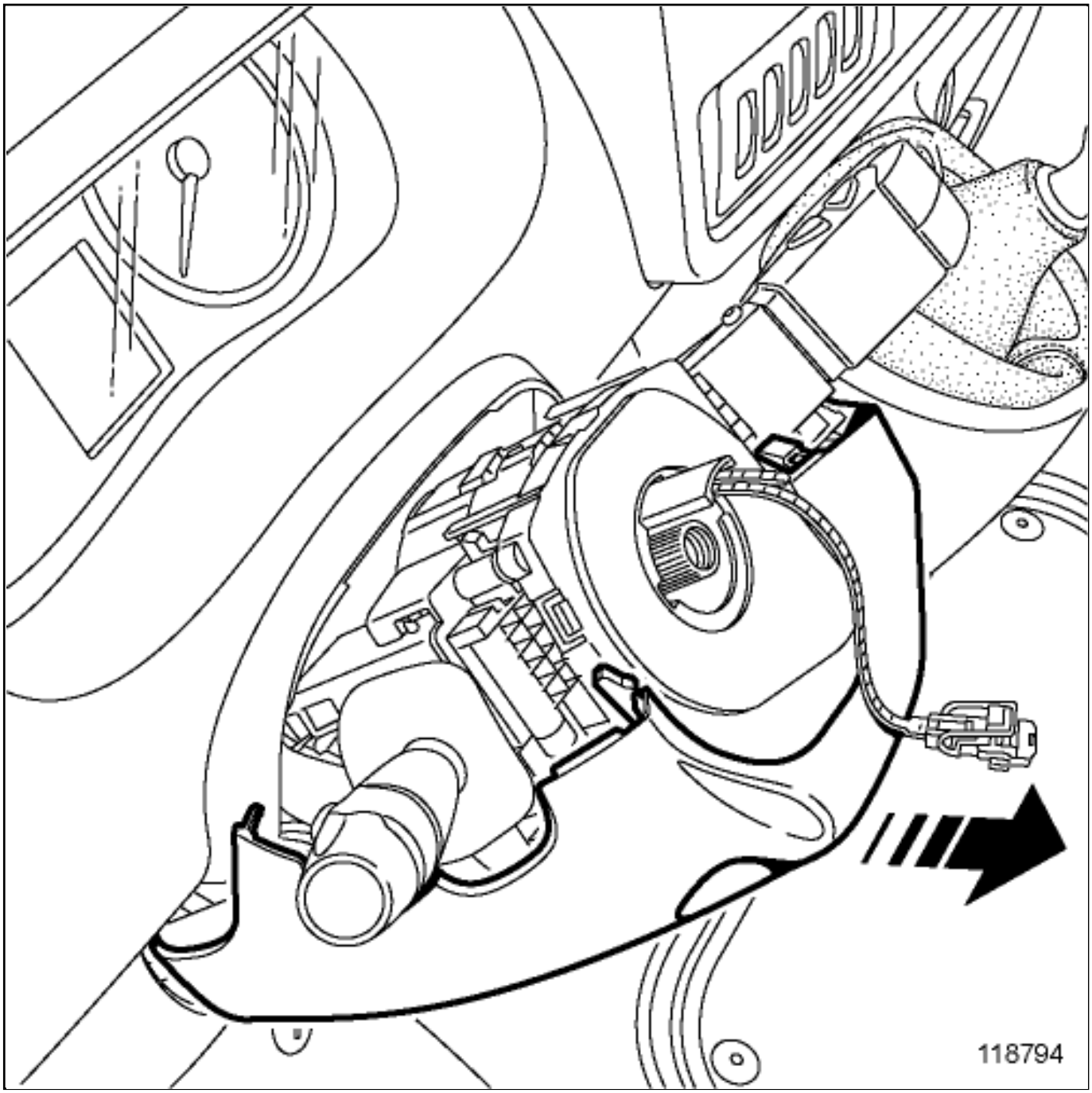
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Apply the procedure for deactivating the safety systems Airbag and pretensioners: Precautions for the repair .
- Disconnect the battery (Battery: Removal - Refitting).
- Remove:
  - the driver's front airbag Driver's frontal airbag: Removal - Refitting ,
  - the steering wheel Steering assembly: Exploded view .

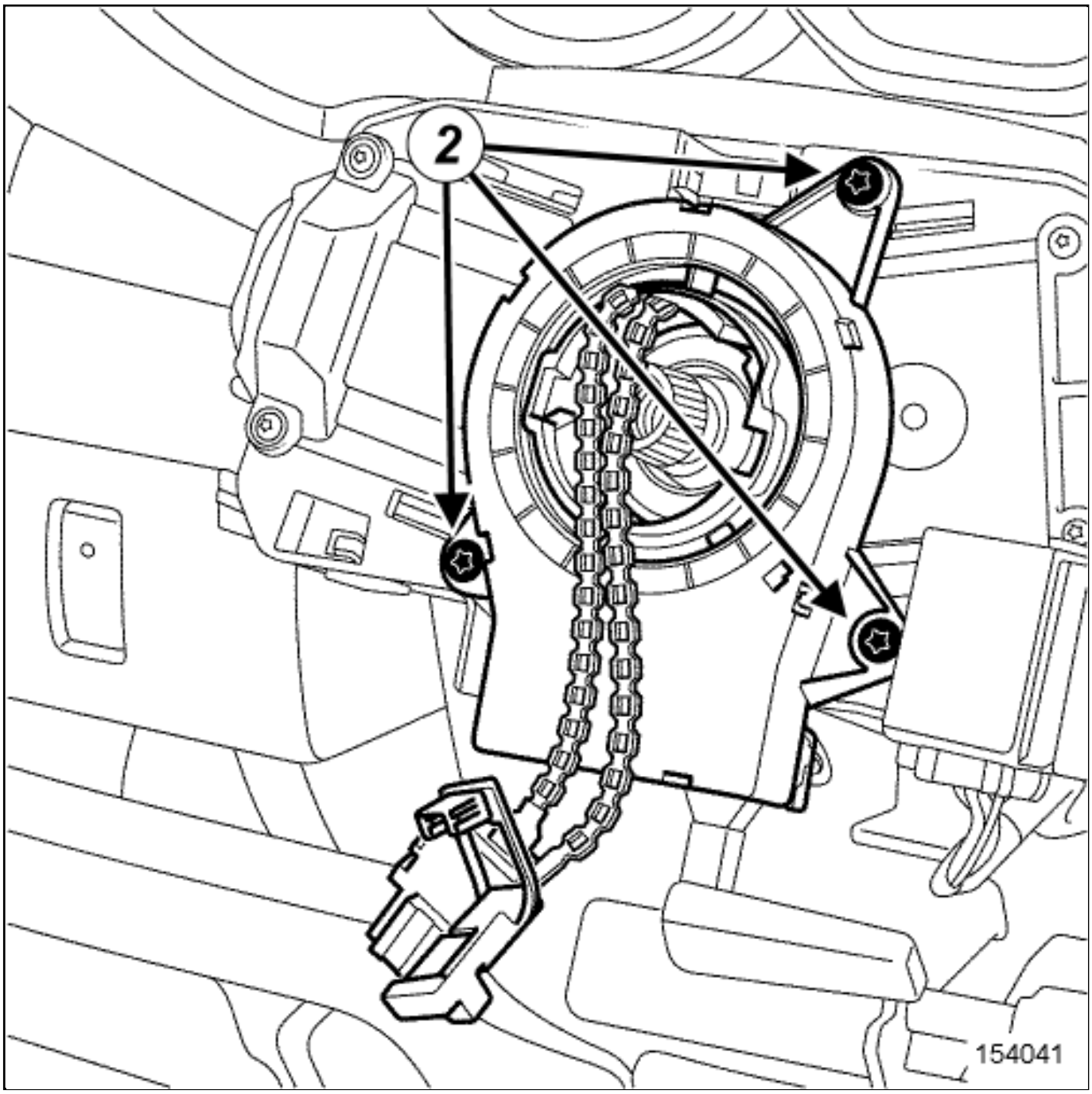


- Remove:
  - the lower cover bolts(1) ,
  - the upper cover.



- Remove the lower cover.

2. REMOVAL OPERATION



- Disconnect the steering wheel angle sensor connector.

- Remove:
  - the bolts(2) from the steering wheel angle sensor,
  - the steering wheel angle sensor.

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

2. FINAL OPERATION

- Connect the battery Battery: Removal - Refitting .

WARNING

To prevent the pyrotechnic components from being permanently deactivated or triggered (airbags or pretensioners), check the airbag computer using the Diagnostic tool .

- Unlock the airbag computer using the Diagnostic tool Airbag and pretensioners: Precautions for the repair .

- Apply the after repair procedure using the Diagnostic tool Diagnostic tool : Use :

-Computer concerned by the after repair procedure:

■ "ABS-ESP computer" .

-Component hosted, concerned by the after repair procedure:

■ "Steering wheel angle sensor"

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XSL version : 3.02 du 22/07/11

STEERING WHEEL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:
Steering wheel bolt

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 36A, Steering assembly , Steering: Precautions for the repair) ,
  - Control - Signals: Precautions for repair ,
  - Vehicle: Precautions for the repair .

- Location and specification (tightening torques, parts always to be replaced, etc.)Steering assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Apply the procedure for deactivating the safety systemsAirbag and pretensioners: Precautions for the repair .

- Remove the driver's frontal airbagDriver's frontal airbag: Removal - Refitting .

- Set the wheels straight ahead.

- Disconnect the connectors.

2. REMOVAL OPERATION

- Remove the steering wheel bolt.
- Remove the steering wheel.

REFITTING

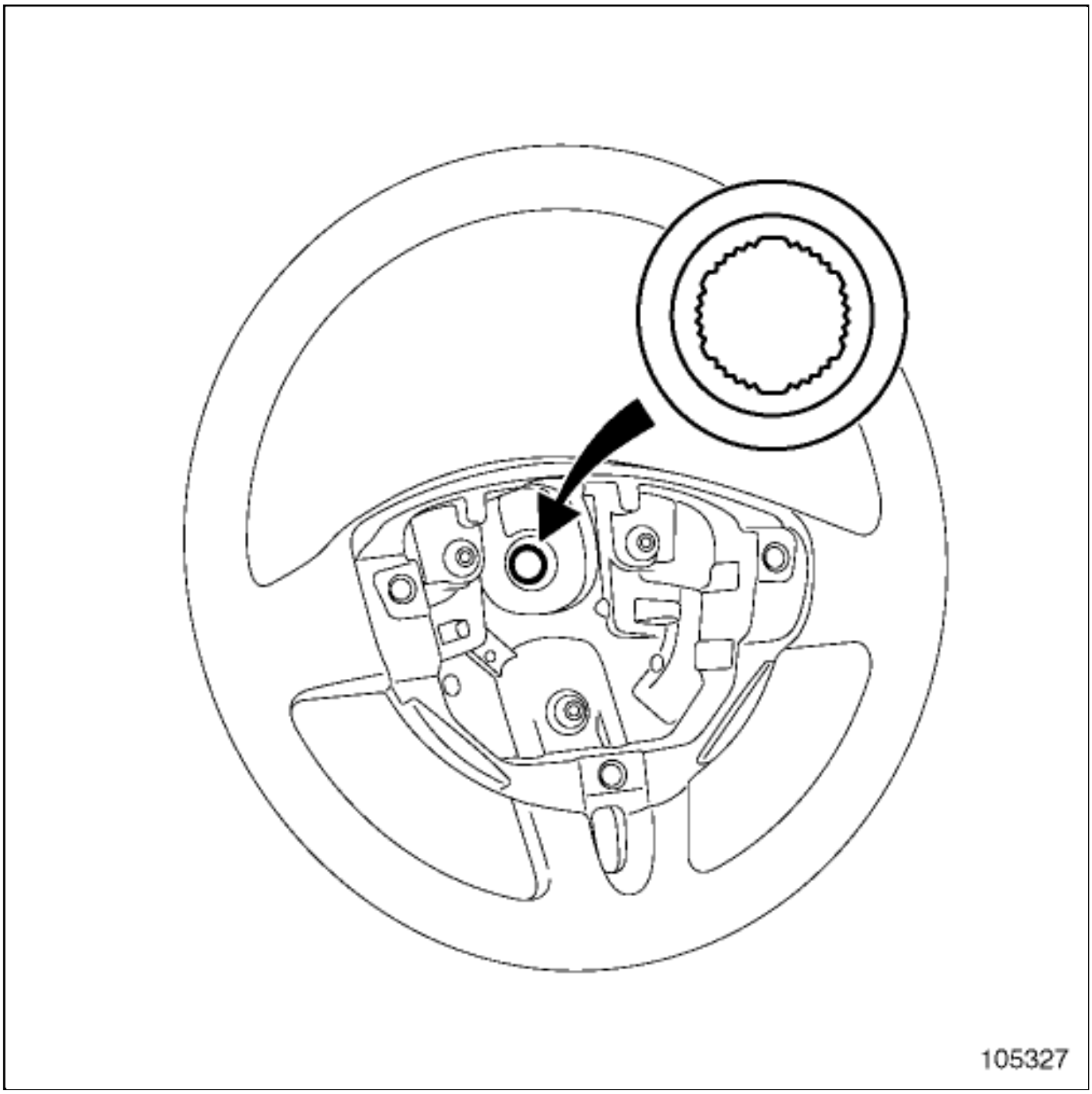
1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: **Steering wheel bolt**.

- Check the alignment of the rotary switch **Rotary switch: Adjustment** .

2. REFITTING OPERATION



CAUTION

In order not to damage the steering wheel or steering column, the steering wheel-column foolproofing devices must be aligned.

- Refit the steering wheel.
- Connect the connectors.
- Refit a new steering wheel bolt.

- Torque tighten the steering wheel bolt Steering assembly: Exploded view .

3. FINAL OPERATION

- Refit the driver's front airbag Driver's frontal airbag: Removal - Refitting .

- Apply the procedure for activating the safety systems Airbag and pretensioners: Precautions for the repair .

4. CHECKING AFTER REPAIR

- Switch on the ignition.

- Check the operation of the rotary switch:
  - turn the steering wheel to the left until it stops,
  - turn the steering wheel to the right until it stops,
  - check that there are no faults on the instrument panel.

STRAIGHTENING A COMPONENT: DESCRIPTION

1. REMOVING DENTS FROM STEEL COMPONENTS

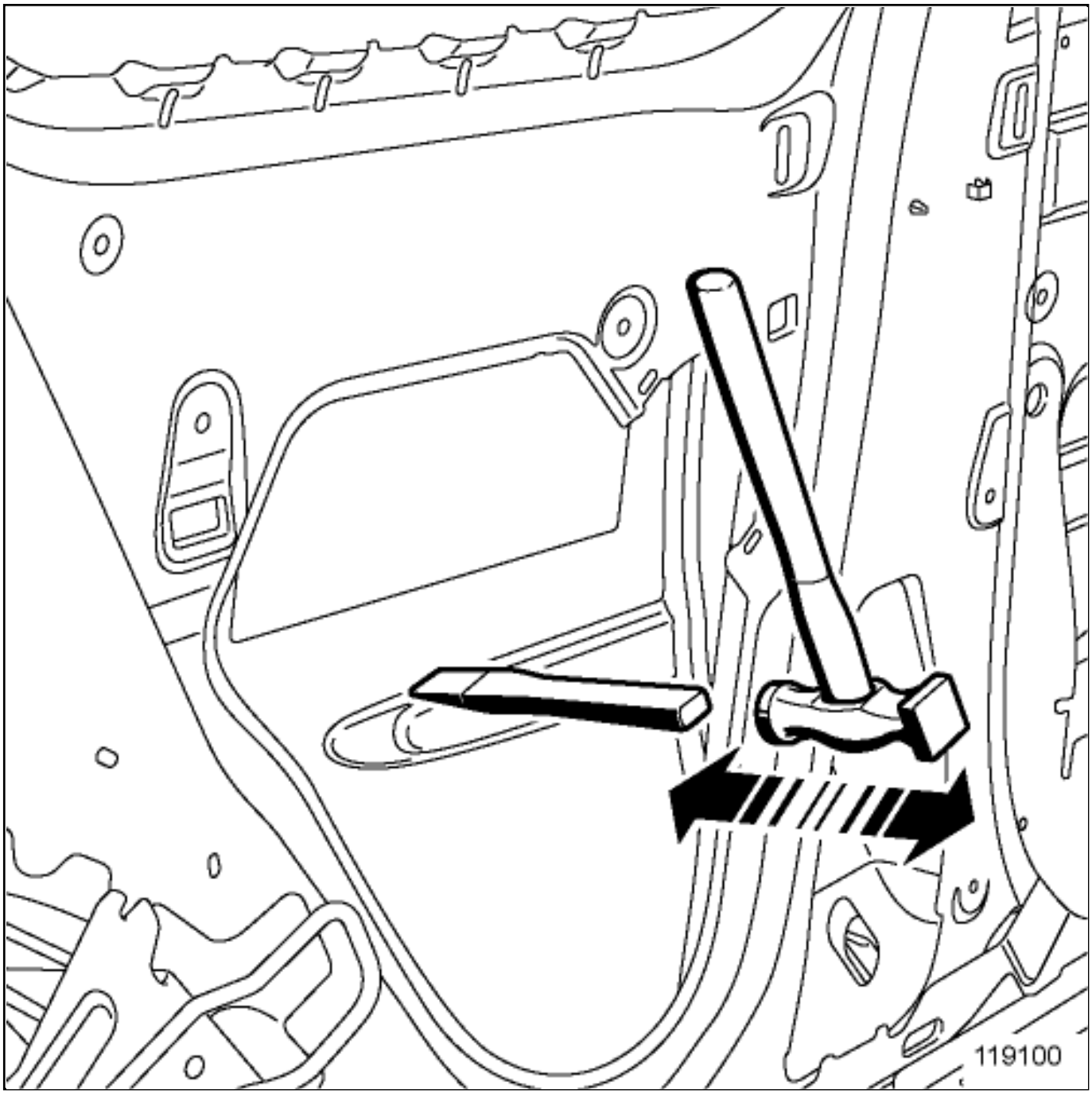
- Used only for straightening visible external components:
  - rear wing panels,
  - door panels,
  - side panels,
  - lining components without a primary structural function (e.g.: wheel arches, floor).

It does not require heavy straightening equipment and can be performed anywhere in the bodyshop.

For all dent removal or heating operations, always start at the outside of the deformity and work towards the centre.

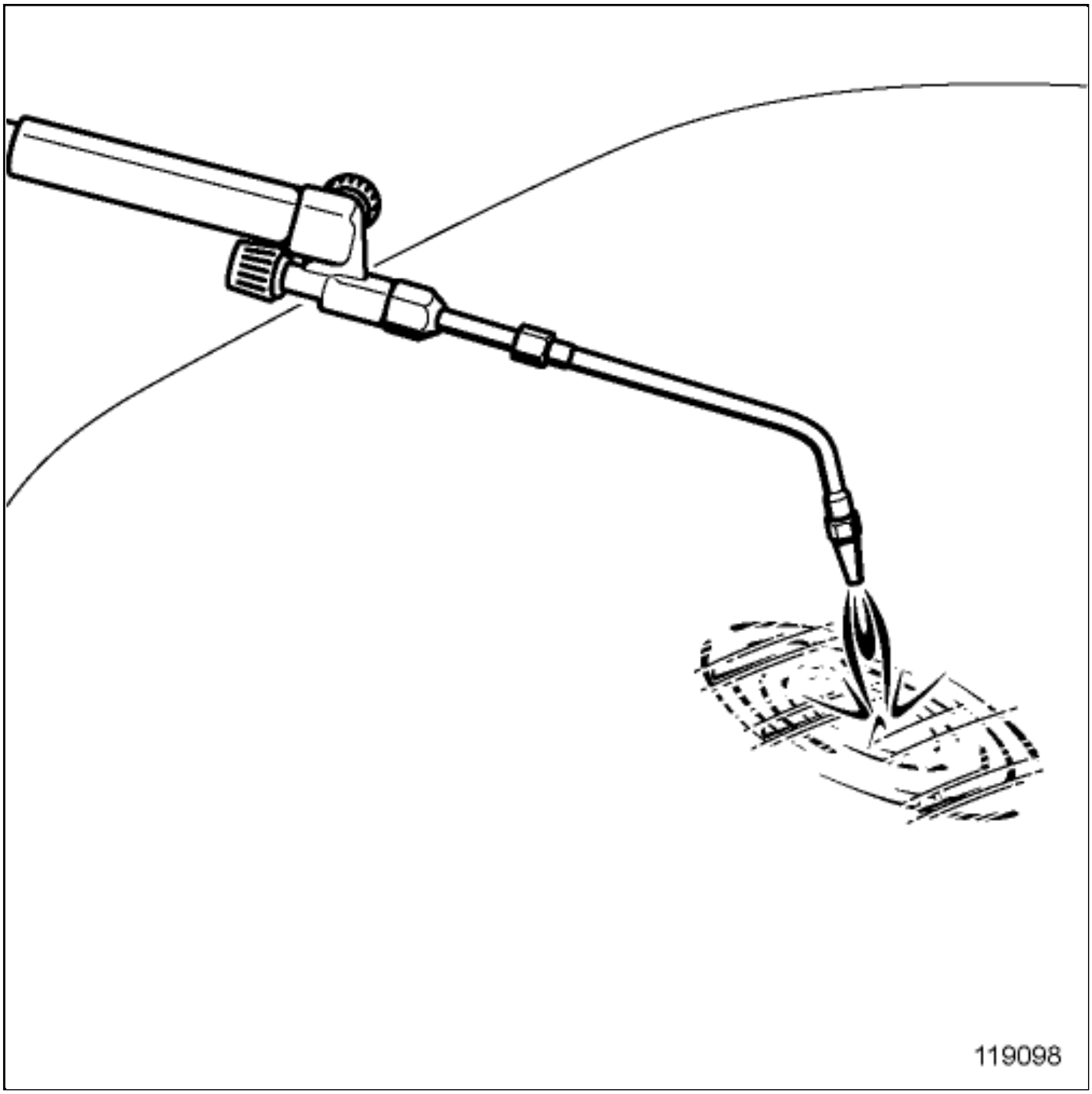
1- DENT REMOVAL WITH ACCESS VIA THE INTERNAL FACE

1)STRAIGHTENING



Straighten the internal face using a drift, stake or hammer until as close as possible to the required shape, then use a planishing hammer or mallet and a suitable stake to strike "the opposite way" .

2)HEATING



The operation is performed using an oxyacetylene torch, a flat stake and a mallet.

Note:

For steel, this operation destroys all original anti-corrosion protection on the internal and external faces of the heated zones. It is essential to carry out a painting procedure on the internal faces.

By definition, shape finishing on a zone accessible via the internal face must be by "planishing" and heating. Under no circumstances should the component panel be filed or ground, so as not to reduce its thickness.

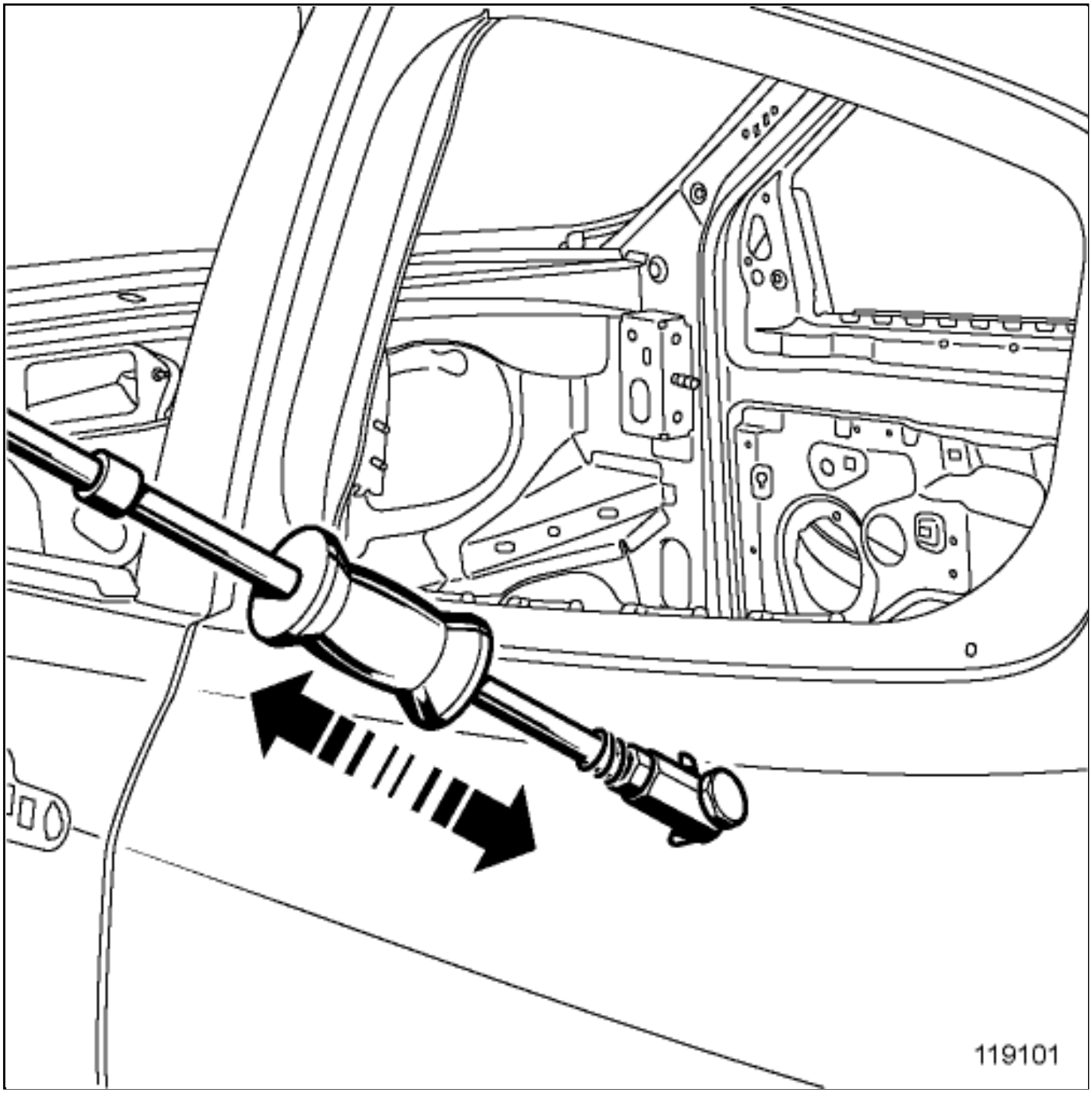
2- DENT REMOVAL WITHOUT ACCESS VIA INTERNAL FACE

This type of straightening is performed with a "welding/puller" type tool, using two techniques depending on the force to be applied.

1)SINGLE POINT INERTIA STRAIGHTENING

Note:

During an operation of this type on the B-pillar, disconnect the side airbags inertia switch electrical connector.

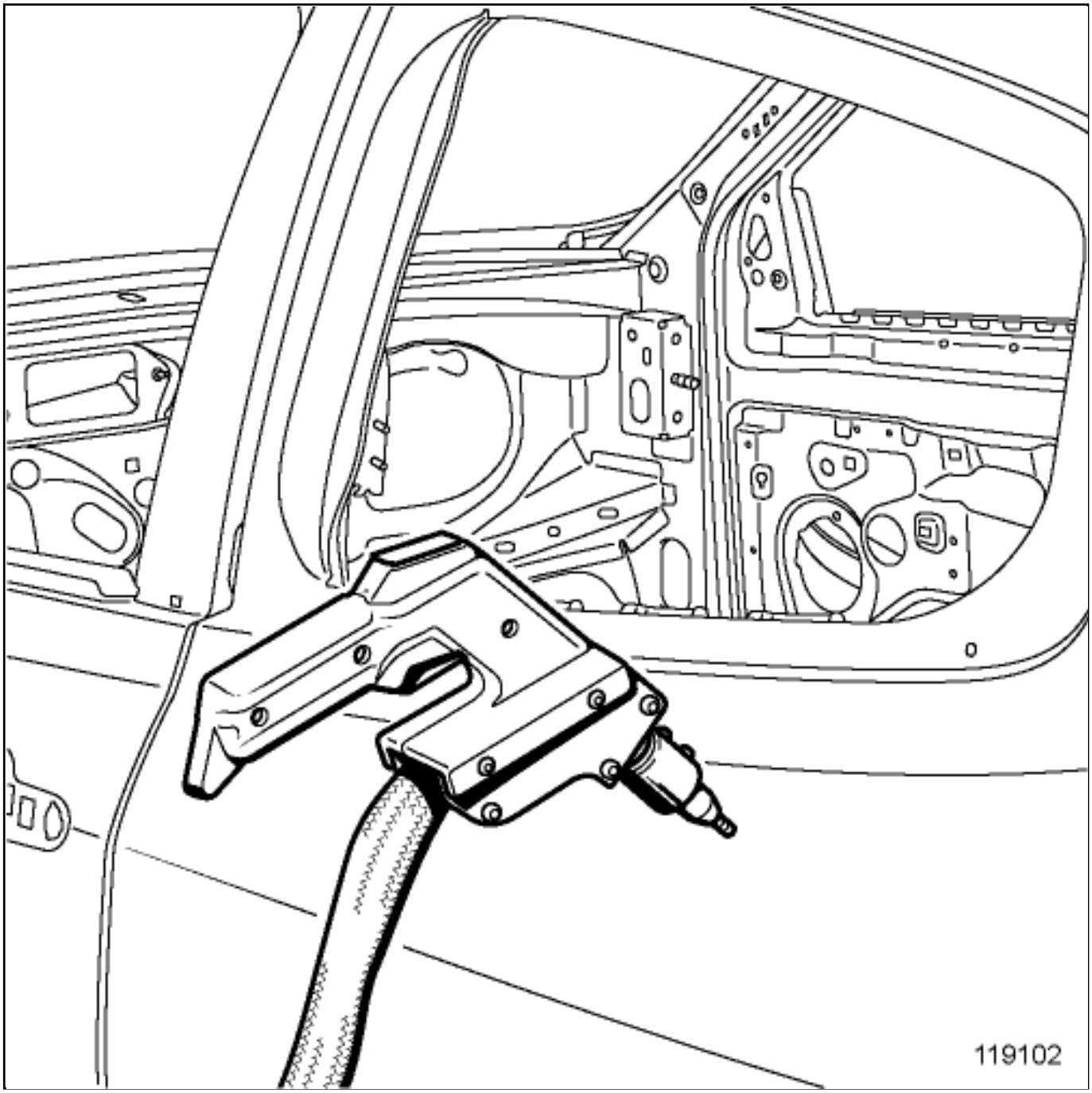


Steel :

■ the operation consists of repeatedly welding a star shape into the recesses of the dent. This is fixed at the end of a rod, along which an inertia weight slides.

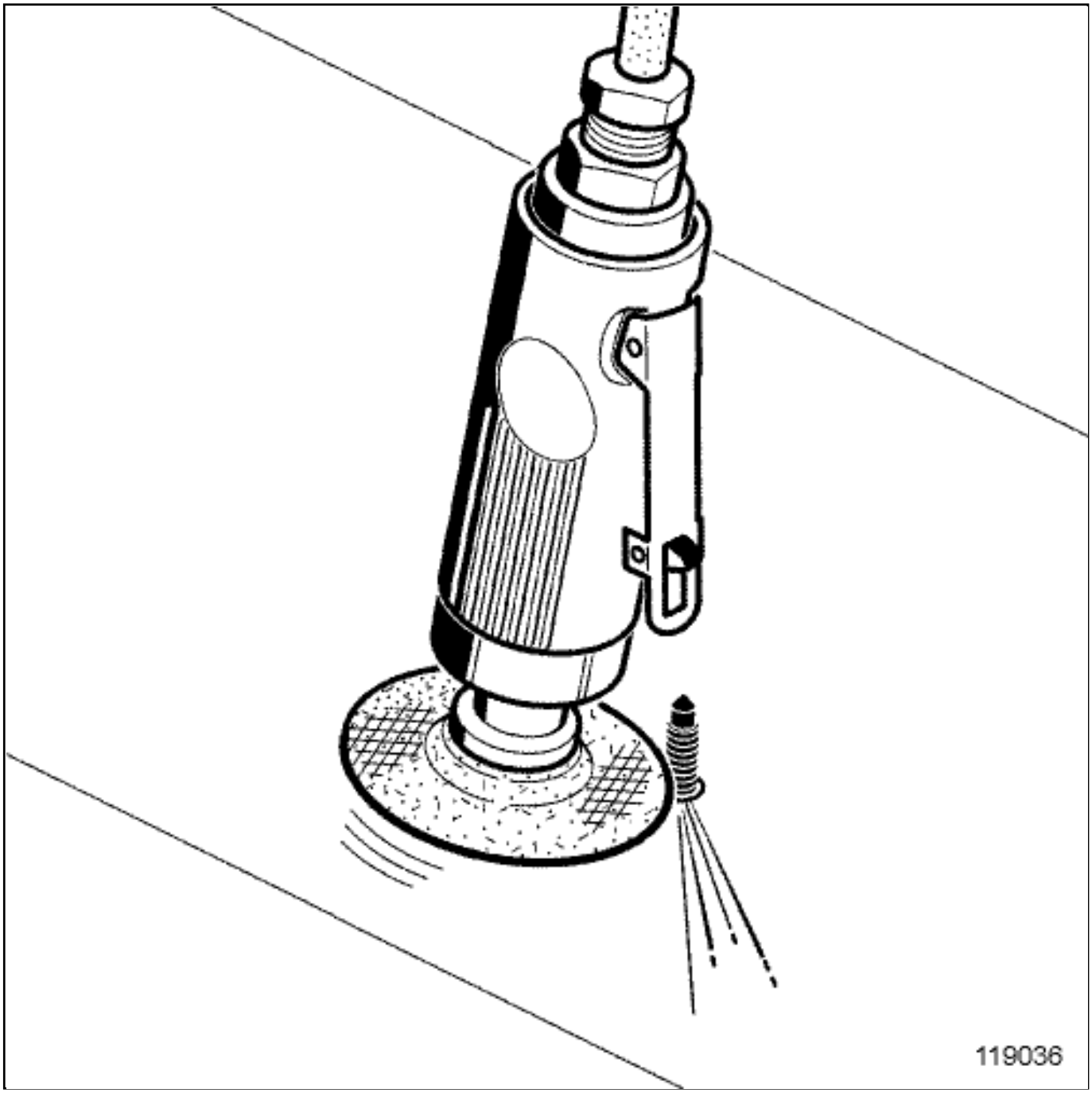
Note:

Always start the repair from the outside edge and work inwards, finishing at the centre.



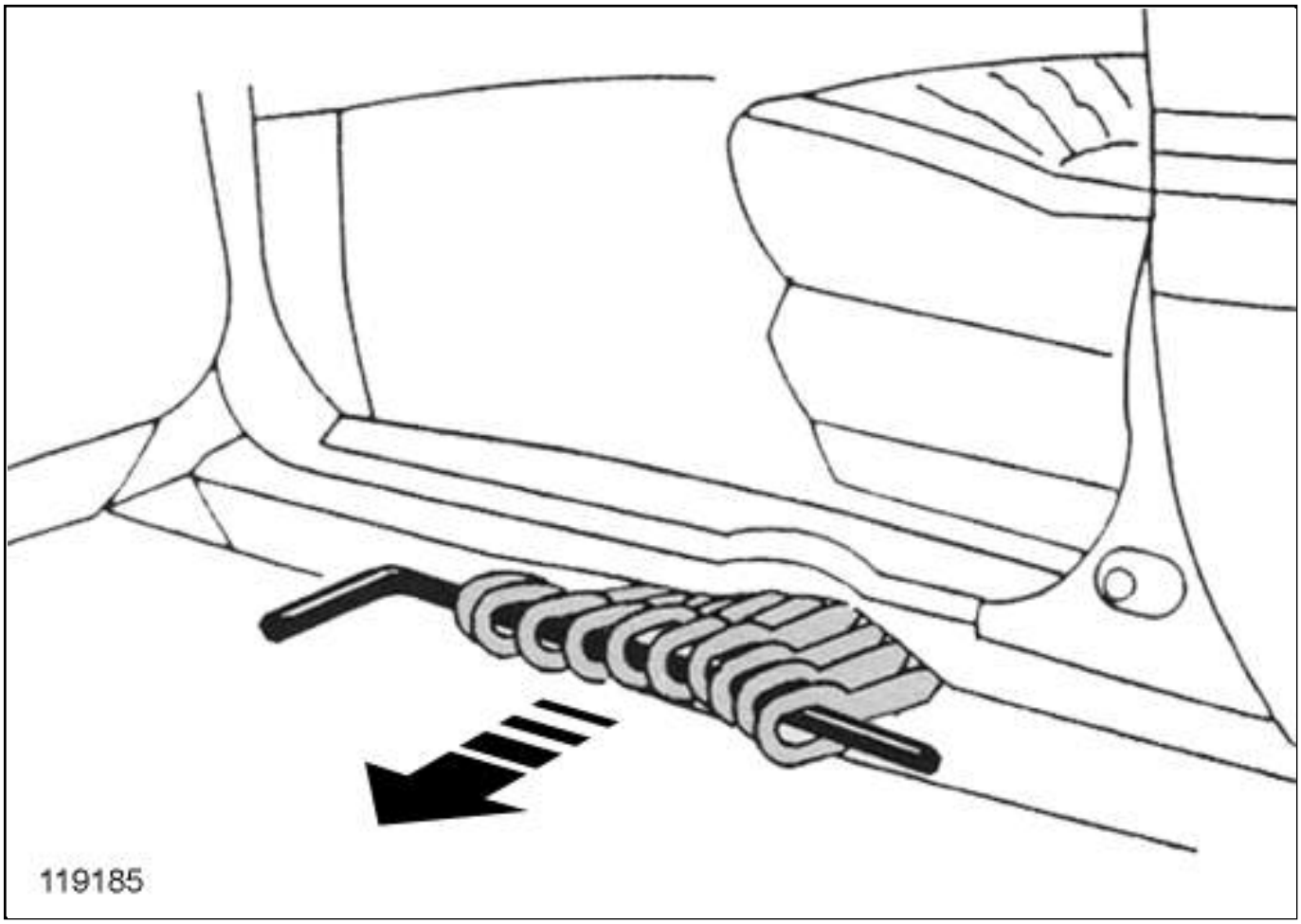
Aluminium :

■ this requires a specific technique and equipment, consisting of welding a threaded stud onto which the pulling device is screwed.



When the operation is complete, the stud is cut then ground. Do not under any circumstances reduce the thickness of the panel, to avoid weakening the component.

2)STRAIGHTENING BY MULTIPOINT PULLING



This technique is used for straightening deep gouge marks; it consists of welding a series of parallel rings in the recess of the deformity, into which a rod is fitted to allow a lever system equipped with a "clamp" to be attached. The advantage is that it can be used to straighten a significant deformation with a single pull.

3)HEATING

Note:

For steel, this operation destroys all original anti-corrosion protection on the internal and external faces of the heated zones. It is essential to inject wax into the hollow sections to protect the internal faces.

Steel :

■ an inductor type tool may be used, however in this process the metal is only hardened on the surface to avoid blistering; lengthening of the panel cannot be reduced.

Note:

In the event of excessive lengthening of the panel without access to the internal face, the component must be replaced.

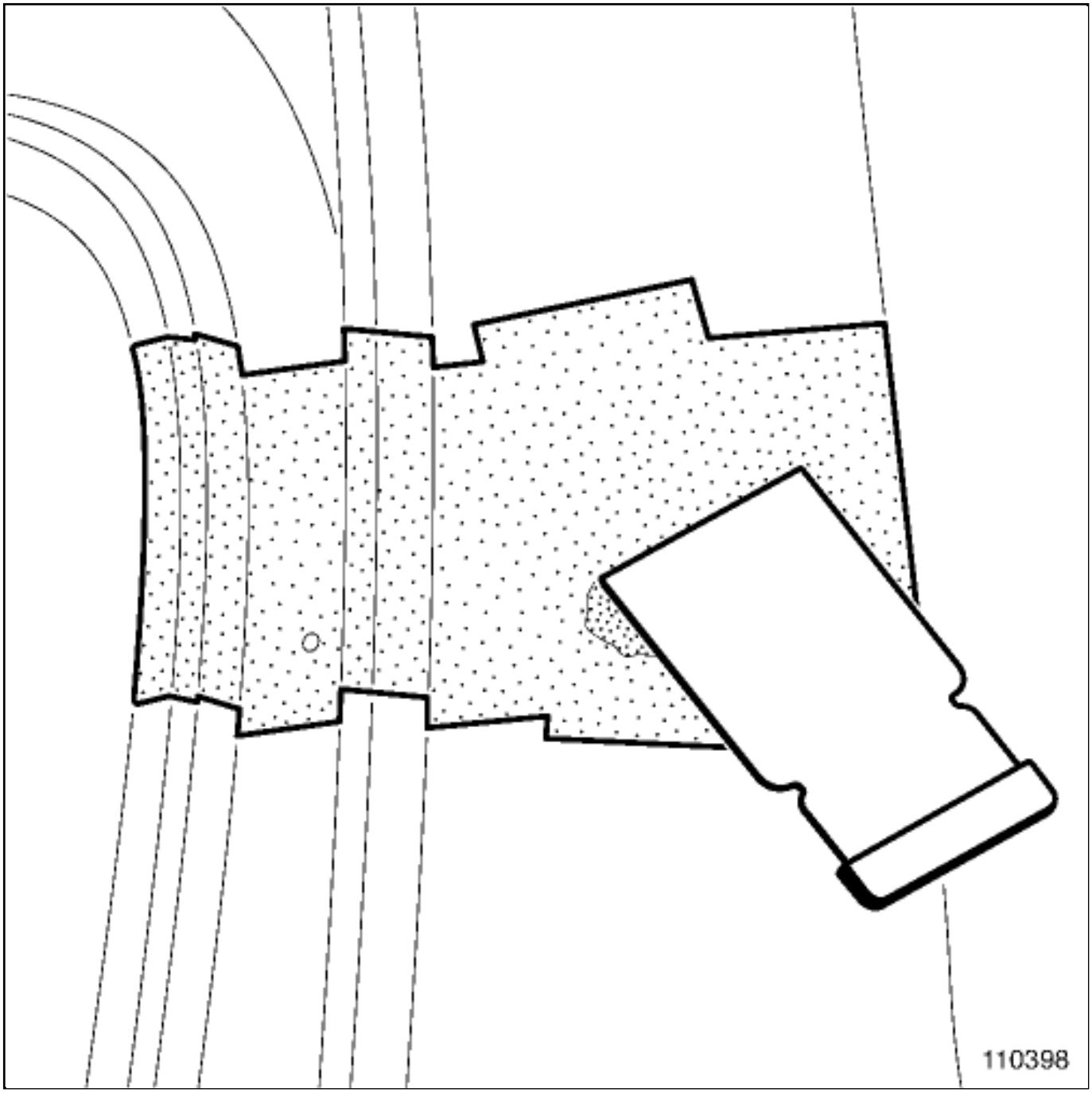
4)SHAPE FINISHING

In accordance with the new European directive on vehicle recycling, vehicles manufactured after the 1st July 2003 should not contain any lead based products.

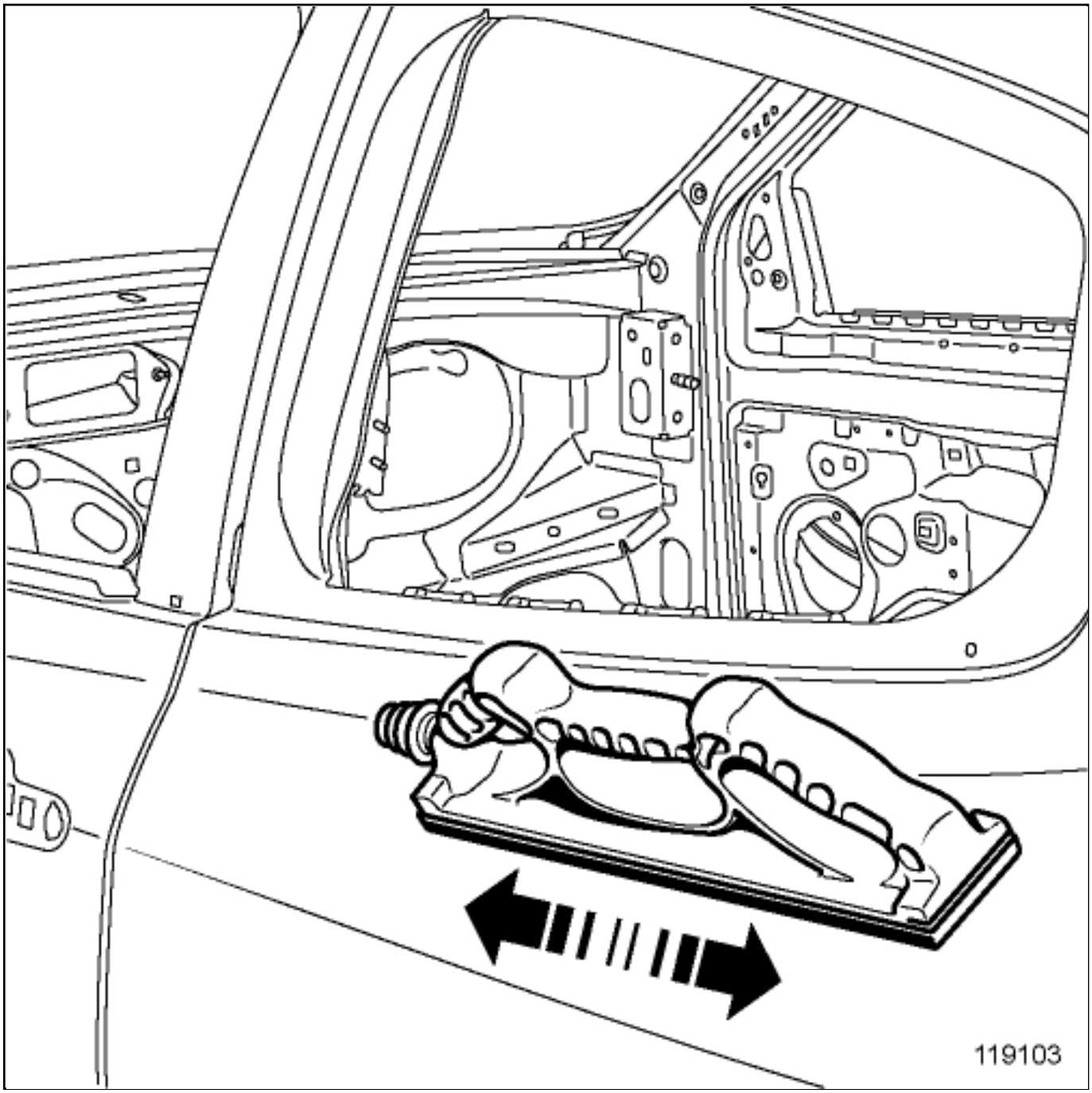
Furthermore, with regard to bodywork repairs, these vehicles should not be repaired using tin, which contains a large amount of lead.

The replacement solution for this type of operation is to use dual component polyester mastic containing aluminium. Aluminium panels are shape finished using "special aluminium" polyester mastic.

It is important that the thickness of the residual mastic following sanding does not exceed 1 mm.



Polyester mastic is applied using a block or broad knife.



Sanding during shaping should be done using P100dry sand paper with a large "file" type block.

Surface finishing should be via light sanding using P150sand paper.

Never use an "orbital" sander to sand during shape finishing, as the motion of this type of equipment is not suitable for the operation.

2. REMOVING DENTS FROM ALUMINIUM COMPONENTS

1- TOOLS

The basic tools used are the same as for repairing steel panels.

Only use tools and abrasive discs specifically used for repairing aluminium, in order to prevent contamination of the aluminium surface with steel particles, which could result in galvanic corrosion.

Favour the use of mallets, wooden stakes or possibly plastic stakes.

In order to prevent any impact marks and scratches, the metal tools should not have any sharp edges, and their surfaces should be smooth and polished.

Consequently, finishing hammers (grooved face) must not be used.

The edges of the files for soft metals should be rounded.

2- DENT REMOVAL

There is a higher risk of lengthening aluminium panels than steel panels; for this reason, the planishing operation should be carried out gently.

Panel lengthening can be eliminated by supplying heat (150˚C) which can be controlled using a temperature indicator.

Note:

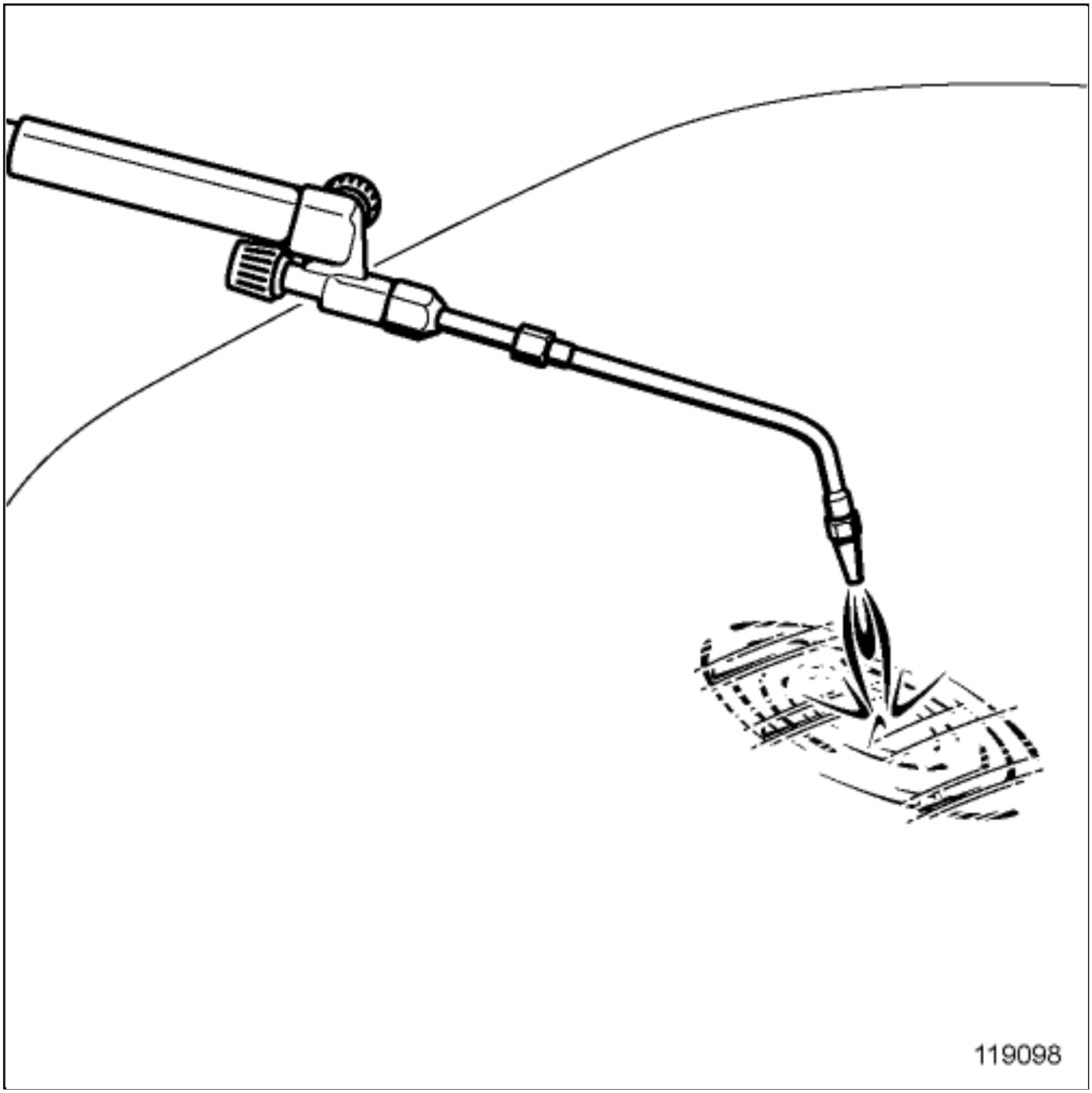
Use a 150˚ Heat Markerto control the heating temperature correctly (see IXELL product catalogue).

1)CHECKING THE TEMPERATURE

Before heating, remove any sign of coating (paint, primer, cataphoretic coating), as these can affect the temperature reading.

The flame of the blowtorch should be adjusted so that there is slightly more acetylene in relation to oxygen.

Mark the area using the pencil.



The marks will melt when the temperature is reached.

3- FINISHING

Aluminium bodywork component: Preparation and paint range (94A, Paint application range for panels).

3. JACKING

For reasons of passive safety, all jacking and straightening operations for structural components which have undergone deformation beyond the elastic limit (marked crumpling) must be followed by a planishing operation.

This applies to all structural components, irrespective of the type of panel. They must be replaced if they cannot be straightened cold.

It is very difficult to cold straighten an ultra high elastic limit panel, and you are strongly advised not to heat the material to make it malleable.

For major impacts, it may be necessary to perform preliminary jacking in order to:

- detach the electrical wiring harnesses,
- release the mechanical components to be removed,
- gain access to a joint.

This should not affect the choice of jacking equipment; this is made according to the type of repair to be carried out (see below).

4. LIGHT JACKING

1- JACKING PARTS OF A VEHICLE WHICH DO NOT HAVE A DIRECT INFLUENCE ON STRUCTURAL BEHAVIOUR (E.G.: REAR END PANEL, WHEEL ARCH, FLOOR, LININGS)

All the straightening techniques described above may be used for any parts which are not directly visible and whose primary function is not structural.

2- JACKING AND STRAIGHTENING A STRUCTURAL COMPONENT

For all straightening operations on one of these components, perfectly align the "edges" and blanks by "planishing" with a suitable stake and hammer.

Note:

Never use an inertia type straightening device.

To do this, detach the component's closure panel to gain access to the internal face during straightening.

You are strongly advised not to use shape finishing mastic on a structural component to hide residual crumpling.

1)JACKING WITHOUT SUBFRAME CHECKS

When there is no need for geometry checks (e.g.: rear end panel, scuttle side panel upper

reinforcement, front or rear side member ends), repair without parts replacement is carried out on a standard small straightening bench (See: Garage equipment catalogue).

2)JACKING WITH SUBFRAME CHECKS

When geometry checks are necessary (e.g.: assembled side members, front half unit or all parts comprising mechanical mounting points), repair without parts replacement is carried out on a small straightening bench equipped with special raised anchoring clamps to allow a geometry checking system to be positioned underneath the vehicle.

5. HEAVY JACKING AND REBUILDING WITH SUBFRAME CHECKS

The parts concerned by this procedure are identified in each vehicle MR in sub-section 40A**Structural components to be positioned on the repair bench: Description** .

The parts may be partially replaced, except for ultra high elastic limit components, for which complete replacement is compulsory.

When straightening or replacing these parts, it is essential to check the geometry of the components; repairs are carried out on a repair bench (body jig bench) (See: Garage equipment catalogue.

The repair bench consists of several components, each of which fulfils a distinct function:

- The body jig bench: rigid base plate which simultaneously supports and secures the vehicle. This is equipped with an anchoring system comprising four anchoring clamps which may be fitted with additional retaining devices for the three-dimensional checks.
- The jacking system: must comprise at least a 10 tonne bracket, a special “pulling” chain and a gripping device.
- The geometry checking system: this may be either positive, or use three-dimensional measuring. It is used to check and realign important structural points during straightening operations, and the spatial positioning of replaced components in relation to the body.

STRUCTURALACOUSTICPROTECTION

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

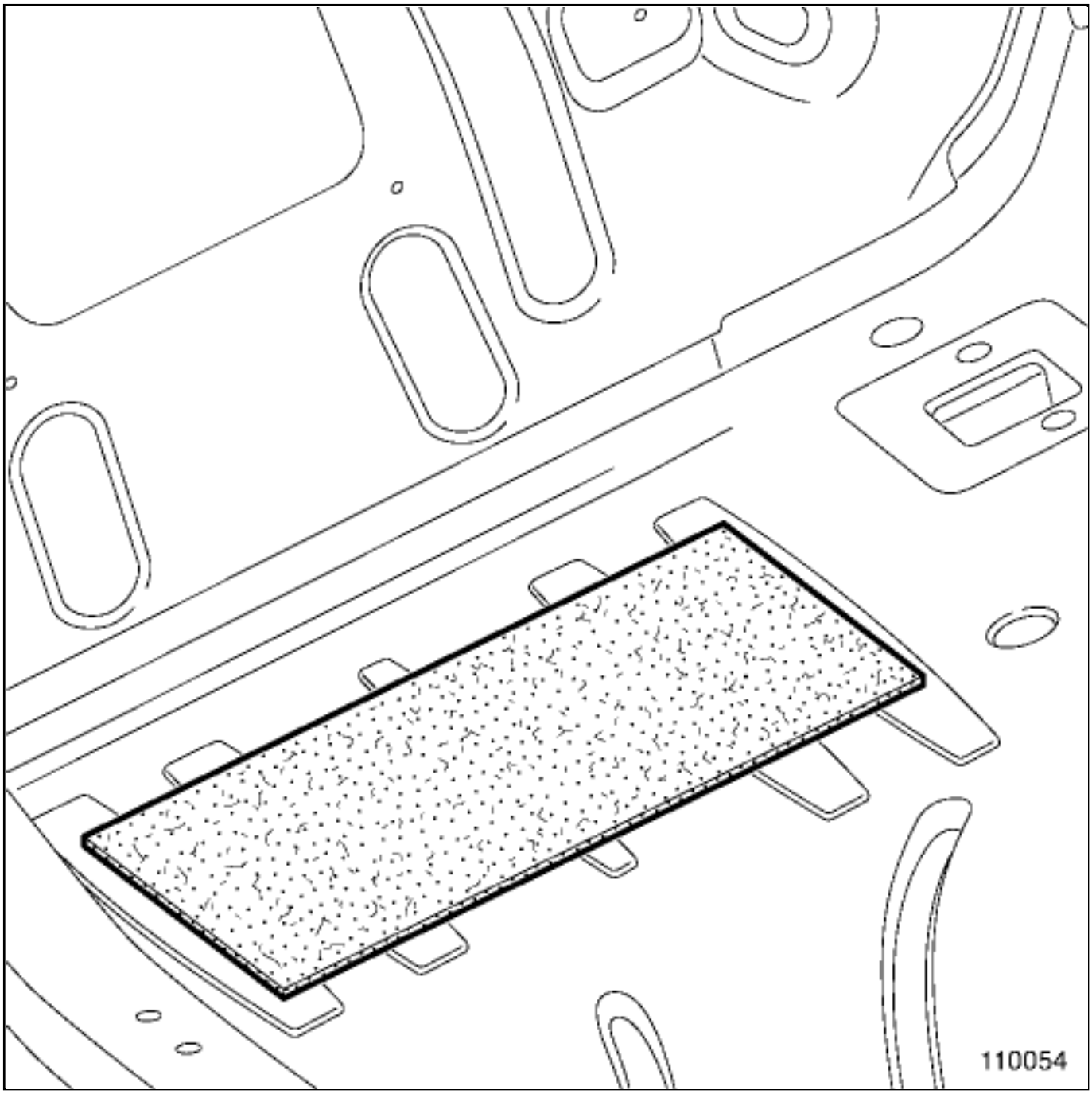
1. SHOCK ABSORBING PANELS

1- PREPARATION

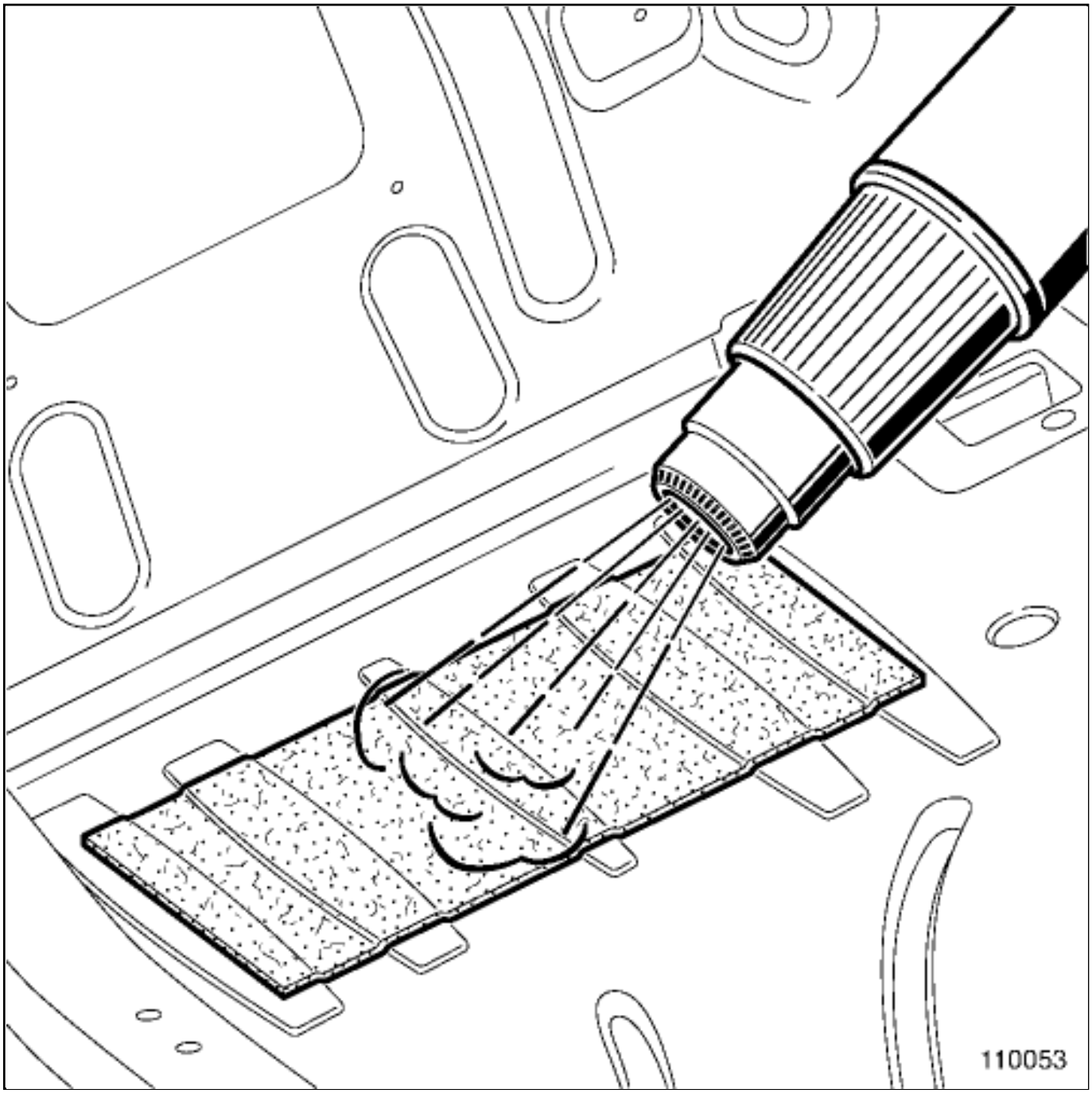
Cut out the panel according to the shape and the dimensions of the original.

Clean the application area on the vehicle.

2- BONDING



Apply the panel on the original location.



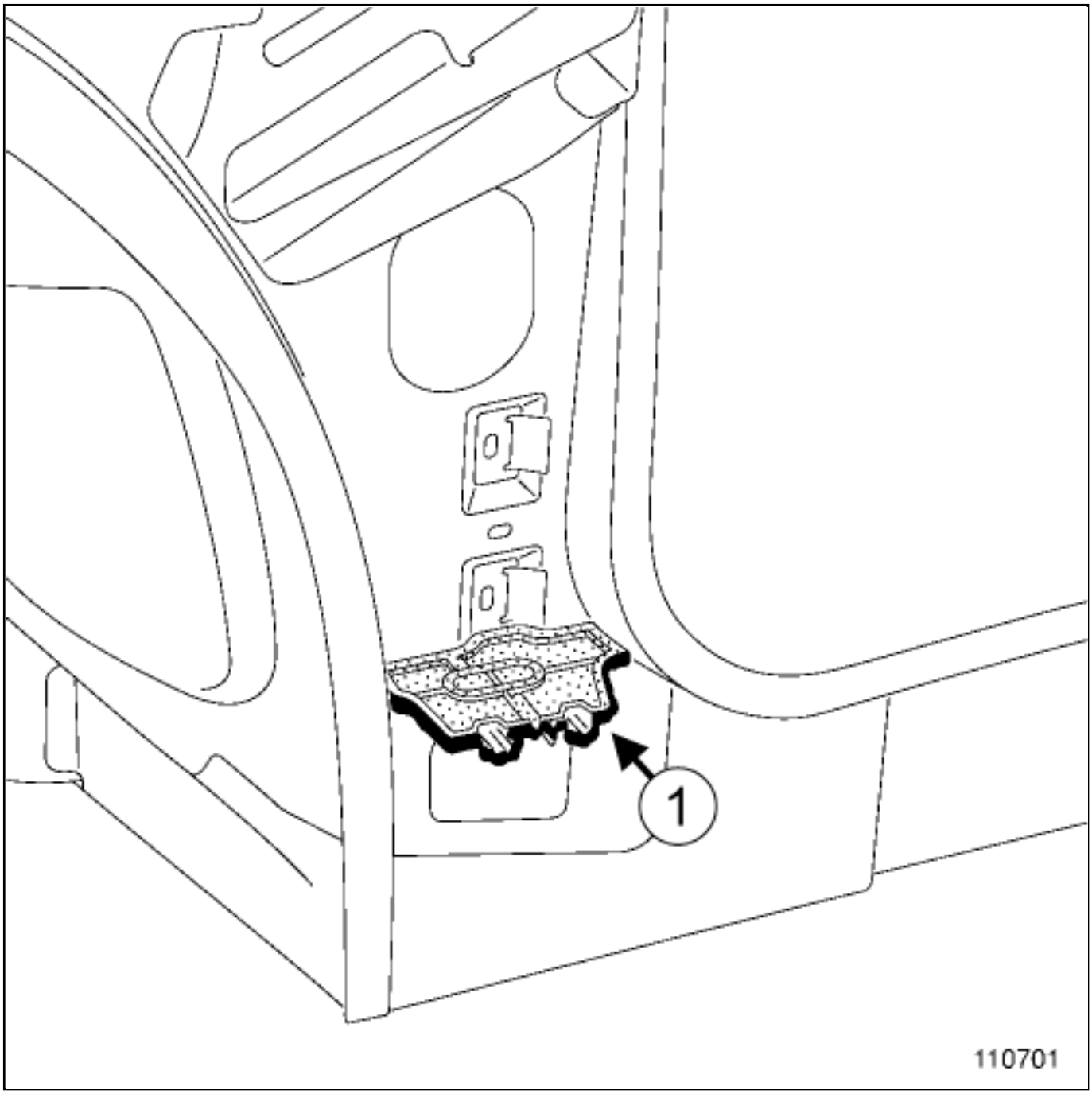
Remove the protective film on the sticky side of the panel.

Lightly and regularly heat the panel by flattening it with a spatula to optimise the adherence and the shaping of the panel in relation to the support shape.

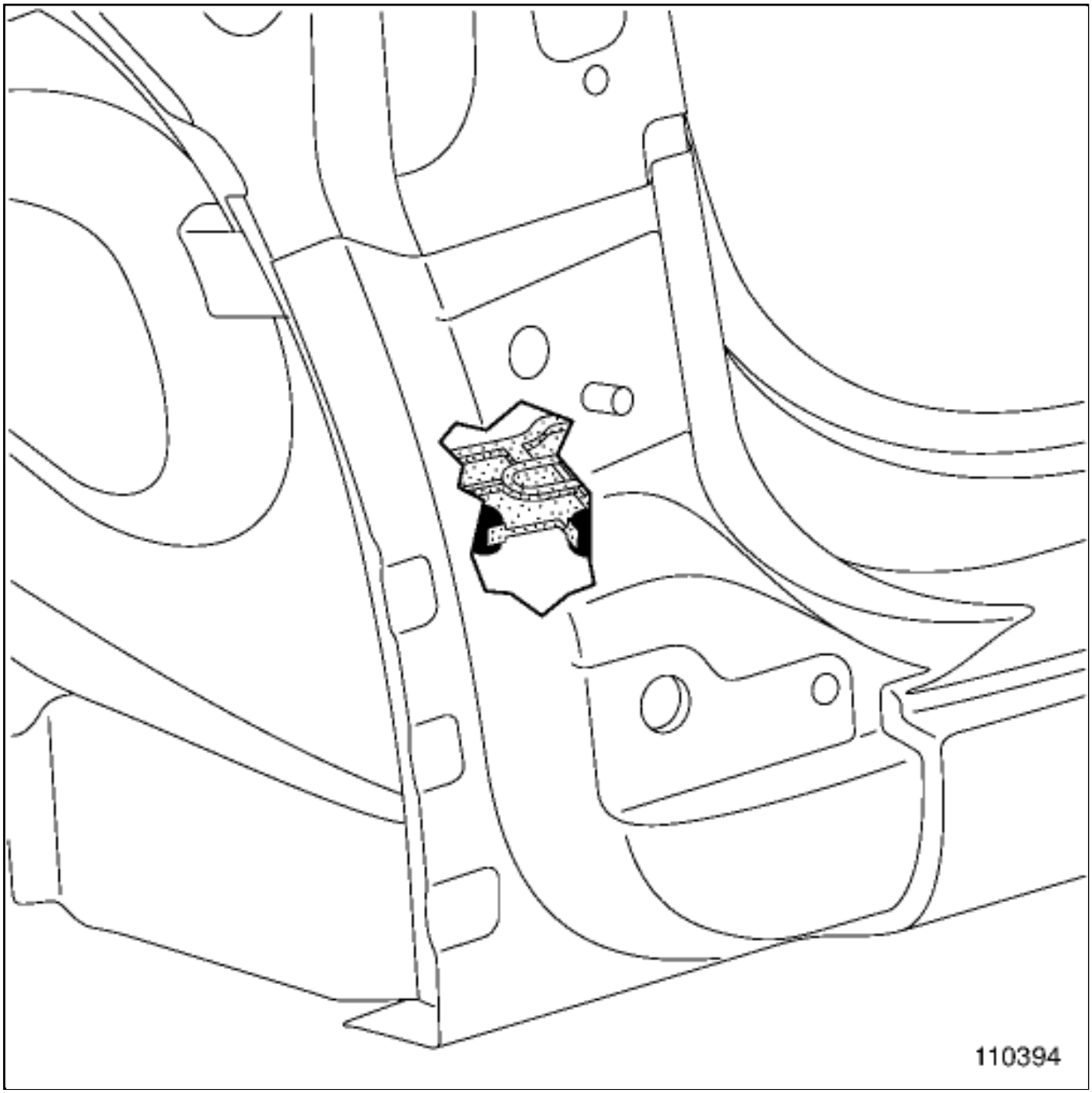
After cooling, check for the absence of air bubbles; if then appear, the area should be reheated.

2. HOLLOW SECTION INSERT

Clean the insert fitting area on the vehicle and on the new part.



Position the preformed masticbeading (1) on the vehicle in the same position as the original insert.



Assemble the new part by squeezing the bead.

STRUCTURALBODYWORKDOCUMENTATION:DESCRIPTION

1. CLASSIFYING INFORMATION

This information is classified in two complementary documents:

1- VEHICLE STRUCTURE BODYWORK REPAIR PROCEDURES (MR OF THE VEHICLE CONCERNED)

This document comprises two sections:

1)SECTION 0:

- This section does not contain repair methods, it only contains description information; it consists of several subsections:
  - 01C Vehicle bodywork specifications,
  - 02A Lifting equipment,
  - 02B Bodywork innovations,
  - 03B Collision,
  - 04B Consumables - Products,
  - 04E Painting,
  - 05B Bodywork equipment and tooling.

2)SECTION 4:

- This section consists of several subsections:
  - 40A General information,
  - 41A Lower front structure,
  - 41B Lower central structure,
  - 41C Lower side structure,
  - 41D Lower rear structure,
  - 42A Upper front structure,
  - 43A Upper side structure,
  - 44A Upper rear structure,
  - 45A Top of body,
  - 47A Side opening elements,
  - 48A Non-side opening elements.

- These subsections are linked to the Replacement Parts Catalogue and contain two types of information:
  - Section 1: General description. This section contains information relating to generic structural spare parts and to their design. This information may be the same for several vehicles.
  - Section 2: Description, Removal - Refitting, Stripping - Rebuilding and Adjustment. This section contains information relating to structural spare parts and the special features of the vehicle concerned.

Note:

Always read both parts in order to have all the necessary information to repair the vehicle.

2- FUNDAMENTALS OF THE STRUCTURE BODYWORK REPAIR (MR 400)

This document comprises two sections:

1)SECTION 0:

this section consists of several subsections:

- 04F Bodywork products and mountings
- 05B Bodywork equipment and tooling

2)SECTION 4:

This section contains information on the basic operating ranges which concern the bodyshop technician.

this section consists of several subsections:

- 40A General information
- 40B Electrical resistance welded connections
- 40C Gas metal arc welded connections (GMAW)
- 40D Laser welded connections
- 40E Partial replacement connections
- 04F Bonded connections
- 40G Riveted connections
- 40H Screw connections
- 40J Protective devices

2. INFORMATION SEARCH

Questions	Answers
Features of specific tools to repair a given vehicle.	Refer firstly to section 0 of the Vehicle MR then refer to the "special tooling catalogue" or the "garage equipment catalogue" .
Features of specific products to repair a given vehicle.	Firstly refer to section 0 of the Vehicle MR then refer to the "IXELL product catalogue" .
Description and part number of a specific tool to repair a given vehicle.	Firstly refer to section 0 of the Vehicle MR.
Using a bodywork tool.	Refer to subsection 40A of the Vehicle MR.
Information concerning the replacement parts of a given vehicle regarding: ■ the possibilities of replacement with the position on vehicle, ■ an adaptation before the assembly, ■ a cutting place with the special notes on this cut, ■ special notes on right-left symmetry. ■ special features of the version or equipment.	Refer to the subsection which corresponds to the part concerned: 41 to 48 of the Vehicle MR.
Information concerning the spare parts of a given vehicle, the composition and the specifications of each part it contains.	Firstly refer to the parts description exploded view in subsection 40 of the Vehicle MR.
	If this is detailed in the document, refer to subsections 41 to 48 of the Vehicle MR which corresponds to the part concerned.
	If this does not appear in the description, refer to subsection 41 to 48 for the part in the next level up.

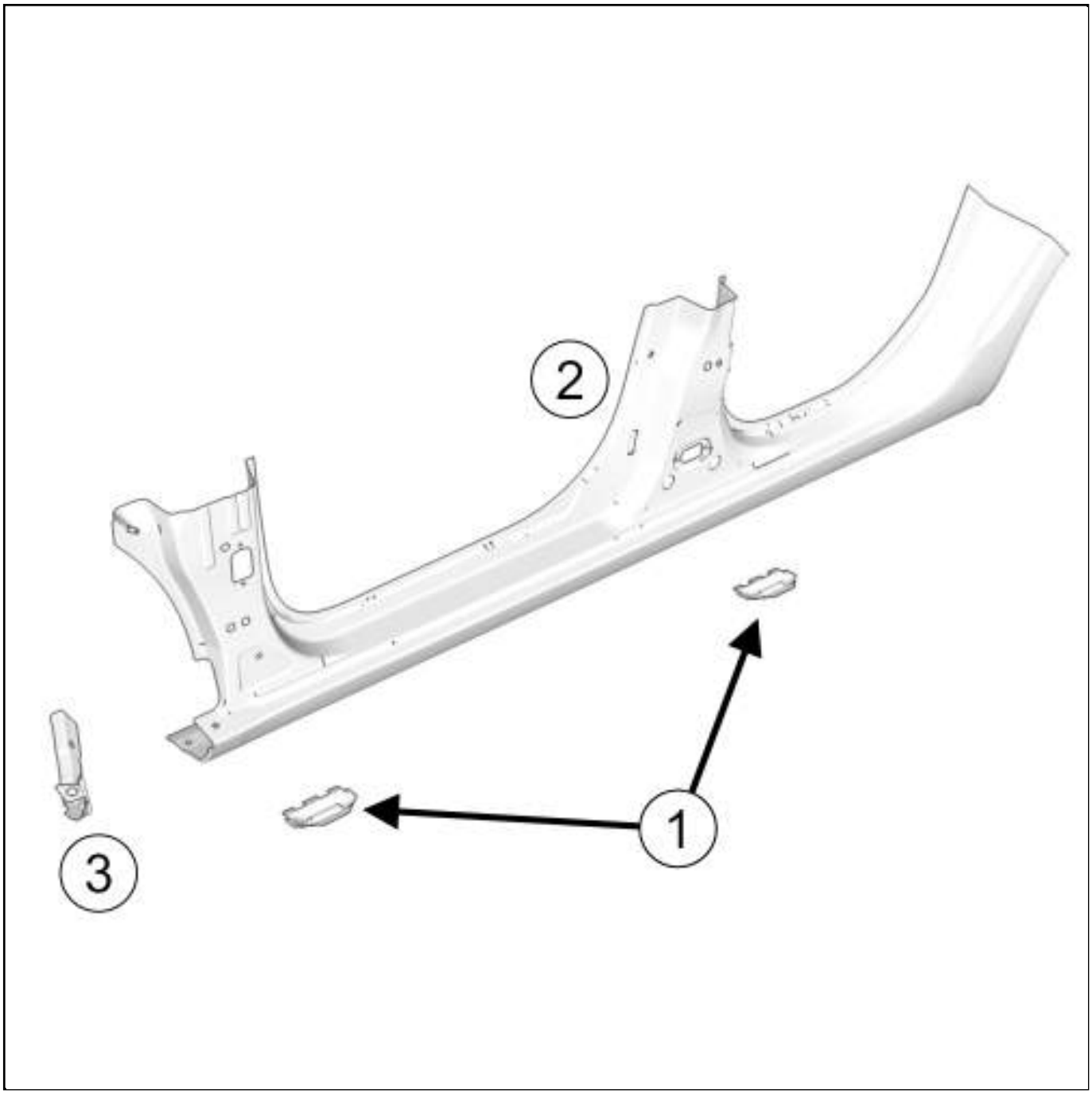
❑ Information concerning: ■ details of panel overlap on a joint, ■ a procedure and an operational mode relating to a new type of assembly in Renault, ■ a method for using a tool or a new product which is unfamiliar in Renault.	Refer to the subsection which corresponds to the part concerned: 41 to 48 of the Vehicle MR then subsection 40 of Vehicle MR 400.
Towing and raising a vehicle after an accident.	Firstly refer to subsection 02A of the Vehicle MR then the equipment catalogue.
Combination of impacts to repair a given vehicle.	Refer to subsection 03B of the Vehicle MR.
Fault finding on an impact for a given vehicle.	Firstly refer to subsection 03B of the Vehicle MR or MR 400.
Logic of impact fault finding.	See MR 400.
❑ General instructions for: ■ repair, ■ safety, ■ preparing a vehicle, ■ tool classification, ■ precautions for repair.	Refer to section 0 of the Vehicle MR or MR 400.

3. SYMBOLS FOR STRUCTURE REPAIR PROCEDURES

You will find below the detailed explanations of all the symbols used in the structure bodywork methods.

❑ At the top of each DU you will find a reminder of these different components:
- ■ the tightening torques,
- ■ the specific tools.

1- SPECIFICATIONS OF SPARE PARTS



When a spare part consists of several parts, a table indicates the components of the spare part with notes on the illustration.

No.	Description	Type	Thickness (mm)
(1)			
(2)			
(3)			

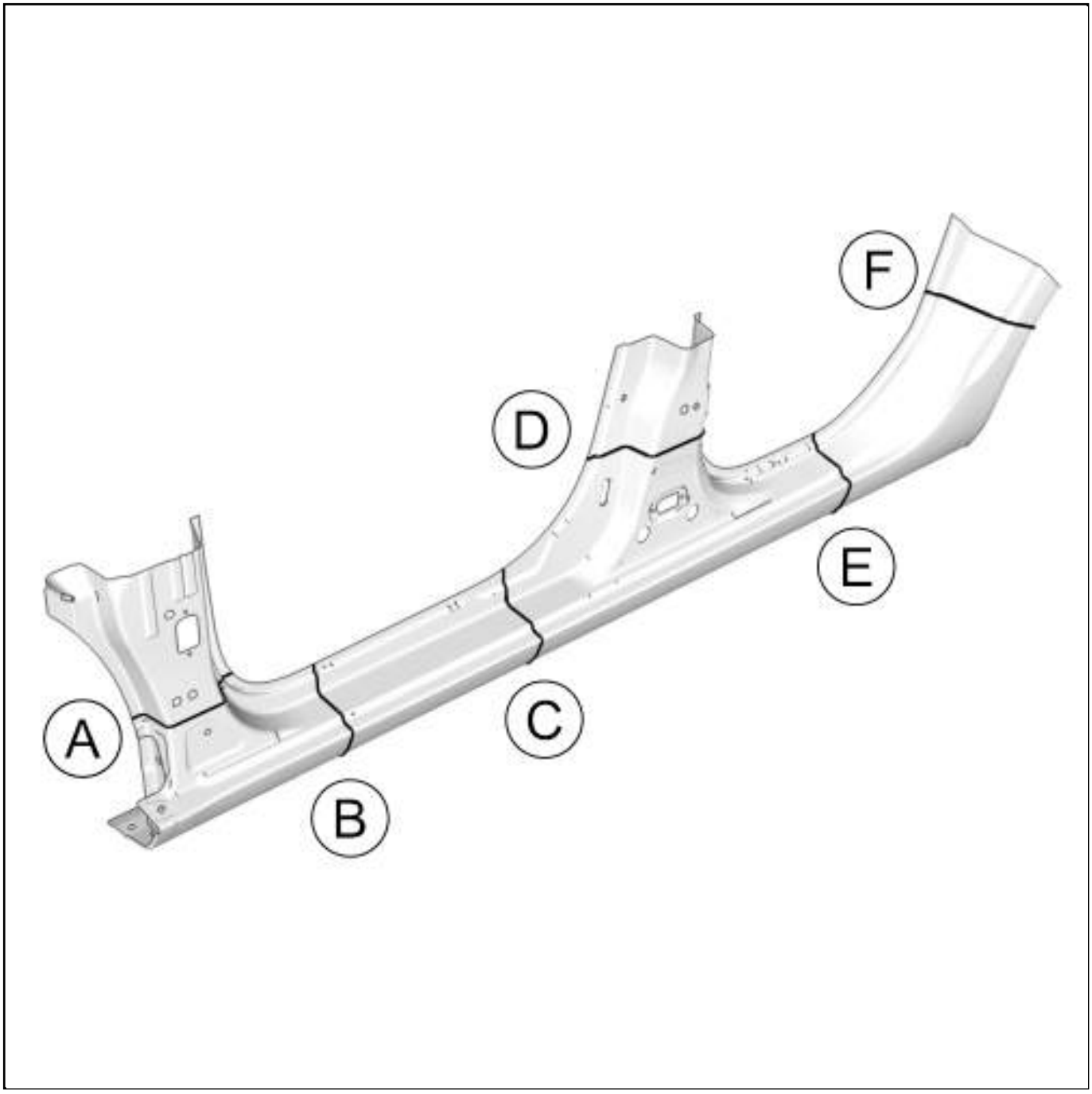
2- IN THE EVENT OF REPLACEMENT

Only on illustrations of replacement parts, the bold lines indicate the possible cuts that can be made in the case of a partial replacement.

A list indicates the name and the marks that delimit the replacement.

The options for replacing this part are as follows:

- complete replacement A-D-F,
- front end partial replacement A-C,
- front section partial replacement A-D-E,
- partial replacement under door B-C,
- rear section partial replacement C-D-F,
- rear end section partial replacement E-F.



3- PART IN POSITION ON THE VEHICLE

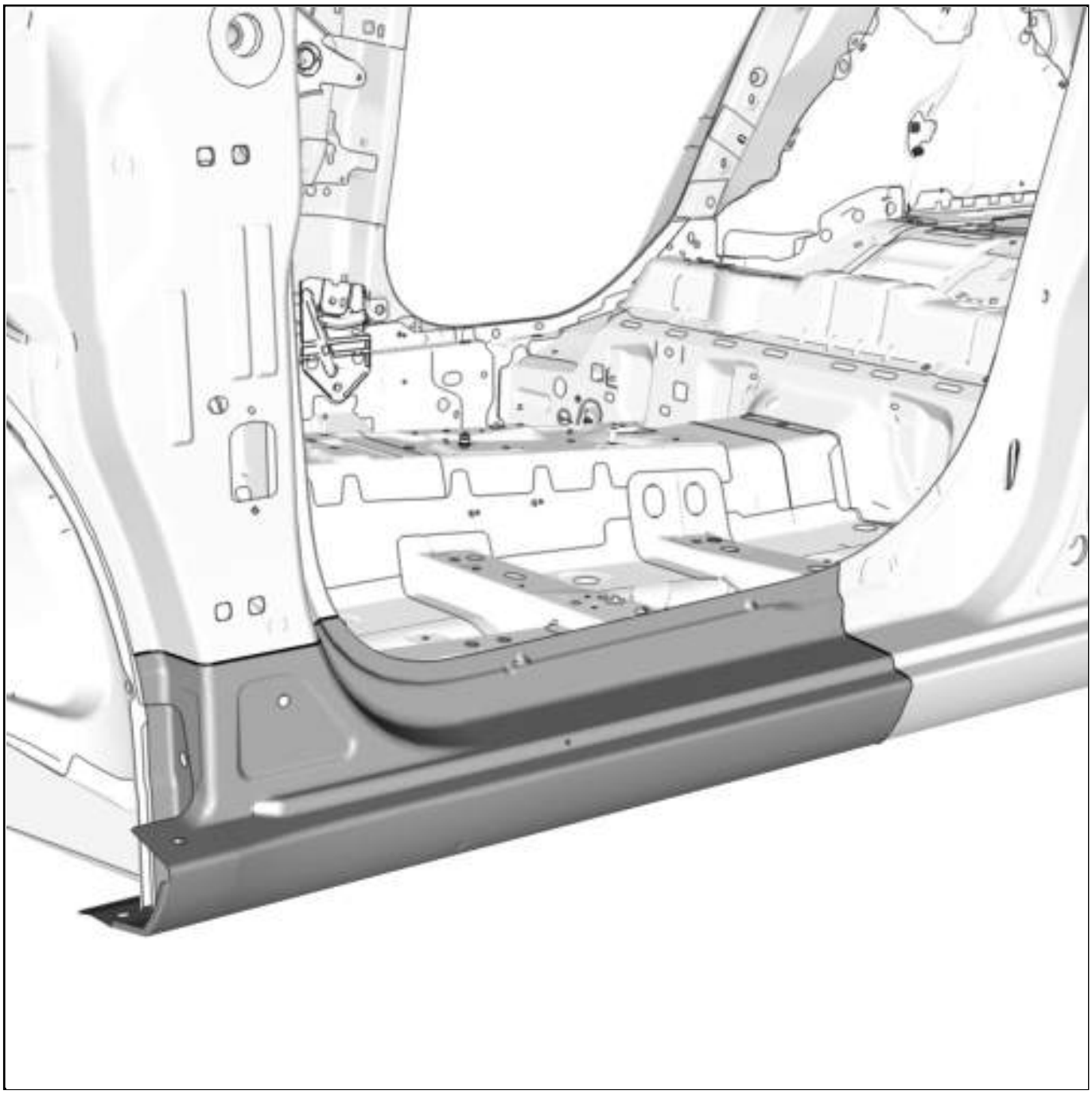
The spare part is always shaded when shown on the vehicle.

The drawings prioritise the different parts depending on the replacement method.

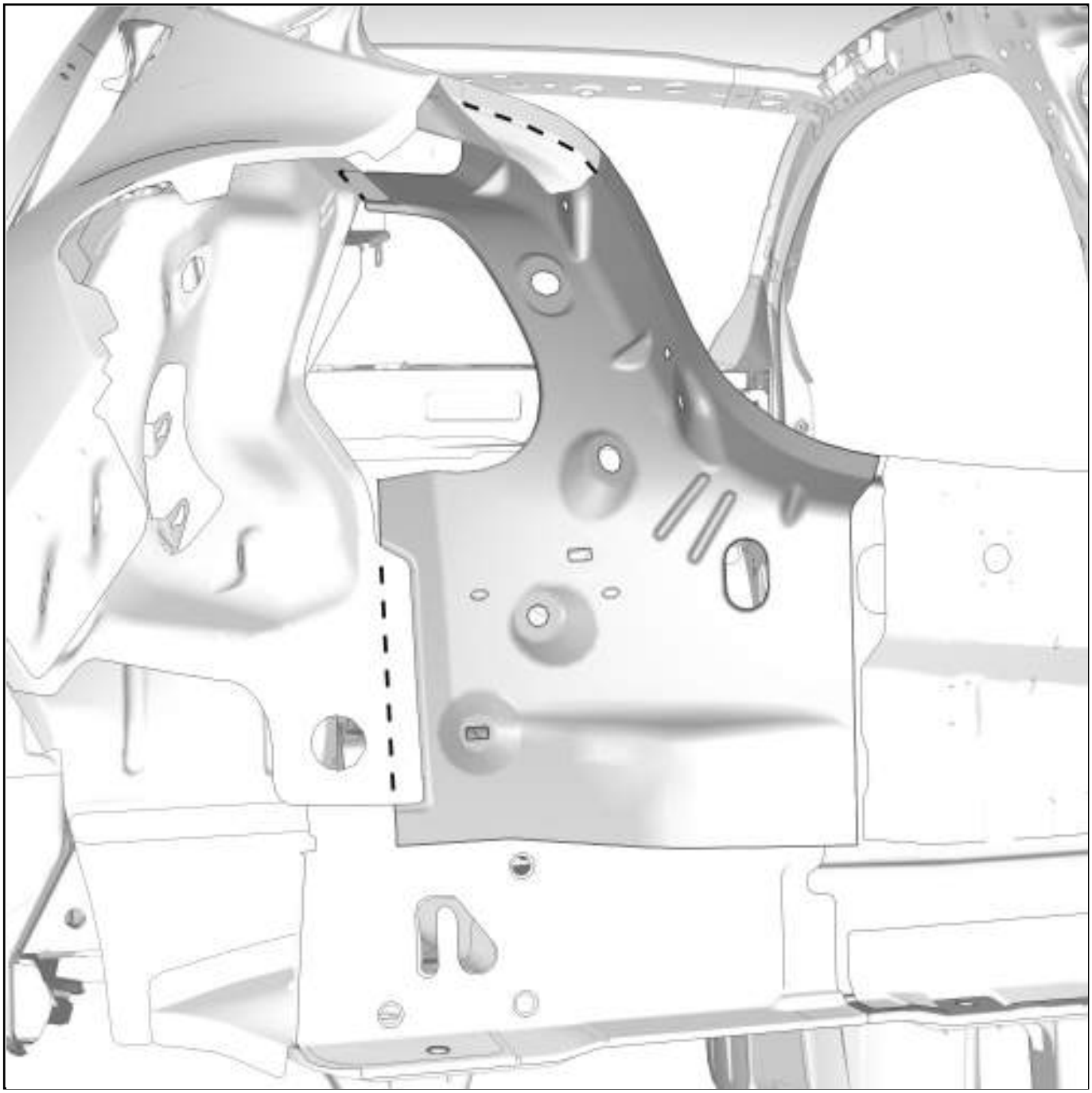
The illustration should show the part to be replaced without the neighbouring components as if they have already been removed.

However, some diagrams may not follow this rule in order to better depict the part in its location.

The structural repair methods are carried out using uncoated steel bodywork panels. The original mastics are not illustrated.



The hidden parts of the spare part are shown with dotted lines.



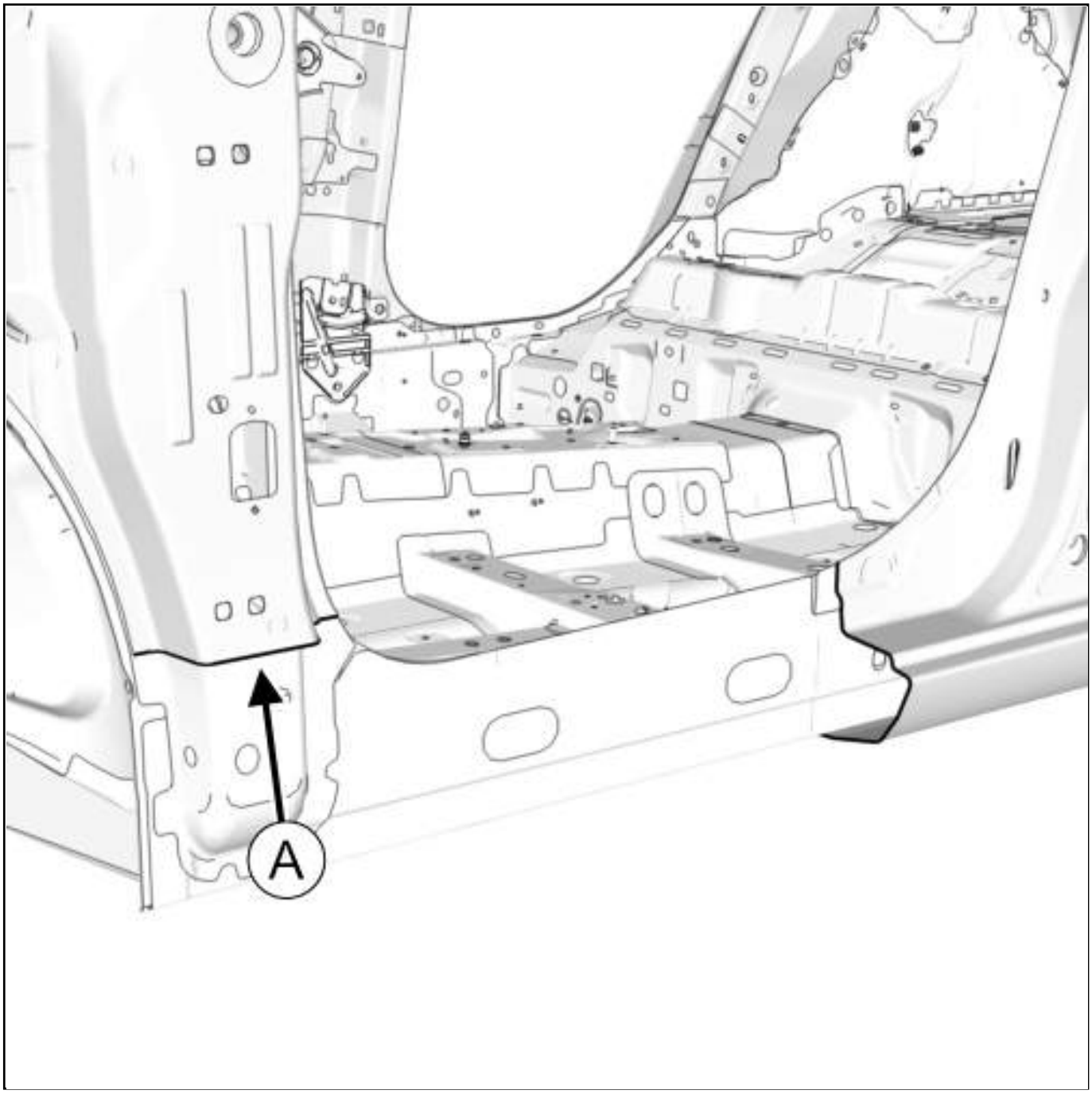
When a part is symmetrical (identical right and left side), there will only be one side shown in the method (e.g.: partial replacement of rear section rear floor).

This means that the same operation is to be carried out on the opposite side (number of spot welds, etc.).

If the opposite is the case, specific details are indicated (including cases with right- and left-hand versions).

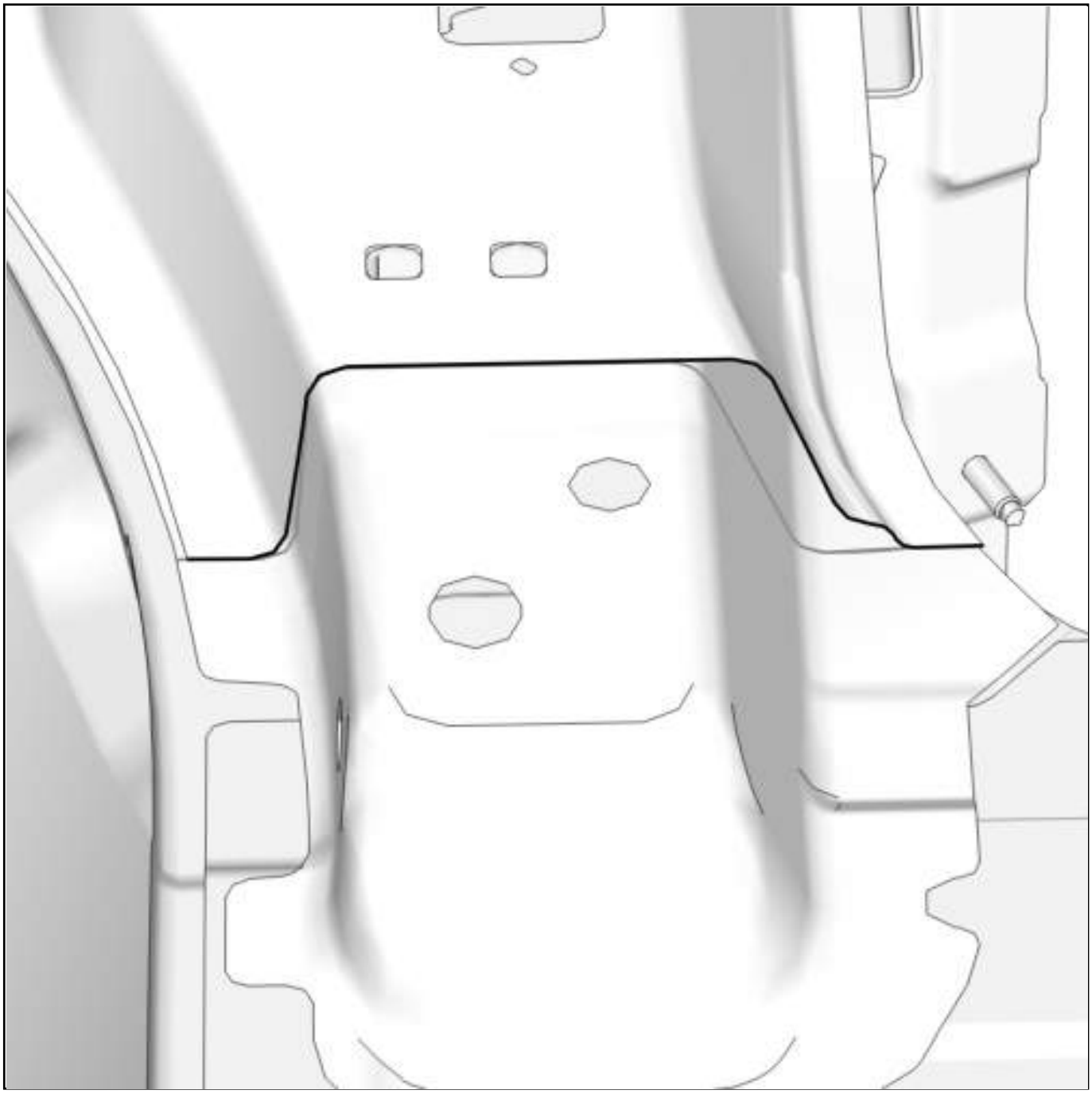
4- SYMBOLS FOR DETAILED VIEWS

The detailed views define the space between the part to replace and the vehicle structure.



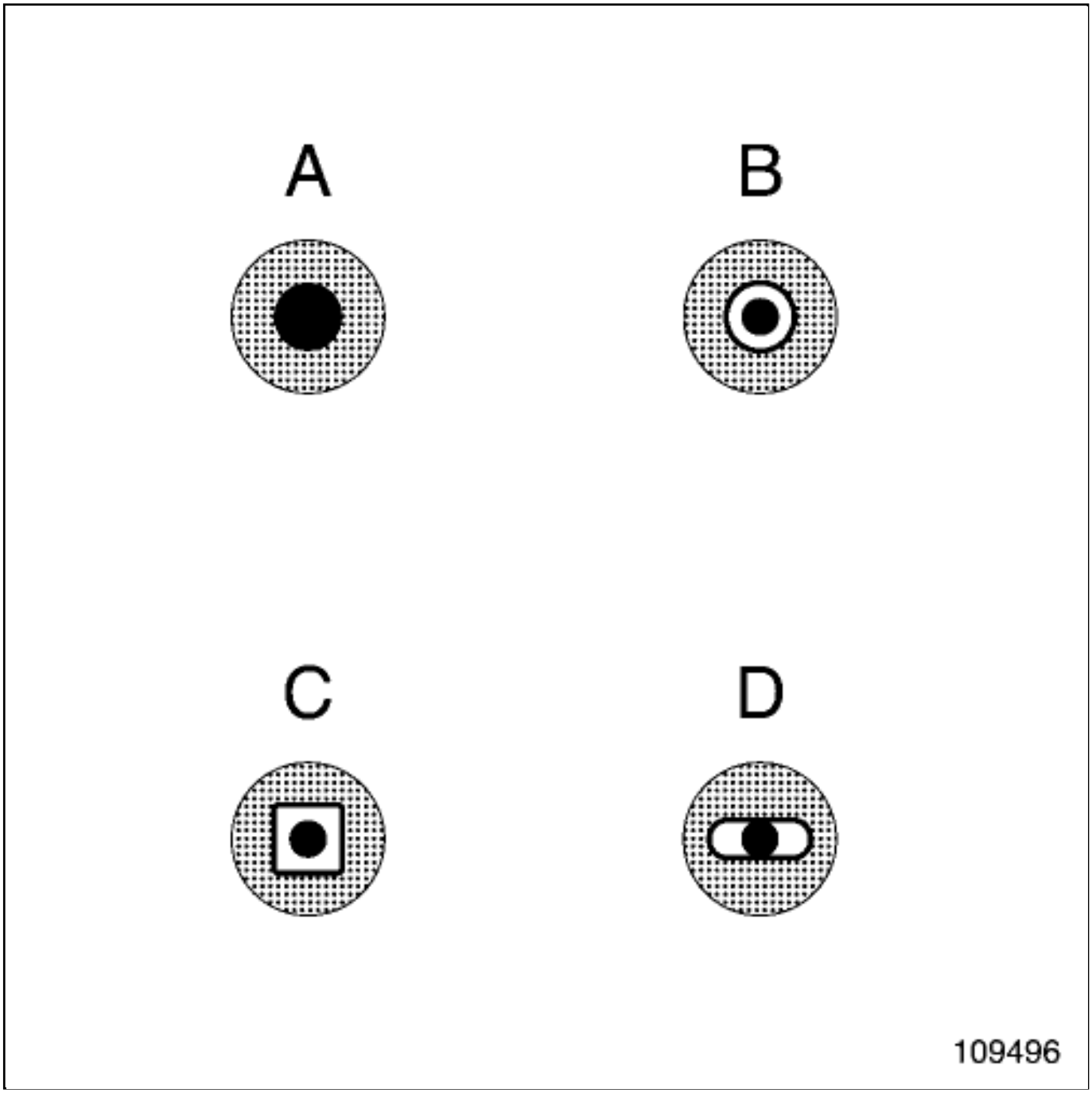
The mark(A) designates the viewing direction of the detailed view for proper orientation of the associated detailed view.

DETAILED VIEW A



5- SYMBOLS FOR OPENING ELEMENT ADJUSTMENTS

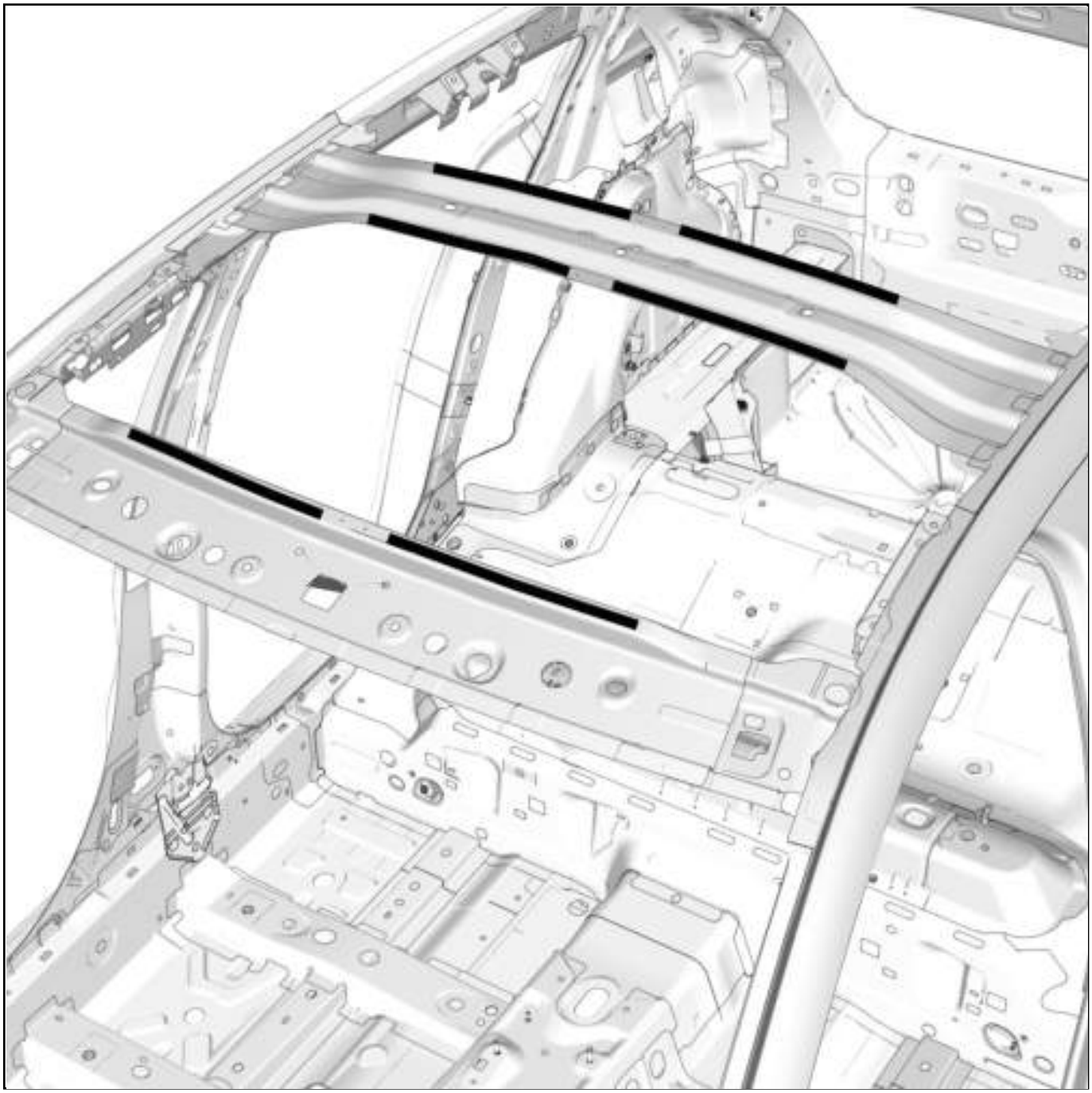
Different symbols indicate the possibilities for adjustment:



The mountings are shaded.

6- SYMBOLS FOR ADHESIVES AND MASTICS

A shaded band represents the path of a bead of adhesive or mastic.

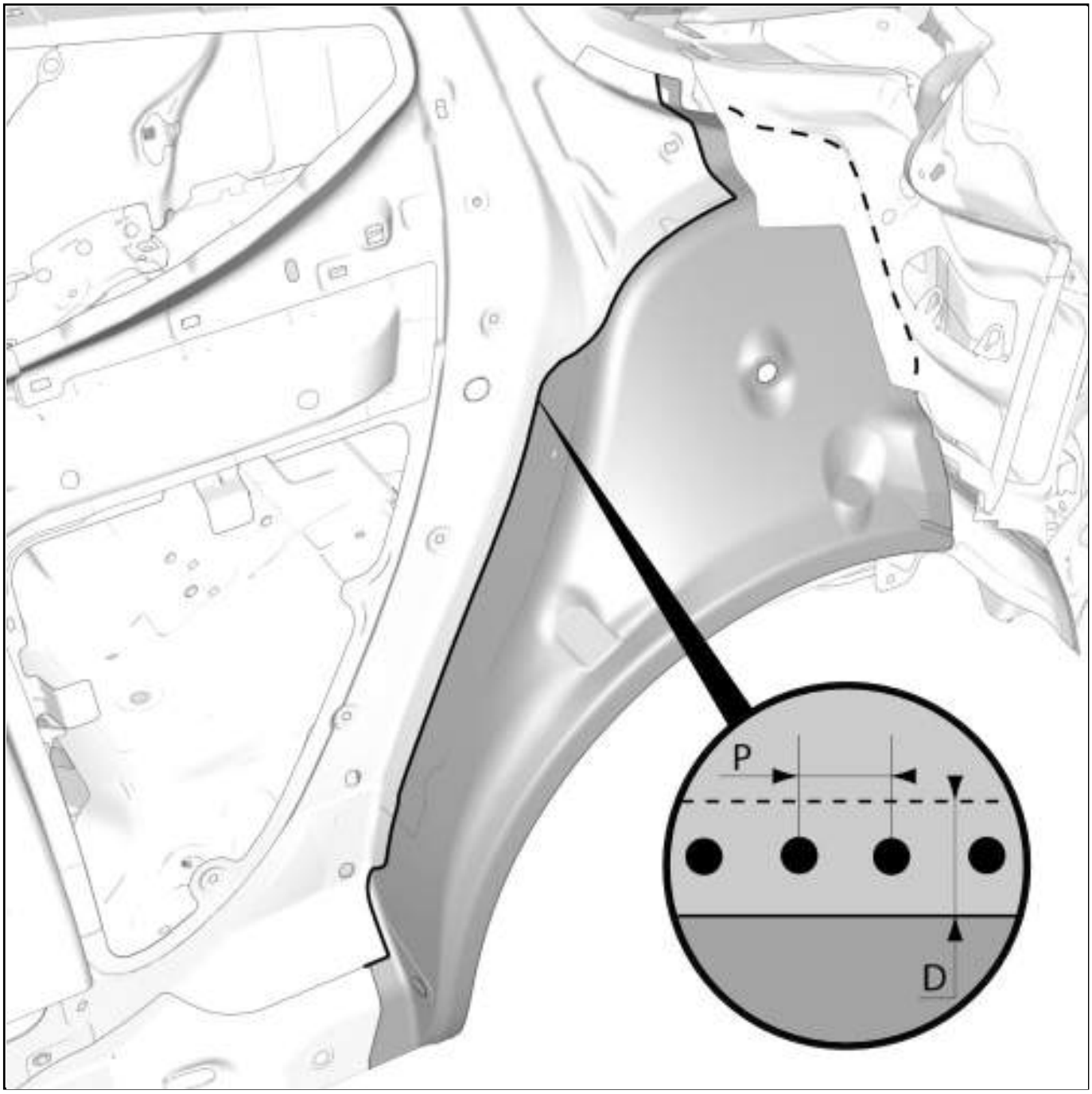


7- SYMBOLS FOR WELDS

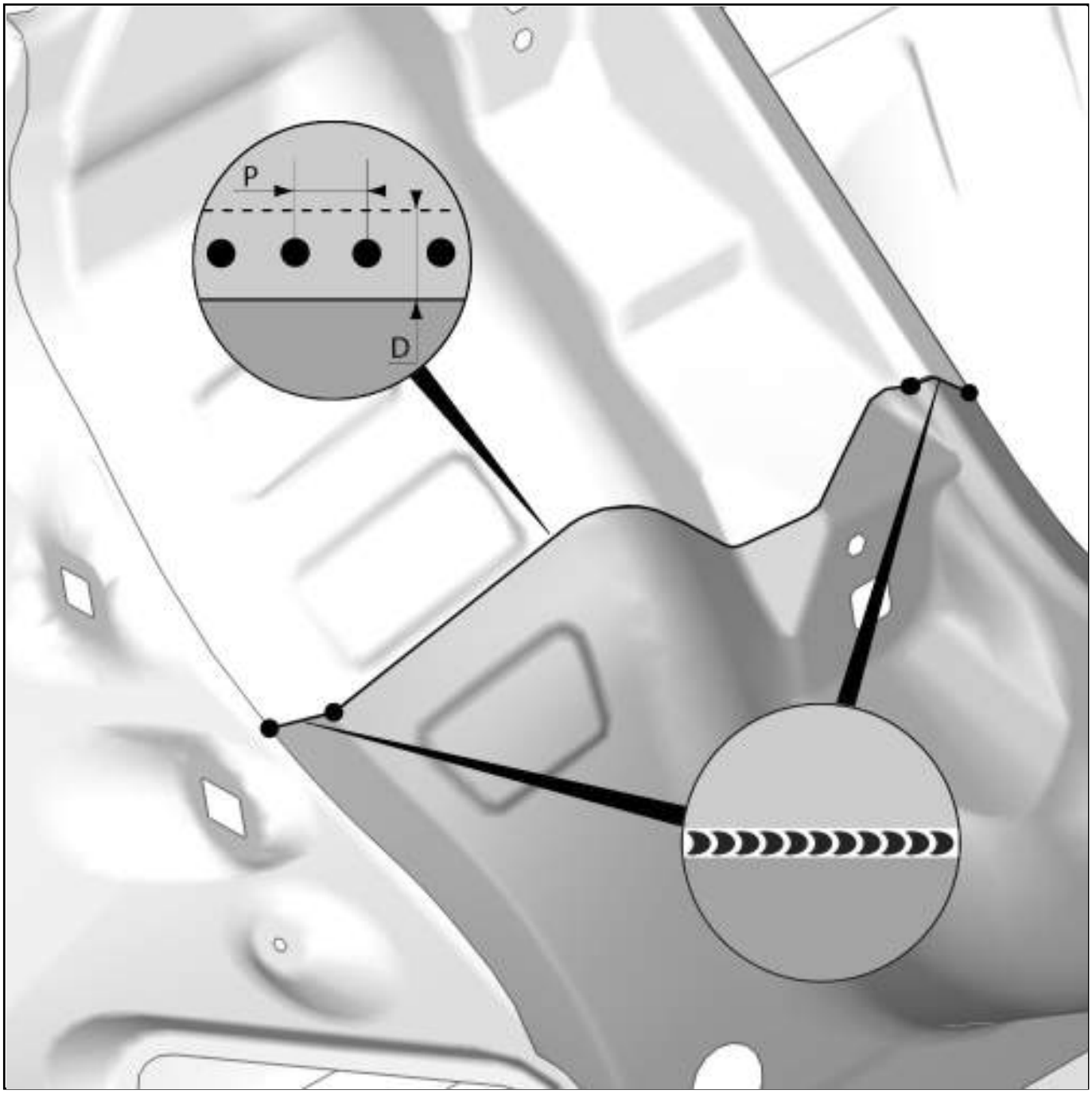
Different symbols represent the type of weld to be made if it is not an original weld.

In case of superimposed or joggle welds, the type of weld to be made is indicated in the text accompanying the illustration.

SUPERIMPOSED WELD



COMBINATION OF TWO TYPES OF WELDS

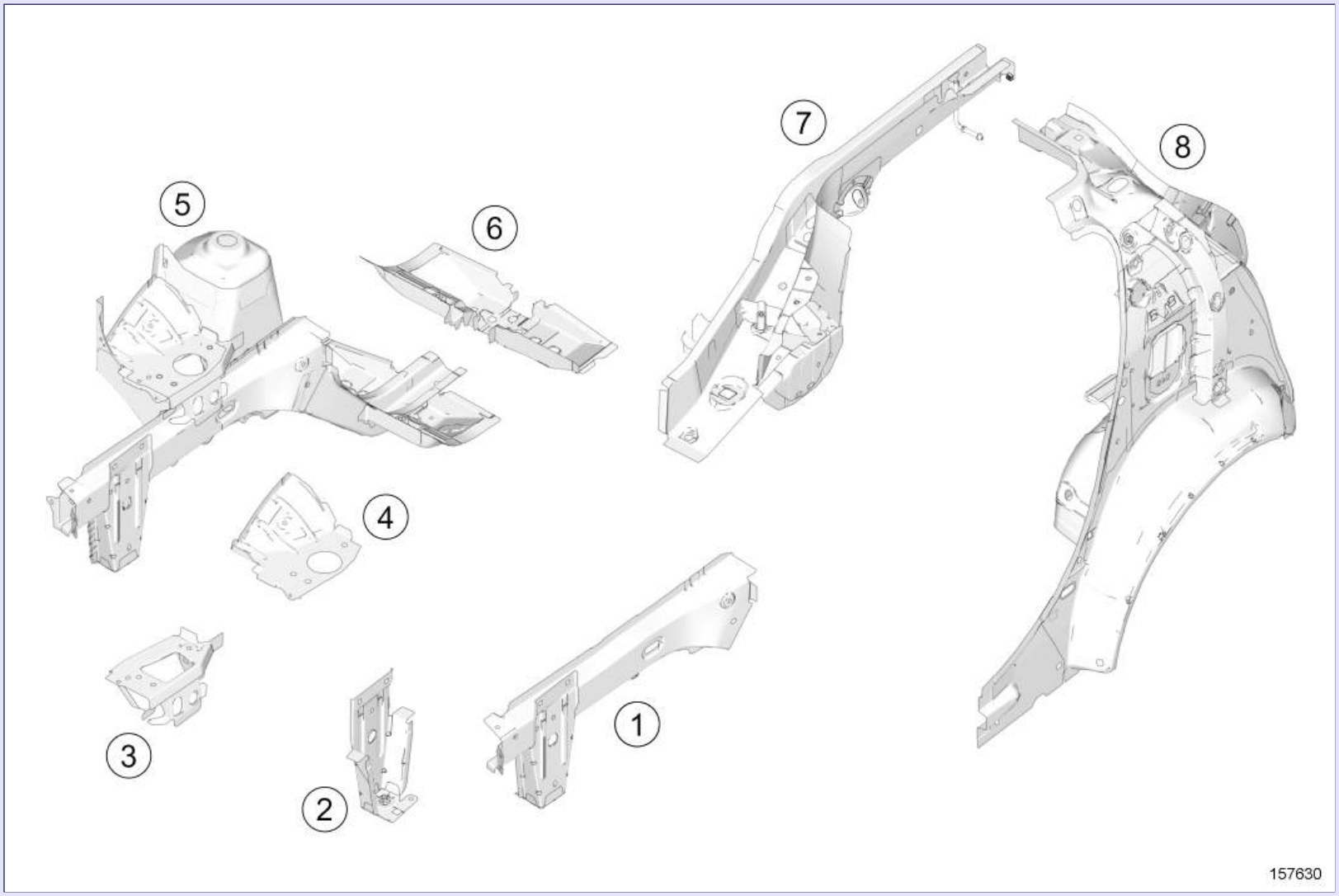


If two types of welds are used, points delimit the areas.

STRUCTURAL COMPONENTS TO BE POSITIONED ON THE REPAIR BENCH: DESCRIPTION

1. PARTS REQUIRING THE USE OF A BODY JIG BENCH

B52(B52)



(1) Front side member front section

(2) Front subframe front mounting unit

(3) Engine stand

(4) Front wheel arch, front section

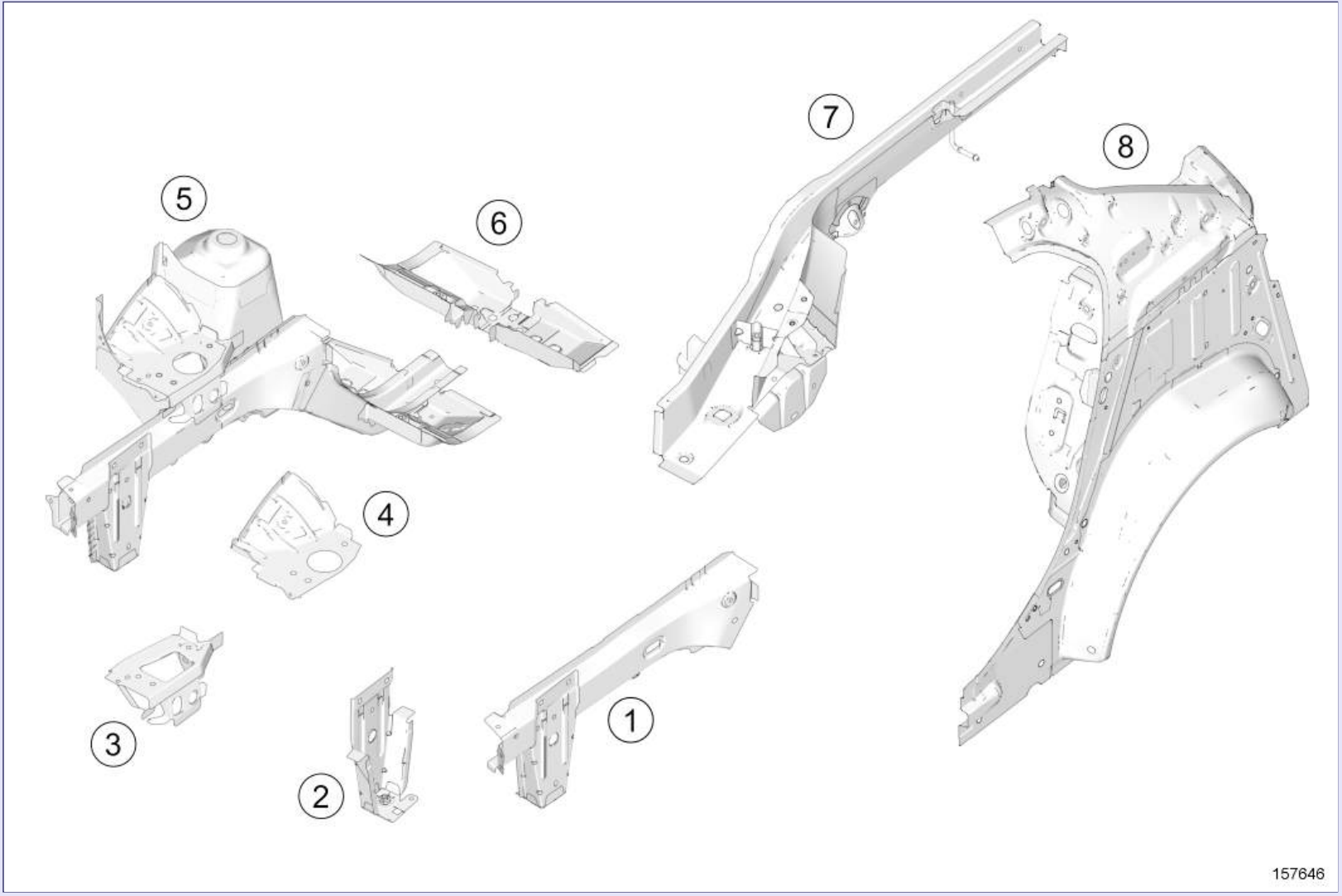
(5) Front half-unit

(6) Centre floor front side cross member

(7) Rear side member assembly

(8) Body side rear lining

L52(L52)



(1) Front side member front section

(2) Front subframe front mounting unit

(3) Engine stand

(4) Front wheel arch, front section

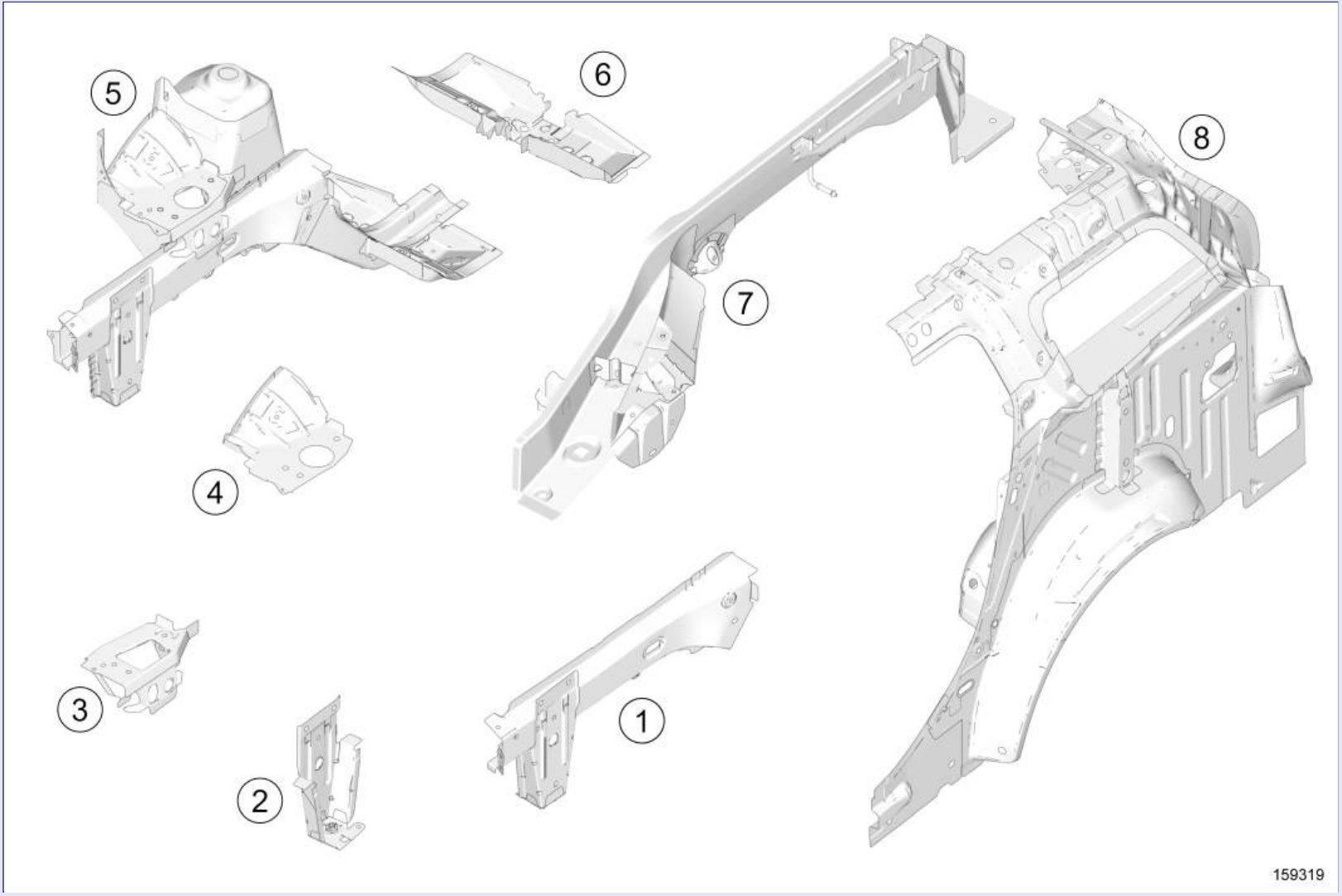
(5) Front half-unit

(6) Centre floor front side cross member

(7) Rear side member assembly

(8) Body side rear lining

K52(K52)



(1) Front side member front section

(2) Front subframe front mounting unit

(3) Engine stand

(4) Front wheel arch, front section

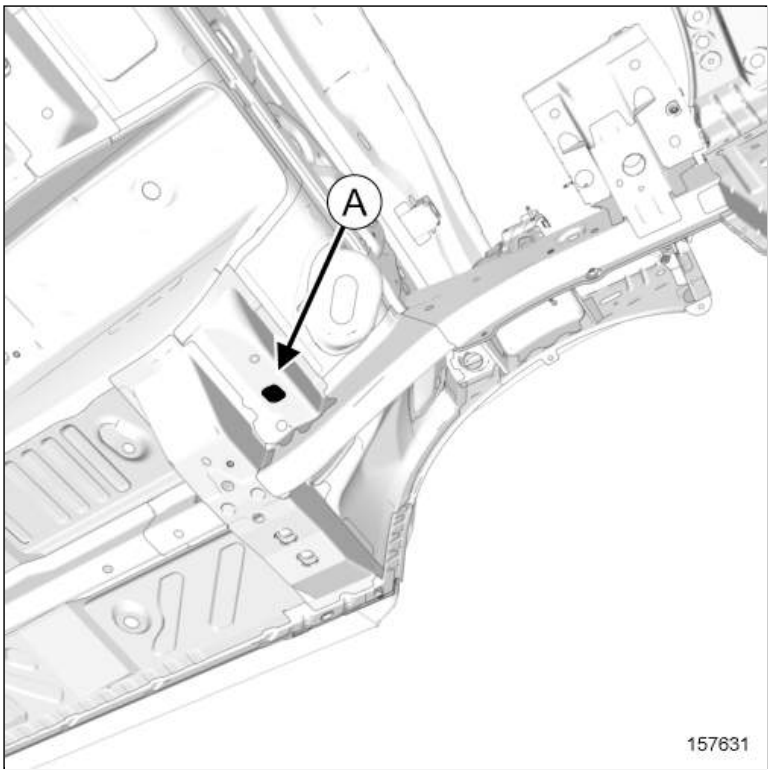
(5) Front half-unit

(6) Centre floor front side cross member

(7) Rear side member assembly

(8) Body side rear lining

2. FRONT SUB-FRAME REAR MOUNTING

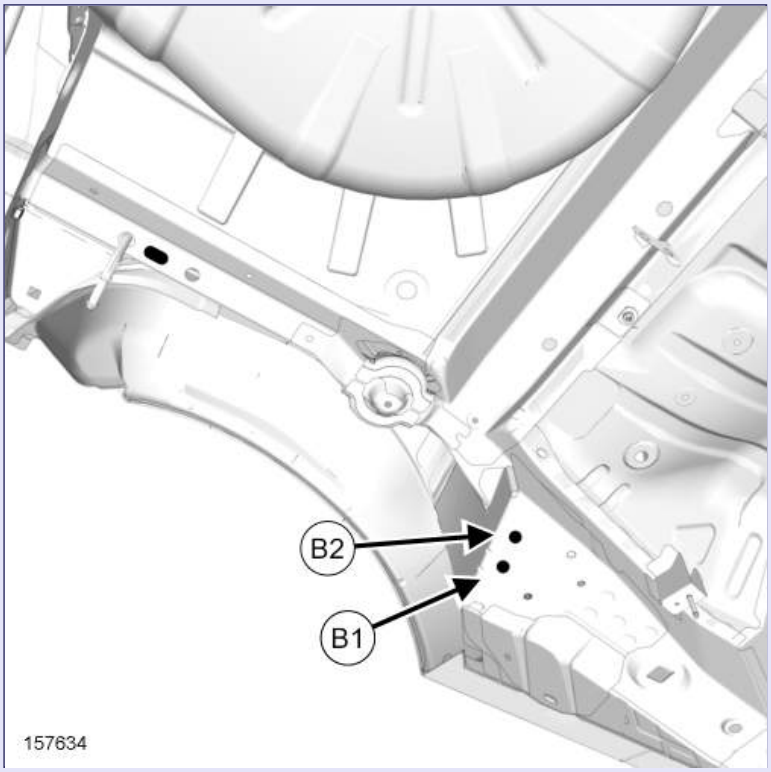


The jig rests under the sub-frame mounting unit and is centred in the threaded hole(A) .

It is used for replacing a complete front half unit.

3. REAR AXLE ASSEMBLY FRONT MOUNTING

B52(B52)



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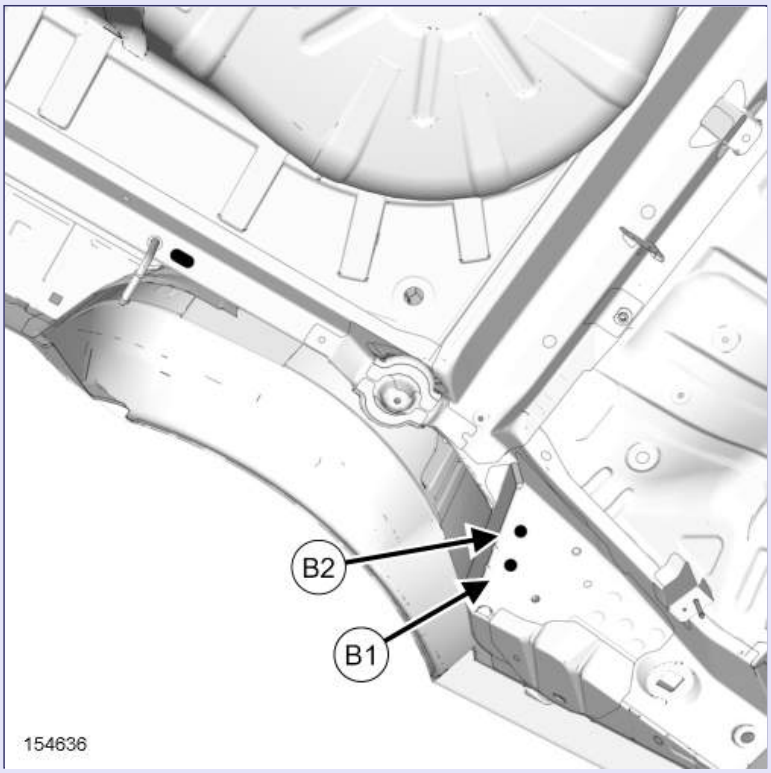
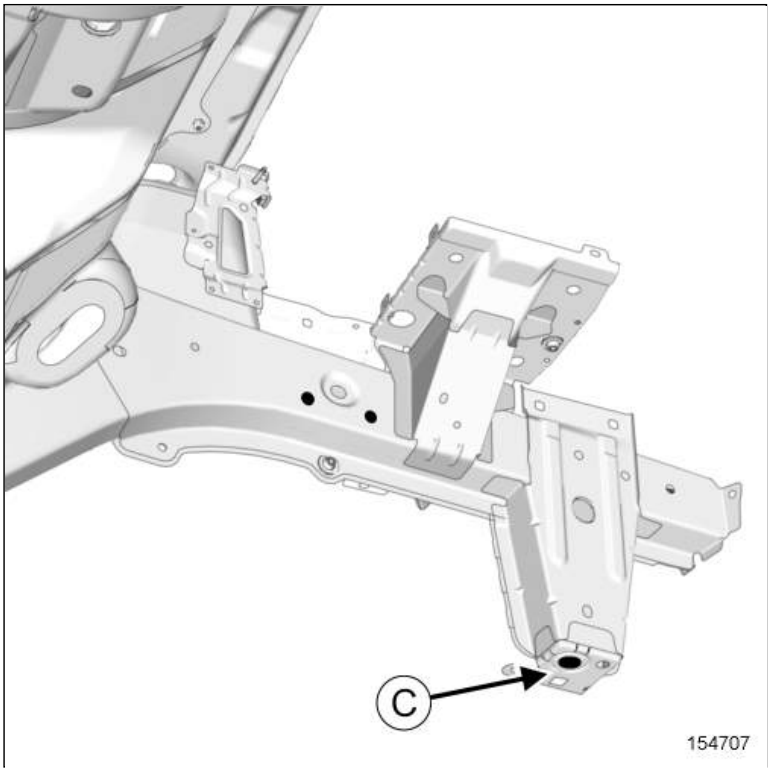


The jig supports the underneath of the rear axle assembly mounting unit and is centred on hole(B1) and fixed on tapped hole(B2) of the rear axle bearing mounting.

It is used for replacing a rear side member assembly.

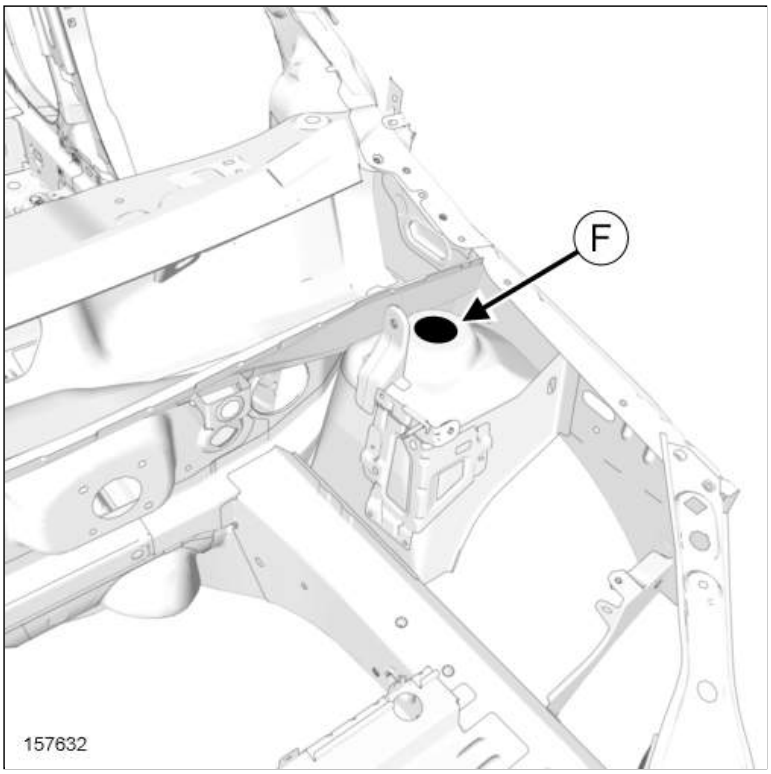
4. FRONT SUB-FRAME FRONT MOUNTING



The jig supports the underneath of the front sub-frame mounting and is centred on tapped hole(C) .

- It is used when replacing:
  - a complete front side member,
  - a front half unit.

5. FRONT SHOCK ABSORBER UPPER MOUNTING

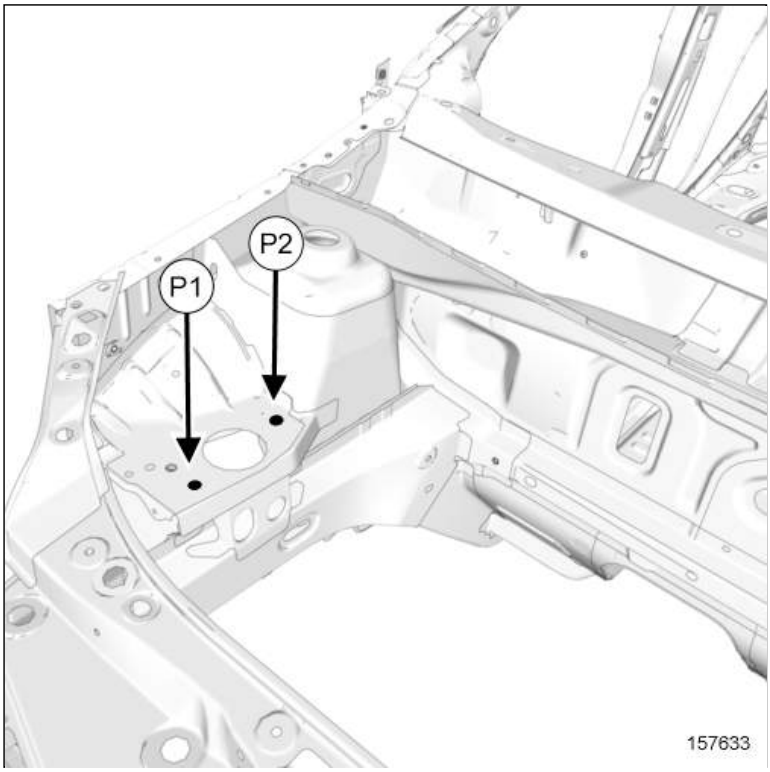


The jig supports the underneath of the shock absorber cup and is centred in the hole(F) of the shock absorber cup.

It is used for replacing a complete front half unit.

It is also used in straightening.

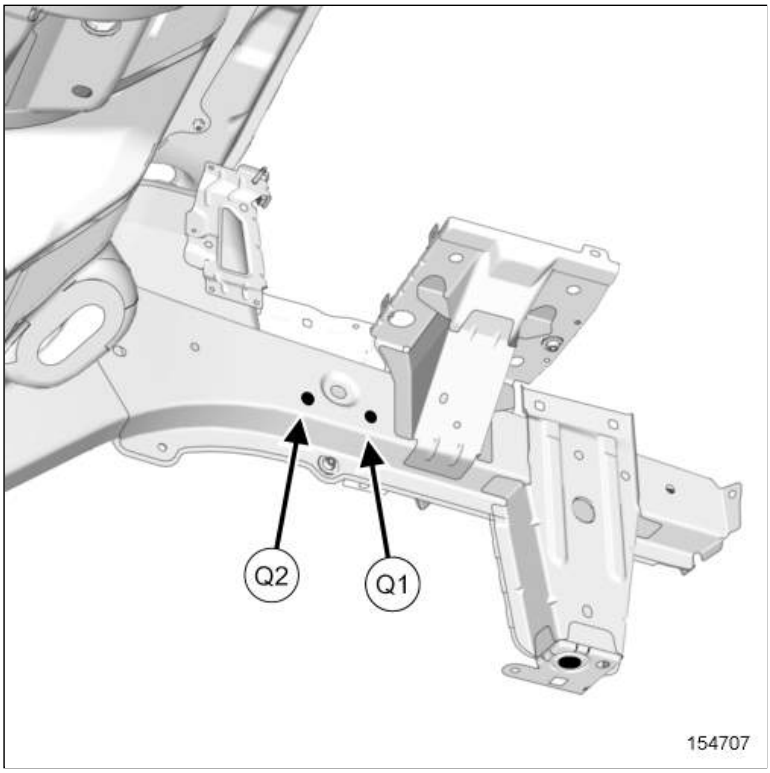
6. ENGINE MOUNTING



The jig rests on the engine mounting and is centred in the engine mounting holes(P1) and (P2) .

- It is used with the mechanical components removed for the replacement of:
  - a front half unit,
  - the engine mounting.

7. GEARBOX MOUNTING



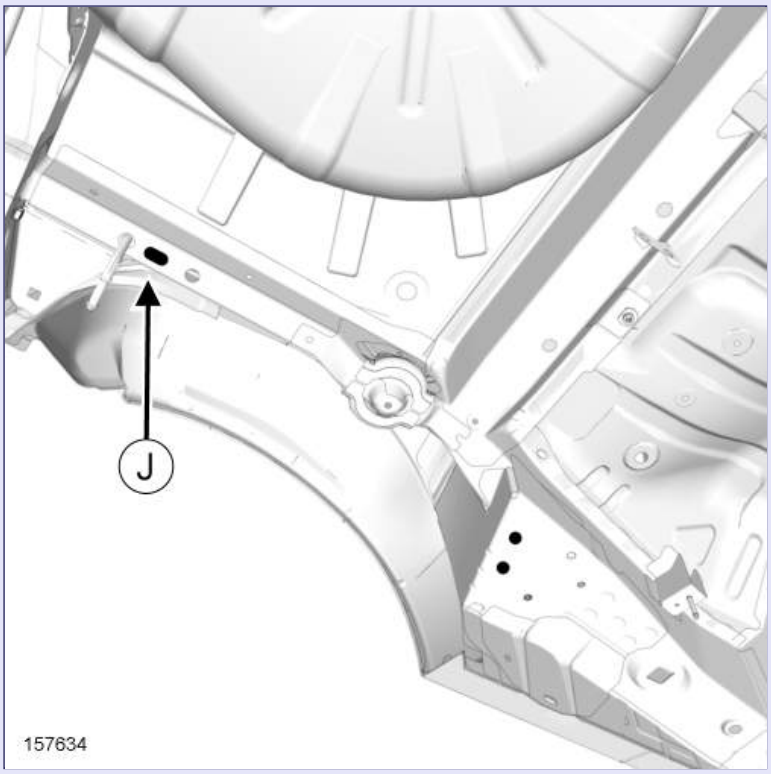
The jig is positioned against the side member, and is centred in the threaded holes(Q1) and (Q2) of the gearbox mounting.

- It is used with the subframe removed for the replacement of:
  - a front side member,
  - a front half-unit.

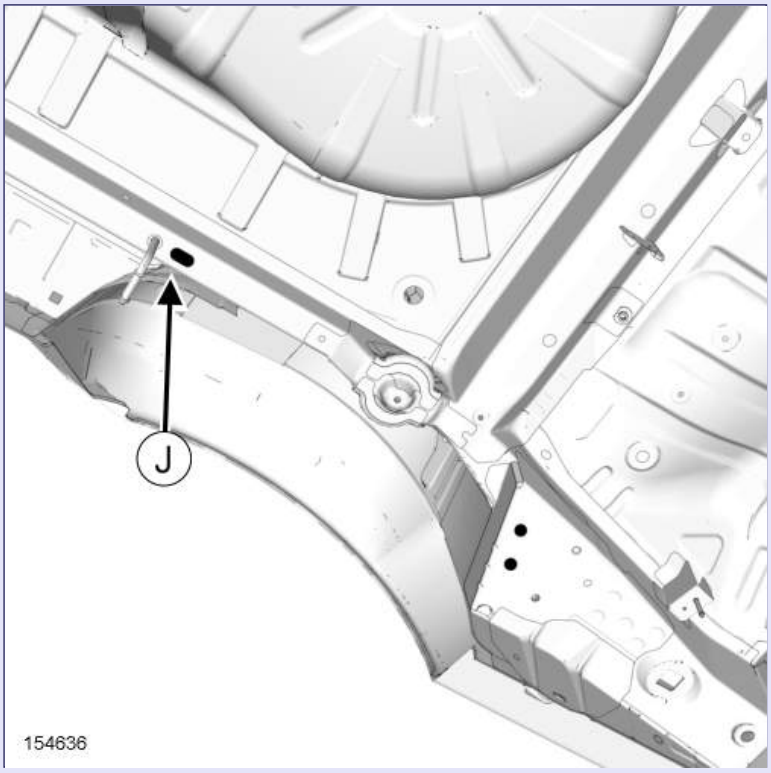
It is also used in straightening.

8. REAR SIDE MEMBER END

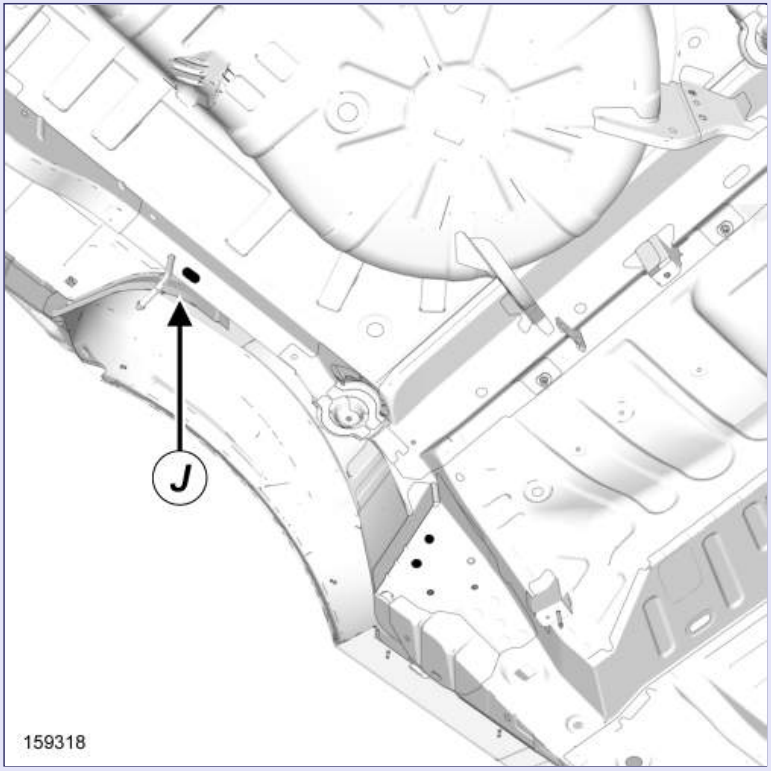
B52(B52)



L52(L52)



K52(K52)



The jigs is positioned(J) under the rear side member.

It should be used with the subframe in place to realign a rear side member.

It is used with the mechanical parts removed, under the same conditions, to replace the rear side member.

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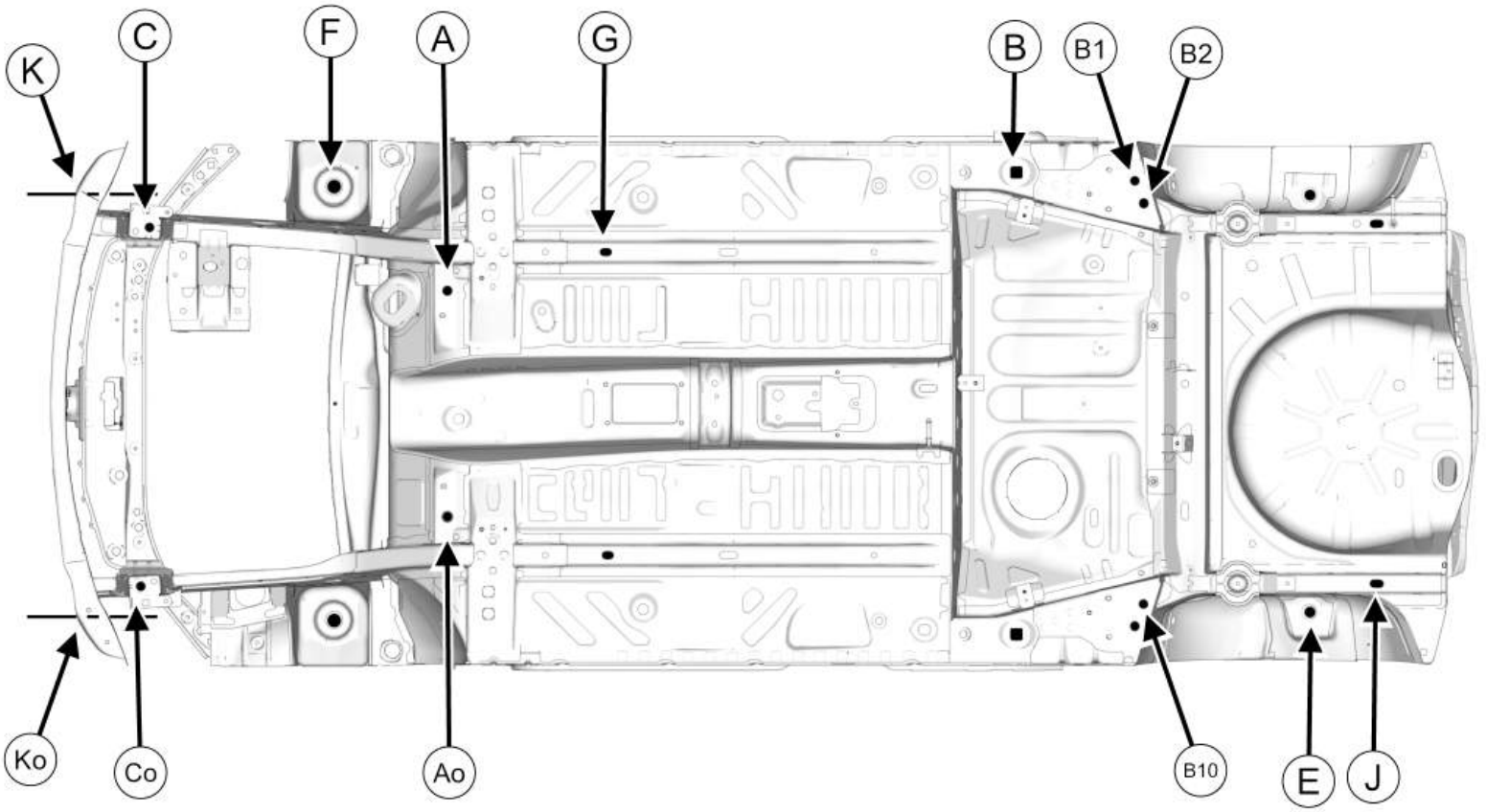
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B1
B2
Ko
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Ao
B10
E
J
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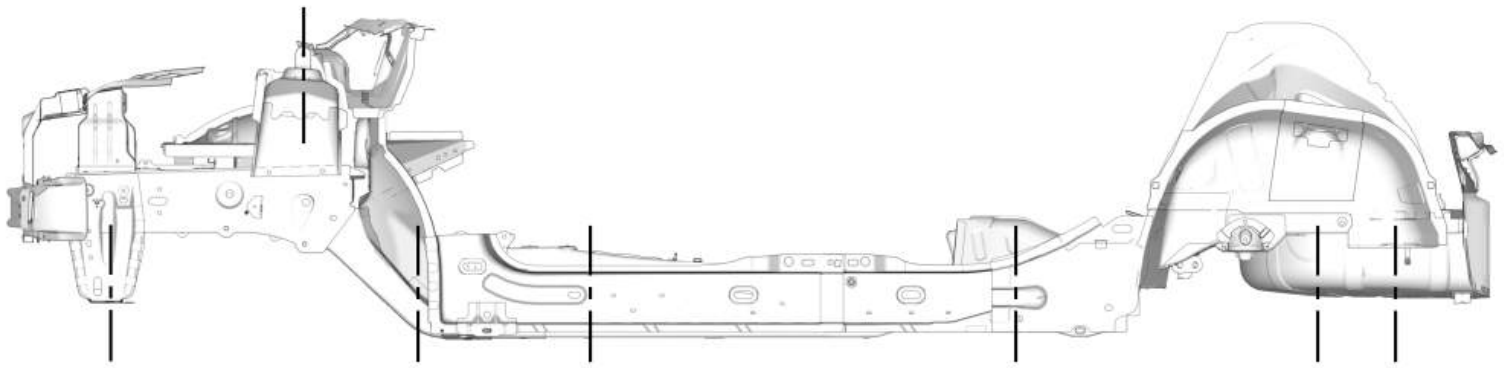

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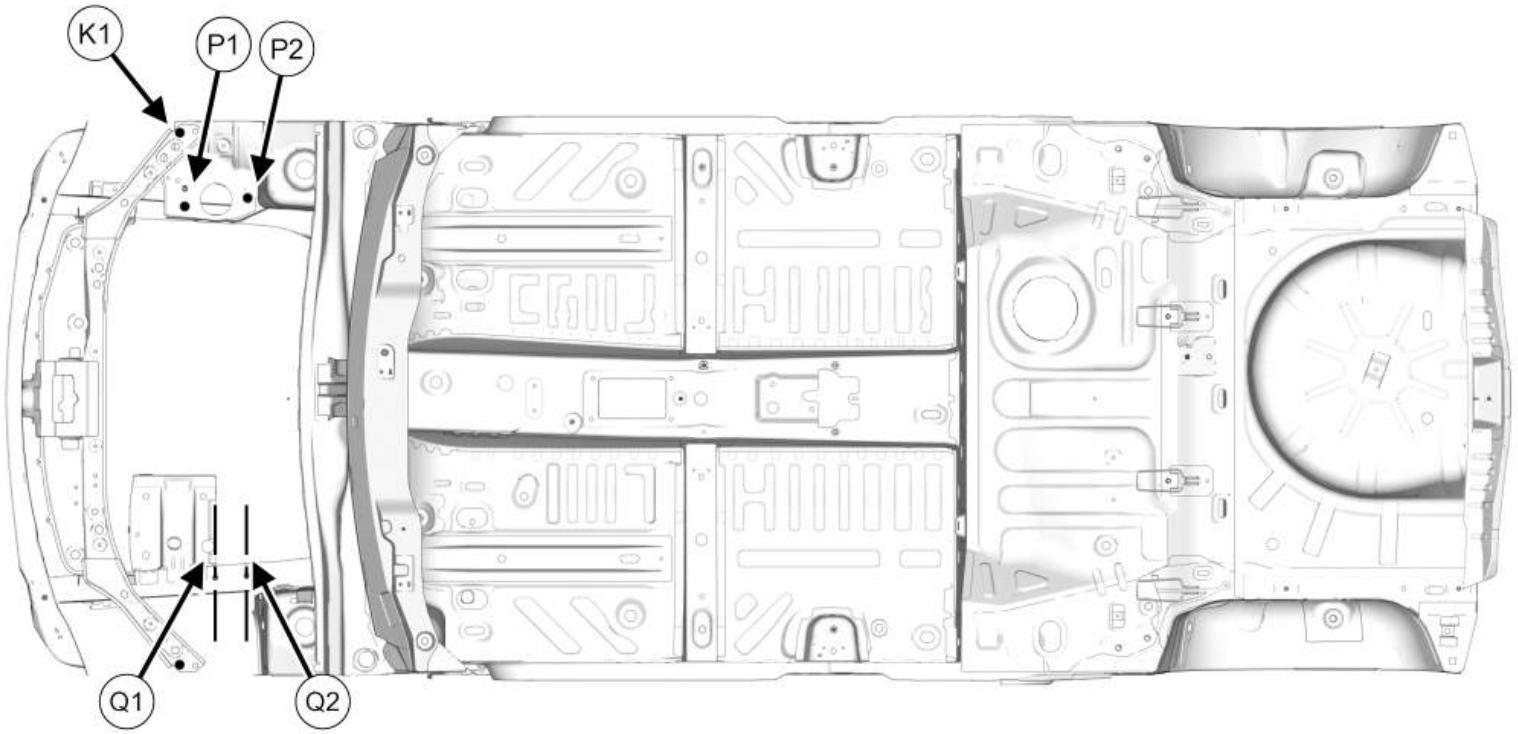
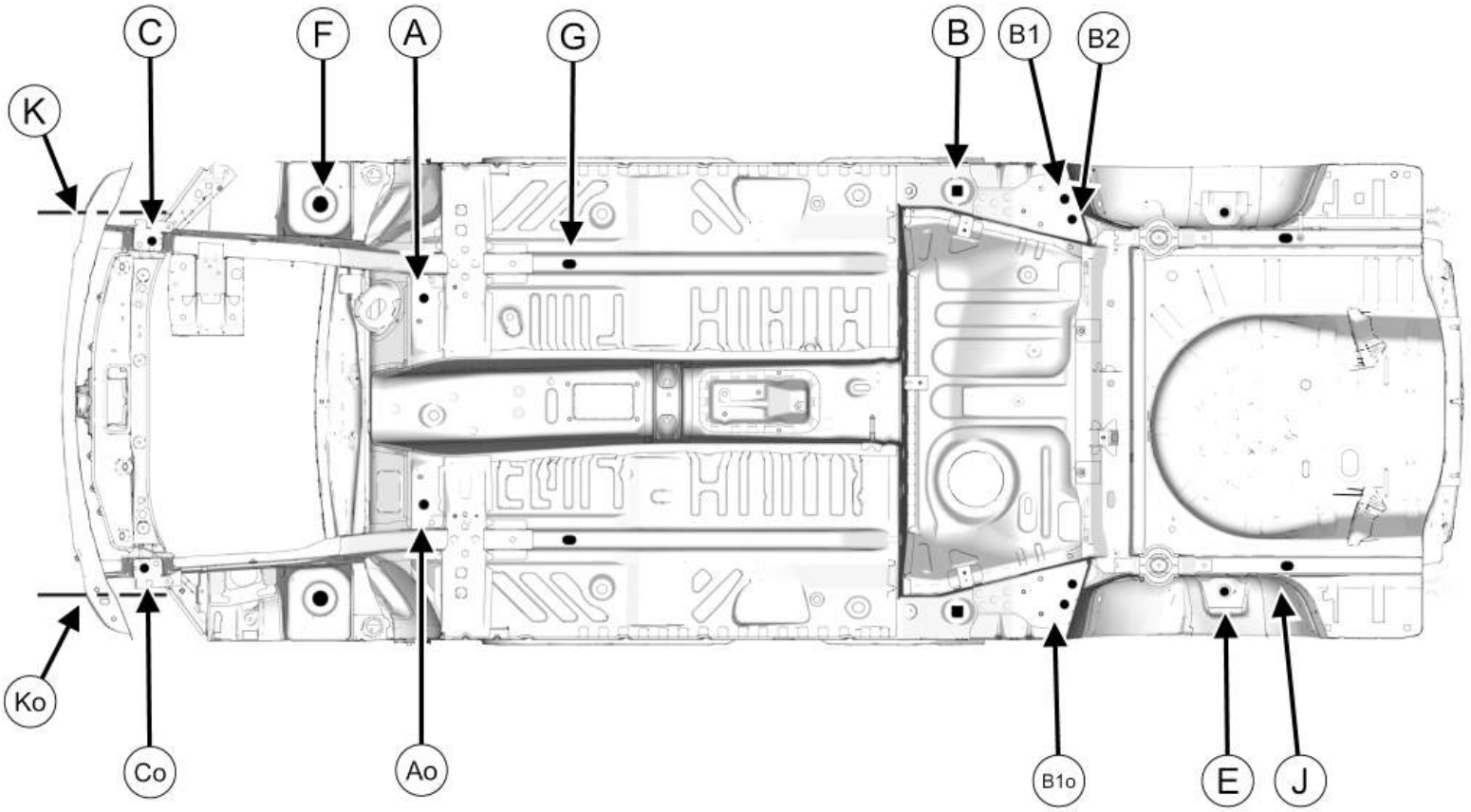


157543

No.	Description	Dimension X (mm)	Dimension Y (mm)	Dimension Z (mm)	Diameter (mm)	Angle
A	Front left-hand subframe rear mounting without mechanical components	301	-305	78	24.7-M12	-
Ao	Front right-hand subframe rear mounting without mechanical components	301	305	78	24.7x29.6-M12	-
A	Front left-hand subframe rear mounting with mechanical components	301	-305	26	Bolt head	-
Ao	Front right-hand subframe rear mounting with mechanical components	301	305	26	Bolt head	-
B	Rear side member front leader pin	1838	622	72.5	30x30	0˚
B1	Rear left-hand axle mounting leader pin without mechanical components	2155	-600	118.5	16.2	-
B1o	Rear right-hand axle mounting leader pin without mechanical components	2155	595.5	118.5	16.2x24.2	-
B2	Rear axle rear mounting SM	2179	540	118.5	M10	-
C	Front subframe front left-hand mounting without mechanical components	-502	-476	82	M12	0˚
Co	Front subframe front right-hand mounting without mechanical components	-525	492	82	M12	0˚
C	Front subframe front left-hand mounting with mechanical components	-502	-476	80	M12	0˚
Co	Front subframe front right-hand mounting without mechanical components	-525	492	80	M12	0˚
E	Rear shock absorber upper mounting	2627.25	562.5	532.5	18.2	X: 8˚ Y: 0˚
F	Front shock absorber upper mounting	-3	583.5	683	48	x: 0˚35' y: 3˚40'
G	Front side member rear leader pin, centre section	734	409	-8.5	20	-
J	Rear side member rear leader pin	2809	485.5	258	16.2x32.2	-
K	Front left-hand end lower cross member	-698	-565.5	314.75	16	90˚
Ko	Front right-hand end lower cross member	-698	566.5	314.75	12.2x16.2	90˚
K1	Front upper cross member	-324	680	665	M6	180˚
P1	Engine mounting 1	-310	492.5	490	M10	z: 180˚
P2	Engine mounting 2	-150	514.5	490	M10	z: 180˚
Q1	Gearbox mounting 1	-234.5	-426	316.5	M10	x: 90˚ y: 4˚ z: 90˚
Q2	Gearbox mounting 2	-154.5	-420.5	316.5	M10	x: 90˚ y: 4˚ z: 90˚

A and B = vehicle trim height reference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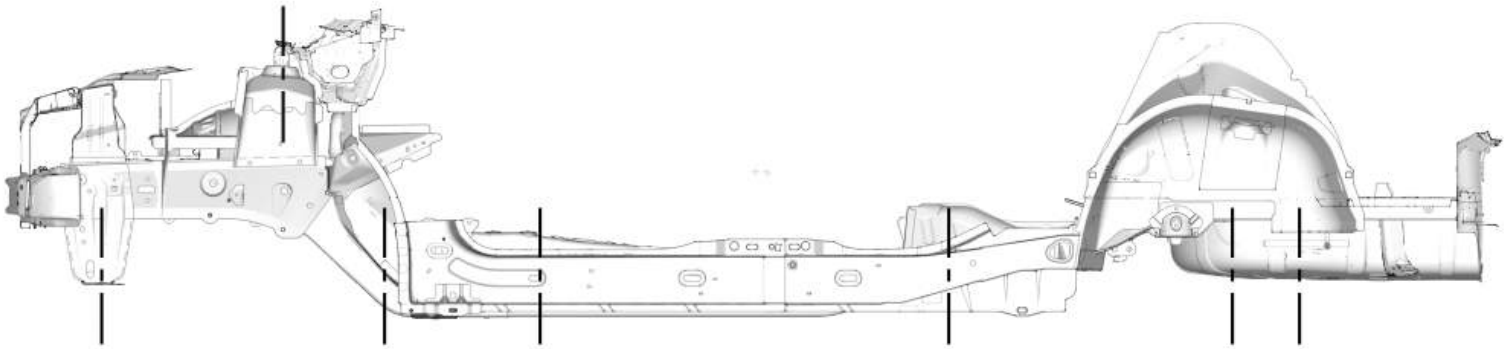

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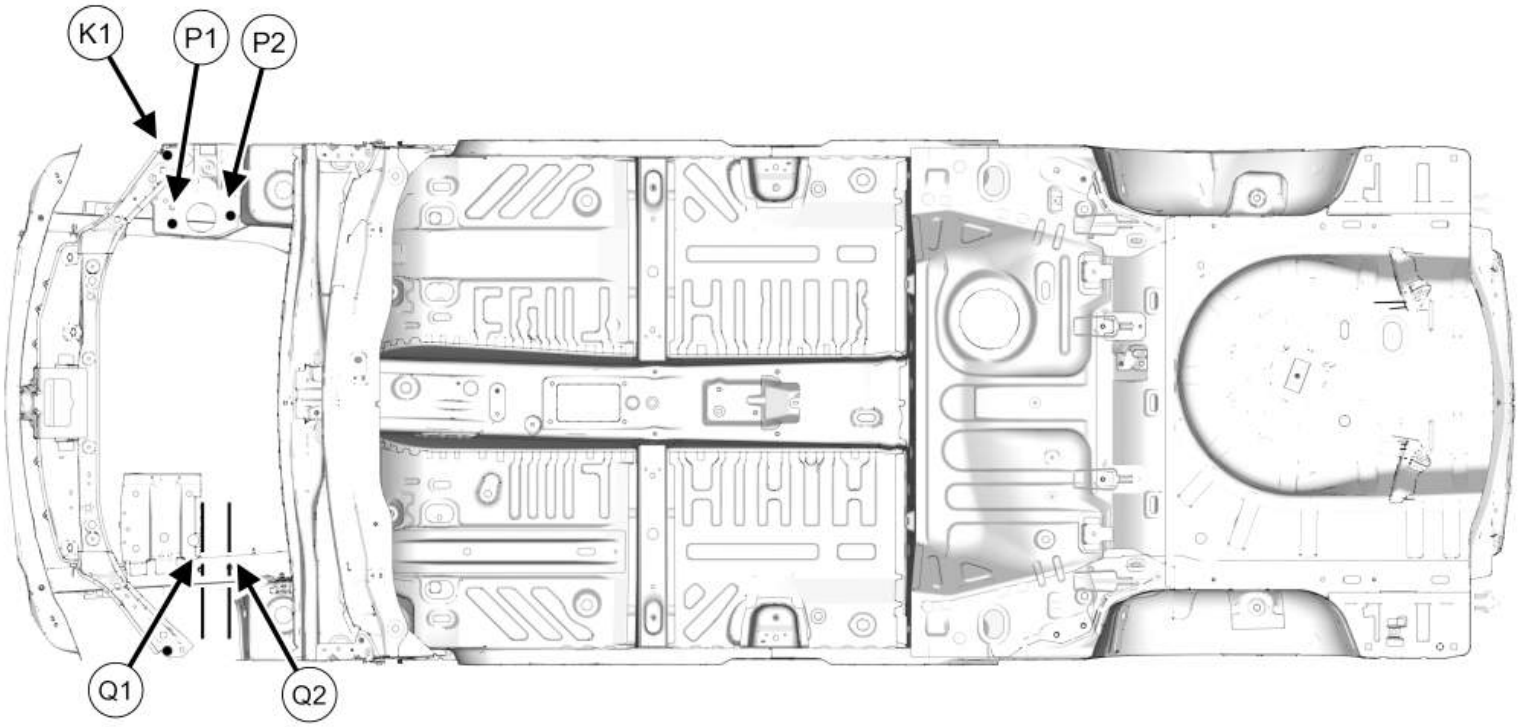


157550

No.	Description	Dimension X (mm)	Dimension Y (mm)	Dimension Z (mm)	Diameter (mm)	Angle
A	Front left-hand subframe rear mounting without mechanical components	301	-305	78	24.7-M12	-
Ao	Front right-hand subframe rear mounting without mechanical components	301	305	78	24.7x29.6-M12	-
A	Front left-hand subframe rear mounting with mechanical components	301	-305	26	Bolt head	-
Ao	Front right-hand subframe rear mounting with mechanical components	301	305	26	Bolt head	-
B	Rear side member front leader pin	1883	622	72.5	30x30	0˚
B1	Rear left-hand axle mounting leader pin without mechanical components	2200	-600	118.5	16.2	-
B1o	Rear right-hand axle mounting leader pin without mechanical components	2200	600	118.5	16.2x24.2	-
B2	Rear axle rear mounting SM	2223.8	540	118.5	M10	-
C	Front subframe front left-hand mounting without mechanical components	-502	-476	82	M12	0˚
Co	Front subframe front right-hand mounting without mechanical components	-525	492	82	M12	0˚
C	Front subframe front left-hand mounting with mechanical components	-502	-476	80	M12	0˚
Co	Front subframe front right-hand mounting without mechanical components	-525	492	80	M12	0˚
E	Rear shock absorber upper mounting	2672.25	562.5	532.5	18.2	X: 8˚ Y: 0˚
F	Front shock absorber upper mounting	-3	583.5	683	48	x: 0˚35' y: 3˚40'
G	Front side member rear leader pin, centre section	734	409	-8.5	20	-
J	Rear side member rear leader pin	2854	485.5	258	16x20	-
K	Front left-hand end lower cross member	-698	-565.5	314.75	16	90˚
Ko	Front right-hand end lower cross member	-698	566.5	314.75	12.2x16.2	90˚
K1	Front upper cross member	-324	680	665	M6	180˚
P1	Engine mounting 1	-310	492.5	490	M10	z: 180˚
P2	Engine mounting 2	-150	514.5	490	M10	z: 180˚
Q1	Gearbox mounting 1	-234.5	-426	316.5	M10	x: 90˚ y: 4˚ z: 90˚
Q2	Gearbox mounting 2	-154.5	-420.5	316.5	M10	x: 90˚ y: 4˚ z: 90˚

A and B = vehicle trim height reference

THROTTLE VALVE: CLEANING

Note, one or more warnings are present in this procedure

Equipment required
compressed air nozzle

parts always to be replaced:
Throttle valve seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Note:

Be sure to work in a clean environment so as not to allow any contamination of the throttle valve.

CLEANING

1. CLEANING PREPARATION OPERATION

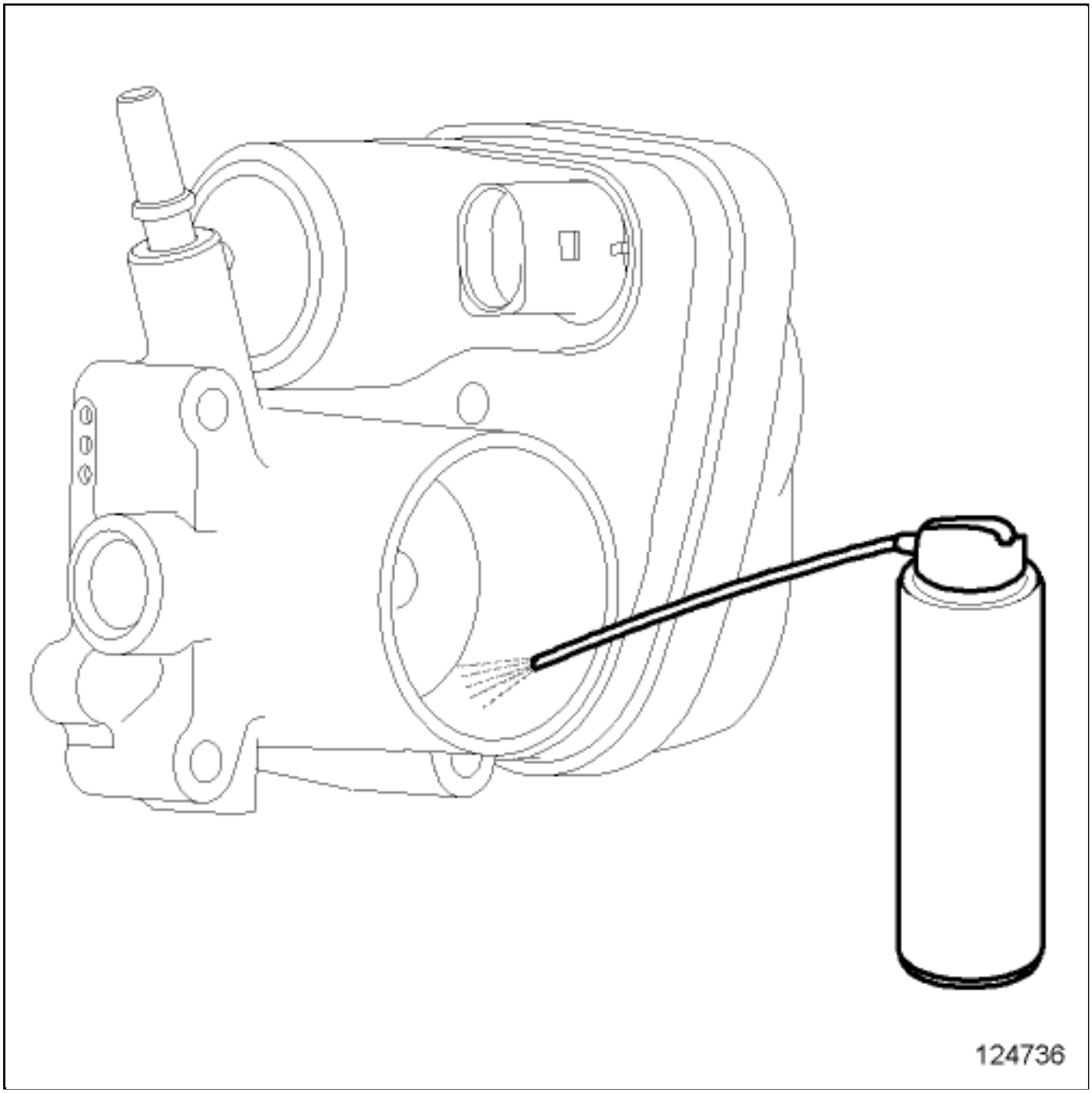
- Remove the throttle valve(see 12A, Fuel mixture, Throttle valve: Removal - Refitting) .

2. CLEANING

Note:

The CARBURETTOR CLEANERproduct damages the seals.

- Remove the seal(s) of the throttle valve.

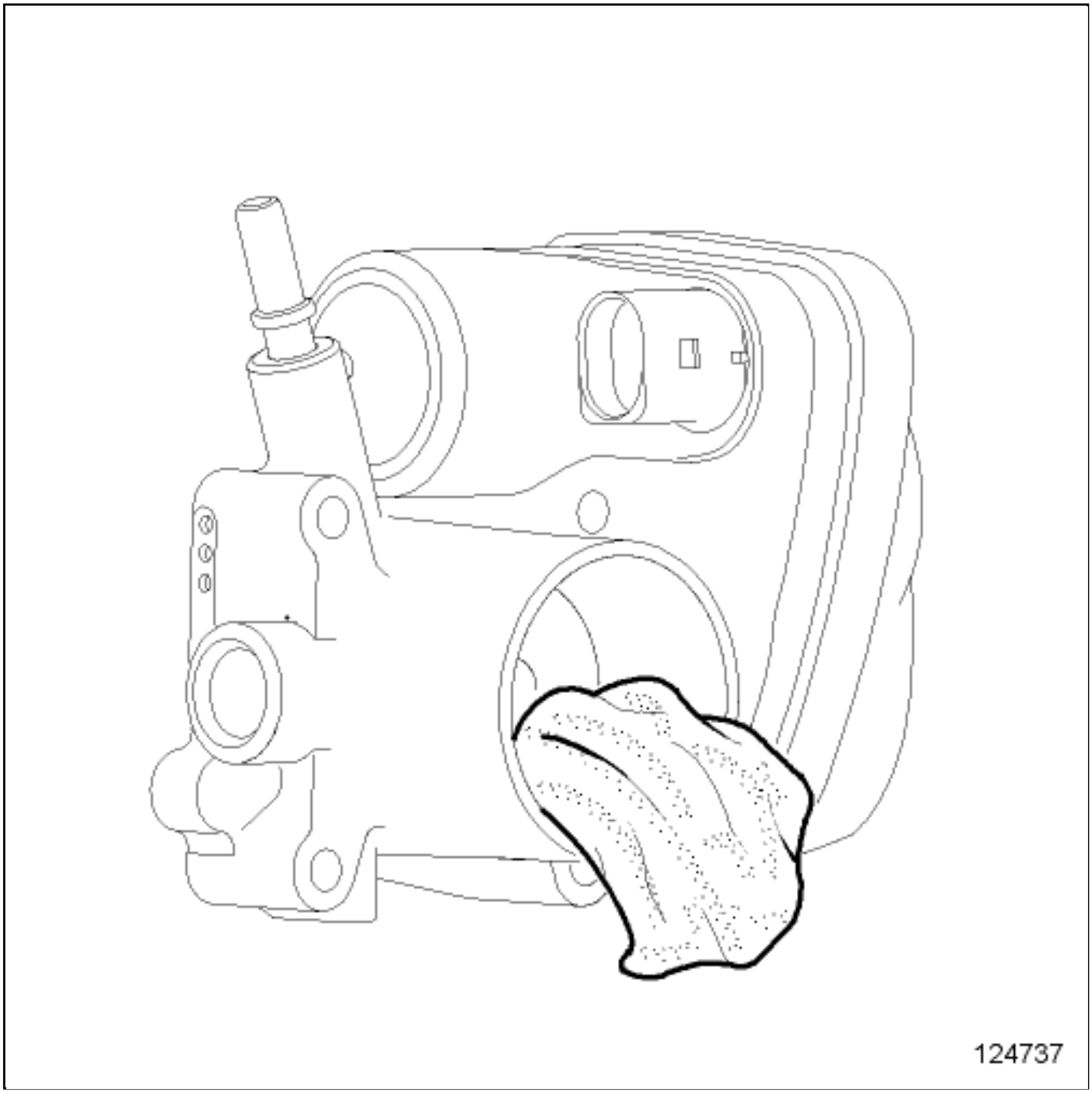


- Hold the throttle valve flap open manually.

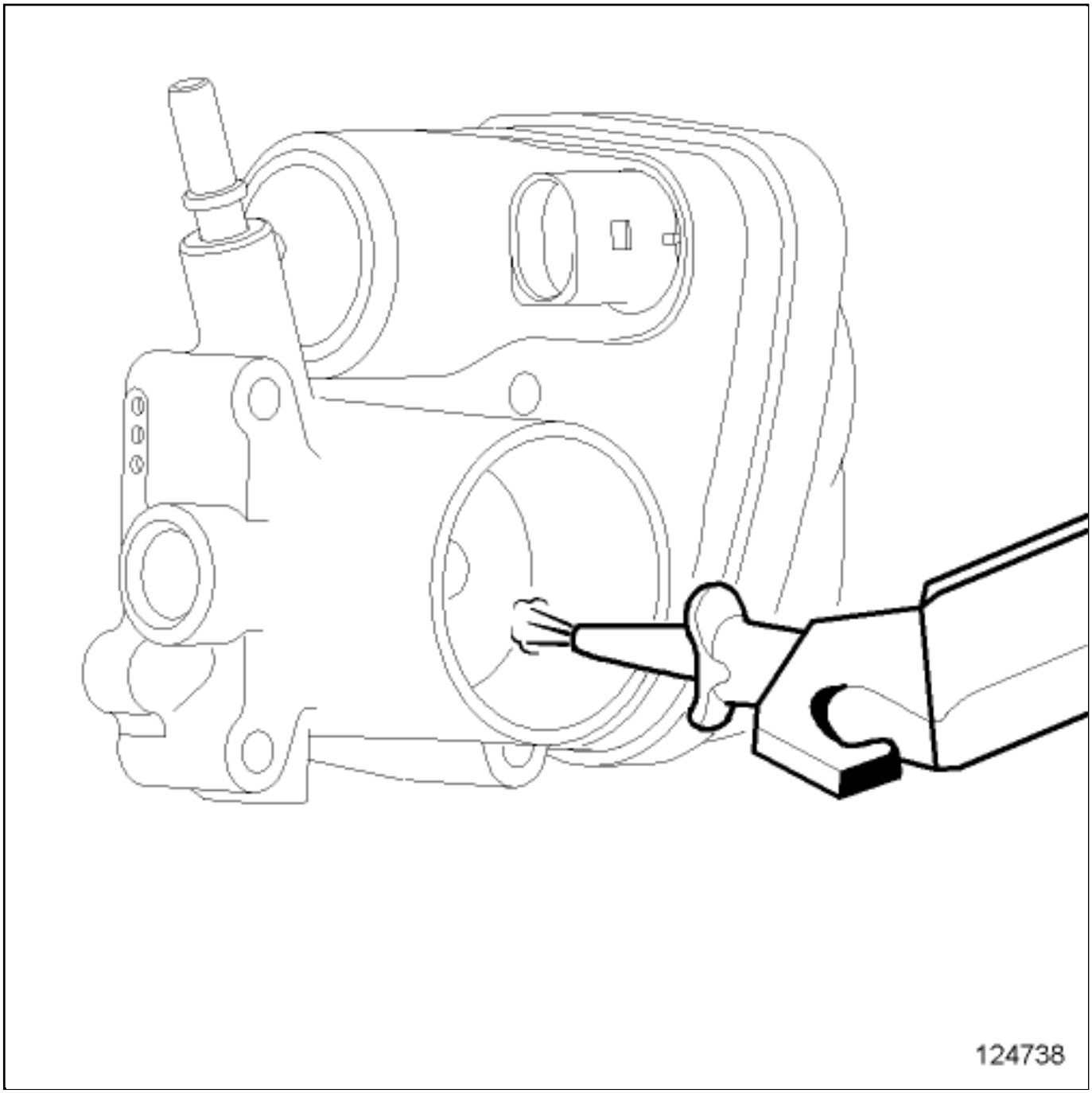
Note:

Do not spray any cleaning product onto the outside of the cylinder, inside the spring housing or onto the connector.

- Spray carburettor cleaner Vehicle: Parts and consumables for the repair into the air vent until all traces of clogging have disappeared.



- Remove the residues of carburettor cleanerand the residual dirt using a lint-free cloth**Vehicle: Parts and consumables for the repair** .



- Use a compressed air nozzle to blast the throttle valve edges and the air vent.
-

parts always to be replaced: Throttle valve seal .

Note:

If the throttle valve is dropped or receives any other impact, it will need to be replaced.

3. FINAL OPERATION

- Refit the throttle valve(see 12A, Fuel mixture, Throttle valve: Removal - Refitting) .

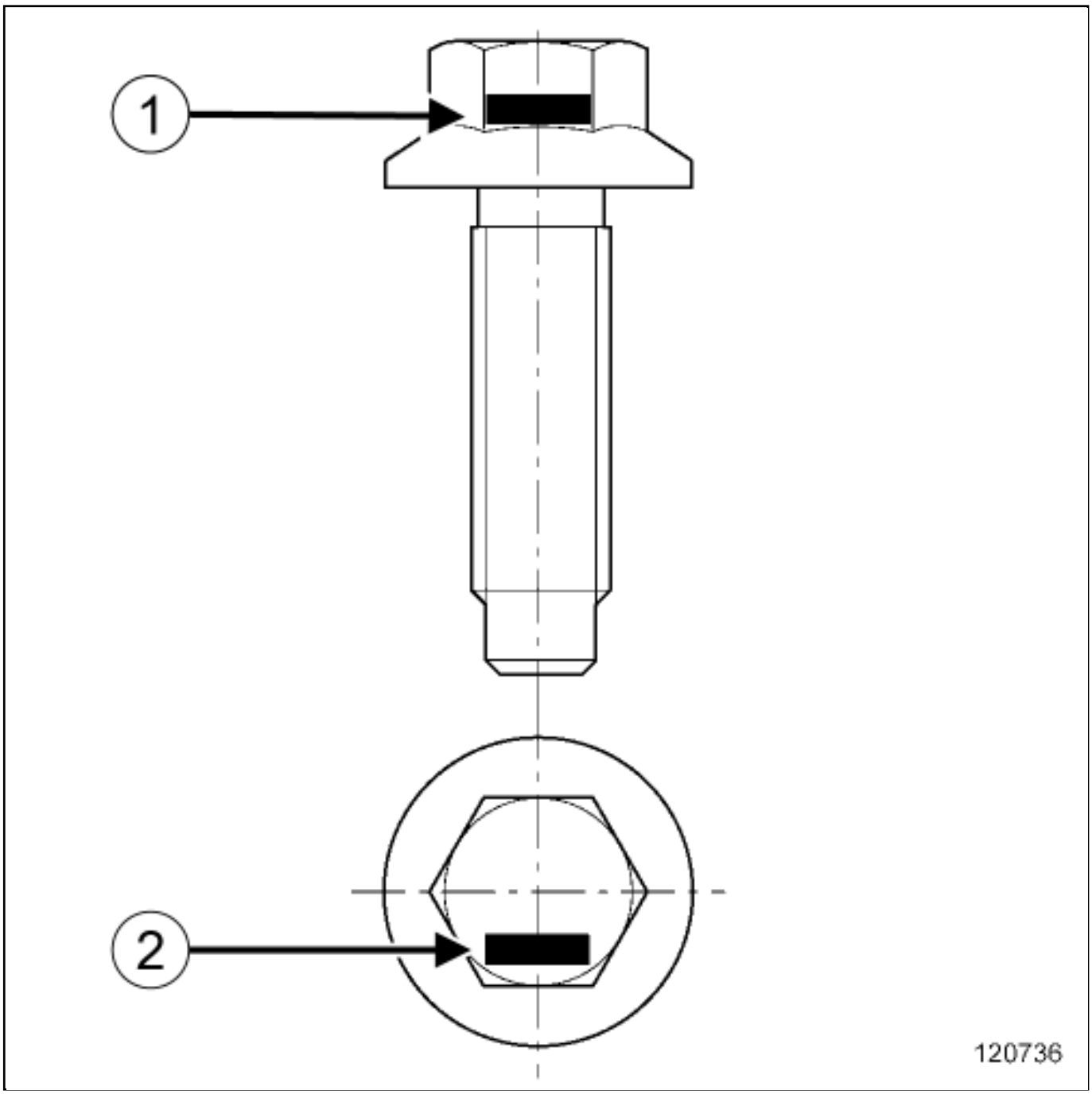
TIGHTENINGTORQUES:GENERALINFORMATION

1. TABLE OF STANDARD TORQUES

Fastenings		Standard tightening torque (N.m)
Diameter	Property class	
M6	8.8	10
M8	8.8	25
M10	8.8	50
M10	10.9	62
M12	10.9	105
M14	10.9	180
M16	10.9	280
M18	10.9	400

SPECIAL NOTES ON ELECTRICAL EARTHS

Fastenings Diameter	Standard tightening torque (N.m)
M6	8
M8	21
M10	44

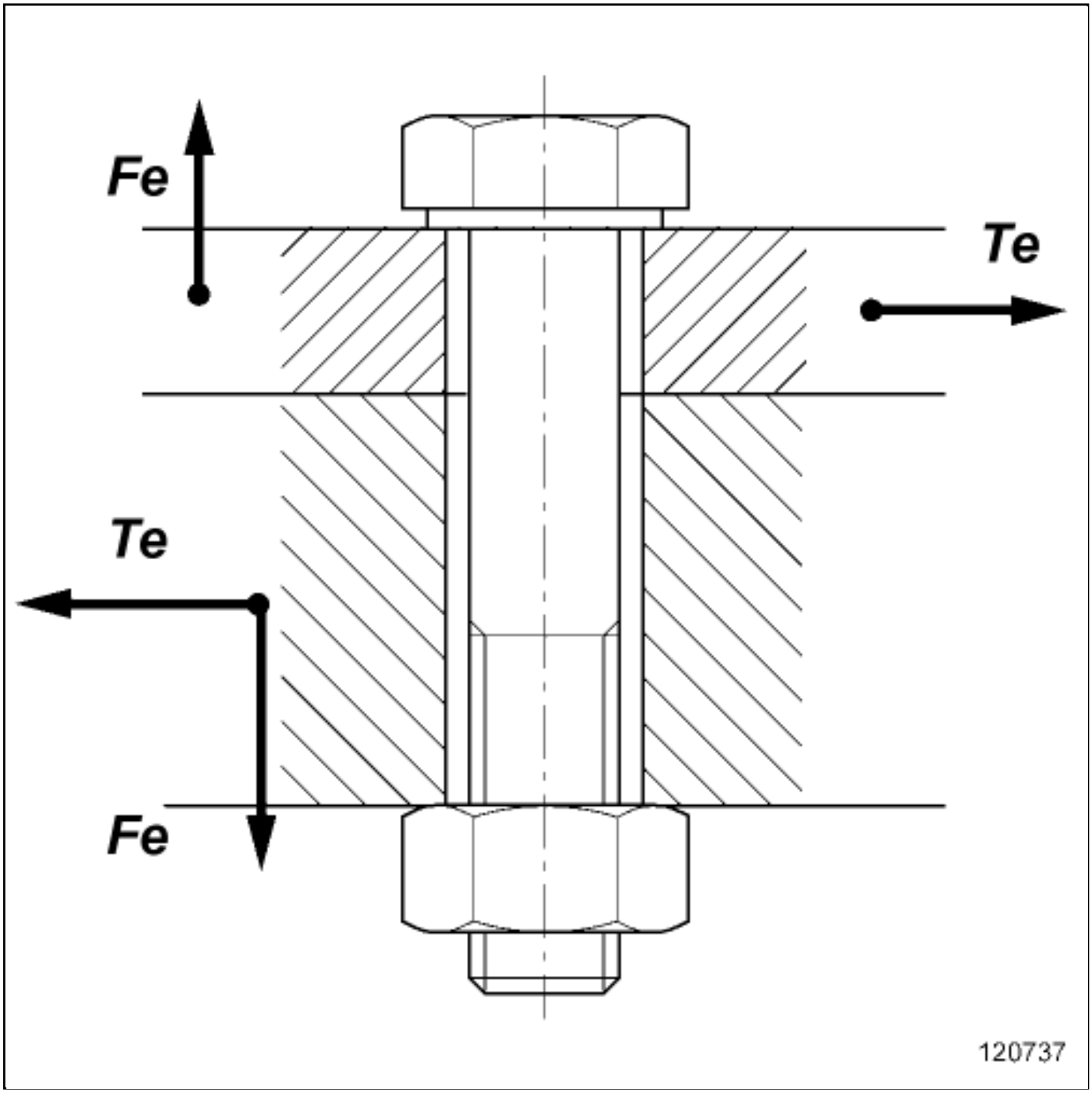


The property class is indicated on the bolt(1) or (2) .

2. FUNCTION OF A BOLTED ASSEMBLY

The bolting system connects parts of an assembly to prevent their separation or sliding when submitted to exterior forces.

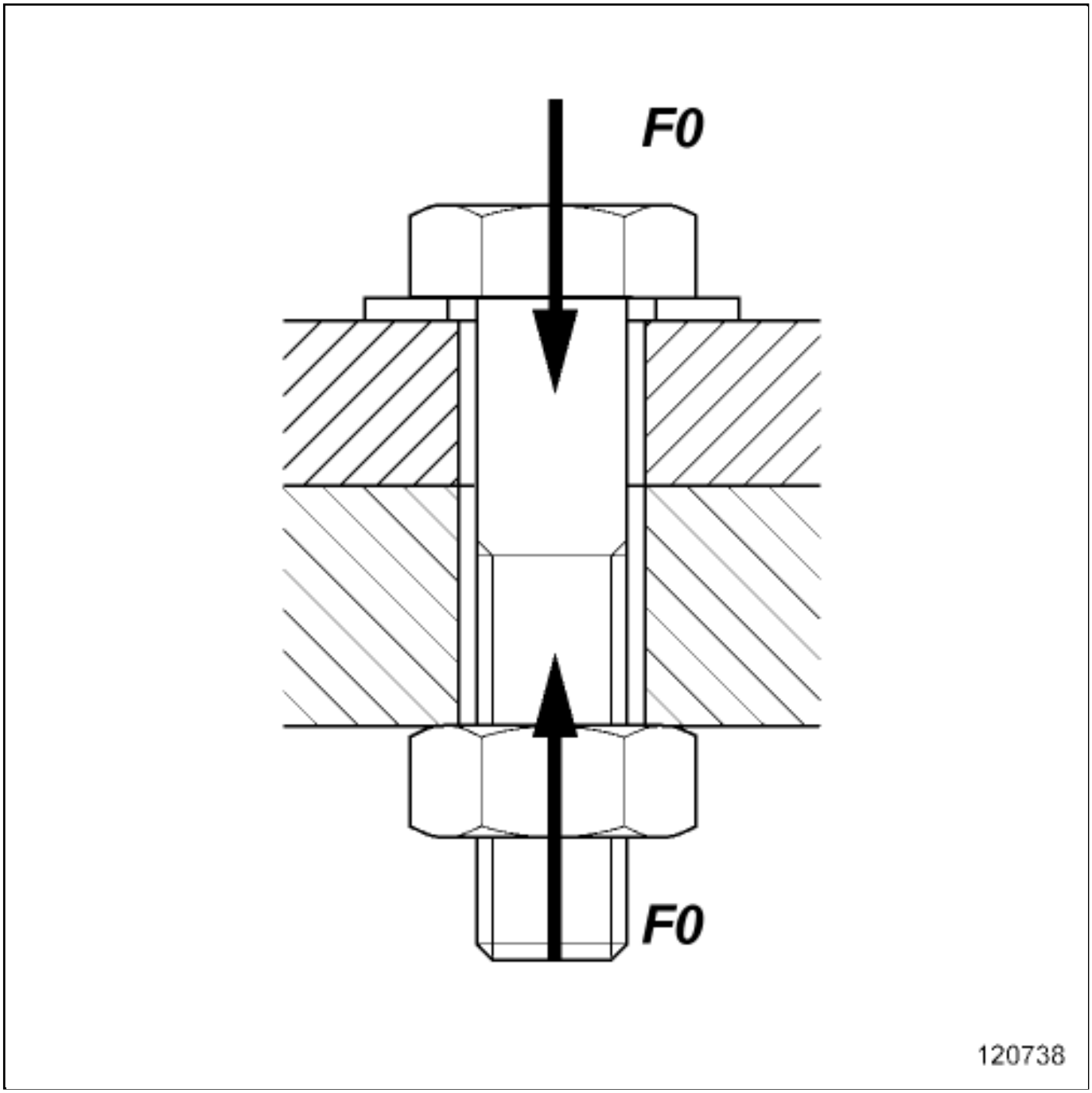
EXTERIOR FORCES



- The assembly is submitted to forces that are:
  - static and / or dynamic,
  - simple (e.g. simple traction),

- multiple (traction + flexion + torsion).

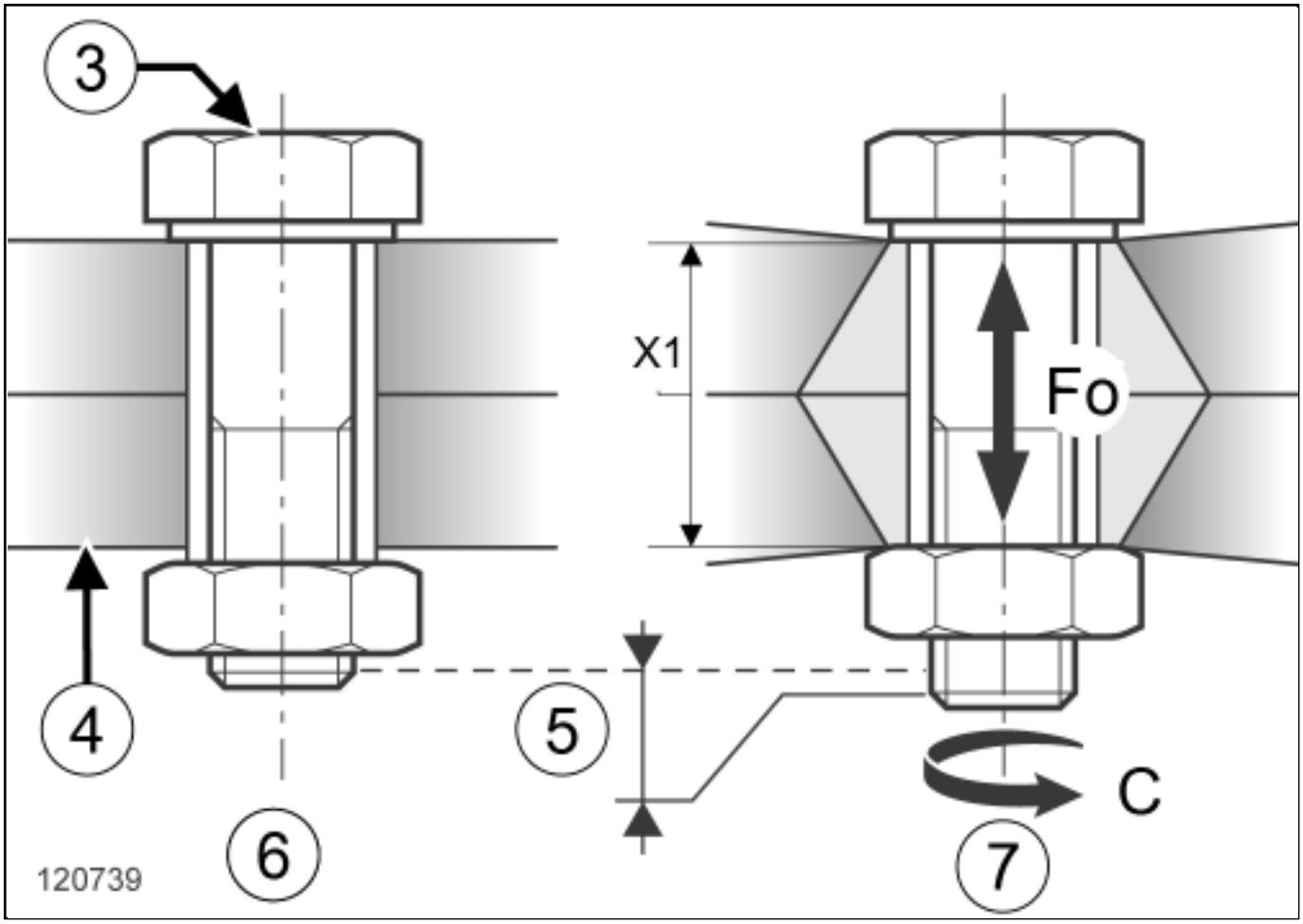
CREATING TENSION (OR PRELOAD) F0



The assembly is held together by the tension created in the bolt when it is tightened.

A reliable assembly is only possible if the correct tension is used:

- insufficient tension: risk of loosening,
- too much tension: risk of deformation of the parts to be assembled, or shearing of the bolt.



(3) Bolt

(4) Assembled components

(5) Extension of the bolt

(6) Non-tightened assembly

(7) Tightened assembly

(X1) Compression of the assembly

(Fo) Sensor

(C) Tightening torque

Customer complaints resulting from incorrect tightening may be, following assembly, a safety issue (fire, loss of control of the vehicle etc.), an immobilising fault or a noise.

3. TIGHTENING PROCEDURES

The two controlled tightening procedures adapted to automotive repairs because of their low cost and

simple operation are torque tightening and angle tightening (also called torque and angle).

1- TORQUE TIGHTENING

This is the most commonly used procedure. Is consists of tightening until a given resisting torque is reached, known as tightening torque.

The tightening torque is distributed in a large part as friction torque (under the head and in the thread) and in a small part as useful torque (to create the tension).

This practise spreads the tension significantly due to the variation in the friction coefficients from one assembly to another and the uncertainty of the tightening procedures and methods.

2- ANGLE TIGHTENING

The principle consists of putting the parts of the assembly in contact using a mating torque (approximately 25 to 30% of the final torque) then to tighten to a determined angle.

This method, which is not dependent on the friction of the tightened assembly, gives more precise results than torque tightening.

4. OBSERVING THE TIGHTENING TORQUES AND ANGLES

Bolted assemblies whose tightening torques and angles are explicitly specified in the removal / refitting procedures must be observed using the appropriate tools (torque wrench, angle measuring disc). Failure to observe this can lead to safety risks, immobilising faults or unwanted noises.

For other bolted assemblies, non-measured tightening (using standard spanners) is acceptable. Nevertheless, the corresponding tightening torque is indicated in the table of standard tightening torques.

5. RECOMMENDED TIGHTENING TOOLS

For measured tightening, the repairer must have available torque wrenches to tighten from 4 to 400 N.m as well as an angle measuring disc.

The torque wrenches used may be click type or electronic.

For example:

- 1 torque wrench 4 - 40 N.m,
- 1 torque wrench 20 - 100 N.m,
- 1 torque wrench 80 - 400 N.m,
- 1 angle measurement disc.

The torque wrenches used must comply with the ISO 6789standard. They must be calibrated regularly following the supplier's recommendations using the appropriate procedures.

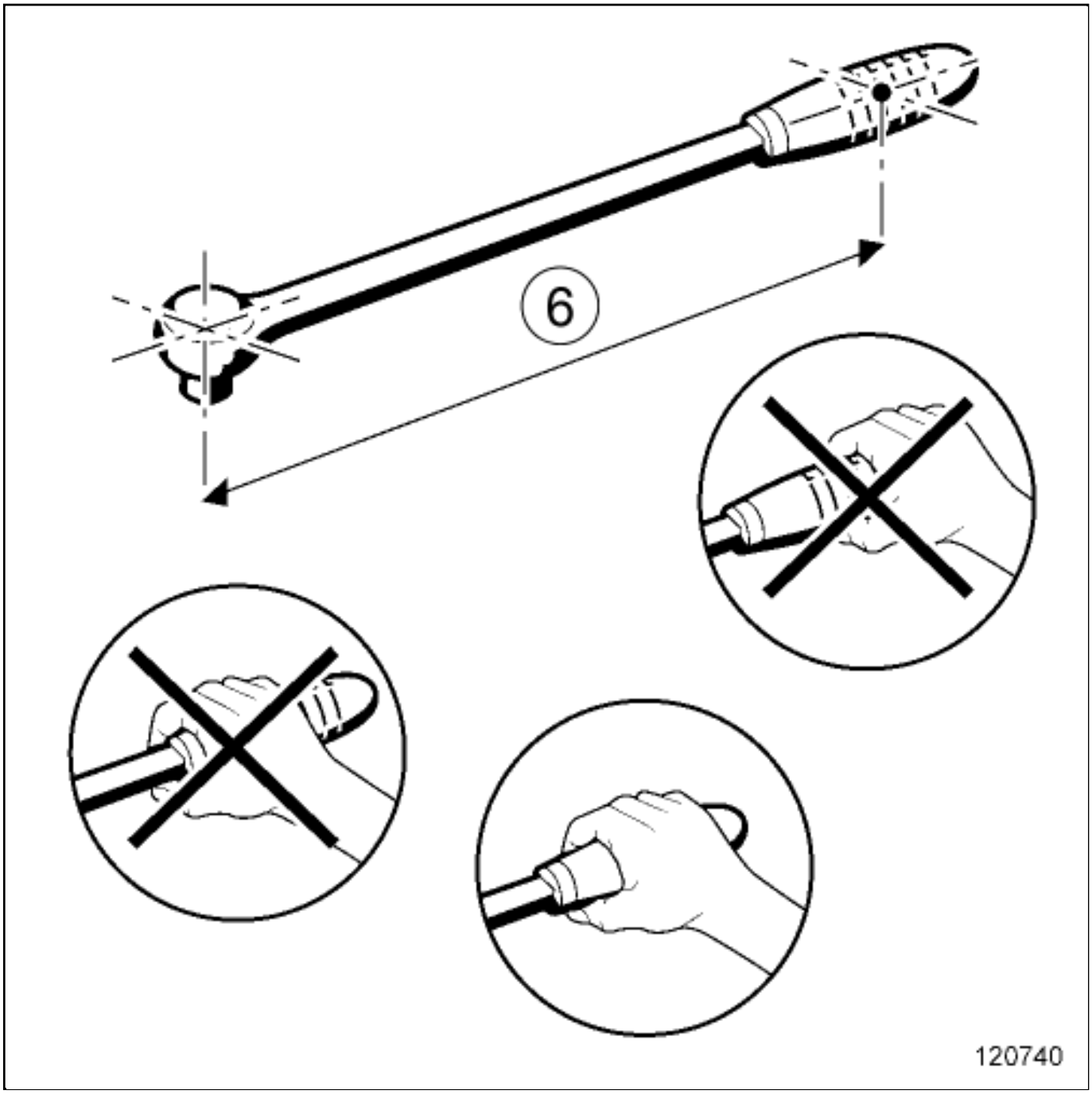
6. PRECAUTIONS WHEN USING A CLICK TYPE TORQUE WRENCH

A click type torque wrench is a manual tightening tool. The trigger mechanism causes a break or disengagement of the wrench past a force threshold.

This threshold depends on the setting of the wrench but also depends on the way the wrench is handled.

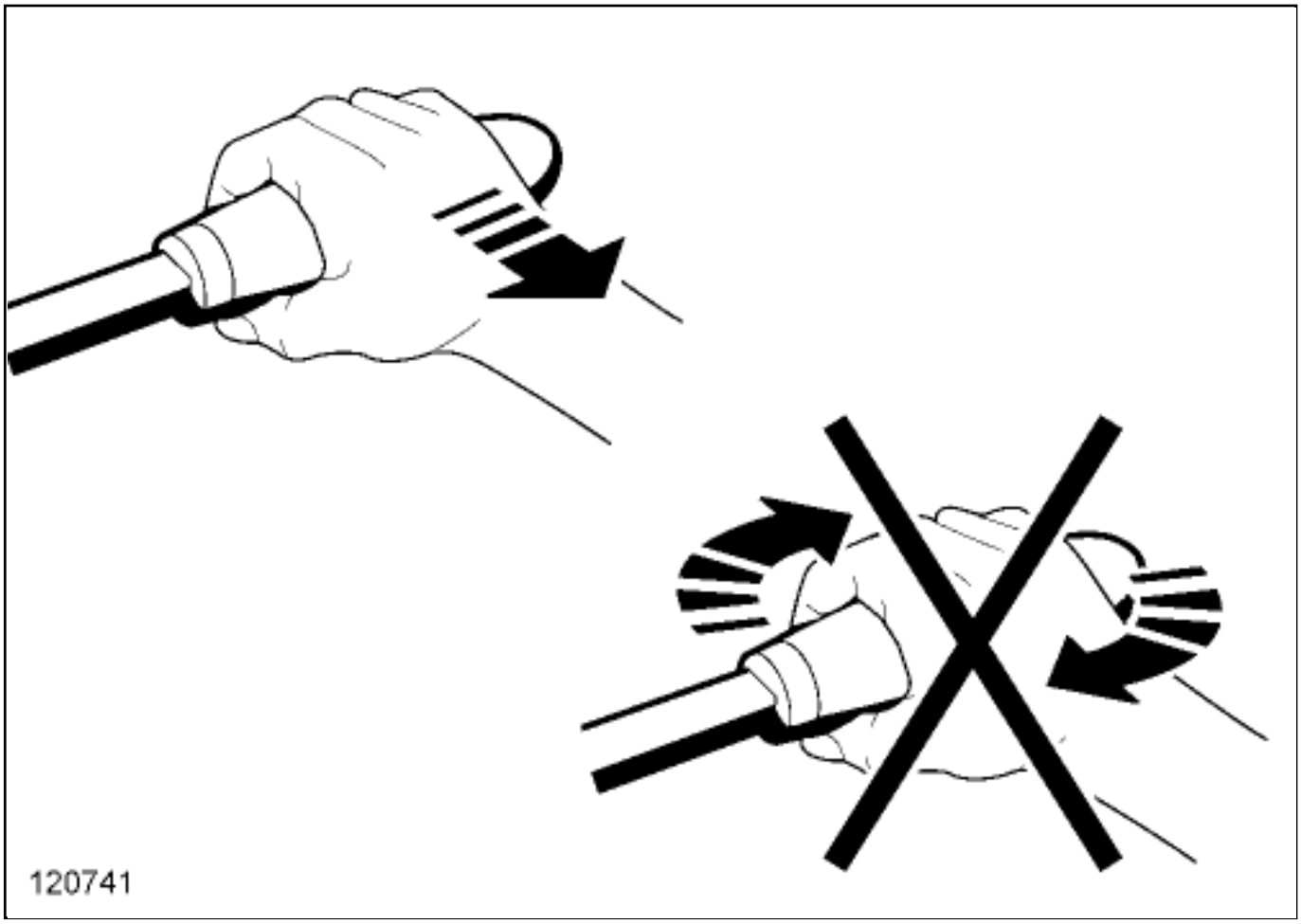
When used following best practises, the accuracy of the tightness when using a click type torque wrench is ± 15%.

The instructions to be observed are:



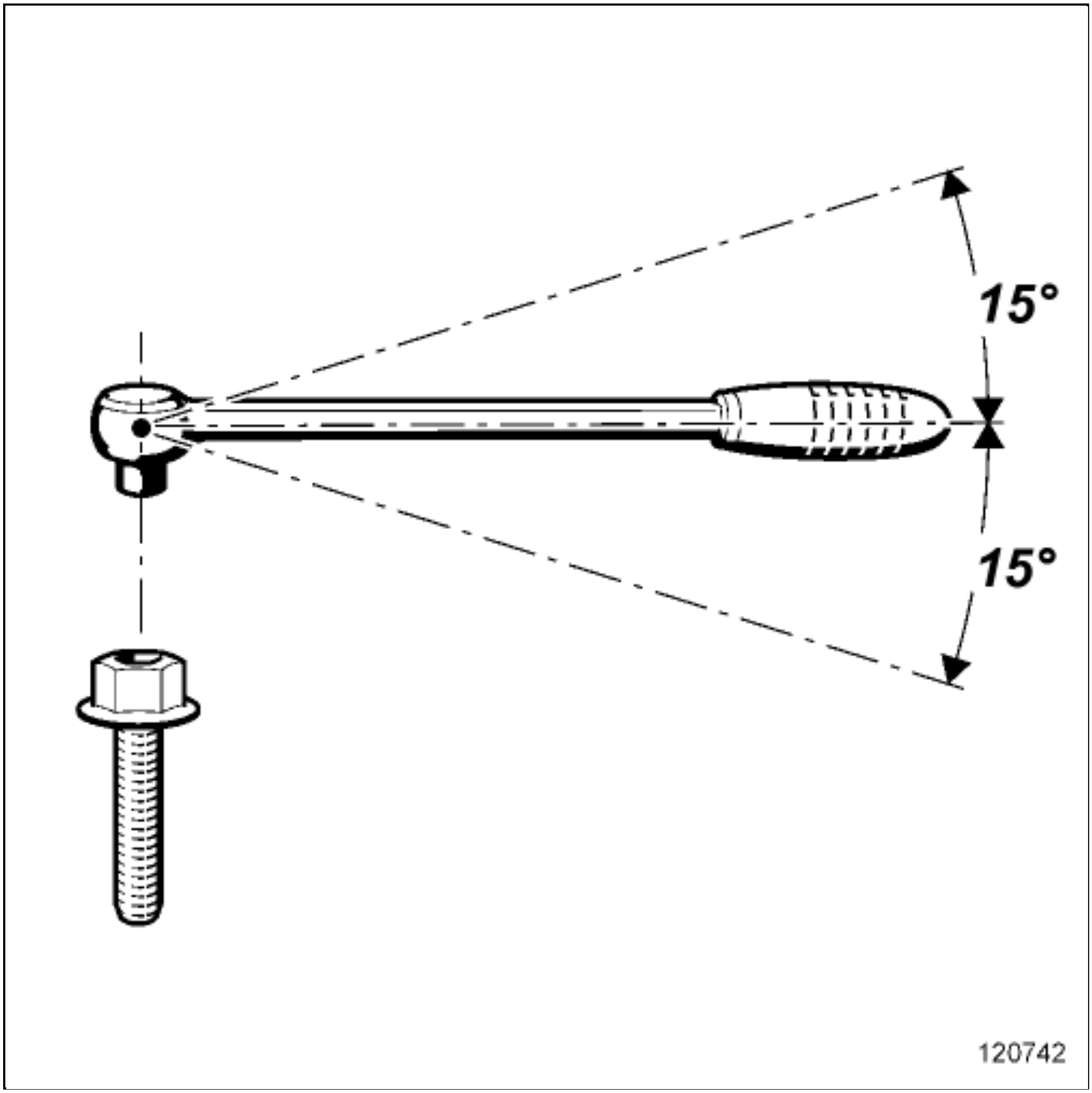
(6) lever arm

- Place the hand in the centre of the handle. An incorrectly positioned hand on the handle will alter the trigger threshold.



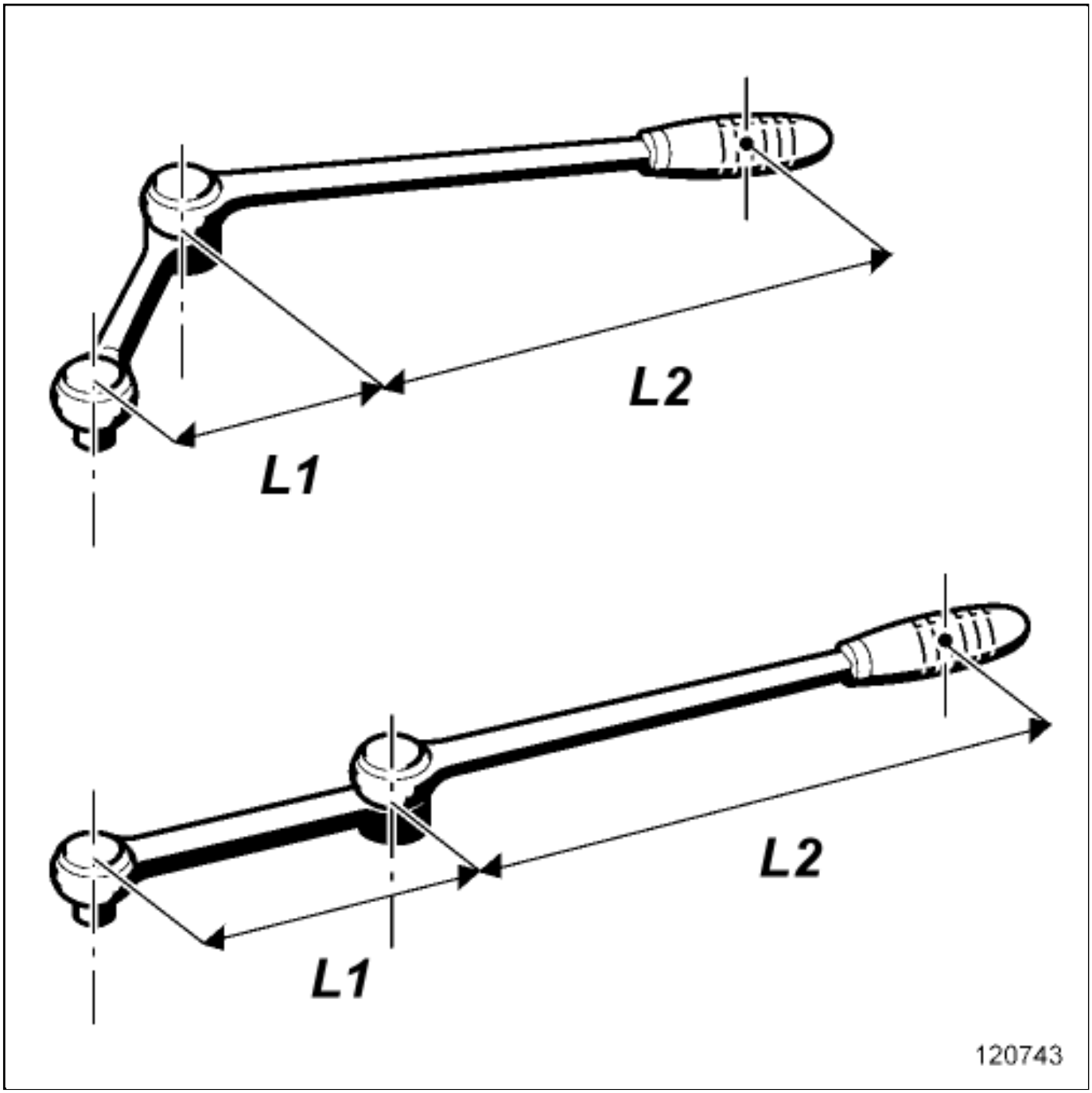
- Pull the wrench gently and steadily, without applying any torsion. Excessive tightening speed as well as jerkiness are major causes of overtightening. Any torsion applied to the wrench will alter the trigger threshold.

- Hold the wrench on the bolt using a minimum of effort. Any effort applied to the wrench head will alter the trigger threshold.



- Apply the tightening effort perpendicular to the mounting observing a tolerance of ± 15˚ relative to the perpendicularity. If the wrench is not perpendicular to the mounting axis, this will result in insufficient tightening.

- Stop tightening as soon as the wrench is triggered. Continued tightening after the wrench is triggered will lead to overtightening.



If the length of the wrench is modified (extending the handle, adapting an end piece) it is essential to recalibrate the wrench to its new configuration.

Modifying the length of the wrench will modify its trigger threshold.

- Use the formula: C1 = CO x L2 / (L1+L2)
  - CO: torque to apply,
  - C1: adjustment torque to be displayed on the wrench,
  - L1: length of the extension,
  - L2: length of the wrench.

Unless there are special instructions in the repair method, a universal joint (CARDAN joint type) should be used for measured tightening. Using a universal joint will result in a difference between the set torque

of the wrench and the actual torque applied.

Before storing the wrench, loosen the adjustment spring completely. A wrench stored with a spring under tension will lose its tightening accuracy.

7. PRECAUTIONS WHEN USING ELECTRONIC TORQUE WRENCHES

An electronic torque wrench is a manual tightening tool. The tightening torque and, depending on the model, the angle is read directly.

When used following best practises, the accuracy of the tightness when using an electronic torque wrench is ± 5%.

Electronic torque wrenches are not affected by the position of the operator's hand.

It is advisable to handle the wrench with care and to stop tightening when the required value is displayed on the wrench.

TIMING BELT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
TDC locating pin.	Mot. 1489
Set of 5 crankshaft and camshaft pulley timing pins.	Mot. 1430

Equipment required
offset spanner

parts always to be replaced:
Timing belt
Timing belt tensioning roller
Crankshaft accessories pulley bolts

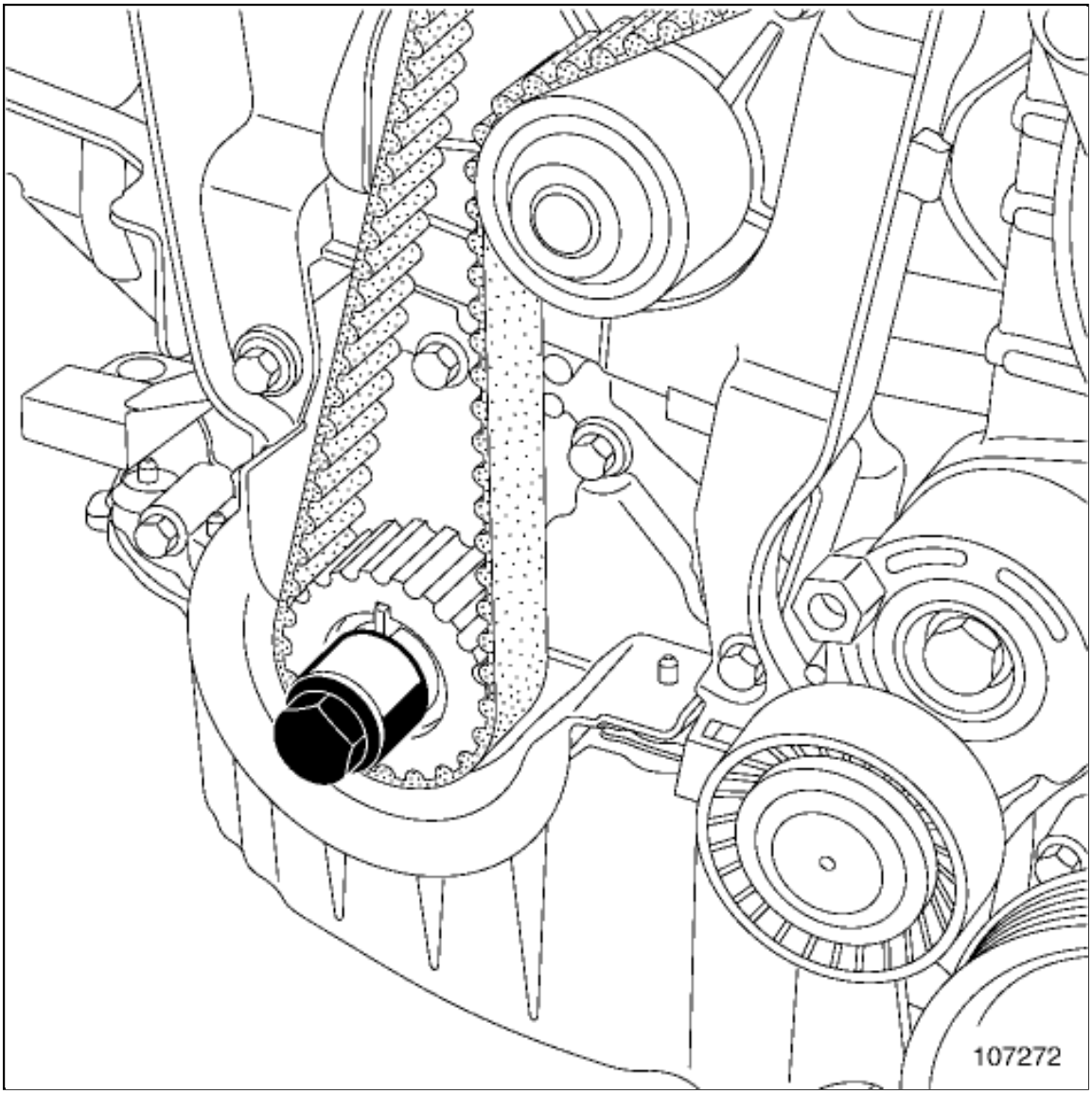
WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

REMOVAL

1. REMOVAL PREPARATION OPERATION

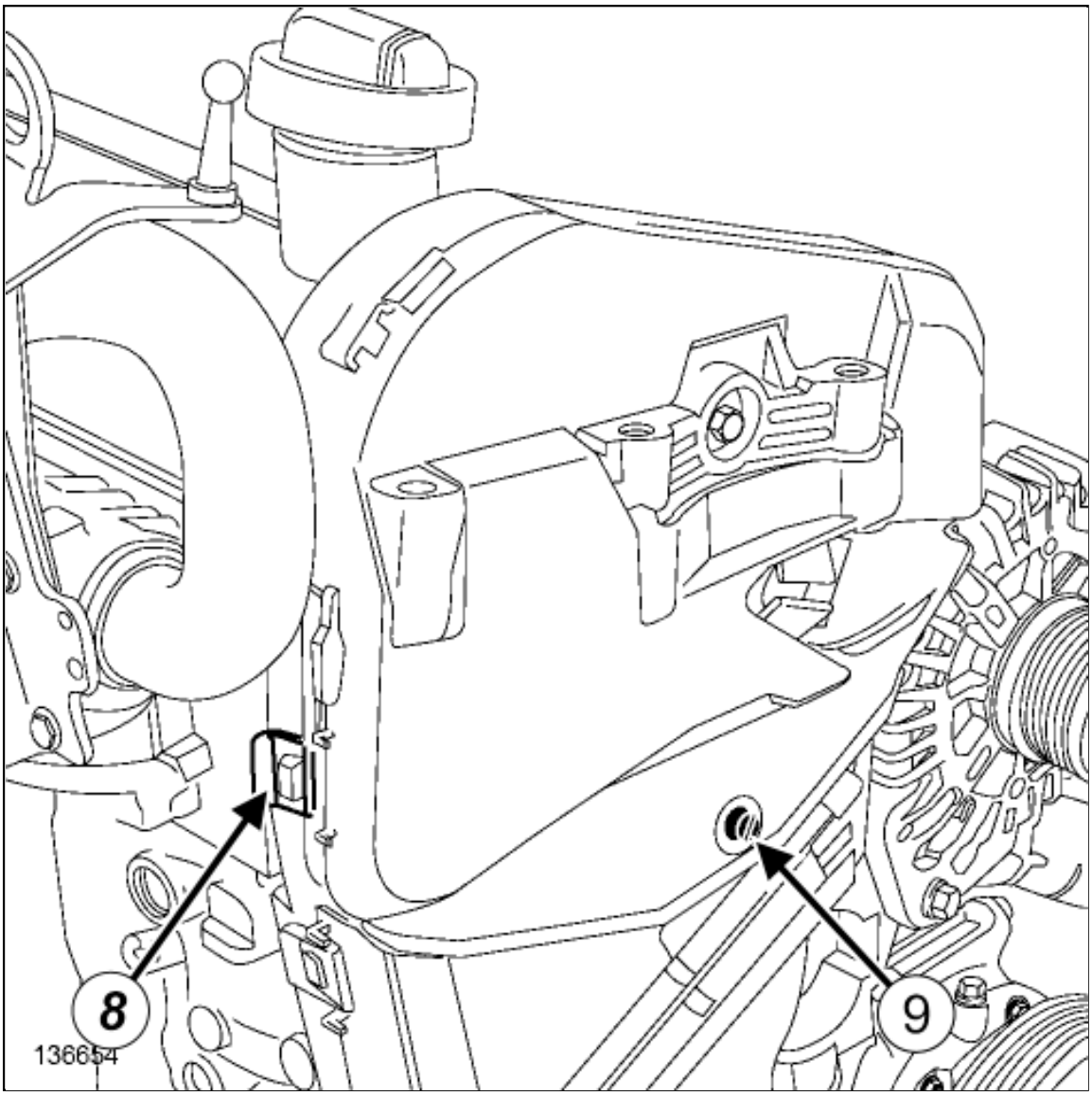
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Remove the front right-hand wheel Wheel: Removal - Refitting .
- Remove:
  - the engine undertray bolts,
  - the engine undertray,
  - the accessories belt(see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page) ,
  - the crankshaft accessories pulley(see **Crankshaft accessories pulley: Removal - Refitting**) .
- Remove the lower engine tie-bar Lower engine tie-bar: Removal - Refitting .



- Refit the old crankshaft accessories pulley bolt with a spacer (which does not cover the crankshaft timing sprocket mark) on the crankshaft.

- Remove the right-hand suspended engine mounting Right-hand suspended engine mounting: Removal - Refitting .

- Remove the camshaft position sensor Camshaft position sensor: Removal - Refitting .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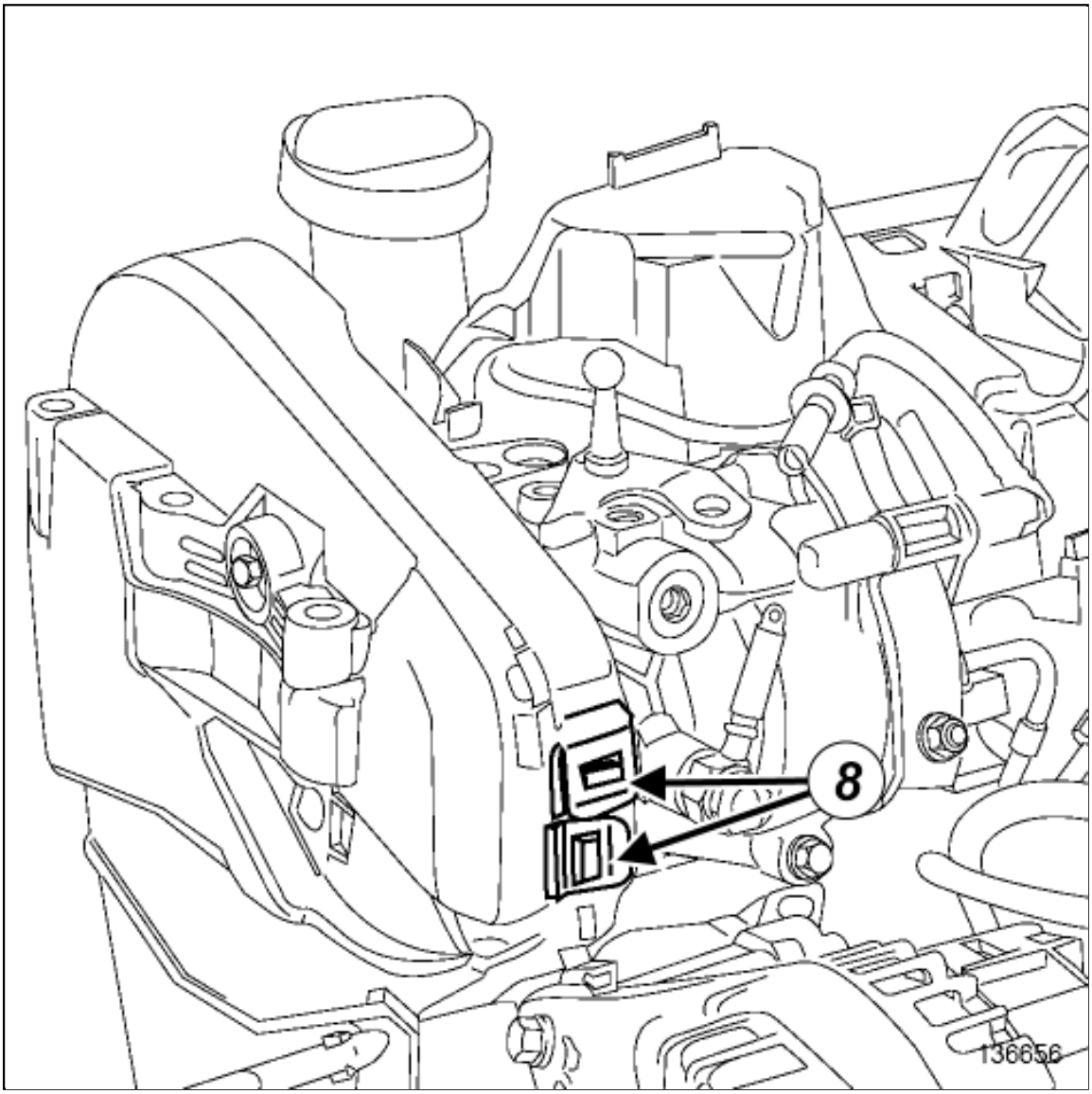
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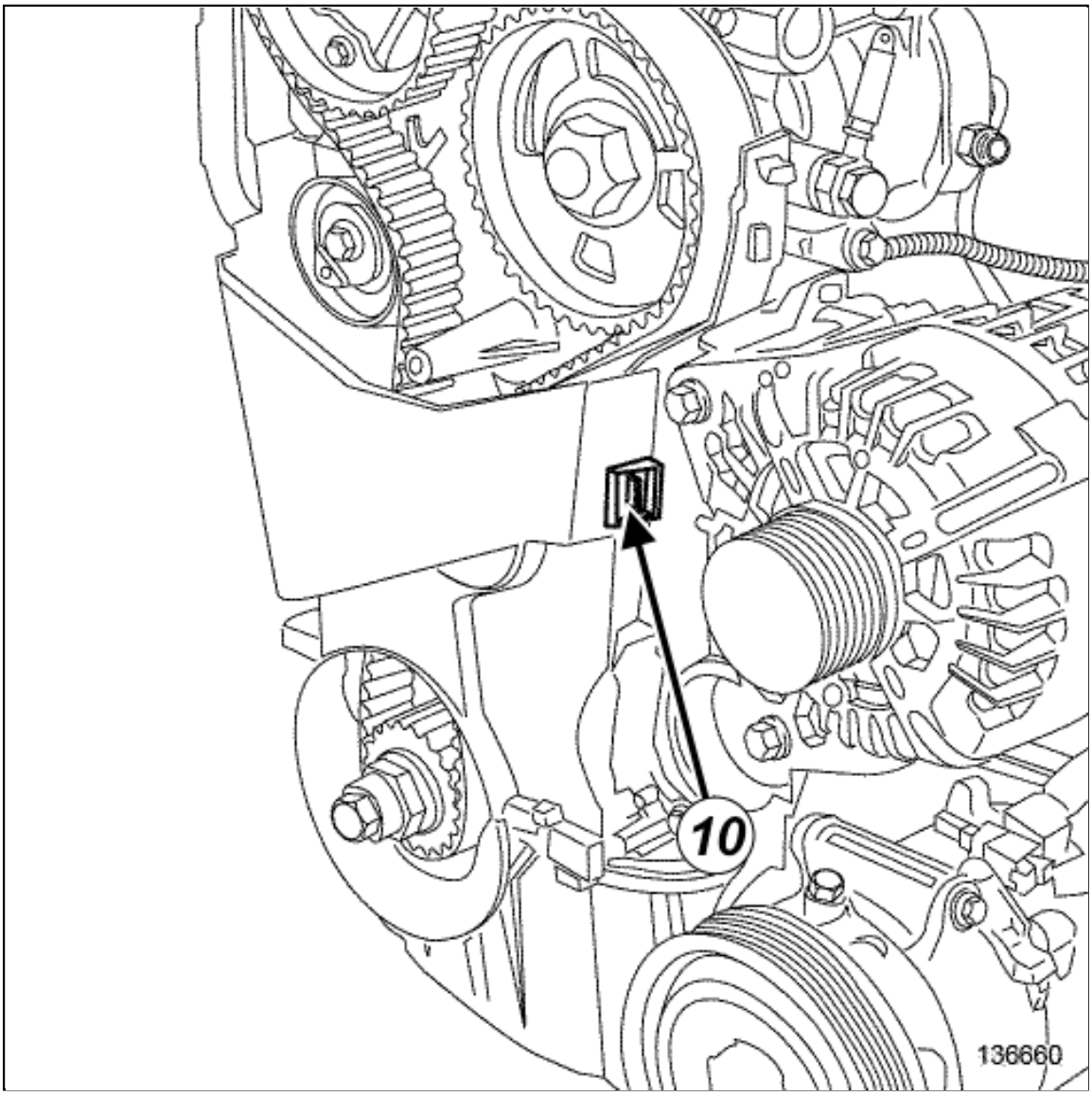
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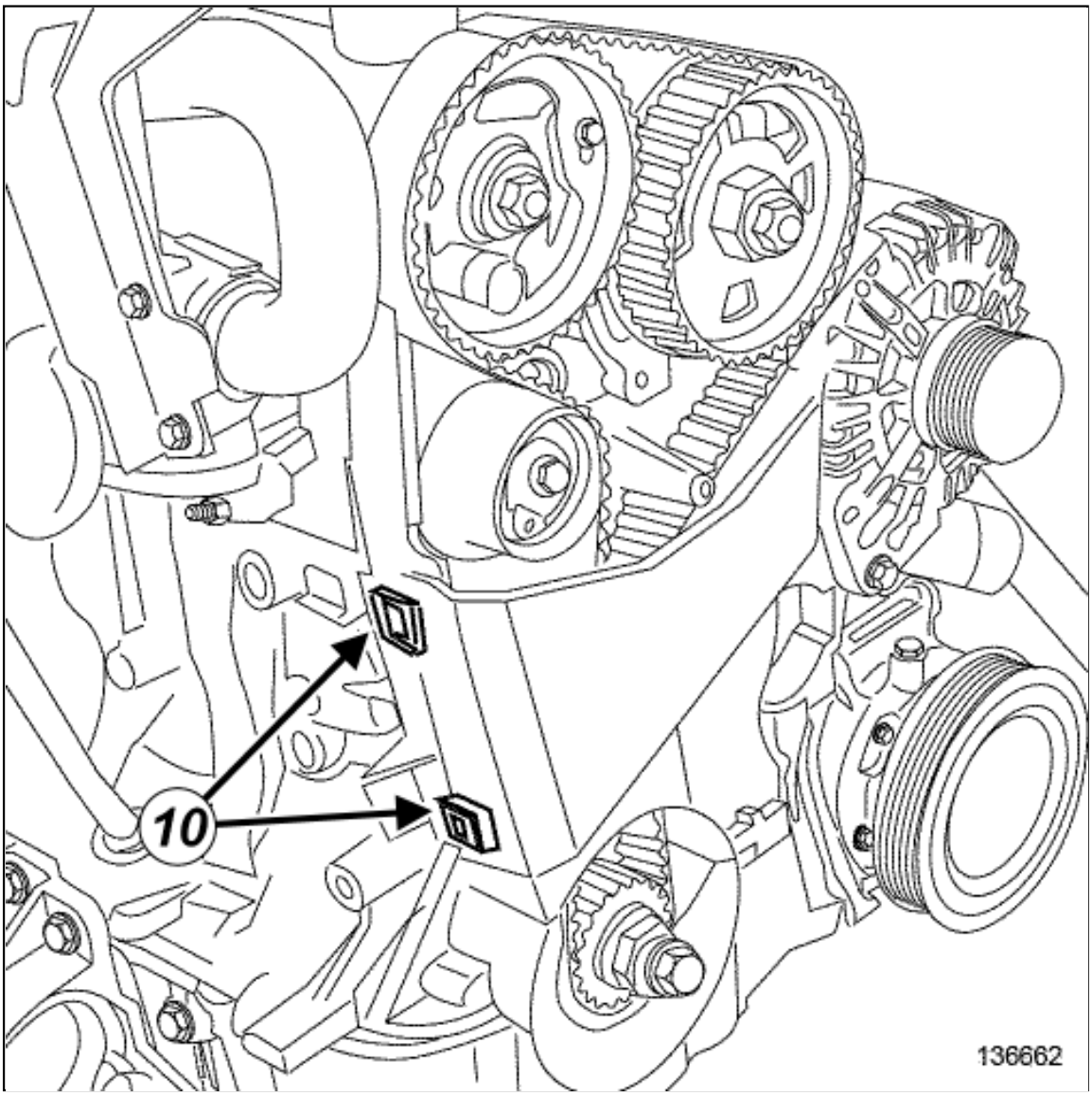
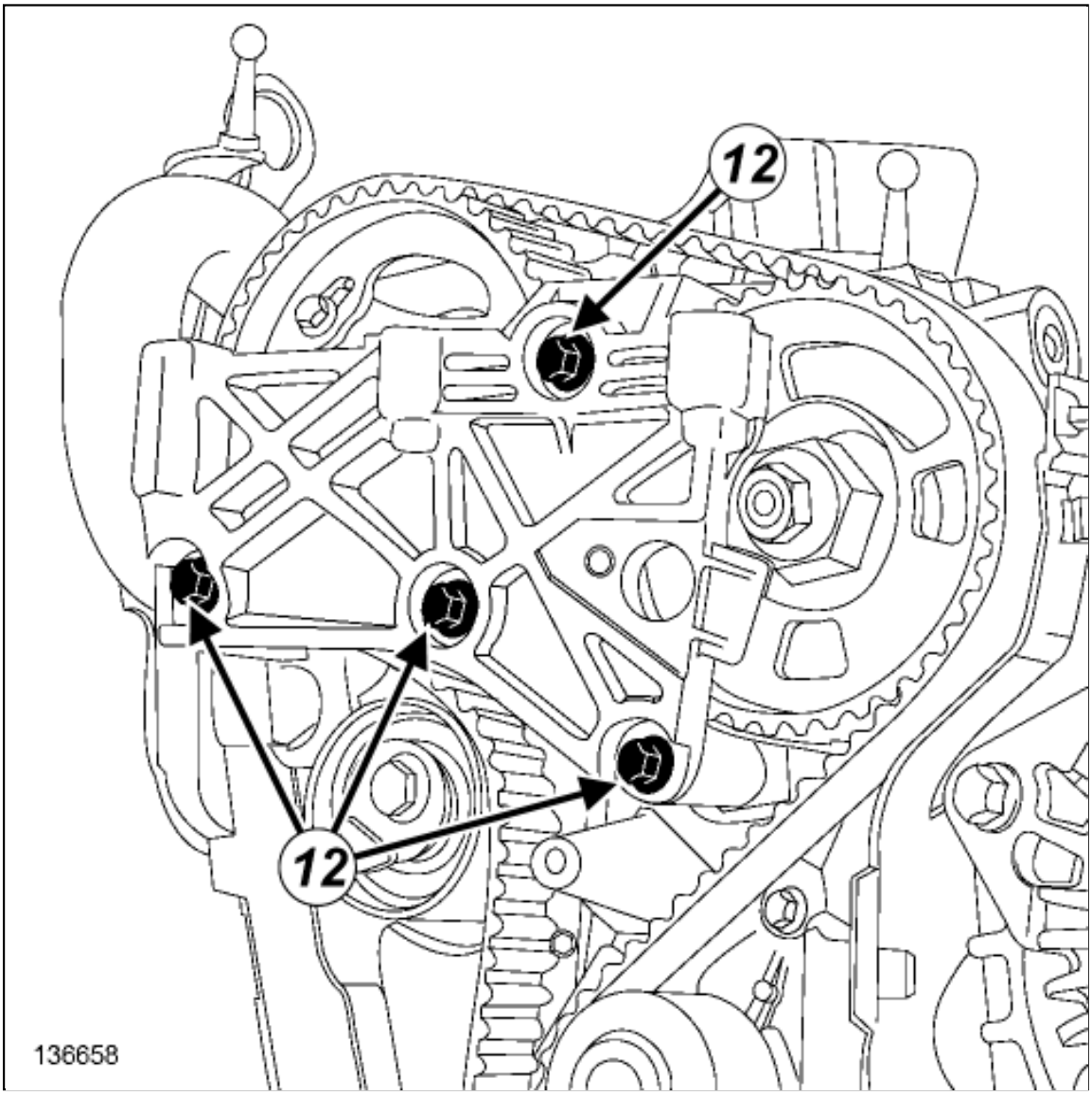


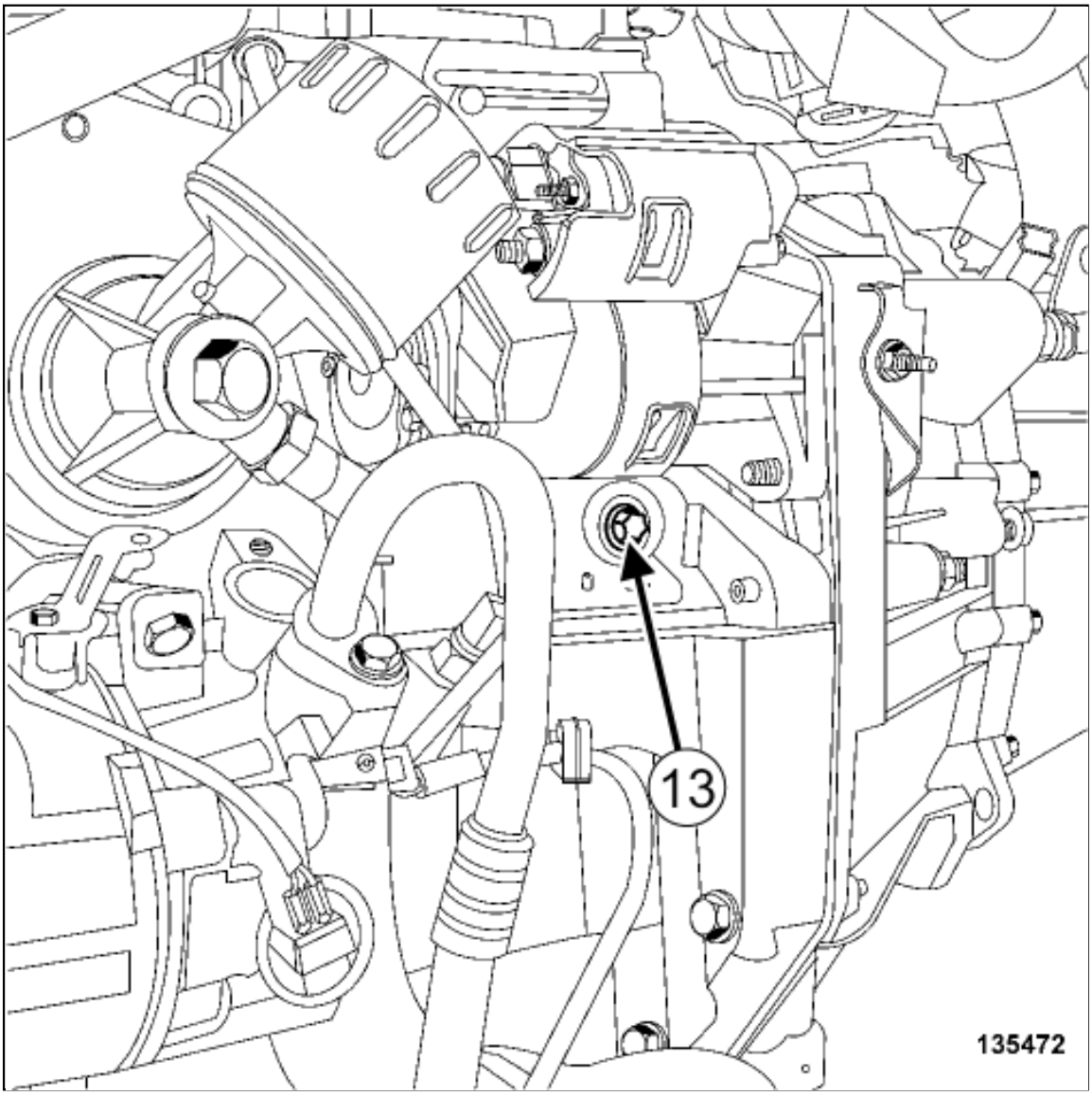
- Unclip the upper timing cover at(8) .

- Remove:
  - the bolt(9) from the upper timing cover,
  - the upper timing cover,
  - the lower timing cover by pressing the clips(10) .



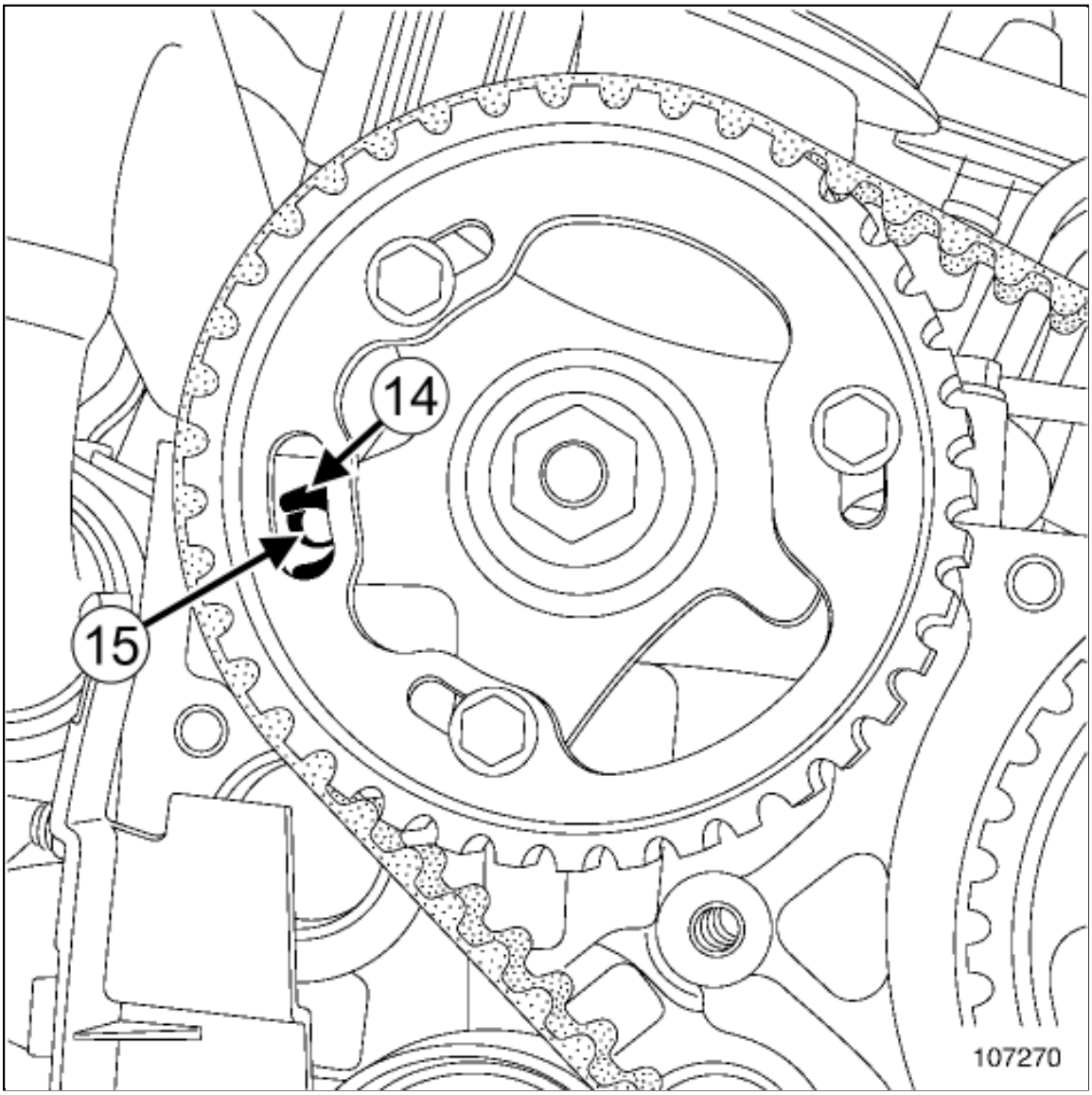
- Remove the bolts(12) from the right-hand suspended engine mounting support on the cylinder head.

- Remove the right-hand suspended engine mounting support.

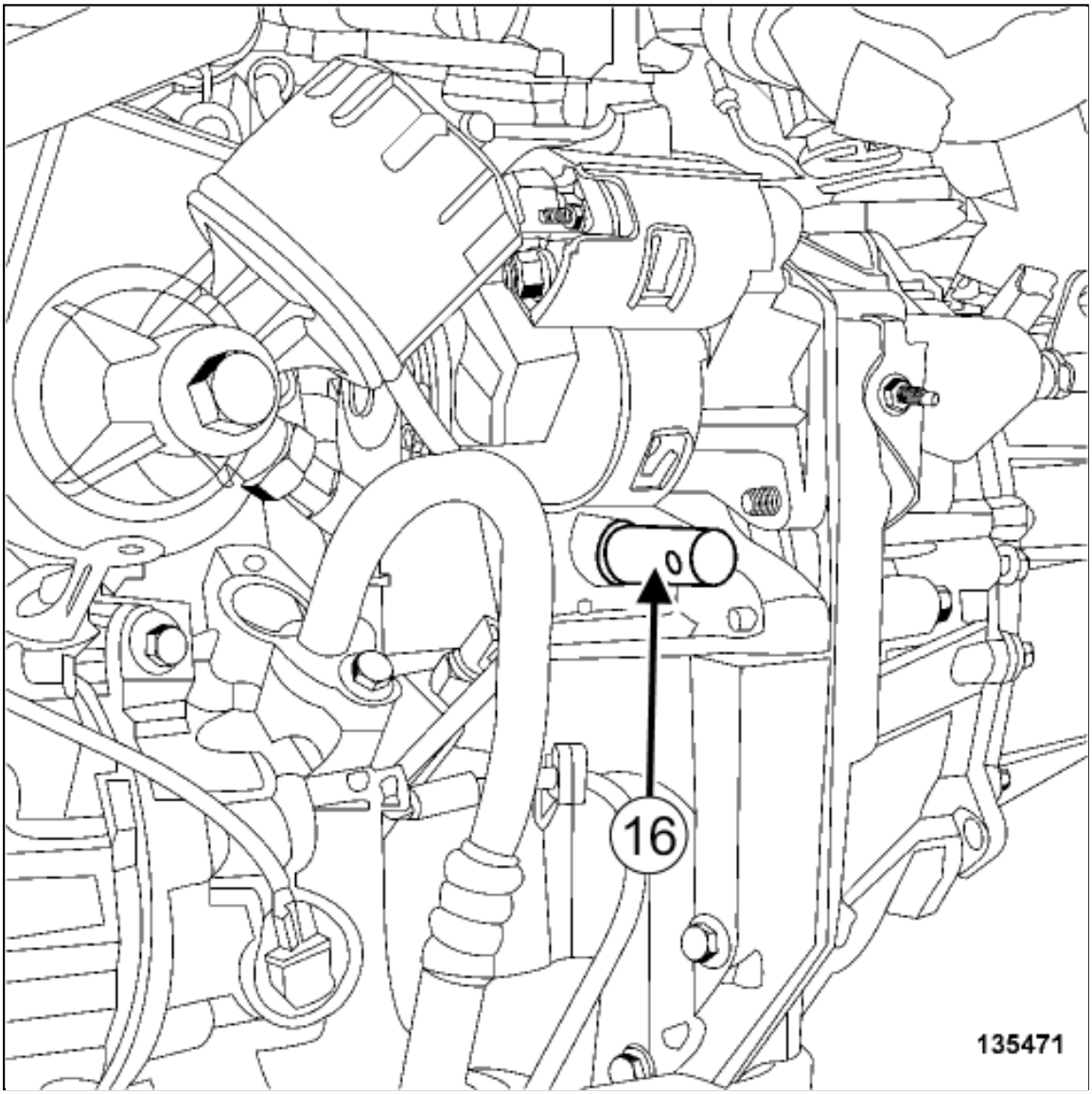


- Remove the TDC setting pin plug(13) .

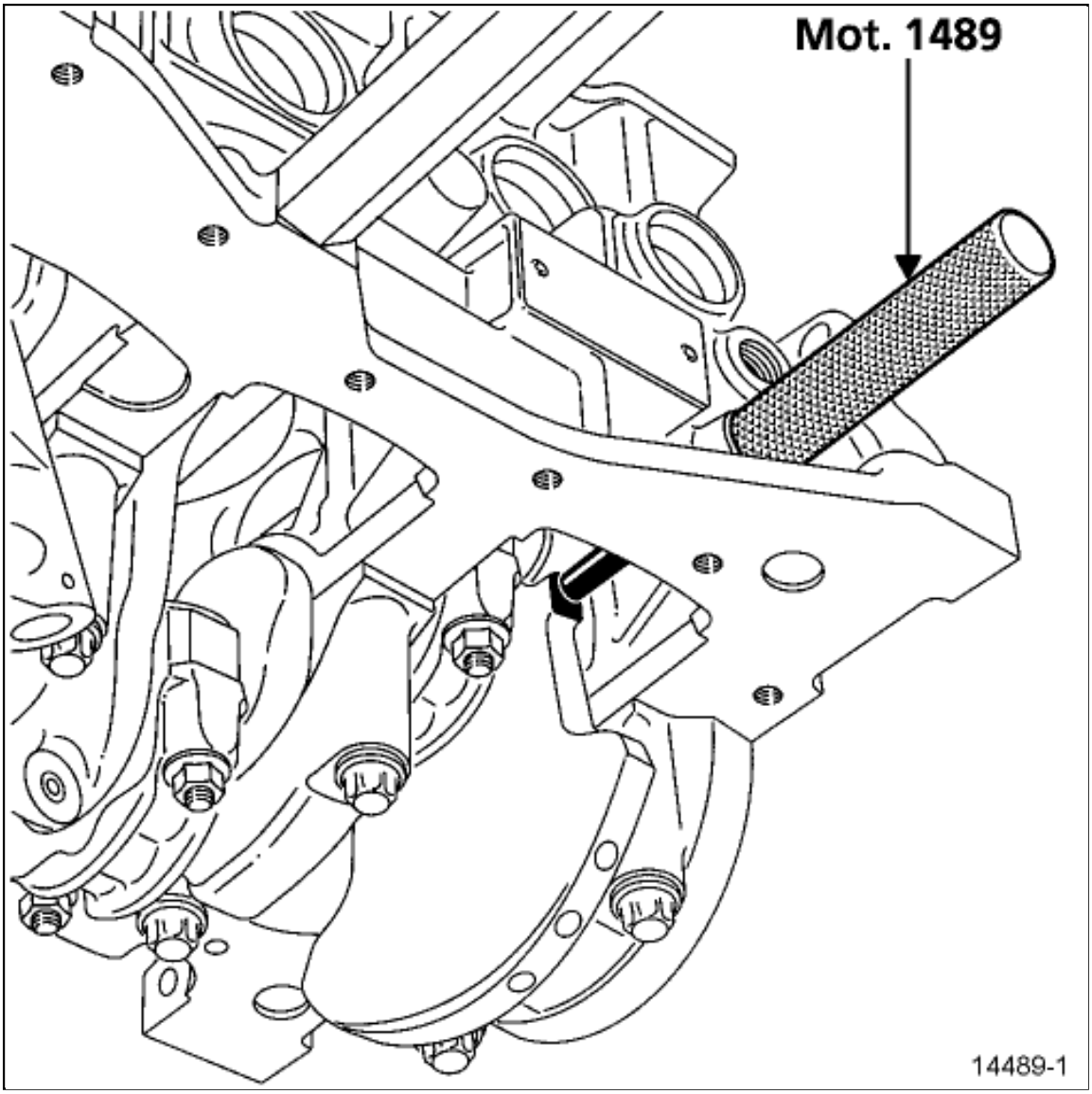
2. REMOVAL OPERATION



- Turn the crankshaft clockwise (timing end) using the old crankshaft accessories pulley bolt and its spacer to position the hole (14) of the camshaft pulley hub almost opposite the hole(15) in the cylinder head.

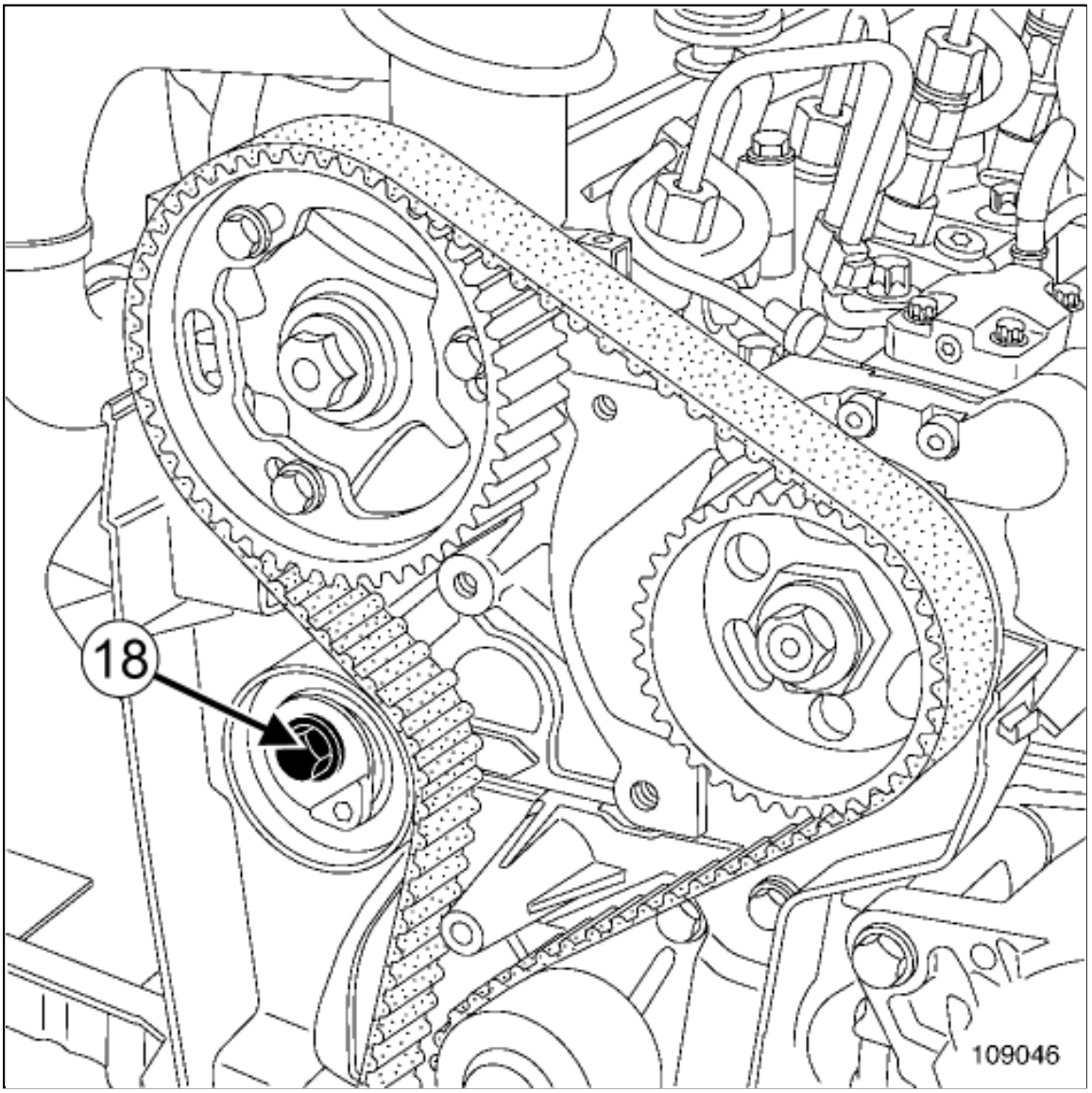


- Screw tool TDC locating pin.(Mot. 1489) (16) into the cylinder block.



- Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes in contact with theTDC locating pin.(Mot. 1489) .

- Insert the toolSet of 5 crankshaft and camshaft pulley timing pins.(Mot. 1430) (17) in the holes of the camshaft pulley hub and the hole of the cylinder head.



- Undo the timing belt tensioning roller bolt(18) .

- Loosen the timing belt tensioning roller by turning the eccentric cam using a 6 mmAllen key.

- Remove:
  - the timing belt,
  - the timing belt tensioning roller bolt,
  - the timing belt tensioning roller.

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: Timing belt .

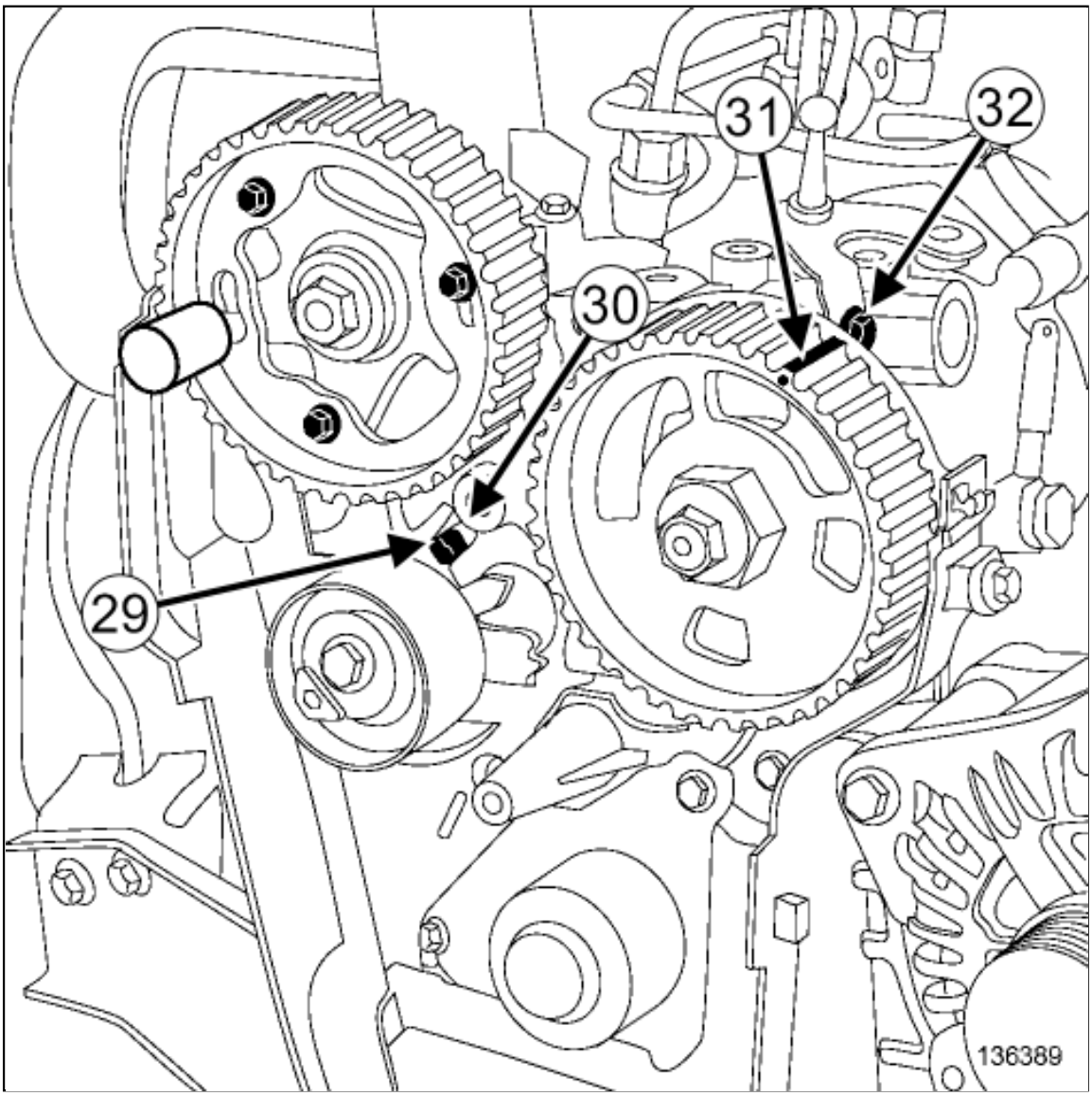
-

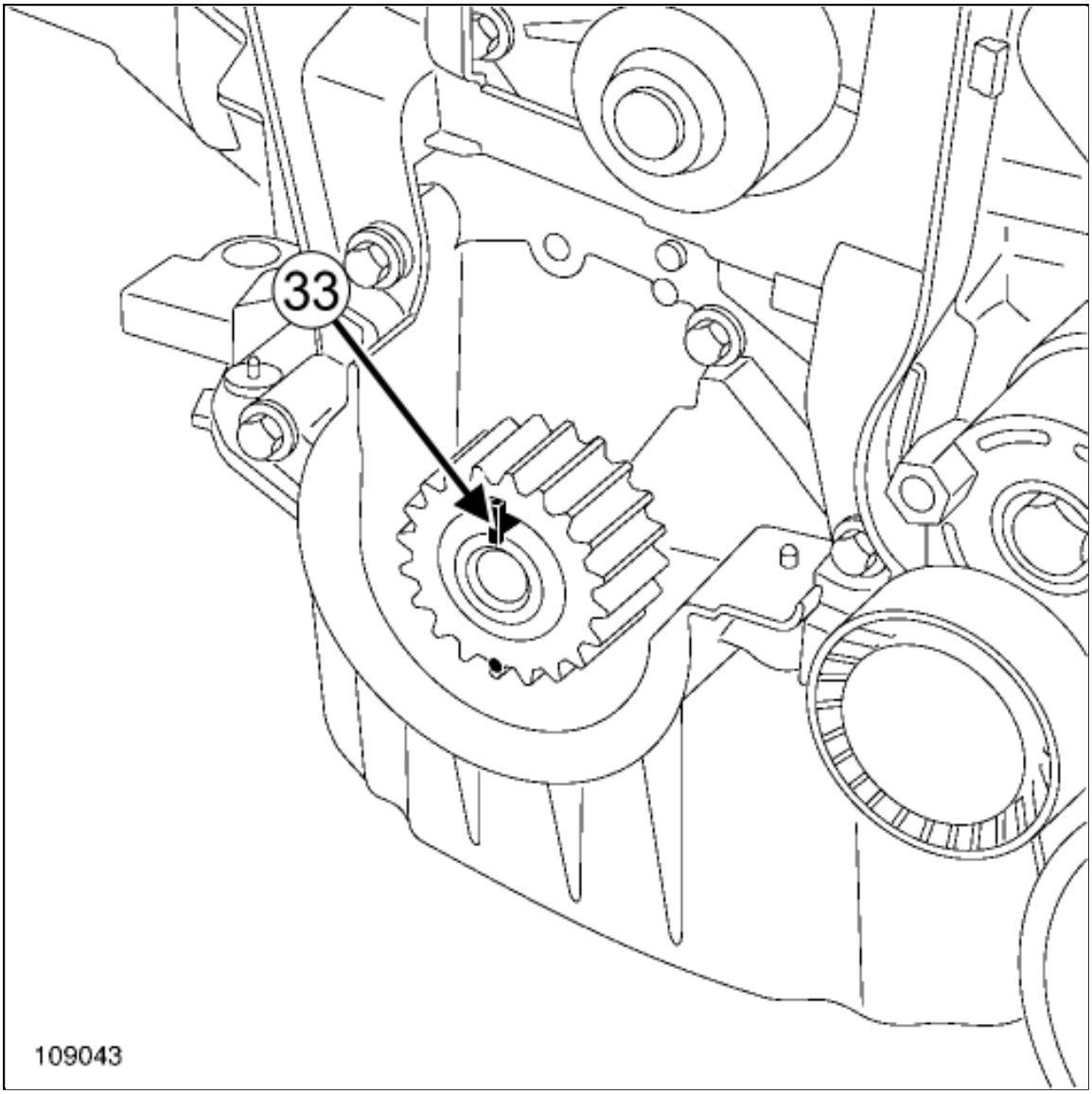
parts always to be replaced: Timing belt tensioning roller.

parts always to be replaced: Crankshaft accessories pulley bolts.

Always replace the timing belt tensioning roller bolt.

2. REFITTING OPERATION

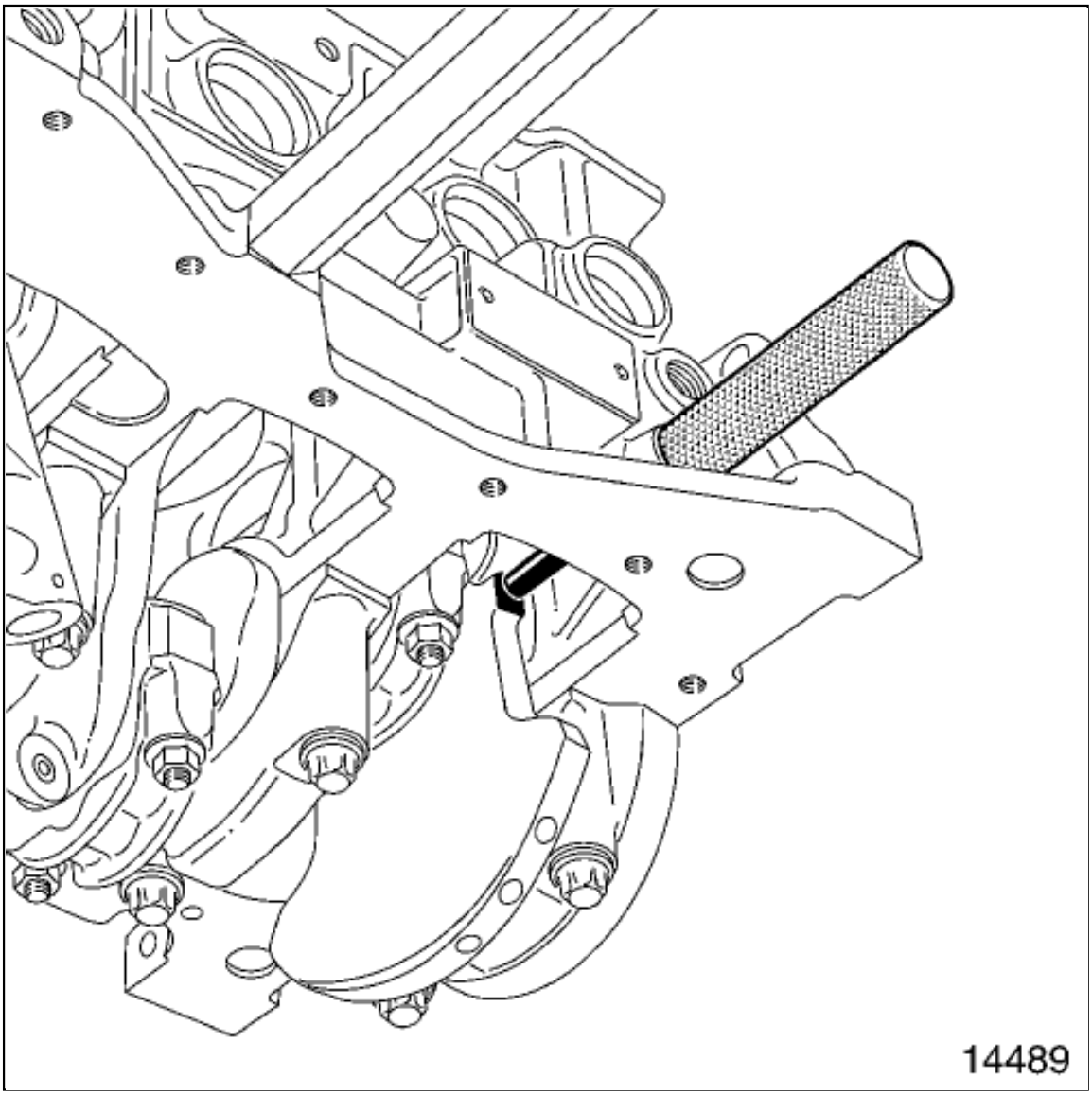




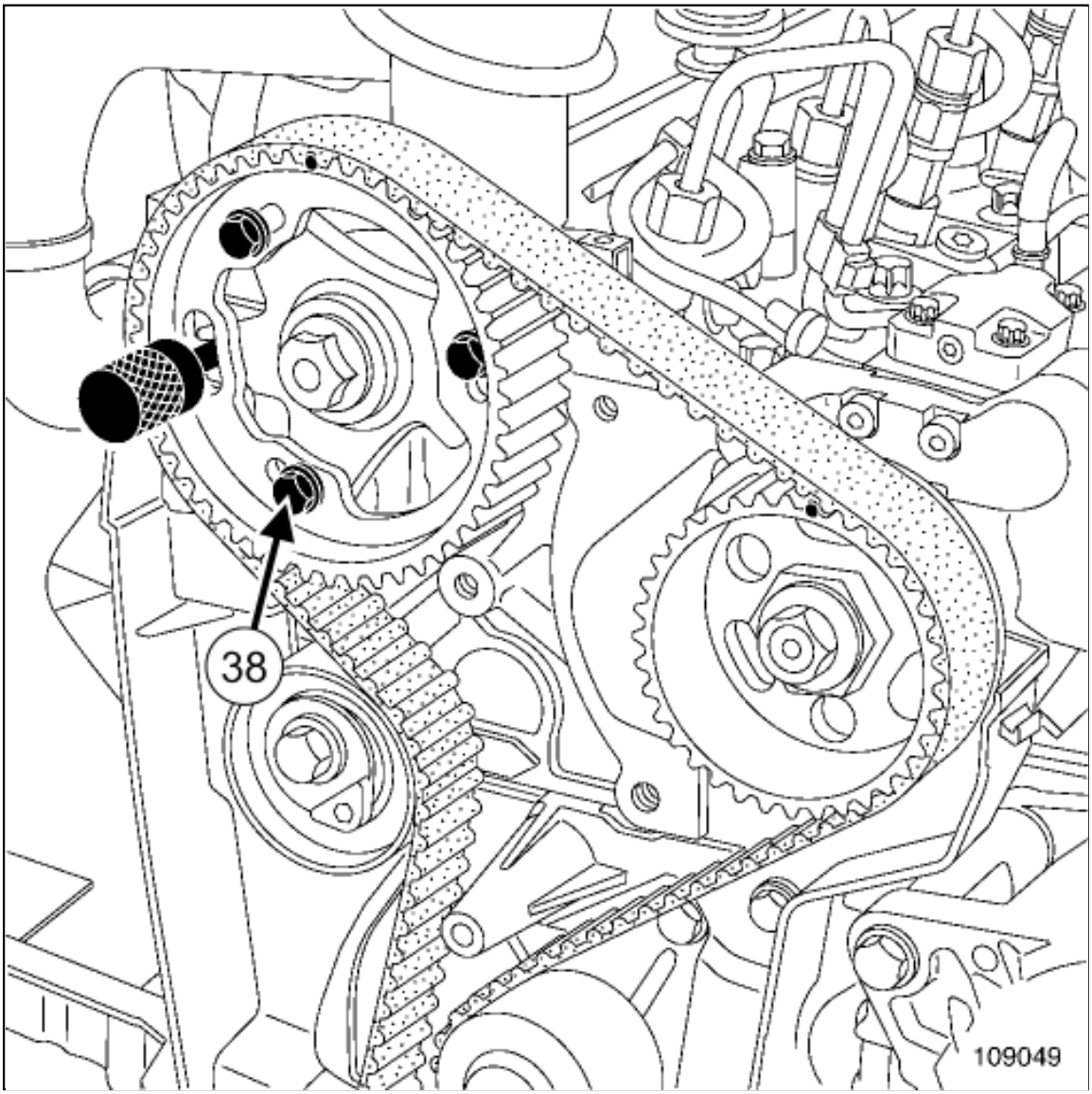
- Refit the new timing belt tensioning roller.

- Fit the timing belt tensioning roller lug(29) in the cylinder head groove(30) .

- Check that:
  - Check that the mark(31) on the high pressure pump is opposite the bolt head(32) .
  - the crankshaft is resting on the toolTDC locating pin.(Mot. 1489) (the cotter(33) of the crankshaft timing sprocket upwards).

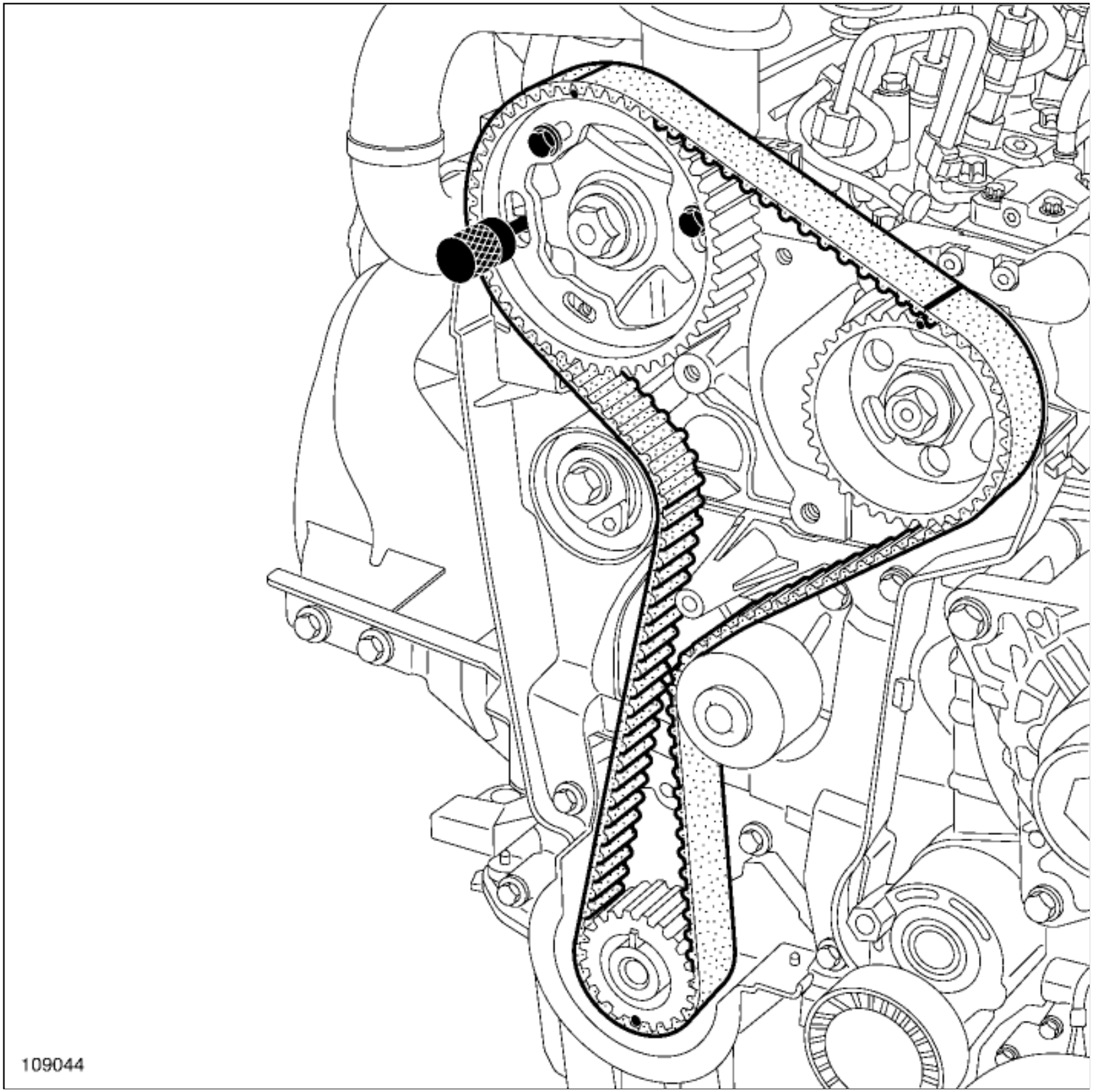


- Check that the crankshaft is resting on the toolTDC locating pin.(Mot. 1489) while turning the crankshaft clockwise using the old crankshaft accessories pulley bolt and its spacer.



- Remove the bolt(38) from the camshaft pulley hub.

- Loosen the other bolts of the camshaft pulley hub by one turn.

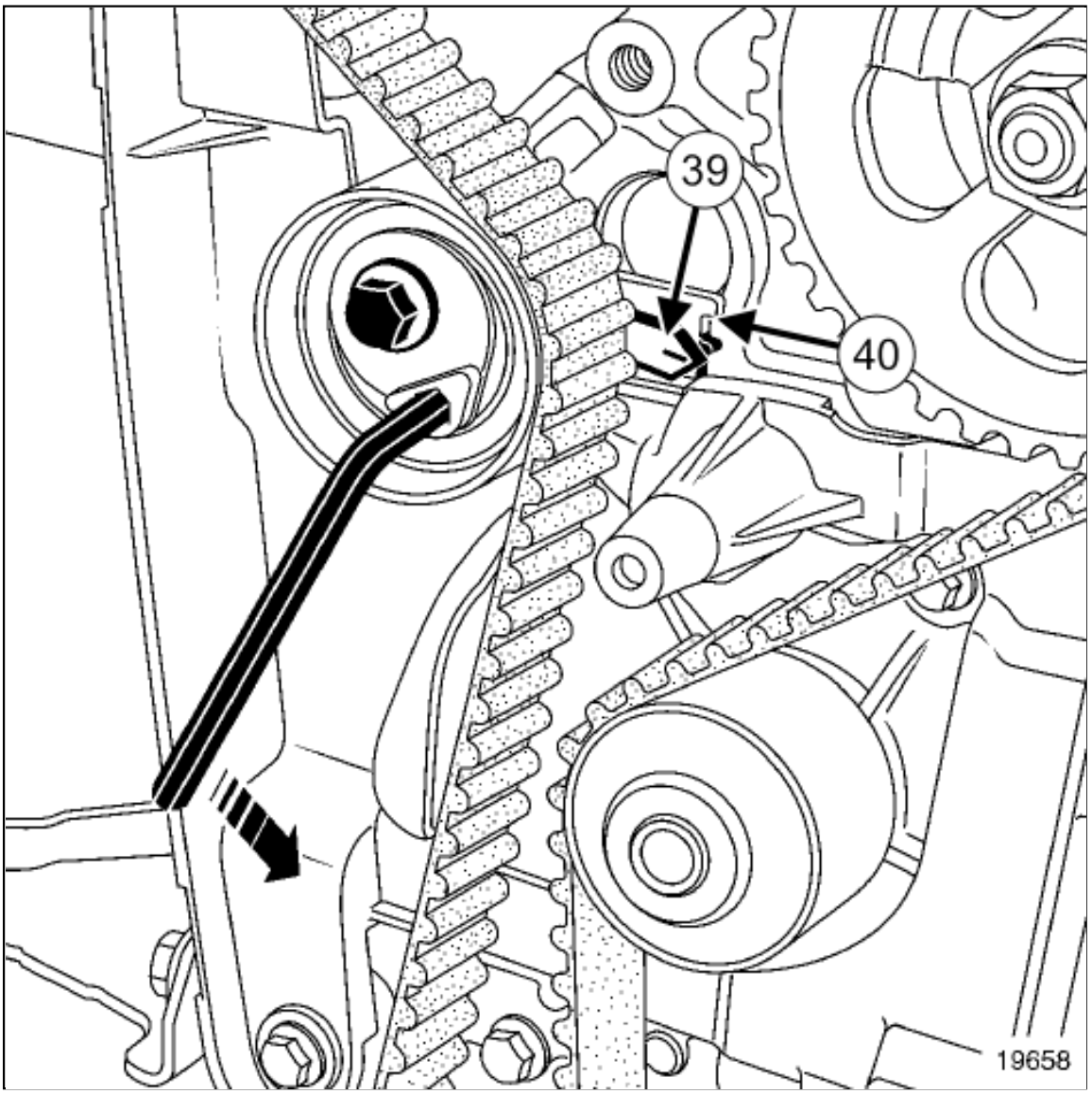


- Fit the new timing belt starting with the crankshaft sprocket.

- Align the timing belt marks with the marks:
  - of the crankshaft timing sprocket,
  - of the camshaft pulley,
  - of the high pressure pump pulley.

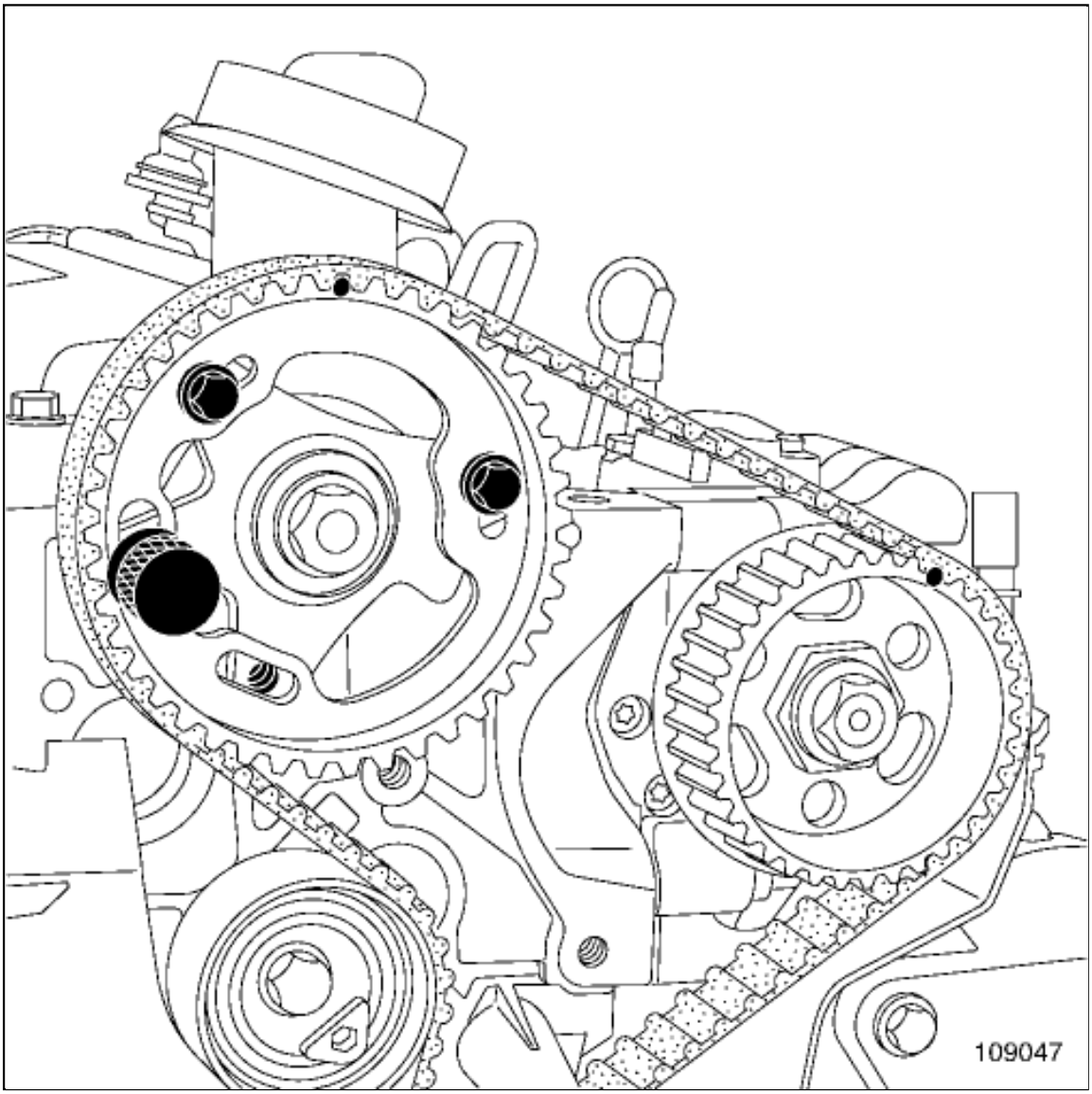
Note:

There should be 19 timing belt tooth grooves between the marks on the camshaft pulley and the high pressure pump pulley and 51 timing belt tooth grooves between the marks on the crankshaft timing sprocket and the high pressure pump pulley.



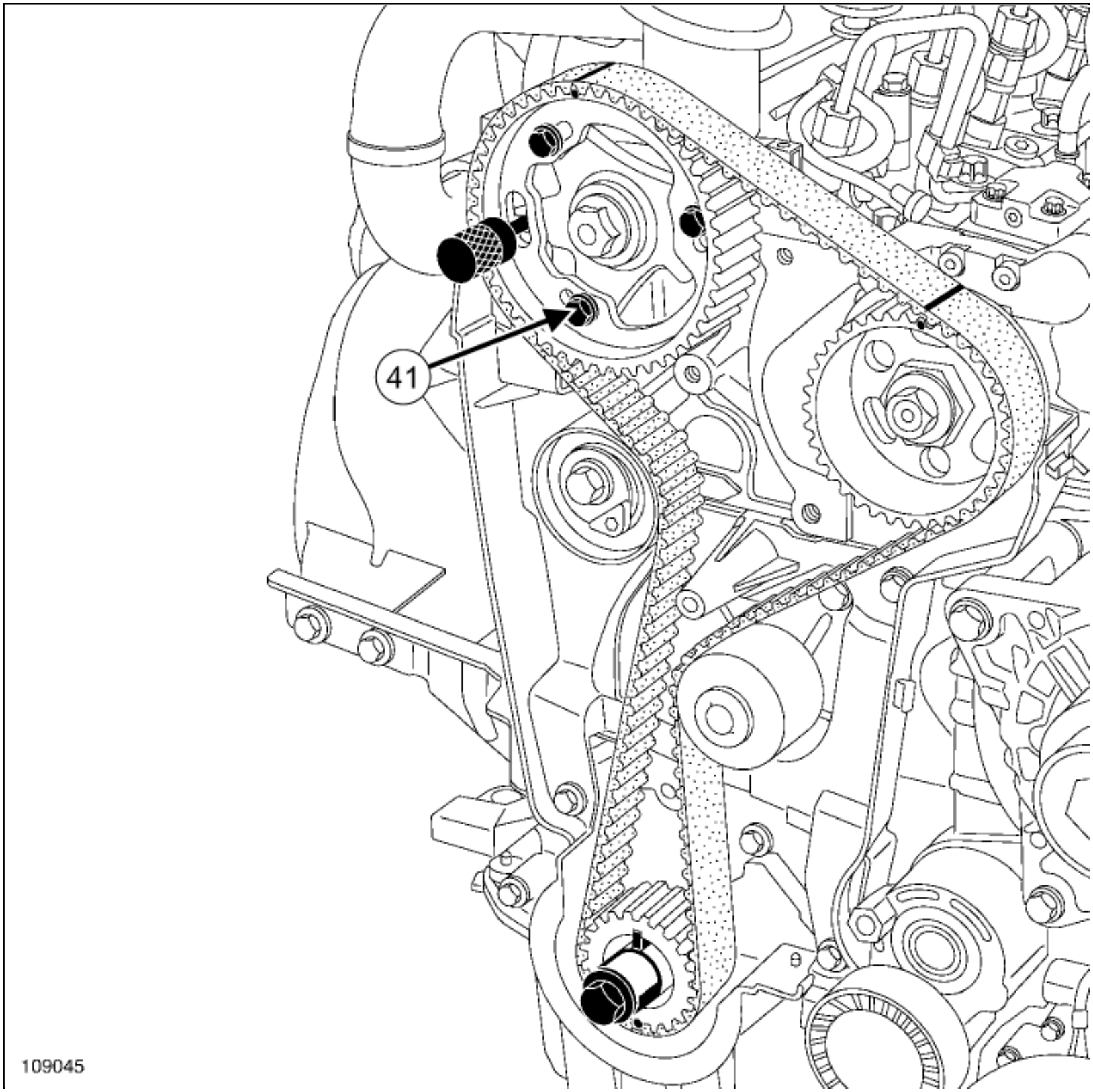
- Bring the timing belt tensioning roller adjustable index(39) opposite the lug (40) using a 6 mmAllen key, turning it anti-clockwise.

- Tighten the timing belt tensioning roller bolt.



Note:

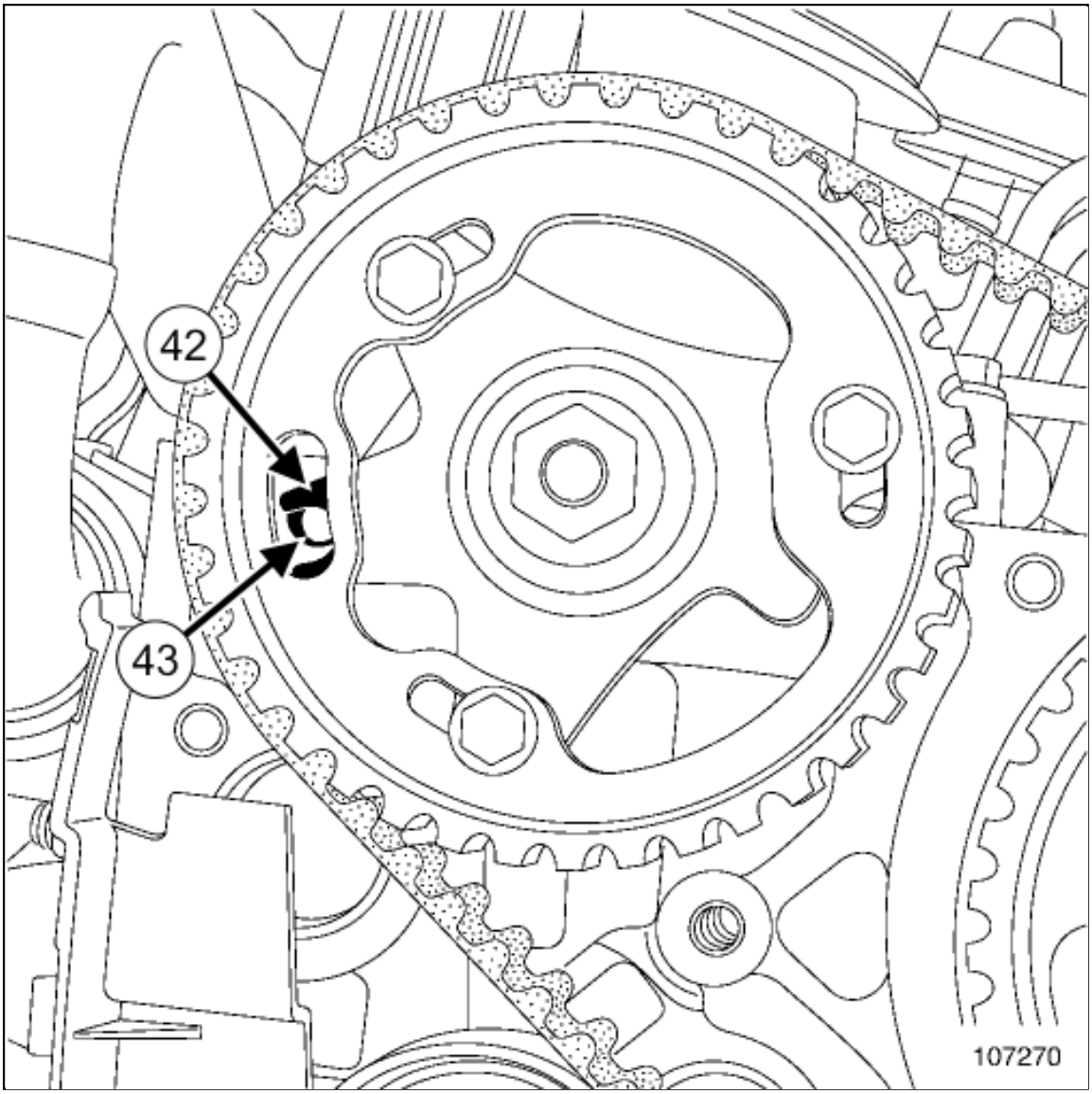
Check that the camshaft pulley hub bolts are not fully up against the camshaft pulley wheel.



- Refit the camshaft pulley hub lower bolt(41) .

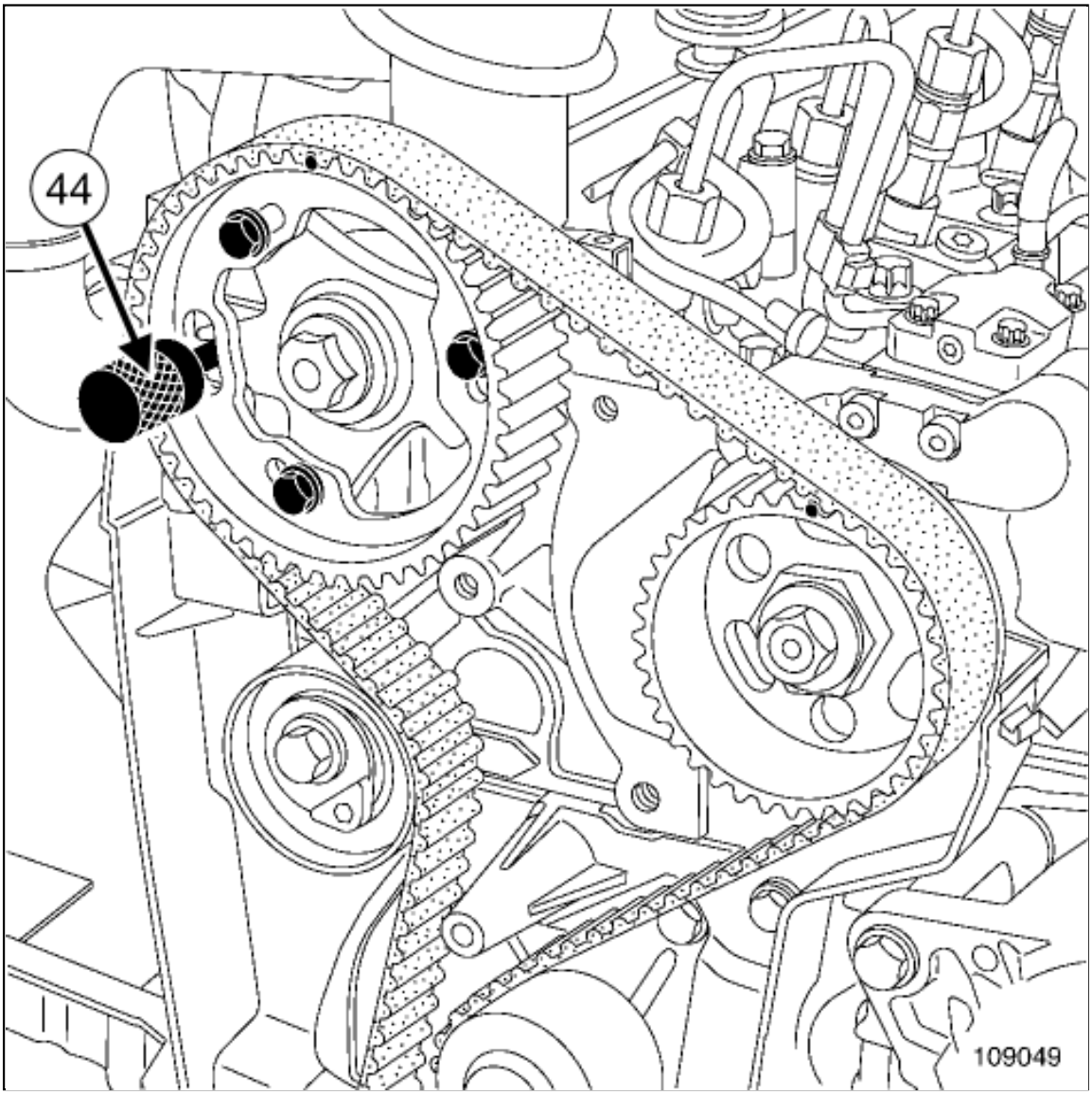
- Tighten the camshaft pulley hub bolts.

- Remove:
  - the toolTDC locating pin.(Mot. 1489) ,
  - theSet of 5 crankshaft and camshaft pulley timing pins.(Mot. 1430) .

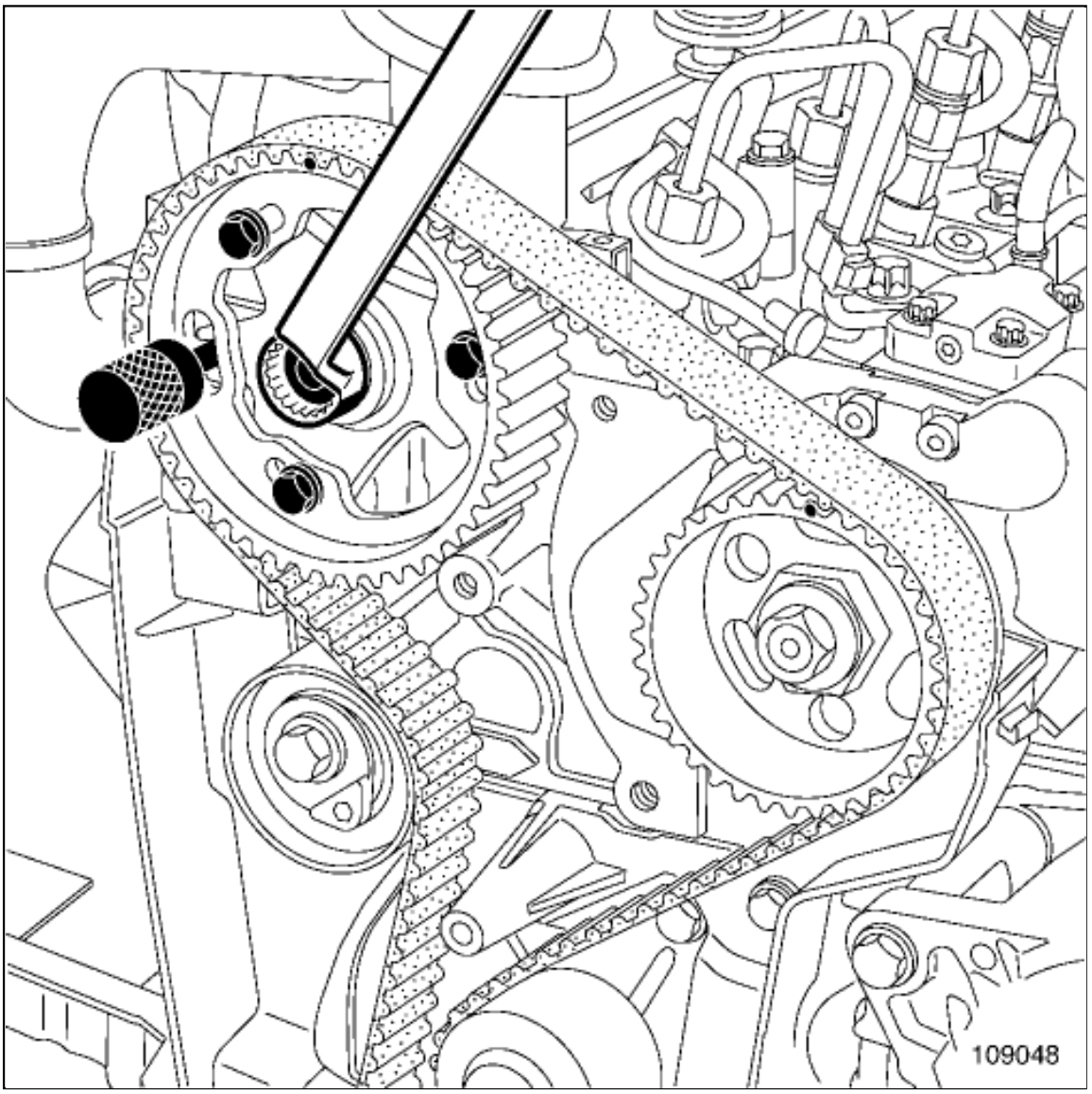


Turn the crankshaft two turns clockwise (timing end) using the old crankshaft accessories pulley bolt and its spacer until the hole(42) of the camshaft pulley hub is opposite the hole(43) in the cylinder head:

- screw toolTDC locating pin.(Mot. 1489) into the cylinder block,
- turn the crankshaft clockwise (timing end) smoothly using the old crankshaft accessories pulley bolt and its spacer, until the crankshaft comes into contact with theTDC locating pin.(Mot. 1489) .



- Set the camshaft pulley hub using the toolSet of 5 crankshaft and camshaft pulley timing pins.(Mot. 1430) (44) .



Note:

If the toolSet of 5 crankshaft and camshaft pulley timing pins.(Mot. 1430) does not engage correctly:

-loosen the camshaft pulley hub bolts by up to one turn,

-turn the camshaft pulley hub using an 18mm offset spanner to set the camshaft pulley hub,

-do not retighten the camshaft pulley hub bolts.

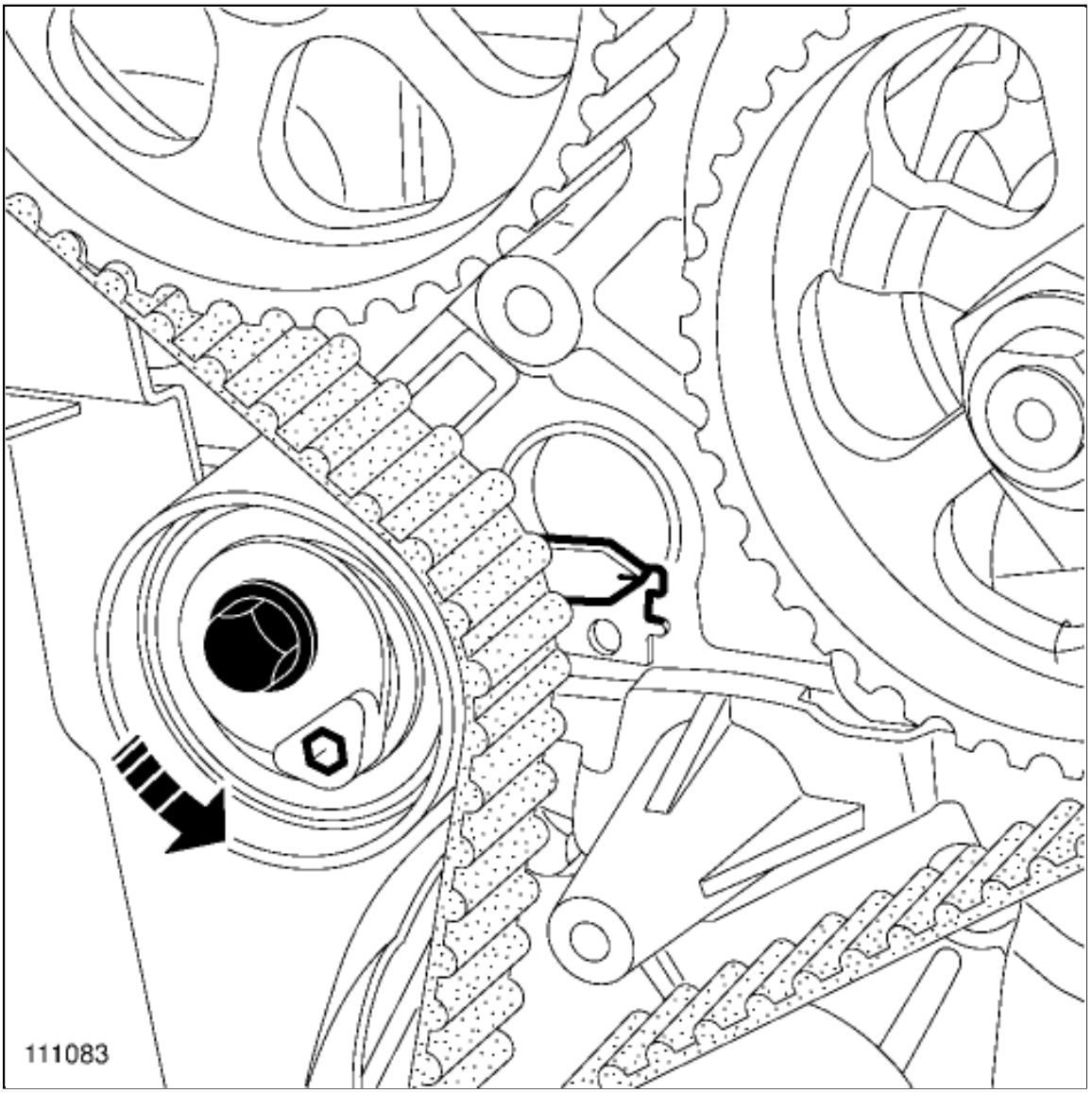
- Loosen the camshaft pulley hub bolts by one turn.

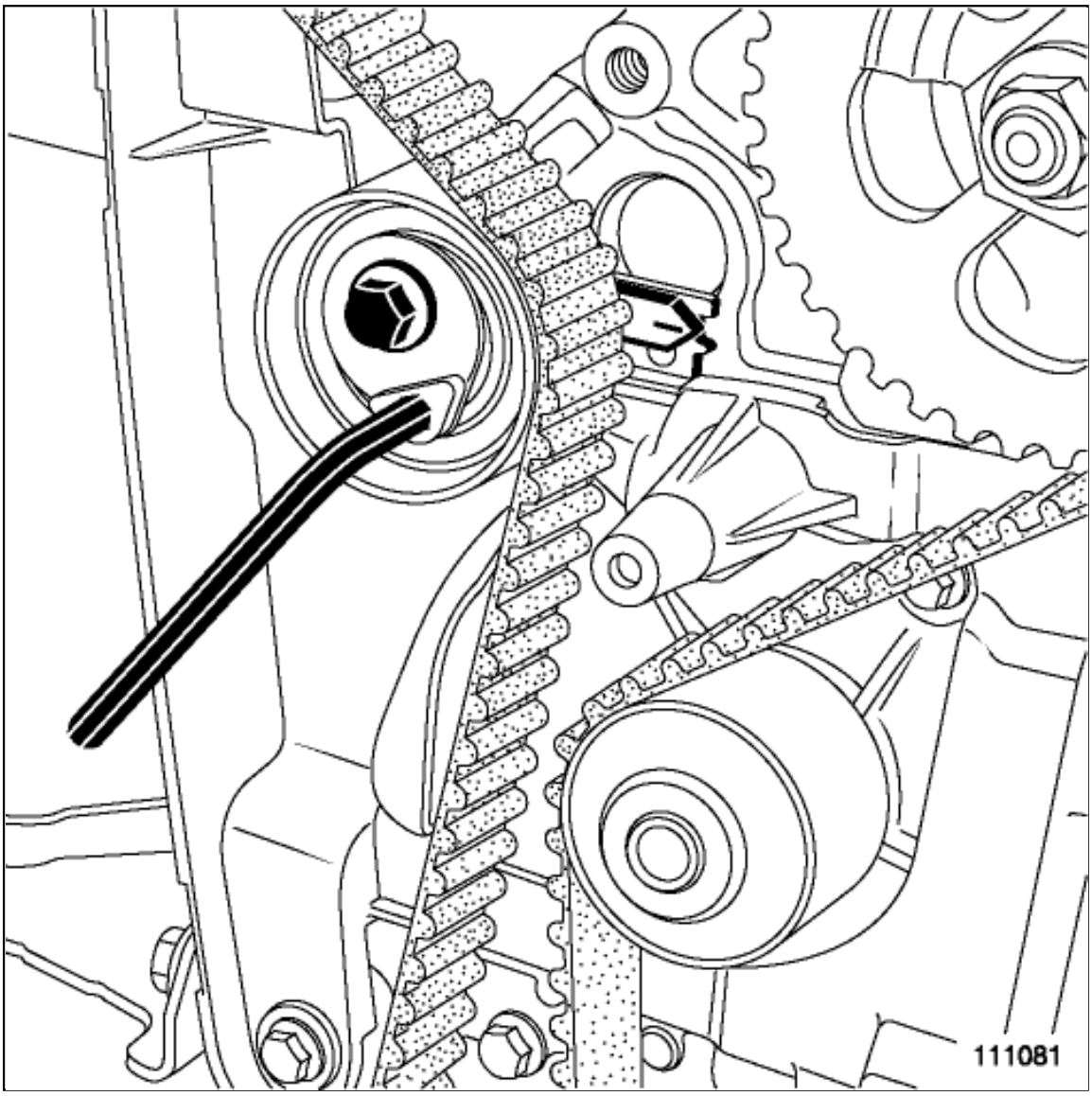
Note:

After the two turns, the adjustable index of the tensioning roller may be in two different positions.

The rotation of the tension wheel eccentric depends on the position.

FIRST POSITION OF THE INDEX OF THE TIMING BELT TENSIONING ROLLER

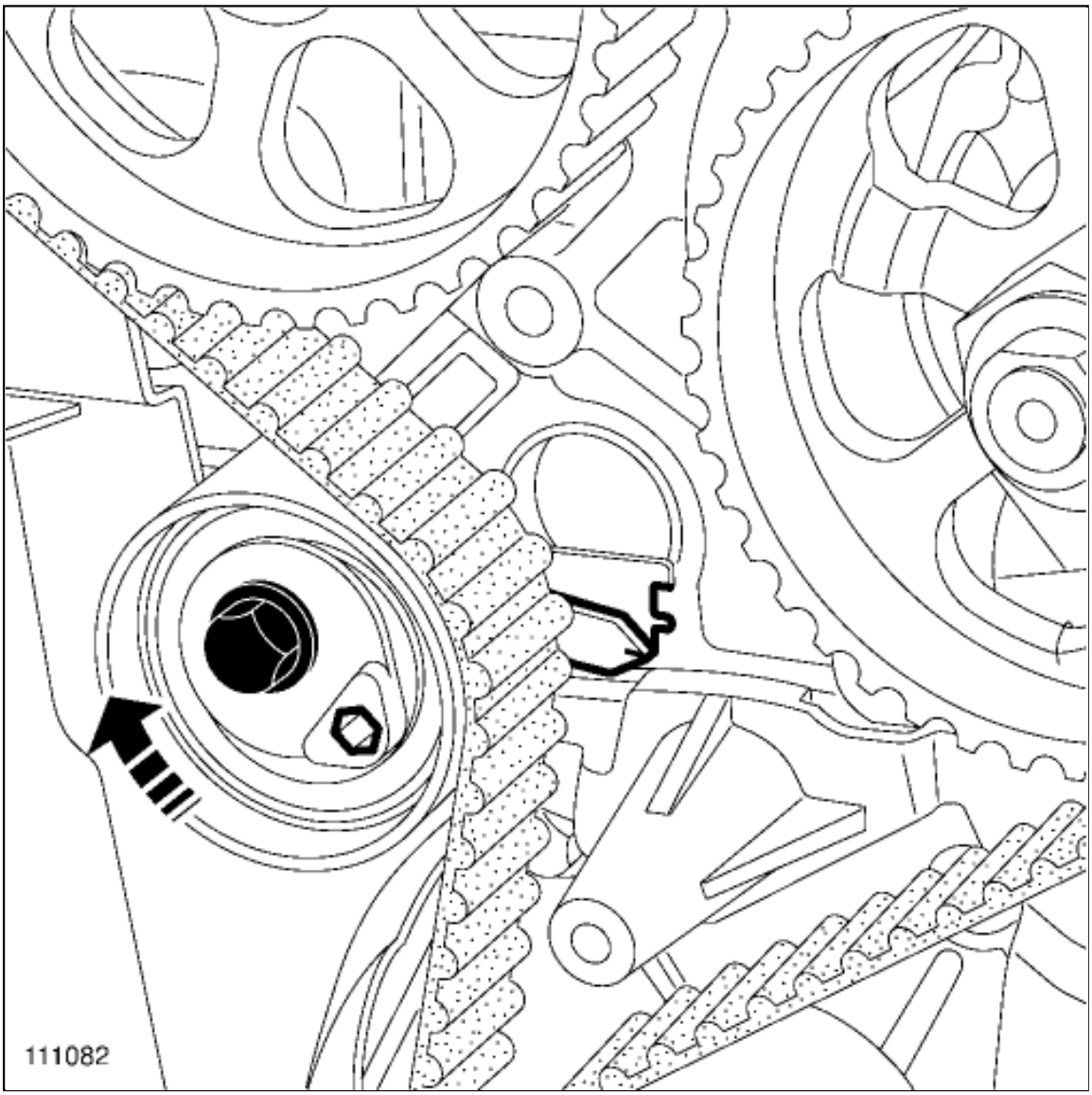




- Loosen the timing belt tensioning roller bolt by up to one turn while holding the adjustable index with a 6 mmAllen key.

- Gradually align the adjustable index of the timing belt tensioning roller in the middle of the timing window by turning the key anticlockwise.

SECOND POSITION OF THE ADJUSTABLE INDEX OF THE TIMING BELT TENSIONING ROLLER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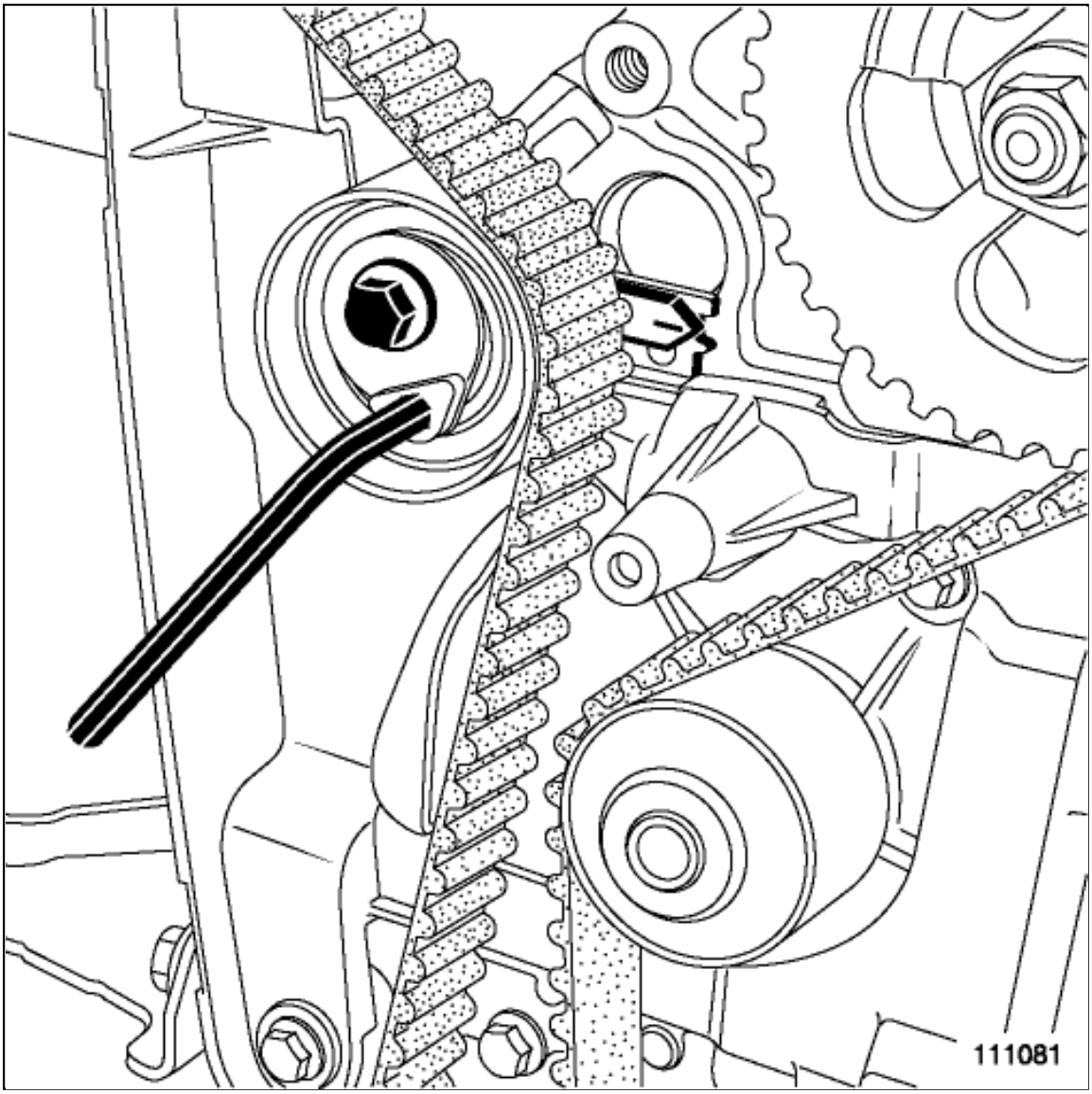


- Loosen the timing belt tensioning roller bolt by up to one turn while holding the adjustable index with a 6 mmAllen key.

- Gradually position the adjustable index of the timing belt tensioning roller in the middle of the timing window by turning the key clockwise.

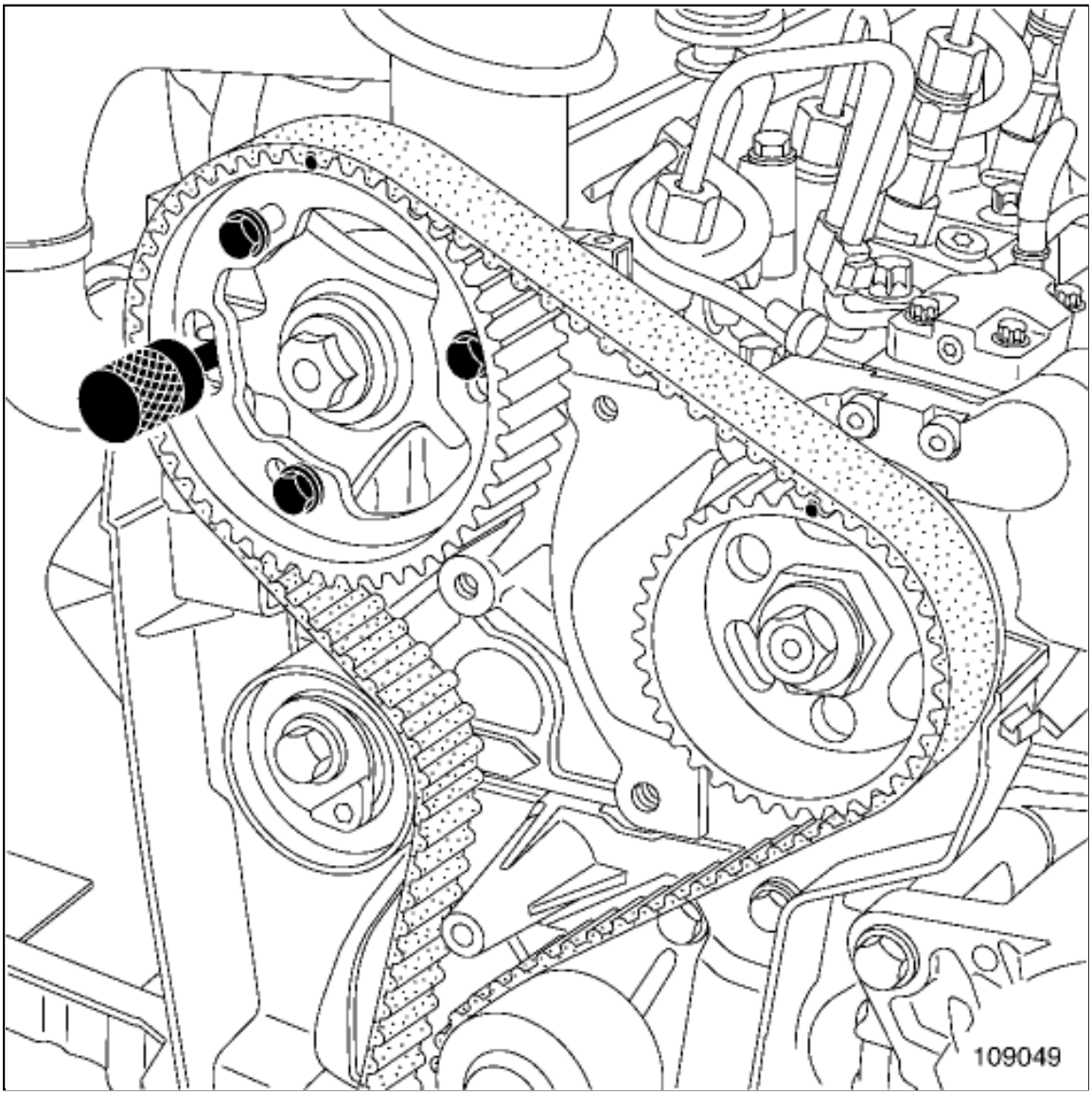
- Torque tighten:
  - the timing belt tensioning roller bolt27 N.m,
  - the camshaft pulley hub bolts14 N.m.

- Remove:
  - the toolTDC locating pin.(**Mot. 1489**) ,
  - theSet of 5 crankshaft and camshaft pulley timing pins.(**Mot. 1430**) .

- Turn the crankshaft two turns clockwise (timing end) using the old crankshaft accessories pulley bolt and its spacer until the hole of the camshaft pulley hub is opposite the hole in the cylinder head.

- Screw tool TDC locating pin.(**Mot. 1489**) into the cylinder block.

- Turn the crankshaft clockwise (timing end) smoothly using the old crankshaft accessories pulley bolt and its spacer, until the crankshaft comes into contact with the toolTDC locating pin.(**Mot. 1489**) .

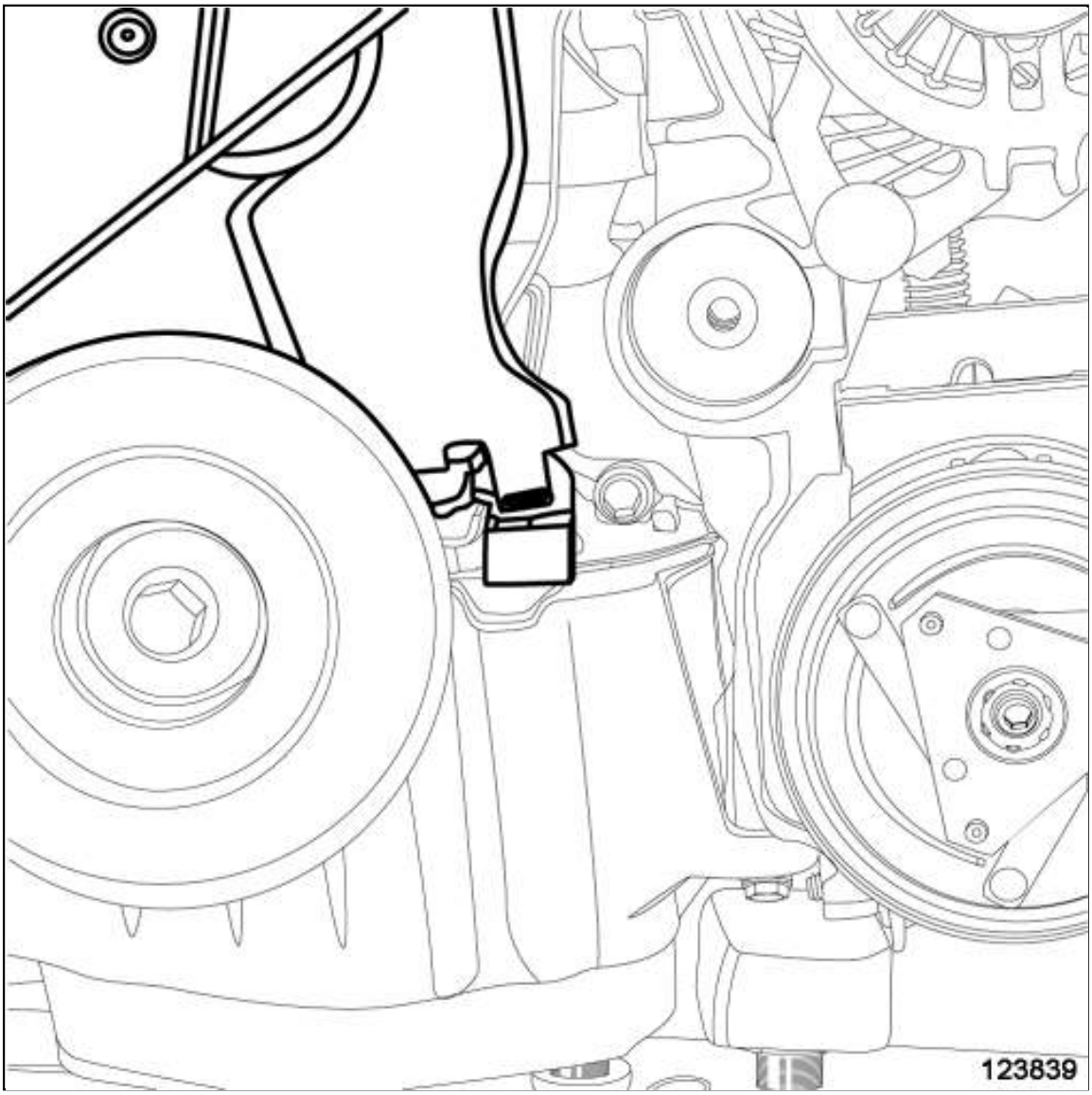


- Set the camshaft pulley hub using the toolSet of 5 crankshaft and camshaft pulley timing pins.(Mot. 1430) .

- If the toolSet of 5 crankshaft and camshaft pulley timing pins.(Mot. 1430) does not engage, repeat the timing belt refitting operation.

3. FINAL OPERATION

- Refit the right-hand suspended mounting support.



- Refit the lower timing cover by positioning the lower timing cover tab in the inner cover opening.

- Clip on the lower timing cover.

- Refit:
  - the upper timing cover,
  - the upper timing cover bolt.

- Clip on the upper timing cover.

- Refit the camshaft position sensorCamshaft position sensor: Removal - Refitting .

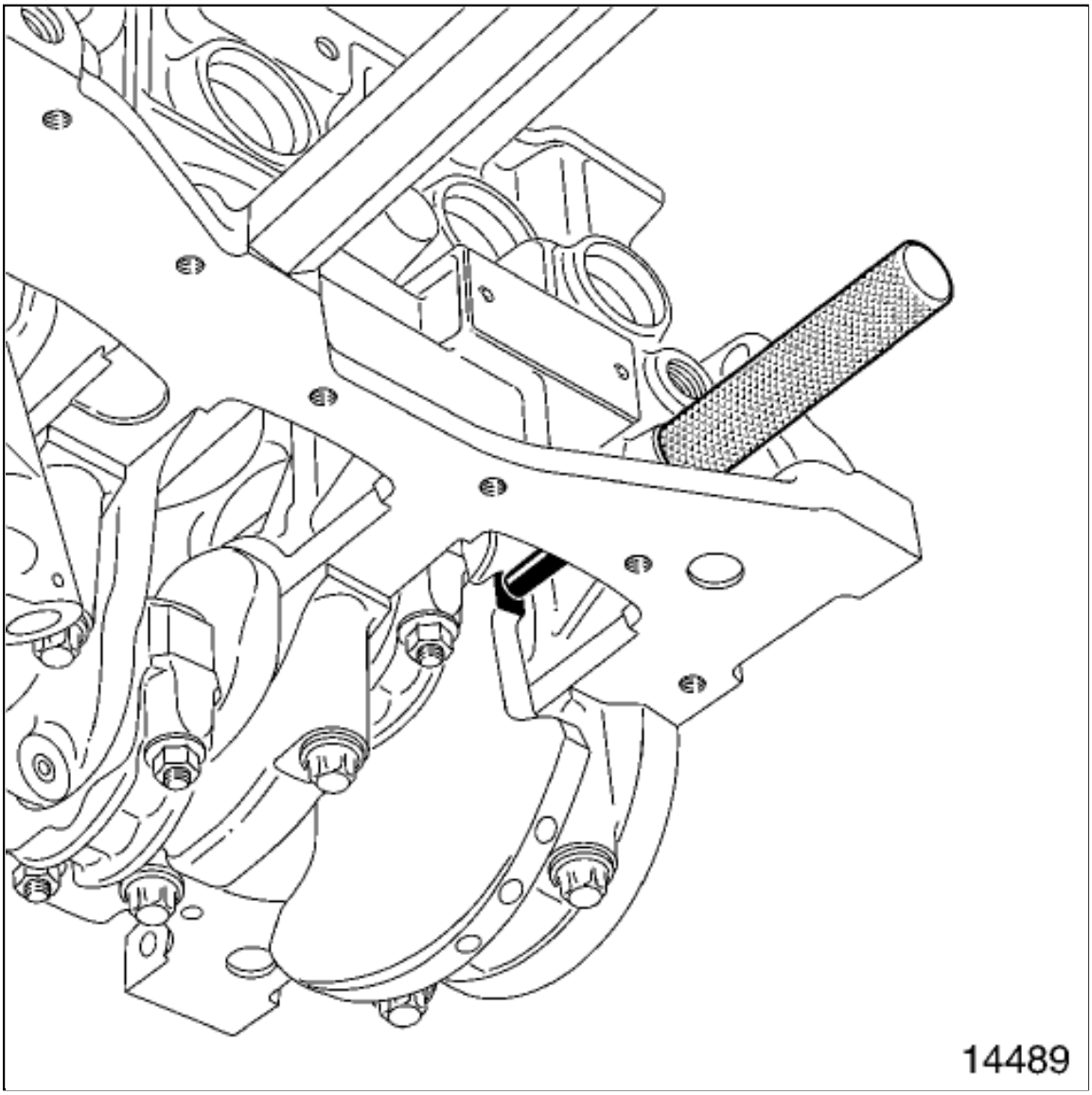
- Refit the right-hand suspended engine mountingRight-hand suspended engine mounting: Removal - Refitting .

- Refit the lower engine tie-barLower engine tie-bar: Removal - Refitting .

- Remove the old crankshaft accessories pulley bolt with its spacer.

Refit:

- the crankshaft accessories pulley,
- a new crankshaft accessories pulley bolt.



Turn the crankshaft clockwise (timing end) smoothly using the bolt of the crankshaft accessories pulley, until the crankshaft presses against the toolTDC locating pin.(Mot. 1489) .

Torque tighten a new crankshaft accessories pulley bolt120 N.m + 95 ± 15˚.

Remove the toolTDC locating pin.(Mot. 1489) .

Apply a drop of silicone adhesive sealantVehicle: Parts and consumables for the repair to the thread of the TDC setting pin plug.

Torque tighten the TDC setting pin plug25 N.m.

Refit:

- the accessories belt(see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page) ,
- the engine undertray,

Refit the front right-hand wheelWheel: Removal - Refitting .

- Connect the battery **Battery: Removal - Refitting** .

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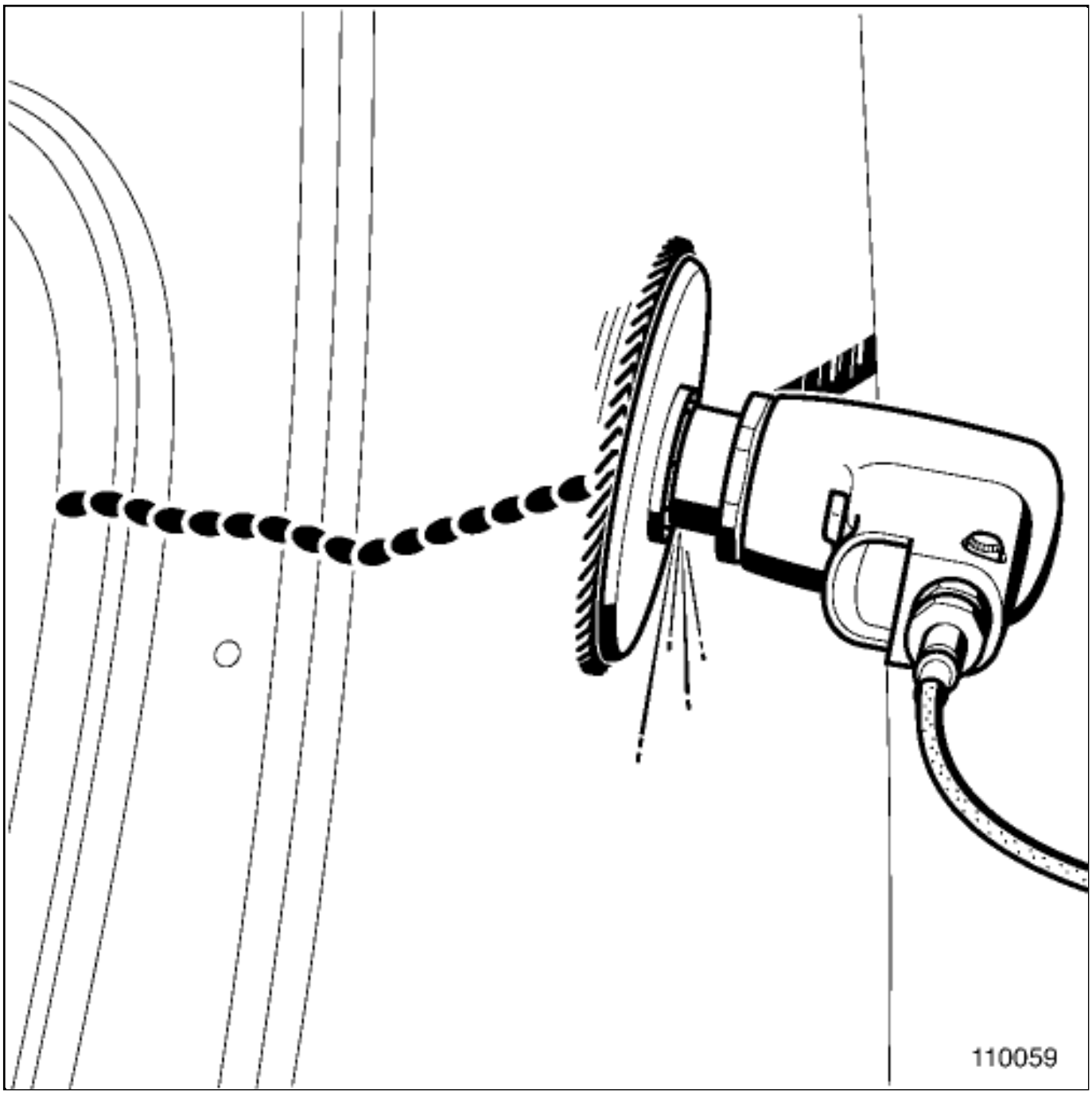
XSL version : 3.02 du 22/07/11

TOOL FOR LEVELLING OFF WELD RESIDUE

1. FLAT FLUSH GRINDING

Use of a grinding disc on an angle grinder (5,000 rpm).



- Advantage:
  - Very rapid for flush grinding a large surface.

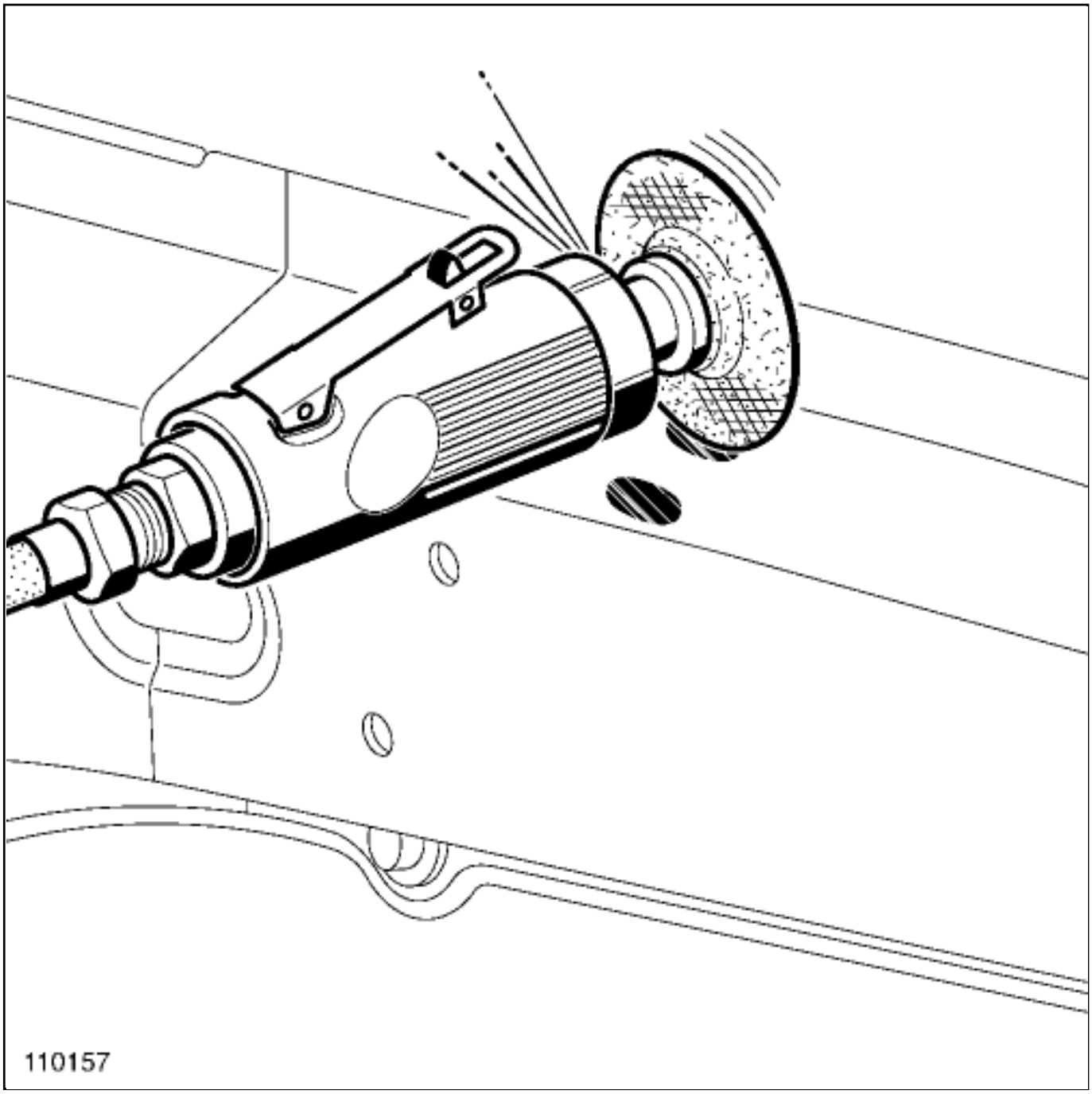
- Disadvantage:
  - Causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).

- Operator protection:
  - obligatory eye protection,
  - obligatory hand protection,
  - obligatory ears protection.

- Protection in the work area:
  - protection of interior fittings,
  - protection of internal and external window faces.

2. ANGLE FLUSH GRINDING

Use of a flush grinding disk on an angle grinder (10,000 rpm) fitted with speed control.



- Advantage:
  - Means for flush grinding in narrow areas.

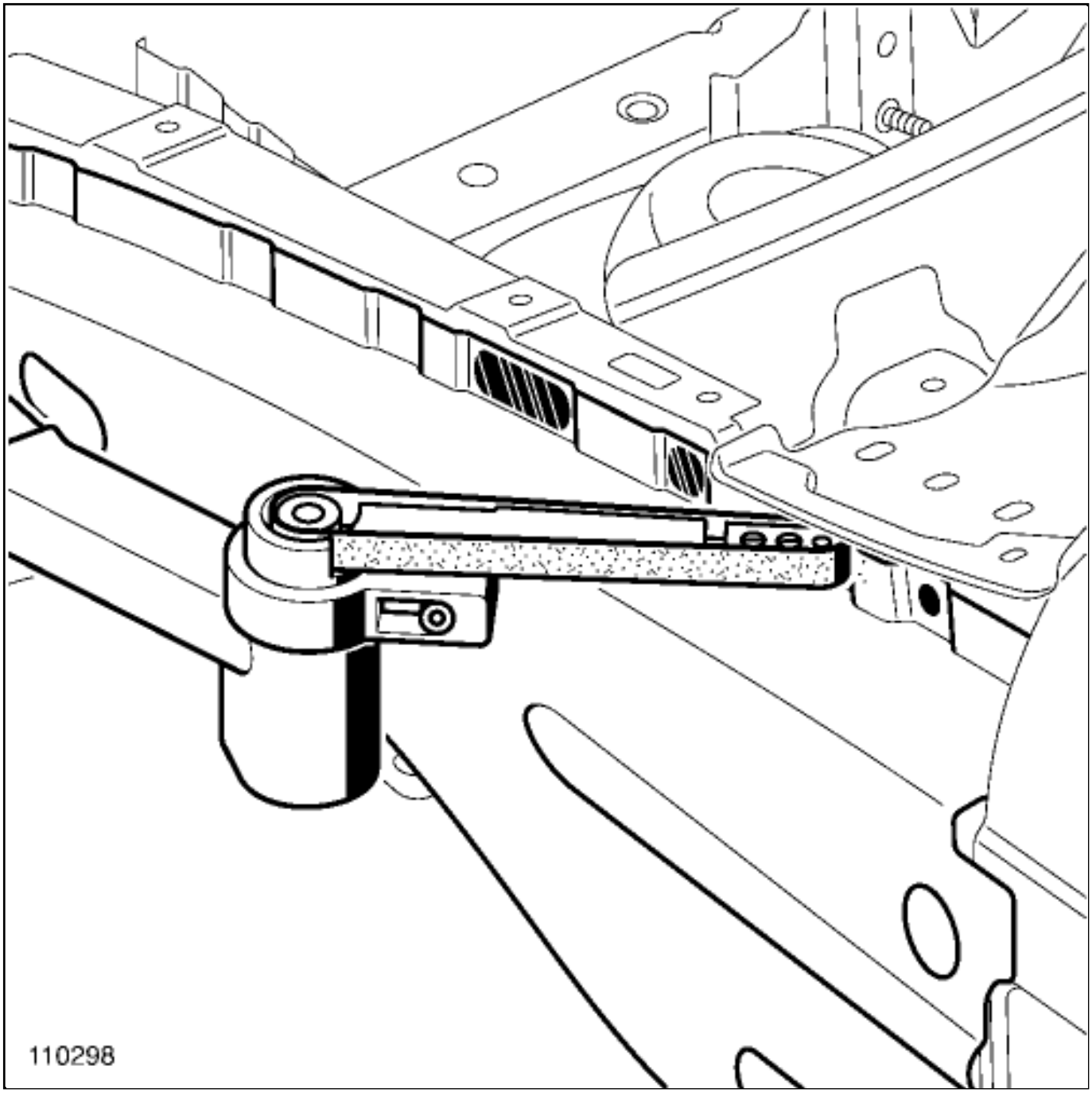
- Disadvantage:
  - Causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).

- Operator protection:
  - obligatory eye protection,
  - obligatory hand protection,
  - obligatory ears protection.

- Protection in the work area:
  - protection of interior fittings,
  - protection of internal and external window faces.

3. CORNER FLUSH GRINDING

Use of a strip sander fitted with a 36grit strip.



- Advantage:
  - Rapid means for flush grinding in corners.
- Disadvantage:
  - Lets off sparks which can be harmful close to sensitive components (windows, plastic components, fabric, etc.).
- Operator protection:
  - obligatory eye protection,
  - obligatory hand protection,

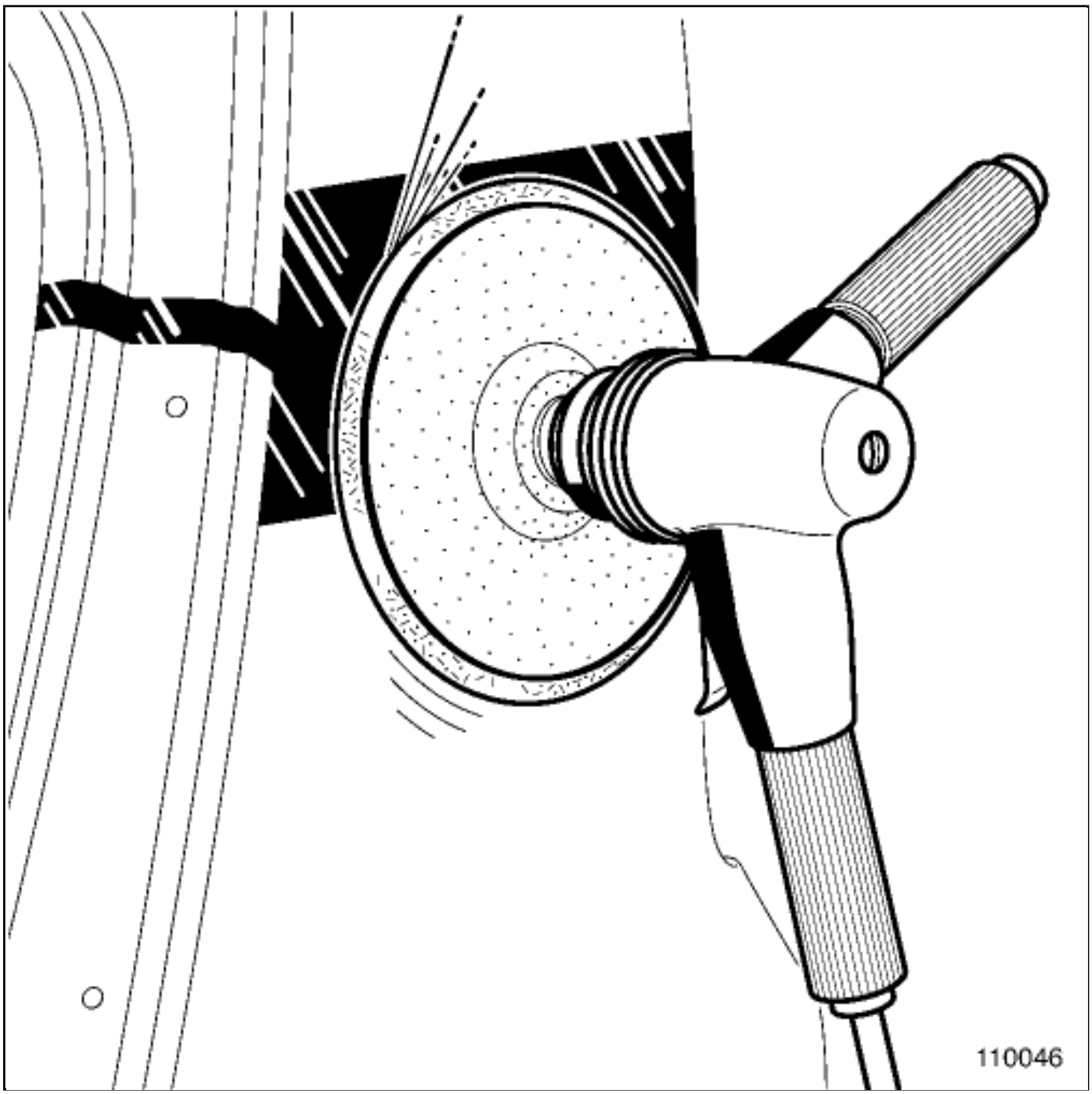
obligatory ears protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.

TOOL FOR SURFACING MATING FACES

1. FLAT SURFACING



Use of a bladed disk mounted on a (5000 rpm) angle grinder.

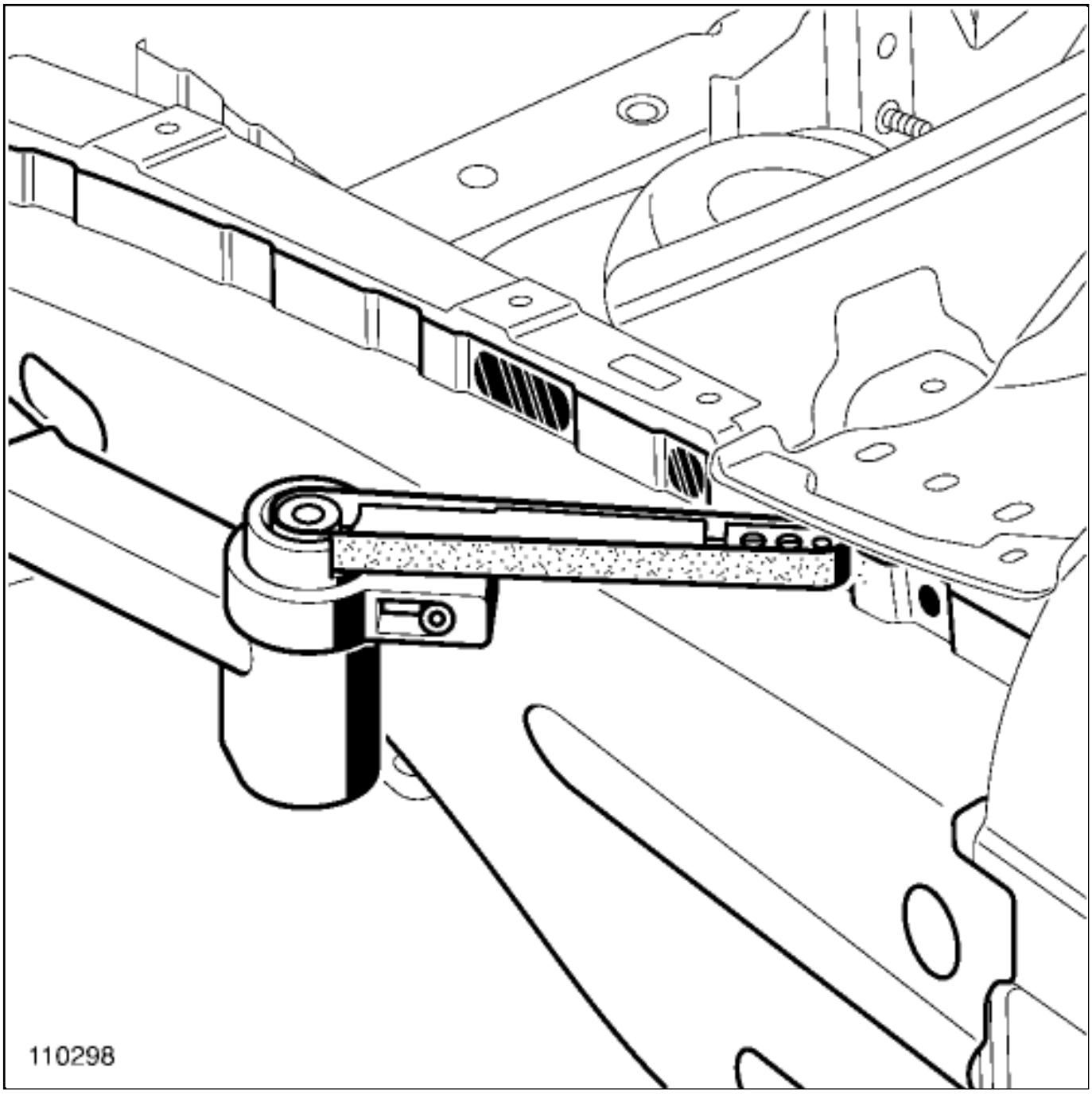
- Advantage:
  - Fast method which allows wide area to be surfaced.

- Disadvantage:
  - Lets off sparks which can be harmful close to sensitive components (windows, plastic components, fabric, etc.).

- Operator protection:
  - obligatory eye protection,
  - obligatory hand protection,
  - obligatory ears protection.

- Protection in the work area:
  - protection of interior fittings,
  - protection of internal and external window faces.

2. ANGLE AND CORNER SURFACING



Use of a strip sander fitted with a 50to 80grit strip.

Advantage:

- Method which allows areas to be surfaced which are difficult to access.

Disadvantages:

- Showers filings which can be harmful close to sensitive components (windows, plastic components, fabric, etc.).
- The surfacing is relatively slow.

Operator protection:

- obligatory eye protection,
- obligatory hand protection,
- obligatory ears protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.

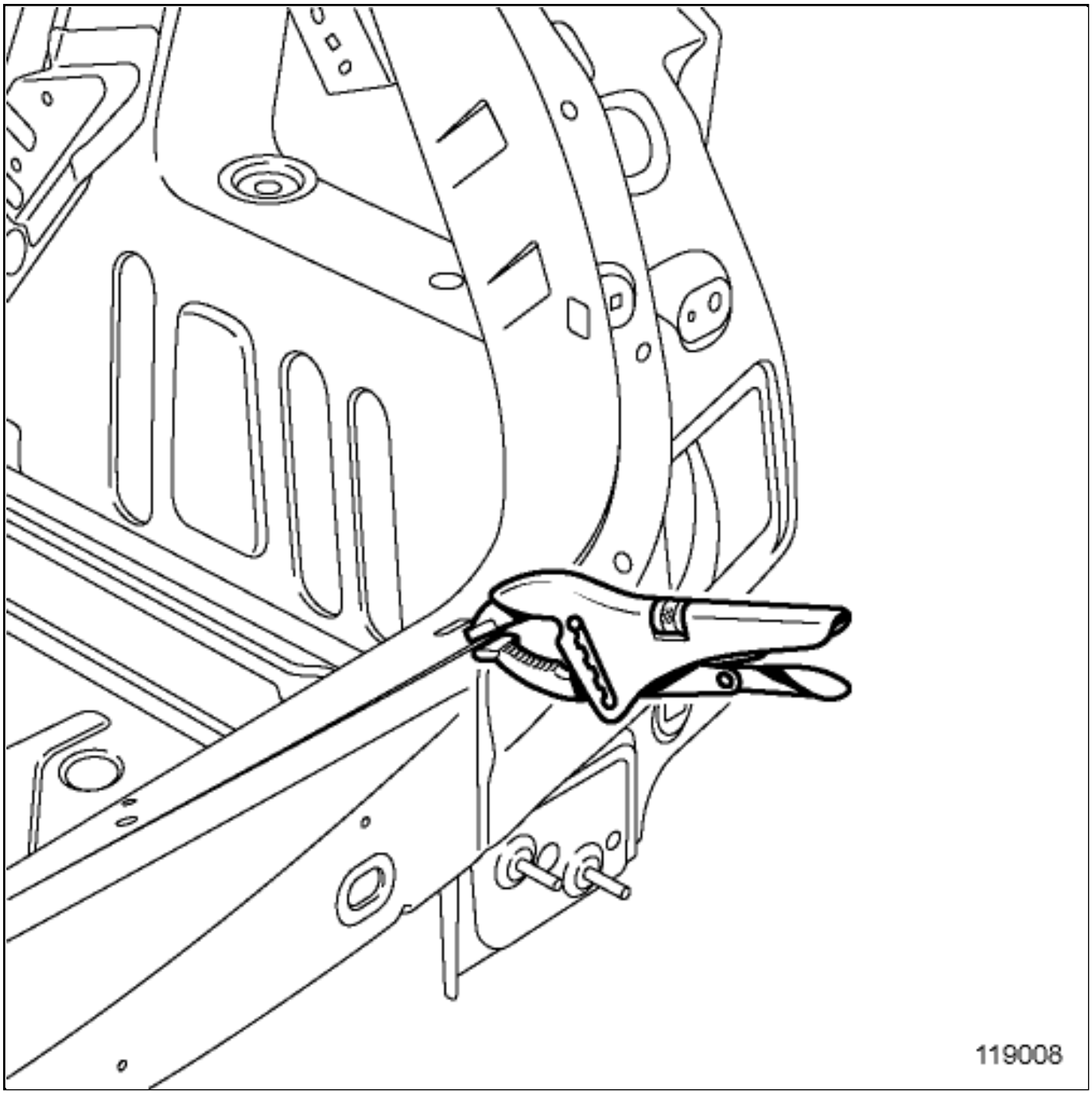
TOOLS FOR ADJUSTING AND SUPPORTING A STRUCTURAL COMPONENT: USE

1. VICE GRIPS

- Use to hold the flanges of parts in position.

There are several different vice grips depending on access and the environment.

1- STANDARD VICE GRIP

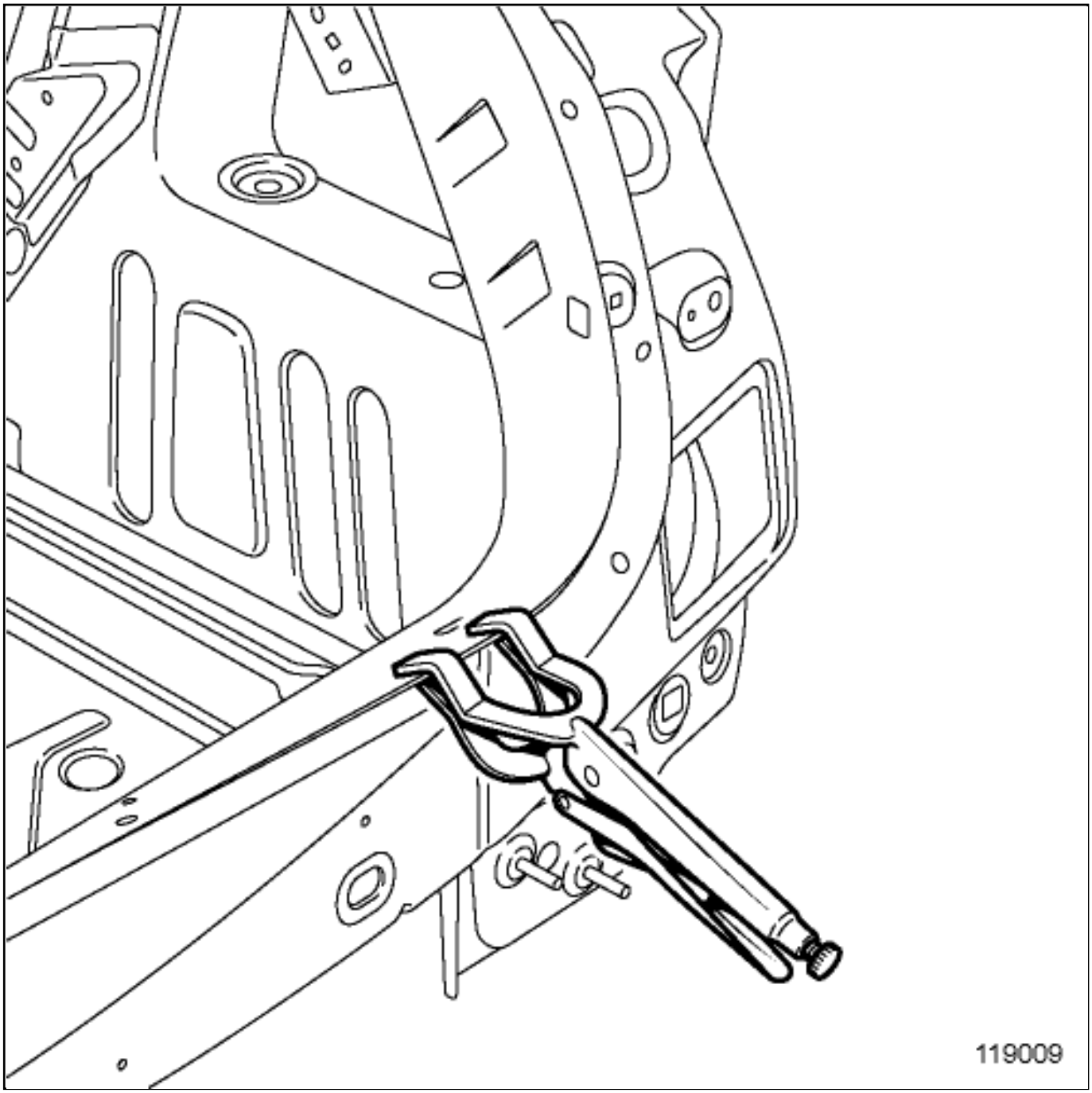


- Use to hold and adjust all types of part.

- Advantage:
  - easy to use.

- Disadvantage:
  - requires easy access.

2- WELDING VICE GRIP



- Used to hold and adjust all types of parts, allows access for a welding clamp or torch.

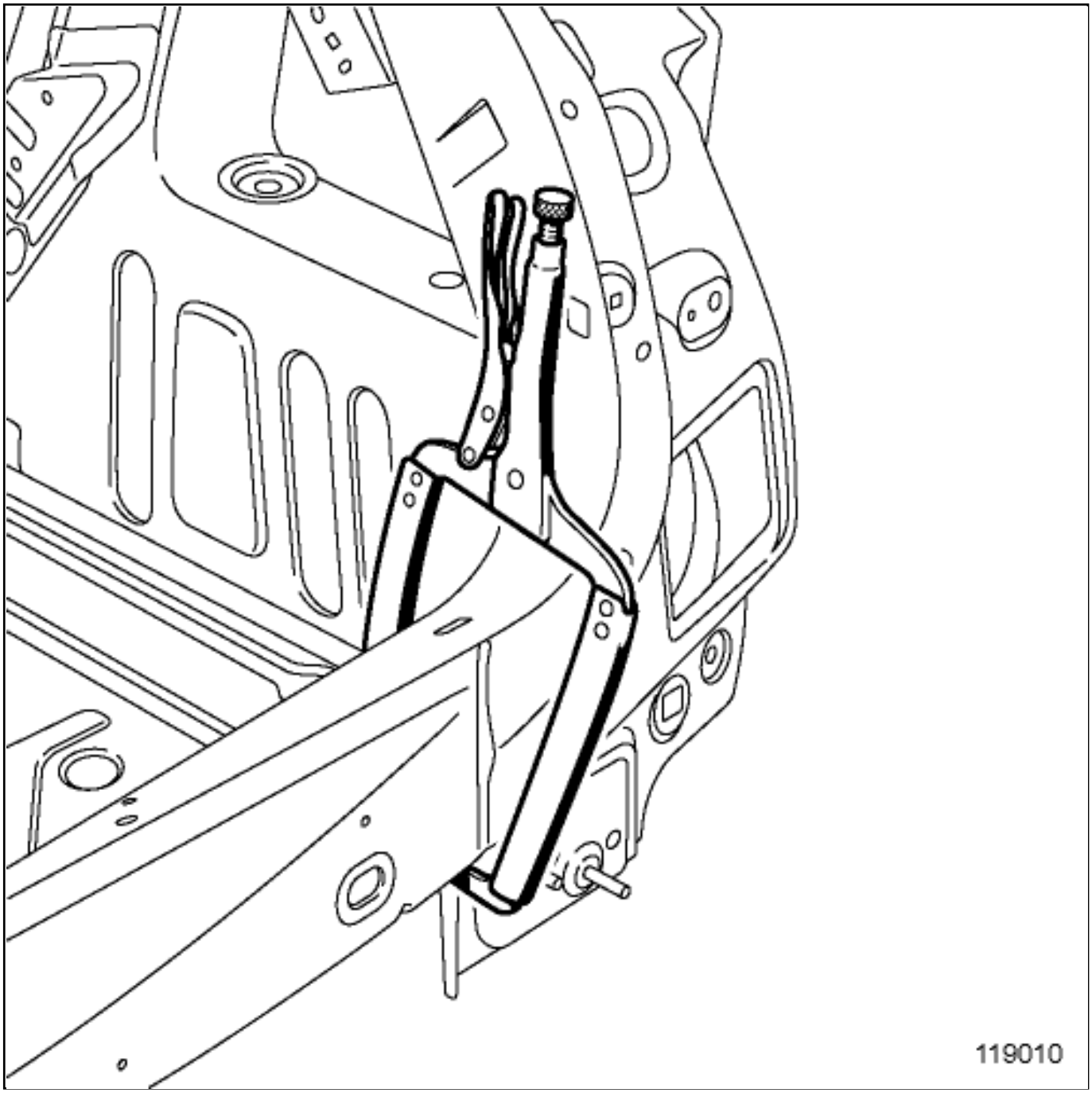
Advantage:

- easy to use.

Disadvantage:

- requires easy access.

3- SWAN'S NECKVICE GRIP



Use to hold and adjust parts with an overlap that is away from the edge of the part.

Advantages:

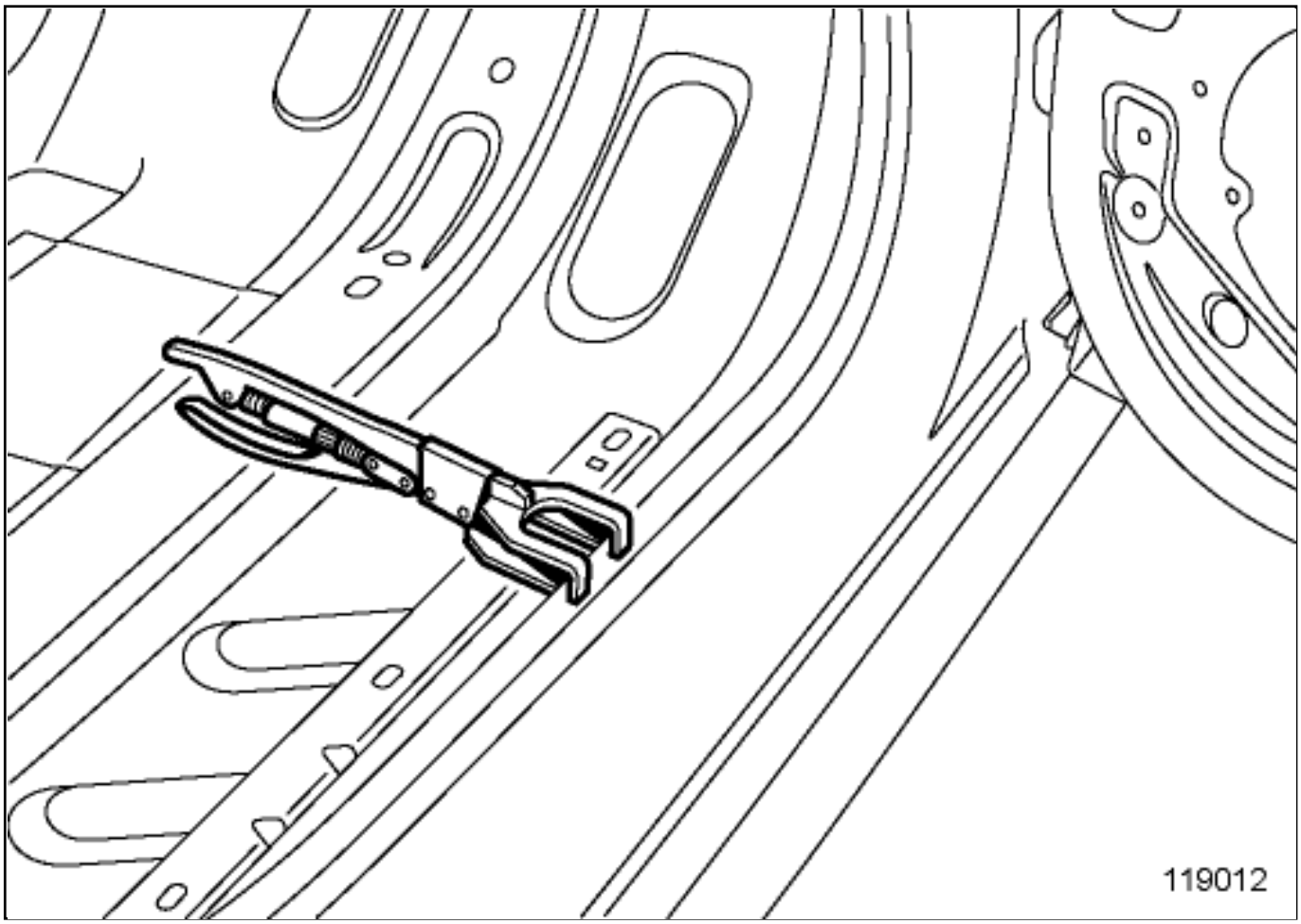
- easy to use,

- makes it possible to fit around a member, or to make a floor type overlap.

Disadvantage:

- cumbersome.

4- MINI VICE GRIP (FLANGING)



Use to hold and adjust all types of flanged parts.

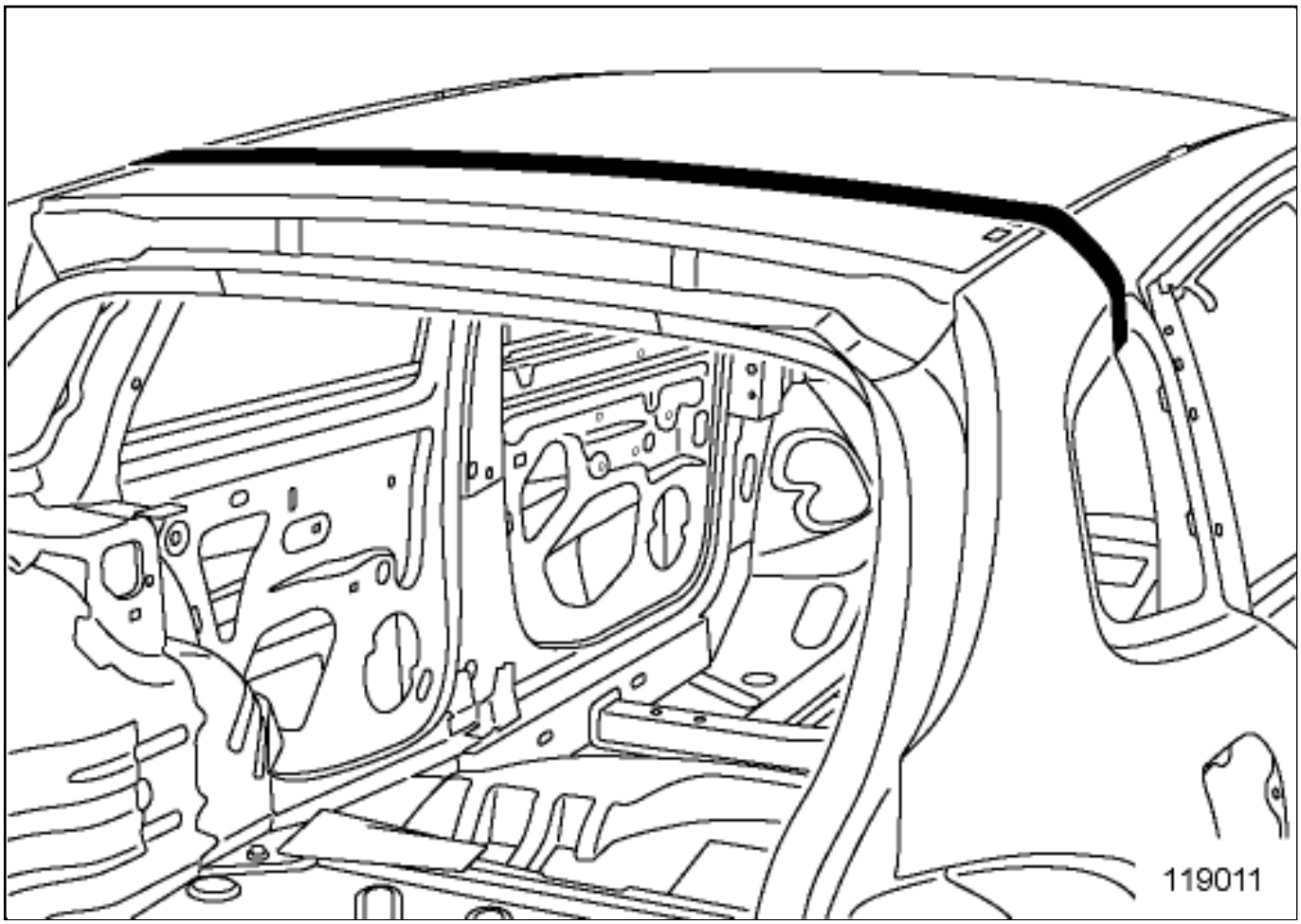
Advantages:

- easy to use,
- allows the opening elements to be adjusted as well as the replacement part.

Disadvantage:

- requires several vice grips to be positioned to carry out the adjustment.

2. STRAP



Use to hold bonded roof type components.

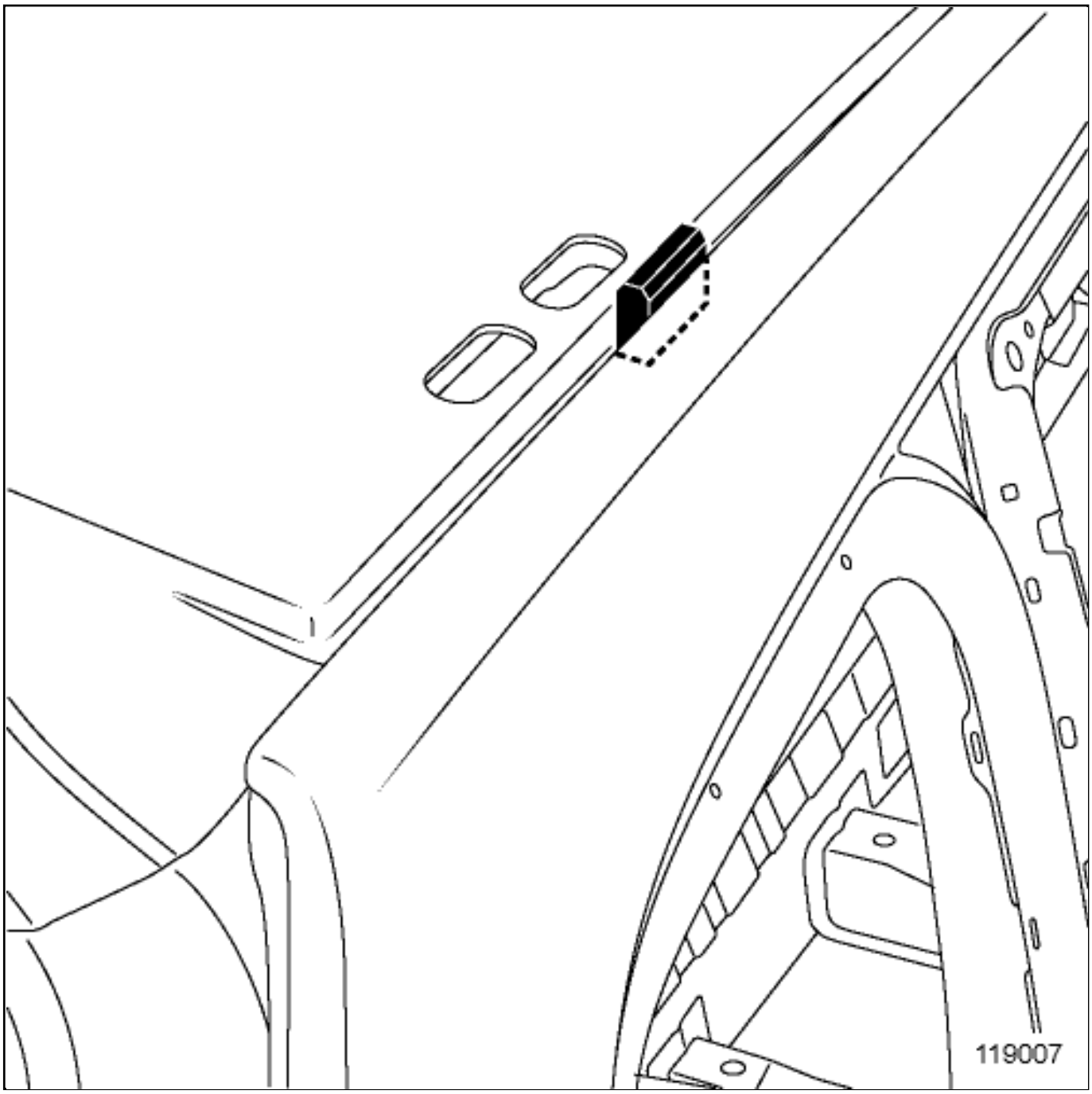
Advantage:

- ensures constant support during drying times.

Disadvantage:

- two operators are required for fitting.

3. ADJUSTMENT SHIM



Use to carry out adjustments to different parts during bonding type operations.

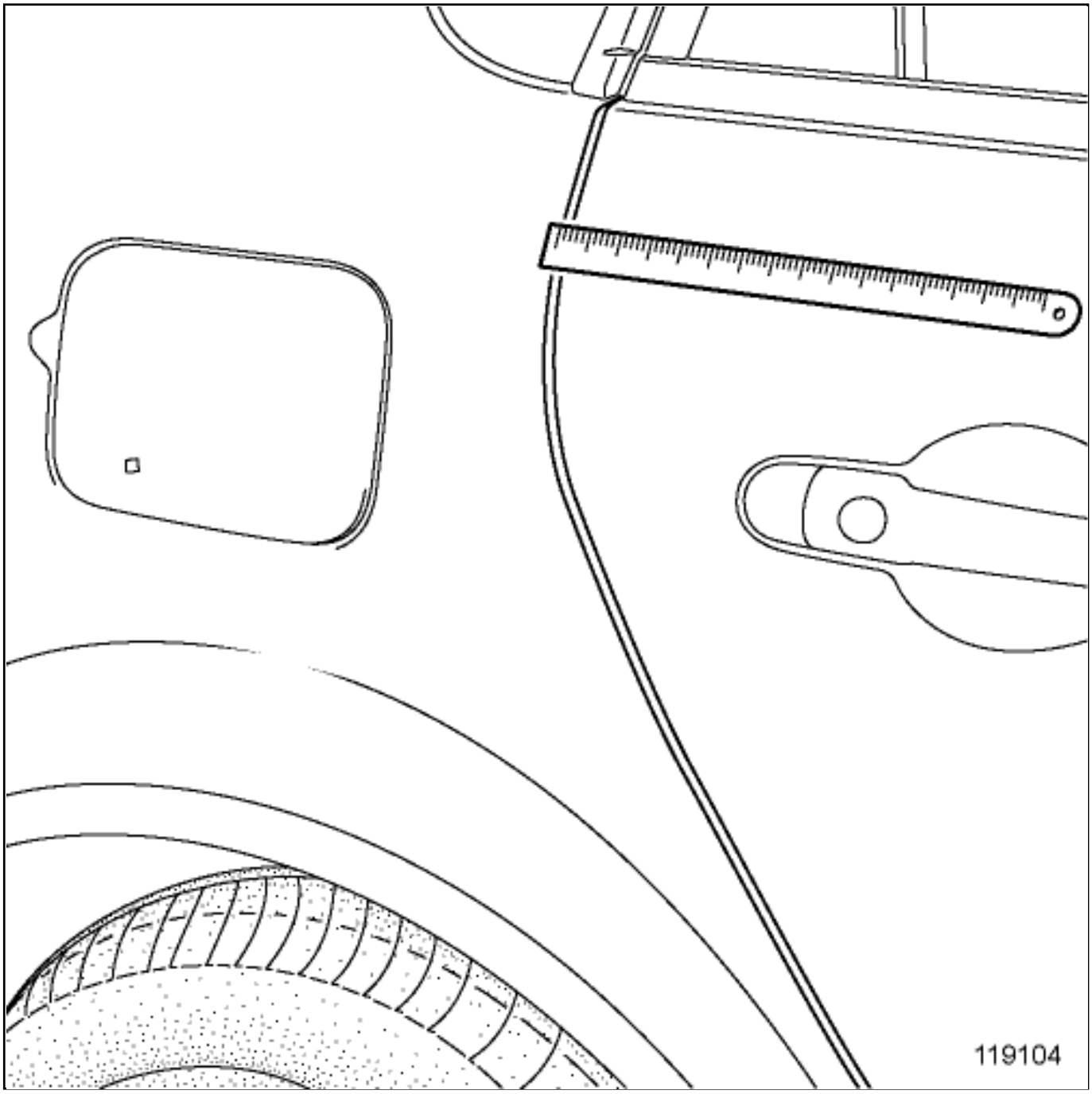
Advantages:

- easy to use,
- allows precise adjustment.

Disadvantage:

- diversity relating to the vehicle.

4. RULER



Use to measure the adjustment between several components.

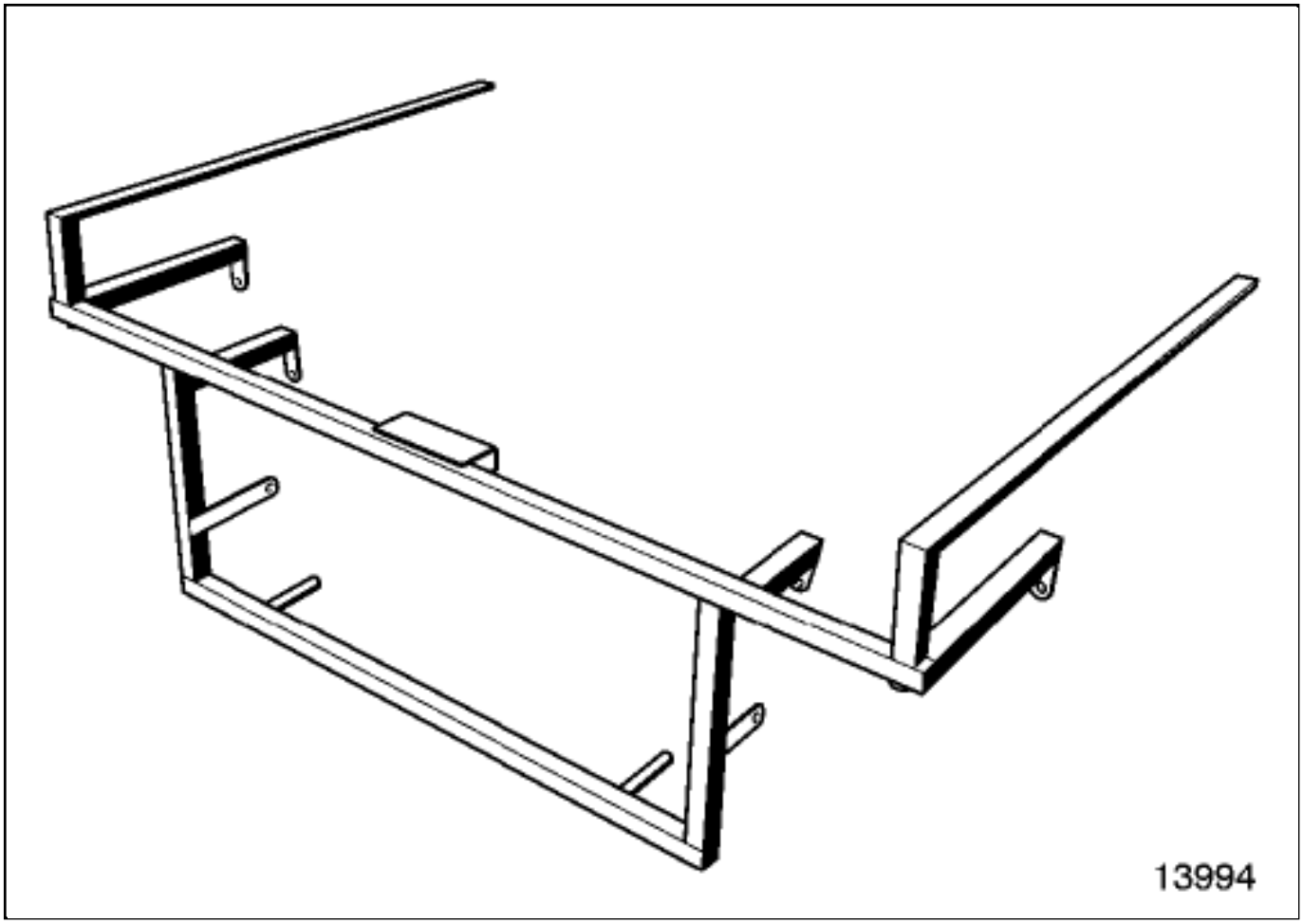
Advantages:

- easy to use,
- allows precise measurement of the adjustment.

Disadvantage:

- difficult to measure in curves.

5. FRONT PANEL JIG



Special tool to be used for adjusting and supporting the front end panel components.

Advantages:

- saves time after fitting (no need to dry fit the other components),
- possibility of making connection directly with the jig in place.

Disadvantages:

- cumbersome,
- time taken for fitting,
- each model specific to one vehicle.

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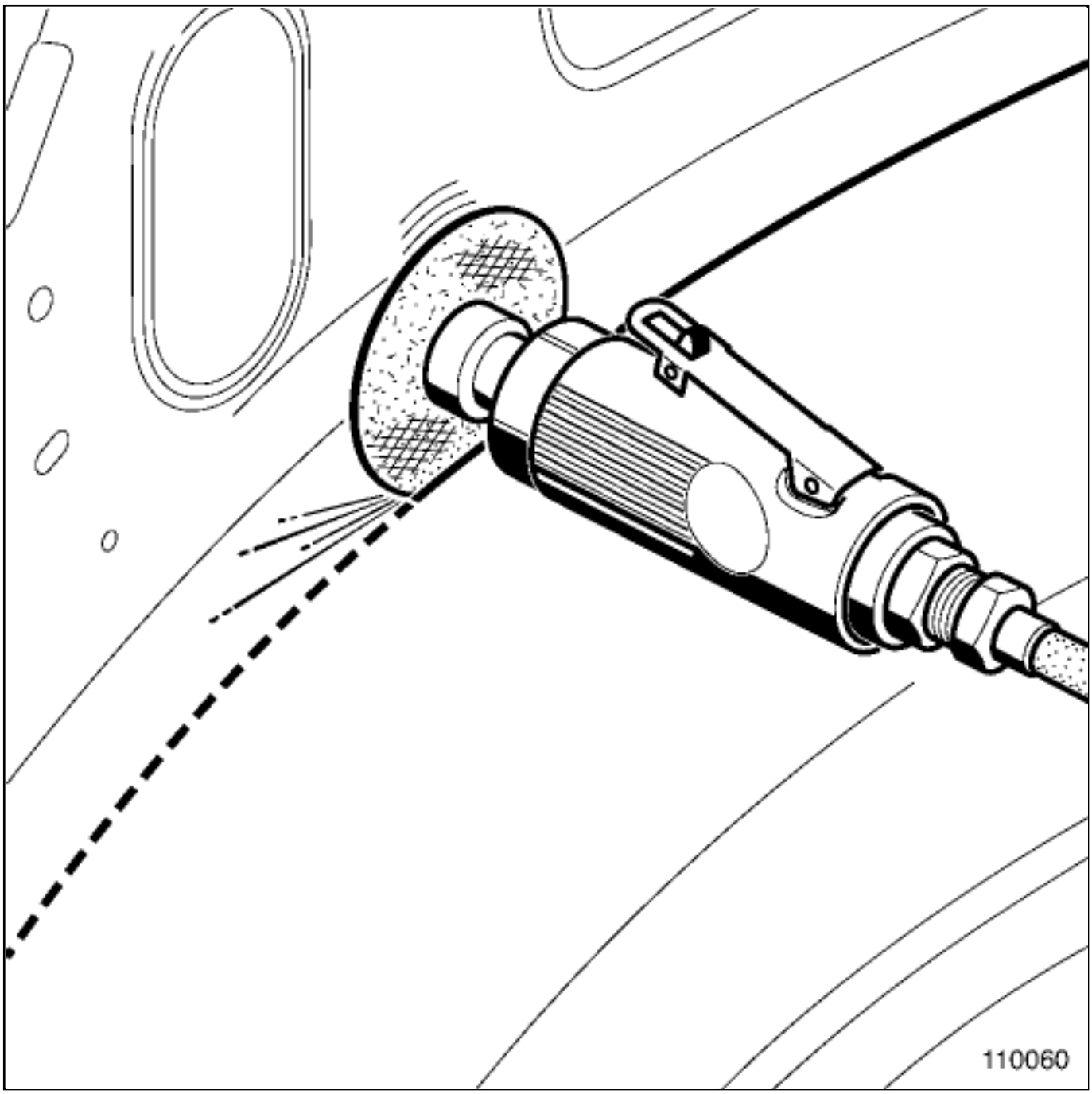
TOOLS FOR CUTTING A STRUCTURAL COMPONENT

1. STRAIGHT LINE CUTTING

Use of a cutter wheel on an angle grinder (10,000 rpm) fitted with speed control.



- Advantages:
  - Direct cutting anywhere on the sheet without drilling.
  - Ideal for cuts over partial replacements.

- Disadvantages:

- Does not allow curved cutting.
- Causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).

Operator protection:

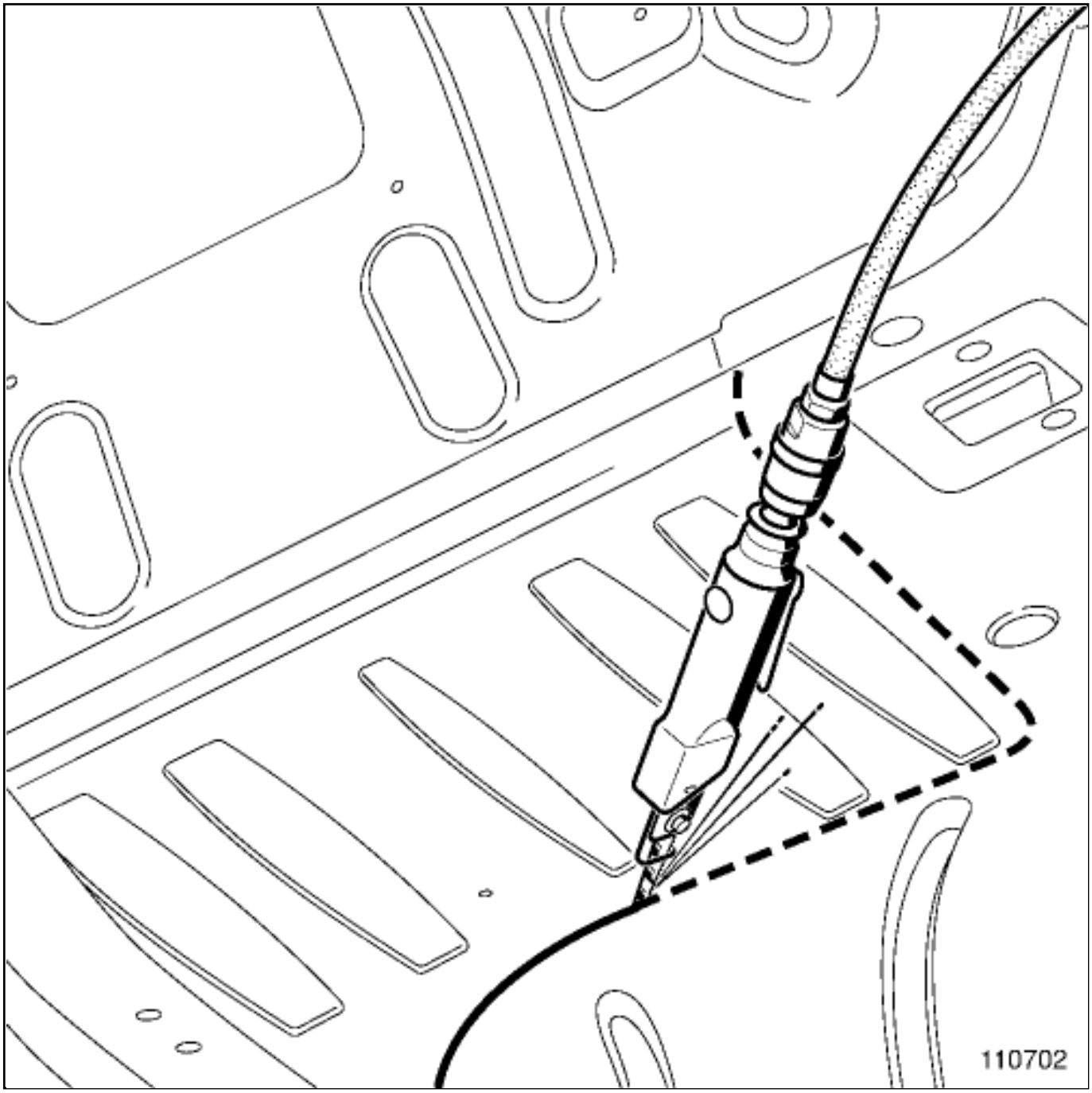
- obligatory eye protection,
- obligatory ears protection,
- obligatory respiratory protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.

2. CURVED CUTTING

Use of a jigsaw with a small blade (5,000 cycles per minute).



Advantage:

- Can be used for curved cuts with a minimum radius of 25 mm.

Disadvantages:

- Fine metal filings that get into fabric and the window weather strips.
- Straight cutting very difficult.

Operator protection:

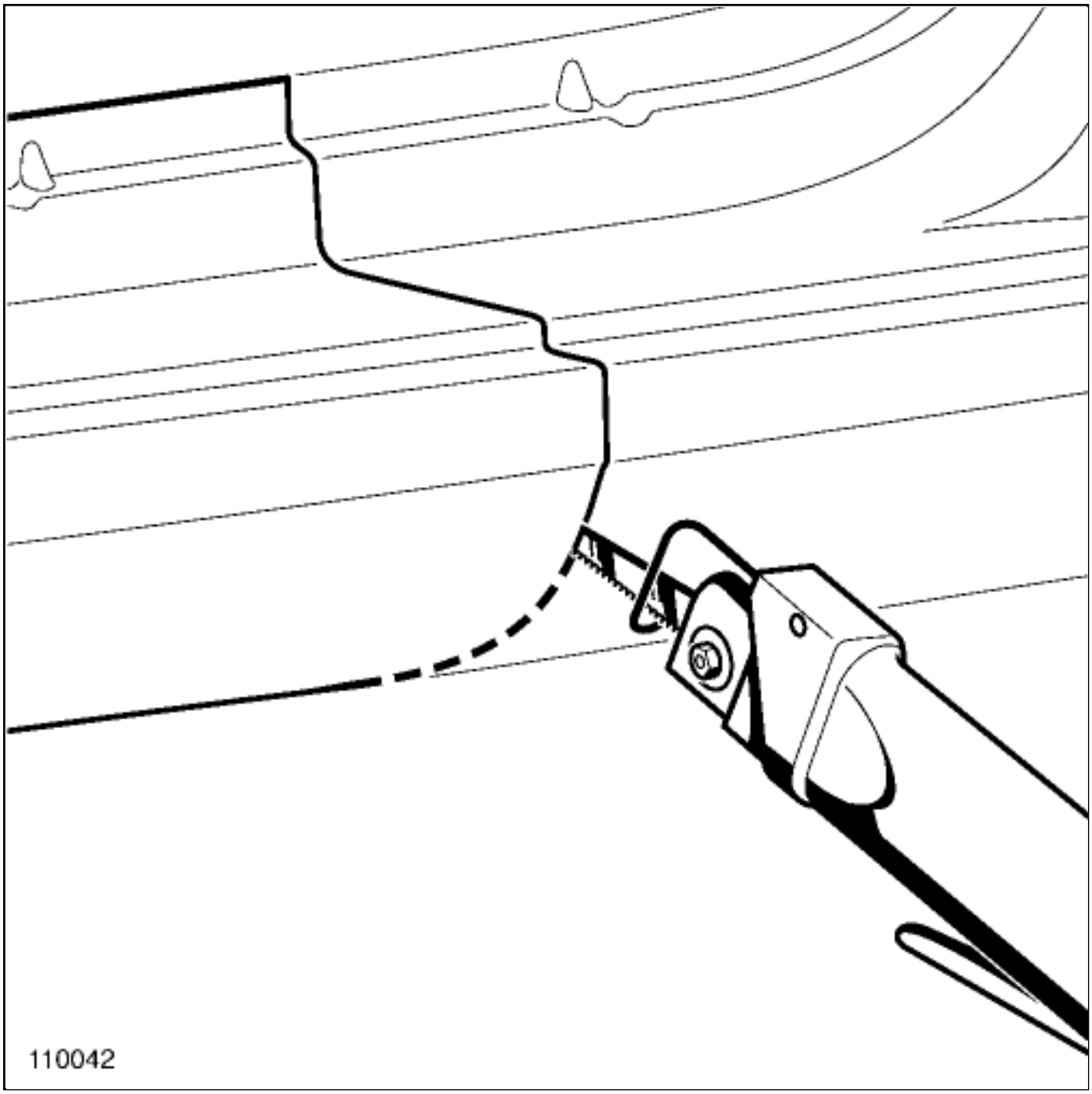
- obligatory eye protection,
- obligatory ears protection,
- obligatory respiratory protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings.

3. STRUCTURE MEMBER CUTTING

Use of a jigsaw with a small blade (5,000 cycles per minute).



Advantage:

- Allows cutting in complex shapes.

Disadvantages:

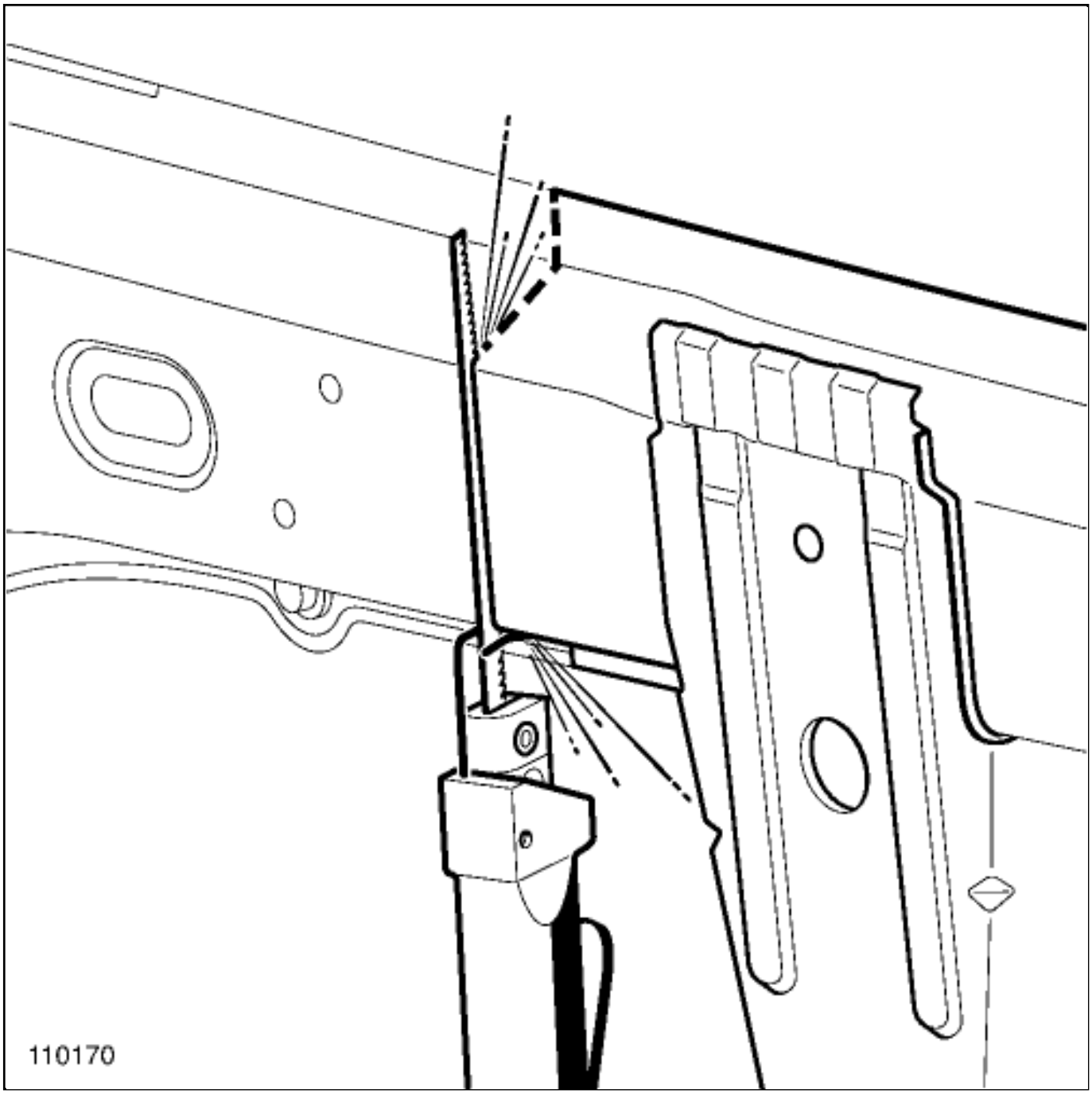
- Fine metal filings that get into fabric and the window weather strips.
- Straight cutting very difficult.

- Operator protection:
  - obligatory eye protection,
  - obligatory ears protection,
  - obligatory respiratory protection,
  - obligatory hand protection.

- Protection in the work area:
  - protection of interior fittings.

4. STRAIGHT CUTTING OF A STRUCTURE MEMBER

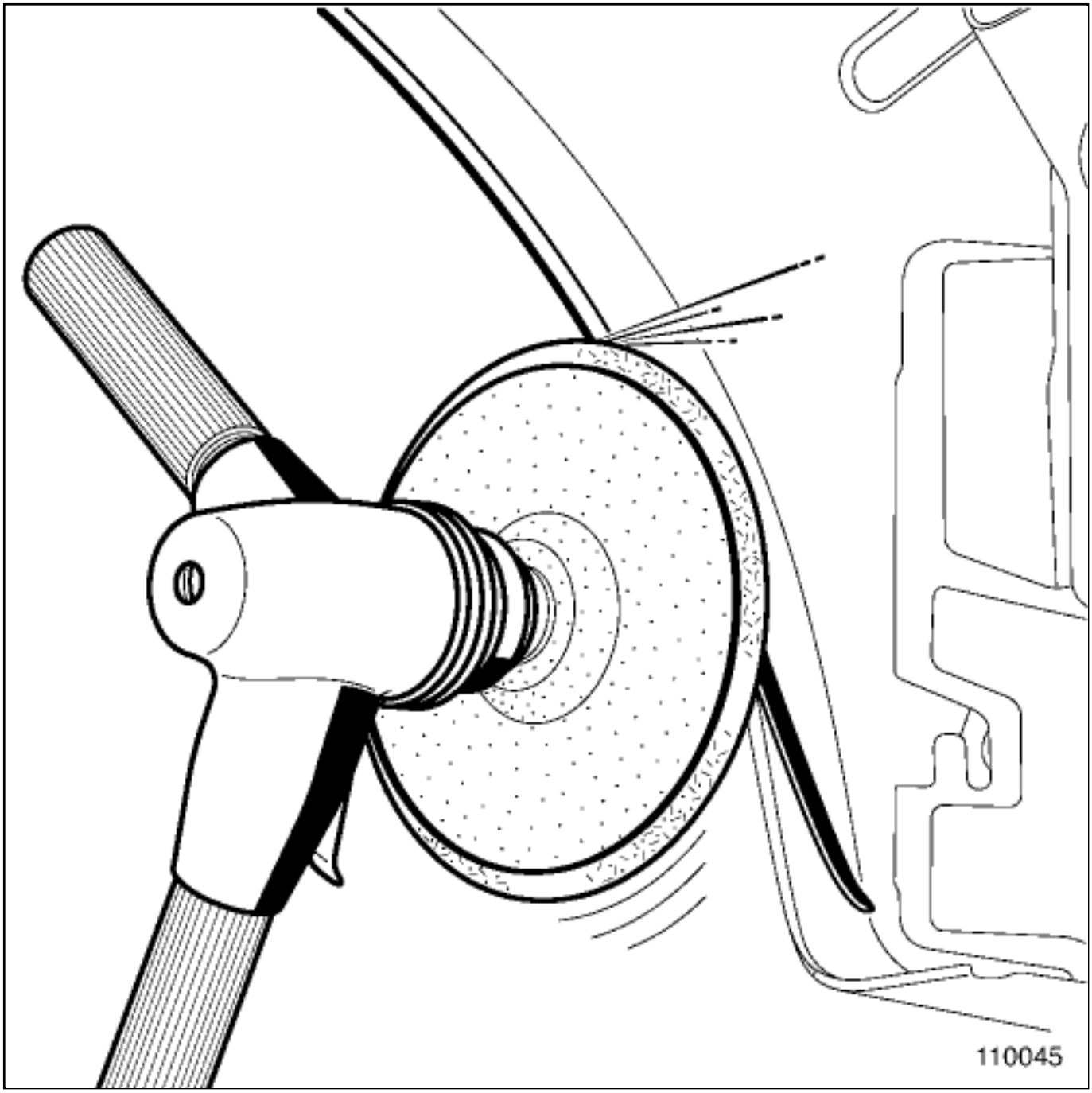
Use of a jigsaw with a large blade (5,000 cycles per minute).



- Advantage:
  - Straight cutting of a big section.
- Disadvantages:
  - Fine metal filings that get into fabric and the window weather strips.
  - Precise curved cutting minimum radius 100 mm.
- Operator protection:
  - obligatory eye protection,
  - obligatory ears protection,
  - obligatory respiratory protection,
  - obligatory hand protection.
- Protection in the work area:
  - protection of interior fittings.

5. CUTTING A PROTRUDING SQUARE

Use of a deburring disk on a stone cutter (2,000 rpm).



Advantage:

- Cutting a protruding square out of a thin piece.

Disadvantages:

- Causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).

Makes a very sharp burr on the sheet edge.

Operator protection:

- obligatory eye protection,
- obligatory ears protection,
- obligatory respiratory protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.

XSL version : 3.02 du 22/07/11

TOOLS FOR PLASTIC MATERIAL BODYWORK COMPONENTS: DESCRIPTION

1. RECOMMENDED TOOLS

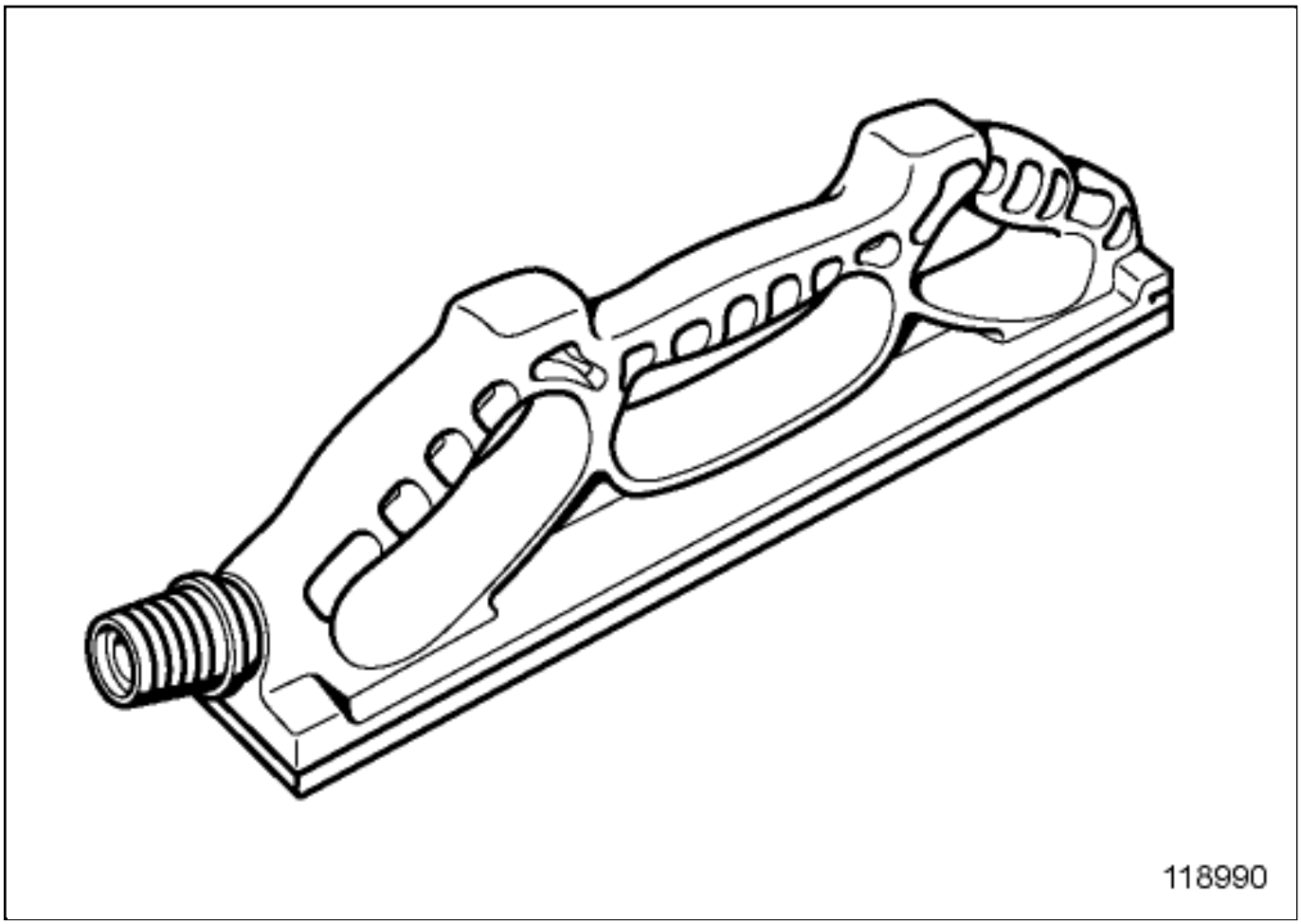
- Orbital sander,
- Angle grinder/belt sander,
- Drill,
- Drill bit with a diameter of 4 mm,
- P 80to P 240sandpaper,
- Sanding block,
- Mastic knife,
- Air gun.

TOOLS FOR SANDING A STRUCTURAL COMPONENT: USE

1. SANDING LARGE SURFACES

- Use a large manual sanding block with or without extractor.

1- VELCROTYPE SANDING BLOCK WITH EXTRACTOR FOR 115X226 MM, 100 OR 150 GRIT STRIPS



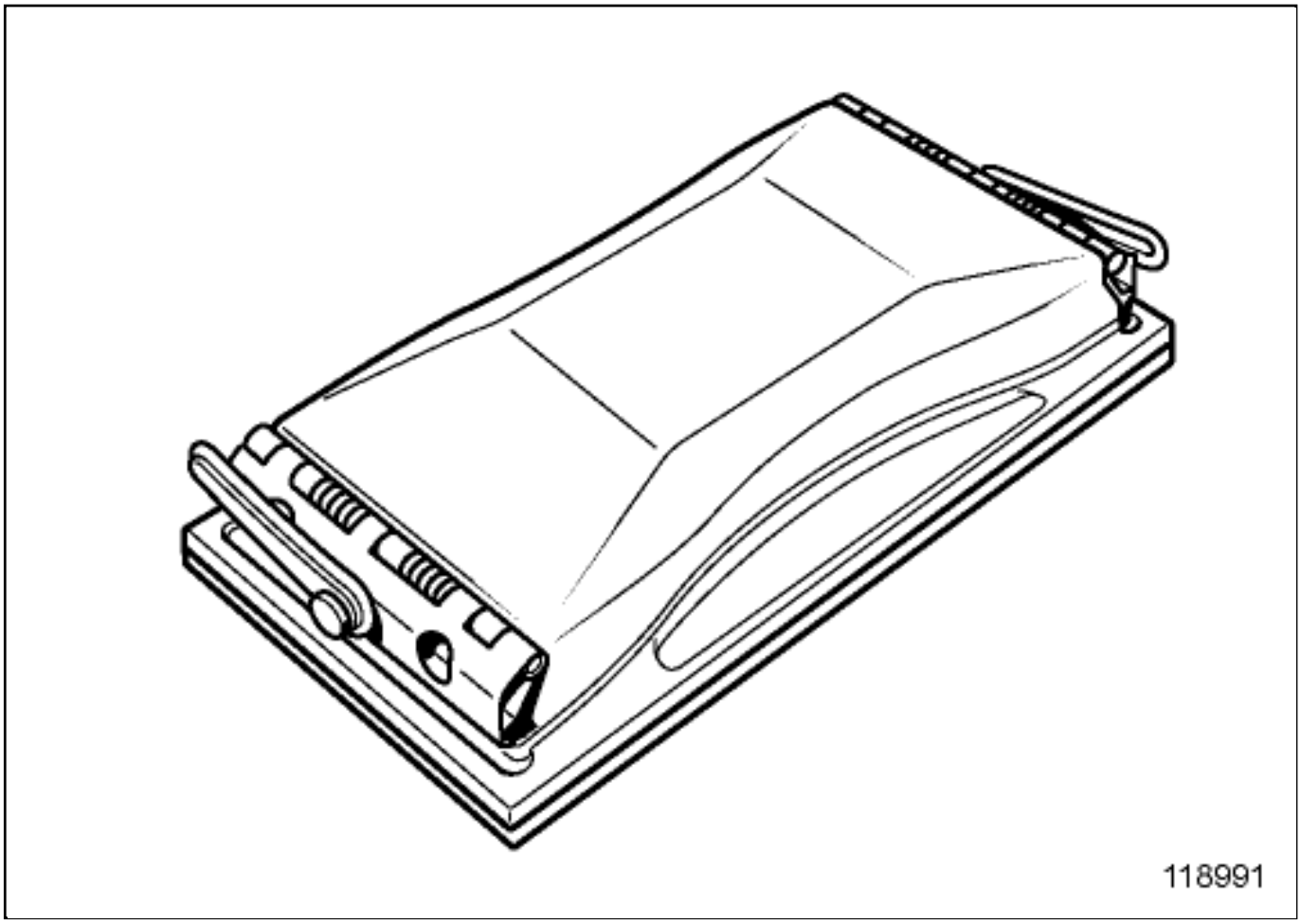
- Advantages:
  - allows the paper to be maintained in perfect contact with the block, preventing the paper from folding,
  - worn paper is easily replaced,
  - the extractor system avoids dust buildup.

- Disadvantages:
  - suction pipe obstructs movement slightly.

- Operator protection:
  - obligatory respiratory protection.

- Protection in the work area:
  - None

2- KAUPPTYPE SANDING BLOCK



- Advantages:
  - is compatible with standard paper types,
  - holds the paper during sanding.

- Disadvantages:
  - paper must be cut to size,
  - extraction not possible.

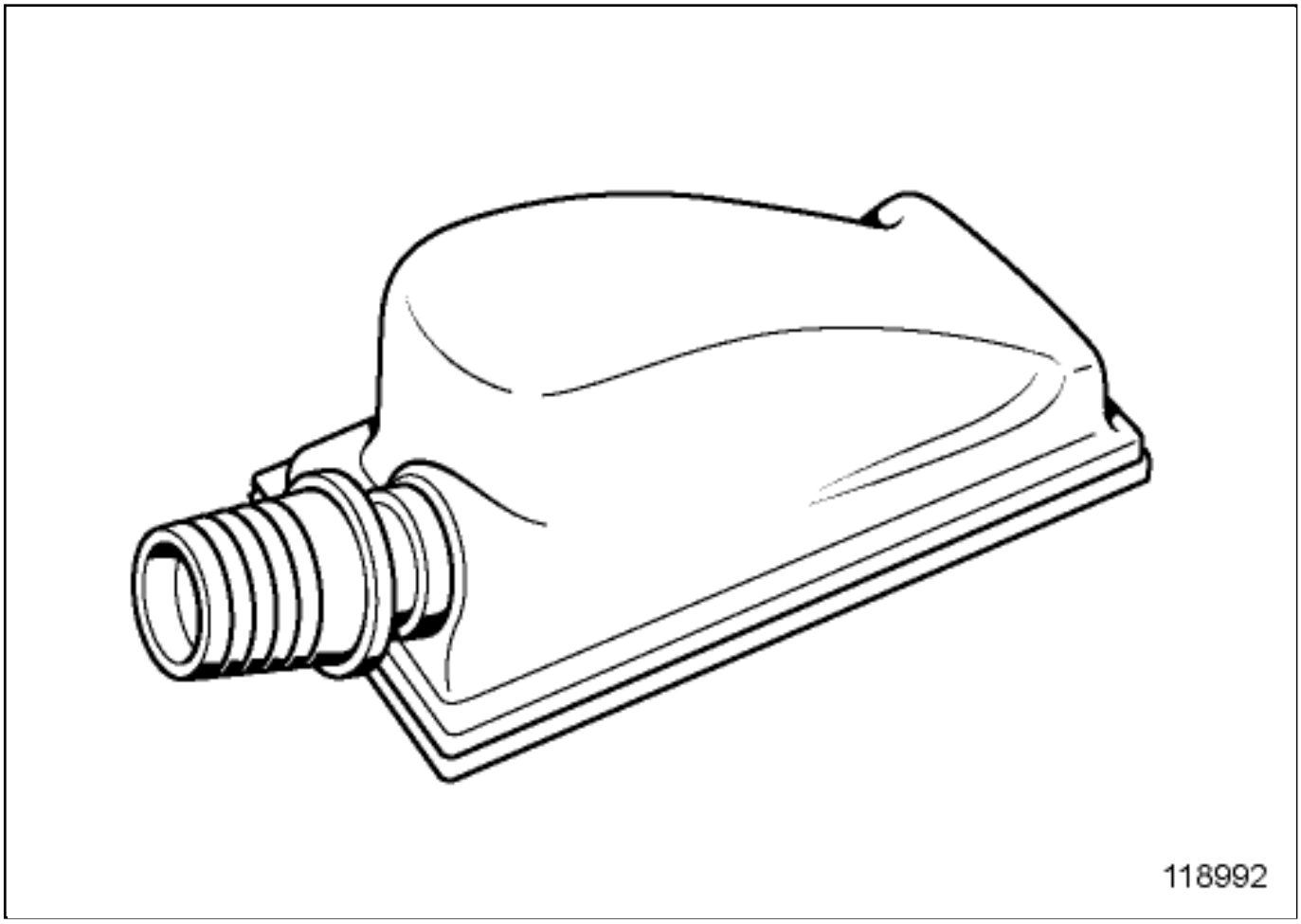
- Operator protection:
  - obligatory respiratory protection.

- Protection in the work area:
  - None

2. ANGLE AND SMALL AREA SURFACING

- Use a standard size manual sanding block with or without extractor.

1- VELCROTYPE SANDING BLOCK WITH EXTRACTOR FOR 81 X 153 MM, 100 OR 150 GRIT STRIPS



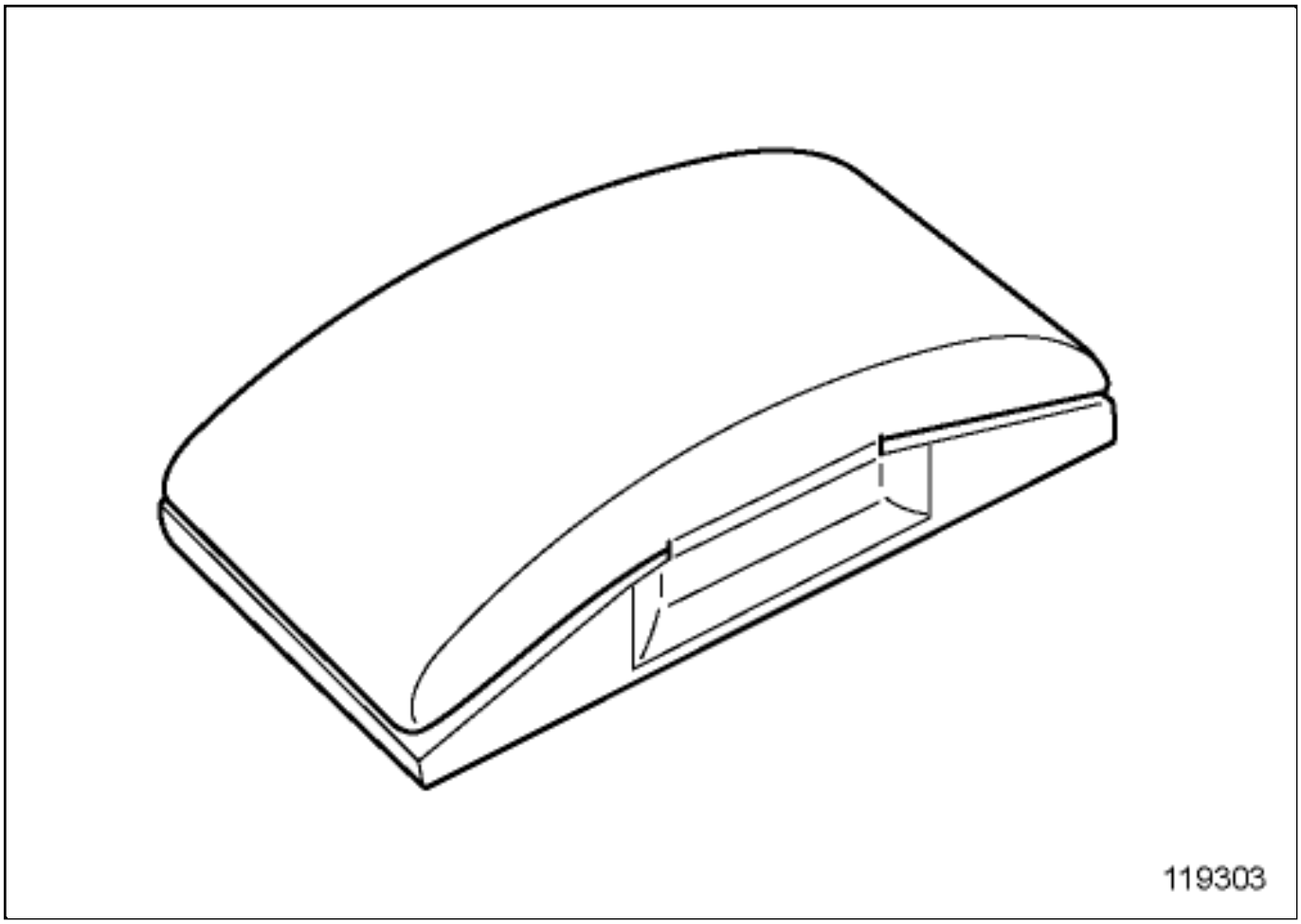
- Advantages:
  - is compatible with orbital sander paper,
  - allows the paper to be maintained in perfect contact with the block, preventing the paper from folding,
  - worn paper is easily replaced,
  - allows angles to be sanded,
  - the extractor system avoids dust buildup.

- Disadvantages:
  - suction pipe obstructs movement slightly.

- Operator protection:
  - obligatory respiratory protection.

- Protection in the work area:
  - None

2- BLOCKTYPE SANDING BLOCK



- Advantage:
  - is compatible with standard paper types.

- Disadvantages:
  - paper must be cut to size,
  - does not hold the paper during sanding,
  - extraction not possible.

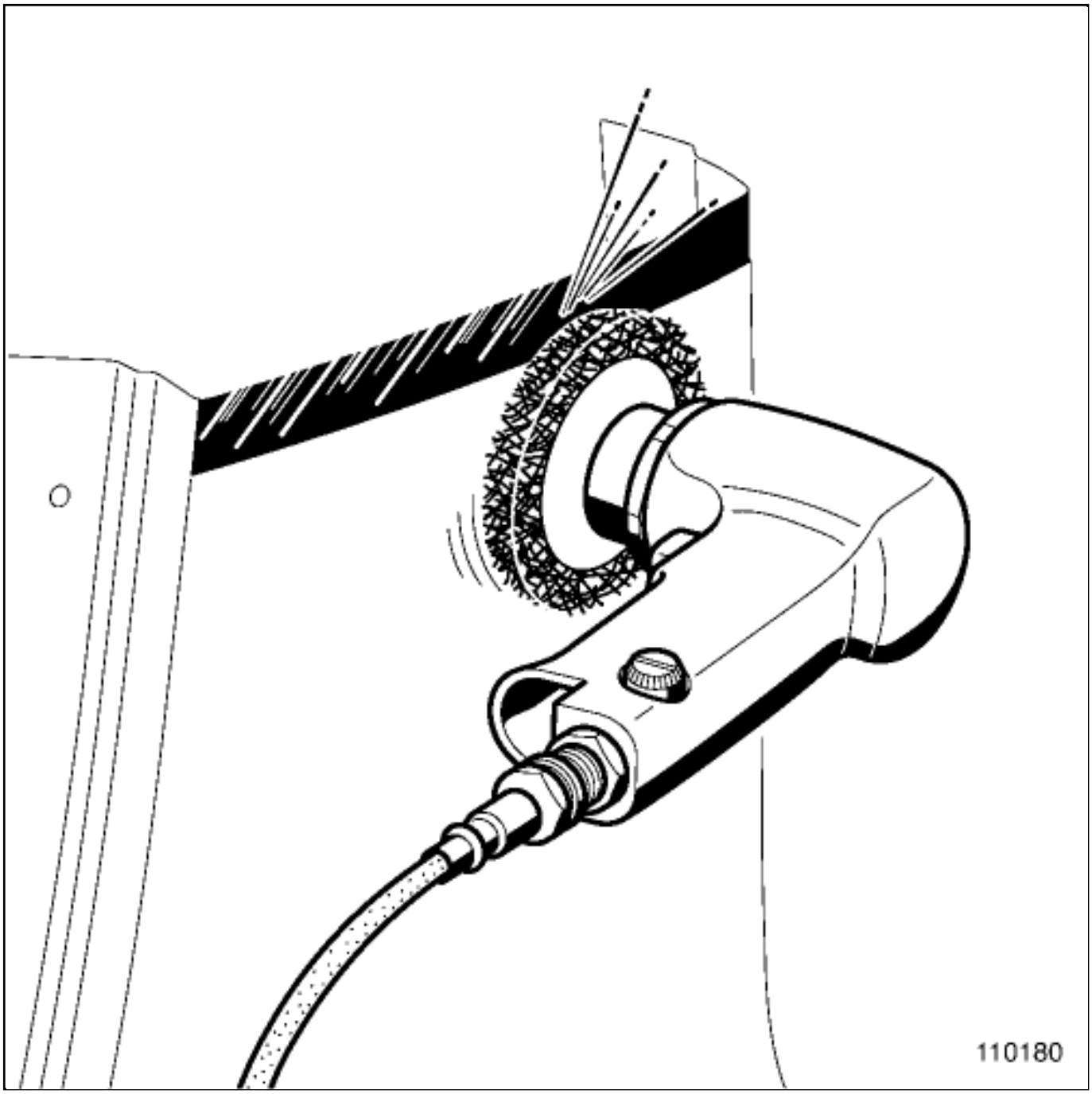
- Operator protection:
  - obligatory respiratory protection.

- Protection in the work area:
  - None

TOOLS FOR SCRAPING RIGID ADHESIVES AND PAINT: USE

1. FLAT STRIPPING

USE OF A PLASTIC FIBRE DISC, ON AN ANGLE GRINDER (5,000 RPM) FITTED WITH SPEED CONTROL



Advantage:

- Rapid means for cleaning a large painted surface with rigid adhesive mastic without damaging the support sheet and the galvanising.

Note:

When used on the edge of a sheet, the plastic fibre disc must be positioned parallel to the cut and should be applied from the centre of the part to the edge of the cut.

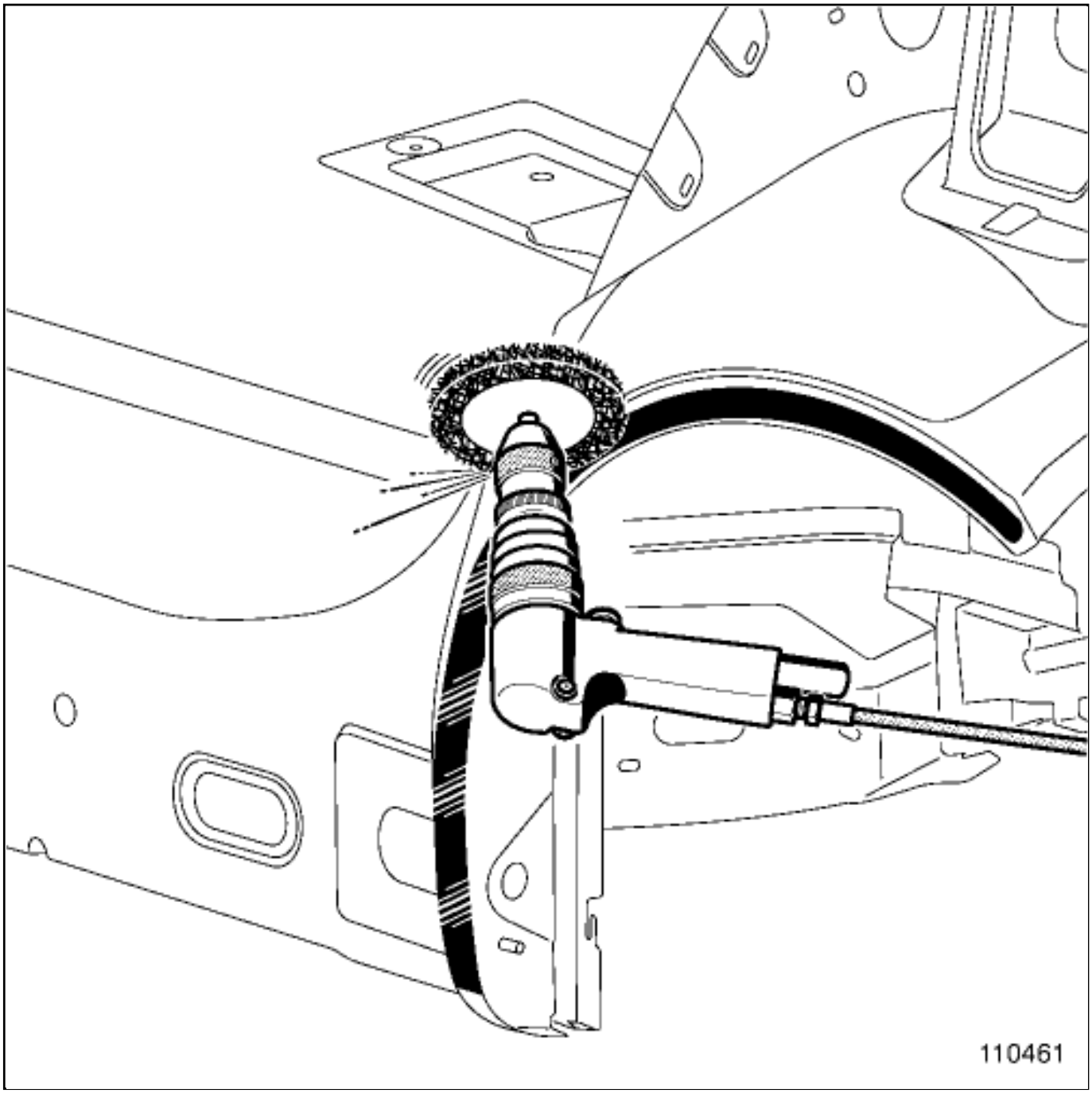
- Disadvantage:
  - Causes a large quantity of dust.

- Operator protection:
  - obligatory eye protection,
  - obligatory respiratory protection,
  - obligatory hand protection.

- Protection in the work area:
  - protection of interior fittings.

2. ANGLE STRIPPING

USE OF A PLASTIC FIBRE DISK ON A POWER DRILL (5,000 RPM)



- Advantage:
  - allows cleaning into corners without damaging the support sheet and galvanising.

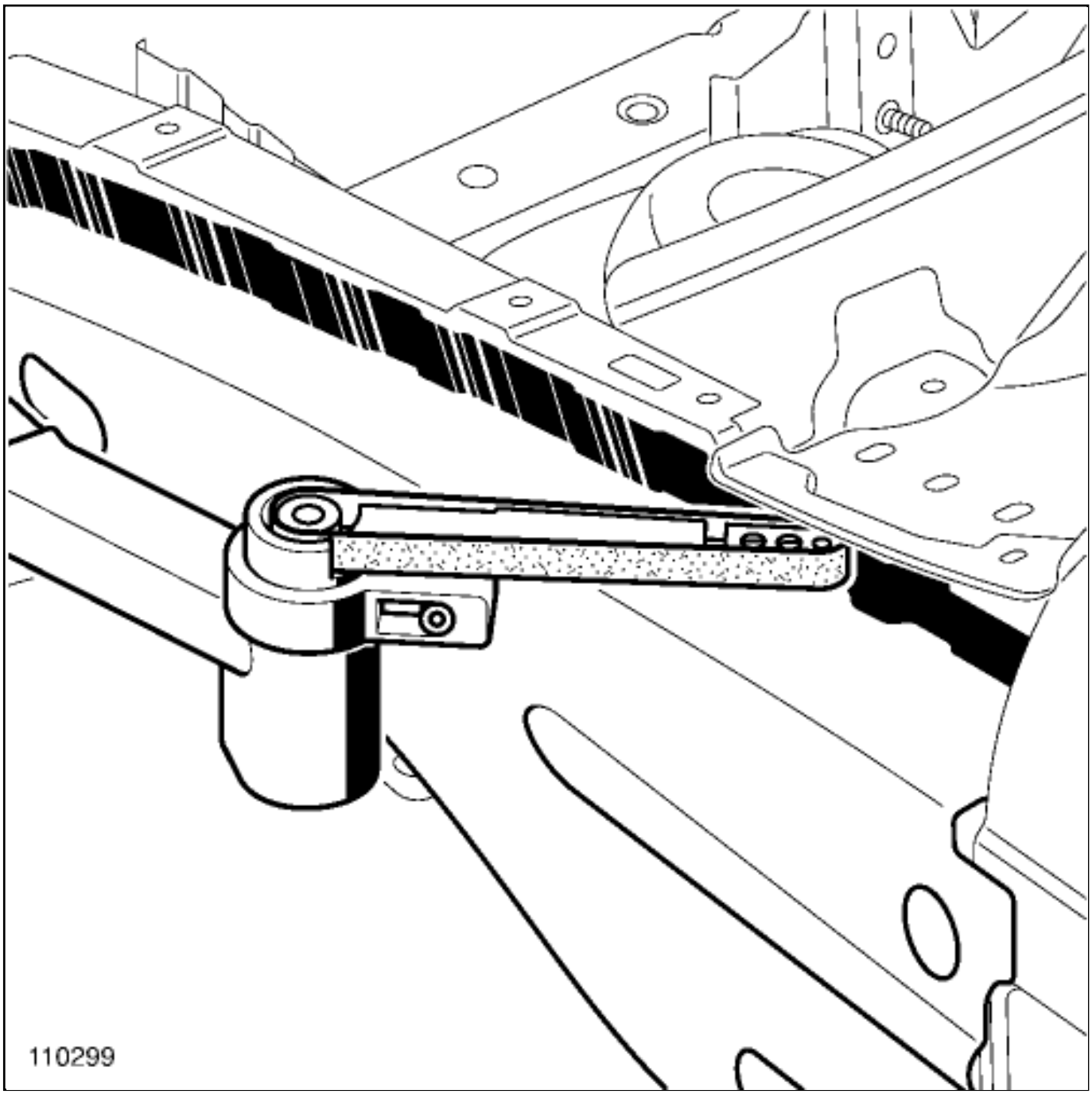
- Disadvantage:
  - Causes dust.

- Operator protection:
  - obligatory eye protection,
  - obligatory respiratory protection,
  - obligatory hand protection.

- Protection in the work area:
  - protection of interior fittings.

3. CORNER STRIPPING

USE OF A STRIP SANDER WITH AN ABRASIVE STRIP (50 GRIT)



- Advantage:
  - Rapid means for stripping areas that are difficult to get to, corner or enclosed area stripping.

- Disadvantages:
  - Causes dust,
  - Attacks the galvanising and the support sheet.

- Operator protection:
  - obligatory eye protection,
  -

- obligatory respiratory protection,
- obligatory hand protection.

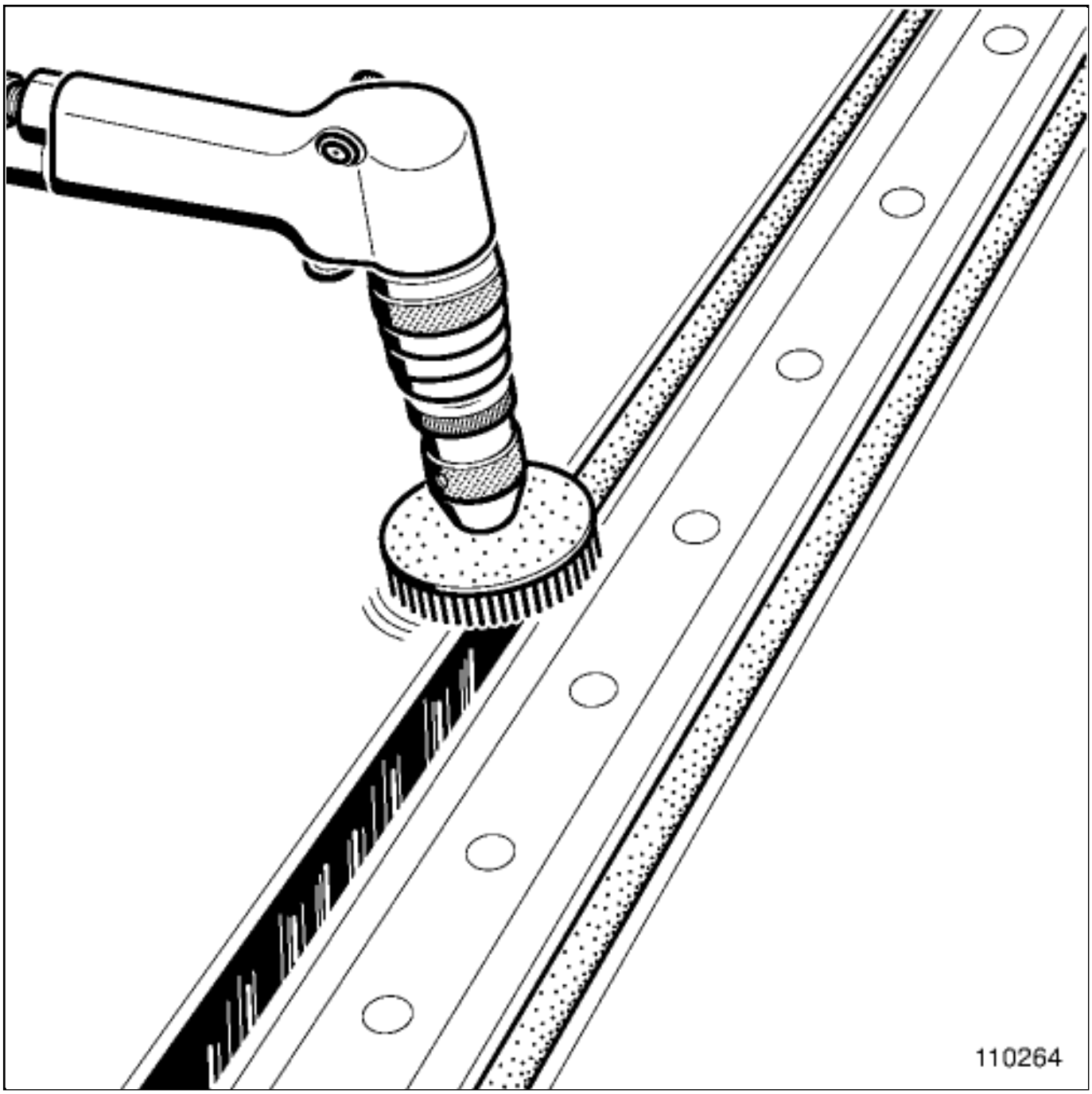
Protection in the work area:

- protection of interior fittings.

TOOLS FOR STRIPPING VERY THICK SOFT MASTIC: USE

1. FLAT STRIPPING

Use of a plastic brush on a power drill (5.000 rpm).



Advantages:

- Rapid means for cleaning large anti-chip surfaces and setting mastic without damaging the support sheet and the galvanising.

Disadvantages:

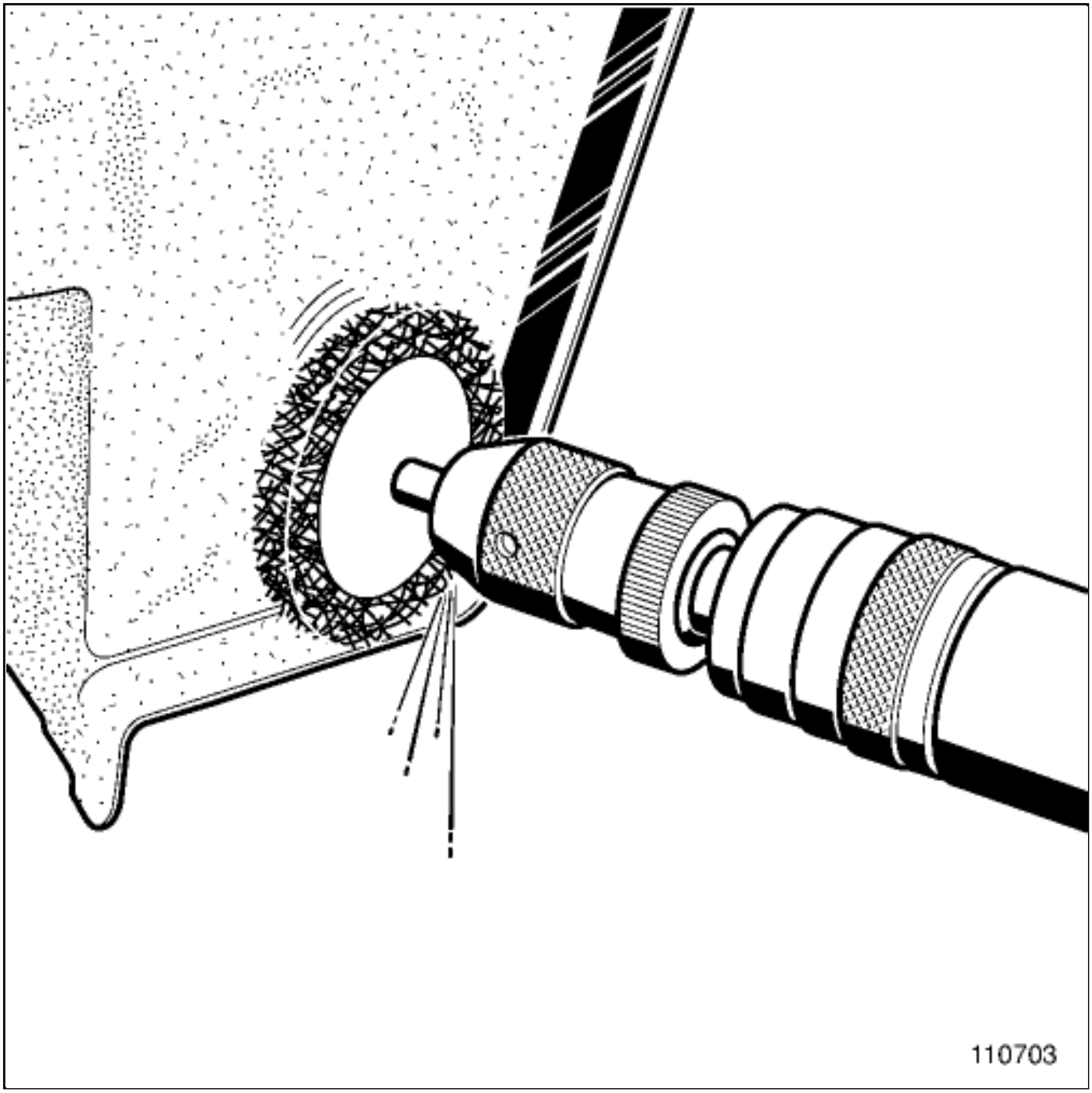
- Causes a large quantity of shavings and dust.

- Operator protection:
  - obligatory eye and face protection,
  - obligatory respiratory protection,
  - obligatory ears protection,
  - obligatory hand protection.

- Protection of the environment:
  - protection of interior fittings.

2. ANGLE STRIPPING

Use of a plastic fibre disk on a power drill (5,000 rpm).



Advantages:

- Allows cleaning into corners without damaging the support sheet and galvanising.

Disadvantages:

- Causes a large quantity of shavings and dust.
- Risk of the fibre getting caught on the sheet edge.

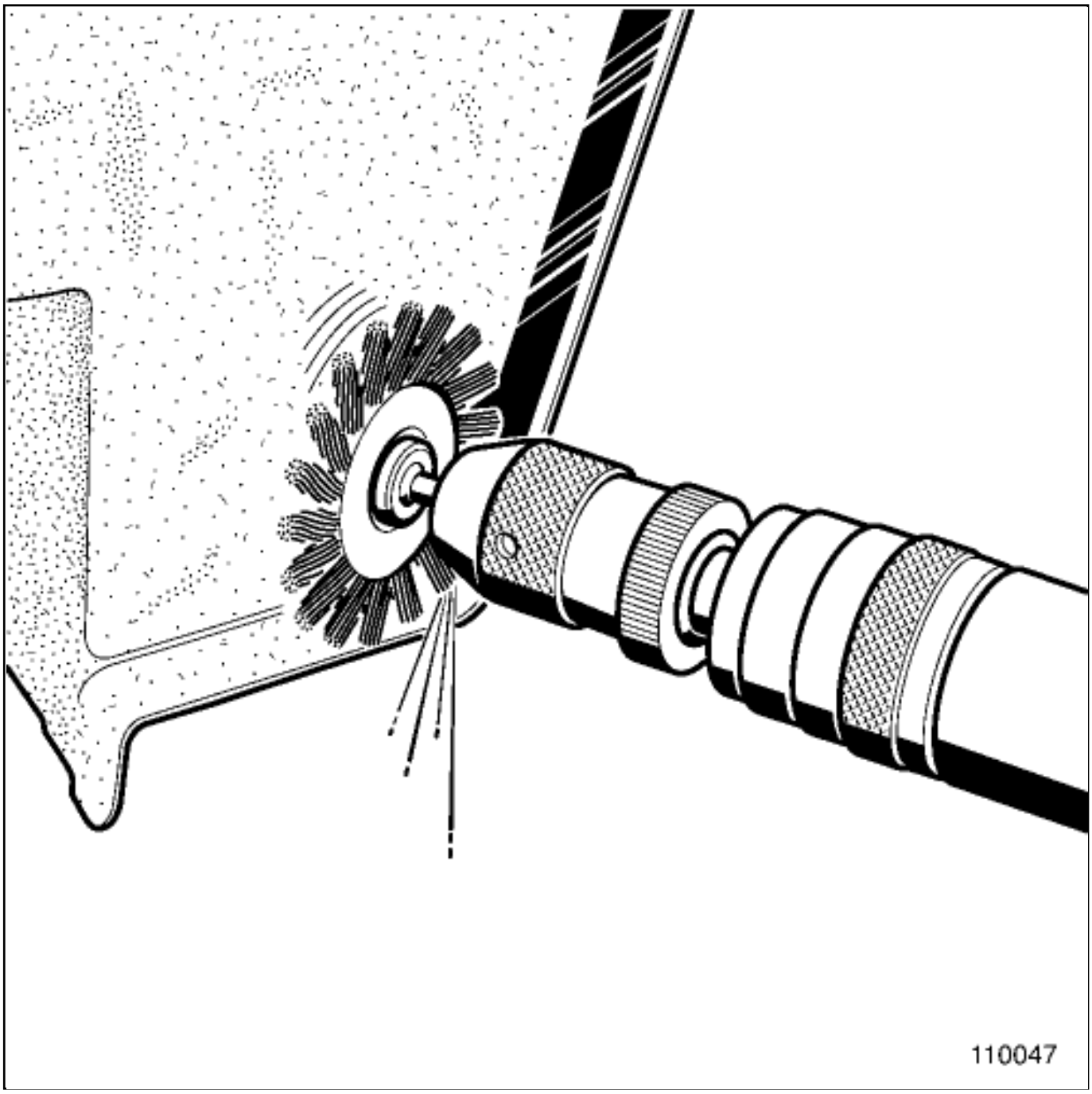
Operator protection:

- obligatory eye and face protection,
- obligatory respiratory protection,
- obligatory ears protection,
- obligatory hand protection.

Protection of the environment:

- protection of interior fittings.

Use of a steel brush disk on a power drill (5,000 rpm).



Advantage:

- Rapid method for cleaning in corners without damaging the support sheet.

Disadvantages:

- Causes shavings and dust.
- Slightly attacks the galvanised protection.

Operator protection:

- obligatory eye and face protection,
- obligatory respiratory protection,

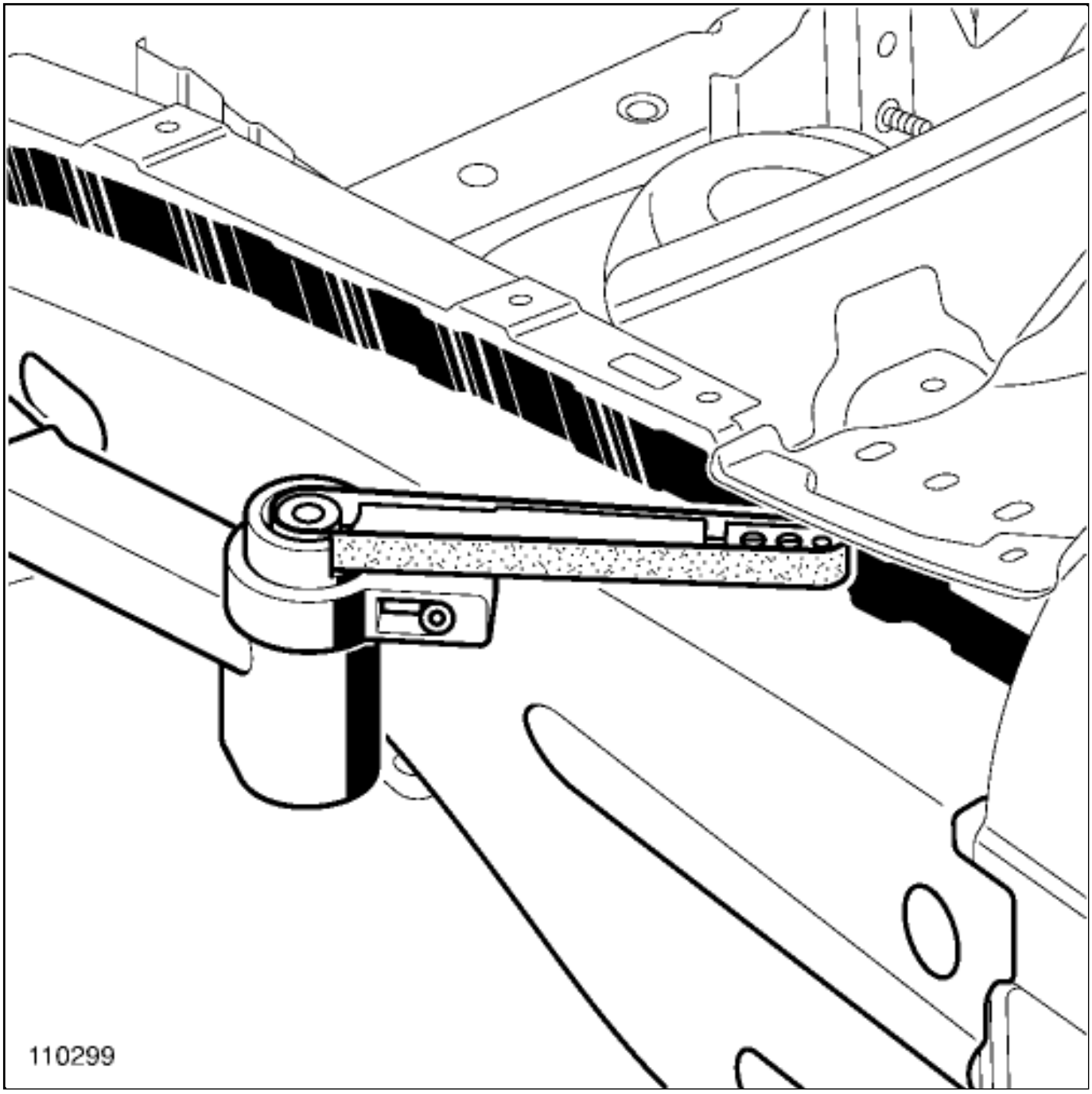
- obligatory ears protection,
- obligatory hand protection.

Protection of the environment:

- protection of interior fittings.

3. CORNER STRIPPING

Use of a strip sander with a 36grit strip.



Advantage:

- Can be used to strip in areas difficult to access (stripping a corner or an enclosed area).

Disadvantages:

- Not a rapid means.

Attacks the galvanising and the support sheet.

Operator protection:

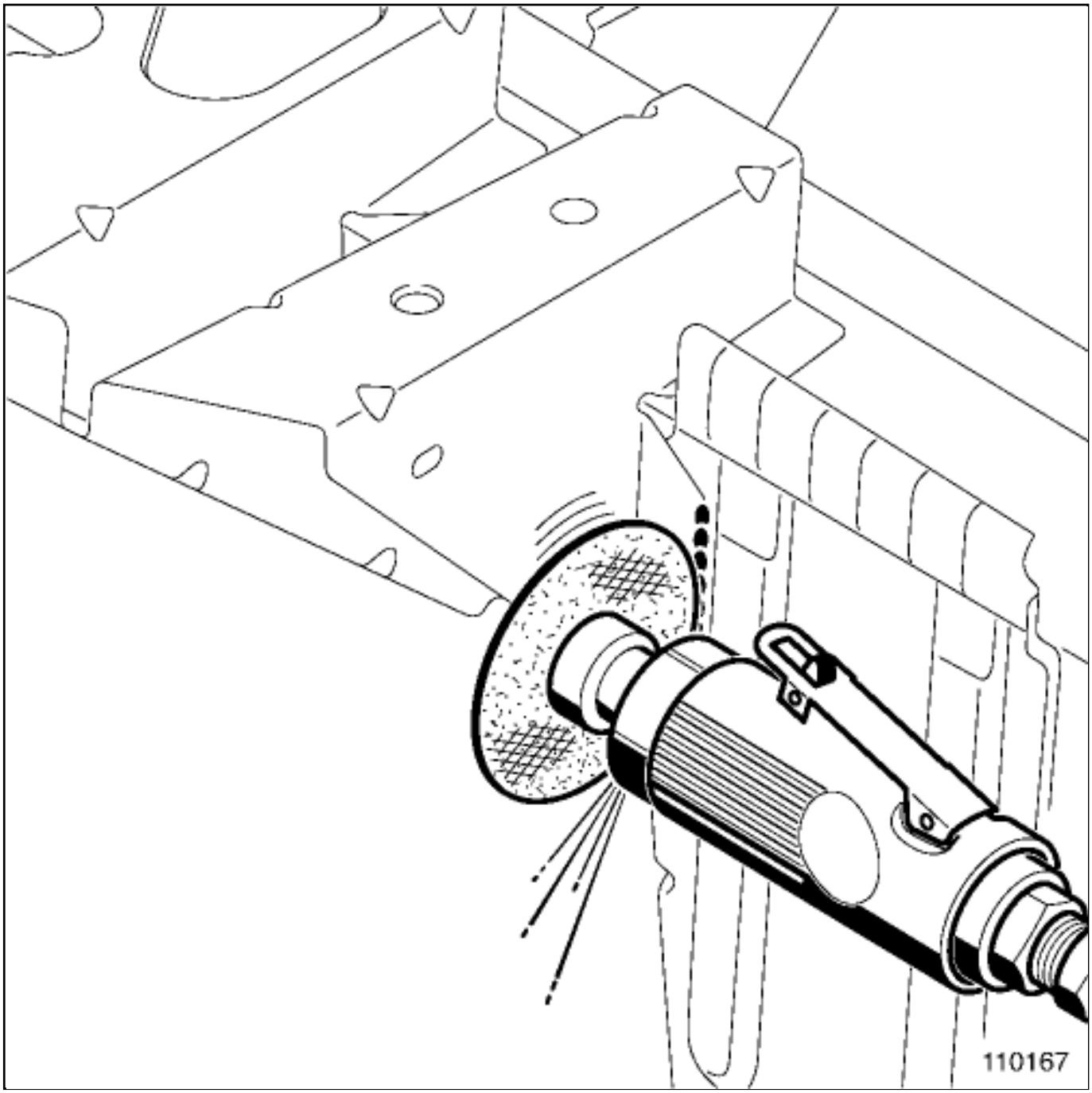
- obligatory eye and face protection,
- obligatory respiratory protection,
- obligatory ears protection,
- obligatory hand protection.

Protection of the environment:

- protection of interior fittings.

TOOLS FOR UNPICKING A STRUCTURAL COMPONENT: USE

1. FLAT UNWELDING AND UNWELDING A WELD BEAD



- Use of a unwelding grinder ∅ 76 mmthickness 3 mm, fitted to a straight grinder (20000 rpm)fitted with speed control.

- Advantages:
  - a very fast method that causes the least damage to the sheet located underneath the mating surface overlap,
  - allows unwelding of THLE and UHLE sheets.

Disadvantages:

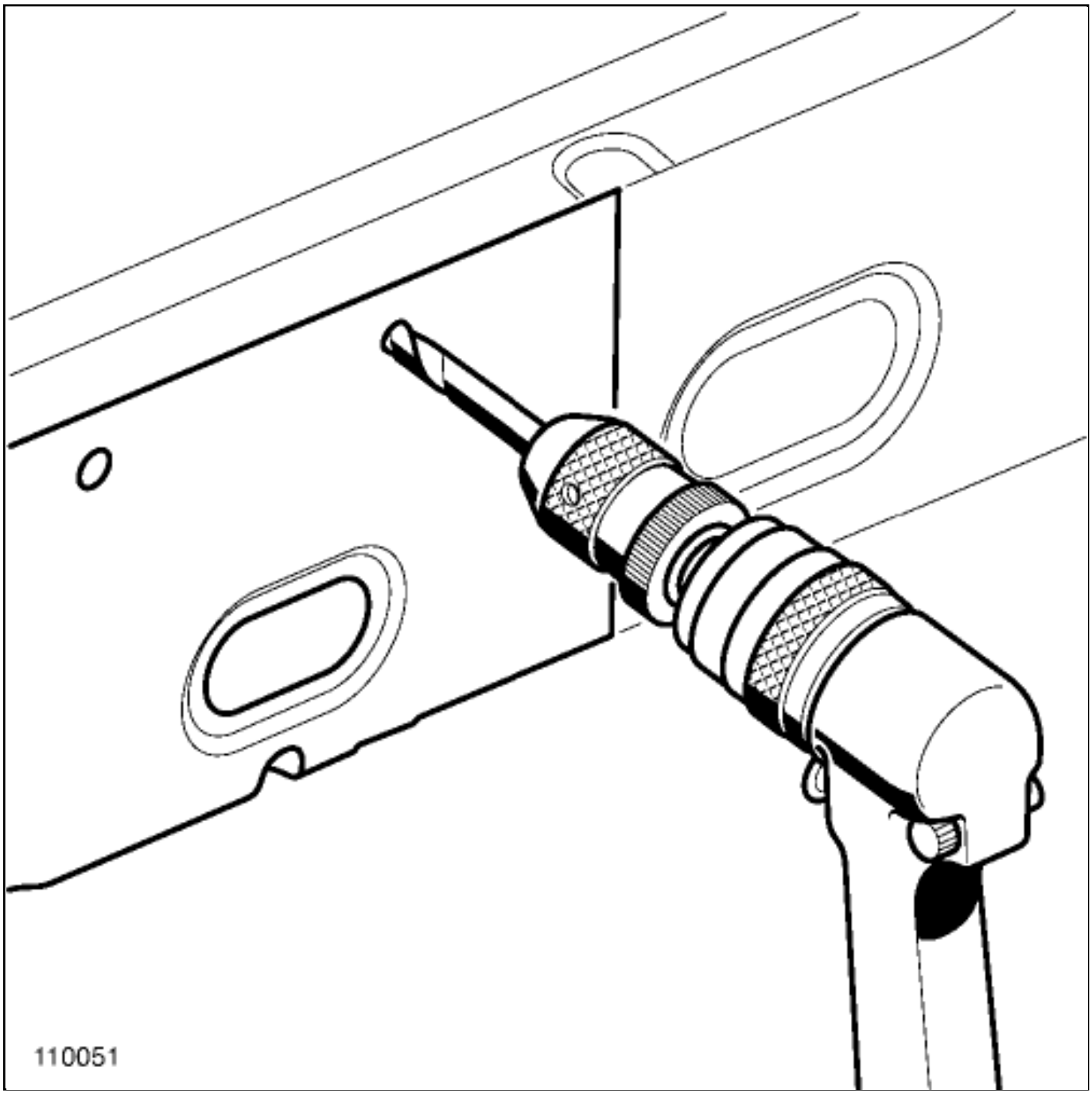
- causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).

Operator protection:

- obligatory eye protection,
- obligatory hand protection,
- obligatory ears protection,
- obligatory respiratory protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.



- Use of a hardened steel bit ∅ 6 to 10 mm, fitted to a drill (2000 rpm), fitted with speed control.

- Advantages:
  - Rapid unwelding without projections,
  - clean holes, ideal for plug welding the first sheet.

- Disadvantages:
  - it is necessary to drill vertically into the part,
  - not for unwelding THLE and UHLE sheets.

- Operator protection:
  - obligatory eye protection,
  - obligatory hand protection.

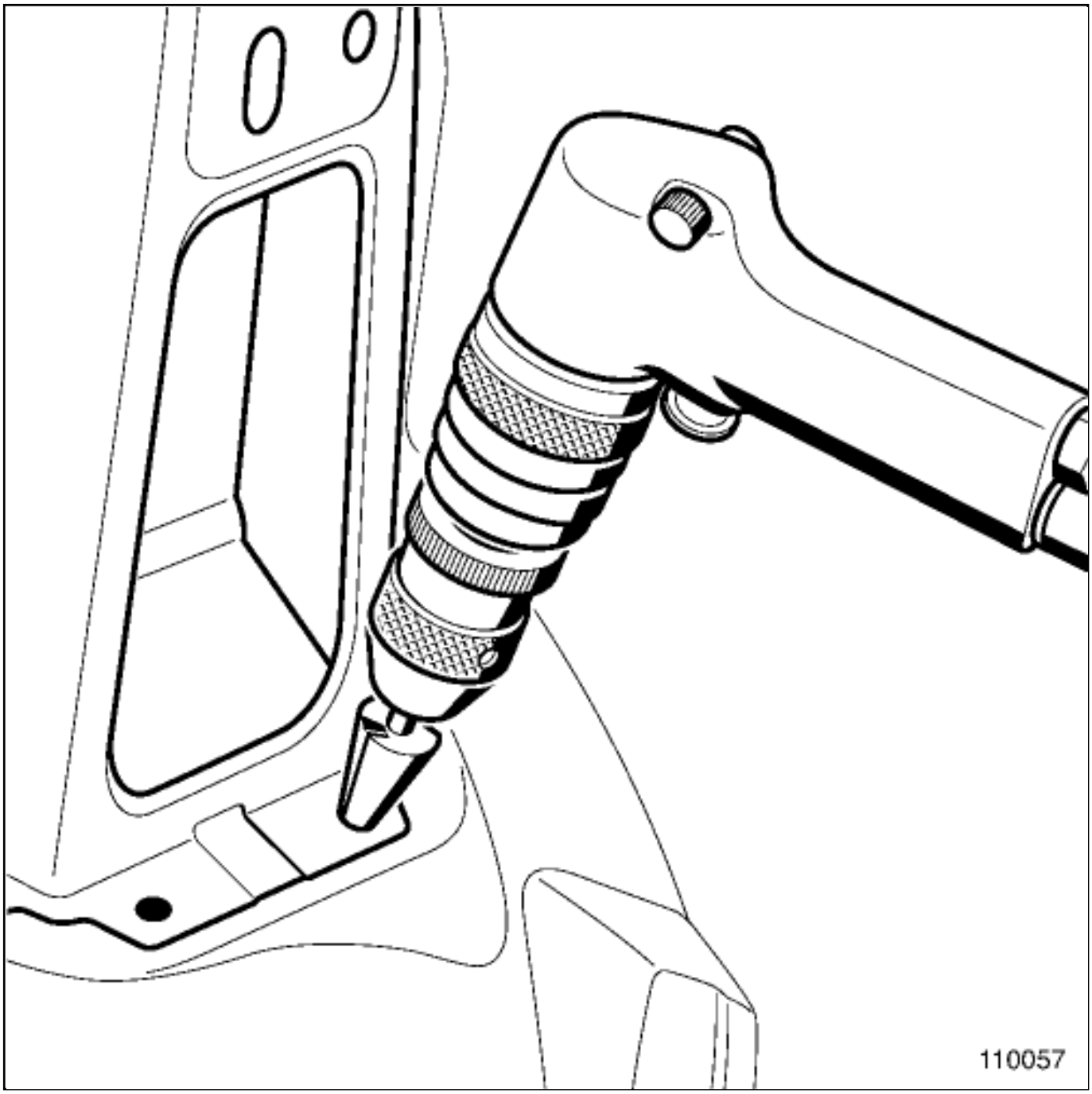
- Protection in the work area:
  - protection of interior fittings.

Note:

The speed control is for optimising the cut and bit penetration, avoids premature wear, above all for drilling high tensile sheets.

In that case, use HSStype drill bits.

1- PARTICULAR CASE OF UNWELDING A SHEET LOCATED BEHIND, FOR TWO THICKNESSES



- Use of a tapered drill bit, fitted to a drill (2000 rpm), fitted with speed control.

- Advantages:
  - clean hole and correctly matched to the spot weld diameter, allowing you to plug weld.

- Disadvantages:
  - It is necessary to drill vertically into the part.

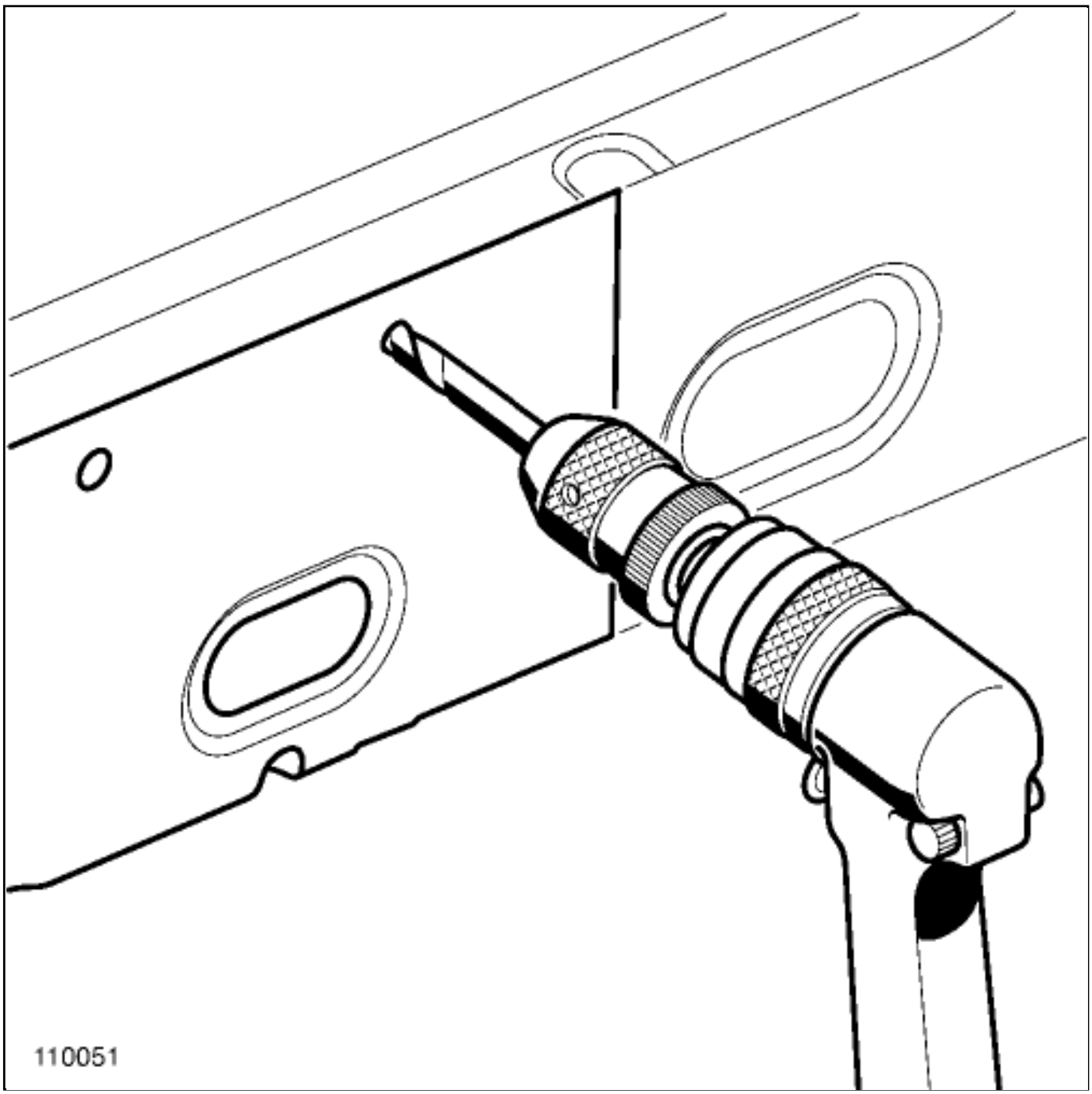
- Operator protection:
  - obligatory eye protection,
  - obligatory hand protection.

- Protection in the work area:
  - protection of interior fittings.

Note:

Before drilling, you are advised to centre punch the point in such a way as the hole required for unpicking is as small as possible.

2- PARTICULAR CASE OF UNWELDING A SHEET LOCATED BEHIND, FOR THREE THICKNESSES



- Use of a hardened steel bit, fitted to a drill (2000 rpm), fitted with speed control.

- Advantages:
  - enables you to drill the first hole by making a clean hole for plugging,
  - unwelds the second sheet without damaging the third sheet.

- Disadvantages:
  - requires certain precautions to avoid perforating the third sheet.
  - it is necessary to drill vertically into the part.

- Operator protection:
  - obligatory eye protection,
  - obligatory hand protection.

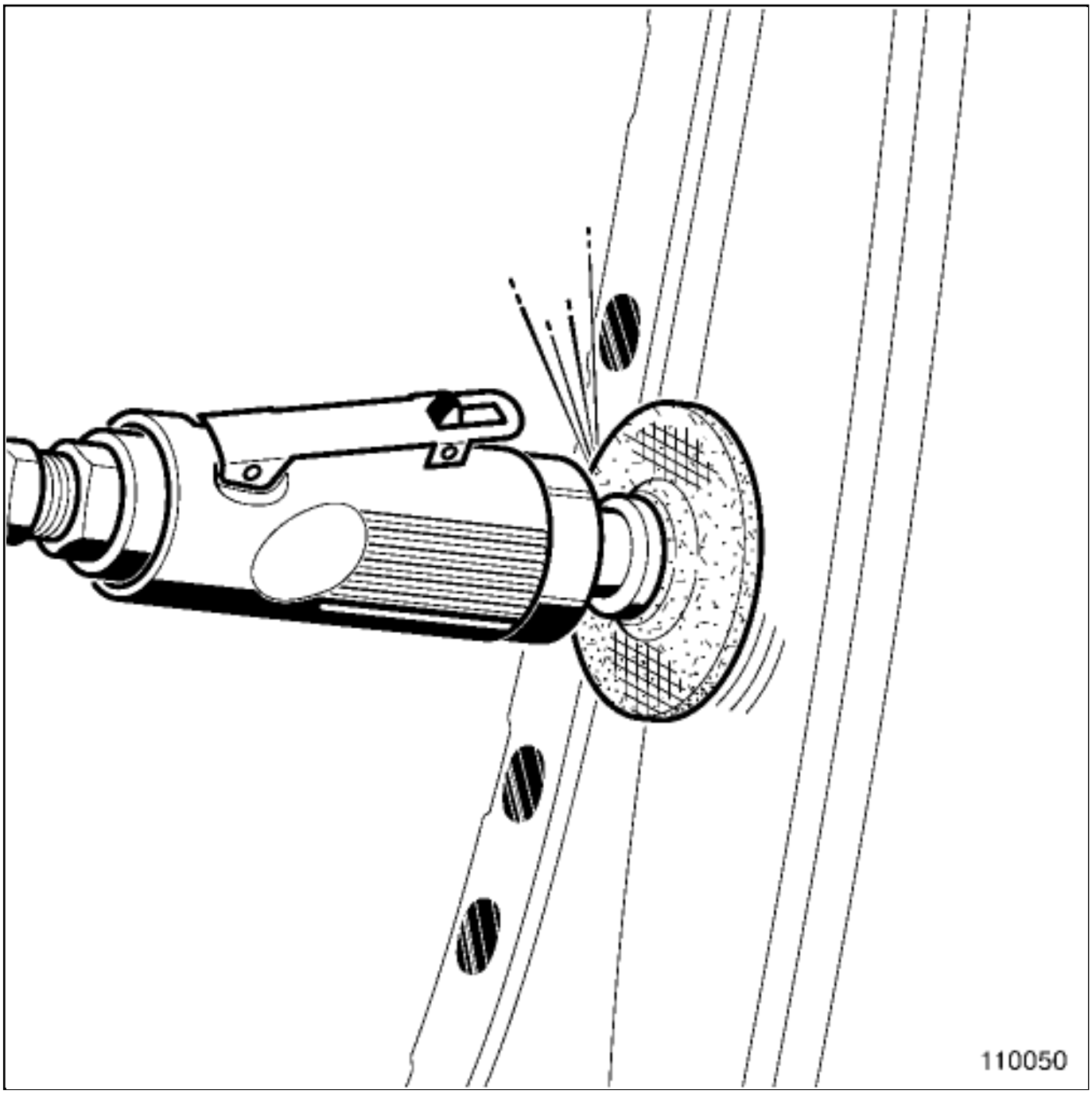
- Protection in the work area:
  - protection of interior fittings.

Note:

The speed control is for optimising the cut and bit penetration, avoids premature wear, above all for drilling high tensile sheets.

In that case, use HSStype drill bits.

2. UNWELDING AT AN ANGLE



- Use of a unwelding grinder ∅ 76 mmthickness 3 mm, fitted to a straight grinder (2000 rpm)fitted with speed control.

- Advantages:
  - a very fast method that causes the least damage to the sheet located underneath the mating surface overlap,
  - allows unwelding of THLE and UHLE sheets.

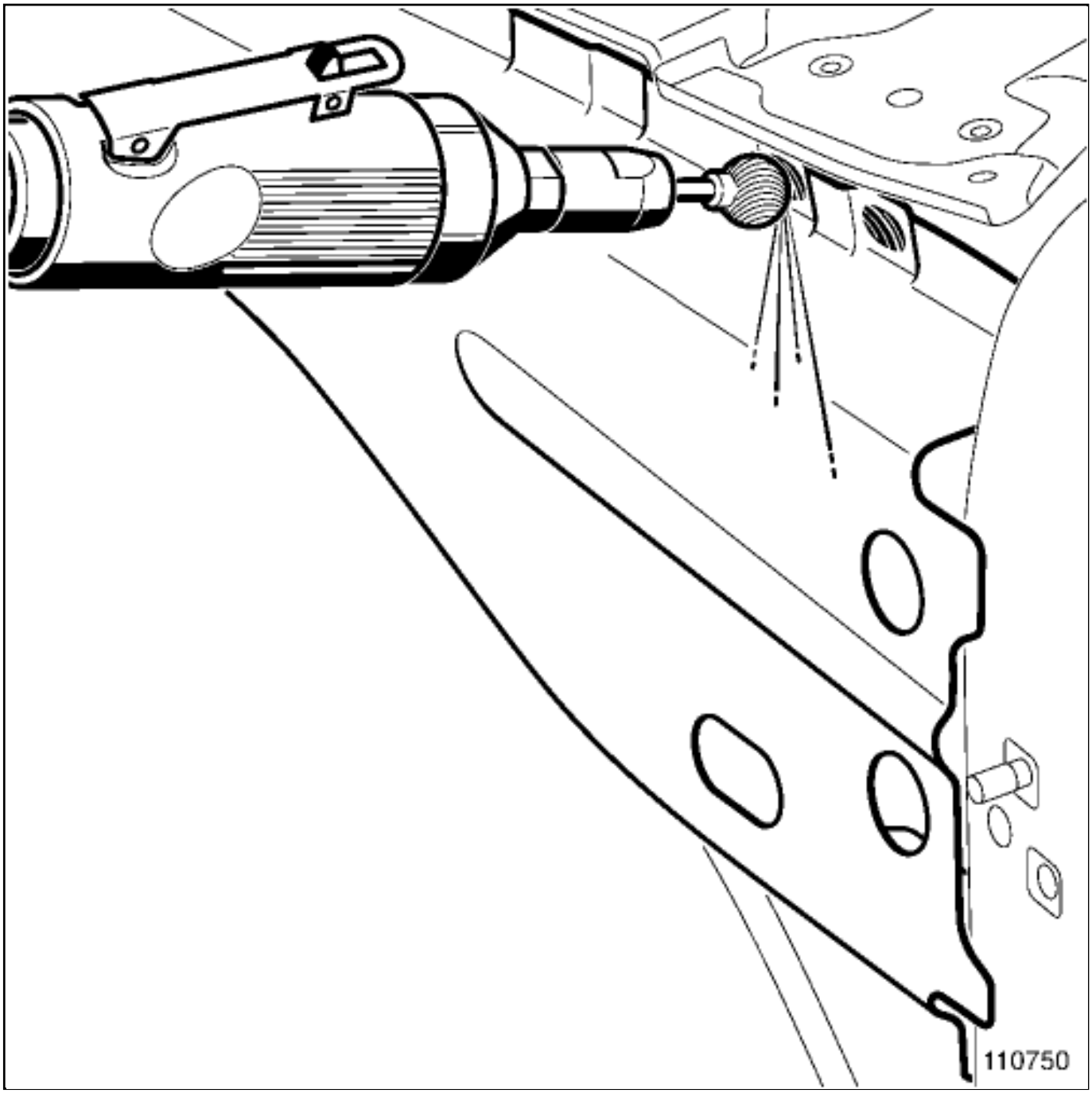
- Disadvantages:
  - causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).

- Operator protection:
  - obligatory eye protection,
  - obligatory hand protection,
  - obligatory ears protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.

3. UNWELDING IN A CORNER



Use of a spherical burr on a straight grinder (20,000 rpm), equipped with speed control.

Advantages:

- a very fast method that causes the least damage to the sheet located underneath the mating surface overlap,
- allows unwelding of THLE and UHLE sheets.

Disadvantages:

- causes a large quantity of metal filings,
- it is forbidden to drill vertically into the part.

Operator protection:

- obligatory eye protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings.

TRACK ROD: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Ball joint extractor.	Tav. 476

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 36A, Steering assembly , Steering: Precautions for the repair) ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

- Location and specifications (tightening torques, parts always to be replaced, etc.)Steering assembly: Exploded view .

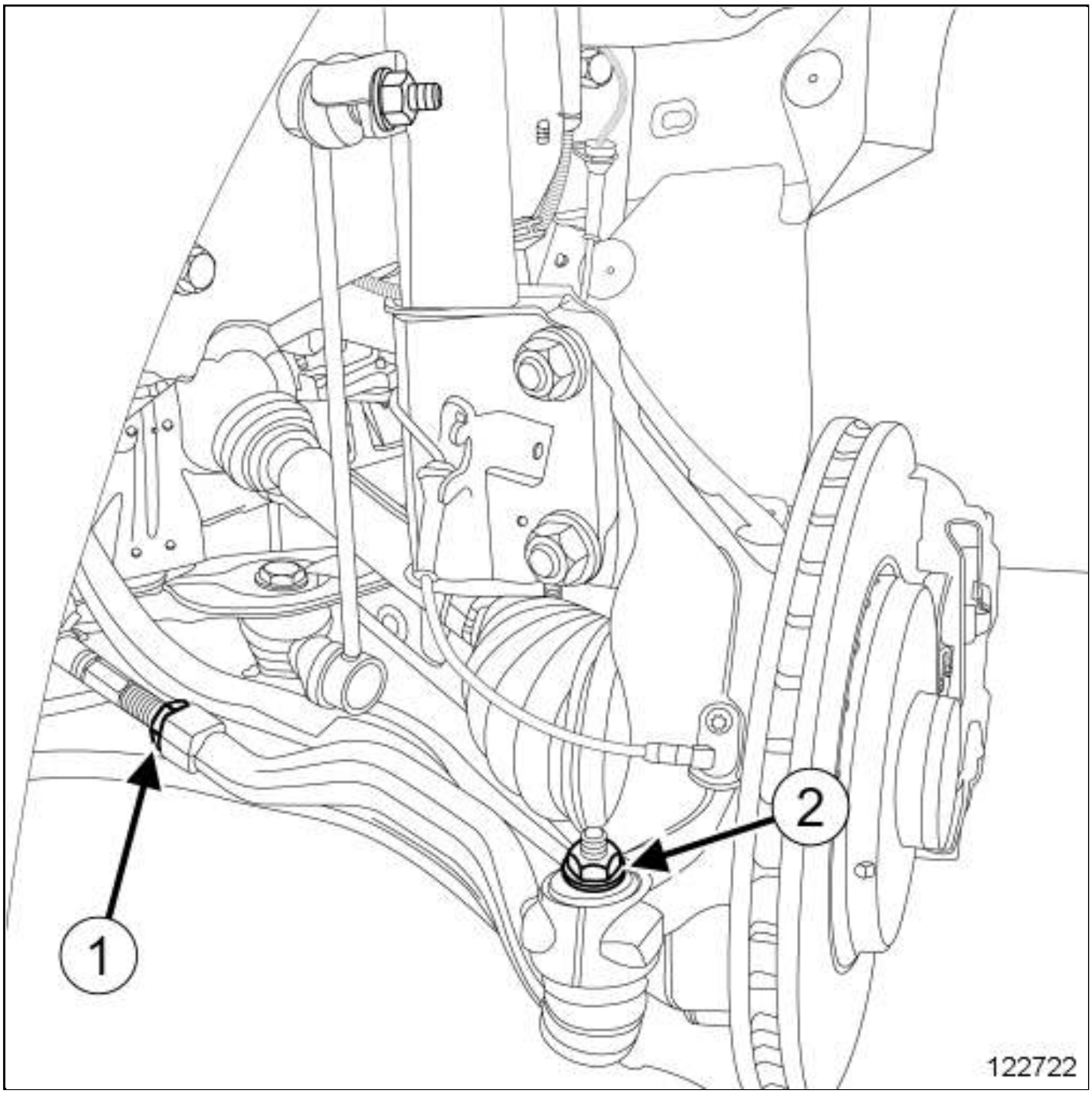
REMOVAL

1. REMOVAL PREPARATION OPERATION

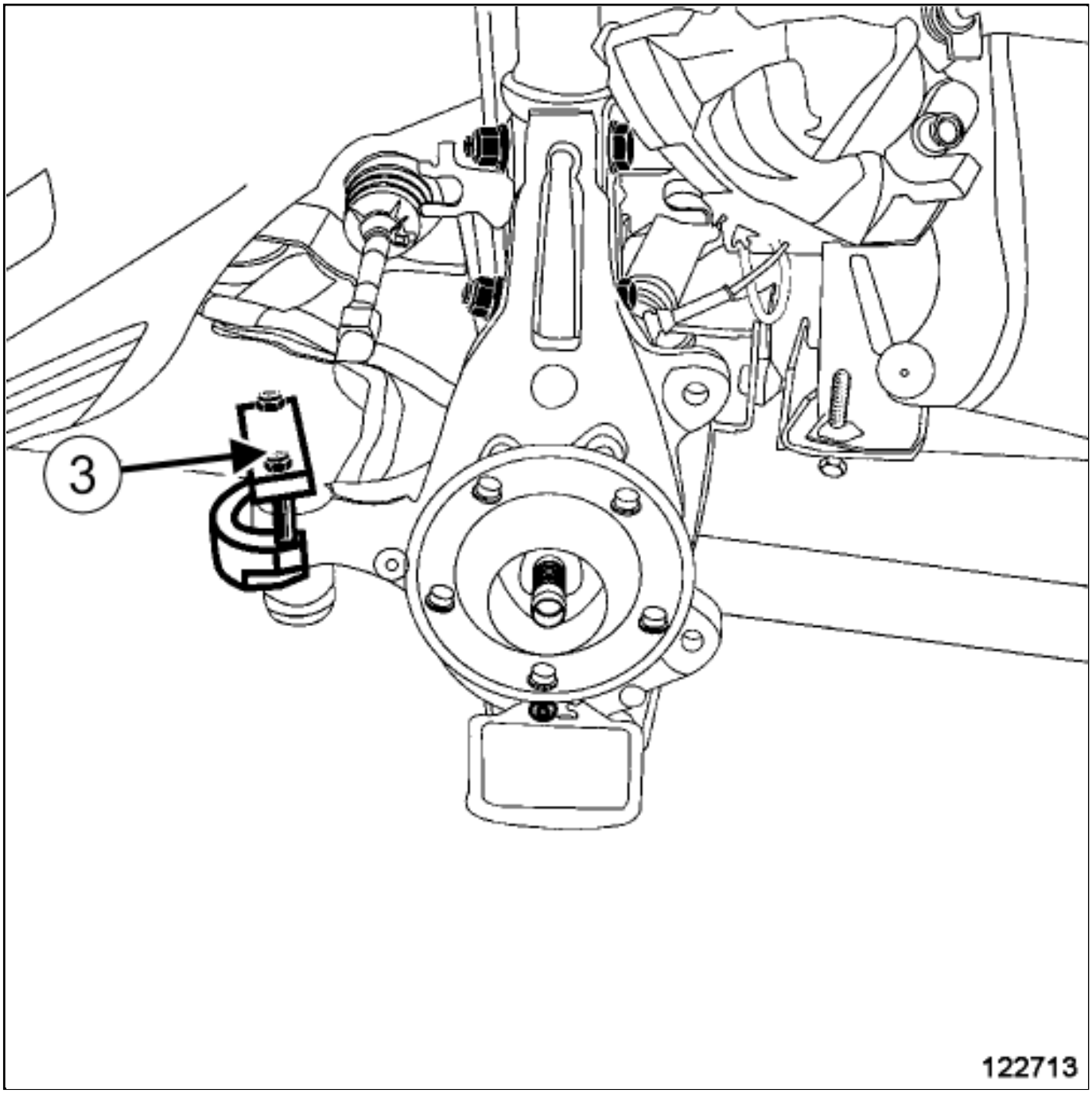
- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove the front wheelFront hub carrier assembly: Exploded view .

2. REMOVAL OPERATION



- Loosen the wheel alignment adjustment lock nut(1) .
- Remove the track rod ball joint nut(2) .



- Extract the ball joint usingBall joint extractor.(Tav. 476) .
- Unscrew the track rod anti-clockwise and note the number of turns for refitting.
- Remove the track rod.

REFITTING

1. REFITTING OPERATION

- Screw the track rod back in place by the number of turns noted during removal.
- Fit the track rod end in the hub carrier.
- Refit the track rod ball joint nut.
- Torque tighten **Steering assembly: Exploded view** :
  - the track rod ball joint nut,
  - the wheel alignment adjusting lock nut.

2. FINAL OPERATION

- Refit the front wheel **Front hub carrier assembly: Exploded view** .
- Check the axle geometry **Axle assemblies: Check** .
- If necessary, adjust the geometry of the axle assemblies **Front axle system: Adjustment** .

TRACKING UNIT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

REMOVAL

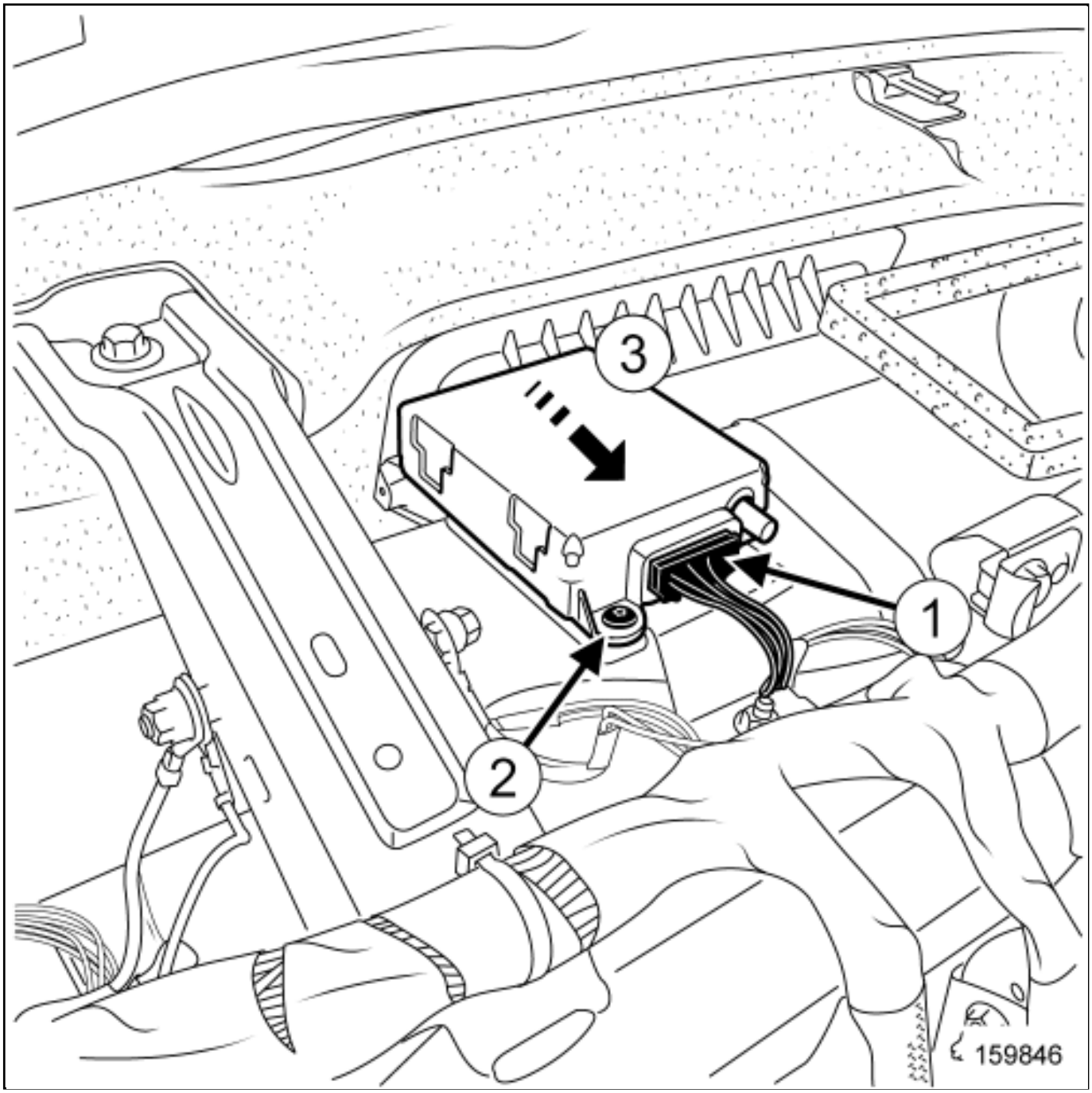
1. REMOVAL PREPARATION OPERATION

- Apply the "Before repair procedure" using the Diagnostic tool(see Fault finding - Replacement of components) (82A, Immobiliser).
- Switch off the ignition.
- Disconnect the battery Battery: Removal - Refitting .
- Remove the instrument panel. Instrument panel: Removal - Refitting

2. REMOVAL OPERATION

WARNING

Wear protective gloves during the operation.



- Unclip the connector(1) from the tracking unit.
- Remove:
  - the tracking unit bolt(2) ,
  - the tracking unit at(3) .

REFITTING

Proceed in the reverse order to removal.

Apply the "After repair procedure" using the Diagnostic tool(see Fault finding - Replacement of components) (82A, Immobiliser).

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XSL version : 3.02 du 22/07/11

TURBOCHARGER OIL PIPE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Offset wrench for tightening High Pressure pump pipes.	
Set of high pressure pipe removal wrenches (diameter 14,17,19)	

Equipment required
Diagnostic tool
self-contained starter

parts always to be replaced:
turbocharger oil supply pipe
Turbocharger oil supply pipe bolt
turbocharger oil pipe seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

Note:

This procedure deals with removing and refitting the turbocharger oil return pipe and the turbocharger oil supply pipe.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Wear protective gloves during the operation.

CAUTION

Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.

Check that the turbocharger oil return pipe is not partially or completely blocked by scale. Check that there are no leaks. If there are, replace the part.

CAUTION

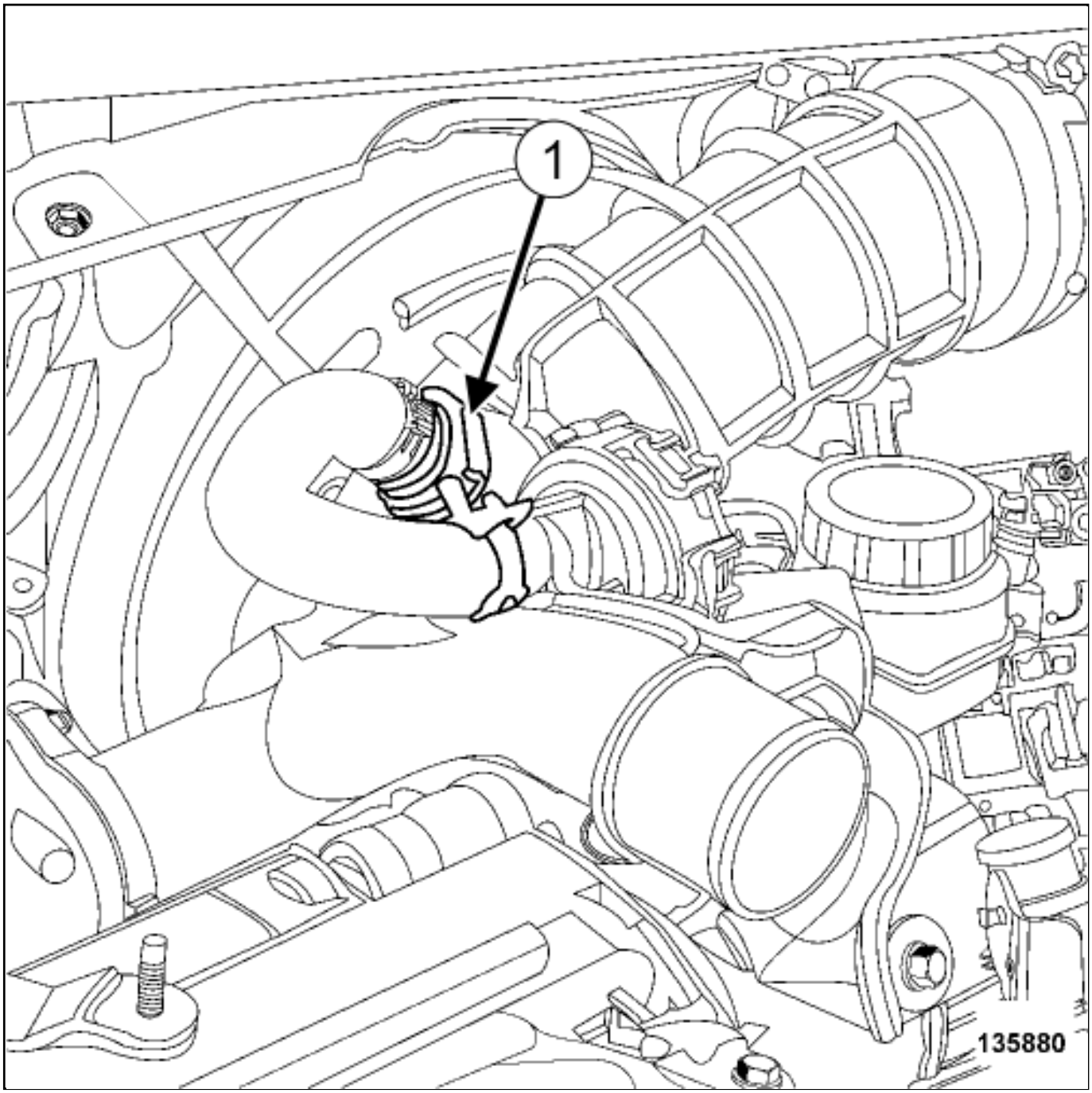
Metal objects may enter the oil and air circuits as a result of a broken turbocharger.

Failure to observe the following instructions will lead to the turbocharger breaking again.

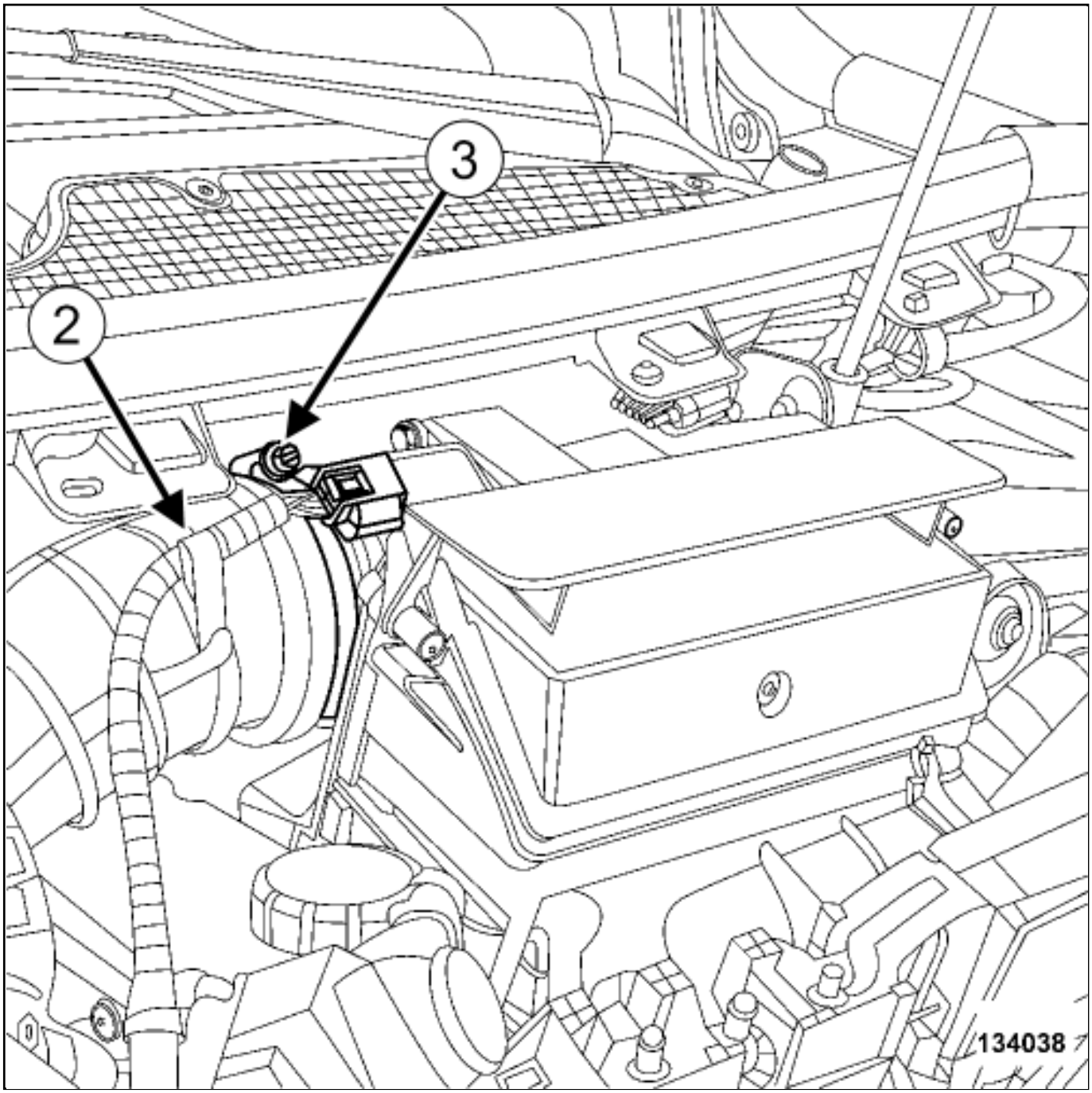
REMOVAL

1. REMOVAL PREPARATION OPERATION

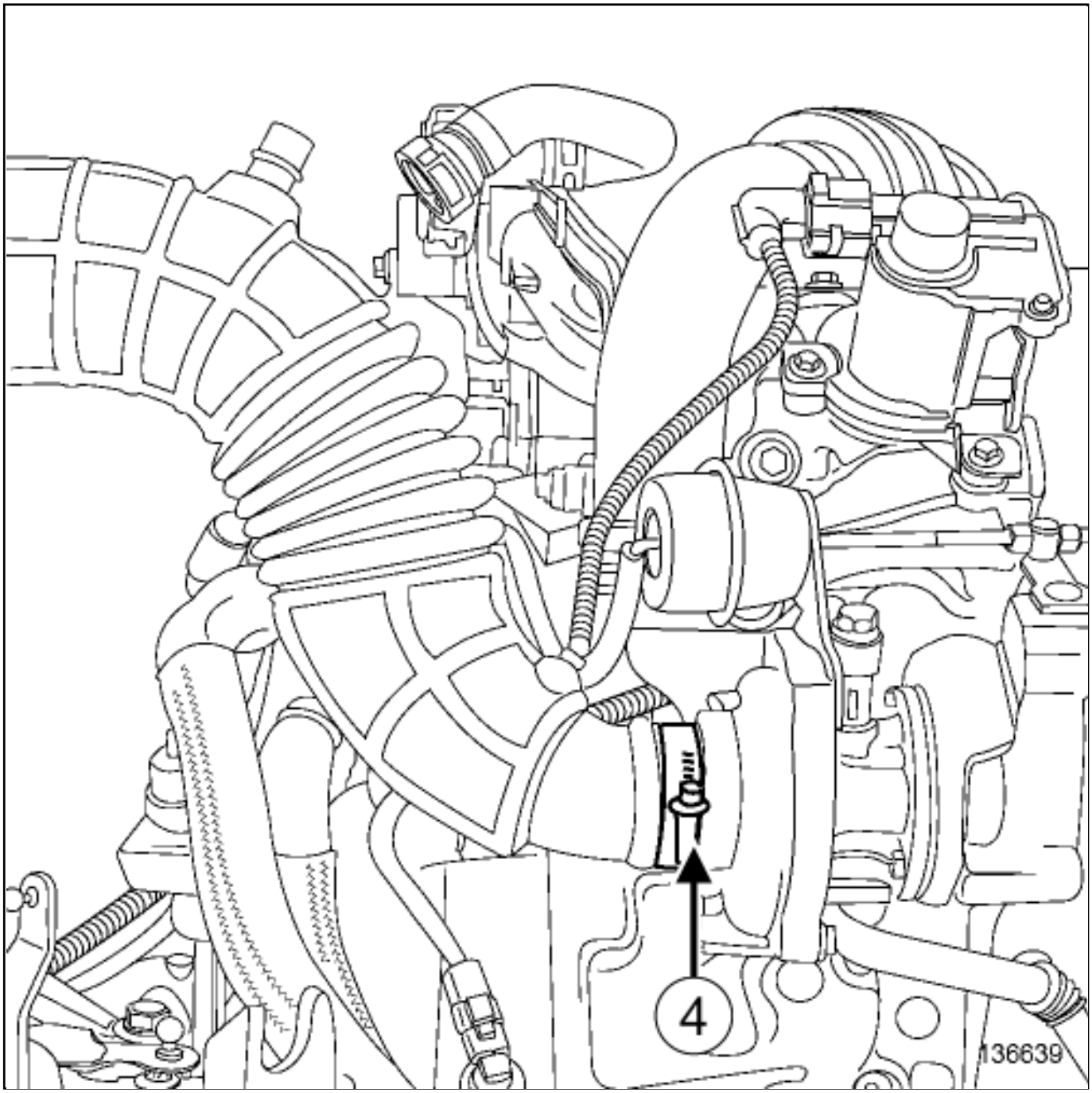
- Disconnect the batteryBattery: Removal - Refitting .
- Remove the front engine cover.



- Disconnect the oil vapour rebreathing pipe union from the air filter unit air outlet pipe(1) .



- Unclip the air flowmeter wiring from the air filter unit air outlet pipe at(2) .
- Loosen the clip(3) of the air filter unit air outlet pipe from the air filter unit.
- Disconnect the air filter unit air outlet pipe from the air filter unit.

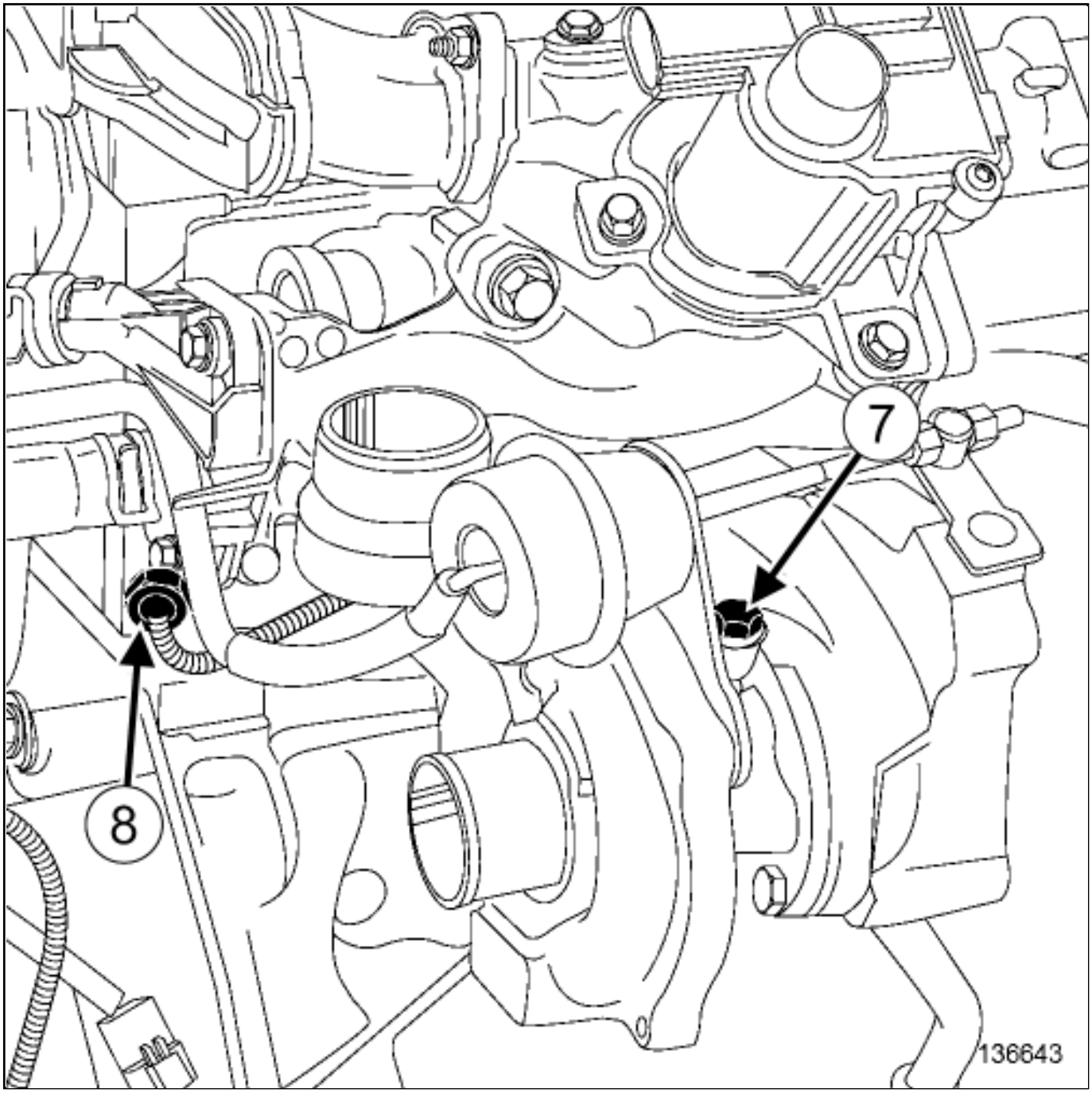


- Undo the air filter unit air outlet pipe clip(4) from the turbocharger.

- Disconnect the air filter unit air outlet pipe from the turbocharger.

- Remove the air outlet pipe from the air filter box.

2. REMOVAL OPERATION



- Remove the turbocharger oil supply pipe hollow bolt(7) .

- Loosen the nut(8) for the turbocharger oil supply pipe on the cylinder head, using the toolSet of high pressure pipe removal wrenches (diameter 14,17,19) or the toolOffset wrench for tightening High Pressure pump pipes. .

- Remove the nut(8) for the turbocharger oil supply pipe from the cylinder head.

- Remove the turbocharger oil supply pipe.

- Wipe away any oil run-off.

REFITTING

1. REFITTING PREPARATION OPERATION

- parts always to be replaced: turbocharger oil supply pipe.
- parts always to be replaced: Turbocharger oil supply pipe bolt.

2. REFITTING OPERATION

- Refit a new turbocharger oil supply pipe.
- Fit the turbocharger oil supply pipe nut on the cylinder head, without tightening it.
- Refit a new hollow bolt for the turbocharger oil supply pipe on the turbocharger.
- Torque tighten:
  - the turbocharger oil supply pipe nut on the cylinder head35 N.musing the toolSet of high pressure pipe removal wrenches (diameter 14,17,19) or the toolOffset wrench for tightening High Pressure pump pipes. ,
  - the turbocharger oil supply pipe hollow bolt14 N.m.

3. FINAL OPERATION

- Refit the air outlet pipe onto the air filter unit.
- Connect the air filter unit air outlet pipe to the turbocharger.
- Torque tighten the air filter unit air outlet pipe clip on the turbocharger5.5 N.m .
- Connect the air filter unit air outlet pipe to the air filter unit.
- Torque tighten the clip of the air filter unit air outlet pipe on the air filter unit5.5 N.m .
- Clip the air flowmeter wiring onto the air filter unit air outlet pipe.
- Connect the oil vapour rebreathing pipe union to the air filter unit air outlet pipe.

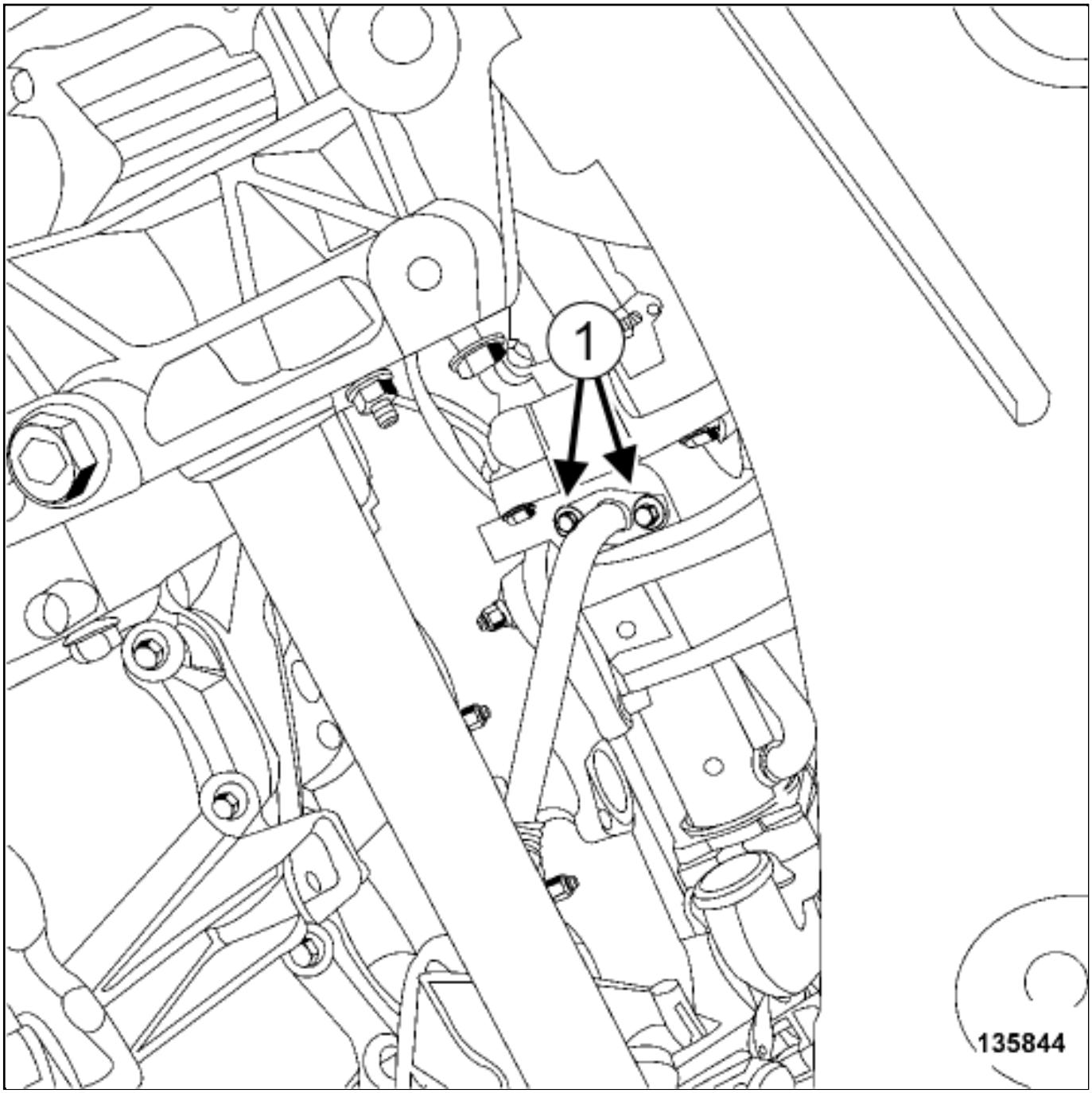
- Refit the engine cover.
- Connect the battery Battery: Removal - Refitting .
- Disconnect the crankshaft (TDC) position sensor connector to prevent the engine from starting-up.
- Connect a self-contained starter.
- Run the starter until the oil pressure warning light goes out on the instrument panel (wait for a few seconds).
- Switch off the ignition.
- Disconnect the self-contained starter.
- Connect the crankshaft (TDC) position sensor connector.
- Start the engine.
- Let the engine idle then depress the accelerator several times with no load.
- Switch off the ignition.
- Check:
  - that the turbocharger is operating correctly,
  - that there are no oil leaks from the turbocharger.
- Use the Diagnostic tool to check for an absence of stored faults; deal with these and clear them as necessary.

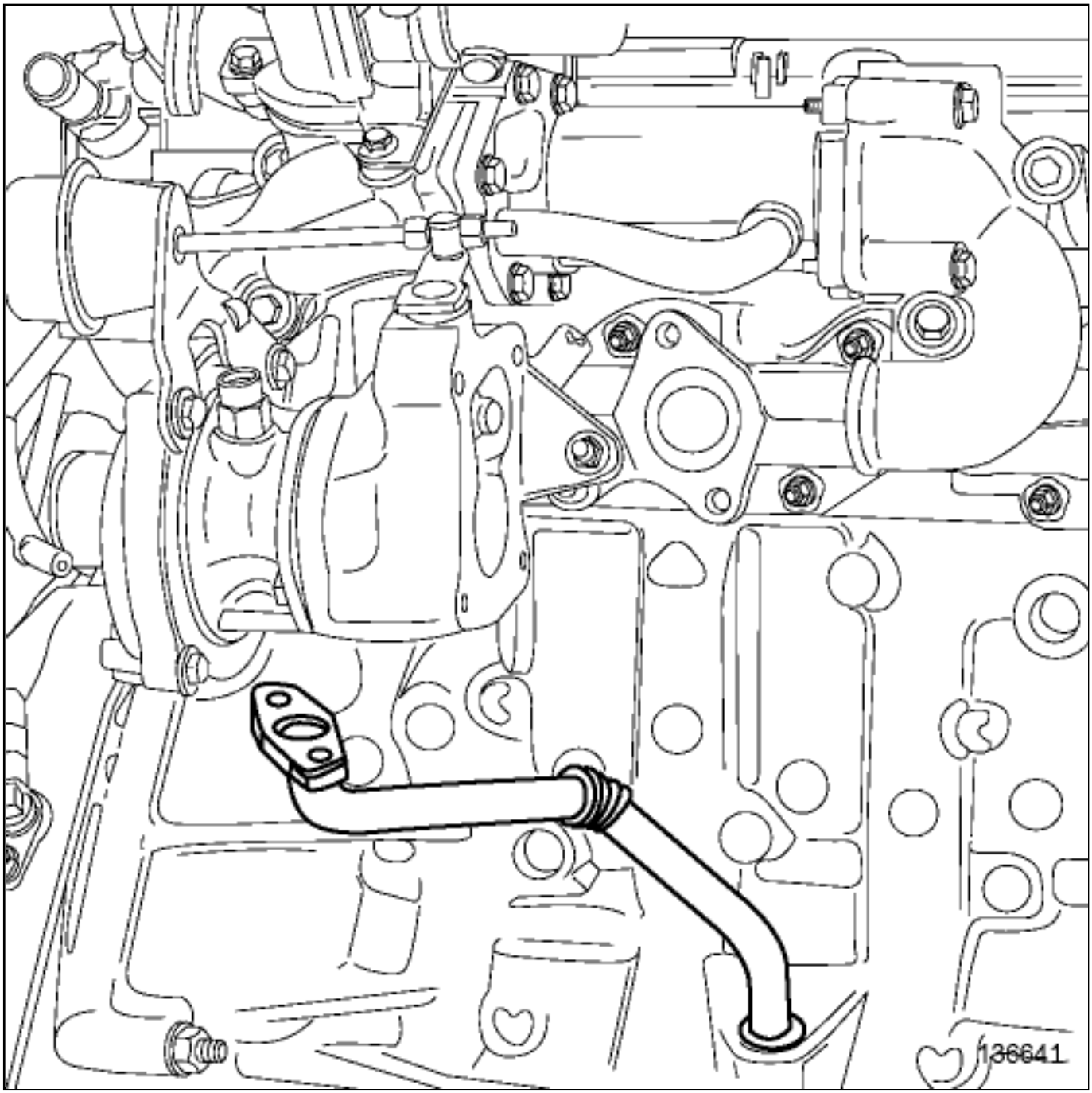
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the engine undertray bolts,
  - the engine undertray.
- Remove the catalytic converter Catalytic converter: Removal - Refitting .

2. REMOVAL OPERATION





- Remove the turbocharger oil return pipe bolts(1) .
- Turn the turbocharger oil return pipe to facilitate its removal.
- Extract the turbocharger oil return pipe from the cylinder block.
- Remove the turbocharger oil return pipe seals.

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: turbocharger oil pipe seal .

2. REFITTING OPERATION

- Refit a new turbocharger oil return pipe fitted with a new seal.
- Lubricate the O-ring of the turbocharger oil return pipe with fresh engine oil.
- Tighten to torque the turbocharger oil return pipe bolts on the turbocharger12 N.m.

3. FINAL OPERATION

- Refit the catalytic converterCatalytic converter: Removal - Refitting .
- Refit the engine undertray.
- Connect the batteryBattery: Removal - Refitting .

TURBOCHARGER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
torque wrench

parts always to be replaced:
seal between exhaust manifold and turbocharger
Turbocharger nut
exhaust manifold stud on the turbocharger (if loosened)

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions **Vehicle: Precautions for the repair**

WARNING

Wear protective gloves during the operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift **Vehicle: Towing and lifting** .
- Disconnect the battery **Battery: Removal - Refitting** .
- Remove the front engine cover.
- Remove:
  - the engine undertray bolts,

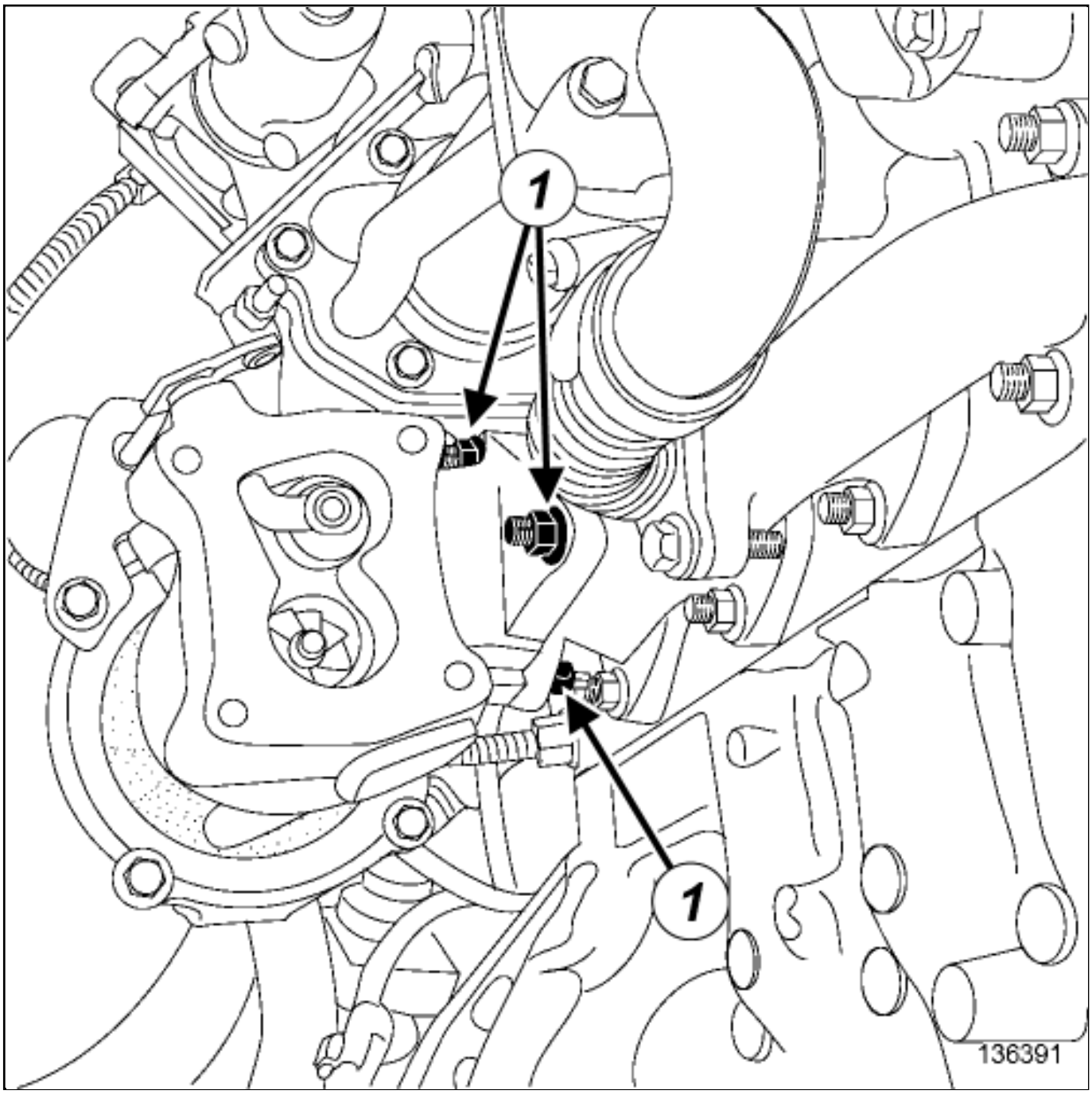
- the engine undertray.

Remove:

- the catalytic converter Catalytic converter: Removal - Refitting ,
- the turbocharger oil return pipe (see 12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting) ,
- the turbocharger air outlet pipe (see 12B, Turbocharging, Intercooler air inlet pipe: Removal - Refitting) ,
- the turbocharger oil supply pipe (see 12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting) .

2. REMOVAL OPERATION

Disconnect the turbocharging pressure regulation valve control hose from the turbocharger.



Remove:

- the turbocharger nuts(1) ,
- the turbocharger,
- the turbocharger seal.

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.

Check that the turbocharger oil return pipe is not partially or completely blocked by scale. Check that there are no leaks. If there are, replace the part.

CAUTION

Following a turbocharger fault, check that the intercooler and air circuit assembly are not full of oil. If they are, remove them and clean them with a cleaning tray or station and dry them with a compressed air gun.

parts always to be replaced: seal between exhaust manifold and turbocharger.

parts always to be replaced: Turbocharger nut.

parts always to be replaced: exhaust manifold stud on the turbocharger (if loosened) (if loosened).

Use grey abrasive pads Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean the joint face:

- the exhaust manifold,
- of the turbocharger if reused.

Use surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products) and clean clothsto clean and degrease the joint faces:

- the exhaust manifold,
- of the turbocharger if reused.

When replacing the turbocharger studs, torque tighten:

- the new turbocharger studs on the exhaust manifold9 N.m,
- the new turbocharger stud on the turbocharger9 N.m.

2. REFITTING OPERATION

Refit:

- a new seal between the exhaust manifold and the turbocharger on the exhaust manifold,
- the turbocharger.

Bolt without tightening the turbocharger nuts using an open-jawed spanner (the turbocharger must rest on the manifold and the spanner must no longer turn without effort).

Put a paint mark using a marker pen on the turbocharger coinciding with a crest of the turbocharger lower nut.

Tighten the lower nut of the turbocharger until the next nut crest coincides with the paint mark made on the turbocharger (the angle achieved corresponds to 60°).

Torque tighten the other two turbocharger nuts28 N.musing a torque wrench.

Put some fresh oil in the internal oil circuit of the turbocharger using an oil can to facilitate the repriming.

Connect the turbocharger pressure regulating valve control hose.

3. FINAL OPERATION

Refit:

- the turbocharger oil supply pipe(see 12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting) ,
- the turbocharger air outlet pipe(see 12B, Turbocharging, Intercooler air inlet pipe: Removal - Refitting) ,
- the turbocharger oil return pipe(see 12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting) ,
- the catalytic converterCatalytic converter: Removal - Refitting .

Refit the engine undertray.

Refit the engine cover.

Connect the batteryBattery: Removal - Refitting .

TURBOCHARGING: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

Equipment required
parts washer

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

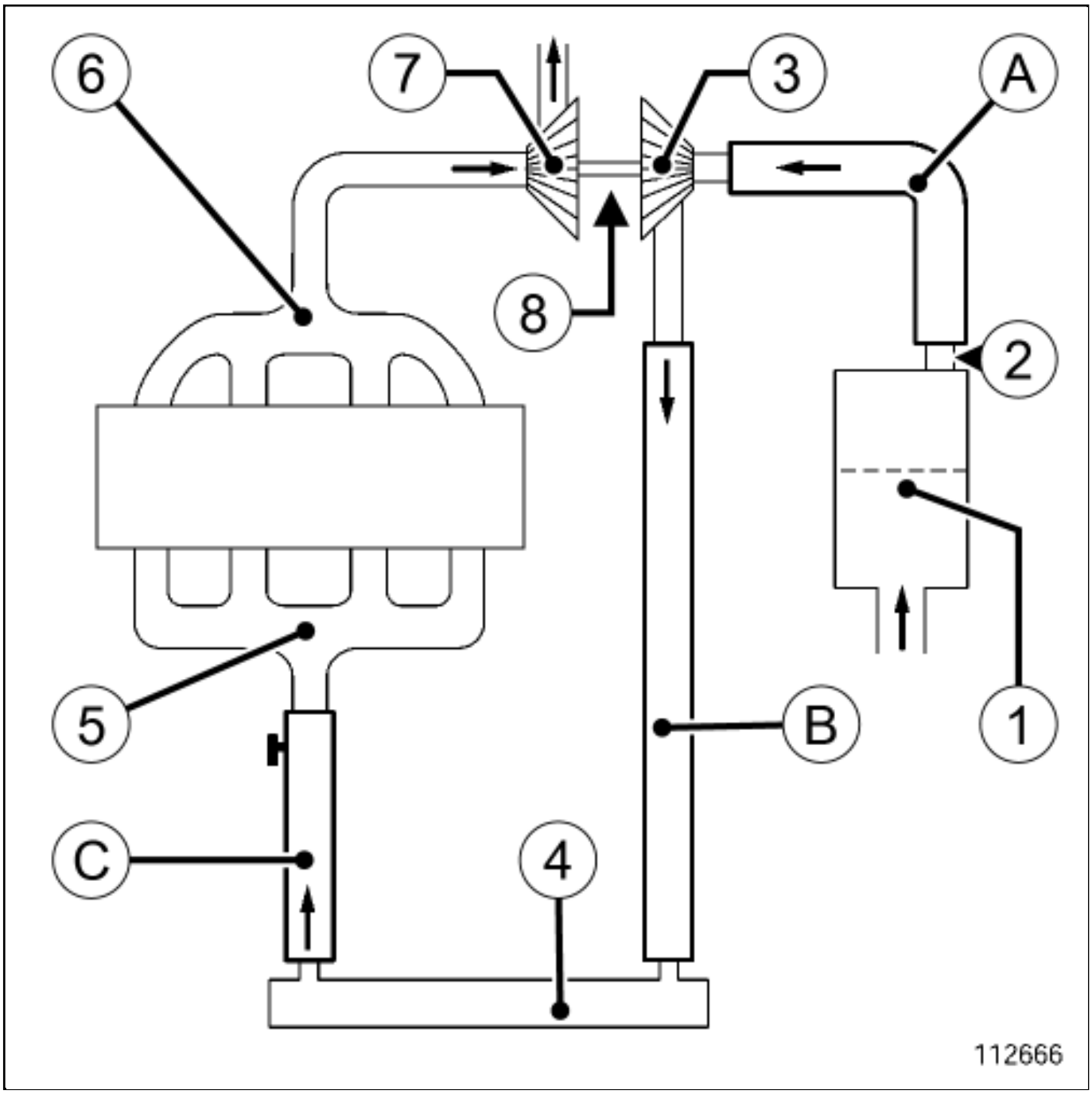
1. TURBOCHARGER: GENERAL INSTRUCTIONS

For the turbocharging pressure regulator check (see Fault finding - Tests) (TN 3419A, 12B, Turbocharging).

CAUTION

The turbocharger pressure regulator rod must not be adjusted.

2. TURBOCHARGER CIRCUIT DIAGRAM



(1) Air filter unit

(2) Air flowmeter

(3) Compressor wheel

(4) Intercooler

(5) Inlet distributor

(6) Exhaust manifold

(7) Turbine wheel

(8) Bearing system (bearing + wheel shaft)

(A) Air filter unit outlet pipe

(B) Turbocharger air outlet pipe

(C) Intercooler air outlet pipe

3. APPLICATION CONDITIONS OF INSTRUCTIONS

The instructions below must be followed when replacing a turbocharger due to mechanical damage:

- damage to the bearing system,
- broken shaft or turbine wheel,
- compressor wheel rubbing against the turbocharger casing,
- broken or damaged compressor wheel,
- extensive clogging of the turbine wheel casing (hard deposits).

FOR THE AIR CIRCUIT:

-Consequences:

■swarf or metal objects in the turbocharger inlet and outlet pipes,■oil in the air circuit (collected in the intercooler).

-Risks (after replacing the turbocharger):

■metal objects sucked in by the compressor wheel (destruction of the turbocharger).

FOR THE LUBRICATION CIRCUIT:

-Consequences:

■swarf found in the engine oil circuit,■circulation of swarf within the circuit.

-Risks (after replacing the turbocharger):

■premature wear on the bearing system (destruction of turbocharger).

CAUTION

Failure to observe the following instructions will lead to the turbocharger breaking again.

Metal objects may enter the oil and air circuits as a result of a broken turbocharger.

INSTRUCTIONS:

- Drain the engine oil(see **Engine oil: Draining - Refilling**)
- Replace the oil filter(see **Oil filter: Removal - Refitting**) .
- Replace the seals and fittings,

-Carry out the following only if the compressor wheel is broken or rubbing against the turbocharger casing:

■Drain the intercooler,■Clean the turbocharger air pipes.

Note:

When carrying out an operation on the air or lubrication circuit, it is necessary to plug the open holes to prevent any risk of foreign bodies entering the system.

4. AIR CIRCUIT*: INSTRUCTIONS FOLLOWING MECHANICAL DAMAGE TO THE TURBOCHARGER

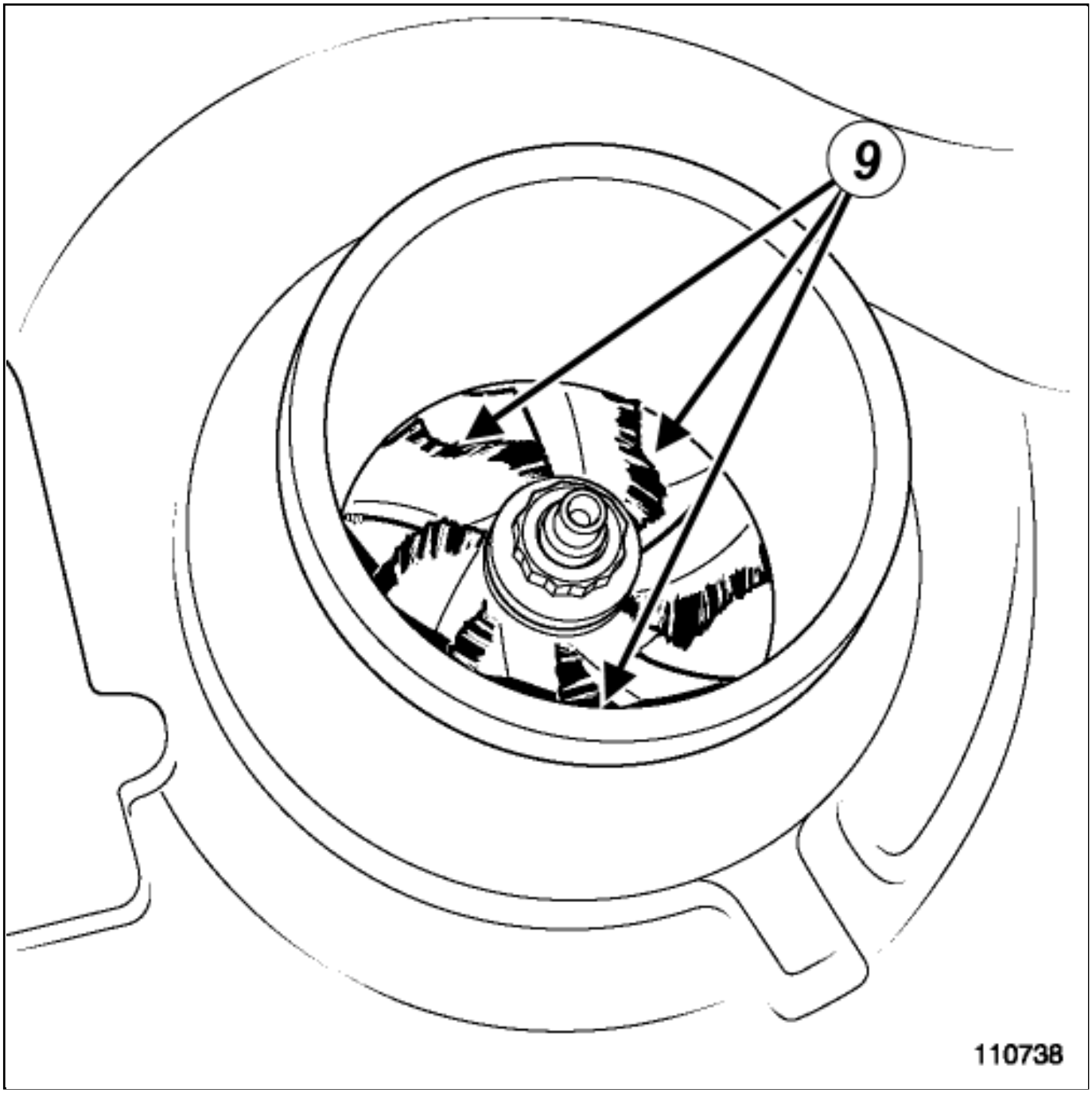
Note:

(*) These instructions for the air circuit are only to be followed in the case of:

- broken compressor wheel,
- compressor wheel rubbing against the turbocharger casing.

Remove the intercooler if fitted to the vehicle(see 12B, Turbocharging, Intercooler: Removal - Refitting) .

Turn the intercooler over and allow the oil inside to drain out.



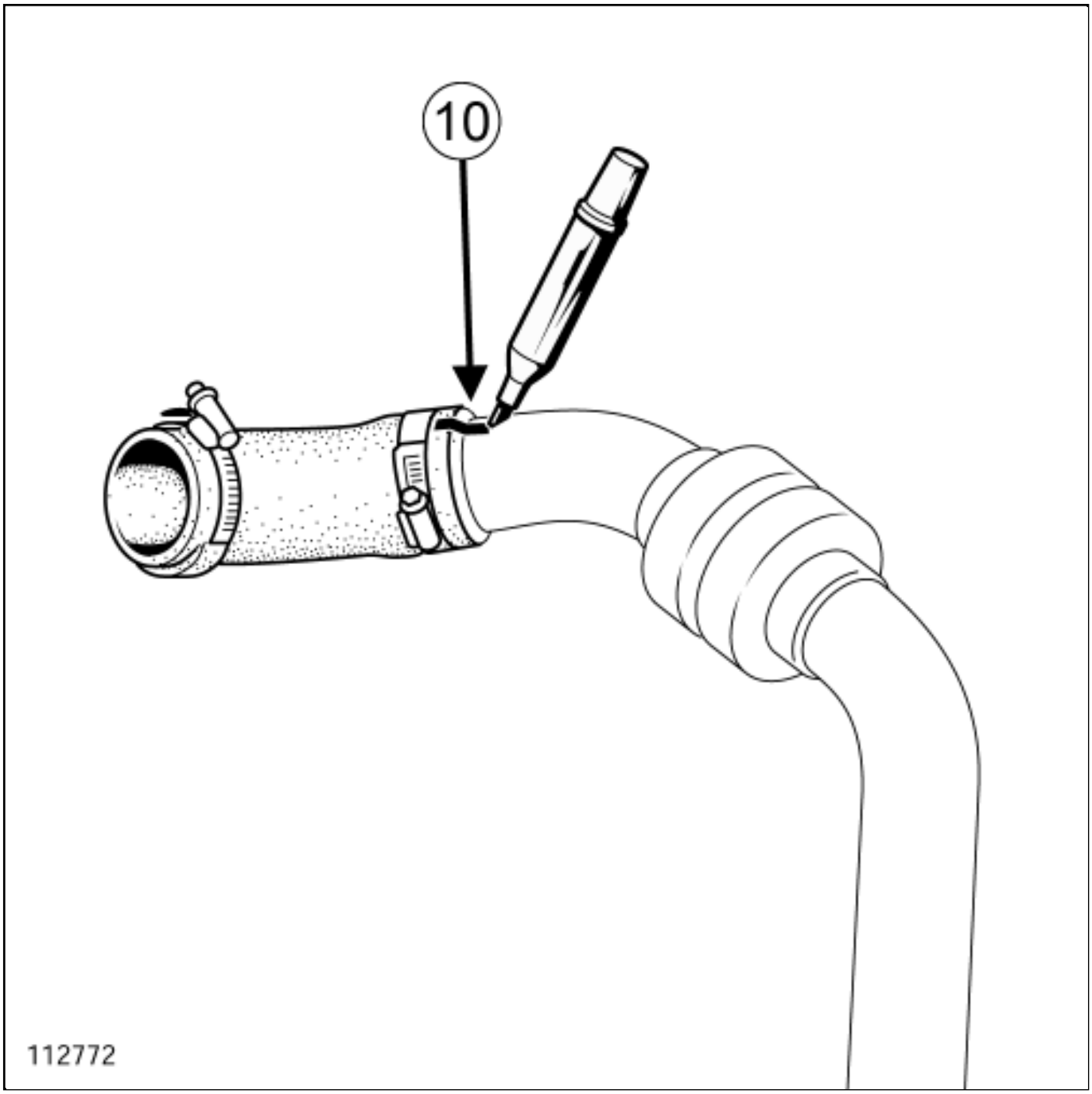
Note:

If the compressor wheel(9) is damaged, metal objects are ejected inside the air pipes.

Check that there are no metal objects inside the air flowmeter(2) .

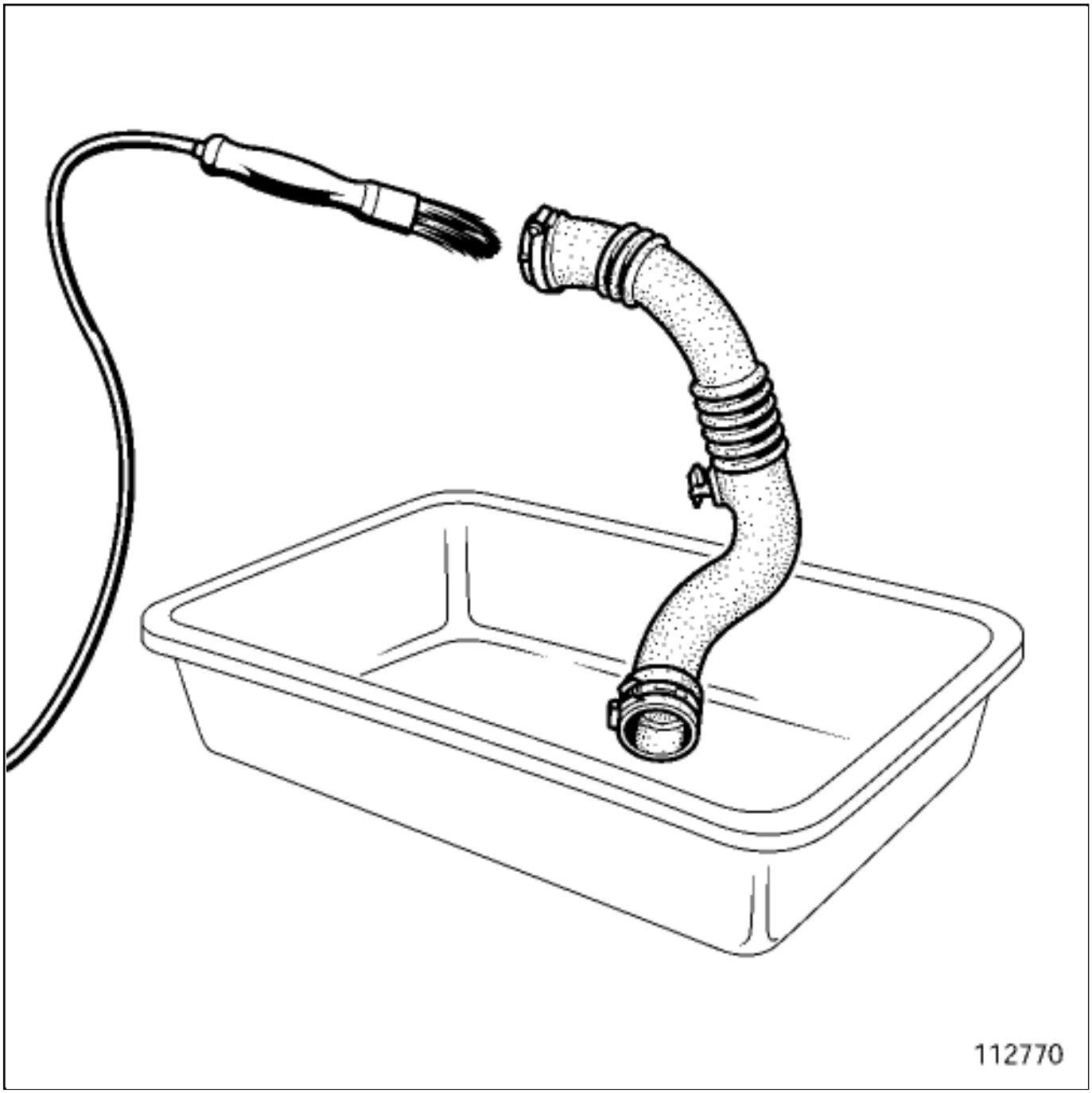
Remove:

- the air pipe (between the air filter unit and the turbocharger)(A) ,
- the air pipe(B) (between the turbocharger and the intercooler).



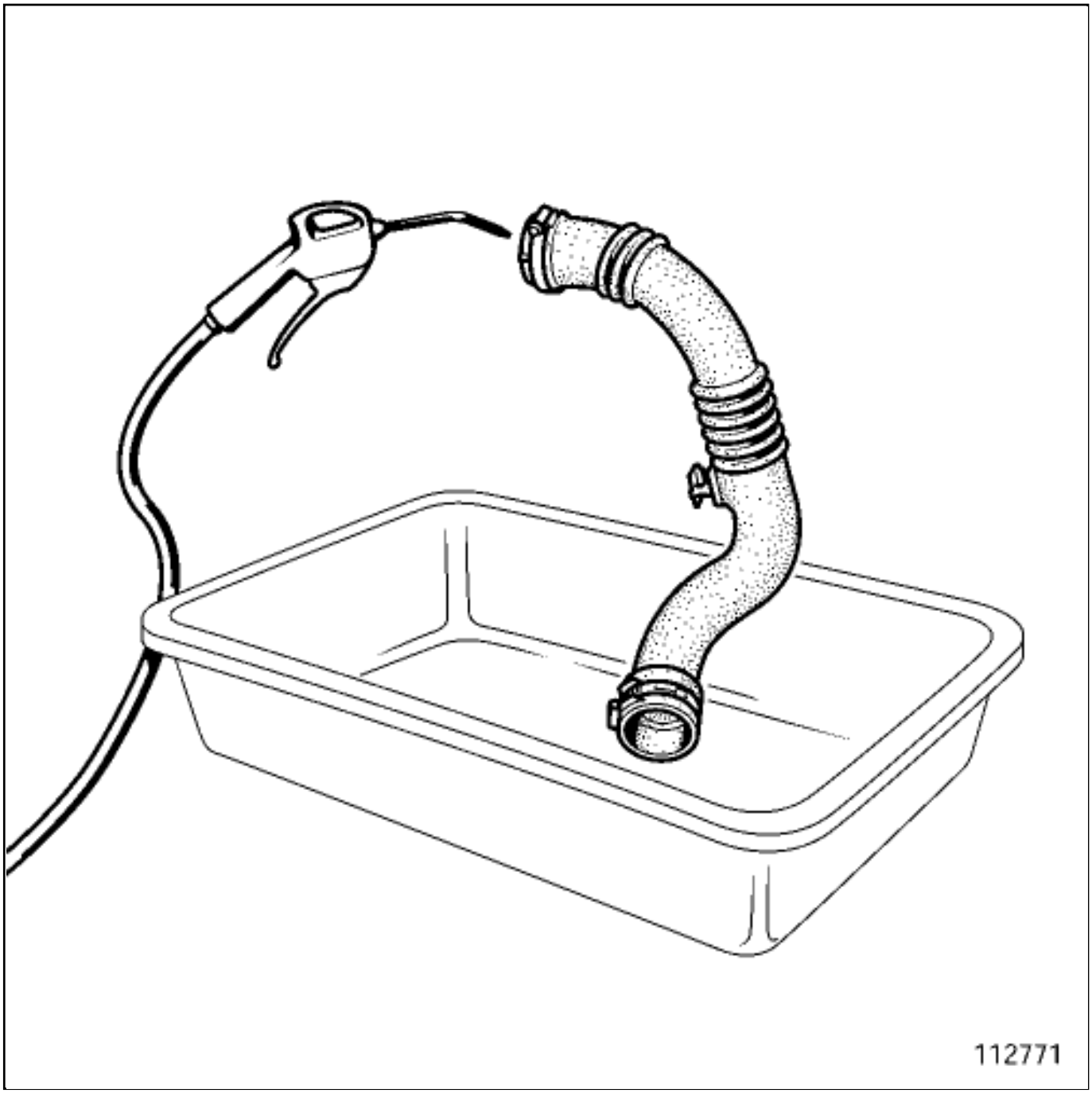
For air pipes comprising several components:

- mark(**10**) the fitting position of each component,
- separate all the components.



One by one, clean the pipes removed with the parts washer:

- brush as much of the inside of the pipe as possible (only use brushes with plastic bristles),
- wash plenty of cleaning product from the cleaning station through the pipe,
- allow the cleaned pipe to drain by standing it upright,
- ensure the cleaning product has drained out completely (check areas where liquid may be retained, e.g. gaiters, resonators etc.).



Dry the pipes one by one using a compressed air spray gun.

- For pipes comprising several components:
  - assemble the components, taking note of their correct fitting position(**10**) .

- Refit:
  - the air pipe(between the air filter unit and the turbocharger)(**A**) ,
  - the air pipe(**B**) (between the turbocharger and the intercooler).

Refit the intercooler, if fitted to the vehicle**(see 12B, Turbocharging, Intercooler: Removal - Refitting)** .

5. LUBRICATION CIRCUIT**: INSTRUCTIONS FOLLOWING MECHANICAL DAMAGE TO THE TURBOCHARGER

Note:

(**) These instructions relating to the lubrication circuit must always be followed in all cases of mechanical damage as listed above.

Drain the engine oil(see **Engine oil: Draining - Refilling**) .

Replace the oil filter(see **Oil filter: Removal - Refitting**) .

Only fill the engine with a suitable oil typeEngine oil: Specifications (TN 6013A, 04A, Lubricants).

6. GENERAL INSTRUCTIONS TO BE FOLLOWED WHEN REMOVING A TURBOCHARGER

Always replace:

- all seals that have been removed,
- all fittings that have been removed.

-the oil supply pipe:

■if the pipe is blocked, even partially (due to scale, carbonised oil etc.),■if the pipe is fitted with self-retaining seals.

-the oil return pipe:

■if the pipe is blocked, even partially (due to scale, carbonised oil etc.),■if the pipe is fitted with self-retaining seals.

CAUTION

Failure to observe the following instructions will lead to the turbocharger breaking again.

Metal objects may enter the oil and air circuits as a result of a broken turbocharger.

CAUTION

Failure to observe the following procedure may lead to destruction of the turbocharger.

When starting the engine:

- do not accelerate,
- allow the engine to run for 1 minute, the time taken for the oil circuit pressure to increase (until the oil pressure warning light on the instrument panel goes out),
- accelerate several times at no load,
- check the air circuit and the oil circuit for leaks.

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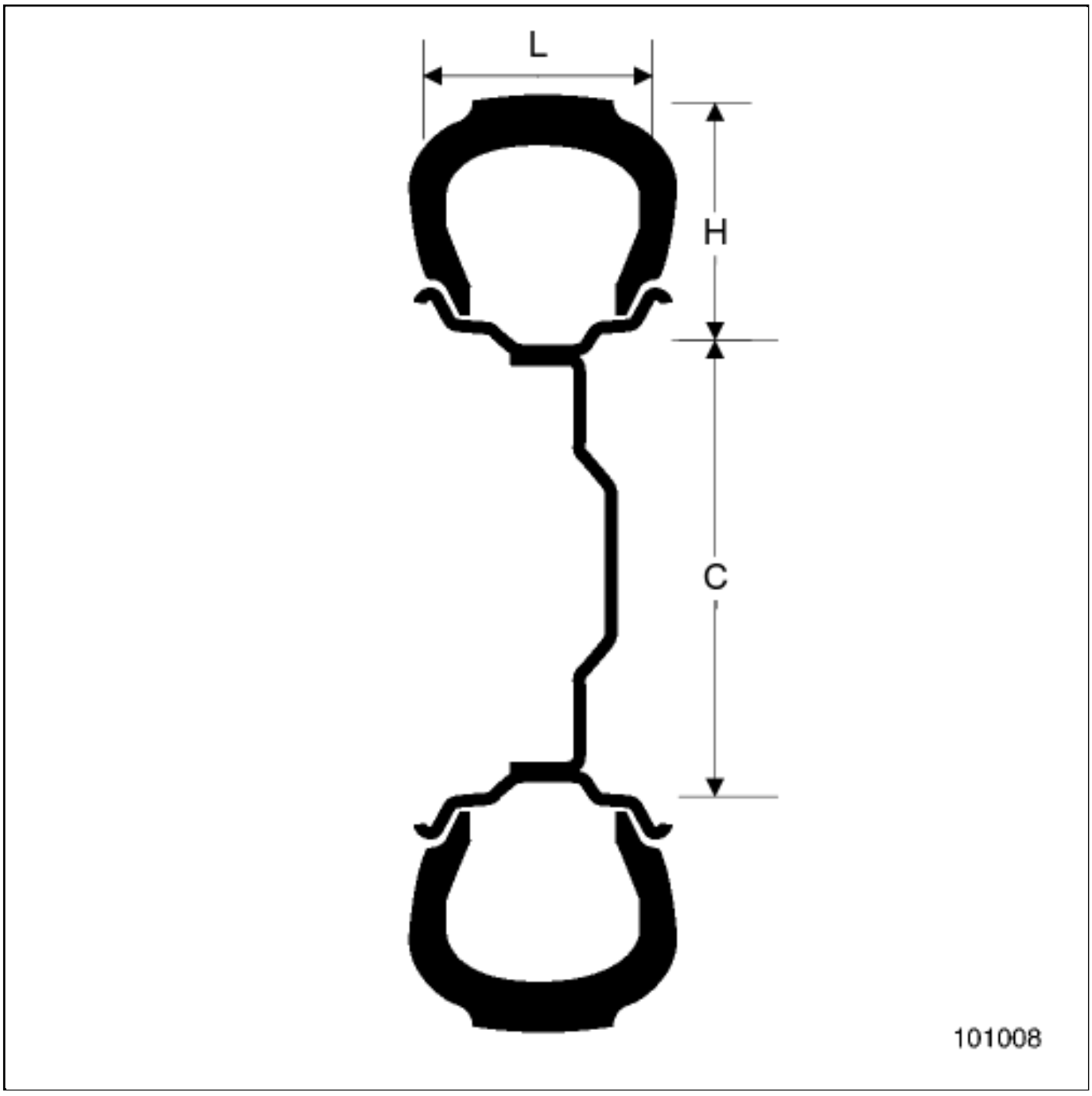
TYRE IDENTIFICATION

Example of a tyre identification mark: 205/65 R 15 91 V.



205/65R15
TUBELESS
91V
M+S
RADIAL
xxxxxxxxxxxxxxxx 3605
MARQUE
RENFORCE
XXX
E
123448

205	Tyre width in mm (L)
65	Height/width ratio
R	Radial structure
15	Internal diameter in inches (c)
91	Load index
V	Speed code

SPEED CODE TABLE:

Code	Maximum speed in mph (km/h)
R	170
S	180
T	190
U	200
H	210
V	240
ZR	above 240
W	270
Y	300

TYRE: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. CLEANLINESS

Clean:

- the tyre bead,
- the tyre bead/wheel rim contact surface.

Remove any stones trapped in the tyre tread.

2. GENERAL RECOMMENDATIONS

CAUTION

If checking the pressure when hot, increase the tyre inflation pressure by 0.2to 0.3 bar above the recommended pressure.

CAUTION

In order to remove any flat spots on the tread after the vehicle has stopped, it is essential to carry out a road test for a minimum distance of 1.2 miles (2 km)before balancing the wheels.

CAUTION

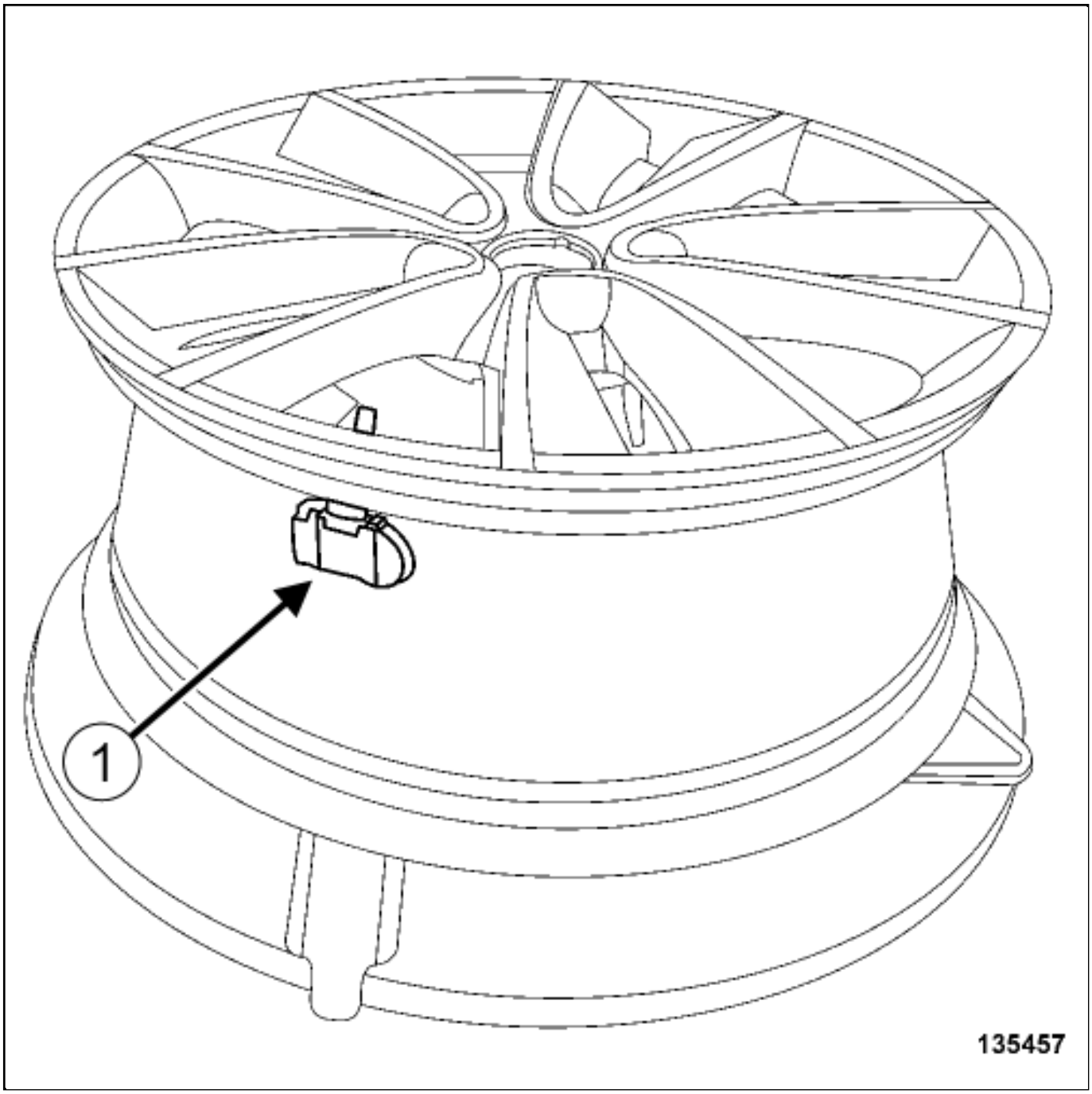
To avoid detachment of the balance weights, use only weights which correspond to the vehicle wheel rims.

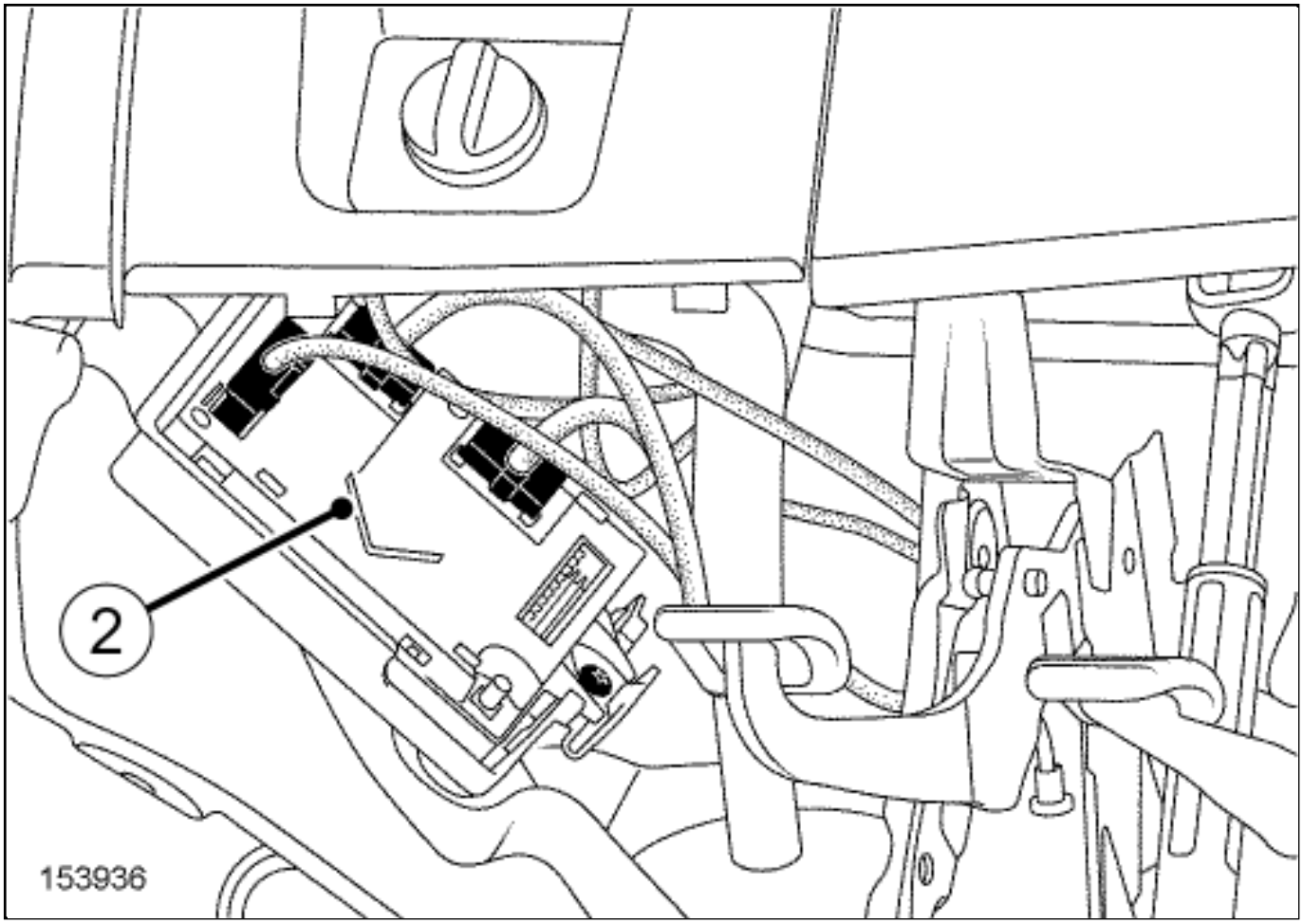
TYRE PRESSURE MONITOR: LIST AND LOCATION OF COMPONENTS

Equipment required
Diagnostic tool

The system consists of:

- four pressure sensors built into the valves (one per wheel); the sensors transmit a radiofrequency signal,
- a computer which collects, decodes and processes sensor signals, and then determines which message to display,
- a display integrated to the instrument panel,
- a switch to establish the pressure reference for the tyres.




2
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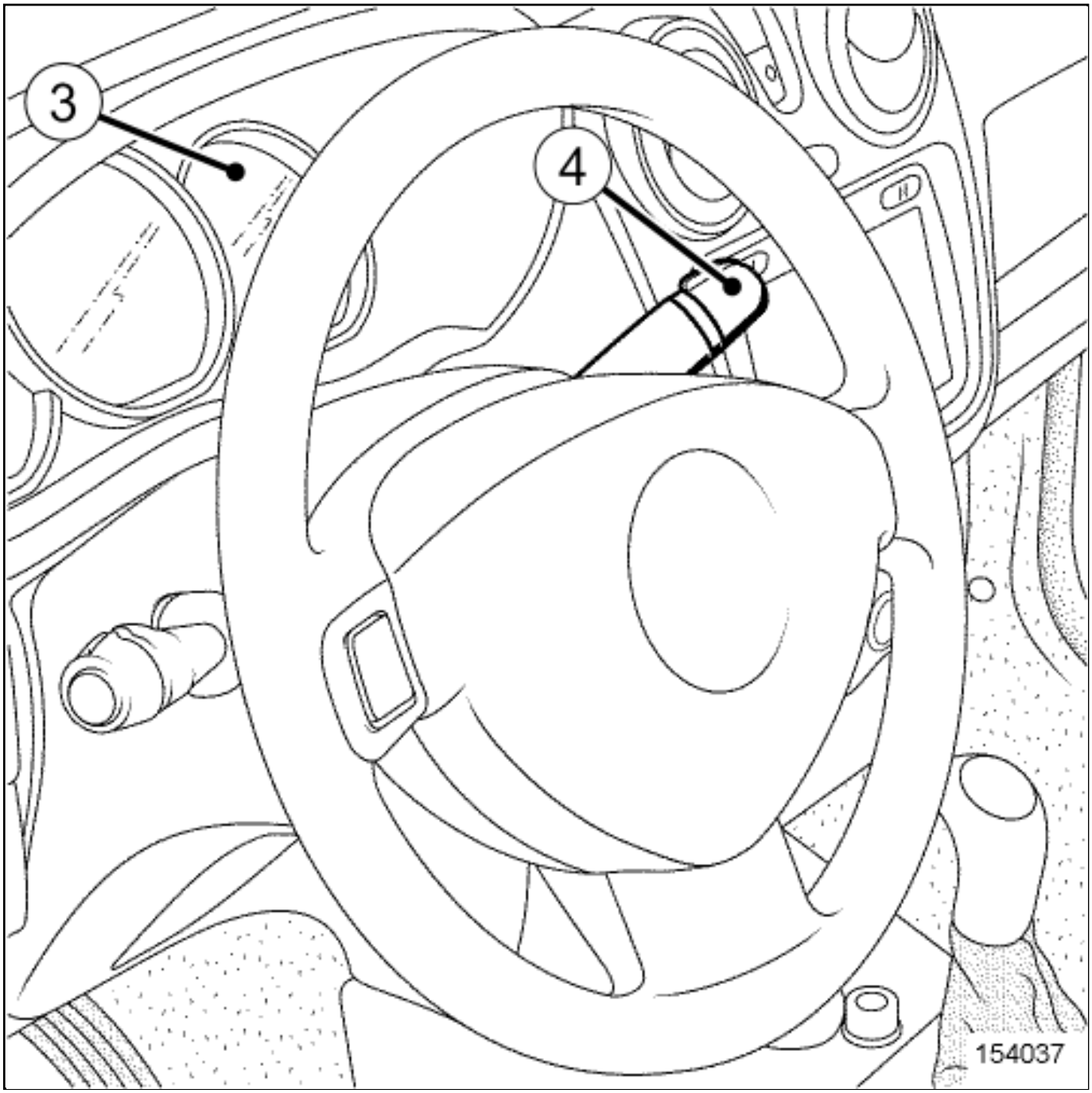
3
4
154037

Marks	Designations	Informations
1	Tyre pressure sensor	(see 35B, Tyre pressure monitor, Pressure sensor: Removal - Refitting) Apply the after repair procedure using the Diagnostic tool Diagnostic tool : Use : -Computer concerned by the after repair procedure: ■"UCH" -Component affected by the after repair procedure: ■"Tyre pressure sensor"
2	UCH	UCH: Removal - Refitting Apply the before and after repair procedure using Diagnostic tool Diagnostic tool : Use : -Computer concerned by the before/after repair procedure: ■"UCH" -Component affected by the before/after repair procedure: ■"UCH"
3	Tyre pressure indicator	
4	Switch	

TYRE PRESSURE MONITOR: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

1. CLEANLINESS

Clean the bearing faces on the tyre pressure monitor valve.

2. GENERAL RECOMMENDATIONS

Do not swap the wheels if they have been removed.

CAUTION

Hold the sensor in position on the wheel to prevent it from turning during tightening.

CAUTION

To avoid any damage to the sensor, make sure the tyre bead never presses on the sensor.

Note:

Follow the after repair procedure, when the position of the wheels between the axles has been changed.

Adjust the tyres to the recommended pressure(see **Tyre pressure: Identification**) .

Apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the after repair procedure:

■"UCH"

-Component affected by the after repair procedure:

■"Pressure sensor"

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TYRE: REPAIR

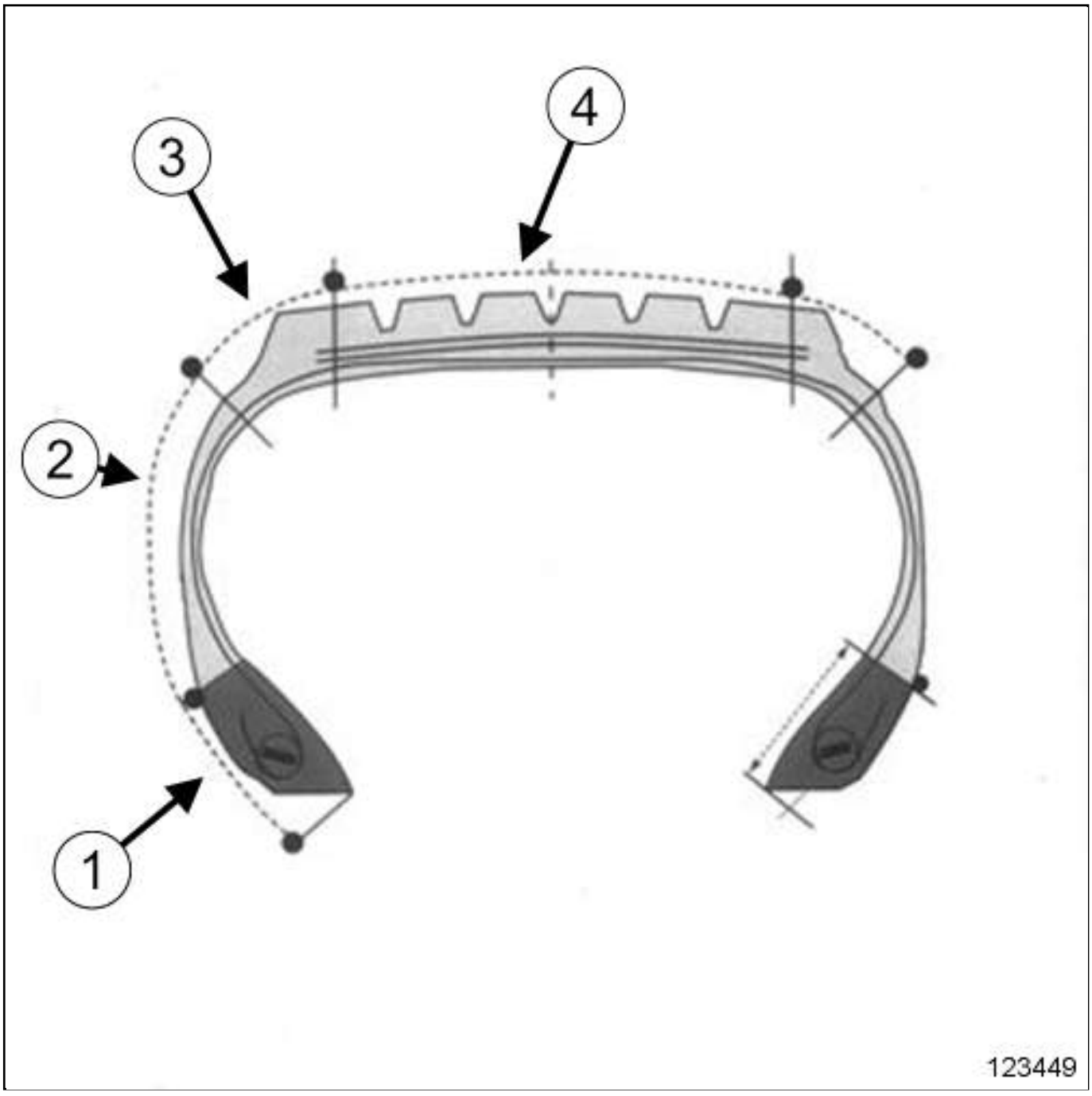
Perforation

There are two types of perforation:

- single perforation: perforation caused by nail etc. not requiring a reinforced tyre boot and which can be repaired when the tyres are cold,
- damage: rubber detachment etc. requiring repair and reinforcement of damaged plies.

This repair method only covers single perforations.

Tyre areas



- Areas which cannot be repaired:
  - tyre bead(1) ,
  - shoulder(3) .
- Areas which can be repaired:
  - sidewall(2) ,
  - crown(4) .

Perforation table *

	Area	
	Crown: max Ø in mm	Sidewall: max Ø in mm
LV speed rating less than or equal to T	6	3
LV speed rating greater than or equal to H	6	0
LCV load index less than or equal to 121	6	3
HGV load index 122 to 177 (inc.)	10	3

LV: Light Vehicle

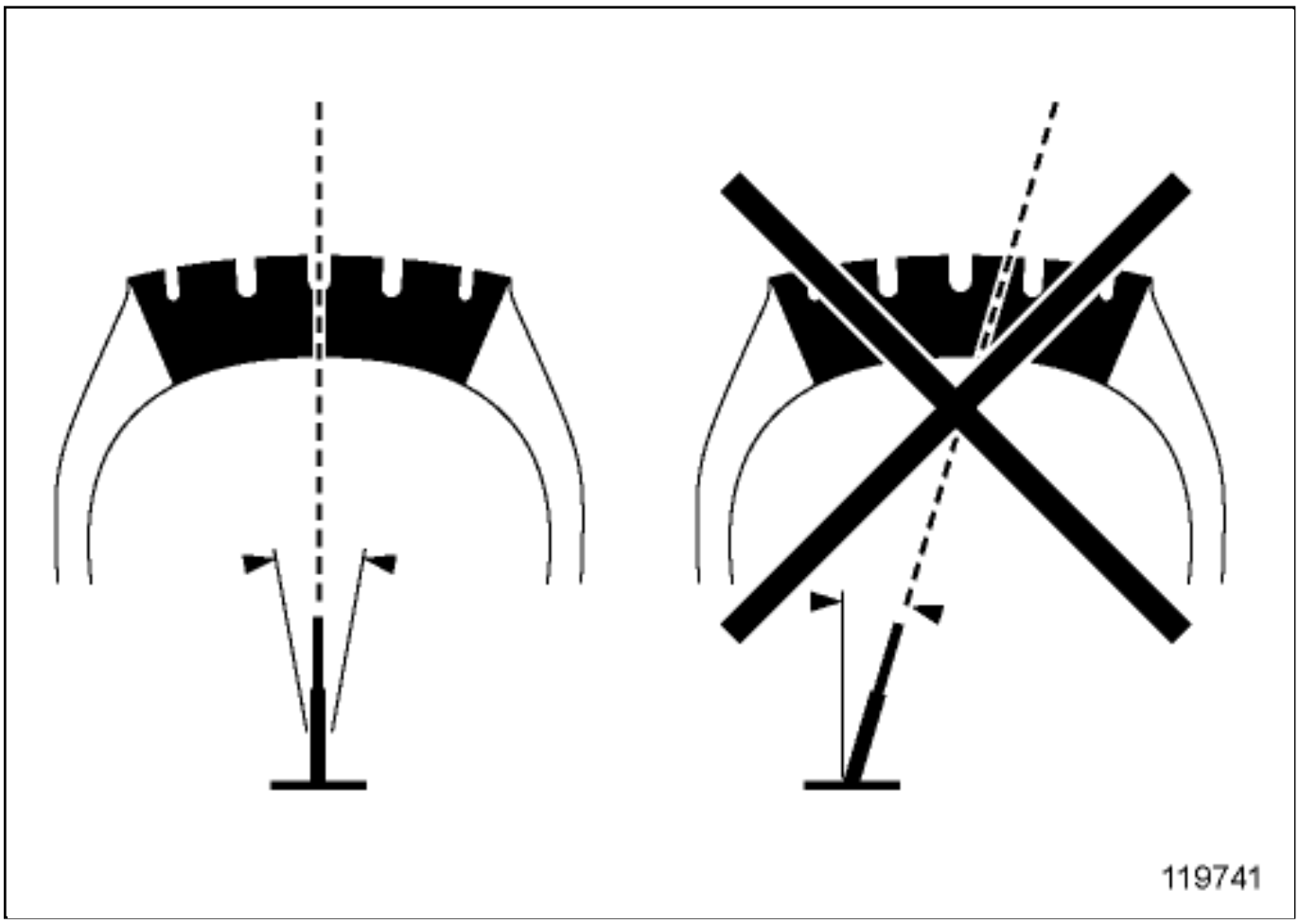
LCV: Light Commercial Vehicle

HGV: Heavy Goods Vehicle

* If the diameter of the puncture is greater than these figures, replace the tyre.

- The tyre cannot be repaired if:
  - a compulsory marking has been worn away(see 35A, Wheels and tyres, Tyres: Identification) ,
  - the interior of the tyre shows signs of under-inflation or overloading,
  - the rubber shows signs of chemical damage (hydrocarbons and other corrosive substances),
  - incorrect and irreversible repairs have previously been made to the tyre,
  - the carcass has been damaged,
  - cuts or circumferential wear (cracks) are visible on the interior or exterior of the tyre,
  - the tyre bead has been damaged (ply visible),
  - the tyre's bead wires are visible, damaged or deformed,
  - the tyre shows an irregular wear pattern which may impair vehicle handling,
  - the repair requires two tyre boots to be overlapped,

- the manufacturer has expressly prohibited any repairs, in writing,
- there is damage to the shoulder area (junction between the sidewall and the crown),
- the angle of the perforation channel (hole) is greater than 15˚.



Tyre inflation kit

using the tyre inflation kit, supplied with vehicles or available from retailers, will leave a film on the inner surface of the tyre.

Before carrying out the repair, clean the inner surface of the tyre and the valve with water.

If the tyre cannot be cleaned in this way, contact the tyre supplier for details of cleaning products which can be used.

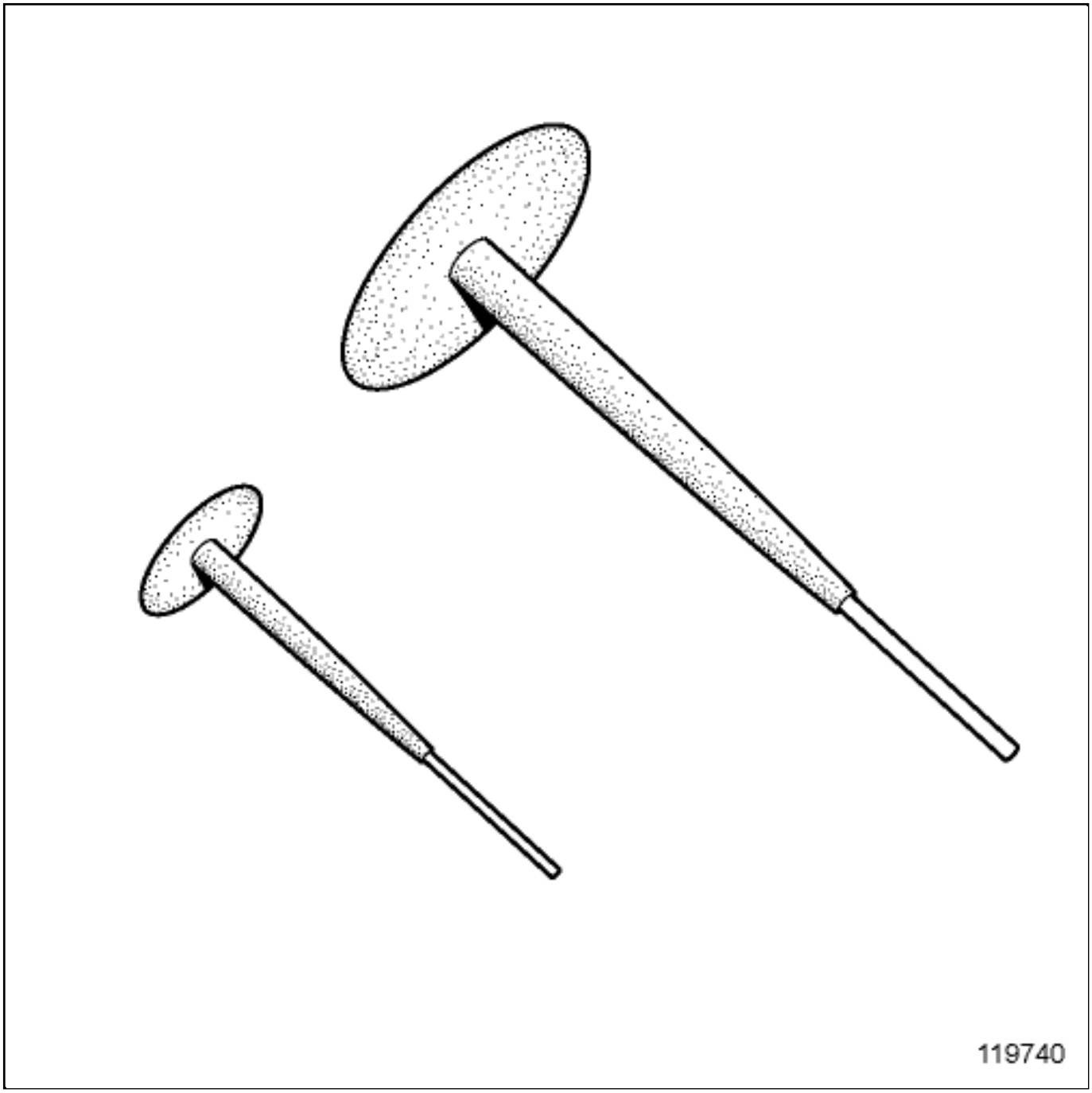
REPAIR

1. REPAIR PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).

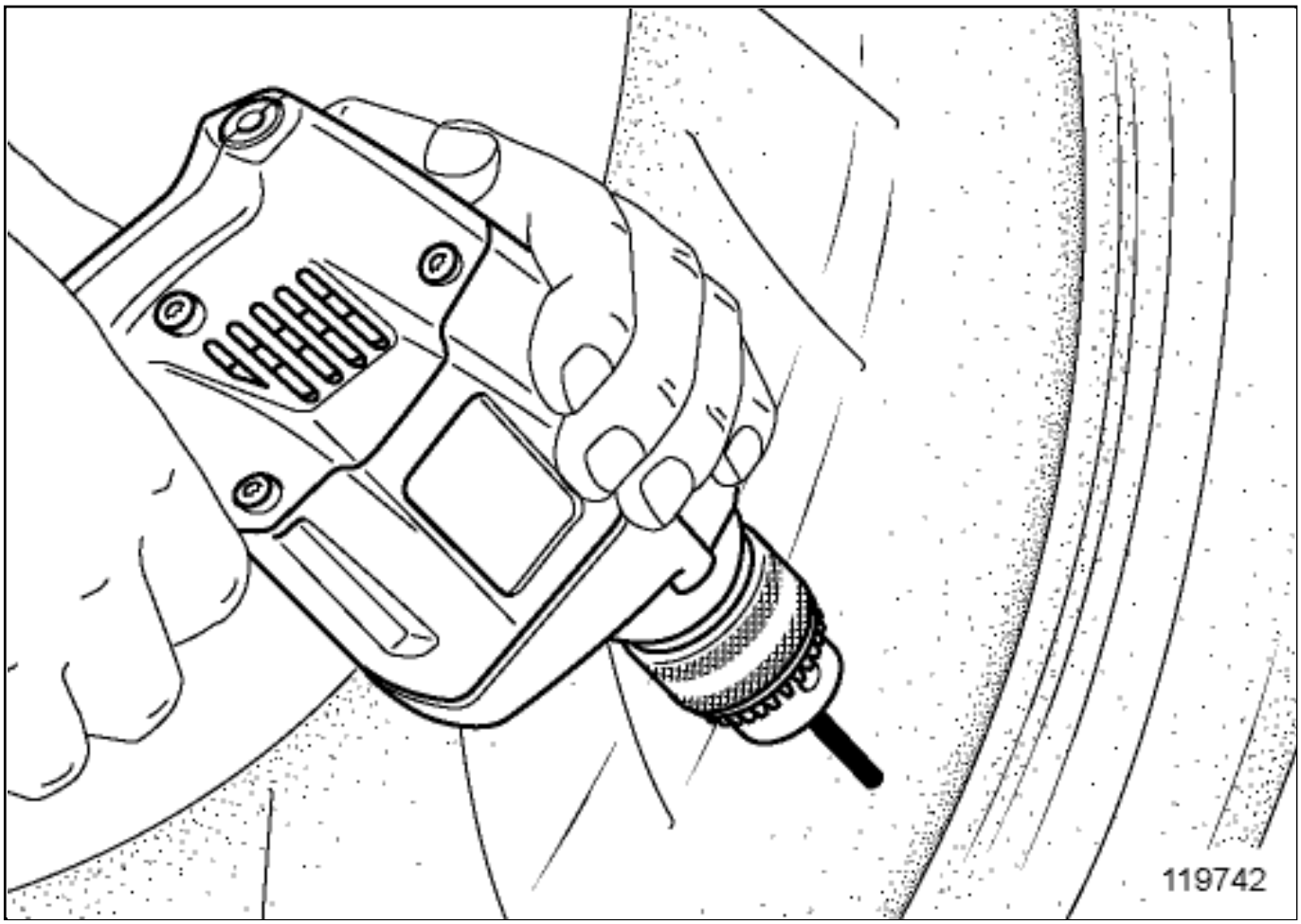
- Remove the wheel (see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

- Inflate the tyre.
- Locate the perforation on the exterior of the tyre and mark it with chalk.
- Remove the tyre.
- Locate the perforation on the interior of the tyre and mark it with chalk.
- Remove the foreign body which caused the puncture.
- Determine the direction of the perforation channel.
- Determine the size of the hole:
  - measure the size of the foreign body,
  - measure the extent of the damage to the tyre.

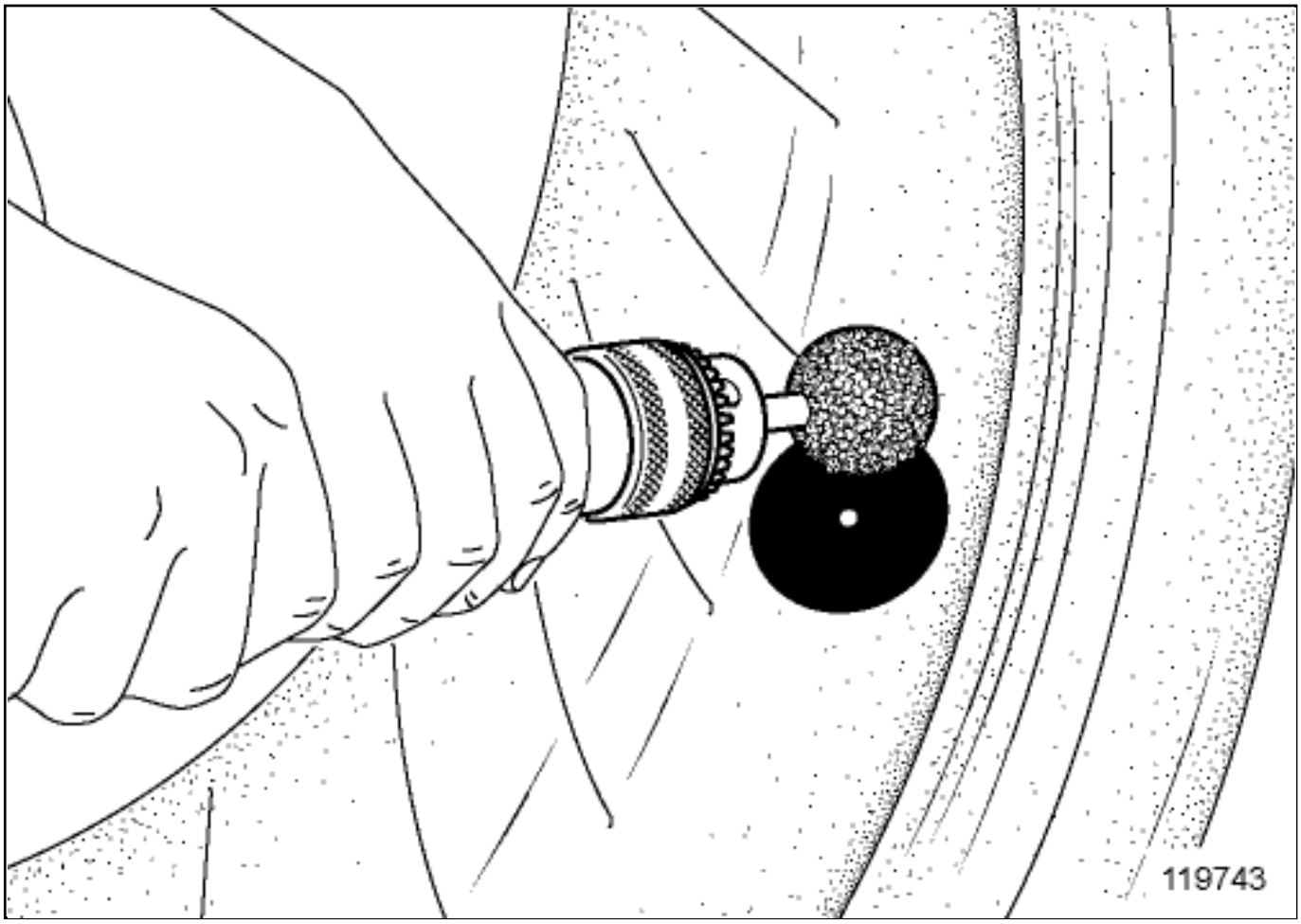


- Choose the size of plug (mushroom type plug) depending on the size of the hole.

2. REPAIR OPERATION



- Use a drill fitted with a suitable bit, perpendicular to the surface of the tyre, to bore the interior then the exterior of the perforation channel.

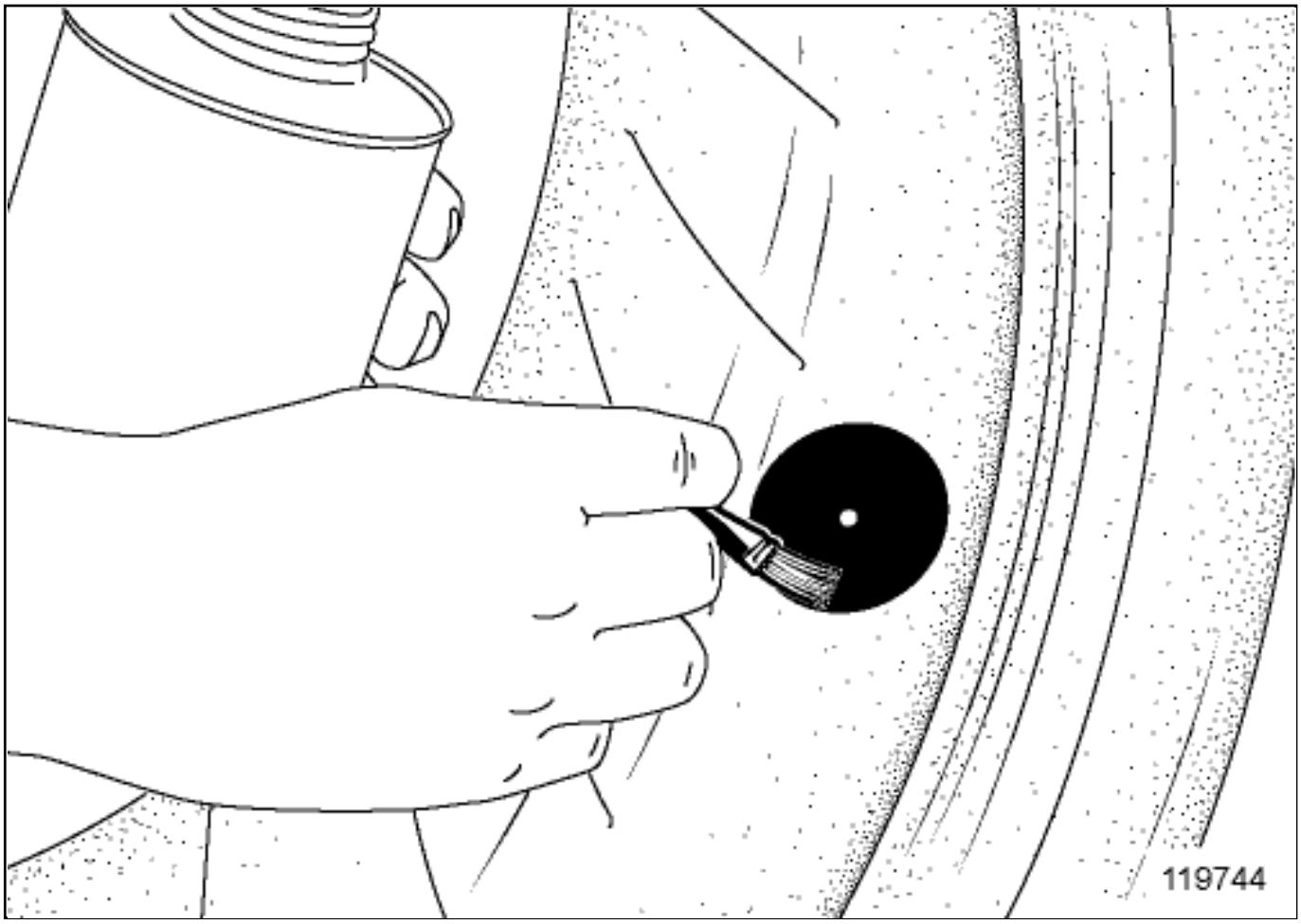


- Carefully scrape the rubber seal around the perforation, to the size of the base of the plug (mushroom type plug).

Note:

If the rubber seal is damaged during this operation, replace the tyre.

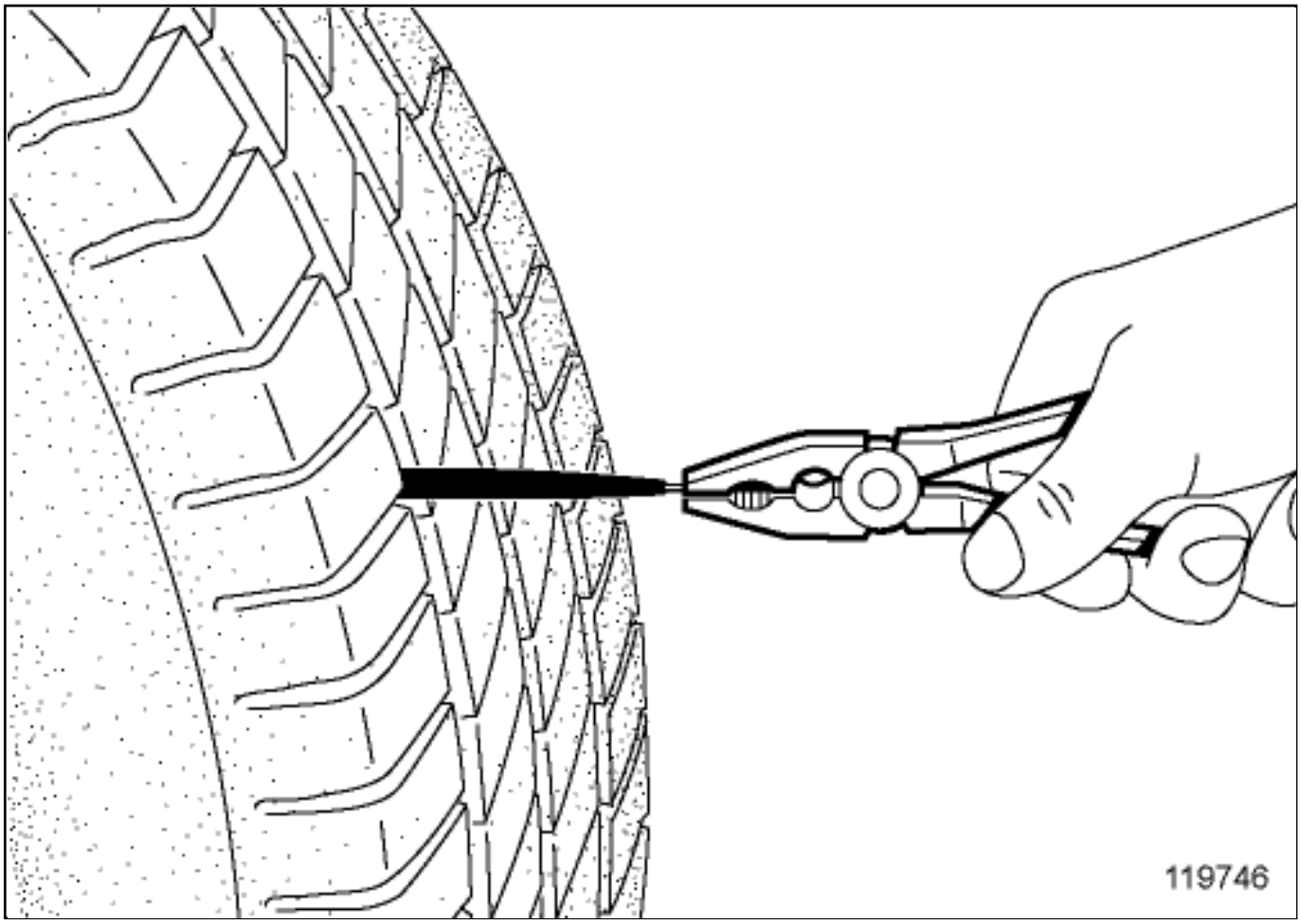
- Remove any dust and remaining particles of rubber using a clean, dry cloth.



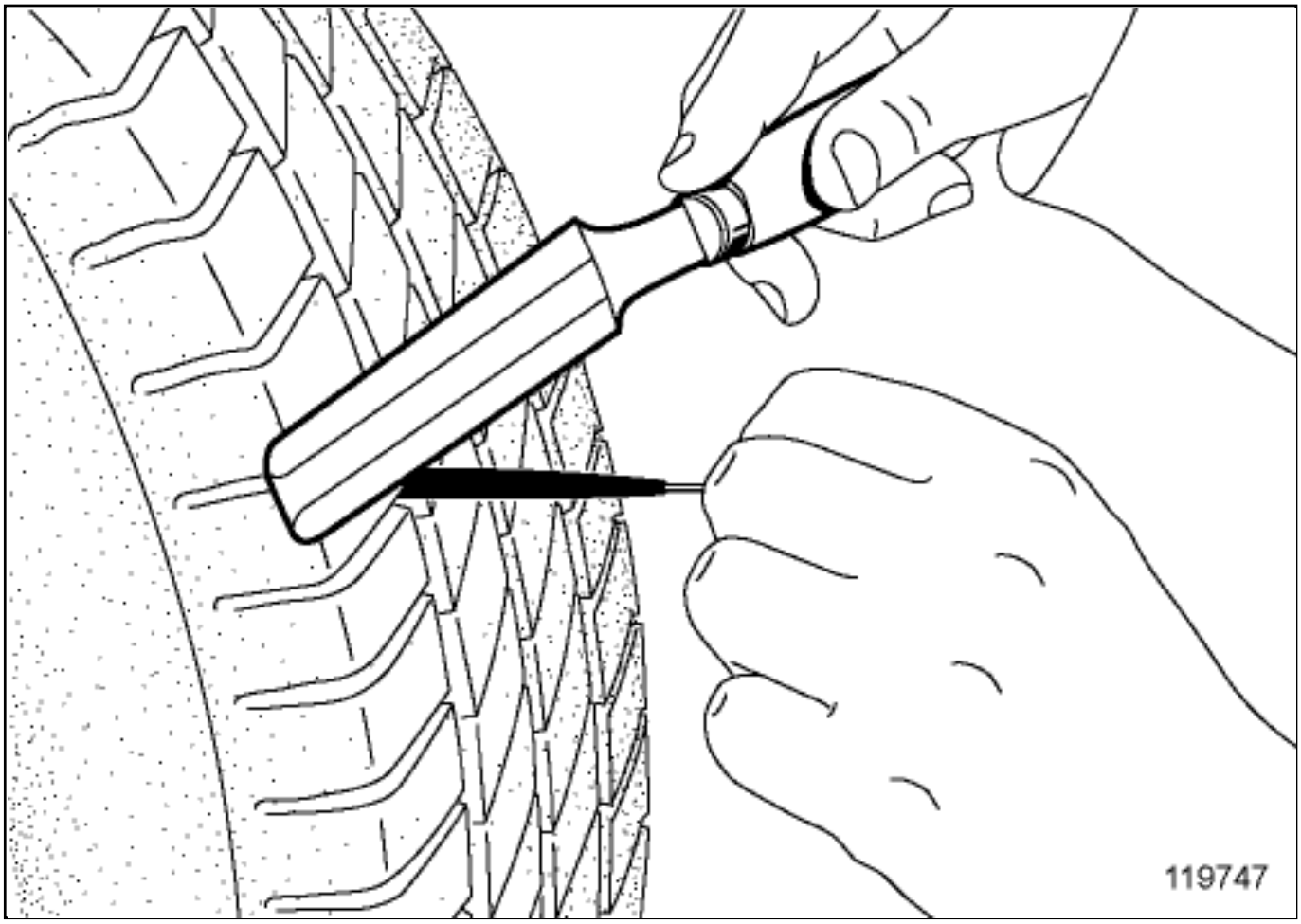
- Apply the solution to the scraped surface.

Note:

Respect the required drying time for the solution.



- Fit the (mushroom type) plug via the interior of the tyre by pulling on it using pliers.
- Press gently on the base of the mushroom plug, inside the tyre.
- Refit the tyre.
- Inflate the tyre Tyre pressure: Identification .



- Cut the protruding end of the stalk without pulling on it.
- Check the tyre seal.

3. FINAL OPERATION.

- Balance the wheel(see 35A, Wheels and tyres, Wheel: Balancing) .
- Refit the wheel(see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

TYRES: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Tyre valve

REMOVAL

1. REMOVAL PREPARATION OPERATION

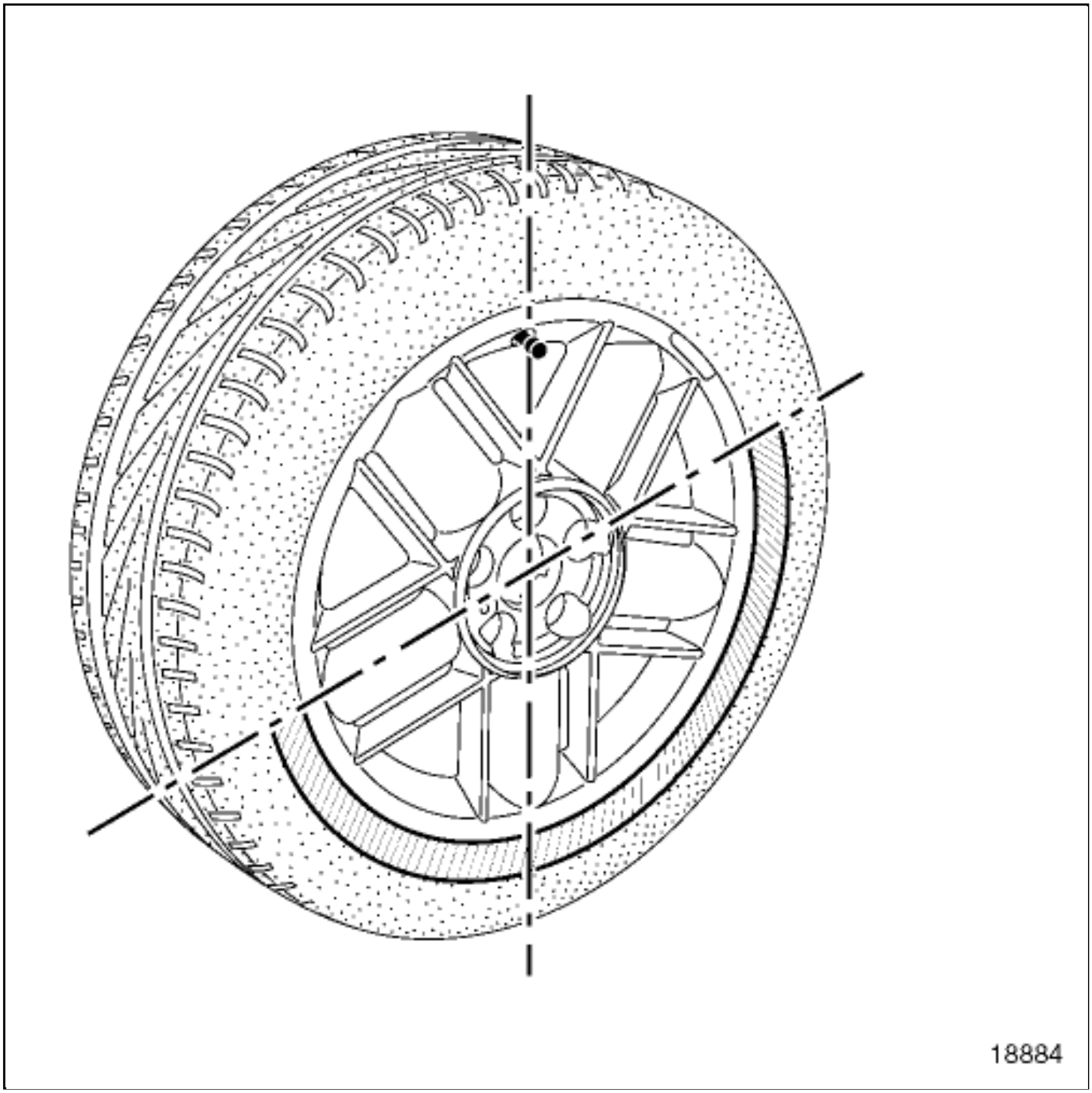
- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).

- Remove:
  - the wheel in question (see 35A, Wheels and tyres, Wheel: Removal - Refitting) ,
  - the balance weights,
  - the valve mechanism.

2. REMOVAL OPERATION

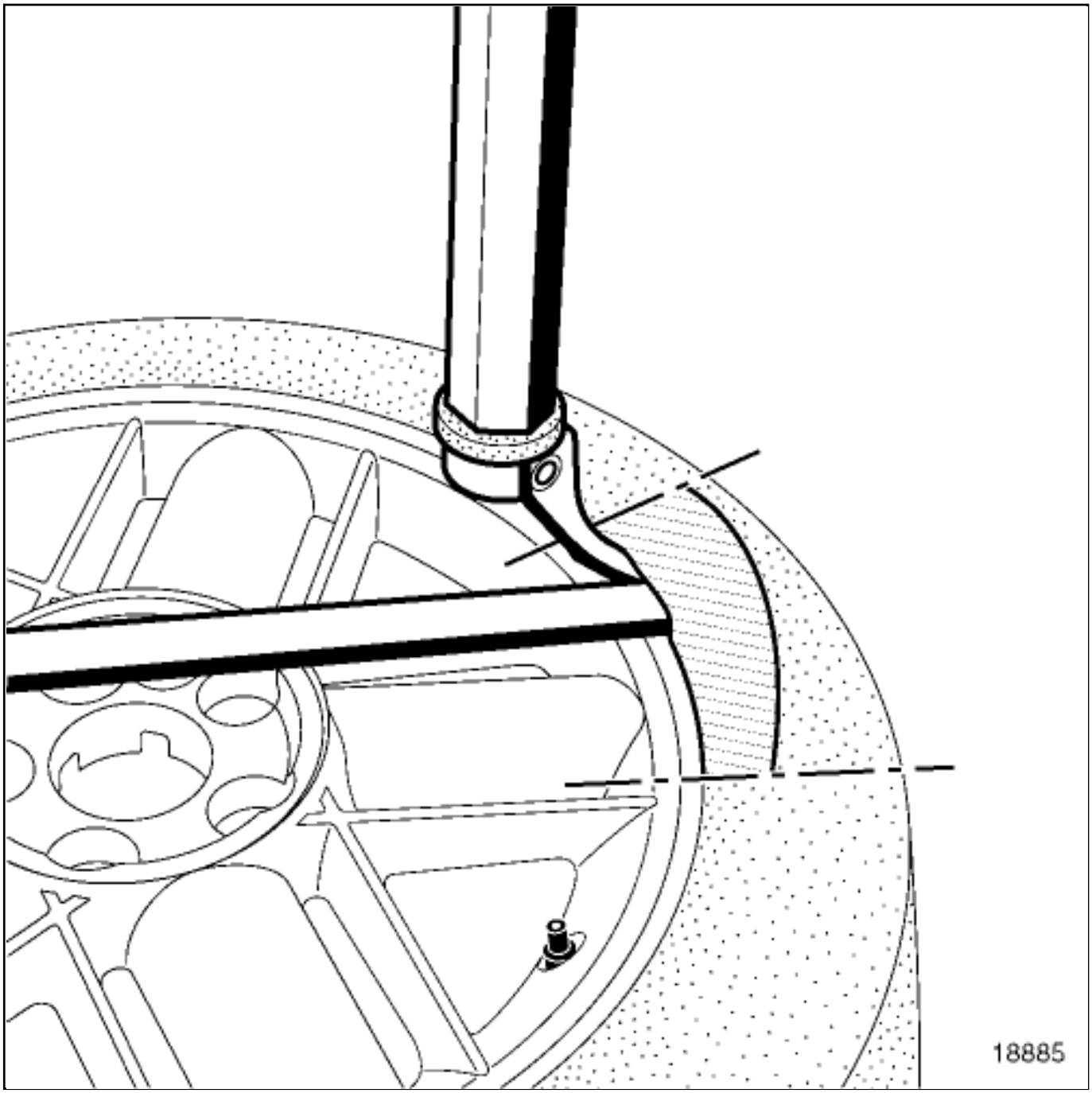
CAUTION

To avoid any damage to the sensor, make sure the tyre bead never presses on the sensor.



Detach:

- the bead from the outside of the tyre, starting with the side opposite the valve,
- the bead from the inside of the tyre.



- Position the tyre lever approximately 15 cmfrom the valve on the outside of the wheel rim in order to remove the exterior bead from the tyre.

- Remove the exterior bead of the tyre, finishing at the valve.

- Position the tyre lever approximately 15 cmfrom the valve on the outside of the wheel rim in order to remove the bead from inside the tyre.

- Remove the interior bead of the tyre, finishing at the valve.

- Remove the pressure sensor Pressure sensor: Removal - Refitting .

REFITTING

1. REFITTING PREPARATION OPERATION

-

parts always to be replaced: Tyre valve .

- Always replace the pressure sensor bolt.

- Lubricate the two tyre beads correctly using the tyre paste Vehicle: Parts and consumables for the repair .

2. REFITTING OPERATION

- Refit the pressure sensor Pressure sensor: Removal - Refitting .

- Engage the lower tyre bead approximately 15 cm after the valve.
- Finish fitting the tyre at the valve.
- Fit the exterior bead approximately 15 cm after the valve using the tyre lever.
- Inflate the tyre to 3.5 bar to press the tyre beads against the wheel rim.

3. FINAL OPERATION

- Refit the valve mechanism.
- Inflate the tyre to the recommended pressure Tyre pressure: Identification .

Note:

It is not necessary to drive the vehicle before and after a new wheel is balanced.

- Balance the wheel **(see 35A, Wheels and tyres, Wheel: Balancing)** .
- Refit the wheel in question **(see 35A, Wheels and tyres, Wheel: Removal - Refitting)** .

UCH: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

REMOVAL

1. REMOVAL PREPARATION OPERATION

CAUTION

To avoid permanently locking the steering column lock, never fit a UCH that has been previously used on another vehicle.

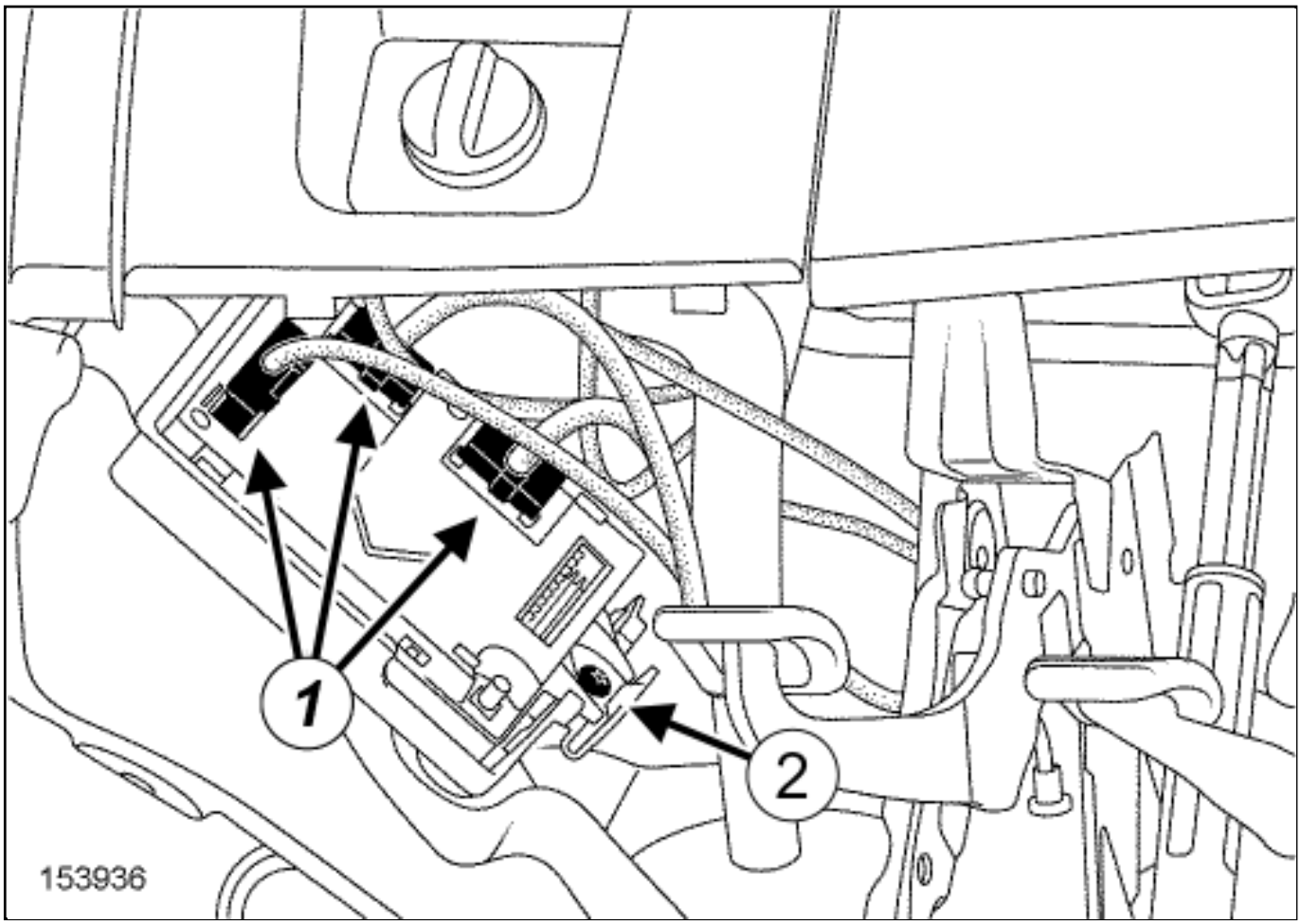
- Apply the before repair procedure using Diagnostic tool(see **Diagnostic tool : Use**) :

-Calculateur concerned by the before repair procedure:

■"UCH"

- Switch off the ignition.
- Disconnect the batteryBattery: Removal - Refitting .

2. REMOVAL OPERATION



- Disconnect the connectors(1) .

- Remove:
  - the UCH bolt(2) ,
  - the UCH.

REFITTING

- Proceed in the reverse order to removal.

- In the event of a replacement, apply the after repair procedure using the Diagnostic tool:
  - connect the Diagnostic tool,
  - select "UCH",
  - go to repair mode,
  - display the "Before/after repair procedure" for the computer selected,
  - carry out the operations described in the "After repair procedure" section.

- Apply the after repair procedure using Diagnostic tool(see **Diagnostic tool : Use**) :

-Calculateur concerned by the before repair procedure:

- "UCH"

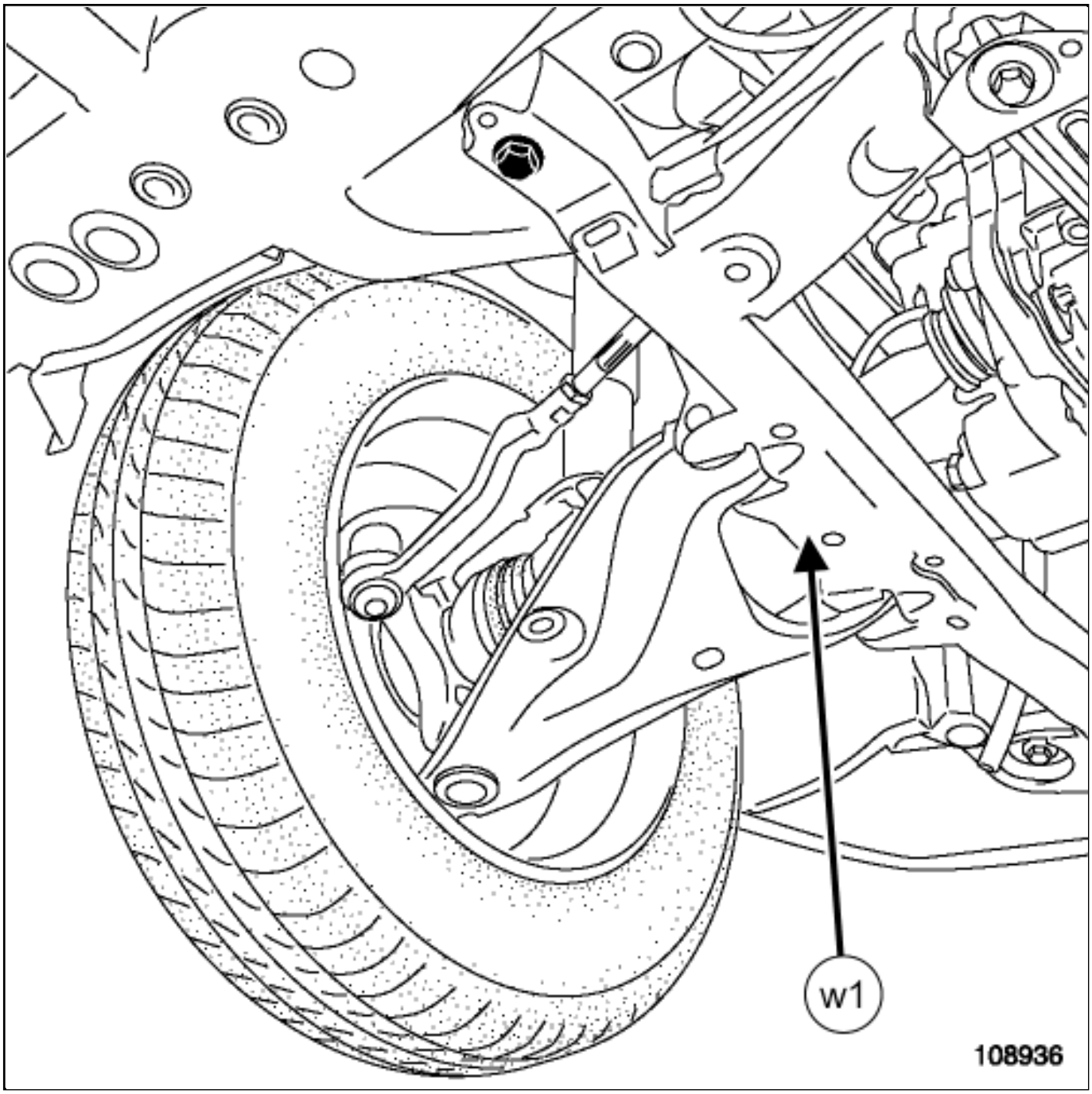
UNDERBODY HEIGHTS: ADJUSTMENT VALUE

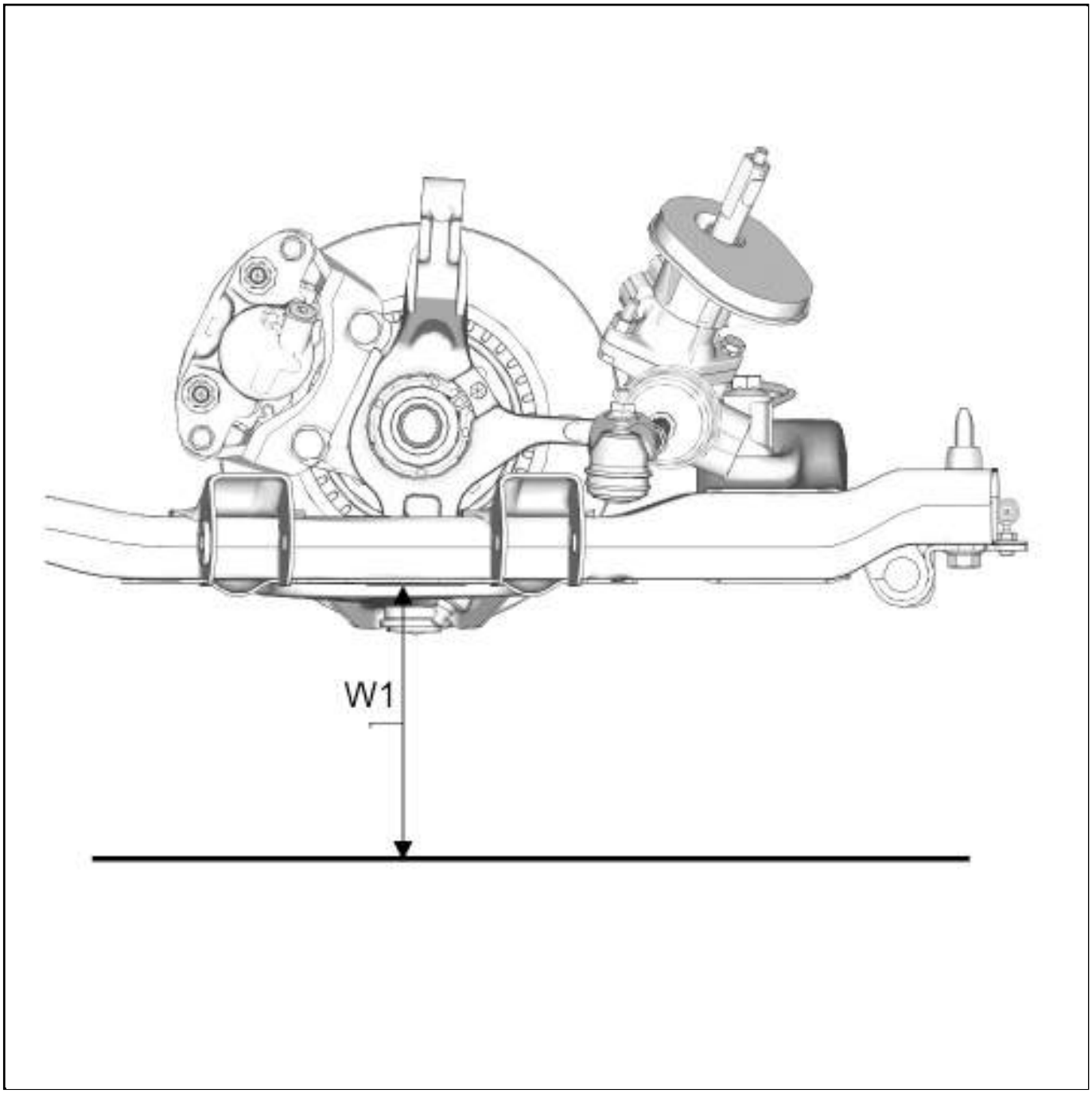
1. MEASURING POINTS

Radius under load:

- (R1) : Distance between the ground and the front wheel shaft
- (R2) : Distance between the ground and the rear wheel shaft

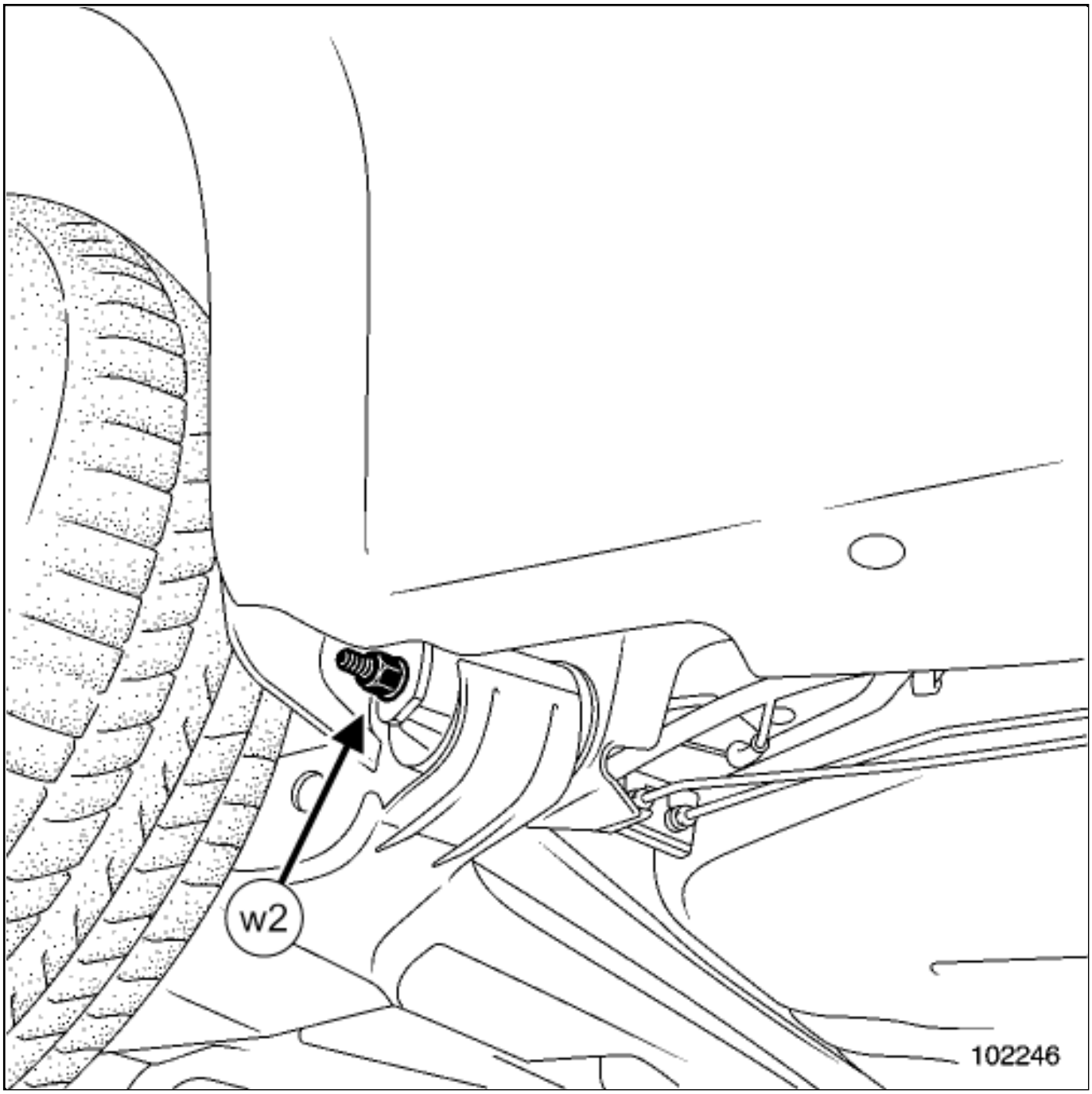
1- FRONT HEIGHT (W1)

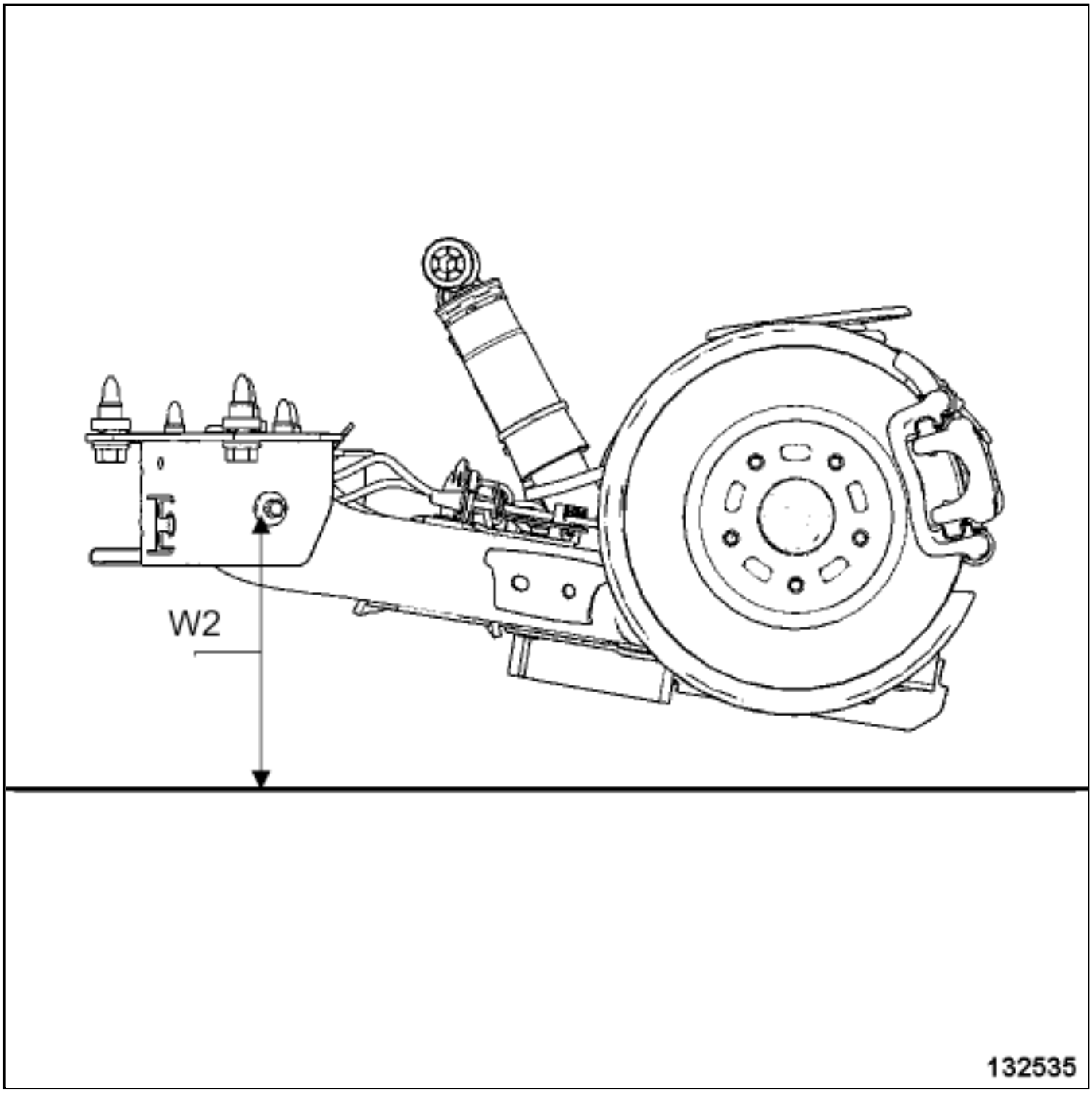

w1
108936



(W1) : Height between the ground and the side member (the measuring point is located directly in line with the stub axle carrier).

2- REAR HEIGHT (W2)


w2
102246



(W2) : Height between the ground and the shaft of the rubber bush on the bearing.

2. MEASURING PROCEDURE

Note:

For measurements(W1) and (W2) , take into account the height difference between the plates and the lift.

Measure the heights:

- R1 right-hand and left-hand,
- R2 right-hand and left-hand,
- W1 right-hand and left-hand,
- W2 right-hand and left-hand.

Note:

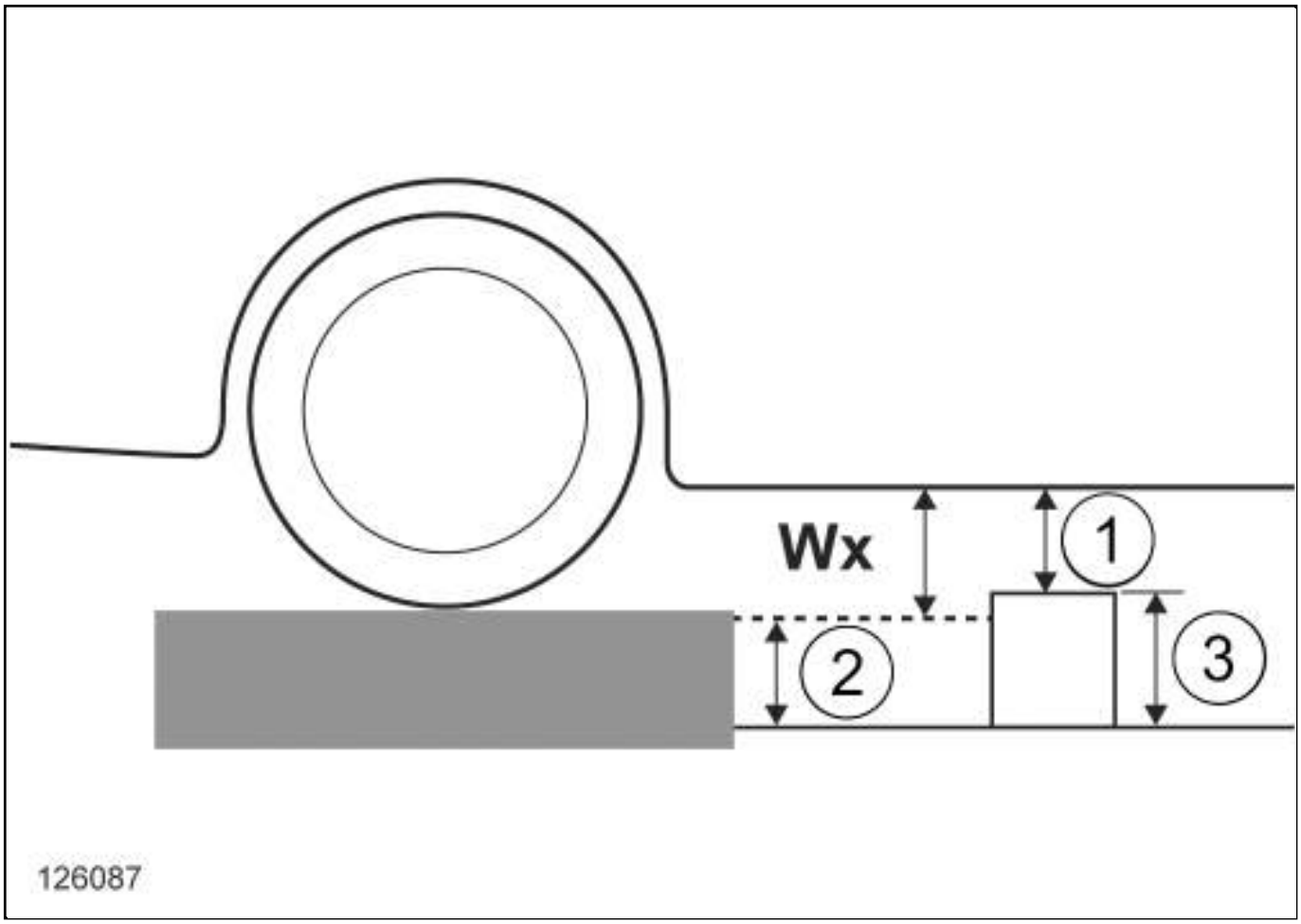
The value of Wx to be entered into the geometry bench is the average of the W1 heights, right-hand and left-hand and of the W2 heights, right-hand and left-hand.

Specific case:

Note:

If the measuring points are located in empty space (between the rails of the lift), use a bar.

1- PLATE HIGHER THAN THE LIFT:



Measure the heights(1) , (2) , (3) .

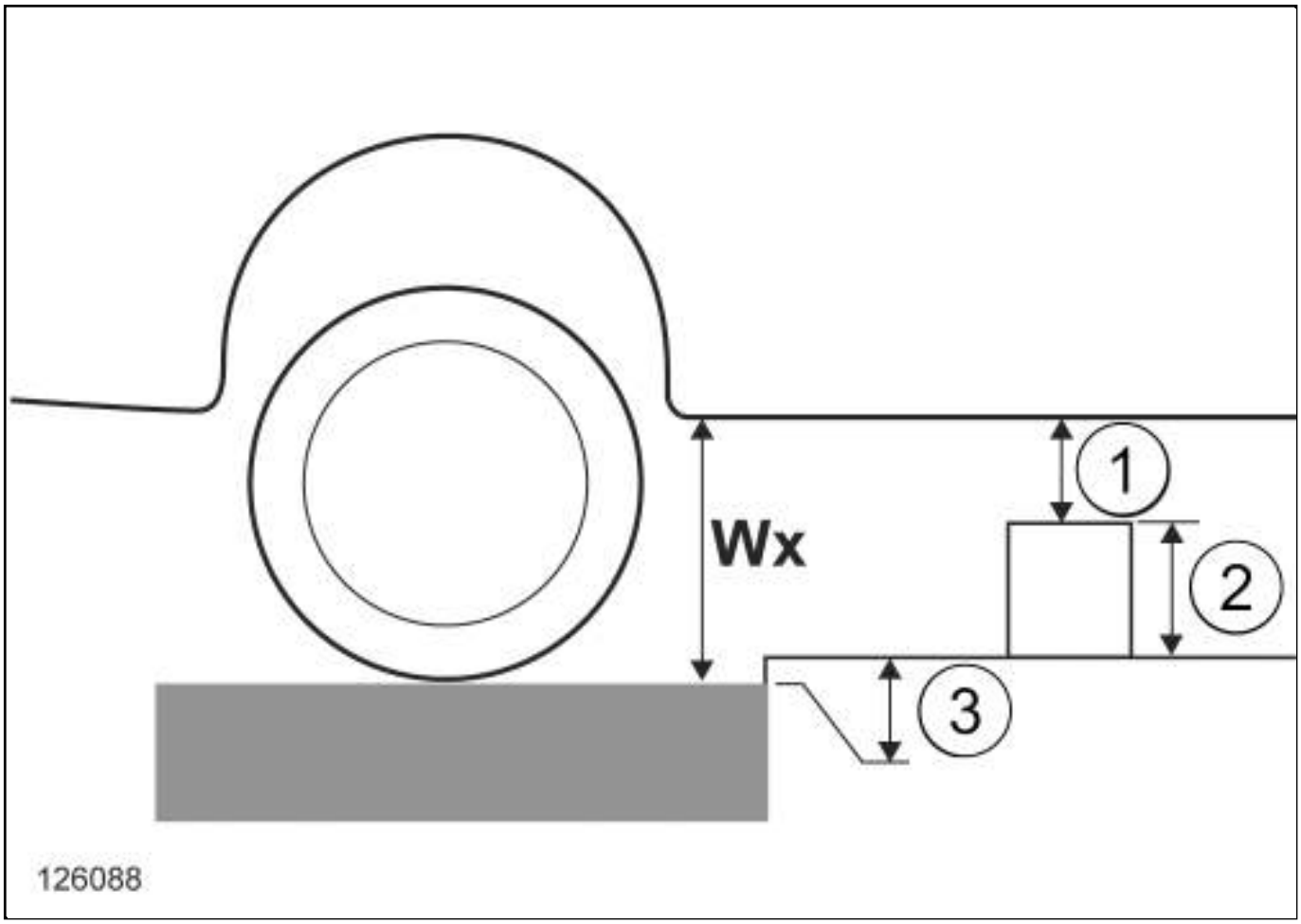
Example (1) := 13 cm, (2) = 8 cm, (3) = 10 cm.

Calculate the height Wx:

Wx = height(1) + height(3) - height(2) ,

Wx = 15 cm.

2- PLATE LOWER THAN THE LIFT:



Measure the heights(1) , (2) , (3) .

Example: (1) = 8 cm, (2) = 10 cm, (3) = 4 cm,

Calculate the height Wx:

Wx = height(1) + height(2) + height(3) ,

Wx = 22 cm.

3. VEHICLE IN RUNNING ORDER POSITION

- Position VODM (Vehicle in working condition):
  - Tank full,
  - Vehicle empty (without luggage, etc.).

- For vehicles made outside Russia
  - (W1) = 219.4 ± 14 mm

- (W2) = 319.6 ± 15 mm

For vehicles made in Russia

- (W1) = 229.4 ± 14 mm
- (W2) = 329.6 ± 15 mm

Note:

The position of the vehicle varies according to:

- the weight of the engine,
- the springs and shock absorbers,
- the tyres,
- the amount of fuel in the tank.

UNDERSIDE OF THE VEHICLE: PREPARATION AND PAINT RANGE

Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Use extra ventilation source.

Steps	Description	Special notes
1	Clean the subframe	Soapy water
2	Rinse / Blow	
3	Strip the PVC mastic from the subframe on the areas to be repaired	Tools for stripping very thick soft mastic: Use Tools for scraping rigid adhesives and paint: Use (40A, General information)
4	Wipe / blow	
5	Sand the PVC mastic remaining from the repair, slightly overlapping by 150to 200 mm	P180-P240 / Red pad
6	Wipe / blow	
7	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). wipe with a dry lint-free cloth
8	Masking	Masking paper
9	Apply a pre-treatment primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Remove solvent	
11	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
12	Remove solvent / dry	
13	Sand the primer	P400 to P500dry / P400 to P800water

14	Wipe / blow	
16	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). wipe with a dry lint-free cloth
17	Masking	Masking paper
18	Apply a sealing mastic	Anti-corrosion protection products after assembly: Use (40A, Generalinformation) Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
19	Apply the paint finishing	

UNDERSIDE OF THE VEHICLE: SEALING CHECK

Note:

Before any operation, check the water outlets. if necessary, clean any residue which has accumulated (for example: dead leaves, twigs, etc.) and check that water flows out correctly.

Note:

When checking the sealing of the underside of the vehicle, the interior trims must be partially removed to enable the sealing check (see MR for the vehicle concerned).

Note:

The list of the joint areas dealt with here is general. Additional zones may exist depending on the layout of each vehicle (see MR for the vehicle concerned).

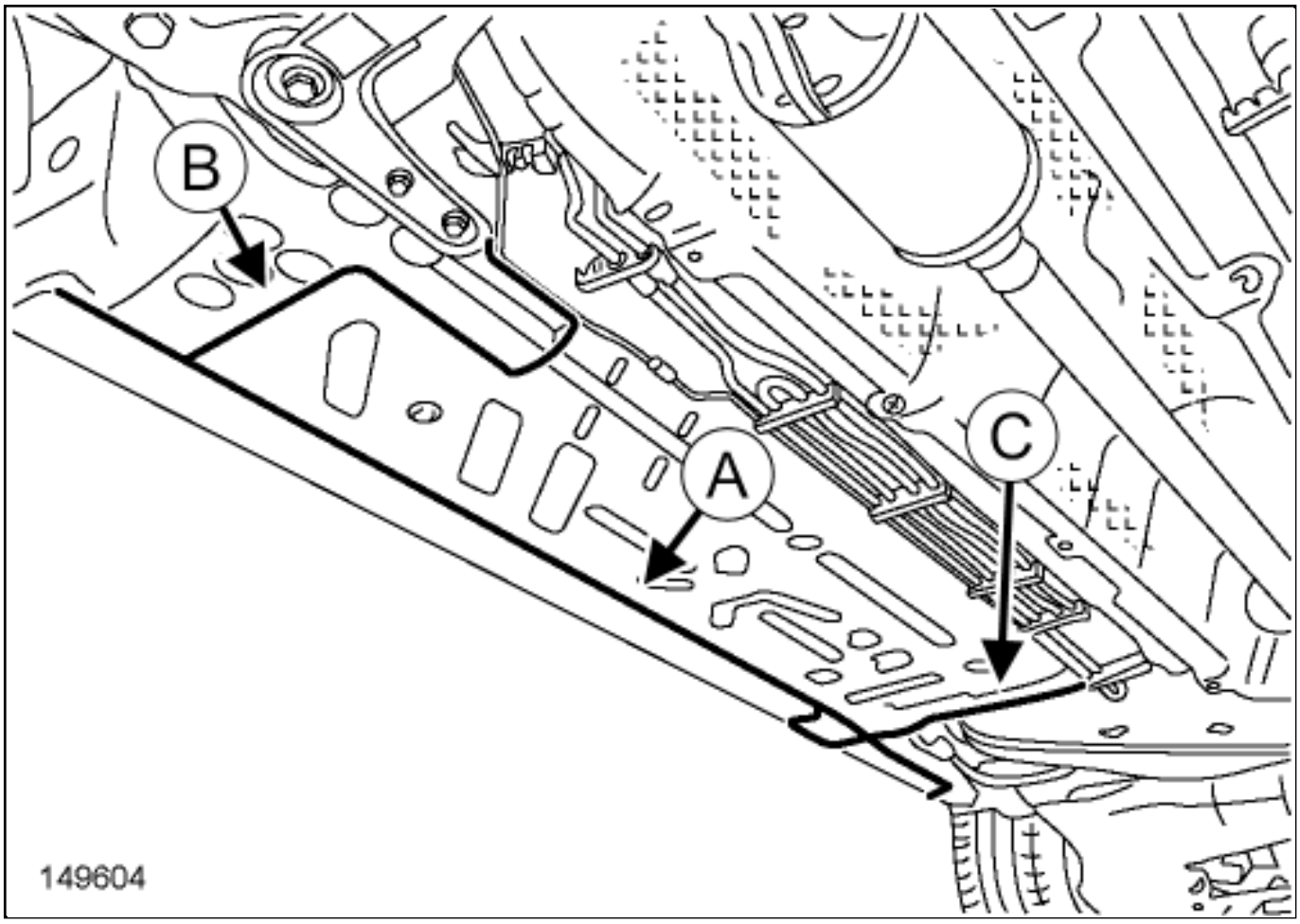
1. PREPARATION OPERATION FOR CHECKING THE SEALING

1- CONDITIONS TO RESPECT BEFORE CHECKING THE SEALING

- Position the vehicle on a level washing area(see 60A, General information, Vehicle sealing: General information) .
- Check that all the opening elements are closed(see 60A, General information, Vehicle sealing: General information) .
- Prepare the equipment to perform the operation(see 60A, General information, Sealing tools: Use) ,(see 60A, General information, Sealing tools: Description) and(see 60A, General information, Vehicle sealing: General information) .
- Adjust the flow of the water jet(see 60A, General information, Sealing tools: Use) .

2. OPERATION FOR CHECKING THE SEALING

1- CENTRE FLOOR



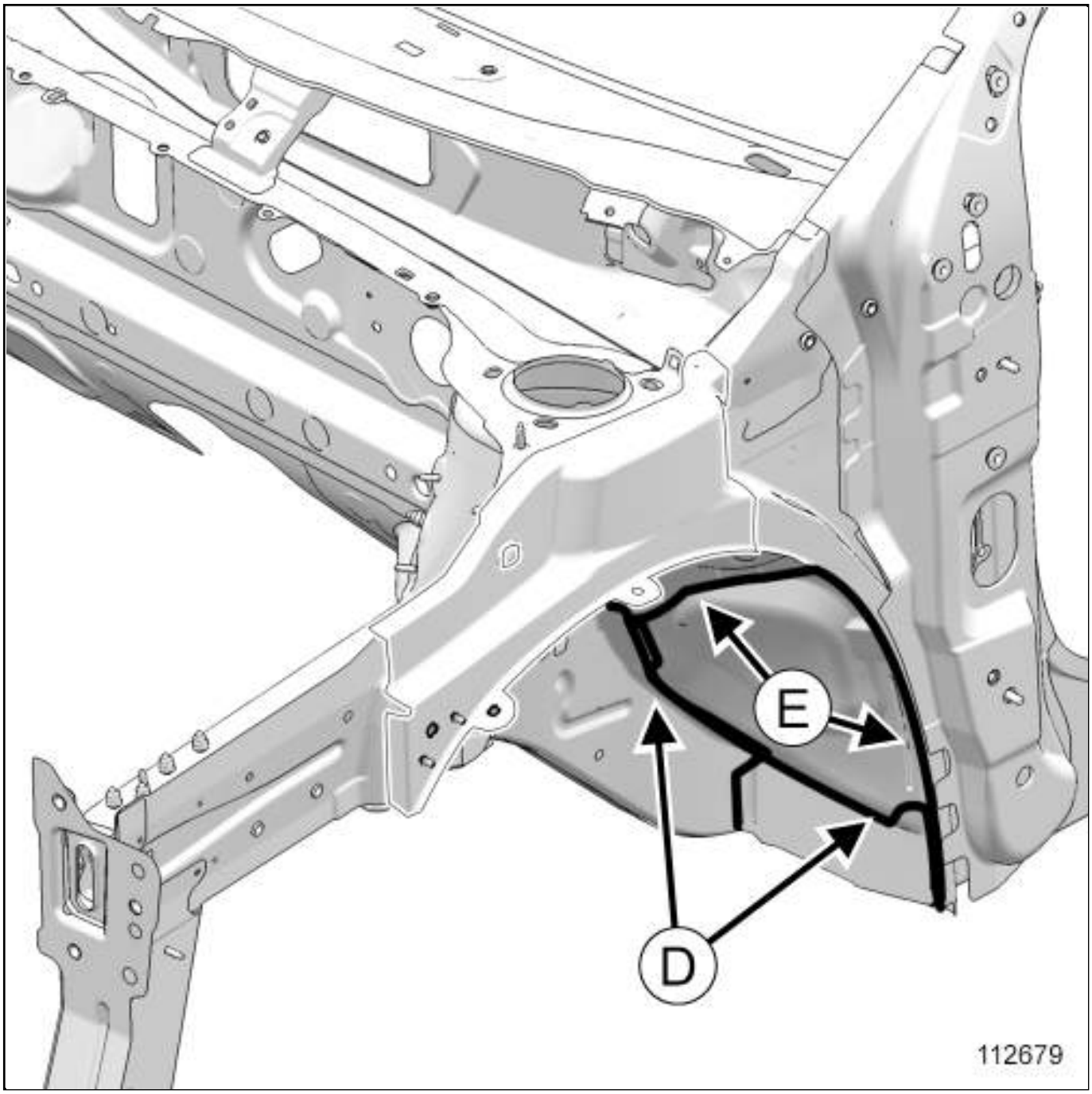
- Spray by sweeping the joint area between the centre floor / inner sill panel(A) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray by sweeping the joint area between the centre floor / centre floor centre cross member(B) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray by sweeping the joint area between the centre floor / rear floor front section(C) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the edge of the blanking covers of the centre floor in a circular manner.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing:

General information) .

- Spray by sweeping the joint area of the centre floor right-hand side section / centre floor left-hand side section.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

2- FRONT WHEEL ARCH



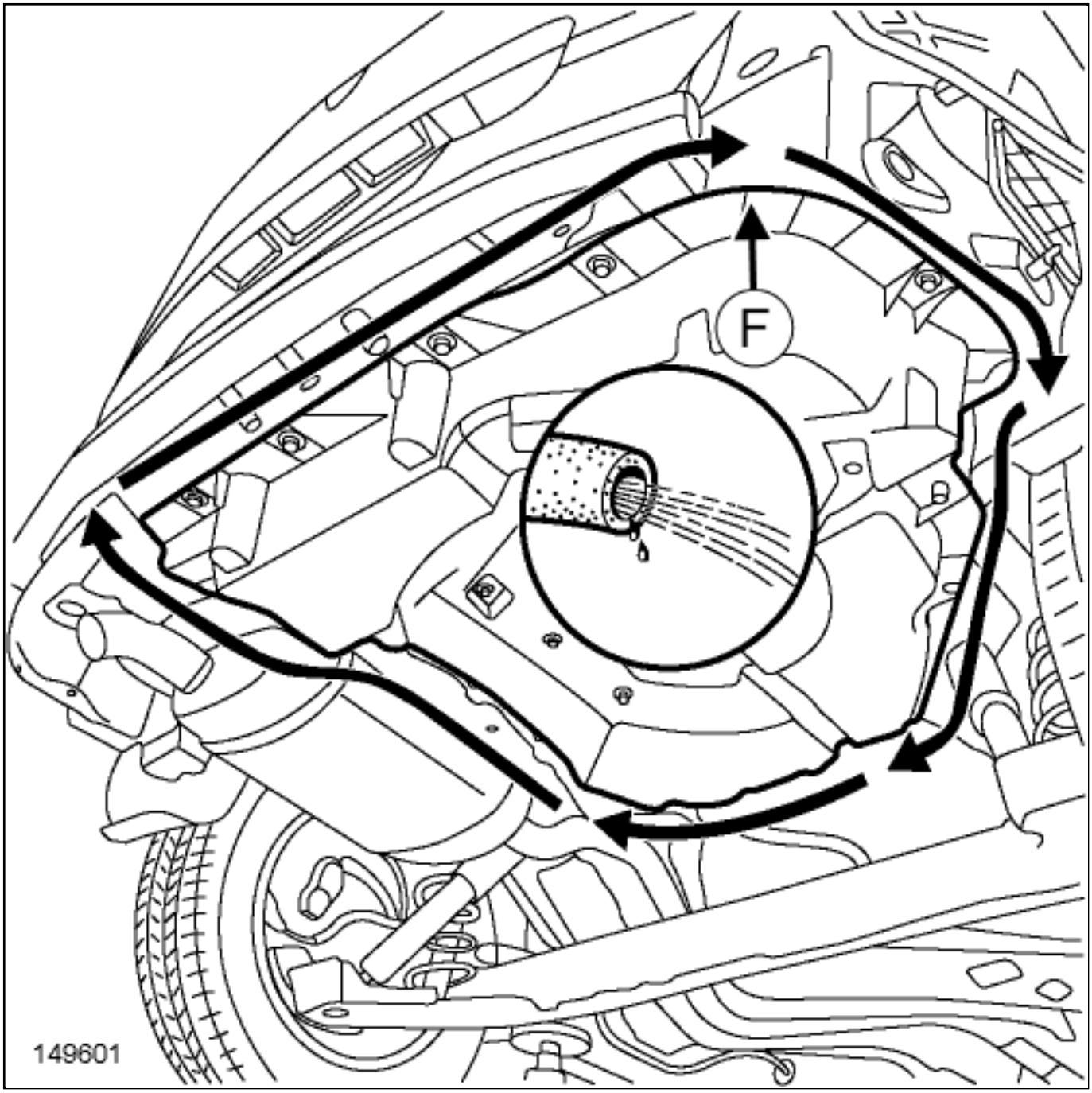
- Spray the wheel arch / front bulkhead joint area gradually from the bottom upwards(D) .

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Spray the wheel arch / scuttle side panel / bulkhead joint area gradually from the bottom upwards(E) .

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

3- BOLTED AND WELDED REAR FLOOR



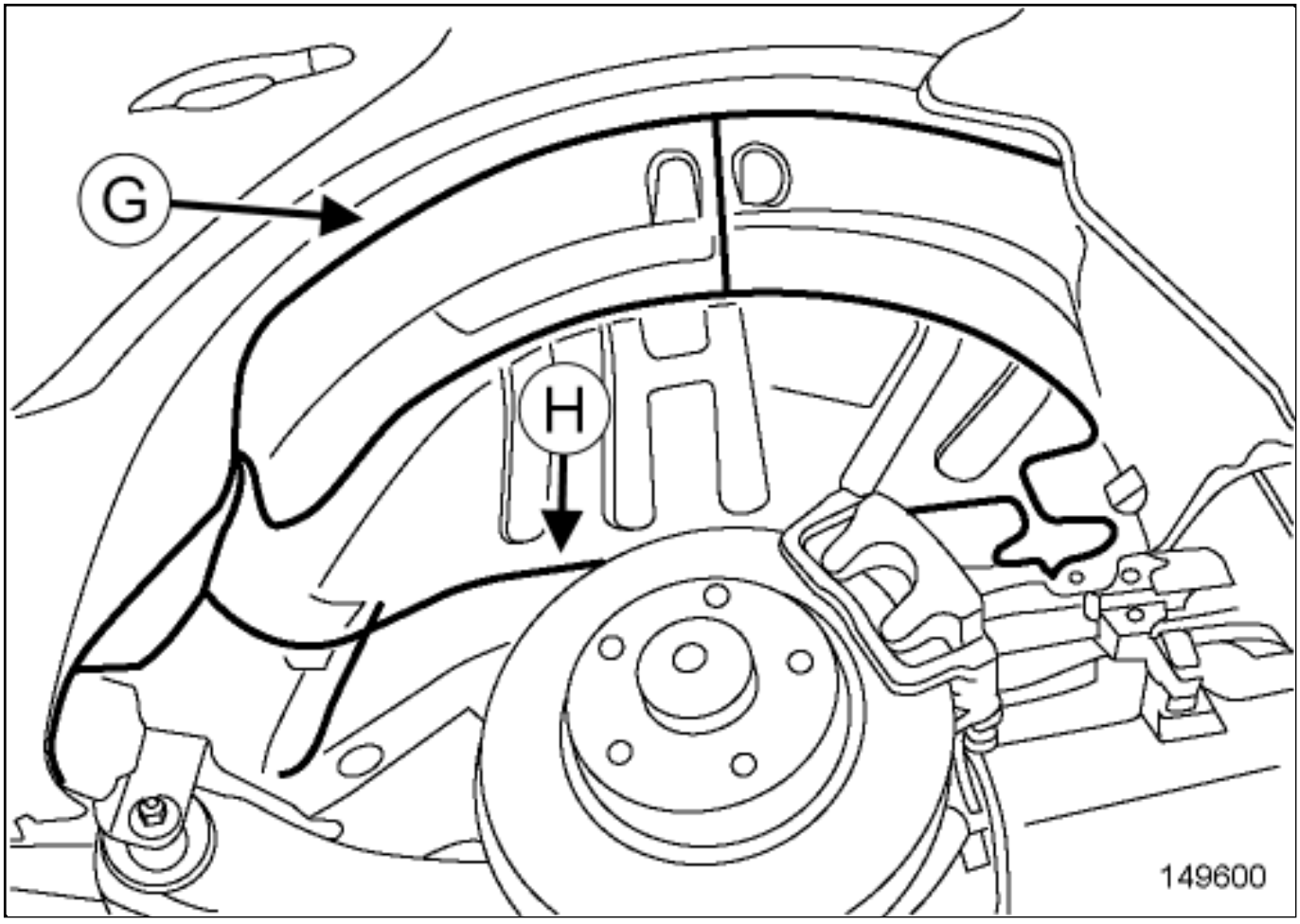
- Spray the edge(F) of the rear floor by sweeping the zone.

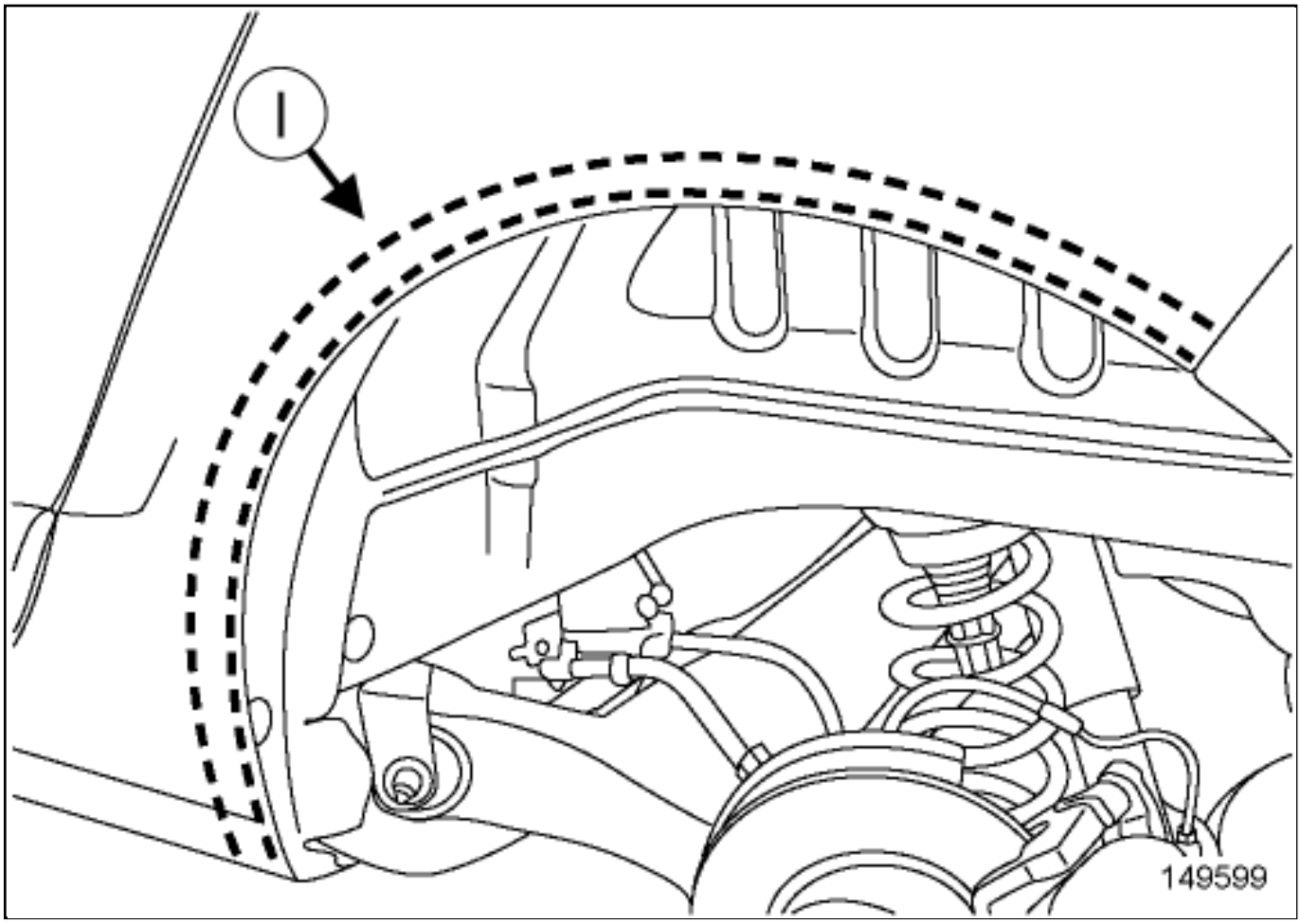
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Spray the edge of the blanking covers of the rear floor in a circular manner.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

4- REAR WHEEL ARCH





- Spray the inner wheel arch / outer wheel arch joint area gradually from the bottom upwards(G) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray by sweeping the inner wheel arch / rear floor joint area(H) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the outer wheel arch / rear wing panel joint area gradually from the bottom upwards(I) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the edge of the wheel arch blanking covers in a circular manner.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the contact zone of the rear shock absorbers in a circular manner.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

5- CHECKING THE SEALING WITH THE TRIM REMOVED

If the customer complaint could not be reproduced in accordance with the procedure, remove the interior trims (see Body internal trim of the vehicle's repair manual) then repeat the sealing check from step 1; extend the sealing check to the surrounding areas(see 60A, General information, Vehicle: Sealing check) .

UNDERSIDE OF THE VEHICLE: SEALING REPAIR

Note:

Before repairing the sealing, check the sealing of the zone concerned(see 60A, General information, Vehicle: Sealing check) .

1. PREPARATION OPERATION FOR REPAIRING THE SEALING

1- CHECK THE POSITION AND ADJUST IF NECESSARY:

- the blanking covers,
- the rear shock absorbers(see **Rear axle components: Removal - Refitting**) (33A, Rear axle components),
- the sealing mastic.

2- WAS ANY ACTION PERFORMED?

☐ NO: move on to the next step.

☐ YES: check the sealing of the zone(see 60A, General information, Underside of the vehicle: Sealing check) .

☐ Was water present in the passenger compartment of the vehicle?

- YES: move on to the next step.
- NO: fault resolved.

2. SEALING REPAIR OPERATION

1- REPAIRING THE SEALING OF THE CENTRE FLOOR

☐ Is water present in the passenger compartment after the centre floor sealing has been checked?

☐ NO: move on to the next step.

☐ YES:

- a) if the blanking covers of the centre floor are detached, refit the blanking covers of the centre floor,
- b) if the blanking covers of the centre floor are deformed or cracked, replace the blanking covers of the centre floor,
- c) if the sealing mastics of the centre floor are detached, faulty or incorrectly positioned, clean the faulty mastics Tools for stripping very thick soft mastic: Use (05B, Equipment and tools),
- apply extruded mastic and sprayed mastic to the cleaned zonesAnti-corrosion protection products after assembly: Use (04F, Bodywork products and mountings).

- Check the sealing of the centre floor(see 60A, General information, Underside of the vehicle: Sealing check) .

2- REPAIRING THE SEALING OF THE FRONT WHEEL ARCH

- Is water present in the passenger compartment after the front wheel arch sealing has been checked?

- NO: move on to the next step.

- YES:
  - a) if the front wheel arch liner is incorrectly positioned, refit the front wheel arch linerFront wheel arch liner: Removal - Refitting (55A, Exterior protections),
  - b) if the front wheel arch liner is deformed or cracked, replace the front wheel arch linerFront wheel arch liner: Removal - Refitting (55A, Exterior protections),
  - c) if the blanking covers of the front wheel arch are detached, refit the blanking covers of the front wheel arch,
  - d) if the blanking covers of the front wheel arch are deformed or cracked, replace the blanking covers of the front wheel arch,
  - e) if the sealing mastics of the front wheel arch are detached, faulty or incorrectly positioned, clean the faulty mastics Tools for stripping very thick soft mastic: Use (05B, Equipment and tools),
  - apply extruded mastic and sprayed mastic to the cleaned zonesAnti-corrosion protection products after assembly: Use (04F, Bodywork products and mountings).

- Check the sealing of the front wheel arch(see 60A, General information, Underside of the vehicle: Sealing check) .

3- REPAIRING THE SEALING OF THE REAR FLOOR

1)BOLTED REAR FLOOR

- Is water present in the passenger compartment after the bolted rear floor sealing has been checked?

- NO: move on to the next step.

- YES:
  - a) if the rear floor mountings are loosened, tighten the rear floor mountingsRear floor, rear section: Removal - Refitting (41D, Rear lower structure),
  - b) if the sealing mastic of the rear floor is faulty or incorrectly positioned, replace the sealing mastic of the rear floor Rear floor, rear section: Removal - Refitting (41D, Rear lower structure).

2)WELDED REAR FLOOR

- Is water present in the passenger compartment after the welded rear floor sealing has been checked?

- NO: move on to the next step.

YES:

- a) if the blanking covers of the rear floor are detached, refit the blanking covers of the rear floor,
- b) if the blanking covers of the rear floor are deformed or cracked, replace the blanking covers of the rear floor.
- c) if the sealing mastics of the rear floor are detached, faulty or incorrectly positioned, clean the faulty mastics **Tools for stripping very thick soft mastic: Use** (05B, Equipment and tools),
- apply extruded mastic and sprayed mastic to the cleaned zones**Anti-corrosion protection products after assembly: Use** (04F, Bodywork products and mountings).

Check the sealing of the rear floor**(see 60A, General information, Underside of the vehicle: Sealing check)** .

4- REPAIRING THE SEALING OF THE REAR WHEEL ARCH

Is water present in the passenger compartment after the rear wheel arch sealing has been checked?

NO: fault resolved.

YES:

- a) if the rear wheel arch liner is incorrectly positioned, refit the rear wheel arch liner**Rear wheel arch liner: Removal - Refitting** (55A, Exterior protections),
- b) if the rear wheel arch liner is deformed or cracked, replace the rear wheel arch liner**Rear wheel arch liner: Removal - Refitting** (55A, Exterior protections),
- c) if the blanking covers of the rear wheel arch are detached, refit the blanking covers of the rear wheel arch,
- d) if the blanking covers of the rear wheel arch are deformed or cracked, replace the blanking covers of the rear wheel arch,
- e) if the sealing mastics of the rear wheel arch are detached, faulty or incorrectly positioned, clean the faulty mastics **Tools for stripping very thick soft mastic: Use** (05B, Equipment and tools),
- apply extruded mastic and sprayed mastic to the cleaned zones**Anti-corrosion protection products after assembly: Use** (04F, Bodywork products and mountings).
- f) if the upper mounting of the shock absorber is incorrectly positioned, refit the upper sealing component of the shock absorber(see **Rear axle components: Removal - Refitting**) (33A, Rear axle components).

Check the sealing of the rear wheel arch**(see 60A, General information, Underside of the vehicle: Sealing check)** .

VACUUM PUMP: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

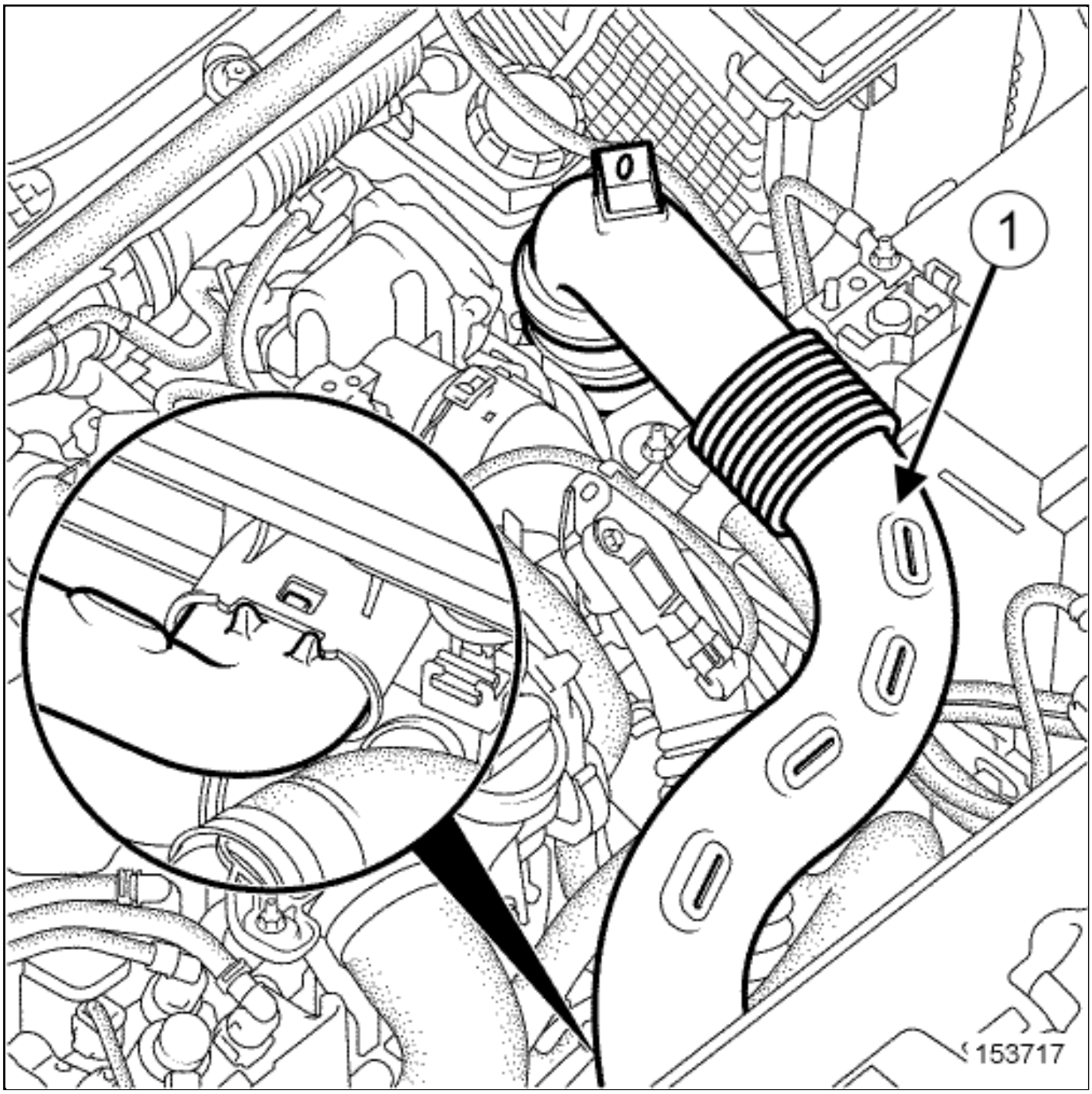
parts always to be replaced:
Brake servo vacuum pump seal

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**Vehicle: Precautions for the repair** .

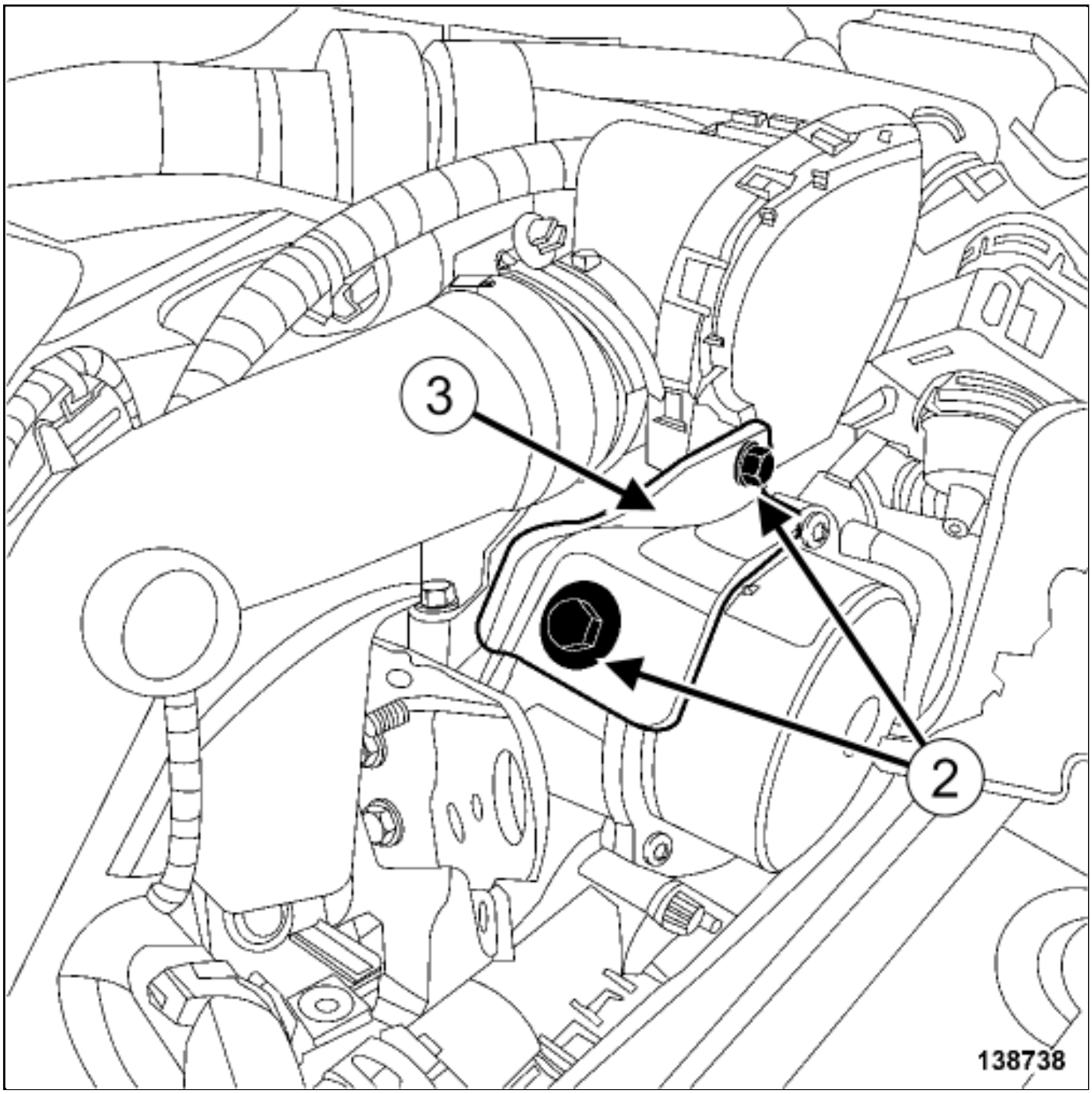
REMOVAL

1. REMOVAL PREPARATION OPERATION



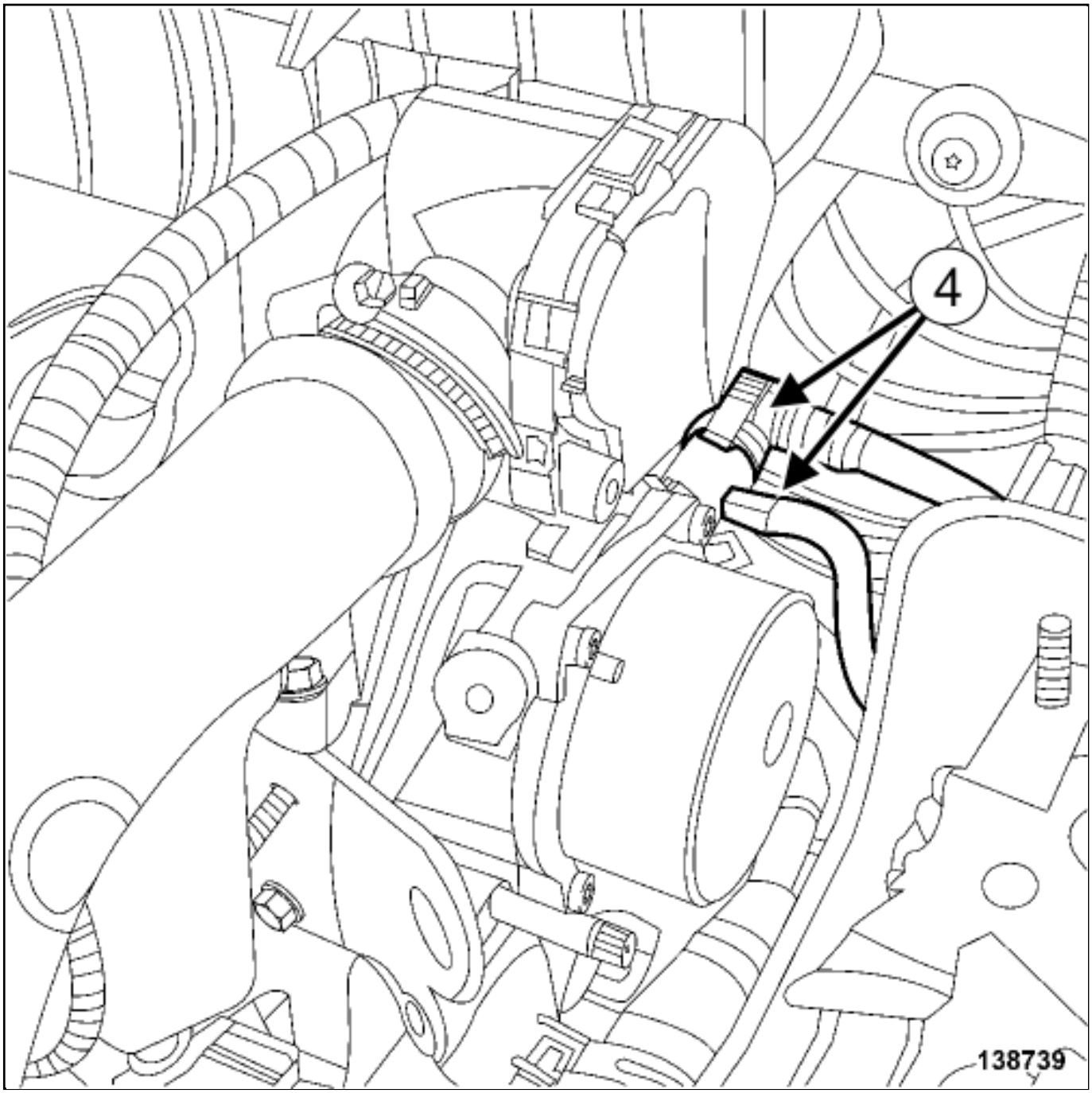
- Remove the air filter inlet duct(1) .

2. REMOVAL OPERATION

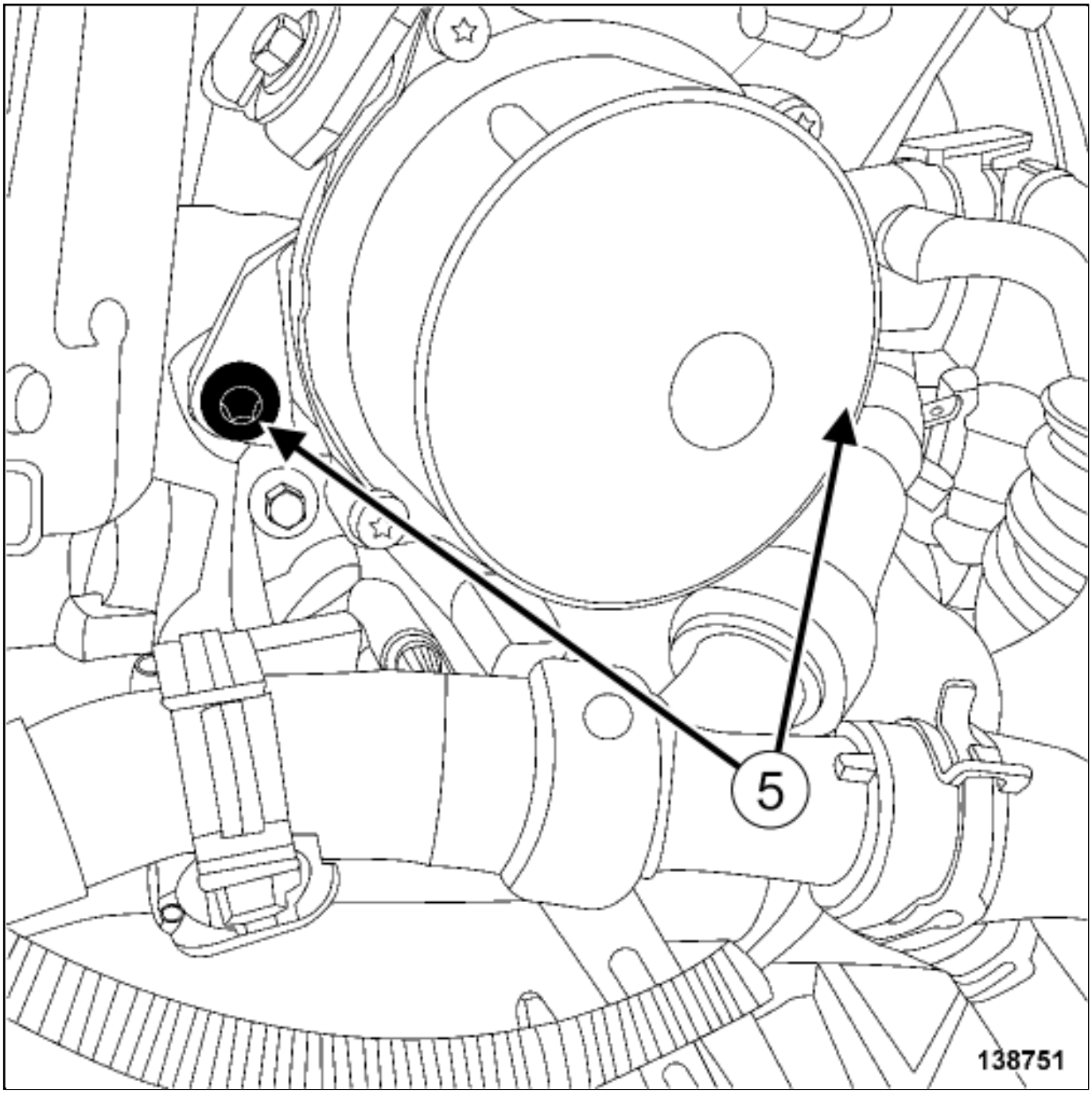


Remove:

- the retaining bracket bolts(**2**) ,
- the retaining bracket(**3**) .



- Disconnect the vacuum pipes(4) from the vacuum pump.



Remove:

- the vacuum pump bolts(**5**) ,
- the vacuum pump.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean the joint faces of:
  - the vacuum pump,
  - the cylinder head.

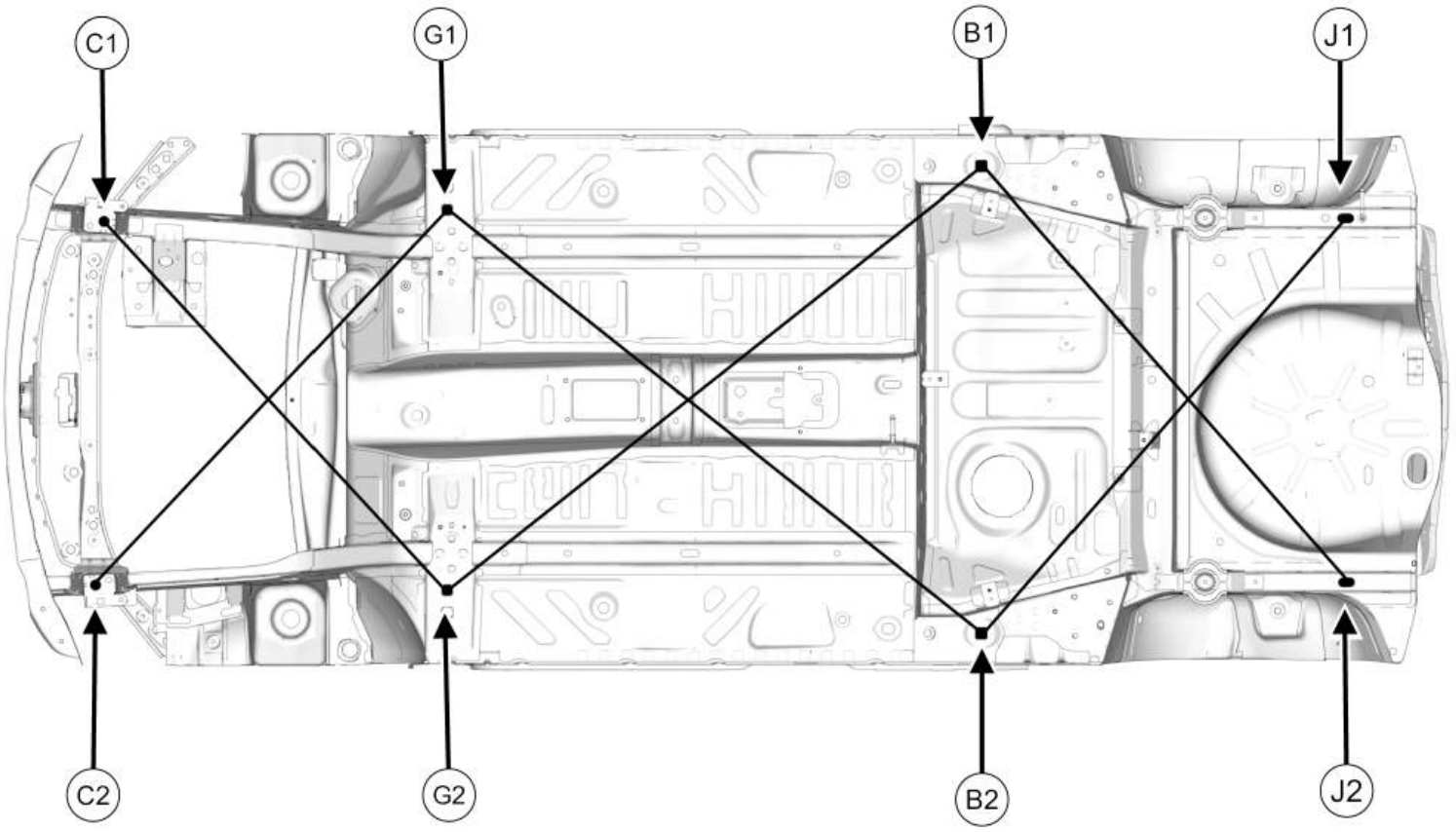
parts always to be replaced: Brake servo vacuum pump seal

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Torque tighten the vacuum pump bolts21 N.m.

B52(B52)



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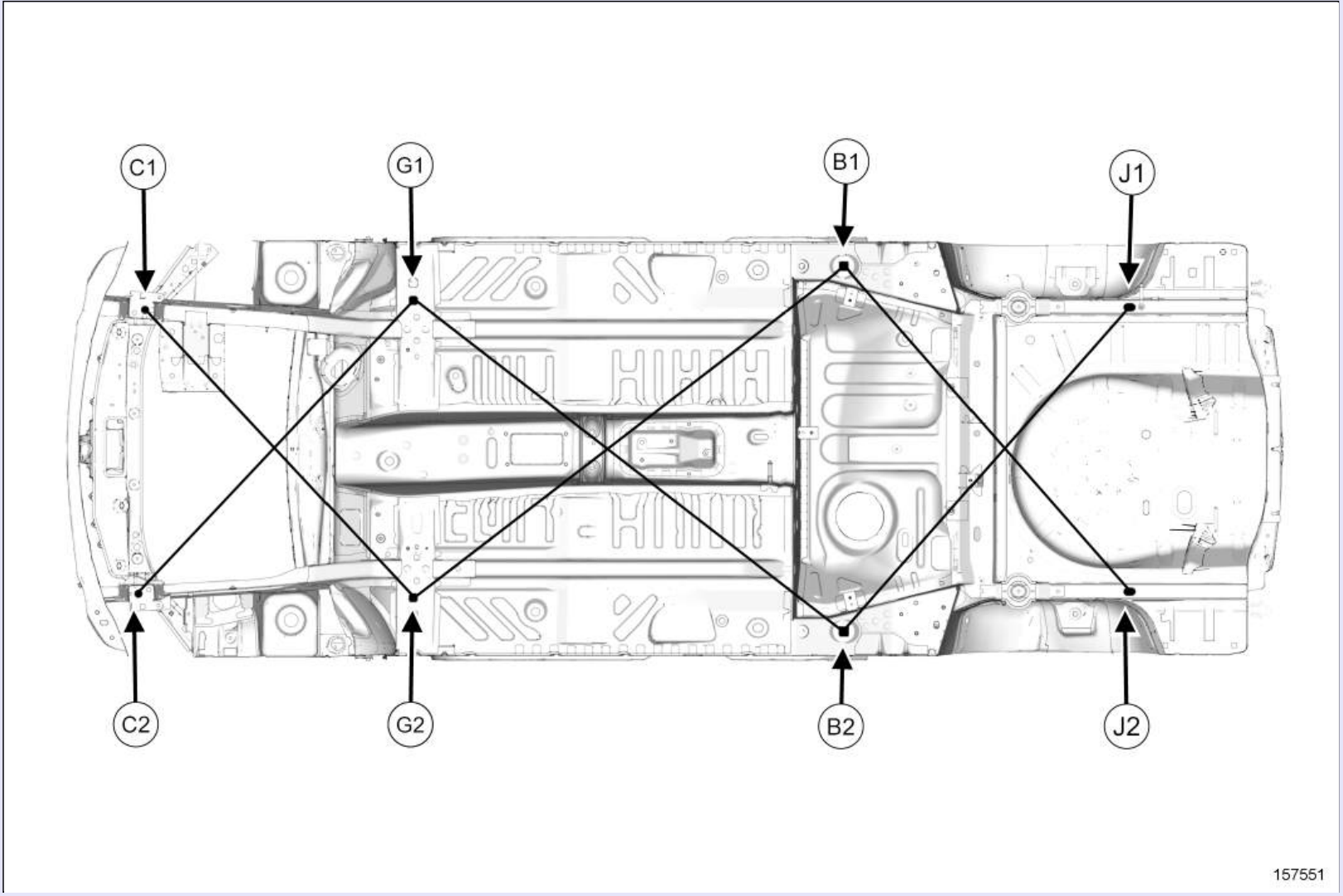


1. CHECKING THE SUBFRAME

1- CHRONOLOGICAL ORDER OF CHECKS

FRONT impact

Compare the following distances between diagonally opposite points:

- 1: B1 - G2 = B2 - G1
- 2: G1 - C2 = G2 - C1

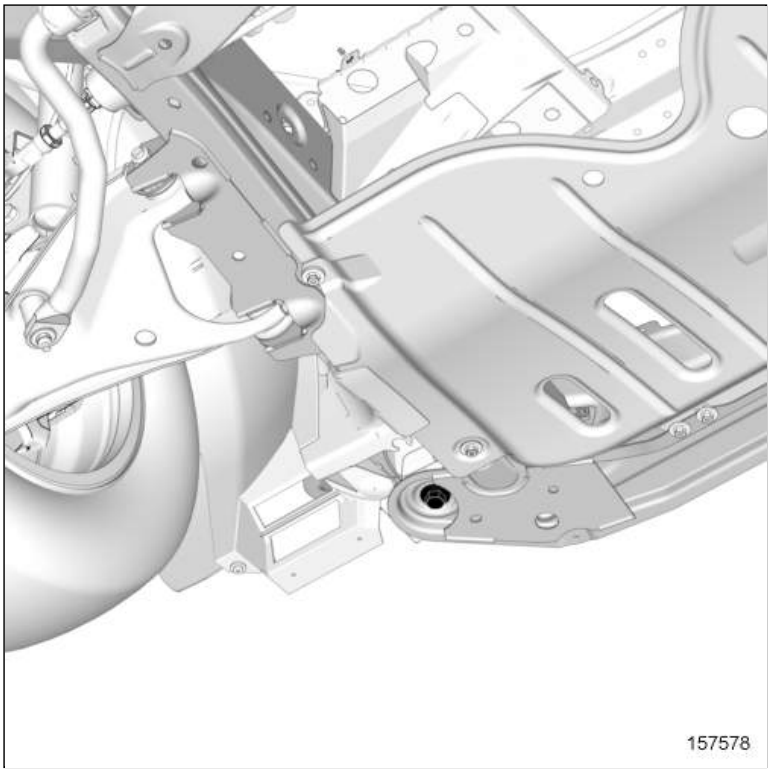
REAR impact

Compare the following distances between diagonally opposite points

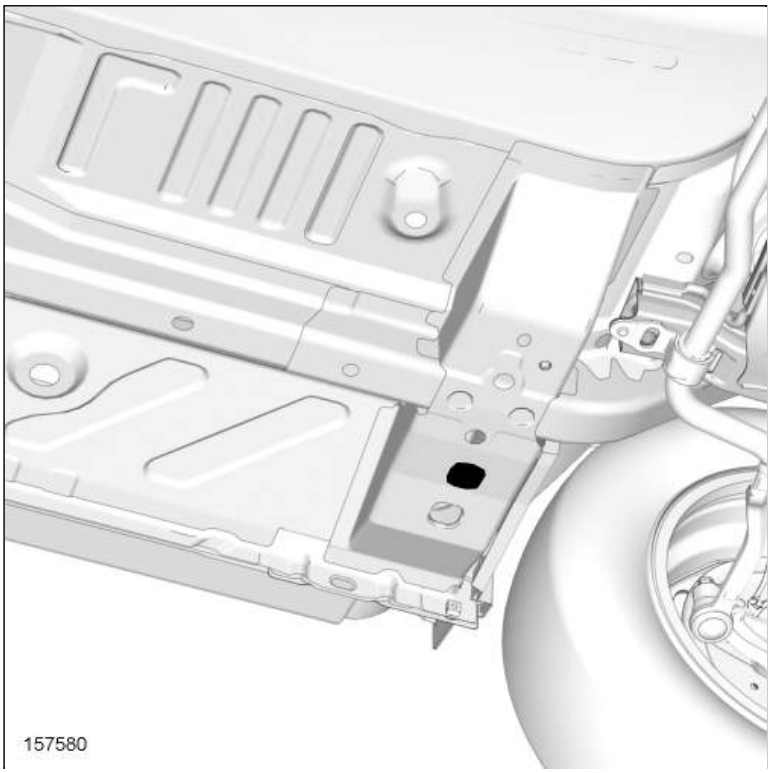
- 1: G2 - B1 = G1 - B2
- 2: B1 - J2 = B2 - J1

2. DETAILED VIEW OF INSPECTION POINTS

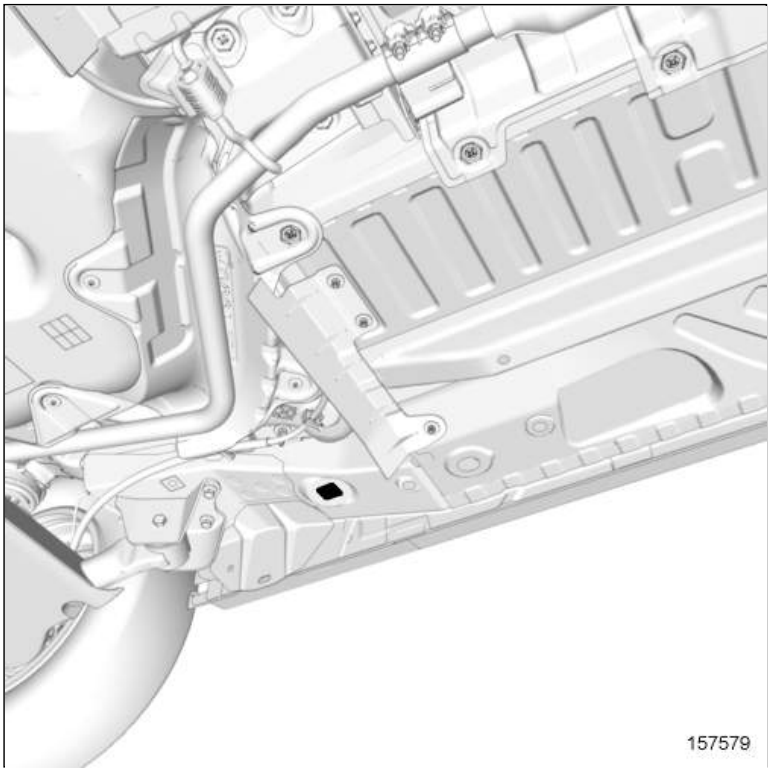
POINT C1 - C2



POINT G1 - G2



POINT B1 - B2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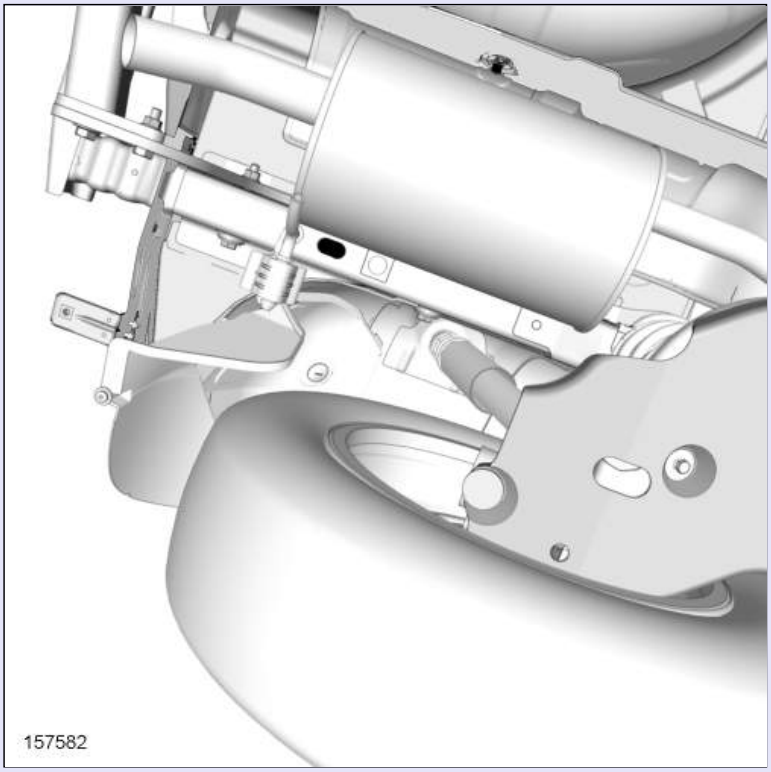
POINT J1 - J2



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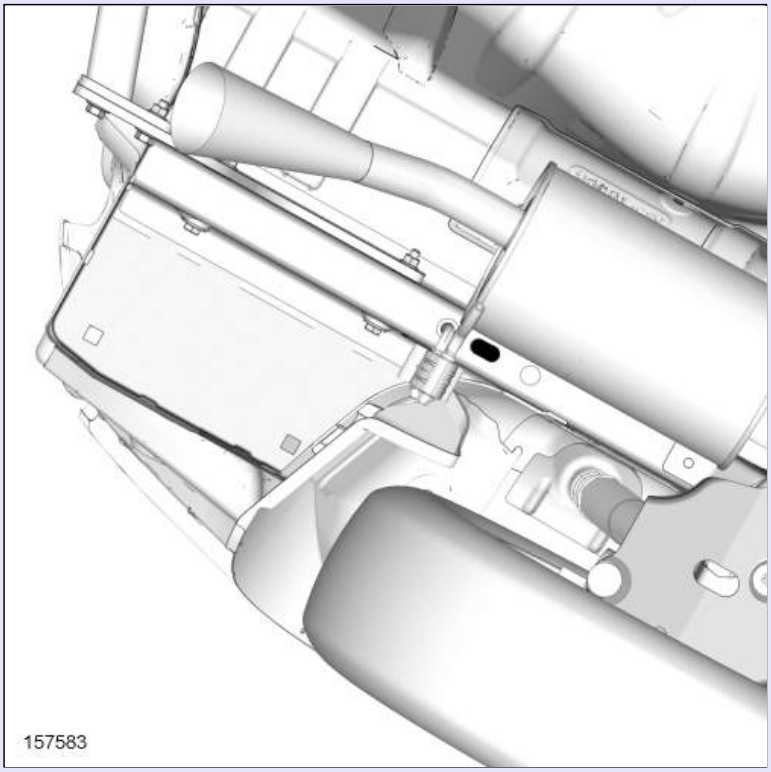
POINT J1 - J2



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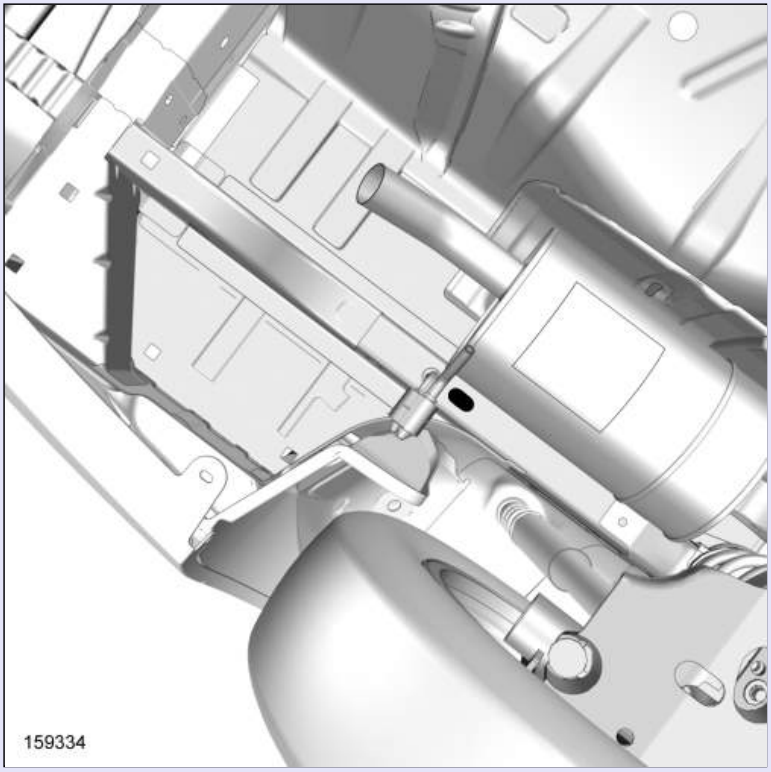
POINT J1 - J2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VEHICLE PANEL GAPS: ADJUSTMENT VALUE

Note, one or more warnings are present in this procedure

CAUTION

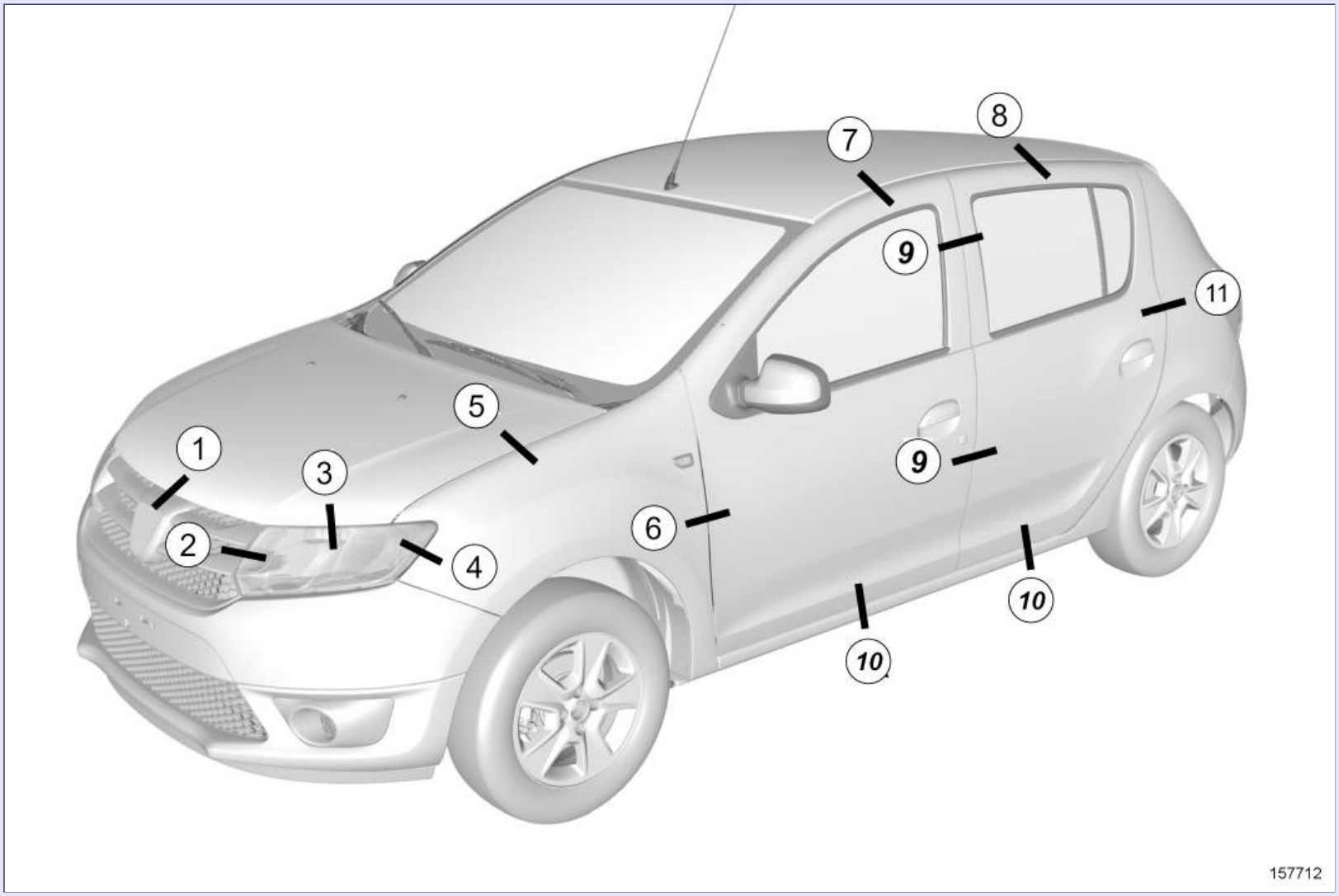
The clearance values are given for information purposes.

When adjusting clearances, certain rules have to be followed:

- maintain symmetry with respect to the opposite side,
- ensure that the flush fitting is correct,
- check the correct operation of the opening element, and the water/air-tightness.

1.

B52(B52)



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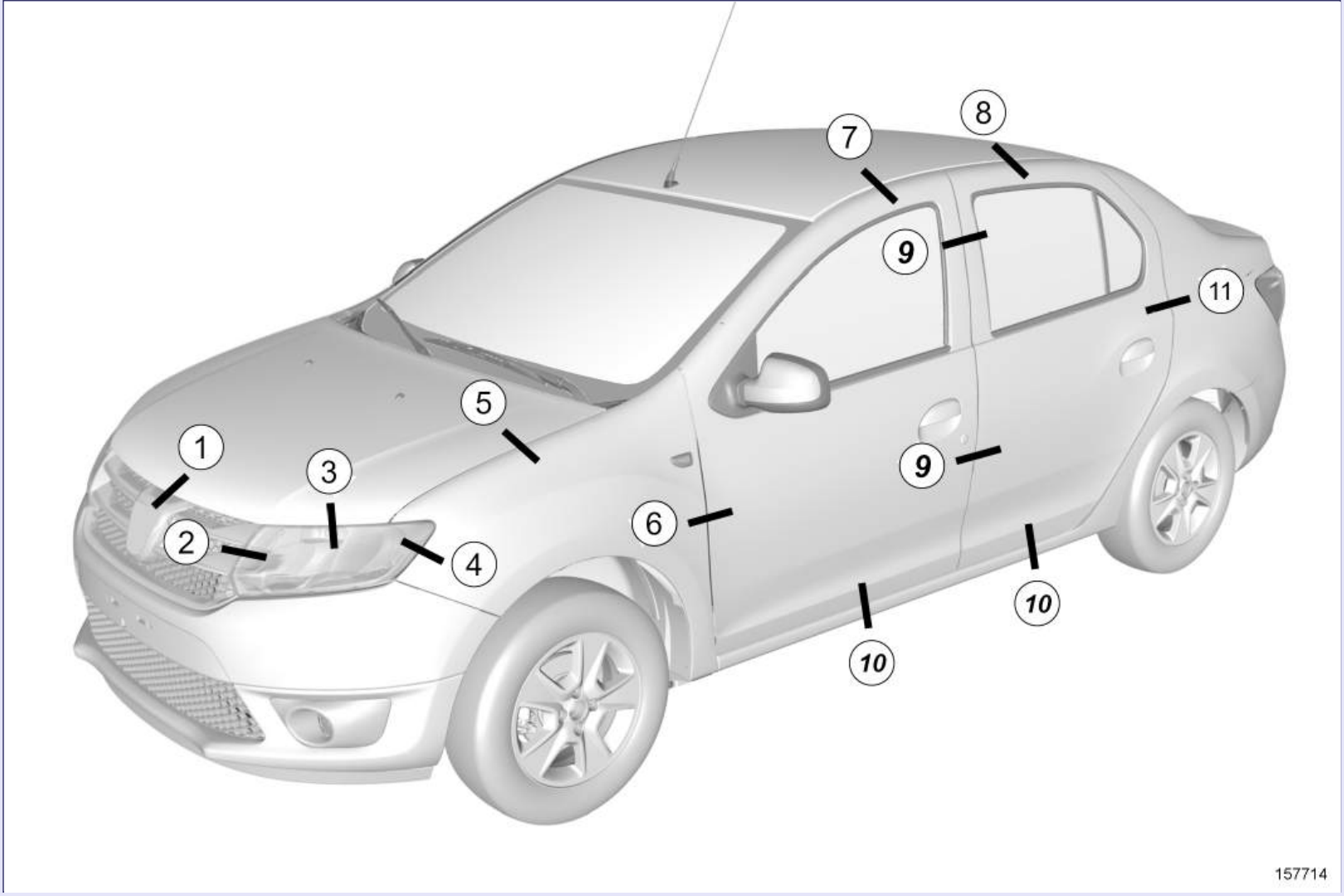

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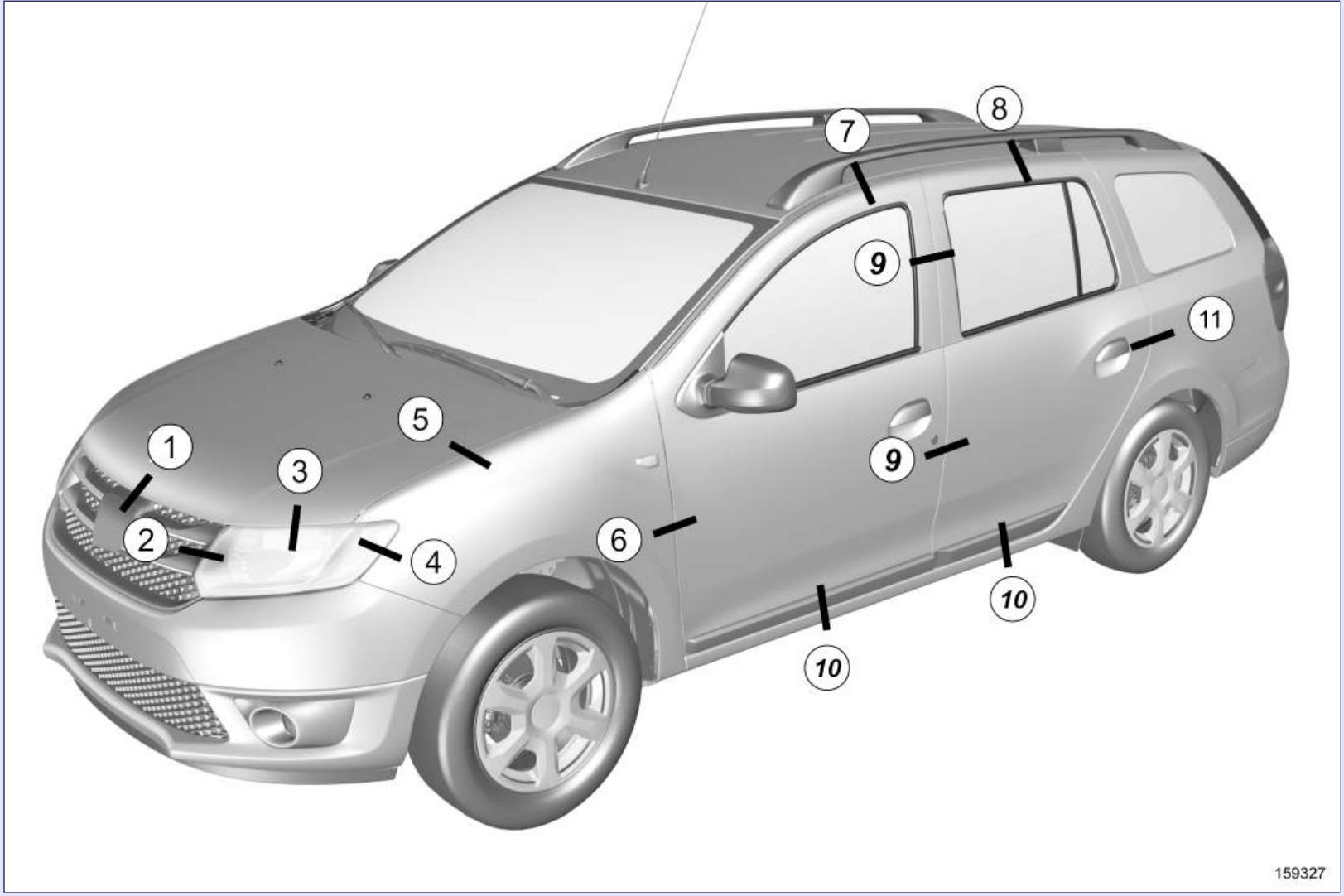
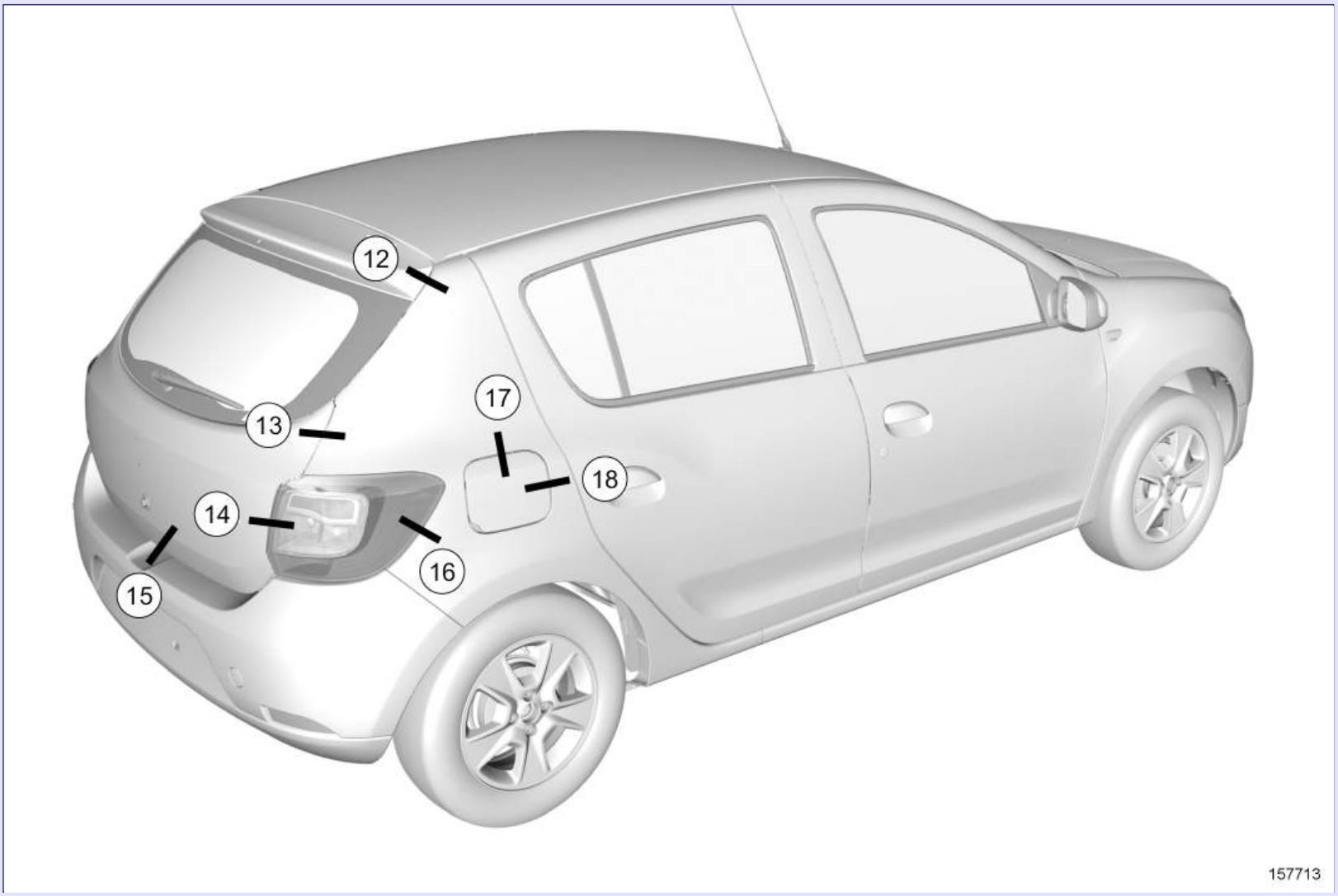


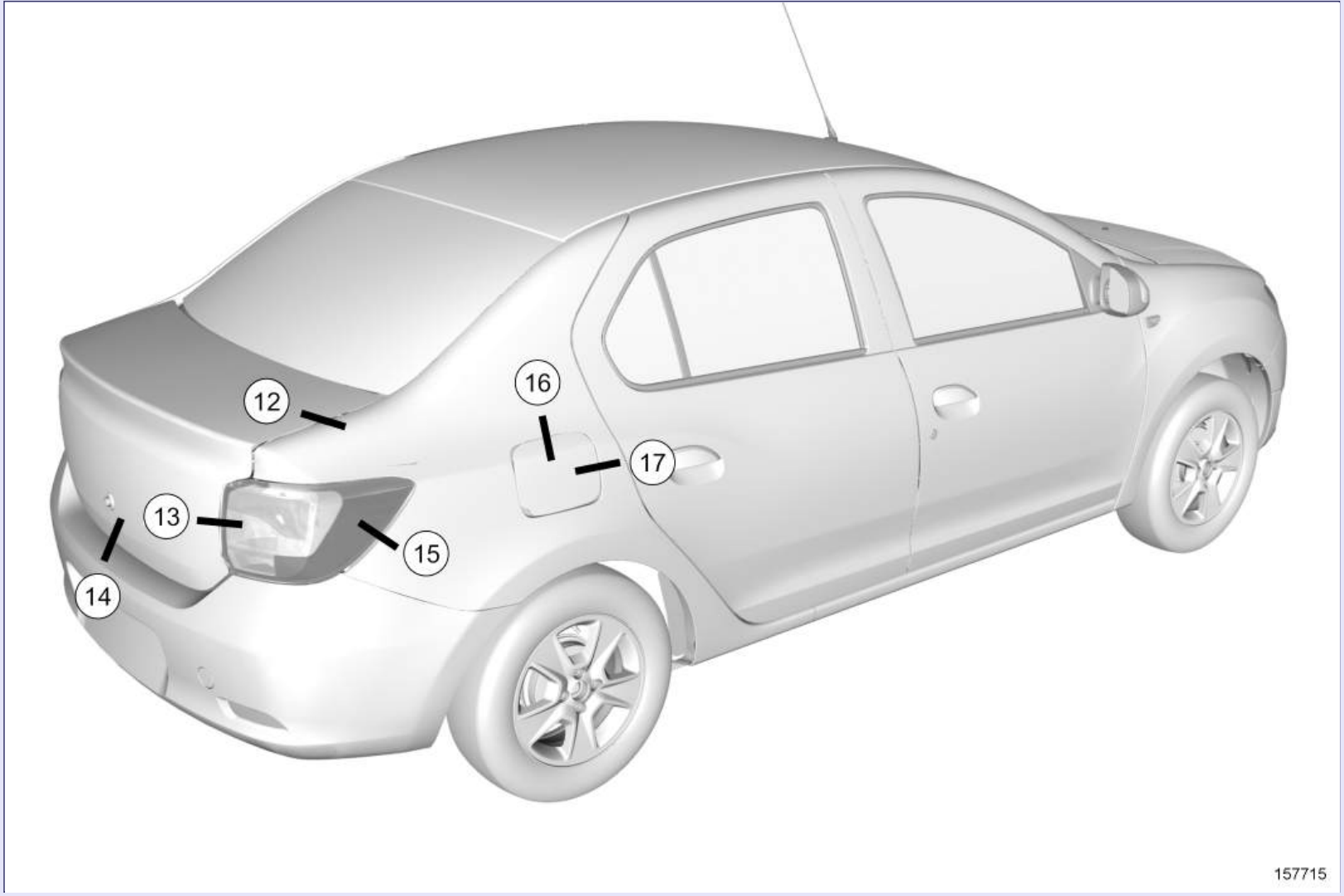
No.	Location	Clearances (mm)
(1)	bonnet / radiator grille	19 ± 1
(2)	headlight / radiator grille	2.5 ± 1.5
(3)	bonnet / headlight	5.5 ± 1.2
(4)	headlight / front wing	1.6 ± 1
(5)	bonnet / front wing	3.5 ± 1.5
(6)	front wing / front side door	4 ± 1.2
(7)	front side door / roof	17.5 ± 1.8
(8)	rear side door / roof	17.5 ± 1.8
(9)	front side door / rear side door	4 ± 1.2
(10)	side doors / sill panel	5 ± 2
(11)	rear side door / rear wing panel	4 ± 1.2

B52(B52)



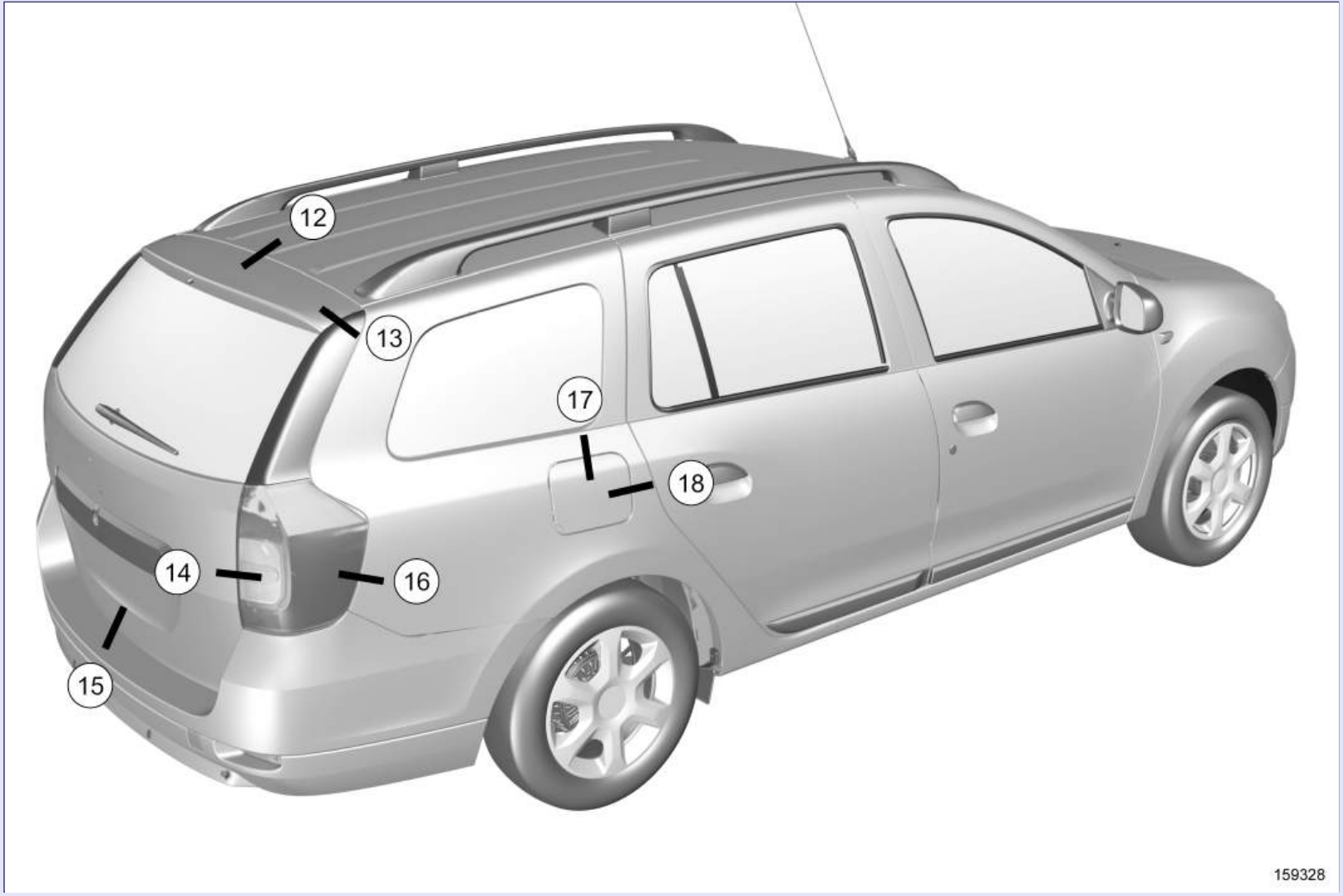
No.	Location	Clearances (mm)
(12)	rear wing panel / tailgate spoiler	4 ± 1.5
(13)	tailgate / rear wing panel	4 ± 1.5
(14)	tailgate / rear light	4.5 ± 1.6
(15)	tailgate / rear bumper	6 ± 2.5
(16)	rear light / rear wing panel	1.3 ± 1
(17)	rear wing panel / fuel filler flap cover	3.5 ± 1.2
(18)	rear wing panel / fuel filler flap cover	3.5 ± 1.2

L52(L52)



No.	Location	Clearances (mm)
(12)	boot lid / rear wing panel	3.5 ± 1.6
(13)	boot lid / rear light	4.7 ± 1
(14)	boot lid / rear bumper	6 ± 2.5
(15)	rear light / rear wing panel	1.3 ± 1
(16)	rear wing panel / fuel filler flap cover	3.5 ± 1.2
(17)	rear wing panel / fuel filler flap cover	3.5 ± 1.2

K52(K52)



No.	Location	Clearances (mm)
(12)	roof / tailgate spoiler	5 ± 1
(13)	rear light upper trim / tailgate spoiler	4 ± 1.6
(14)	tailgate / rear light	4 ± 1.6
(15)	tailgate / rear bumper	6 ± 2.5
(16)	rear light / rear wing panel	1.3 ± 1
(17)	rear wing panel / fuel filler flap cover	3.5 ± 1.2
(18)	rear wing panel / fuel filler flap cover	3.5 ± 1.2

VEHICLE: PARTS AND CONSUMABLES FOR THE REPAIR

CONSUMABLES FOR MECHANICAL REPAIR:

DEFINITION	PACKAGING	PART NUMBER
MECHANICAL SEALANTS		
SILICOR sealing paste	85 g tube	77 11 236 470
MASTIXO Joint face seal	100 g tube	77 11 428 232
Bearing sealing kit For crankshaft bearing cap side sealing	Kit	77 11 428 232
Transparent sealing mastic	45 g tube	77 11 223 369
Silicojoint	90 g tube	77 11 236 469
LOCTITE ADHESIVE 597 Sealing paste for PXX gearboxes	Cartridge	77 11 219 705
RESIN ADHESIVEor SEALING RESIN Sealing resin for engine and gearbox covers	25 ml tube	77 11 427 907
Leak detector	400 ml aerosol	77 11 236 176
ADHESIVES		
FRENETANCHE Sealing the threading at low and medium pressure	50 ml bottle	77 11 236 471

HIGH-STRENGTH THREADLOCK For locking bolts	50 ml bottle	77 11 230 112
SEALING RESIN For locking the bearings	50 ml bottle	77 11 236 472
LUBRICANT CLEANERS		
Nételec Avoid bad contacts in electrical circuits	150 ml aerosol	77 11 225 871
Injector cleaner	355 ml container	77 11 224 188or 77 11 425 574
Cloth for injection system		77 11 211 707
super releasing agent	500 ml aerosol	77 11 429 184
Super cleaner for joint faces For cleaning joint faces	300 ml aerosol	77 11 238 181
Surface cleaner	5 L container	77 01 404 178
Silicone lubricant	500 ml aerosol	77 11 429 447
Silicone-free lubricant	500 ml aerosol	77 11 236 167
Brake cleaner	600 ml aerosol	77 11 422 413
	150 ml aerosol	77 11 422 414
Bio brake cleaner	750 ml spray bottle	77 11 427 217

Air conditioning cleaner	250 ml aerosol	77 11 424 850
Carburettor cleaner	Aerosol	77 11 236 177
Ixtar engine cleaner	400 ml can	77 11 229 365
GREASE		
BR2+ GREASE For: ■ the lower arm bearings, ■ the anti-roll bar grooves, ■ the driveshaft splines.	1 kgpack	77 01 421 145
Silicone grease For: ■ the tubular rear axle bushes, ■ the anti-roll bar bushes.	100 g tube	77 11 419 216
COPPER ANTI-SEIZE GREASE Grease for turbochargers (high temperature)	85 g tube	77 11 236 173
Copper-aluminium lubricant Grease for turbochargers (high temperature)	500 ml aerosol	77 11 429 448
Grease For driveshaft seals	180 g sachets	77 11 420 011
WHITE GREASE For wheel sensors	400 ml aerosol	77 11 236 174

Multipurpose grease	500 ml aerosol	77 11 429 449
	250 ml aerosol	77 11 429 450
fluorstar 2L Silicone-free electric sealing grease	100 g tube	82 00 168 855
LACQUER		
Jelt argent Varnish for repairing heated rear screens	5 g bottle	77 11 230 111
BRAKE		
DOT 4, ISO Class 6, Renault standard: 03-50-006, For vehicles with and without electronic stability program (ESP)	0.5 L container	77 11 218 589
	5 L container	77 11 238 318
	25 L container	77 11 238 319
DOT 4, ISO Class 4, Renault standard: 03-50-005 Authorised for vehicles without ESP	0.5 L container	77 11 172 381
	5 L container	77 01 395 503
	25 L container	77 11 171 926
DOT 4 Authorised for vehicles without ESP, without clutch with hydraulic tappet	0.5 L container	86 71 000 000
	5 L container	86 71 014 277
	25 L container	86 71 014 278
COOLING SYSTEM		

ANTIFREEZE (type D)	1 L container	77 11 428 132
COOLANT (type D)	1 L container	77 11 428 133
	2 L container	77 11 428 129
	5 L container	77 11 428 130
OIL		
Engine oil	Engine oil: Specifications (Technical Note 6013A, 04A, Lubricants)	
Gearbox oil	Manual gearbox oil: Specifications (Technical Note 6012A, 04A, Lubricants)	
	(see **Automatic gearbox oil: Specifications**) (Technical Note 6012A, 04A, Lubricants)	
	(see **Sequential gearbox oil: Specifications**) (Technical Note 6012A, 04A, Lubricants)	
Axle oil	(see **Rear axle oil: Specifications**) (Technical Note 6012A, 04A, Lubricants)	
Elf Renault matic D2 Oil for power-assisted steering: Pump connected, pump assembly (except Laguna III and Latitude)	2 L container	77 01 402 037
TOTAL POWER-ASSISTED STEERING FLUID Oil for power-assisted steering: Pump assembly (Laguna III and Latitude)	1 L container	ordered from the ELF representative

Planetelf PAG 488 Oil for air conditioning compressor thermal vehicles	250 ml container	77 11 172 668
Sanden SP 10 Oil for air conditioning compressor thermal vehicles		77 01 419 313
Denso ND 11 Oil for air conditioning compressor electric vehicles	250 ml container	77 11 431 340
UNIVIS J26 Oil for retractable roof hydraulic system	250 ml container	77 11 172 160
TYRES		
Tyre paste	1 kgpack	77 11 223 052
	5 kgpack	77 11 223 053
Tyre repair agent	400 ml tube	77 11 221 296
	300 ml tube	77 11 222 802
BLANKING PLUG		
Engine type	Injection type	Part no.
F8Q		77 01 206 340
F9Q		77 01 208 229
G9T and G9U		77 01 208 229

K9K	DELPHI	77 01 206 804
K9K	SIEMENS	77 01 476 857
M9R		77 01 209 062
P9X		77 01 474 730
ZD3		77 01 208 229
MISCELLANEOUS		
Grey abrasive pad		77 01 405 943

CONSUMABLES FOR BODYWORK REPAIR:

HOLLOW SECTION WAX		
SPR CC	1 L container	77 11 172 672
SPR CC SPRAY	500 ml aerosol	77 11 211 654
STRUCTURAL ADHESIVE		
STRUCTURAL ADHESIVE	Kit =2 80 mlcartridges	77 11 219 885
HIGH PERFORMANCE STRUCTURAL ADHESIVE	1 195 mlcartridge	77 11 419 113
GLAZING PRODUCTS AND ADHESIVES		
MONOPAC EVOLUTION ADHESIVE KIT	310 ml cartridge	77 11 428 304
MONOPAC EVOLUTION ADDITIONAL CARTRIDGE + NOZZLE	310 ml cartridge	77 11 421 431
S-P KIT ADHESIVE KIT	310 ml cartridge	77 11 421 432
ADDITIONAL S-P KIT CARTRIDGE + NOZZLE	310 ml cartridge	77 11 421 433
BIPAC EVOLUTION ADHESIVE KIT	2 225 mlcartridges	77 11 421 434
KIT BASICPAC XL	310 ml cartridge	77 11 428 713
ADDITIONAL BASICPAC XL CARTRIDGE	310 ml cartridge	77 11 428 725
LINT-FREE CLOTH	Box of 340cloths	77 11 237 262
WINDOW SEALING MASTIC	310 ml cartridge	77 11 170 222
SPECIAL ADHESIVE FOR WINDOWS		77 11 425 759

ADHESION PROMOTER For bonding double-sided adhesive tape	Cloth	77 11 423 222
MISCELLANEOUS		
DOUBLE-SIDED ADHESIVE	18 mm wide	77 11 226 308
DOUBLE-SIDED ADHESIVE	8 mmwide	77 11 427 869
FRENETANCHE	50 ml bottle	77 11 236 471
Adhesive patch		82 00 043 181
Adhesive pad		77 05 042 163
SEALS		
BLACK MJ PRO(Electroweldable)	310 ml cartridge	77 11 172 676
WHITE MJ PRO II(Electroweldable)	310 ml cartridge	77 11 426 951
PREFORMED SEALING MASTIC BEAD	2.6 m roll	77 01 423 330
BRUSH MASTIC	1 kgpack	77 11 228 113
FILLER MASTIC	60 beads Ø 6 mm by 0.3 m	77 11 170 230
GREASE		
WHITE GREASE	400 ml aerosol	77 11 236 174
OPENING ELEMENT MECHANISM GREASE	20 g sachets	77 11 419 865

SILICONE LUBRICANT	500 ml aerosol	77 11 236 168
SILICONE-FREE LUBRICANT	500 ml aerosol	77 11 236 167
JOINT LUBRICANT (sunroof)	250ml container	77 11 429 898
SOUNDPROOFING		
SPR GREY EVOLUTION	1 l cartridge	77 11 419 114
SPR GREY EVOLUTION SPRAY	400 ml aerosol	77 11 419 116
SPR BLACK EVOLUTION II	1 l cartridge	77 11 419 115
SOUNDPROOFING PAD (3.5 Kg/m²)	Pack of 10	77 01 423 546
SOUNDPROOFING PAD (6.5 Kg/m²)	Pack of 5	77 01 423 269
POLISHING		
Polishing liquid	1 L container	77 11 420 288
Finishing liquid	1 L container	77 11 420 289
MASTIC		
Universal mastic		
GALAXI	2.5 kg pack	77 11 172 238
OPTIMAX	1.23 l cartridge	77 11 172 239

EXCELLENCE + For finishing plastic repair	960 g cartridge	77 11 423 539
	1 kgpack	77 11 423 540
Plugging mastic		
XFIBRE FIBREGLASS MASTIC	975 kg pack	77 11 172 235
STANDARD BASIX POLYESTER MASTIC	1.975 kg pack	77 11 172 234
ALUX ALUMINIUM MASTIC	975 kg pack	77 11 172 236
Sprayable mastic		
PIXTO SPRAYABLE POLYESTER MASTIC	1.5 kg tin	77 11 172 237
Finishing mastic		
IXTRA POLYESTER MASTIC	1.625 kg pack	77 11 172 233
Anti-grit mastic		
MAG PRO 1	310 ml cartridge	77 11 172 679
MAG PRO 3(Dual component)	1.5 kg tin	77 11 218 364
SURFACE CLEANER		
HEPTANE	500 ml container	77 11 170 064
SOLVENT SURFACE CLEANER	5 L container	77 01 404 178
WATER-BASED SURFACE CLEANER	5 L container	77 11 421 337
ANTISTATIC THINNER(for plastic materials)	400 ml aerosol	77 01 408 493

BIO SHAMPOO	30 L container	77 11 228 950
PRESSURE SPRAY	1 L capacity	77 11 171 246
COMPOSITE MATERIAL REPAIR BY BONDING		
Plastic repair kit		77 11 423 516
Nozzle for plastic repair kit		77 11 423 523
Plastic repair cleaner	1 L container	77 11 423 517
Plastic repair primer	150 ml bottle	77 11 423 518
Plastic repair adhesive	2 x 25 mlbicomponent cartridge	77 11 423 519
Plastic repair cloth	90 m roller	77 11 423 520
Plastic repair nozzles	12 nozzles	77 11 423 522
COMPOSITE MATERIAL REPAIR BY WELDING		
Plastic weld repair set		77 11 425 742
Protective strips	Bag of 10protective strips	77 11 425 744
Stainless steel mesh	Bag of 2meshes	77 11 425 743
Cooler	400 ml aerosol	77 11 425 745
Brush	Box of 10brushes	77 11 237 793
WINDOW MASKING TAPE		

10 mm windscreen tape		77 11 171 708
20 mm windscreen tape		77 11 171 709
PROTECTIVE WELDING		
ANTI-SPLASH SPRAY	400 ml aerosol	77 11 218 270
SPECIFIED UNDERCOAT		
PRE-TREATMENT PRIMER WITHOUT ZINC CHROMATE(I-Alpha) + Thinner	1 L container	77 11 420 027 (Primer) 77 11 420 028 (Thinner)
I-PREMIA REACTIVE PRIMER(do not use on aluminium)	3.5 l container	77 11 239 243 (Primer) 77 11 228 654 (Thinner)
I-PREMIA REACTIVE PRIMER(do not use on aluminium)	400 ml aerosol	77 11 419 416
Adhéra Spray(adhesion promoter for thermoplastics)	400 ml aerosol	77 11 423 734
PRIMARA black(adhesion promoter/primer for thermoplastics)	1 L container	77 11 423 735 77 11 171 514 (Activator)
PRIMARA(adhesion promoter/primer for thermoplastics)	1 L container	77 11 423 735 77 11 171 514 (Activator)

OPTIC PRIMER	0,5 L container	77 11 429 949
UNDERCOAT		
LEVIA	3.5 l container	77 11 228 651
FORTIA	3.5 l container	77 11 228 650

VEHICLE: SEALING CHECK

Note:

In order to make the sealing check easier, the vehicle has been divided into several zones.

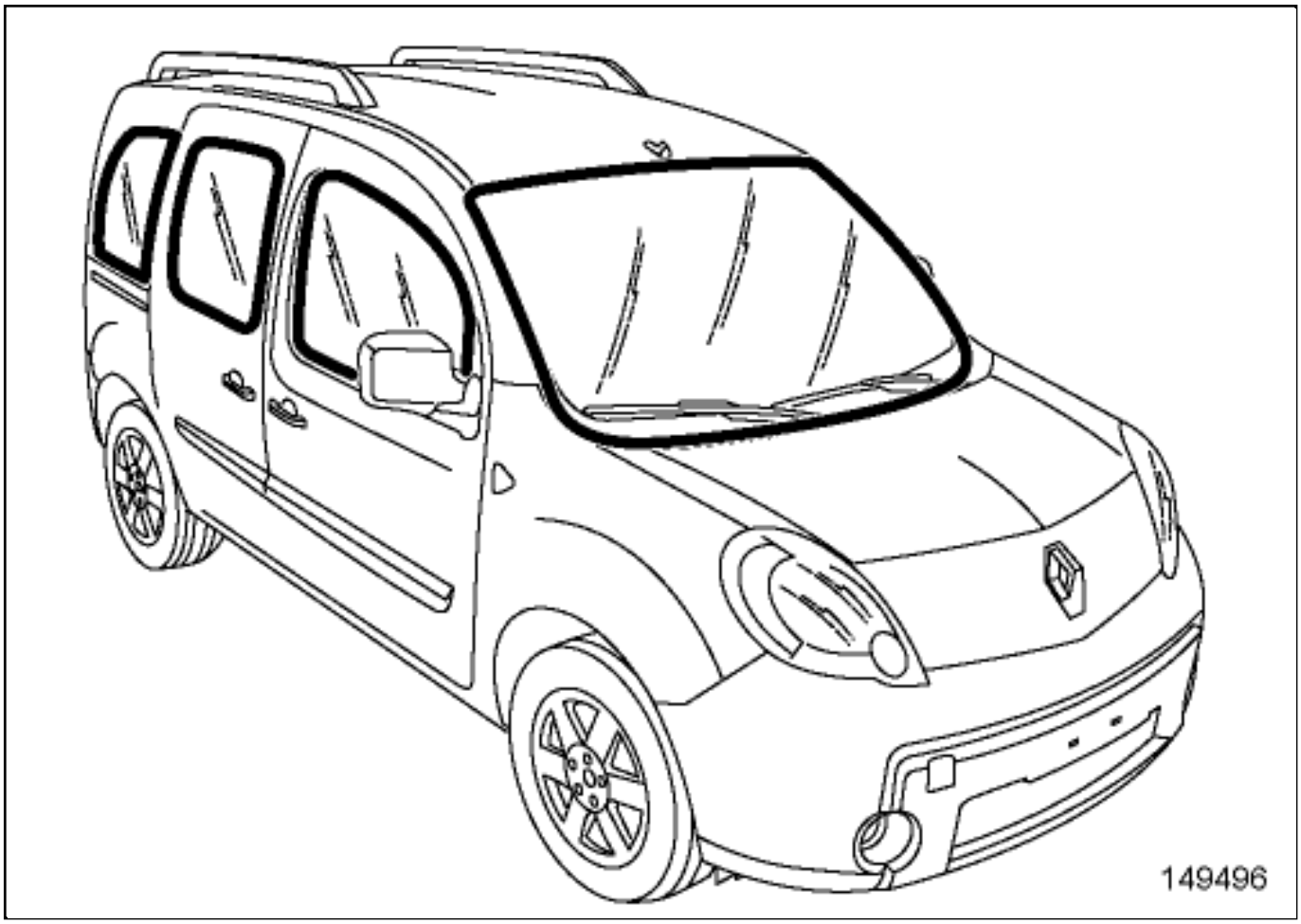
These zones are split specifically to allow for a focused search.

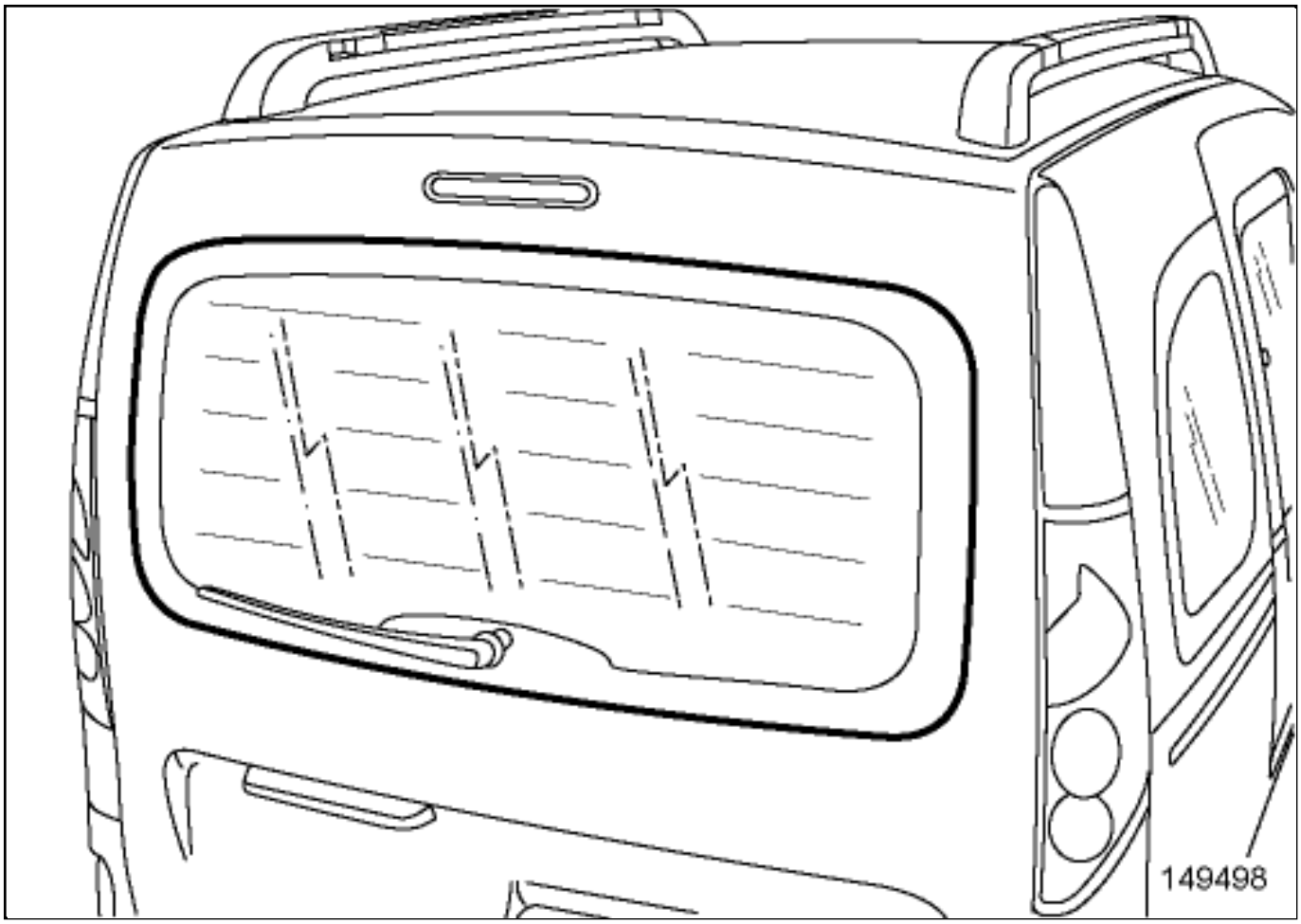
Note:

You will find below the links to access the methods for checking the sealing of the zones concerned.

1. DISTRIBUTION OF ZONES

ZONE 1

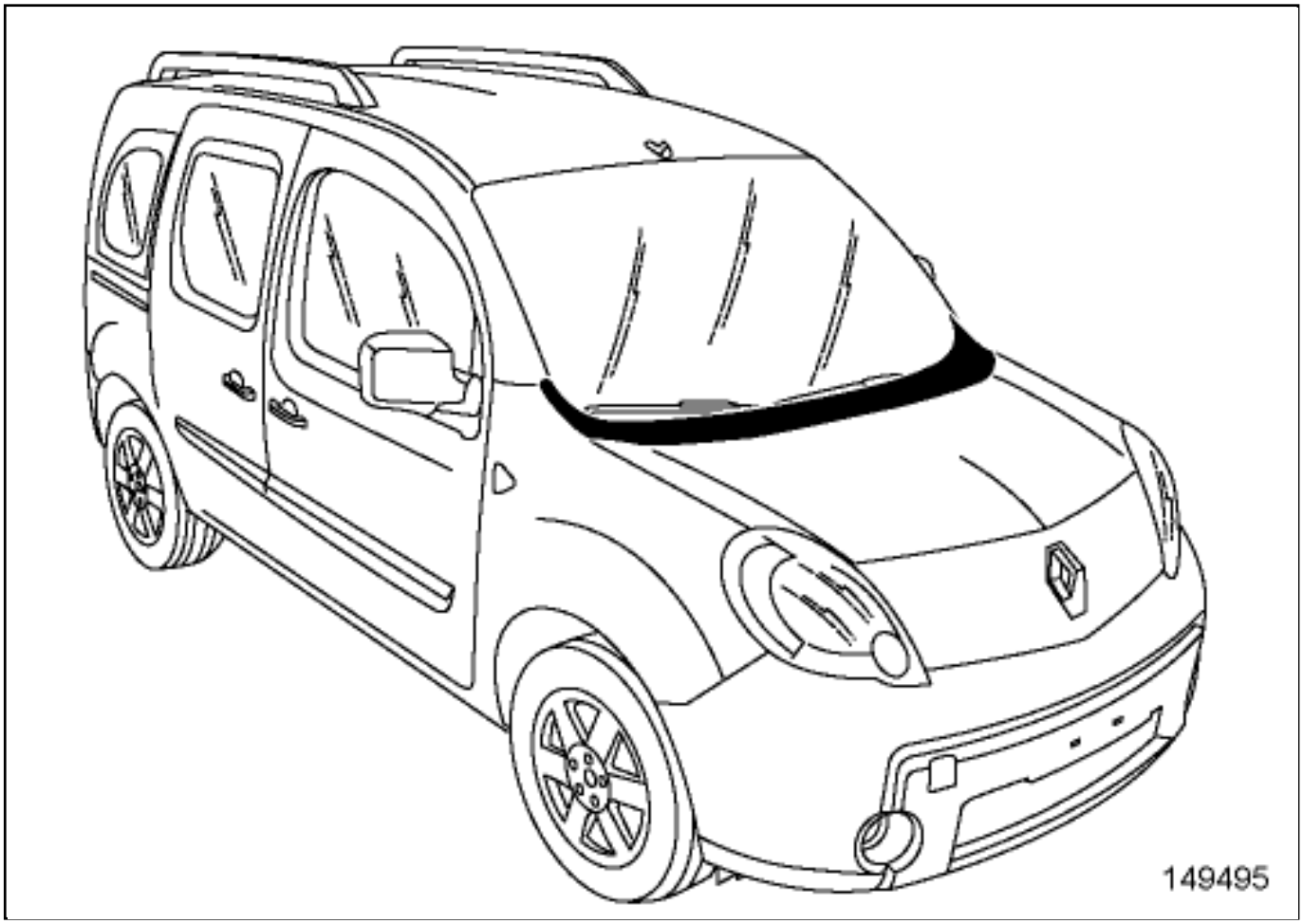




Zone 1:

- Windows **(see 60A, General information, Windows: Sealing check)**

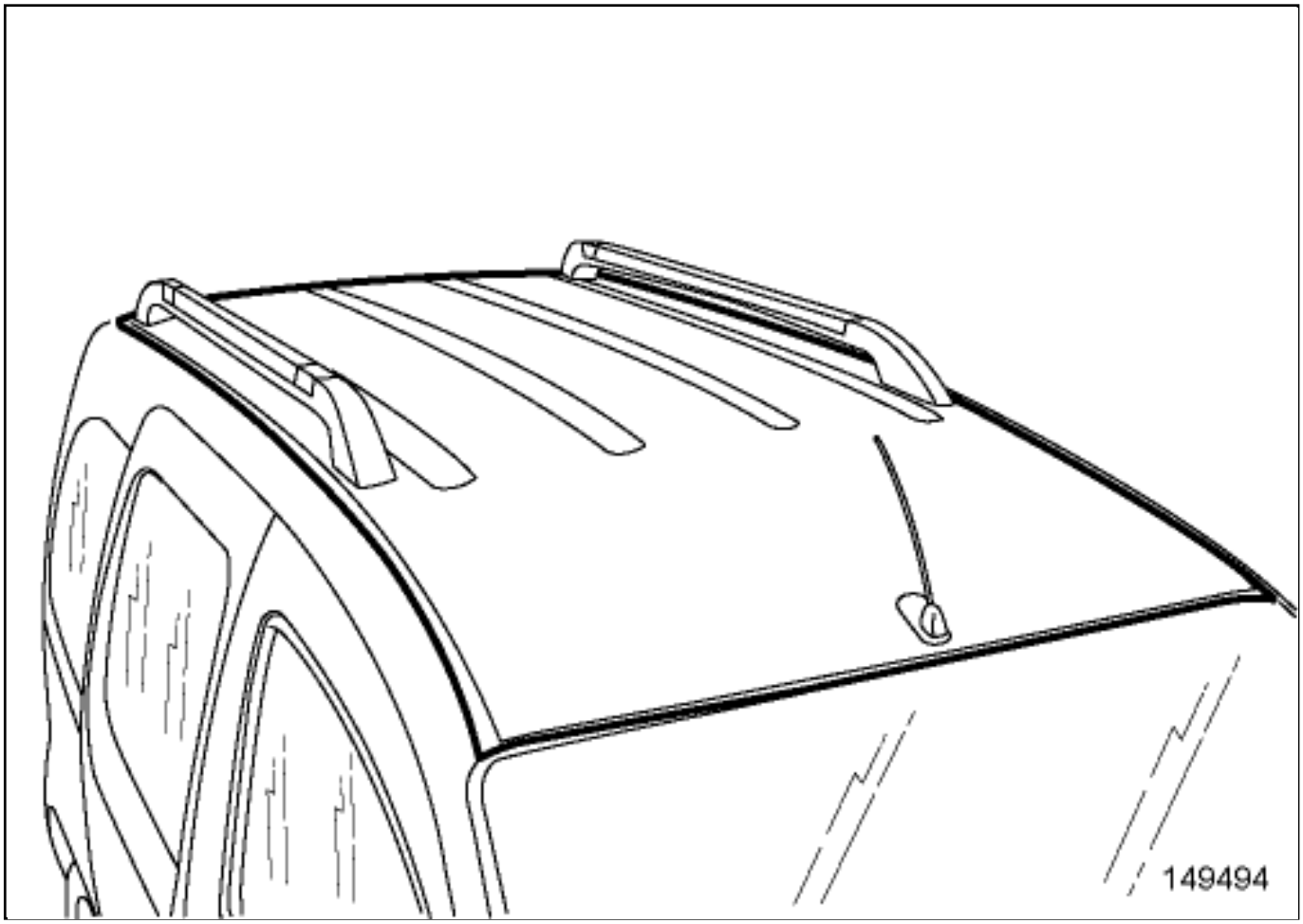
ZONE 2



Zone 2:

■ Front section of the vehicle: Checking the sealing(see 60A, General information, Front section of the vehicle: Sealing check) .

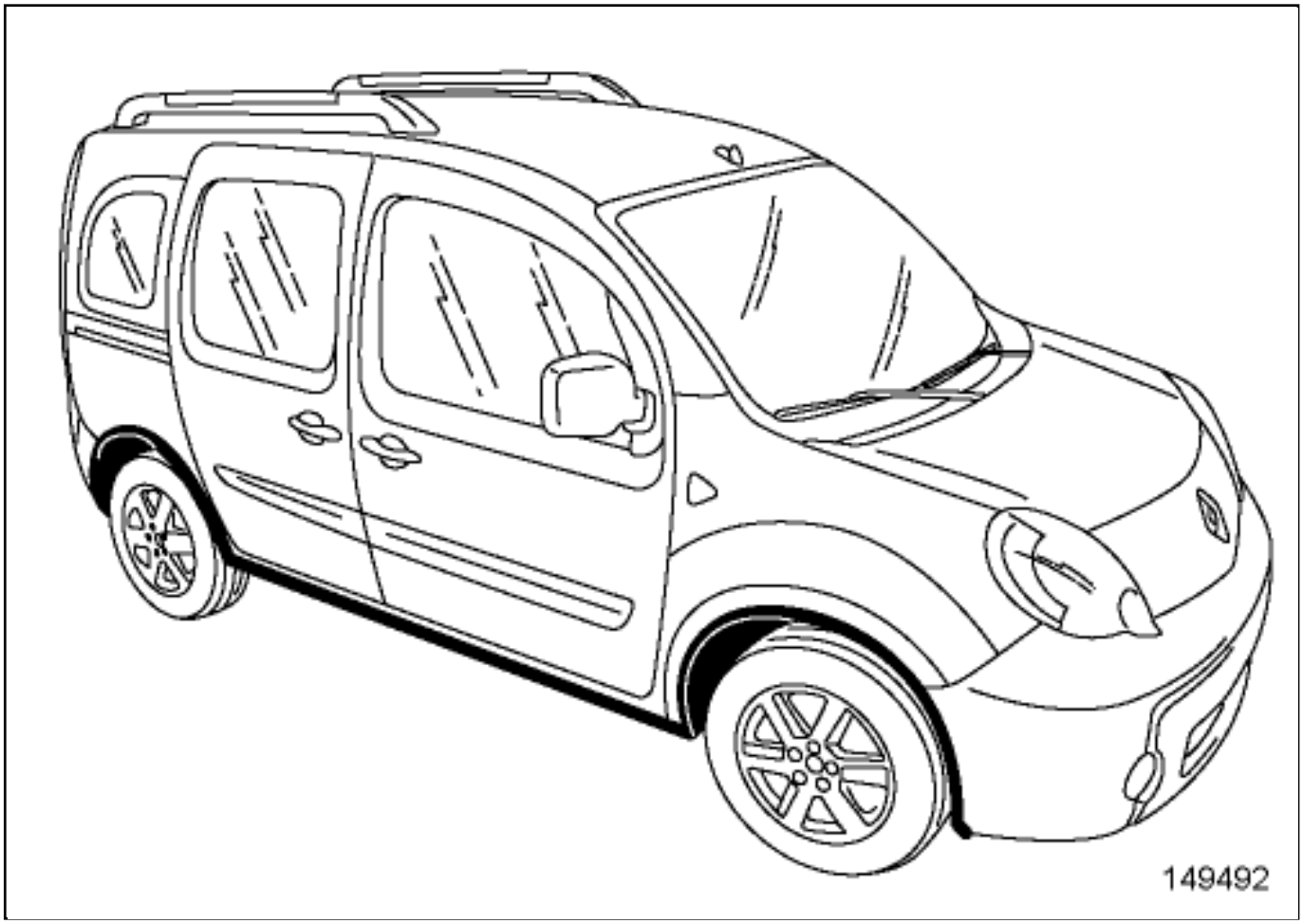
ZONE 3



Zone 3:

- Roof(see 60A, General information, Roof: Sealing check) and retractable roof(see 60A, General information, Retractable roof: Sealing check) .

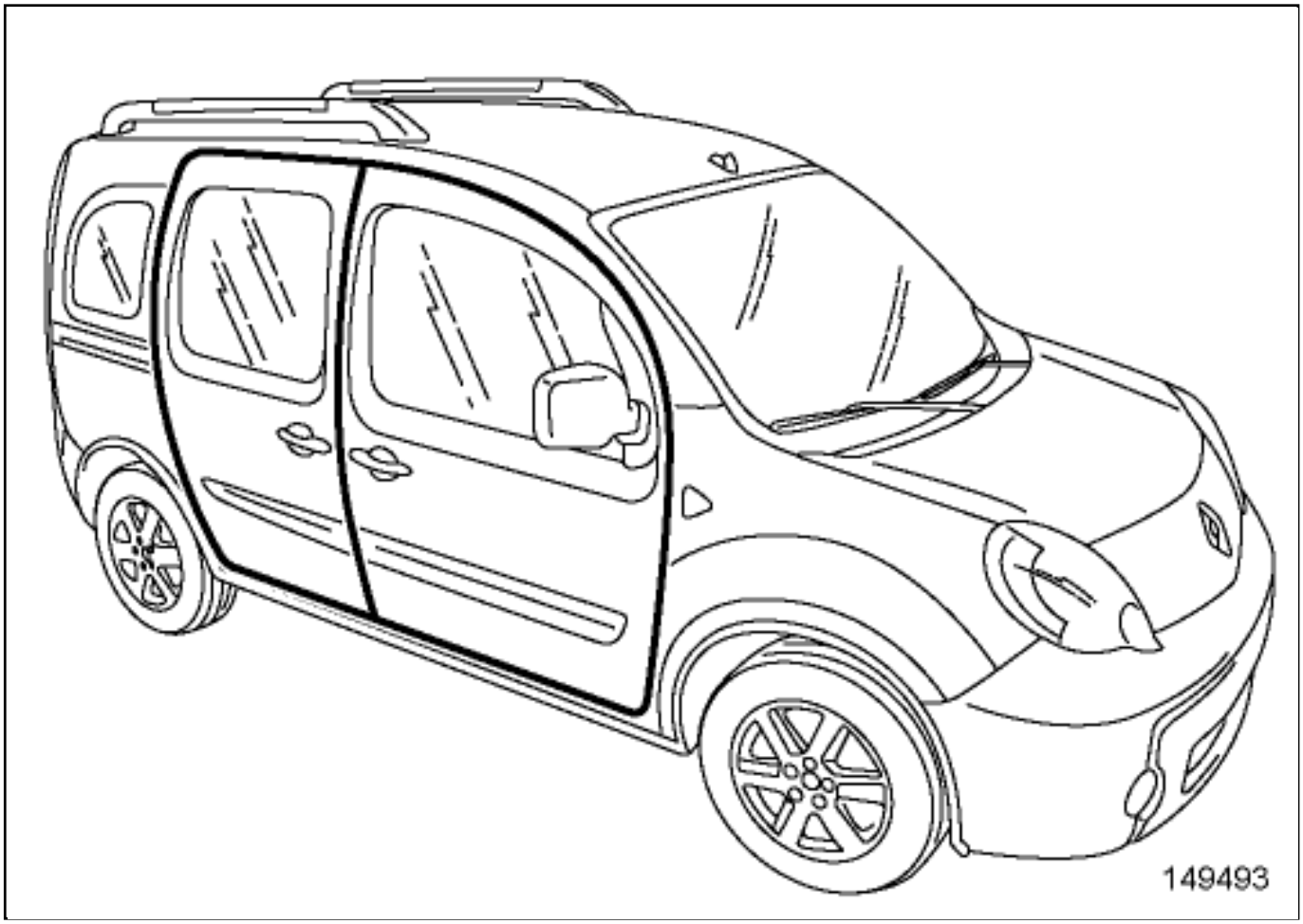
ZONE 4



Zone 4:

■ Underside of the vehicle: Checking the sealing(see 60A, General information, Underside of the vehicle: Sealing check) .

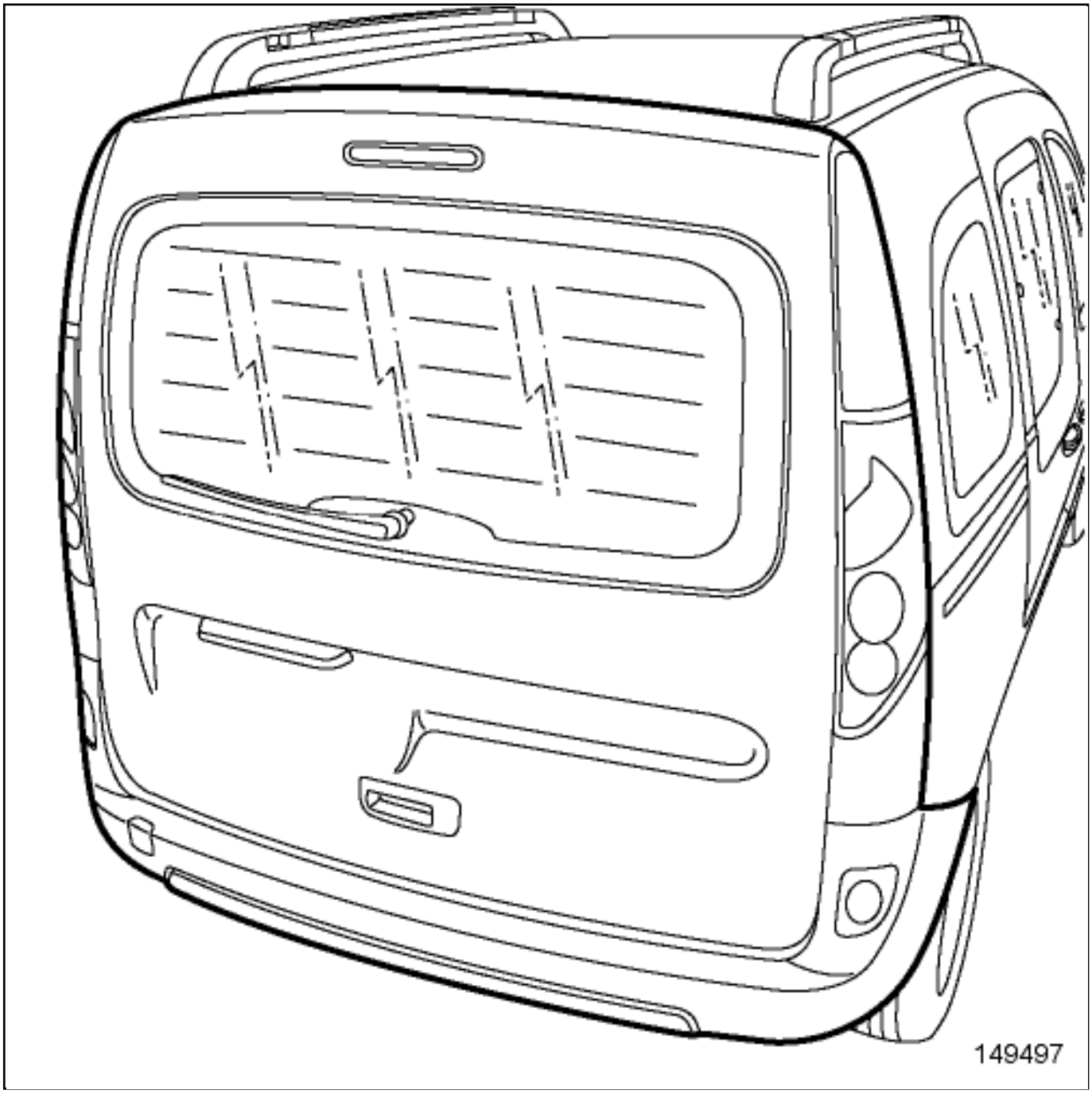
ZONE 5



Zone 5:

■ Side opening elements: Checking the sealing(see 60A, General information, Side opening elements: Sealing check) .

ZONE 6



Zone 6:

■ Rear section of the vehicle: Checking the sealing(see 60A, General information, Rear section of the vehicle: Sealing check) .

Note:

When checking the sealing of a zone, if the customer complaint was not reproduced, extend the sealing check to neighbouring zones.

As the flow of water can sometimes be complex, water may enter through a zone opposite to where the water is actually present.

XSL version : 3.02 du 22/07/11

VEHICLESEALING:GENERALINFORMATION

1. DEFINITION

1- SEALING RING

Rendering a component watertight means stopping or diverting the flow of fluid.

For vehicles, this means protecting a passenger compartment against any ingress of water.

- The design and production of the vehicle bodywork, generally speaking, depend on:
  - the shape of the bodywork (design, aerodynamics, etc.),
  - safety,
  - the variety and number of parts it comprises (means of manufacture and assembly),
  - the anti-corrosion protection of the structure,
  - the raw materials and products it comprises (plastic, rubber, mastic, adhesives, etc.).

- A certain number of faults may appear in After-Sales, even though they do not necessarily appear when the vehicle exits the production line, despite all the means made use of in the assembly plant:
  - various checks during assembly,
  - systematic passage of all vehicles through a multi-jet wash.

During the "first few days of a vehicle's life", the bodywork is subjected to various stresses.

These stresses may be determining factors for possible sealing faults.

In a vehicle, certain zones are designed to allow water to flow out.

The water outlet zones are therefore located at the lower section of the components (opening element box sections, sill panel, central or side section of the scuttle panels, front and rear sections of the sunroofs, etc.).

2- CHECKING THE SEALING

Vehicle spraying methodology.

3- REPAIRING THE SEALING

Procedure for resolving water ingress.

2. PREPARATION BEFORE CHECKING AND REPAIRING THE SEALING

Before any operation involving checking the sealing, check that all of the opening elements are correctly

closed (sliding and tilting windows, sunroof mobile panel, etc.).

All the checks must be performed in the washing area of the workshop equipped with sealing tools. In the event of a customer fault, the check must reproduce the conditions described by the customer (as much as possible).

Note:

Ask the customer questions before any operation; information collected about the environment and position of the vehicle are important to locate the leak.

Example:

- vehicle parked forwards or backwards on a significant slope or parked partially on a pavement,
- very heavy rain, accompanied by a gust of wind,
- washing with a high pressure cleaning device without respecting the manufacturer's recommendations described in the driver's handbook,
- automatic car washes may clog the outlet holes,
- jet washing by an untrained operator directing a flow of water at the air inlets and outlets, etc.,
- vehicle parked under vegetation (accumulation of dead leaves in the scuttle panel, etc.),
- identify the nature of the liquid present in the vehicle (rainwater, washer fluid or coolant, etc.),
- Does using the air conditioning cause the presence of water?

1- VISUAL INSPECTION

Before beginning to spray the vehicle, perform a "First visual inspection" to look for any dry signs of infiltration.

Inspecting the vehicle enables visible points of infiltration to be identified (seals which are not flush or damaged, incorrect positioning of a grommet, blanking cover, mastic bead, etc.).

2- PREPARATION OF THE TOOLS

(see 60A, General information, Sealing tools: Description) .

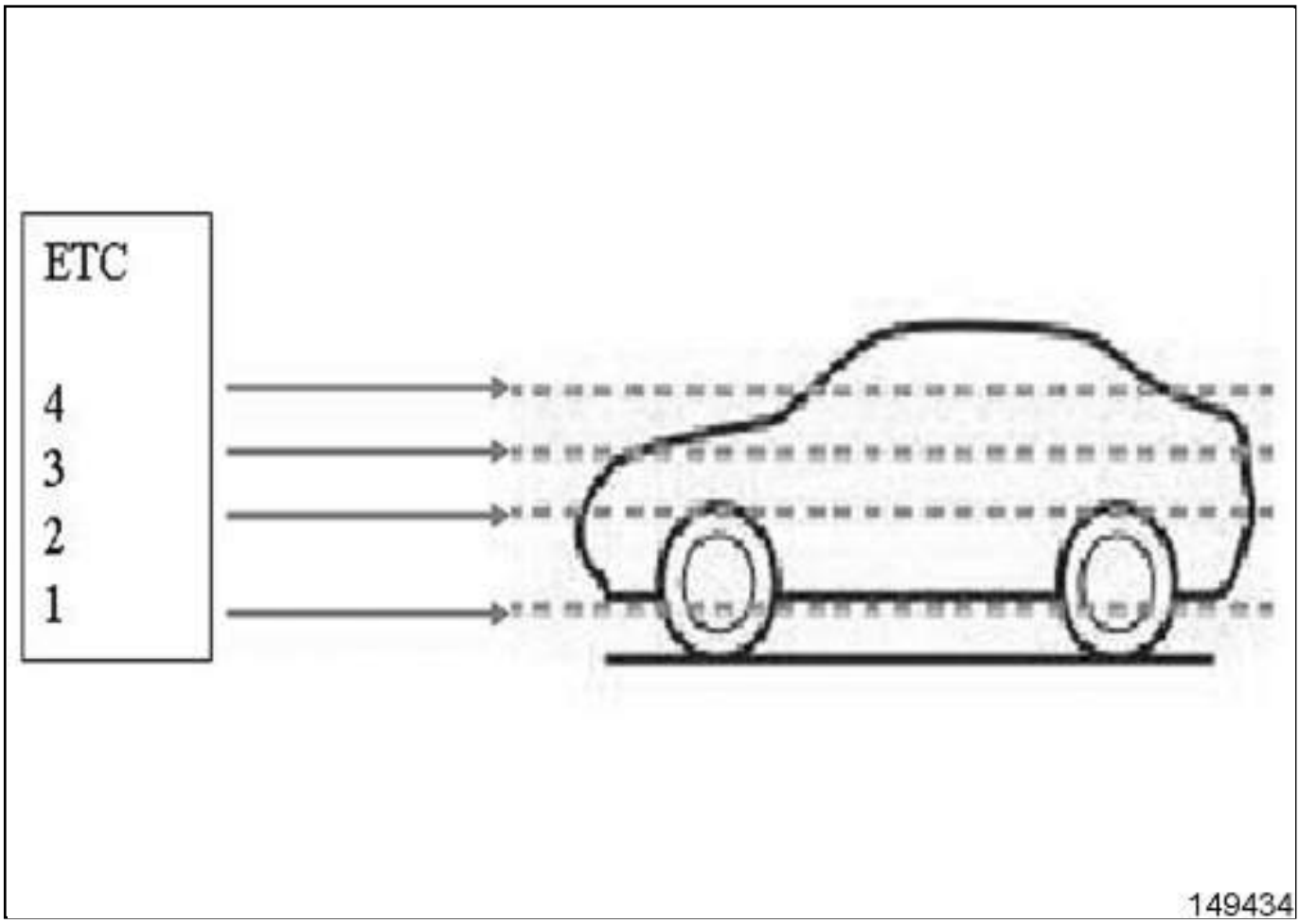
3. CHECKING THE SEALING

1- SPRAYING THE VEHICLE

"Spraying" the vehicle is an important point in the method and detection of water ingress.

Start spraying the vehicle at the lowest zones. If water is not found to be present in the vehicle, eliminate the sprayed zone as a zone of water ingress and spray increasingly higher.

1)SPRAYING LEVEL



2)SPRAYING ZONE

In order to make it easier to check the sealing, the vehicle is split into several zones(see 60A, General information, Vehicle: Sealing check) .

2- LOOKING FOR WATER INGRESS

- It may sometimes be necessary to request the help of a second operator:
  - one person directs the jet in the area to be checked.
  - the other operator, inside the passenger compartment, observes and locates the origin of the infiltration (obtain a door mirror glass and a pocket torch for areas which cannot be seen directly or are not well lit).

4. REPAIRING THE SEALING

1- POSSIBLE CAUSES OF WATER INGRESS

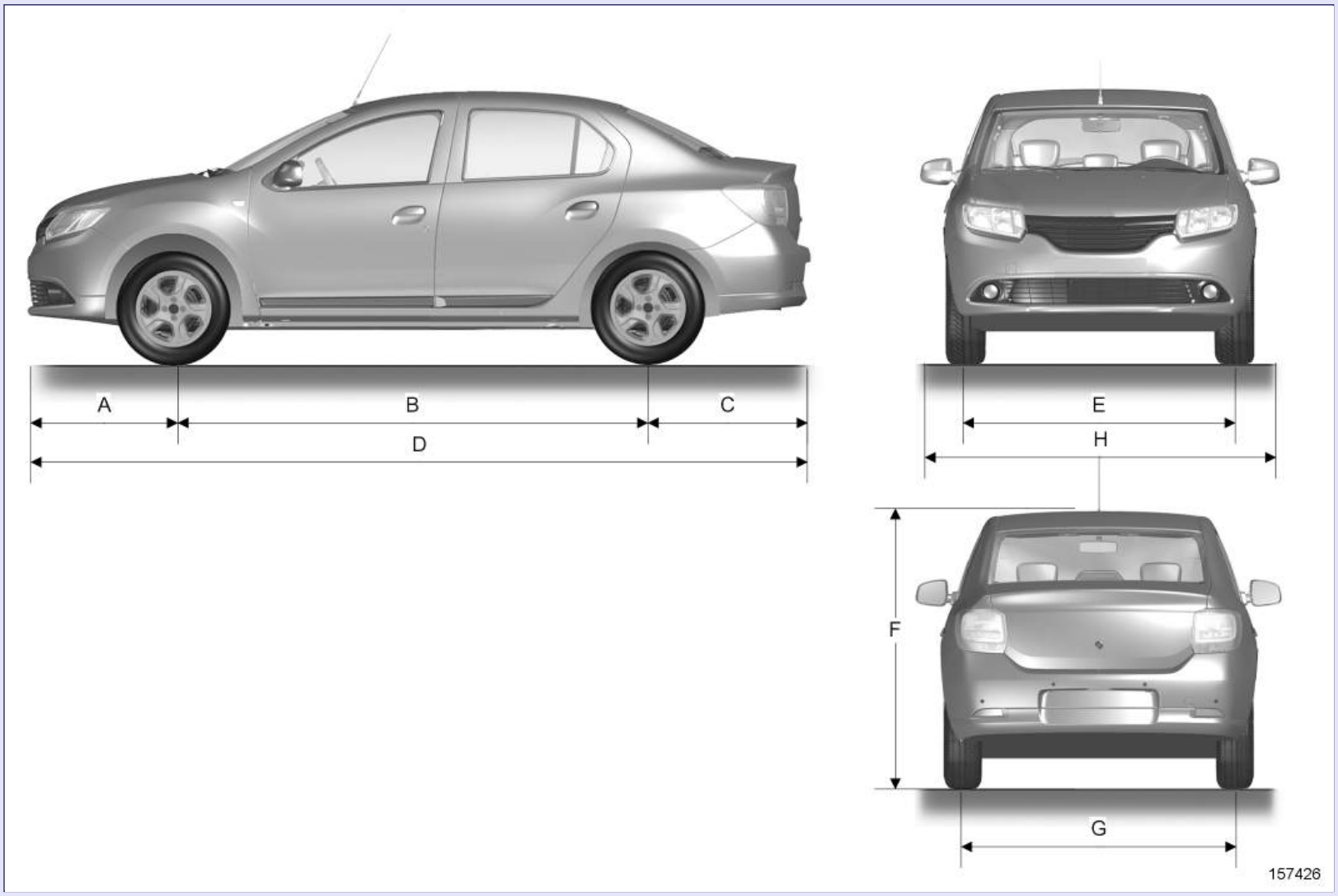
The infiltrations are generally due to:

- a mastic seal next to the assembly line or partially detached or cracked,
- (micro) holes made by air bubbles when applying mastic,
- incorrect window bonding,
- incorrect mating between two parts (welded, removable, bonded, etc.),
- incorrect positioning of the various grommets or blanking covers,
- incorrect positioning of or damage to the various rubber profiles (door seals, luggage compartment, glass run channels, etc.),
- a dirty seal,
- partially obstructed or crushed drain pipes,
- a door sealing film which is deformed, poorly positioned, torn, etc.,
- poorly performed repair operations.

2- REPAIRING THE SEALING

Sealing repair consists of:

- individually testing the possible causes of the water ingress detected.
- stopping the identified cause.
- checking the repair.
- continue the checking cycle to ensure that there is no other ingress of water.
- confirm the repair through a checking cycle of the zone.



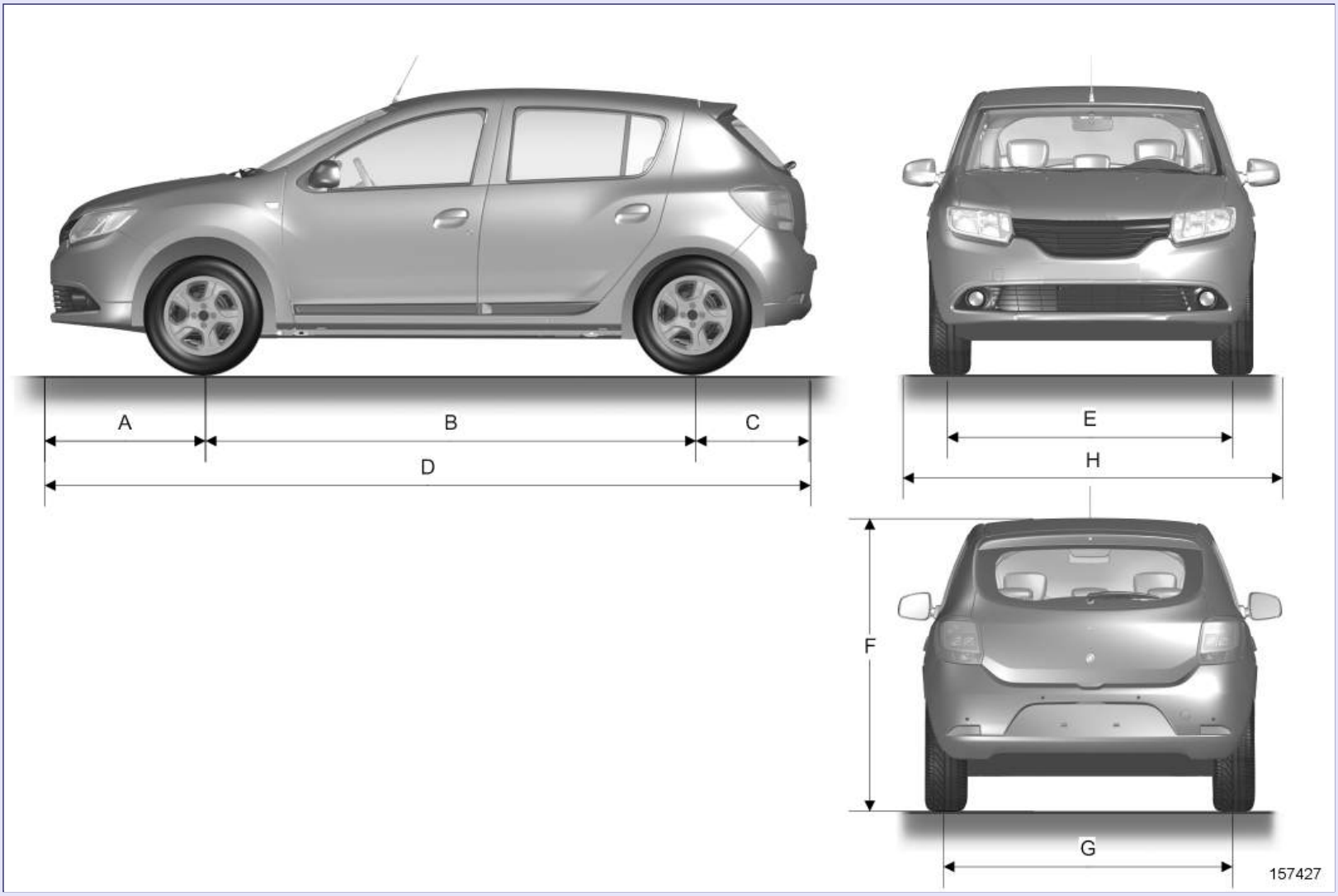
DIMENSIONS IN METRES:

(A)	0.818
(B)	2.634
(C)	0.894
(D)	4.346
(E)	1.497
(F) (unladen)	1.543
(G)	1.486
(H)	1.994

Engine			Gearbox		Emissions standard
Engine type	Engine suffix	Cubic capacity (cm^3)	Gearbox type	Gearbox suffix	
K9K	612	1461	JR5	336	EURO 5
				373	
	830			345	EURO 4
				369	
	838			345	EURO 3
				369	
K7M	764[b]	1598	JS3	001	LEV 5
			JH3	095	
	812			069	EURO 5
				088	EURO 4 EURO 5
				092	EURO 4
				542	EURO 5
			JS3	001	
K4M	842	1598	JH3	093	EURO 5
				542	
				369	EURO 4
				370	T2B5
	845		DP2	226	EURO 4
D4D	754[b]	999	JH3	094	LEV 5
D4F	732	1149	JH3	081	EURO 4 EURO 5
				085	
				087	
				090	
	734[a]			087	
H4B	400	899	JH3	336	EURO 5
				351	
			JS3	002	

a : Engine running on LPG.

b : Engine running on an ethanol/petrol mixture



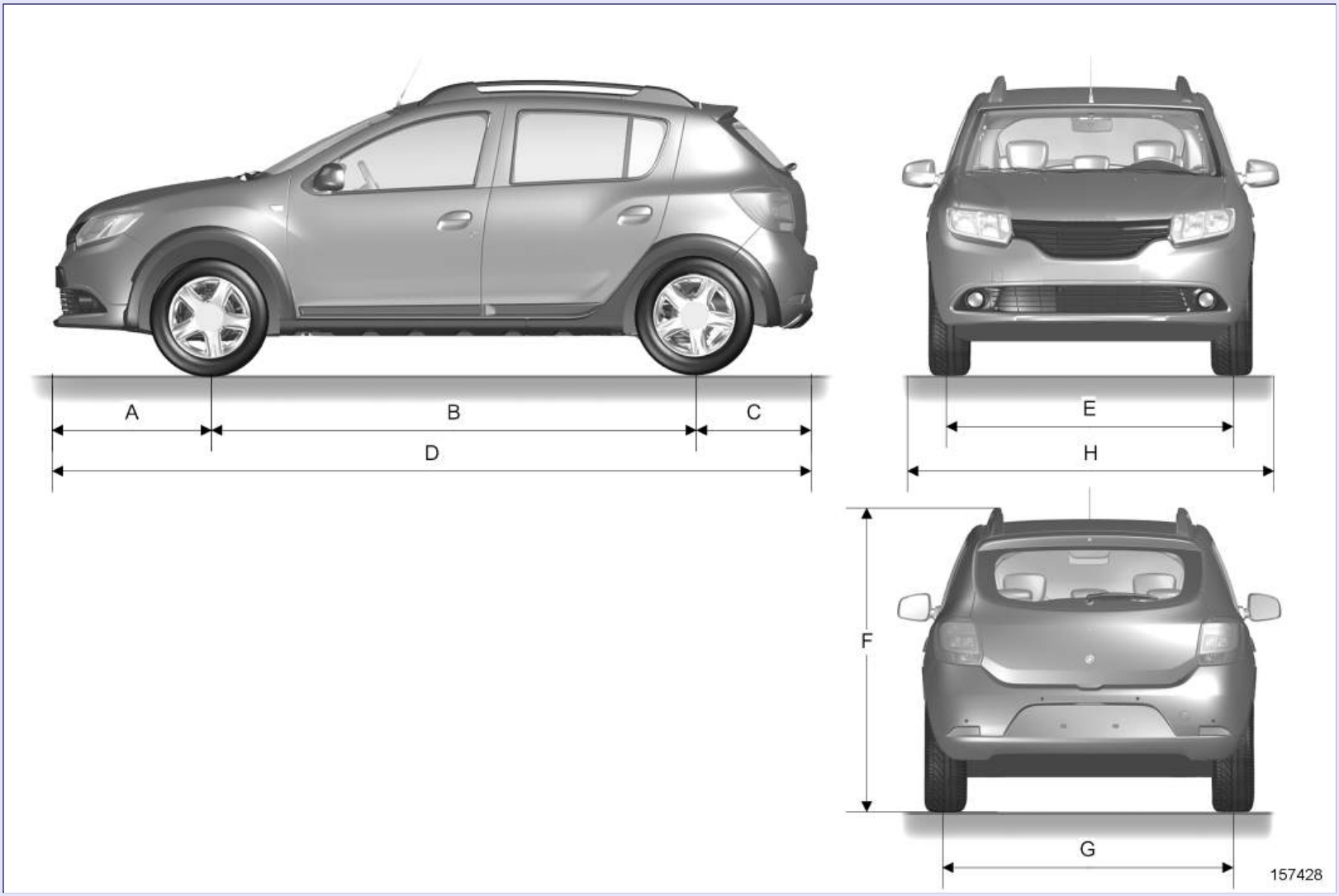
DIMENSIONS IN METRES:

(A)	0.818
(B)	2.589
(C)	0.650
(D)	4.057
(E)	1.497
(F) (unladen)	1.523
(G)	1.486
(H)	1.994

Engine			Gearbox		Emissions standard
Engine type	Engine suffix	Cubic capacity (cm^3)	Gearbox type	Gearbox suffix	

K9K	612	1461	JR5	336	EURO 5
				368	
				373	
				374	
	830			345	EURO 4
				369	
	838			345	EURO 3
				369	
K7M	812	1598	JH3	088	EURO 4
				091	
				092	
D4F	732	1149	JH3	081	EURO 4 EURO 5
				085	
				087	
				090	
	734[a]		JH3	087	
H4B	400	899	JH3	336	EURO 5
				351	
			JS3	002	
K4M	842	1598	JH3	365	EURO 5
				369	EURO 4
				370	T2B5
	845		DP2	226	EURO 4

a : Engine running on LPG.



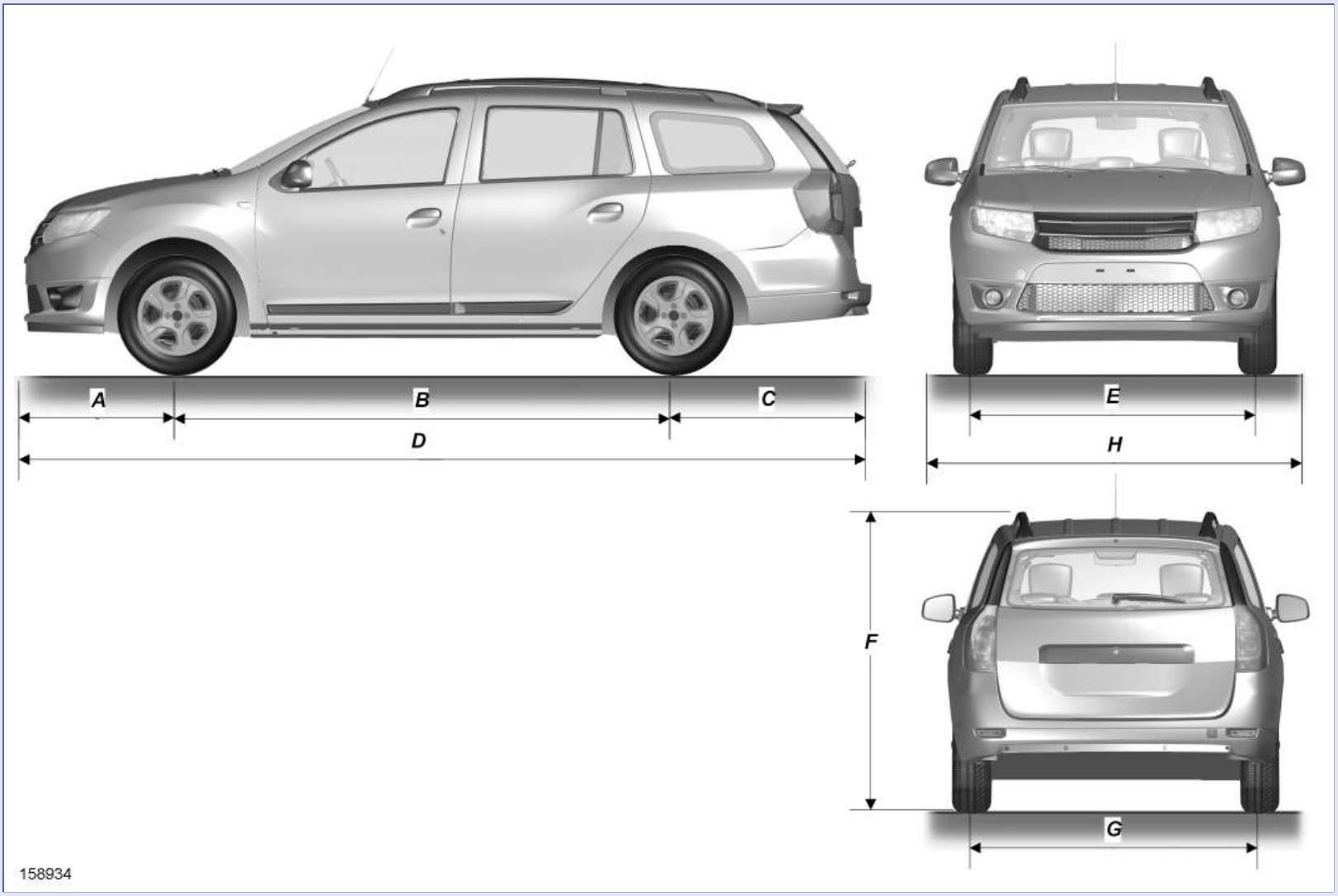
DIMENSIONS IN METRES:

(A)	0.835
(B)	2.589
(C)	0.656
(D)	4.080
(E)	1.497
(F) (unladen)	1.618
(G)	1.486
(H)	1.994

Engine			Gearbox		Emissions standard
Engine type	Engine suffix	Cubic capacity (cm^3)	Gearbox type	Gearbox suffix	

K9K	612	1461	JR5	336	EURO 5
				368	
				373	
				374	
	830			345	EURO 4
				369	
K7M	764[b]	1598	JH3	358	LEV 2
	812			088	EURO 4
				091	
				092	
				365	EURO 5
			JS3	001	EURO 5
H4B	400	899	JH3	336	EURO 5
				351	
			JS3	002	
K4M	842	1598	JH3	358	EURO 5
				365	
				369	EURO 4
				370	T2B5
	845		DP2	226	EURO 4

b : Engine running on an ethanol/petrol mixture



DIMENSIONS IN METRES:

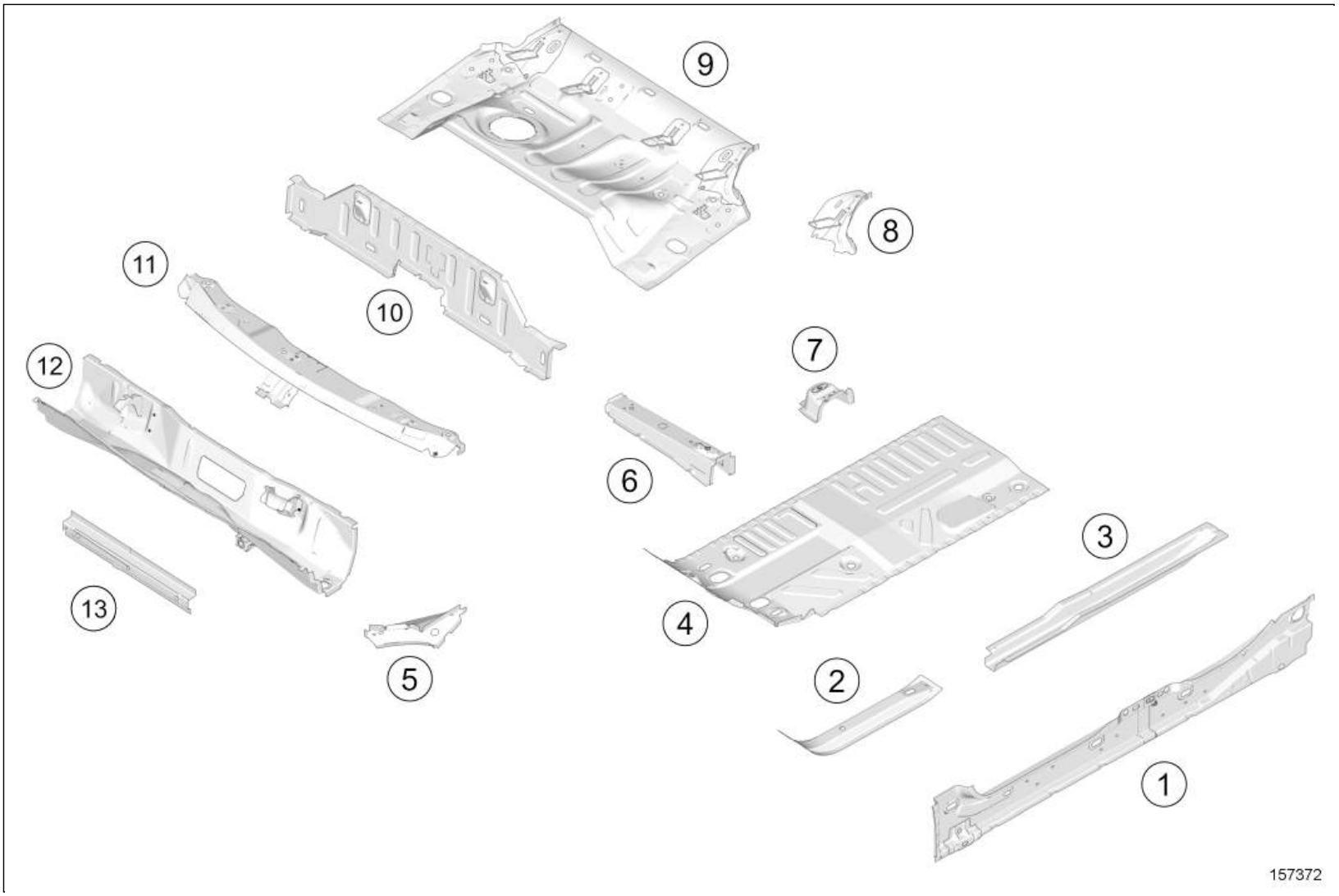
(A)	0.818
(B)	2.634
(C)	1.042
(D)	4.494
(E)	1.497
(F) (unladen)	1.550
(G)	1.486
(H)	1.994

Engine			Gearbox		Emissions standard
Engine type	Engine suffix	Cubic capacity (cm^3)	Gearbox type	Gearbox suffix	

K9K	612	1461	JR5	336	EURO 5
				373	
	830			345	EURO 4
				369	
	838			345	EURO 3
				369	
K7M	812	1598	JH3	088	EURO 4
				092	
D4F	732	1149	JH3	081	EURO 4 EURO 5
				087	
				090	
	734[a]			087	
H4B	400	899	JH3	336	EURO 5
				351	
			JS3	002	

a : Engine running on LPG.

b : Engine running on an ethanol/petrol mixture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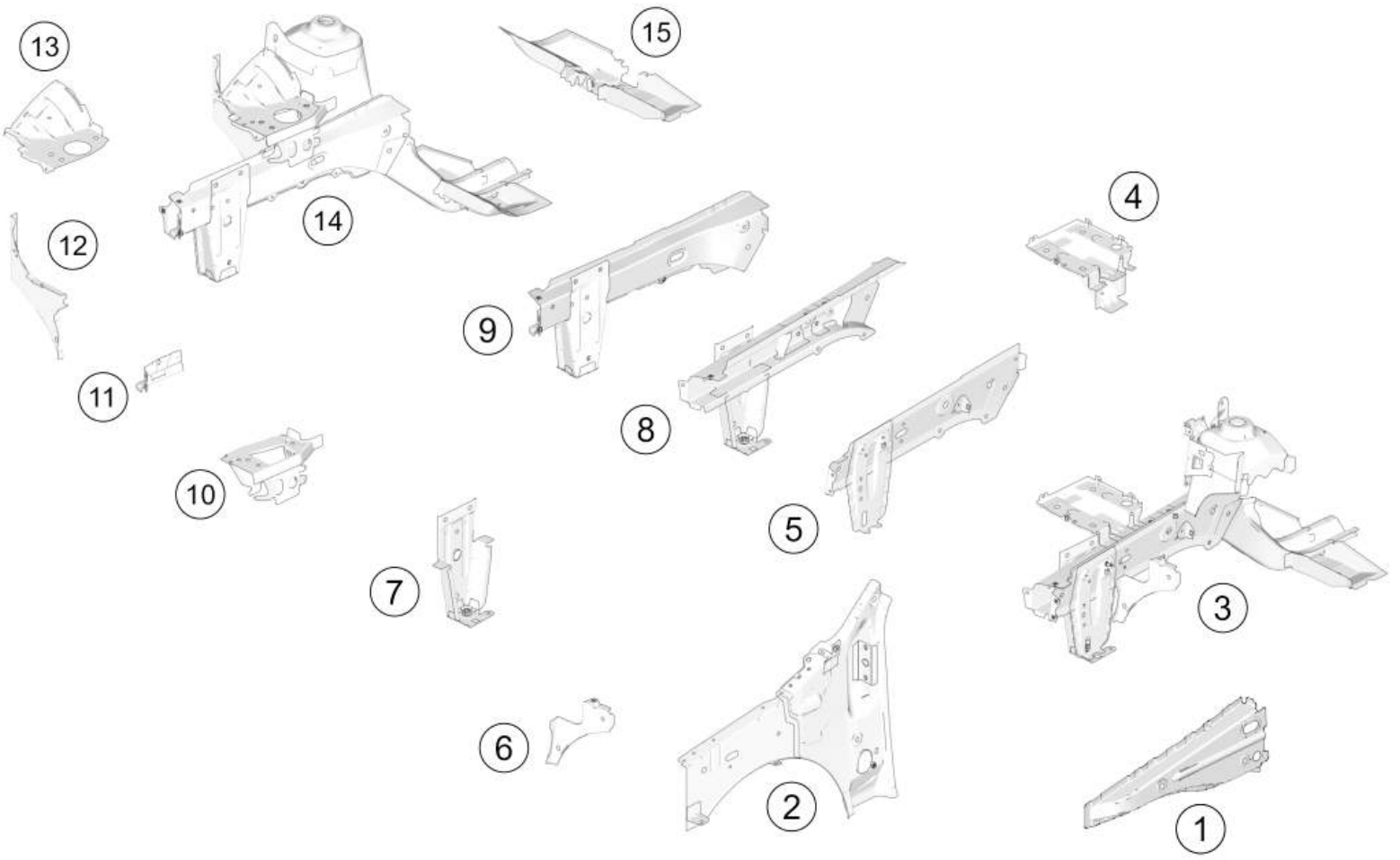
157372

No.	Description	Reference	Thickness (mm)
(1)	Sill panel closure panel	Sill panel closure panel: Replacement	1.3
(2)	Centre floor reinforcement		2.5
(3)	Centre side member		1.7
(4)	Centre floor, side section	Centre floor, side section: Replacement	0.65
(5)	Bulkhead reinforcement		1.2
(6)	Central floor front cross member		1.2
(7)	Front seat rear mounting support		1.2
(8)	Front section of rear floor side reinforcement		1.8
(9)	Front section of rear floor	Rear floor, front section: Replacement	0.65/1.8
(10)	Rear floor front cross member	Rear floor front cross member: Replacement	0.95/1.5
(11)	Windscreen aperture lower cross member		0.65/1.45
(12)	Heater bulkhead		0.95/1.5
(13)	Bulkhead cross member		1.6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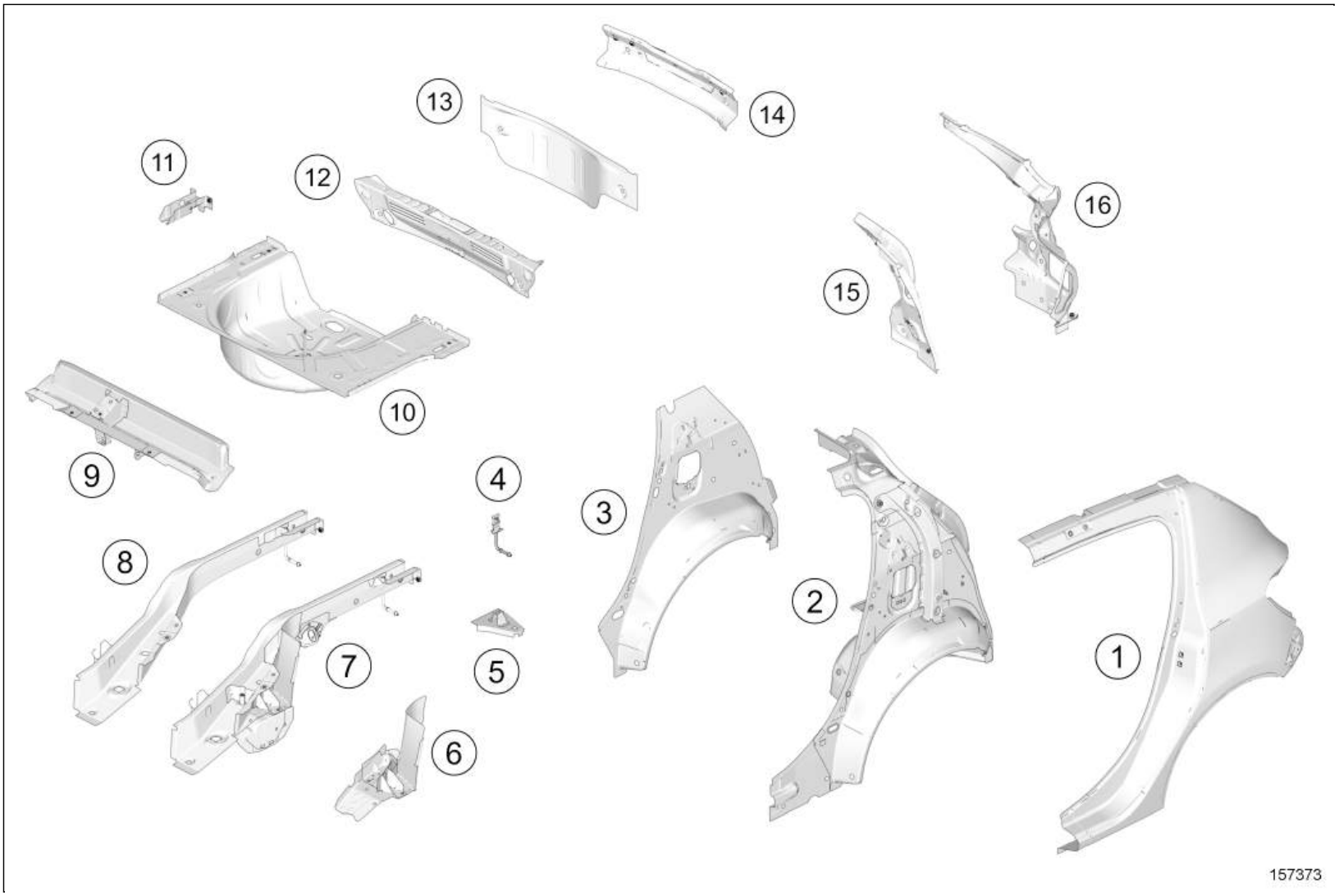
157371

No.	Description	Reference	Thickness (mm)
(1)	Scuttle side panel upper reinforcement	Scuttle side panel upper reinforcement: Replacement	0.95
(2)	A-pillar lining	A-pillar lining: Replacement	0.9/1.2
(3)	Front left-hand half unit	Front half-unit: Replacement	0.95/3
(4)	Battery tray bracket		1.4
(5)	Front section of front side member closure panel	Front section of front side member closure panel: Replacement	1.2/2
(6)	Left-hand front end side cross member		1.2
(7)	Front subframe front mounting unit		1.2/3
(8)	Front left-hand section of front side member	Front side member, front section: Replacement	1.2/3
(9)	Front right-hand section of front side member	Front side member, front section: Replacement	1.2/3
(10)	Engine stand		2.5
(11)	Front towing ring support		2.5
(12)	Right-hand front end side cross member		1.2
(13)	Front wheel arch front section		1.2
(14)	Front right-hand half unit	Front half-unit: Replacement	0.95/3
(15)	Centre floor front side cross member	Centre floor front side cross member: Replacement	0.95/1.95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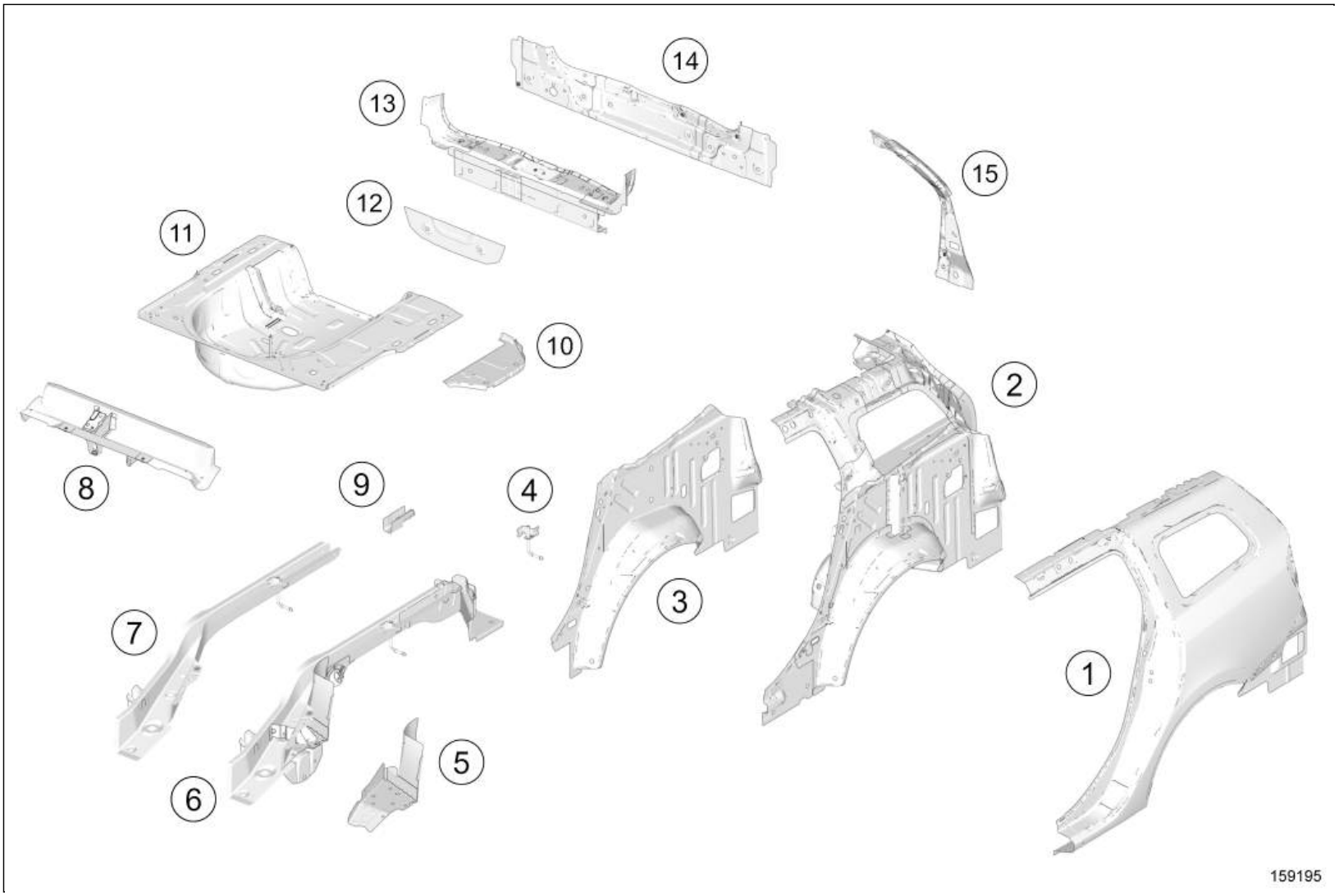
157373

No.	Description	Reference	Thickness (mm)
(1)	Rear wing panel	Rear wing panel: Replacement	0.65/1.2
(2)	Body side rear lining	Body side rear lining: Replacement	0.65/2.5
(3)	Outer rear wheel arch	Outer rear wheel arch: Replacement	0.65
(4)	Exhaust rear support		2
(5)	Rear floor side closure panel		0.65
(6)	Rear side cross member		1.9/3.5
(7)	Rear side member assembly	Rear side member assembly: Replacement	1.4/3.5
(8)	Rear side member	Rear side member: Replacement	1.45/2.5
(9)	Rear centre cross member		1.2/2
(10)	Rear floor, rear section	Rear floor, rear section: Replacement	0.7/1.2
(11)	Rear towing eye mounting		2.5
(12)	Rear end panel lining, upper section		0.8/1.5
(13)	Rear end panel lining, lower section		0.8
(14)	Rear end panel	Rear end panel: Replacement	0.8/1
(15)	Rear light mounting lining		0.65
(16)	Rear light mounting	Rear light mounting: Replacement	0.7/2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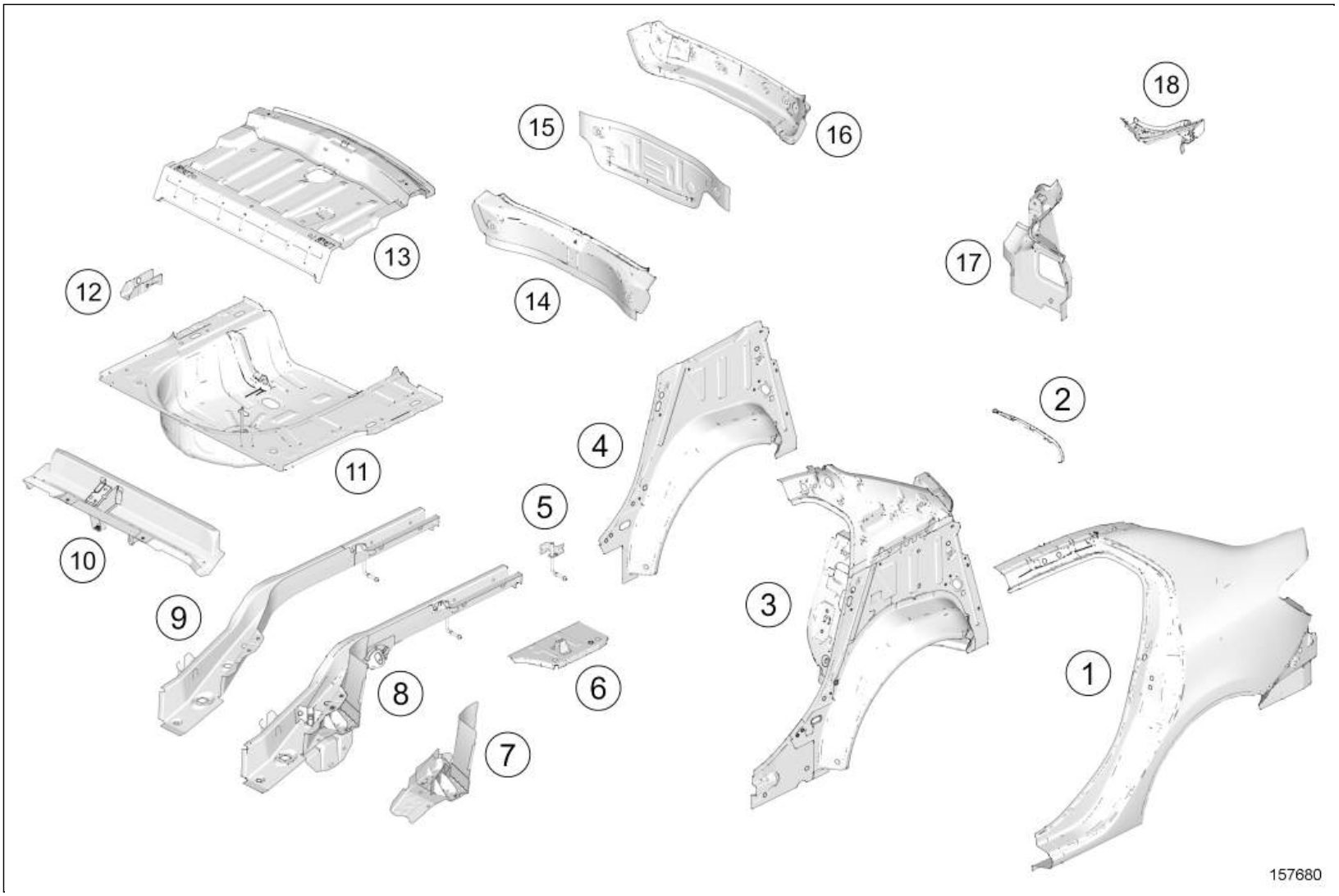
No.	Description	Reference	Thickness (mm)
(1)	Rear wing panel	Rear wing panel: Replacement	
(2)	Body side rear lining	Body side rear lining: Replacement	
(3)	Outer rear wheel arch	Outer rear wheel arch: Replacement	
(4)	Exhaust rear support		2
(5)	Rear side cross member		1.9/3.5
(6)	Rear side member assembly	Rear side member assembly: Replacement	
(7)	Rear side member	Rear side member: Replacement	
(8)	Rear centre cross member		1.2/2
(9)	Rear towing eye mounting		2.5
(10)	Rear floor side closure panel		0.65
(11)	Rear floor, rear section	Rear floor, rear section: Replacement	
(12)	Rear end panel lining, lower section		0.8
(13)	Rear end panel lining	Rear end panel lining: Replacement	
(14)	Rear end panel	Rear end panel: Replacement	
(15)	Rear light mounting	Rear light mounting: Replacement	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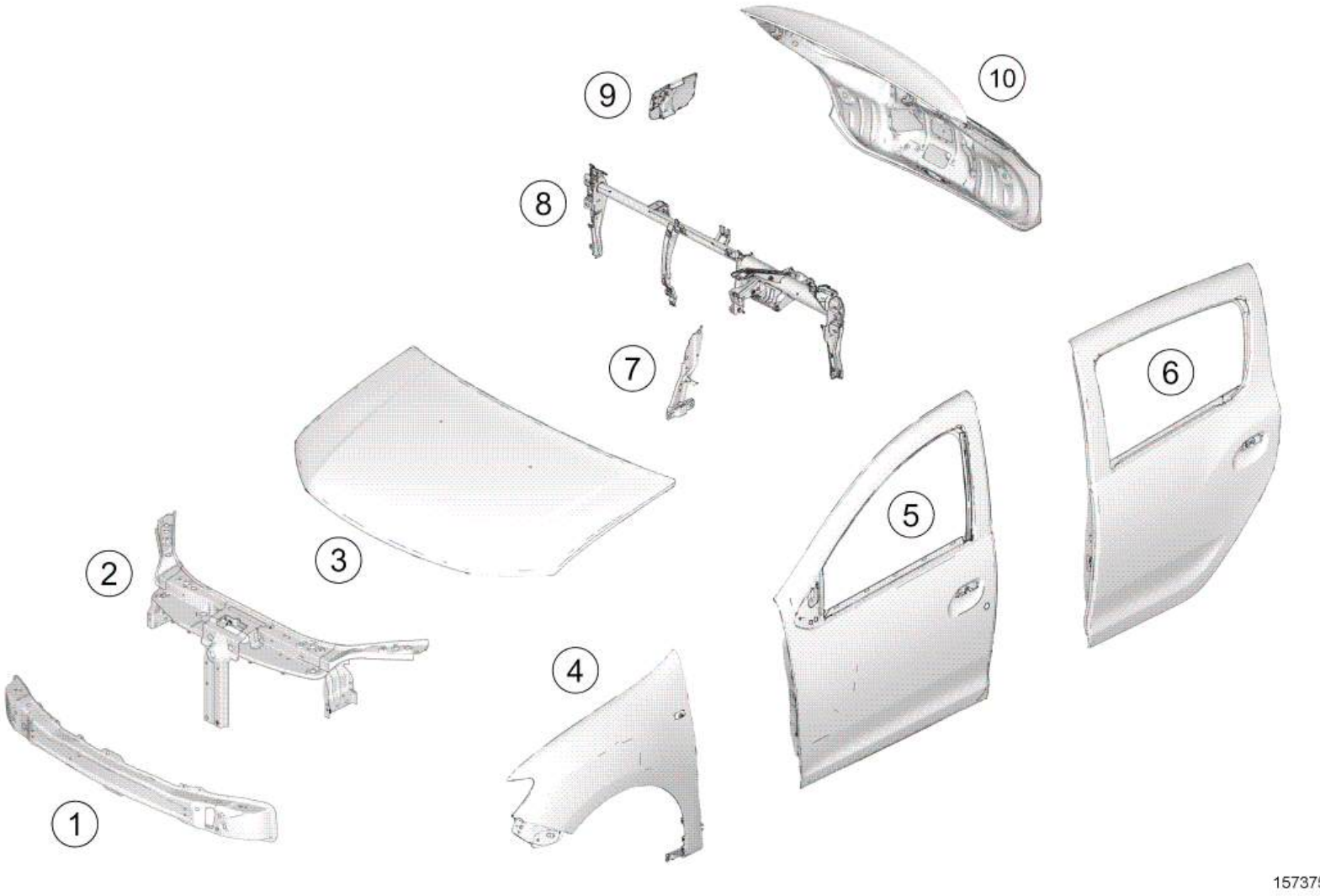
No.	Description	Reference	Thickness (mm)
(1)	Rear wing panel	Rear wing panel: Replacement	0.65/1.2
(2)	Rear double seal support		0.65
(3)	Body side rear lining	Body side rear lining: Replacement	0.65/2.5
(4)	Outer rear wheel arch	Outer rear wheel arch: Replacement	0.65
(5)	Exhaust rear support		2
(6)	Rear floor side closure panel		0.65
(7)	Rear side cross member		1.9/3.5
(8)	Rear side member assembly	Rear side member assembly: Replacement	1.4/3.5
(9)	Rear side member	Rear side member: Replacement	1.45/2.5
(10)	Rear centre cross member		1.2/2
(11)	Rear floor, rear section	Rear floor, rear section: Replacement	0.7/1.2
(12)	Rear towing eye mounting		2.5
(13)	Rear parcel shelf		0.65/1.8
(14)	Rear end panel lining, upper section		0.8/1.45
(15)	Rear end panel lining, lower section		0.8/1.2
(16)	Rear end panel	Rear end panel: Replacement	0.8/1.2
(17)	Rear light mounting	Rear light mounting: Replacement	0.8
(18)	Rear wing panel rain channel		0.65/1.5

VEHICLE STRUCTURE, REMOVABLE SECTION: DESCRIPTION



No.	Description	Reference
(1)	Front impact cross member	Front impact cross member: Removal - Refitting
(2)	Front end panel	Front end panel: Removal - Refitting
(3)	Front opening element	Front opening element: Removal - Refitting
(4)	Front wing	Front wing: Removal - Refitting
(5)	Front side opening element	Front side opening element: Removal - Refitting
(6)	Rear side opening element	Rear side opening element: Removal - Refitting
(7)	Dashboard cross member centre plate	
(8)	Dashboard cross member	
(9)	Fuel filler flap cover	
(10)	Rear opening element	Rear opening element: Removal - Refitting

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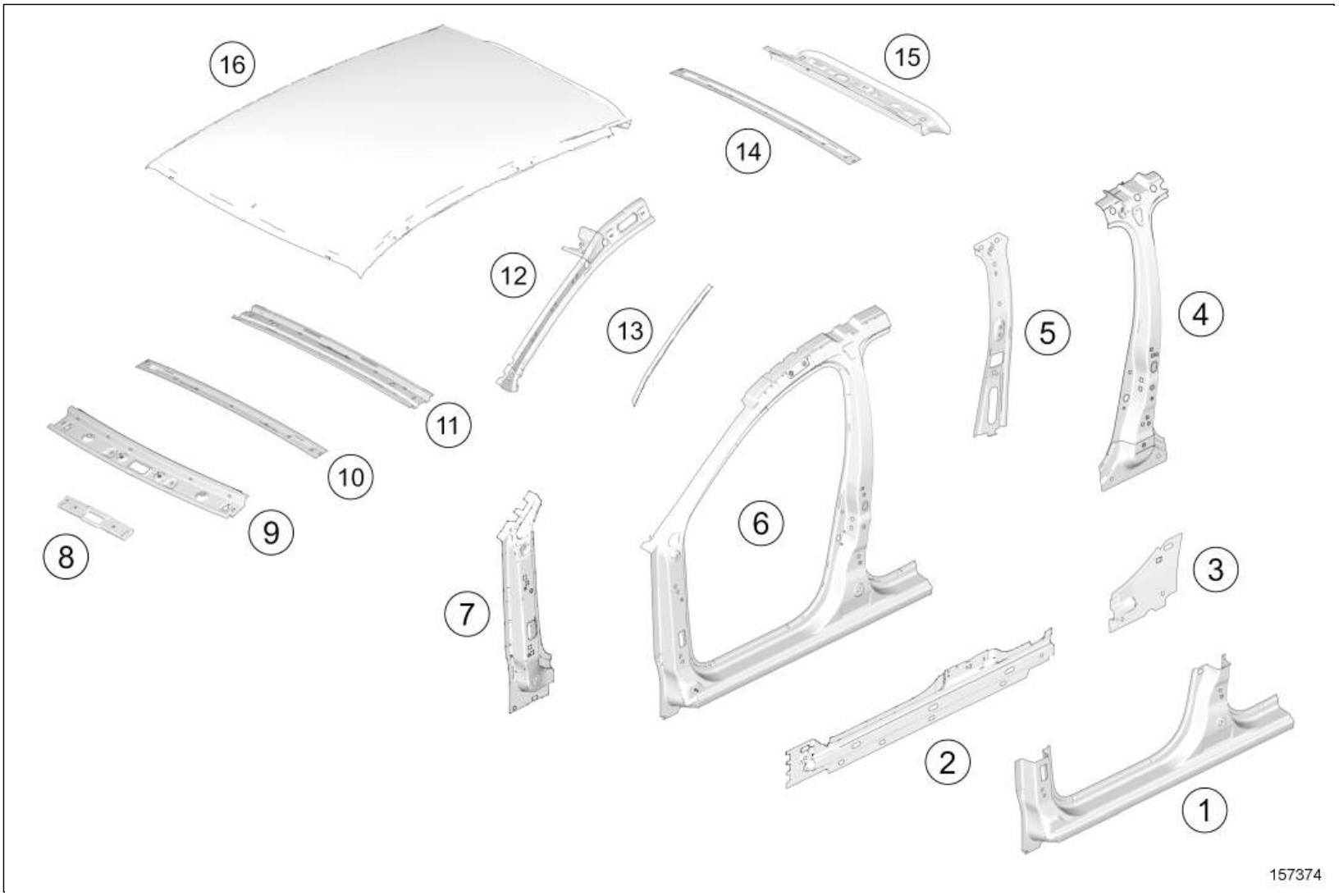
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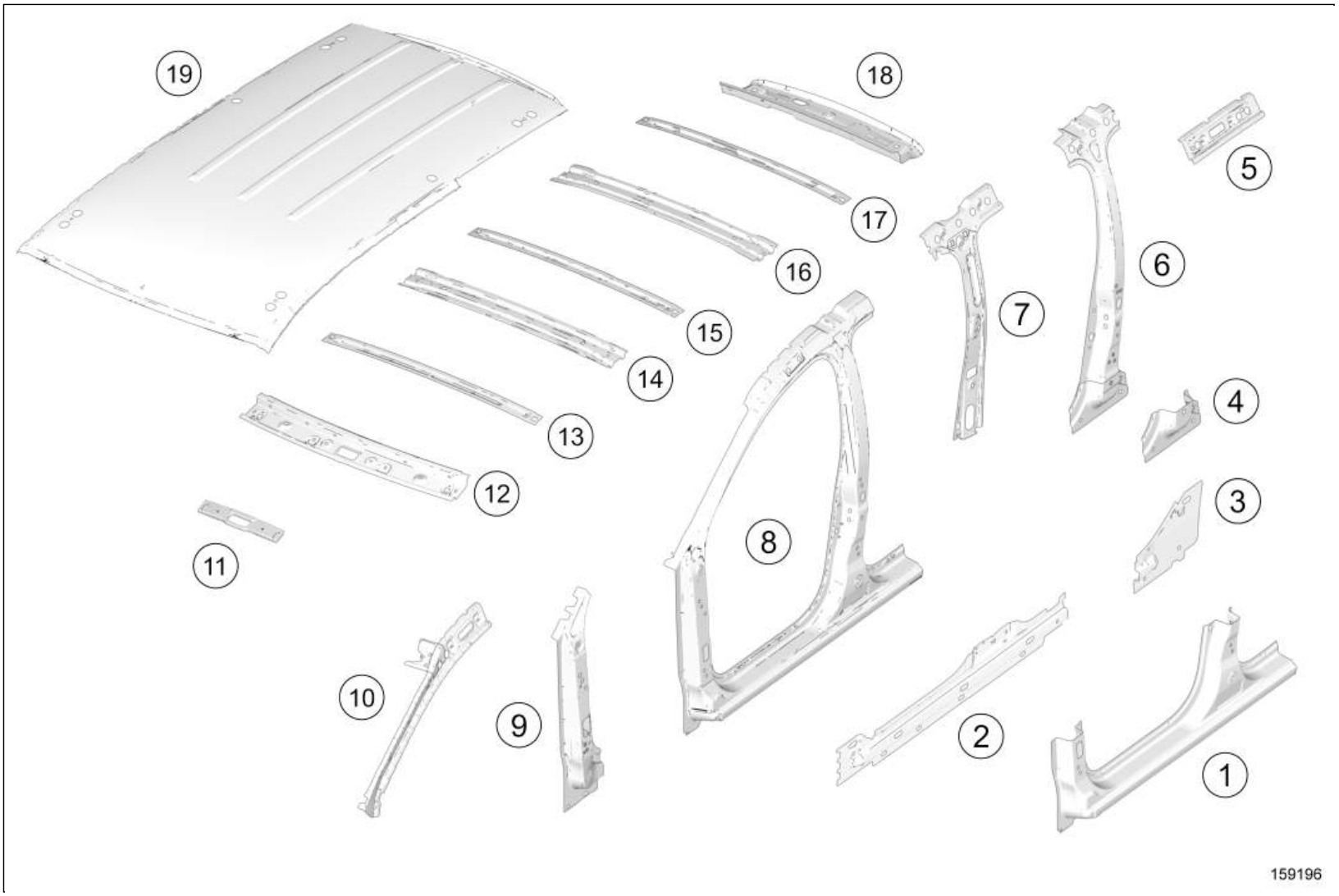
No.	Description	Reference	Thickness (mm)
(1)	Sill panel	Sill panel: Replacement	0.75
(2)	Sill panel reinforcement	Sill panel reinforcement: Replacement	1.2
(3)	Sill panel rear reinforcement		1.2
(4)	B-pillar reinforcement	B-pillar reinforcement: Replacement	0.9/1.6
(5)	B-pillar lining		1.15
(6)	Body side, front section	Body side, front section: Replacement	0.75
(7)	A-pillar reinforcement	A-pillar reinforcement: Replacement	1.3/2
(8)	Acoustic mass		
(9)	Roof front cross member		0.95
(10)	Roof front acoustic cross member		0.8
(11)	Roof centre cross member		1
(12)	Windscreen pillar lining		0.95/1.4
(13)	Double seal mounting		0.65
(14)	Roof rear acoustic cross member		0.8
(15)	Roof rear cross member		0.8
(16)	Roof	Roof: Replacement	0.7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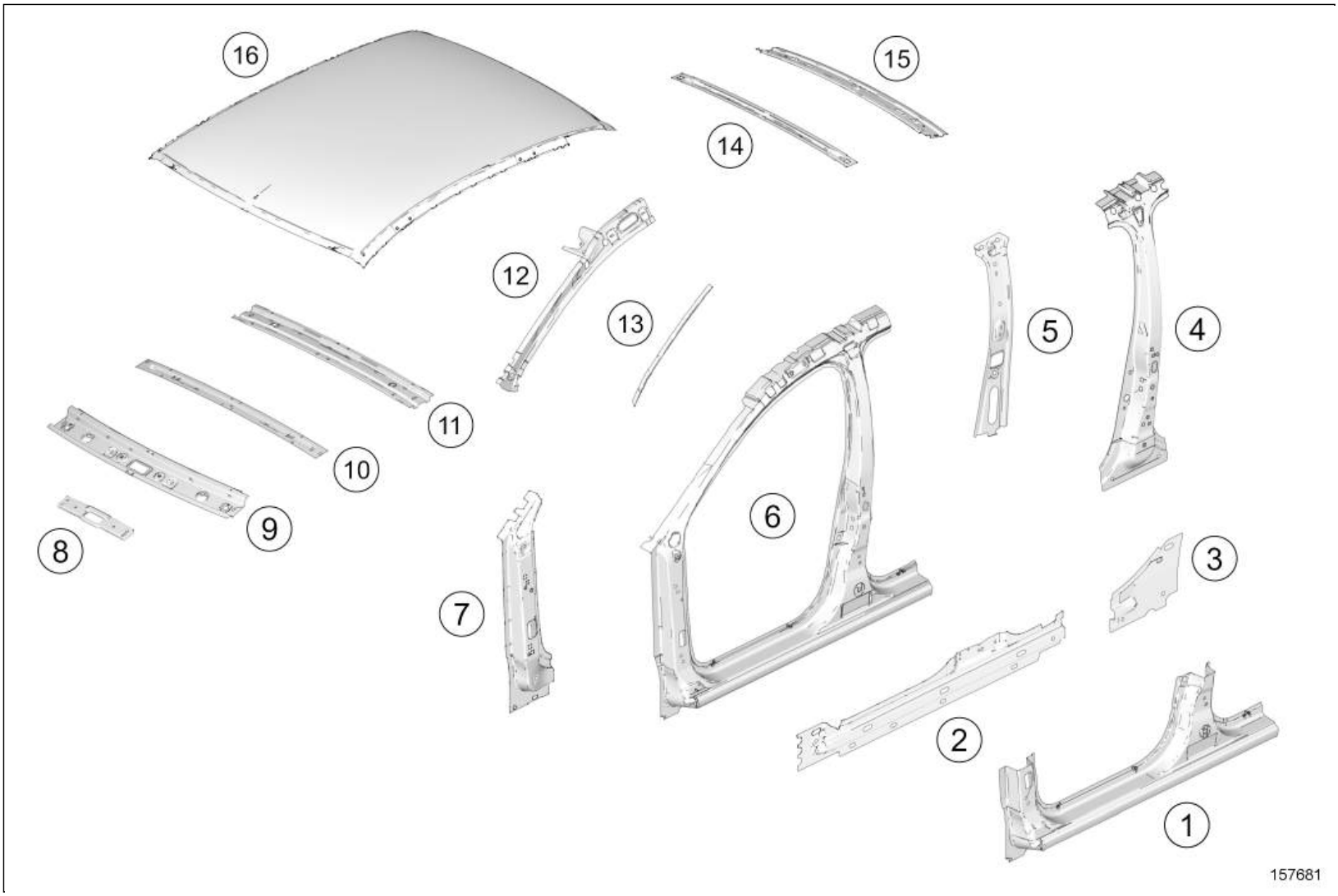
No.	Description	Reference	Thickness (mm)
(1)	Sill panel	Sill panel: Replacement	
(2)	Sill panel reinforcement	Sill panel reinforcement: Replacement	
(3)	Sill panel rear reinforcement		1.2
(4)	B-pillar lower reinforcement	B-pillar reinforcement: Replacement	
(5)	Rear side roof rail lining		0.95
(6)	B-pillar reinforcement	B-pillar reinforcement: Replacement	
(7)	B-pillar lining		1/1.5
(8)	Body side, front section	Body side, front section: Replacement	
(9)	A-pillar reinforcement	A-pillar reinforcement: Replacement	
(10)	Windscreen pillar lining		0.95/1.4
(11)	Acoustic mass		
(12)	Roof front cross member		0.95
(13)	Roof front acoustic cross member		0.8
(14)	Roof centre cross member		1
(15)	Roof centre acoustic cross member		0.8
(16)	Roof panel arch		0.8
(17)	Roof rear acoustic cross member		0.8
(18)	Roof rear cross member		0.8
(19)	Roof	Roof: Replacement	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No.	Description	Reference	Thickness (mm)
(1)	Sill panel	Sill panel: Replacement	0.75
(2)	Sill panel reinforcement	Sill panel reinforcement: Replacement	1.2
(3)	Sill panel rear reinforcement		1.2
(4)	B-pillar reinforcement	B-pillar reinforcement: Replacement	0.9/1.6
(5)	B-pillar lining		1.15
(6)	Body side, front section	Body side, front section: Replacement	0.75
(7)	A-pillar reinforcement	A-pillar reinforcement: Replacement	1.3/2
(8)	Acoustic mass		
(9)	Roof front cross member		0.95
(10)	Roof front acoustic cross member		0.8
(11)	Roof centre cross member		1
(12)	Windscreen pillar lining		0.95/1.4
(13)	Double seal mounting		0.65
(14)	Roof rear acoustic cross member		0.8
(15)	Roof rear cross member		0.65
(16)	Roof	Roof: Replacement	0.7

VEHICLE

Note, one or more warnings are present in this procedure

Equipment required
safety strap(s)

1. TOWING

CAUTION

See the current towing regulations in each country.

Never use the drive shafts as attachment points.

The towing points may only be used for towing on the road.

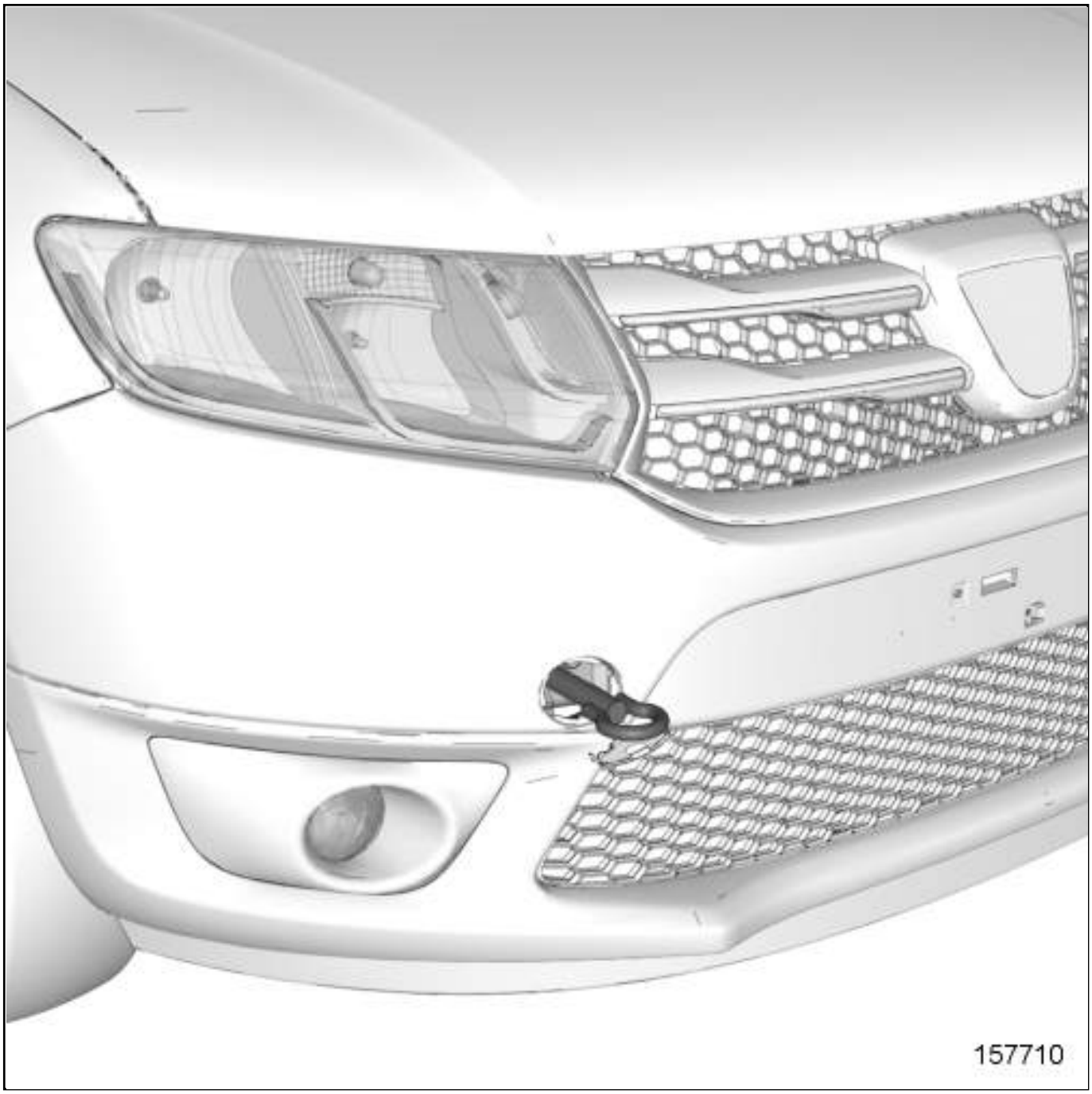
Never use the towing points for removing the vehicle from a ditch or to lift the vehicle, either directly or indirectly.

Screw in and lock the towing ring before towing.

- Vehicles fitted with automatic transmission:
  - It is preferable to transport the vehicle on a flatbed or tow it by lifting the front wheels. As an exception, the vehicle may be towed with the wheels on the ground but at a speed below 12 mph (20 km/h) and over a maximum distance of 18 miles (30 km)(with the gear lever in neutral).

- Vehicles fitted with Renault Card:
  - If the vehicle battery is flat, the steering column remains locked. In this case, fit a new battery or connect to an electrical source to lock the airbag computer using the diagnostic tool, (see Fault finding - Replacement of components) (88C, Airbags and pretensioners), which unlocks the steering column.
  - If it is not possible to lock the airbag computer, the front of the vehicle must be lifted.

1- POSITION OF FRONT ATTACHMENT POINT



2- POSITION OF REAR ATTACHMENT POINT

2. LIFTING POINT USING A TROLLEY JACK

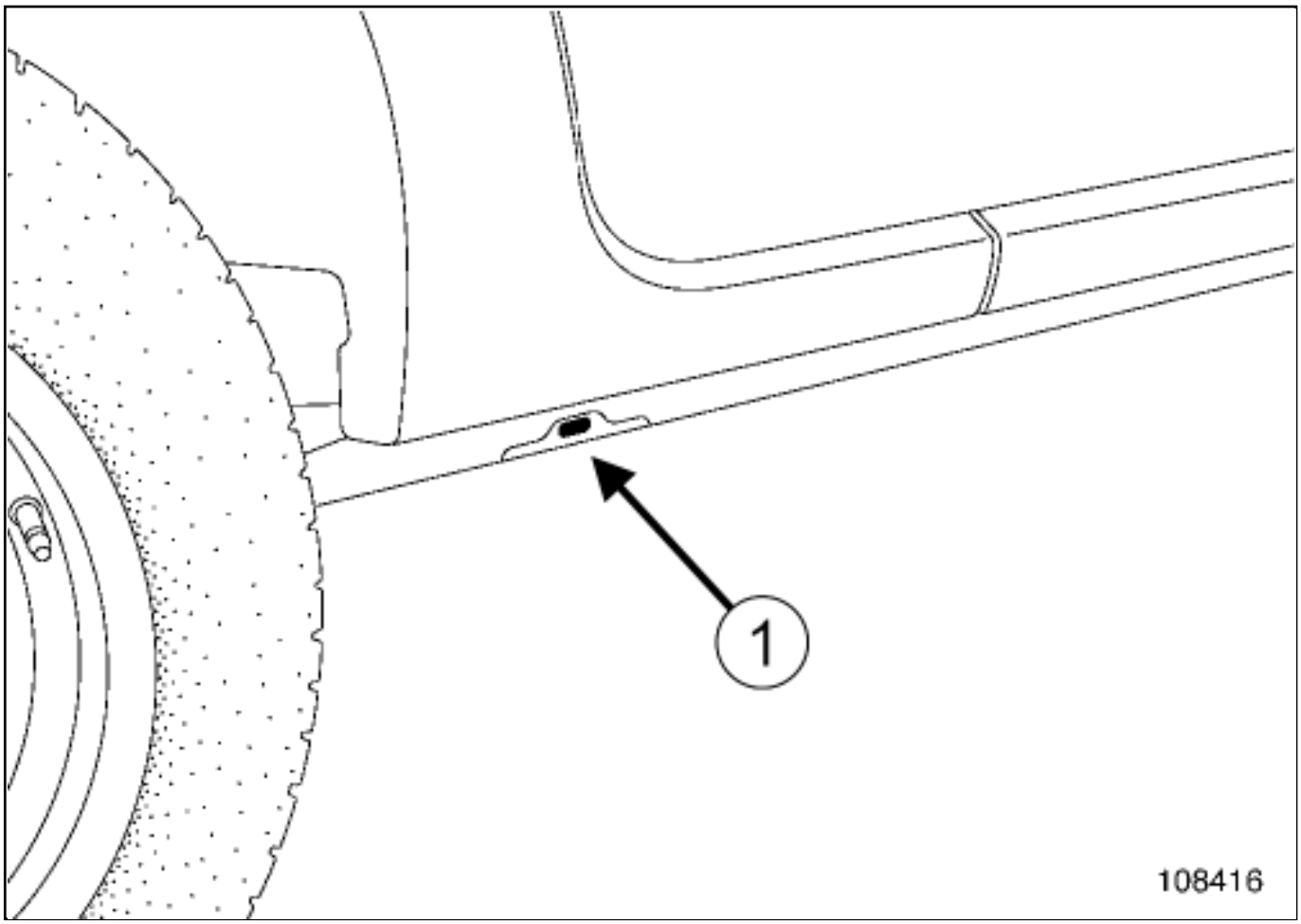
WARNING

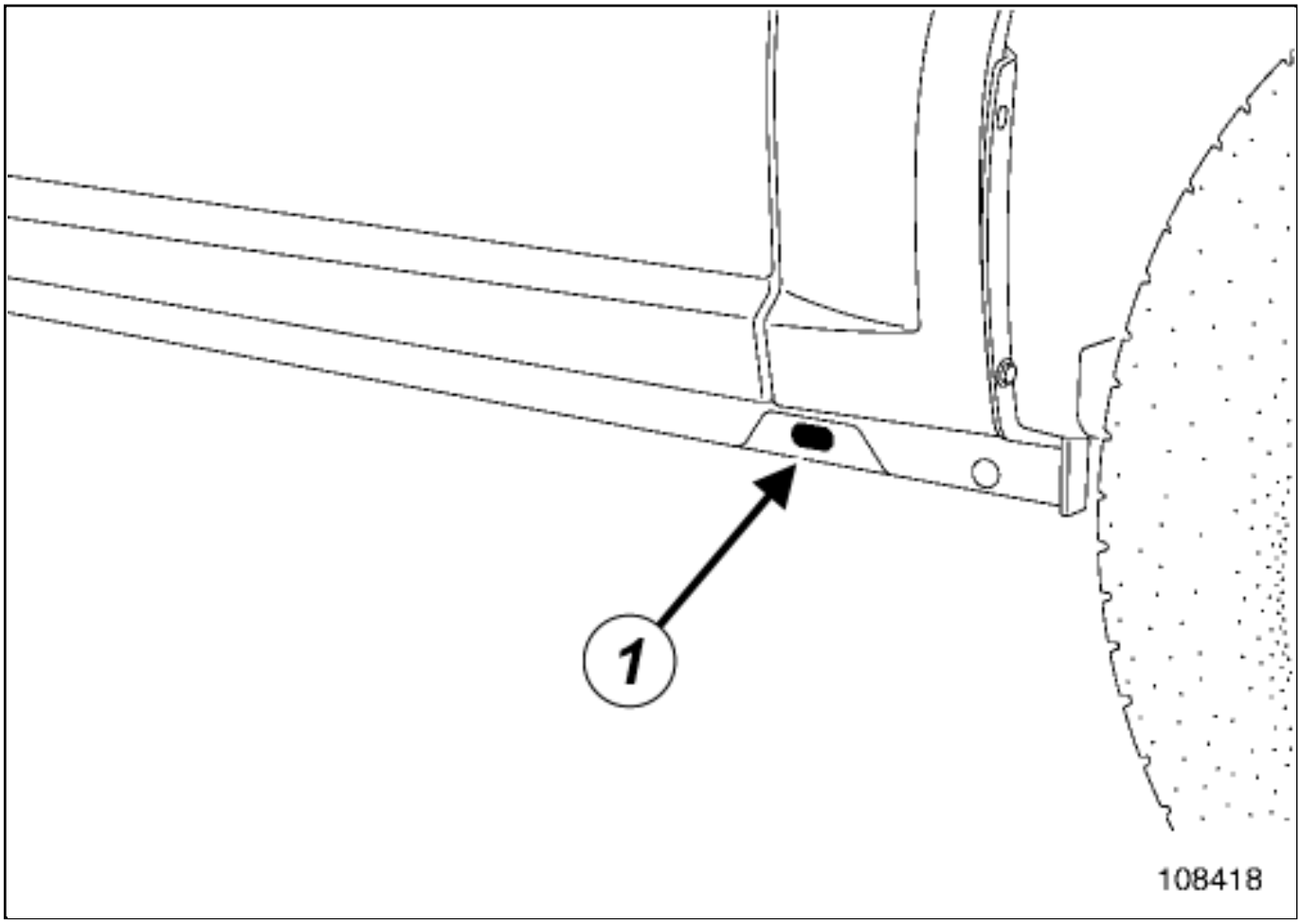
To prevent any accidents, the trolley jack must only be used to lift and/or move the vehicle. The vehicle height must be maintained with axle stands which are strong enough to support the weight of the vehicle.

CAUTION

To avoid any damage to the original protection, use equipment fitted with rubber pads to prevent the equipment coming into direct contact with the vehicle.

To avoid any damage to the axle assemblies, the vehicle must not be raised using the front suspension arms for support or under the rear axle.



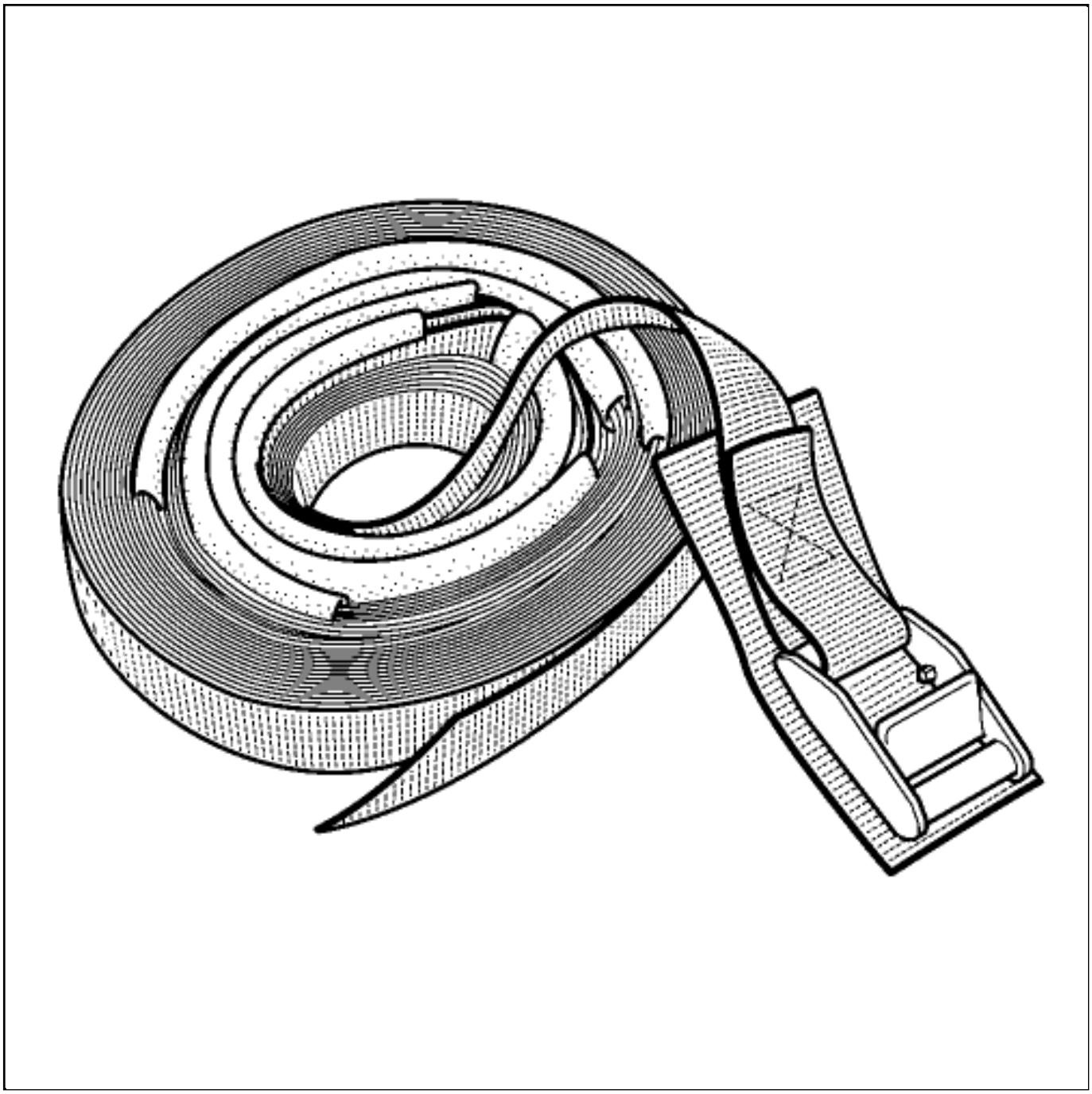


To raise a front or rear wheel, use(1) as the support point.

To mount the vehicle on axle stands, the entire vehicle must be lifted on one side and axle stands must be placed under the jacking points for the tool kit jack(1) .

3. LIFTING POINT USING A VEHICLE LIFT

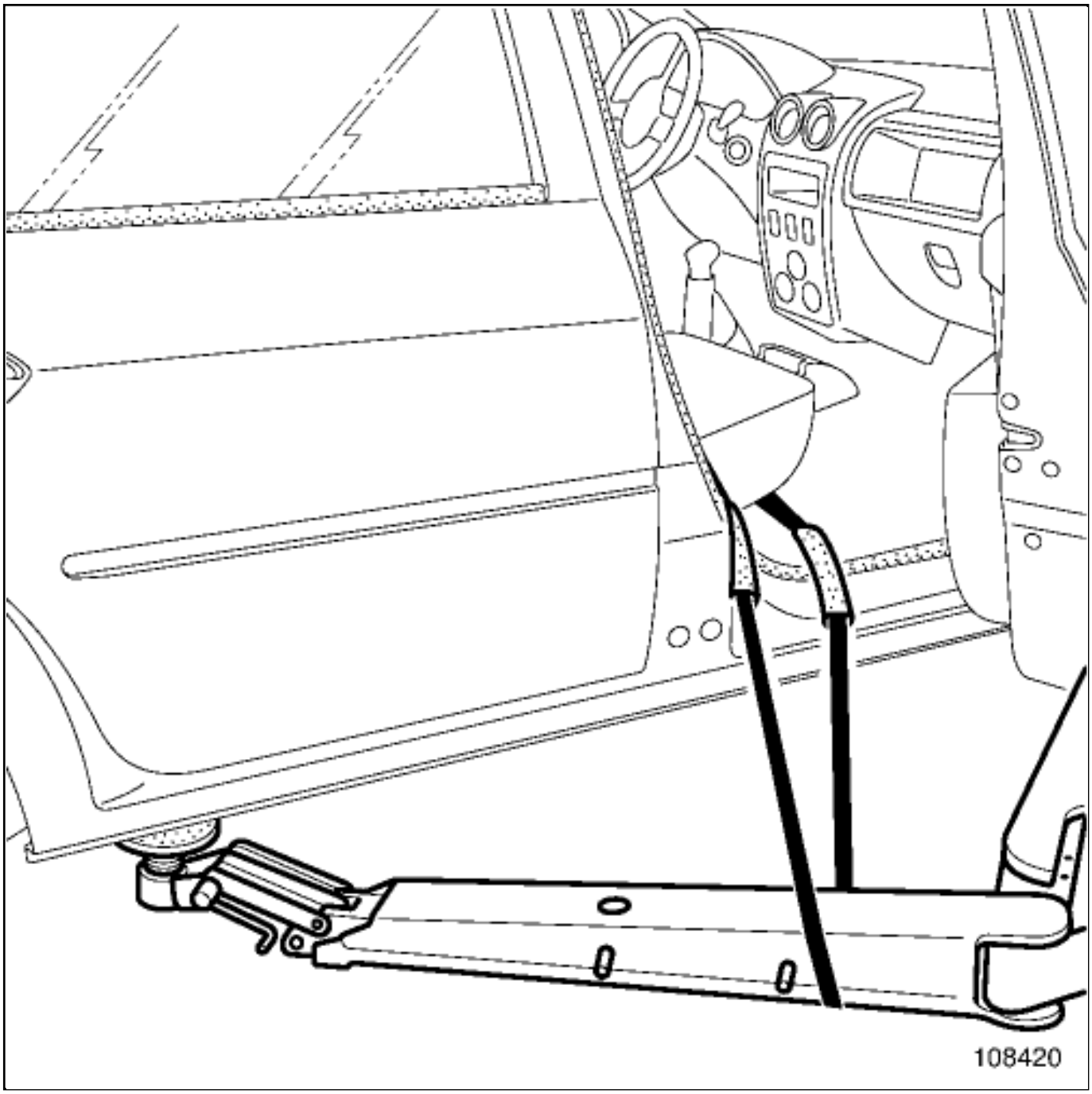
1- SAFETY ADVICE REMINDER



If it is necessary to remove heavy components from the vehicle, it is preferable to use a four-post lift.

There is a danger that the vehicle will tilt on a two-post lift after certain components have been removed (e.g. engine and transmission assembly, rear axle assembly, gearbox). Fit the safety strap(s)available from the Parts Department.

2- FITTING THE STRAPS



For safety purposes, the straps must always be in perfect condition; replace them if they are damaged.

When fitting the straps, check that the seats and fragile parts of the vehicle are correctly protected.

1)TILTING TOWARDS THE FRONT

Pass the strap under the rear right-hand arm of the lift.

Pass the strap through the inside of the vehicle.

Pass the strap under the rear left-hand arm of the lift.

Pass the belt through the inside of the vehicle again.

Tighten the strap.

2)TILTING TOWARDS THE REAR

Pass the strap under the front right-hand arm of the lift.

Pass the strap through the inside of the vehicle.

Pass the strap under the front left-hand arm of the lift.

Pass the belt through the inside of the vehicle again.

Tighten the strap.

3- PERMITTED JACKING POINTS

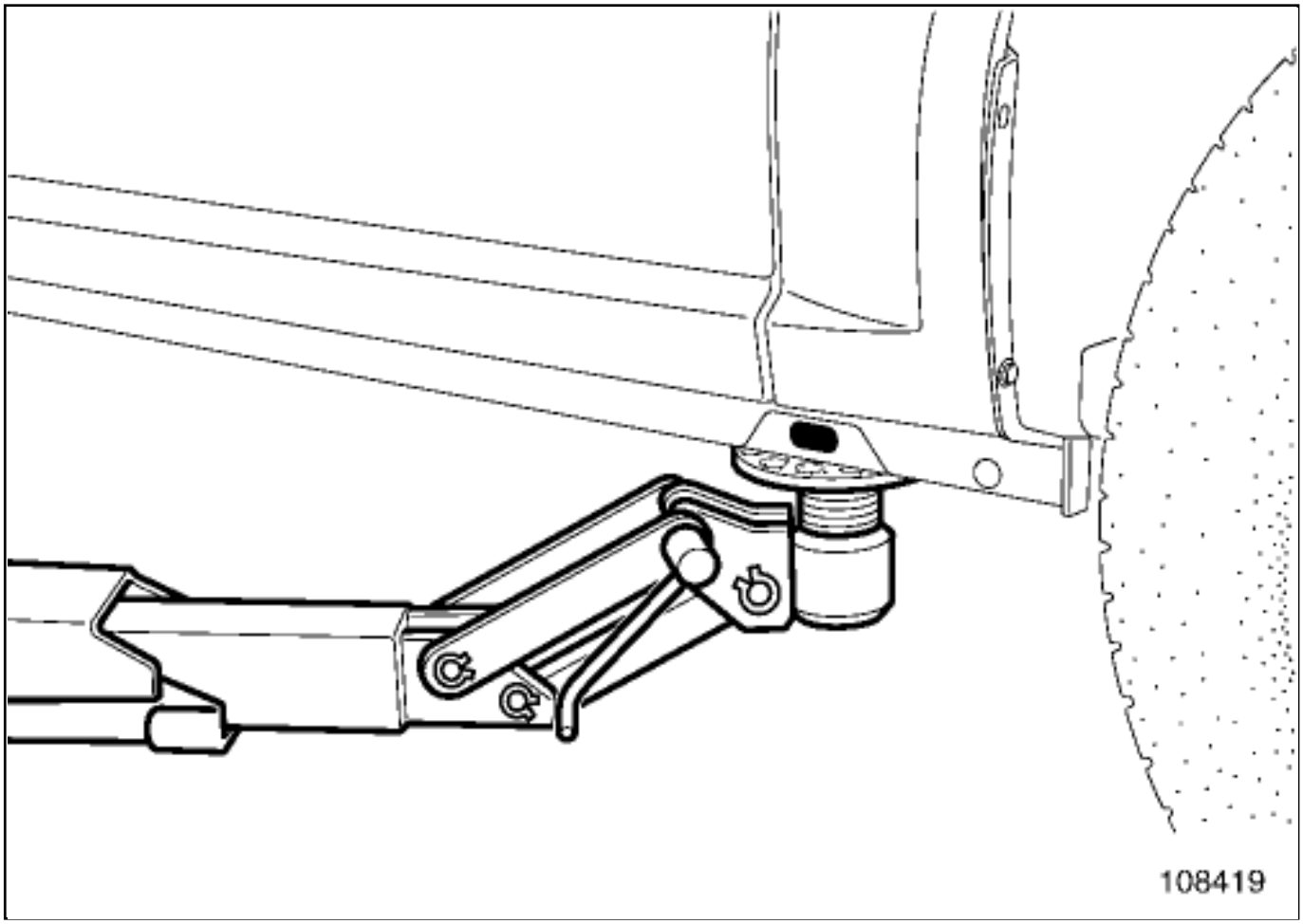
To raise the vehicle, position the pads of the lift arms as indicated below taking care not to damage the end of the front wing or the underside of the sill panel.

WARNING

Only the jacking points described in this section allow the vehicle to be raised in complete safety.

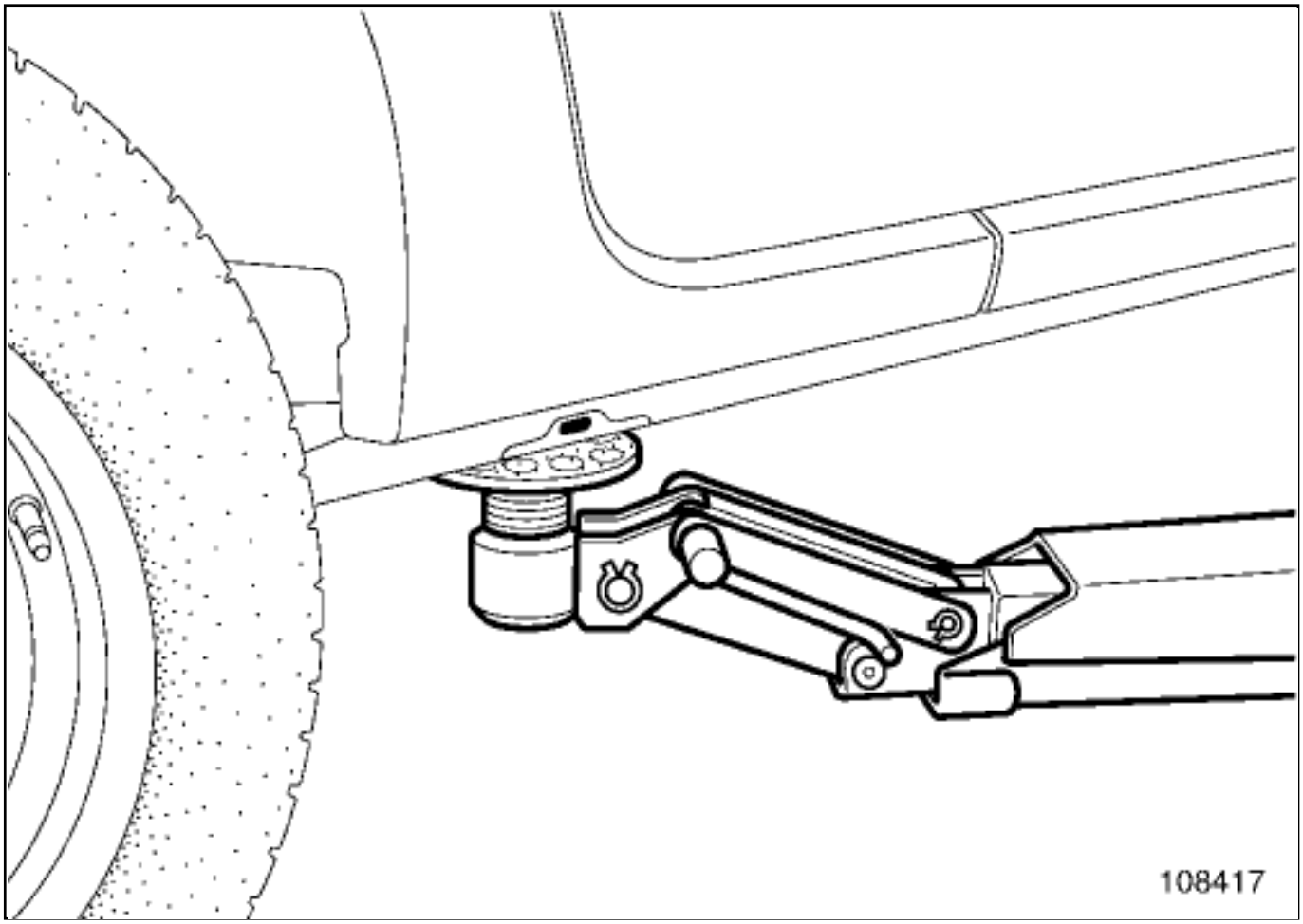
Do not raise the vehicle using points other than those described in this section.

FRONT LIFTING POINTS



Position the lift arms under the end of the sill panel body flanges.

REAR LIFTING POINTS



Position the lift arms under the end of the sill panel body flanges.

VENTURI: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair**

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair**(see 13B, Diesel injection, Diesel injection: Precautions for the repair)** .

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CAUTION

Keep the pipe unions away from contaminated areas.

Note:

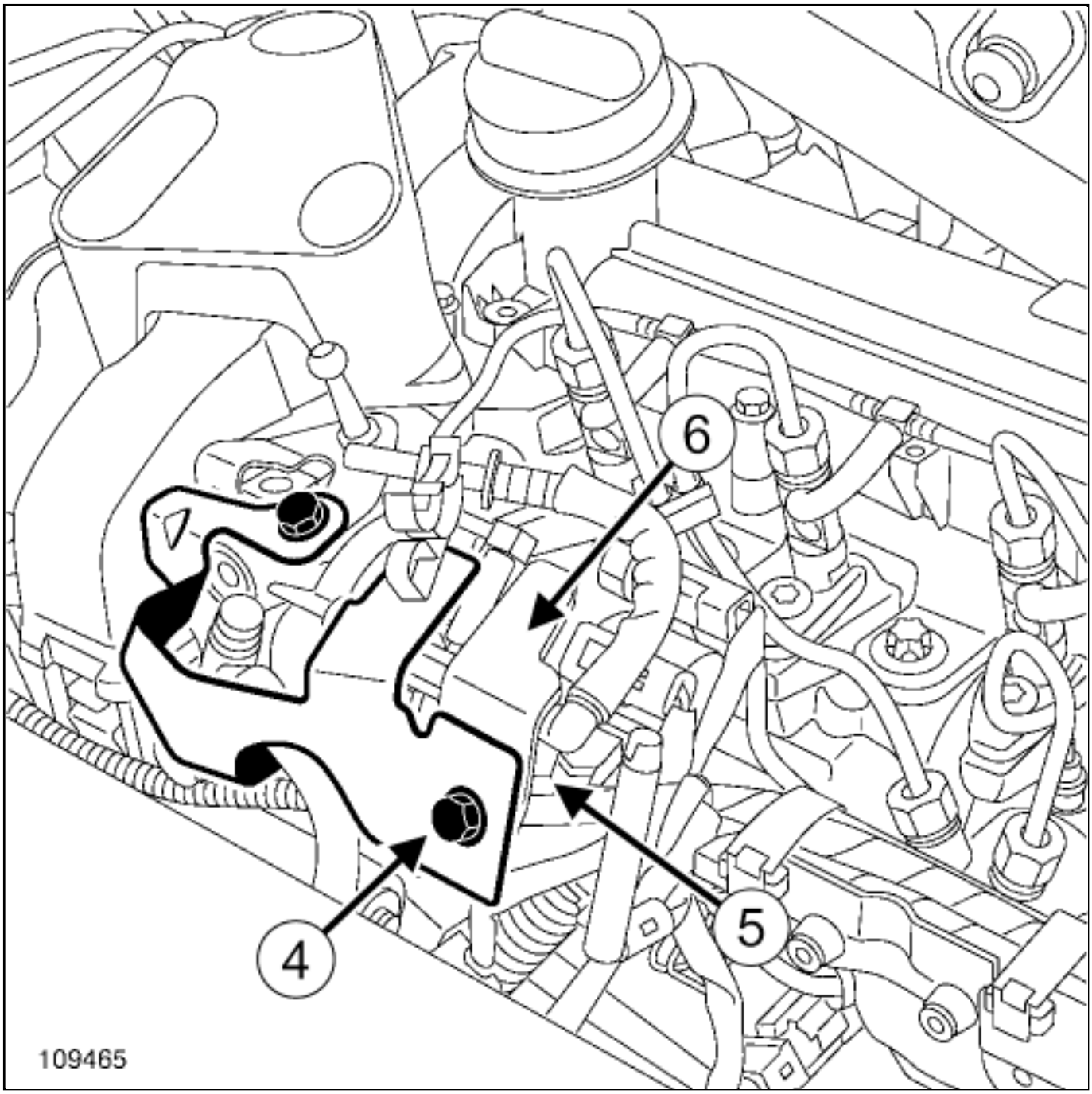
Ensure that you have a new Venturi before opening up the fuel circuit.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

- the engine cover,
- the turbocharger air outlet pipe**Intercooler air inlet pipe: Removal - Refitting** .

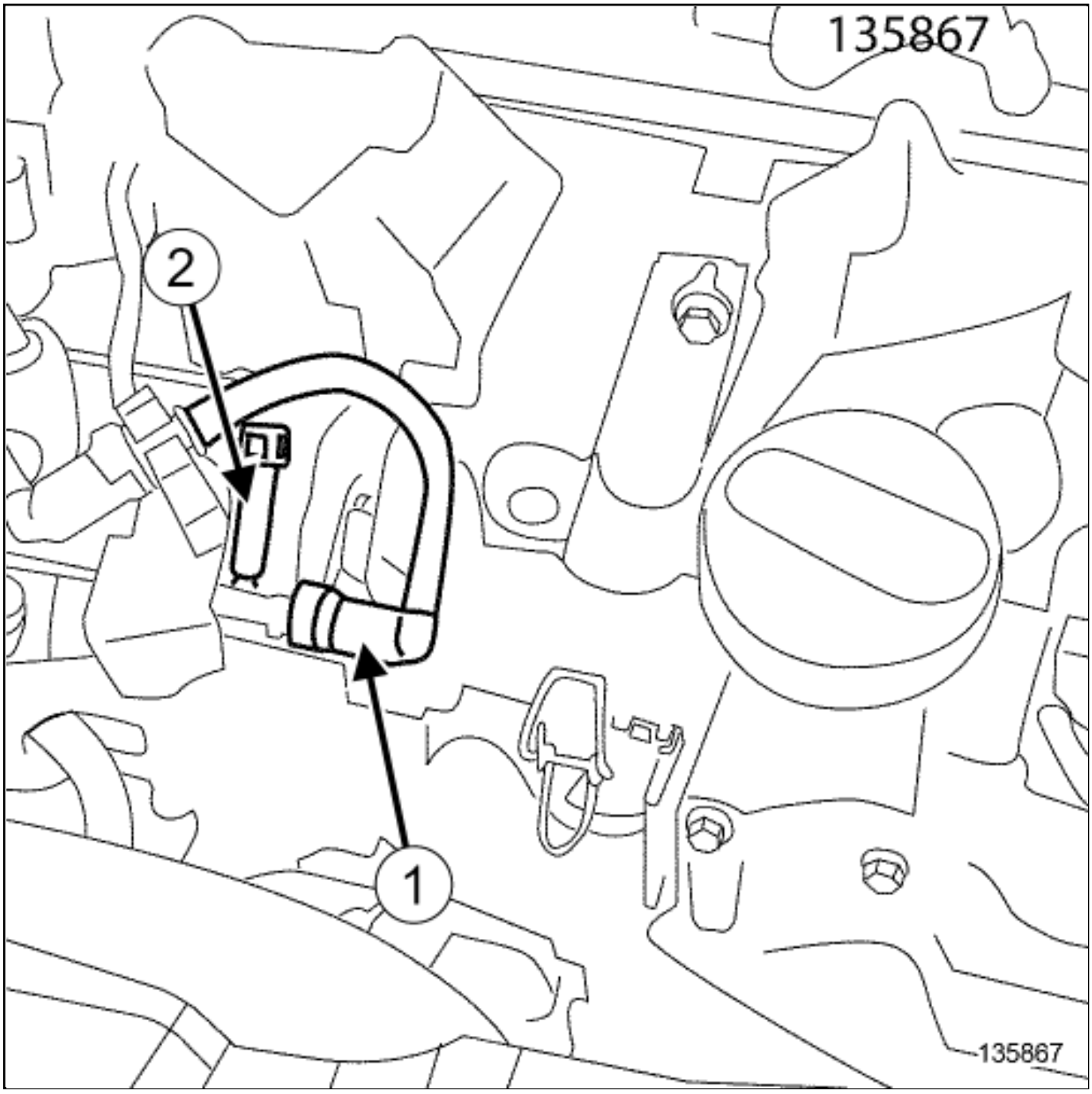


Remove :

- the high pressure pump protector bolt(**4**) ,
- the venturi protector bolt(**5**) ,

Move aside the venturi protector(**6**) .

2. OPERATION FOR REMOVAL OF PART CONCERNED

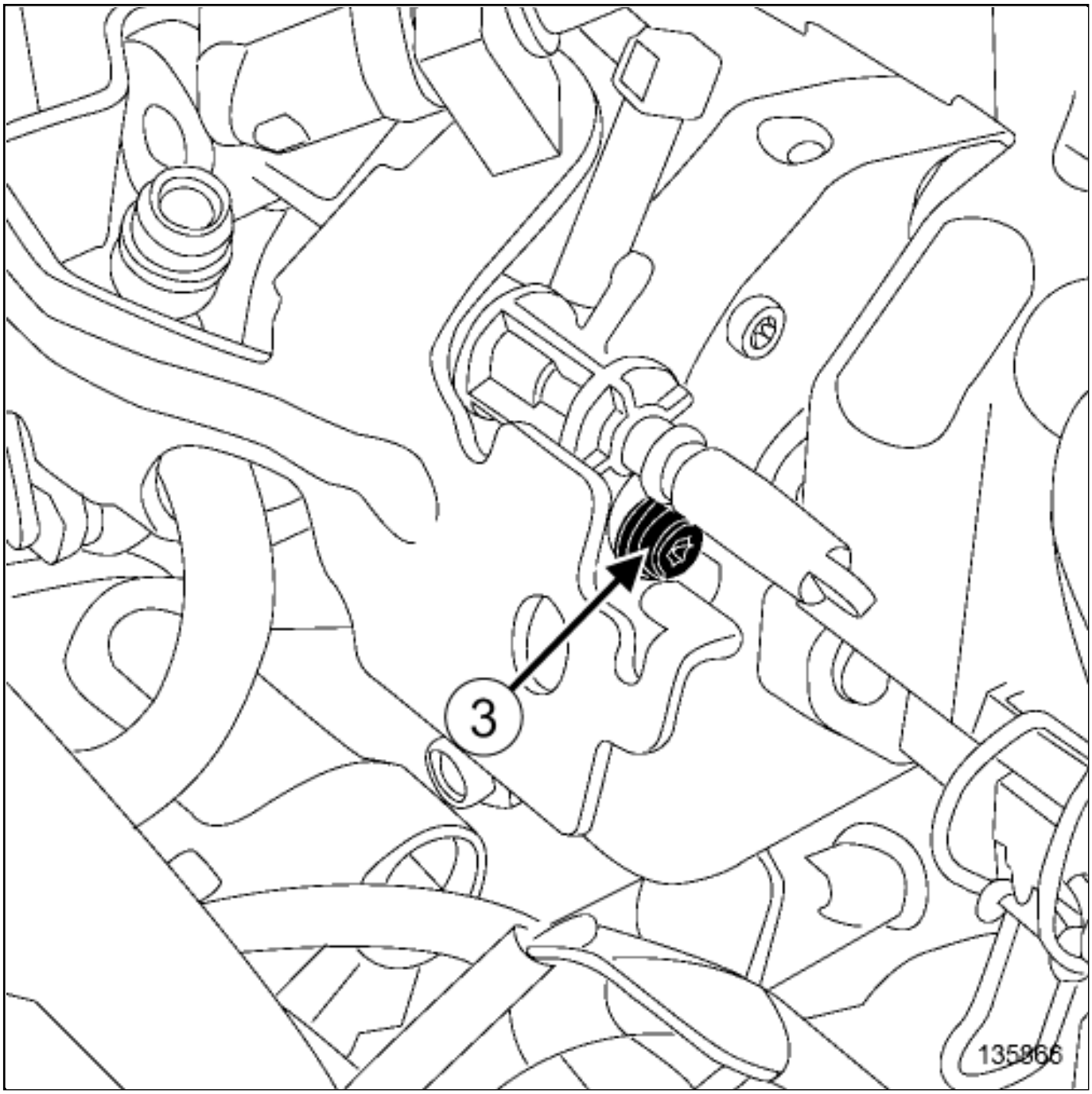


- Disconnect the diesel fuel return pipe union from the Venturi(1) .

- Fit blanking plugs on:
  - the opening of the venturi,
  - the diesel fuel return pipe opening.

- Disconnect the diesel fuel injector return rail from the Venturi(2) .

- Fit suitable blanking plugs on:
  - the opening of the venturi,
  - the opening of the diesel injector fuel return rail.



- Remove:
  - the Venturi bolt(3) ,
  - the Venturi.

- Take care to ensure that no impurities get into the high pressure pump once the Venturi is removed.

CAUTION

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Only use cleaning cloths.

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Note:

Do not lubricate the seals with grease or used diesel fuel. Use the applicator provided in the kit for the new part.

- Refit the venturi to the high pressure pump.
- Torque tighten the Venturi bolt5.5 N.m .
- Remove the blanking plugs from:
  - the diesel injector fuel return rail opening,
  - the Venturi opening.
- Connect the fuel return rail to the Venturi.
- Remove the blanking plugs from:
  - the opening of the diesel fuel return pipe union,
  - the Venturi opening.

Connect the diesel return pipe to the Venturi.

2. FINAL OPERATION

Refit :

- the venturi protector,
- the venturi protector bolt,
- the high pressure pump bolt.

Refit the turbocharger air outlet pipe **Intercooler air inlet pipe: Removal - Refitting** .

Start the engine.

Check that there are no fuel leaks.

Refit the engine cover.

WHEEL:BALANCING

Note, one or more warnings are present in this procedure

1. PREREQUISITES FOR WHEEL BALANCING

- Wheel balancing is a measurement operation.

Several conditions must be met to achieve a reliable result in a single operation.

The wheel balancer must be installed in accordance with the manufacturer's instructions.

It is essential to calibrate the balancer according to the frequency recommended by the manufacturer.

Do not grease the threaded shaft.

Check the condition of the supports, centring components and mountings.

Replace any faulty parts (see manufacturer's instructions).

The wheel and the wheel balancer must be clean.

1- DRIVER'S PERCEPTION

- If the wheels are not correctly balanced this causes the steering wheel and/or the vehicle floor to vibrate.

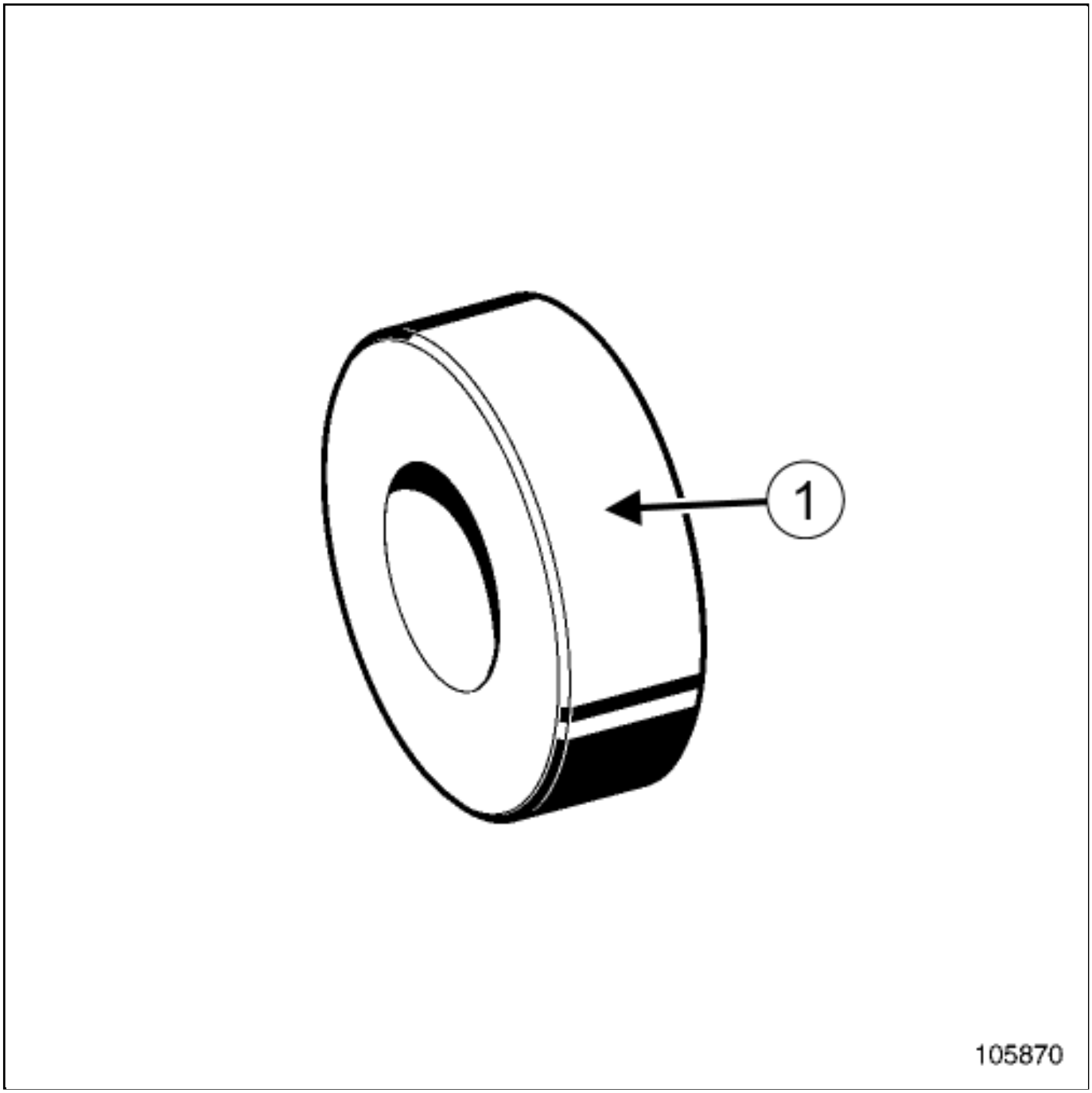
These vibrations appear between 54 mph (90 km/h)and 90 mph (150 km/h).

2. BALANCING PREPARATION OPERATION

- Adjust the tyre pressure Tyre pressure: Identification .

- Always carry out a road test for a minimum distance of 1 mile (2 km)before balancing the wheels, in order to remove any flat spots on the tread caused by the vehicle being immobilised.

- Actions to be carried out immediately after the test drive:
  - Position the vehicle on a two-post vehicle lift Vehicle: Towing and lifting ,
  - raise the vehicle,
  - leave the four wheels hanging free,
  - release the parking brake.



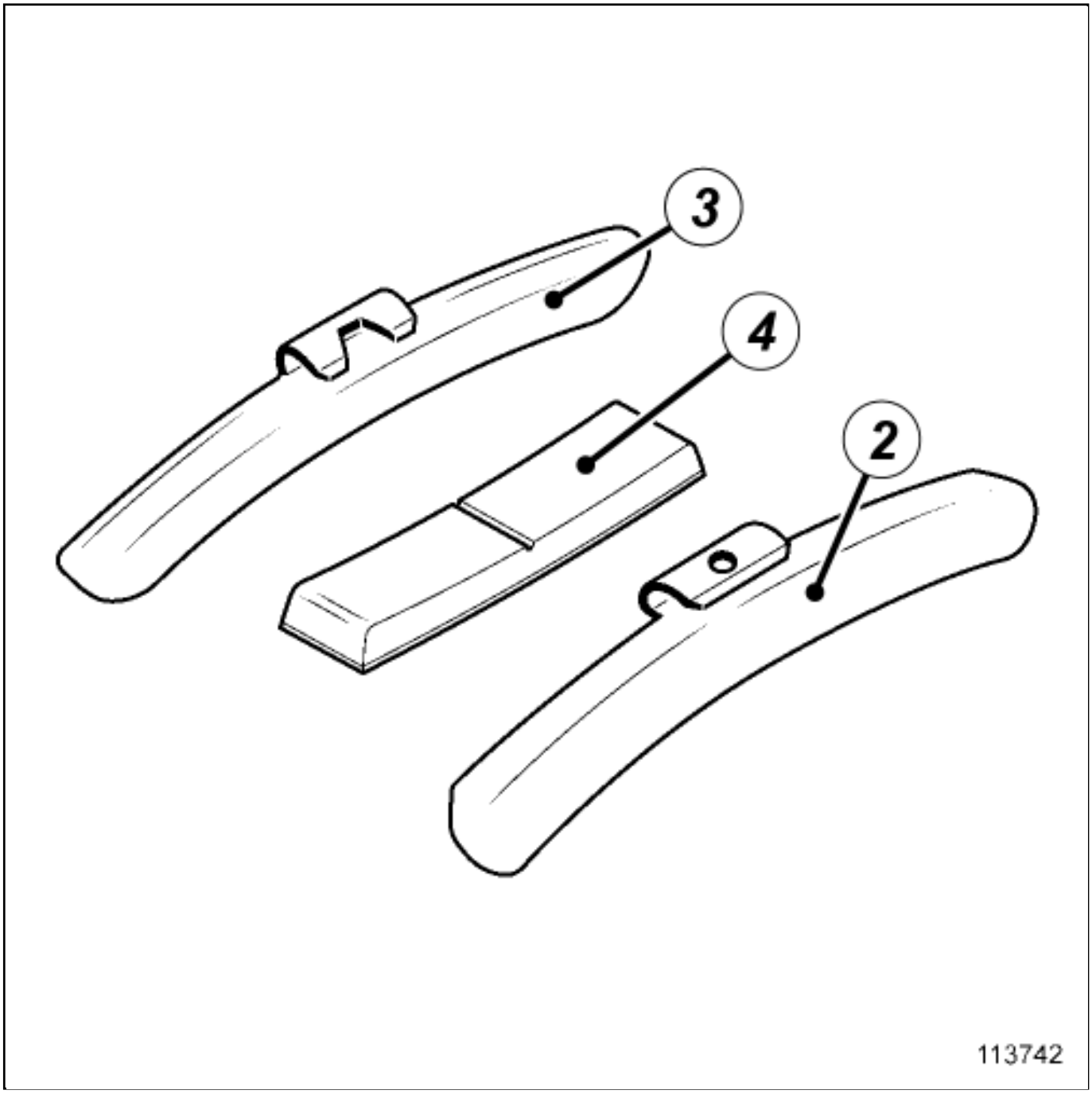
Note:

The ring is available from the supplier of the equipment used.

To reproduce the exact vehicle wheel assembly, use a ring(1) of diameter:

- 60 mm

There are three types of weight:



(2) Steel wheel with flange

(3) Alloy wheel with flange

(4) Alloy wheel without flange

In some countries, the use of lead weights is forbidden; in this case it is recommended to use ZAMAK weights instead.

Only use weights provided by the Parts Department.

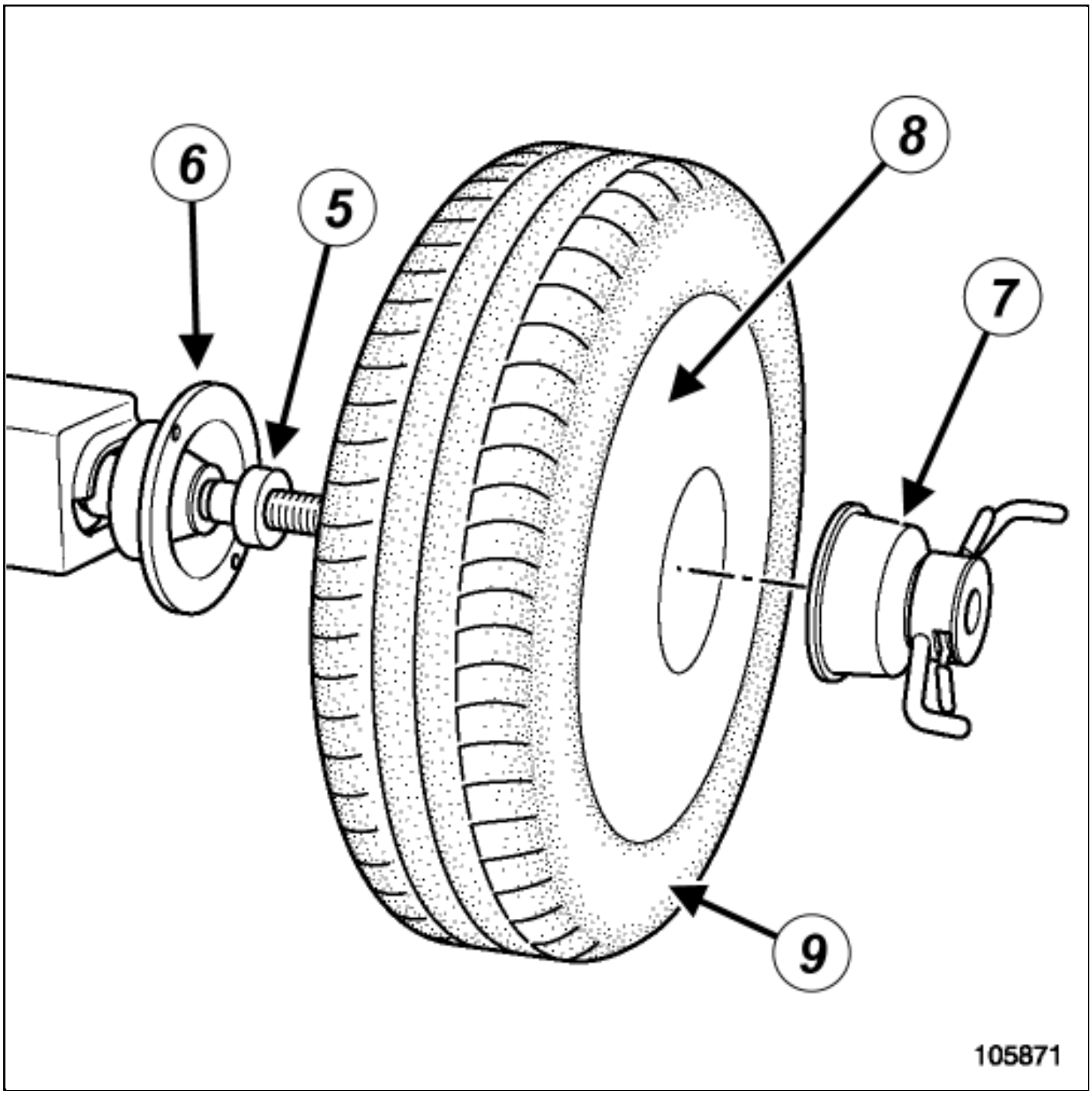
- Remove the wheels (see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

- Always clean the wheel, disc, and hub bearing surfaces.

3. PROCEDURE FOR BALANCING THE WHEEL IN QUESTION

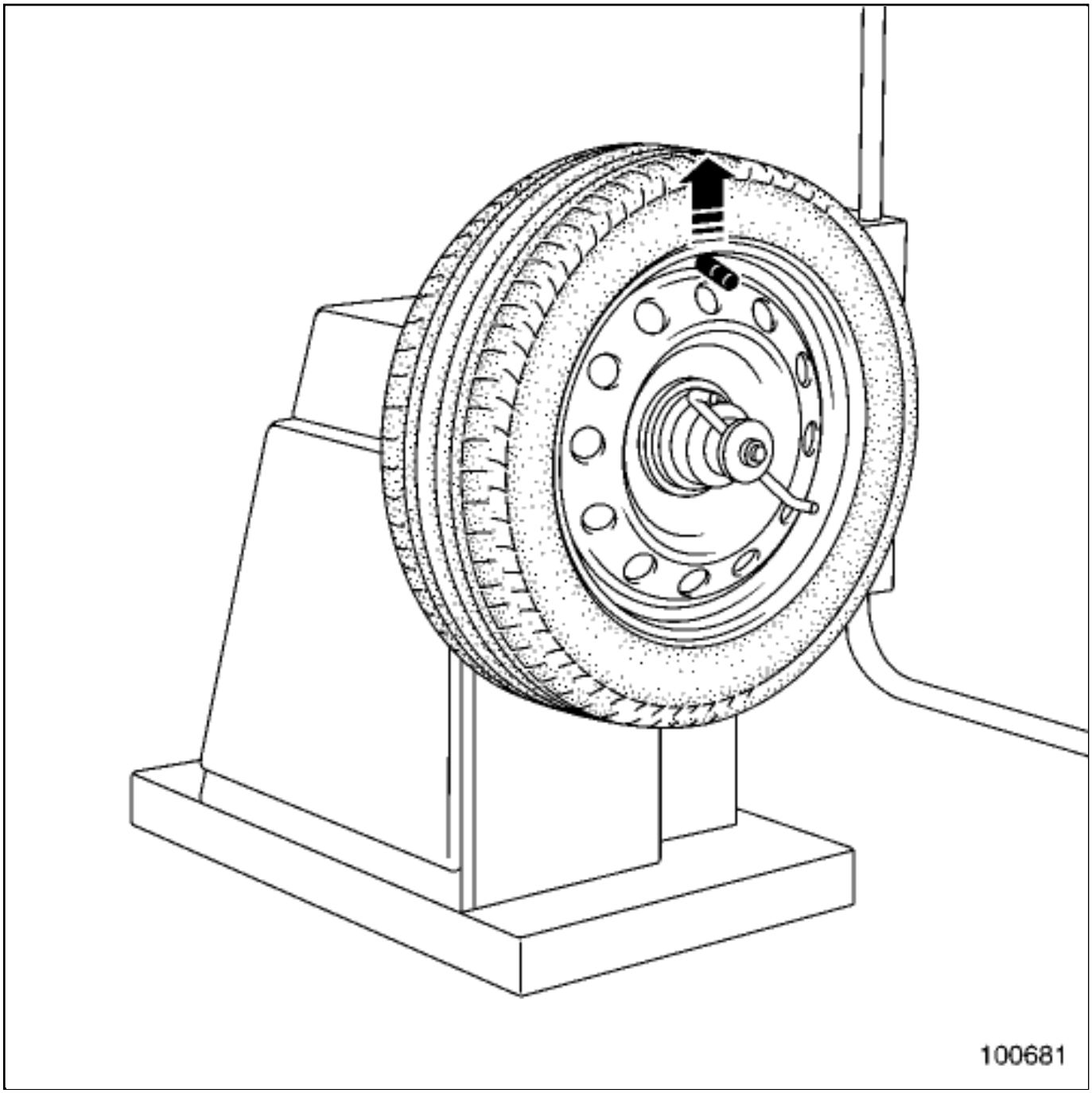
- Make sure that the wheel balancer bearing surface and all the centring equipment (ring, thrust plate, etc.) are kept clean.

- Try not to scratch the (alloy) wheel rim with the wheel tightening device.



The wheel is fitted on the wheel balancer as follows:

- (5) ring,
- (6) wheel balancer back-plate,
- (7) wheel tightening device (certain alloy wheels require a device 200 mm in diameter to ensure that the wheel has been correctly tightened),
- (8) outer wheel plane,
- (9) wheel.



Place the wheel on the wheel balancer, with the valve at the top, then lock the wheel in place.

Remove any stones trapped in the tyre tread.

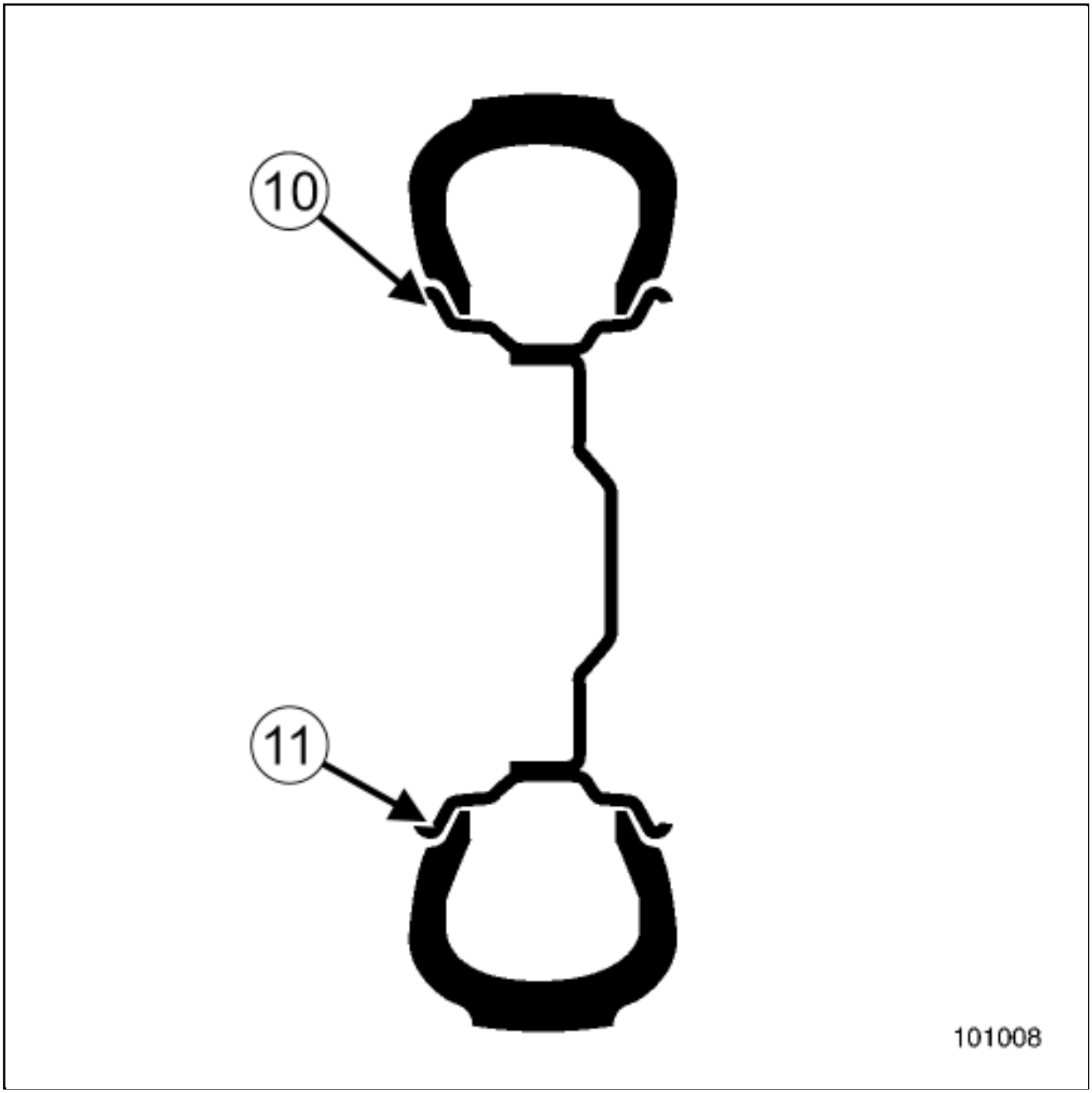
- Enter the specific wheel parameters when starting the wheel balancer.

- Start the wheel balancer and check the wheel balance, which should be 0 gon each plane of the wheel.

- If this is not the case, remove the old wheel balancing weights and repeat the wheel balancing procedure, checking that the wheel balance equals 0on each wheel plane.

CAUTION

To avoid detachment of the balance weights, use only weights which correspond to the vehicle wheel rims.



To ensure that the wheels are balanced correctly:

- Position a 10 g adhesive weight (10) on the interior of the wheel rim,
- Repeat the wheel balancing procedure; the wheel balancer should indicate an equivalent weight (± 4 g) opposite the weight added(11) ,
- Repeat the balancing method from the start if this is not the case.
- Remove the adhesive weight.

4. FINAL OPERATION

Refit the wheel(see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

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WHEEL: REMOVAL - REFITTING

The removal - refitting procedure is the same for all wheels.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Release the parking brake.
- Remove the trim .
- Position the wheel so that the valve is at the top.
- Mark the position of the wheel on the hub.

Note:

- This mark is required in order to:
  - Note the original position of the wheel on the hub,
  - perform the balancing operation.

2. REMOVAL OPERATION

- Loosen the wheel bolts with the wheel on the ground.

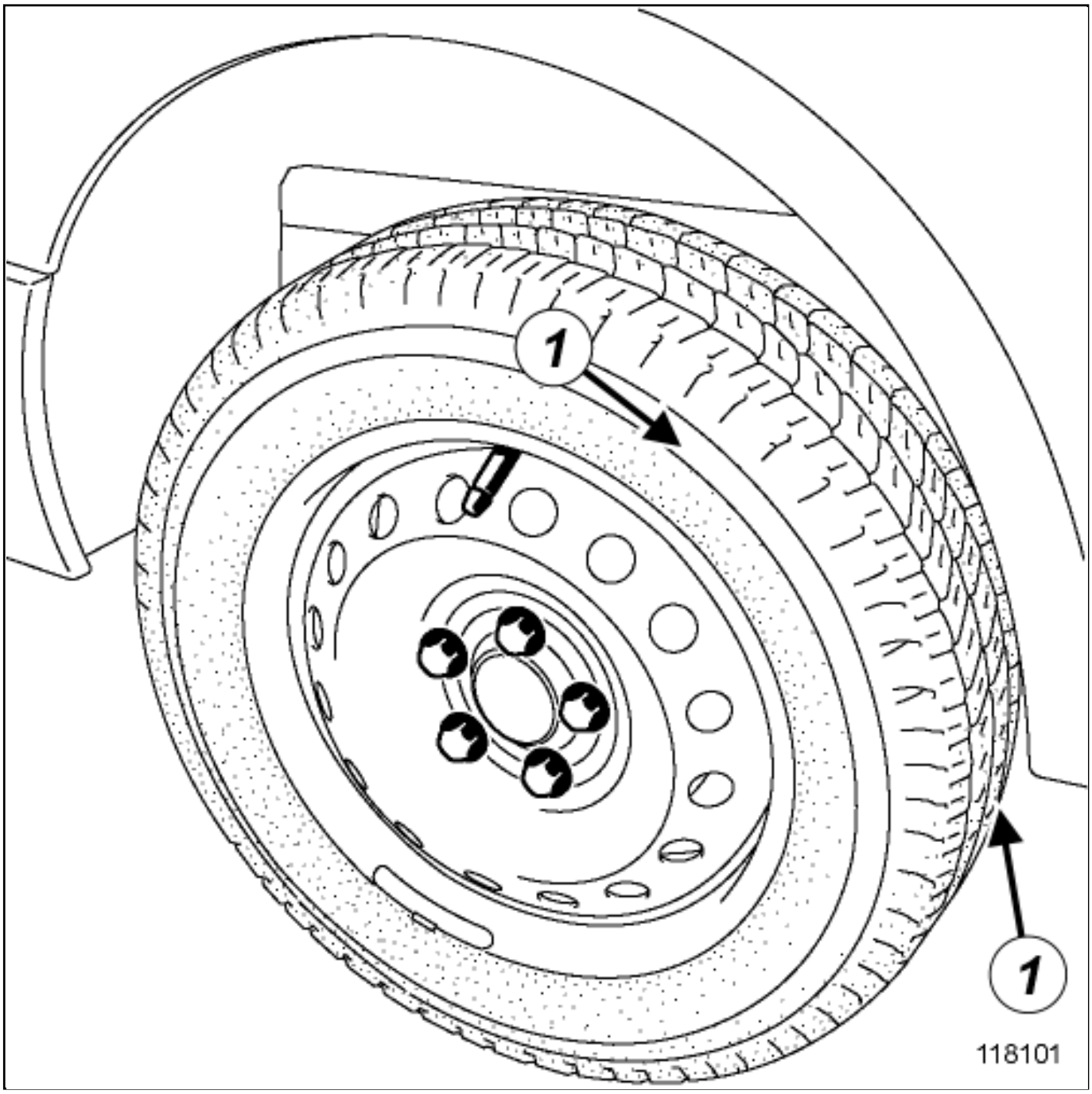
Note:

Use sockets with protective sheaths in order to avoid scratching the alloy wheel rims.

- Raise the lift.
- Remove:
  - the wheel bolts,
  - the wheel.

1- IF THE WHEEL CANNOT BE REMOVED AFTER THE BOLT HAS BEEN UNDONE:

- Position all the wheel bolts.
- Tighten the wheel bolts to bring all the bolt heads into contact with the wheel.
- Undo the wheel bolts by one turn.

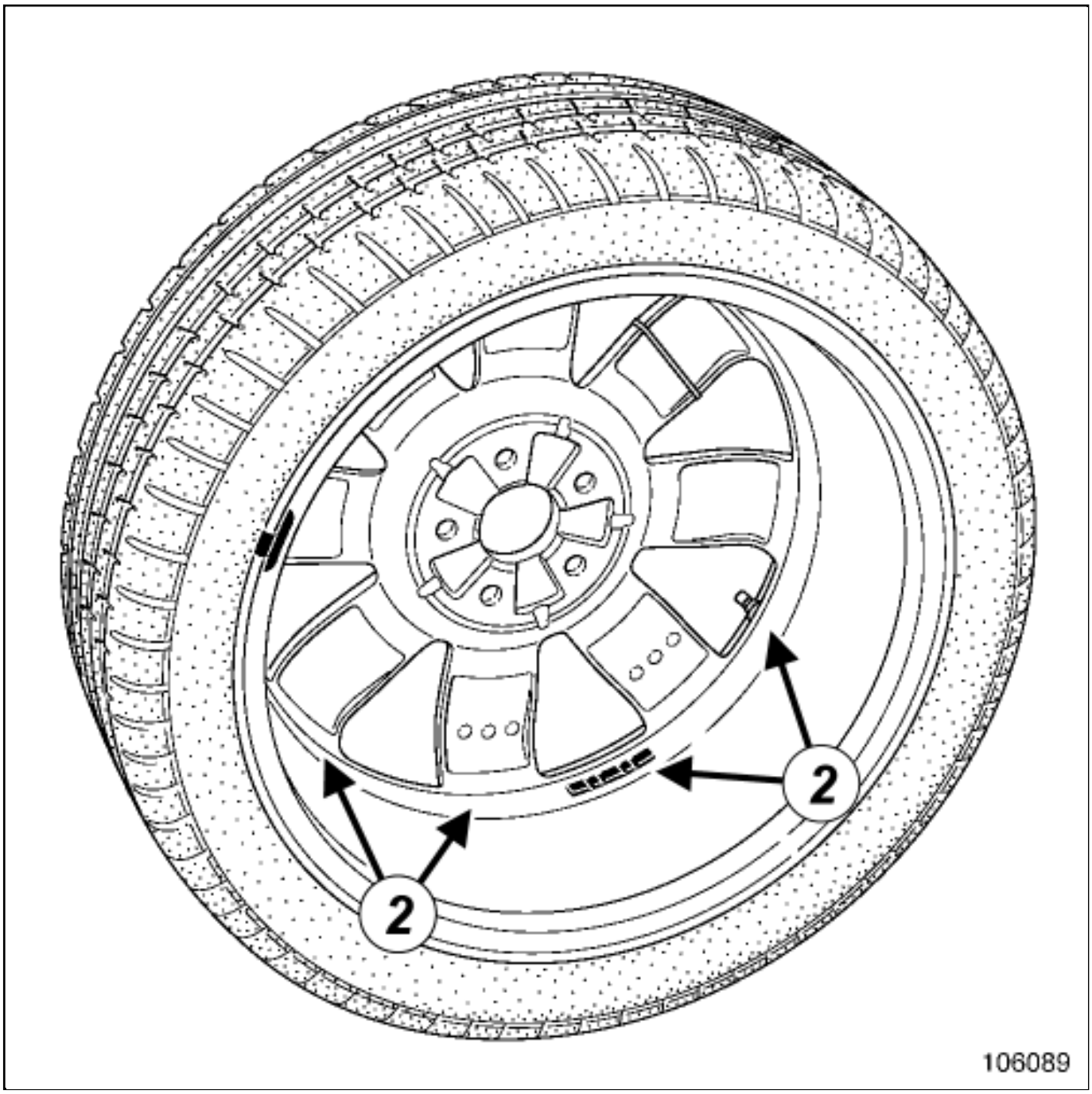


- Strike around the edge of the tyre walls(1) several times using a mallet on the inner and outer surfaces of the wheel to detach the wheel.

- Remove:

- the wheel bolts,
- the wheel.

1)IF THIS PROCEDURE DOES NOT WORK:



Strike the inner surface of the wheel(2) using a mallet and a wooden block to detach it.

Note:

Do not strike the surface of the wheel using excessive force as this may damage it.

- Remove:
  - the wheel bolts,
  - the wheel.

REFITTING

1. REFITTING PREPARATION OPERATION

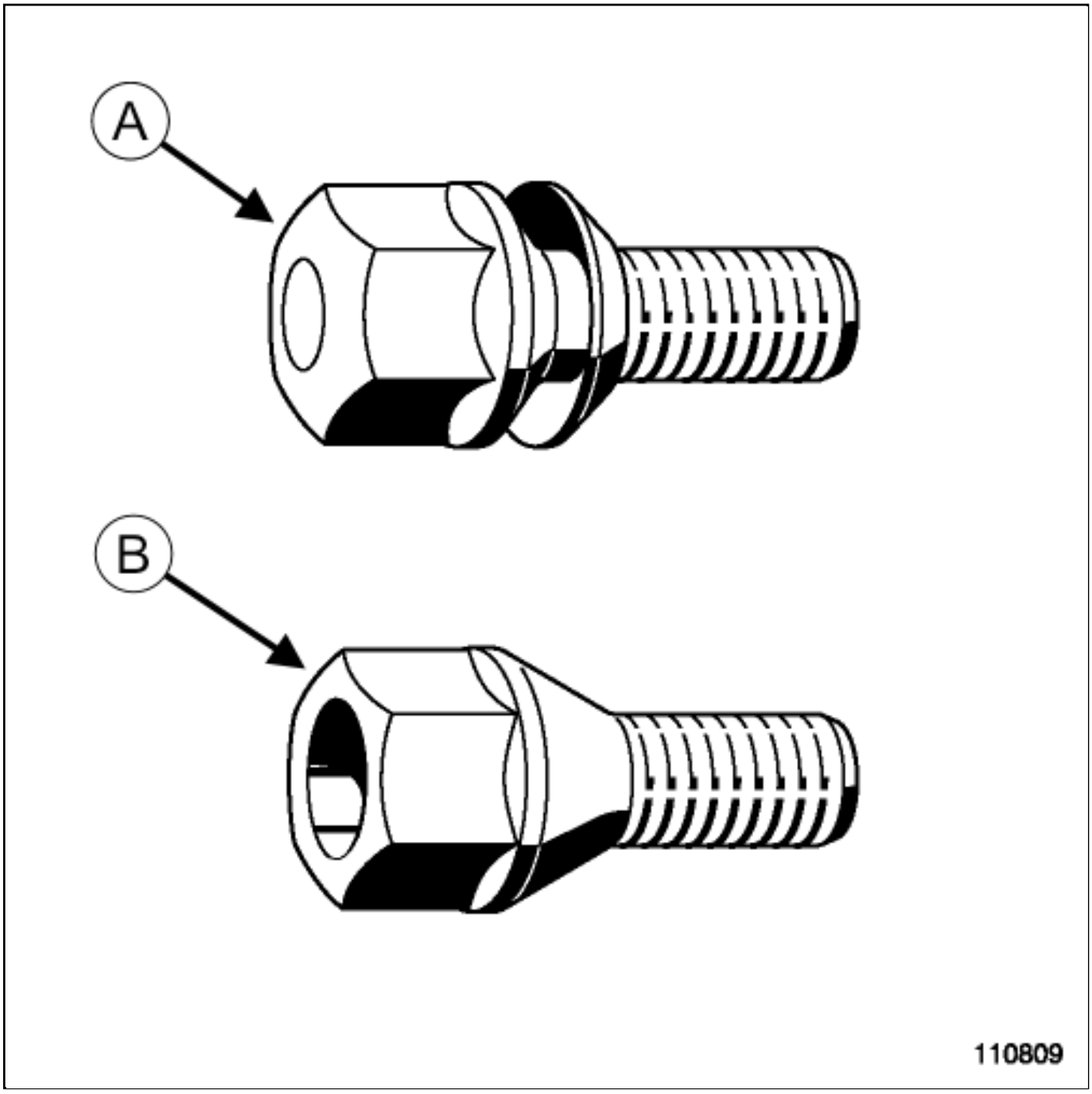
- Clean the hub carrier using a wire brush.

Note:

There are two types of wheel bolts for alloy and steel wheel rims; do not swap them.

- Check the condition of the tyre.

- Do not move or remove the balance weights.

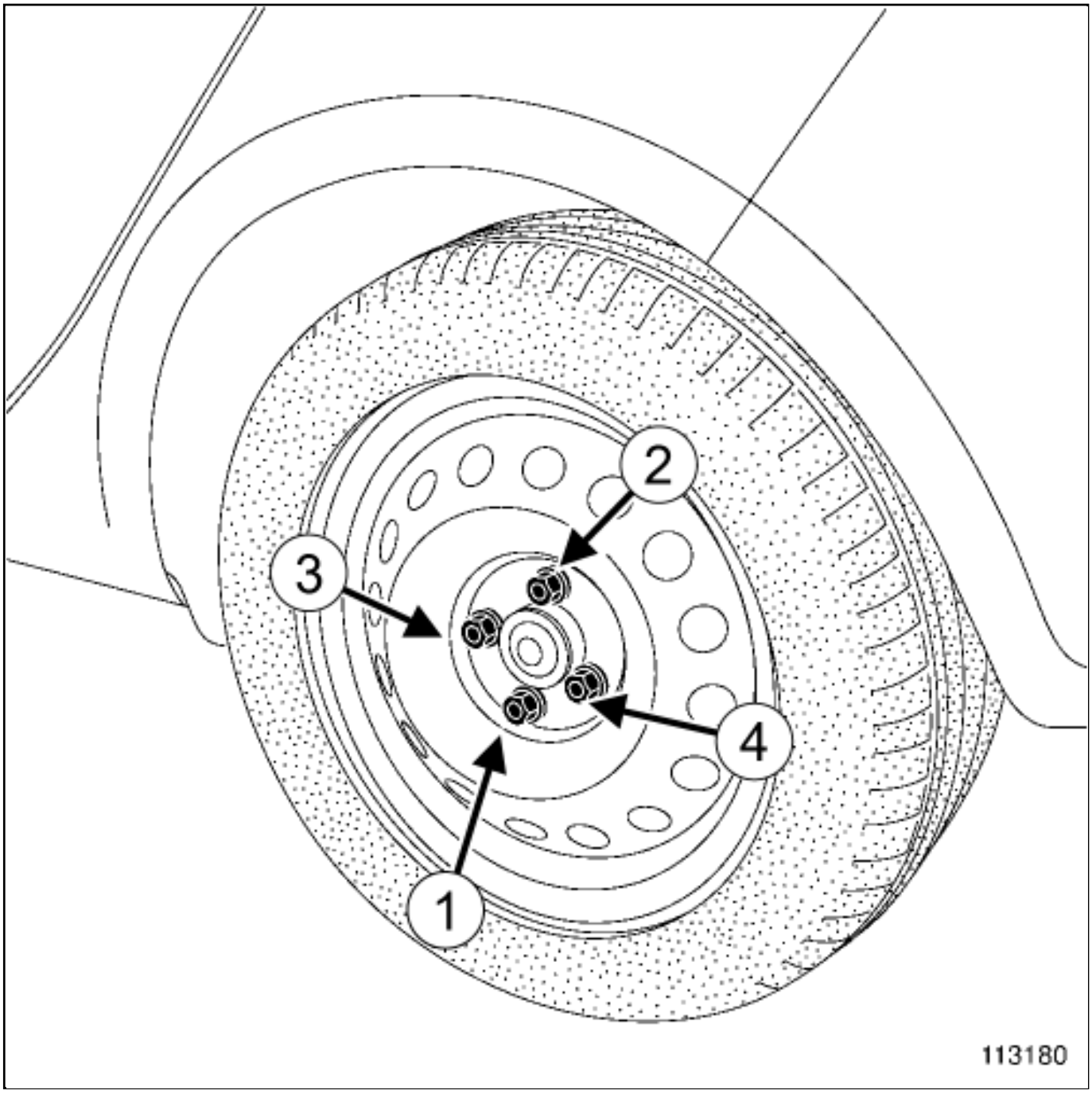


- There are two types of wheel bolts, do not swap them:
  - aluminium wheel rims(**A**)
  - steel wheel rims(**B**)

2. REFITTING OPERATION

- Clean the mating surfaces between the wheel and the hub carrier using a wire brush.
- Align the mark on the wheel with the mark made on the hub when it was removed.
- Fit the wheel to the vehicle, positioning the valve at the top.

- Insert the wheel bolts.



- Tighten the wheel bolts to bring all the bolt heads into contact with the wheel.

- Pretighten the wheel bolts to 30 N.m, with the wheel suspended, starting with the bolts at the bottom.

- Rotate the wheel through 180˚to bring the valve into the bottom position.

- Position the vehicle on its wheels.

Note:

Use sockets with protective sheaths in order to avoid scratching the alloy wheel rims.

- Torque tighten the wheel bolts in order:
  - **Front hub carrier assembly: Exploded view** ,
  - **Rear hub carrier assembly: Exploded view** .

- Refit the trim piece.

WHEELRIMIDENTIFICATION

1. IDENTIFICATION

1- MARKING

There are two types of identification marking on the wheel rims:

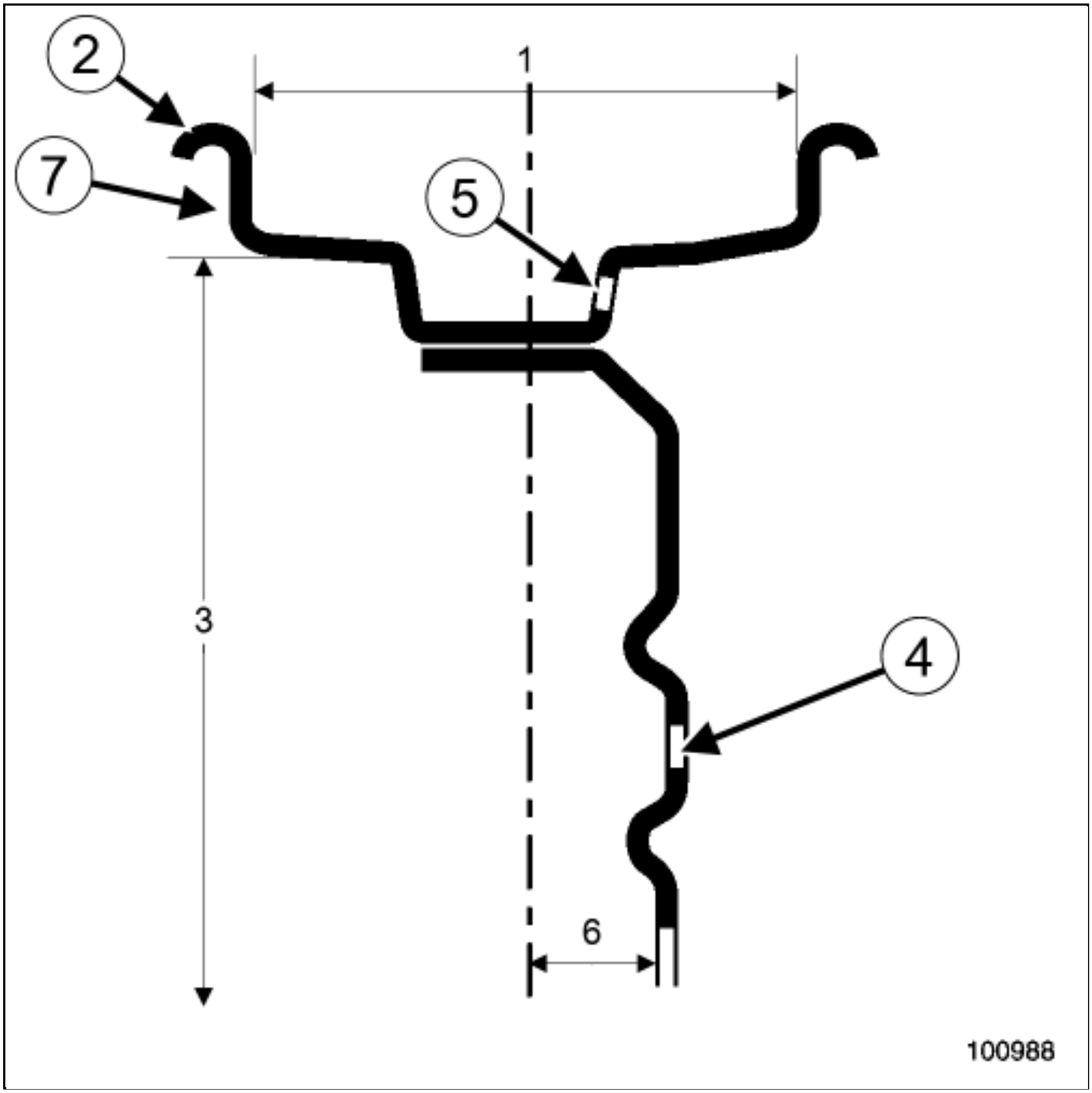
- engraved marking for steel wheel rims,
- cast marking for alloy wheel rims.

The marking gives the main dimensional specifications of the wheel rim.

This marking may be:

- complete, for example 6 J 15 5 CH 36,
- simplified, for example 6 J 15.

	Wheel type	6 J 15
1	Width (in inches)	6
2	Rim edge profile	J
3	Nominal diameter (in inches)	15
4	Number of holes	5
5	Anchorage profile of the tyre	CH
6	Offset (in mm)	36



There are 3 types of wheel rim edges(2) :

- those with two flat edges,
- those with two raised edges,
- those with one flat edge and one raised edge.

2- INSTALLATION DIAMETER FOR THE WHEEL BOLTS

The wheel bolts are positioned with a pitch circle diameter of 100 mm(4 holes).

3- RIM RUN-OUT

The maximum run-out is measured at the wheel rim edge(7) .

Steel wheel rims: 0.8 mm

Alloy wheel rims: 0.3 mm

4- OUT-OF-ROUNDNESS

The maximum out-of-round value is measured on the tyre bead bearing surface.

Steel wheel rims: 0.7 mm

Alloy wheel rims: 0.3 mm

WINDOW BONDING: DESCRIPTION

1. PREPARATION AND BONDING PROCEDURES

Special notes on the preparation and bonding operations for windows

For cutting(see 54A, Windows, Window detachment: Description) operations.

On bodywork components	
Original bodywork component: Example: "removal - refitting" and/or replacement of windows	Procedure 1
Bodywork component repaired and/or replaced: Example: replacement of roof, windscreen frame	Procedure 2
New bodywork component(Parts department): Example: bare body supplied painted, cataphoretic steel tailgate, primed plastic tailgate	Procedure 3

On windows	
New windows(Parts Department)	Procedure 4
New POLYCARBONATE windows(Parts Department)	Procedure 5
Removed window (with residual bead)	Procedure 6
Removed POLYCARBONATE window(with residual bead)	Procedure 7

2. PROCEDURE 1: ON ORIGINAL BODYWORK COMPONENT

1- FOR ALL BODY TYPES

Carefully clean the bonding area with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products) avoiding the cement bead.

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Grind the residual beading (leave a thickness of 1 to 2 mm of cement bead).

> Note:
>
> In the case of paint damage larger than 1 mm, apply a layer of primer (green and red marking) with a single, uniform stroke over the entire damaged area.

Let it dry for a minimum of 10 minutes.

Apply the primer with a single, uniform stroke onto the entire bonding area (residual/lacquer beading).

Let it dry for a minimum of 10 minutes.

Prepare the window (see procedure 4 or 5).

Apply the cement bead (preferably onto the window).

Bond the window immediately.

3. PROCEDURE 2: ON REPAIRED AND/OR REPLACED BODYWORK COMPONENT

1- BEFORE PAINTING

Carefully clean the bonding area with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products) avoiding the cement bead.

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Before applying the paint range, protect the bonding area with masking tape.

2- AFTER PAINTING

Remove the masking tape.

Clean the bonding area carefully with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Grind the residual beading (leave a thickness of 1 to 2 mm of cement bead).

Apply the primer with 2 uniform strokes over the entire bonding area, waiting a minimum of 10 minutes between strokes.

Let it dry for a minimum of 10 minutes.

Note:

Apply the primer 1 hour after the component is completely dry and cooled.

Prepare the window (see procedure 4 or 5).

Apply the cement bead (preferably onto the window).

Bond the window immediately.

4. PROCEDURE 3: ON NEW BODYWORK COMPONENT (PARTS DEPARTMENT)

1- BEFORE PAINTING

Sand lightly using a grey pad Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Clean the bonding area carefully with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Before applying paint range, protect the bonding area with masking tape.

2- AFTER PAINTING

1)FOR ALL BODY TYPES

Remove the masking tape.

Clean the bonding area carefully with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Apply the primer over the entire bonding area.

Note:

Apply the primer 1 hour after the component is completely dry and cooled.

Let it dry for a minimum of 10 minutes.

Prepare the window (see procedure 4 or 5).

Apply the cement bead (preferably onto the window).

Bond the window immediately.

5. PROCEDURE 4: ON A NEW WINDOW (PARTS DEPARTMENT)

Ensure you have the correct window.

Check that there are no faults or cracks.

Clean the bonding area carefully with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Fit the trims (according to the vehicle).

Carry out a test assembly for the vehicle window.

Apply the glass cleaner/activator with a pre-soaked wipe.

Clean immediately with the dry wipe.

Apply the primer with a single, uniform stroke around the outside edge of the window, along the bonding line.

Let it dry for a minimum of 10 minutes.

Apply the cement bead.

Bond the window immediately.

6. PROCEDURE 5: ON NEW POLYCARBONATE WINDOWS

7. PROCEDURE 6: ON REMOVED WINDOW (WITH RESIDUAL BEADING)

Check that there are no faults or cracks.

Carefully clean the bonding area with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products) avoiding the cement bead.

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Grind the residual beading (leave a thickness of 1 to 2 mm of cement bead).

Fit the trims (according to the vehicle).

Carry out a test assembly for the vehicle window.

Note:

If there is an area with no residual beading on the window (for example: difficulty in adhering):

- apply the glass cleaner/activator using a pre-soaked wipe along the bonding line,
- wipe with a dry cloth.

Apply the primer (green and red marking) with a single, uniform stroke over the entire bonding area.

Let it dry for a minimum of 10 minutes.

Apply the cement bead.

Bond the window immediately.

8. PROCEDURE 7: ON REMOVED POLYCARBONATE WINDOW (WITH RESIDUAL BEADING)

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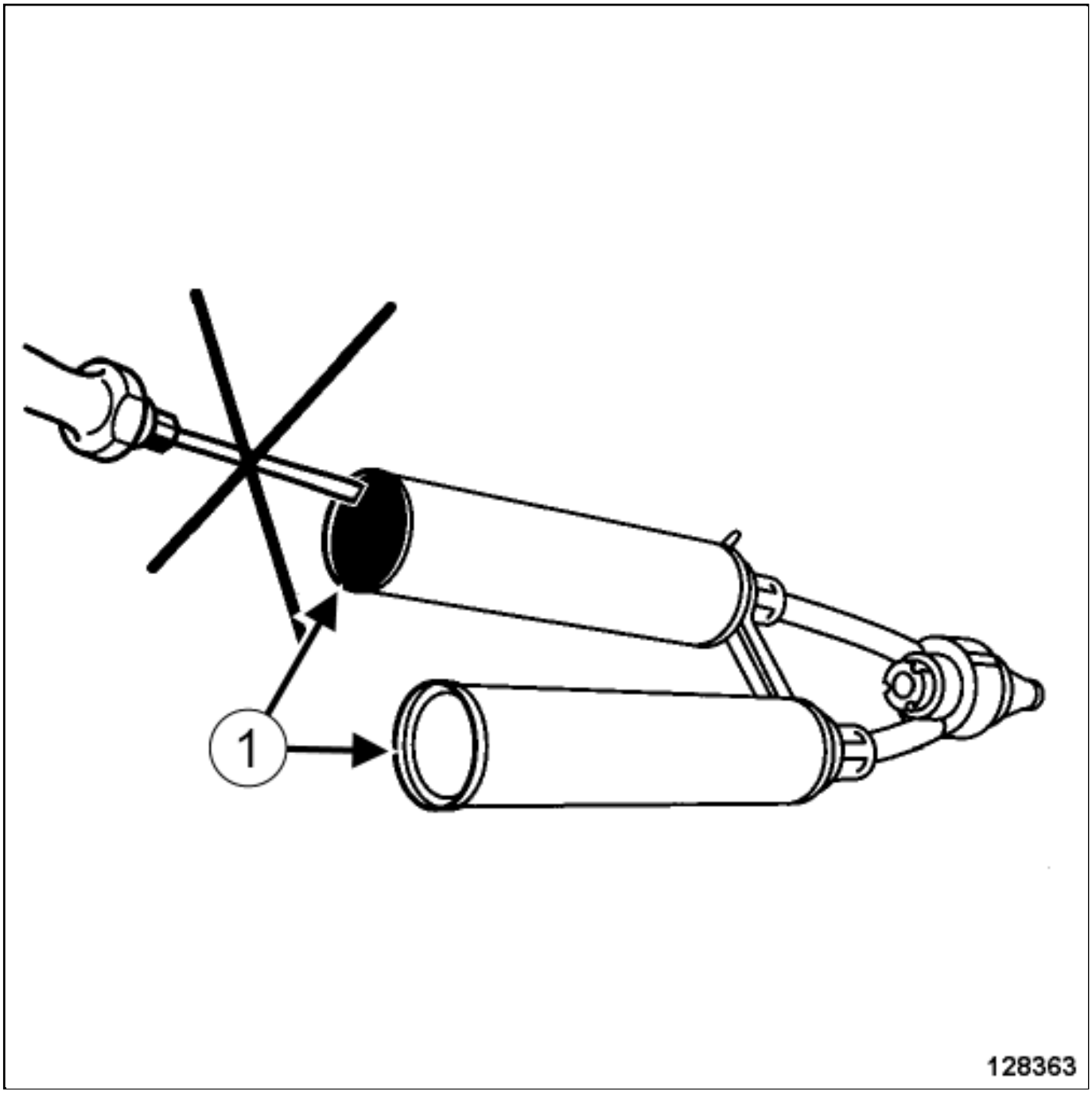
XSL version : 3.02 du 22/07/11

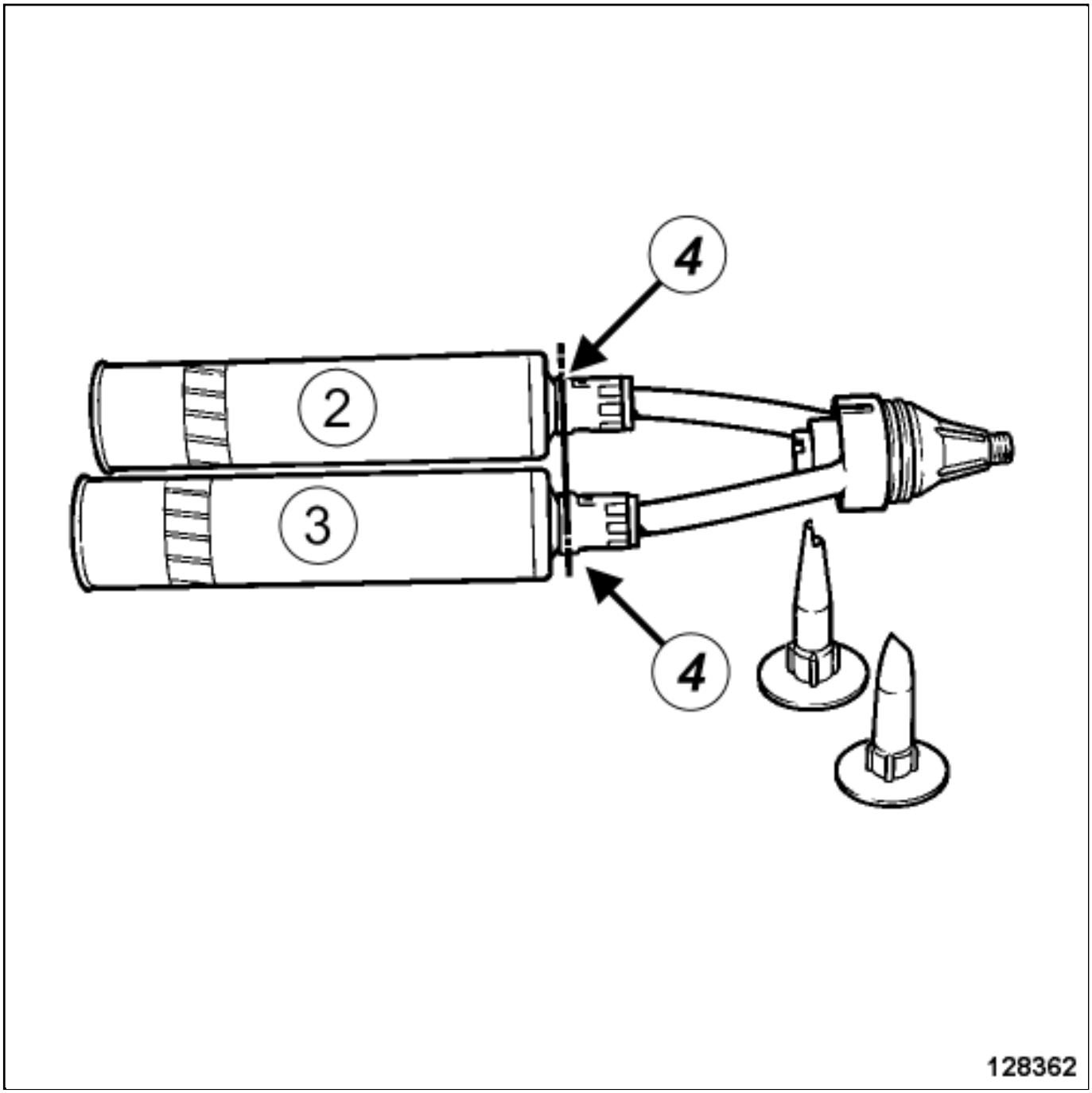
WINDOW BONDING TOOL: USE

Note:

When bonding windows using a two-component mastic, in order to guarantee good bonding you must always take the following recommendations into account.

1. TWIN MASTIC AND ACTIVATOR CARTRIDGE PROTECTIVE CAPS

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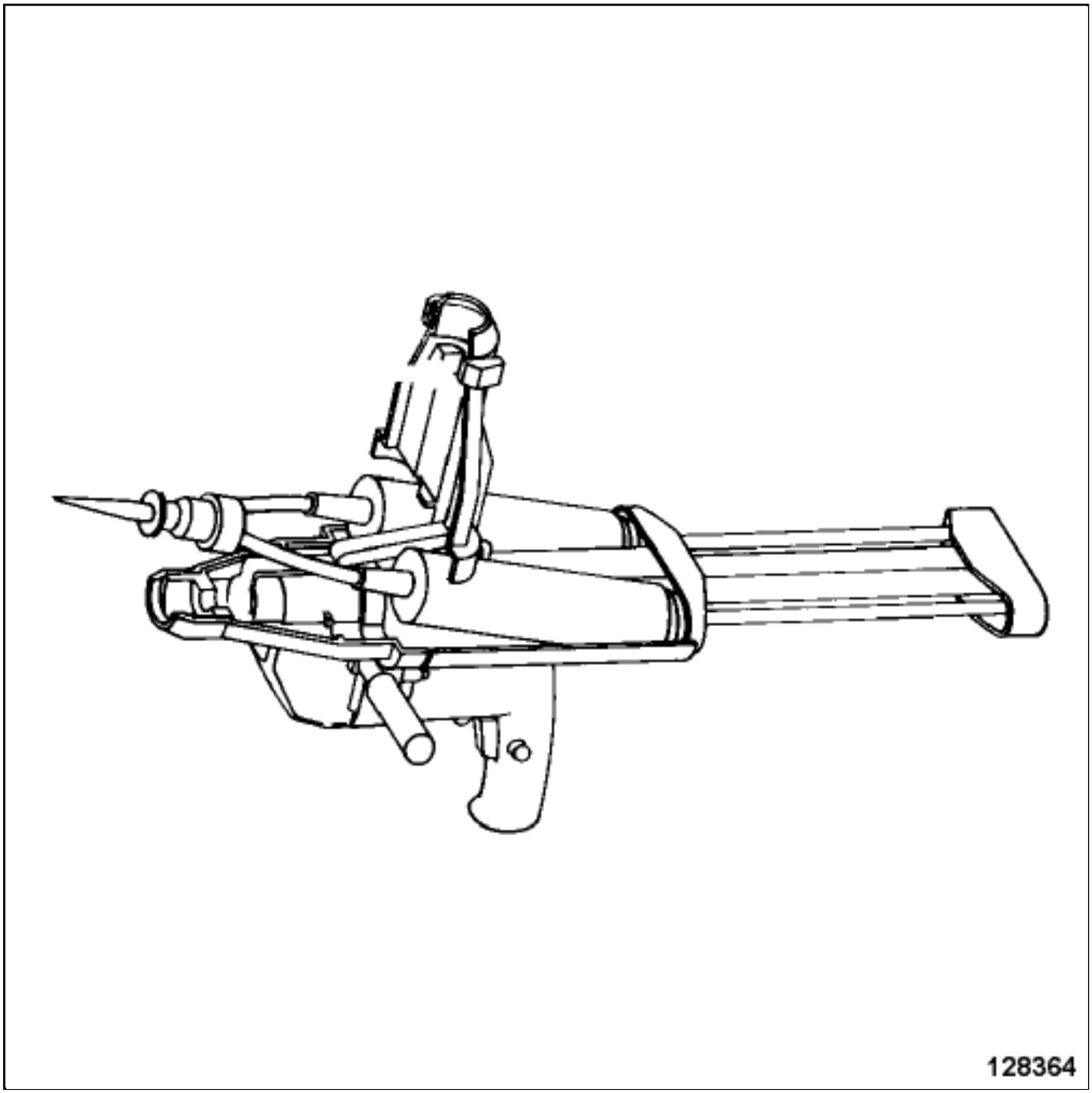


- The twin cartridges of the two-component mastic kit have pre-cut metal protective caps(1) .

These discs are automatically removed when theBETAGUNis operated.

When the two actuating arms of the gun are pushed in, the protective caps separate from the cartridges and the two products(2) and (3) pass simultaneously to their ends(4) on the mixer nozzle side.

The mastic and its activator can then be extruded and mixed.

Note:

Do not remove the front protective caps(1) before fitting the twin cartridges in the glue gun.

If these protective caps are not present, the gun presses directly on the plastic pistons and compresses the mastic and activator before it strikes the cartridges.

As the products are of different densities, the two cartridges do not burst simultaneously and the mixture of the two products is no longer guaranteed.

WINDOW CEMENT BEAD: DESCRIPTION

Note, one or more warnings are present in this procedure

Note:

If using a BIPAC EVOLUTIONbonding kit, extrude 100 to 150 mmof cement bead so that the product is uniformly mixed before application.

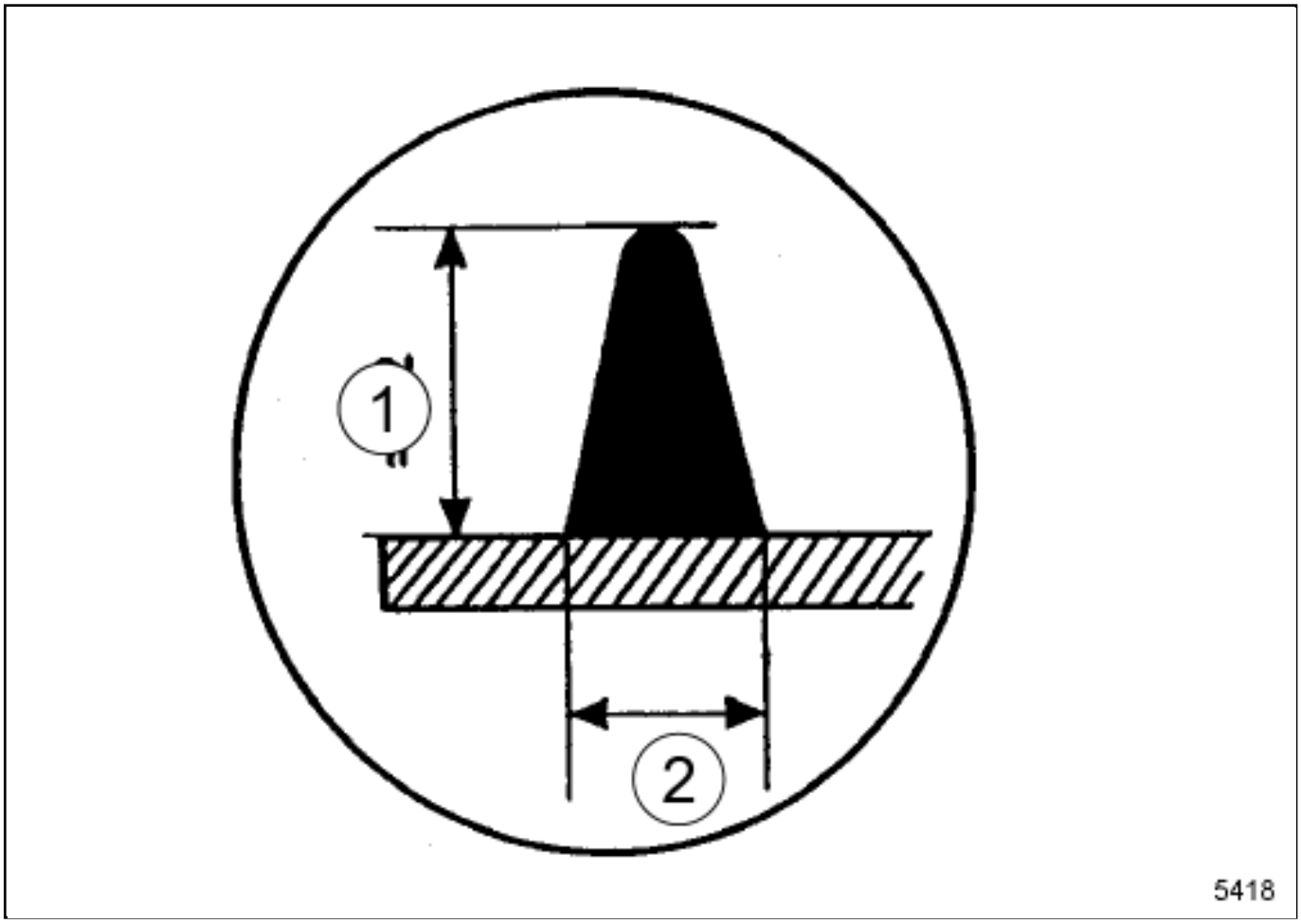
CAUTION

To prevent the risk of interfering with the radio reception if the vehicle's aerial is integrated into the window and to prevent the risk of corrosion on an aluminium structure, use a non-conducting adhesive.

1. APPLICATION

Level the residual beading at the last possible minute to maximise cleanliness (reduced risk of contamination).

The cement bead must be triangular in shape (an adhesive application nozzle is supplied in each bonding kit).



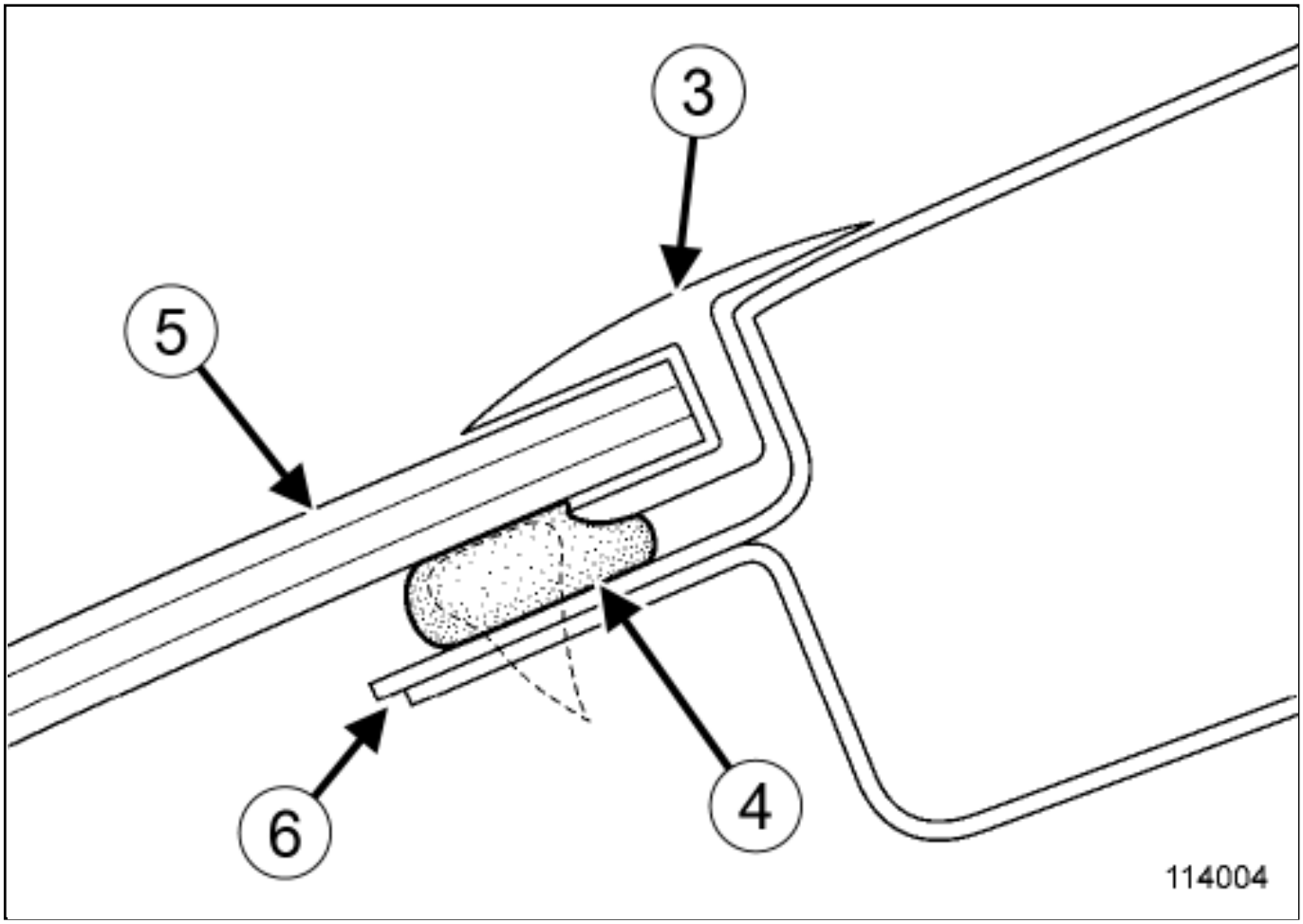
(1) : 12 mm

(2) : 8 mm

If there is no specific nozzle, follow the dimensions of the beading.

Apply adhesive to the windows (rather than the mounting) for the following reasons:

APPLICATION ON WINDOWS

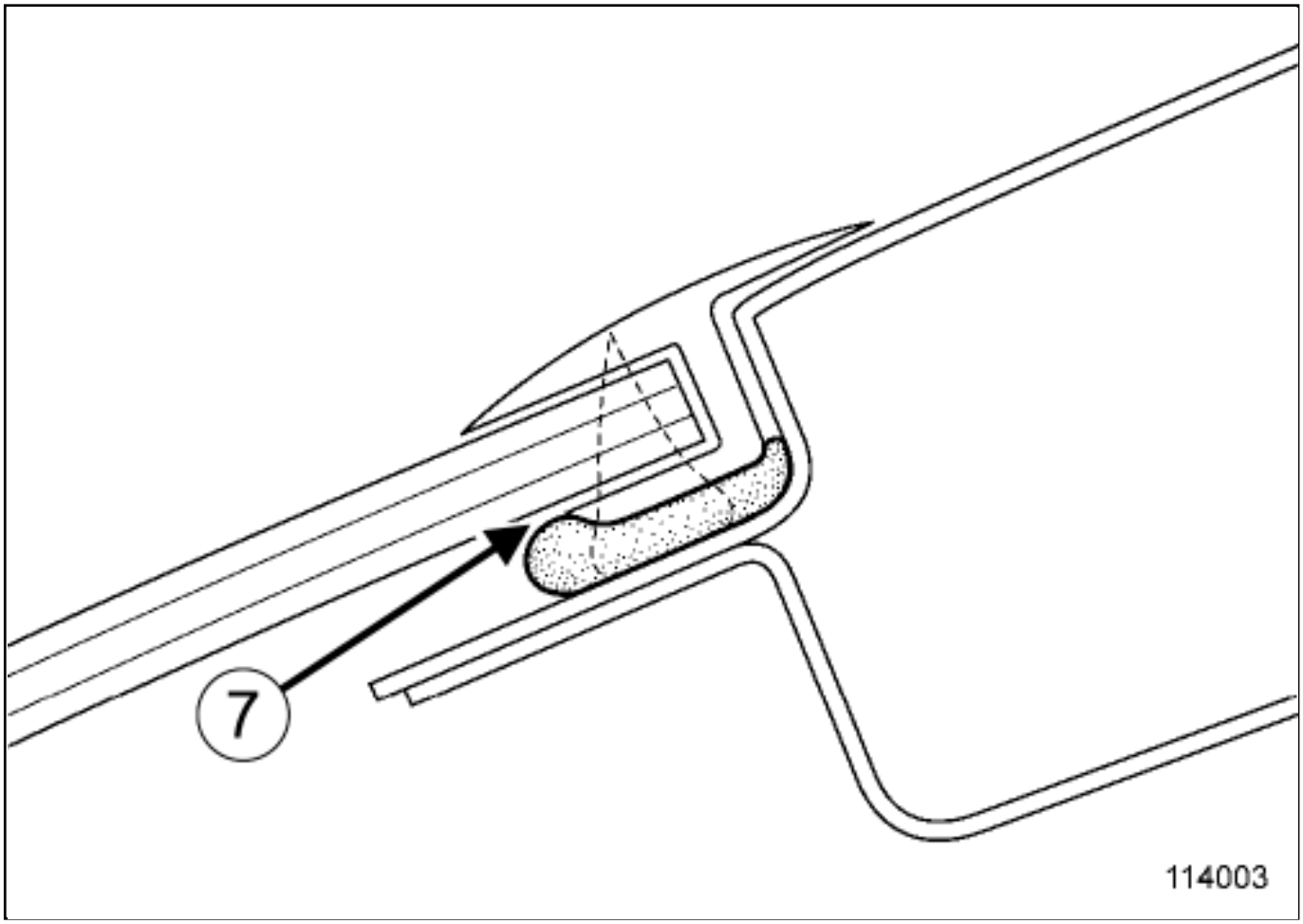


Ideal working position.

The trim(3) may be used as a guide.

When the cement bead(4) is applied in the correct position, it forms a link between the window(5) and the mounting(6) .

APPLICATION ON MOUNTING



Incorrect working position.

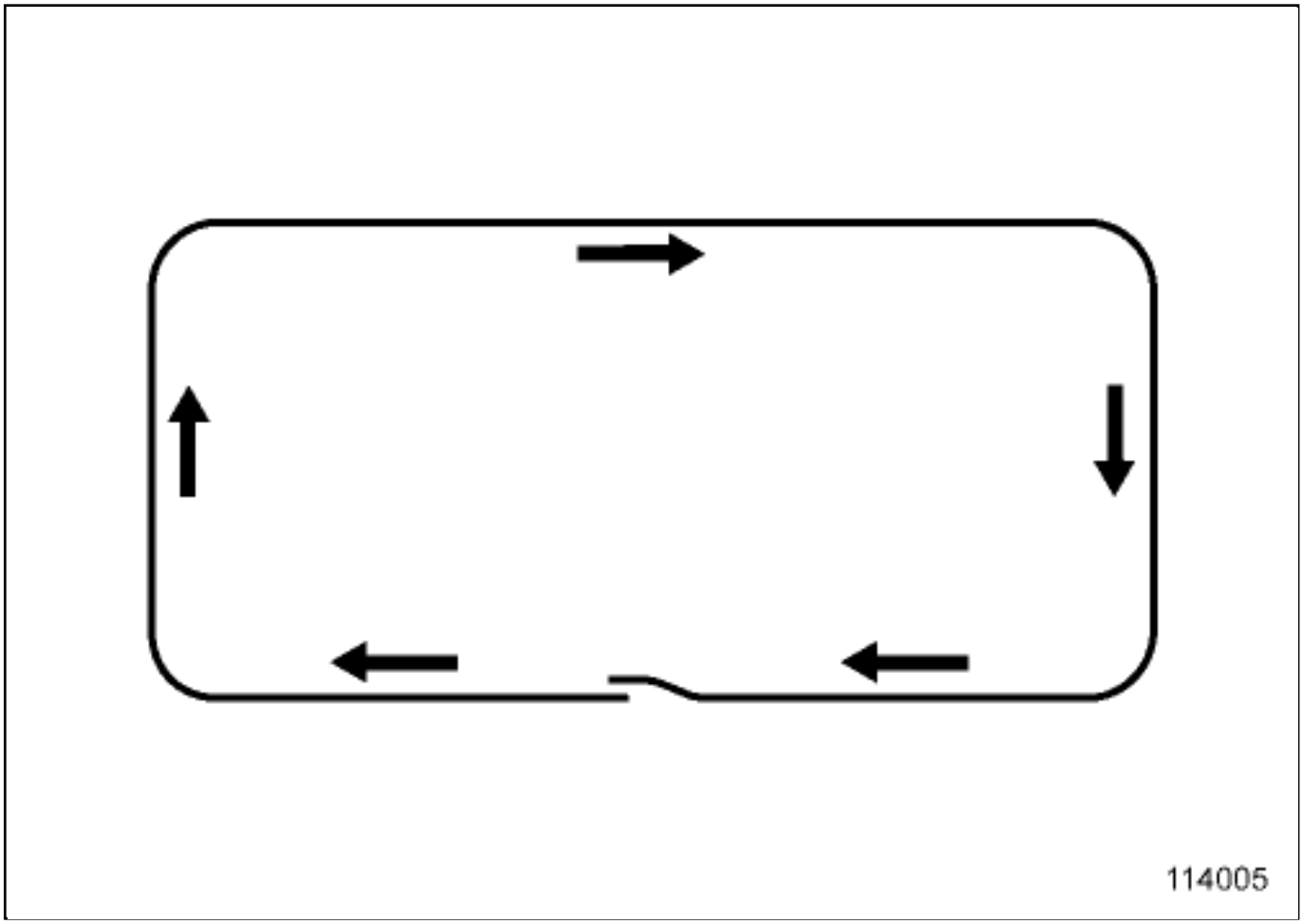
There is no marking to aid the application of the cement bead.

If applied without a guide, there is a risk that the cement bead will no longer come into contact with the window (7) and this will cause a sealing fault.

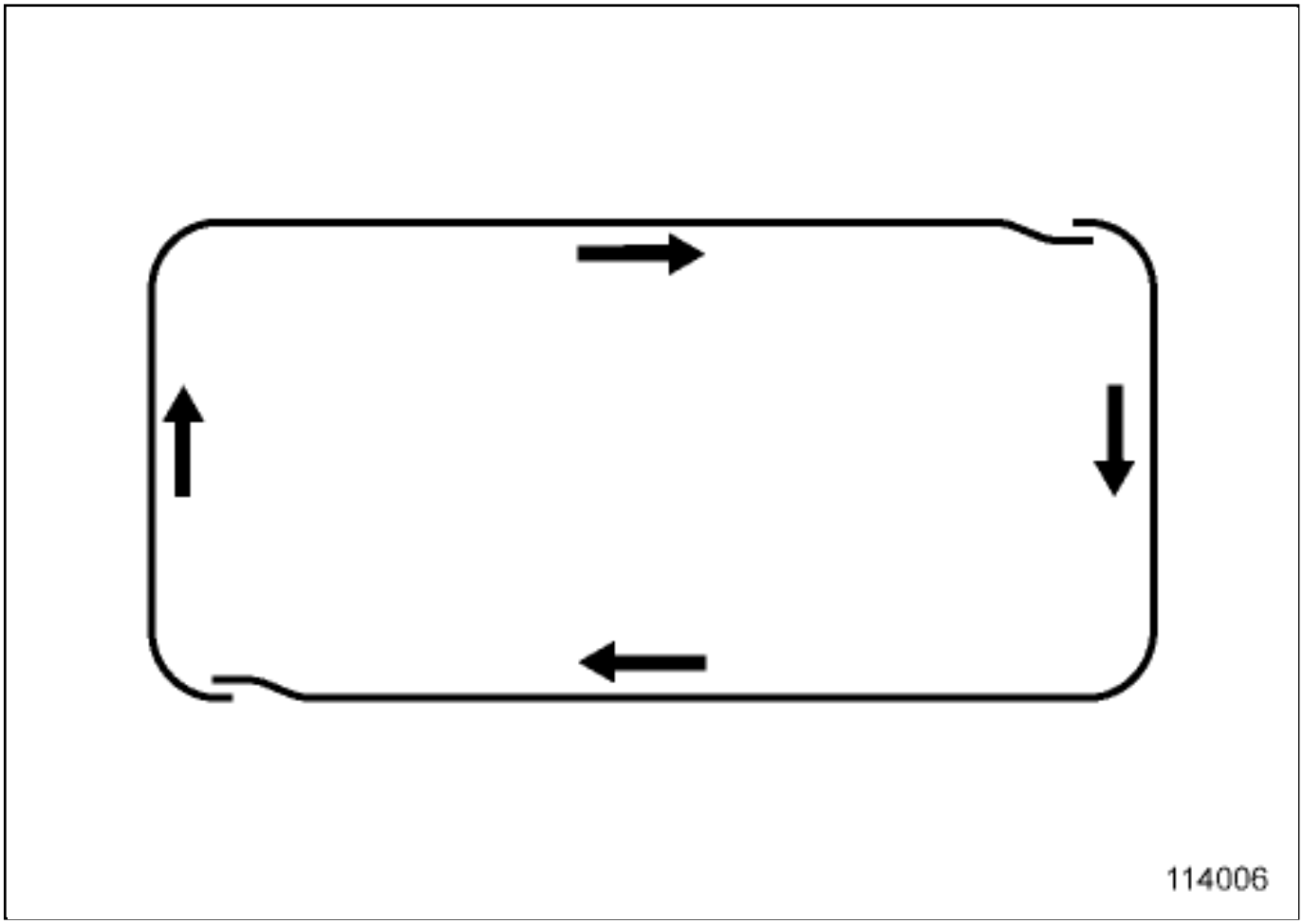
The cement bead must be even and applied perpendicular to the bonding area (starting with the bottom and centre of the mounting when bonding a window).

At the end of the application procedure, a union is formed by juxtaposing the cement beads by 50 mm.

APPLICATION ON WINDOW OR MOUNTING



APPLICATION ON SUNROOF MECHANISM OR MOUNTING



Note:

After laying down the cement bead, immediately fit the window or sunroof mechanism to the vehicle.

WINDOW DETACHMENT: DESCRIPTION

Note, one or more warnings are present in this procedure

Special tooling required	
Wire insertion tool for removing bonded mirror glass.	Car. 1033
Universal protector	Car. 1847

1. PREPARATION

WARNING

Wear protective gloves and goggles when cutting the window or sunroof operating mechanism.

Use an appropriate work station when replacing a window or sunroof mechanism.

Protect the vehicle interior.

Remove the various trims and interior and exterior equipment (see the MR of vehicle concerned).

Protect the bodywork around the window using masking tape.

Position the universal guardUniversal protector (Car. 1847) or remove the upper section of the dashboard (according to vehicle).

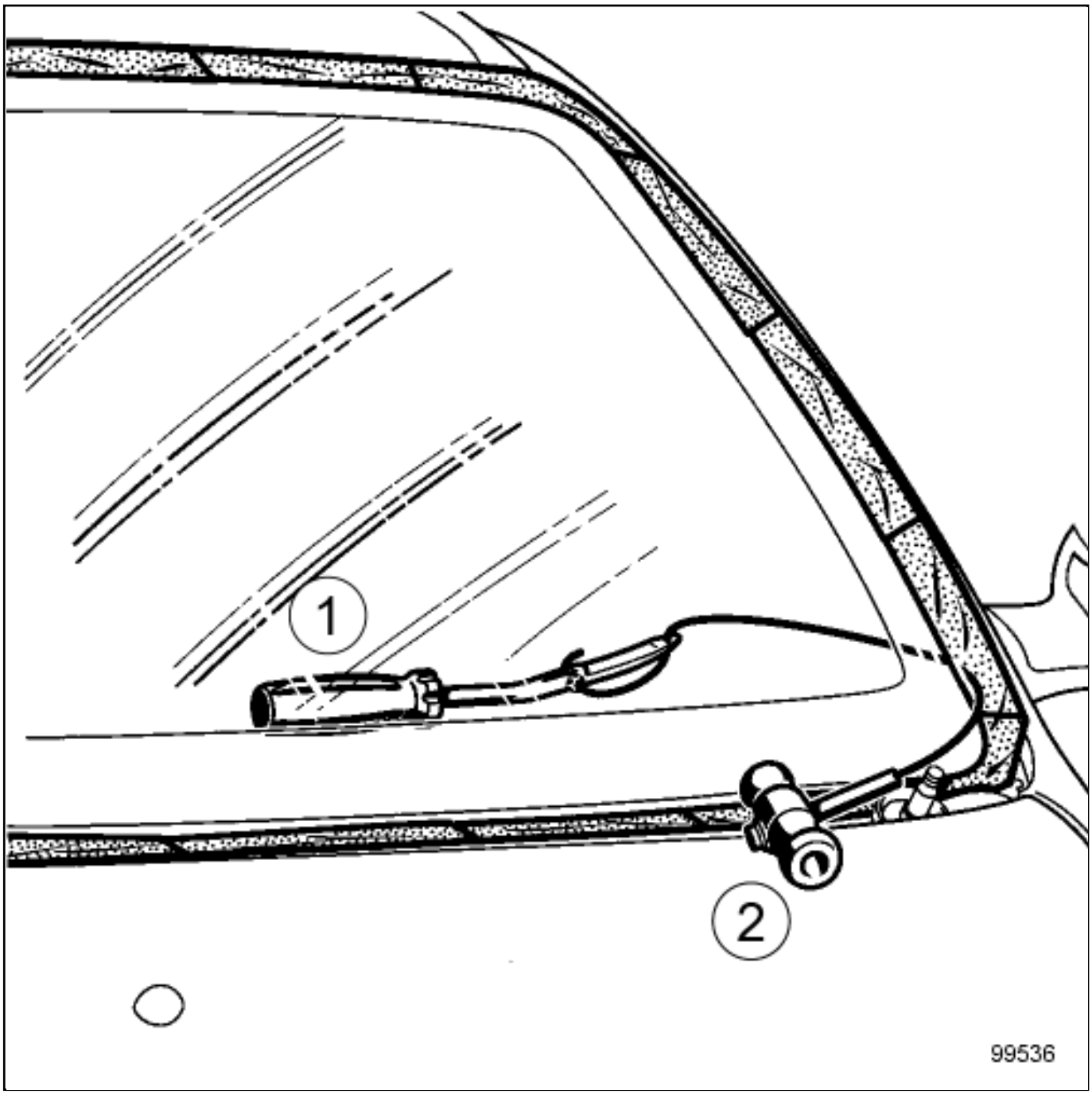
2. CUTTING

1- FIRST PROCEDURE

Make a hole in the cement bead with a wire insertion tool.

Note:

Place the wire insertion tool into the most accessible part of the window or sunroof mechanism.



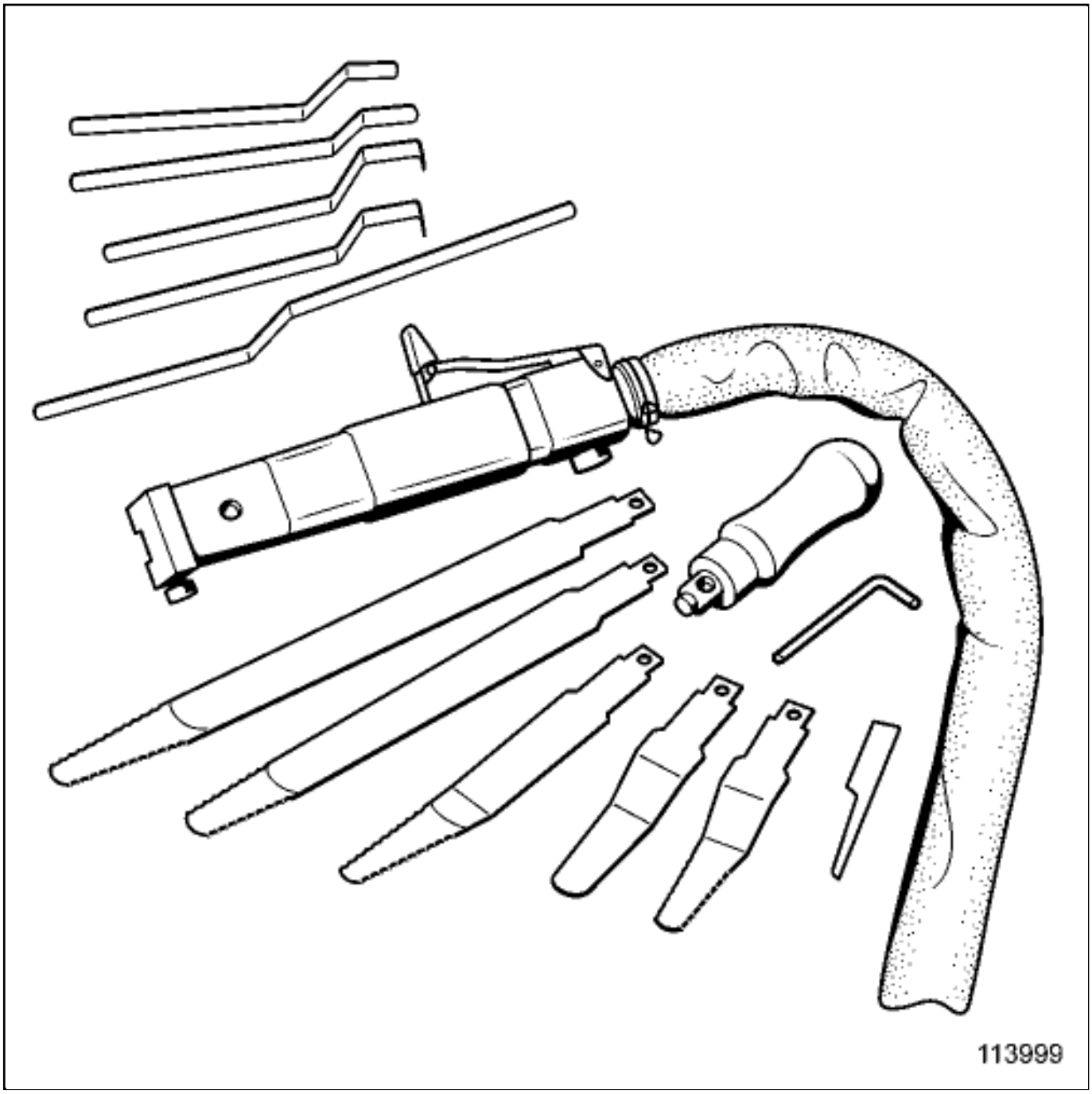
The first person places the retaining tool(1) on the cement bead, from inside the vehicle at approximately 300 mmfrom where the wire passes through.

The second person pulls the pulling handle(2) from outside the vehicle towards the first person's tool.

Repeat this operation until the cement bead has been completely cut.

CAUTION

To prevent any bonded component from being damaged during the cutting operation, make sure that the wire does not damage the parts near the cement bead.



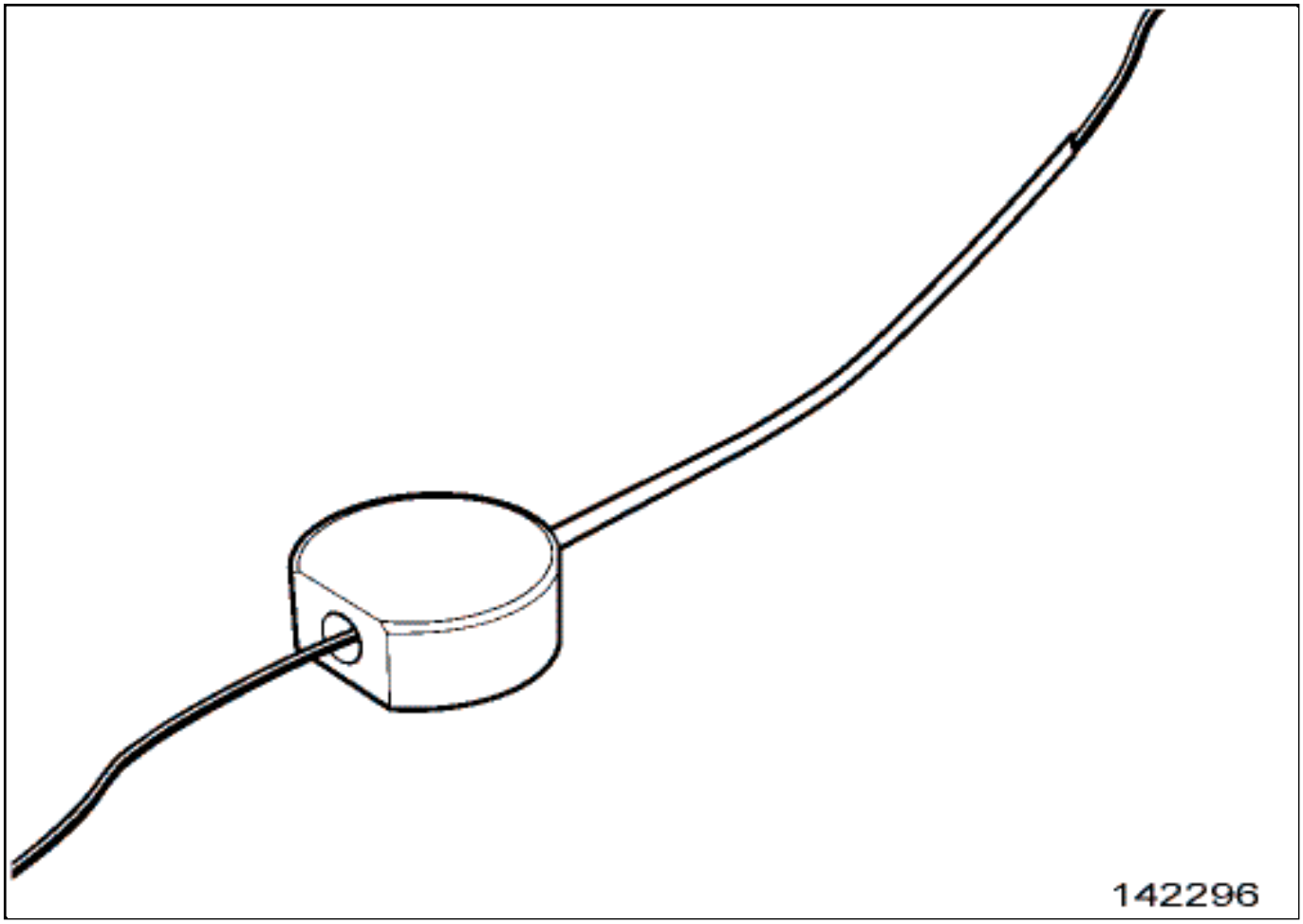
Part no.: 77 11 171 946

The cement bead can be cut using a pneumatic cutting tool(see 54A, Windows, Window removal tool: Use) .

2- SECOND PROCEDURE

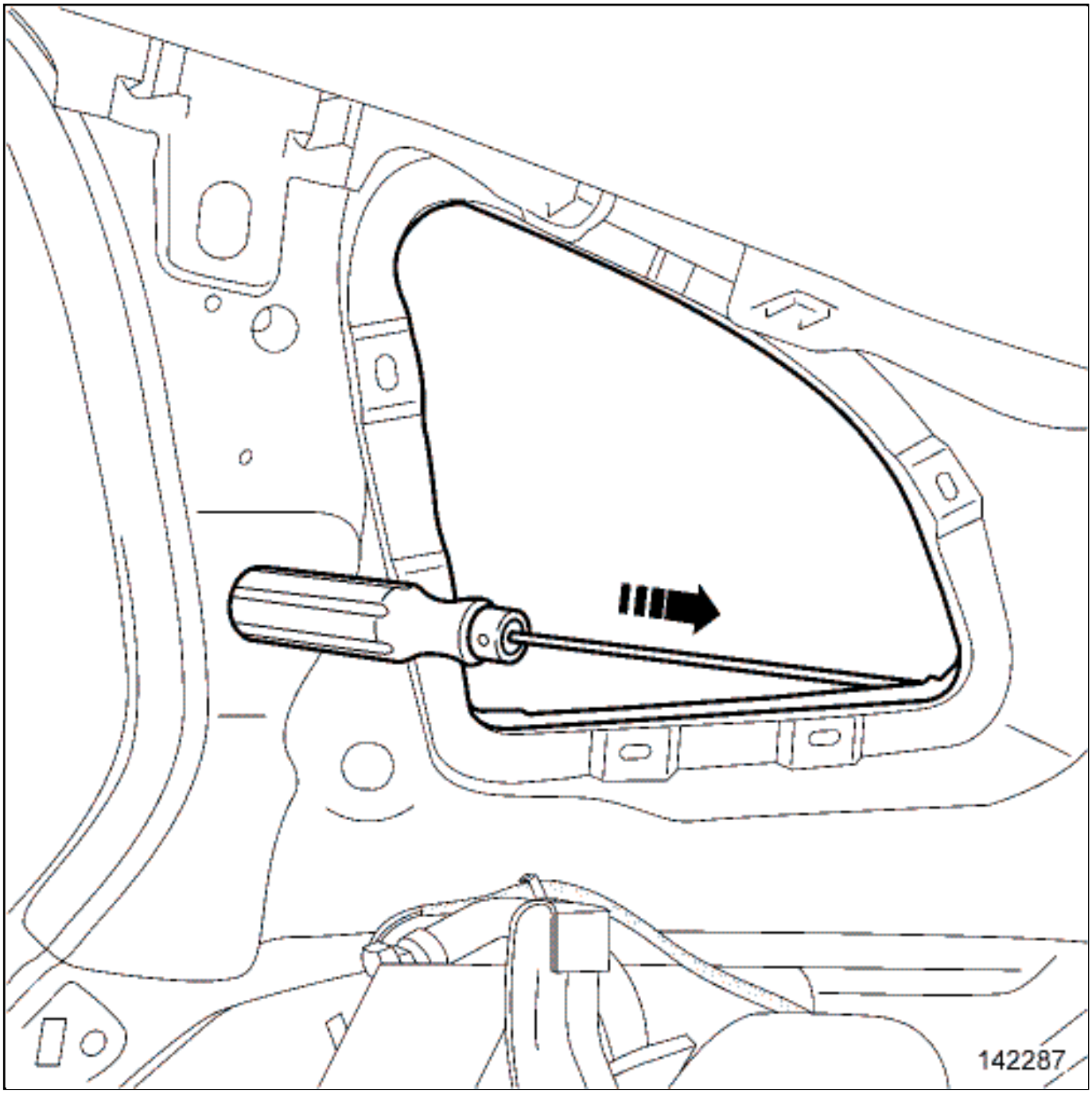
Note:

Use a cutting wire with a square cross-section.

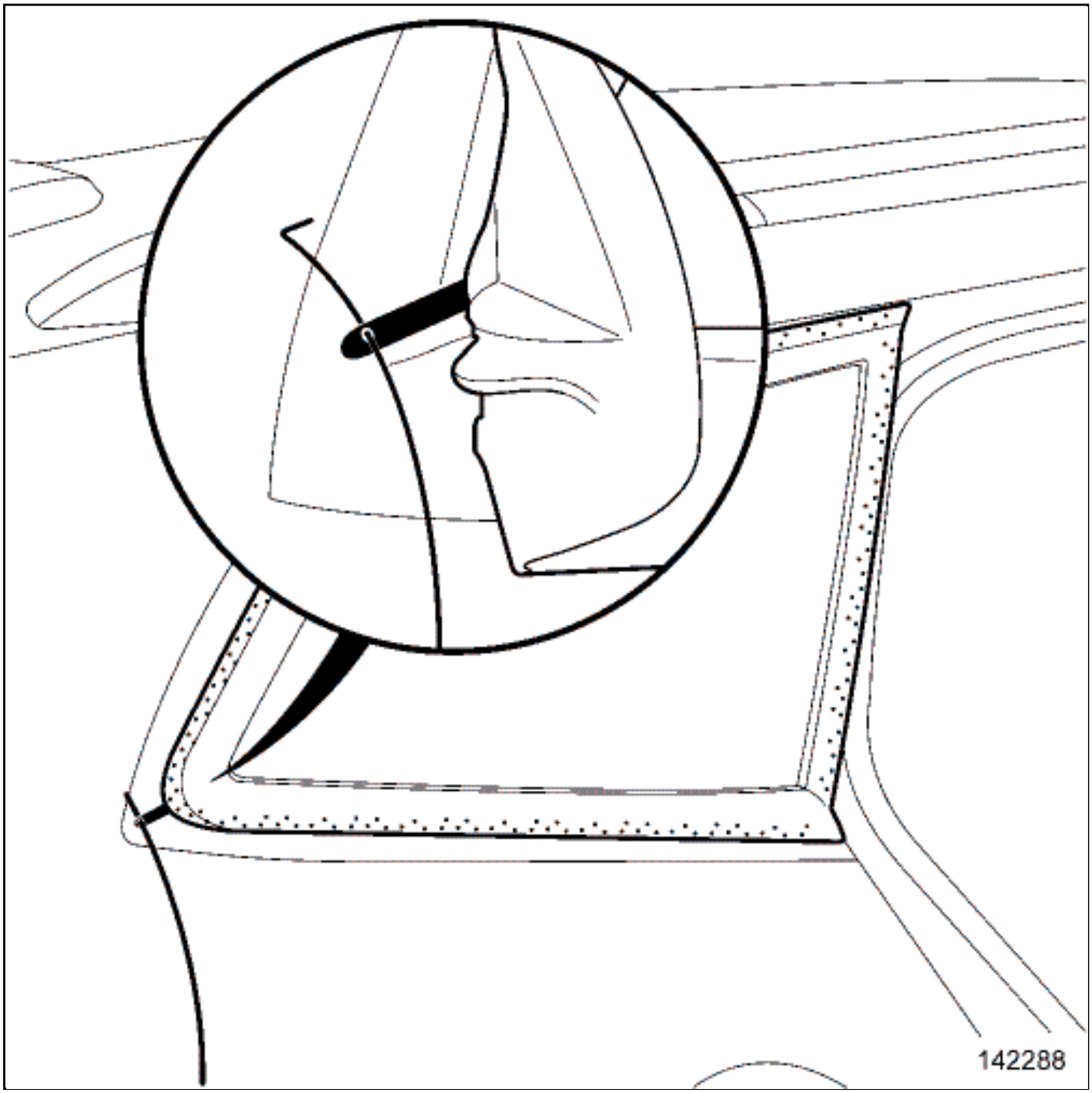


Part no.: 77 11 171 909

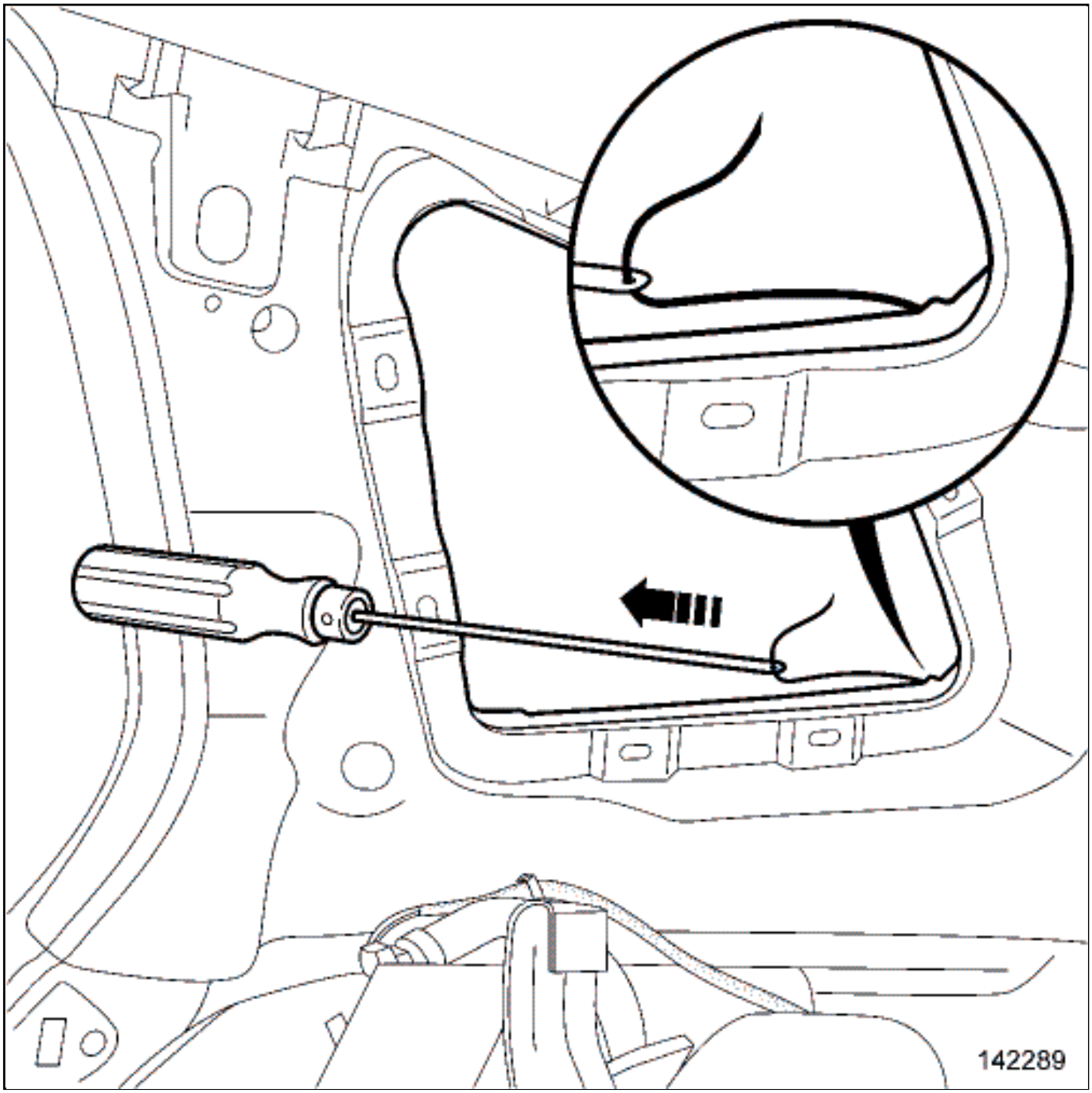
Insert the cutting wire in the wire insertion tool, or in a small 2.5 mmdiameter tube.



Using the Wire insertion tool for removing bonded mirror glass.(Car. 1033) , pierce the cement bead of the window at the most accessible place.

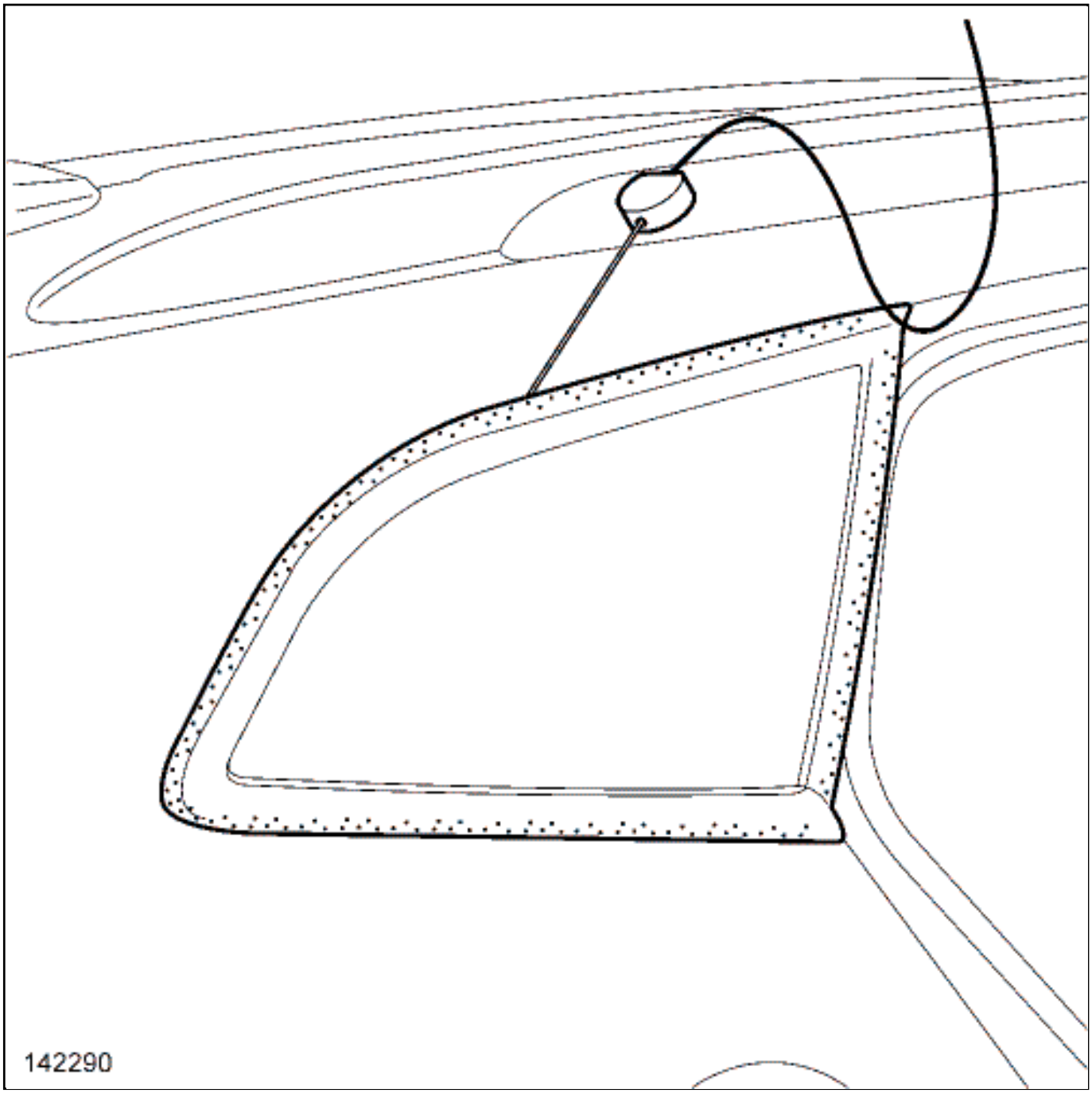


Insert the cutting wire in theWire insertion tool for removing bonded mirror glass.(Car. 1033) .



Pass the cutting wire from the exterior towards the interior using theWire insertion tool for removing bonded mirror glass.(Car. 1033) .

Fit the first pulling handle on the section of the cutting wire inside the vehicle.



Using the wire insertion tool, slide the cutting wire between the rear quarter panel window and the panelwork around the entire edge outside the vehicle.

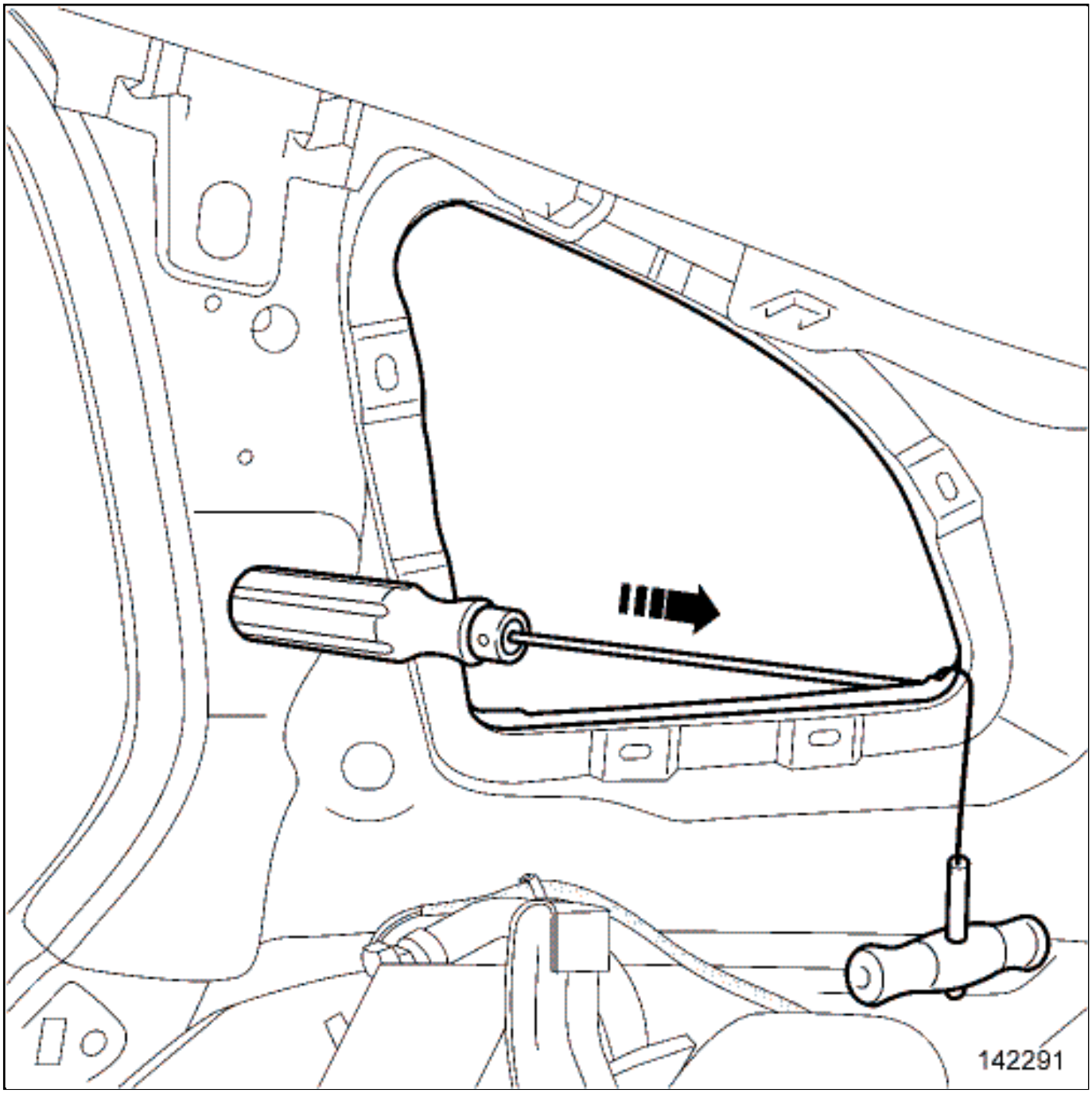
Cut a sufficient length of cutting wire.

Remove the cutting wire insertion tool.

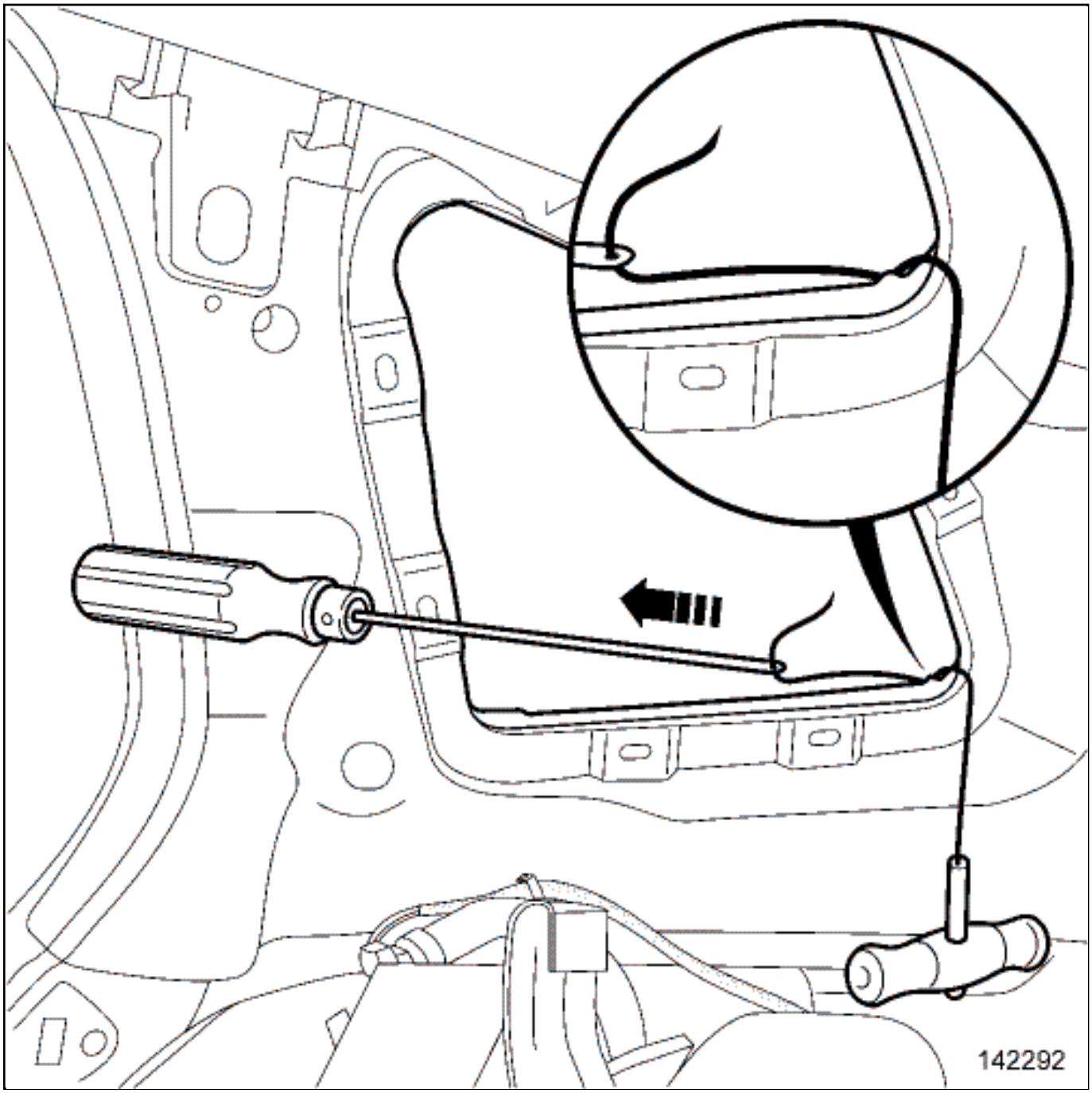
Note:

When passing the cutting wire into the vehicle interior, be careful not to cross the 2 wires.

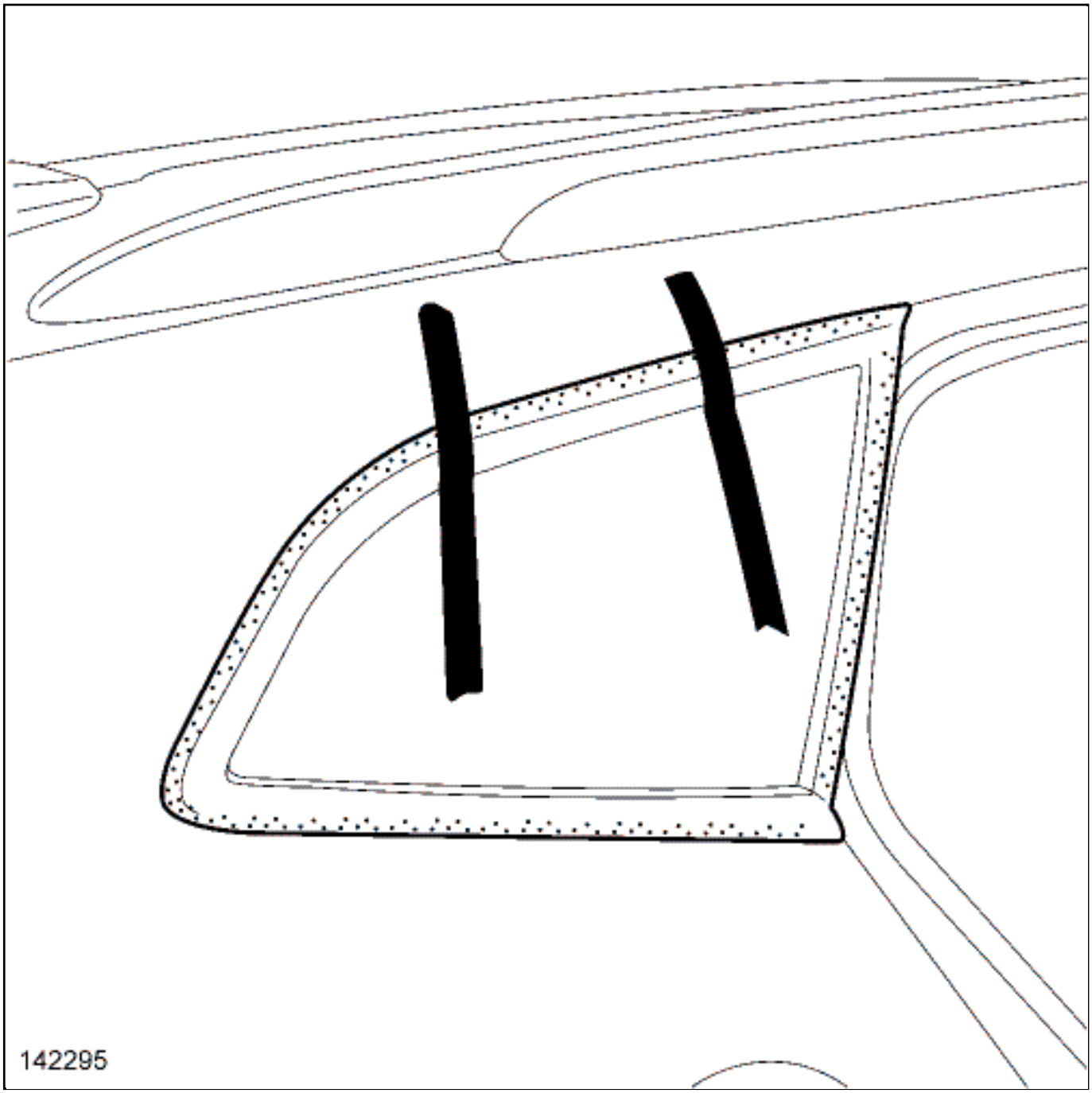
This would make cutting impossible.



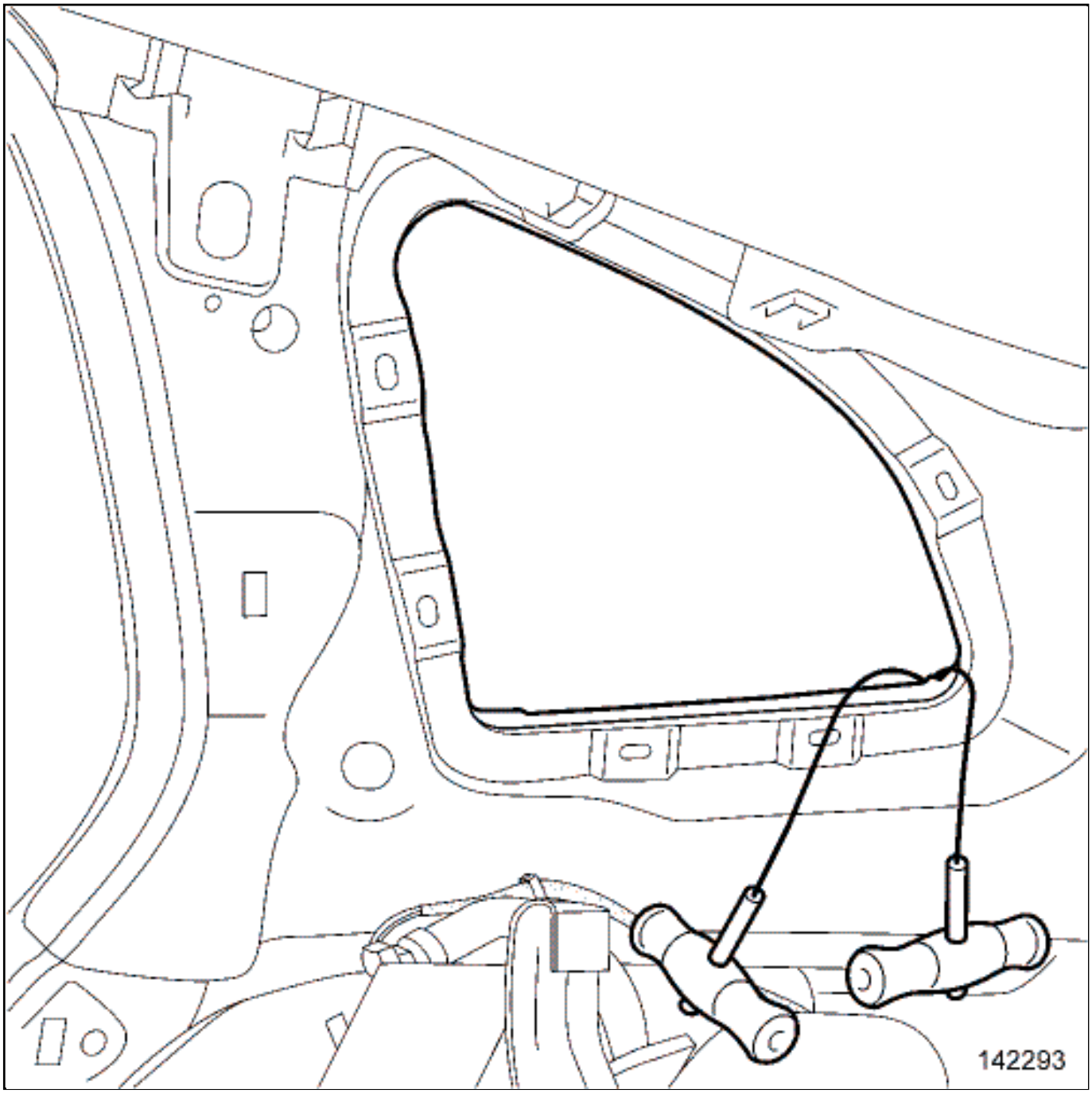
Pass the Wire insertion tool for removing bonded mirror glass.(Car. 1033) near the first piercing of the cement bead.



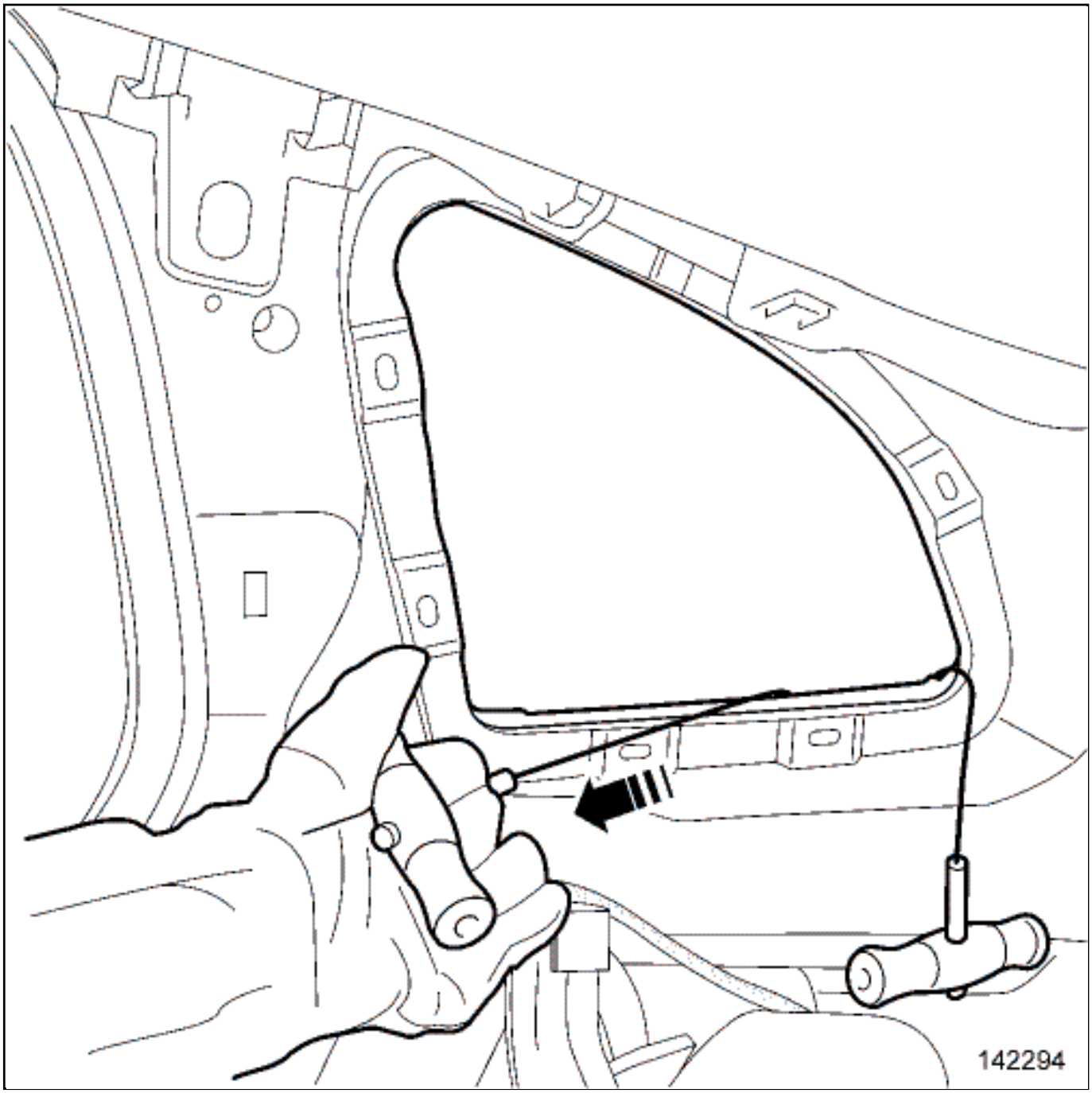
Pass the cutting wire from the exterior towards the interior using theWire insertion tool for removing bonded mirror glass.(Car. 1033) .



Secure the window on the panelwork using masking tape.



Fit the second pulling handle on the other section of the cutting wire inside the vehicle.



Pull one of the two pulling handles until the cement bead is completely cut.

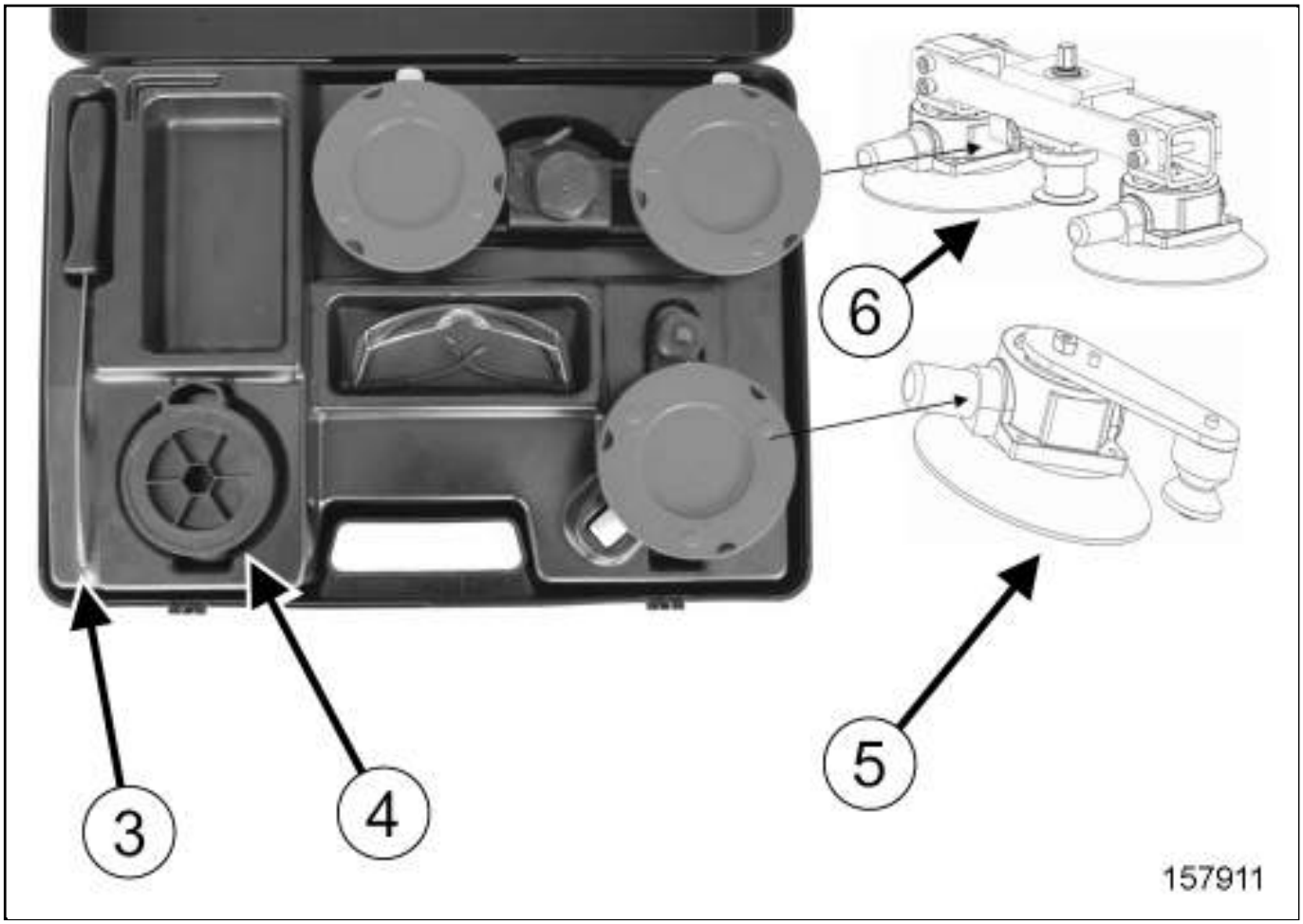
Note:

Reduce the length of the cutting wire as you cut.

Remove the window.

3- THIRD PROCEDURE

PART NO.: 77 11 573 521



(3) Wire insertion tool

(4) Cutting wire

(5) Roller

(6) Winding device

Wind the cutting wire(7) around a mounting bolt.

Pass the cutting wire from the exterior towards the interior using the wire insertion tool.

Note:

While tensioning the cutting wire ensure that the cutting wire is in the correct position under the windshield.

Grip the other end of the cutting wire on the winding device .

Cut the cement bead until the middle of the windshield.

Note:

The angle must be between 0˚and 45˚and the winding of the cutting wire on the winding device must be done correctly.

Move the winding device and install the roller as the cutting progresses.

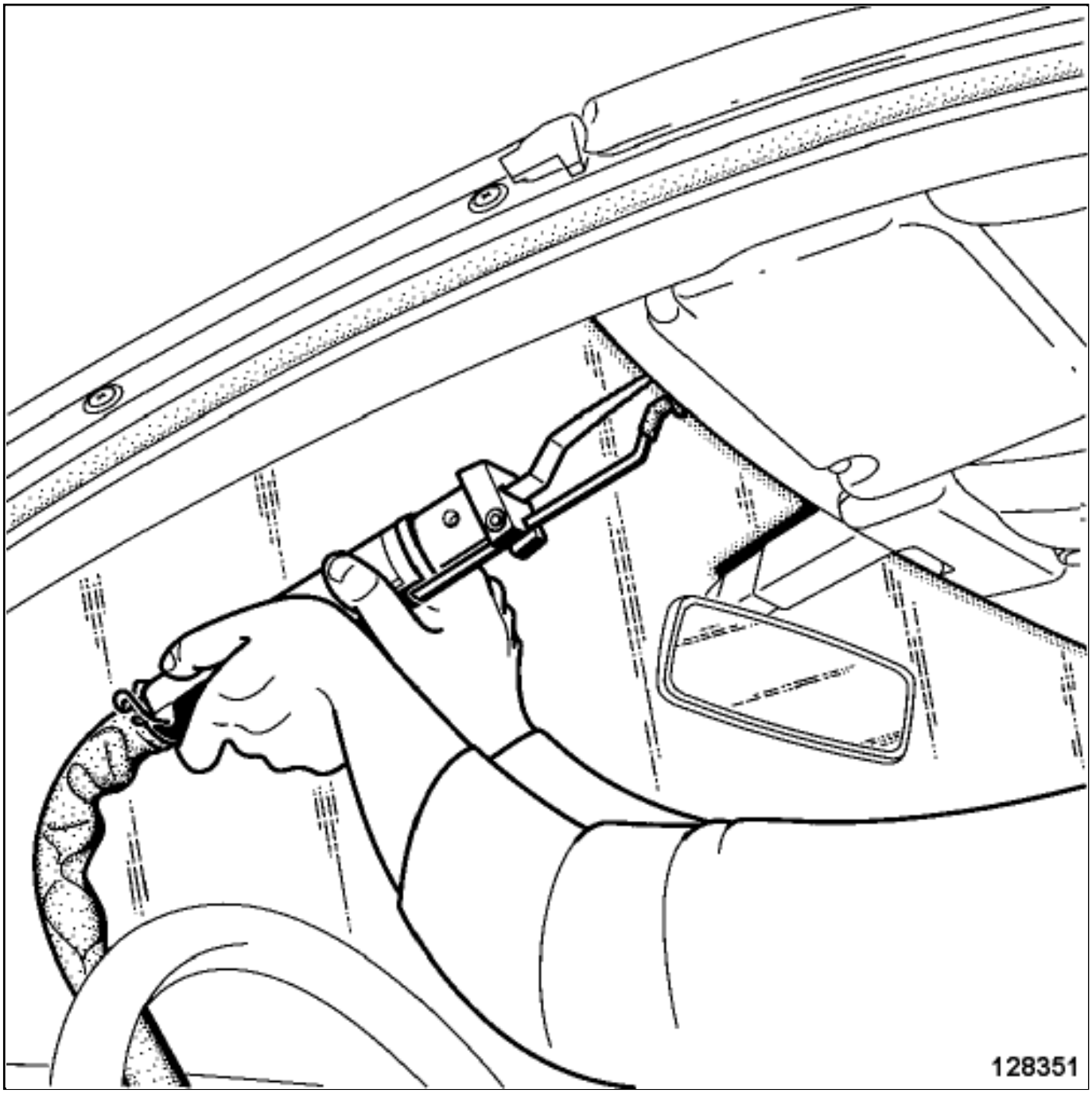
Continue the cutting until the cutting wire can't be guided by roller.

Remove the roller and continue the cutting.

Repeat the operation until the cutting is complete.

WINDOW REMOVAL TOOL: USE

1. DESCRIPTION

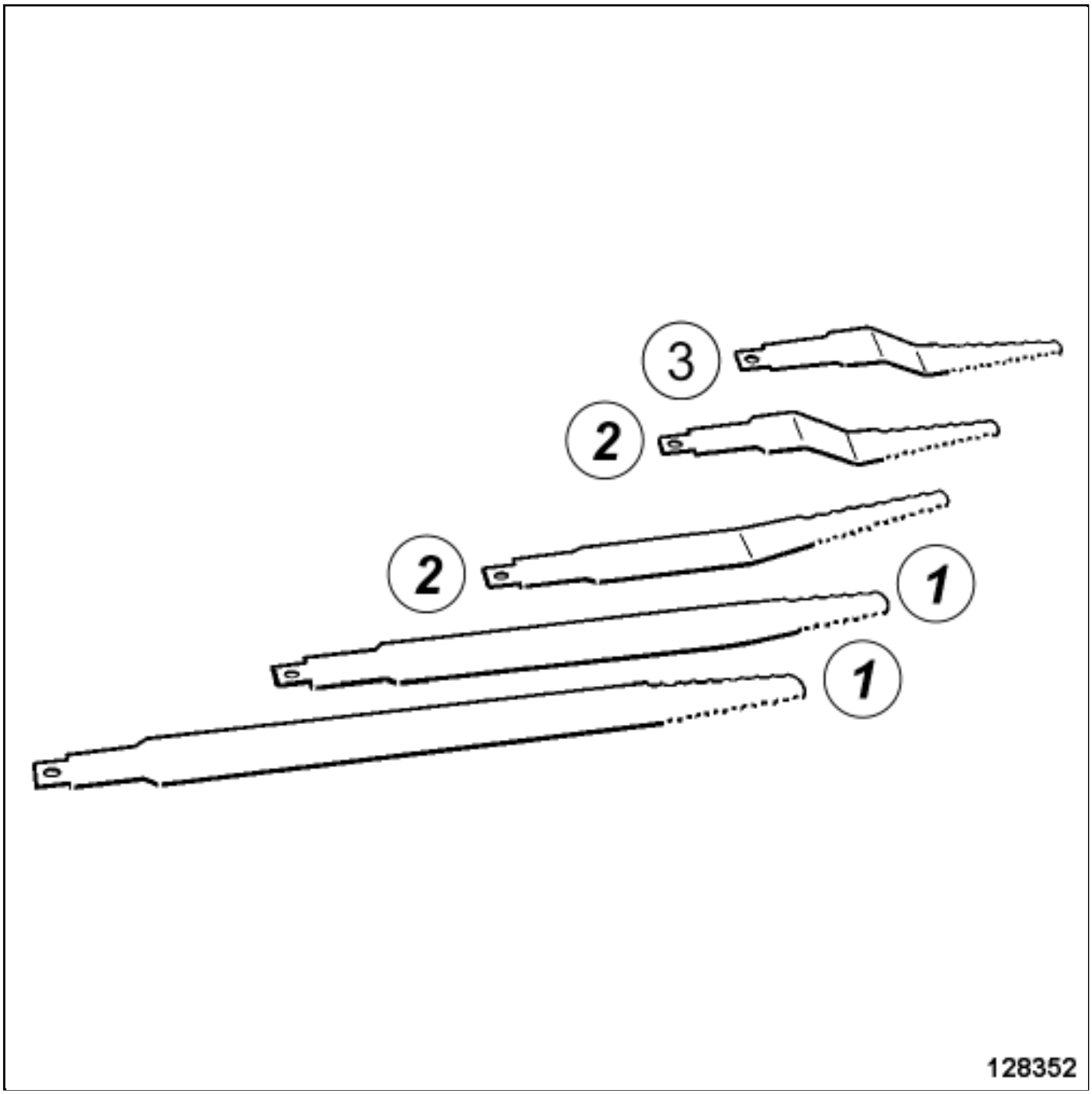


- The cutting principle is based on short reciprocating strokes like those of a jigsaw.
- The tool is equipped with a flat rigid sharpened blade with saw teeth.
- The cutting operation is generally done from the interior side of the window.

The principal advantages are:

- the removal of all the windows including the "mouldings" ,
- a single operator for the removal,
- an accessory kit comprising blades that can also cut sheet metal or plastic panels.

2. CHOOSING BLADES



All these blades have efficient micro-teeth at the ends for cutting the cement bead quickly and easily.

The cutting kit comprises two types of blades.

1- LONG BLADES

- The long blades(1) WK1SC andWK2SC enable the bottom of the windscreen to be cut out by plunging them between the dashboard and the windscreen.

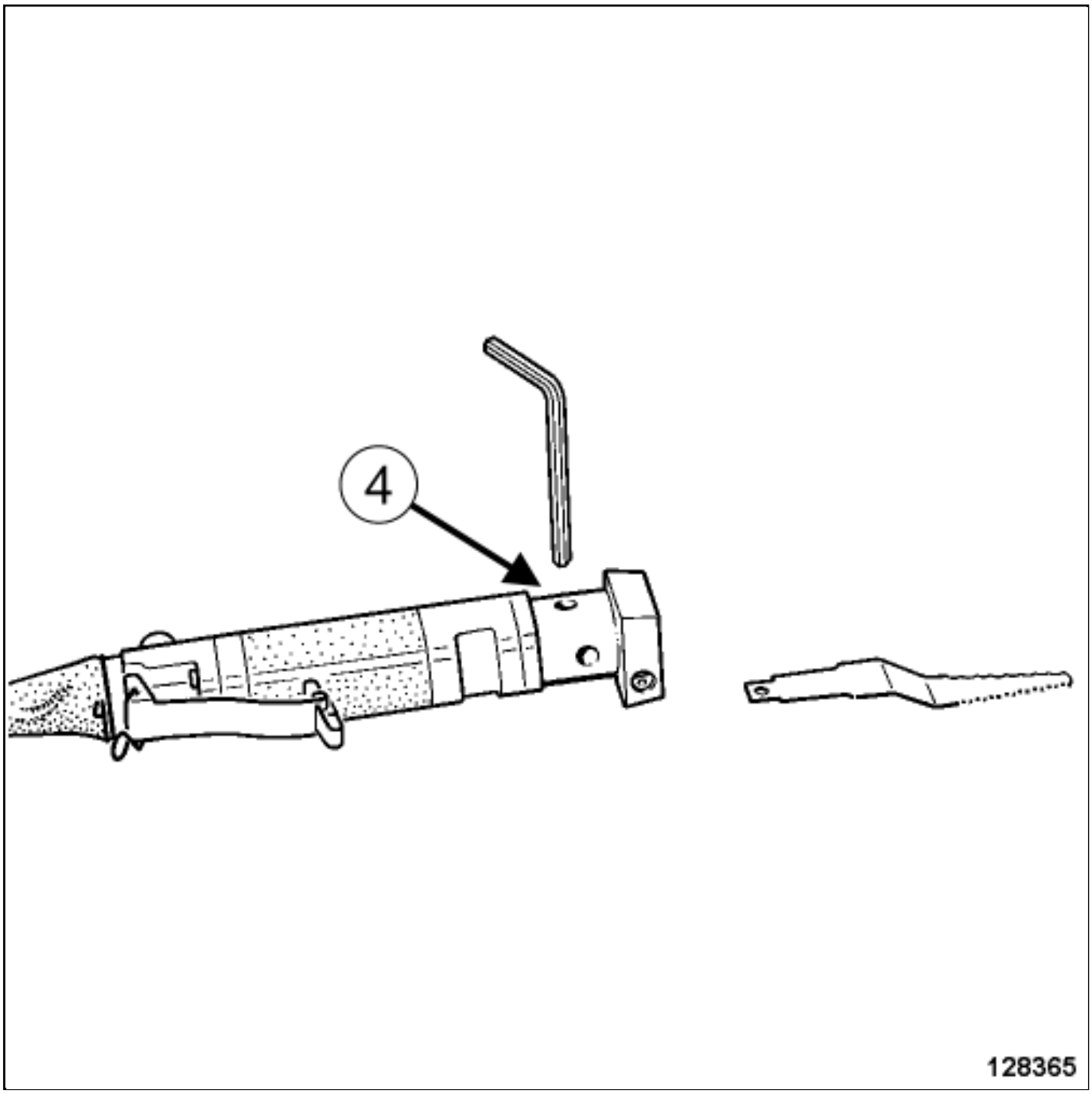
These blades can also be used for removing rear quarter panel windows in zones that are difficult to reach.

2- SHORT BLADES

- The short blades(2) WK24SC andWK24ZSC enable the windscreen to be cut out at the roof and its pillars.

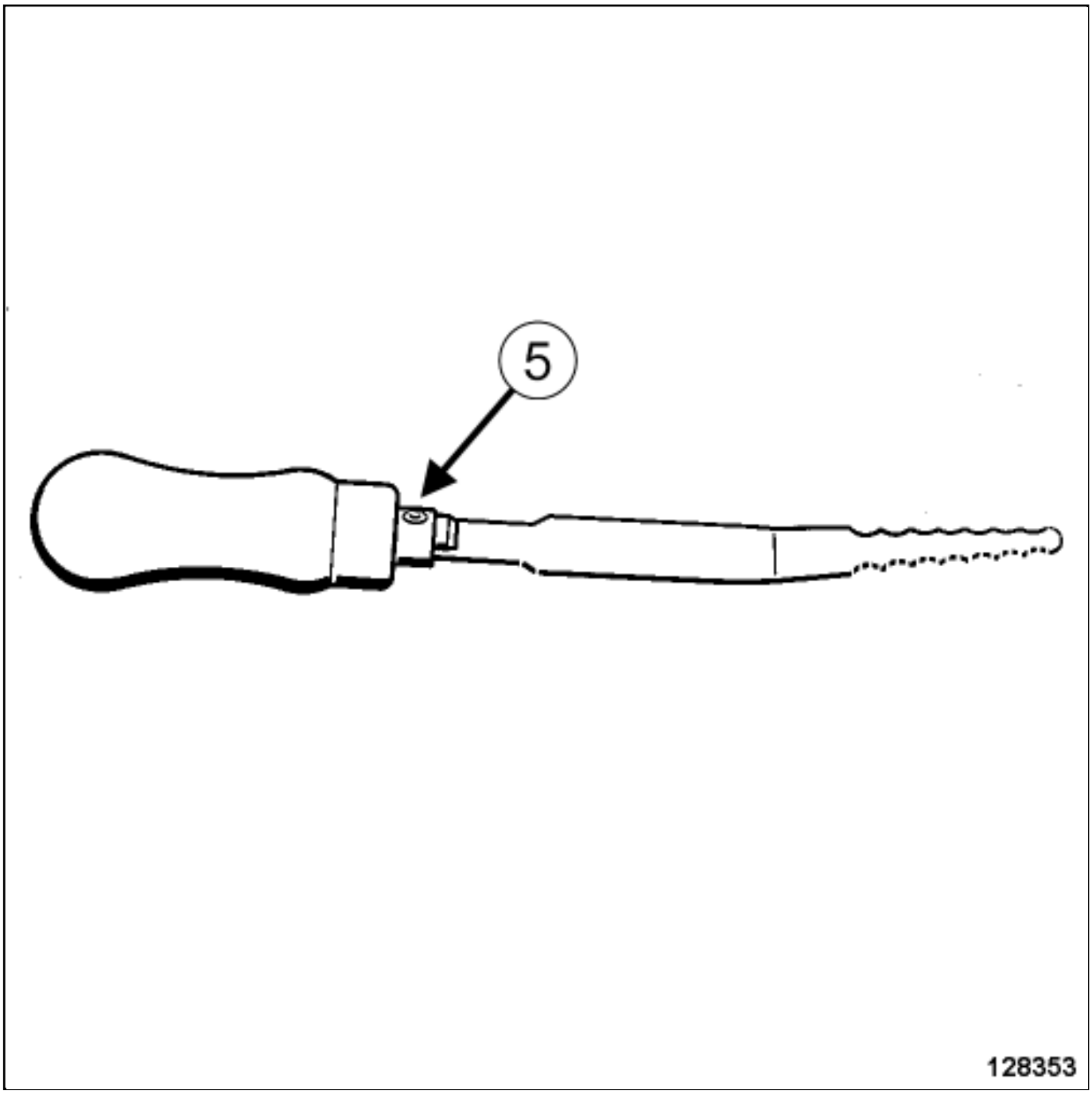
The blade(3) WK24ZR is only for cutting windows with moulded seals.

3. FITTING BLADES



- Loosen the bolt(4).
- Insert the blade as far as it will go into the slit in the tool.
- Tighten the bolt(4).

4. MANUAL BLADE HOLDER



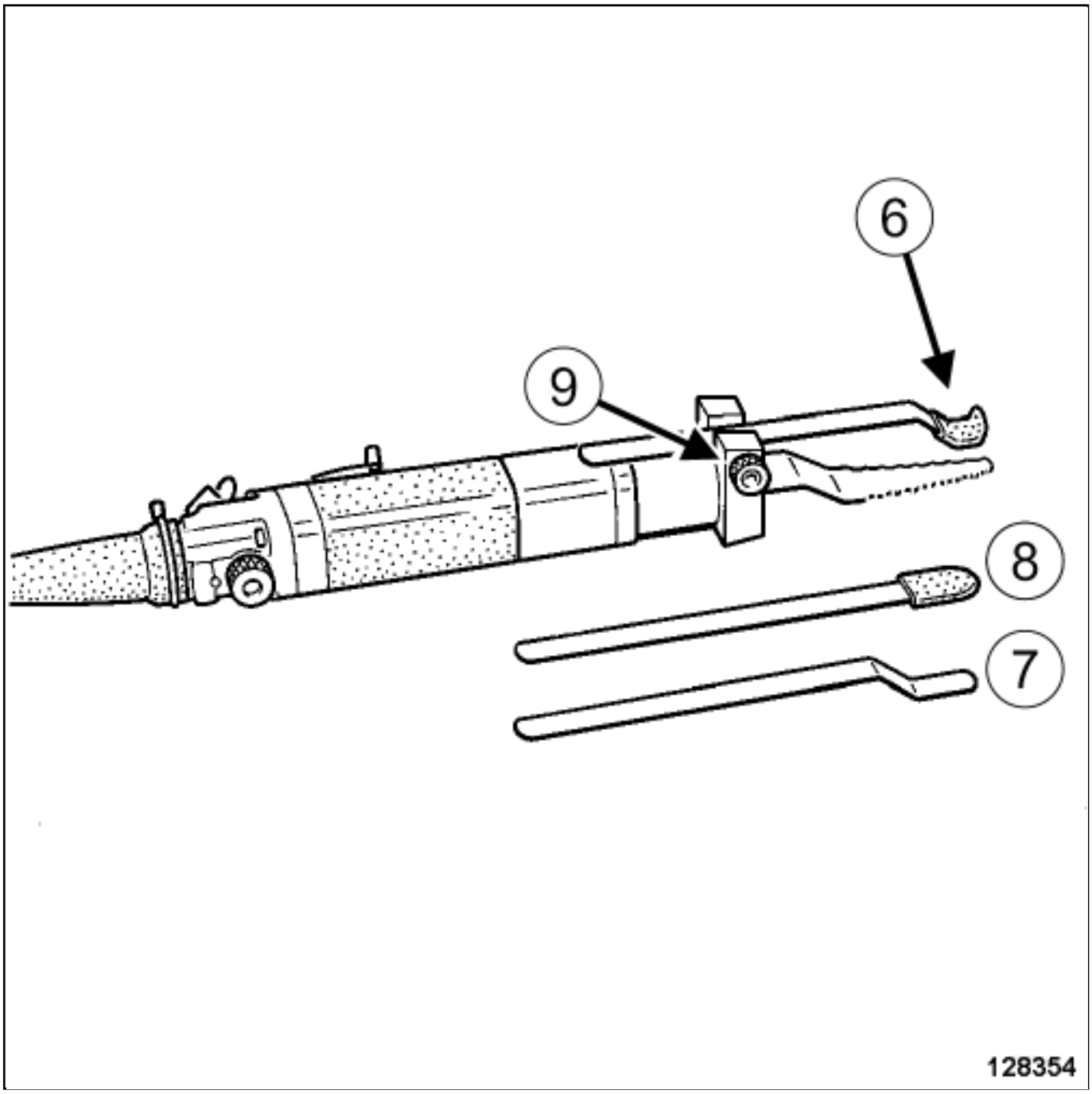
- The kit includes a manual blade holder for manual cutting to complete the removal of the window.
- Loosen the bolt(5) .
- Insert the blade as far as it will go into the slit in the manual blade holder.

Note:

Only the long(1) and short(2) blades can be inserted into the manual blade holder

- Tighten the bolt(5) .

5. FITTING CUTTING GUIDES



To avoid any damage to the paint in the surrounding area when cutting with the toothed blade, a depth guide should be used to ensure that the blade protrudes as much as possible.

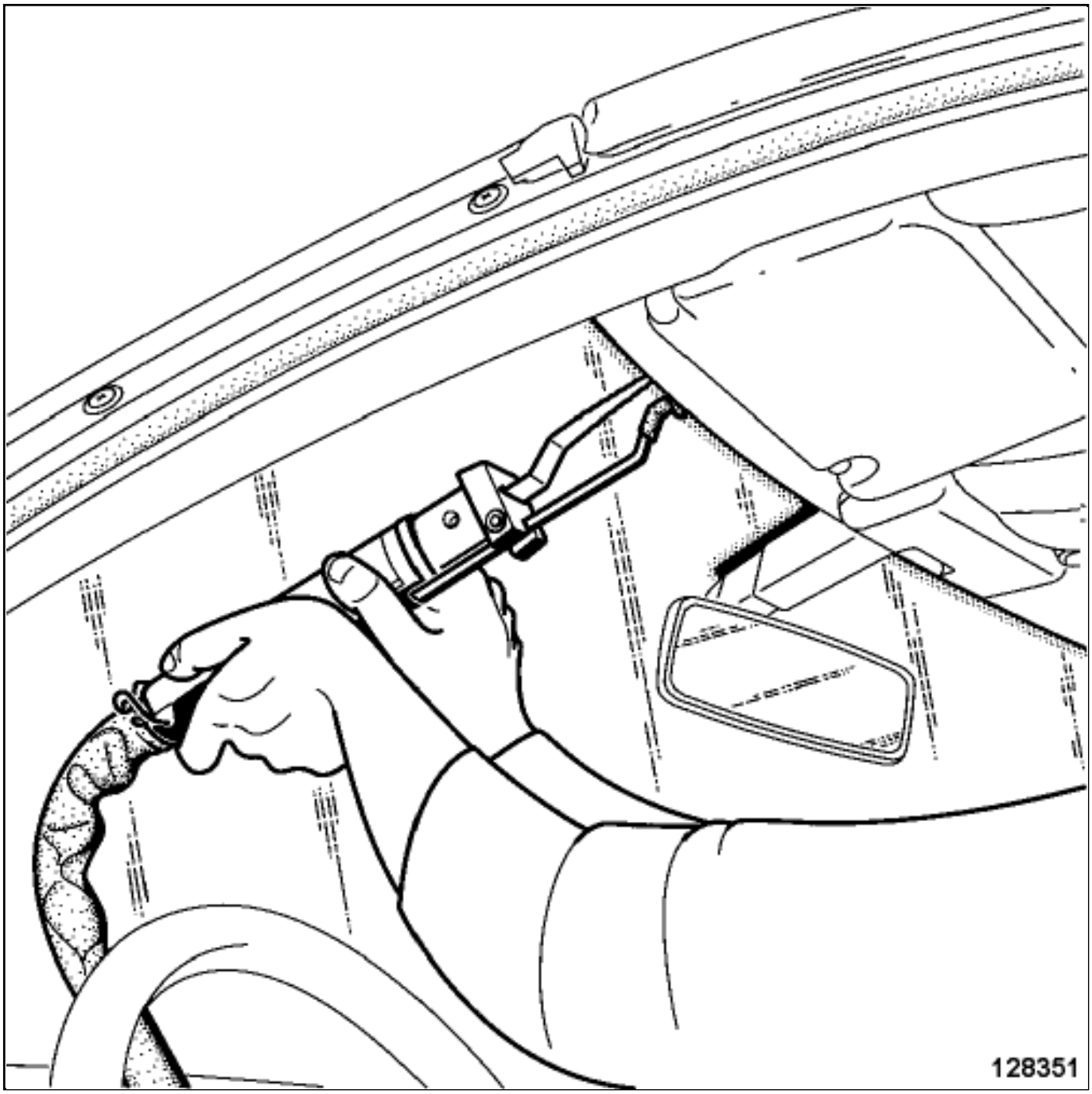
This guide can be supported either on the surrounding trim for type(6) guides, or on the cement bead itself for type(7) guides.

The type(8) guide only acts as a shim when removing windows with moulded seals (see cutting windows with moulded seals).

These guides are quickly fitted and adjusted on the tool head with the help of a manual tightening wheel (9) .

6. ADJUSTING CUTTING GUIDES

- Fit the guide most suited to the working area and slide it in without tightening the manual tightening wheel (9) .



- Position the tool at right angles to the cement bead and carefully push the blade in until it has gone all the way through the cement bead.

Note:

To perform the adjustment, it is recommended that you stand outside the vehicle in order to see the moment when the blade emerges through the cement bead.

The stroke of the blade must be adjusted so that during its alternating movement it cuts the cement bead without risk of damaging the paintwork.

- Stop the tool and without moving it, put the depth guide in contact with the trim.

Note:

Take into account the fact that in the "tool stopped" position the blade is located approximately 6 mmback from the end of its stroke.

- Tighten the manual tightening wheel(9) .

- Detach the tool from the cement bead.

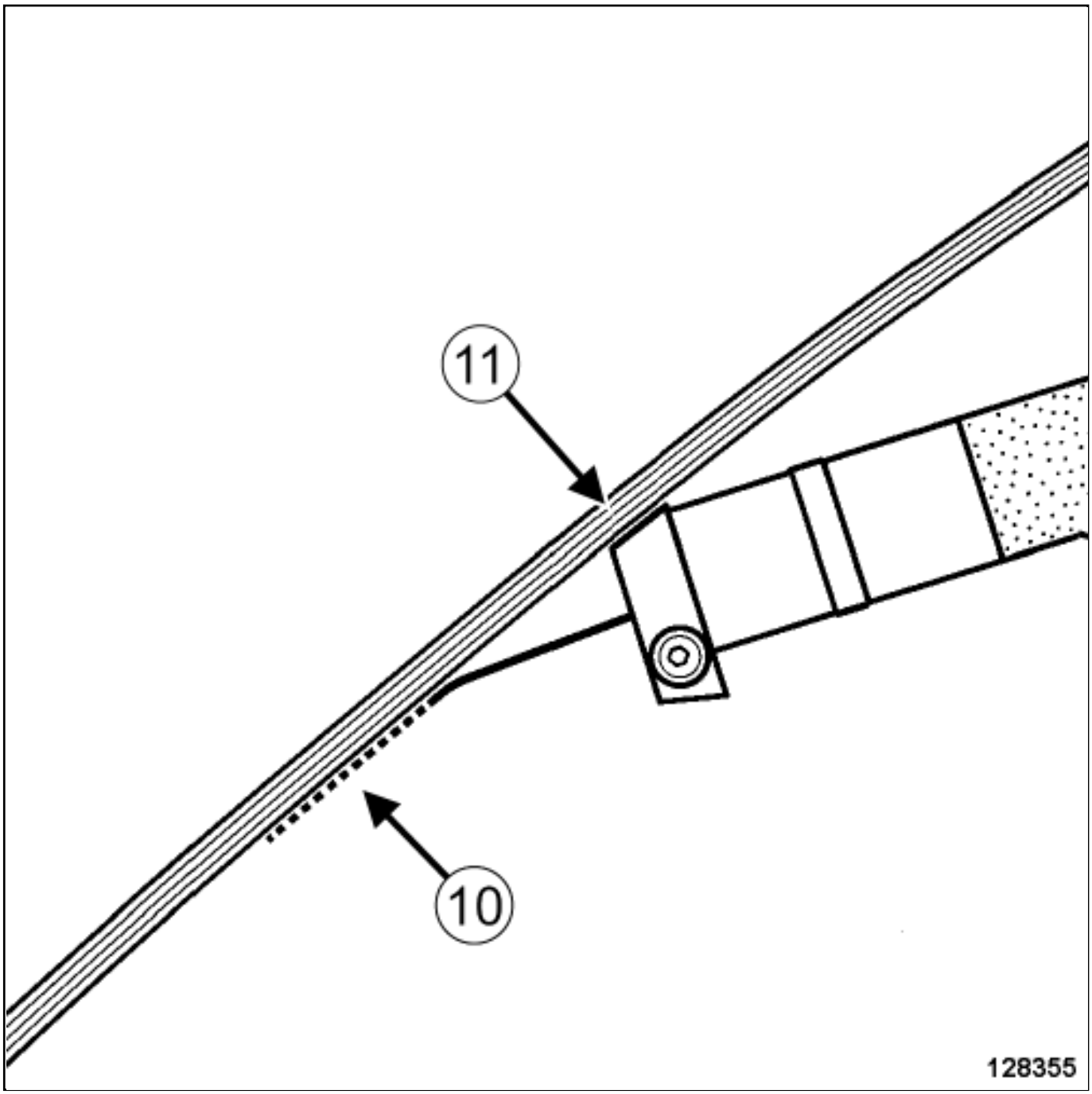
Note:

Do not use the depth guide when cutting the window corners.

You are advised to watch the blade from the outside and limit its depth by eye.

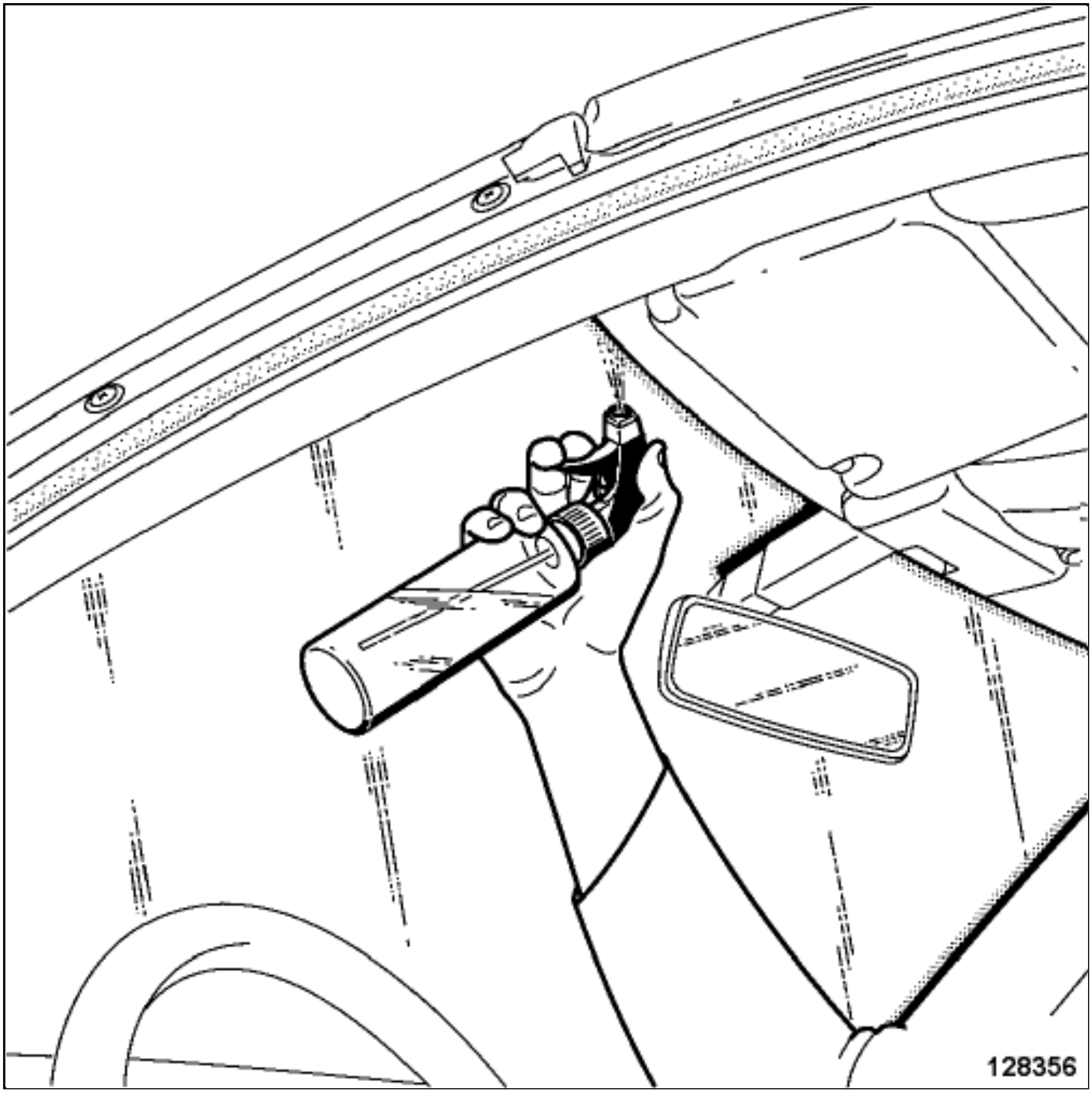
On certain vehicles, the bottom of the windscreen frame does not require the use of a depth guide.

7. PRECAUTIONS WHEN CUTTING



To ensure that the cement bead is cut under the best conditions, follow the instructions below:

- always to keep part(**10**) of the blade flat and parallel with the glass,
- the stop(**11**) always must be in permanent contact with the glass,
- it is imperative to hold the tool body with two hands when cutting the cement bead,
- use a depth guide if necessary,
- start the tool outside the cement bead before beginning cutting,
- cut the cement bead by drawing the tool towards yourself. This allows better control of the movement of the tool during cutting.



Note:

Before any action with the tool, spray water on the cement bead using the atomiser provided in the cutting kit.

The water allows the blade to slide and cut the cement bead more easily.

8. POSITION OF THE OPERATOR

Note:

When cutting at the window pillars and upper section of the windows do not use a long blade as this carries a risk of overhanging.

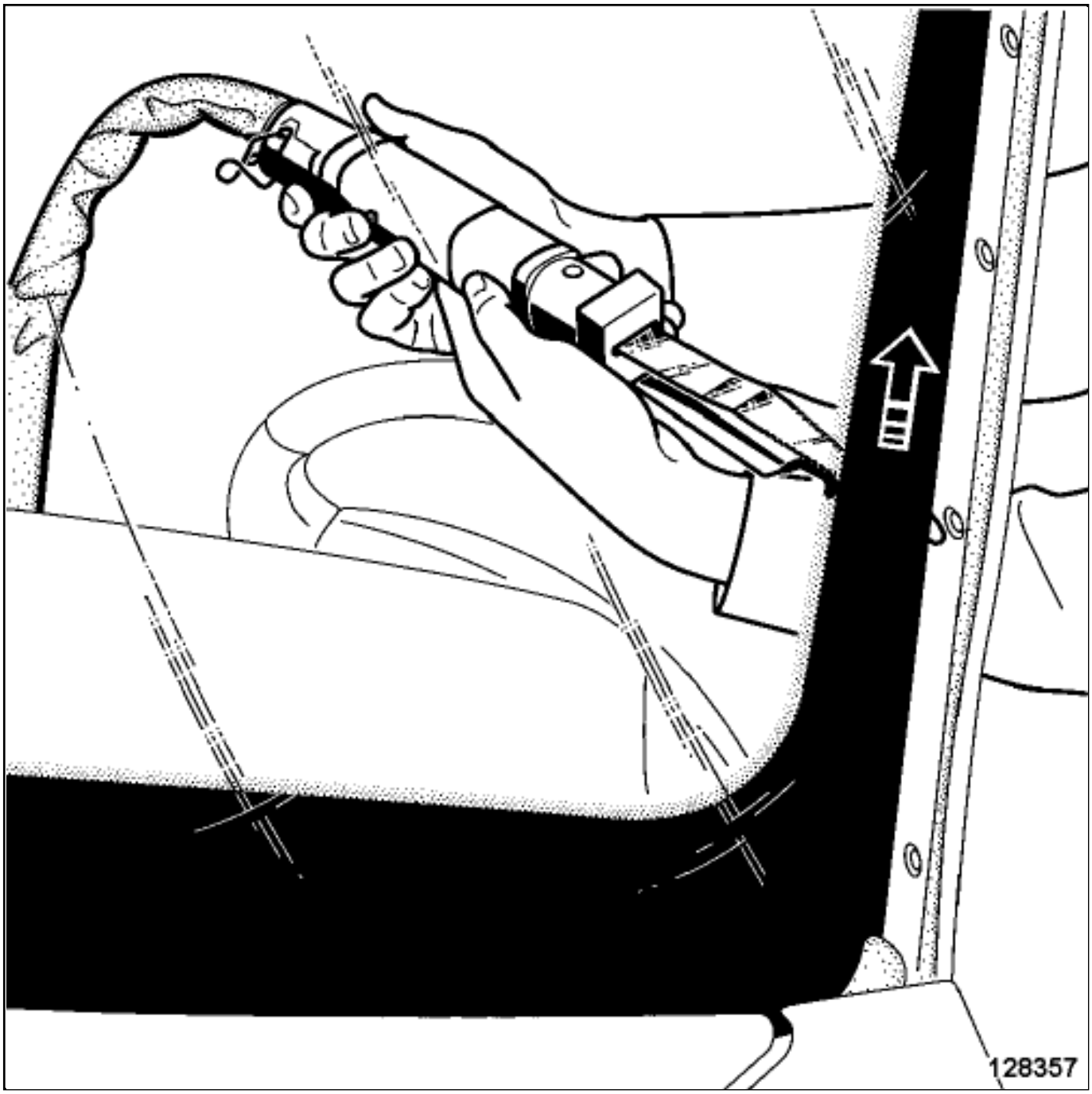
Spray water on the cement bead, before cutting it and spray regularly during the cutting operation to avoid all release of fumes due to the blade heating up.

Ensure that the depth guide is always in contact with its reference surface during cutting of the cement bead.

If the blade has difficulty in cutting very thick cement bead, make progressive cuts into the area until the blade passes through it.

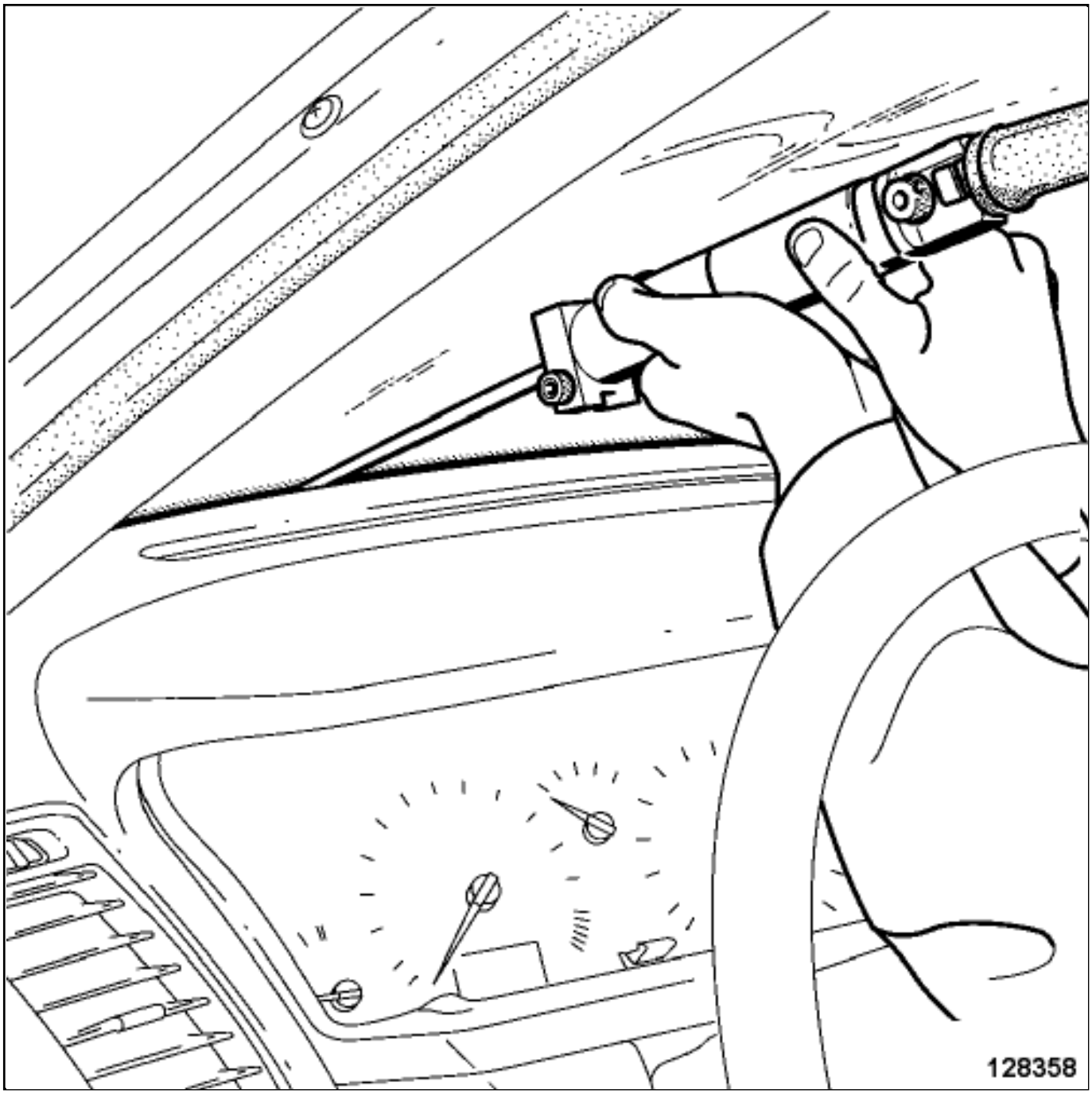
To avoid all risk of accident during the cutting operation, do not place yourself directly in line with the blade.

1- CUTTING SIDE SECTIONS



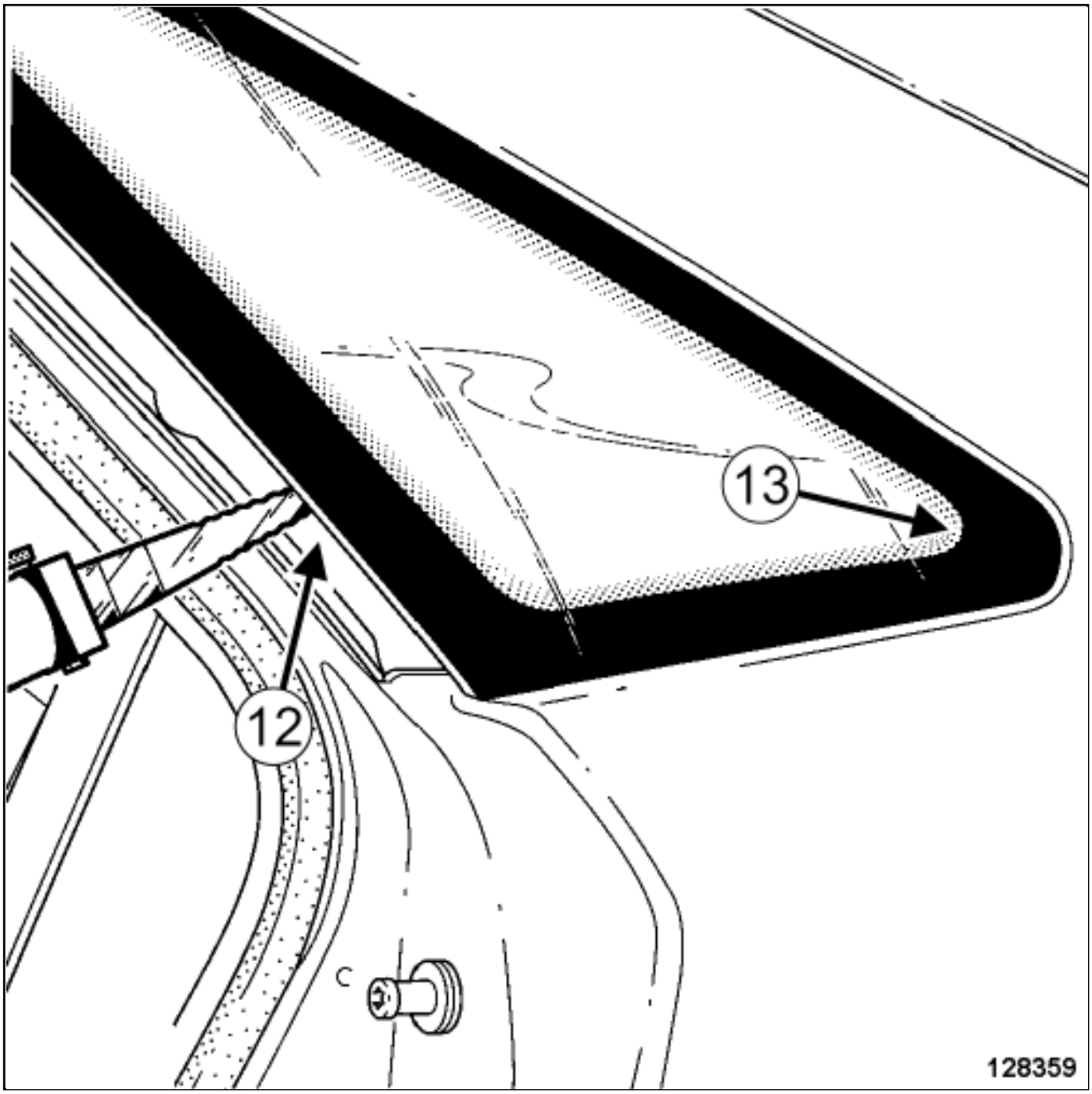
- Stand outside the vehicle, start at the bottom of the windows and cut the beading by drawing the tool as far as the top corner.

2- CUTTING UPPER AND LOWER SECTIONS OF WINDOWS



- Go inside the vehicle and work by bringing back the tool towards yourself.

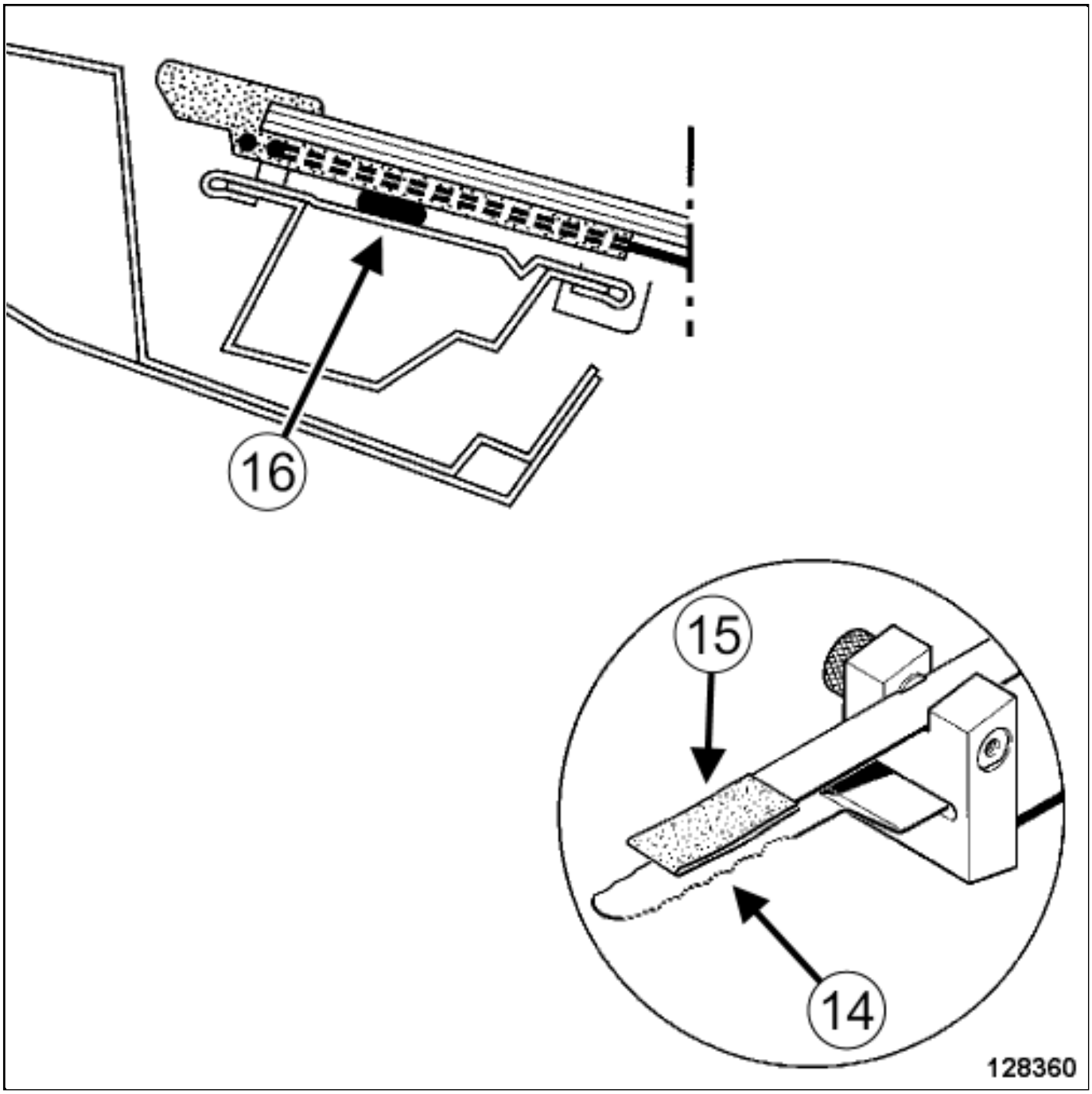
3- CUTTING THE REAR QUARTER PANEL WINDOW



Cut the most accessible part(12) from outside.

Using the long bladeWK1SC, cut the remainder of the cement bead as far as the corner(13) by inserting the blade at(12) .

4- CUTTING WINDOWS WITH MOULDED SEALS



Use a specific bladeWK 24ZRthat does not damage the moulding of the windows.

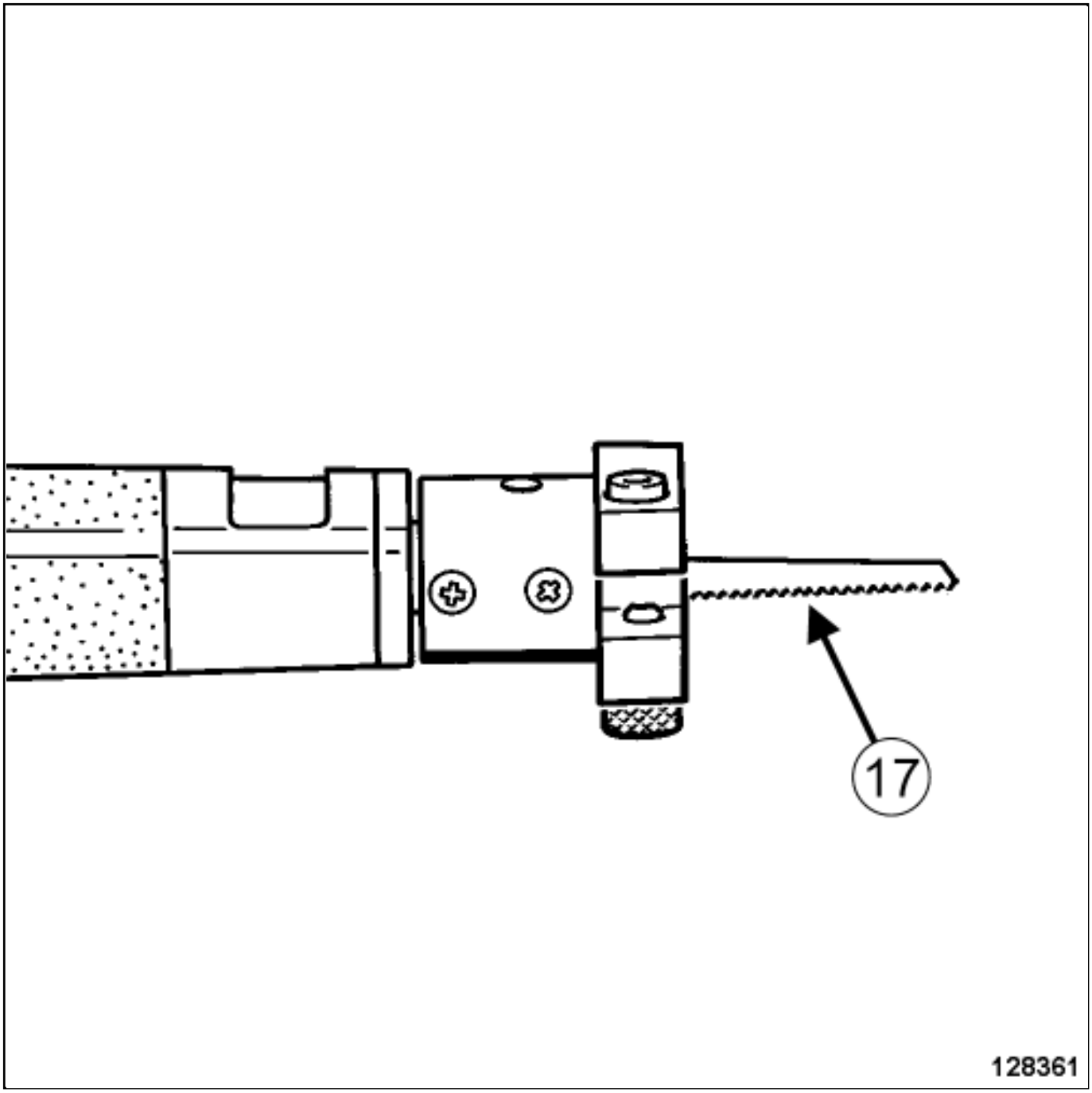
The cutting teeth of the blade(14) are oriented to the rabbet side and the other side is slightly convex so as to limit the damage to the moulding.

The straight guide(15) fitted on the tool must be kept in contact with the glass in order to bring the blade as close as possible to the rabbet when cutting the cement bead(16) .

Note:

You must always cover the end of the guide(15) with a layer of Velcro (supplied in the cutting kit) in order not to damage the screen printing of the windows.

9. USE AS A JIGSAW



It is possible to use the tool as jigsaw.

A blade(17) and a specific guide are supplied in the cutting kit.

The blade can cut sheet metal or plastic panels with ease.

WINDOW TOOLS: DESCRIPTION

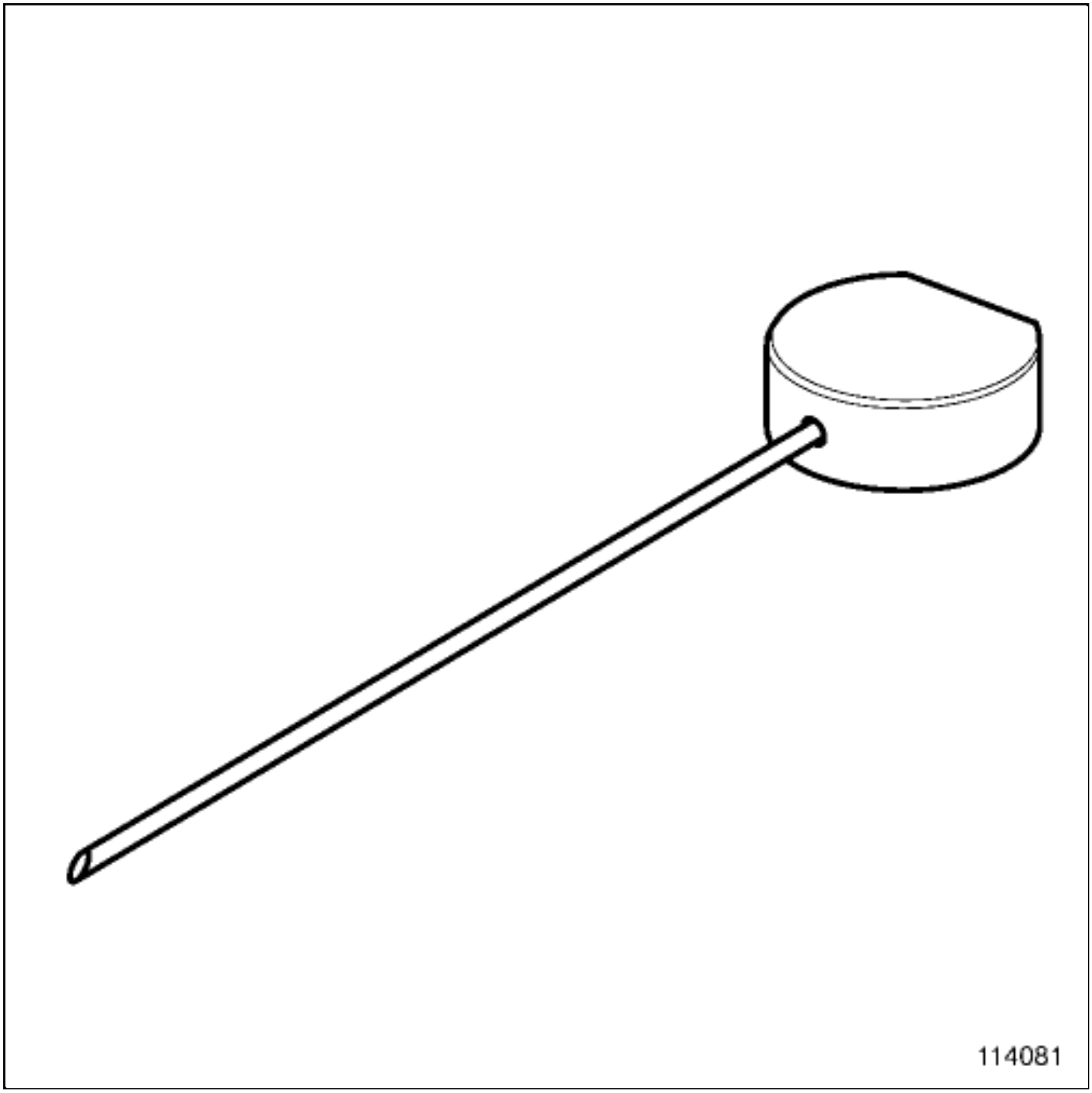
Examples of equipment and tools:

1. PROTECTION

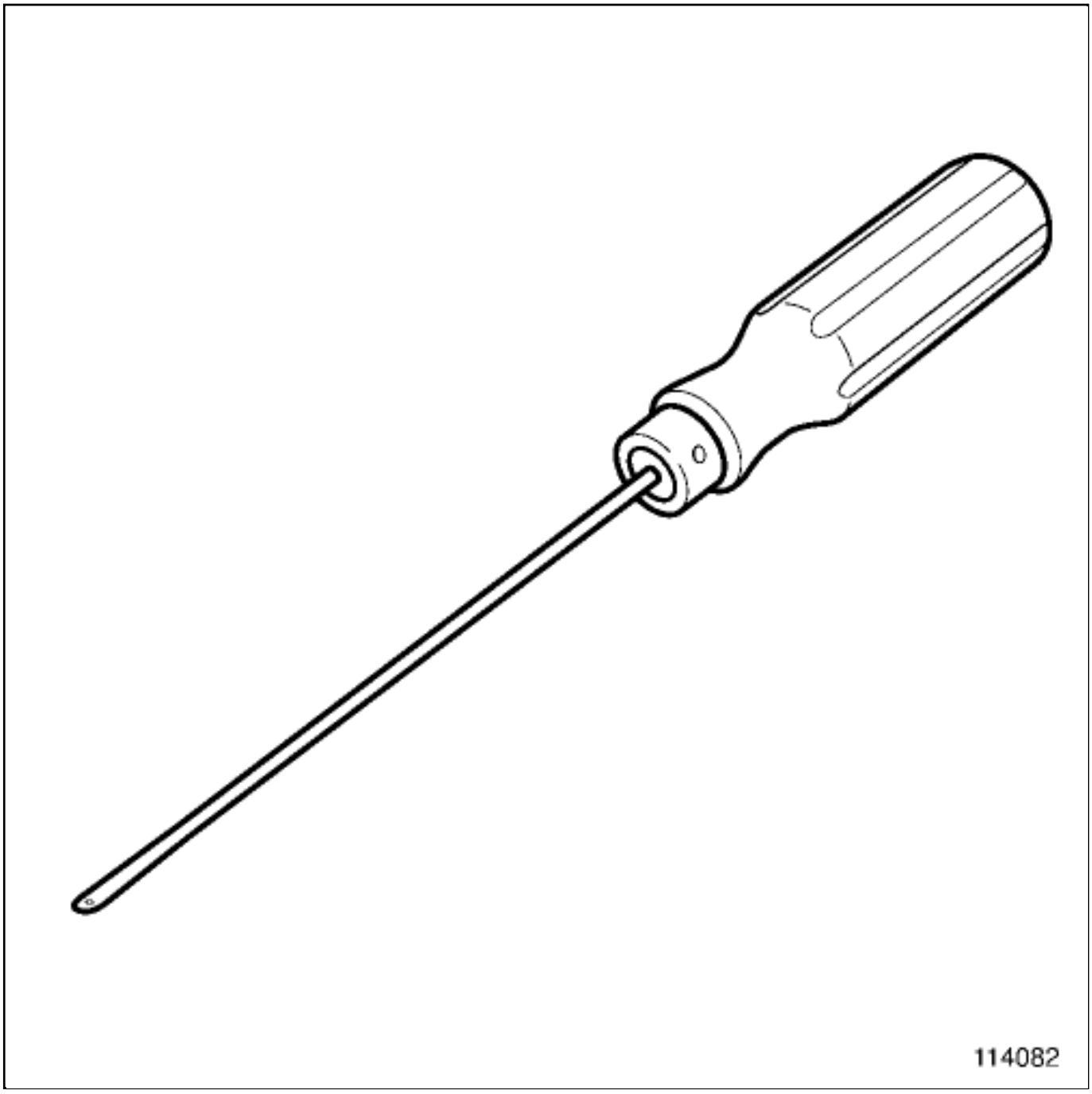
UNIVERSAL PROTECTOR (CAR.1847)

2. CUTTING

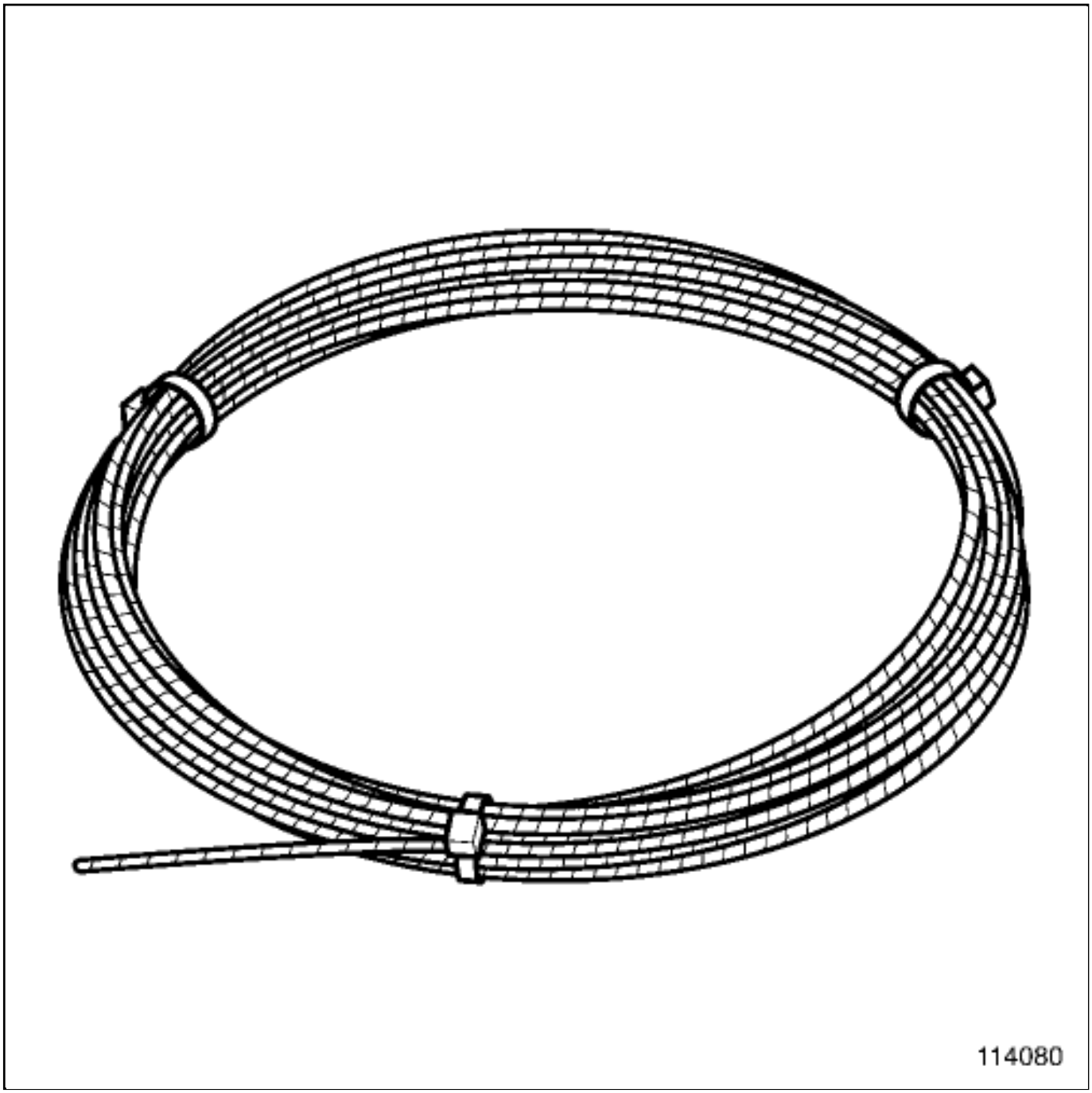
CUTTING WIRE INSERTION TOOL



WIRE INSERTION TOOL (CAR.1033)

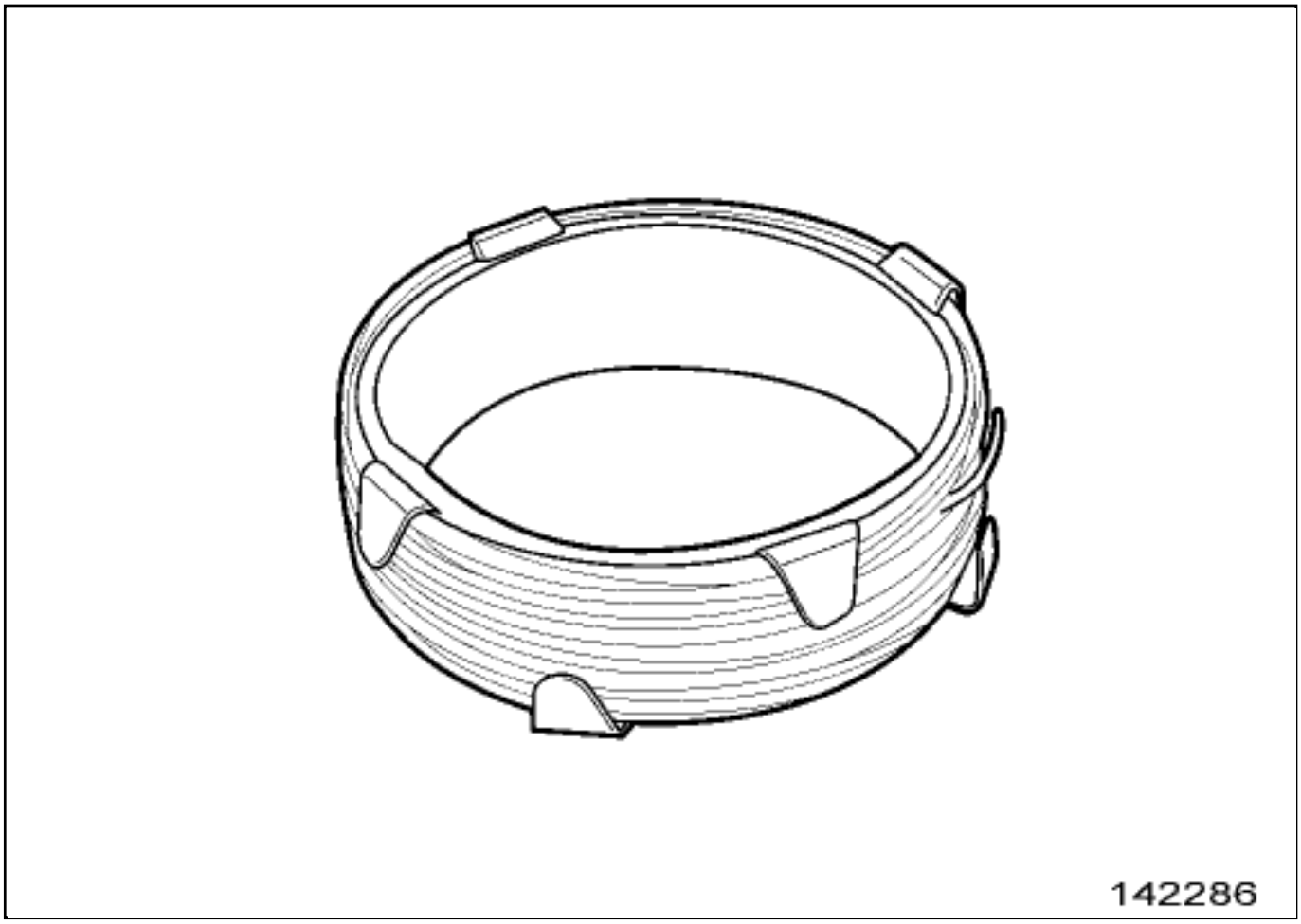


CUTTING WIRE (TWISTED)



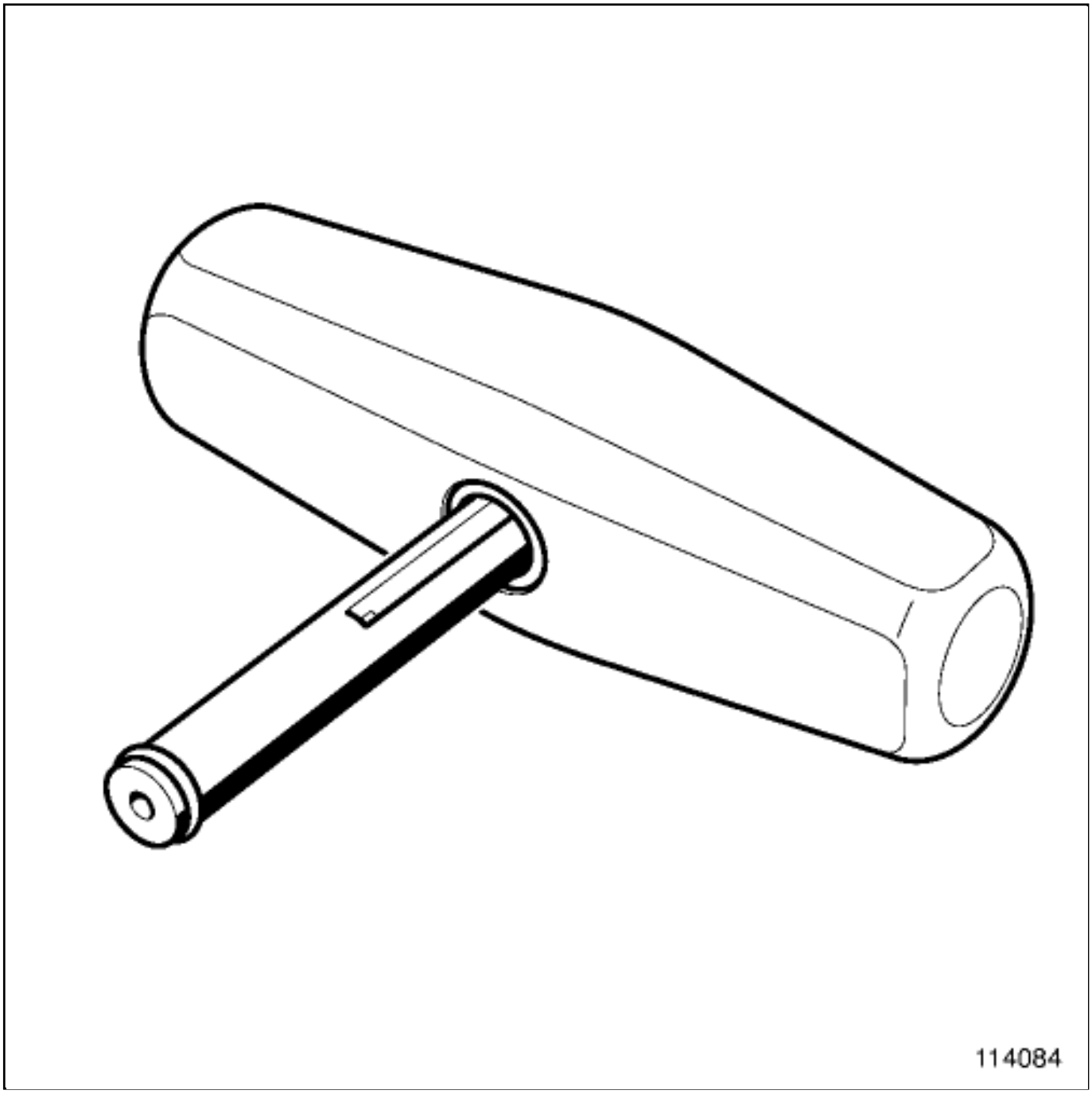
Part no.: 77 11 210 485

CUTTING WIRE (SQUARE)

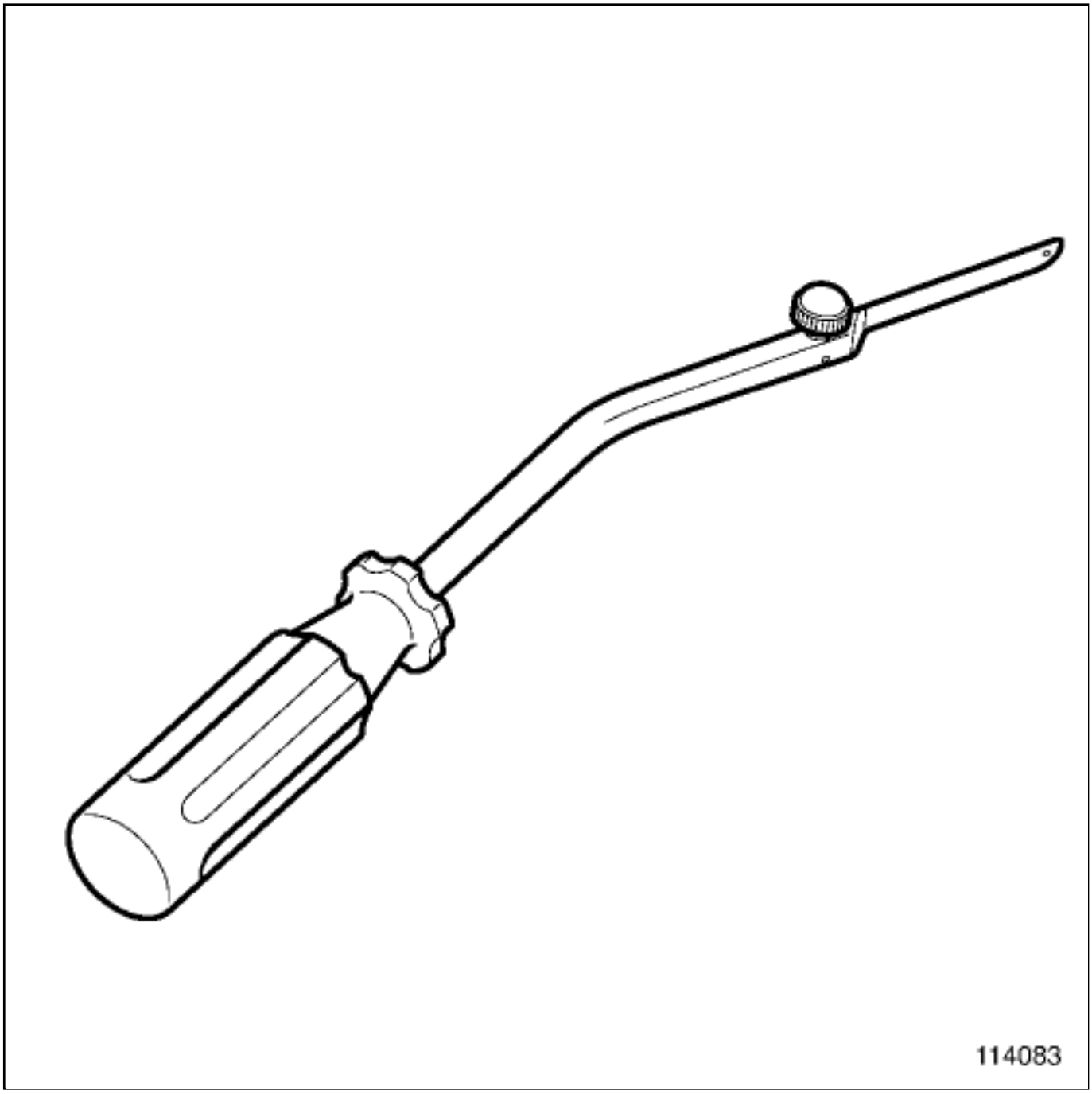


Part no.: 77 11 431 073

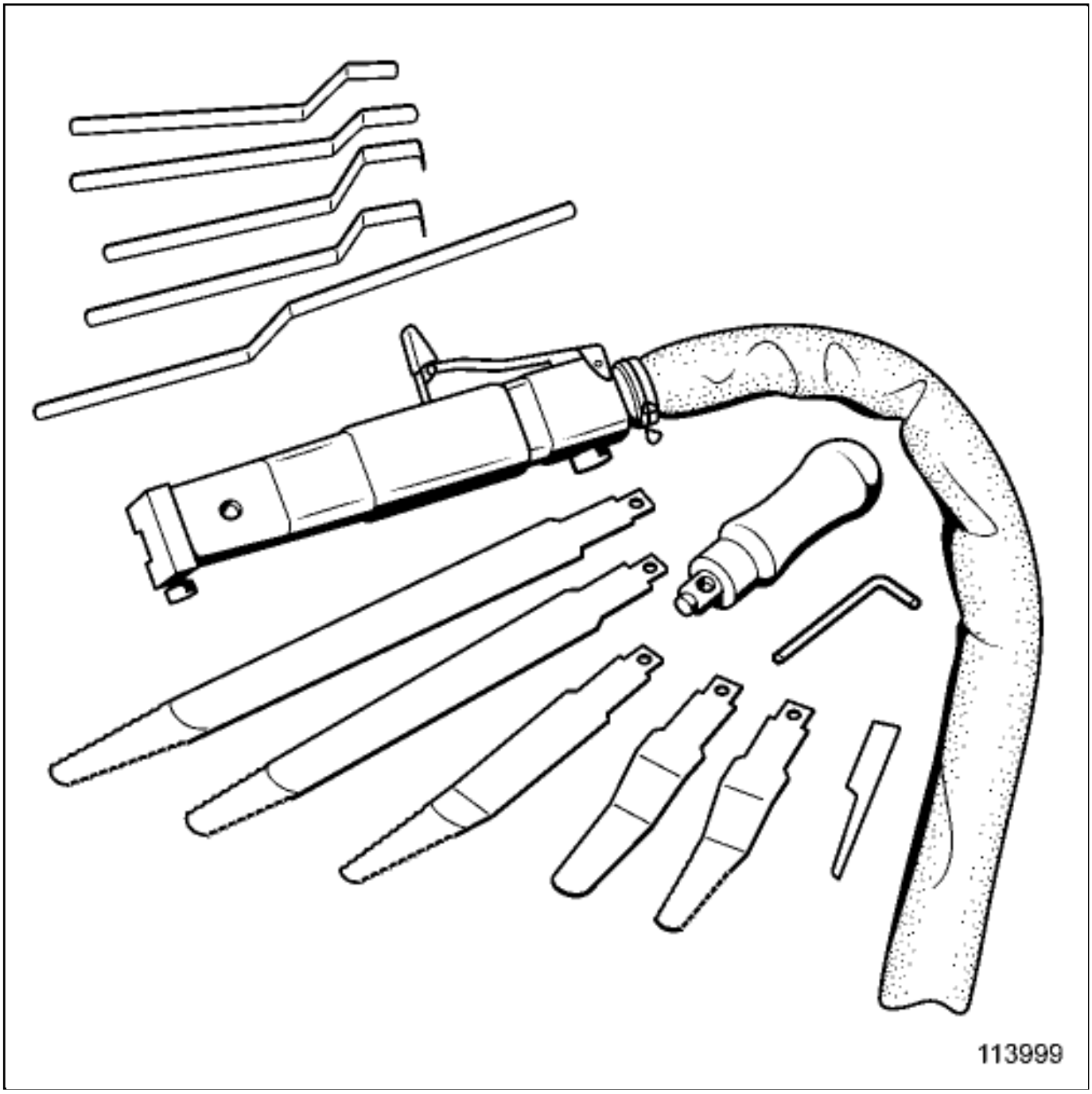
PULLING HANDLE



SUPPORT TOOL



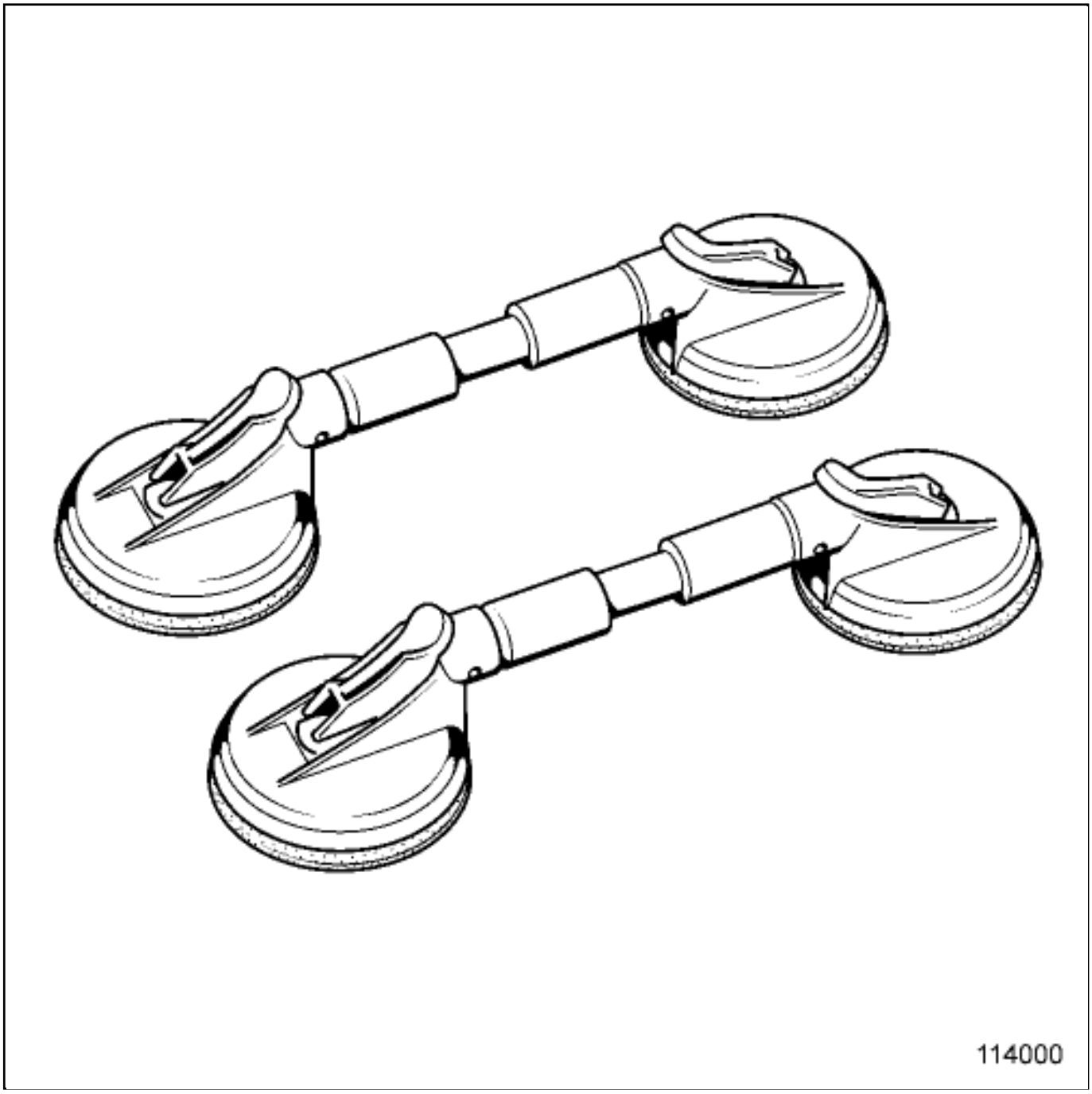
PNEUMATIC OR ELECTRIC CUTTING TOOL



Part no.: 77 11 171 946

3. PREHENSION

RETAINING SUCTION CUP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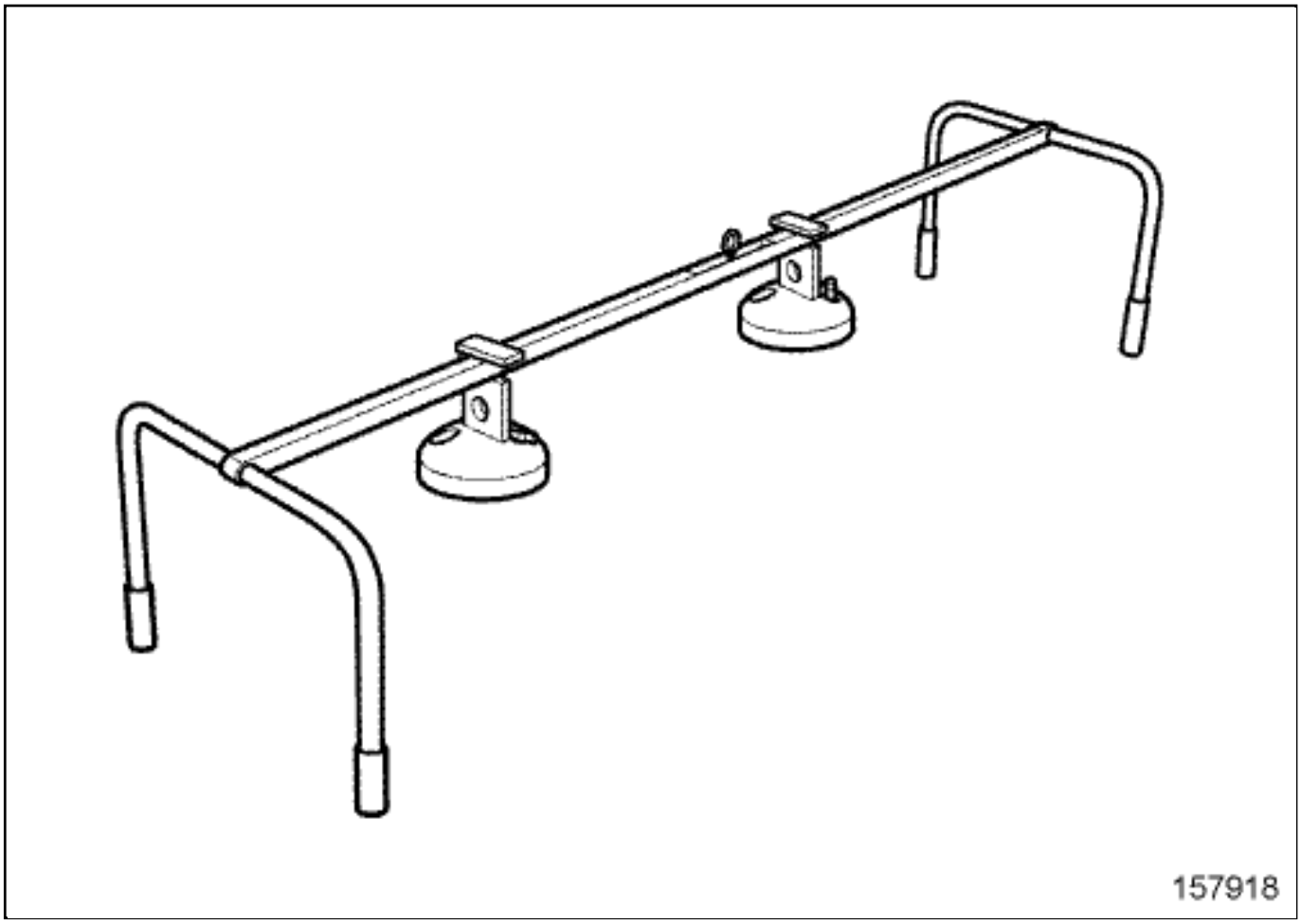
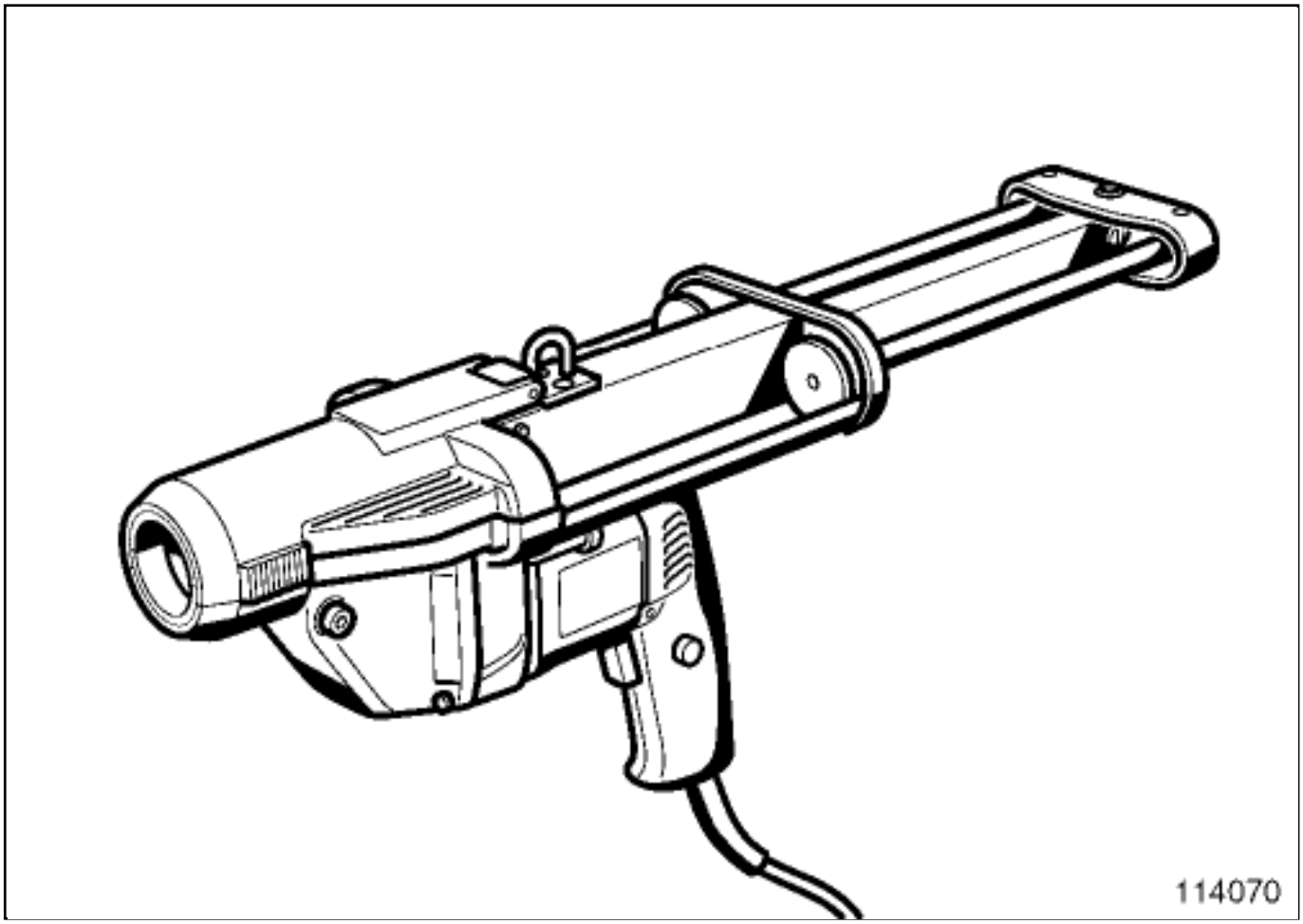


Note:

For the "removal - refitting" of the sunroof cassette, use two tools.

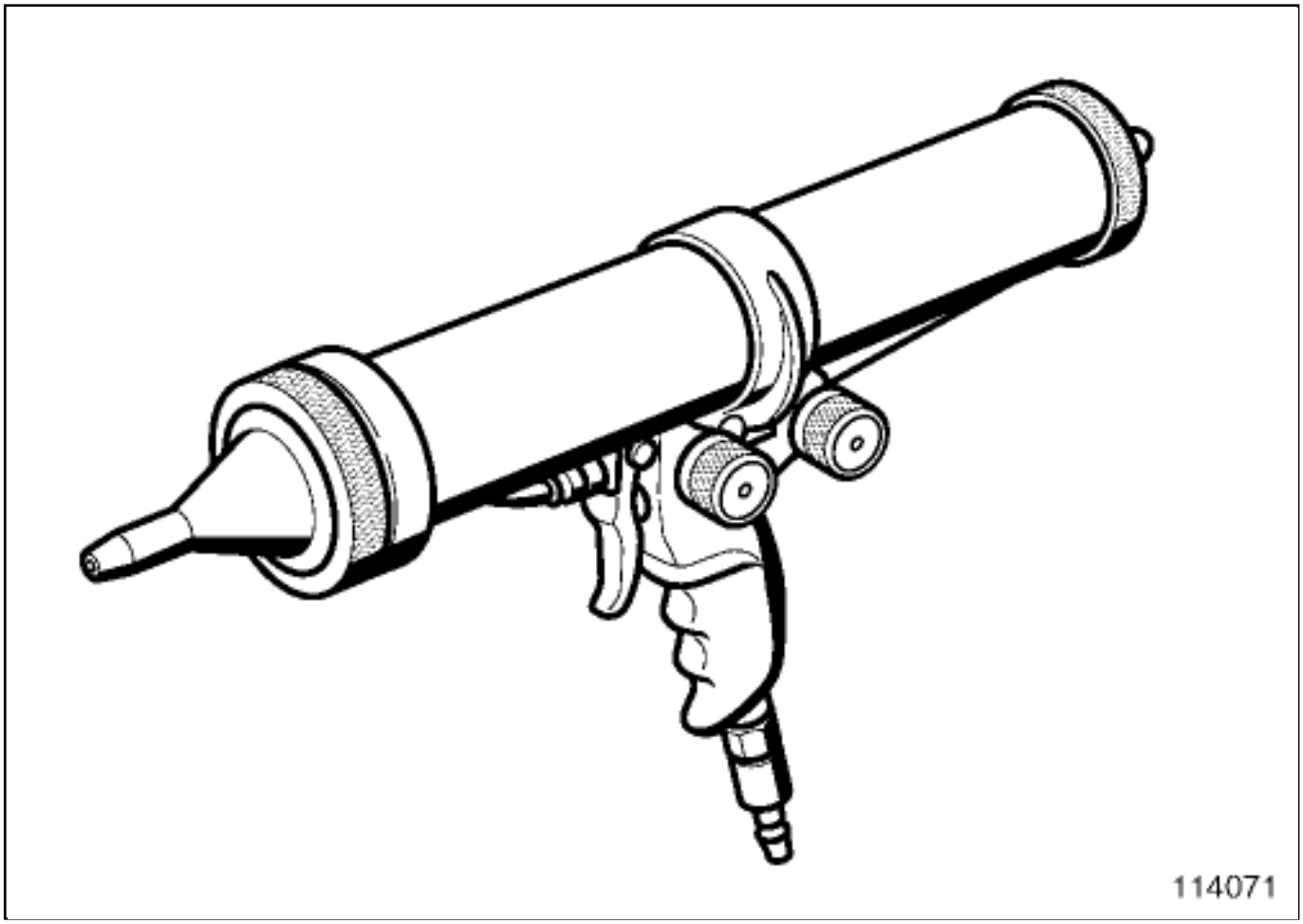
4. APPLICATION

NOZZLE FOR DUAL COMPONENT ADHESIVE



Part no.: 77 11 408 909

NOZZLE FOR SINGLE COMPONENT ADHESIVE



Part no.: 77 11 171 310

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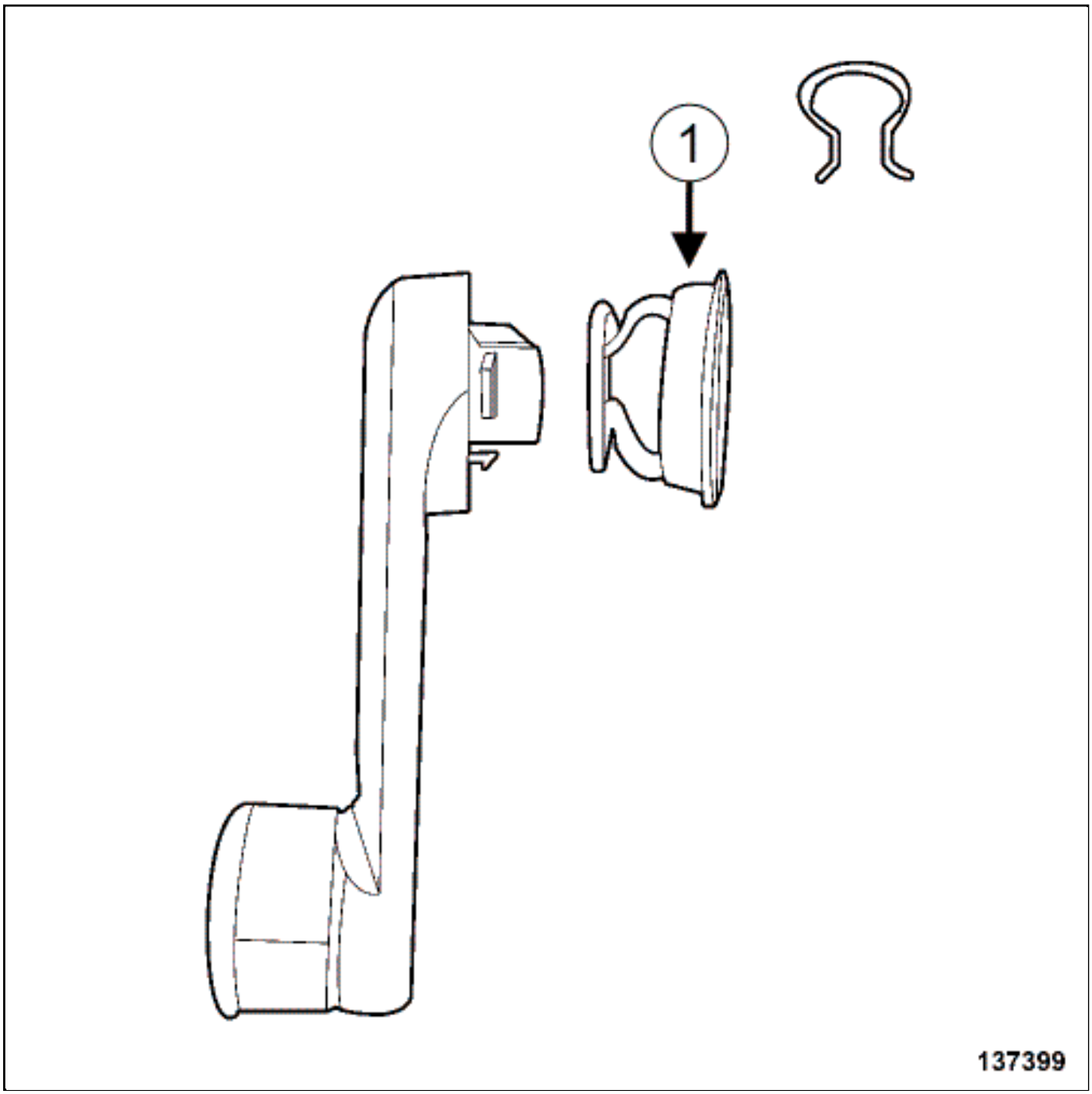
XSL version : 3.02 du 22/07/11

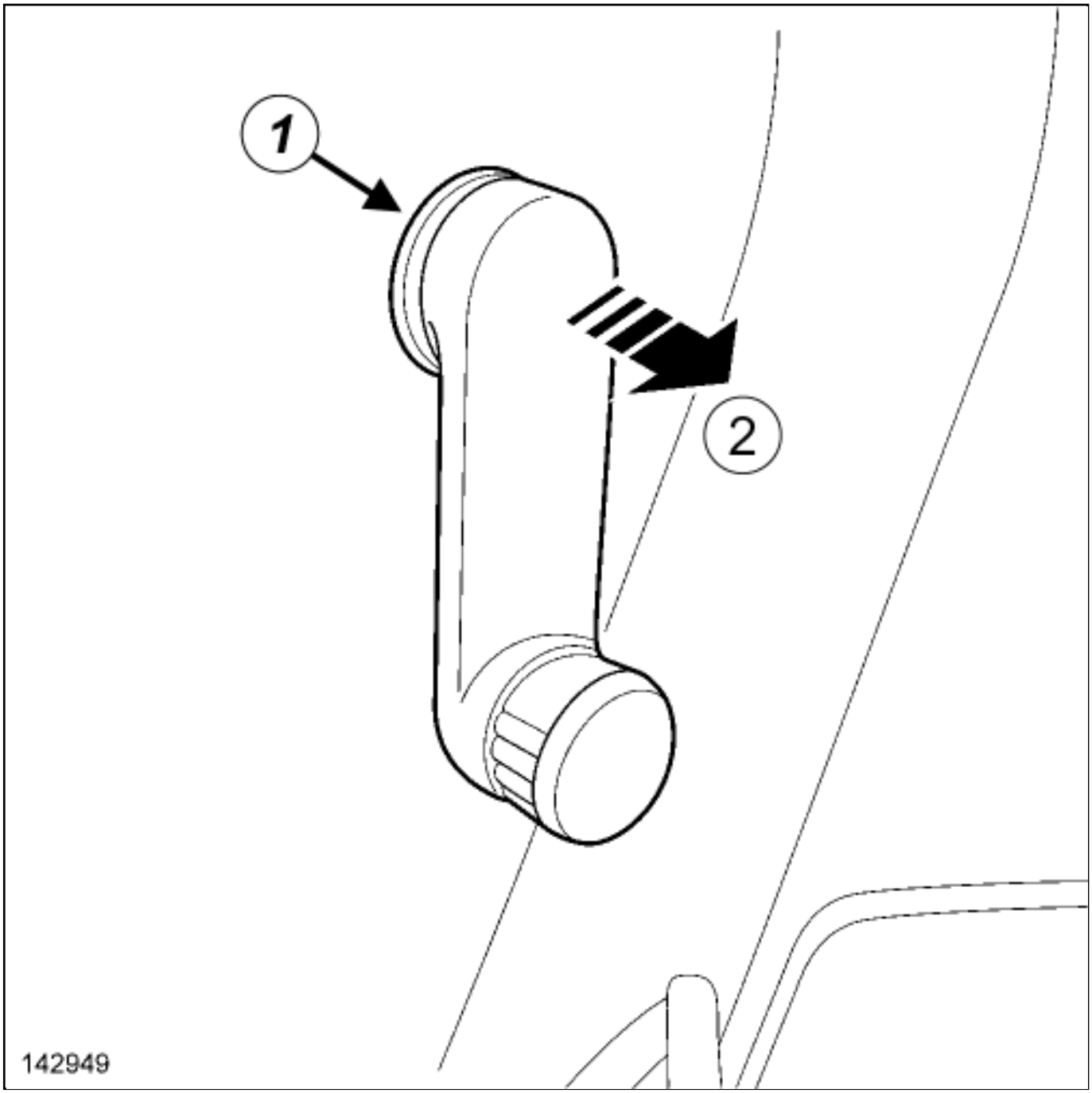
WINDOW WINDER HANDLE: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)Front side opening element assembly on the passenger compartment side: Exploded view orRear side opening element assembly on the passenger compartment side: Exploded view .

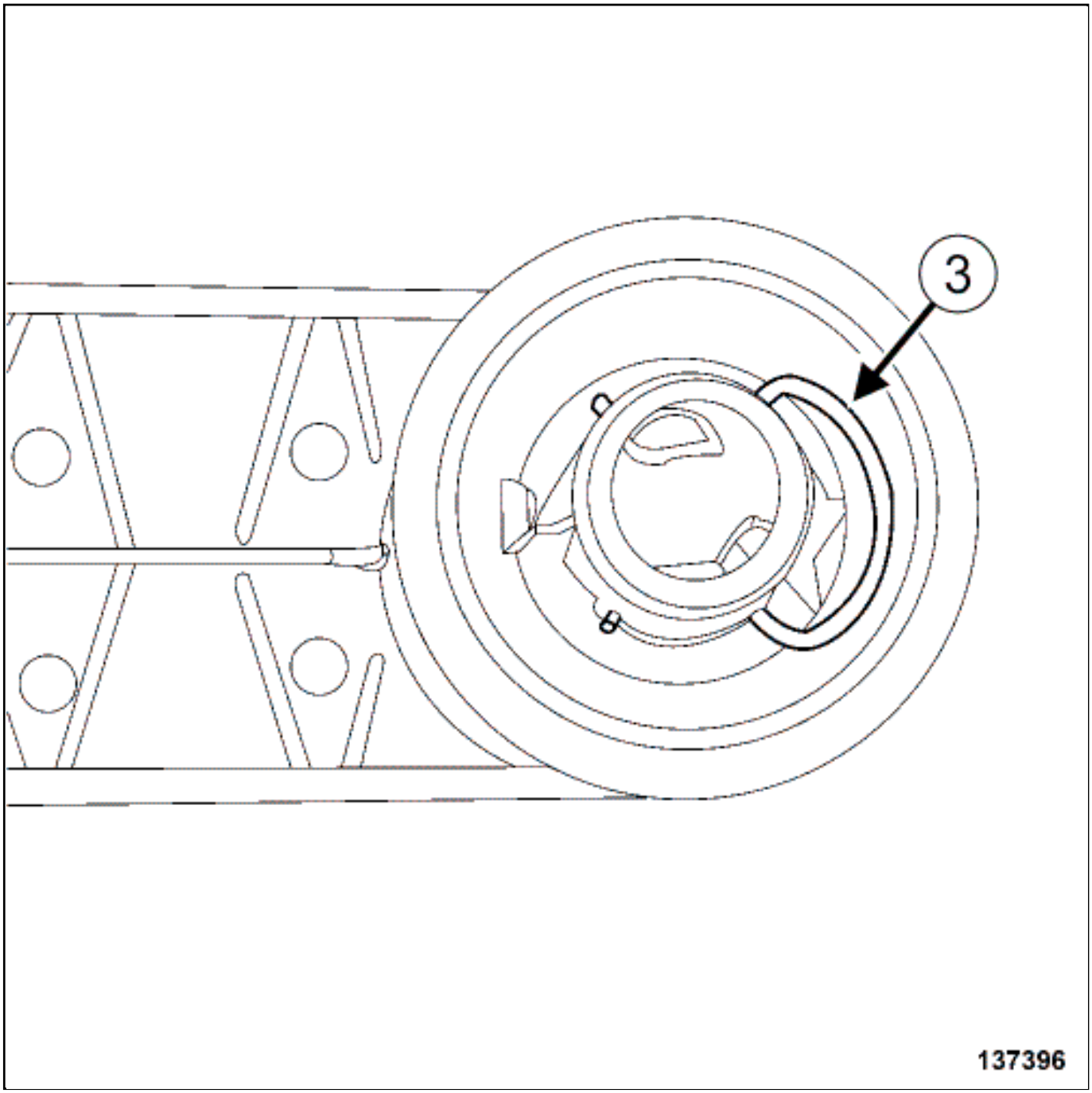
REMOVAL

1. REMOVAL OPERATION





- Pull the ring(1) towards the vehicle interior(2) .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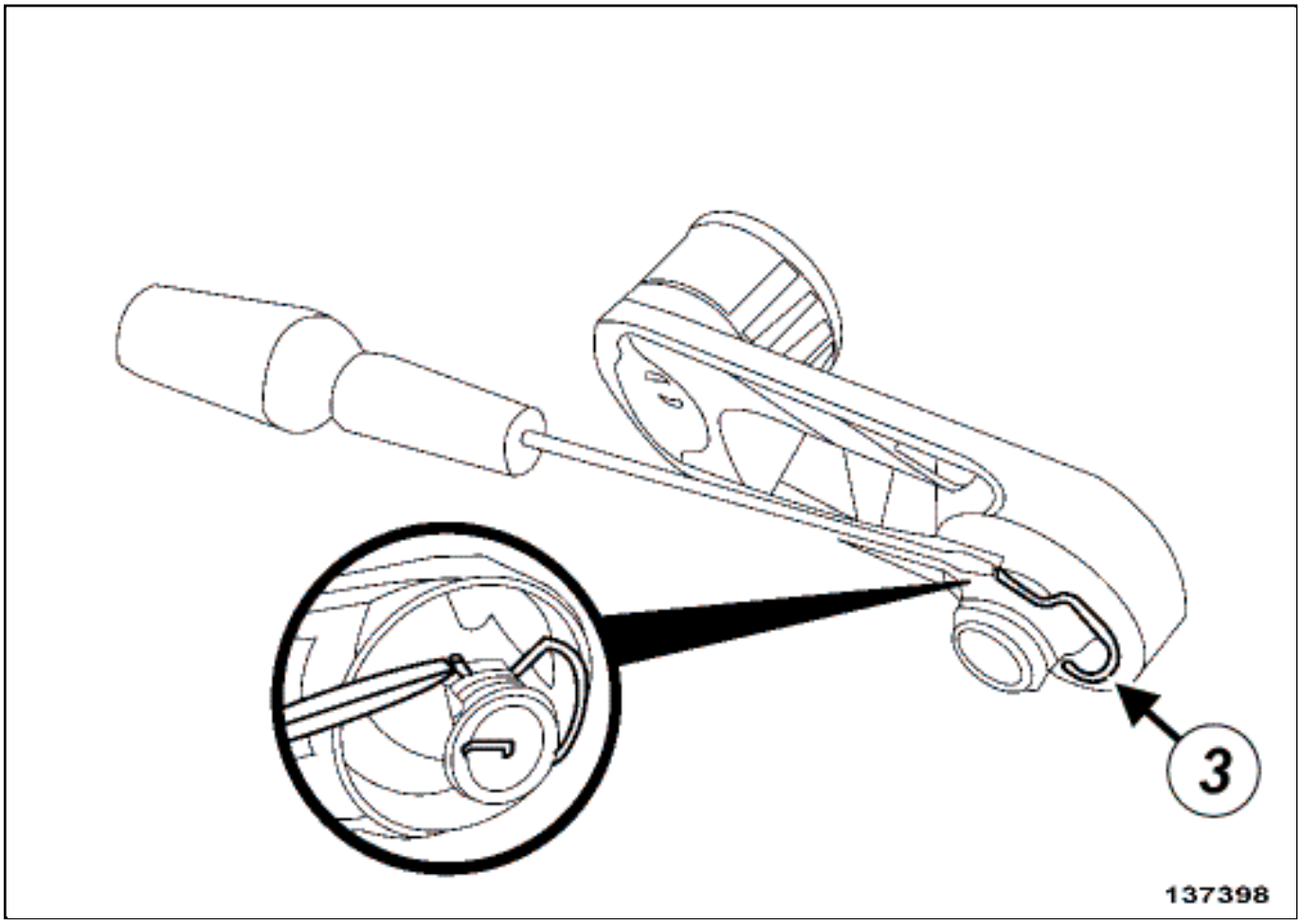


Unclip the clip(3) .

Remove the window winder handle.

REFITTING

Proceed in the reverse order to removal.

WINDOWS: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. INTRODUCTION

Bonded windows form an integral part of the vehicle structure.

To maintain the stiffness of origin of the vehicle and its performance in crash tests,RENAULTrequires that windshield adhesives meet the Technical Specifications. All products in the rangeIXELLhave been tested and validated byRENAULTengineering.

To ensure optimum safety and product quality, carefully observe:

- the safety instructions,
- use recommended products,
- the repair procedures.

This note may change depending on the products, equipment and tools.

2. PROTECTIVE GEAR

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

3. REPAIR TIME

Vehicle which is equipped with:	No airbag One airbag	Two airbags
Bipac evolution	30 minutes	1 hour
S-P KIT	30 minutes	1 hour
BASICPAC	1 hour	2 hours
SIKAFLEX - 222 UV	12 hours	

All times shown are the minimum times for which the vehicle should be immobilised in a temperature of 20˚C with 50%relative humidity.

Do not use the products at temperatures below 10˚C.

Always adhere to these minimum immobilisation times to ensure maximum safety.

Never mix the products when carrying out any adhesive bonding process.

Only products contained in the selected bonding kit must be used.

Shake the primers for a minimum of 1 minutebefore use.

4. PROHIBITED PRODUCTS

Contact between the adhesive product and any of the following products is prohibited:

- thinner,
- grease,
- oil,
- alcohol,
- pre-treatment primer (before drying),
- silicone products,
- soap and soapy water.

For significant impurities (silicone type) before any preparation operation, clean with distilled water.

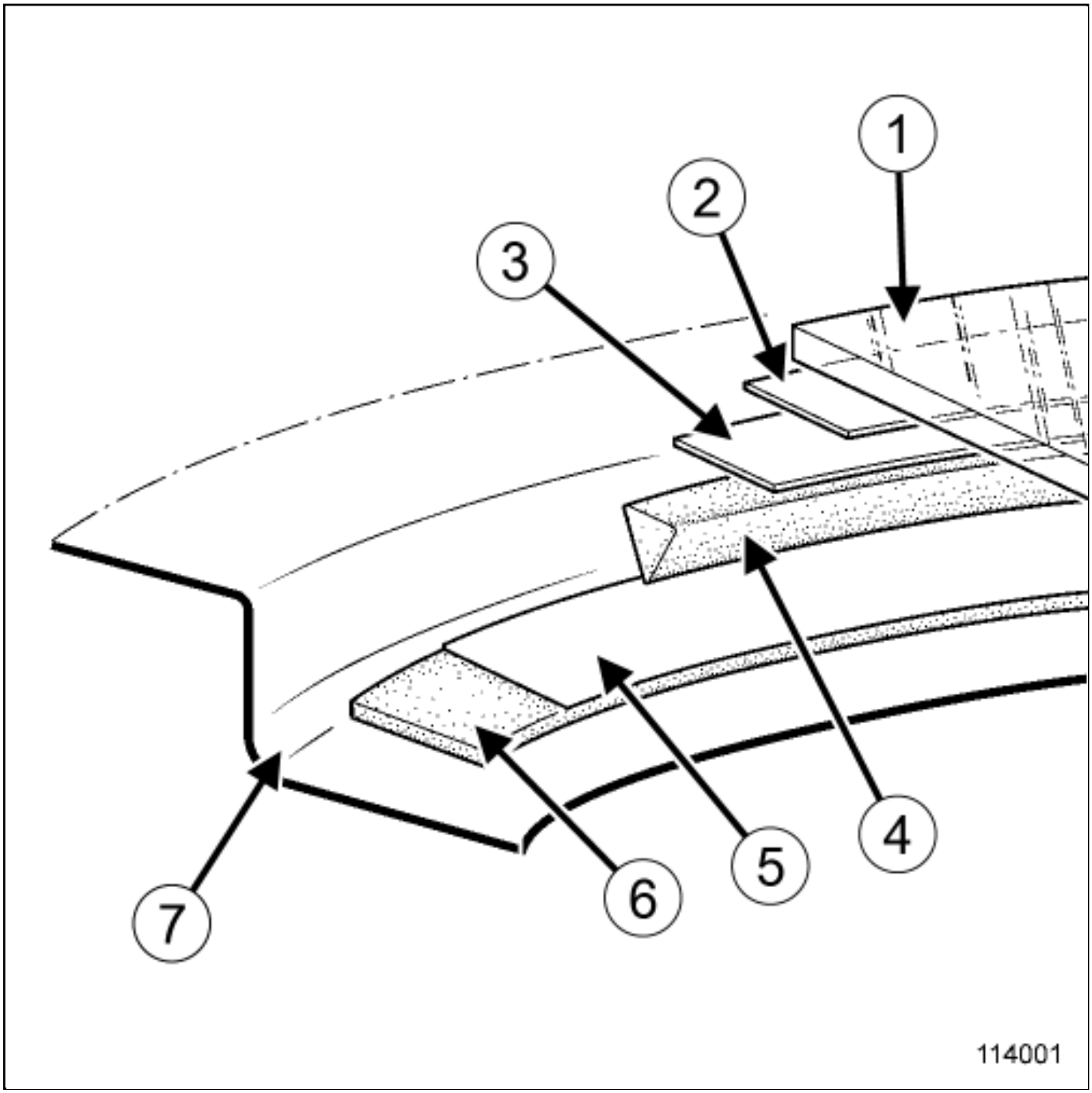
5. DIAGRAMS

Note:

Most cases of water ingress result from failure to adhere to bonding procedures.

Lay down the cement bead so that it is perpendicular to the mounting to be bonded.

1- TO REPLACE A WINDOW OR SUNROOF MECHANISM



(1) Glass + screen printing or sunroof mechanism (Parts Department)

(2) Glass cleaner

(3) Primer on glass

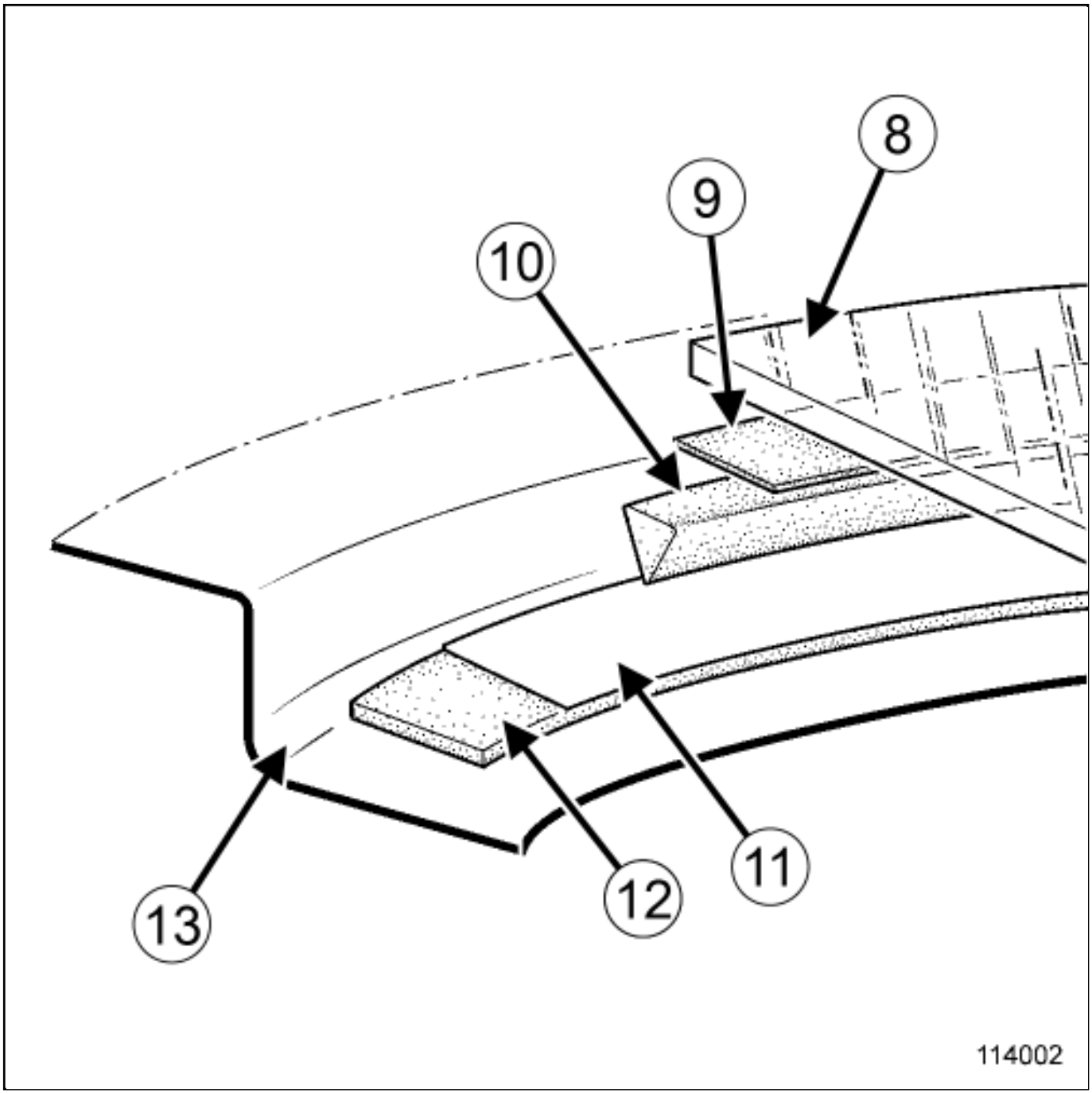
(4) Cement bead

(5) Primer on residual beading

(6) Residual bead

(7) Bodywork mounting

2- TO “REMOVE AND REFIT” A WINDOW OR SUNROOF MECHANISM



(8) Glass + screen printing or sunroof mechanism removed

(9) Residual bead on window or sunroof mechanism

(10) Cement bead

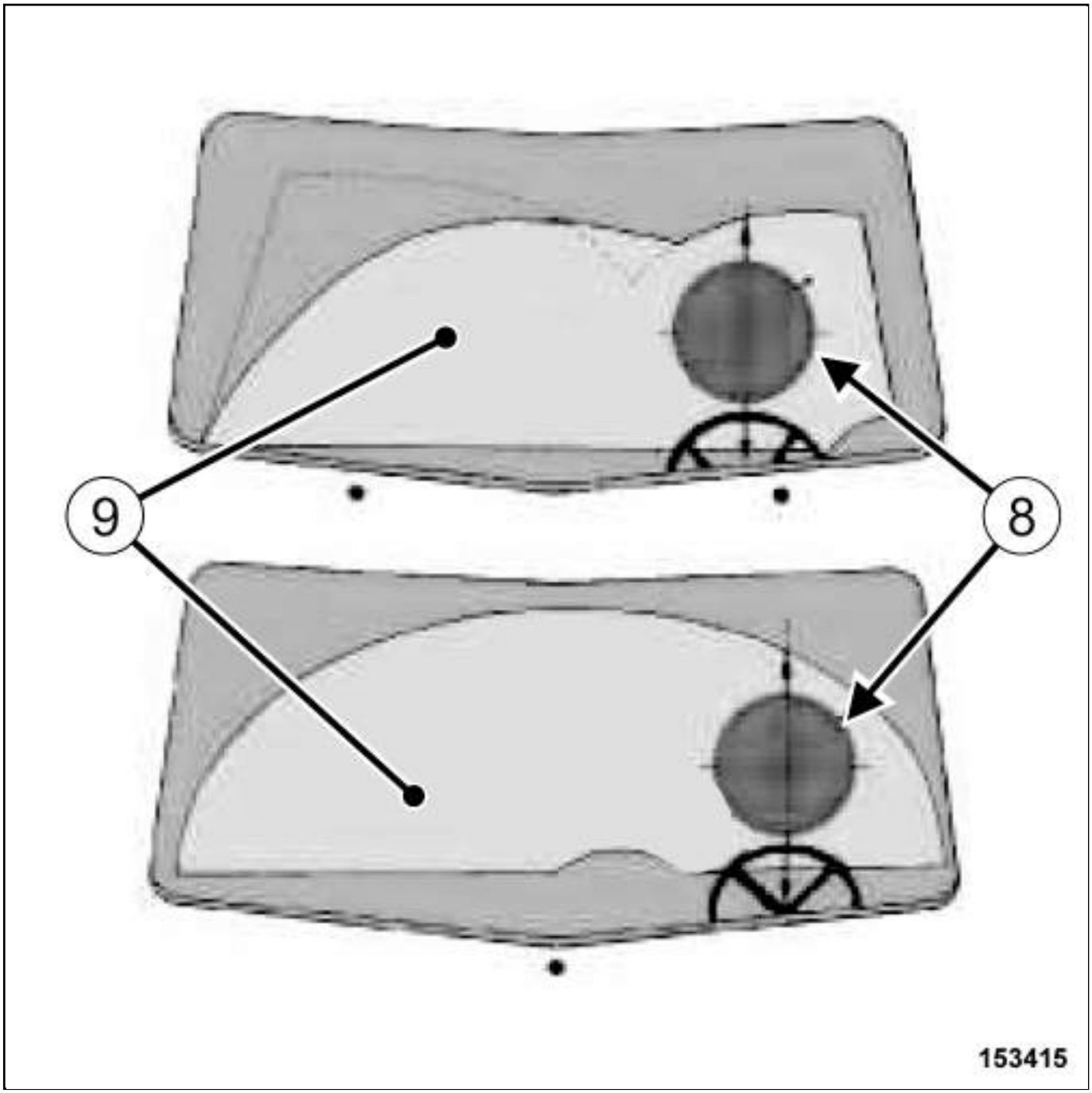
(11) Primer on residual beading

(12) Residual bead

(13) Bodywork mounting

WINDOWS: REPAIR

1. AREAS OF APPLICATION



- The chip must be recent and located outside the field of vision of the driver(8) .

The area can be defined simply using the sweep of the wipers(9) .

2. PRECAUTIONS FOR THE USE AND STORAGE OF THE PRODUCTS

- Before beginning all operations, check that the windscreen to be repaired is clean and dry and at an ideal temperature.

The ideal conditions are between 15˚and 25˚.

If this is not the case, leave the vehicle engine running for a few minutes with de-icing at the maximum until the windscreen is slightly warm.

- Do not store resin or cans of resin with food.

- To keep the resin in good condition, these cans must be stored in the dark, in a cool dry place.

Note:

Do not expose the resin to frost.

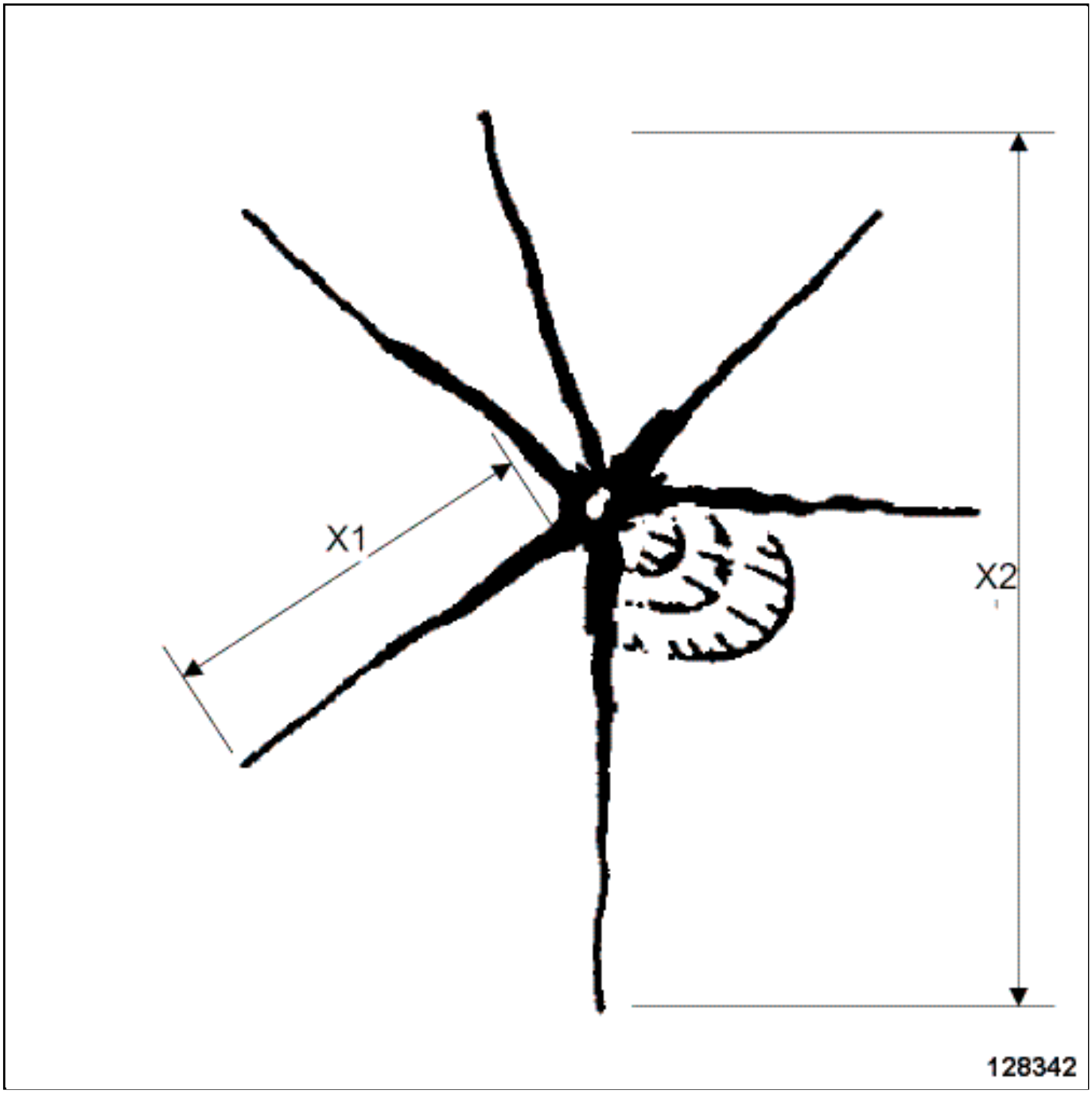
- Do not expose the products to the sun or to a fluorescent light.

- Do not open the protective envelope before using the resin.

- The resin reacts to exposure to ultra-violet radiation (UV). That means that the light changes the resin from a liquid state to a solid state.

3. WHAT CAN BE REPAIRED

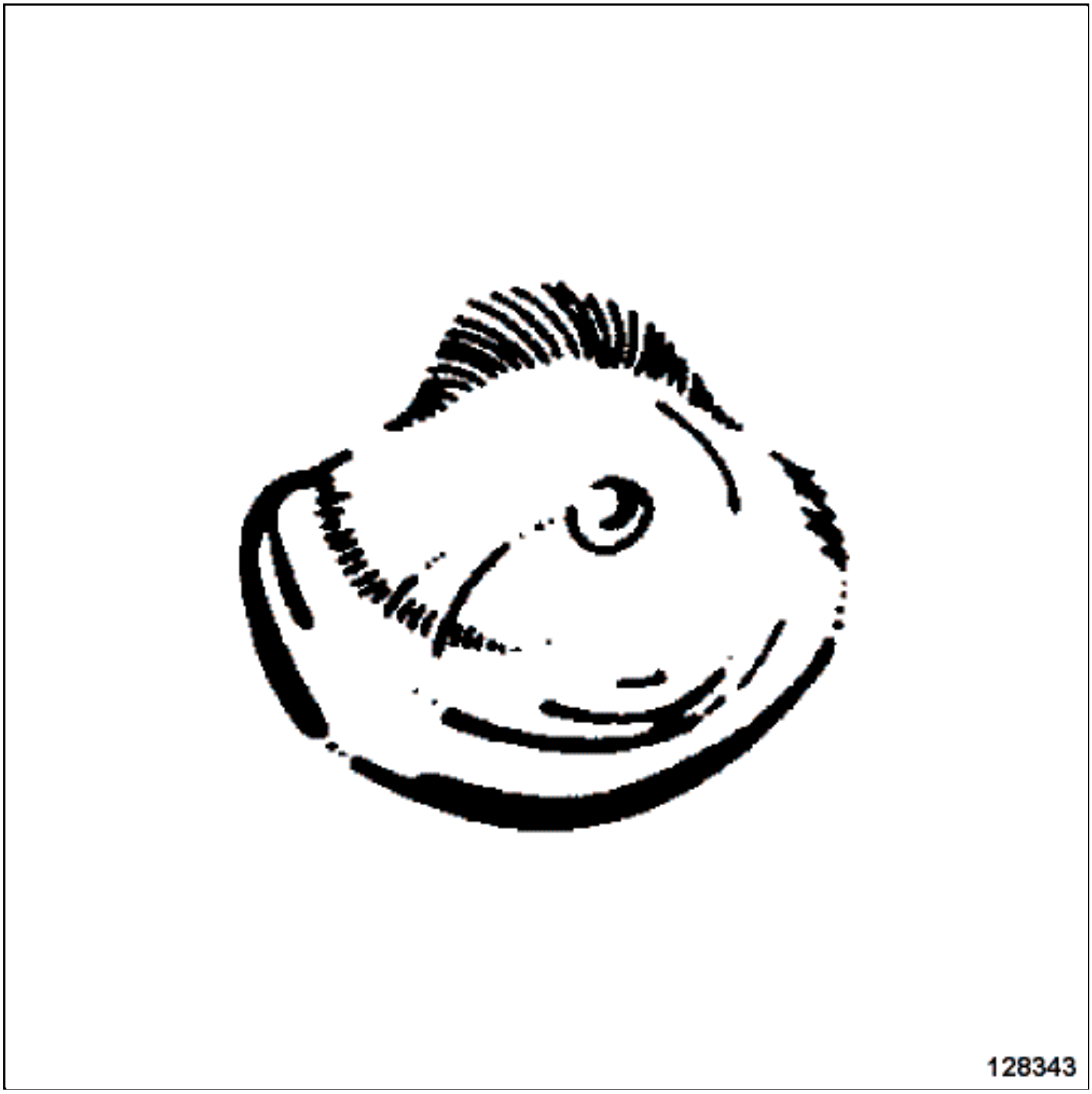
STAR



- "Arm" of the star(X_1) = 10 mmto 12 mm.

"Arm" of the star(X_2) = 40 mm.

BUBBLE

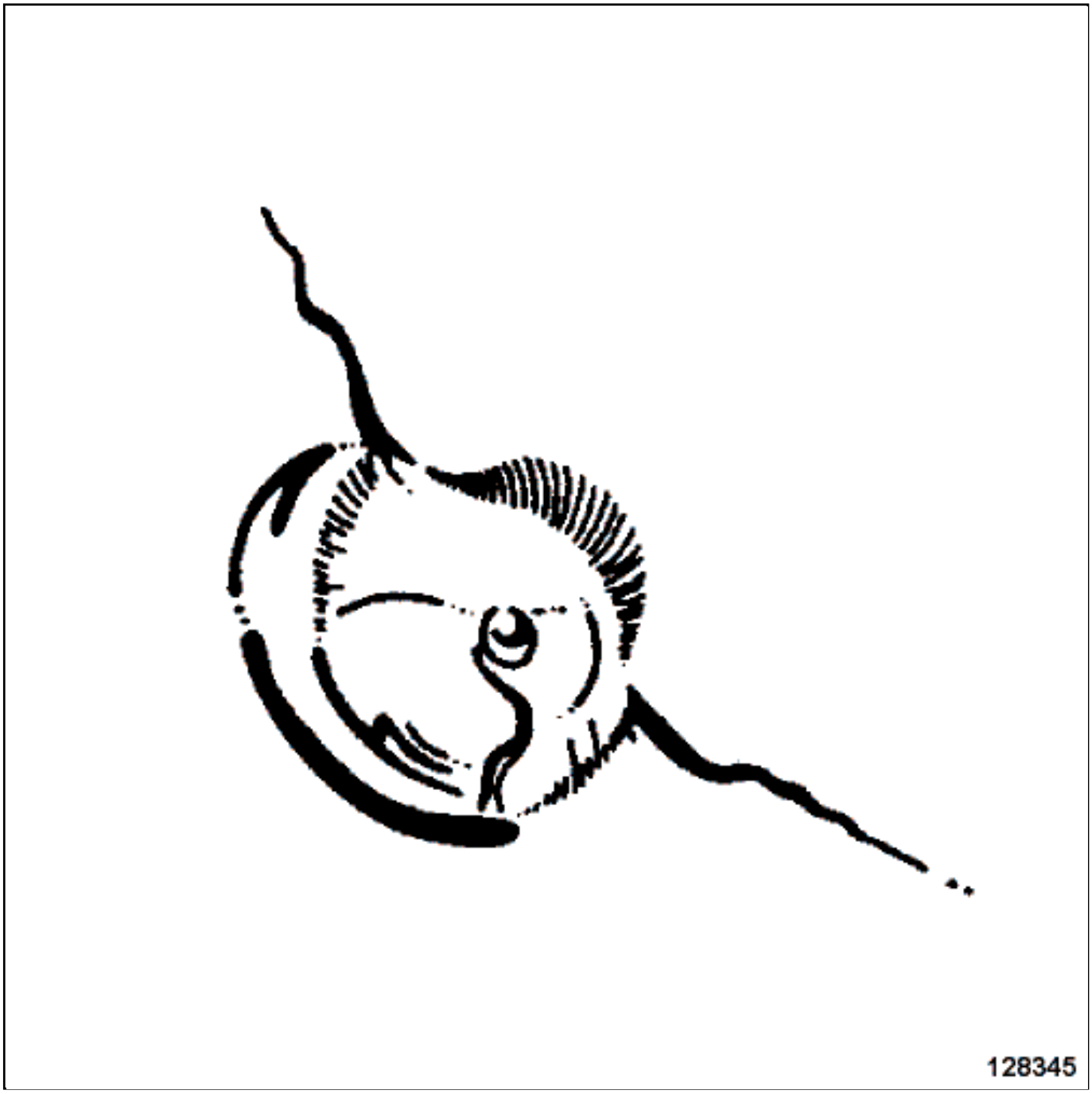


- Bubble max ∅ = 20 mm.

HALF BUBBLE

- Half bubble max dia. = 20 mm.

STAR + BUBBLE + CRACKS



- Star + bubble + crack max = 40 mm.

4. WHAT MUST NOT BE REPAIRED

- athermic windscreen,
- heated windscreen,
- the circular area of 300 mm diameter in the field of driver's vision(8) ,
- any crack more than 60 mm long,
- any chip at less than 40 mm from the edge of the windscreen,
- any chip at less than 20 mm from any sensor,
- if there are more than three chips,

- any chip that has resulted on oxidation of the intermediate layer.

Note:

This oxidation is characterized by a round opaque zone.

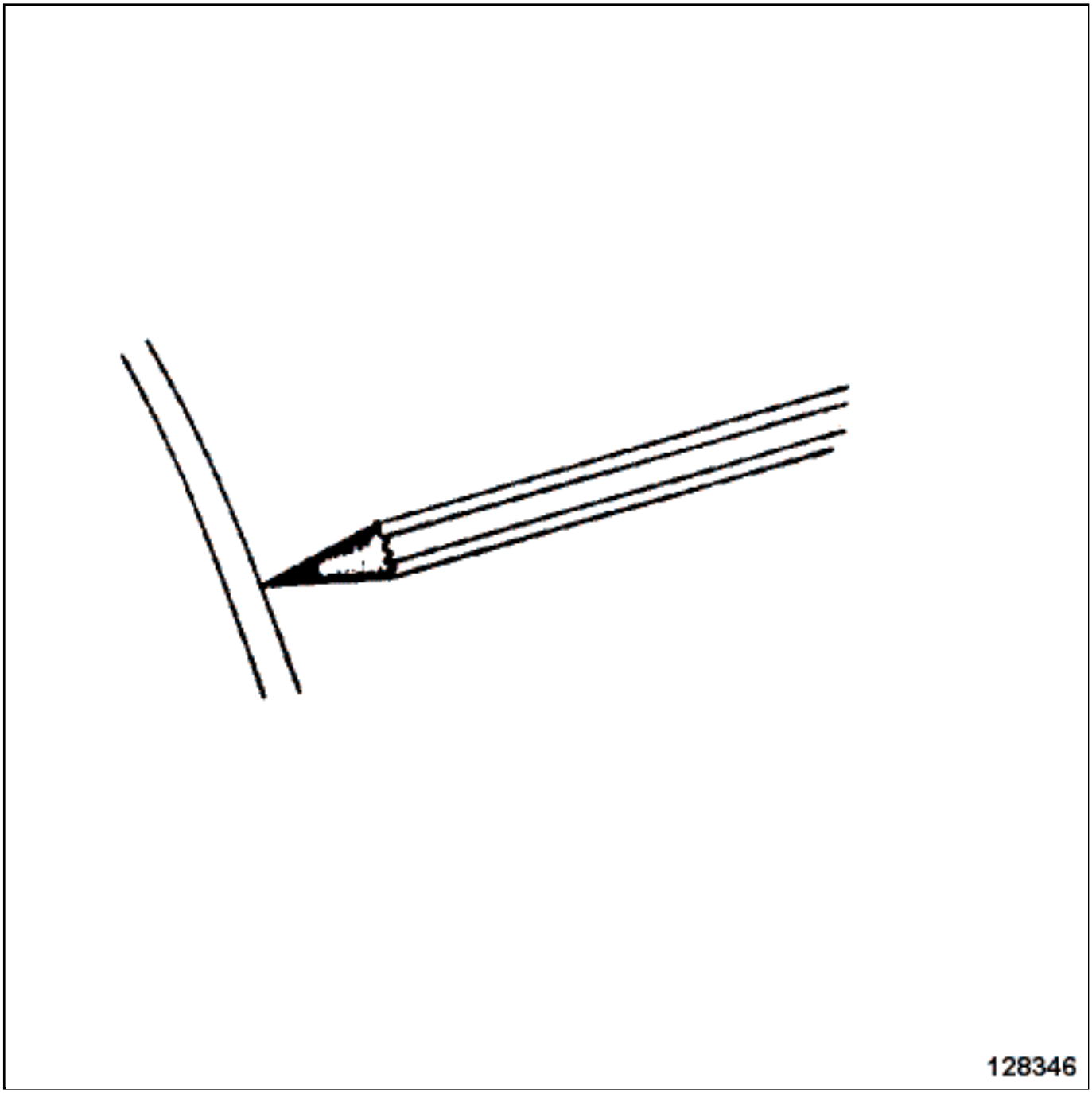
5. GENERAL REPAIR METHOD

Note:

This section considers the basic procedures for repair with the appropriate tools.

1- INSPECTION OF CHIP AND USE OF THE CARBIDE-TIPPED STYLUS

- Take great care when examining the chip.
- Check whether the radial cracks spread and note their length and the depth.
- Decide whether holes should be drilled at the ends of the cracks.
- Repair only the first layer.



- Use the carbide tip of the stylus to gently scratch away any dirt or glass in the chip crater.

Note:

Do not enlarge the chip.

2- FITTING THE MAGNIFYING MIRROR

- Place the magnifying mirror on the inside of the windscreen so that the chip on the outside is clearly

visible.

The magnifying mirror enables you to see the progress of the repair clearly.

3- FITTING THE TOOL HOLDER

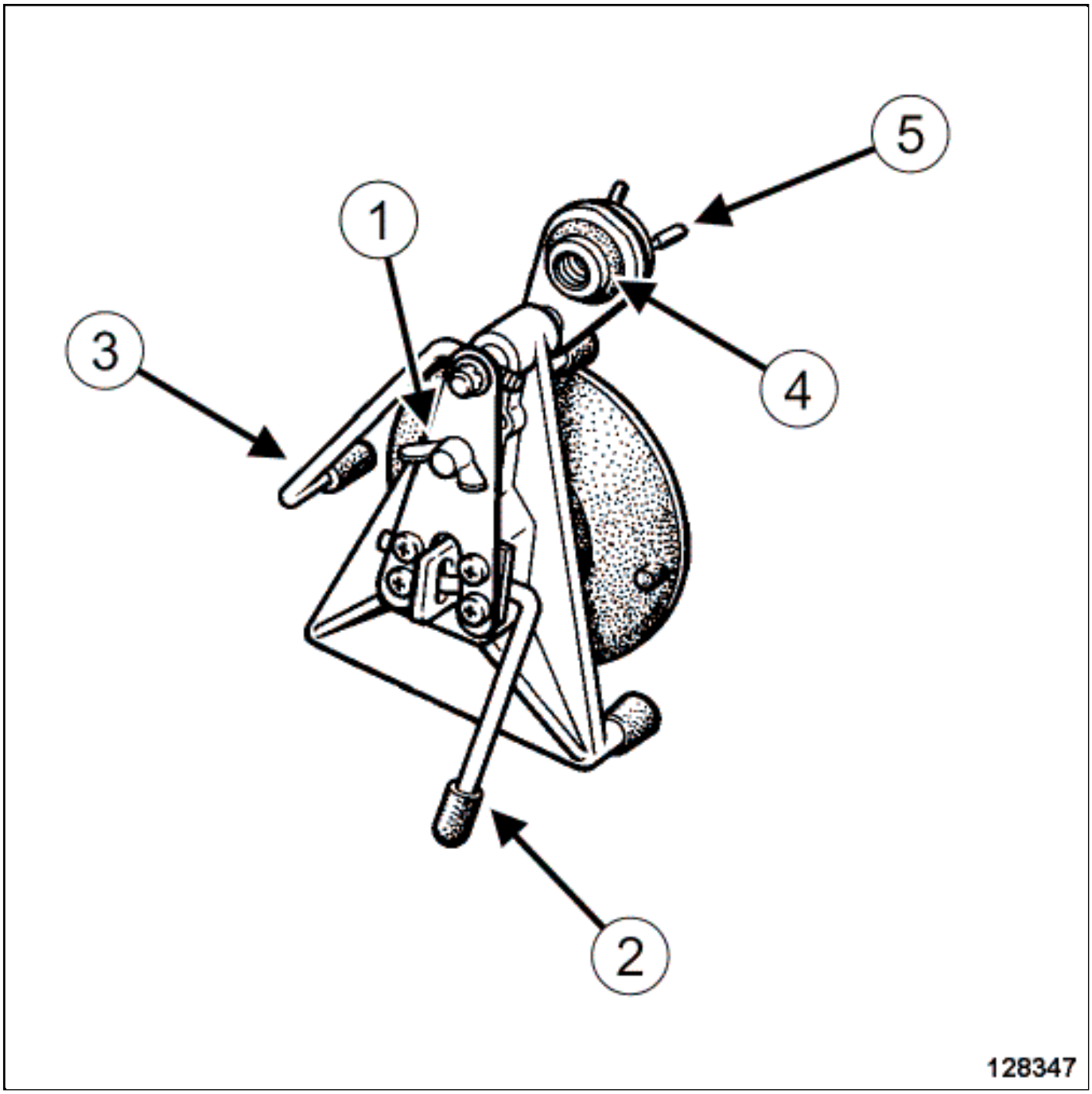
- This is your most important tool.

It is used for injecting the resin when it is equipped with the injector.

- Find a position that makes operation easy.

It is desirable to locate the tool holder below the chip.

1)FITTING THE TOOL HOLDER



- Fully undo the spider support(1) so as not to put pressure on the chip.
- Apply lubricating gel to the edge of the suction cup.
- Check that the suction cup lever(2) is pointing forward.
- Hold the tool holder so that the control lever(3) is right up against the left-hand side of the tool holder.
- Centre the injector holder(4) above the point of impact of the chip.
- Press the tool holder firmly so that the suction cup is correctly pressed against the windscreen.
- Use the lever(2) to lock the suction cup.

The spider of the threaded gun can then be handled freely.

- Tighten the pressure bolt(1) of the threaded gun until the spider(5) is immobilised on the windscreen.

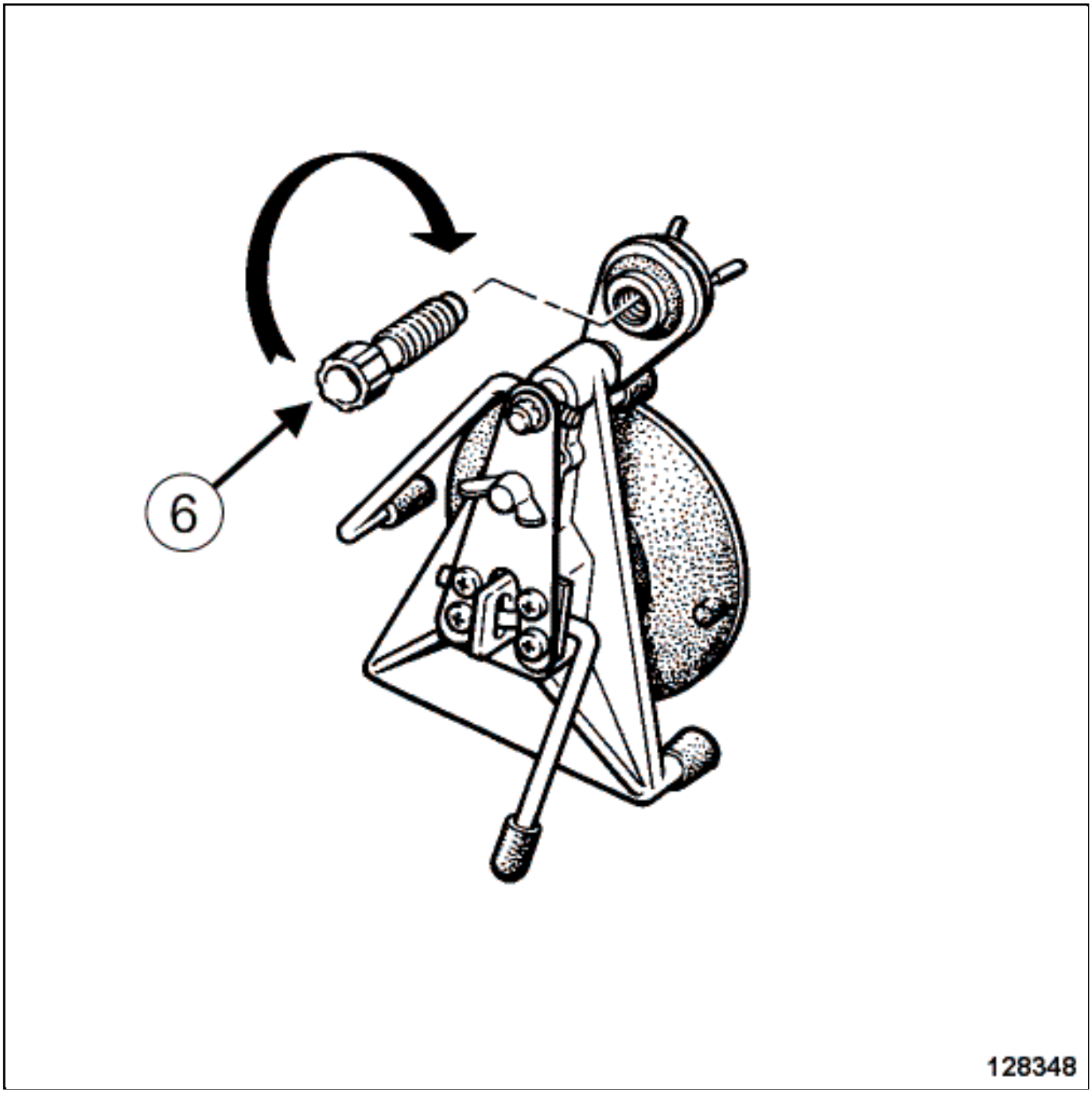
Note:

Check that the spider feet are definitely in contact with the glass.

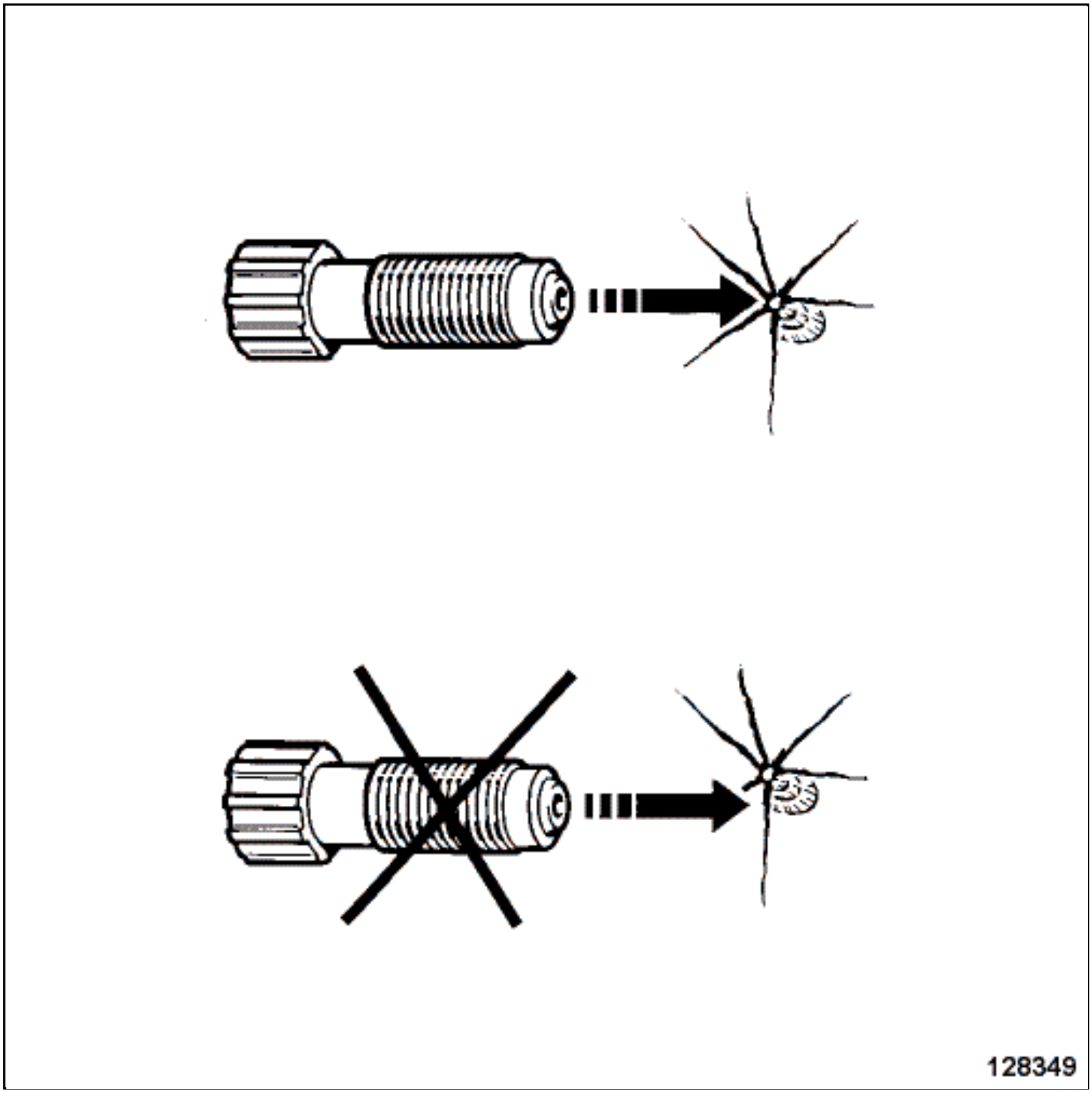
This is very important as it ensures a perfectly perpendicular position for injection.

4- INJECTION

- A resin sachet contains a bottle of resin and a plastic injector.



- Without tightening the injector(6) , place it on the injector holder to bring it in contact with the glass.



- Centre the injector opposite the crater of the chip.

- Remove the injector, taking care of not to move the injector holder.

- Take the bottle of resin and remove the small protective plug.

- Cut off the tip of the bottle using the scraper blade (supplied in the kit).

- Unscrew the piston of the injector by 5to 6 mm.

- Fill the injector with resin up to the edge on the white rubber seal side.

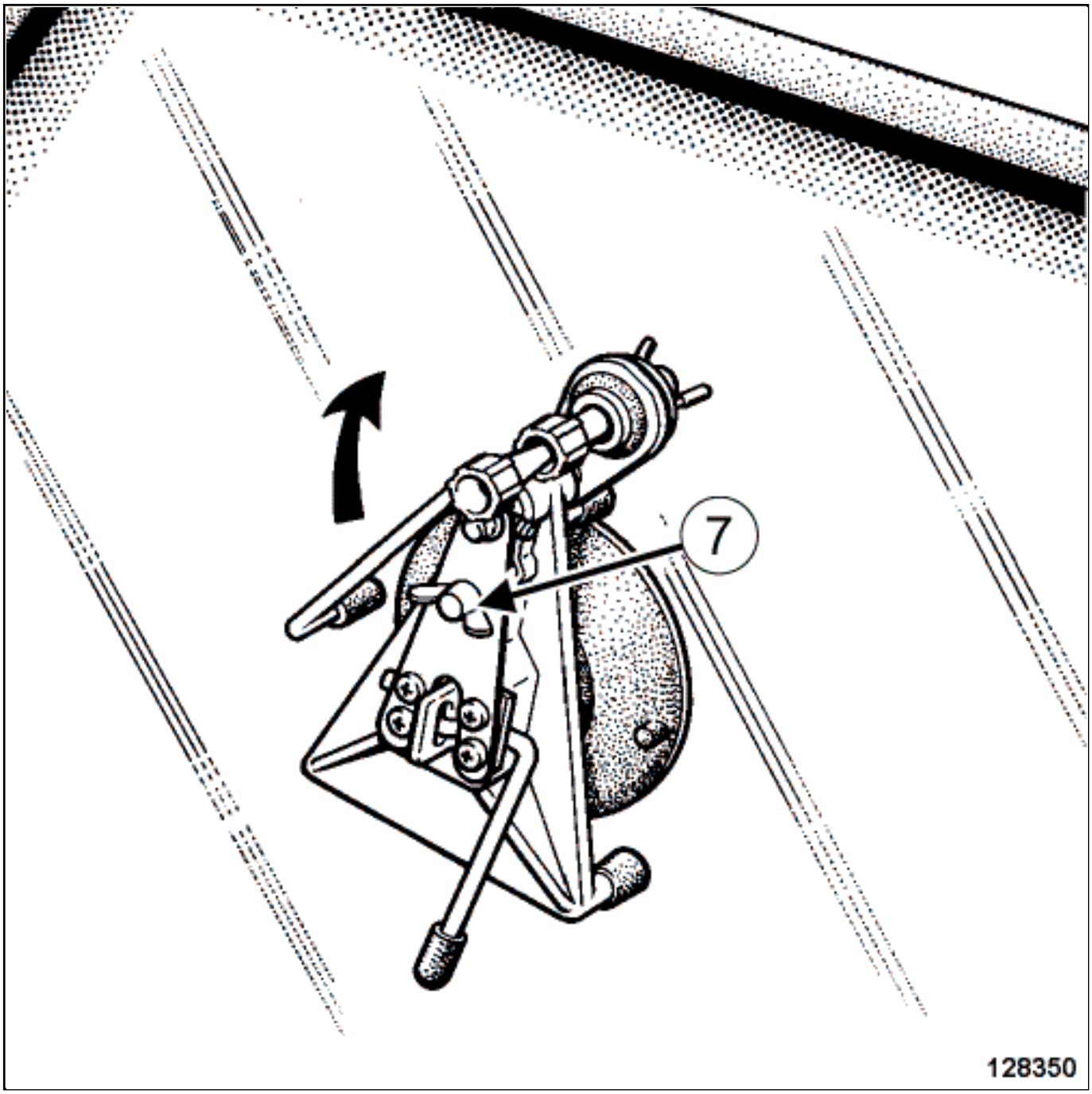
Note:

To fill the injector more easily, use the resin bottle as a dropper.

Check that the edge of the white rubber seal is clean and dry, wiping off any resin that may be there.

- Put the flask of resin away where it will not be exposed to daylight.
- Refit the injector on the injector holder but do not tighten it.
- When the white rubber seal comes into contact with the glass, tighten it by one or two additional turns in order to obtain the seal needed for applying pressure to the resin.
- Do this by holding the body of the injector with two fingers and screwing the piston very slowly with the other hand.
- During this operation, look in the mirror to observe the moment when the seal of the injector expands slightly.
- Continue to screw the piston in by no more than one turn, then do not touch it any more.
- Wait for 1 minutes, then observe what happens in the mirror. You would normally expect to see an improvement.
- To accelerate the process of transferring the resin to the inside of the chip, from time to time you can undo the piston of the injector a little more than it was when you filled it with resin, without changing the position, and wait for a few seconds, then screw the piston up again until the seal expands once more.
- Repeat this operation several times until the chip has completely disappeared.
- The resin takes 2to 5 minutesto spread to the furthest ends of the cracks.

5- INSPECTION OF THE REPAIR



- Release the spider pressure using the bolt(7) .
- Rotate the injector assembly to free the area of the chip.

This will relieve all pressure on the repair area.

- Check and inspect the crack under different angles.
- If no chip modification can be seen after 5 minutes, the glass must be drilled at the location of the crater (see When and how it is necessary to drill).

this means that when the projectile came into contact with it, the windscreen broke as a result of the shock wave but the glass was not perforated.

6- FINISHING

- When the chip has disappeared, remove the tool holder, which is no longer needed.

- Fit:

  - a drop or two of finishing resin above the crater and put the plastic sheet or film over the repair (the quantity of resin will have to protrude slightly in order to take into account the effect of "contraction" at the time of polymerisation),
  - the UV lamp astride the repair on the windscreen after first applying gel to the suction cups.

- Drying time: as per supplier's instructions.

- Once polymerisation has finished, use a scraper blade to remove the surplus resin that is on the windscreen. Scratch at right angles to the glass surface until only what is needed is left.

- Fit the felt disc in the drill mandrel.

- Apply a little polish to the area where the repair has been done.

- Polish the repair without putting too much pressure on the window in order to obtain the right appearance.

7- WHEN AND HOW IS IT NECESSARY TO DRILL?

- In certain cases, despite the application of pressure to the resin, nothing happens.

It is then necessary to drill to access the inside of the chip.

- That means that the glass has broken internally under the effect of the shock wave, without the outer glass being damaged.

1)DRILLING

- Put the carbide drill bit on the drill.

- Drill in successive and brief operations in order to avoid the tool overheating.

- When the plastic film separating the two layers of glass is reached, stop drilling.

- Carry out the repair as described below.

2)REPAIR AFTER DRILLING

- If repairing a crack, drill at the end of the crack to prevent it from propagating.
- Inject the resin through this hole.

This will move up the crack by capillarity.

- Harden this part using the UV lamp.
- Position the injector holder so that the injector is located astride the slit, 5 cmaway from the end of the resin just injected.

By capillarity, the resin will distribute itself on either side of the injector.

- Harden this part, and continue progressively until the whole of the crack is repaired.

Note:

Only drill once at the end of the crack.

WINDOWS: SEALING CHECK

Note:

Before any operation, check the water outlet openings. Clean any residue which has accumulated (for example: dead leaves, twigs, etc.) and check that water flows out correctly.

1. PREPARATION OPERATION FOR CHECKING THE SEALING

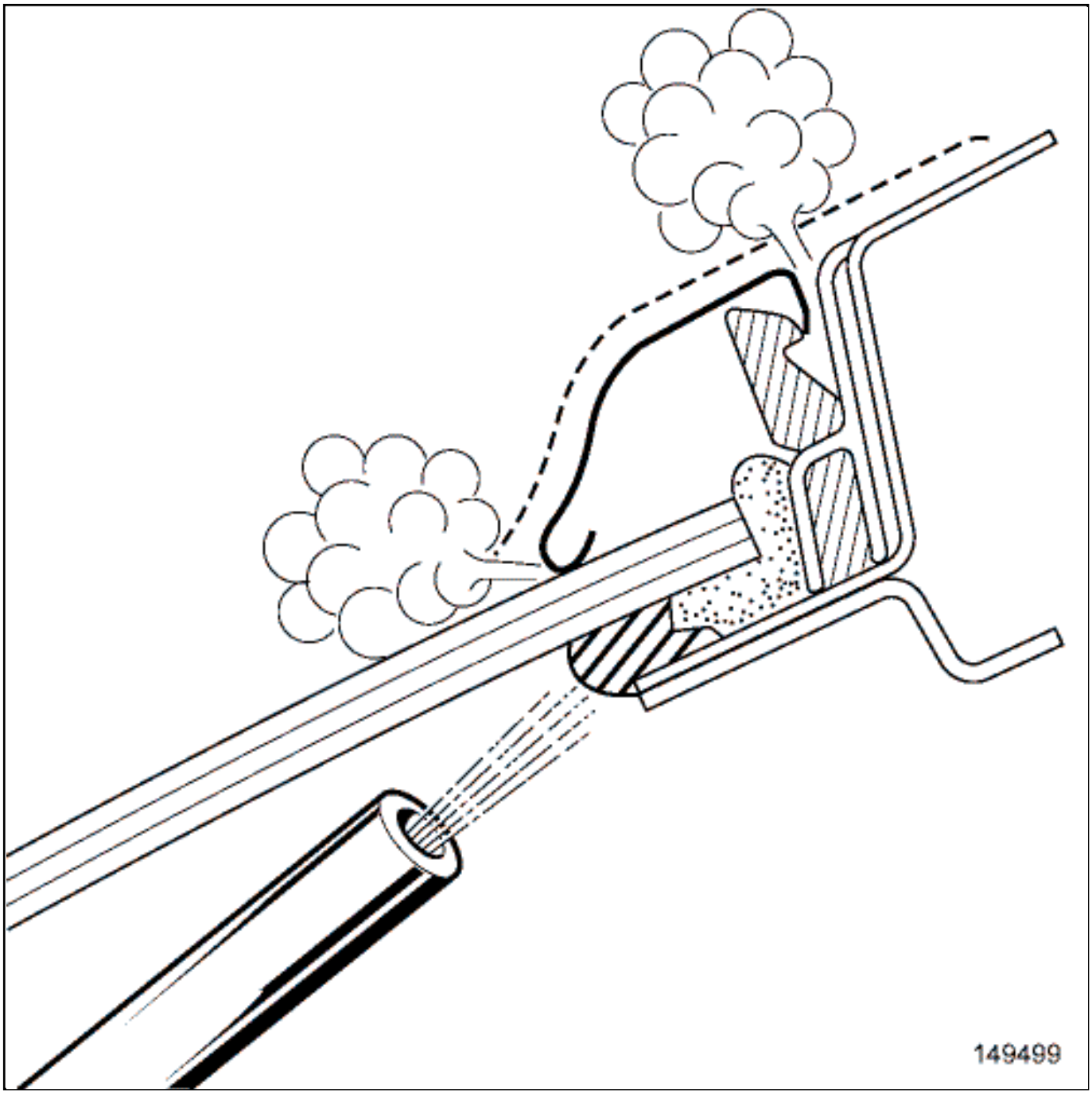
1- CONDITIONS TO RESPECT BEFORE CHECKING THE SEALING

- Position the vehicle on a level washing area(see 60A, General information, Vehicle sealing: General information) .
- Check that all the opening elements are closed(see 60A, General information, Vehicle sealing: General information) .
- Prepare the equipment to perform the operation(see 60A, General information, Sealing tools: Use) and(see 60A, General information, Vehicle sealing: General information) .
- Adjust the flow of the water jet(see 60A, General information, Sealing tools: Use) .

2. OPERATION FOR CHECKING THE SEALING

1- BONDED WINDOWS

1)FIRST PROCEDURE

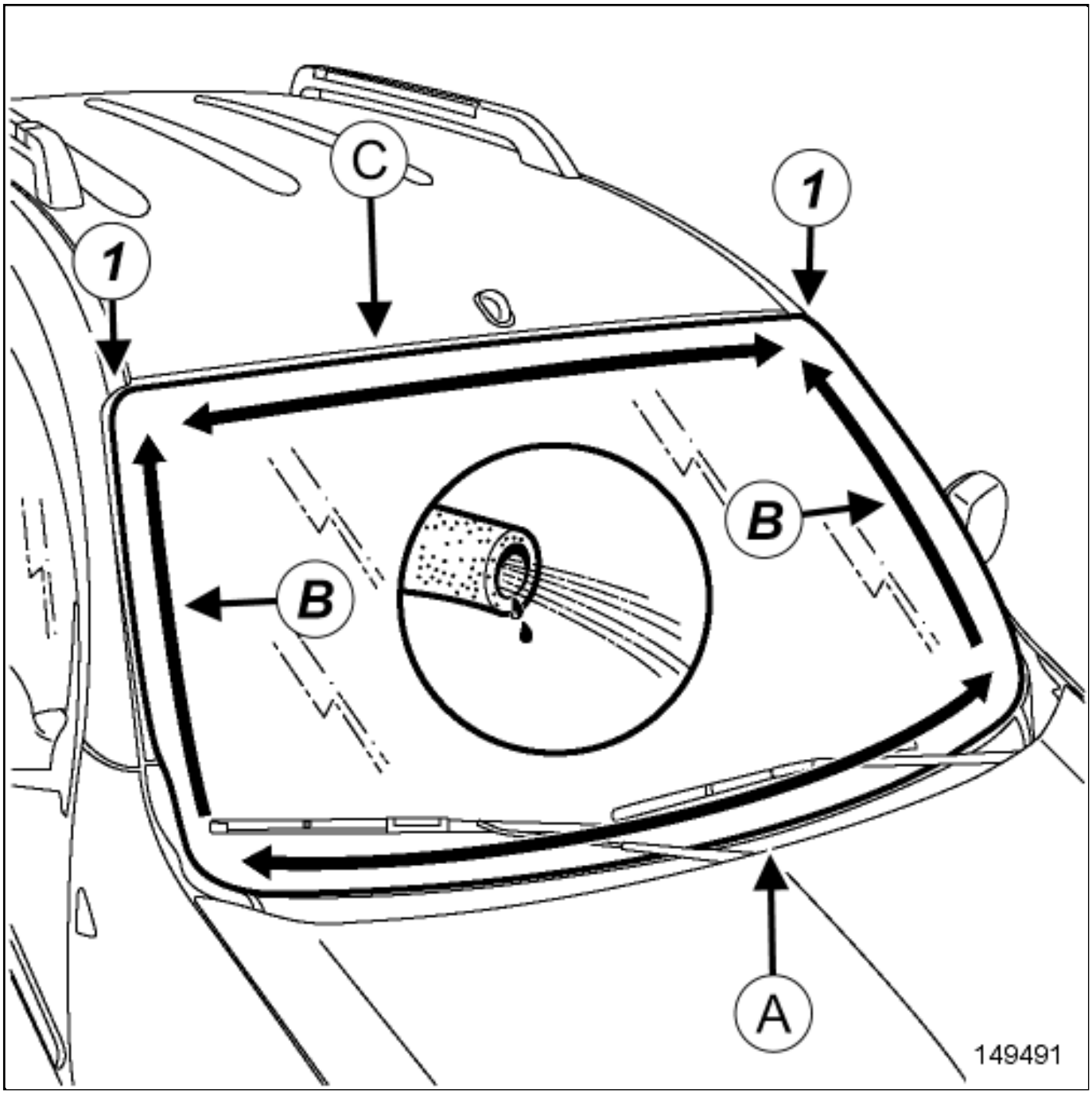


- Wet the exterior edge of the windows using soapy water(see 60A, General information, Bodywork sealing products: Description) .

- From inside the vehicle, blow the entire zone using the air gun(see 60A, General information, Sealing tools: Description) .

- Visually inspect for the presence of bubbles around the windows.

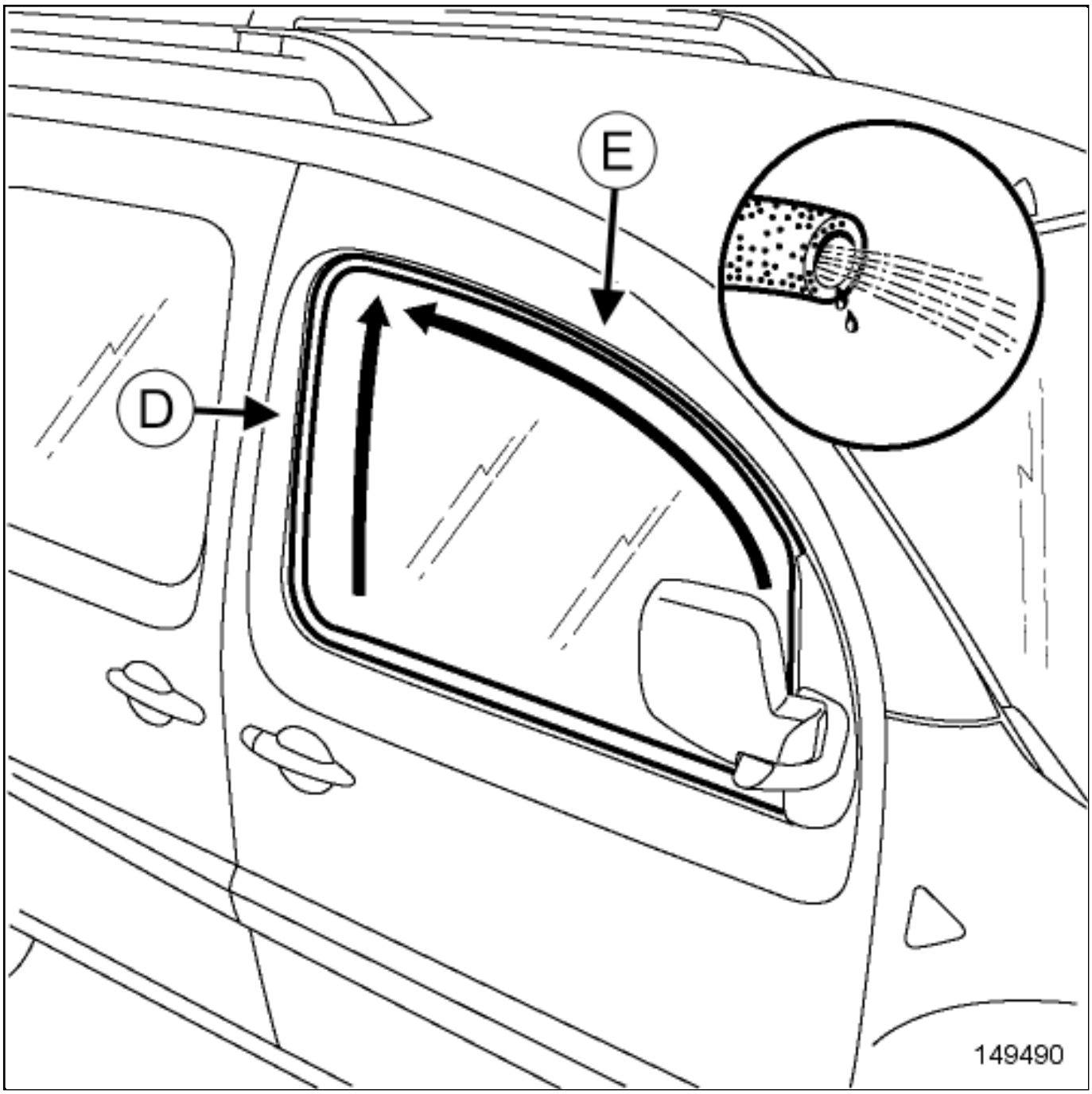
2)SECOND PROCEDURE



- Spray the lowest section(A) of the windows by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Gradually spray the window pillars(B) from the bottom upwards to point(1) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the upper section(C) of the windows by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing:

General information) .

2- SLIDING WINDOWS



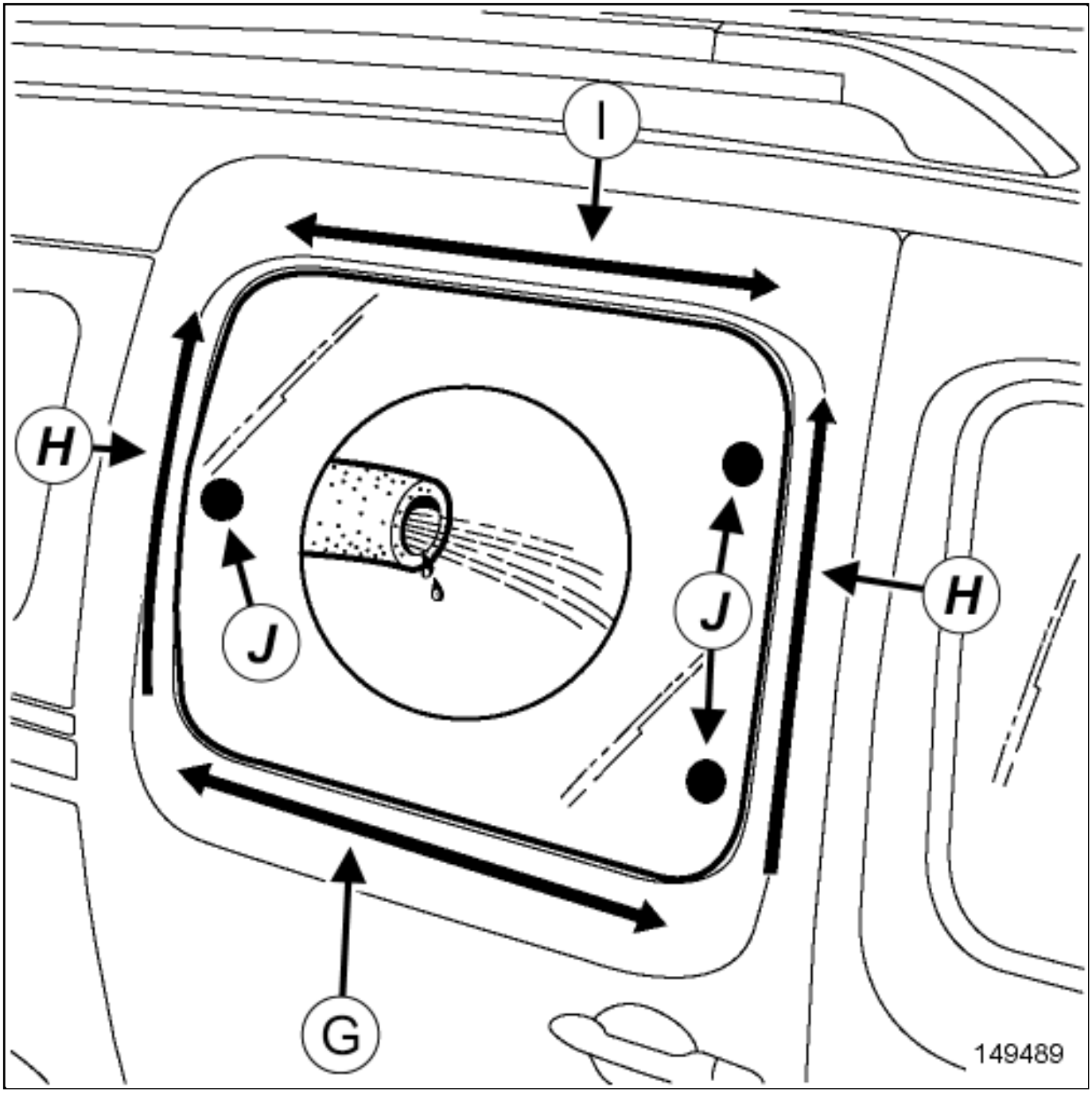
- Gradually spray the window pillar(D) from the bottom upwards to the upper section.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Gradually spray the window pillar(E) from the bottom upwards to the upper section.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

3- HINGED WINDOWS



- Spray the lowest section(G) of the windows by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Gradually spray the window sections(H) from the bottom upwards to the upper section.

- Visually inspect for the presence of water inside the vehicle (see 60A, General information, Vehicle sealing: General information) .

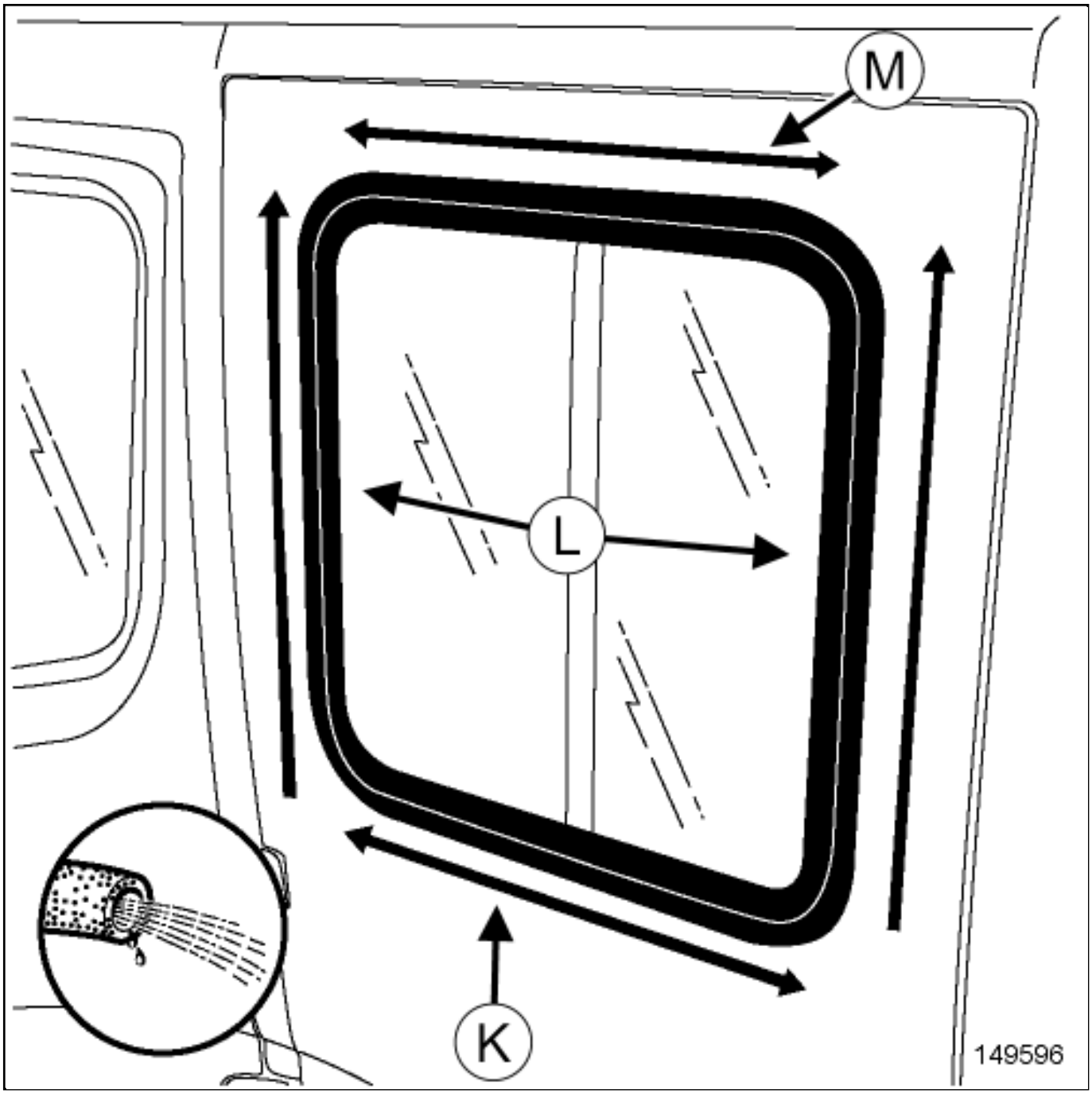
- Spray the upper section(I) of the windows by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle (see 60A, General information, Vehicle sealing: General information) .

- Spray the window mountings directly without moving(J) .

- Visually inspect for the presence of water inside the vehicle (see 60A, General information, Vehicle sealing: General information) .

4- FITTED WINDOWS



- Spray the lowest section(K) of the windows by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Gradually spray the window sections(L) from the bottom upwards to the upper section.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the upper section(M) of the windows by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing:

General information) .

5- CHECKING THE SEALING WITH THE TRIM REMOVED

If the customer complaint could not be reproduced in accordance with the procedure, remove the interior trims (see Body internal trim in the vehicle's repair manual) then repeat the sealing check from step 1; extend the sealing check to the surrounding areas(see 60A, General information, Vehicle: Sealing check) .

WINDOWS: SEALING REPAIR

Note:

Before performing a sealing repair, check the sealing of the zone concerned(see 60A, General information, Vehicle: Sealing check) .

1. PREPARATION OPERATION FOR REPAIRING THE SEALING

1- CHECK AND ADJUST IF NECESSARY:

a) for bonded windows:

- the trim pieces.

b) for mobile windows:

- the front sliding window glass run channelFront side door window run channel: Removal - Refitting (66A, Window sealing) or rear sliding window glass run channelRear side door window run channel: Removal - Refitting (66A, Window sealing),
- the front sliding window exterior weatherstripFront side door exterior weatherstrip: Removal - Refitting (66A, Window sealing) or rear sliding window exterior weatherstripRear side door window run channel: Removal - Refitting (66A, Window sealing),
- the seal of the pivoting windows,
- the clearances and flush fitting of the side windowsSide windows: Adjustment (54A, Windows),
- the opening rear screen seal,
- the rear quarter panel window mountingsRear quarter panel window: Removal - Refitting (54A, Windows),
- the opening rear screen mountingsOpening rear screen: Removal - Refitting (54A, Windows).

Note:

If the seals are dirty, clean them in soapy water(see 60A, General information, Vehicle sealing: General information) .

c) for the fitted windows:

- the seal.

2- WAS ANY ACTION PERFORMED?

- NO: move on to the next step.
- YES: check the sealing of the zone(see 60A, General information, Windows: Sealing check) .

Was water present in the passenger compartment of the vehicle?

- YES: move on to the next step.
- NO: fault resolved.

2. SEALING REPAIR OPERATION

1- REPAIRING THE SEALING OF BONDED WINDOWS

☐ Is water present in the passenger compartment after the sealing of the bonded windows has been checked?

- NO: move on to the next step.
- YES:

☐ If the mastic of the bonded windows is faulty:

- remove the windows**Windscreen: Removal - Refitting** (54A, Windows) or**Rear quarter panel window: Removal - Refitting** (54A, Windows) or(54A, Windows),
- re-apply the window bonding range**Window bonding: Description** (Technical Note 0560A, 54A, Windows) or **Bonding sunroof operating mechanisms: Description** (Technical Note 0560A, 54A, Windows).

☐ Check the sealing of the bonded window**(see 60A, General information, Windows: Sealing check)** .

2- REPAIRING THE SEALING OF SLIDING WINDOWS

☐ Is water present in the passenger compartment after the sealing of the sliding windows has been checked?

- NO: move on to the next step.
- YES:
- a) if the sliding mobile window channel is deformed or cut, replace the sliding window glass run channel**Front side door window run channel: Removal - Refitting** (66A, Window sealing) or**Rear side door window run channel: Removal - Refitting** (66A, Window sealing),
- b) if the panelwork is deformed in the fitting zone of the mobile window channel, flatten the contact zone, check the channel, replace the channel if necessary**Front side door window run channel: Removal - Refitting** (66A, Window sealing) or**Rear side door window run channel: Removal - Refitting** (66A, Window sealing).

☐ Check the sealing of the mobile window**(see 60A, General information, Windows: Sealing check)** .

3- REPAIRING THE SEALING OF HINGED WINDOWS

☐ Is water present in the passenger compartment after the sealing of the hinged windows has been checked?

☐ NO: move on to the next step.

☐ YES:

- a) if the seal of the mobile window is deformed or cut, replace the mobile window seal,
- b) if the panelwork is deformed in the fitting zone of the mobile window seal, flatten the contact zone, check the seal of the mobile window, replace the mobile window seal if necessary,

■ c) if the mountings and hinges of the mobile window are deformed, replace the mountings and hinges of the mobile window Rear quarter panel window: Removal - Refitting (54A, Windows) or(see **Rear side door window: Removal - Refitting**) (54A, Windows) or(54A, Windows).

Check the sealing of the hinged window(see 60A, General information, Windows: Sealing check) .

4- REPAIRING THE SEALING OF FITTED WINDOWS

Is water present in the passenger compartment after the sealing of the hinged windows has been checked?

NO: fault resolved.

YES:

■ a) if the seal of the fitted window is deformed or cut, replace the fitted window seal,

■ b) if the panelwork is deformed in the contact zone of the fitted window seal, flatten the contact zone, check the seal and replace the seal if necessary,

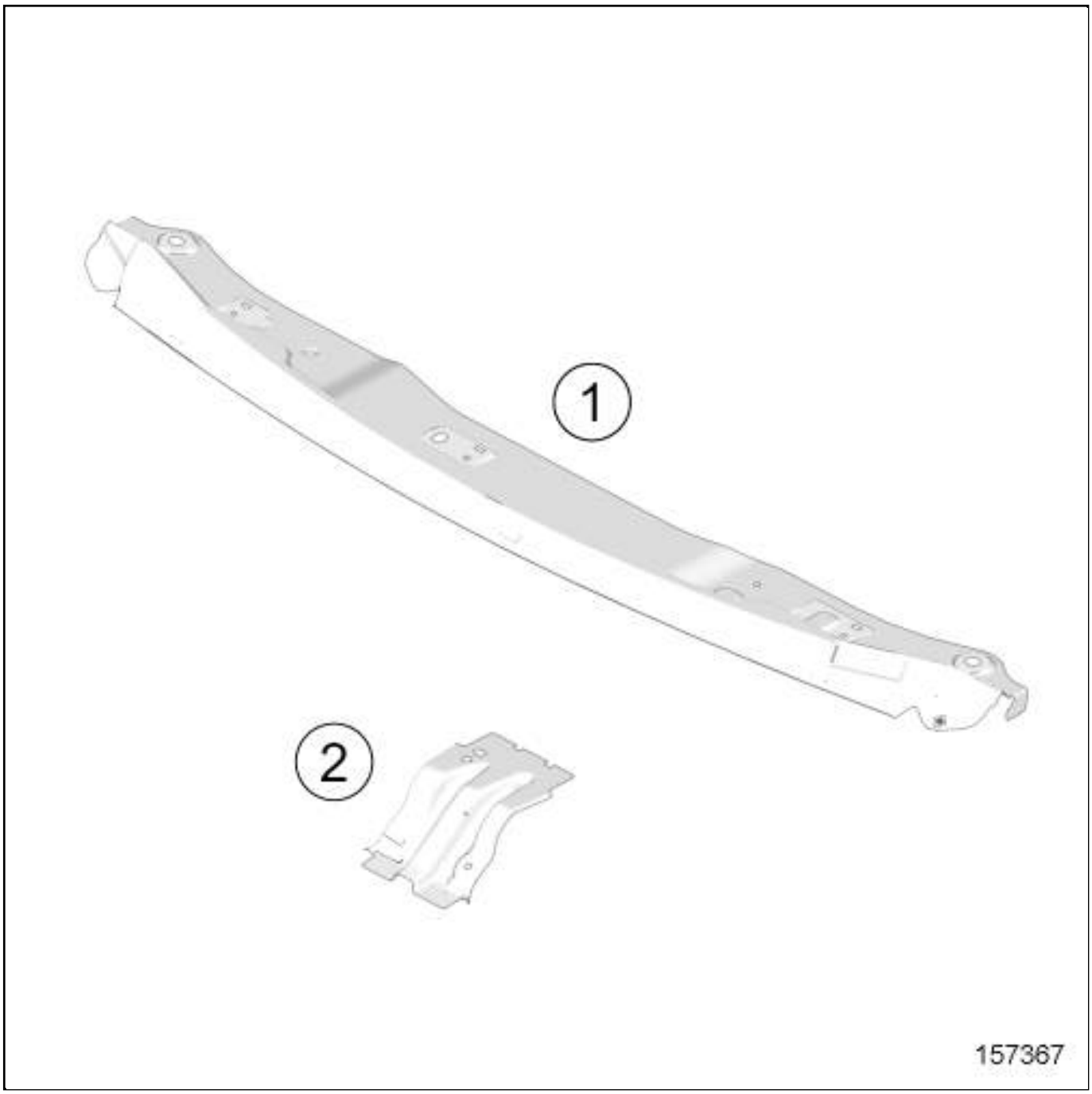
■ c) if the fitted window seal does not present any faults, apply window sealing mastic between the seal and the panel and between the seal and the window(see 60A, General information, Sealing tools: Description) ,(see 60A, General information, Sealing tools: Use) and(see 60A, General information, Bodywork sealing products: Description) .

Check the sealing of the fitted window(see 60A, General information, Windows: Sealing check) .

WINDSCREEN APERTURE LOWER CROSS MEMBER: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Windscreen aperture lower cross member	0.65
(2)	Wiper support reinforcement	1.45

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

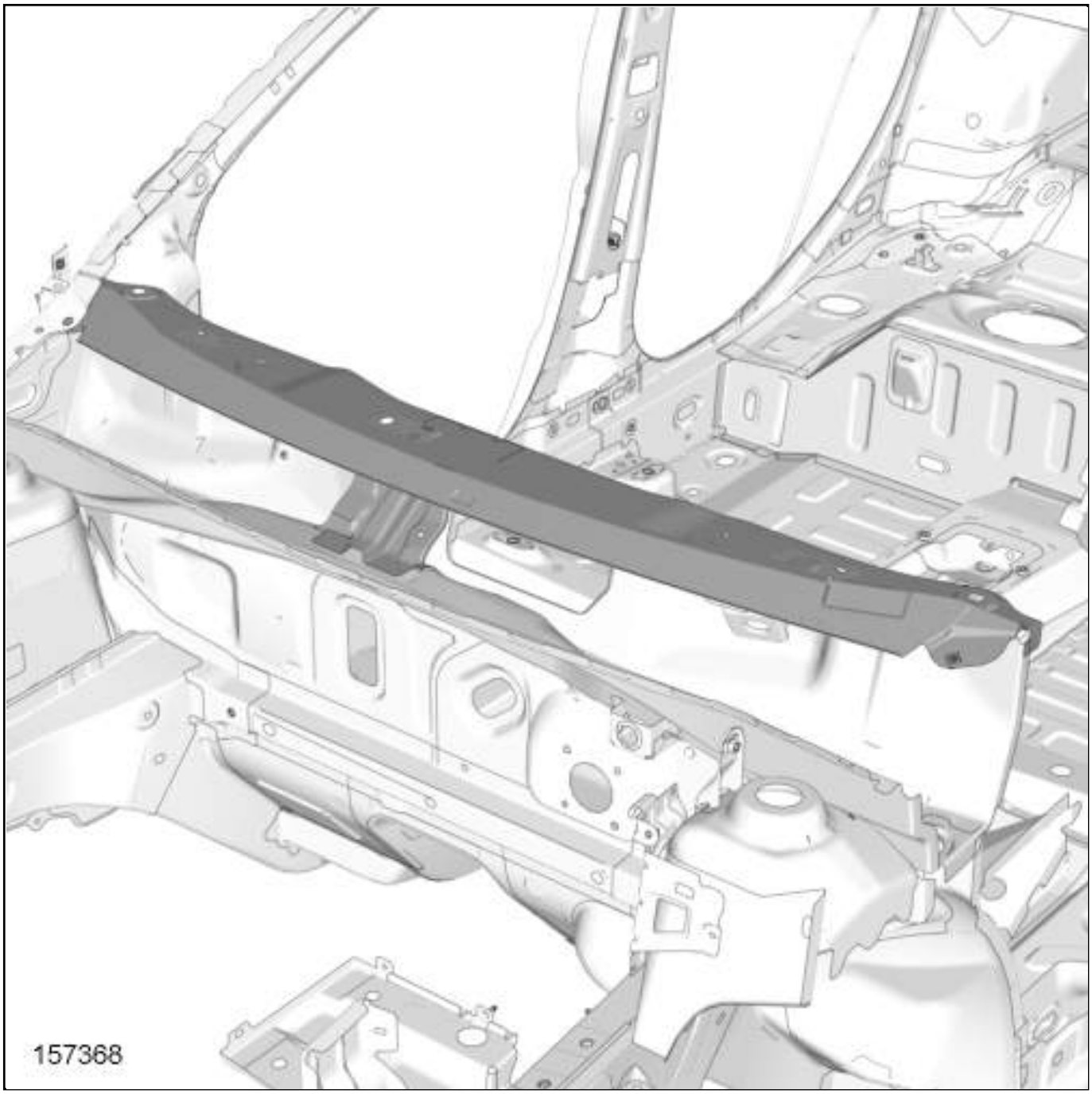
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld areaEarths on body: List and location of components .

1- COMPLETE REPLACEMENT

1)PART IN POSITION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WINDSCREEN: REMOVAL - REFITTING

Special tooling required	
Universal protector	Car. 1847

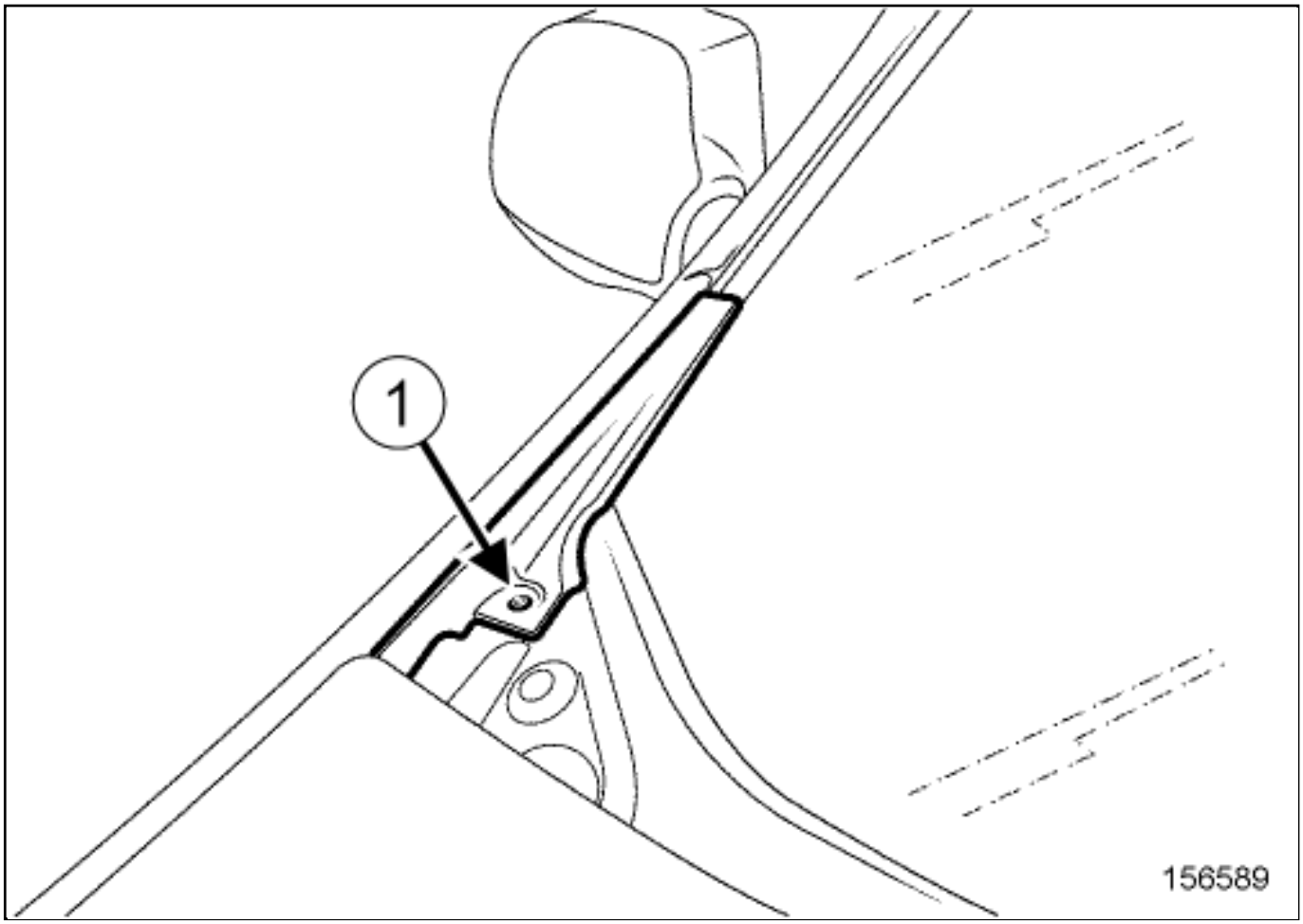
parts always to be replaced:
Windscreen adjusting shim

REMOVAL

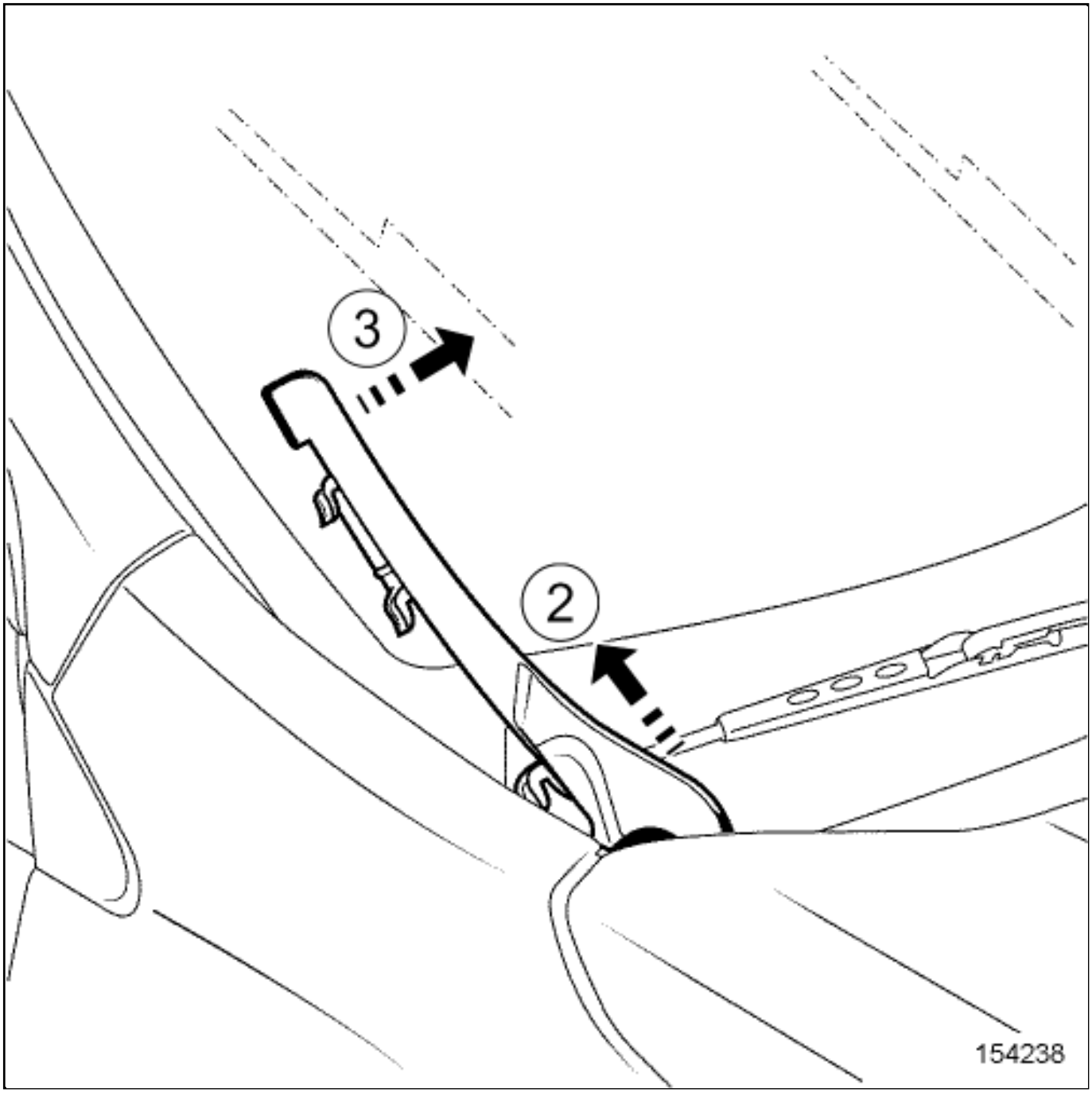
1. REMOVAL PREPARATION OPERATION

Remove:

- the interior rear-view mirror,
- the windscreen pillar trims Interior body side trim assembly: Exploded view .



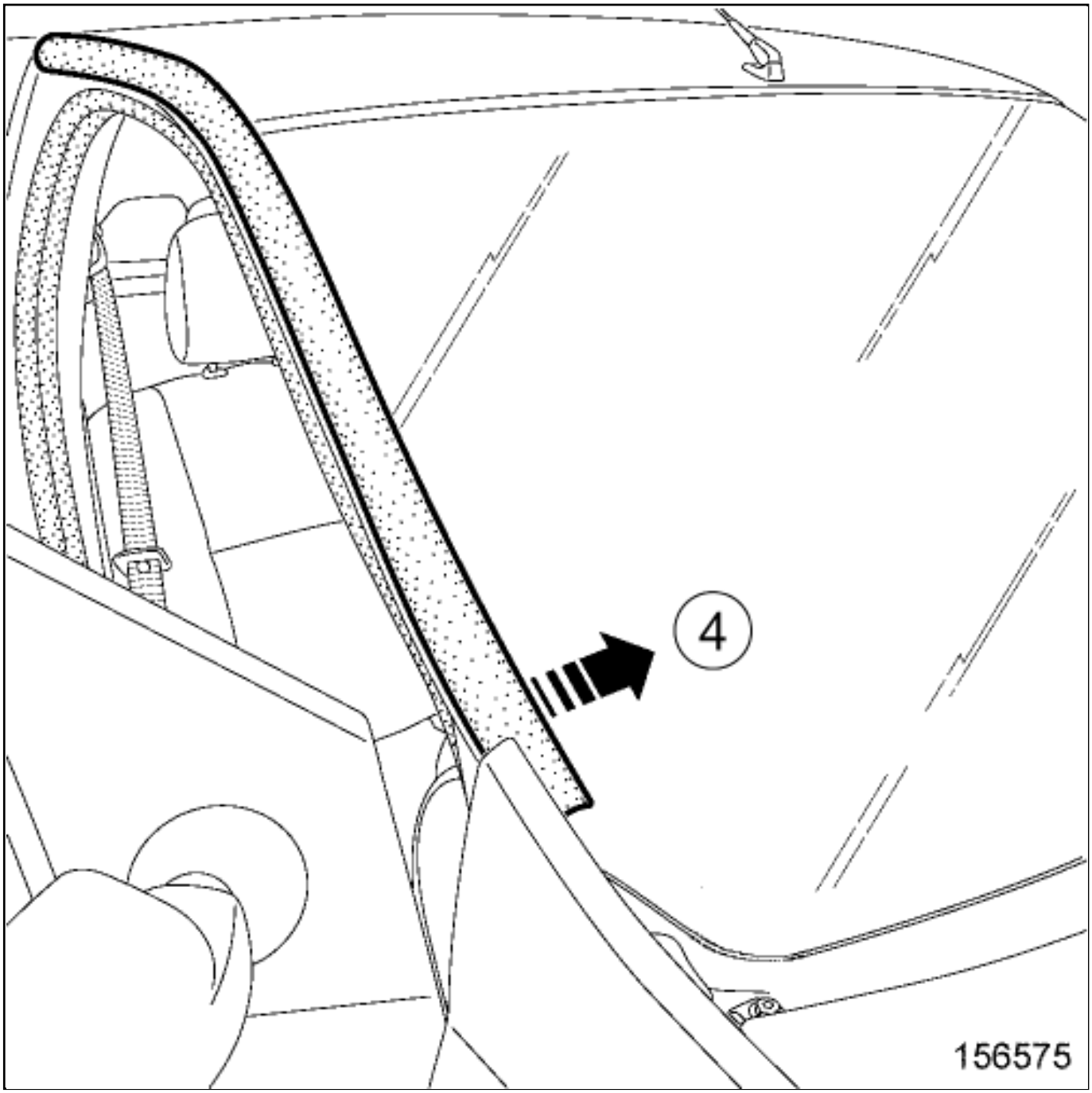
Remove the windscreen lower side trim bolt(1) .



Unclip the windscreen lower side trim by sliding at(2) and pulling at(3) .

Remove:

- the windscreen wiper arms **Wipers/washing assembly : Exploded view** ,
- the scuttle panel grille **Scuttle panel grille: Removal - Refitting** .



- Partially remove the seals(4) .

- Protect the windscreen surround and the headlining with masking tape.

- Fit the toolUniversal protector (Car. 1847) on the dashboard.

2. REMOVAL OPERATION

- Cut the cement bead (see Technical Note 0560A).

- Remove the windscreen (this operation requires two people).

REFITTING

1. REFITTING PREPARATION OPERATION

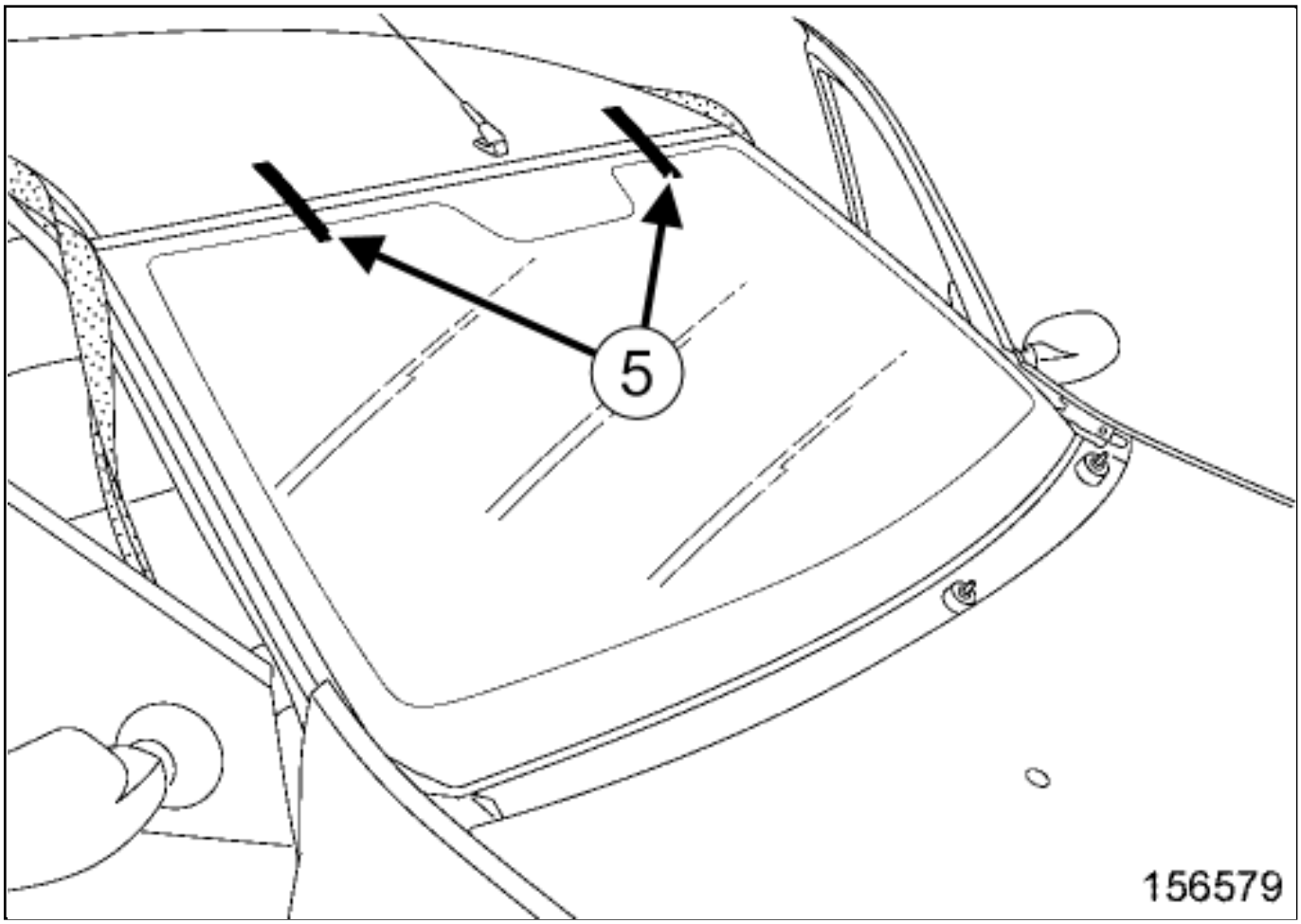
-

parts always to be replaced: Windscreen adjusting shim

- Fit new shims and retaining stops.

- For preparation and bonding (see Technical Note 0560A).

2. REFITTING OPERATION



- Bond the windscreen (this operation requires two people).

- Respect the following clearances and flush fitting:

- "windscreen - roof"
- "windscreen - windscreen pillar"

Stick on strips of masking tape(5) to hold the windscreen in position while the cement is drying.

Proceed in the reverse order to removal.

WIPERS/WASHING ASSEMBLY : EXPLODED VIEW

FRONT

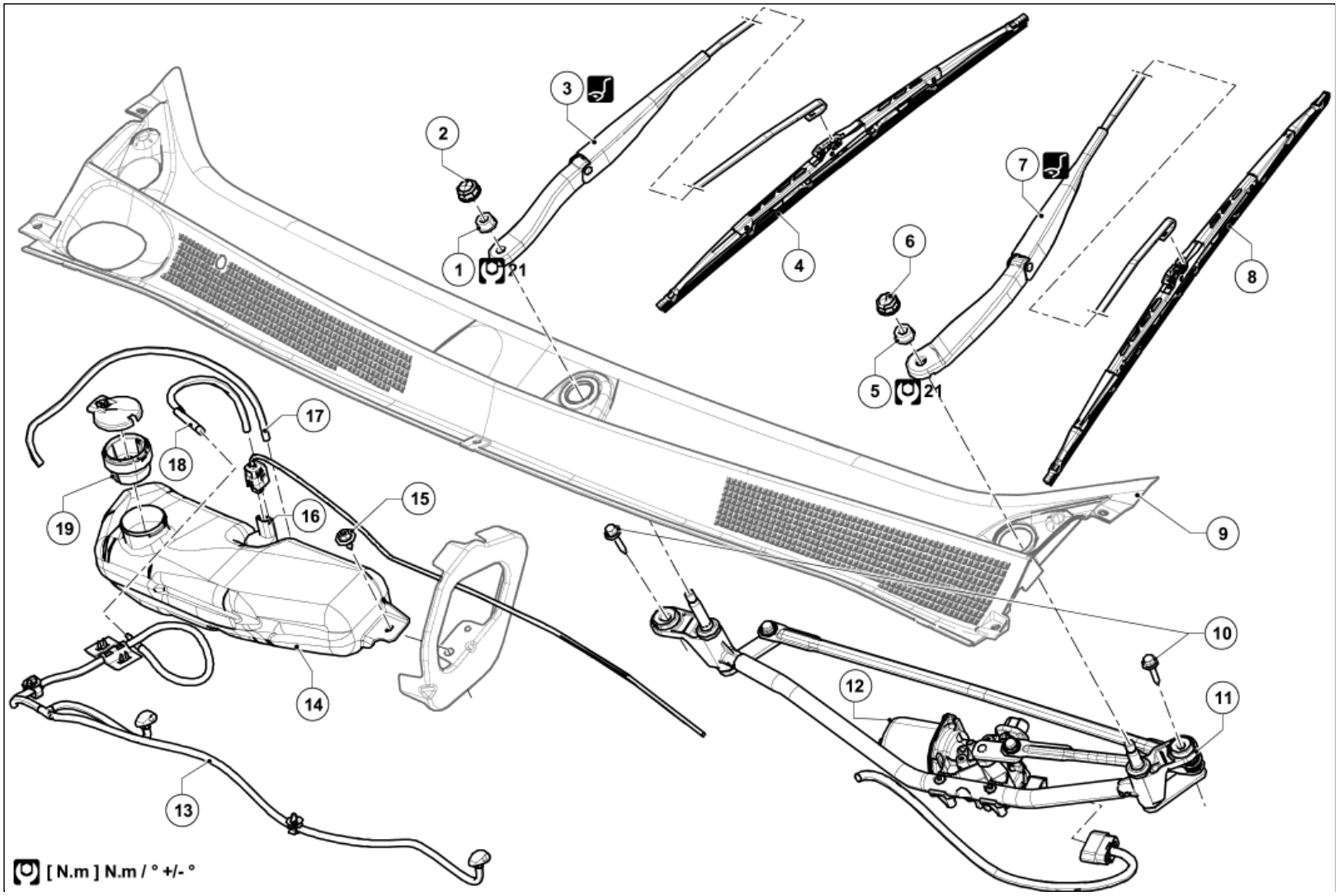


Illustration key: Description Legend .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Windscreen wiper arm,	
2	Windscreen wiper arm nut cover	
3	Windscreen wiper arm	(Ele. 2000)
4	Wiper blade	
5	Windscreen wiper arm nut	
6	Windscreen wiper arm nut cover	
7	Windscreen wiper arm	(Ele. 2000)
8	Wiper blade	
9	Scuttle panel grille	
10	Windscreen wiper mechanism screws	
11	Windscreen wiper mechanism	
12	Windscreen wiper motor	
13	Windscreen washer hose, jet inlet	
14	Windscreen washer bottle	
15	Windscreen washer bottle screws	
16	Windscreen washer pump	
17	Rear screen washer hose, front part	
18	Windscreen washer hose, pump outlet	
19	Windscreen washer reservoir plug	

B52 K52(B52 OR K52)**REAR**

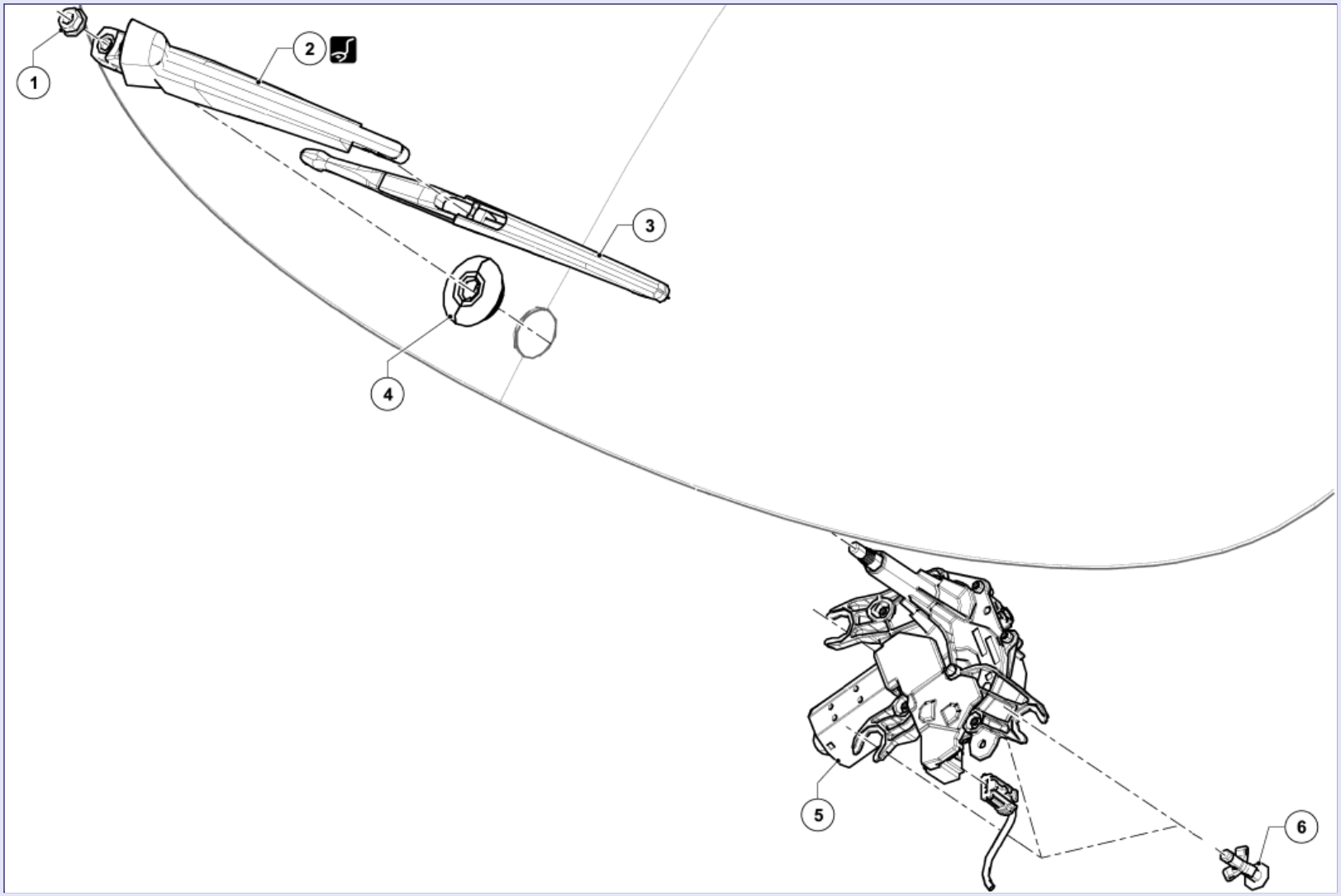


Illustration key: Description **Legend .**

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Rear screen wiper arm nut	
2	Rear screen wiper arm	(Ele. 2000)
3	Wiper blade	
4	Rear screen wiper ring	
5	Windscreen wiper motor	
6	Rear screen wiper mechanism rivet	

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XSL version : 3.02 du 22/07/11

WIRING: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. SAFETY

WARNING

To prevent any risk of the pyrotechnic systems (pretensioners or airbags) triggering, the use of a multimeter or any other electrical measuring device on these elements is prohibited.

1- POTENTIALLY DANGEROUS COMPONENTS

Do not leave any unused +12V connectors exposed to the air without any protection (see Connector: Sealing and locking) (Technical Note 6015A, 88A, Wiring).

Check that there is no contact between the wiring and the fuel and brake pipes.

Avoid mounting the wiring in areas with a temperature above 100˚C.

2- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Before carrying out any work on the 12V supply circuit wiring, disconnect the 12V battery.

CAUTION

Consult the disconnection procedures (see Connector: Disconnection and reconnection) (Technical Note 6015A, 88A, Wiring) to prevent damaging the connectors.

CAUTION

To prevent any risk of noise, premature wear, short circuits, etc. after the refitting operation, mark the wiring routing and how to connect the connectors.

3- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

CAUTION

To prevent any damage during the removal operation, check that the wiring is free from its mountings (retaining clip, plastic clip, adhesive tape, connector, etc.).

To prevent the wiring from being damaged, check that the surrounding area is not mechanically harmful (e.g.: door windows, sharp corners, burrs, studs, etc.).

The wiring should be at least 30 mmaway from any moving components (belt, pulley, steering column, etc.).

Depending on the surrounding area, check that the unused connectors respect the necessary sealing constraints (see Connector: Sealing and locking) (Technical Note 6015A, 88A, Wiring).

All of the connections (connectors) used in the engine compartment are sealed; do not remove the seal from around the connectors.

2. GENERAL RECOMMENDATIONS

Do not connect an earth to a stud with insulating protection (paint,etc.).

Do not use more than two earth terminals on the same point.

Do not use power earths on the same point as electronic earths.

To prevent water flowing into the connectors, make a low point just on the wiring routing (just before the connector).

For connections between fixed and mobile components, secure the wiring on the fixed part.

Overlapping of the battery feed wires (positive and negative) causes disruption; they must be secured

separately.

Wiring mountings:

- use plastic clips, ensuring that the colour coding is respected,

- do not use steel clips that are not protected with rubber,

- keep the clips integrated into the wiring during a replacement operation,

- do not leave steering wheel wires without protection.

Check that:

- the shunts are correctly secured,

- the connectors are correctly housed and locked.

Wiring routing:

- when it is visible it must be aesthetically pleasing, and resemble the routing marked during removal,

- prohibit wiring routing in grooves and overlaps (risk of wear through friction),

- prohibit mounting several wires on the same clip,

- do not lock the connectors or wiring in areas that are sensitive to drilling (number plate etc.).