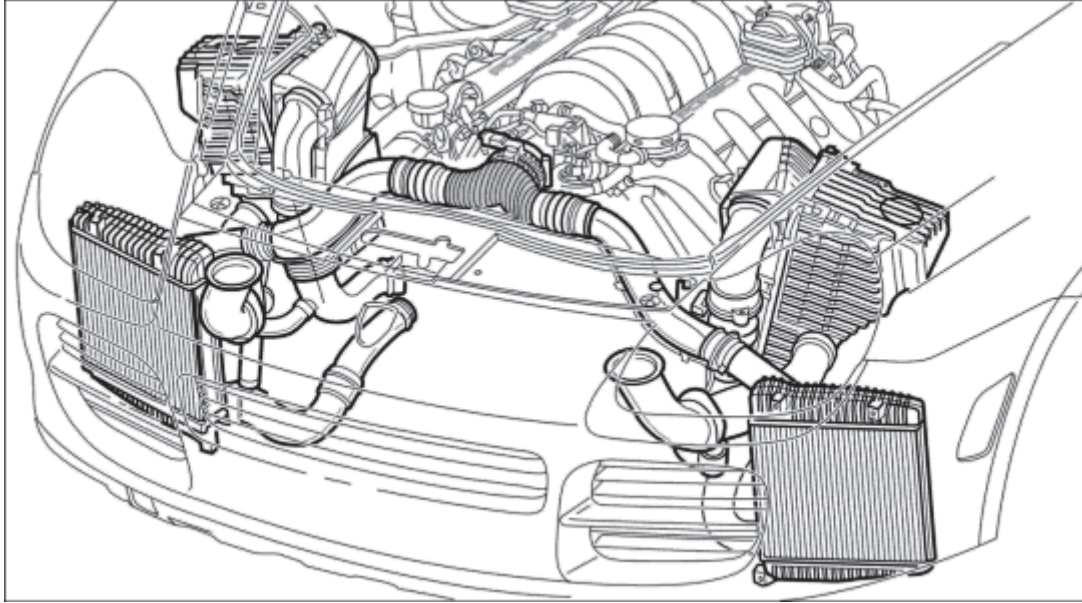


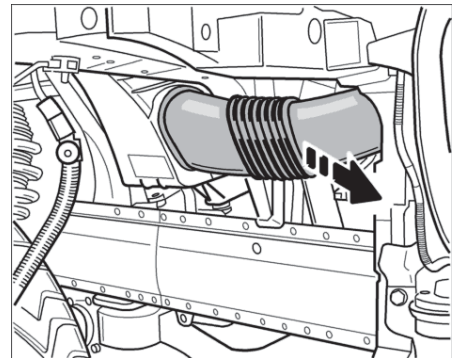
Installation position for air guide for V8 S



Installation position for air guide for V8 Biturbo

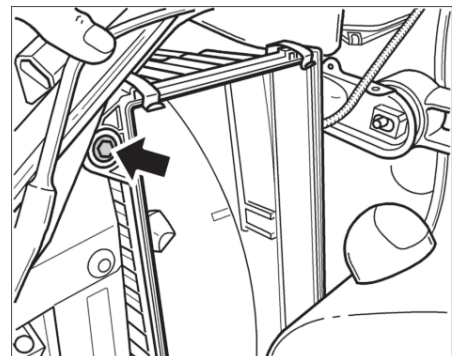
Removing air cleaner housing - Cayenne S (type M48/00)

1. Pull the air guide of the air cleaner housing out of the wheel well. To do this take hold of the air guide in one hand and pull it forwards at an angle.



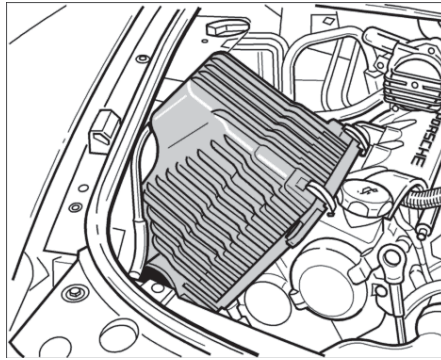
Air guide

2. Unscrew the fastening screw on the air cleaner housing.

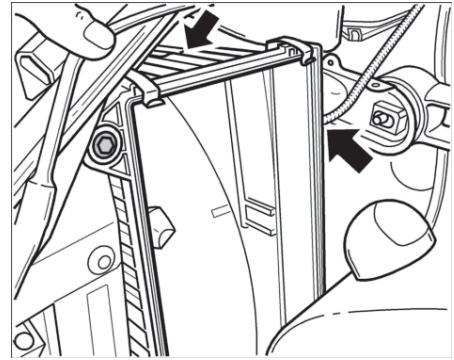


Fastening screw

3. Unclip the electric cable from the coolant expansion tank on the cylinder bank 1 - 4. The cable is clipped in at 2 points.
4. Lift the air cleaner housing, tip it towards the engine and remove it from the engine compartment.



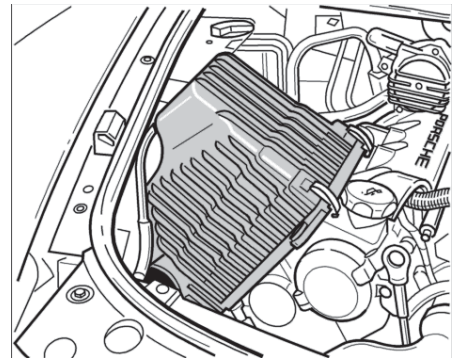
Air cleaner housing



Electric cable

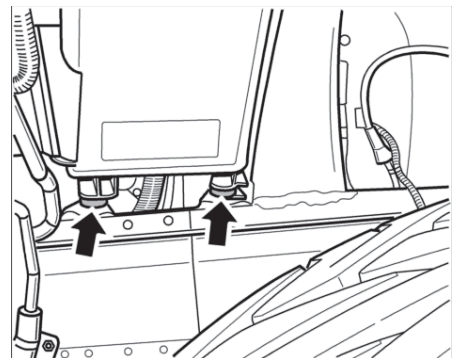
Installing air cleaner housing - Cayenne S (type M48/00)

1. Insert the air cleaner housing into the engine compartment at an angle from above.



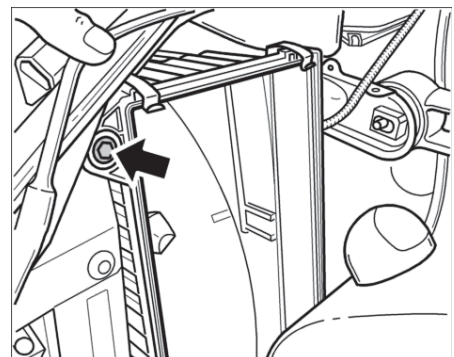
Air cleaner housing

2. Introduce the 2 retaining bolts on the underside into the take-up bores in the body. Check the wheel well to make sure that the blue rubber discs are present and ensure that the bolts are properly fitted.



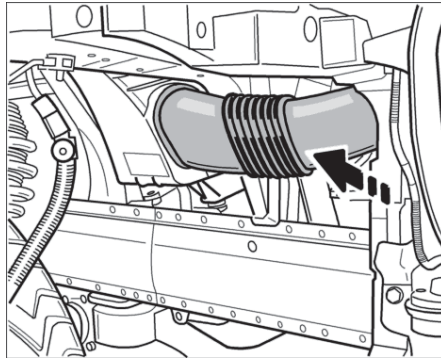
Fastening bolts and rubber washers

3. Tighten the fastening screw on the air cleaner housing. → **Tightening torque: 7.5 ftlb.**

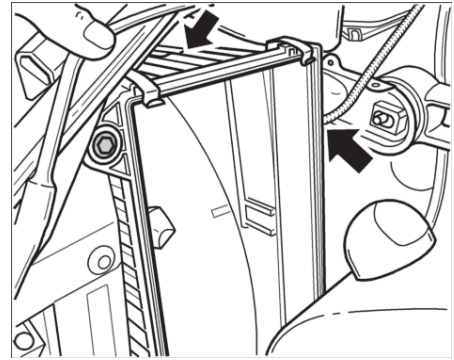


Fastening screw

4. Unclip the electric cable from the coolant expansion tank on cylinder bank 1 - 4. The cable is clipped in at two points.
5. Replace the air guide on the air cleaner housing from the wheel well. Check that the elements are installed correctly.



Air guide



Electric cable

Subsequent work

Subsequent work

1. The steps required to replace the air-cleaner element are to be performed in the same way. → 242455 Replacing air cleaner element
2. Install the relevant wheel-housing liner. → 505619 Removing and installing front wheel housing liner.

9PAAE1, 9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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AVERTISSEMENT

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24 30 19 Removing and installing fuel pipe - as of MY 2003

Removing and installing fuel pipe

1. The steps involved in removing and installing the fuel pipe (fuel distributor pipe, pressure pipe) are identical to those involved in removing and installing the fuel injectors. → 244019 Removing and installing injection valve

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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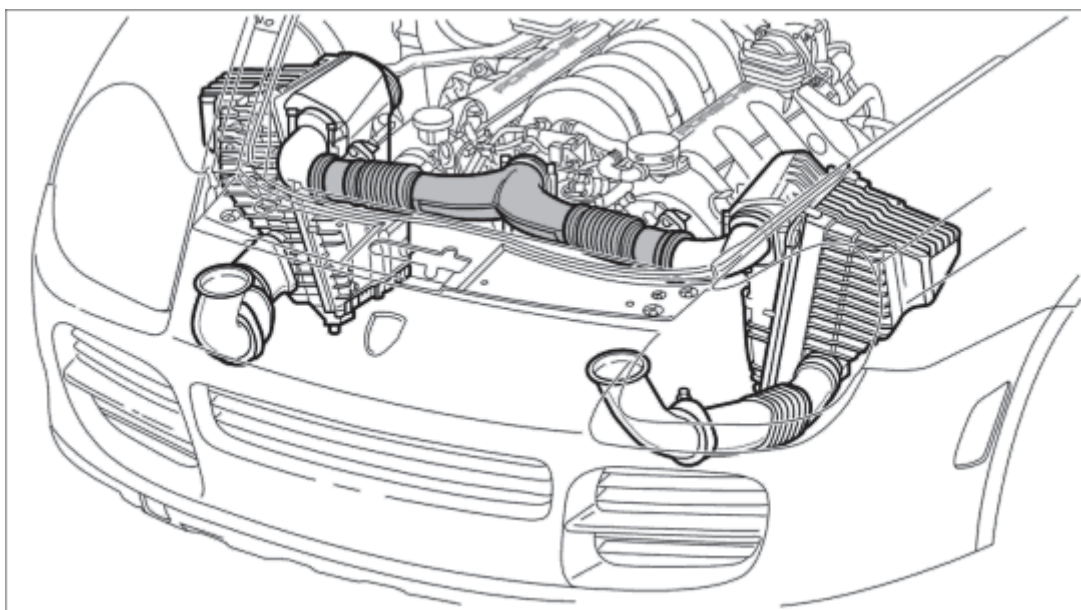
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24 35 19 Removing and installing cowl for throttle housing (Y-shaped pipe) - as of MY 2003

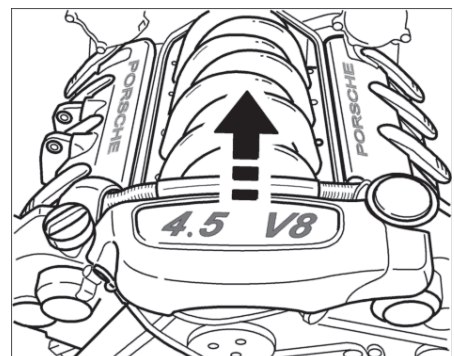
- Removing cowl for throttle housing (Y-shaped pipe) - Cayenne S (type M48/00)
- Installing cowl for throttle housing (Y-shaped pipe) - Cayenne S (type M48/00)

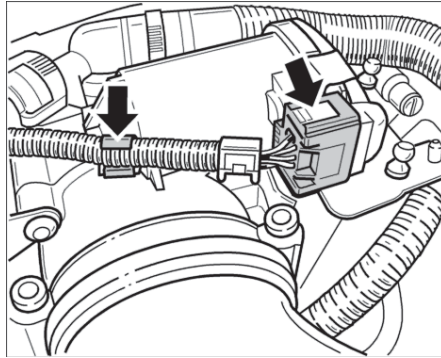
Removing cowl for throttle housing (Y-shaped pipe) - Cayenne S (type M48/00)



Installation position for V8 S

1. Remove front engine compartment cover. → 700219 Removing and installing front cover (engine compartment) - "Removing" section
2. Pull the cover of the throttle body up and off.

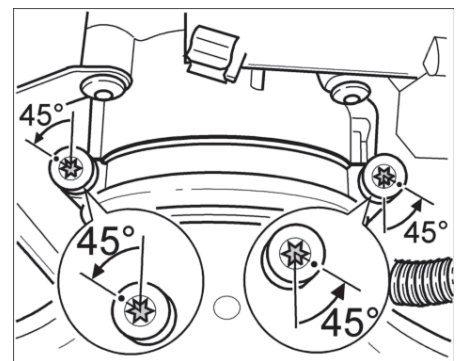




Cable plug for throttle housing

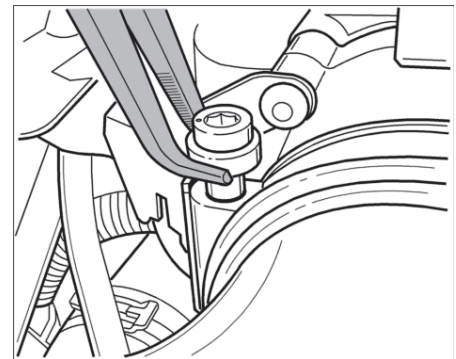
Front design cover

3. Separate the electric connection from the throttle adjuster. To do this, press on the plug at the top and bottom and, at the same time, pull it off. Unclip the cable from the sheetmetal holder.
4. Release the fastening bolts on the throttle body. To do this, twist bolts through 45° in an anti-clockwise direction. The spot on the bolts must lie as shown in the picture. → *Fastening bolts*



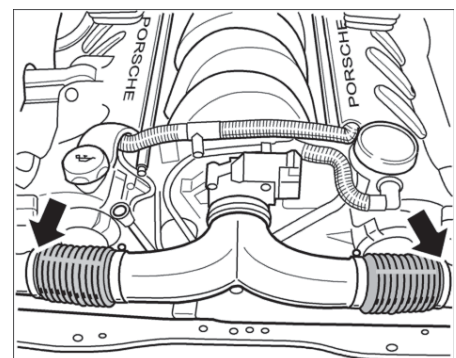
Fastening bolts

5. Remove the fastening bolts. To do this, take hold of the bolt by the rubber ring with pliers and pull it out.
6. Pull off the Y-shaped pipe from the throttle body.



Removing fastening bolts

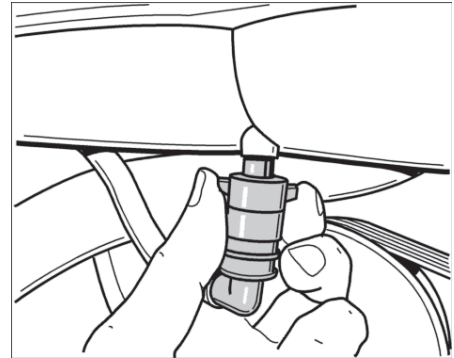
7. Disconnect the air flow sensor connections. To do this, undo the hose clamps to the left and right on the bellows and pull the bellows off the air flow sensors.



Bellows

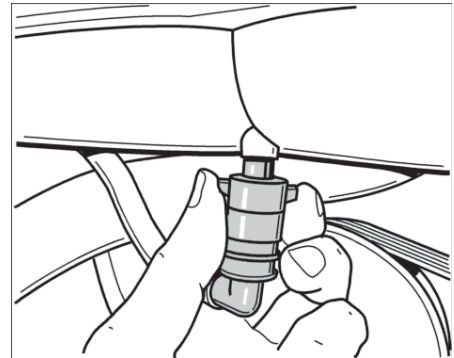
8. Remove the hose on the Y pipe. To do this, press the button and disconnect the vacuum line.

Installing cowl for throttle housing (Y-shaped pipe) - Cayenne S (type M48/00)



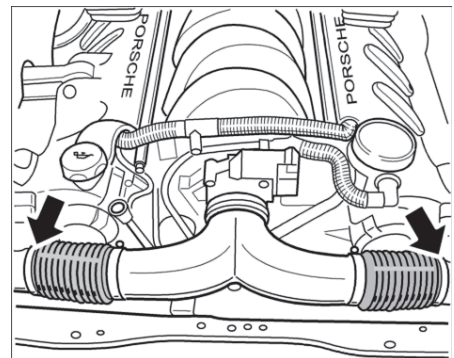
Vacuum line

1. Attach the vacuum line to the underside of the Y-shaped pipe.



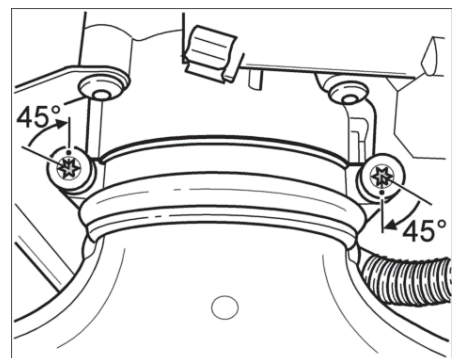
Vacuum line

2. Slide the bellows onto the air flow sensors and tighten the hose clamps.



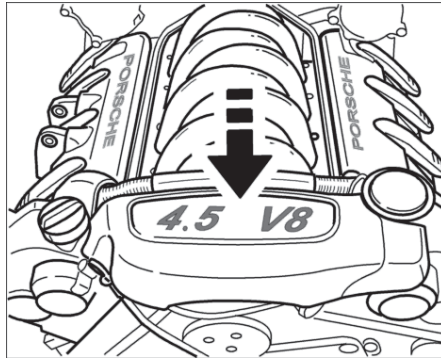
Bellows

3. Slide the Y-shaped pipe onto the throttle adjuster. Then insert the left and right fastening bolts. Turn the bolts 45° clockwise.
→ *Fastening bolts*

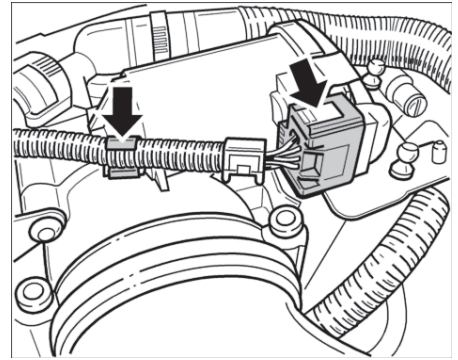


Fastening bolts

4. Connect the throttle adjuster. The plug must engage audibly. Clip the connecting cable into the sheetmetal holder.
5. Press the 4 rubber elements in the cover onto the 4 ball head supports. The mounts must be felt to engage.
6. Install front engine compartment cover. → 700219 Removing and installing front cover (engine compartment) - "Installing" section



Front design cover



Cable plug for throttle housing

9PAAE1, 9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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24 40 19 Removing and installing fuel injector - as of MY 2003

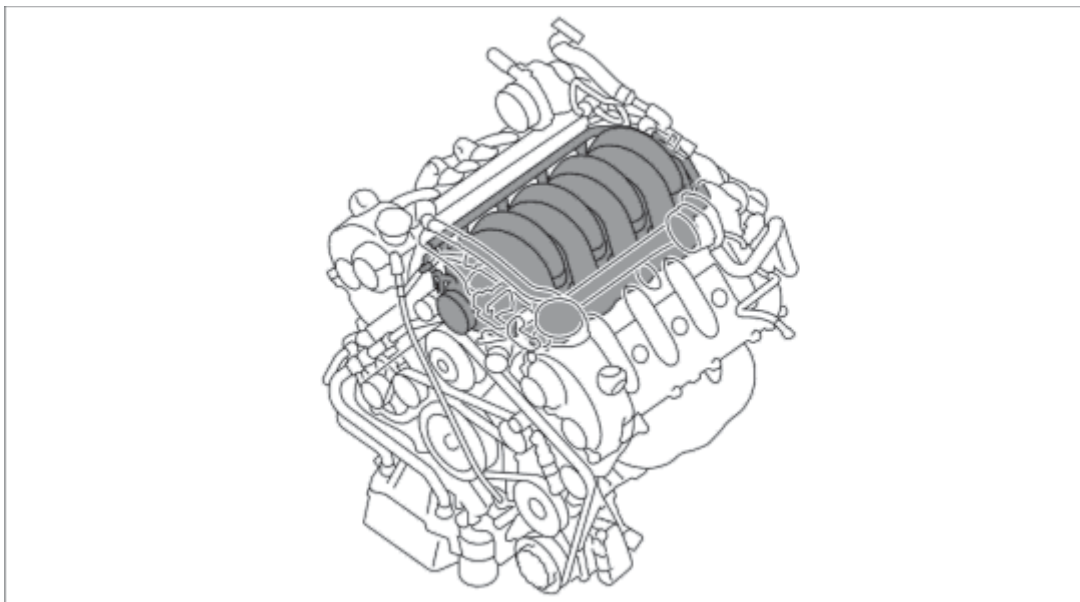
- Preliminary work
- Removing fuel injector
- Installing fuel injector
- Subsequent work

Preliminary work

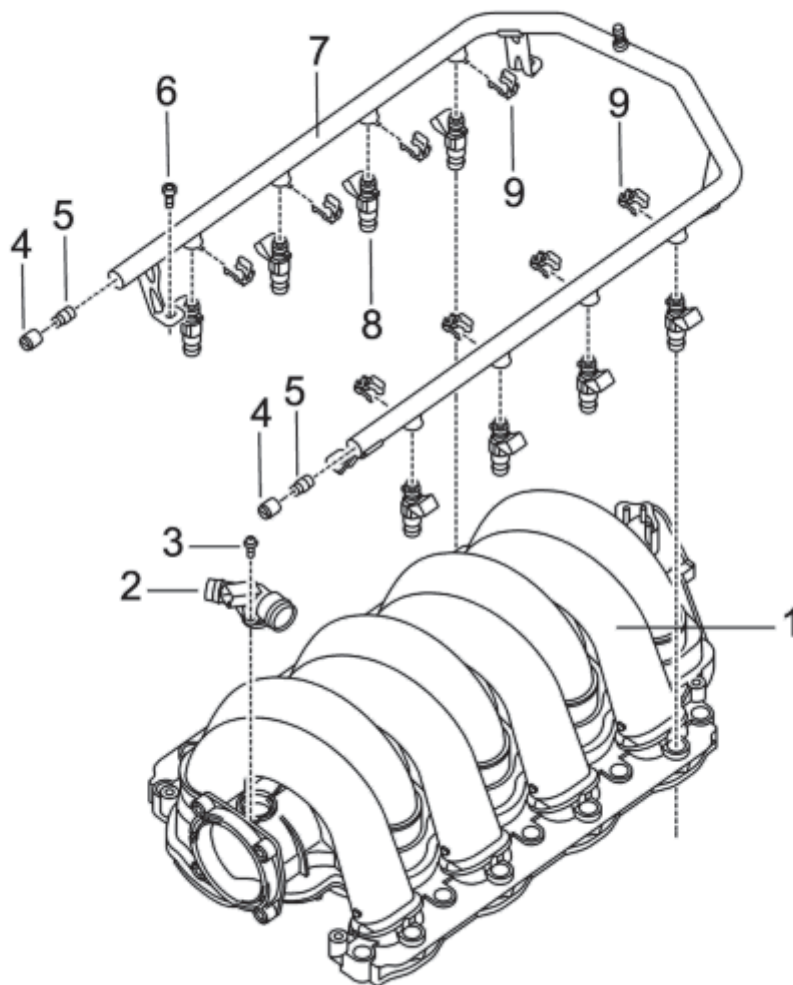
Preliminary work: Installing fuel injectors

1. Remove engine compartment lining at the rear and on the right-hand side. → 700219 Removing and installing front cover (engine compartment) - "Removing" section
2. Remove design covers from engine. → 108319 Removing and installing engine cover - "Removing" section

Component overview



Installation position for suction module and fuel injectors



Fuel pipe and fuel injectors

- 1 - Intake-air distributor
- 2 - Positive crankcase ventilation (T flange)
- 3 - K50 x 12 lens-head screw → **Tightening torque: 1.6 ftlb.**
- 4 - Cap; replace
- 5 - Valve insert
- 6 - M6 x 10 oval-head screw
- 7 - Fuel gallery; do not bend
- 8 - Fuel injector
- 9 - Safety clip

Removing fuel injector

Removing injection valve

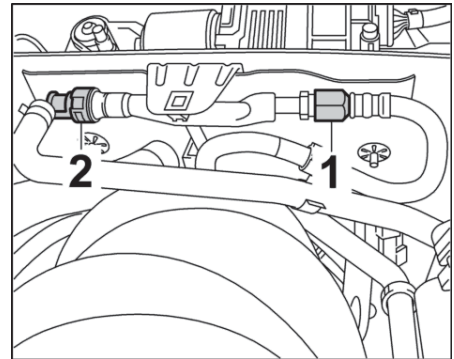
Ignition is off, ignition key is removed.



DANGER

Danger of poisoning from fuels!

- Gasoline is toxic.
- Inhaling vapours can cause irritation of the mucous membranes and eyes.
- It can be carcinogenic. It represents a serious risk to health when inhaled, touched or swallowed over longer periods.
- Only work on the fuel system in well-ventilated rooms.
- Wear protective gloves that are fuel-resistant.
- Wear a breathing mask with active charcoal filter; do not breathe in any fuel vapours.
- Ensure that there is adequate ventilation and extract all fuel vapours.
- Before opening the fuel lines or fuel hoses, relieve the fuel pressure.
- Collect escaping fuel, absorb it if necessary with a suitable binding material and dispose of properly.
- Pay attention to cleanliness when working on the fuel system.



Fuel connections



DANGER

Danger of fire from fuel!

- Keep clear of ignition sources.
- Do not smoke.
- Disconnect battery.
- Danger of fire due to naked flames and sparks, e.g. during welding or grinding work.
- Danger of fire due to escaping fuel, e.g. on hot engine components or due to electrostatic charge. Allow engine to cool down.
- Secure the vehicle, e.g. with a warning sign.
- Change any clothing soaked with fuel immediately.
- In case of fire, use CO₂ or dry powder fire extinguishers.

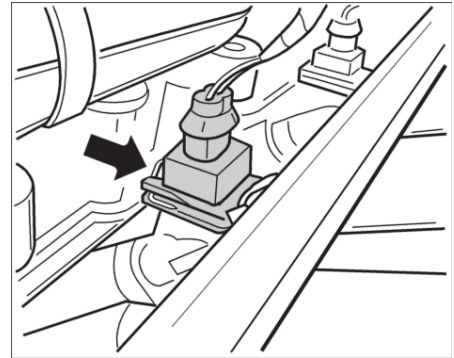


Note

- *The ignition must be switched off when working on the fuel system.*
- *Absorb any escaping fuel using a suitable binding material or a cloth.*
- *Cloths which have absorbed fuel must be disposed of according to the applicable national laws.*
- *The fuel system must be depressurised before starting work on it.*
- *Only work on the fuel system in well-ventilated rooms.*

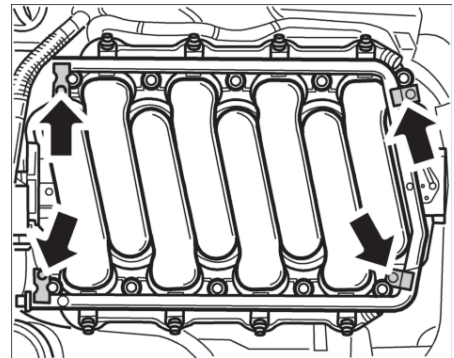
- Any seals which have been removed must always be replaced.

1. Disconnect fuel line **-1-** and line **-2-** from the carbon canister on the radiator tank splash panel.
2. Disconnect the electric connectors to the eight fuel injectors. To do this, press the metal clip on the plug and pull off the plug.



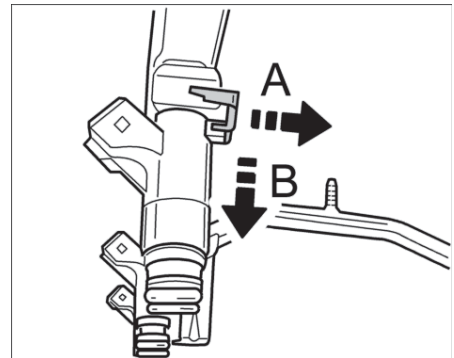
Metal clip on plug

3. Unscrew the four fastening screws on the fuel distribution pipe.
4. Remove fuel distribution pipe with the fuel injectors.



Fastening screws for fuel distribution pipe

5. Pull off the clamp on the fuel injector **-A-** and pull the fuel injector out of the fuel distribution pipe **-B -**.



Fuel injector

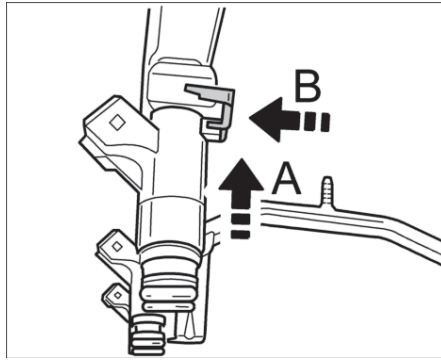
Installing fuel injector



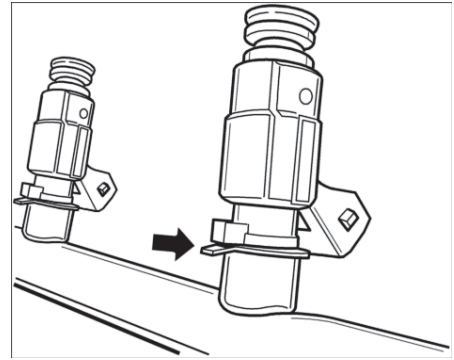
Note

- If the fuel injectors are to be reused, the sealing rings should be replaced.

1. Replace sealing rings on the injection valves. Take care not to damage the fuel injector when removing the sealing rings.
2. Insert injection valve into the fuel distribution pipe and align. The electric connector must be positioned opposite the lug on the distributor. Then fit sheetmetal clips **-arrow-**.

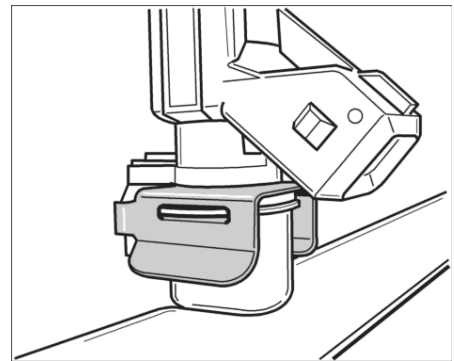


View shows fitting



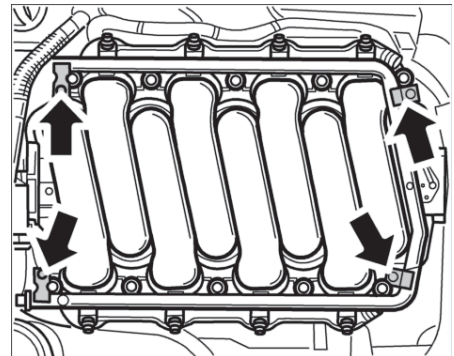
Valve alignment

3. Insert the fuel injector into the fuel distribution pipe **-A-** and insert the clamp on the fuel injector **-B-**.
4. Check that the sheetmetal clip is correctly fitted. The sheetmetal clip must engage in the flanged edge on the fuel distribution pipe.
5. Insert fuel injectors into the openings in the intake module and press the fuel gallery down.



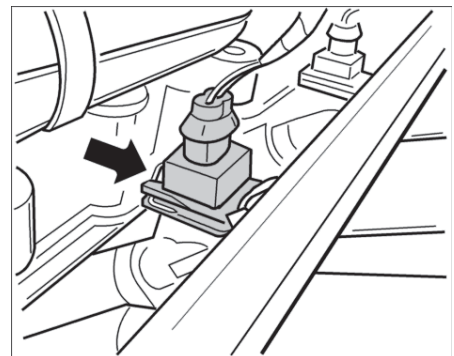
Installation position for sheetmetal clip

6. Tighten the four fastening screws to the specified torque. → **Tightening torque: 6 ftlb.**



Fastening screws for fuel distribution pipe

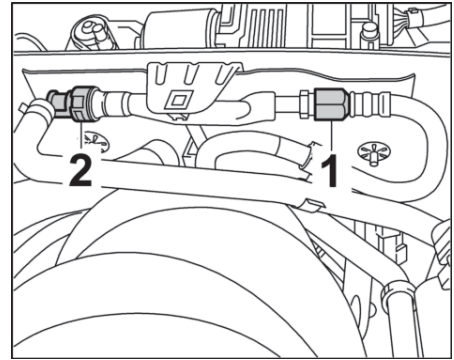
7. Connect the 8 electric connectors to the injection valves. The connectors must engage audibly.



Fuel injector clamp

8. Connect fuel line **-1-** and line **-2-** from the carbon canister on the radiator tank splash panel.
9. Switch on ignition and check the system for leaks.

Subsequent work



Fuel connections

Work subsequent to installing injection valves

1. Install design covers for engine. → 108319 Removing and installing engine cover - "Installing" section
2. Install engine compartment cover at the rear and on the right-hand side. → 700219 Removing and installing front cover (engine compartment) - "Installing" section

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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ADVERTENCIA

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24 42 19 Removing and installing throttle body - as of MY 2003

- Preliminary work
- Removing throttle body
- Installing throttle body
- Subsequent work

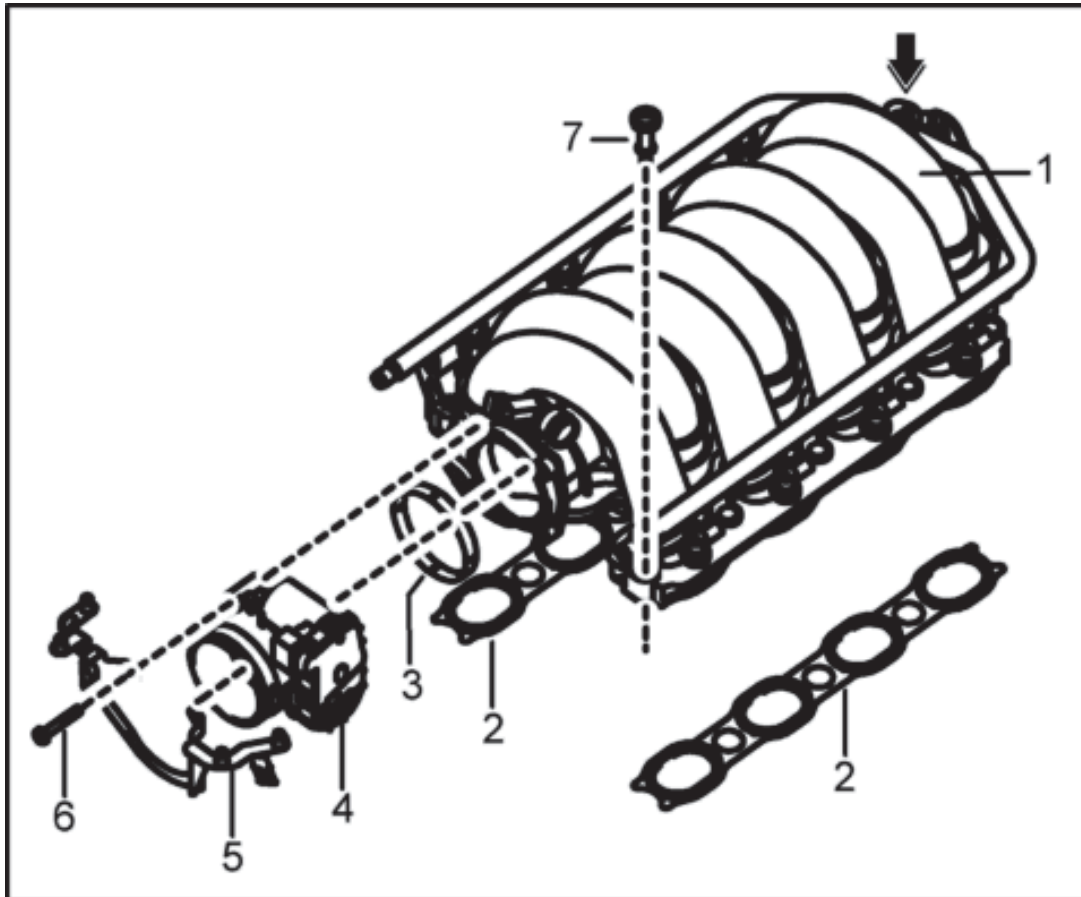
Preliminary work

Preliminary work

1. Remove Y-shaped pipe (intake manifold in front of throttle housing). → 243519 Removing and installing air box for throttle housing (Y-pipe) - section on "Removing" [9PAAF1 9PAAJ1]→ 243519 Removing and installing air box for throttle housing (Y-pipe) - section on "Removing" [9PAAE1 9PAAE7]

Removing throttle body

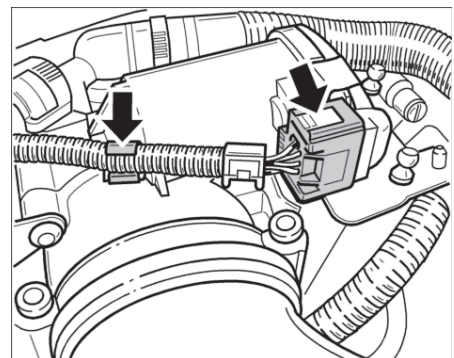
Removing throttle housing



Suction module

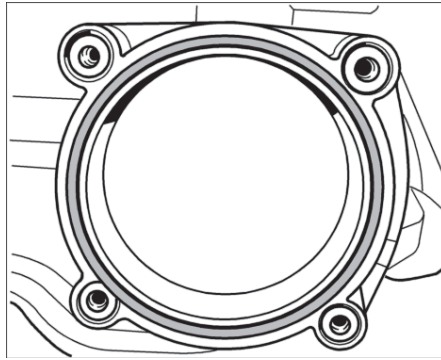
- 1 - Intake-air distributor and throttle housing
- 2 - Seals for intake-air distributor; replace
- 3 - Seal for throttle adjuster; replace
- 4 - Throttle adjuster; do not actuate by hand
- 5 - Support for throttle body cover; secure with the fastening screws for the throttle adjuster
- 6 - Fastening screw, M6 x 45
- 7 - Fastening screws

1. Pull off cable plug on the throttle housing and pull cable out of the clip **-Arrows-** .

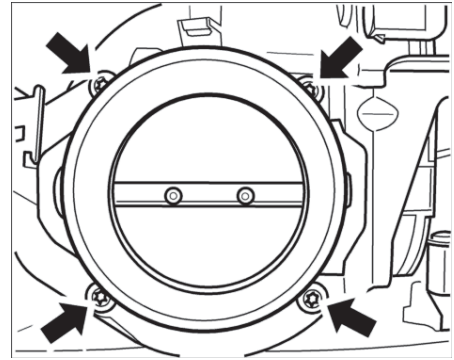


Cable plug for throttle housing

2. Undo four screws on the throttle housing **-Arrows-** . Loosen sheetmetal reinforcement around the throttle housing. Remove throttle housing.
3. Check condition of sealing ring. Replace sealing ring if necessary → *Sealing ring for throttle housing* .



Sealing ring for throttle housing

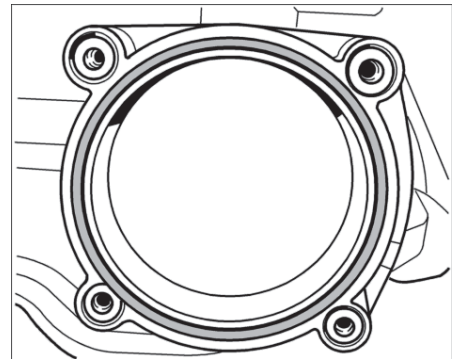


Loosening throttle adjuster

Installing throttle body

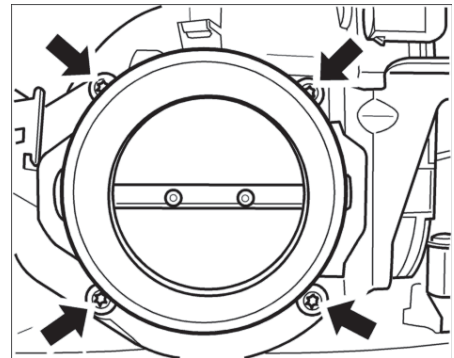
Installing throttle housing

1. Check condition of sealing ring. Replace sealing ring if necessary
→ *Sealing ring for throttle housing* .



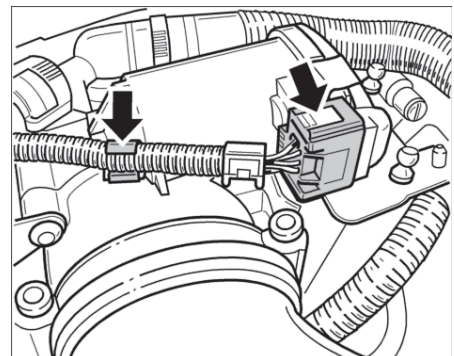
Sealing ring for throttle housing

2. Move throttle housing into installation position and place sheetmetal reinforcement around the throttle housing. Insert and screw in four screws **-Arrows-** . → **Tightening torque: 8 (6 ftlb.) Nm**



Throttle adjuster mount

3. Attach cable plug to throttle housing and insert cable into clip **-Arrows-** .



Cable plug for throttle housing

Subsequent work

Subsequent work

1. Install Y-shaped pipe (intake manifold in front of throttle housing). → 243519 Removing and installing air box for throttle housing (Y-pipe) - section on "Installing" [9PAAF1 9PAAJ1]→ 243519 Removing and installing air box for throttle housing (Y-pipe) - section on "Installing" [9PAAE1 9PAAE7]

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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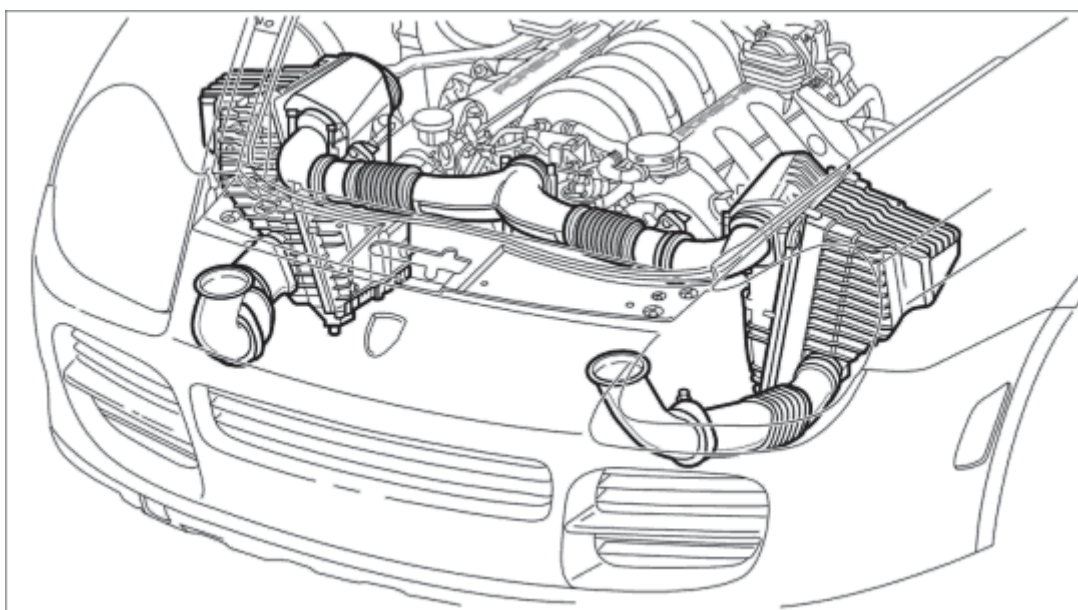
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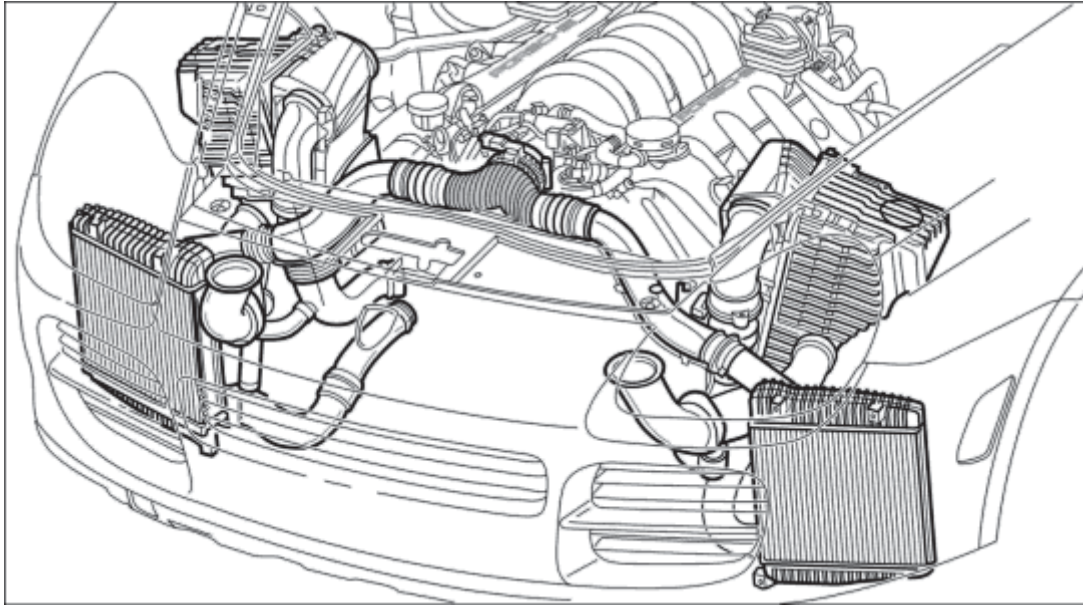
24 45 19 Removing and installing air flow sensor - as of MY 2003

- [Information](#)
- [Removing air flow sensor - Cayenne S \(type M48/00\)](#)
- [Installing air flow sensor - Cayenne S \(type M48/00\)](#)

Information



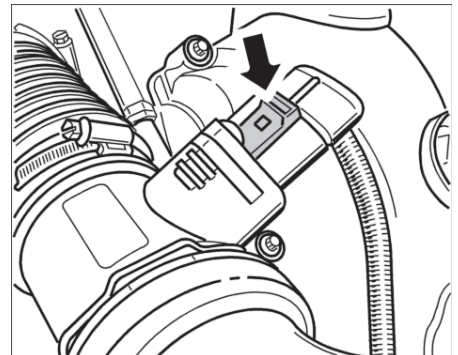
Suction routes for V8 S



Suction routes for V8 Turbo

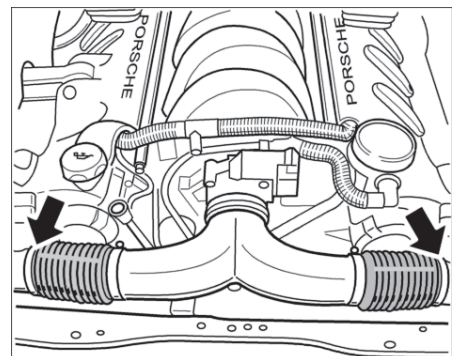
Removing air flow sensor - Cayenne S (type M48/00)

1. Remove left and right engine compartment cover. → 700219 Removing and installing front cover (engine compartment) - "Removing" section
2. Separate electric connections on the air flow sensor.



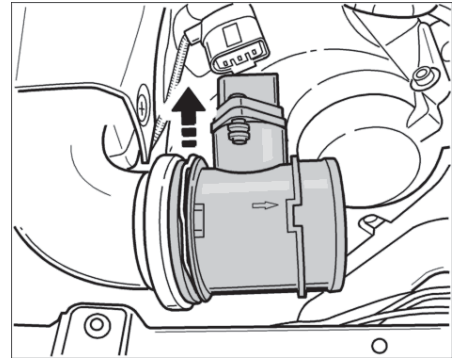
Cable plug for hot-film mass air flow meter

3. Disconnect the air flow sensor connections. To do this, undo the hose clamps to the left and right on the bellows and pull the bellows off the air flow sensors.



Bellows

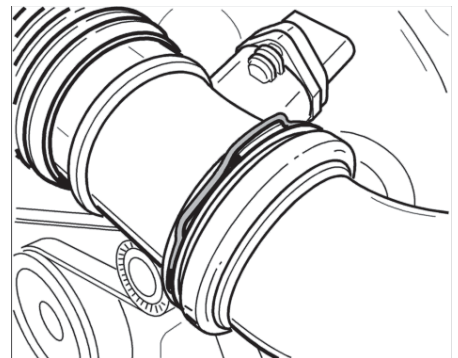
4. Pull out retaining clip on the air flow sensor. → *Clamp for hot-film mass air flow meter*
5. Pull out air flow sensor.



Clamp for hot-film mass air flow meter

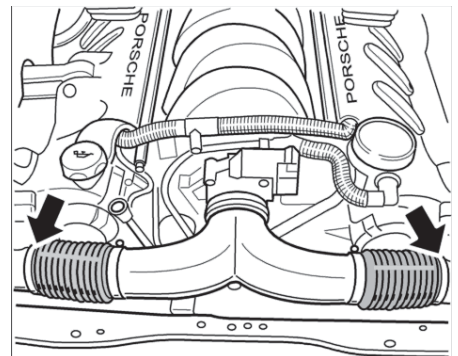
Installing air flow sensor - Cayenne S (type M48/00)

1. Insert air flow sensor in the pipe on the air cleaner housing cover. When doing so, observe the flow direction. There is a small arrow on the housing which must point towards the engine. Then connect the retaining clip.



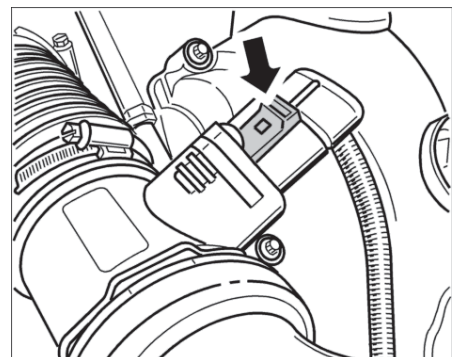
Clamp for hot-film mass air flow meter

2. Connect the bellows and tighten the hose clamps.



Bellows

3. Connect electric connector to the air flow sensor.
4. Fit engine compartment cover. → 700219 Removing and installing front cover (engine compartment) - "Installing" section



Cable plug for hot-film mass air flow meter

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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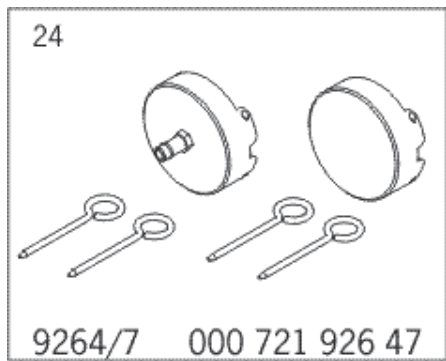
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24 46 01 Checking the intake-air distributor for leaks - as of MY 2003

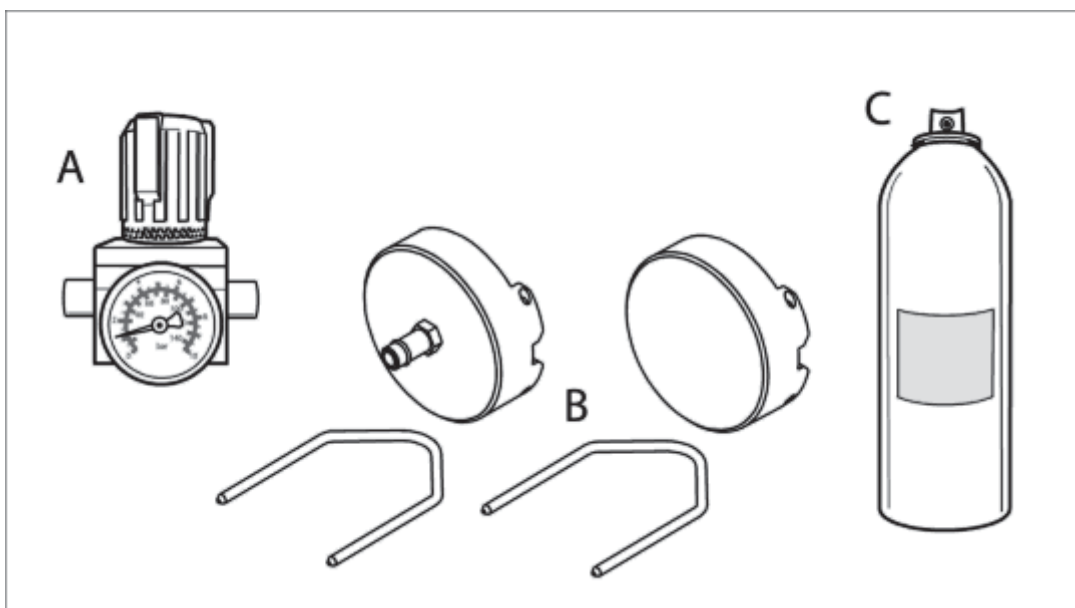
- Tools and materials
- Leak test

Tools

Designation	Type	Number	Explanation	
Plug	special tool	9264/7		

Tools and materials

Required tools



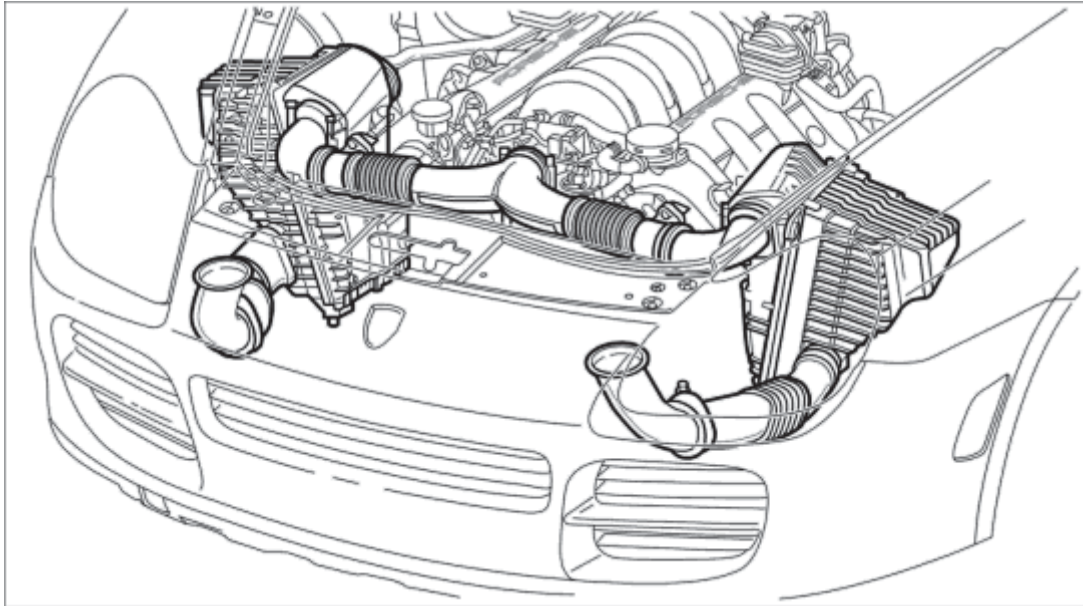
Item	Designation of tool	Explanation
-A-	Compressed-air reducer	Commercially available, see Workshop Equipment Manual. Set it to a maximum operating pressure of 1.2 bar.
-B-	Plug 9264/7	
-C-	Leak-locating spray	Commercially available, see Workshop Equipment Manual.

Leak test



Note

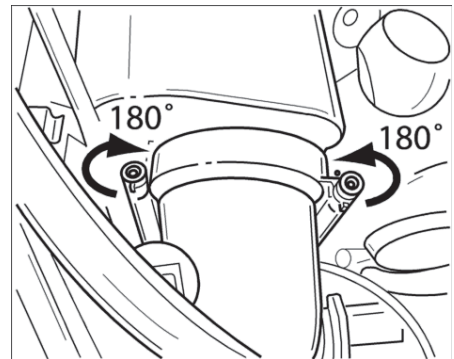
- The specified description can be used to check the intake system from the air cleaner outlet to the injection valves for leaks.



Suction routes for V8

Cylinders must not be located in the overlapping TDC. This happens only if the crankshaft was turned manually.

1. Remove engine compartment cover. → 700219 Removing and installing front cover (engine compartment) - "Removing" section
2. Separate connections on the air cleaner covers. To do this, turn the pins by 180° and pull them out. Then pull off the intake manifolds.



Fastening bolts

3. Connect the **plugs 9264/7** to the two air cleaner connections and push in the securing clip.

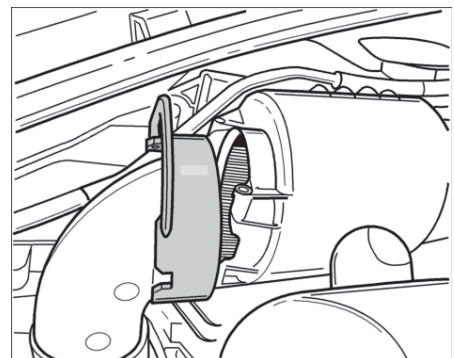


WARNING

Danger of damaging the intake system if pressure is too high!

- Intake system can burst.
- Danger of injury from flying components.

→ Do not subject intake system to excessive air pressure (max. 1.2 bar of absolute pressure).



Plugs on intake manifold



WARNING

Danger of injury from flying components.

→ Do not pull out the oil dipstick or open the engine during the test procedure.

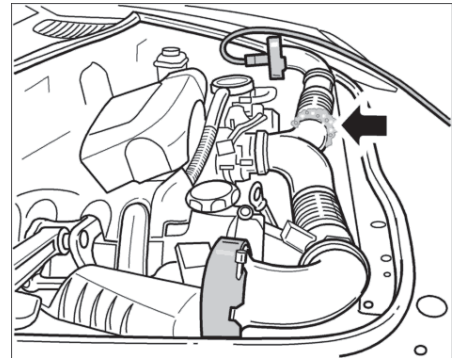
4. Set compressed-air reducer to 0.2 bar (approx. 1.2 bar absolute pressure).
5. Push a compressed-air hose onto the connection from the **plug 9264/7** and connect the other end to the pressure reducer.
6. Spray the intake system systematically with a leak-locating spray. Bubbles can be seen clearly at the locations where there are leaks (e.g. **-arrow-**).



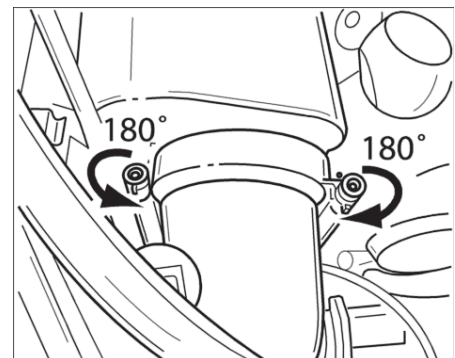
Note

- Any leaks that exist between the air cleaner cover and the intake distributor seal can be located using this method.
- Proceed systematically with the check.

7. Seal defective areas.
8. Remove special tool.
9. Push the connections onto the cover of the air cleaner housing and mount and lock the fastening pins.
10. Fit engine compartment cover. → 700219 Removing and installing front cover (engine compartment) - "Installing" section



View shows a leaking Y pipe



9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

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ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

24 46 19 Removing and installing intake-air distributor - as of MY 2003

- Preliminary work
- Information
- Removing intake-air distributor
- Installing intake-air distributor
- Subsequent work

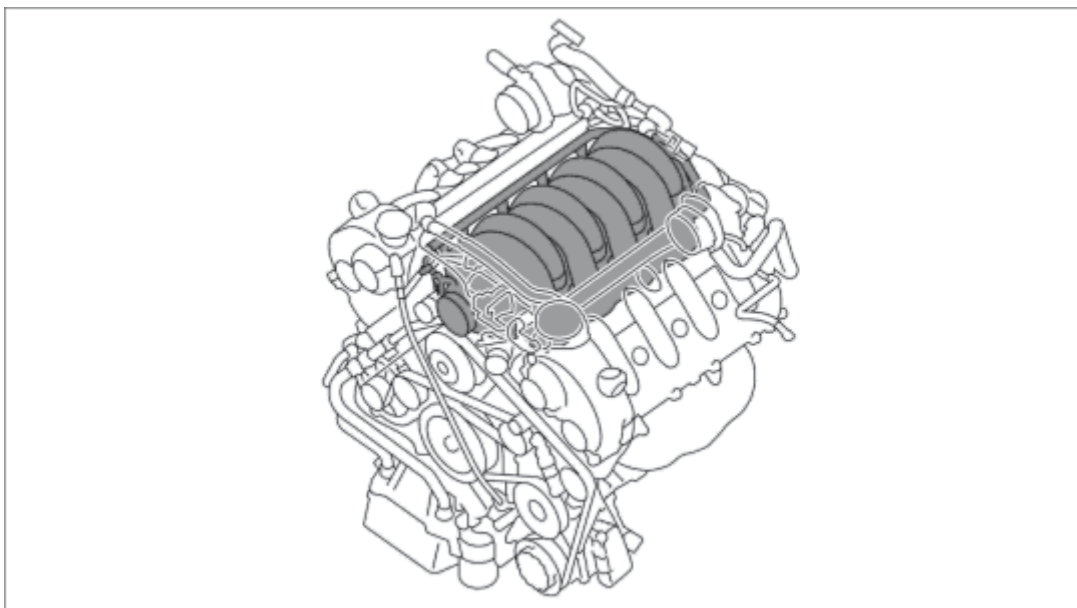
Preliminary work

Preliminary work for removing intake distributor

1. Remove design cover → 108319 Removing and installing engine cover - "Removing" section.

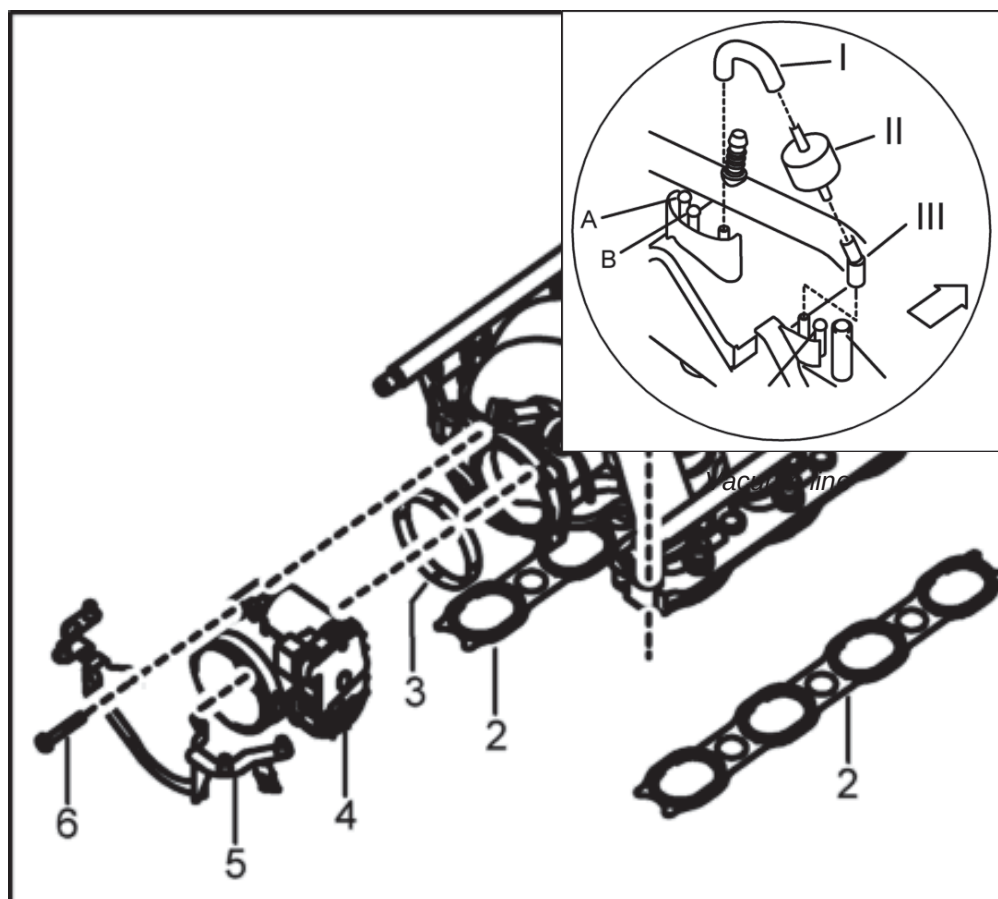
Information

Component overview



Installation location for intake-air distributor

- I - Curved hose
- II - Check valve
- III - Hose
- A - Vacuum line closed
- B - Vacuum line closed



Suction module

- 1 - Intake-air distributor and throttle housing
- 2 - Seals for intake-air distributor; replace
- 3 - Seal for throttle adjuster; replace
- 4 - Throttle adjuster; do not actuate by hand
- 5 - Support for throttle body cover; secure with the fastening screws for the throttle adjuster
- 6 - Fastening screw, M6 x 45
- 7 - Fastening screws

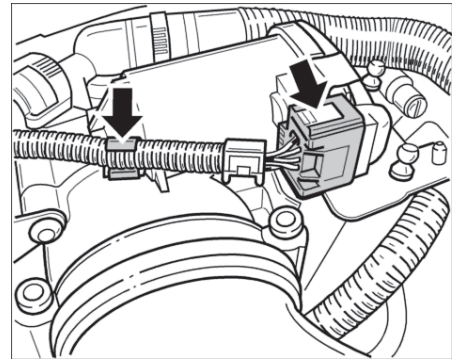
Removing intake-air distributor



Note

- The ignition must be switched off when working on the fuel system.
- Absorb any escaping fuel using a suitable binding material or a cloth.
- Cloths which have absorbed fuel must be disposed of according to the applicable national laws.
- The fuel system must be depressurised before starting work on it.
- Only work on the fuel system in well-ventilated rooms.
- Any seals which have been removed must always be replaced.

1. Separate the electric connection from the throttle adjuster. To do this, press on the plug at the top and bottom and, at the same time, pull it off. Unclip the cable from the sheetmetal holder.



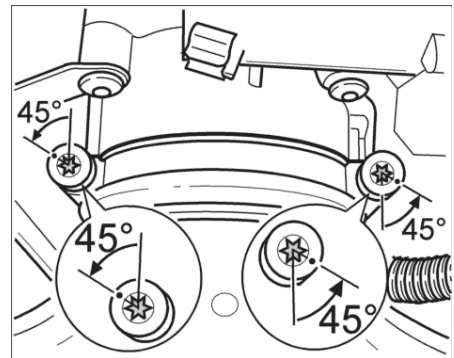
Cable plug for throttle housing



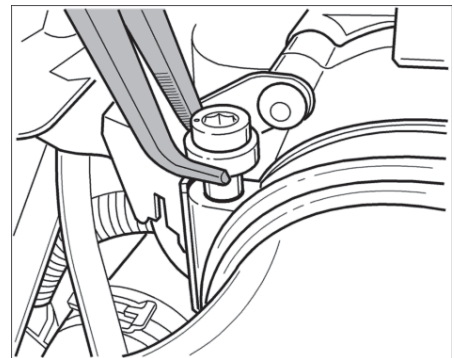
ATTENTION

Risk of damaging the fastening bolts!

- The fastening bolts will break if they are turned in the wrong direction.
- Only turn the fastening bolts in the correct direction of rotation for opening and closing.
2. Release the fastening bolts on the throttle body. To do this, twist the right and left pin through 45° in an anti-clockwise direction.
 3. Remove the fastening bolts. To do this, take hold of the bolt by the rubber ring with pliers and pull it out.
 4. Pull off the Y-shaped pipe from the throttle body.

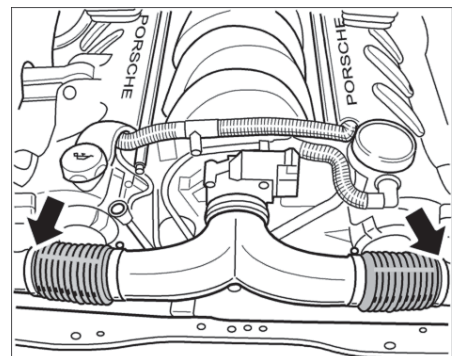


Direction of rotation for fastening bolts



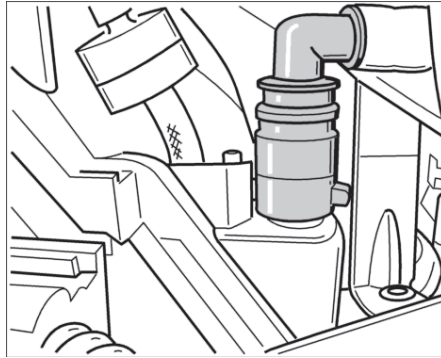
Fastening bolts

5. Disconnect the air flow sensor connections. To do this, undo the hose clamps to the left and right on the bellows and pull the bellows off the air flow sensors.

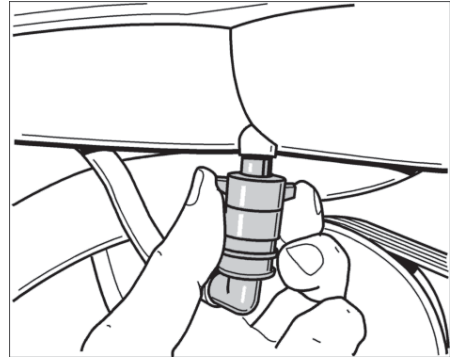


Bellows

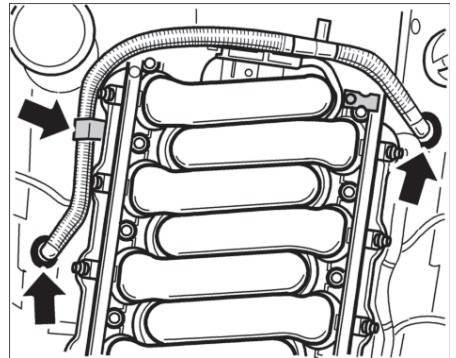
6. Remove the vacuum line on the Y-shaped pipe. To do this, press the button and disconnect the vacuum line.
7. Disconnect the vacuum line on the rear of the intake system.



Vacuum line on rear side of suction module

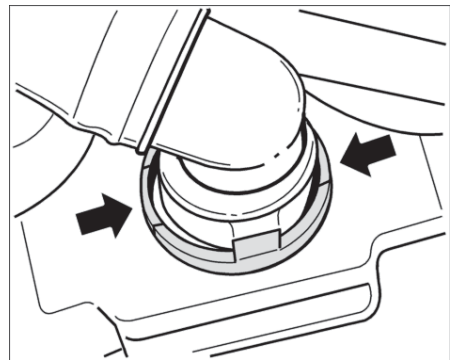


Vacuum line connection



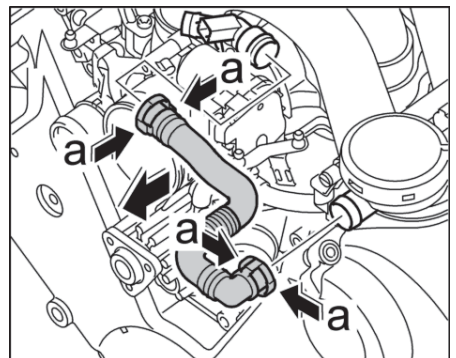
Positive crankcase ventilation

8. Disconnect positive crankcase ventilation line on the two valve covers. To do this press the plastic ring and pull the connections. Then remove the positive crankcase ventilation line from the retaining clip.



Positive crankcase ventilation line connection

9. Then remove the line between the oil mist collector and the intake distributor.



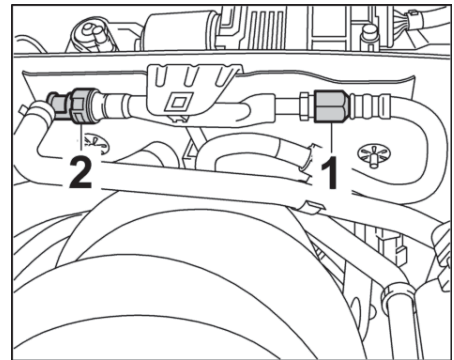
Line for oil mist separator



DANGER

Danger of fire from fuel!

- Keep clear of ignition sources.
- Do not smoke.
- Disconnect battery.
- Danger of fire due to naked flames and sparks, e.g. during welding or grinding work.
- Danger of fire due to escaping fuel, e.g. on hot engine components or due to electrostatic charge. Allow engine to cool down.
- Secure the vehicle, e.g. with a warning sign.
- Change any clothing soaked with fuel immediately.
- In case of fire, use CO₂ or dry powder fire extinguishers.



Fuel lines



DANGER

Danger of poisoning from fuels!

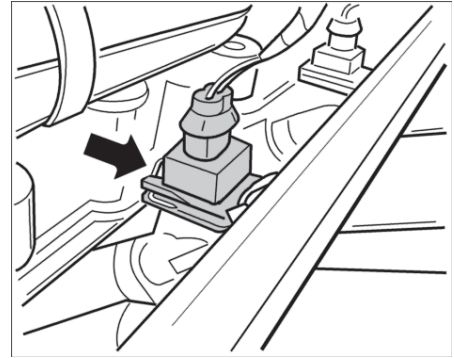
- Gasoline is toxic.
- Inhaling vapours can cause irritation of the mucous membranes and eyes.
- It can be carcinogenic. It represents a serious risk to health when inhaled, touched or swallowed over longer periods.
- Only work on the fuel system in well-ventilated rooms.
- Wear protective gloves that are fuel-resistant.
- Wear a breathing mask with active charcoal filter; do not breathe in any fuel vapours.
- Ensure that there is adequate ventilation and extract all fuel vapours.
- Before opening the fuel lines or fuel hoses, relieve the fuel pressure.
- Collect escaping fuel, absorb it if necessary with a suitable binding material and dispose of properly.
- Pay attention to cleanliness when working on the fuel system.



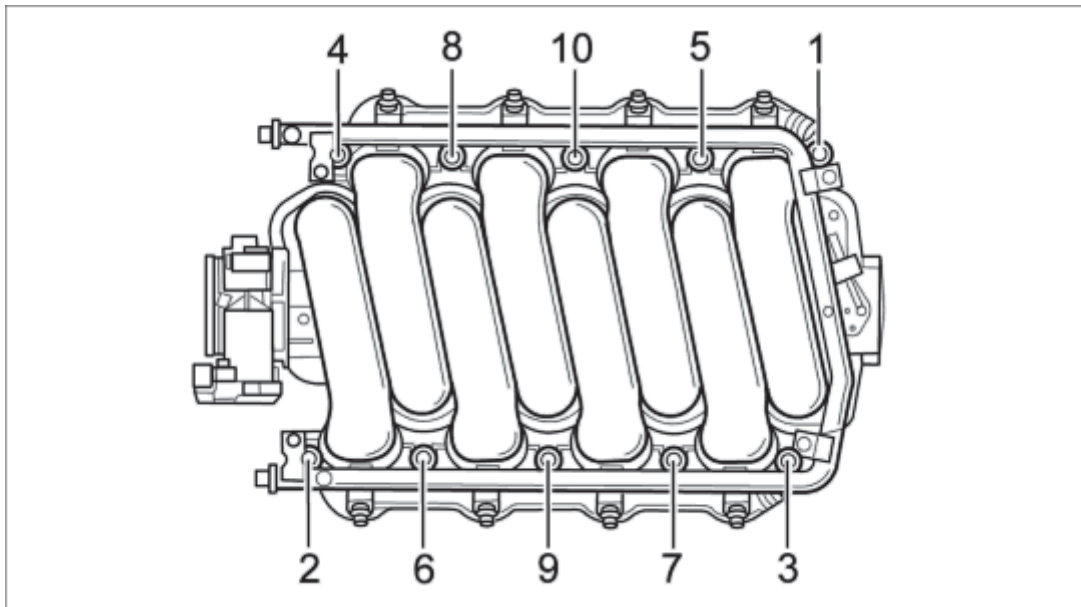
Note

- Before the lines are opened, place a cloth or a suitable container underneath them!
- Collect escaping fuel.

10. Disconnect fuel line **-1-** and line **-2-** to the carbon canister on the radiator tank splash panel.
11. Disconnect the electric connectors to the eight fuel injectors. To do this, press the metal clip on the plug and pull off the plug.
12. Unscrew the fastening screws on the intake distributor in the sequence shown below. → *Loosening order for suction module*



Cable plug for injection valves



Loosening order for suction module

13. Remove intake distributor from the engine in an upward direction.

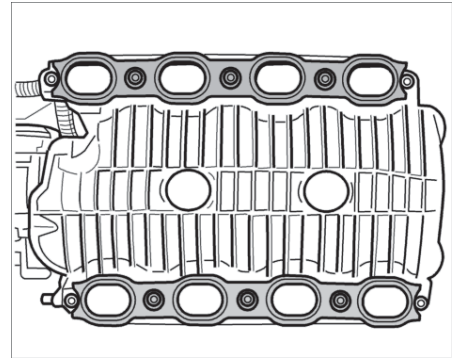
Installing intake-air distributor



Note

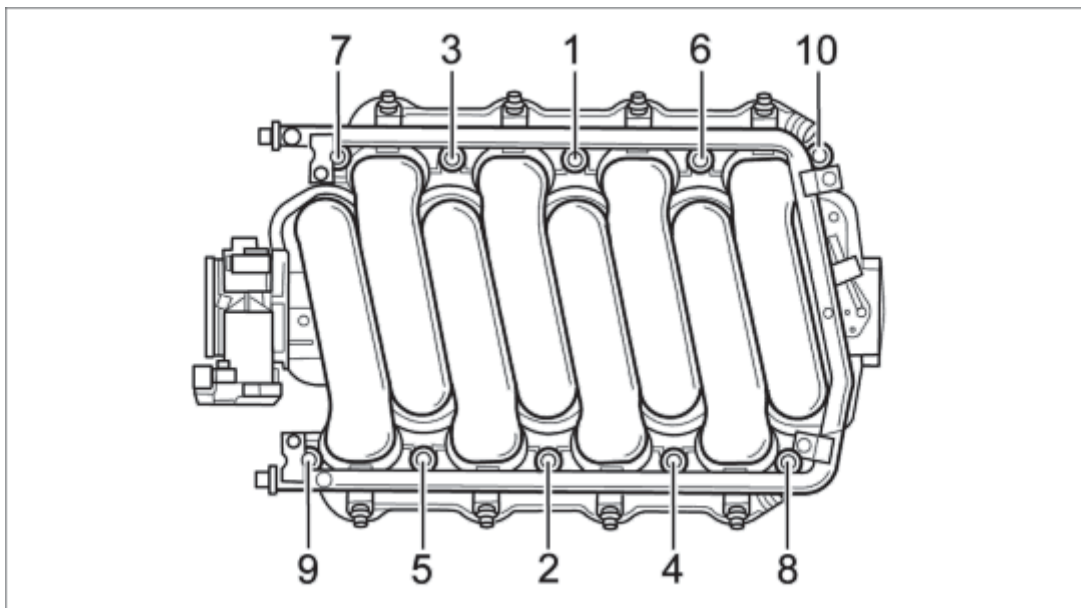
- The ignition must be switched off when working on the fuel system.
- Absorb any escaping fuel using a suitable binding material or a cloth.
- Cloths which have absorbed fuel must be disposed of according to the applicable national laws.
- The fuel system must be depressurised before starting work on it.
- Only work on the fuel system in well-ventilated rooms.
- Any seals which have been removed must always be replaced.

1. Replace intake distributor gaskets.
2. Place intake-air distributor on the engine and tighten the screws in the sequence shown below.



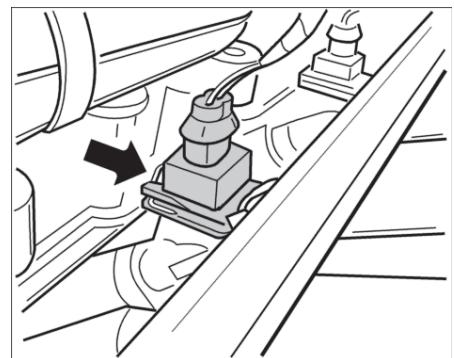
Installation position for seals

→ *Tightening sequence for suction module* → Initial tightening: 7.5 ftlb. → Final tightening: 11 ftlb.



Tightening sequence for suction module

3. Connect the 8 electric connectors to the injection valves. The connectors must engage audibly.



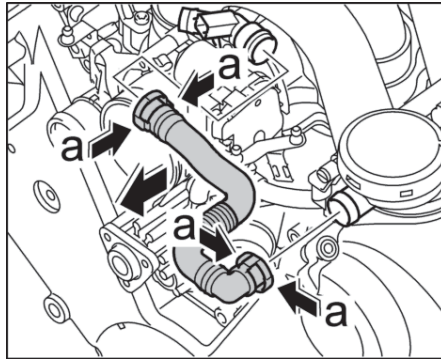
Cable plug for injection valves

4. Install positive crankcase ventilation line. The 2 connections must audibly engage. Then close the mounting clip.
5. Install line between intake distributor and oil mist collector.

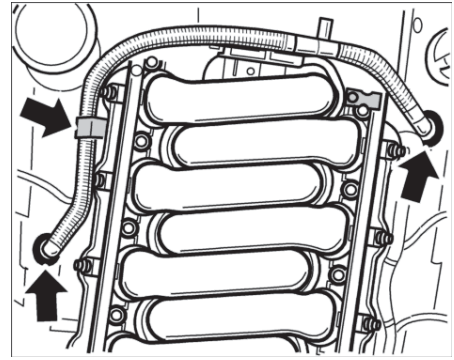


DANGER

Danger of poisoning from fuels!

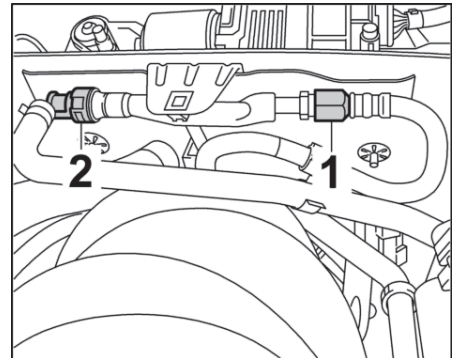


Line for oil mist separator



Positive crankcase ventilation

- Gasoline is toxic.
- Inhaling vapours can cause irritation of the mucous membranes and eyes.
- It can be carcinogenic. It represents a serious risk to health when inhaled, touched or swallowed over longer periods.
- Only work on the fuel system in well-ventilated rooms.
- Wear protective gloves that are fuel-resistant.
- Wear a breathing mask with active charcoal filter; do not breathe in any fuel vapours.
- Ensure that there is adequate ventilation and extract all fuel vapours.
- Before opening the fuel lines or fuel hoses, relieve the fuel pressure.
- Collect escaping fuel, absorb it if necessary with a suitable binding material and dispose of properly.
- Pay attention to cleanliness when working on the fuel system.



Fuel lines

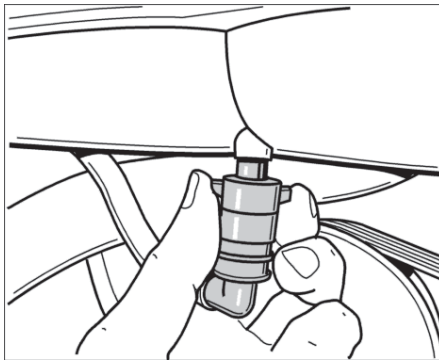


DANGER

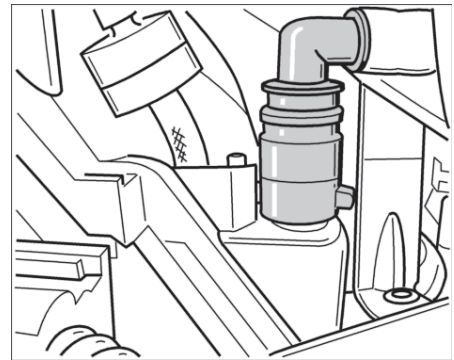
Danger of fire from fuel!

- Keep clear of ignition sources.
- Do not smoke.
- Disconnect battery.
- Danger of fire due to naked flames and sparks, e.g. during welding or grinding work.
- Danger of fire due to escaping fuel, e.g. on hot engine components or due to electrostatic charge. Allow engine to cool down.
- Secure the vehicle, e.g. with a warning sign.
- Change any clothing soaked with fuel immediately.
- In case of fire, use CO₂ or dry powder fire extinguishers.

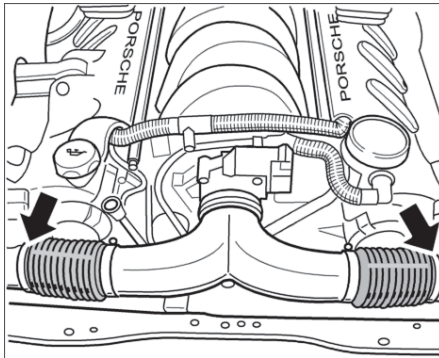
6. Connect fuel line **-1-** and line **-2-** from the carbon canister on the radiator tank splash panel.
7. Connect vacuum line to the rear of the intake distributor. The plug must engage audibly.
8. Attach the vacuum line to the underside of the Y-shaped pipe.
9. Slide the bellows onto the air flow sensors and tighten the hose clamps.



Vacuum line connection



Vacuum line on rear side of suction module



Bellows



ATTENTION

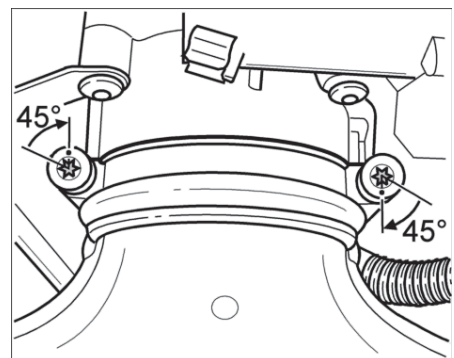
Risk of damaging the fastening bolts!

- The fastening bolts will break if they are turned in the wrong direction.

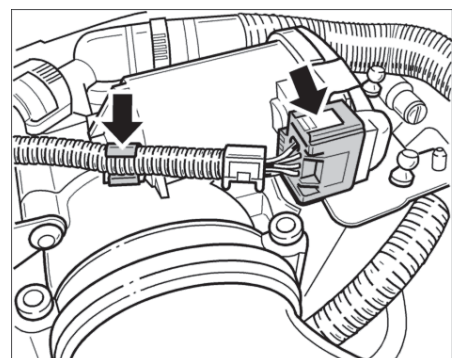
→ Only turn the fastening bolts in the correct direction of rotation for opening and closing.

10. Slide the Y-shaped pipe onto the throttle adjuster. Then insert the left and right fastening bolts. Turn the right and left bolts 45° clockwise.

11. Connect the throttle adjuster. The connector must engage audibly. Clip the connecting cable into the sheetmetal holder.



Direction of rotation for fastening bolts



Cable plug for throttle housing

Subsequent work

Subsequent work for installing intake distributor

1. Install design cover → 108319 Removing and installing engine cover - "Installing" section.
-

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
- Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrucke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrucke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

Danger of losing text-figure correspondence when printing out.

- For technical reasons, it can currently not be ruled out that the correspondence between text and associated figure can be lost when it is printed out, even though the display on the screen is correct.
- If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

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→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

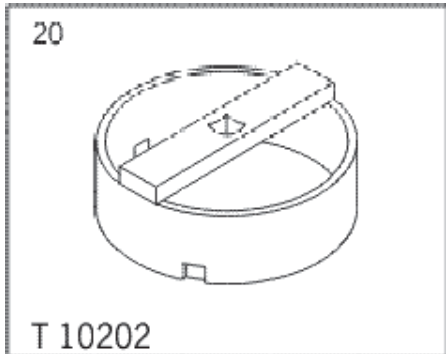
- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

24 58 19 Removing and installing fuel pressure regulator - as of MY 2003

- Preliminary work
- Information
- Removing fuel pressure regulator
- Installing fuel pressure regulator
- Subsequent work

Tools

Designation	Type	Number	Explanation	
key	special tool	T10202		

Preliminary work

Preliminary work



Note

The fuel filter is located under the left connection unit, and the pressure regulator is under the right connection unit. The procedure "Open tank" can be applied to both connection units (right pressure regulator, left fuel filter)

1. Empty the fuel tank. → Draining and filling fuel

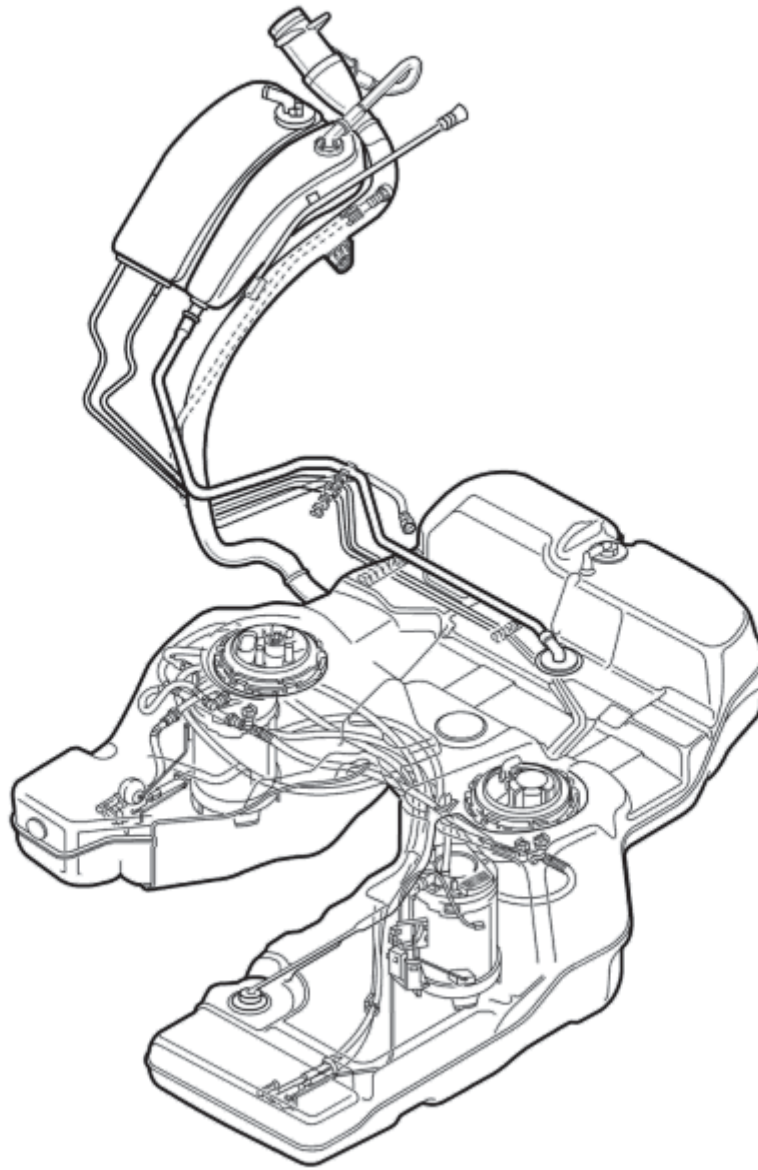
Opening the tank



Note

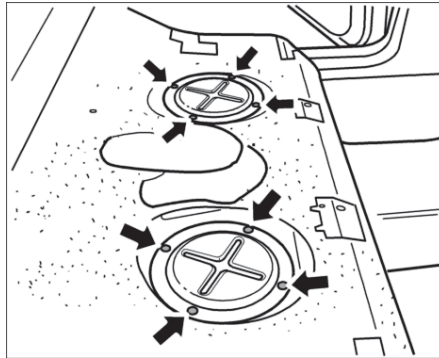
- If the tank must be opened for emptying, disconnect all connections.

Installation Location:

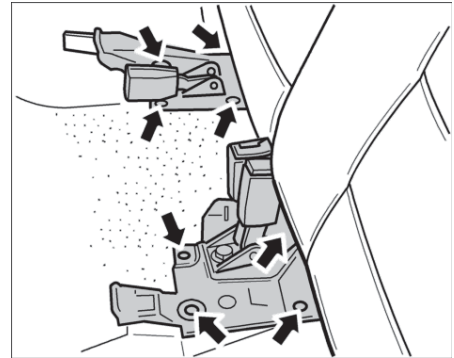


Component overview: fuel tank

1. Open filler flap.
2. Fold rear seat forwards.
3. Fold up the retaining brackets of the (right and left) seat-belt buckles. To do so, loosen the four fastening screws and fold up the bracket with the seat-belt buckle. Do not use the fastening screws again.
4. Undo the caps (figure shows both). To do so, cut out the carpeted floor along the perforated lines using a carpet knife and fold it over. Then unscrew the four fastening nuts and remove the lid.
5. Empty the fuel tank if this has not already been done or if the fuel level in the fuel tank is very low. → Draining and filling fuel



Fastening nuts for cap



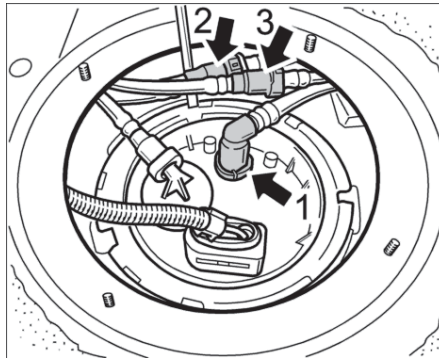
Fastening screws for retaining brackets of seat-belt buckles



DANGER

Danger of poisoning from fuels!

- Gasoline is toxic.
- Inhaling vapours can cause irritation of the mucous membranes and eyes.
- It can be carcinogenic. It represents a serious risk to health when inhaled, touched or swallowed over longer periods.
- Only work on the fuel system in well-ventilated rooms.
- Wear protective gloves that are fuel-resistant.
- Wear a breathing mask with active charcoal filter; do not breathe in any fuel vapours.
- Ensure that there is adequate ventilation and extract all fuel vapours.
- Before opening the fuel lines or fuel hoses, relieve the fuel pressure.
- Collect escaping fuel, absorb it if necessary with a suitable binding material and dispose of properly.
- Pay attention to cleanliness when working on the fuel system.



Fuel supply and disconnection points at right connection unit



DANGER

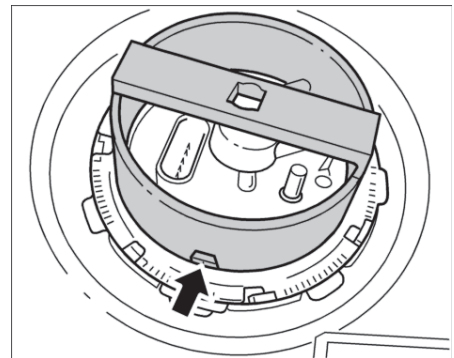
Danger of fire from fuel!

- Keep clear of ignition sources.
- Do not smoke.
- Disconnect battery.
- Danger of fire due to naked flames and sparks, e.g. during welding or grinding work.
- Danger of fire due to escaping fuel, e.g. on hot engine components or due to electrostatic charge. Allow engine to cool down.
- Secure the vehicle, e.g. with a warning sign.
- Change any clothing soaked with fuel immediately.
- In case of fire, use CO₂ or dry powder fire extinguishers.



Note

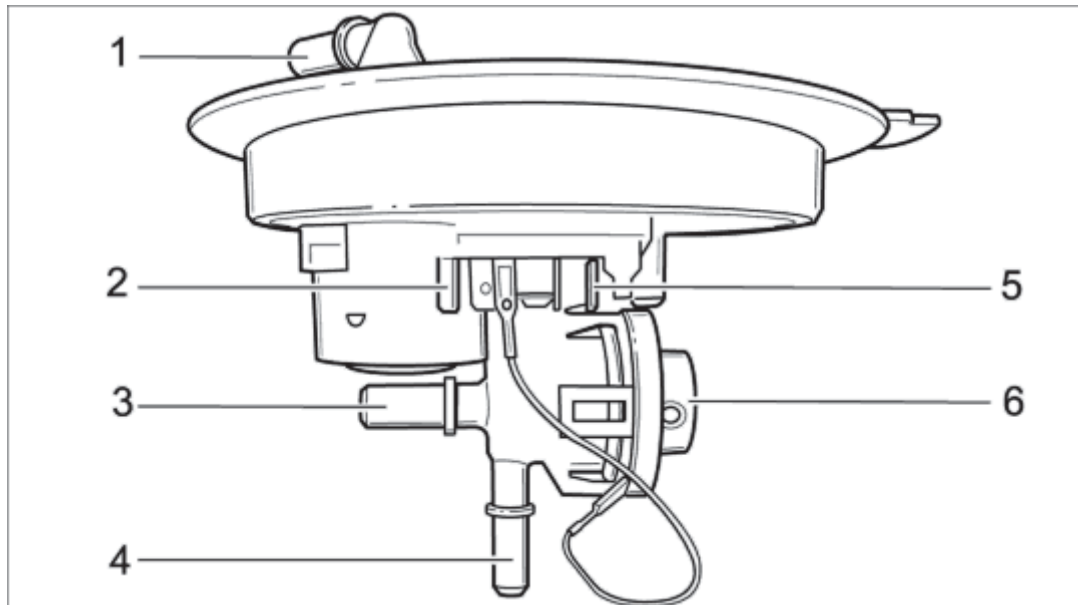
- The ignition must be switched off when working on the fuel system.
 - Absorb any escaping fuel using a suitable binding material or a cloth.
 - Cloths which have absorbed fuel must be disposed of according to the applicable national laws.
 - The fuel system must be depressurised before starting work on it.
 - Only work on the fuel system in well-ventilated rooms.
 - Any seals which have been removed must always be replaced.
6. Carefully remove the fuel supply **-1-** at the relevant connection unit (right connection unit here) and loosen the two disconnection points **-2 and 3-**. Also remove line (not shown here) in vehicles with auxiliary heating (auxiliary heater). Do the same at the left connection unit. Disconnect all connections on the connection unit.
 7. Open the relevant cap with the **key T10202** and lift up the connection unit (cap).



Cap

Information

Component overview



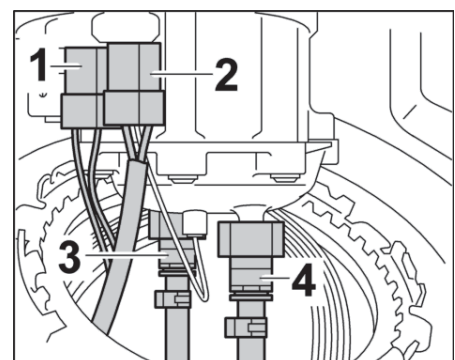
Connecting flange with pressure regulator

- 1 - Fuel pressure line
- 2 - Electric connection for fuel pump
- 3 - Connection to fuel delivery unit right and left (unpressurised)
- 4 - Pressure regulator input from fuel filter
- 5 - Electric connection for fuel level indicator
- 6 - Fuel pressure regulator; 4 bar supply pressure

Removing fuel pressure regulator

Removing fuel pressure regulator

1. Pull off electric connectors **-1 and 2-** . Then pull off the fuel lines **-3 and 4-** and remove the connection unit (pressure regulator).



Connection unit (pressure regulator)

Installing fuel pressure regulator

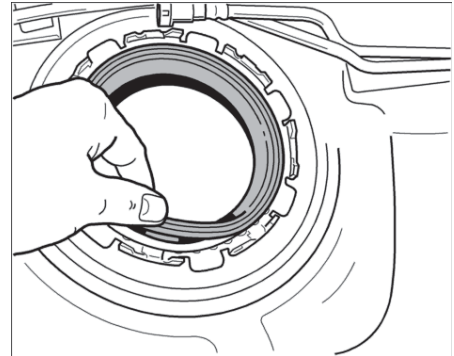
Installing fuel pressure regulator



Note

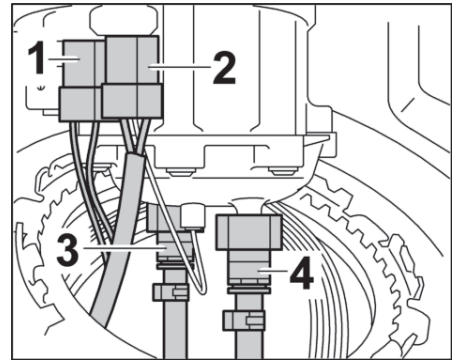
- The pressure regulator is integrated into the connection unit.
- The connection unit together with integrated pressure regulator is replaced as a complete unit and not disassembled.

1. Fit new seal in the opening of the tank.



Seal

2. Connect the connection unit. Fit electric connector -1 and 2- and hose connections -3 and 4- .
3. Place the connection unit into the tank. When doing so, make sure that the plastic lug is pointing forwards.

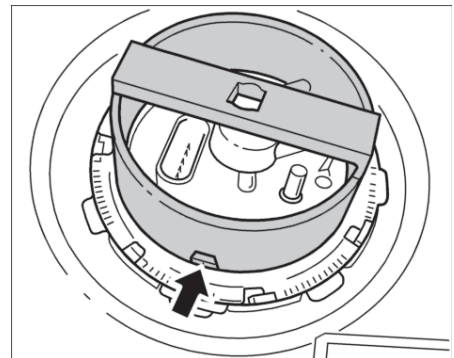


Connection unit

Subsequent work

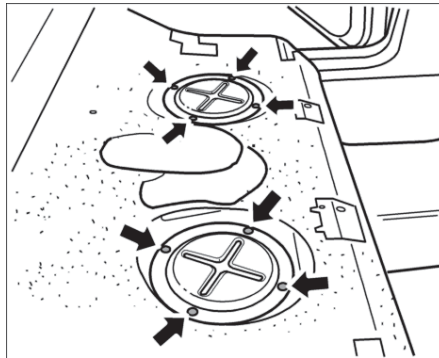
Closing the tank

1. Close the tank. To do so, fit the sheetmetal ring and tighten using the **key T10202**. → **Tightening torque: 104 ftlb.**

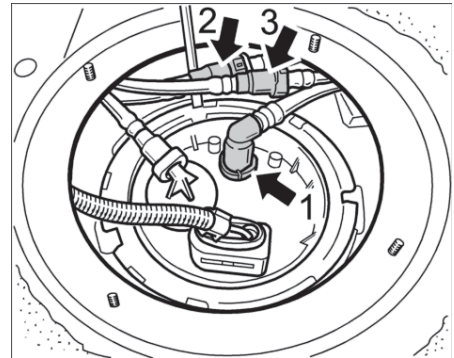


Cap

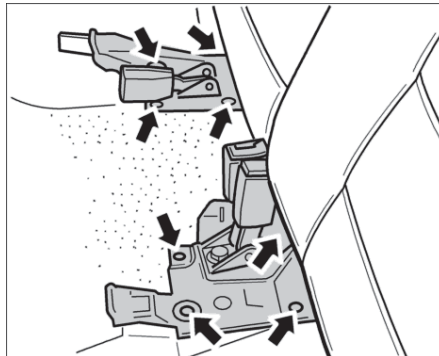
2. Fit all connections (fuel lines, ventilation tubes and electric plugs).
3. Fit the lid. Then tighten the four fastening nuts. → **Tightening torque: 7.5 ftlb.** Refit carpeted floor and fix with double-sided adhesive tape.
4. Tighten the seat-belt buckle fastening plates. Use three new fastening screws for this and tighten. For



Fastening nuts for cap



Fuel lines, ventilation tubes and electric plugs



Fastening screws for retaining brackets of seat-belt buckles

tightening torque, see → 692519 Removing and installing rear belt lock .

5. Fold rear seat down again.
6. Fill fuel tank (refuel). → Draining and filling fuel

Subsequent work

1. Fill fuel tank (refuel). → Draining and filling fuel

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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24 69 19 Removing and installing oxygen sensors in front of catalytic converter - as of MY 2003

- Preliminary work
- Tools and materials
- Removing oxygen sensors in front of catalytic converter - Cayenne S (M48/00)
- Installing oxygen sensors in front of catalytic converter - Cayenne S (M48/00)
- Subsequent work

Tools

Designation	Type	Number	Explanation	
Torque wrench, signal-transmitting with changeover ratchet	commercially available tool	NR.90	Only in combination with wrench inserts	PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
Accessory for torque wrench: Open ring wrench angled	commercially available tool	NR.96-3	various overall lengths, e.g. Hazet 4681-1 to 3	
Accessory for torque wrench: Open ring wrench angled	commercially available tool	NR.97	various overall lengths, e.g. Hazet 4681-1 to 3	

				
Accessory for torque wrench: Open ring wrench angled assembly	commercially available tool	NR.98	various overall lengths, e.g. Hazet 4681-1 to 3	

Preliminary work

Preliminary work for removing oxygen sensors in front of catalytic converter - Cayenne S (M48/00)

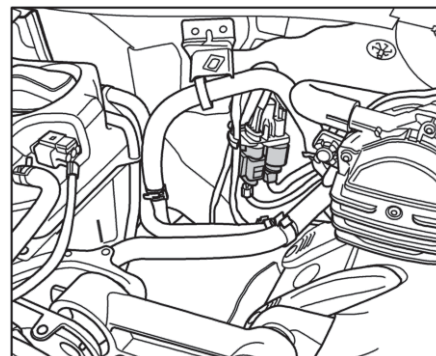
1. Remove front wheel → 440519 Removing and installing wheel.
2. Remove front wheel housing liner → 505619 Removing and installing front wheel housing liner - "Removing" section.
3. Remove engine compartment cover above the oxygen sensor plugs → 700219 Removing and installing front cover (engine compartment) - "Removing" section.
4. Disconnect oxygen sensor plug for the oxygen sensor in front of catalytic converter at the right of the water splash panel and unclip the cable from the holder.
5. Remove air cleaner housing → 242519 Removing and installing air cleaner housing - "Removing" section.



ATTENTION

Danger of burns from hot exhaust system!

- Only remove the exhaust system once it has cooled down.
- Wear protective gloves.

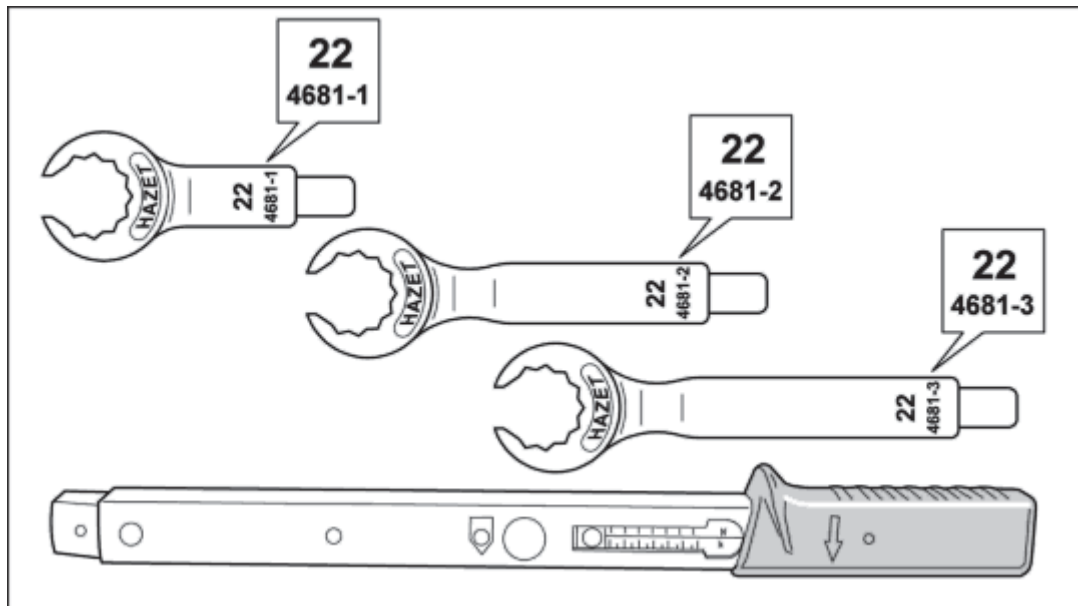


Cable plugs for oxygen sensors

6. Release oxygen sensor wire from the cable guide and leave it at the oxygen sensor.

Tools and materials

Tools - oxygen sensor



Special tools - oxygen sensors

- **Special tools - oxygen sensors** - Accessory for torque wrench: Open ring wrench angled NR.96-3
- **Special tools - oxygen sensors** - Accessory for torque wrench: Open ring wrench angled NR.97
- **Special tools - oxygen sensors** - Accessory for torque wrench: Open ring wrench angled assembly NR.98
- **Special tools - oxygen sensors** - Torque wrench, signal-transmitting with changeover ratchet NR.90

Removing oxygen sensors in front of catalytic converter - Cayenne S (M48/00)

Removing oxygen sensors in front of catalytic converter - Cayenne S (M48/00)

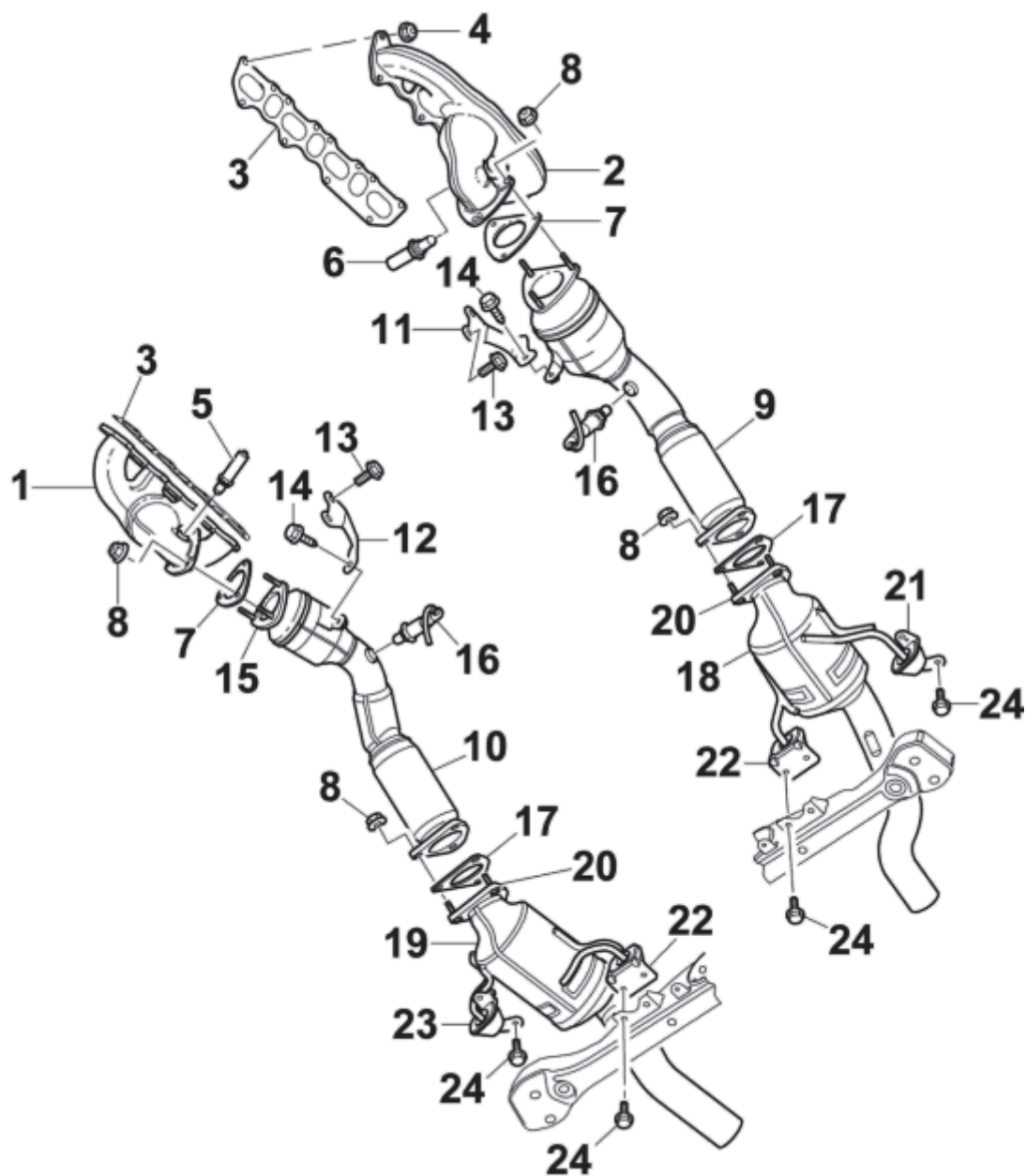


ATTENTION

The oxygen sensor cable can be damaged if twisted!

- Change in emissions.
- Check Engine light comes on.

- Always release oxygen sensor cable so that the wire can turn when unscrewing or screwing in the sensor.
- Do not kink cable.



Component overview for primary catalytic converter

- 1 - Exhaust manifold, cylinders 1 -4
- 2 - Exhaust manifold, cylinders 5 - 8
- 3 - Seal for exhaust manifold; replace
- 4 - M8 hexagon nut; replace, coat thread of bolts with Microgleit
- 5 - Oxygen sensor ahead of catalytic converter
- 6 - Oxygen sensor ahead of catalytic converter
- 7 - Seal; replace
- 8 - M8 hexagon nut; replace
- 9 - Catalytic converter, front
- 10 - Catalytic converter, front
- 11 - Support
- 12 - Support
- 13 - Hexagon-head bolt M10 x 25
- 14 - Hexagon-head bolt, M8 x 15
- 15 - Stud M8 x 25

- 16 - Oxygen sensor behind catalytic converter
- 17 - Seal; replace
- 18 - Catalytic converter
- 19 - Catalytic converter
- 20 - Screw
- 21 - Bracket
- 22 - Bracket
- 23 - Bracket
- 24 - Hexagon-head bolt, M8 x 25

1. Remove the oxygen sensor in the exhaust manifold using a mirror. To do this, screw out the oxygen sensor with an open-ended wrench SW 22.

Installing oxygen sensors in front of catalytic converter - Cayenne S (M48/00)

Installing oxygen sensors in front of catalytic converter - Cayenne S (M48/00)



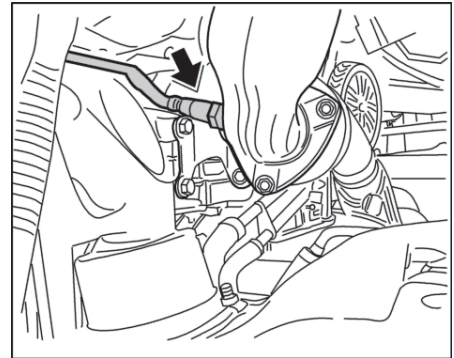
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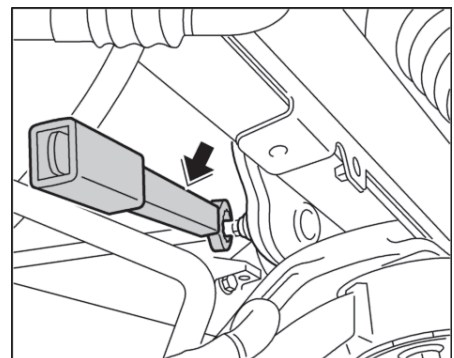
- Change in emissions.
- Check Engine light comes on.

- Always expose oxygen sensor cable so that the wire can turn when unscrewing or screwing in the sensor.
- Do not kink cable.

1. Preassemble the oxygen sensor in the exhaust manifold by hand using a mirror. Tighten oxygen sensor using a special tool.
→ 246919 Removing and installing oxygen sensor ahead of catalytic converter - "Tools and materials" section → **Tightening torque: 33 ftlb. +/-3.5 ftlb.**



Oxygen sensor for exhaust manifold

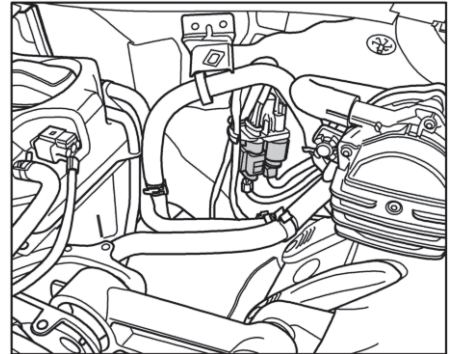


Tool on exhaust manifold oxygen sensor

Subsequent work

Touching up for installing oxygen sensors in front of catalytic converter - Cayenne S (M48/00)

1. Push oxygen sensor wire into the cable guide.
2. Connect the oxygen sensor plug for the oxygen sensor in front of catalytic converter at the right of the water splash panel and clip the wires into the guide. Fit cable plug.
3. Install air cleaner housing → 242519 Removing and installing air cleaner housing - chapter on "installing".
4. Fit engine compartment cover above the oxygen sensor plugs → 700219 Removing and installing front cover (engine compartment) - "Installing" section.
5. Install front wheel housing liner → 505619 Removing and installing front wheel housing liner - "Installing" section.
6. Fit front wheel → 440519 Removing and installing wheel.



Cable plugs for oxygen sensors

9PAAE1, 9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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24 70 19 Removing and installing DME control module - as of MY 2003

- Information
- Obtaining read-out and saving vehicle data from DME control module
- Removing DME control module
- Installing DME control module
- Programming new DME control module
- Programming DME control module

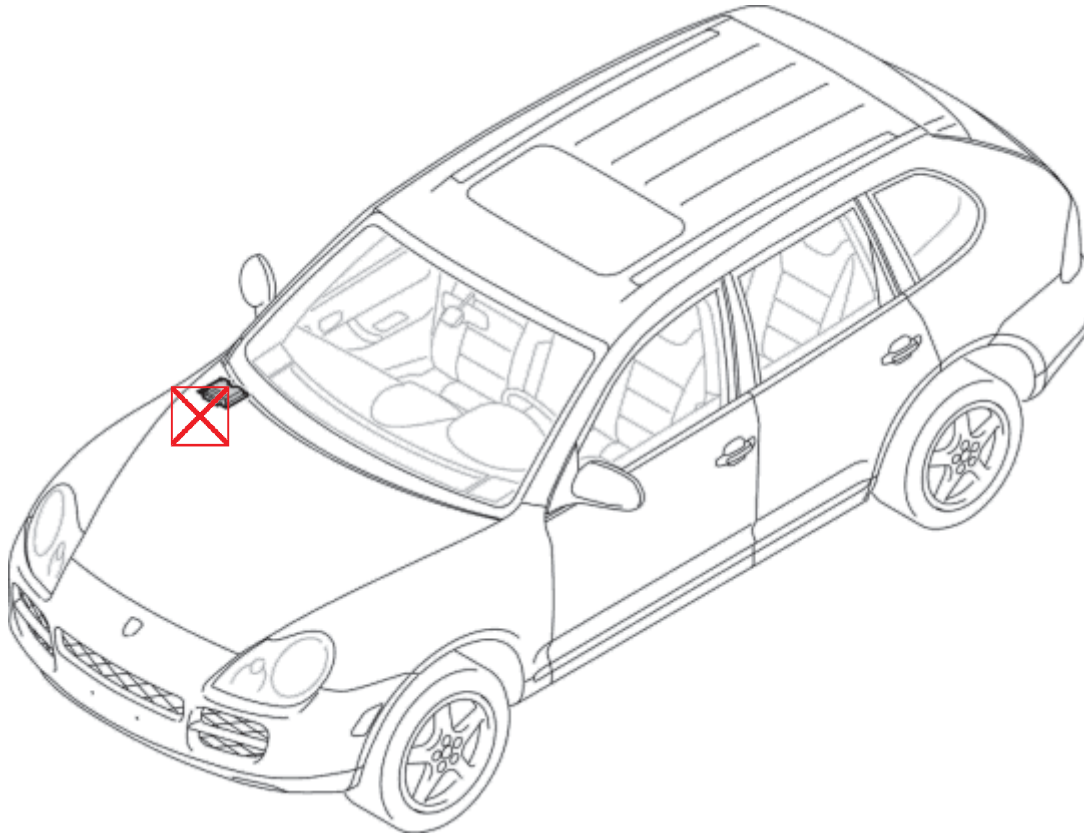
Information



Note

- If the DME control module is replaced, it must be programmed using the Porsche System Tester. Thus, the DME control module can be adapted to the vehicle, the national variant and the equipment. The DME control module is located in the radiator tank near the right fender.
- If possible, before the DME control module is removed and replaced, a read-out of the vehicle data should be obtained from the Porsche System Tester.
- Symbol for the Tab key = 
- The Porsche System Tester instructions take precedence and in the event of a discrepancy these are the instructions that must be followed. Deviations may occur with later software versions.

Installation Location:



Overview of the DME control module

Exhaust-gas standard

Type	ME 7.1.1 min	
	Version	Explanation
OBD 2	LEV	Low Emission Vehicle, USA As of model year '03.
RoW	EU2	Rest of world As of model year '03.
EOBD	EU4	European On-Board Diagnosis. As of model year '03.

Obtaining read-out and saving vehicle data from DME control module

1. Connect the Porsche System Tester to the vehicle and start the System Tester. Switch on ignition. >> Continue.
2. Select vehicle type using the cursor keys.
3. Using the  key, move from the vehicle type to the control modules.
4. Select DME with the cursor keys and press the >> key.
5. Select Control unit programming with the cursor keys and press the >> key.
6. Select Read out control unit (vehicle data) with the cursor keys and press the >> key.

7. The message Vehicle data read-out complete will appear on the screen of the Porsche System Tester.
8. After replacement of the DME control module, the vehicle data is installed in the menu Program control module (see Section 6).

Removing DME control module



ATTENTION

Risk of short circuit!

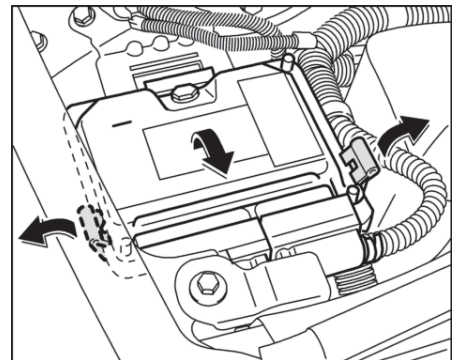
→ Before removing the control unit, switch off the ignition.



Note

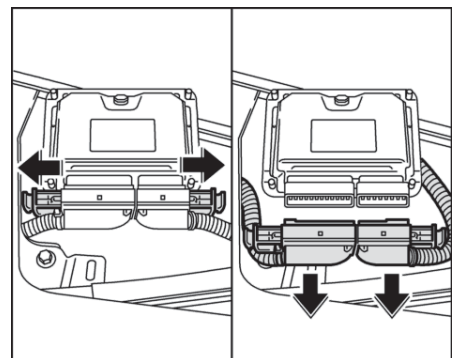
- Unscrew the two fastening screws for the cowl panel cover and lift up the cover in this area. → 664419 Removing and installing cowl panel cover

1. Push the two retaining clips aside **-arrows-** and remove control unit to the front.



Retaining clips for control unit

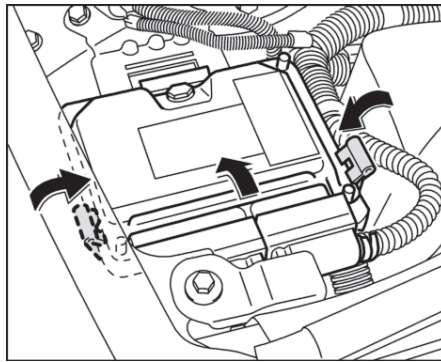
2. Pull out latch on both connectors in **-direction of arrow-** and remove the connectors.



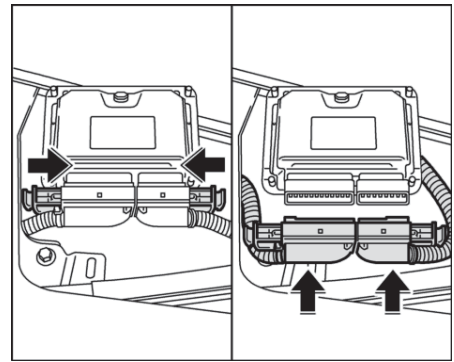
Latch for connectors

Installing DME control module

1. Insert both connectors into the control unit and push in latch in **-direction of arrow-** .
2. Insert control unit and secure with the two retaining clips **-arrow-** .



Retaining clips for control unit



Latch for connectors

Programming new DME control module



Note

- If a new DME control module is to be installed in a vehicle, the immobiliser code specified in IPAS must be entered in the DME control module.
- You can get the codes from IPAS or from your importer by specifying the vehicle identification number.
- During DME programming, it is essential to guarantee the power supply for the Porsche System Tester. It is essential to connect a battery charger with a current rating of at least 40 A to the vehicle battery.
- Symbol for the Tab key = .
- The Porsche System Tester instructions take precedence and in the event of a discrepancy these are the instructions that must be followed. Deviations may occur with later software versions.
- The procedure described here has been structured in general terms; different text or additions may appear in the Porsche System Tester.

1. Connect the Porsche System Tester to the vehicle and start the System Tester. Switch on ignition. Read out DME control module. → 247019 Removing and installing DME control module - "Reading out" section
2. Switch off ignition and replace DME control module with a new unit. → 247019 Removing and installing DME control module - "Removing" section
3. Change to the Control module programming menu and press .
4. Program control module and press .
5. Observe System Tester conditions .
6. Select vehicle type and press .
7. Select transmission type and press .
8. Select emission standard and press . → 247019 Removing and installing DME control module - "Information" section
9. Program control module and confirm with .
10. The data and programming status is then loaded on to the DME control module. Do not interrupt the programming sequence.
11. The System Tester indicates whether the control unit is programmable and the approximate

programming time.



Note

- *During programming, the electric radiator fans may start.*
12. Once the DME control module has been programmed successfully, switch to the Program immobiliser code menu and press **>>**.
 13. Enter the new immobiliser code (IPAS), confirm with the **>>** key, check the code again and confirm with the **F7** key.
 14. When the programming period expires follow the instructions on the Porsche System Tester.



Note

- *In some countries (currently USA, Canada) the Ready status must be obtained following a test drive and/or by using the Porsche System Tester after a DME control module is programmed. If in doubt about this, contact the relevant importer.*
 - *See On-Board Diagnosis Manual (DME 7.1.1)*
 - *With all DME systems, the engine must run for several minutes before the engine control unit can relearn the idle speed and mixture adaptation values!*
15. For the learning and adaptation routine of the throttle (E-gas), switch the ignition on for 30 seconds without starting the engine. Do not actuate accelerator pedal. This completes the adaptation of the throttle adjusting unit and the programming sequence is complete.
 16. Read out the fault memory and delete the DME control module fault on every control unit connected to the CAN.
 17. Carry out a test drive and read out fault memory.



Note

- *If faults are present, proceed in accordance with the DME 7.1.1 Manual. See On-Board Diagnosis Manual (DME 7.1.1)*

Programming DME control module



Note

- *If a DME control module from a different vehicle with ME 7.1.1 is being used, proceed as follows. As a check, the immobiliser code of the vehicle in which the control unit is being installed (NEW) and of the vehicle from which the control unit has been removed (OLD) are required.*
- *During DME programming, it is essential to guarantee the power supply for the Porsche System Tester. It is essential to connect a battery charger with a current rating of at least 40 A to the vehicle battery.*
- *You can get the necessary codes from IPAS or from your importer by specifying the vehicle identification number.*
- *Symbol for the Tab key = **→|***

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2. Switch off ignition and replace DME control module with a new unit. → 247019 Removing and installing DME control module - "Removing" section
3. Change to the Control unit programming menu and press **>>**.
4. Program control module **>>**.
5. Observe System Tester conditions **>>**.
6. Select vehicle type **>>**.
7. Select transmission type and press **>>**.
8. Select emission standard and press **>>**. → 247019 Removing and installing DME control module - "Information" section
9. Program control module and confirm with **F8**.
10. The data and programming status is then loaded on to the DME control module. Do not interrupt the programming sequence.
11. The System Tester indicates whether the control unit is programmable and the approximate programming time.
12. Once the DME control module has been programmed successfully, switch to the Program immobiliser code menu and press **>>**.
13. Enter the old immobiliser code (IPAS, vehicle - OLD), continue with the **>>** key, check the code again and confirm with **F7**.
14. Enter the new immobiliser code (IPAS, vehicle - NEW), continue with the **>>** key, check the code again and confirm with **F7**.
15. When the programming period expires follow the instructions on the Porsche System Tester.



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 17. Read out the fault memory and delete the DME control module fault on every control unit connected to

the CAN.

18. Carry out a test drive and read out fault memory.



Note

- *If faults are present, proceed in accordance with the DME 7.1.1 Manual. See On-Board Diagnosis Manual (DME 7.1.1)*

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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24 73 19 Removing and installing oxygen sensors behind catalytic converter - as of MY 2003

- Preliminary work
- Tools and materials
- Removing oxygen sensors behind catalytic converter - Cayenne S (M48/00)
- Installing oxygen sensors behind catalytic converter - Cayenne S (M48/00)
- Subsequent work

Tools

Designation	Type	Number	Explanation	
Torque wrench, signal-transmitting with changeover ratchet	commercially available tool	NR.90	Only in combination with wrench inserts	PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
Accessory for torque wrench: Open ring wrench angled	commercially available tool	NR.96-3	various overall lengths, e.g. Hazet 4681-1 to 3	
Accessory for torque wrench: Open ring wrench angled	commercially available tool	NR.97	various overall lengths, e.g. Hazet 4681-1 to 3	

				
Accessory for torque wrench: Open ring wrench angled assembly	commercially available tool	NR.98	various overall lengths, e.g. Hazet 4681-1 to 3	

Preliminary work

Preliminary work: Removing oxygen sensors behind catalytic converter

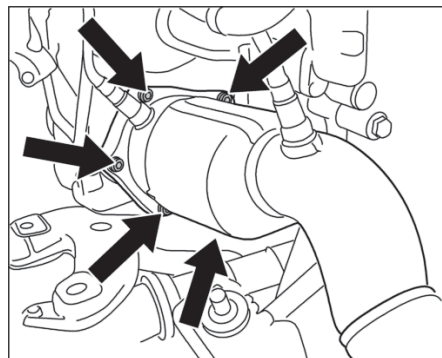


ATTENTION

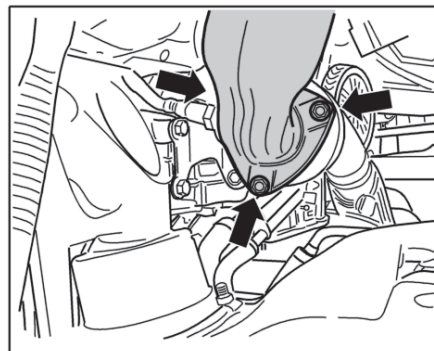
Danger of burns from hot exhaust system!

- Only remove the exhaust system once it has cooled down.
- Wear protective gloves.

1. Loosen and bend primary catalytic converter (primary catalytic converter does not need to be removed completely). For details see → 267619 Removing and installing primary catalytic converter - "Removing" section.



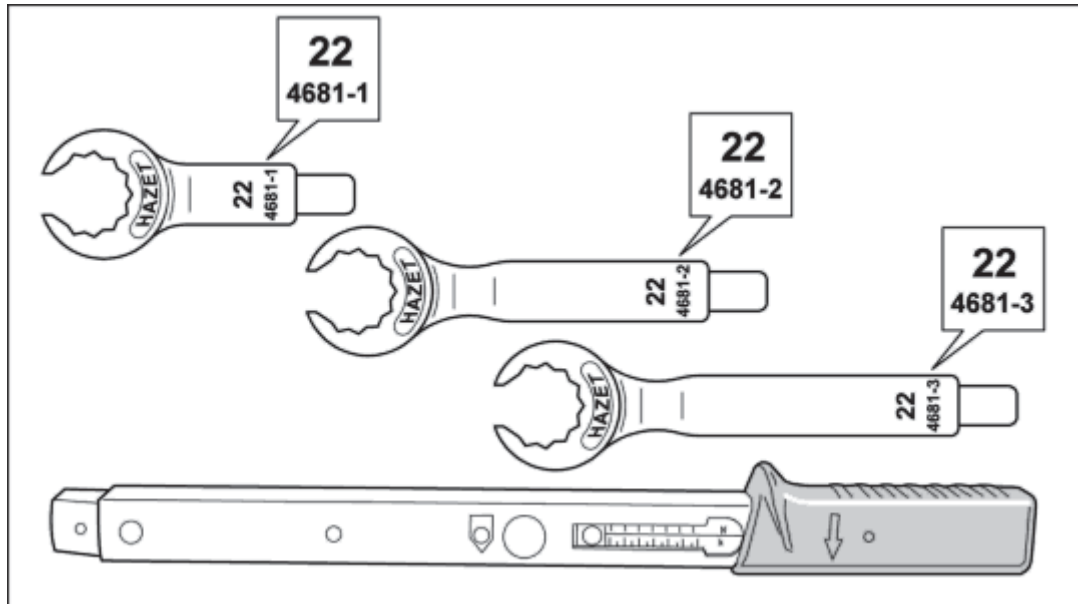
Mount for primary catalytic converter in Turbo



Mount for primary catalytic converter in
naturally aspirated engine

Tools and materials

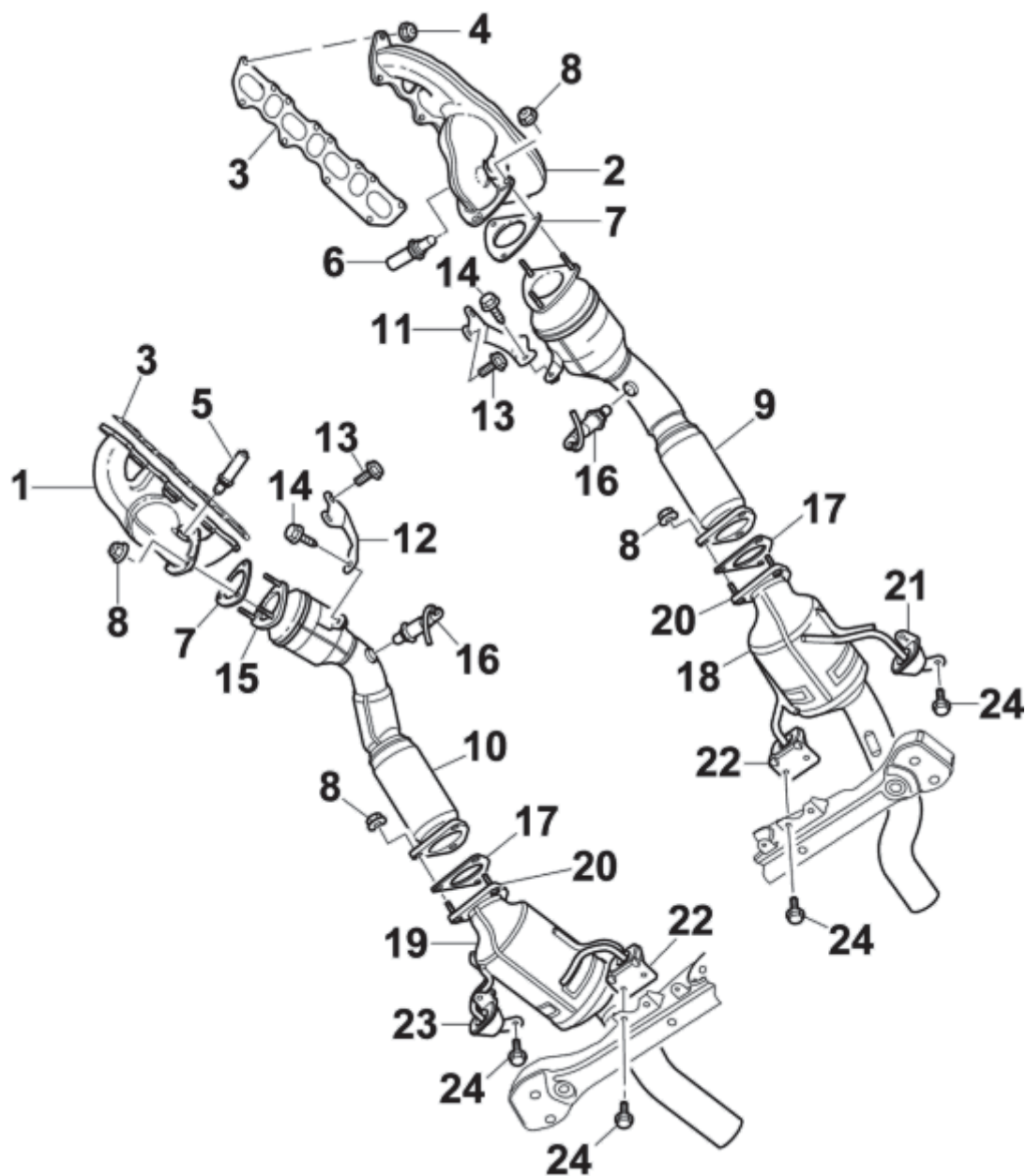
Tools - oxygen sensor



Special tools - oxygen sensors

- **Special tools - oxygen sensors** - Accessory for torque wrench: Open ring wrench angled NR.96-3
- **Special tools - oxygen sensors** - Accessory for torque wrench: Open ring wrench angled NR.97
- **Special tools - oxygen sensors** - Accessory for torque wrench: Open ring wrench angled assembly NR.98
- **Special tools - oxygen sensors** - Torque wrench, signal-transmitting with changeover ratchet NR.90

Removing oxygen sensors behind catalytic converter - Cayenne S (M48/00)



Component overview for primary catalytic converter

- 1 - Exhaust manifold, cylinders 1 -4
- 2 - Exhaust manifold, cylinders 5 - 8
- 3 - Seal for exhaust manifold; replace
- 4 - M8 hexagon nut; replace, coat thread of bolts with Microgleit
- 5 - Oxygen sensor ahead of catalytic converter
- 6 - Oxygen sensor ahead of catalytic converter
- 7 - Seal; replace
- 8 - M8 hexagon nut; replace
- 9 - Catalytic converter, front
- 10 - Catalytic converter, front
- 11 - Support
- 12 - Support
- 13 - Hexagon-head bolt M10 x 25
- 14 - Hexagon-head bolt, M8 x 15
- 15 - Stud M8 x 25

- 16 - Oxygen sensor behind catalytic converter
- 17 - Seal; replace
- 18 - Catalytic converter
- 19 - Catalytic converter
- 20 - Screw
- 21 - Bracket
- 22 - Bracket
- 23 - Bracket
- 24 - Hexagon-head bolt, M8 x 25



ATTENTION

The oxygen sensor cable can be damaged if twisted!

- Change in emissions.
- Check Engine light comes on.

- Always expose oxygen sensor cable so that the wire can turn when unscrewing or screwing in the sensor.
- Do not kink cable.

1. Carefully unscrew oxygen sensors on primary catalytic converter.

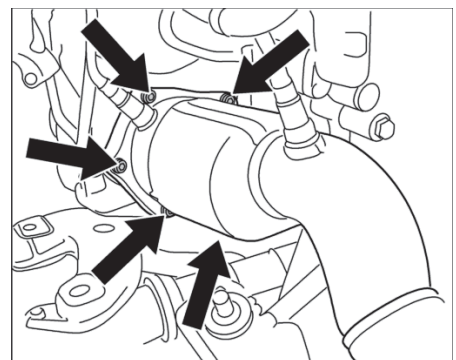
Installing oxygen sensors behind catalytic converter - Cayenne S (M48/00)

1. Position the oxygen sensor by hand and screw in as far as possible.
2. Tighten oxygen sensor using special tool → 247319 Removing and installing oxygen sensors behind catalytic converter - "Tools and materials" section. → **Tightening torque: 33 ftlb. +/-3.5 ftlb.**

Subsequent work

Subsequent work: Installing oxygen sensor behind catalytic converter

1. Install primary catalytic converter → 267619 Removing and installing primary catalytic converter - "Installing" section.

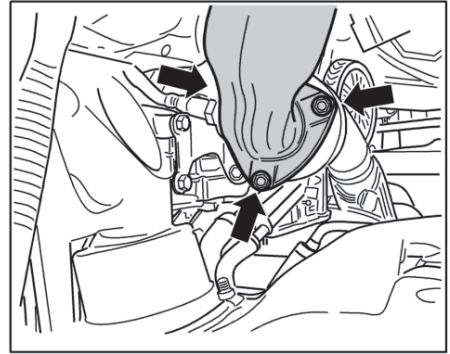


Mount for primary catalytic converter in Turbo

9PAAE1, 9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14,
C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28,
C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



*Mount for primary catalytic converter in
naturally aspirated engine*



WARNUNG

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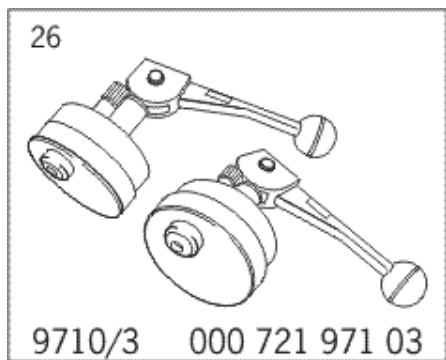
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26 01 01 Checking exhaust system for leaks - as of MY 2003

- Preliminary work
- Leak test
- Subsequent work

Tools

Designation	Type	Number	Explanation	
plugs	special tool	9710/3		

Preliminary work

Preliminary work

1. Lift the vehicle. → 40 *Lifting the vehicle*

Leak test



ATTENTION

Danger of burns from hot exhaust system!

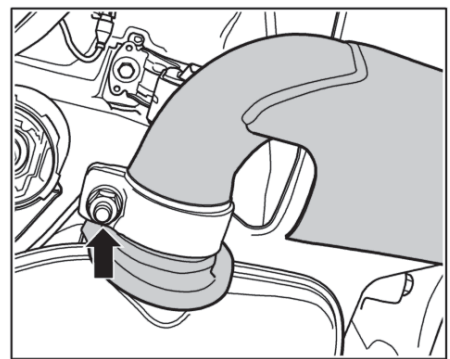
- Allow components to cool down.
- Wear protective gloves.



Note

- After the connecting clamps in the exhaust system have been released, they must always be replaced.
- During assembly work on the exhaust system, ensure that the components are aligned and installed correctly.
- Seals must be replaced by new ones following removal.
- Observe the correct tightening sequence and tightening torques.
- The general warning notes must be observed. → 10 The most important working regulations and warning notes

1. Remove tailpipes. To do this, loosen the fastening screws and pull the tailpipes out of the rear silencer by swivelling them gently to the side.
2. Insert **plugs 9710/3** on both sides of the rear silencer and twist these by folding over the lever.



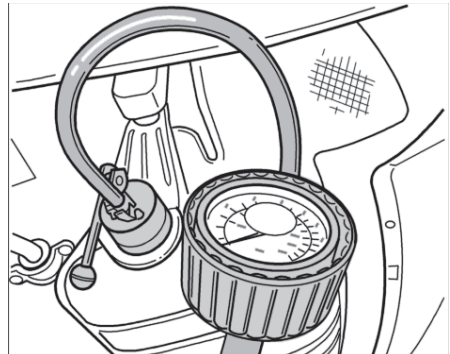
Fastening screw for tailpipe

3. Remove the protective cap of the test valve on one side and apply excess pressure of approx. 0.3 bar using a tyre-inflating device.



Note

- The exhaust system must be completely sealed between the engine and the catalytic converters.
4. Check exhaust system for leaks and repair if necessary.
 5. Remove the plugs and insert the tailpipes into the rear silencer.



Tyre-inflating device on test valve

Subsequent work

Subsequent work

1. Align tailpipes with the bumper and secure them. → 263415 Aligning tailpipes [9PAAD1 9PAAD7 9PAAE1 9PAAE7]→ 263415 Aligning tailpipes [9PAAF1 9PAAJ1]
2. Lower the vehicle. → 40 Lifting the vehicle

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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26 01 19 Removing and installing exhaust system - as of MY 2003

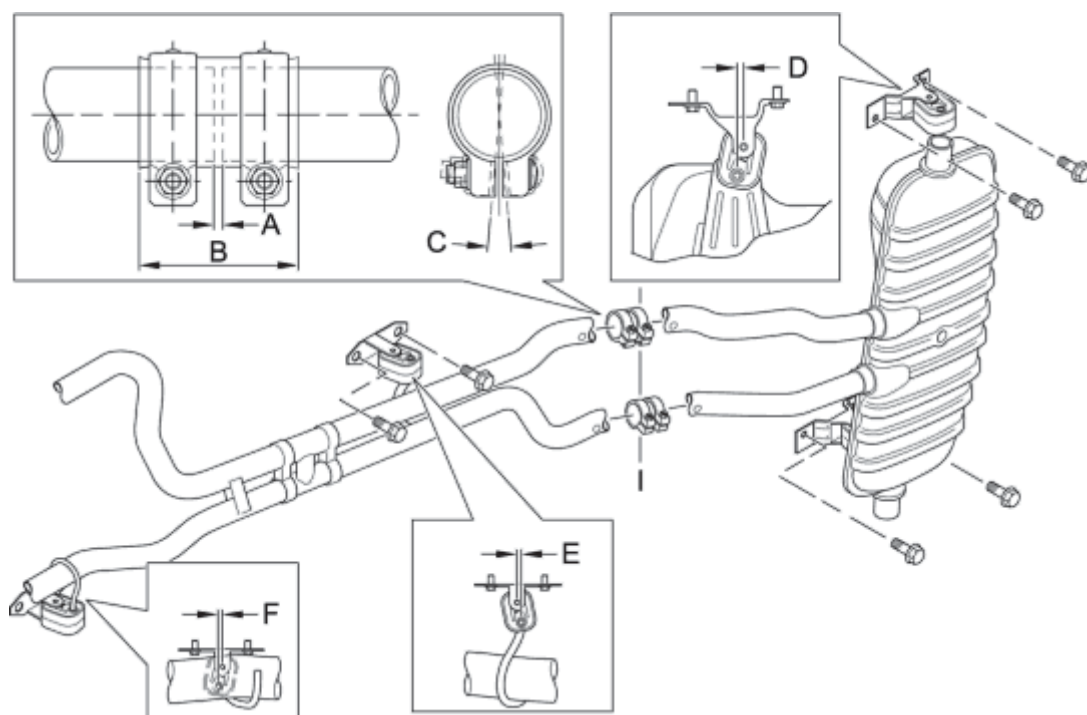
- [Information](#)
- [Removing exhaust system](#)
- [Installing exhaust system](#)

Tools

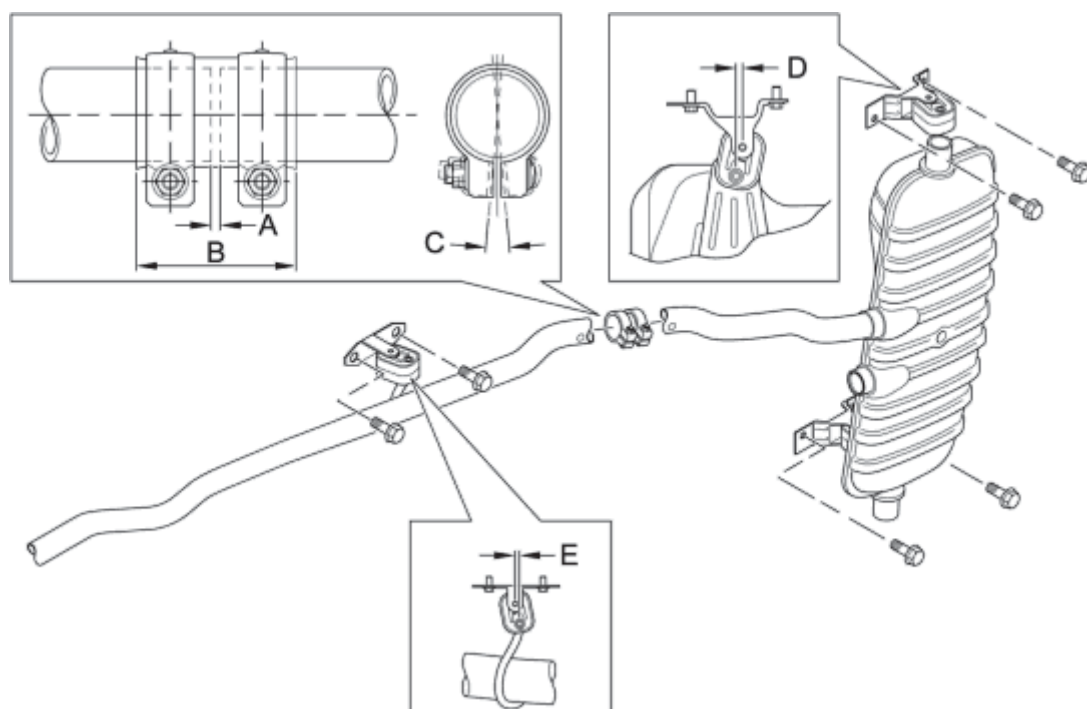
Designation	Type	Number	Explanation	
chain pipe cutters	commercially available tool	NR.166		

Information

Component information



Component overview for V8 exhaust system



Component overview for V6 exhaust system

No.	Designation	Qty.	Removal	Fitting
-I-	Repair separation point	2	When carrying out repairs, separate at the central notch with chain pipe cutters NR.166 .	Link up the separation point with 2 exhaust straps. Position the straps horizontally. (Nut pointing downwards)
-A-	Gap dimension			Max. 5 mm
-B-	Exhaust strap length			95 mm

-C-	Inclination		Maximum inclination: 10 °
-D-	Offset of the rear silencer retainer	2	10 mm
-E-	Off-centre position of central mount	1	4 mm
-F-	Off-centre position of front mount	1	2 mm

Removing exhaust system



Note

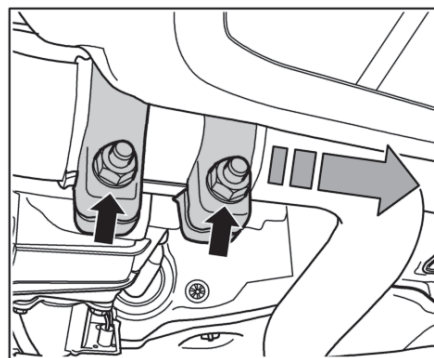
The exhaust system in the V6 is designed as a single strand. Repair instructions and notes apply to both exhaust systems.



WARNING

Danger of burns from hot exhaust system!

- Only remove the exhaust system when it has cooled down!
 - Wear protective gloves!
1. Release connecting straps between the catalytic converters and the exhaust system. Then push the straps backwards onto the exhaust system. The exhaust straps must not be reused.



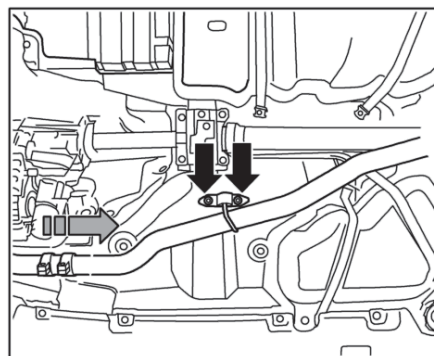
Exhaust clamps



WARNING

Danger of injury from heavy exhaust system!

- Before loosening the exhaust system, it should be secured to prevent it from falling.
2. Release the front and middle retainers. To do this, loosen the 2 fastening screws.



Bracket for exhaust system



Note

- Before the rear silencer is released, the exhaust system must be supported with a transmission jack or held by another person.
3. Unscrew the fastening screws on the left and right of the rear silencer.
 4. Remove exhaust system.

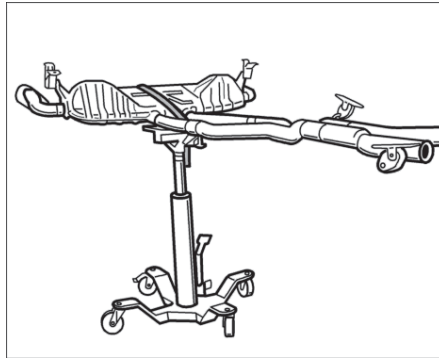
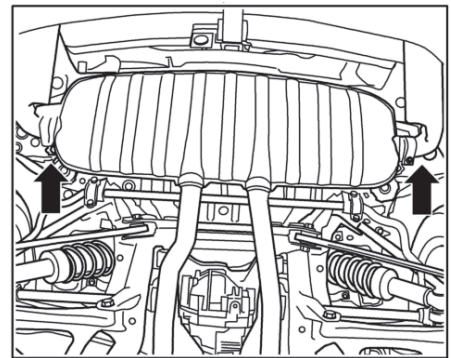


Figure shows exhaust system on transmission jack



Mount for rear silencer

Installing exhaust system

1. Position exhaust system under the vehicle supported by a transmission jack or another person.

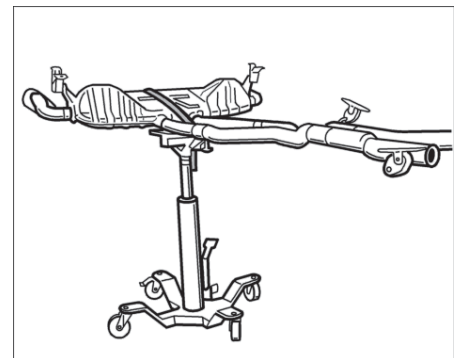
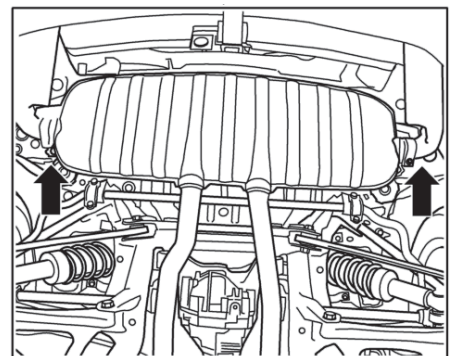


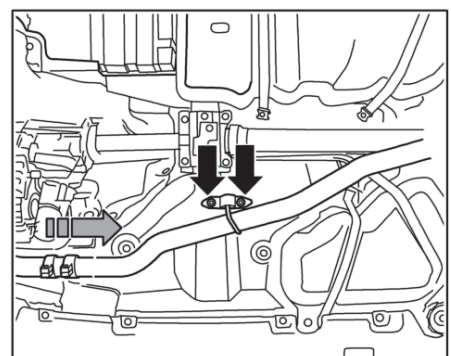
Figure shows exhaust system on transmission jack

2. Tighten the fastening screws of the rear muffler. For tightening torques see → 263355 Replacing rear silencer - "Replacing" section.



Mount for rear silencer

3. Tighten the front and middle supports **-arrows-** . → **Tightening torque: 17 ftlb.**



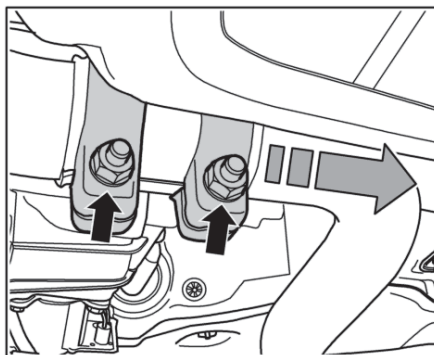
Bracket for exhaust system

4. Install new exhaust clamps. The bolts must be pointing downwards. → **Adjustment value: 10 °** → **Tightening torque: 44 ftlb.**

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14,
C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28,
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26 10 19 Removing and installing exhaust manifold - as of MY 2003

- Preliminary work
- Removing exhaust manifold — Cayenne S (type M48/00)
- Installing exhaust manifold — Cayenne S (type M48/00)
- Subsequent work

Preliminary work

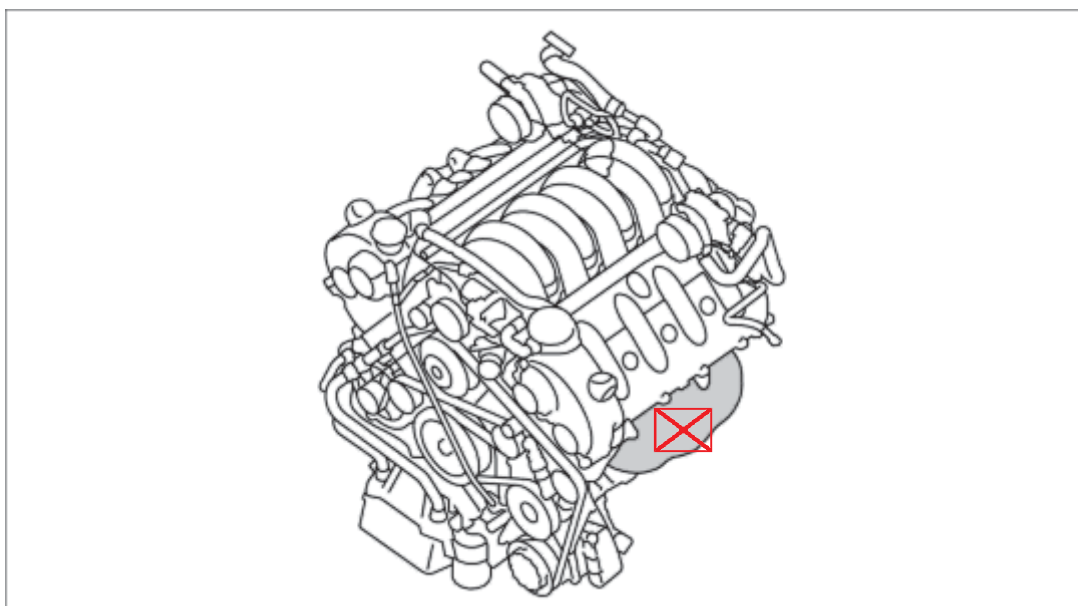
Preliminary work for removing exhaust manifold

1. Remove engine. → 100119 Removing and installing V8 4.5 l engine - section on "Removing"

Removing exhaust manifold — Cayenne S (type M48/00)

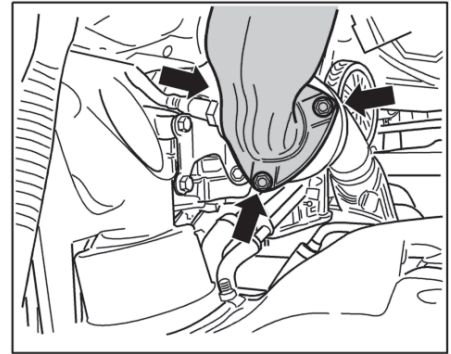
Removing exhaust manifold - Cayenne S (type M48/00)

Installation Location:

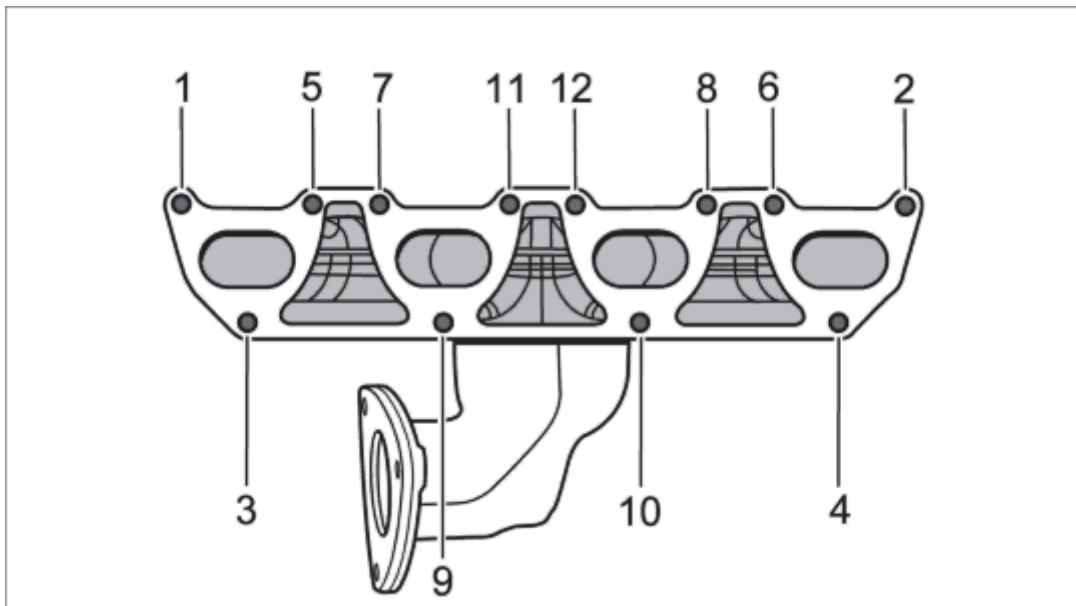


Overview of exhaust manifold

1. Loosen starter catalyst from exhaust manifold. To do this, loosen the three fastening screws **-arrows-** .
2. Unclip the oxygen sensor cable from all holders. Remove oxygen sensor when replacing exhaust manifold.
3. Loosen the 12 fastening nuts in the sequence shown below. Remove the exhaust manifold.



Fastening screws for securing primary catalytic converter onto exhaust manifold



Fastening nuts

Installing exhaust manifold — Cayenne S (type M48/00)

Installing exhaust manifold - Cayenne S (type M48/00)

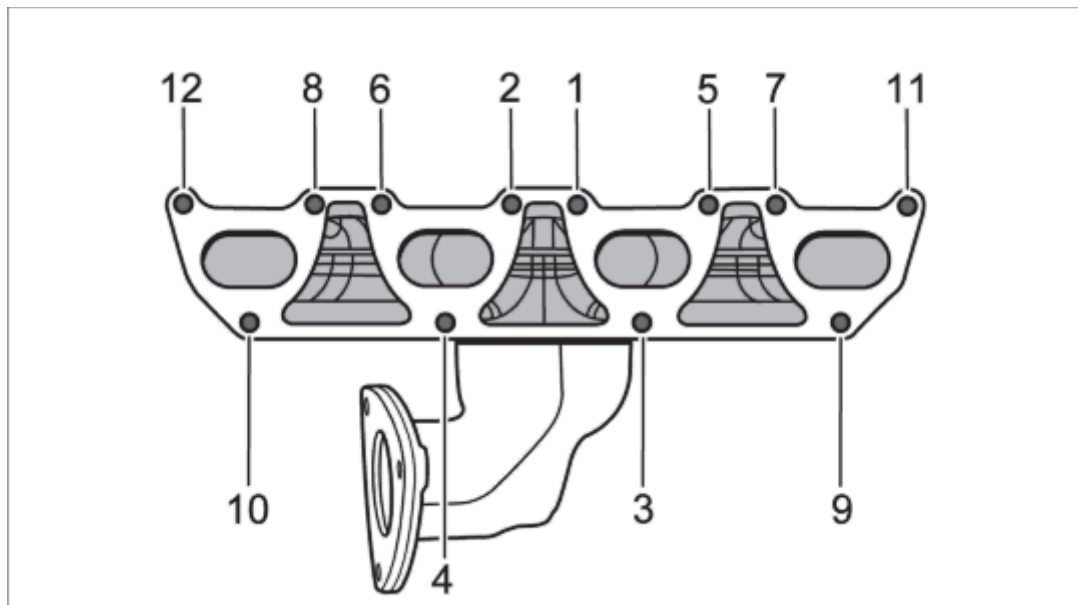


Note

- Visually inspect exhaust manifold for cracks and distortion.
- A cracked or distorted exhaust manifold may not be reinstalled.
- As a matter of principle, replace seals on manifold.
- If the studs in the cylinder head are damaged, they must be replaced. → 157356 Replace mount for exhaust manifold (stud) - "Replacing" section

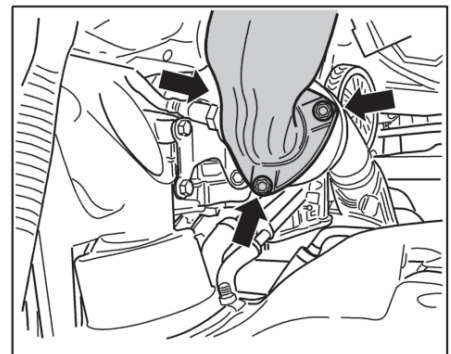
1. Clean sealing surfaces. The surfaces must be free from foreign objects.
2. Use a new seal. The seal must be positioned so that the part number is visible from the outside.

3. Push the manifold across the studs and fit it with 12 new fastening nuts. The fastening nuts are tightened in two stages in accordance with the tightening sequence → *Tightening sequence for fastening nuts* → **Tightening torque: 19 ftlb.** and → **Tightening torque: 24 ftlb.** .



Tightening sequence for fastening nuts

4. Fit oxygen sensor when replacing exhaust manifold. For details see → 246919 Removing and installing oxygen sensor ahead of catalytic converter - "Installing" section. Clip oxygen sensor cable into the holders.
5. Fit starting catalytic converters with new gaskets. For details see → 267619 Removing and installing primary catalytic converter - "Installing" section.



Fastening screws for securing primary catalytic converter onto exhaust manifold

Subsequent work

Subsequent work for installing exhaust manifold

1. Install engine. → 100119 Removing and installing V8 4.5 l engine - section on "Installing"

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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26 28 01 Checking exhaust system mount - as of MY 2003

Tools

Designation	Type	Number	Explanation	
chain pipe cutters	commercially available tool	NR.166		

Checking exhaust system mount



ATTENTION

Danger of burns from hot exhaust system!

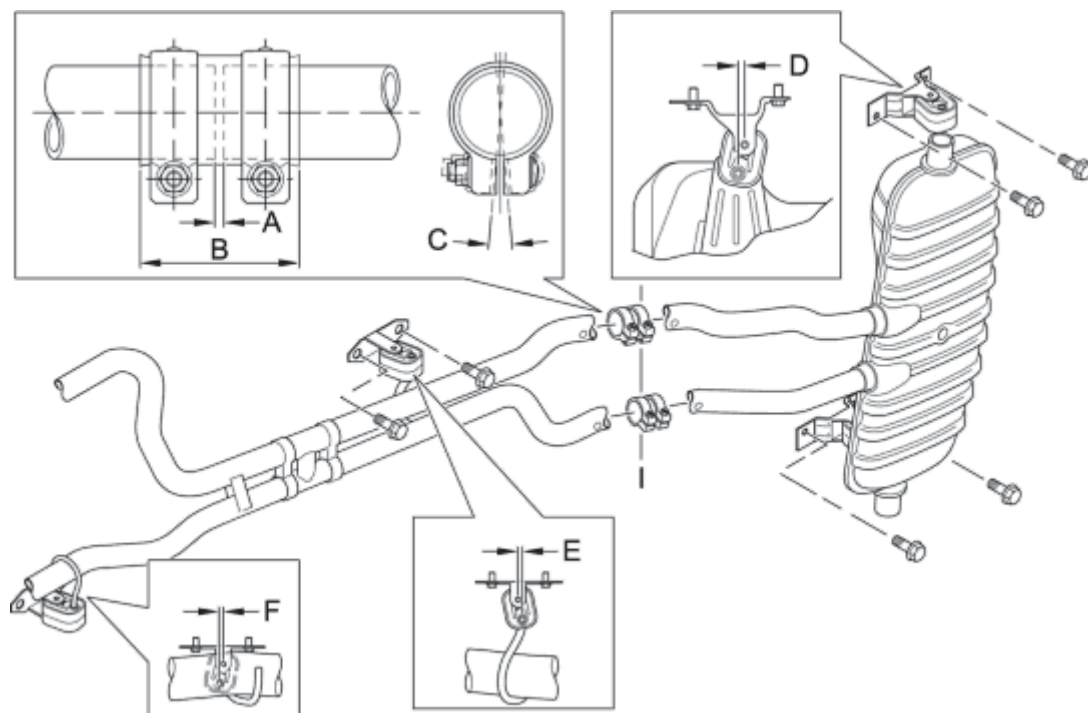
- Do not touch the exhaust system until it has cooled down!
- Wear protective gloves!



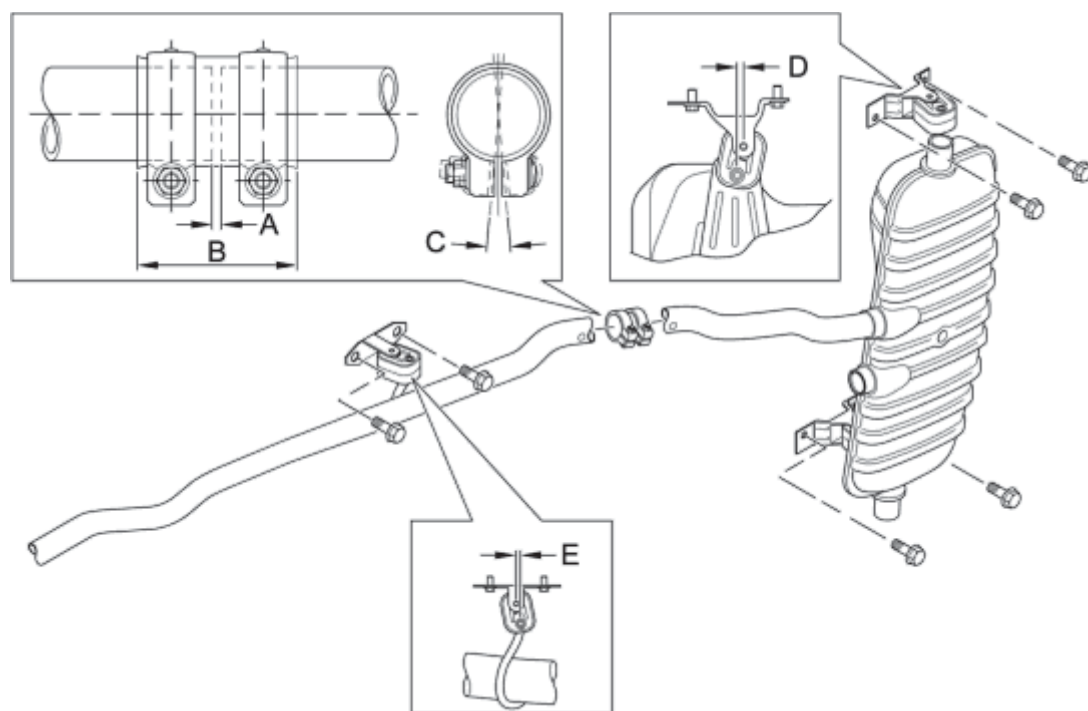
Note

- Check the rubber-metal mounts between the body and the exhaust system for cracks and elongation and check overall condition.
- During the life of the vehicle, the rubber-metal mounts must not soften to such an extent that the exhaust system starts to hit against adjacent components or the body.
- Check the exhaust system for contact with adjacent parts by shaking it manually.
- Examine the metal mount for corrosion and damage and check that it is positioned correctly.
- Damaged components must be replaced.
- The exhaust system must be moved to the correct installation position or damaged components must be

replaced if necessary.



Component overview for V8 exhaust system

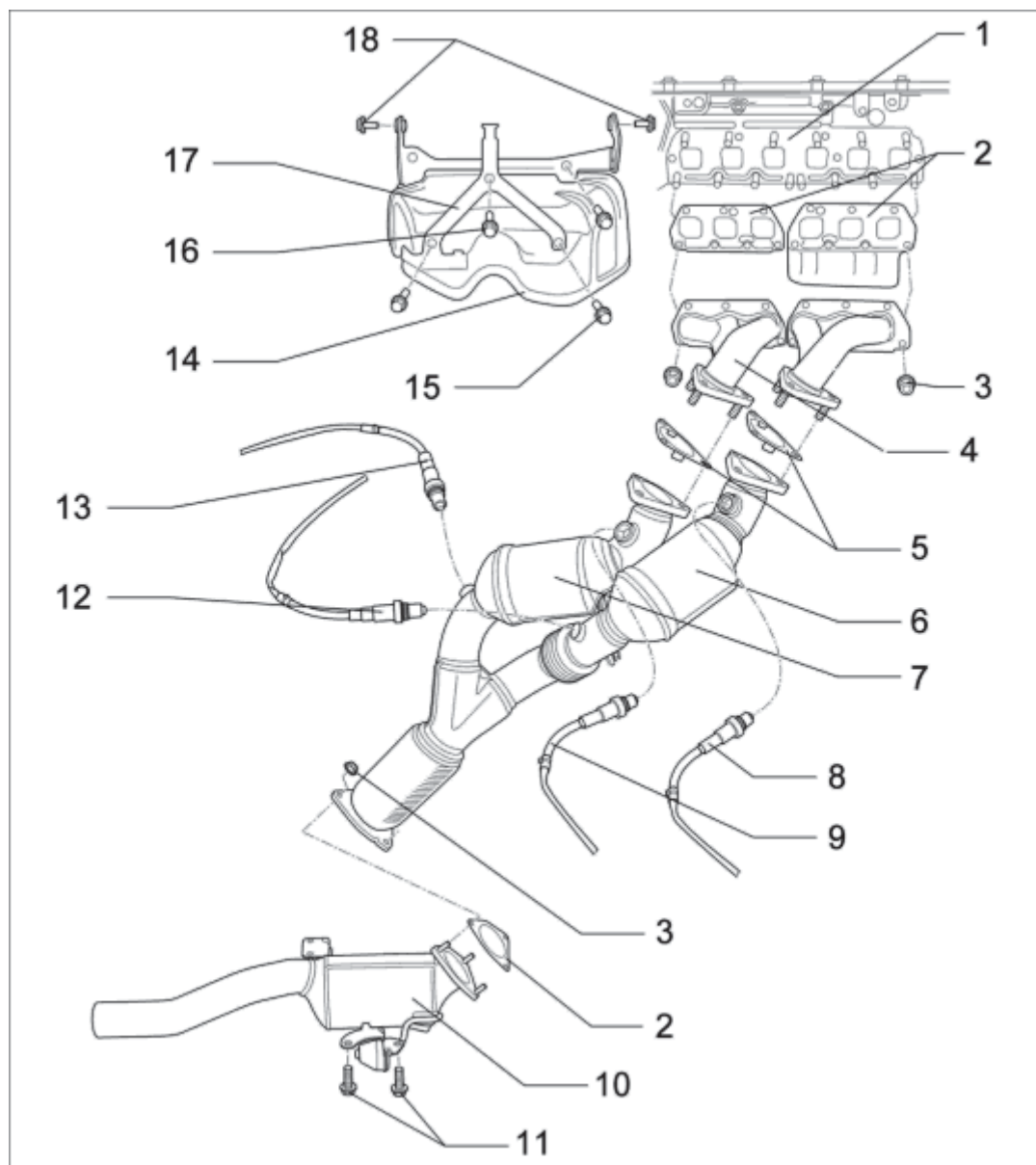


Component overview for V6 exhaust system

No.	Designation	Qty.	Removal	Fitting
-I-	Repair separation point	2	When carrying out repairs, separate at the central notch with chain pipe cutters NR.166 .	Link up the separation point with 2 exhaust straps. Position the straps horizontally. (Nut pointing downwards)
-A-	Gap dimension			Max. 5 mm

-B-	Exhaust strap length	95 mm
-C-	Inclination	Maximum inclination: 10 °
-D-	Offset of the rear silencer 2 retainer	10 mm
-E-	Off-centre position of central 1 mount	4 mm
-F-	Off-centre position of front 1 mount	2 mm

Main catalytic converter V6 and V8 are of the same design -10-



Exhaust manifold and catalytic converters V6

- 1 - Cylinder head
- 2 - Exhaust manifold seal
- 3 - M8 fastening nut; replace
- 4 - Exhaust manifold
- 5 - Flange gasket; replace
- 6 - Primary catalytic converter, cylinders 1, 2 and 3

- 7** - Primary catalytic converter, cylinders 4, 5 and 6
 - 8** - Oxygen sensor in front of catalytic converter, cylinders 1, 2 and 3
 - 9** - Oxygen sensor in front of catalytic converter, cylinders 4, 5 and 6
 - 10** - (Main) catalytic converter (of same design as V8)
 - 11** - Fastening screws M8
 - 12** - Oxygen sensor behind catalytic converter, cylinders 1, 2 and 3
 - 13** - Oxygen sensor behind catalytic converter, cylinders 4, 5 and 6
 - 14** - Heat shield
 - 15** - Fastening screw M8
 - 16** - Fastening screws M8 for intake distributor
 - 17** - Support for intake distributor
 - 18** - Side fastening screws M8 for intake distributor
-

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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26 33 55 Replacing rear silencer - as of MY 2003

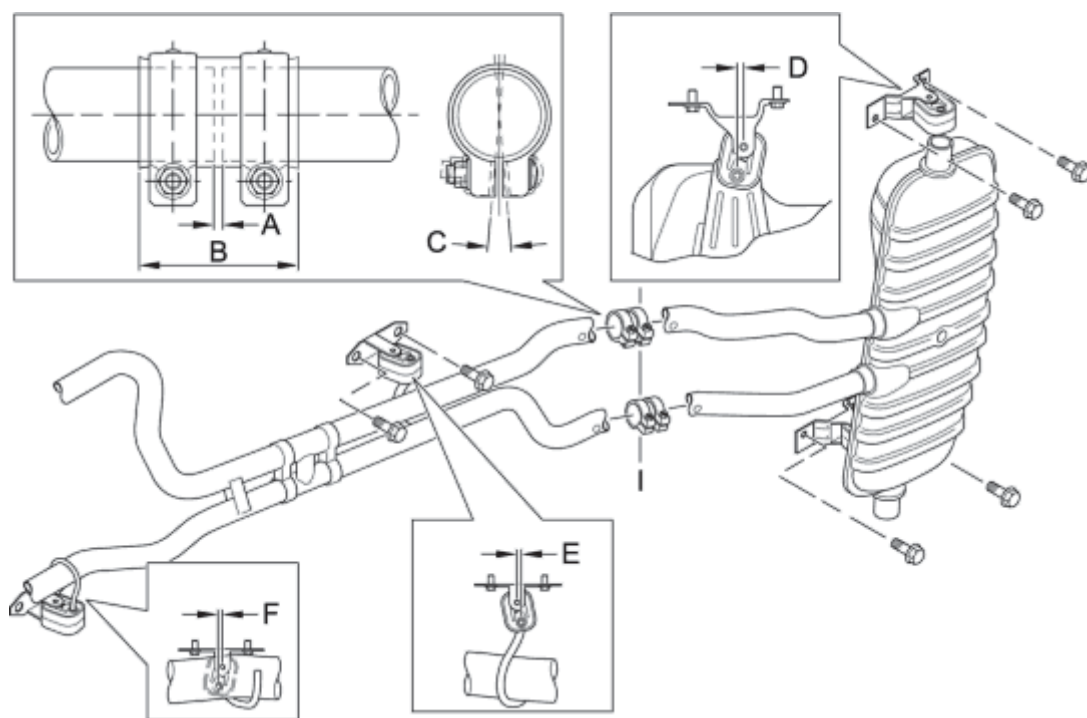
- [Information](#)
- [Detaching rear silencer](#)
- [Replacing rear silencer](#)

Tools

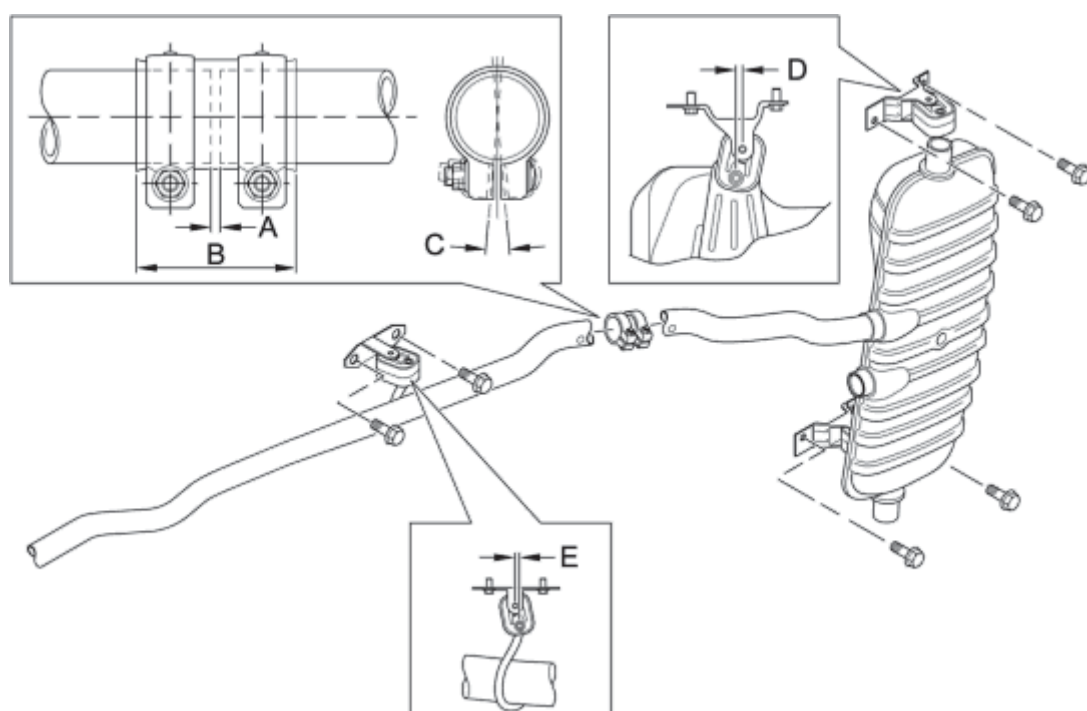
Designation	Type	Number	Explanation	
chain pipe cutters	commercially available tool	NR.166		

Information

Component overview



Component overview for V8



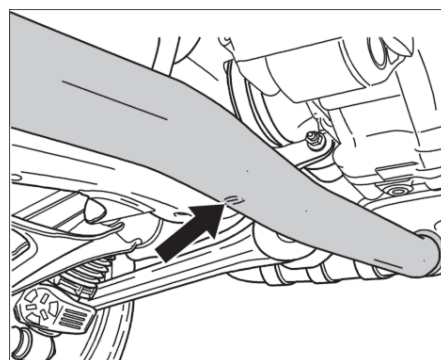
Component overview for V6 (single-strand exhaust system)

No.	Designation	Qty.	Removal	Fitting
I	Repair separation point	2	When carrying out repairs, separate at the central notch with chain pipe cutters NR.166 .	Link up the separation point with 2 exhaust straps. Position the straps horizontally. (Nut pointing downwards)
A	Gap dimension			Max. 5 mm
B	Exhaust strap length			95 mm

C	Inclination	Maximum inclination: 10 °
D	Offset of rear silencer retainer 2	10 mm
E	Off-centre position of central holder	4 mm
F	Off-centre position of front holder	2 mm

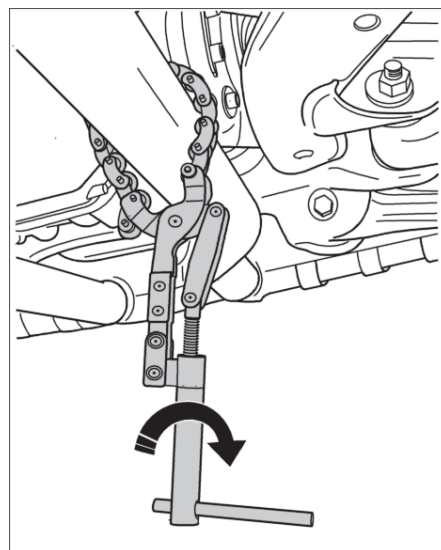
Detaching rear silencer

1. Use a transmission jack to prevent the rear silencer from falling.
2. There is a small notch on the underside of the exhaust pipes that is level with the rear axle transmission. The notch marks the disconnection point.



View shows the disconnection point

3. Place the pipe cutter chain around the exhaust pipe near the notch and engage in the other end of the pipe cutter. Then clamp the chain firmly by twisting the handle.



Laying chain of pipe cutter around exhaust pipe

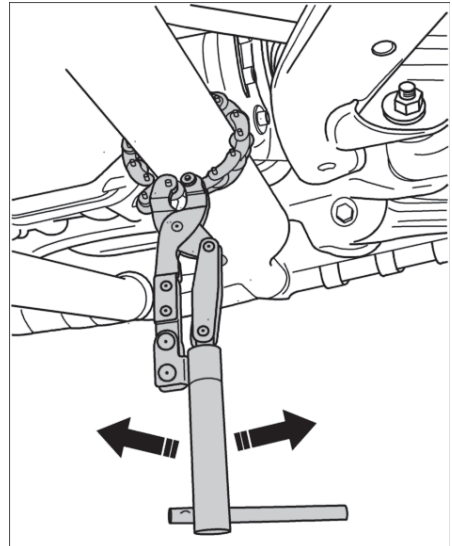
4. Swivel the pipe cutter to and fro in large movements until the pipe is cut through. While doing this, keep tightening the chain by twisting the handle.



Note

The exhaust system in the V6 is designed as a single strand. Repair instructions and notes apply to both exhaust systems.

5. Then cut through the second exhaust pipe.



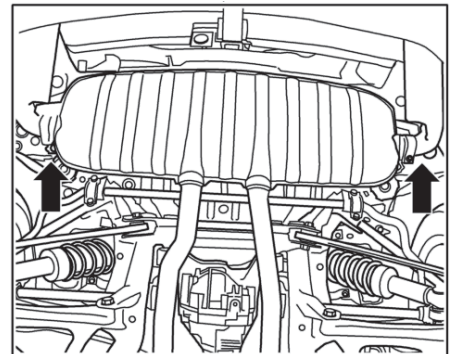
Cutting through pipe with pipe cutter



Note

- Before the rear silencer is released, the exhaust system must be supported with a transmission jack or held by another person.

6. Undo the four fastening screws to the left and right on the rear silencer and remove the rear silencer from the vehicle.



Fastening screws for rear silencer

Replacing rear silencer

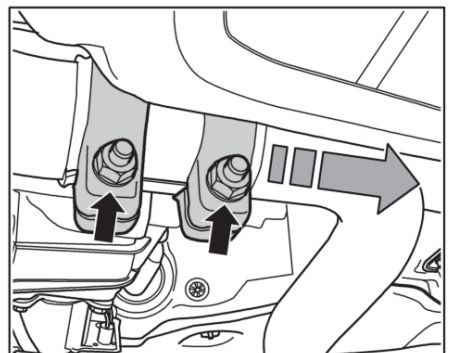
1. Remove the tailpipes on the old rear silencer and attach them to the new one. Fit new attaching rubbers.



Note

The exhaust system in the V6 is designed as a single strand. Repair instructions and notes apply to both exhaust systems.

2. Push the two new connecting clamps onto the exhaust pipes on the rear silencer . Then install the rear silencer using a transmission jack. Tighten the four fastening screws to the specified tightening torque. → **Tightening torque: 17 ftlb.**
3. Push connecting clamps over the exhaust system and align them → 263355 Replacing rear muffler - "Information" section. Tighten fastening screws. → **Tightening torque: 44 ftlb.**



Connecting clamps on exhaust system

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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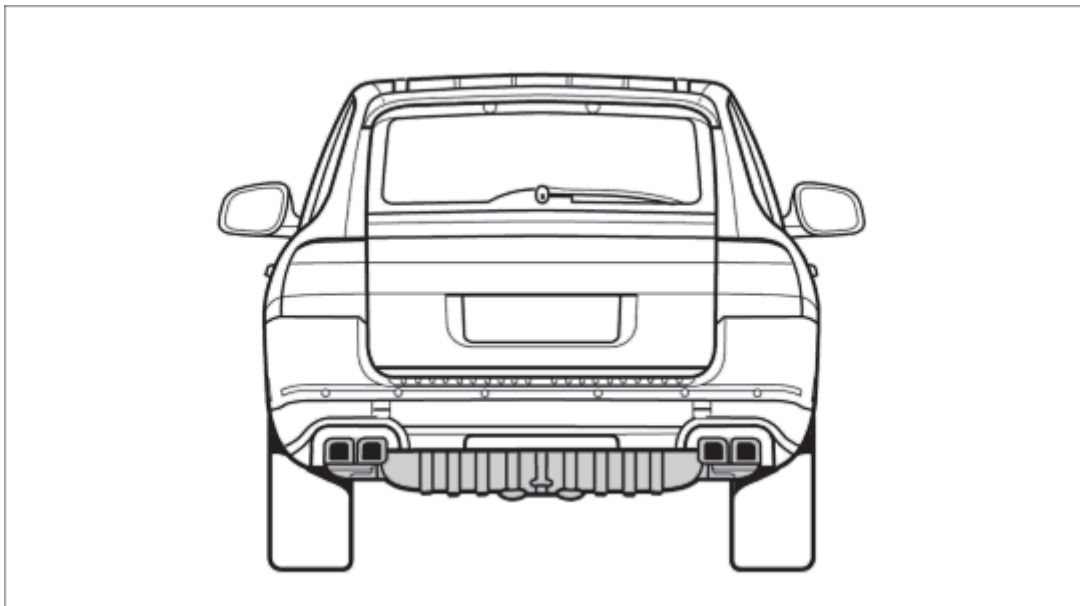
26 34 15 Adjusting tailpipes - as of MY 2003

- Adjusting tailpipes

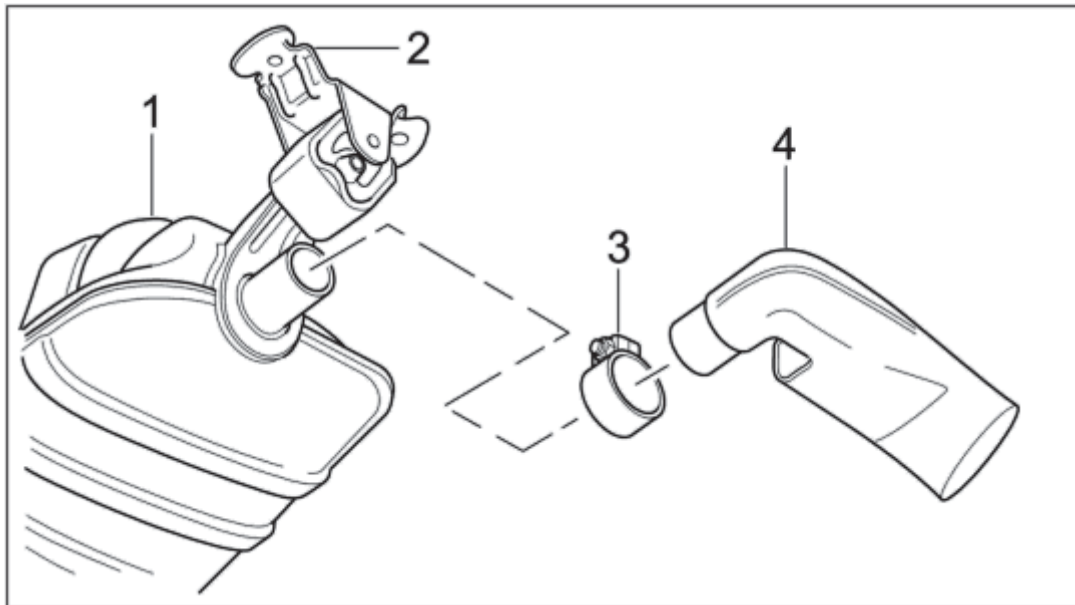
Adjusting tailpipes

Adjusting tailpipes - Cayenne S (type M48/00) and V6

Installation Location:



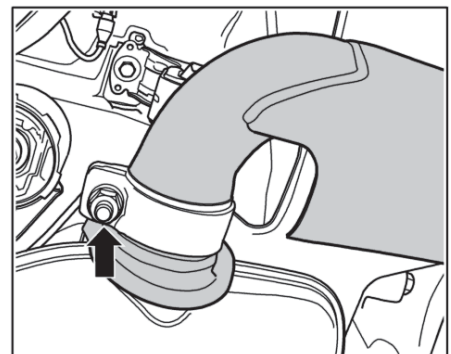
Overview of tailpipes



Component overview

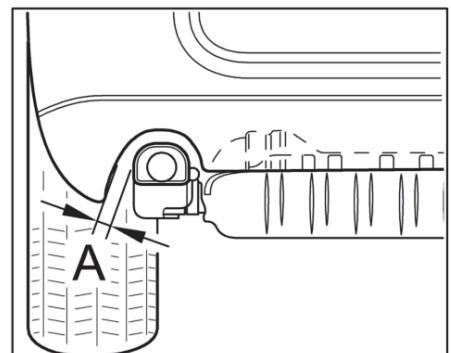
- 1 - Rear muffler
- 2 - 2 mounts (align during installation)
- 3 - 2 tailpipe clamps
- 4 - 2 tailpipes (align during installation)

1. Undo screw **-arrow-** on tailpipe clamp.



Fastening screw for tailpipe

2. Align tailpipes. The circumferential gap **-A-** should be → **Adjustment value: 31 mm +/- 1 mm** .

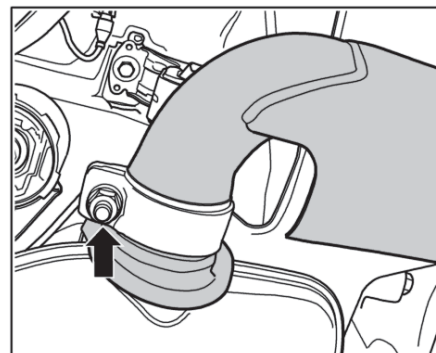


Aligning tailpipes

3. Tighten bolt on tailpipe clamp. → **Tightening torque: 44 ftlb.** .

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14,
C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28,
C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



Fastening screw for tailpipe



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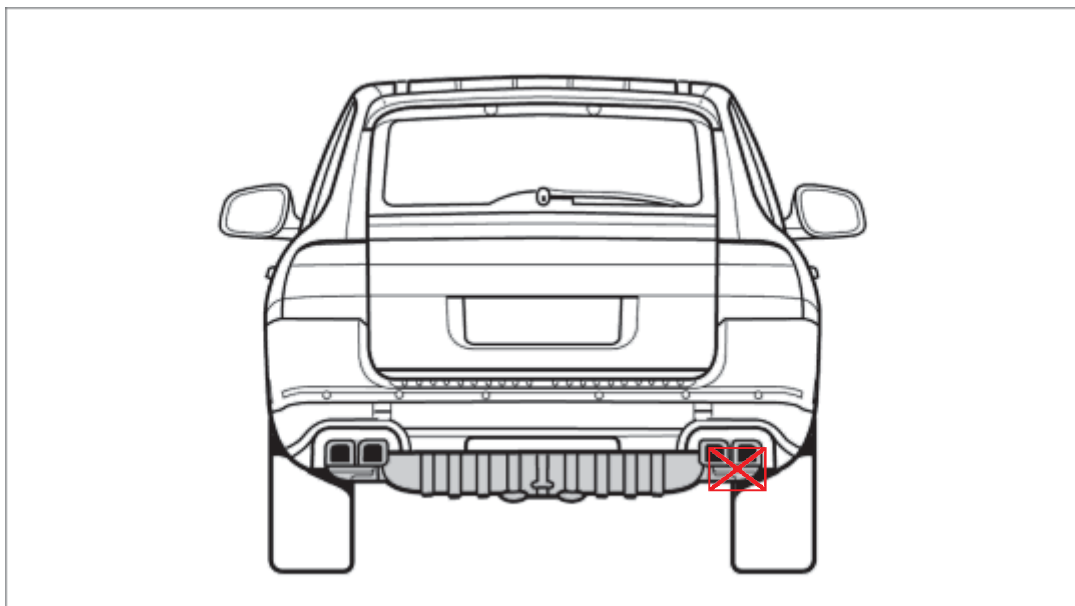
26 34 19 Removing and installing tailpipes - as of MY 2003

- Removing and installing tailpipes

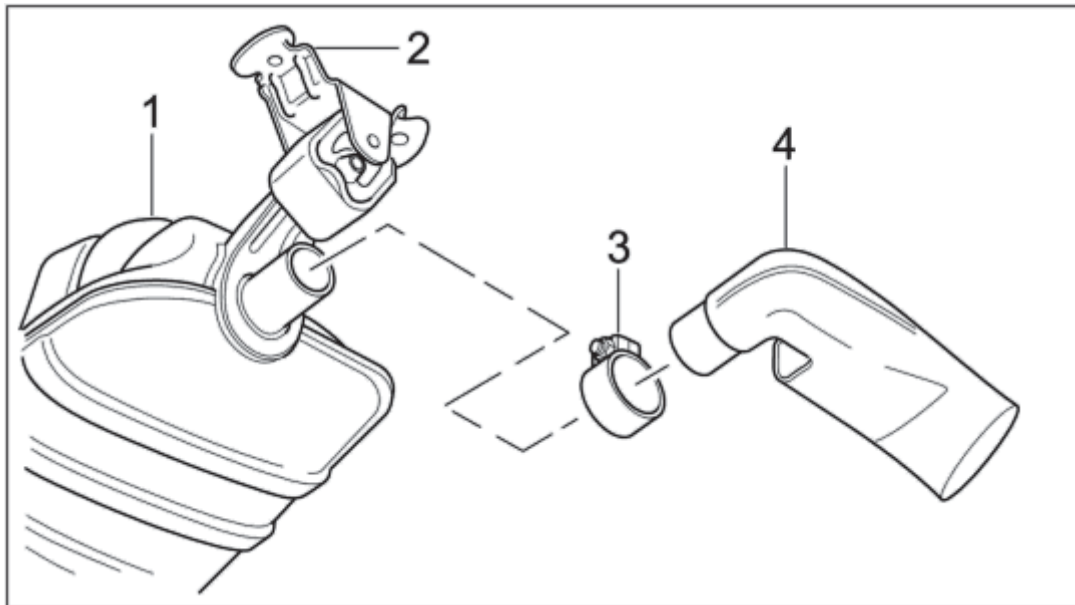
Removing and installing tailpipes

Removing and installing tailpipes

Installation Location:

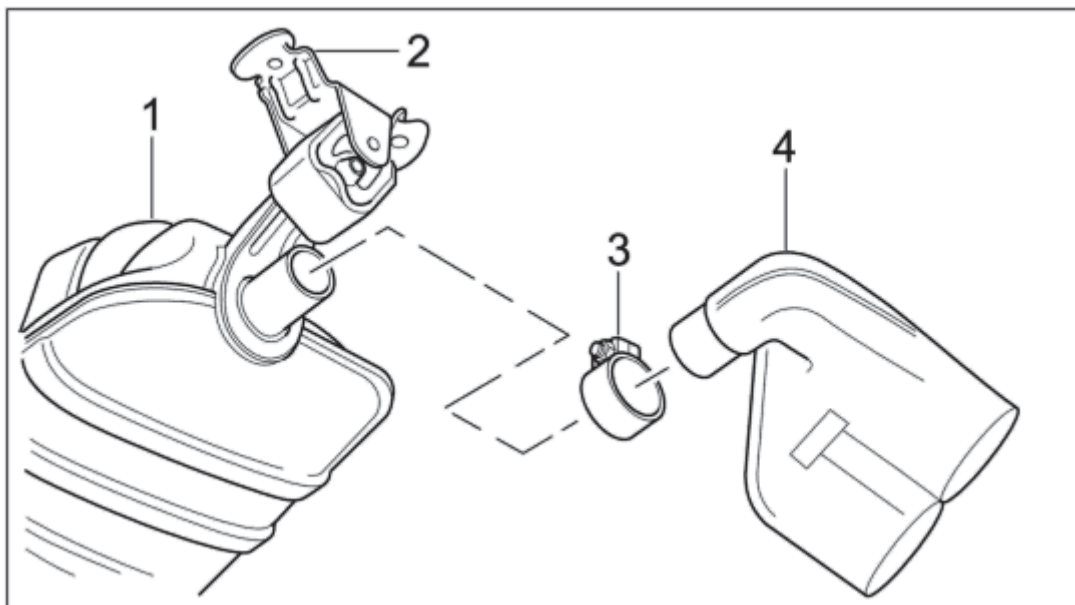


Tailpipes (1/2 page)



Component overview for Cayenne naturally-aspirated engine

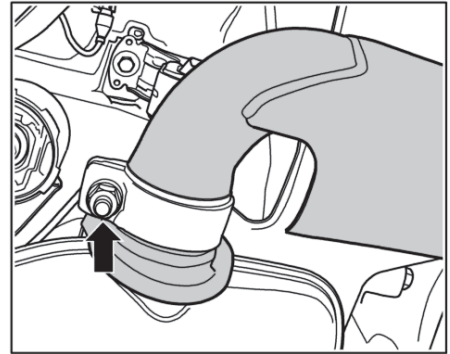
- 1 - Rear muffler
- 2 - 2 mounts (align during installation)
- 3 - 2 tailpipe clamps
- 4 - 2 tailpipes (align during installation)



Component overview for Cayenne Turbo

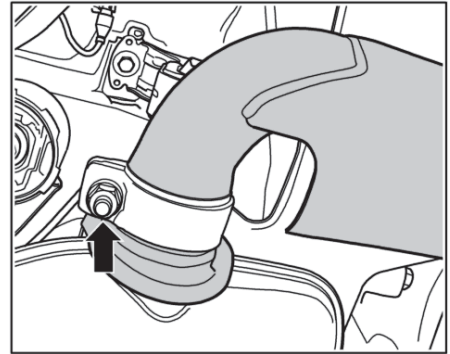
- 1 - Rear muffler
- 2 - 2 mounts (align during installation)
- 3 - 2 tailpipe clamps
- 4 - 2 tailpipes (align during installation)

1. Undo screw **-arrow-** on tailpipe clamp.
2. Loosen tailpipes by turning and pulling off.



Fastening screw for tailpipe

3. Clean extension positions and replace tailpipe clamp if necessary depending on the condition.
4. Put tailpipes in installation position and align → 263415 Aligning tailpipes [9PAAD1 9PAAD7 9PAAE1 9PAAE7]→ 263415 Aligning tailpipes [9PAAF1 9PAAJ1].
5. Tighten the bolt on the tailpipe clamp. → **Tightening torque: 60 (44 ftlb.) Nm** .



Fastening screw for tailpipe

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
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AVERTISSEMENT

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26 65 19 Removing and installing secondary air pump - as of MY 2003

- Preliminary work
- Removing secondary air pump
- Installing secondary air pump
- Subsequent work

Preliminary work

Preliminary work for removing secondary air pump

1. Remove engine compartment cover on left, right and rear. → 700219 Removing and installing front cover (engine compartment) - chapter on "removing"

Removing secondary air pump

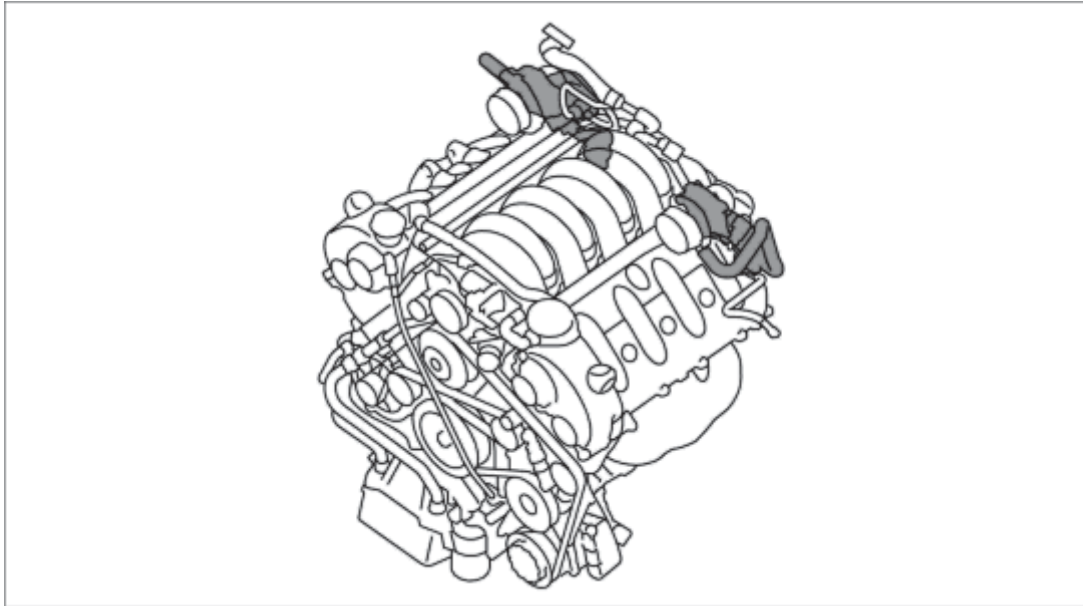
Removing secondary air pump



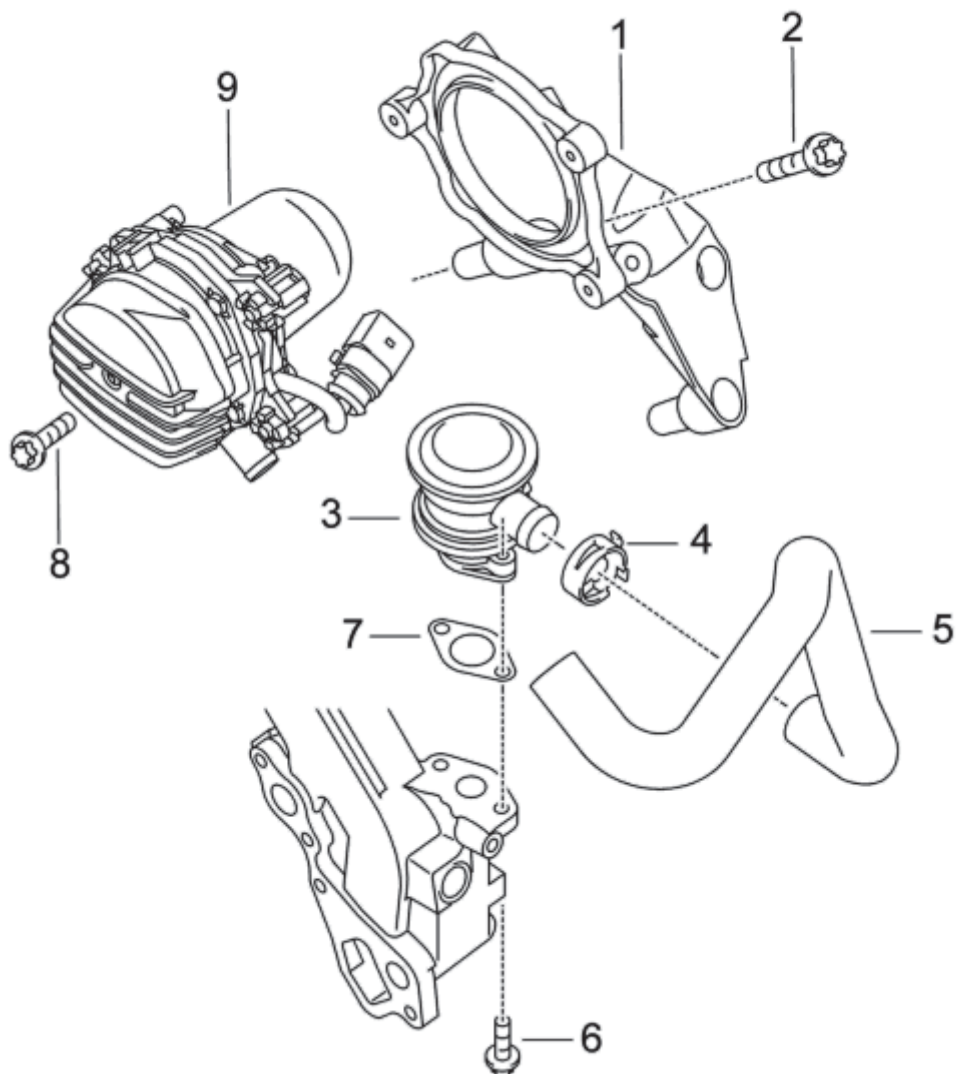
Note

- *The description only relates to one secondary air pump.*
- *The second pump is removed in a similar way.*

Installation Location:



Overview of secondary air pump



Component overview

- 1** - Bracket for secondary air pump
- 2** - Fastening screw M6 x 50
- 3** - Secondary air pump valve
- 4** - Spring band clamp
- 5** - Connecting hose
- 6** - 2 fastening screws M6 x 20
- 7** - Seal (replace during installation)
- 8** - 3 fastening screws M6 x 50
- 9** - Secondary air pump

1. Remove hose from secondary air pump. Then separate the electric connector on the secondary air pump.
2. Unscrew the 3 fastening screws on the secondary air pump.
3. Remove pump from support.

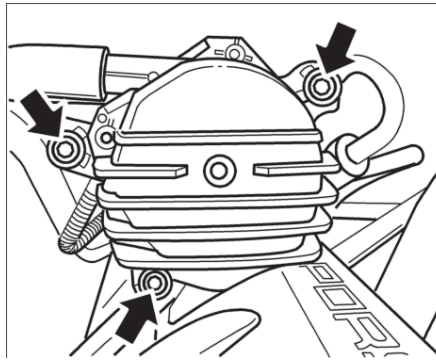
Removing bracket for secondary air pump



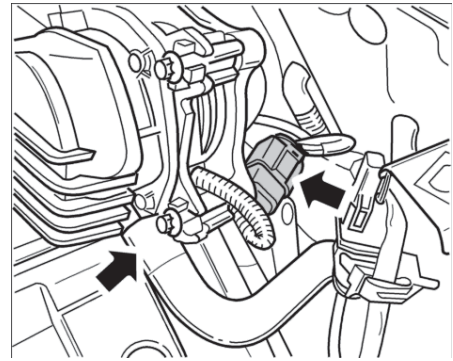
Note

On the right secondary air pump also unclip the cooling water hose and vacuum hose.

1. Undo the three fastening screws for the bracket and remove the bracket.



Fastening screws for secondary air pump



Hose and electric connector on secondary air pump

Installing bracket for secondary air pump



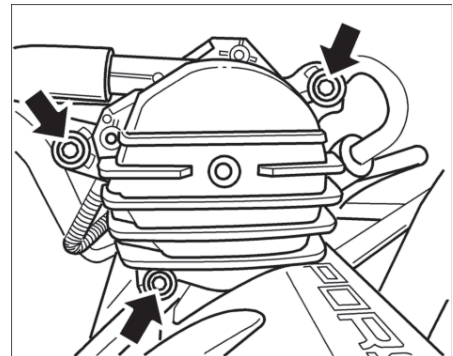
Note

On the right secondary air pump also unclip the cooling water hose and vacuum hose.

1. Install bracket and tighten with the three fastening screws. → **Tightening torque: 7.5 ftlb.**

Installing secondary air pump

1. Push electric connector together and insert pump into the bracket. Then connect the hose to the secondary air pump connection piece.
2. Tighten the three fastening screws. → **Tightening torque: 7.5 ftlb.**



Fastening screws for secondary air pump

Subsequent work

Subsequent work for installing secondary air pump

1. Install engine compartment cover on left, right and rear. → 700219 Removing and installing front cover (engine compartment) - chapter on "installing"

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22,

C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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26 73 19 Removing and installing (main) catalytic converter - as of MY 2003

- Preliminary work
- Removing (main) catalytic converter
- Installing (main) catalytic converter
- Subsequent work

Preliminary work

Preliminary work

1. Remove the engine guard . → 108019 Removing and installing engine guard - chapter on "removing"
2. Lift the vehicle. → 03 Entire vehicle - General

Removing (main) catalytic converter

Removing (main) catalytic converter, cylinder bank 1 - 4



ATTENTION

Danger of burns from hot exhaust system

- Do not remove the exhaust system until it has cooled down!
- Wear protective gloves!



Note

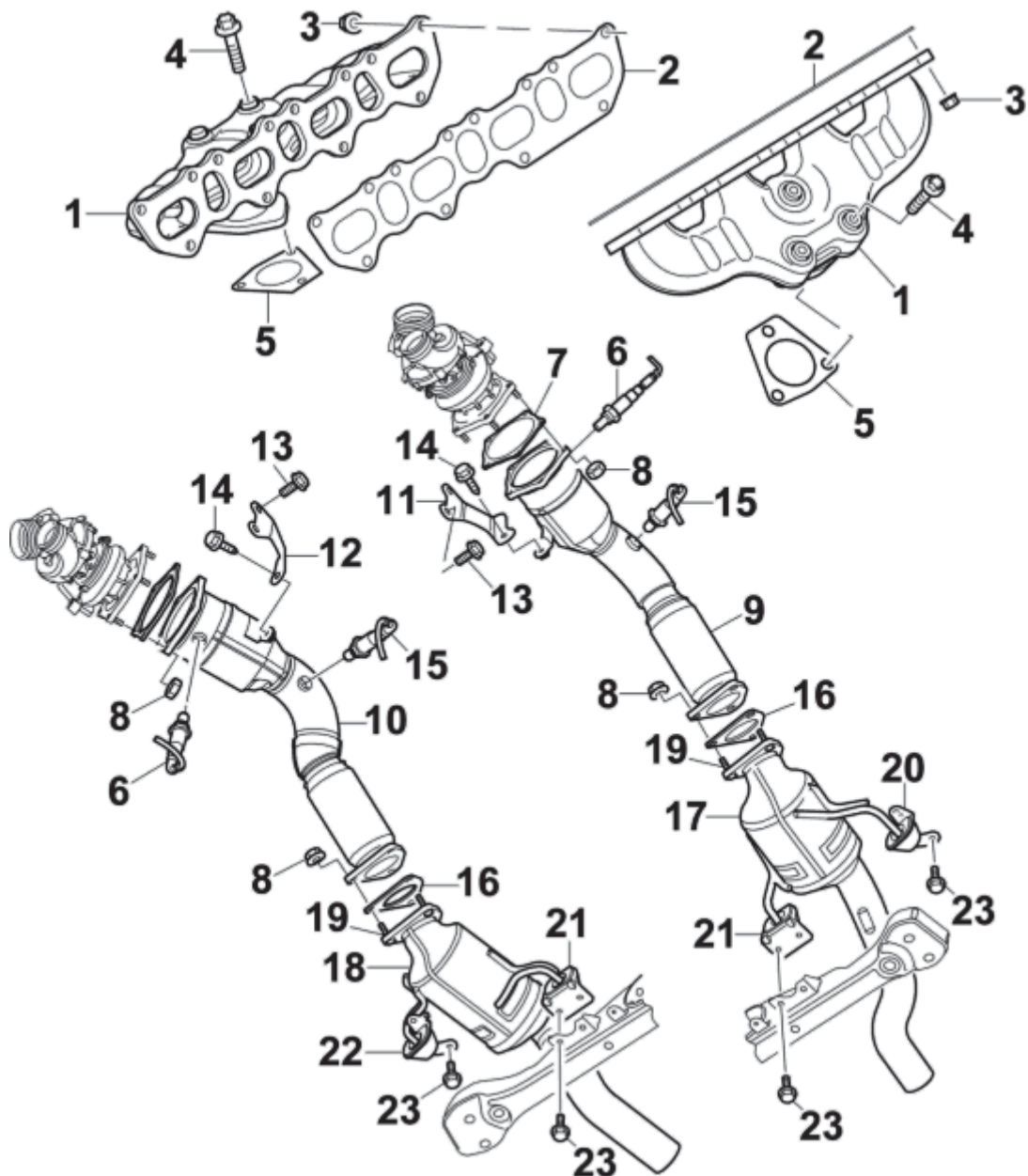
- Cover the right wing and guide through a ratchet from above using several extensions in order to loosen the top nut between the primary and main catalytic converters.



Note

- If the working height of the vehicle has to be changed due to further work, the transmission support must be re-fitted using the old bolts.

Cayenne Turbo (M48/50)

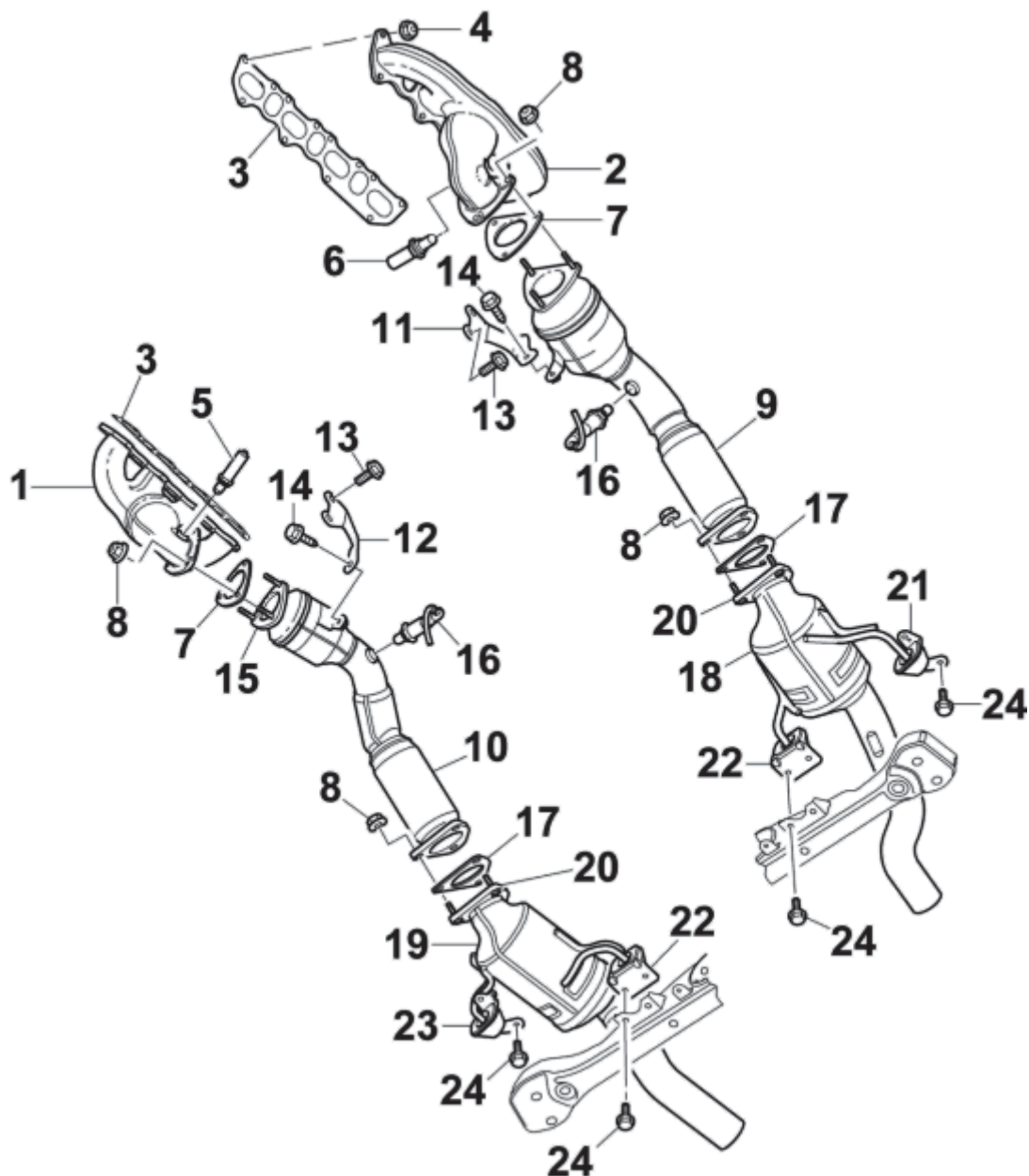


Component overview - Cayenne Turbo

- 1 - 2 exhaust manifolds
- 2 - 2 exhaust manifold gaskets (replace during installation)
- 3 - 24 hexagon nuts M8 (replace during installation; coat threads of studs with Microgleit)
- 4 - 6 Torx screws M8 x 75
- 5 - 2 turbocharger gaskets (replace during installation)
- 6 - 2 oxygen sensors ahead of catalytic converter
- 7 - 2 gaskets (replace during installation)
- 8 - 16 hexagon nuts M8
- 9 - Front catalytic converter
- 10 - Front catalytic converter
- 11 - Support
- 12 - Support
- 13 - 4 hexagon-head bolts M10 x 25
- 14 - 2 hexagon-head bolts M8 x 15

- 15 - 2 oxygen sensors behind catalytic converter
- 16 - 2 gaskets (replace during installation)
- 17 - Catalytic converter
- 18 - Catalytic converter
- 19 - 6 screws
- 20 - Bracket
- 21 - 2 brackets
- 22 - Bracket
- 23 - 8 hexagon-head bolts M8 x 25

Cayenne S (M48/00)

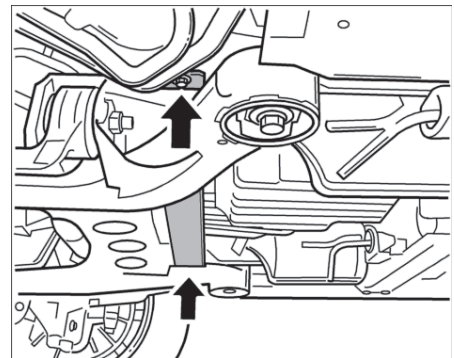


Component overview - Cayenne S

- 1 - Exhaust manifold, cylinders 1 - 4
- 2 - Exhaust manifold, cylinders 5 - 8
- 3 - 2 exhaust manifold gaskets (replace during installation)
- 4 - 24 hexagon nuts M8 (replace during installation; coat threads of studs with Microgleit)

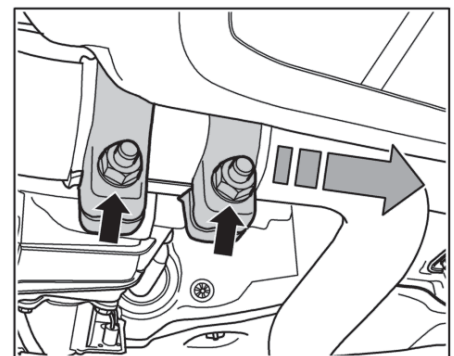
- 5 - Oxygen sensor ahead of catalytic converter
- 6 - Oxygen sensor ahead of catalytic converter
- 7 - 2 gaskets (replace during installation)
- 8 - 12 hexagon nuts M8 (replace during installation)
- 9 - Front catalytic converter
- 10 - Front catalytic converter
- 11 - Support
- 12 - Support
- 13 - 4 hexagon-head bolts M10 x 25
- 14 - 2 hexagon-head bolts M8 x 15
- 15 - 6 studs M8 x 25
- 16 - 2 oxygen sensors behind catalytic converter
- 17 - 2 gaskets (replace during installation)
- 18 - Catalytic converter
- 19 - Catalytic converter
- 20 - 6 screws
- 21 - Bracket
- 22 - 2 brackets
- 23 - Bracket
- 24 - 8 hexagon-head bolts M8 x 25

1. Remove transverse strut. Undo screws (including the centre ones) **-arrows-** .



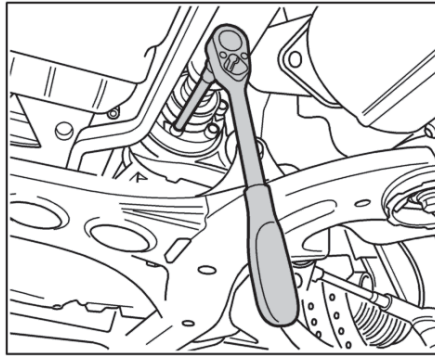
Transverse strut

2. Release connecting clamps between catalytic converters and exhaust system. Then push the clamps backwards onto the exhaust system. The exhaust clamps must not be reused.

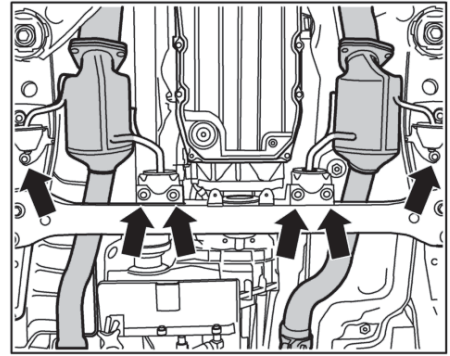


Clamps for connecting catalytic converter to exhaust system

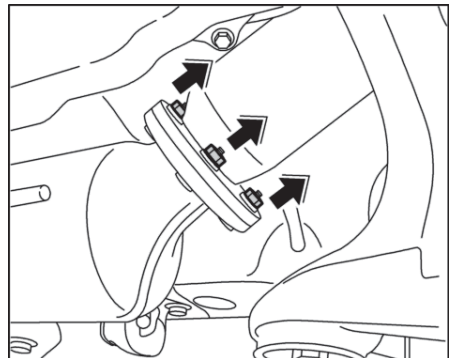
3. Release the catalytic converter mounts from the body and cross member (two screws each).
4. Remove cardan shaft between front-wheel drive and transfer box **-see figure-** . → 390219 Removing and installing front cardan shaft - chapter on "removing" [9PAAE1 9PAAF1 9PAAJ1] → 390219 Removing and installing front cardan shaft - chapter on "removing" [9PAAE7]



Cardan shaft between front-wheel drive and transfer box



Fastening screws to body and cross member



Nuts connecting primary and main catalytic converters

5. Support transmission with transmission jack. Let main catalytic converter hang down. Unscrew the three nuts connecting the primary and main catalytic converters. Remove main catalytic converter. Remove flange gasket.
6. Re-fit transmission support using old screws so that the transmission jack can be removed from under the vehicle.

Removing (main) catalytic converter, cylinder bank 5 - 8

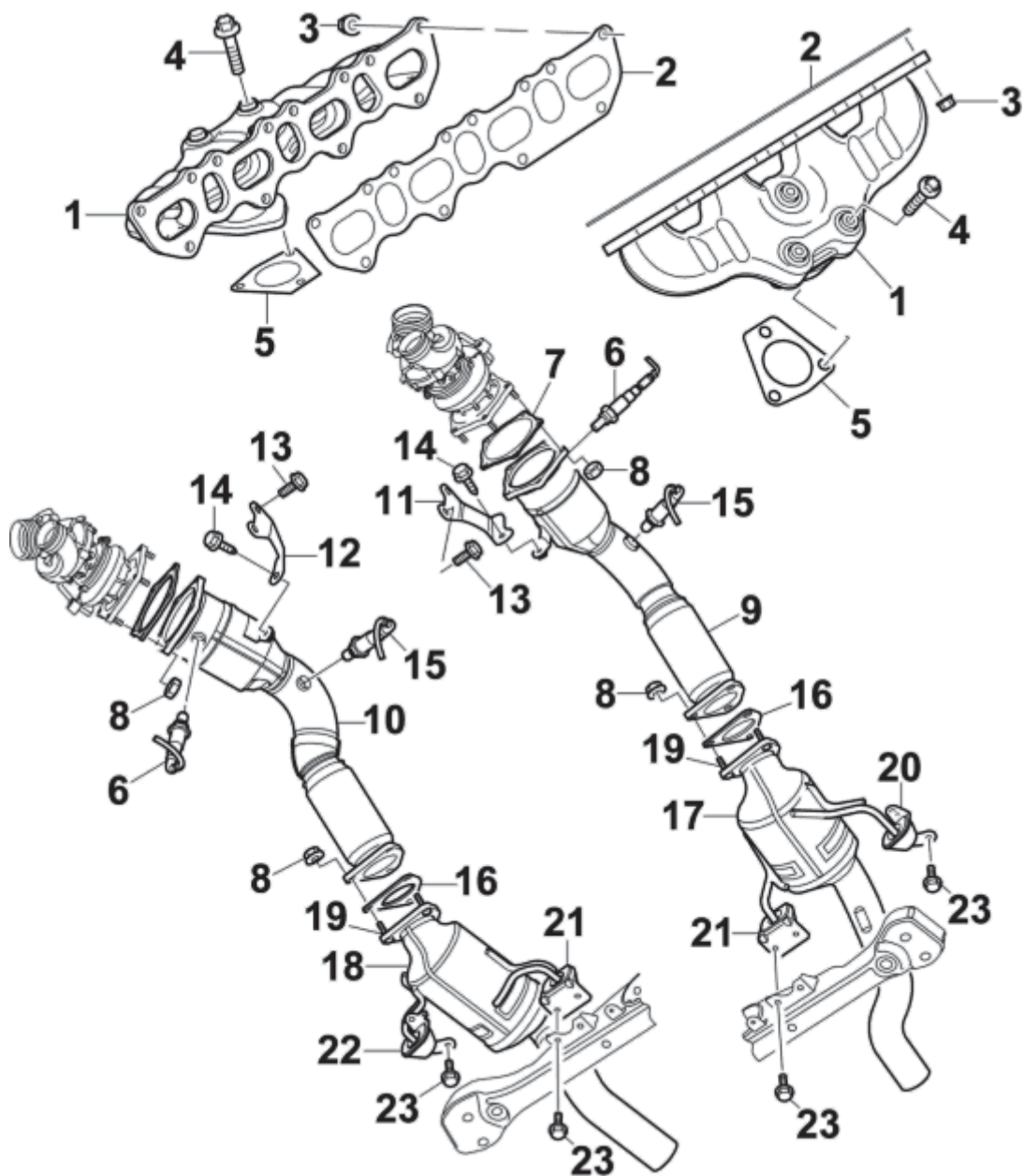


ATTENTION

Danger of burns from hot exhaust system

- Do not remove the exhaust system until it has cooled down!
- Wear protective gloves!

Cayenne Turbo (M48/50)

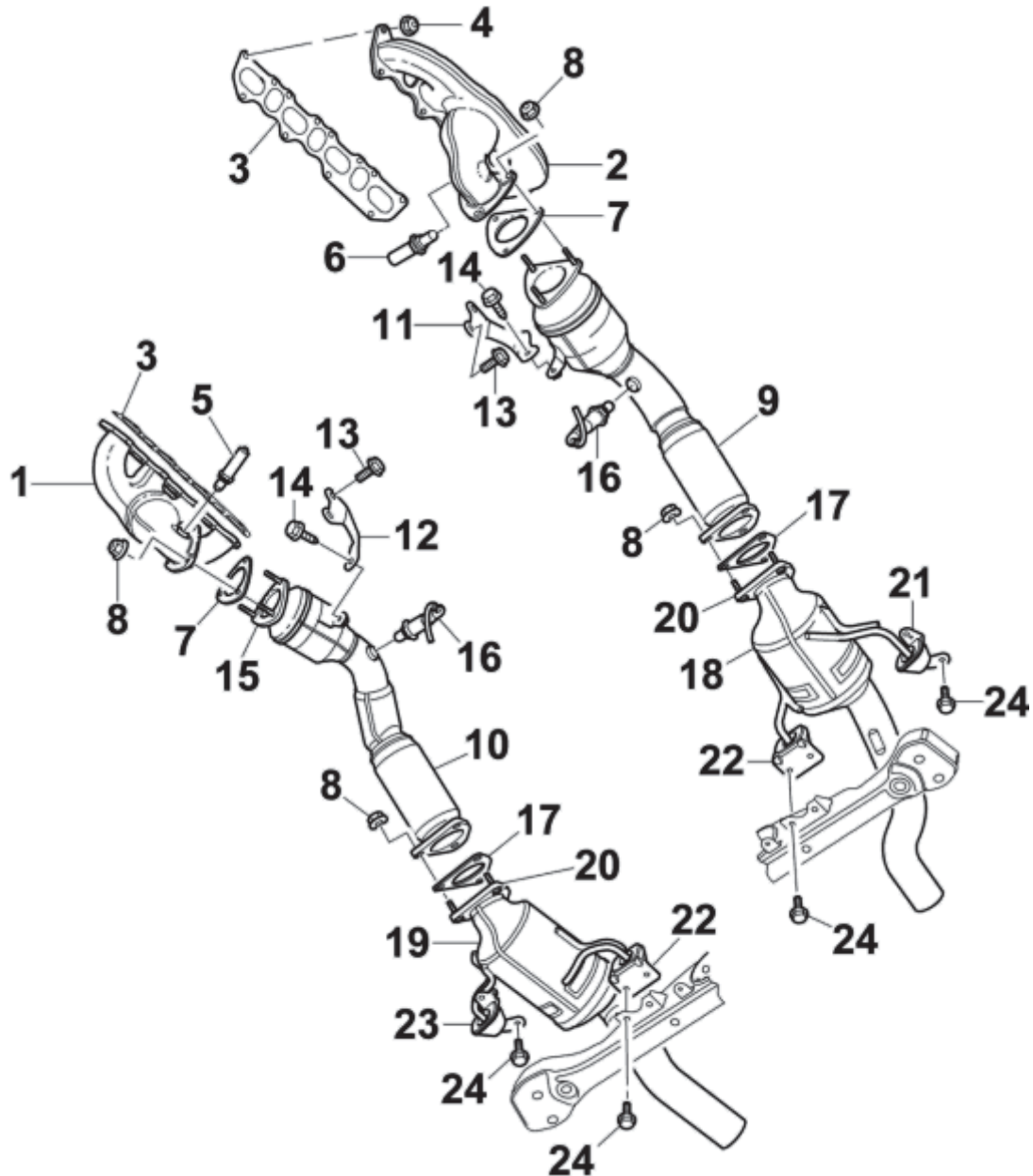


Component overview - Cayenne Turbo

- 1 - 2 exhaust manifolds
- 2 - 2 exhaust manifold gaskets (replace during installation)
- 3 - 24 hexagon nuts M8 (replace during installation; coat threads of studs with Microgleit)
- 4 - 6 Torx screws M8 x 75
- 5 - 2 turbocharger gaskets (replace during installation)
- 6 - 2 oxygen sensors ahead of catalytic converter
- 7 - 2 gaskets (replace during installation)
- 8 - 16 hexagon nuts M8
- 9 - Front catalytic converter
- 10 - Front catalytic converter
- 11 - Support
- 12 - Support
- 13 - 4 hexagon-head bolts M10 x 25
- 14 - 2 hexagon-head bolts M8 x 15
- 15 - 2 oxygen sensors behind catalytic converter

- 16 - 2 gaskets (replace during installation)
- 17 - Catalytic converter
- 18 - Catalytic converter
- 19 - 6 screws
- 20 - Bracket
- 21 - 2 brackets
- 22 - Bracket
- 23 - 8 hexagon-head bolts M8 x 25

Cayenne S (M48/00)

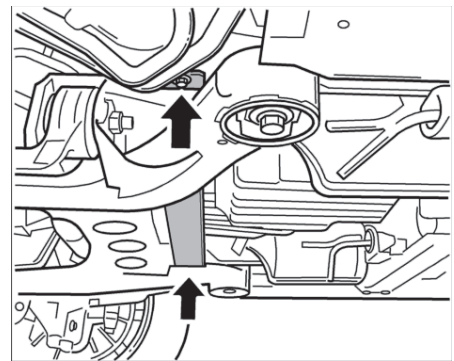


Component overview - Cayenne S

- 1 - Exhaust manifold, cylinders 1 - 4
- 2 - Exhaust manifold, cylinders 5 - 8
- 3 - 2 exhaust manifold gaskets (replace during installation)
- 4 - 24 hexagon nuts M8 (replace during installation; coat threads of studs with Microgleit)
- 5 - Oxygen sensor ahead of catalytic converter

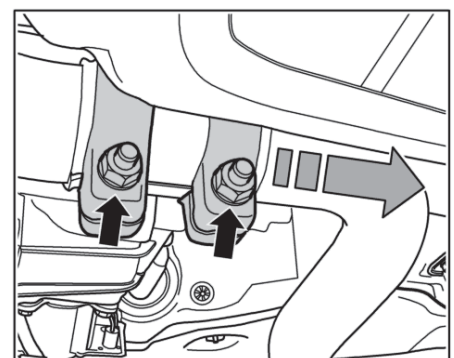
- 6** - Oxygen sensor ahead of catalytic converter
- 7** - 2 gaskets (replace during installation)
- 8** - 12 hexagon nuts M8 (replace during installation)
- 9** - Front catalytic converter
- 10** - Front catalytic converter
- 11** - Support
- 12** - Support
- 13** - 4 hexagon-head bolts M10 x 25
- 14** - 2 hexagon-head bolts M8 x 15
- 15** - 6 studs M8 x 25
- 16** - 2 oxygen sensors behind catalytic converter
- 17** - 2 gaskets (replace during installation)
- 18** - Catalytic converter
- 19** - Catalytic converter
- 20** - 6 screws
- 21** - Bracket
- 22** - 2 brackets
- 23** - Bracket
- 24** - 8 hexagon-head bolts M8 x 25

1. Remove transverse strut. Undo the screws **-arrows-** (do not forget the centre screw).



Transverse strut

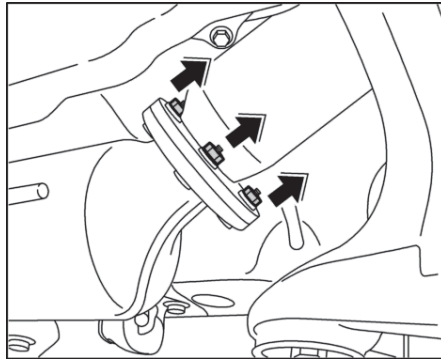
2. Release connecting clamps between catalytic converters and exhaust system. Then push the clamps backwards onto the exhaust system. The exhaust clamps must not be reused.



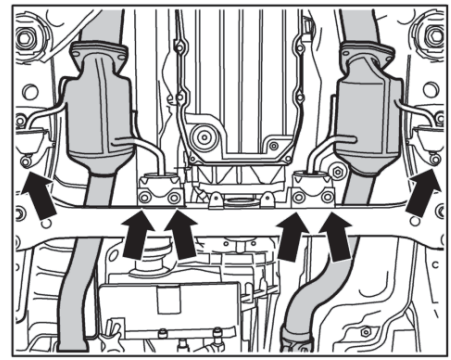
Clamps for connecting catalytic converter to exhaust system

3. Release the catalytic converter mounts from the body and cross member (two screws each).
4. Unscrew the three nuts connecting the primary and main catalytic converters and guide out the main catalytic converter. Remove flange gasket.

Installing (main) catalytic converter



Nuts connecting primary and main catalytic converters



Fastening screws to body and cross member

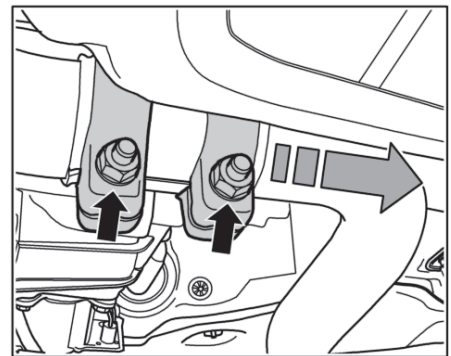
Installing (main) catalytic converter, cylinder bank 1 - 4

1. Transmission support removed and transmission supported with jack.

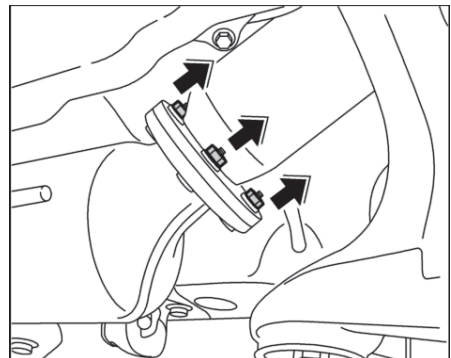


Note

- Gaskets and self-locking nuts and bolts must always be replaced!
2. Push new exhaust clamp onto exhaust pipe.
 3. Ensure sealing faces of exhaust system are clean.
 4. Replace flange gasket and push over the studs of the main catalytic converter.
 5. Put main catalytic converter in the installation position and fit new nuts and bolts.
 6. Tighten nuts connecting primary and main catalytic converters to the specified tightening torque. → **Tightening torque: 17 ftlb.**



Clamps for connecting catalytic converter to exhaust system

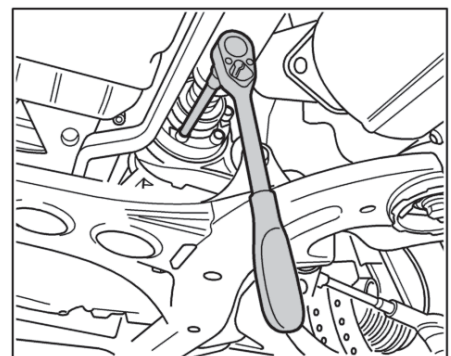


Nuts connecting primary and main catalytic converters



Note

- To fit the cardan shaft, the transmission must be supported again and the transmission support removed. Then fit the transmission support with new screws. → 390219 Removing and installing front cardan shaft - chapter on "installing" [9PAAE1 9PAAF1 9PAAJ1] → 390219 Removing and installing front cardan shaft - chapter on "installing" [9PAAE7]
7. Re-install cardan shaft between front-wheel drive and transfer box. Make sure that the main catalytic converter is also positioned with the cardan shaft over the transmission

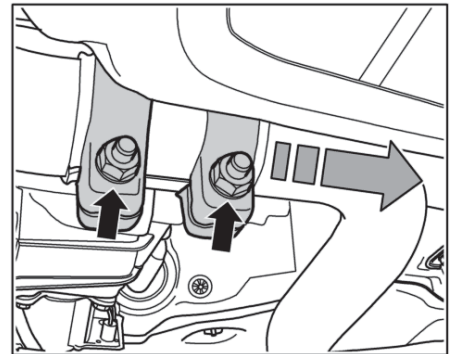


Cardan shaft between front-wheel drive and transfer box

support. → 390219 Removing and installing front cardan shaft - chapter on "installing" [9PAAE1 9PAAF1 9PAAJ1] → 390219 Removing and installing front cardan shaft - chapter on "installing" [9PAAE7]

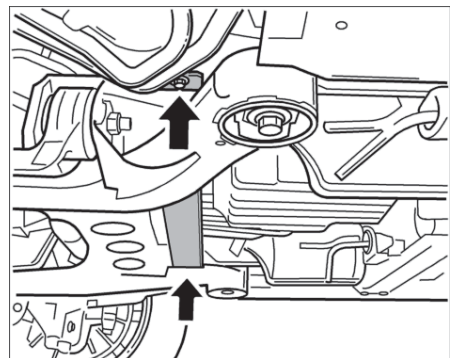
8. Tighten screws of the catalytic converters to the body and cross member with tightening torque. → **Tightening torque: 17 ftlb.**

9. Fit exhaust clamps. For installation position and tightening torque, see → 260119 Removing and installing exhaust system - chapter on "installing".



Clamps for connecting catalytic converter to exhaust system

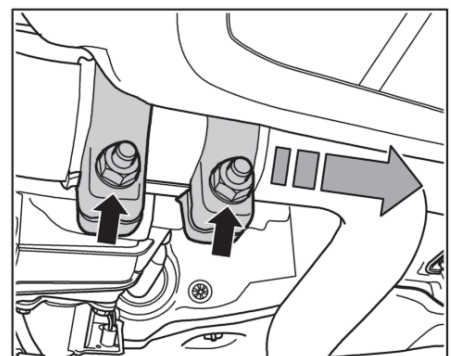
10. Install transverse strut. Tighten the screws **-arrows-** (do not forget the centre screw). → **Tightening torque: 7.5 ftlb.**



Transverse strut

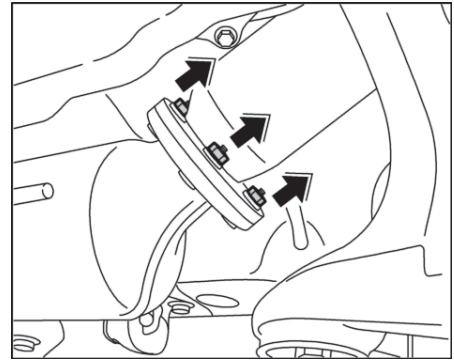
Installing (main) catalytic converter, cylinder bank 5 - 8

1. Push new exhaust clamp onto exhaust pipe.
2. Ensure sealing faces of exhaust system are clean.
3. Replace flange gasket and push over the studs of the main catalytic converter.



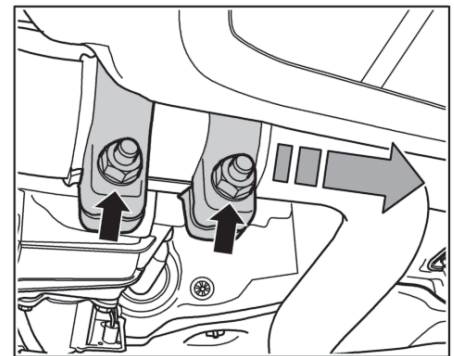
Clamps for connecting catalytic converter to exhaust system

4. Put main catalytic converter in the installation position and fit new nuts and bolts.
5. Tighten nuts connecting primary and main catalytic converters to the specified tightening torque. → **Tightening torque: 17 ftlb.**
6. Tighten screws of the catalytic converters to the body and cross member with tightening torque. → **Tightening torque: 17 ftlb.**



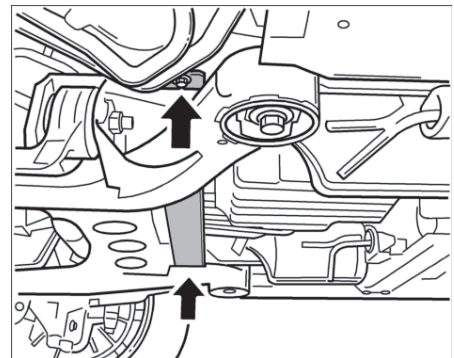
Nuts connecting primary and main catalytic converters

7. Fit exhaust clamps. For installation position and tightening torque, see → 260119 Removing and installing exhaust system - chapter on "installing".



Clamps for connecting catalytic converter to exhaust system

8. Install transverse strut. Tighten the screws **-arrows-** (do not forget the centre screw). → **Tightening torque: 7.5 ftlb.**



Transverse strut

Subsequent work

Subsequent work

1. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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26 76 19 Removing and installing primary catalytic converter - as of MY 2003

- Preliminary work
- Removing primary catalytic converter
- Installing primary catalytic converter
- Subsequent work

Preliminary work

Preliminary work

1. Remove engine compartment cover above the oxygen sensor connectors. → 700219 Removing and installing front cover (engine compartment) - chapter on "removing"
2. Remove wheel . → 440519 Removing and installing wheel - chapter on "Removing"
3. Remove front wheel housing liner. → 505619 Removing and installing front wheel housing liner - chapter on "removing"
4. Remove air cleaner housing. → 242519 Removing and installing air cleaner housing - chapter on "removing"
5. Remove main catalytic converter. → 267319 Removing and installing (main) catalytic converter - chapter on "removing"

Removing primary catalytic converter

Removing primary catalytic converter, cylinder bank 1 - 4



ATTENTION

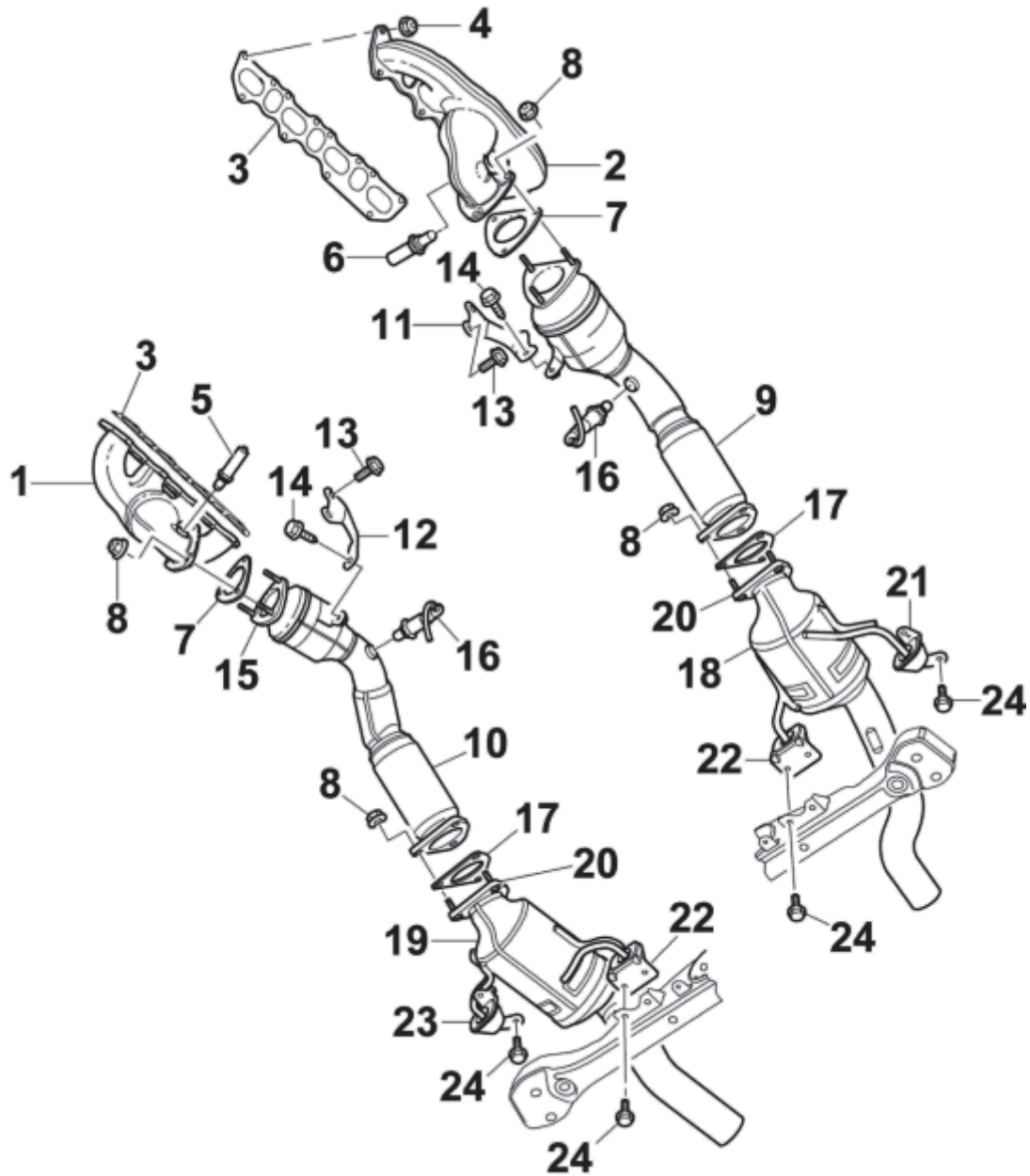
Danger of burns from hot exhaust system

- Do not remove the exhaust system until it has cooled down!
- Wear protective gloves!



Note

- Observe the most important working regulations and warning notes. → 10 The most important working regulations and warning notes

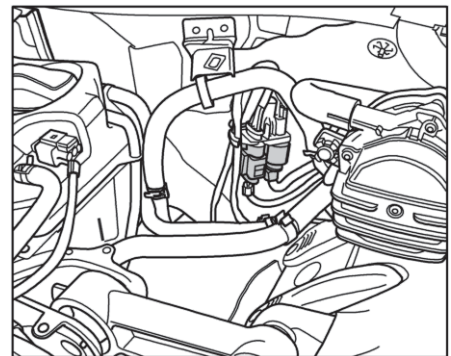


Component overview of primary catalytic converter

- 1 - Exhaust manifold, cylinders 1 - 4
- 2 - Exhaust manifold, cylinders 5 - 8
- 3 - Exhaust manifold gasket; replace
- 4 - Hexagon nut M8; replace nut and coat threads of studs with Microgleit
- 5 - Oxygen sensor ahead of catalytic converter
- 6 - Oxygen sensor ahead of catalytic converter
- 7 - Gasket; replace
- 8 - Hexagon nut M8; replace
- 9 - Front catalytic converter
- 10 - Front catalytic converter

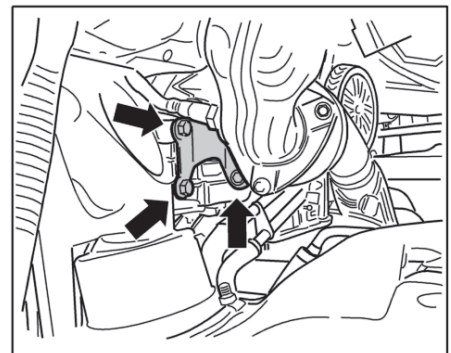
- 11 - Support
- 12 - Support
- 13 - Hexagon-head bolt M10 x 25
- 14 - Hexagon-head bolt M8 x 15
- 15 - Stud M8 x 25
- 16 - Oxygen sensor behind catalytic converter
- 17 - Gasket; replace
- 18 - Catalytic converter
- 19 - Catalytic converter
- 20 - Screw
- 21 - Bracket
- 22 - Bracket
- 23 - Bracket
- 24 - Hexagon-head bolt M8 x 25

1. At the water splash panel, disconnect the connector for the oxygen sensor behind catalytic converter and unclip cable from support.



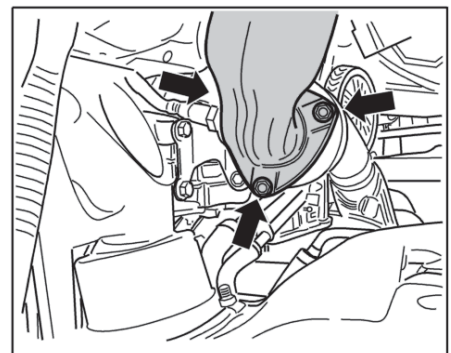
Oxygen sensor connector at water splash panel

2. With the aid of a mirror, remove the fastening screw on the catalytic converter bracket **-arrow lower right-** .



Fastening screw on catalytic converter bracket

3. Remove the three fastening nuts between the exhaust manifold and primary catalytic converter.
4. Release oxygen sensor cable and remove primary catalytic converter in a downward direction. Remove flange gasket.



Fastening nuts for securing exhaust

Removing primary catalytic converter, cylinder bank 5 - 8



ATTENTION

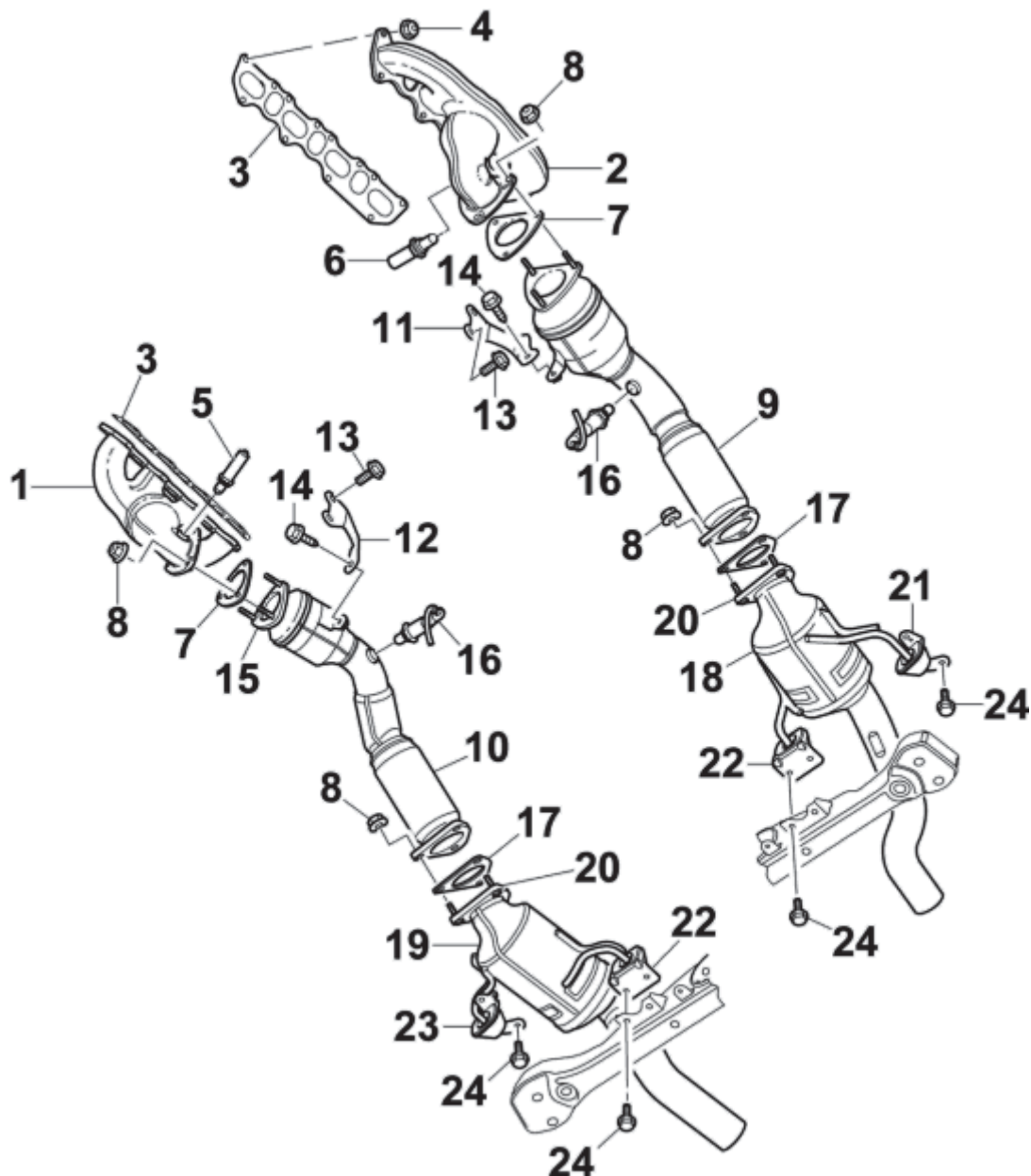
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- Wear protective gloves!



Note

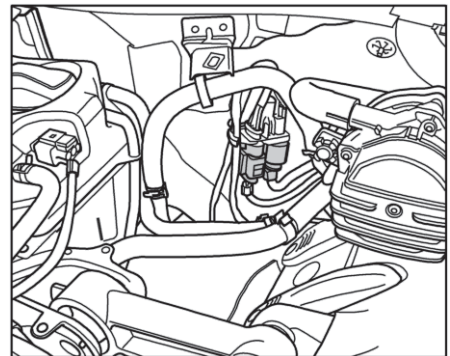
- Observe the most important working regulations and warning notes. → 10 The most important working regulations and warning notes



Component overview of primary catalytic converter

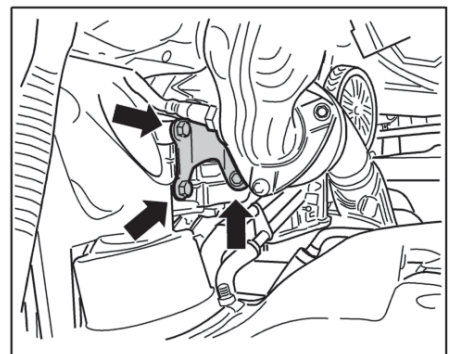
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- 2 - Exhaust manifold, cylinders 5 - 8
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- 4 - Hexagon nut M8; replace nut and coat threads of studs with Microgleit
- 5 - Oxygen sensor ahead of catalytic converter
- 6 - Oxygen sensor ahead of catalytic converter
- 7 - Gasket; replace
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- 19 - Catalytic converter
- 20 - Screw
- 21 - Bracket
- 22 - Bracket
- 23 - Bracket
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1. At the water splash panel, disconnect the connector for the oxygen sensor behind catalytic converter and unclip cable from support.

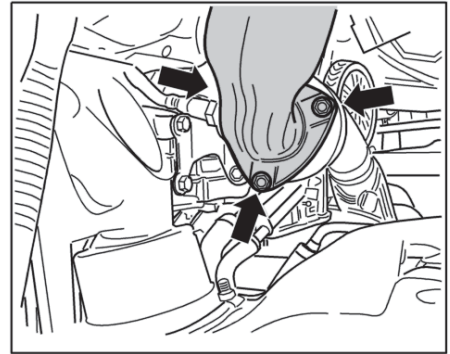


Disconnecting oxygen sensor connector at the splash panel and unclipping cable

2. With the aid of a mirror, remove the fastening screw on the catalytic converter bracket **-arrow lower right-** .



Fastening screw on catalytic converter bracket



Fastening nuts between exhaust manifold and primary catalytic converter

3. Remove the three fastening nuts between the exhaust manifold and primary catalytic converter.
4. Release oxygen sensor cable and remove oxygen sensor.
5. Lower starter catalyst clear. Remove flange gasket.

Installing primary catalytic converter

Installing primary catalytic converter, cylinder bank 1 - 4



Note

- Observe the most important working regulations and warning notes. → 10 The most important working regulations and warning notes
- Metal seals and self-locking nuts and bolts must always be replaced!

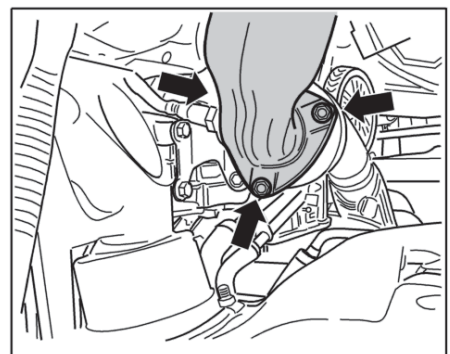
1. Ensure sealing faces of exhaust system are clean.
2. Replace flange gasket and push over the studs of the primary catalytic converter.
3. Place primary catalytic converter in installation position.
4. Through the wheel housing, position fastening screw on catalytic converter bracket.
5. Position the three fastening nuts between the exhaust manifold and primary catalytic converter.
6. Tighten fastening screw to catalytic converter bracket and nuts to specified tightening torque. → **Tightening torque: 17 ftlb.** → **Tightening torque: 17 ftlb.**



ATTENTION

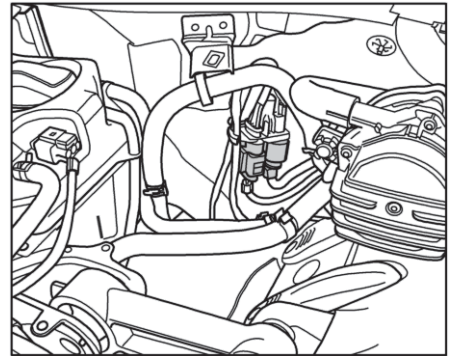
Danger of fire and material damage!

- Lay the oxygen sensor cable so that it cannot touch the exhaust manifold.



Positioning fastening nuts for securing exhaust manifold to primary catalytic converter

7. Lay cable of oxygen sensor and clip it in.
8. At the water splash panel, connect the connector for the oxygen sensor behind catalytic converter.



Connecting oxygen sensor connector at water splash panel

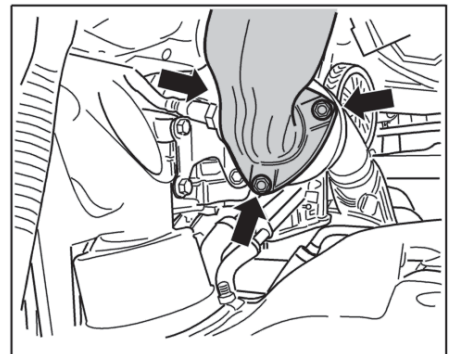
Installing primary catalytic converter, cylinder bank 5 - 8



Note

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- Metal seals and self-locking nuts and bolts must always be replaced!

1. Ensure sealing faces of exhaust system are clean.
2. Replace flange gasket and push over the studs of the primary catalytic converter.
3. Install oxygen sensor.
4. Place primary catalytic converter in installation position.
5. Position the three fastening nuts between the exhaust manifold and primary catalytic converter.



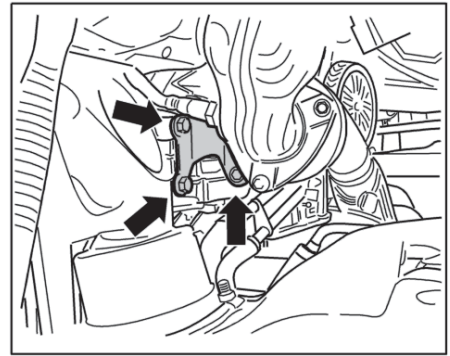
Positioning fastening nuts for securing exhaust manifold to primary catalytic converter

6. Through the wheel housing, position fastening screw on catalytic converter bracket **-lower right screw-**.
7. Tighten fastening screw to catalytic converter bracket and nuts to specified tightening torque. → **Tightening torque: 17 ftlb. → Tightening torque: 17 ftlb.**



ATTENTION

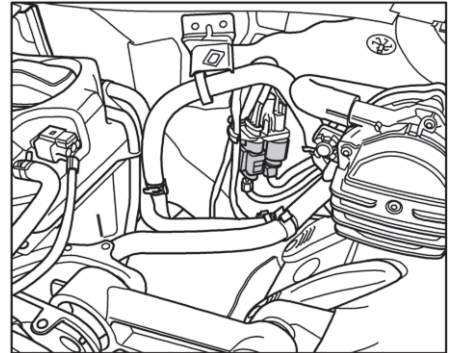
Danger of fire and material damage!



Positioning fastening screw on catalytic converter bracket

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8. Lay cable of oxygen sensor and clip it in.
9. At the water splash panel, connect the connector for the oxygen sensor behind catalytic converter.



Connecting oxygen sensor connector at water splash panel

Subsequent work

Subsequent work

1. Install main catalytic converter. → 267319 Removing and installing (main) catalytic converter - chapter on "installing"
2. Install air cleaner housing. → 242519 Removing and installing air cleaner housing - chapter on "installing"
3. Install front wheel housing liner. → 505619 Removing and installing front wheel housing liner - chapter on "installing"
4. Mount wheel. → 440519 Removing and installing wheel - chapter on "installing"
5. Fit engine compartment cover above the oxygen sensor connectors. → 700219 Removing and installing front cover (engine compartment) - chapter on "installing"

9PAAE1, 9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22,

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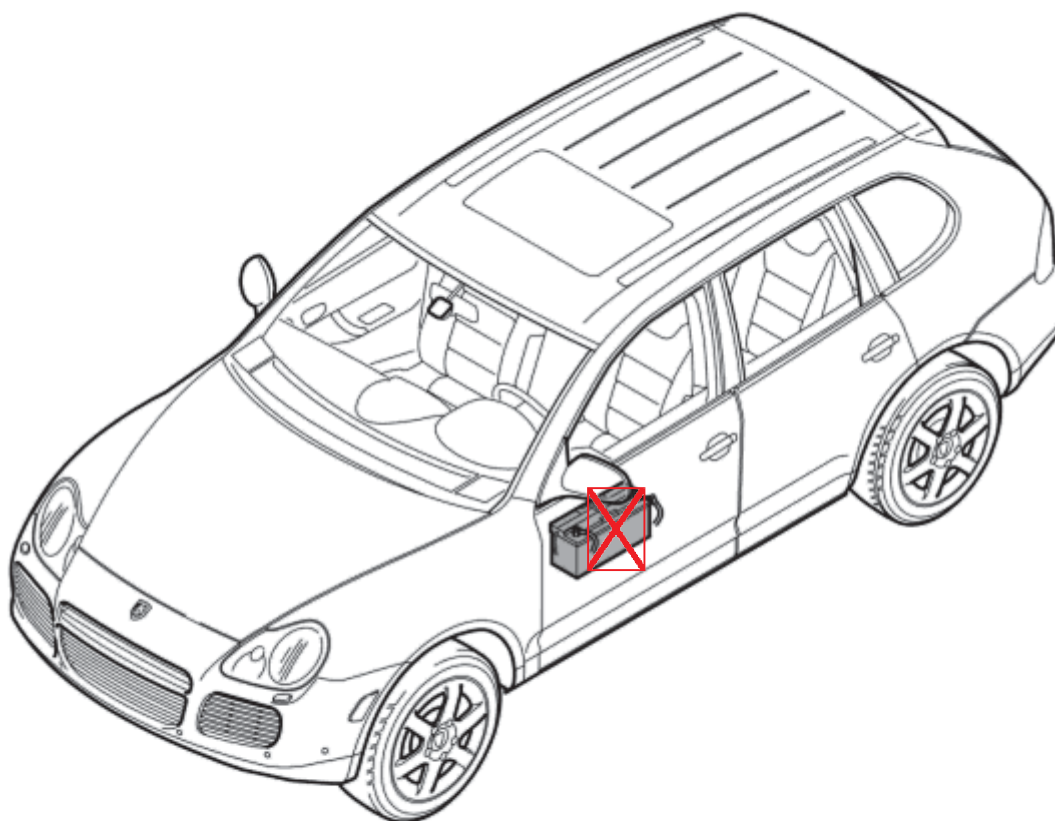
27 06 19 Removing and installing battery - as of MY 2003

- Removing battery
- Installing battery

Removing battery

Removing battery

Installation Location:



Main illustration showing battery installation position in the vehicle



DANGER

Risk of explosion, injury, short circuit and damage to the generator and electronic control units.

- **Do not disconnect battery with engine running.**
- **Disconnect and reconnect battery with extreme caution. Risk of short circuit and explosion.**
- **Do not tilt battery when removing it. Risk of acid burns as a result of emerging acid.**
- **Do not rub the battery with a dry cloth. Risk of explosion as a result of static charge.**

→



Note

- *The battery is located in the battery case under the left front seat.*
- *The vehicle must be supplied with external power at the jump lead starting points so that the seat can be moved even when the battery is completely discharged. → External power connection, jump lead starting*

Switch off all loads and remove ignition key.

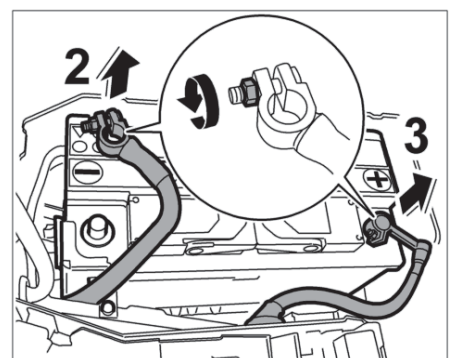
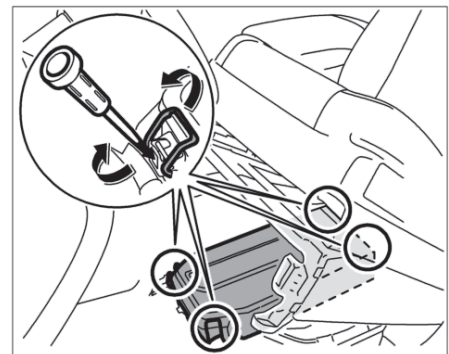
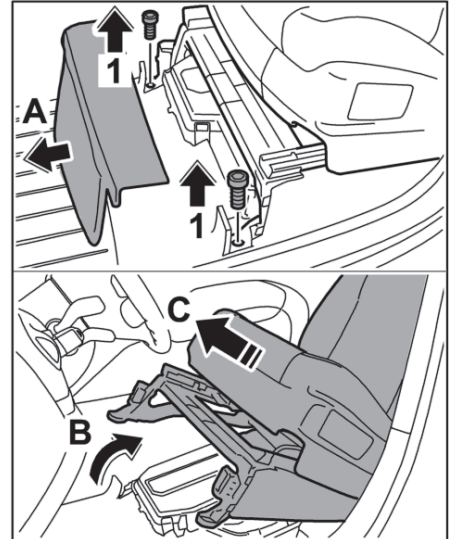
Observe the warning notes and safety regulations for lead-acid batteries.→ Warning notes and safety regulations for lead-acid batteries [9PAAD1 9PAAD7]→ Warning notes and safety regulations for lead-acid batteries [9PAAE1 9PAAE7 9PAAF1]



Note

For vehicles with a Vehicle Tracking System (VTS), please read the → 906323 *Vehicle Tracking System (VTS) TI*!

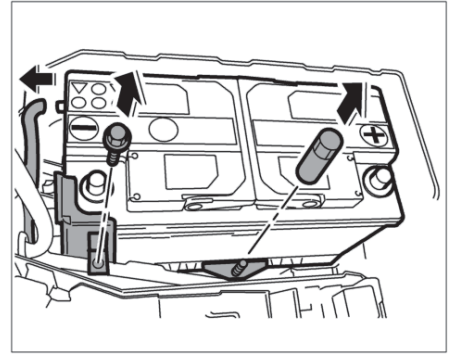
1. Move front left seat back and up as far as possible. Move backrest fully forward.
2. Detach front seat trim towards the front **-Arrow A-** .
3. Fold the carpet sections forward and remove the two fastening screws **-1-** .
4. Fold the seat back as far as possible **-Arrow B-** . With the seat in its folded position, move the seat forward again using the fore-and-aft adjustment **-Arrow C-** .
5. Open the four tension hooks on the battery case cover using a screwdriver.
6. Remove the battery case cover and air duct.
7. Risk of short circuit! First connect the negative cable **-2-** , then the positive **-3-** .



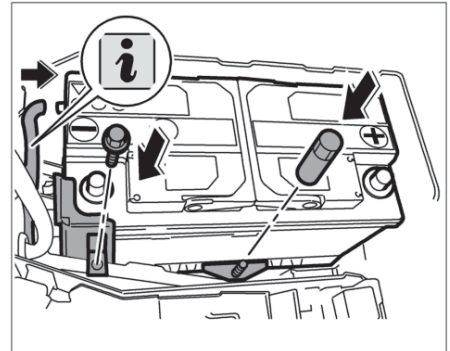
8. Unscrew the fastening screw on the sheetmetal bracket and remove the sheetmetal bracket.
9. Unscrew the screw on the battery mount and remove the battery mount.
10. Pull off the vent hose on the battery.

Installing battery

Installing battery



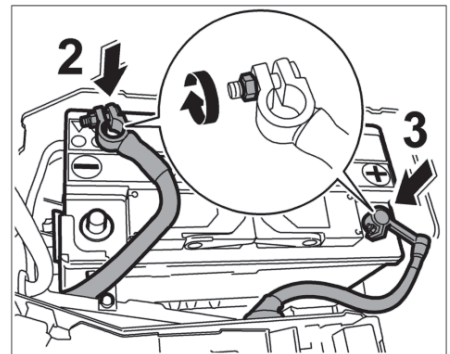
1. Risk of contact with caustic fluid Position the battery in the battery case below the stops, if at all possible without tilting it.
2. Position the battery mount and tighten with the fastening screw.
→ **Tightening torque: 17.5 ftlb.**
3. Position the sheetmetal bracket and secure it with the fastening screw. → **Tightening torque: 6 ftlb.**
4. Insert the vent hose on the battery.



Note

- Make sure that the two ends of the vent hose are routed and inserted correctly.

5. Risk of short circuit! First connect the positive cable **-3-** , then the negative cable **-2-** . → **Tightening torque: 3.5 ftlb.**



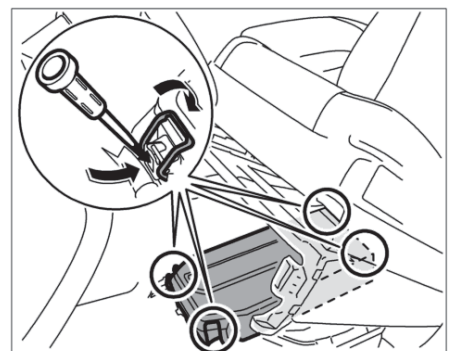
6. Replace the battery box cover carefully. The cover must be mounted properly.
7. Attach the four tension hooks on the battery case cover and close using the screwdriver.



ATTENTION

Risk of material damage to screw connections for seat and seat frame!

- The fastening screws for seat and seat frame are coated and must be replaced after being unscrewed.
- Before screwing in the new fastening screws, clean the thread holes with an M10 x 1.5 tap!

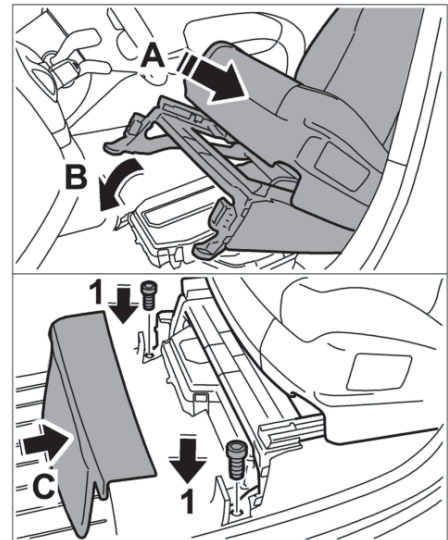


8. Move the seat in its folded position towards the rear **-arrow A-** and then tip forward **-arrow B-** .

9. Screw in fastening screws **-1-** . → **Tightening torque: 33 ftlb.**

10. Clip in front seat trim **-C-** .

Carry out work instructions after disconnecting the battery.→ Work instructions after disconnecting the battery.



9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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27 06 IN General information on the vehicle battery - as of MY 2003

- Information



Note

- *To prevent contact corrosion, only approved bolts, nuts, washers, etc. should be used. These elements have a special surface coating and must be stored separately.*

The battery is one of the most important electrical components in the vehicle. Fault-free functioning of the battery contributes greatly to customer satisfaction. To guarantee long and efficient operation, the battery must be checked and maintained according to the description in this chapter.

Besides the start function, the battery also has the tasks of buffer and supplier of electrical power for the entire vehicle electrical system.

Information

Treatment of the battery

Maintenance-free battery:



Note

- *The tightening torque for the battery terminals is 5 Nm (3.5 ftlb.).*
- *If the battery is to be reconnected, proceed according to → 90 Work instructions after disconnecting the battery.*

Low-maintenance battery:



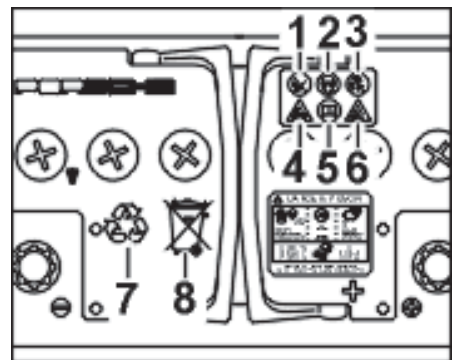
Note

- *Battery terminals do not need to be greased.*
- *The battery terminal clamps must only be attached manually without using excessive force to prevent damage to the battery housing.*
- *The tightening torque for the battery terminals is 5 Nm (3.5 ftlb.).*
- *If the battery is to be reconnected, proceed according to → 90 Work instructions after disconnecting the battery.*

- To ensure that the battery does not leak, it is essential to ensure that the original plugs supplied with the battery are screwed into the battery openings.
- In the event of loss or damage, only original plugs of the same design should be used.
- The plugs must be fitted with an O-ring seal.

Warning notes and safety regulations for lead-acid batteries

1. **-1-** Fire, sparks, naked flames and smoking are forbidden:
 - Avoid sparking when using cables and electrical devices.
 - Avoid short circuits.
 - In batteries with central venting, there is an increased concentration of detonating gas at the hose opening. The venting hose must not be bent or blocked by dirt.
2. **-2-** Wear eye protection
3. **-3-** Keep children away from acids and batteries.
4. **-4-** Risk of causticisation!
 - Battery acid is highly caustic, therefore wear protective gloves.
 - Do not tip battery; acid can emerge from the vent opening.



Battery symbols



Note

- First aid: Rinse acid splashes in the eyes immediately with clean water for a few minutes. Consult a doctor immediately. Neutralise acid splashes on the skin or clothing immediately with soap suds and rinse again with plenty of water. If acid has been drunk unintentionally, consult a doctor immediately.

5. **-5-** Observe information on the battery in the Technical Manual and in the Driver's Manual.
6. **-6-** Risk of explosion:
 - A highly explosive detonating gas mixture occurs when charging batteries.
7. **-7-** Waste disposal:
 - Hand in old batteries at a collection point.
8. **-8-** Never dispose of old batteries in the domestic rubbish!

Notes on removing and installing the battery



Note

- The battery is located under the left front seat.
- In order to avoid triggering the siren in vehicles with an additional alarm siren, the battery must be disconnected while the ignition is on!
- All loads must be switched off beforehand! Remove ignition key!
- Never disconnect battery with engine running!

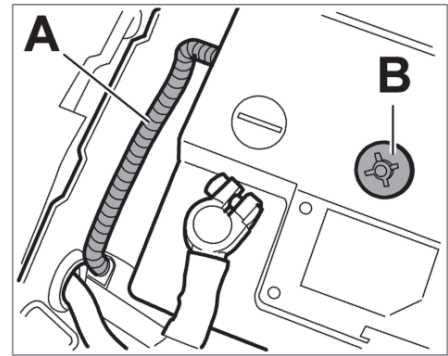
- *Never start engine without a securely connected battery!*
- *The battery terminal clamps must only be attached by hand without using excessive force to prevent damage to the battery housing.*
- *Check that the battery is seated correctly after installation. Otherwise, a loose battery presents risks such as: - Reduced service life due to vibration damage. - Possible damage to the grid plates of the battery. - Damage to the battery housing from mounting parts (possible acid leakage, with high subsequent costs). - Inadequate crash safety.*

Principle of operation of central venting

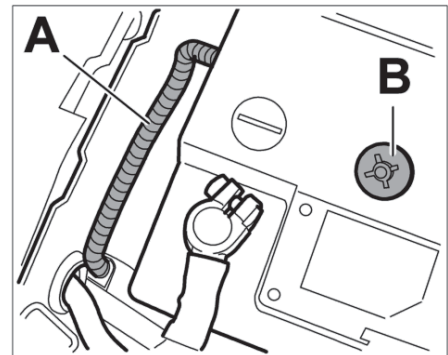


Note

- *State of the art batteries are fitted with central venting -A- .*
- *The gas generated during charging emerges centrally through an opening on the upper cover side. The backfire protection is integrated at the same position, which prevents the ignition of the combustible gas present in the battery.*
- *In batteries with hose/pipe -A- for the central venting, ensure that the hose is not pinched. Only then can the battery be freely vented.*



Central venting



Central venting

Visual inspection

Before measurements such as open-circuit voltage, acid density or the battery load test are carried out, a visual inspection of the battery must be performed.

Through this check, it can be determined:

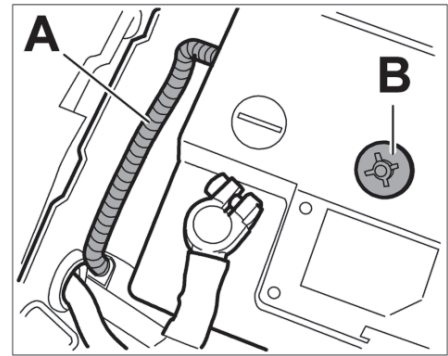
- Whether the housing of the battery is damaged. Acid can leak out due to damage of the housing.
- Whether the battery terminals (battery line connections) are damaged. Contact of the line connections cannot be guaranteed if the battery terminals are damaged. This can cause a line fire and malfunctions in the electrical system.

Checking battery vent hose



Note

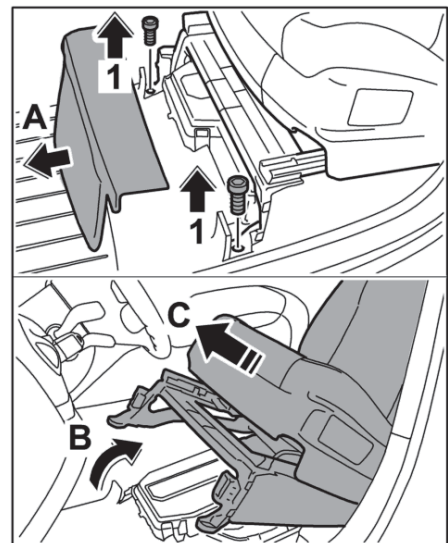
- *Make sure the vent hose -A- is not kinked or damaged. If in doubt, replace it.*
- *Vent hose -A- must be inserted in the battery and in the battery box.*



Central venting

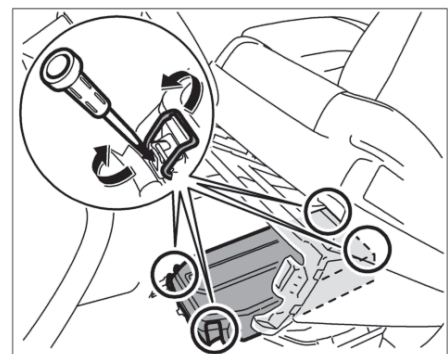
Checking acid level

1. Switch ignition off and remove ignition key.
2. Move front left seat back and up as far as possible. Move backrest fully forward.
3. Detach front seat trim forwards **-Arrow A-**.
4. Fold the carpet cut-outs forwards and remove the two fastening screws **-Arrows 1-**.
5. Fold the seat back completely **-Arrow B-**. With the seat in its folded position, move the seat forward again using the fore-and-aft adjustment **-Arrow C-**.



Folding back the front left seat

6. Open the four tension hooks on the battery box lid using a screwdriver.
7. Remove battery box lid with vent duct.



Opening tension hook

Low-maintenance battery



WARNING

Improper handling of batteries.

- Risk of injury and damage to the environment

→ The accident prevention regulations must be strictly observed when handling battery acids.

- Wear suitable protective clothing and protective glasses.
- Only use a torch to illuminate the inside of the battery. Never illuminate the inside of the battery with a naked flame.
- Do not handle a naked flame or lighted cigarettes near batteries.
- Observe the disposal regulations for batteries and sulphuric acid when disposing of batteries.



Note

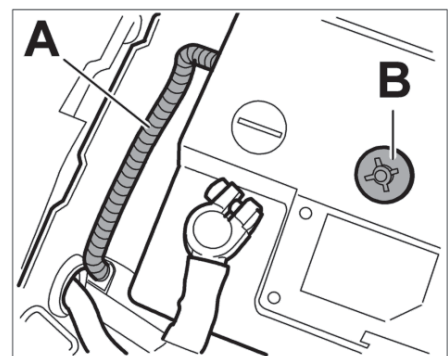
- Use a commercially available battery filling bottle.
 - The correct acid level of the battery is an important factor for long and efficient operation of the battery.
 - When the acid level is too low, a capacity loss (performance loss) of the battery occurs, which is caused by the cell plates drying out. If the cell plates are not surrounded by electrolyte (battery acid), this will lead to corrosion of the lead plates, the plate bridges and the cell connectors. The result of the corrosion is that battery functioning cannot be guaranteed. The battery will become unserviceable.
 - If the acid level is too high, damage can occur by the battery acid (sulphuric acid/water mixture) leaking out of the battery.
1. Unscrew battery plugs.
 2. Shine a torch into the battery. The acid level of the battery must be at the protruding lug.
 - If the acid level is too low, refill with distilled water using the battery filling bottle.
 3. Screw in battery plugs again and ensure that they are seated correctly.
 4. Remount battery cover.

Maintenance-free battery



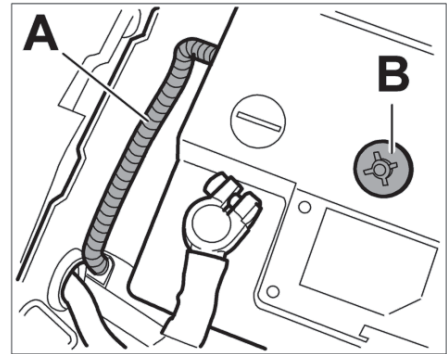
Note

- The maintenance-free battery has an inspection glass.
- The charge state and acid level of the battery can be checked through the inspection glass **-B-**.
- If a battery is more than 5 years old and the indicator of the inspection glass is colourless, replace the battery.
- If the battery has been charged, air bubbles can form under the inspection glass. Before carrying out a visual inspection, tap carefully on the inspection glass with something like the handle of a screwdriver.



Maintenance-free battery

Three different colour indications are possible:



Maintenance-free battery

Colour indication	Charge state
Green	The battery charge is satisfactory. Battery will start reliably.
Dark grey	The battery has no charge or the charge is too low. Recharge battery.
Transparent/clear	Acid level has become critical. Replace battery.

Checking acid density



WARNING

Improper handling of batteries.

- Risk of injury and damage to the environment

- The accident prevention regulations must be strictly observed when handling battery acids.
- Wear suitable protective clothing and protective glasses.
- Only use a torch to illuminate the inside of the battery. Never illuminate the inside of the battery with a naked flame.
- Do not handle a naked flame or lighted cigarettes near batteries.
- Observe the disposal regulations for batteries and sulphuric acid when disposing of batteries.



Note

- Only for low-maintenance batteries.



Note

- Use commercially available battery acid tester.
- The acid density test provides information about the state of the battery in conjunction with the battery load test.
- The temperature of the battery acid must be at least 10°C .

The density of the acid must be checked as follows in all battery cells (low-maintenance battery) :

1. Switch off ignition and remove ignition key.
2. Unscrew all battery plugs (plugs of the battery cells).

3. Dip the acid siphon or the pipette into the battery cell and take up the battery acid.
4. Read off the density of the acid in kg/dm³ on the scale of the battery acid tester and compare with the following table.

Battery charge state in normal climatic zones	Density in kg/dm ³
discharged	1.12
half charged	1.20
well charged	1.28

Battery charge state in tropical climatic zones (hot countries)	Density in kg/dm ³
discharged	1.08
half charged	1.16
well charged	1.23

The acid density must be at least 1.24 kg/dm³ in normal climatic zones.

- If the acid density is too low, charge battery.
- After charging the battery, repeat the acid density test.

The measured values for the acid density of the individual battery cells must not differ by more than 0.03 kg/dm³ from each other.

Examples of non-permissible acid density deviations:						
Battery cell:	1	2	3	4	5	6
Acid density per cell in kg/dm ³						
Example 1:	1.24	1.25	1.25	1.10	1.24	1.25
Example 2:	1.26	1.26	1.25	1.14	1.18	1.24

Example 1: The acid density in cell 4 is too low.

Example 2: The acid density in cells 4 and 5 is too low. The acid density deviations between the battery cells is greater than 0.03 kg/dm³.

- If the nominal values are not achieved, replace battery.
- If the nominal values are achieved, screw in the original plugs again.



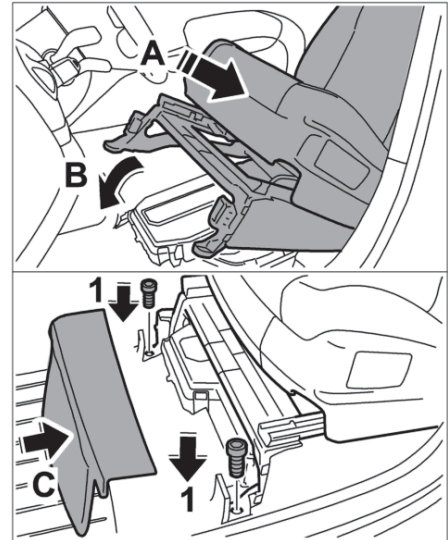
ATTENTION

Risk of material damage to screw connections for seat and seat frame!

- The fastening screws for seat and seat frame are coated and must be replaced after being unscrewed.
- Before screwing in the new fastening screws, clean the thread holes with an M10 x 1.5 tap!

5. Move the seat in its folded position towards the rear **-Arrow A-** and then tip forward **-Arrow B-**.
6. Screw in fastening screws **-Arrow 1-** . → **Tightening torque: 33 ftlb.**

7. Clip in front seat trim **-Arrow C-** .



Folding seat back and screwing down

Open-circuit voltage measurement



Note

- Use a hand-held multimeter to measure the battery voltage.

1. Switch off ignition and remove ignition key.
2. Disconnect ground strap on the battery.



Note

- After charging and waiting for at least 2 hours, during which time the battery should neither be loaded nor charged:
3. Measure the battery voltage with a hand-held multimeter.
 - The battery open-circuit voltage should not fall below 12.5V.
 - If the hand-held multimeter shows 12.5V or more, the battery voltage is OK.
 - If the hand-held multimeter shows a battery voltage below 12.5V: Charge battery.

Battery load test



Note

- The acid density test provides information about the state of the battery in conjunction with the battery load test.
- A battery test device is required for the load test.
- The battery need not be removed or disconnected.
- The battery must be charged before the load test is performed.

Carry out battery load test:

1. Switch off ignition and remove ignition key.

2. Observe the information in the operating instructions of the battery test device.
3. Connect the clamps of the test lines to the battery terminals as described in the operating instructions of the test device.
 - As the load current varies, the current must be set depending on the battery capacity (operating instructions of test device).
4. Perform the battery load test in accordance with the operating instructions.
 - The result of the battery load test is a voltage value that must be compared with the specified minimum voltage (limit value).

Table:			
Battery capacity:	70 Ah	95 Ah	110 Ah
Cold test current	340 A	450 A	520 A
Load current	See tester instructions		
Minimum voltage (limit value)	See tester instructions		

5. If the minimum voltage is not attained, replace battery.

Remarks on battery load test:

The battery voltage sinks during this test due to the severe load on the battery.

If the battery is in order, the voltage value only decreases to the minimum voltage.

If the battery is faulty, the battery voltage will sink very quickly below the specified minimum voltage.

After the test has taken place, the low voltage value remains over a long period of time; the voltage increases again slowly.

Charging battery



WARNING

Danger of fire and explosion

- The battery plugs must always be screwed in correctly when charging and during voltage measurement and load measurement.
- Rooms in which batteries are being charged should not be entered with a naked flame or when smoking. Gases form through the charging process in the batteries which are highly flammable.



Note

- A battery charging device is required.
- Observe charging device operating instructions.
- The battery must have a minimum temperature of 10°C.
- If possible, do not fast charge batteries as this can damage them.
- If exhaustively discharged batteries are charged quickly, they will not take up a charge current or they will be identified too early as full due to the so-called "surface charge".

1. Switch off battery charging device.
2. Switch off ignition and remove ignition key.
3. First disconnect the ground strap of the battery, then the positive battery line.
4. Connect positive line of the battery charging device to the positive terminal of the battery.
5. Connect negative line of the battery charging device to the negative terminal of the battery.
6. Set the charge current on the battery charging device according to the battery capacity.
7. Switch on battery charging device.

Procedure for charging exhaustively discharged batteries:

Batteries which are not in operation for a long period of time discharge.

A battery is exhaustively discharged if the open-circuit voltage has sunk below 11.6 V. **see open-circuit voltage measurement**

In exhaustively discharged batteries, the battery acid (sulphuric acid and water mixture) consists of virtually only water, as the sulphuric acid proportion is considerably reduced.

Exhaustively discharged batteries sulphatise, i.e. the entire plate surfaces of the batteries harden.

If exhaustively discharged batteries are immediately recharged after an exhaustive discharge, the sulphatisation recedes again.

If these batteries are not recharged, the plates continue to harden and charge take-up ability is limited. A reduction in the battery performance is the result.

Exhaustively discharged batteries must be charged with a low charge current as follows:

- Set maximum charge current at 10% of battery capacity; i.e. with a 95 Ah battery the maximum charge current is 9.5 A.
8. Charge battery.

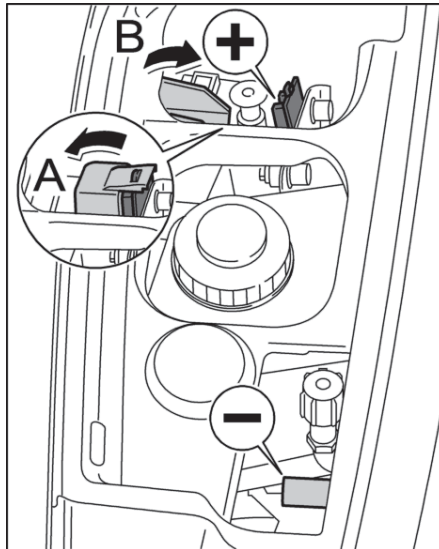
Battery trickle charge



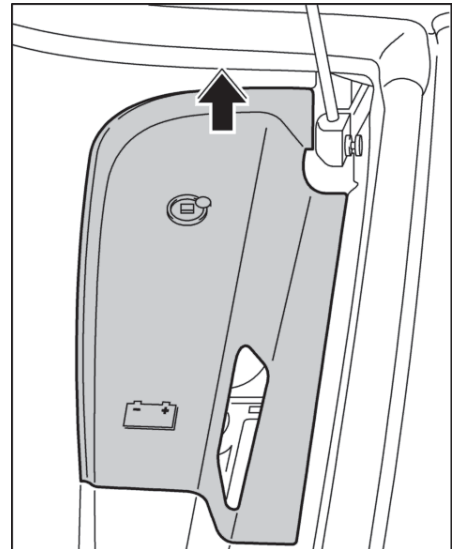
Note

- *When working or carrying out tests on the Cayenne, or when it is in the workshop, a battery charging device with a rated current of at least 40 A must be connected.*
- *As soon as the vehicle is unlocked, e.g. the vehicle is in the workshop or salesroom, it must be trickle charged with a battery charging device.*

1. Switch off battery charging device.
2. Switch off ignition and remove ignition key.
3. Remove cover for jump lead starting terminal.
4. Open protective cover on the positive terminal **-+ -A-**.
5. First, connect the positive cable from the charging device to the positive terminal for jump lead starting **-+ -**. → **Tightening torque: 3.5 ftlb.**



Opening protective cover



Removing cover for jump lead starting terminal

6. Connect the negative cable from the charging device to the ground point for jump lead starting - - - . →
Tightening torque: 3.5 ftlb.
7. Set the charge current on the battery charging device according to the battery capacity.
8. Switch on battery charging device.

Connecting the battery for trickle charging

A suitable battery charging device must be connected to the vehicle electrical system when performing the following tasks. All unnecessary loads must be switched off.

When working on the vehicle for more than 15 minutes

When running a diagnosis using the Porsche System Tester

When adjusting the headlights

When working on or with the Infotainment system

If the doors, bonnet and rear lid are open for a long period of time or if these components are actuated frequently

9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
- Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrucke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrucke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

Danger of losing text-figure correspondence when printing out.

- For technical reasons, it can currently not be ruled out that the correspondence between text and associated figure can be lost when it is printed out, even though the display on the screen is correct.
- If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



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27 07 19 Removing and installing auxiliary battery - as of MY 2003

- Removing auxiliary battery
- Installing auxiliary battery

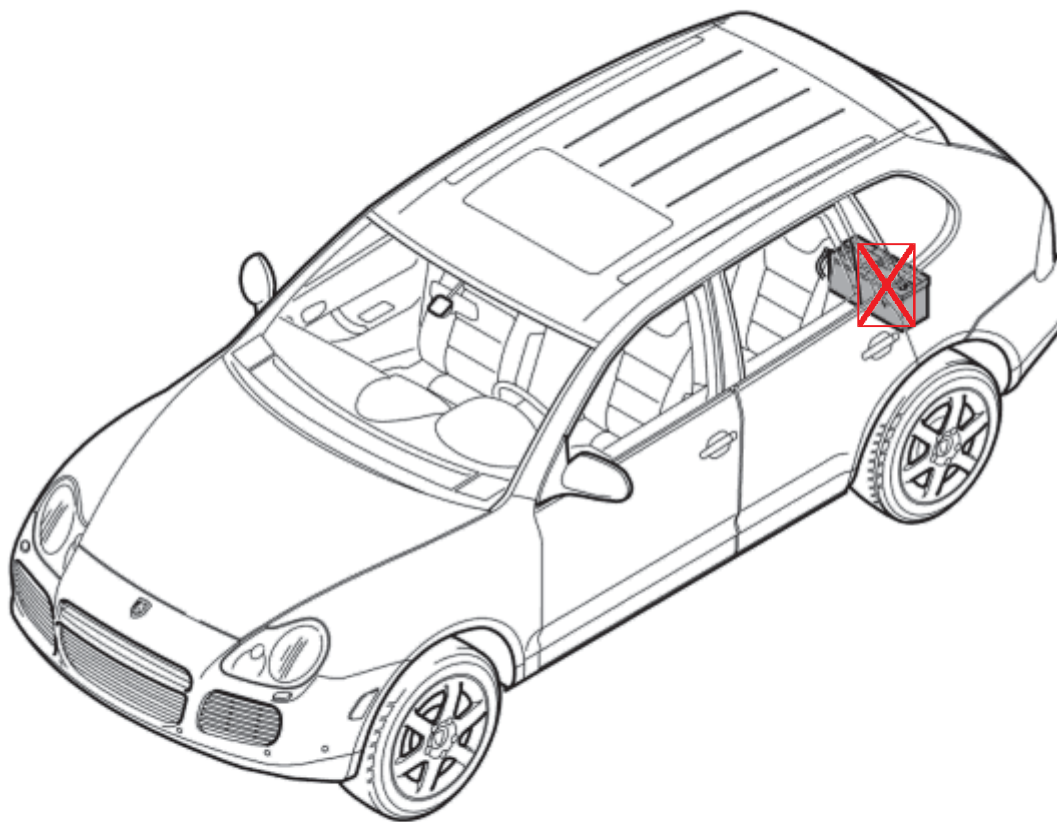
Removing auxiliary battery



Note

- *The battery is located in the luggage compartment under the loadspace floor.*
- *If the vehicle contains a subwoofer or collapsible spare wheel, the relevant component must be removed before the auxiliary battery is removed.*

Installation Location:



Overview of auxiliary battery

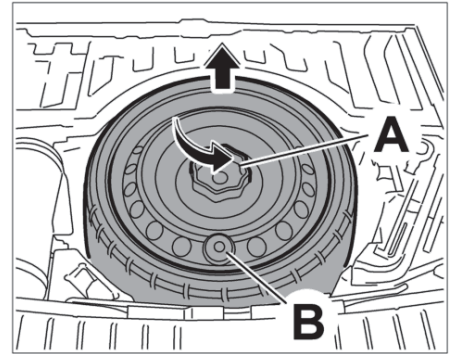


DANGER

Risk of explosion, injury, short circuit and damage to the generator and electronic control units.

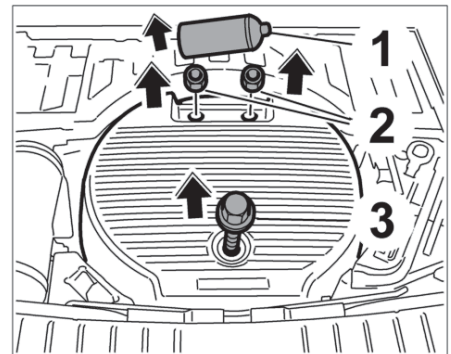
- Do not disconnect battery with engine running.
 - Disconnect and reconnect battery with extreme caution. Risk of short circuit and explosion.
 - Do not tilt battery when removing it. Risk of acid burns as a result of emerging acid.
 - Do not rub the battery with a dry cloth. Risk of explosion as a result of static charge.
1. Switch off all loads and remove ignition key.
 2. Observe the warning notes and safety regulations for hydrocyanic acid batteries → 2706 *Battery*
 3. Remove collapsible spare wheel:

- 3.1. Remove knob **-A-** and position it on bolt **-B-** .
- 3.2. Unscrew the bolt **-B-** and remove it together with the collapsible spare wheel.



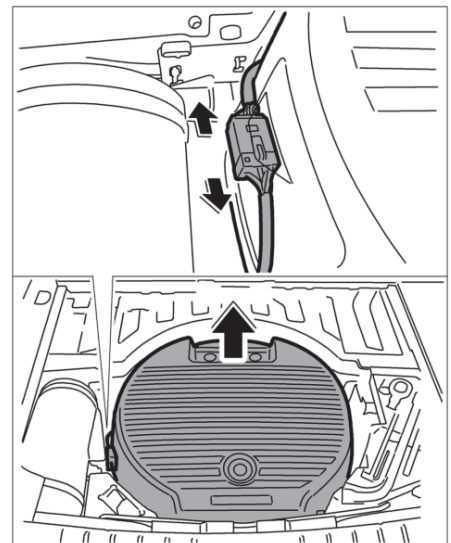
Removing collapsible spare wheel

4. Removing subwoofer fastening:
 - 4.1. Remove tyre sealant **-1-** if present.
 - 4.2. Unscrew the two fastening nuts **-2-** .
 - 4.3. Undo fastening screw **-3-** and washer.



Mount for subwoofer

5. Disconnect plug connection and remove subwoofer:
 - 5.1. Remove plug connection from retaining bracket on the subwoofer and disconnect the plug connection.
 - 5.2. Lift subwoofer up and out.

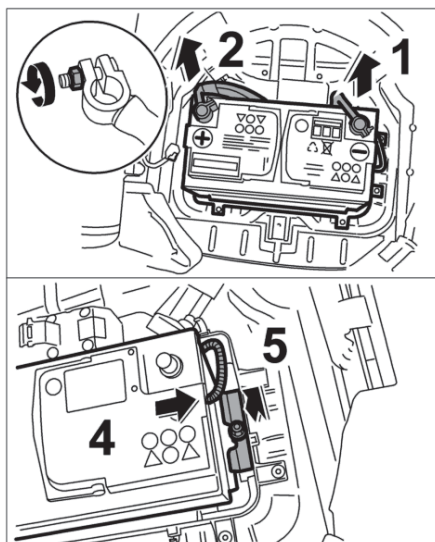


Disconnecting plug connection on subwoofer and removing subwoofer

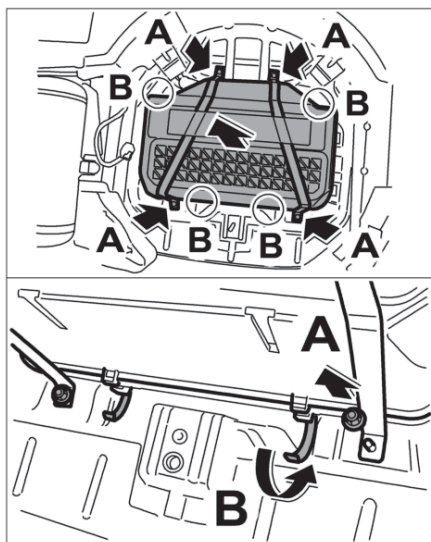
6. Removing cover for housing:
 - 6.1. Unscrew the four fastening nuts **-arrows A-** .
 - 6.2. Unclip the four fastening clips **-arrows B-** using a screwdriver.
 - 6.3. Remove the cover for the housing by pulling it up.

7. Disconnecting and removing the battery:

- 7.1. Risk of short circuit! First disconnect the negative cable **-arrow 1-** , then the positive cable **-arrow 2-** .
- 7.2. Pull off vent hose **-arrow 4-** on the battery.



Disconnecting and removing battery



Removing cover for housing

- 7.3. Unscrew the battery mount nut and remove the retaining bracket for the battery mount **-arrow 5-**.
- 7.4. Risk of causticisation! Remove battery from the battery case by the folding handles, if at all possible without tilting it.

Installing auxiliary battery

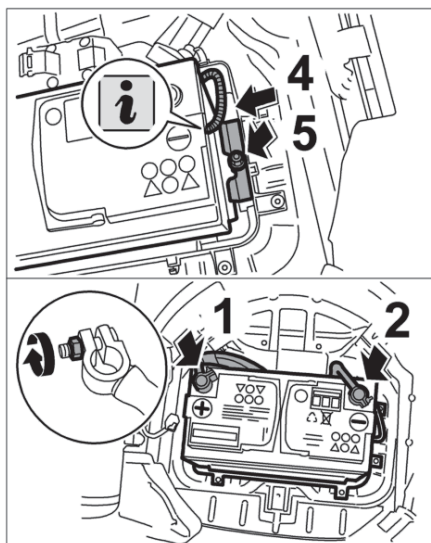
1. Inserting and connecting battery:
 - 1.1. Risk of causticisation! Position the battery in the battery case below the stops, if at all possible without tilting it.
 - 1.2. Position retaining bracket and tighten with fastening nut **-arrow 5-**. → **Tightening torque: 17 ftlb.**



Note

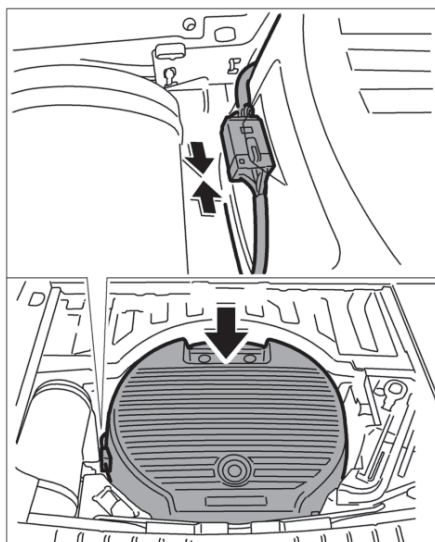
- Make sure that the two ends of the vent hose are routed and inserted correctly.

- 1.3. Insert vent hose **-arrow 4-** on battery.
- 1.4. Risk of short circuit! First connect the positive cable **-arrow 1-**, then the negative cable **-arrow 2-**. → **Tightening torque: 3.5 ftlb.**

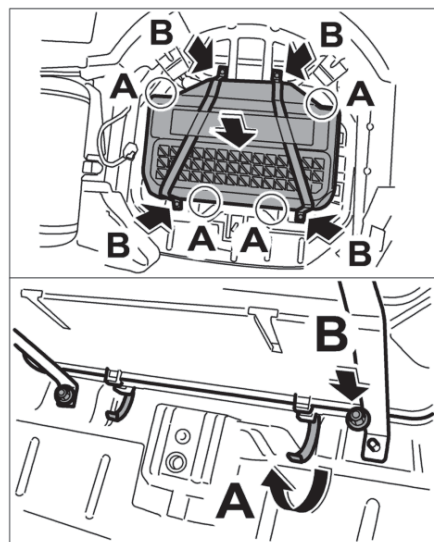


Position and tighten retaining strip, insert breather hose, connect poles

2. Positioning battery case cover and screwing it on:
 - 2.1. Put on the battery case cover, position it and clip in the four fastening clips **-arrows A-** onto the cover.
 - 2.2. Push the retraining straps across the four fastening bolts on the body floor and screw on the four fastening nuts **-arrows B-**. → **Tightening torque: 4.5 ftlb.**
3. Install subwoofer:
 - 3.1. Position the subwoofer over the battery case.



Installing subwoofer



Positioning cover for housing and screwing it on

3.2. Push the electrical plug connection together until the plug is felt to engage.

3.3. Position electrical plug connection on subwoofer.



Note

- If the vehicle contains a subwoofer or collapsible spare wheel the relevant component must be re-installed.

4. Fastening subwoofer:

4.1. Insert fastening screw **-3-** with washer and tighten. →

Tightening torque: 3.5 ftlb.

4.2. Position both fastening nuts **-2-** and tighten them. → **Tightening torque: 1.5 ftlb.**

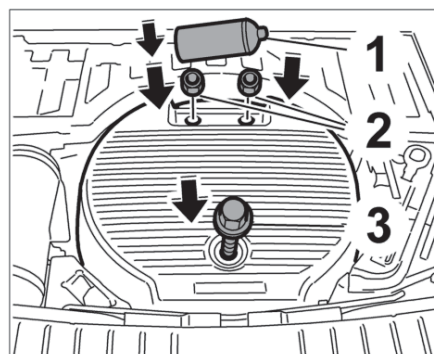
4.3. If present, place tyre sealant **-1-** in well.

4. Install collapsible spare wheel:

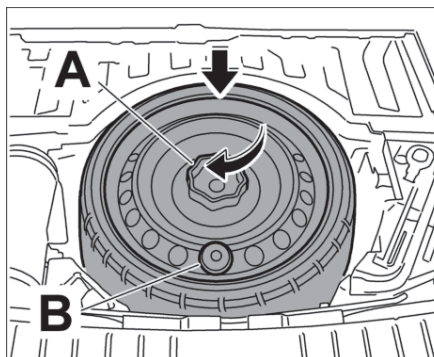
4.1. Insert collapsible spare wheel.

4.2. Screw in fastening screw **-B-**.

4.3. Position twist grip **-A-** and tighten fastening screw **-B-**.



Mount for subwoofer



Installing collapsible spare wheel

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22,
C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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AVERTISSEMENT

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27 22 19 Removing and installing three-phase generator - as of MY 2003

- Preliminary work
- Removing the three-phase generator
- Installing the three-phase generator
- Perform additional assembly work when replacing the three-phase generator
- Subsequent work

Tools

Designation	Type	Number	Explanation	
repair kit for wiring harnesses	special tool	NR.155-1		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
repair kit for Cayenne wiring harnesses	special tool	NR.155-2		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work

Preliminary work

1. Before the three-phase generator can be removed, the battery must be disconnected and the terminal

covered. → 90 *Work instructions after disconnecting the battery*

2. Remove right wheel housing liner. → 505619 Removing and installing front wheel housing liner - chapter on "removing"
3. Remove right air cleaner housing. → 242519 Removing and installing air cleaner housing - chapter on "removing"
4. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"
5. Drain coolant . → 193817 Draining and filling in coolant (includes bleeding) - chapter on "draining"
6. Remove drive belt. → 137819 Removing and installing drive belt - chapter on "removing"

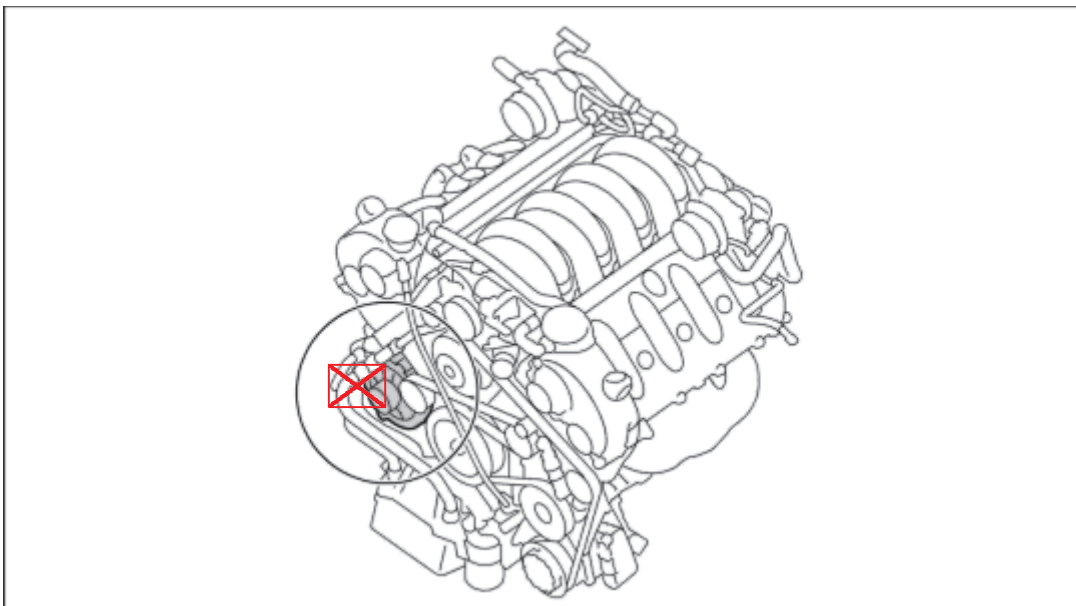
Removing the three-phase generator



Note

- *When the engine is being cleaned with high-pressure cleaning equipment, make sure that the high pressure blast is not directed directly onto the three-phase generator (risk of bearing damage).*

Installation Location:



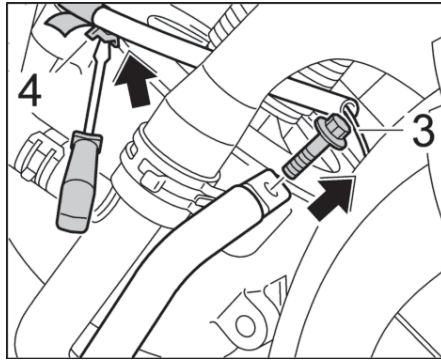
Overview of three-phase generator



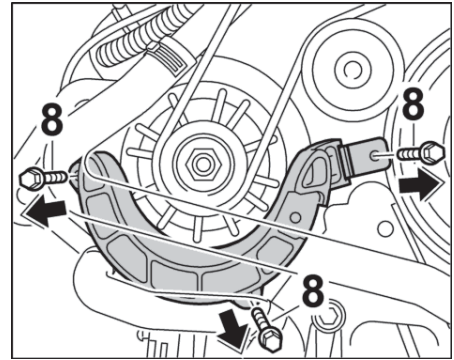
Note

- *If the impact bracket is used, the routing of the wires may differ from this description!*

1. Unscrew the three fastening screws **-8-** for the impact bracket and remove the impact bracket.
2. Unscrew fastening screw **-3-** of ground lead and lay ground lead to one side.
3. Lever out fastening clips **-4-** for the electrical lead using a screwdriver.

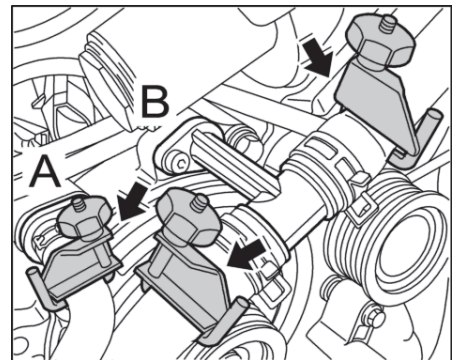


Unscrewing fastening screw of ground lead.



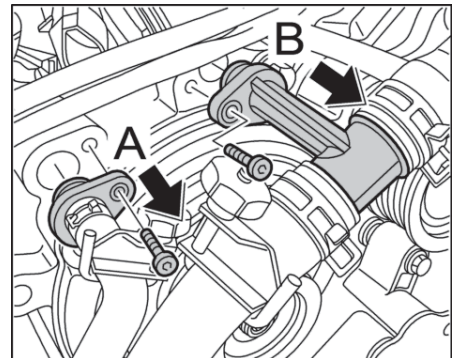
Unscrewing the fastening screws for the impact bracket

4. Seal the coolant hoses **-A and B-** with a hose clamp to prevent them from leaking.



Sealing coolant hoses with hose clip

5. Unscrew fastening screws **-A and B-** of coolant hoses.



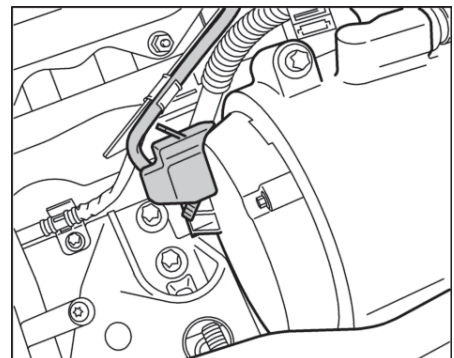
Unscrewing fastening screws of coolant hoses.



Note

- If the protective cap cannot be removed, use a knife to carefully cut it off the three-phase generator. Make sure that the plug connection and the electrical lead are not damaged and that there is no more than minimal damage to the protective cap.

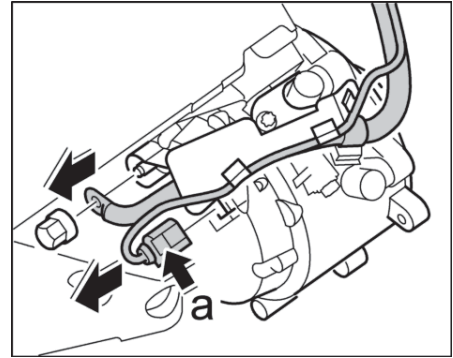
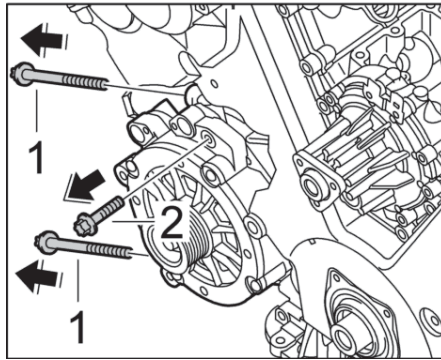
6. Pull off protective cap for electrical plug connection from receptacle on three-phase generator.



Pulling off protective cap for electrical plug connection of three-phase generator

7. Release **-a-** and pull off plug.
8. Unscrew fastening nut for B+ lead and remove the B+ lead.

9. Unscrew the three fastening screws **-1 and 2-** and support the three-phase generator with your hand.
10. Remove the three-phase generator through the opening - wheel housing liner with air-cleaner box removed.



Unscrewing fastening screws of three-phase generator Pulling plug off three-phase generator

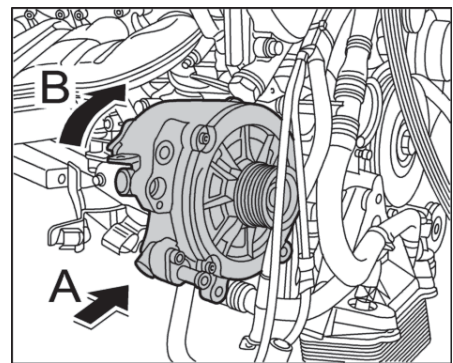
Installing the three-phase generator



Note

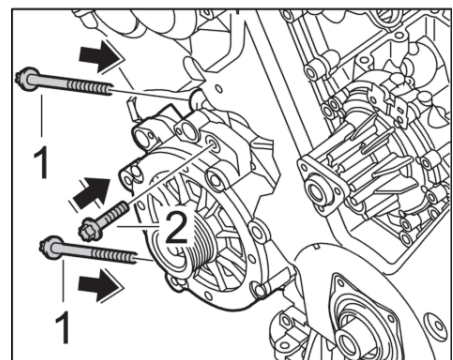
Additional assembly operations must be performed if a new three-phase generator has to be fitted. → 272219
Removing and installing new three-phase generator - chapter on "completing"

1. Insert the three-phase generator through the opening - wheel housing liner with air-cleaner box removed - **-Arrow A-** and position it on the engine **-Arrow B-**.



Position three-phase generator on the engine

2. Position the three fastening screws **-1 and 2-** and tighten them. → **Tightening torque: 17 ftlb.**
3. Additional assembly operations must be performed if a new three-phase generator has to be fitted.



Tightening the fastening screws of the three phase generator

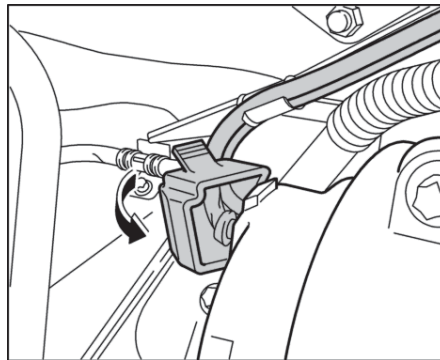
4. Insert the plug **-6-** until the locking tab **-A-** is felt to engage.
5. Clip the line into the two retaining clips **-7-**.
6. Tighten electrical B+ lead with fastening nut **-5-**. → **Tightening torque: 11 ftlb.**



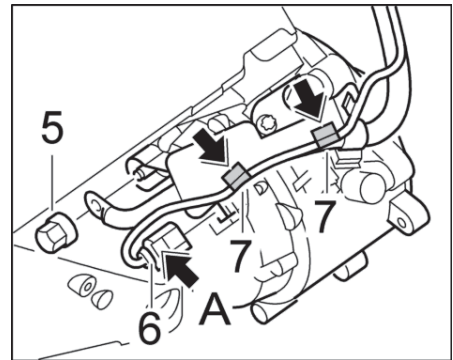
Note

- Check condition of protective cap; if it is damaged it must be repaired using body sealant.

7. Position protective cap and press it on, ensuring it fits securely and is sealed against moisture.

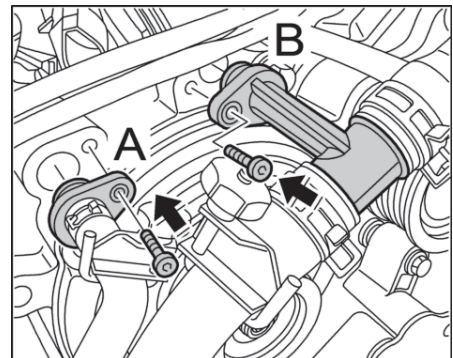


Positioning protective cap for electrical plug connection of three-phase generator



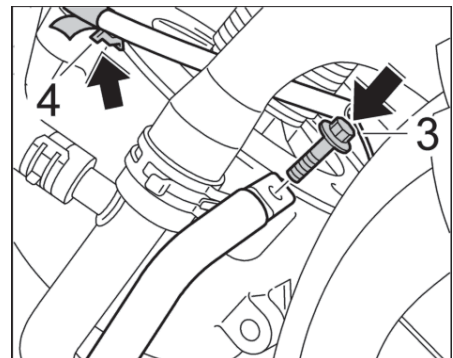
Tightening fastening nut for B + lead

8. Replace sealing rings. Push in coolant connections on the three-phase generator and screw into place using fastening screws **-A and B-**. → **Tightening torque: 7.5 ftlb.**
9. Connect coolant lines and position holding clamps.



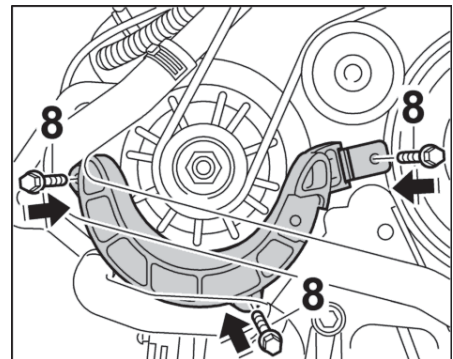
Tightening coolant connections to three phase generator

10. Secure ground lead to three-phase generator with fastening screw **-3-**. → **Tightening torque: 15 ftlb.**
11. Attach clip **-4-** of the electrical lead to the three-phase generator.



Tightening fastening screw of ground lead to three phase generator

12. Position the impact bracket and screw into place with the fastening screws **-8-**. → **Tightening torque: 7.5 ftlb.**



Perform additional assembly work when replacing the three-phase generator

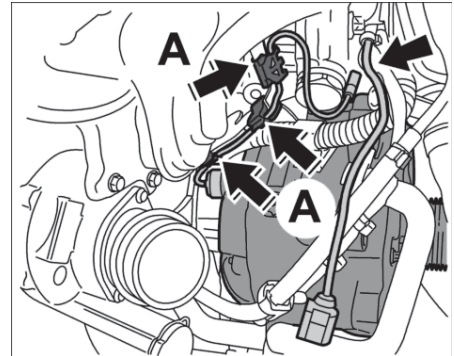
Additional assembly work when replacing three-phase generator



Note

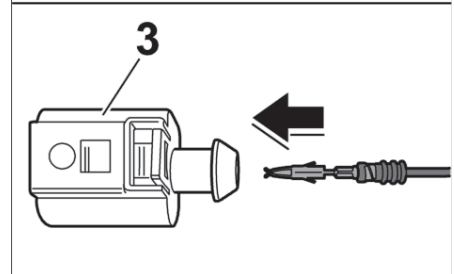
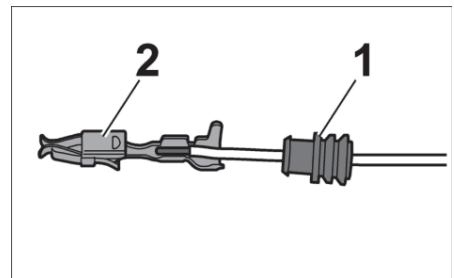
The parts pack of a new three-phase generator contains all the parts required (insulator, PIN and socket).

1. Lay the lead of the new three-phase generator as for the old lead and clip into the three retaining clips **-Arrows A-**.
2. Trim the lead (with 2-pole plug) included in the engine wiring harness to the three-phase generator **-arrow-** such that, together with the new lead already laid from the three-phase generator, it can be joined without tension and without too much slack.
3. In the wiring harness, insulate and immobilise the wire to PIN 2 of the plug that was cut off.



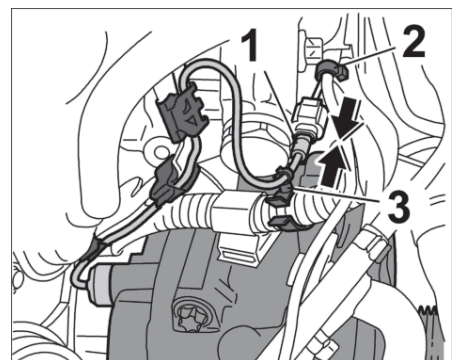
Laying and trimming lead of three-phase generator

4. In the wiring harness, remove the insulation of the wire to PIN 1 of the plug that was cut off and push new insulator **-1-** onto the wire.
5. Crimp new PIN **-2-** using **repair kit for wiring harnesses NR.155-1** and **repair kit for Cayenne wiring harnesses NR.155-2**.
6. Insert wire with new PIN into the new socket **-3-** and lock.



Crimping plug to wiring harness

7. Push the plug connection **-1-** together until it is felt to engage.
8. Tie the plug connection with a tie-wrap **-2-** to the nearby wiring harness.
9. Clip line holder **-3-** to the shaft tube.



Pushing plug connection together and clipping the line holder

Subsequent work

Subsequent work

1. Install drive belt. → 137819 Removing and installing drive belt - chapter on "installing"

2. Fill in coolant. → 193817 Draining and filling in coolant (includes bleeding) - chapter on "filling in"
 3. Install right air-cleaner box. → 242519 Removing and installing air cleaner housing - chapter on "installing"
 4. Install right wheel housing liner. → 505619 Removing and installing front wheel housing liner - chapter on "installing"
 5. Connect the battery and carry out the work instructions. → *90 Work instructions after disconnecting the battery*
 6. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"
-

9PAAE1, 9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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27 22 19 Removing and installing the generator - as of MY 2006

- Preliminary work
- Removing the generator
- Installing the generator
- Subsequent work

Preliminary work

Preliminary work

1. Before the generator can be removed, the battery must be disconnected and the terminal covered. → 90
Work instructions after disconnecting the battery
2. Remove right front wheel. → 440519 Removing and installing wheel - section on "Removing"
3. Remove right wheel housing liner. → 505619 Removing and installing front wheel housing liner - section on "Removing"
4. Remove right air cleaner housing. → 242519 Removing and installing air cleaner housing - section on "Removing"
5. Remove engine guard. → 108019 Removing and installing engine guard - section on "Removing"
6. Drain coolant. → 193817 Draining and filling in coolant (includes bleeding) - section on "Draining"
7. Remove drive belt. → 137819 Removing and installing drive belt - section on "Removing"

Removing the generator

Removing the generator



Note

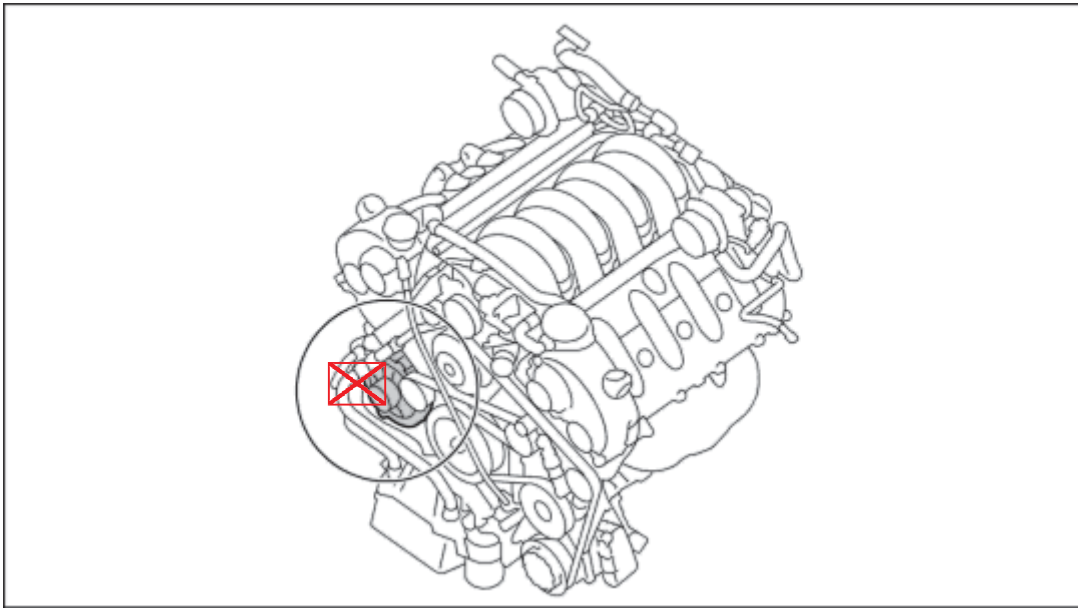
This description applies to engine numbers as of M48/00 816 09867.



Note

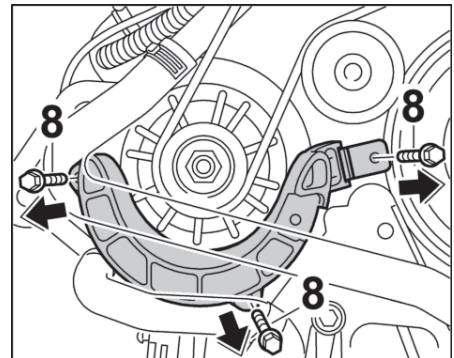
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Installation Location:



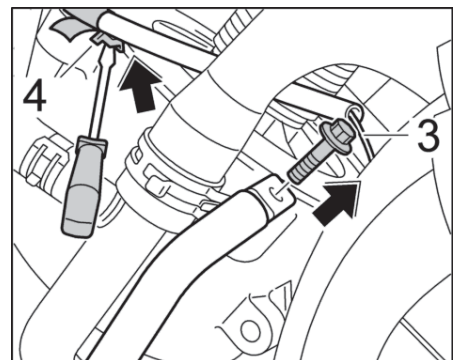
Overview of generator

1. Unscrew the three fastening screws **-8-** for the impact bracket and remove the impact bracket.



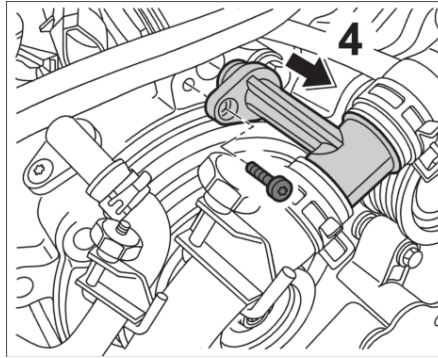
Unscrewing the fastening screws for the impact bracket

2. Unscrew fastening screw **-3-** on ground lead and lay ground lead to one side.
3. Lever out fastening clips **-4-** for the electric line using a screwdriver.

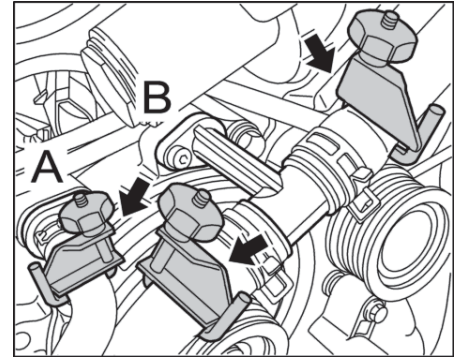


Unscrewing fastening screw on ground lead.

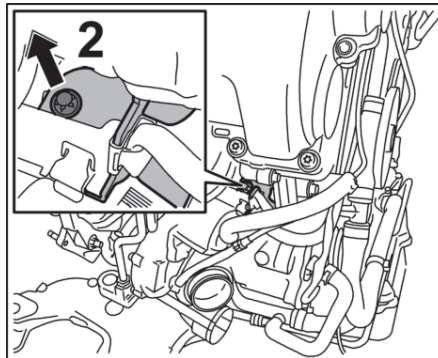
4. Seal the coolant hoses **-A and B-** with a hose clamp to prevent them from leaking.
5. Unscrew fastening screw **-4-** on the return connection piece.
6. Unscrew fastening screw **-2-** on the supply connection piece **-1-**.



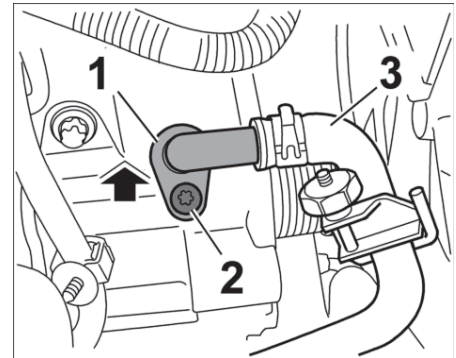
Unscrewing fastening screw on the return connection piece



Sealing coolant hoses with hose clip



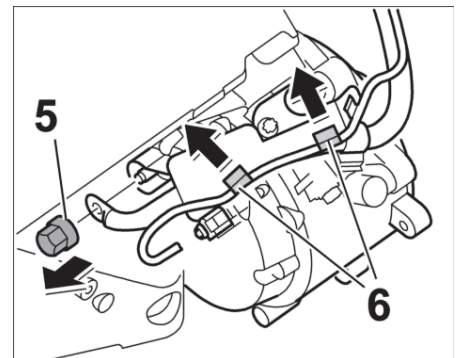
Unscrewing fastening screw on heat protection shield for generator lines



Unscrewing fastening screw on the supply connection piece

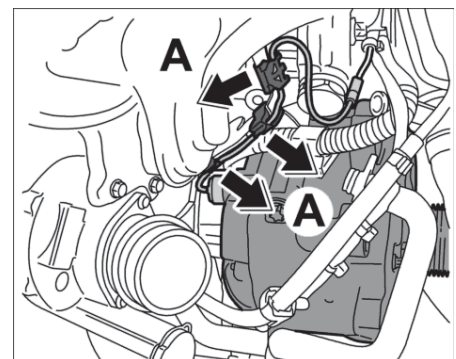
7. Unscrew fastening screw **-2-** on the heat protection shield for generator lines.

8. Unscrew fastening nut **-5-** on the B+ line. Unclip the B+ line at the two retaining clips **-6-** and remove it.



Screwing off B+ line on generator

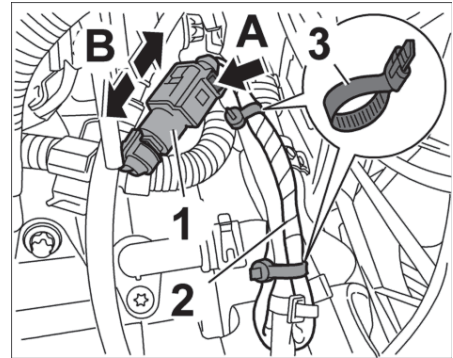
9. Unclip wire harness for the generator at the three retaining clips **-Arrows A-**.



Unclipping wire harness for generator

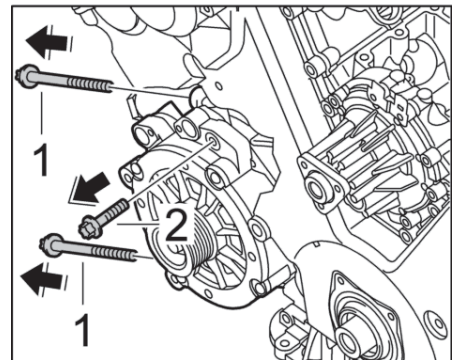
10. Cut both tie-wraps **-3-** on the wire harness for the generator **-2-**.

11. Release plug connection for generator **-1-** (**-Arrow A-**) and disconnect it **-Arrows B-**.



Disconnecting plug connection for generator

12. Unscrew the three fastening screws **-1 and 2-** and support the generator with your hand.
13. Remove the generator through the opening – wheel housing liner with air-cleaner box removed.

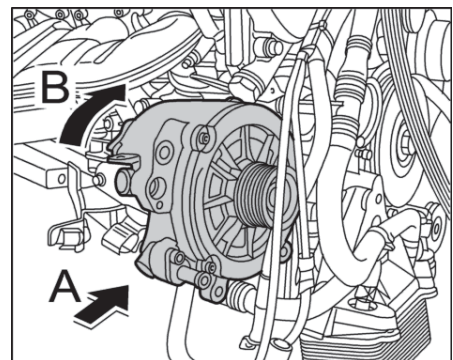


Unscrewing fastening screws on generator

Installing the generator

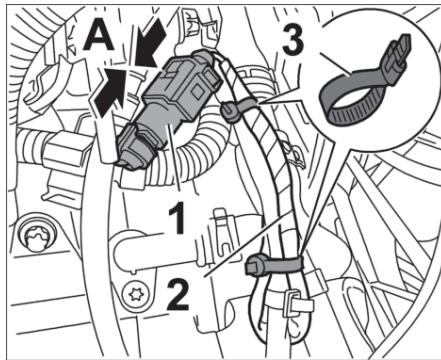
Installing the generator

1. Insert the generator through the opening - wheel housing liner with air-cleaner box removed - **-Arrow A-** and position it on the engine **-Arrow B-**.

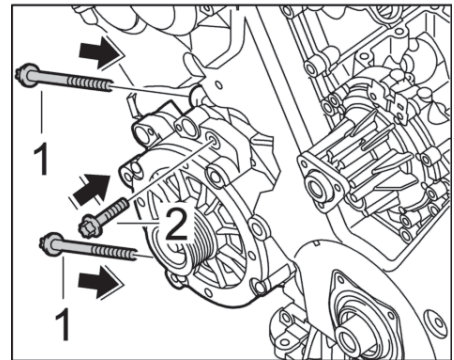


Positioning the generator on the engine

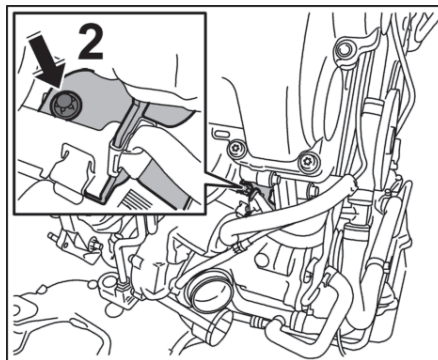
2. Position the three fastening screws **-1 and 2-** and tighten them. → **Tightening torque: 23 (17 ftlb.) Nm**
3. Push the plug connection **-1-** together until it is felt to engage.
4. Secure wire harness **-2-** to the wire harness running parallel using two tie-wraps **-3-**.
5. Secure the heat protection shield with the generator lines to the generator using the fastening screw **-2-**.
→ **Tightening torque: 10 (7.5 ftlb.) Nm**
6. Clip wire harness for the generator in at the three retaining clips **-Arrows A-**.



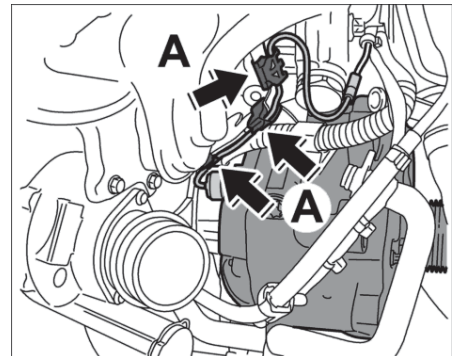
Pushing plug connection together and clipping in the line holder



Tightening fastening screws on the generator

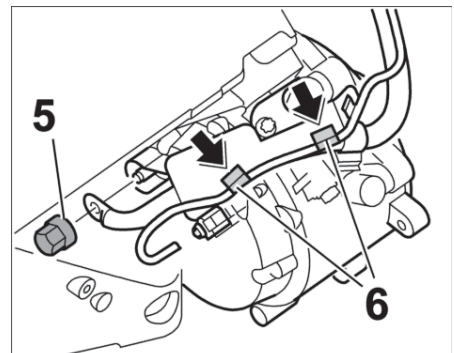


Securing heat protection shield with generator lines to the generator



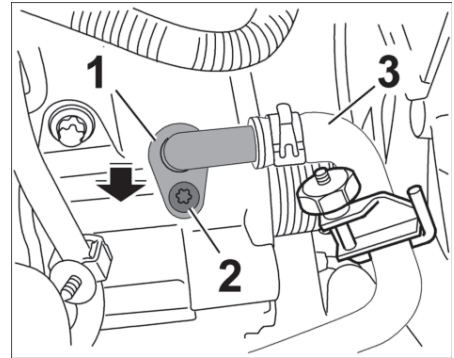
Clipping in wire harness for generator

7. Secure B+ line with the fastening nut **-5-** . → **Tightening torque: 15 (11 ftlb.) Nm**



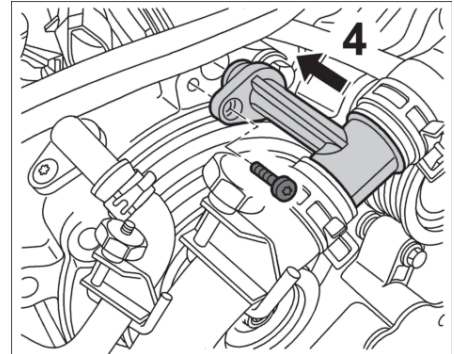
Securing B+ line to generator

8. Screw on supply connection piece **-1-** .
- 8.1. Grease the new seal on the supply connection piece **-1-** with Vaseline.
- 8.2. Press supply connection piece **-1-** as far as it will go into the supply coolant bore on the generator and secure with the new fastening screw **-2-** . → **Tightening torque: 10 (7.5 ftlb.) Nm**



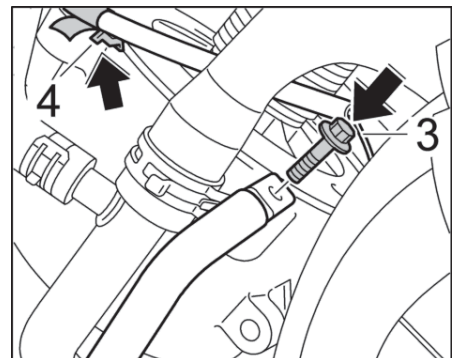
Screwing on supply connection piece

9. Grease new sealing ring with Vaseline. Attach return connection piece to the generator and secure with fastening screws -4-. → **Tightening torque: 10 (7.5 ftlb.) Nm**
10. Remove hose clamps on the coolant hoses.



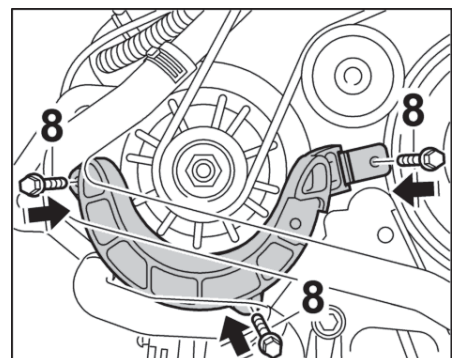
Securing return connection piece

11. Secure ground lead to the generator with the fastening screw -3-. → **Tightening torque: 20 (15 ftlb.) Nm**
12. Attach clip -4- on the electric line to the generator.



Tightening fastening screw securing ground lead to generator

13. Position the impact bracket and secure with the fastening screws -8-. → **Tightening torque: 10 (7.5 ftlb.) Nm**



Tightening fastening screws for the impact bracket

Subsequent work

Subsequent work

1. Install drive belt. → 137819 Removing and installing drive belt - section on "Installing"
 2. Fill in coolant. → 193817 Draining and filling in coolant (includes bleeding) - section on "Filling in"
 3. Install right air cleaner housing. → 242519 Removing and installing air cleaner housing - section on "Installing"
 4. Install right wheel housing liner. → 505619 Removing and installing front wheel housing liner - section on "Installing"
 5. Fit right front wheel. → 440519 Removing and installing wheel - section on "Installing"
 6. Connect the battery and carry out the work instructions. → 90 *Work instructions after disconnecting the battery*
 7. Fit engine guard. → 108019 Removing and installing engine guard - section on "Installing"
-

9PAAE1, 9PAAE7

as of MY 2006

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

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- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
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27 22 55 Replacing the generator - as of MY 2006

- Preliminary work
- Removing the generator
- Installing the generator
- Subsequent work

Tools

Designation	Type	Number	Explanation	
Repair kit for wire harnesses	special tool	NR.155-1		PORSCHE siehe Handbuch Werkstattdausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
Repair kit for Cayenne wire harnesses	commercially available tool	NR.155-2		PORSCHE siehe Handbuch Werkstattdausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work

Preliminary work

1. Before the generator can be removed, the battery must be disconnected and the terminal covered. → 90
Work instructions after disconnecting the battery
2. Remove right front wheel.→ 440519 Removing and installing wheel - section on "Removing"

3. Remove right wheel housing liner. → 505619 Removing and installing front wheel housing liner - section on "Removing"
4. Remove right air cleaner housing. → 242519 Removing and installing air cleaner housing - section on "Removing"
5. Remove engine guard. → 108019 Removing and installing engine guard - section on "Removing"
6. Drain coolant. → 193817 Draining and filling in coolant (includes bleeding) - section on "Draining"
7. Remove drive belt. → 137819 Removing and installing drive belt - section on "Removing"

Removing the generator

Removing the generator



Note

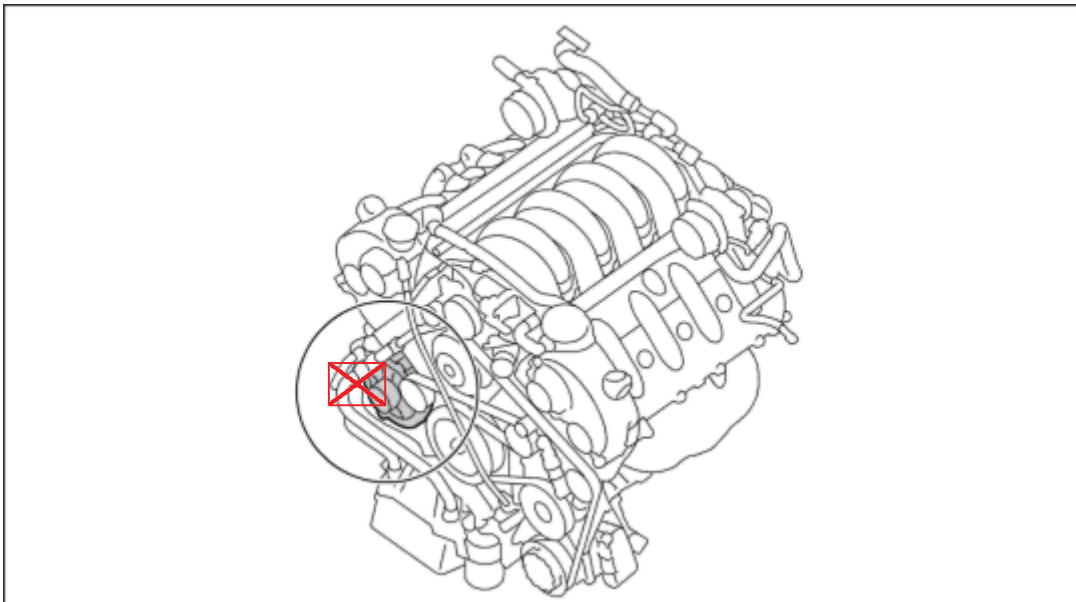
This description applies to engine numbers up to M48/00 816 09866.



Note

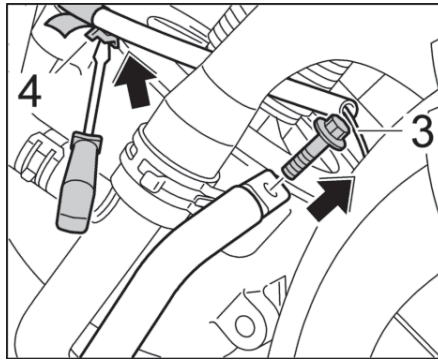
- *When the engine is being cleaned with high-pressure cleaning equipment, make sure that the high pressure blast is not directed directly onto the three-phase generator (risk of bearing damage).*

Installation Location:

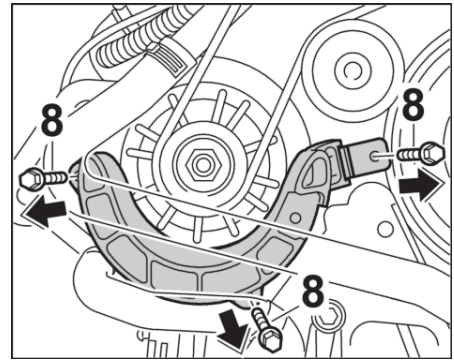


Overview of generator

1. Unscrew the three fastening screws **-8-** for the impact bracket and remove the impact bracket.
2. Unscrew fastening screw **-3-** on ground lead and lay ground lead to one side.

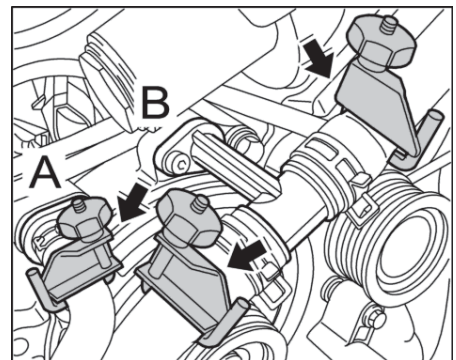


Unscrewing fastening screw on ground lead.



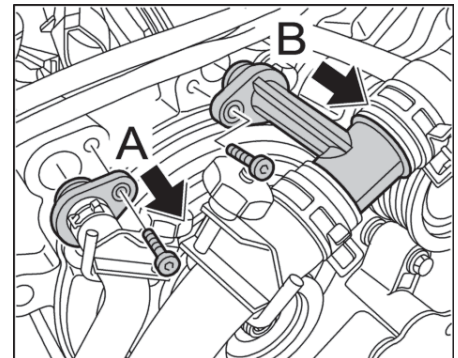
Unscrewing the fastening screws for the impact bracket

3. Lever out fastening clips **-4-** for the electric line using a screwdriver.
4. Seal the coolant hoses **-A and B-** with a hose clamp to prevent them from leaking.



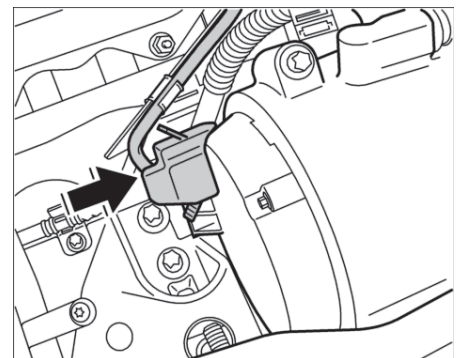
Sealing coolant hoses with hose clamp

5. Unscrew fastening screws **-A and B-** on coolant connections.



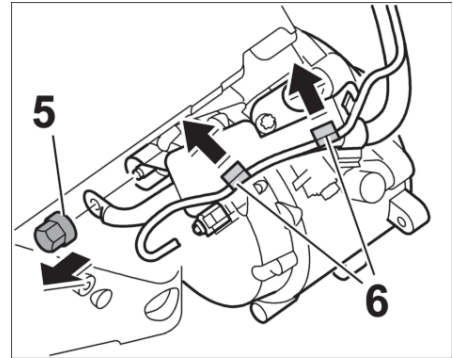
Unscrewing fastening screws on coolant hoses.

6. Cut off the electric line directly behind the protection cap **-Arrow-** on the generator.



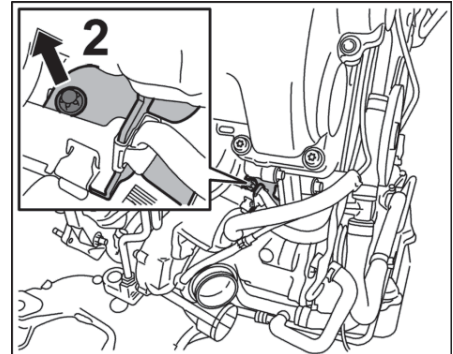
Cutting off electric line behind the protection cap on the generator

7. Unscrew fastening nut **-5-** on the B+ line. Unclip the B+ line at the two retaining clips **-6-** and remove it.



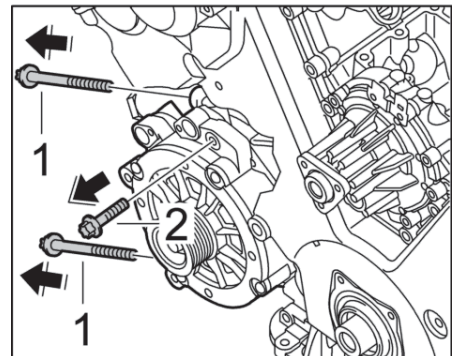
Screwing off B+ line on generator

8. Unscrew fastening screw **-2-** on the heat protection shield for generator lines.



Unscrewing fastening screw on heat protection shield for generator lines

9. Unscrew the three fastening screws **-1 and 2-** and support the generator with your hand.
10. Remove the generator through the opening – wheel housing liner with air-cleaner box removed.



Unscrewing fastening screws on the generator

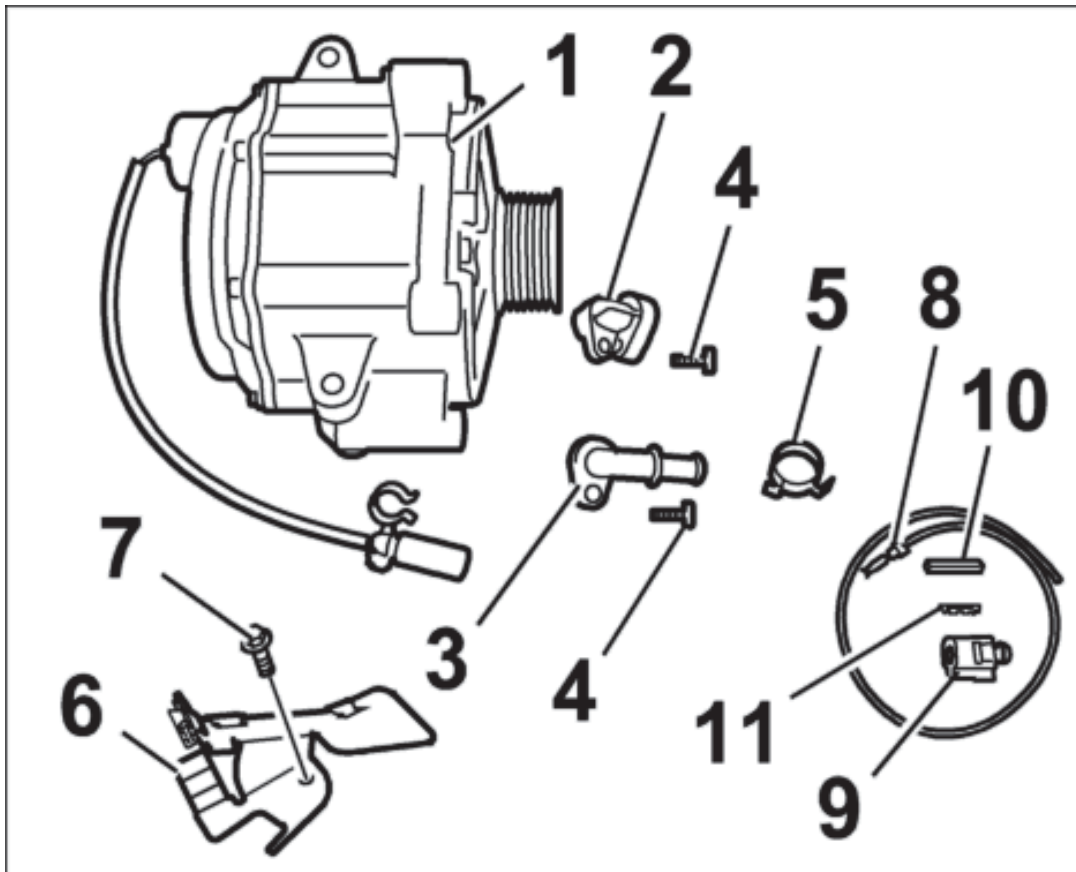
Installing the generator

Installing the generator



Note

The following parts are required for installing the Hitachi generator.



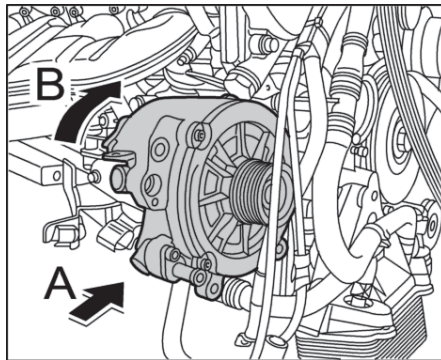
Range of spare parts for the Hitachi generator

- 1 - Generator
- 2 - Return connection piece
- 3 - Supply connection piece
- 4 - 3x screw, M6 x 16
- 5 - 1x hose clamp
- 6 - Heat protection shield
- 7 - 1x screw, M6 x 12
- 8 - 1x line
- 9 - 1x connector
- 10 - 1x shrink-fit hose
- 11 - 1x cable connection

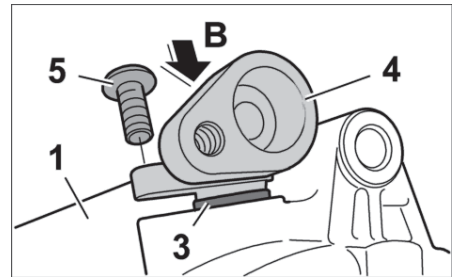
Parts **-1 to 7-** are available as spare parts.

Parts **-8 to 11-** are included in the **Repair kit for Cayenne wire harnesses NR.155-2.**

1. Fit return connection piece **-4-** on the new generator **-1-** .
 - 1.1. Pull off both caps for the coolant bores **-2-** on the new generator **-1-** (**-Arrows A-**).
 - 1.2. Grease the seal **-3-** on the new return connection piece **-4-** with Vaseline.
 - 1.3. Press return connection piece **-4-** as far as it will go into the return coolant bore on the new generator **-1-** (**-Arrow B-**) and secure with the new fastening screw **-5-** . → **Tightening torque: 10 (7.5 ftlb.) Nm**
2. Insert the generator through the opening - wheel-housing liner with air-cleaner box removed - **-Arrow A-** and position it on the engine **-Arrow B-** .

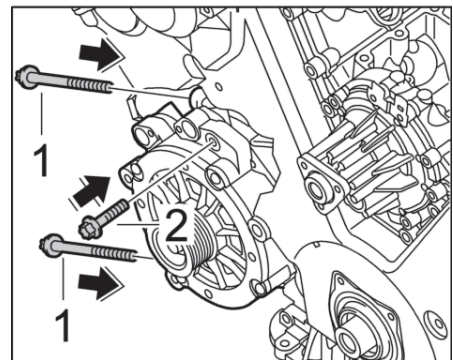


Positioning the generator on the engine



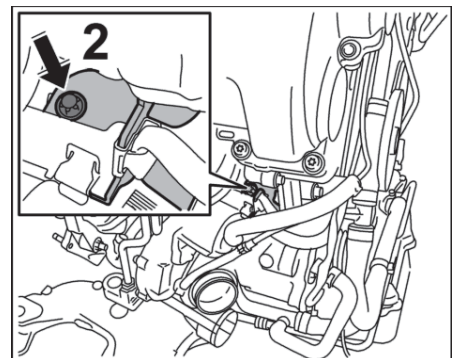
Fitting return connection piece on the new generator

3. Position the three fastening screws **-1 and 2-** and tighten them. → **Tightening torque: 23 (17 ftlb.) Nm**



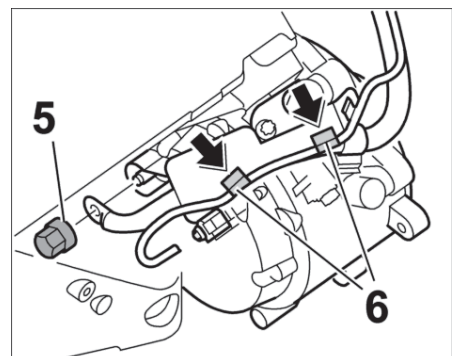
Tightening fastening screws on the generator

4. Secure the heat protection shield with the generator lines to the generator using the fastening screw **-2-**. → **Tightening torque: 10 (7.5 ftlb.) Nm**



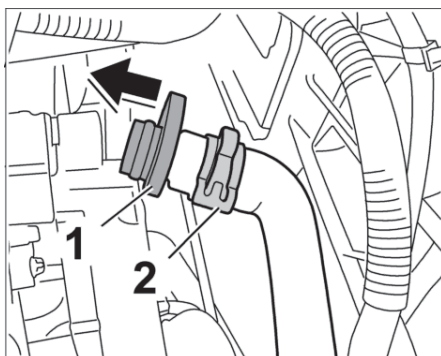
Securing heat protection shield with generator lines to the generator

5. Secure B+ line with the fastening nut **-5-**. → **Tightening torque: 15 (11 ftlb.) Nm**



6. Remove old supply connection piece **-1-** .

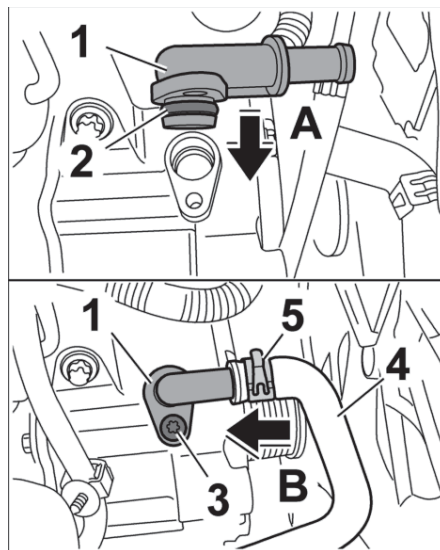
- 6.1. Press hose clamp **-2-** together and pull supply connection piece **-1-** out of the coolant hose.



Removing old supply connection piece

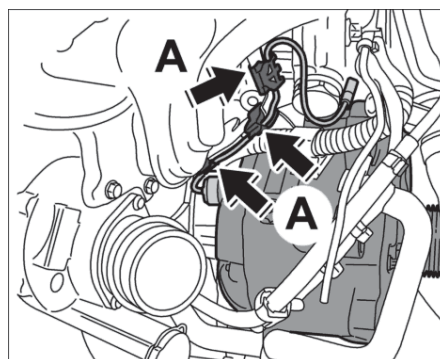
7. Install new supply connection piece **-1-** .

- 7.1. Grease the seal **-2-** on the new supply connection piece **-1-** with Vaseline.
- 7.2. Press supply connection piece **-1-** as far as it will go into the supply coolant bore on the new generator **-Arrow A-** and secure with the new fastening screw **-3-** . → **Tightening torque: 10 (7.5 ftlb.) Nm**
- 7.3. Fit the coolant hose **-4-** with a new hose clamp **-5-** and push it onto the supply connection piece **-1-** (**-Arrow B-**).



Installing new supply connection piece

8. Lay the line for the new generator in the same way as the old line and clip it into the three retaining clips **-Arrows A-** .



Laying generator line

9. Join the new line **-1-** to the new connector **-2-** .
- 9.1. Push new line **-1-** with the PIN fully into the connector housing **-2-** (**-Arrow A-**).
- 9.2. Lock connector **-2-** (**-Arrow B-**) until it engages audibly.
Check that connector **-2-** is locked correctly.



Note

Select a place for the joint where there is enough space to join all the lines present.

Do not cut the lines too short in case they have to be laid in a different position if there is insufficient space in the area of the joint.



Note

The electric lines are located in the splash water area and are thus exposed to the highest demands.

The greatest care must be taken in the individual work steps for stripping insulation from, crimping, and shrinking/insulating the electric lines.

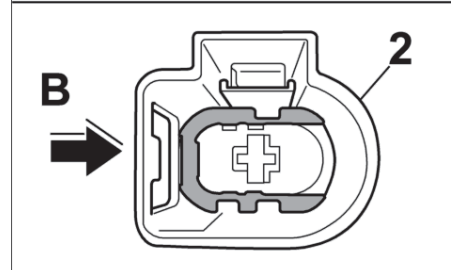
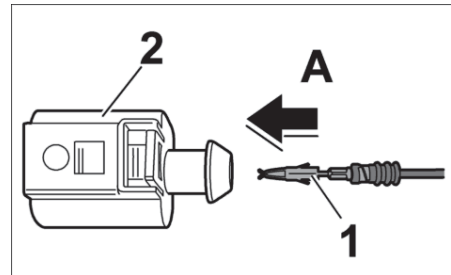
The procedure for stripping insulation from, crimping, and shrinking/insulating the electric lines must be complied with and observed. The procedures are described in detail in the **Repair kit for Cayenne wire harnesses NR.155-2**.

Crimping samples are to be prepared before beginning work.



Note

Allocation of lines - see wiring diagram.



Joining connector to new line

10. Crimp the line from the new generator **-1-** with the line from the engine wire harness **-4-**.

10.1. Trim the line from the engine wire harness **-4-** so that it can be joined to the new line that was already laid from the generator **-1-** without tension and without too much slack.

10.2. In the engine wire harness **-4-**, insulate and immobilise the wire to PIN 2 of the connector that was cut off.

10.3. In the engine wire harness **-4-**, strip 10 mm of the line to PIN 1 of the connector that was cut off and push new shrink-fit hose **-3-** onto the line.

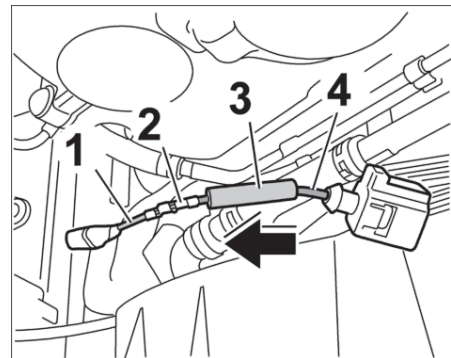
10.4. Crimp both lines **-1 and 4-** using a new crimping sleeve **-2-** and the **hand crimping pliers** from the **Repair kit for wire harnesses NR.155-1**.

10.5. Slide new shrink-fit hose **-3-** over the crimp connection and carefully shrink it to make it watertight using the **hot-air blower with special nozzle** (recommended accessories for the repair kit for wire harnesses).

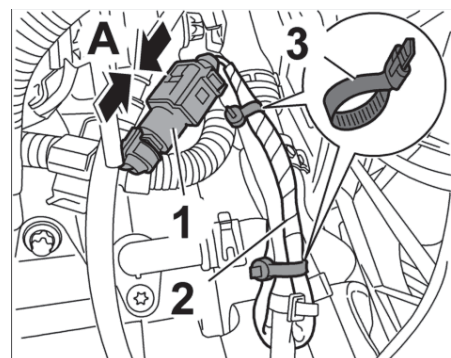
11. Wrap commercially available PVC tape all around the area of the connection point.

12. Push the plug connection **-1-** together until it is felt to engage.

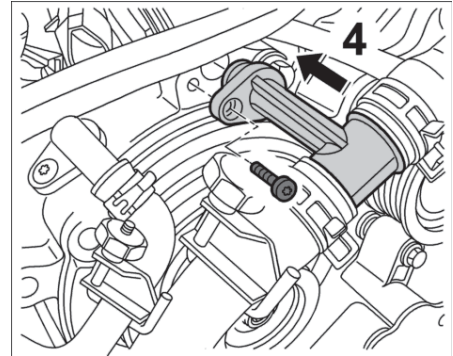
13. Secure wire harness **-2-** to the wire harness running parallel using two tie-wraps **-3-**.



Joining line from new generator to line from engine wire harness

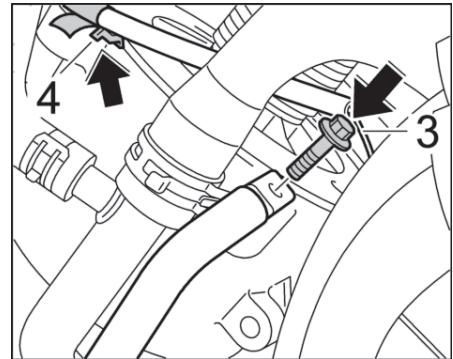


Pushing plug connection together and clipping in the line holder



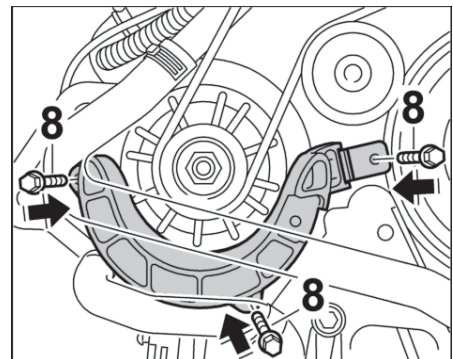
Securing return connection piece

14. Grease new sealing ring with Vaseline. Attach return connection piece to the generator and secure with fastening screws **-4-** . → **Tightening torque: 10 (7.5 ftlb.) Nm**
15. Remove hose clamps on the coolant hoses.
16. Secure ground lead to the generator with the fastening screw **-3-** . → **Tightening torque: 20 (15 ftlb.) Nm**
17. Attach clip **-4-** on the electric line to the generator.



Tightening fastening screw securing ground lead to generator

18. Position the impact bracket and secure with the fastening screws **-8-** . → **Tightening torque: 10 (7.5 ftlb.) Nm**



Tightening fastening screws for the impact bracket

Subsequent work

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1. Install drive belt. → 137819 Removing and installing drive belt - section on "Installing"
2. Fill in coolant. → 193817 Draining and filling in coolant (includes bleeding) - section on "Filling in"
3. Install right air cleaner housing. → 242519 Removing and installing air cleaner housing - section on

"Installing"

4. Install right wheel housing liner. → 505619 Removing and installing front wheel housing liner - section on "Installing"
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9PAAE1, 9PAAE7

as of MY 2006

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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ATTENZIONE

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ADVERTENCIA

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27 60 19 Removing and installing starter - as of MY 2003

- Preliminary work
- Removing the starter
- Installing the starter
- Subsequent work

Preliminary work

Preliminary work

1. Remove intake-air distributor. → 244619 Removing and reinstalling intake-air distributor - chapter on "Removing"
2. Disconnect battery. → 270619 Removing and reinstalling battery - chapter on "Removing"; → 90 *Work instructions after disconnecting the battery*

Removing the starter

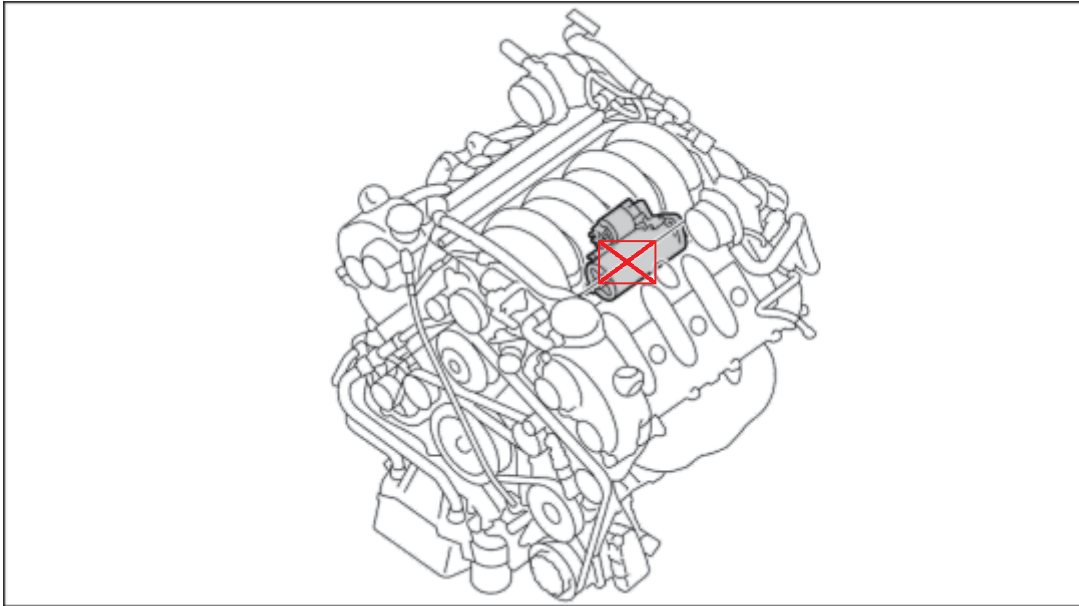


WARNING

Risk of damage to starter

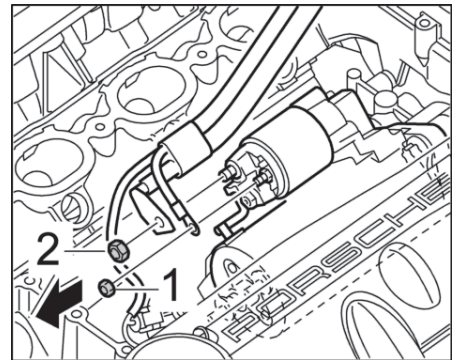
- The battery must be properly disconnected before the electric lines are detached on the starter.

Installation Location:



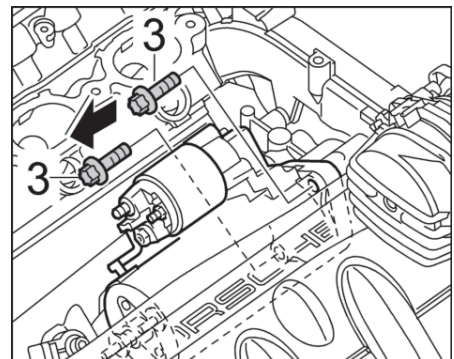
Overview of starter

1. Unscrew fastening nuts **-1-** and **-2-** on the starter, remove the lines and lay them to one side.



Fastening nuts on starter

2. Unscrew the two fastening screws **-3-**.

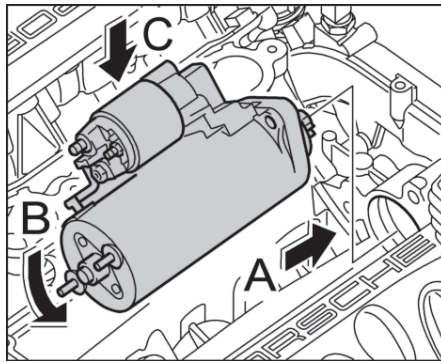


Fastening screws

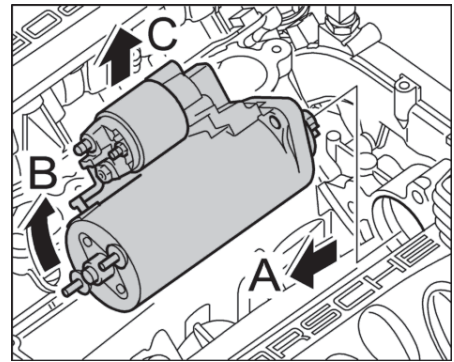
3. Pull starter forward in the direction of travel **-arrow A-**, turn slightly **-arrow B-** and remove in an upward direction **-arrow C-**.

Installing the starter

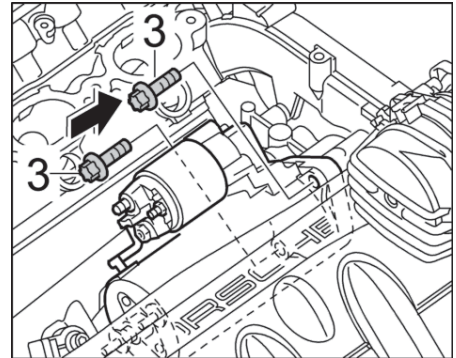
1. Place the starter from above on the engine **-arrow C-**, turn slightly **-arrow B-** and position in the mounting **-arrow A-** on the engine.



Positioning the starter

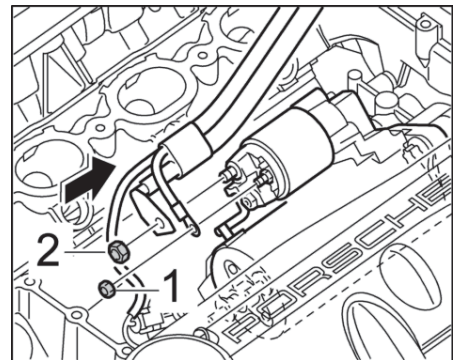


Removing starter



Screwing in fastening screws in engine housing

2. Insert fastening screws **-3-** on starter, screw into the engine housing and tighten. → **Tightening torque: 33 ftlb.**
3. Position electric lines on the starter and tighten with fastening nuts **-1-** and **-2-** . → **Tightening torque: 11 ftlb.** , → **Tightening torque: 6 ftlb.**



Positioning and tightening electric lines to starter

Subsequent work

Subsequent work

1. Install intake distributor. → 244619 Removing and reinstalling intake-air distributor - chapter on "Installing"
2. Connect the battery . → 270619 Removing and reinstalling battery - chapter on "Installing"; → 90 *Work instructions after disconnecting the battery*

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

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ADVERTENCIA

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27 06 External power connection, jump lead starting - as of MY 2003

- Information

Information



Note

- *If the battery is flat, jump leads can be used together with the battery of another vehicle to start the car or to supply external power to the vehicle.*

Both batteries must be 12 V batteries.

The capacity (Ah) of the battery supplying the power must not be significantly lower than that of the flat battery.



WARNING

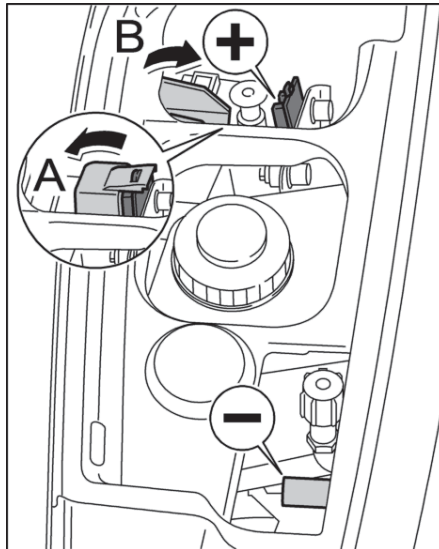
Risk of damage and injury as a result of a short circuit.

- Use only standard jump leads with a sufficiently wide cross section and fully insulated terminal clamps. Observe the cable manufacturer's specifications.
- Route the jump leads so that they cannot become entangled in moving parts in the engine compartment.
- No contact is allowed between the vehicles, otherwise electricity could flow as soon as the positive terminal is connected.

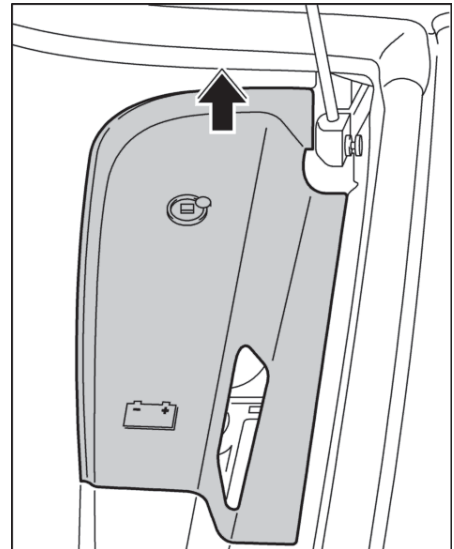
The flat battery must be properly connected to the vehicle electrical system.

1. Remove cover for jump lead starting terminal.
2. Open protective cover on the positive terminal **-+-** for jump lead starting **-arrow A-**.
3. Connect the positive cable to the positive terminal for jump-lead starting **-+-**, then to the positive terminal of the battery supplying the power.
4. First, connect the negative cable to the negative terminal of the battery supplying the power, then to the ground point for jump-lead starting **- - -**.
5. Have the engine of the vehicle supplying the power run at a higher speed.
6. Start engine. Do not spend longer than 15 seconds trying to start the vehicle with the jump leads - after 15 seconds have elapsed, wait for at least one minute.

7. Disconnect the two jump leads in reverse sequence when the engine is running.
8. Close protective cover -**arrow B**-.

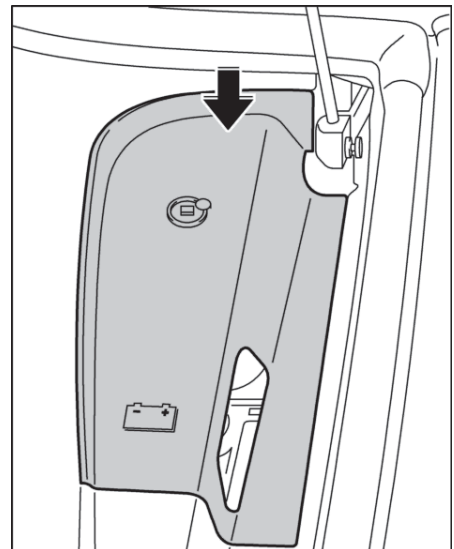


*Protective cover on positive terminal
for jump-lead starting*



Removing the cover.

9. Position the cover.



Positioning the cover

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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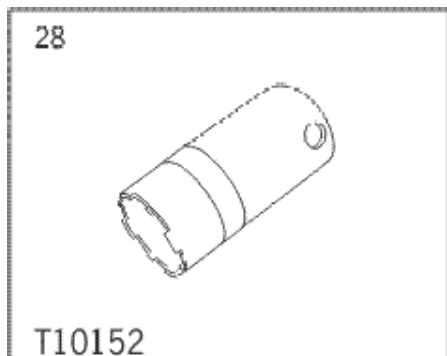
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28 04 19 Removing and installing ignition switch - as of MY 2003

- Preliminary work
- Removing ignition switch
- Installing ignition switch
- Subsequent work
- Information

Tools

Designation	Type	Number	Explanation	
wrench	special tool	T10152		

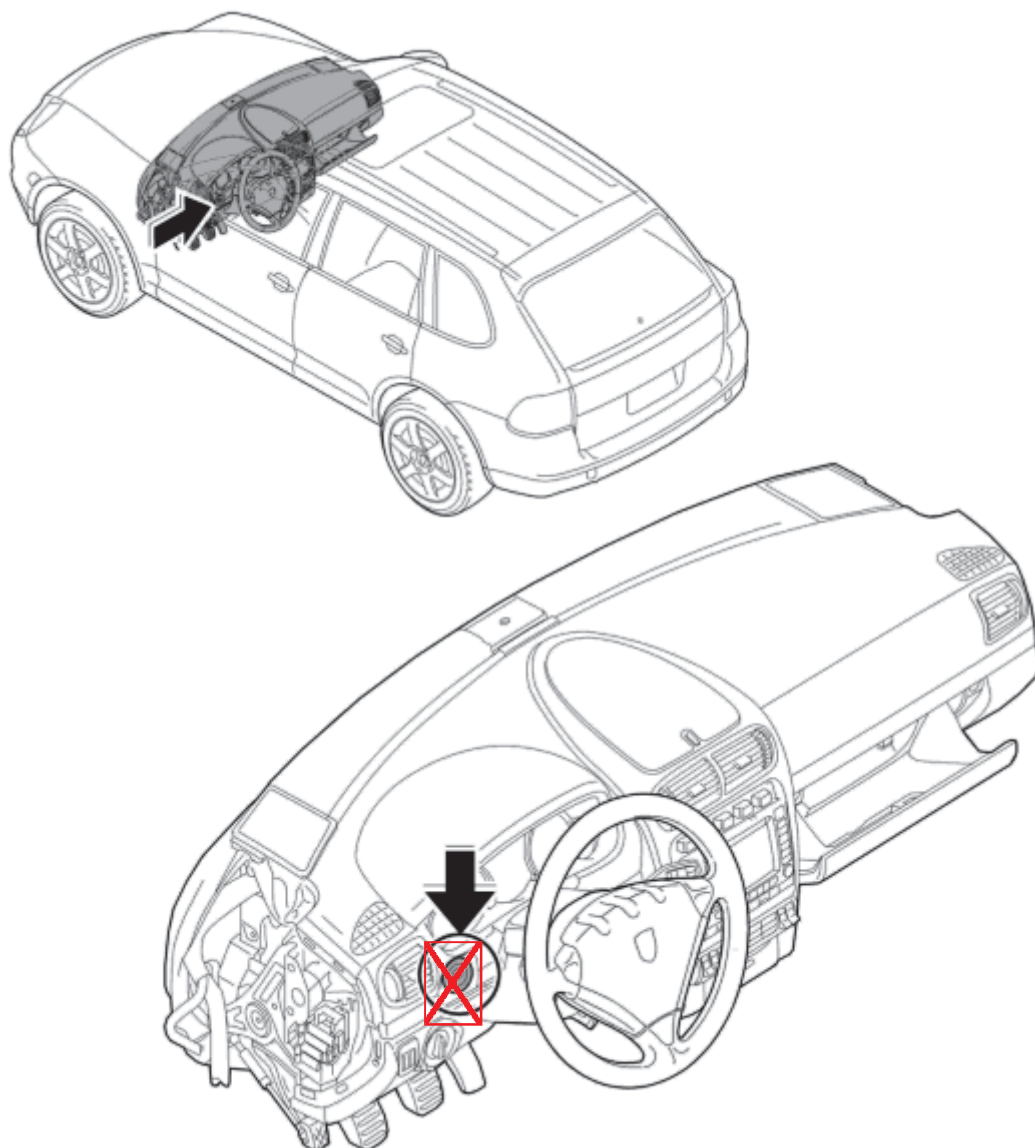
Preliminary work

Preliminary work

1. Remove trim panel under dashboard on left. → 701919 Removing and reinstalling trim panel under dashboard - chapter on "Removing"

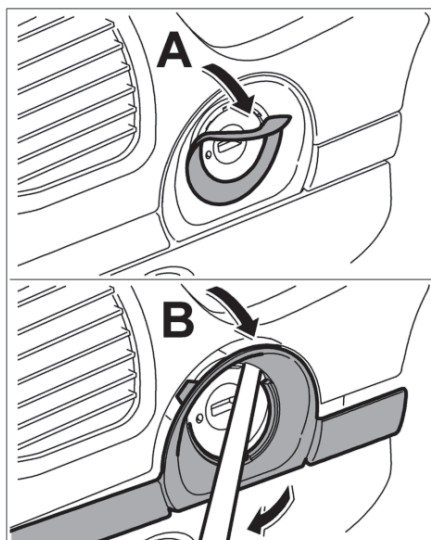
Removing ignition switch

Installation Location:



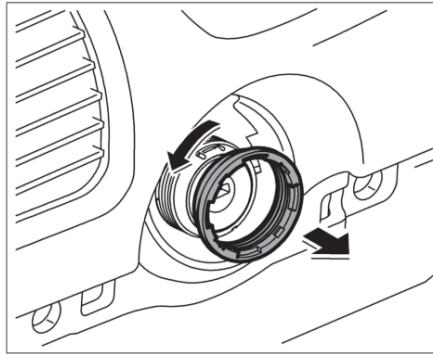
Overview of ignition starter switch

1. Carefully lift rubber sleeve on the ignition starter switch -**arrow A**- using a screwdriver, for example, and remove it.
2. Carefully unclip moulding for dashboard -**arrow B**- with a plastic spatula. Observe the two upper lugs when doing so.



Rubber sleeve on ignition starter

3. Turn union nut using a narrow plastic spatula, for example, or using the special **wrench T10152** tool and unscrew the ring from the ignition starter switch.

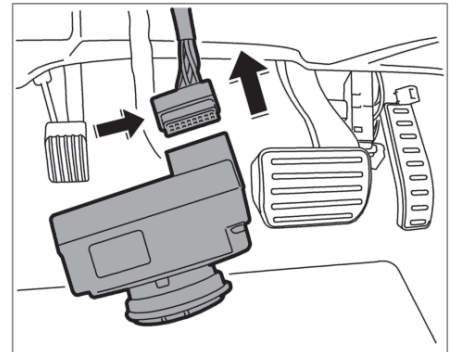


Union nut

4. Press ignition switch inwards and remove towards the bottom.

5. Press connector **-arrow-** and pull off from ignition starter switch.

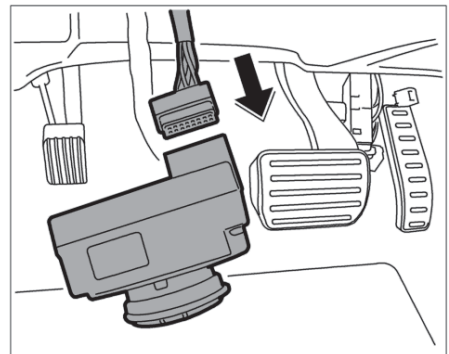
switch



Removing ignition starter switch

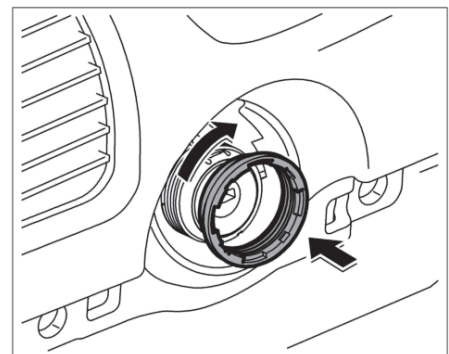
Installing ignition switch

1. Connect the connector to the ignition starter switch until it engages firmly.



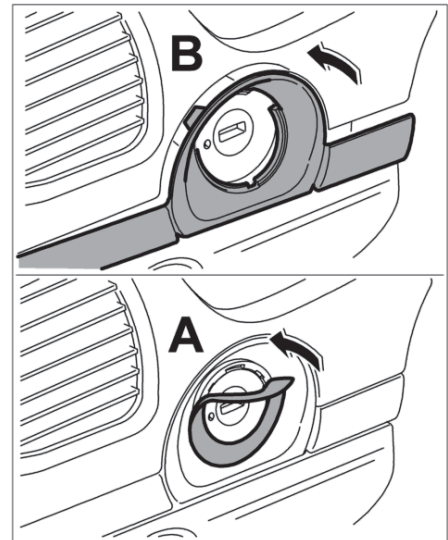
Pushing connector onto ignition starter switch

2. Position ignition starter switch in the dashboard. Position union nut, re-adjust switch and tighten union nut using **wrench T10152**.
→ **Tightening torque: 1 ftlb.**



Positioning the union nut

3. Check clips on the moulding for the dashboard for damage and replace if necessary.



Clips on moulding for dashboard

4. Position moulding and press onto the dashboard until the clips engage.

Subsequent work

Subsequent work

1. Install cover under instrument panel on left. → 702219 Removing and reinstalling cover under dashboard - chapter on "Installing"

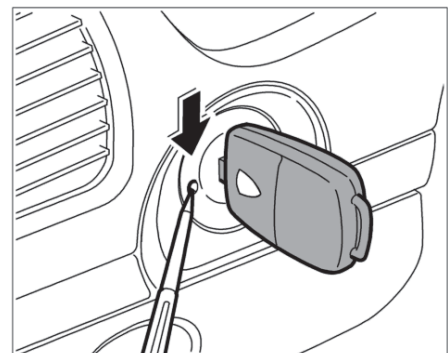
Information

Emergency operation of the ignition key lock



Note

- In the event of insufficient or non-existent battery positive voltage, the ignition key can be removed using the emergency operation.
1. Push a ball-point pen, for example, into the opening next to the key, turn the ignition key to position 0 and pull out.



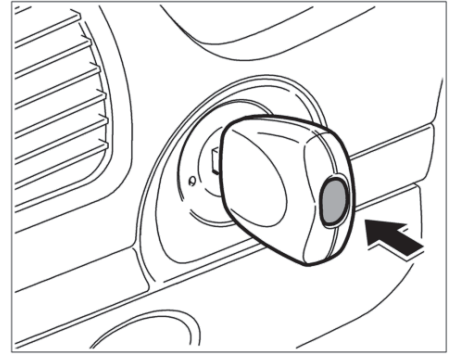
Ignition key

2. Key in position 0, press release **-arrow-** and pull key out.

9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14,
C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28,
C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



Keyless Entry and Drive



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28 20 55 Replacing ignition coils - as of MY 2003

- Preliminary work
- Replacing ignition coils
- Subsequent work

Preliminary work

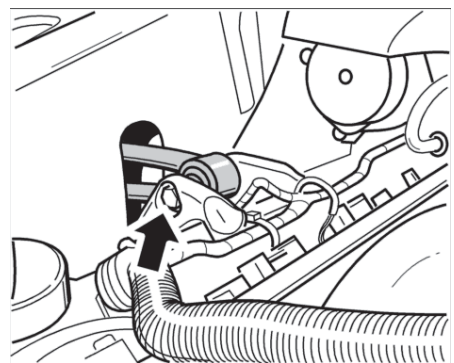
Preliminary work

1. Switch ignition off and remove ignition key
2. Remove engine compartment cover on the right and rear. → 700219 Removing and reinstalling front cover (engine compartment) - chapter on "Removing"

Replacing ignition coils

Replacing ignition coils of cylinder row 1-4

1. Loosen the torque support. To do this unscrew the fastening screw on the torque support bracket.



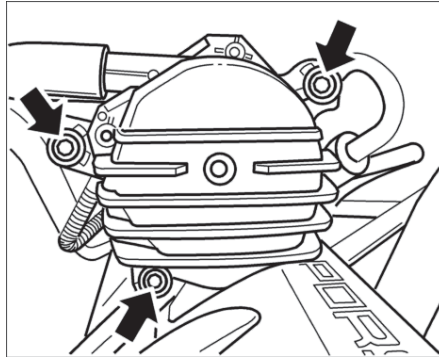
Fastening screw on the torque support bracket

2. Loosen the torque support on the body and swivel upwards.
3. Loosen the secondary air pump from cylinder row 1-4. To do this, unscrew the 3 fastening screws, pull the pump out of the support and lay it aside.

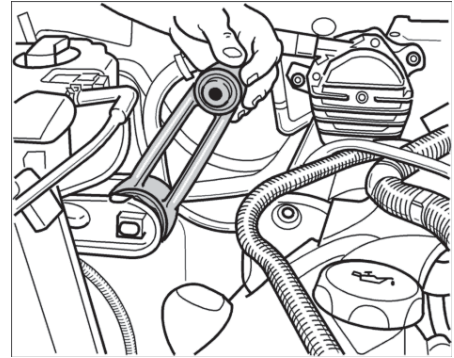


Note

- Place a cloth between design cover and support for secondary air pump to avoid scratching cover.

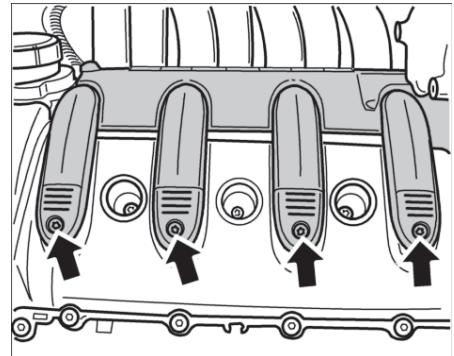


Fastening screws for secondary air pump



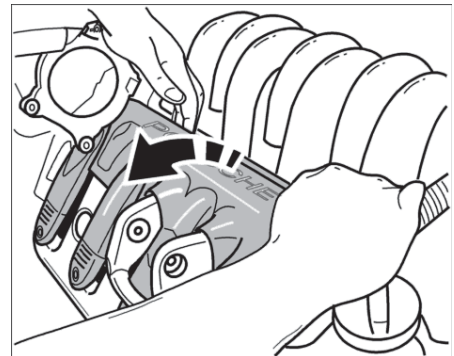
Torque support to body

4. Loosen the 4 fastening screws on the ignition coil cover (picture shows side 5-8).



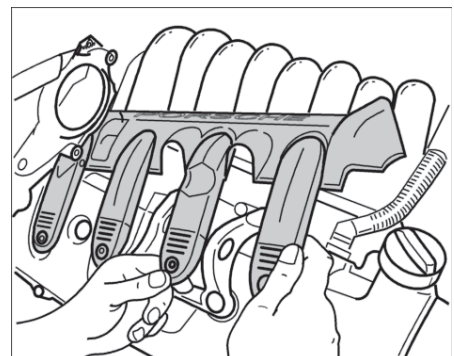
Fastening screws on ignition coil cover

5. Remove design cover from cylinder bank 1-4. Lift the cover slightly with both hands on the side pointing towards the intake system until it snaps out of the fastening points.



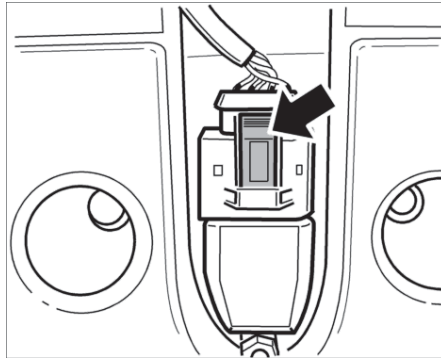
Design cover of cylinder bank 1-4

6. Lift the cover at the front edge and slide the ignition coil cover of the second cylinder out of the torque support bracket. Pull out cover to the front.

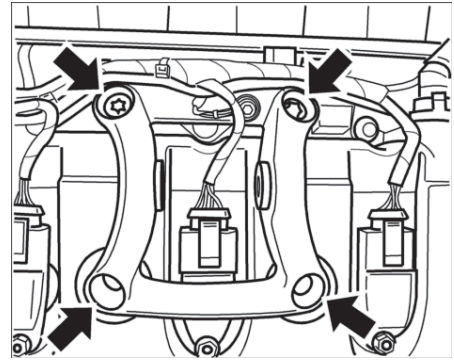


Pulling out cover to the front

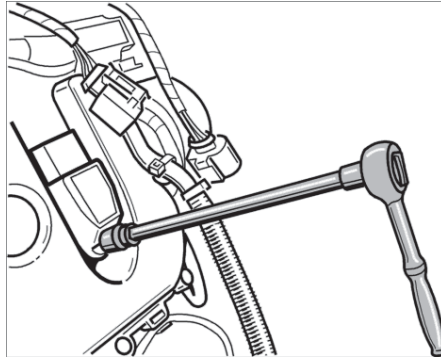
7. Remove torque support bracket. To do so, undo the 4 fastening screws and set bracket aside.
8. Disconnect the ignition coil. To do this, press the button on the connector and pull off the connector.
9. Loosen ignition coil. To do this, unscrew the fastening screw on the valve cover.



Pulling off plug

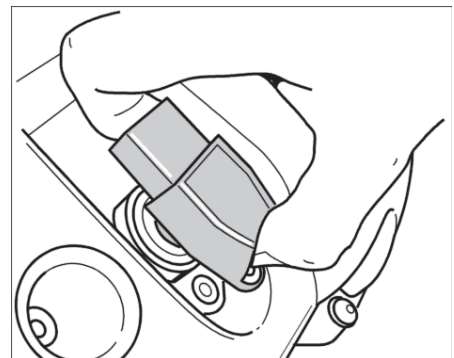


Fastening screws for torque support bracket



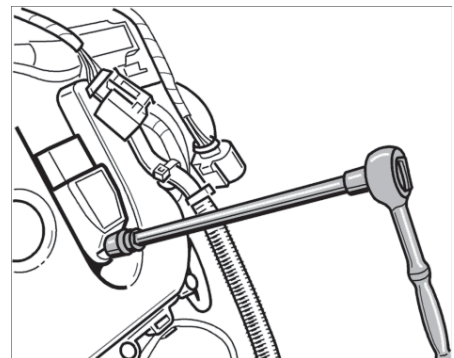
Fastening screws on valve cover

10. Pull the ignition coil out and replace it.



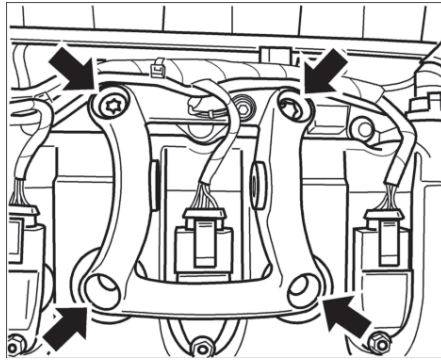
Ignition coil

11. Reconnect the new ignition coil. Tighten the fastening screws. → **Tightening torque: 7.5 ftlb.**

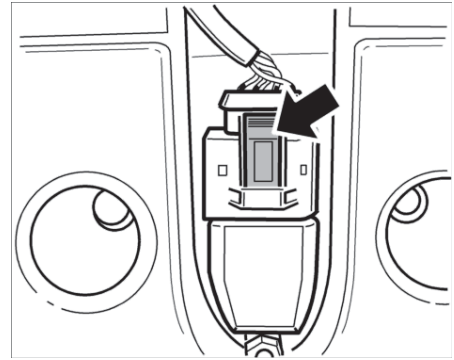


Fastening screws for ignition coil

12. Connect ignition coil. To do this slide on the connector until it locks with an audible click.
13. Install bracket for torque support. The M8 x 45 Torx screws are tightened on the upper screw points. → **Tightening torque: 17 ftlb.** The M6 x 40 screws are tightened on the lower screw fastening points (centre of the valve cover) → **Initial tightening: 3.5 ftlb.** → **Final tightening: 7.5 ftlb.**



Fastening screws for torque support bracket



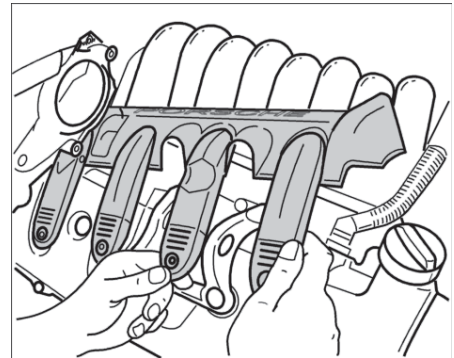
Sliding on the connector



Note

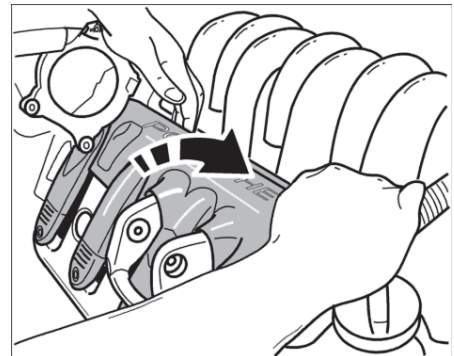
- A rag should be placed between the secondary air pump support and the design cover to prevent the cover from being scratched.

- Slide the design cover of cylinder row 1-4 under the secondary air pump support as shown in the illustration and then slide the cover of the second ignition coil through underneath the torque support bracket.



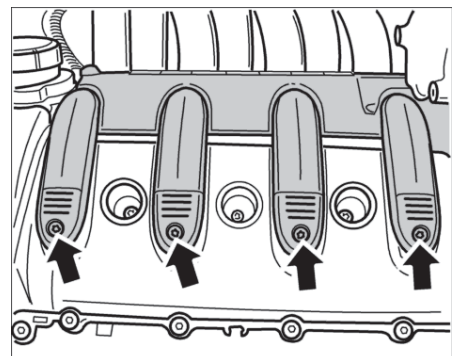
Install cover

- Press down the two rubber mountings on the support. The rubber mountings must be felt to engage.



Rubber mounting on support

- Tighten the four fastening screws on the ignition coils (illustration shows side 5-8). → **Tightening torque: 3.5 ftlb.**

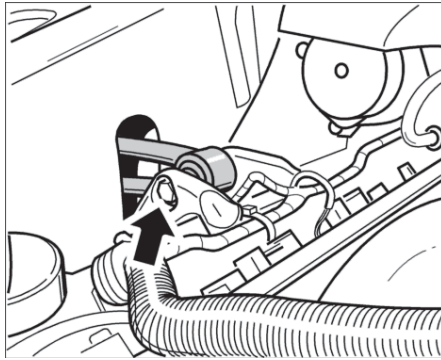


Fastening screws on the ignition coils

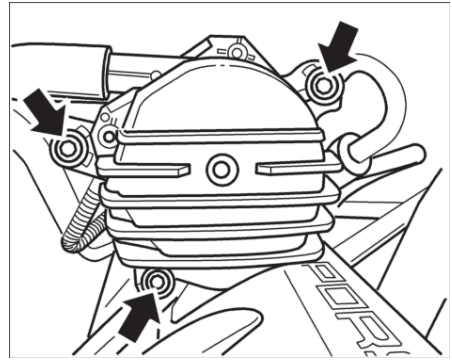
- Reinstall secondary air pump. Tighten the 3 fastening screws. → **Tightening torque: 7.5 ftlb.**

- Reinstall torque support. Install the fastening screw (M10 x 85) with a new fastening nut on the bracket. → **Tightening torque: 44 ftlb.**

- Tighten torque support fastening screw on the body (M10 x 70) . → **Tightening torque: 44 ftlb.**



Fastening screw on the torque support bracket



Fastening screws for secondary air pump

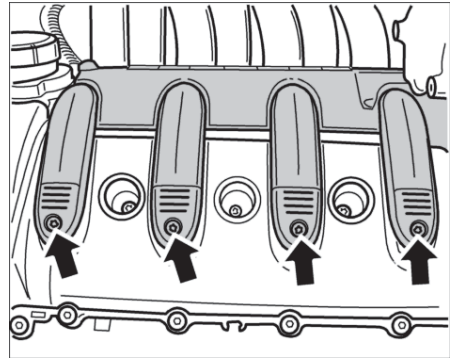
Replacing ignition coils of cylinder row 5-8



Note

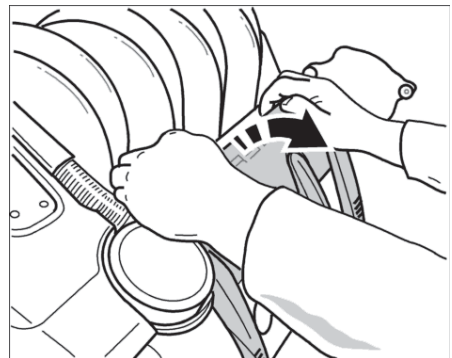
- A rag should be placed between the secondary air pump and the design cover to prevent the cover from being scratched.

1. Unscrew the 4 fastening screws on the ignition coil cover.



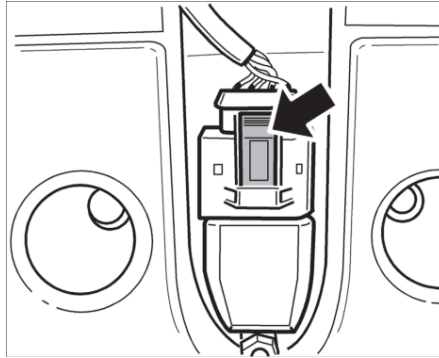
Fastening screws on ignition coil cover

2. Remove design cover of cylinder bank 5-8. To do this, lift the cover slightly with both hands at the side pointing towards the intake system until it is released from its bracket.

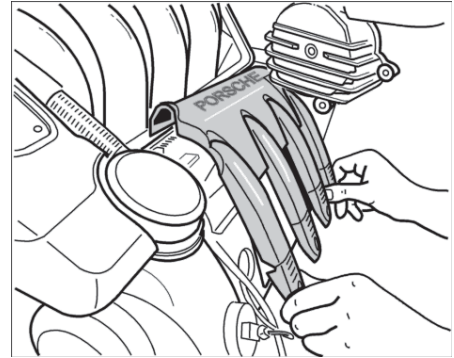


Design cover of cylinder bank 5-8

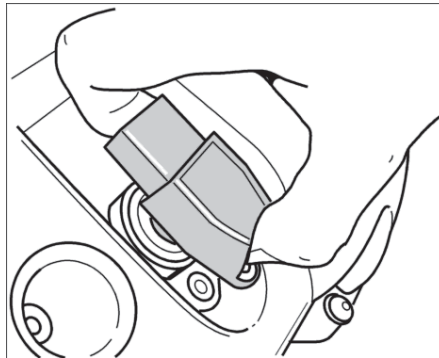
3. Lift the front of the design cover and remove it.
4. Disconnect the ignition coil. To do this, press the button on the connector and pull off the connector.
5. Loosen ignition coil. To do this, unscrew the fastening screw on the valve cover.
6. Pull the ignition coil out and replace it.
7. Reconnect a new ignition coil. Tighten the fastening screws. → **Tightening torque: 7.5 ftlb.**



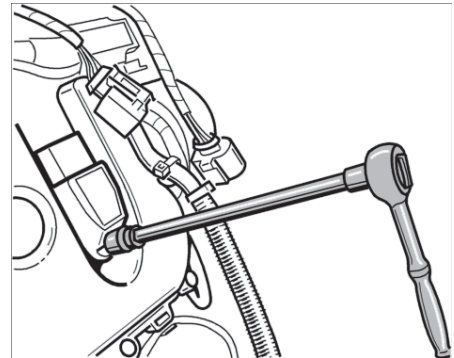
Pulling off plug



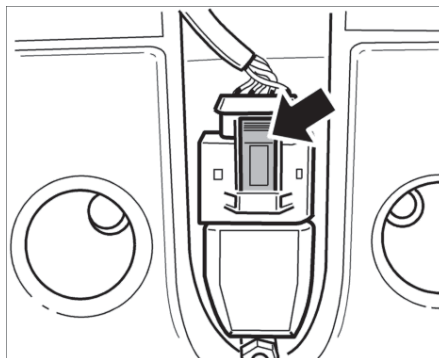
Removing the design cover



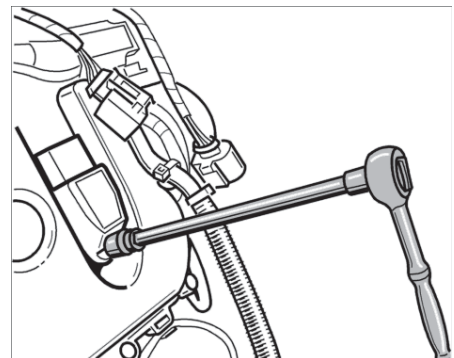
Pulling the ignition coil out and replacing it



Fastening screws for ignition coil



Sliding on the connector



Fastening screws for ignition coil

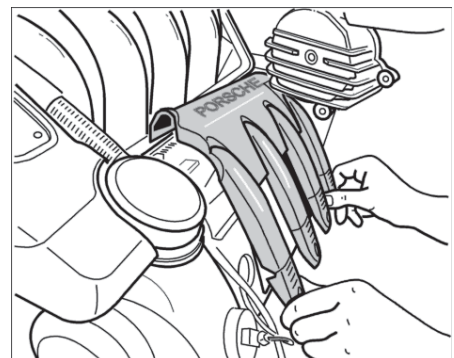
8. Connect ignition coil. To do this slide on the connector until it locks with an audible click.



Note

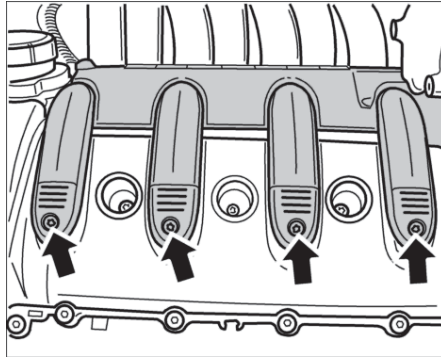
- A rag should be placed between the secondary air pump and the design cover to prevent the cover from being scratched.

9. Slide the design cover under the secondary air pump as illustrated.

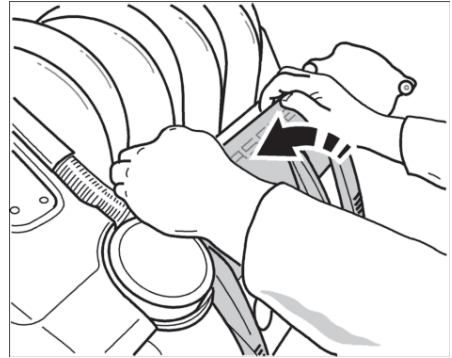


Sliding the design cover onto the secondary air pump

10. Then press in the two rubber mountings on the support. The rubber mountings must be felt to engage.



Fastening screws on the ignition coils



Rubber mounting on support

11. Tighten the 4 fastening screws on the ignition coils. → **Tightening torque: 3.5 ftlb.**

Subsequent work

Subsequent work

1. Install engine compartment cover on the right and rear. → 700219 Removing and reinstalling front cover (engine compartment) - chapter on "Installing"

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

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28 39 19 Removing and installing hall sender - as of MY 2003

- Preliminary work
- Removing hall sender
- Installing hall sender
- Subsequent work

Preliminary work

Preliminary work

1. Remove intake-air distributor. → 244619 Removing and reinstalling intake-air distributor - chapter on "Removing"

Removing hall sender

Removing hall sender



Note

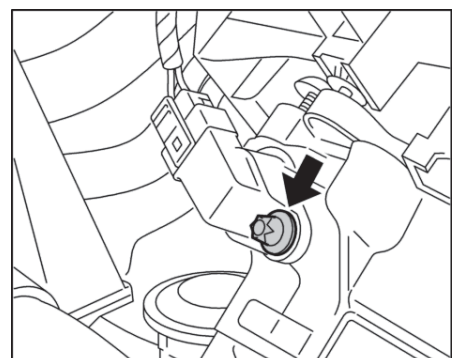
- The hall sensors are located behind the camshaft housing and point towards the intake system.



Note

Replace all seals and O-rings.

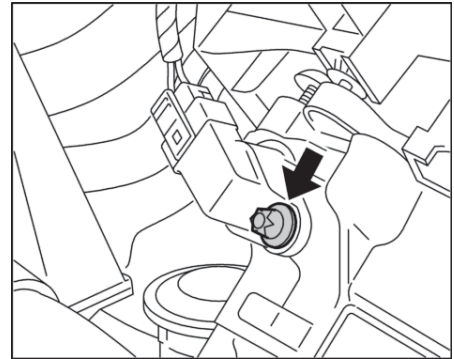
1. Disconnect connector on hall sender. To do so, push the button and remove.
2. Loosen the fastening screw on the hall sender. Use a socket wrench with 1/4 inch drive and a joint.
3. Pull the hall sender out of the camshaft housing.



Installing hall sender

Installing hall sender

1. Push the hall sender into the camshaft housing and tighten the fastening screw. → **Tightening torque: 7.5 ftlb.**
2. Push on electric connector. The connector must engage audibly.



Fastening screw on hall sender

Subsequent work

Subsequent work

1. Install intake distributor. → 244619 Removing and reinstalling intake-air distributor - chapter on "Installing"

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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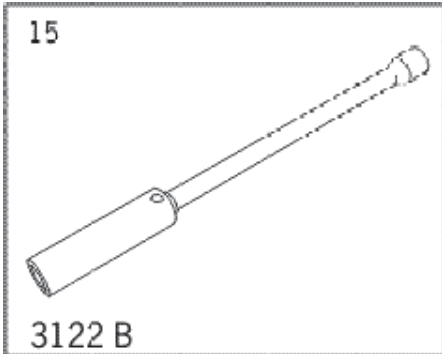
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28 70 55 Replacing spark plugs - as of MY 2003

- Preliminary work
- Removing design cover
- Replacing spark plugs
- Installing design cover

Tools

Designation	Type	Number	Explanation	
spark plug wrench	special tool	3122 B		

Preliminary work

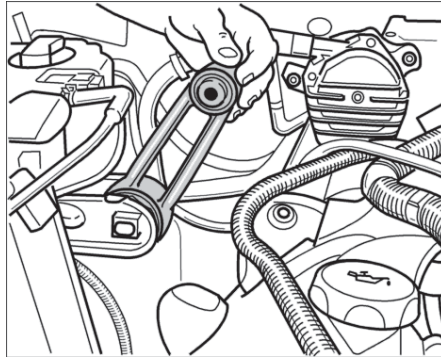
Preliminary work

1. Switch off ignition and remove ignition key.

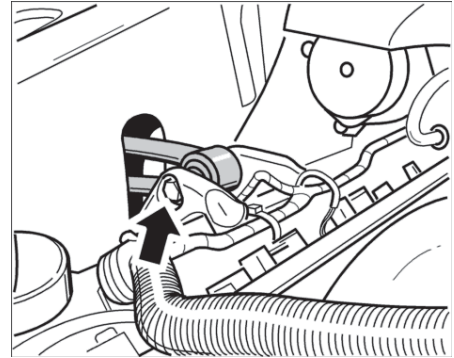
Removing design cover

Removing design cover of cylinder bank 1 -4

1. Remove engine compartment cover on the right and rear. To do this, undo the four bayonet screws and the fastening screw on the washer-fluid reservoir. → 700219 Removing and installing front cover (engine compartment) - chapter on "removing"
2. Detach the torque support. To do this, unscrew the fastening screw on the torque support bracket and pull it out.

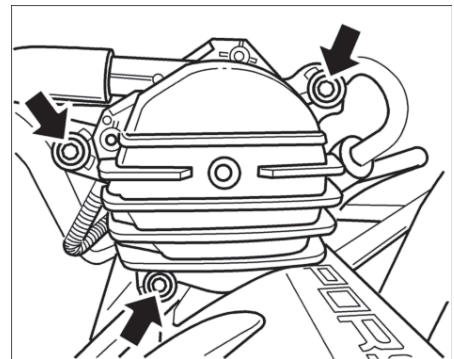


Torque support on body



Fastening screw for torque support

3. Detach the torque support from the body and swivel upwards.
4. Detach the secondary air pump from cylinder bank 1 -4. To do this, unscrew the three fastening screws, pull the pump out of the bracket and lay it aside.



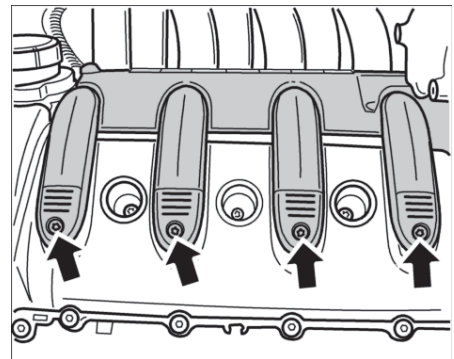
Fastening screws for secondary air pump of cylinder bank 1 - 4



Note

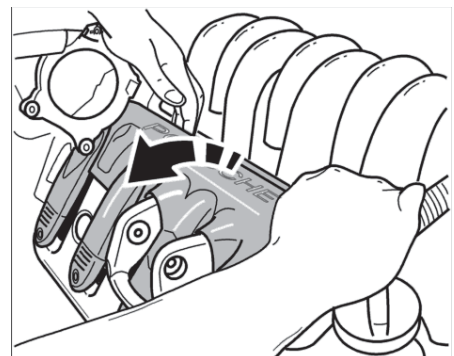
- Place a cloth between design cover and support for secondary air pump to avoid scratching cover.

5. Unscrew the four fastening screws on the ignition coil cover (illustration shows side 5 - 8).



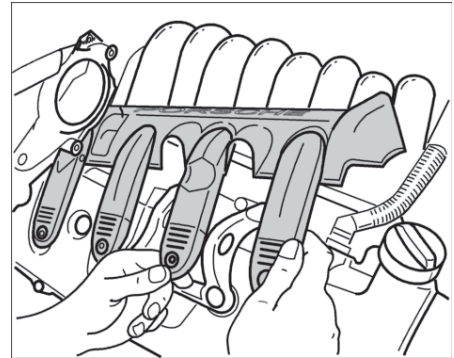
Removing fastening screws of ignition coil cover

6. Remove design cover from cylinder bank 1 - 4. Lift the cover slightly with both hands on the edge pointing towards the intake system until it snaps out of the fastening points.



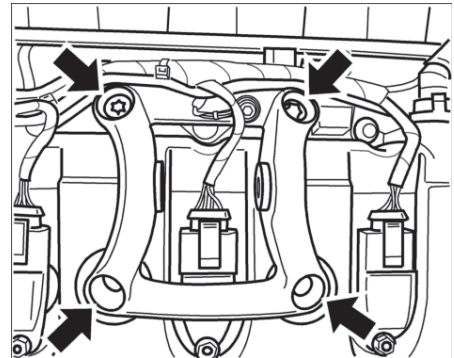
Removing design cover from cylinder bank 1 - 4

7. Lift the cover at the front edge and slide the ignition coil cover of the second cylinder out of the torque support bracket. Pull out cover to the front.



Removing cover

8. Remove torque arm bracket. To do so, undo the four fastening screws and set bracket aside.



Tightening fastening screws of torque support bracket

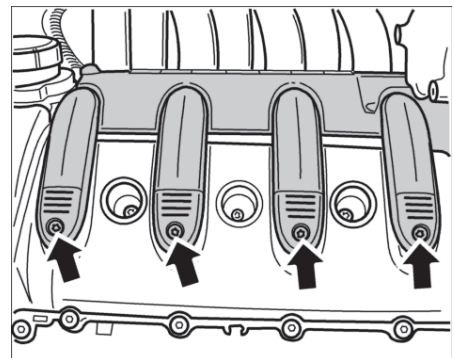
Removing design cover of cylinder bank 5 - 8



Note

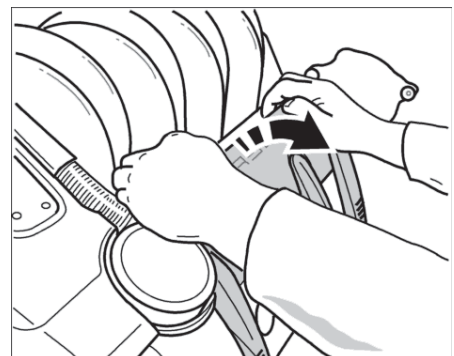
- Place a cloth between secondary air pump and design cover to avoid scratching the cover.

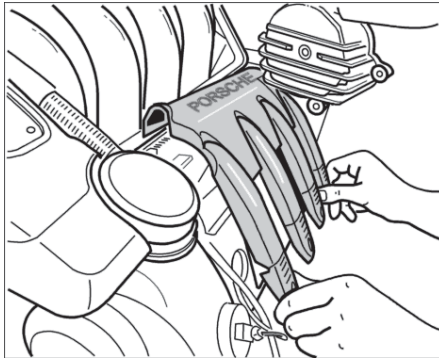
1. Unscrew the four fastening screws on the ignition coil cover.



Fastening screws of ignition coil cover

2. Remove design cover of cylinder bank 5 - 8. To do this, lift the cover slightly with both hands at the edge pointing towards the intake system until it is released from its holder.



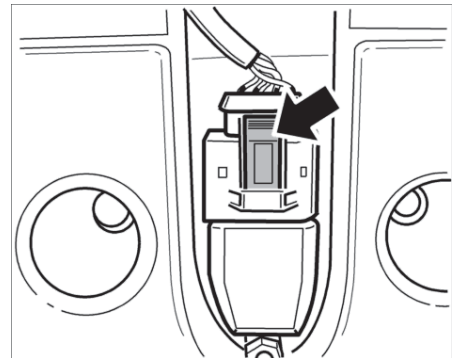


Removing design cover

3. Lift the front of the design cover and remove it.

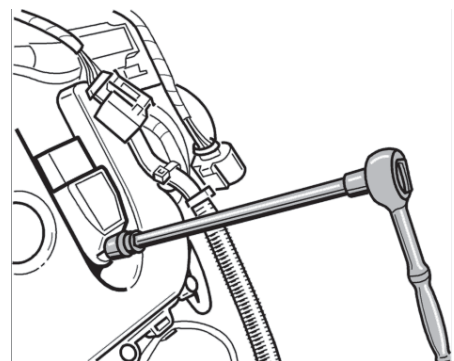
Replacing spark plugs

1. Pull off lower hose from secondary air pump 5 - 8.
2. Separate the eight ignition coils from the wire harness. To do this, press on the button and, at the same time, pull off the plug.



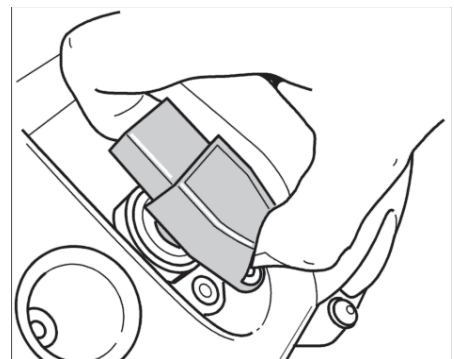
Separating ignition coils from wire harness

3. Undo ignition coil. To do this, unscrew the fastening screw on the valve cover.

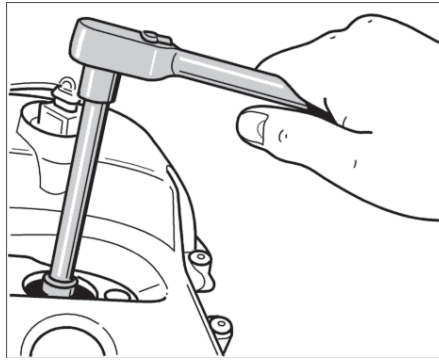


Fastening screw on valve cover

4. Pull out ignition coil and lay it aside.



Ignition coil



Loosening spark plugs using spark plug wrench

5. Undo spark plugs using special tool **spark plug wrench 3122 B**



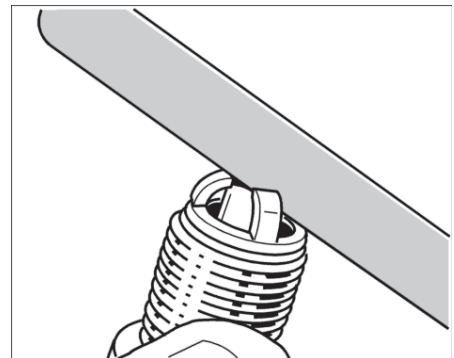
ATTENTION

Broken spark plug electrodes can damage the engine!

- Bits of electrodes can fall into the combustion chamber.

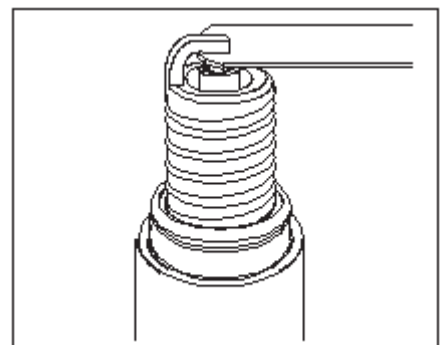
- Only check electrode gap of spark plugs, but do not bend them.
- Spark plugs with an incorrect electrode gap must be replaced.

6. Check electrode gap in V8 naturally aspirated engine. → **Control value: 1.6 mm**



Electrode gap of spark plug in V8 naturally aspirated engine

7. Check electrode gap in V8 turbo engine. → **Control value: 0.8 mm +/-0.05 mm**



Electrode gap of spark plug in V8 turbo engine



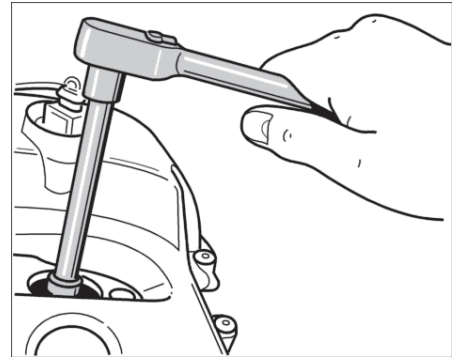
Note

- Use only spark plugs approved by Porsche AG!

- Check electrode gap before screwing in a new spark plug.

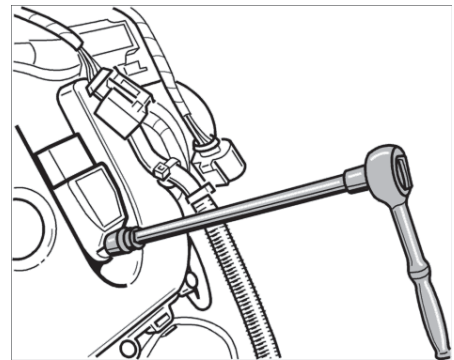
8.

Tighten spark plugs using special tool **spark plug wrench 3122 B**. → **Tightening torque: 25 (19 ftlb.) Nm**, → **Tightening torque: 30 (22 ftlb.) Nm**



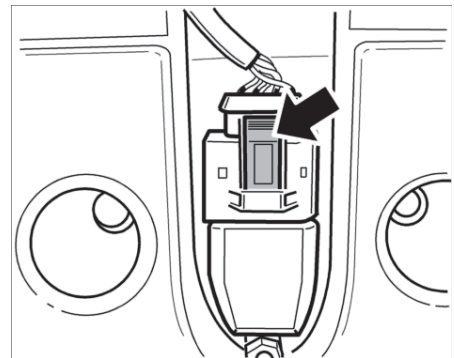
Tightening spark plugs using spark plug wrench

9. Reconnect the ignition coil. Tighten the fastening screws. → **Tightening torque: 10 (7.5 ftlb.) Nm**



Fastening screw on valve cover

10. Connect ignition coil. To do this, push on the connector until it locks with an audible click.
11. Push lower hose onto secondary air pump 5 - 8.



Connecting ignition coil

Installing design cover

Installing design cover of cylinder bank 5 - 8

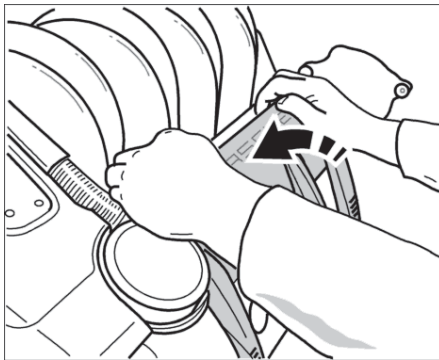


Note

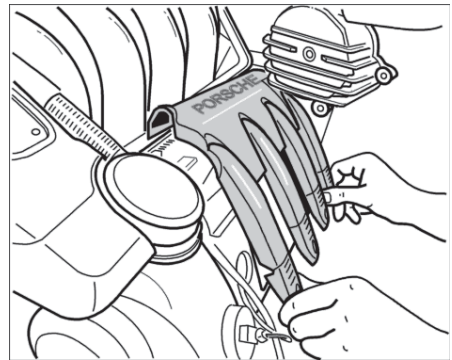
- Place a cloth between secondary air pump and design cover to avoid scratching the cover.

1. Slide the design cover under the secondary air pump as illustrated.
2. Then press in the two rubber mountings on the bracket. The rubber mounts must be felt to engage.
3. Tighten the four fastening screws on the ignition coils. → **Tightening torque: 3.5 ftlb.**

Installing design cover of cylinder bank 1 - 4



Pressing down rubber mountings on bracket

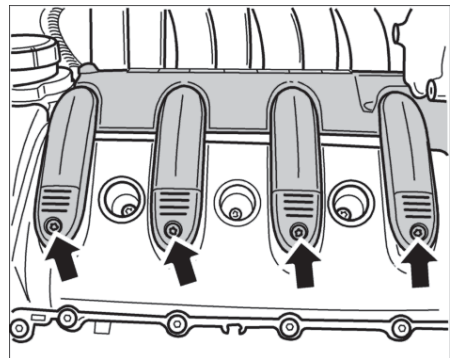


Sliding design cover under secondary air pump



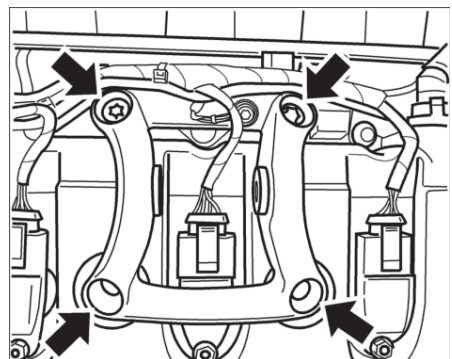
Note

- Place a cloth between secondary air pump bracket and design cover to avoid scratching the cover.



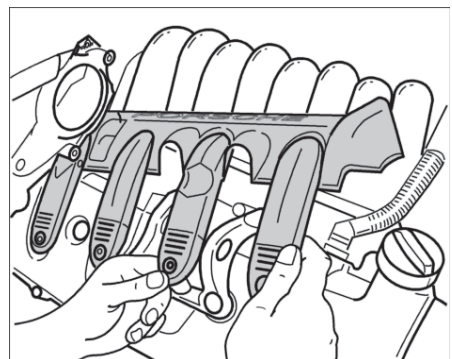
Fastening screws of ignition coil cover

1. Install bracket for the torque support. The M8 x 45 Torx screws are tightened at the upper screw points. → **Tightening torque: 23 ftlb.** At the lower screw-mounting points (centre of valve cover) the M6 x 40 are first tightened to → **Initial tightening: 3.5 ftlb.** and then to → **Final tightening: 7.5 ftlb.** .



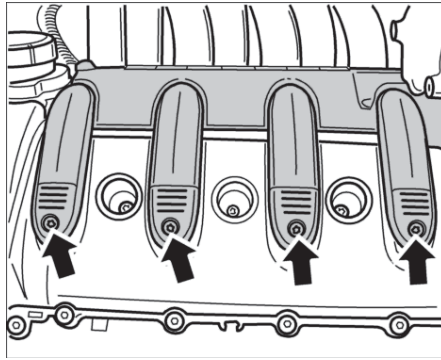
Tightening fastening screws of torque support bracket

2. Slide the design cover of cylinder bank 1 - 4 under the secondary air pump bracket as shown in the illustration and then slide the cover of the second ignition coil through underneath the torque support bracket.

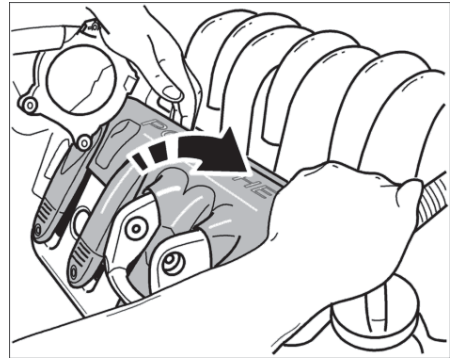


Inserting cover

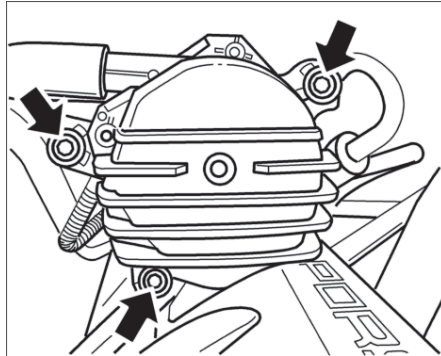
3. Press down the two rubber mounts on the bracket. The rubber mounts must be felt to engage.
4. Tighten the four fastening screws on the ignition coils (illustration shows side 5 - 8). → **Tightening torque: 3.5 ftlb.**



Fastening screws of ignition coil cover

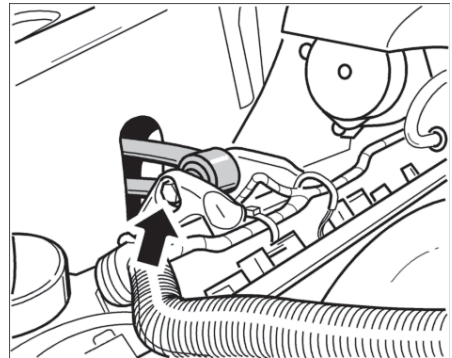


Pressing down rubber mountings on bracket



Fastening screws for secondary air pump of cylinder bank 1 - 4

5. Reinstall secondary air pump. Tighten the three fastening screws. → **Tightening torque: 7.5 ftlb.**
6. Reinstall torque support. Install the fastening screw (M10 x 85) with a new lock nut on the bracket. → **Tightening torque: 44 ftlb.**
7. Tighten torque support fastening screw on the body (M10 x 70) . → **Tightening torque: 44 ftlb.**
8. Install the engine compartment cover at the right and rear. To do this, tighten the four bayonet screws and the sheetmetal screw on the washer-fluid reservoir. → 700219 Removing and installing front cover (engine compartment) - chapter on "installing"



Fastening screw for torque support

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

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ATTENZIONE

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ADVERTENCIA

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28 72 19 Removing and installing knock sensor - as of MY 2003

- Preliminary work
- Removing knock sensor
- Installing knock sensor
- Subsequent work

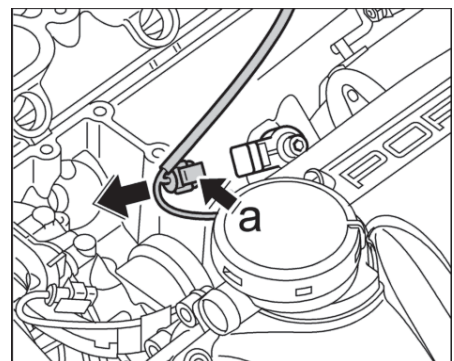
Preliminary work

Preliminary work

1. Remove intake-air distributor. → 244619 Removing and reinstalling intake-air distributor - chapter on "Removing"
2. Remove and fold up cover for coolant regulator (thermostat). → 195819 Removing and installing coolant regulator (thermostat) - chapter on "Removing"

Removing knock sensor

1. Mark and note the installation position of the knock sensor and pull off cable plug.
2. Unscrew fastening screw and take knock sensor out of the crankcase.



Pulling off cable plug

Installing knock sensor



Note

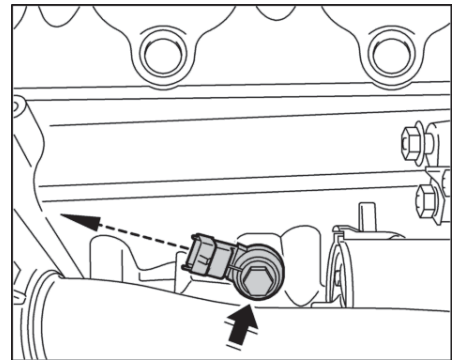
- The knock sensor and the cable plug must be aligned so that they never touch!



ATTENTION

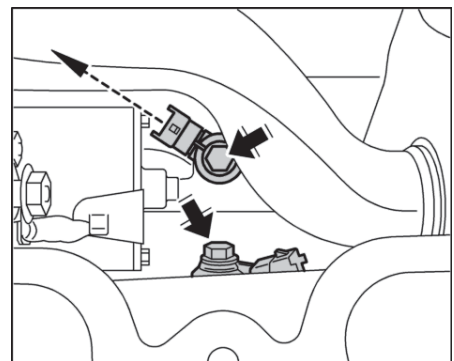
Engine damage and changed exhaust behaviour due to incorrectly mounted knock sensors!

- The precise tightening torque for the knock-sensor screw must be observed, otherwise the proper function of the knock sensor is not ensured.
- The knock sensors must be aligned so that the sensor housing and the cable plug do not touch anywhere, otherwise proper functioning of the knock sensor is not ensured.



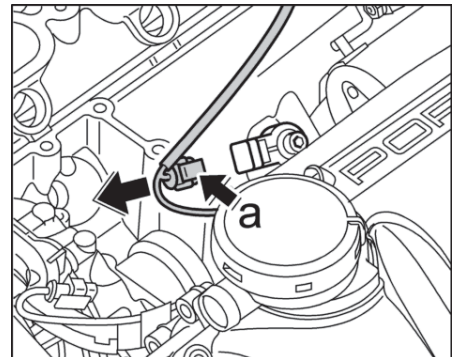
Knock sensor, cylinder row 1-4

1. Install knock sensor. Make sure that the knock sensors are aligned according to the illustrations
-longer arrow points to alignment, smaller arrow points to fastening screw- .
2. Tighten fastening screws. → **Tightening torque: 17 ftlb.**



Knock sensor, cylinder row 5-8

3. Push on cable plug and ensure that the cable plug does not touch.



Pushing on cable plug

Subsequent work

Subsequent work

1. Install cover for coolant regulator (thermostat). → 195819 Removing and installing coolant regulator (thermostat) - chapter on "Installing"
 2. Install intake-air distributor. → 244619 Removing and reinstalling intake-air distributor - chapter on "Installing"
 3. Fill and bleed the cooling system. → 193817 Draining and filling coolant (includes bleeding) - chapter on "Filling"
-

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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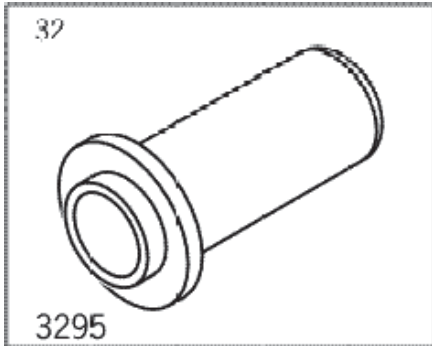
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32 47 19 Removing and installing torque converter sealing ring - as of MY 2003

- Preliminary work
- Removing the torque converter sealing ring
- Installing the torque converter sealing ring
- Subsequent work

Tools

Designation	Type	Number	Explanation	
slide hammer kit	commercially available tool	168		
assembly sleeve	special tool	3295		

Preliminary work

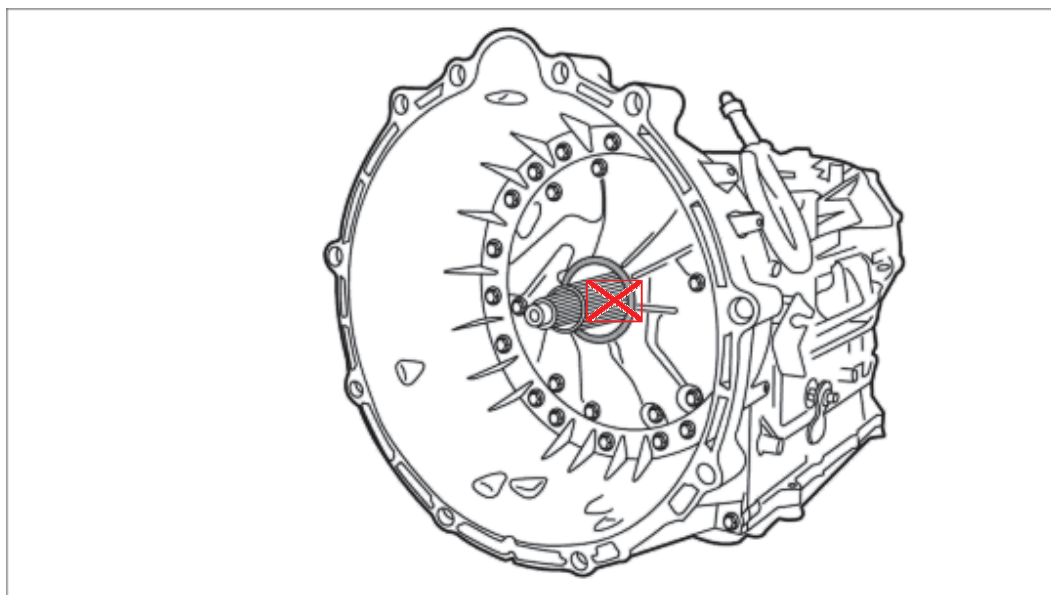
Preliminary work for sealing ring for torque converter

1. Remove transmission. → 373519 Removing and installing transmission - chapter on "removing" [9PAAJ1]
→ 373519 Removing and installing transmission - chapter on "removing" [9PAAE1 9PAAF1] → 373519
Removing and installing transmission - chapter on "removing" [9PAAD1]
2. Remove torque converter. → 325019 Removing and installing torque converter - chapter on
"removing" [9PAAD1] → 325019 Removing and installing torque converter - chapter on "removing" [9PAAE1
9PAAF1 9PAAJ1]

Removing the torque converter sealing ring

Removing the torque-converter sealing ring

Installation Location:



Torque converter overview

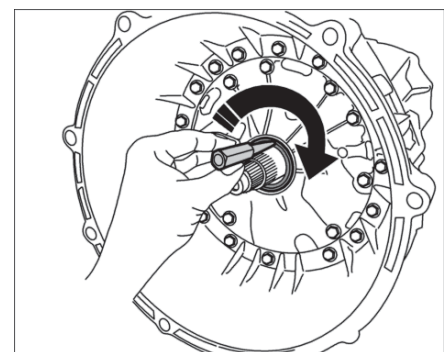
1. Using the bolt adapter from the **slide hammer kit 168**, screw countersunk head bolt into sealing ring **-direction of arrow-** .



WARNING

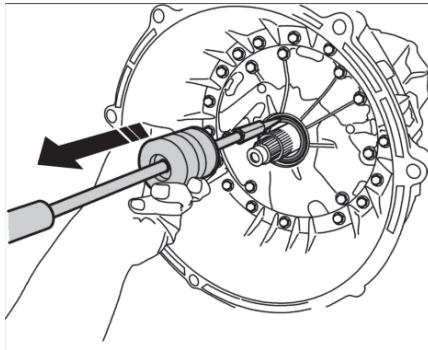
Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)



Preliminary work for removing sealing

ring



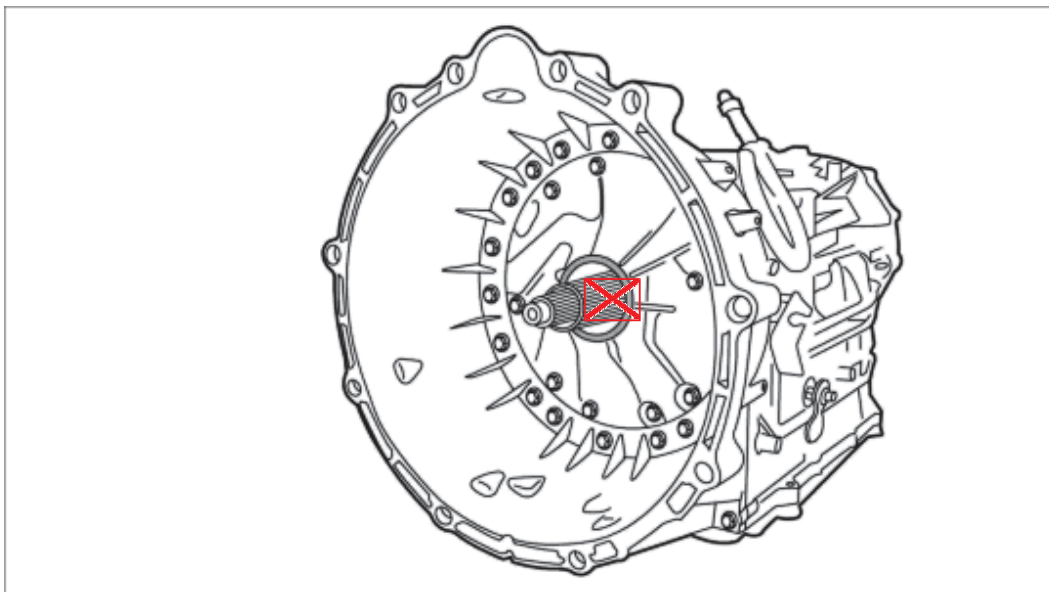
Removing the torque-converter sealing ring

2. Screw on slide hammer from **slide hammer kit 168** and remove sealing ring.

Installing the torque converter sealing ring

Installing the torque-converter sealing ring

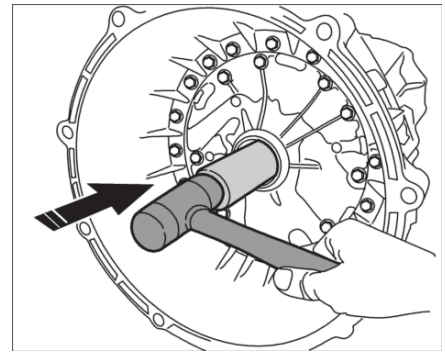
Installation Location:



Torque converter overview

1. Position new sealing ring on special tool **assembly sleeve 3295**.
2. Drive in sealing ring with special tool **assembly sleeve 3295 -arrow-** until special tool touches transmission housing.

Subsequent work



Installing sealing ring

Reworking sealing ring for torque converter

1. Install torque converter. → 325019 Removing and installing torque converter - chapter on "installing" [9PAAD1]→ 325019 Removing and installing torque converter - chapter on "installing" [9PAAE1 9PAAF1 9PAAJ1]
2. Install transmission. → 373519 Removing and installing transmission - chapter on "installing" [9PAAJ1] → 373519 Removing and installing transmission - chapter on "installing" [9PAAE1 9PAAF1]→ 373519 Removing and installing transmission - chapter on "installing" [9PAAD1]

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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32 50 19 Removing and installing torque converter - as of MY 2003

- Preliminary work
- Removing torque converter
- Installing torque converter
- Subsequent work

Tools

Designation	Type	Number	Explanation	
dowel pin	special tool	95950		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work

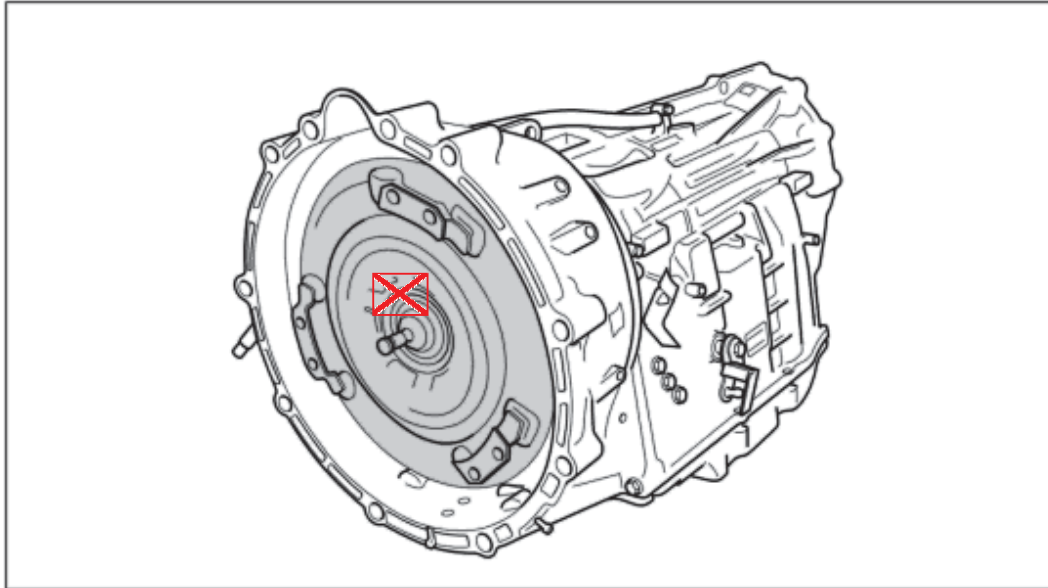
Preliminary work for torque converter

1. Remove Tiptronic gears. → 373519 Removing and installing transmission - section on "Removing" [9PAAJ1]
→ 373519 Removing and installing transmission - section on "Removing" [9PAAE1 9PAAF1]

Removing torque converter

Removing the torque converter

Installation Location:



Torque converter



WARNING

Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)

1. Place oil collection pan under the converter bell housing.



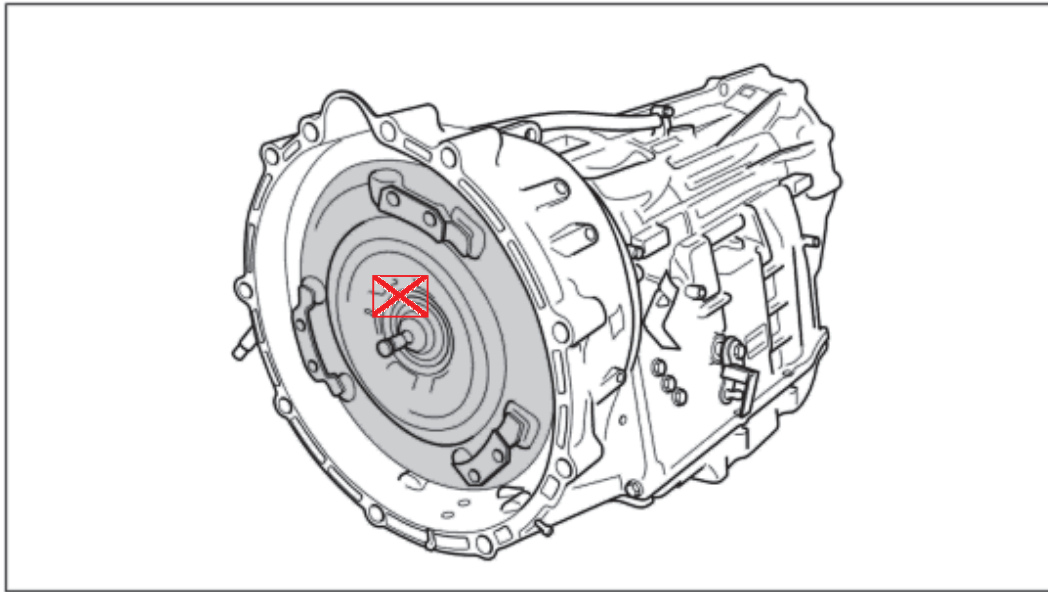
Note

- *ATF can leak out when removing the torque converter.*
- *Place torque converter with transmission side pointing upwards.*

Installing torque converter

Installing the torque converter

Installation Location:

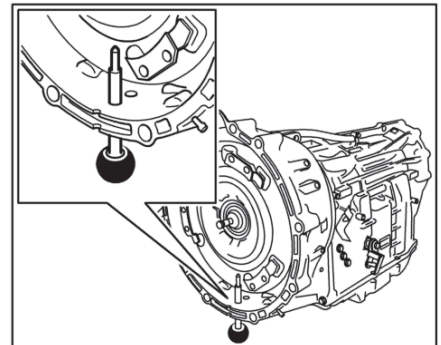


Torque converter



Note

- *Ensure that converter is seated correctly.*
1. Clean any emerging oil off converter bell housing.
 2. Push torque converter as far as it will go on to the transmission shaft.
 3. The correct installation position is achieved when the special tool **dowel pin 95950** can be inserted through the opening in the converter bell housing in front of the converter **-inset-**.



Installation position of torque converter

Subsequent work

Reworking the torque converter

1. Install Tiptronic transmission. → 373519 Removing and installing transmission - section on "Installing" [9PAAJ1] → 373519 Removing and installing transmission - section on "Installing" [9PAAE1 9PAAF1]
2. Check and if necessary, top up the ATF. → 370235 Checking and topping up the ATF

9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23,
C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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- If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

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ADVERTENCIA

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→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

37 02 35 Checking and topping up the ATF - as of MY 2003

- [Information](#)
- [Checking ATF](#)
- [Filling in ATF](#)

Tools

Designation	Type	Number	Explanation	
material	special tool	00000	oil filler for ATF / VW 1924 and 1924/01 / Workshop Equipment Manual No. 3	PORSCHE siehe Handbuch Werkstattaufrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Information

Test conditions with cooler lines closed

ATF cooler line was not opened between thermostat and ATF cooler.

For example: changing transmission, replacing sealing ring on transmission, changing ATF filter, general checks.

- Warm up transmission in lower load range. Switch all transmission ranges several times while doing so.
- Read out ATF temperature with Porsche System Tester (PST) 2.
- ATF temperature: 40 °C.
- Selector lever is in position P.
- Test and filling process at idle speed.

Test conditions after opening cooler lines

ATF cooler line was opened between thermostat and ATF cooler.

For example: replacing ATF, changing ATF line, changing ATF cooler, changing ATF thermostat.

- Warm up transmission in lower load range. Switch all transmission ranges several times while doing so.
- Read out ATF sump temperature with Porsche System Tester (PST) 2.
- The ATF temperature must be 90 °C (coolant circuit open).
- Let ATF cool down to 40 °C.
- Selector lever is in position P.
- Test and filling process at idle speed.

Checking ATF

Checking ATF



Note

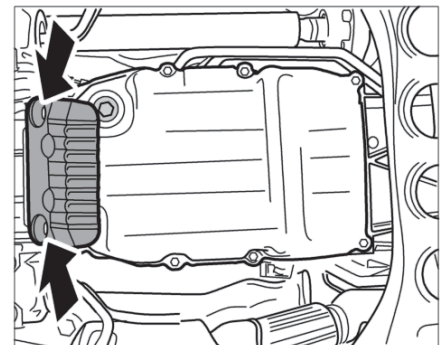
- Always avoid oil leaks after unscrewing the oil inspection plug. This is caused by a certain amount of oil which remains on the screw in the lifting tube.

1. Remove engine guard . → 108019 Removing and installing engine guard - section on "Removing"
2. Remove cover of ATF pan. To do this, loosen the two fastening screws.



Note

- Secure vehicle to prevent it rolling away.
 - Vehicle must be horizontal in order to check ATF.
3. Move selector lever to position N and continue the test process at idle speed.



Shield to transmission



WARNING

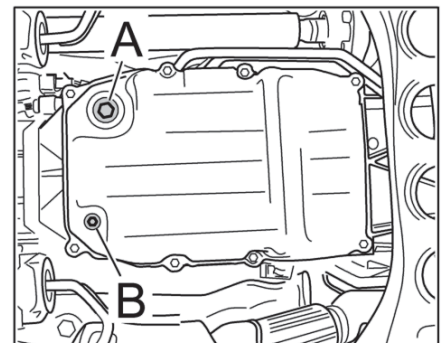
Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)



Note

- Note the test conditions → Test conditions with cooler lines closed → Test conditions after opening cooler lines for the following steps.

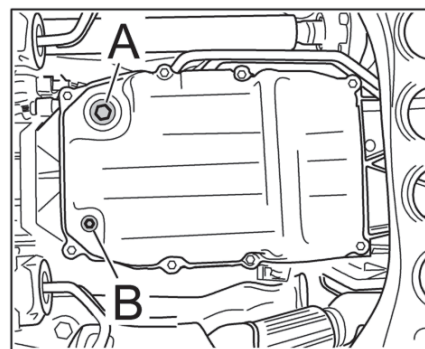


ATF check screws

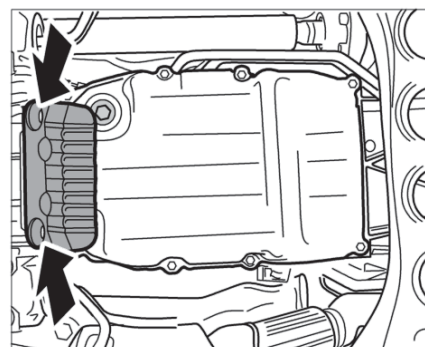


Note

- Undo oil inspection plug **-A-** only when temperature reaches 40 °C.
4. Unscrew oil inspection plug **-A-**.
 5. The oil level is correct when oil emerges at the lifting tube. If this is not the case, add more ATF. → 370235 Checking and topping up ATF - section on "Refilling"
 6. Screw in oil inspection plug **-A-**. → **Tightening torque: 52 ftlb.**
 7. Install cover of ATF pan. To do this, tighten the two fastening screws. → **Tightening torque: 7.5 ftlb.**
 8. Move selector lever to position P and switch off engine.
 9. Fit engine guard. → 108019 Removing and installing engine guard - section on "Installing"



Check screw and oil drain plug



Check screw and oil drain plug

Filling in ATF

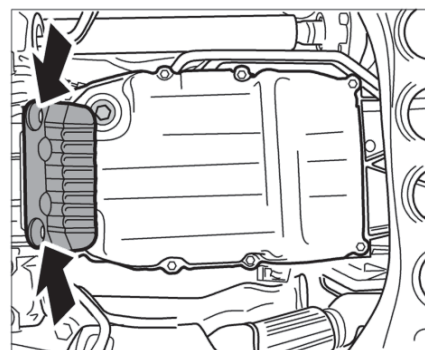
Topping up ATF

1. Remove engine guard . → 108019 Removing and installing engine guard - section on "Removing"
2. Remove cover of ATF pan. To do this, loosen the two fastening screws.



Note

- Secure vehicle to prevent it rolling away.
 - Vehicle must be horizontal in order to check ATF.
3. Start engine, move selector lever to position N and continue at idle speed.



Shield to transmission



WARNING

Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)



Note

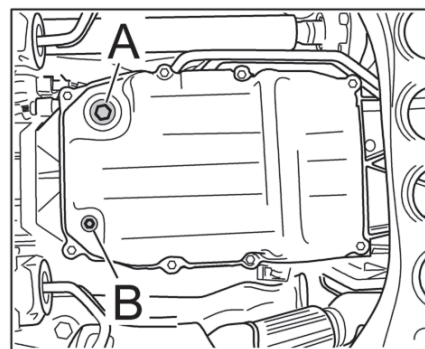
- *Note the test conditions → Test conditions with cooler lines closed → Test conditions after opening cooler lines for the following steps.*



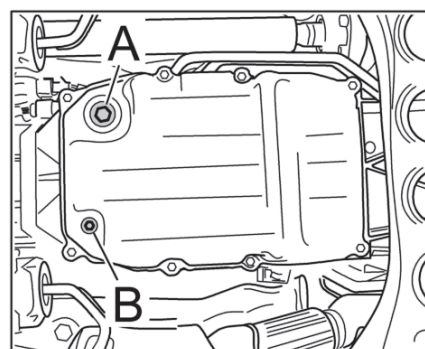
Note

- *Undo oil inspection plug only when temperature reaches 40 °C.*

4. Unscrew oil inspection plug **-A-**.
5. Fill with ATF using **material 00000** until oil emerges at the lifting pipe.
6. Screw in oil inspection plug **-A-**. → **Tightening torque: 70 (52 ftlb.) Nm**
7. Move selector lever to position P and switch off engine.

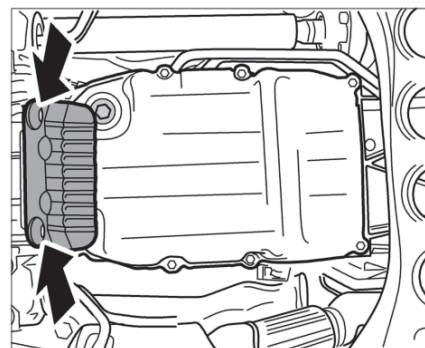


Check screw and oil drain plug



Check screw and oil drain plug

8. Install cover of ATF pan. To do this, tighten the two fastening screws. → **Tightening torque: 10 (7.5 ftlb.) Nm**
9. Fit engine guard. → 108019 Removing and installing engine guard - section on "Installing"



Transmission shield

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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37 02 55 Changing ATF - as of MY 2003

- Preliminary work
- Changing ATF
- Subsequent work

Tools

Designation	Type	Number	Explanation	
(material)	special tool	00000	discharge chute	PORSCHE siehe Handbuch Werkstattaufrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work

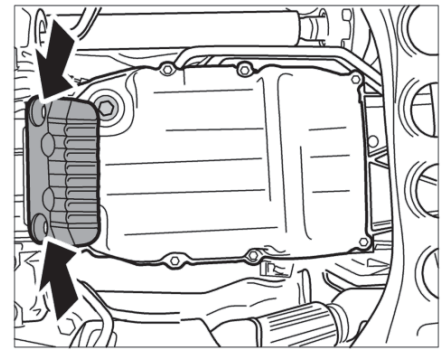
Preliminary work for replacing ATF

1. Remove engine guard . → 108019 Removing and installing engine guard - section on "Removing"

Changing ATF

Replacing ATF

1. Remove cover of ATF pan. To do this, loosen the two fastening screws **-arrows-** .
2. Place oil collecting container underneath the vehicle.



Shield to transmission



WARNING

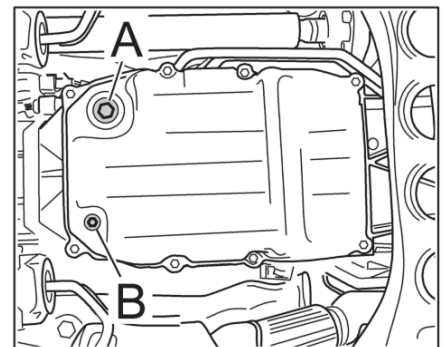
Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)



Note

- ATF must be changed when the engine/transmission is cold.



Check screw and oil drain plug



Note

- Only part of the total change quantity can be filled because of the test specifications stipulated for the ATF.
- The rest must then be filled as described in the Checking ATF chapter.

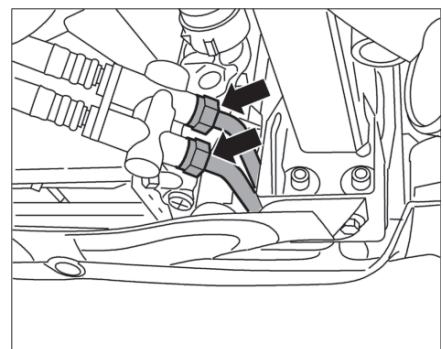
3. Unscrew oil drain plug **-B-** and drain ATF.
4. Screw in oil drain plug **-B-** with new sealing ring. → **Tightening torque: 28 (21 ftlb.) Nm**



Note

- Counter when loosening the ATF lines.

5. Undo ATF line screw connection on cooler side **-arrow-** at the thermostat.



ATF line to ATF thermostat

6. Unscrew bolt **-arrow-** on ATF thermostat holder.

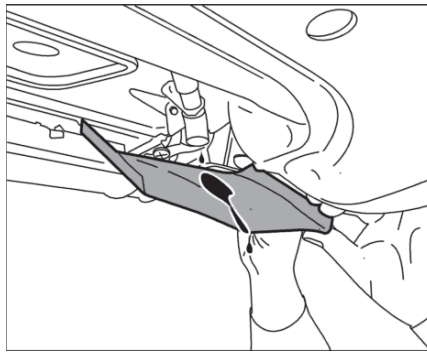


WARNING

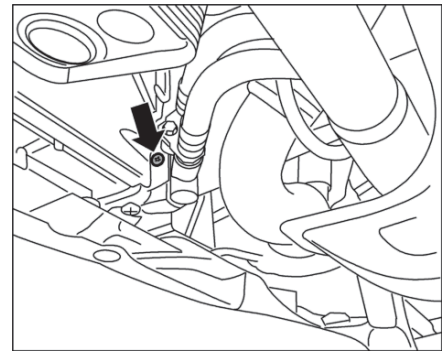
Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)

7. Hold shop-made tool **(material) 00000 -Figure-** under ATF thermostat.



Drip tray



ATF thermostat holder to cooler

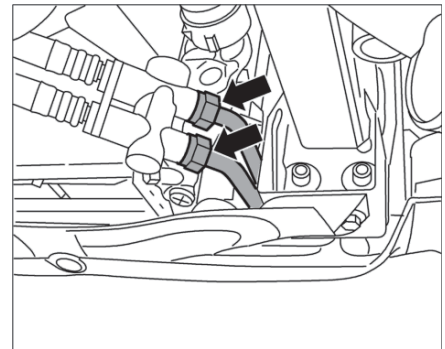
8. Drain ATF from ATF cooler.



Note

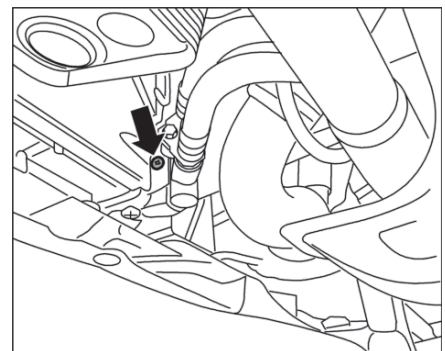
- *Counter when fastening the ATF lines.*

9. Tighten ATF line screw connection on cooler side **-arrow-** at the thermostat. → **Tightening torque: 30 (22 ftlb.) Nm**



ATF line to ATF thermostat

10. Screw in bolt **-arrow-** on ATF thermostat holder. → **Tightening torque: 3.5 (2.5 ftlb.) Nm**



ATF thermostat holder to cooler

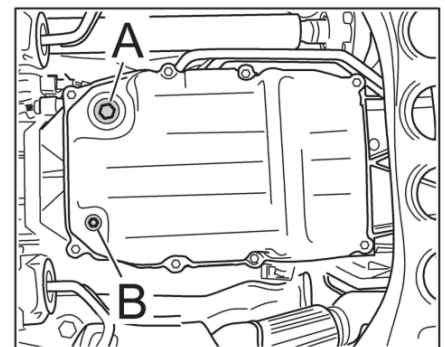
11. Unscrew ATF inspection plug/filler screw **-A-**. → **Tightening torque: 70 (52 ftlb.) Nm**



Note

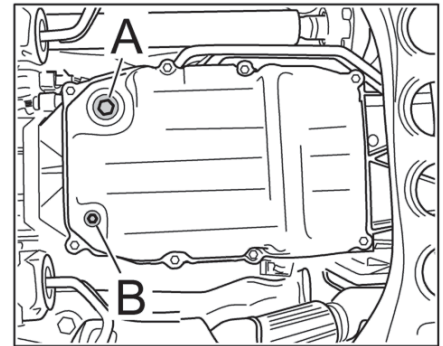
- *Modified ATF filling capacity in the transmission in combination with new control units.*
- *Observe → " Technische Information Ti 01/04 Gruppe 3" and numbers on transmission and control unit.*

12. Fill with ATF using **material 00000** until oil emerges at the lifting pipe. → **Change quantity: 8.5 l** or → **Change quantity: 9.6 l**



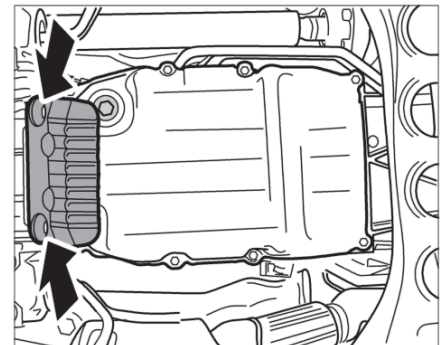
Check screw and oil drain plug

13. Screw in ATF inspection plug/filler screw **-A-** .



Check screw and oil drain plug

14. Install cover of ATF pan. To do this, tighten the two fastening screws **-arrows-** . → **Tightening torque: 10 (7.5 ftlb.) Nm**



Shield to transmission

Subsequent work

Reworking for replacing ATF

1. Fit engine guard. → 108019 Removing and installing engine guard - section on "Installing"
2. Check and if necessary, top up the ATF. → 370235 Checking and topping up the ATF

9PAAD1, 9PAAE1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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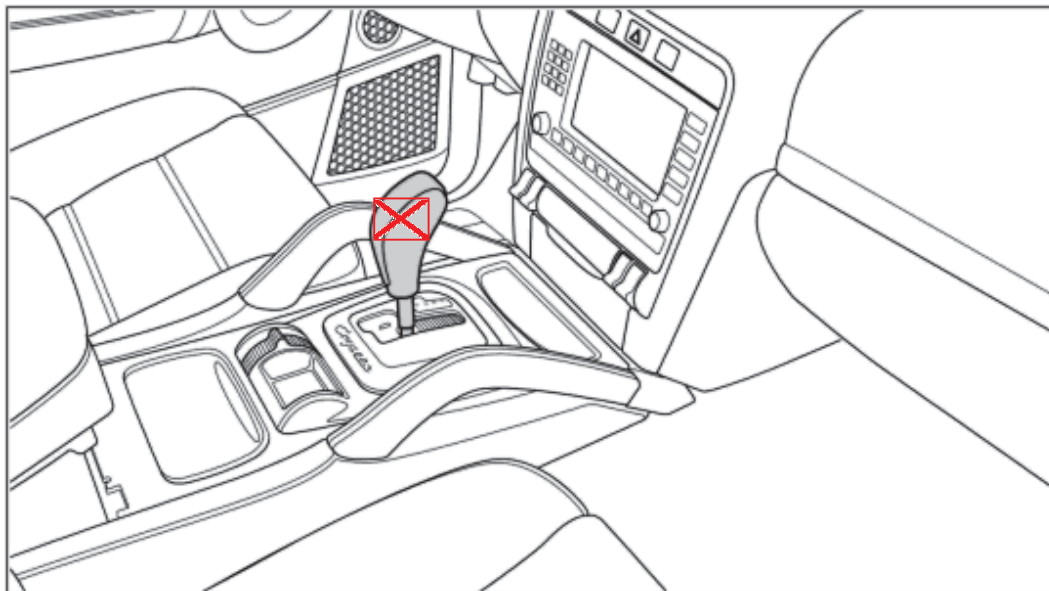
37 04 19 Removing and installing selector knob - as of MY 2003

- [Removing selector knob](#)
- [Installing selector knob](#)

Removing selector knob

Removing selector knob

Installation Location:



Overview of selector knob

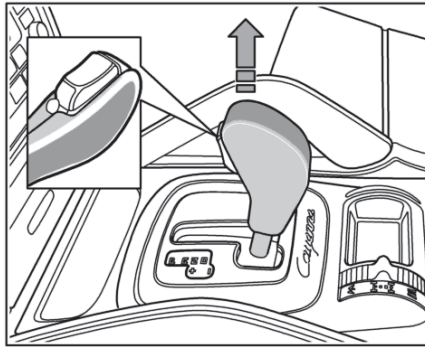
1. Selector lever in position D.



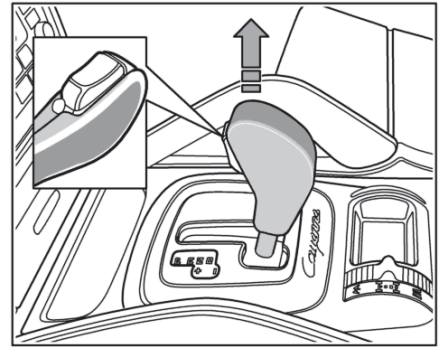
Note

- The button **-inset-** at the front must not be pressed down when the selector knob is pulled.

2. Pull selector lever up and off.



Removing selector knob

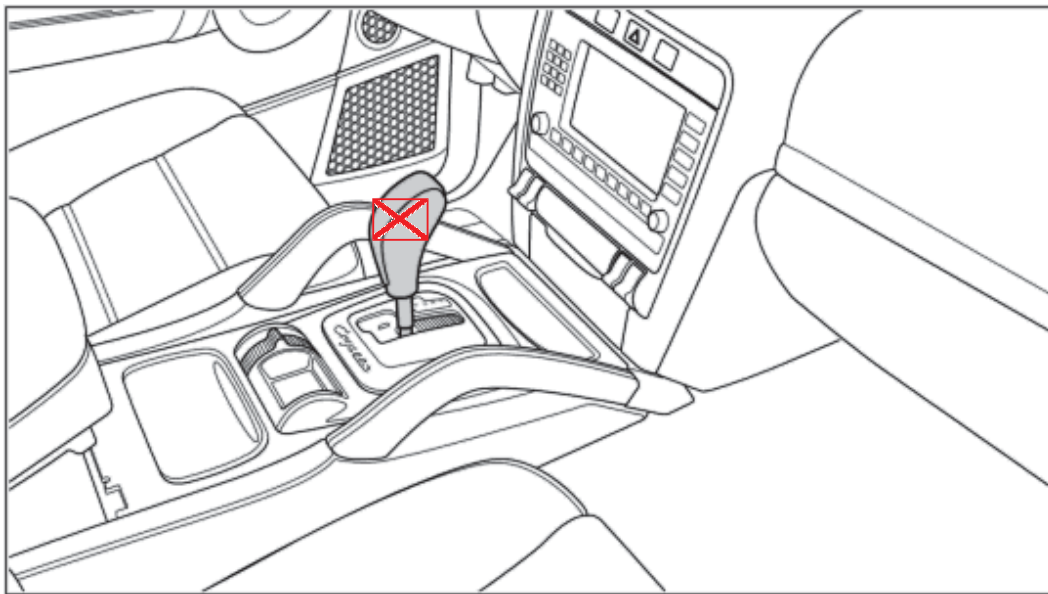


Removing selector knob

Installing selector knob

Installing selector knob

Installation Location:



Overview of selector knob

1. Selector lever in position D.



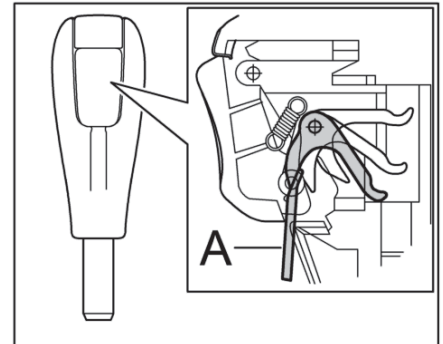
ATTENTION

Overstretch the spring in selector knob.

- Unlocking button does not return to the initial position.

→ Only move the selector knob as far forward until the tool can be inserted. Avoid any further overstretching.

2. The unlocking hook in the selector knob must retract to the **-Hebel grau-**. Lock the hook under the button,



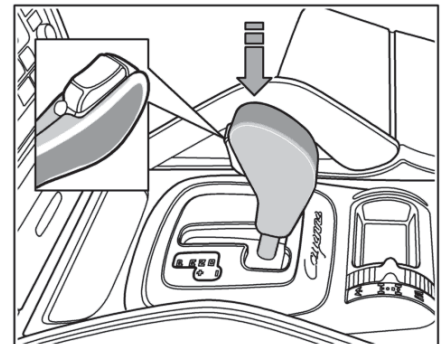
Section of selector knob

using short screwdriver **-A-** for example.



Note

- *The button must not be pressed down when the selector knob is installed.*
3. Push on the selector knob until it audibly engages in the selector support. The sleeve is then inserted in the selector lever cover.
 4. Remove the tool on the handle.
 5. Functional test of gear selecting system:
 - Will the vehicle start?
 - Do all the selector lever positions work?



Pushing off selector knob

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

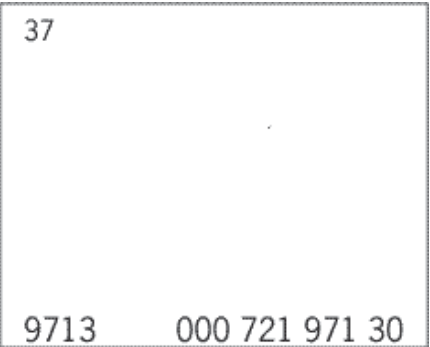
- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

37 08 19 Removing and installing selector support - as of MY 2003

- Preliminary work
- Removing selector support
- Installing selector support
- Subsequent work

Tools

Designation	Type	Number	Explanation	
unlocking hook	special tool	9713		
special inserts model AB	special tool	NR.170		
accessory for the torque wrench: open ring wrench insert a/f 13 + adapter	special tool	NR.98-1		

				PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work

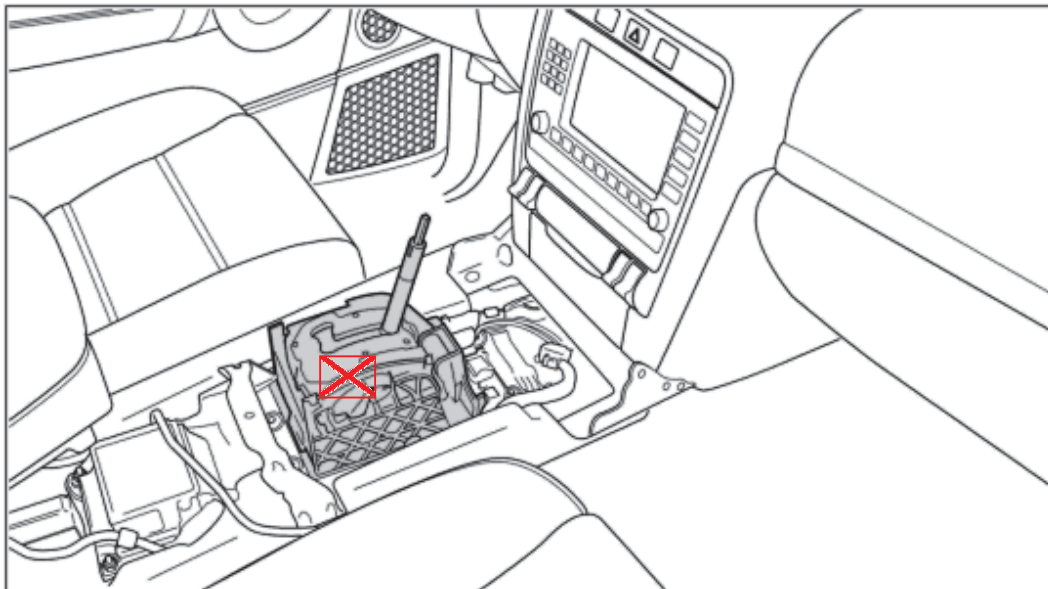
Preliminary work for selector frame

1. Remove selector knob. → 370419 Removing and installing selector knob - removing

Removing selector support

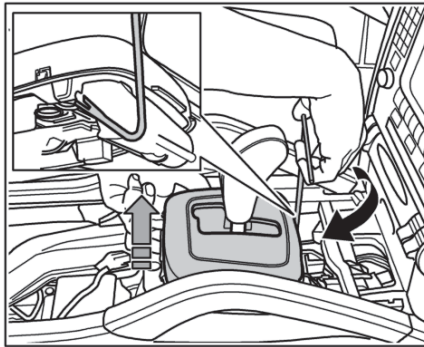
Removing selector frame

Installation Location:

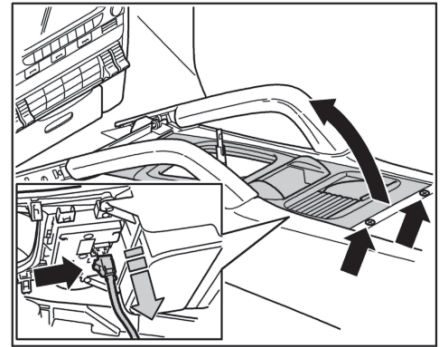


Overview of selector frame

1. Remove cover of centre console. To do this unscrew two screws **-right arrows-** , separate plug connection **-inset-** , tip cover up **-curved arrow-** and back and remove.

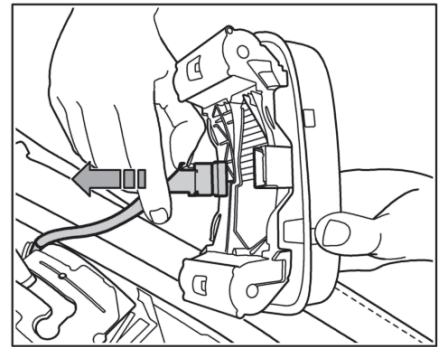


Releasing the selector lever cover



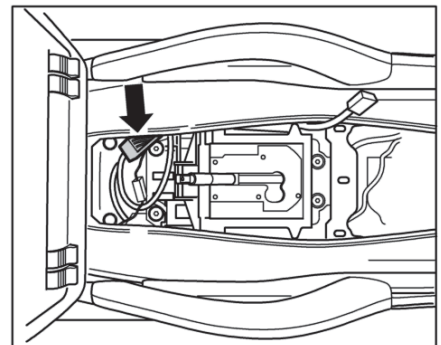
Removing centre console cover

2. Remove selector lever cover with special tool **unlocking hook 9713**. To do this hook into the left and right of the unlocking bracket **-inset-** from the front and press outwards. Pull the cover upwards slightly at the same time.
3. Unlock the rear unlocking brackets in the same way.
4. Remove selector lever cover and separate cable connection.



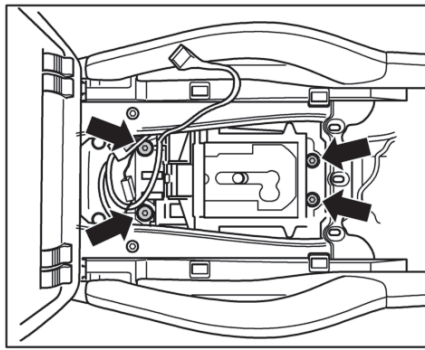
Cable plug for selector lever cover

5. Pull off electrical plug connections.

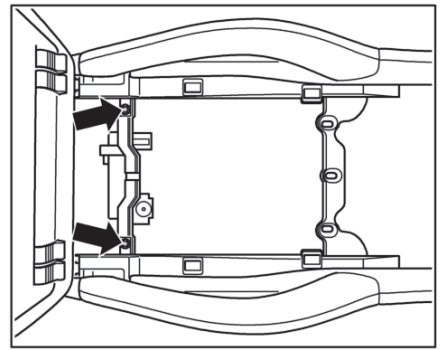


Cable plug for selector frame

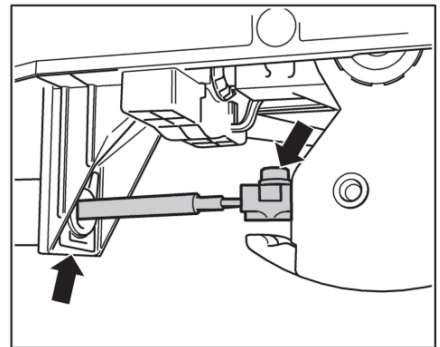
6. Remove the transverse strut of the centre console.
7. Unscrew selector frame screws **-arrows-**.
8. Unscrew cable fastening screw **-right arrow-** on the cable adjustment using special tool **special inserts model AB NR.170** and remove retaining clip **-left arrow-**.
9. Remove selector frame.



Screw connection of selector frame



Transverse strut of selector frame



Selector lever cable connection

Installing selector support

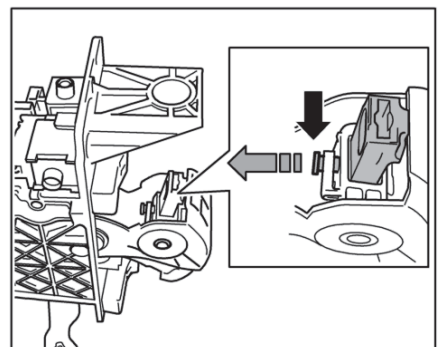
Removing and installing cable adjustment



Note

- When a new selector support is used, the cable adjustment of the selector cable must be modified.

1. Remove pins **-direction of arrow-** and take out cable adjustment.

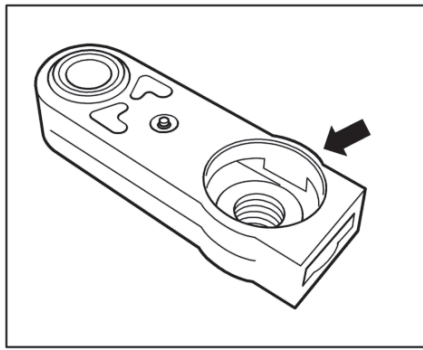


Removing the cable adjustment

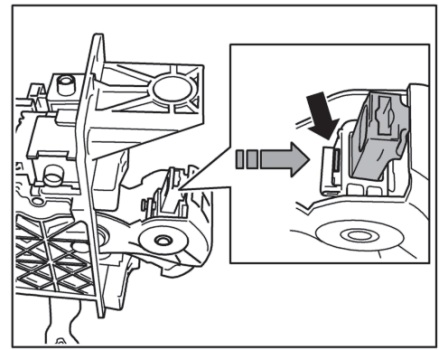
2. Insert cable adjustment on the new selector support and install pins **-direction of arrow-**.
3. When doing so, ensure that the opening for the adjusting screw **-arrow-** is turned upwards.

Installing selector frame

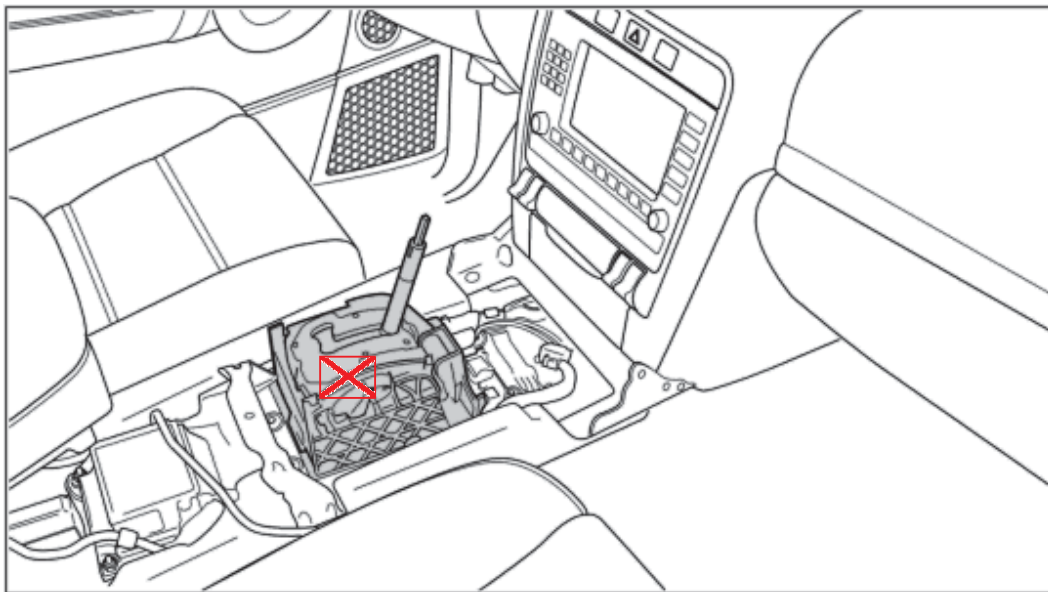
Installation Location:



Cable adjustment

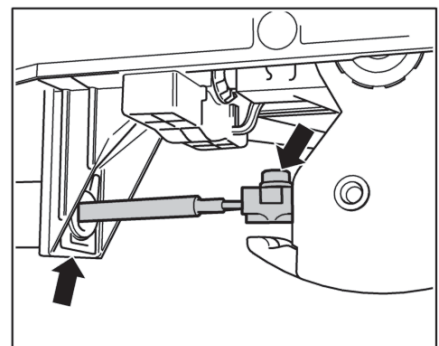


Installing the cable adjustment



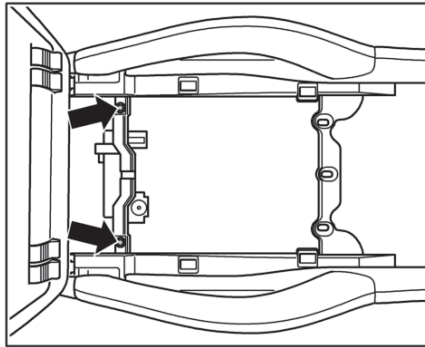
Overview of selector frame

1. Push selector lever cable into cable adjustment.
2. Push on retaining clip **-left arrow-** and screw in fastening screw **-right arrow-** using the **special inserts model AB NR.170** tool and the **accessory for the torque wrench: open ring wrench insert a/f 13 + adapter NR.98-1** on the cable adjustment. → **Tightening torque: 7.5 ftlb.**
3. Adjust selector lever cable . → 371515 Adjusting selector lever cable [9PAAE1 9PAAF1 9PAAJ1]→ 371515 Adjusting selector lever cable [9PAAD1]

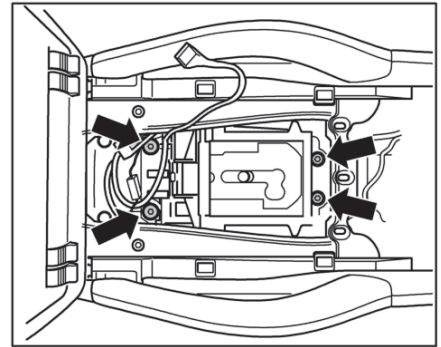


Selector lever cable connection

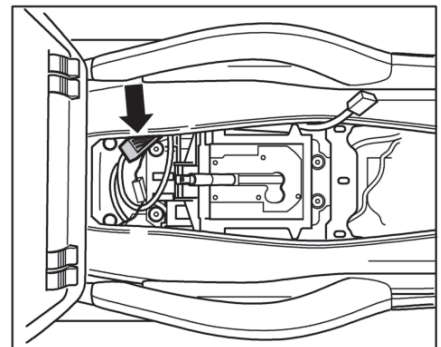
4. Position selector frame and screw in screws **-arrows-** . → **Tightening torque: 4.5 ftlb.**
5. Install the transverse strut of the centre console.
6. Position electric plug connections **-arrow-** on the selector frame.



Transverse strut of selector frame

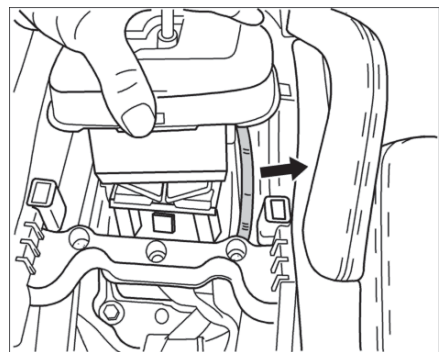


Selector frame to body



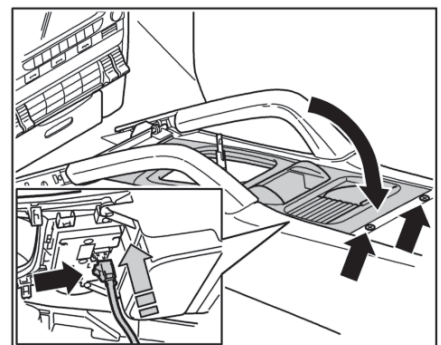
Cable plug for selector frame

7. Position cable connection on the underside of the selector lever cover.
8. Install selector lever cover. Make sure that the wiring harness **-arrows-** is not pinched in the selector frame.

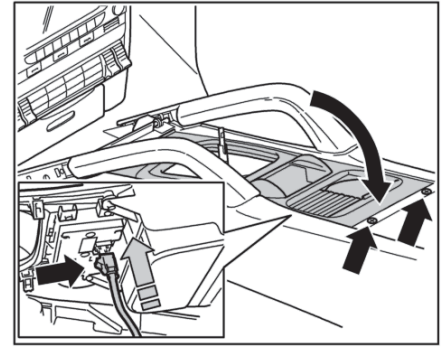


Cable lead to selector frame

9. Position cable connection **-inset-** on the underside of the centre console cover.



Fitting centre console cover



Fitting centre console cover

10. Insert centre console cover at the front and tip backwards **-curved arrow-** . Screw in two screws **-right arrows-** .

Subsequent work

Reworking selector frame

1. Install selector knob. → 370419 Removing and installing selector knob - installing

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
- Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

Danger of losing text-figure correspondence when printing out.

- For technical reasons, it can currently not be ruled out that the correspondence between text and associated figure can be lost when it is printed out, even though the display on the screen is correct.
- If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

37 08 IN Selector lever emergency release - as of MY 2003

- Preliminary work
- Operating emergency release
- Subsequent work

Preliminary work

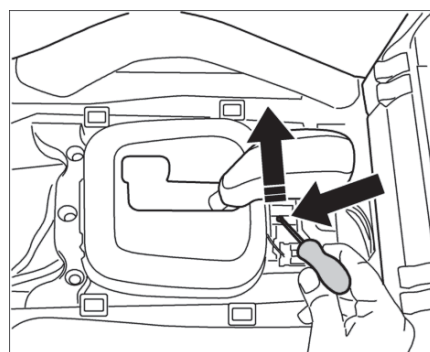
Preliminary work for emergency release

→ 681919 Removing and installing cover for centre console - "Removing" chapter

Operating emergency release

Operating emergency release

1. Using a screwdriver, push the locking lever on the front of the selector frame **-arrow-** towards the driver's side **-direction arrow-**.
2. Move selector lever to position N.



Centre console without cover

Subsequent work

Subsequent work on emergency release

→ 681919 Removing and installing cover for centre console - "Installing" chapter

9PAAD1, 9PAAE1, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
- Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

Danger of losing text-figure correspondence when printing out.

- For technical reasons, it can currently not be ruled out that the correspondence between text and associated figure can be lost when it is printed out, even though the display on the screen is correct.
- If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

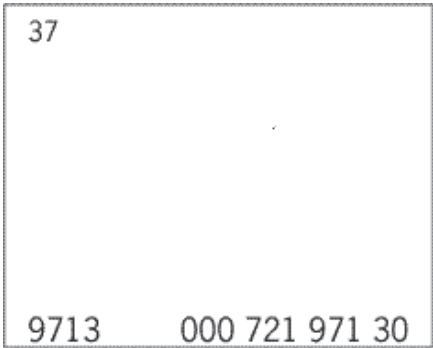
- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

37 12 37 Disassembling and assembling cover for selector lever - as of MY 2003

- Preliminary work for cover for selector lever
- Disassembling cover for selector lever
- Assembling cover for selector lever
- Subsequent work

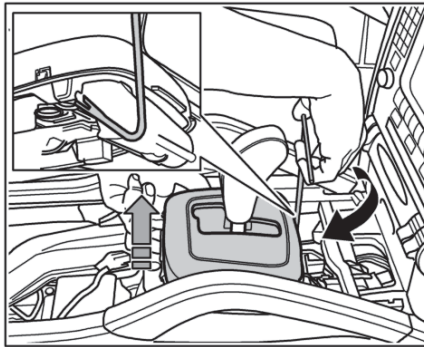
Tools

Designation	Type	Number	Explanation	
unlocking hook	special tool	9713		

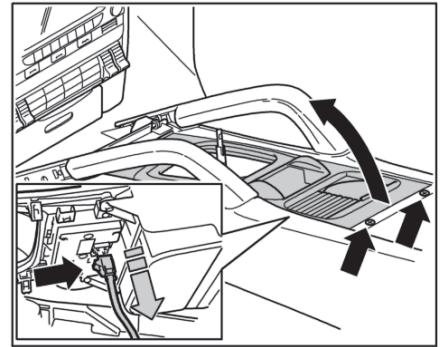
Preliminary work for cover for selector lever

Preliminary work for cover for selector lever

1. Remove selector knob. → 370419 Removing and installing selector knob - section on "Removing"
2. Remove cover of centre console. To do this, unscrew two screws **-arrows on right-**, separate plug connection **-inset-**, tip cover up **-curved arrow-** and back, and remove.
3. Remove selector lever cover with special tool **unlocking hook 9713**. To do this hook into the left and right of the unlocking bracket **-inset-** from the front and press outwards. Pull the cover upwards slightly at the same time.

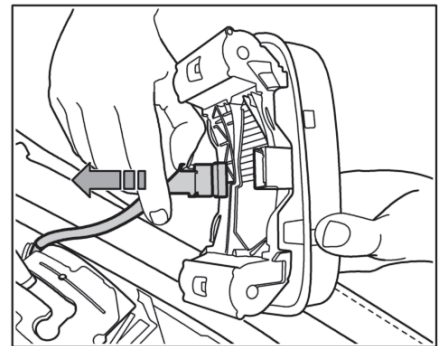


Releasing the selector lever cover



Removing centre console cover

4. Release the rear release plates in the same way.

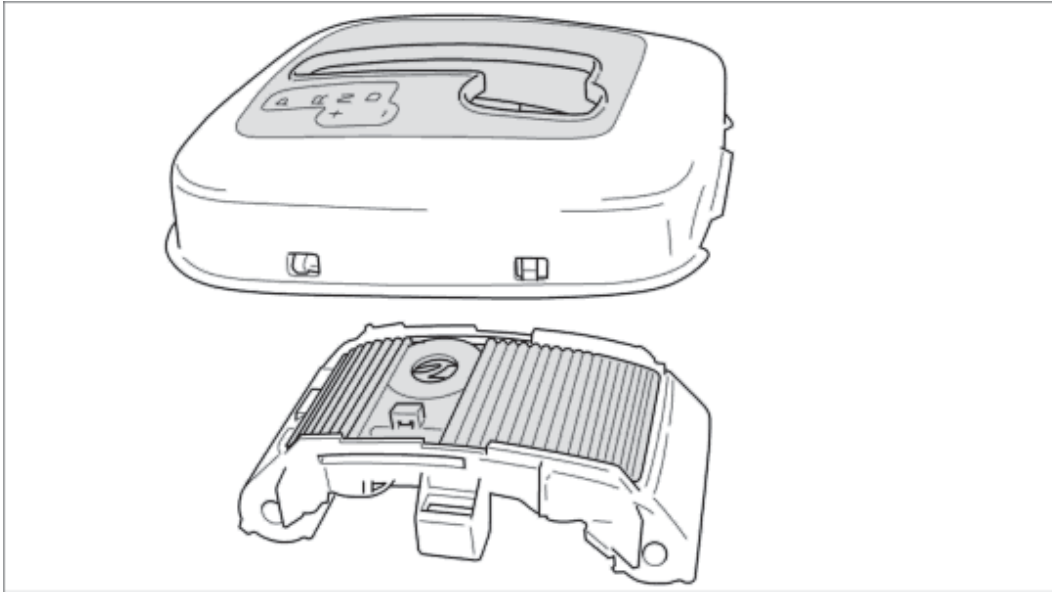


Cable plug for selector lever cover

Disassembling cover for selector lever

Disassembling cover for selector lever

Installation Location:



Overview of cover for selector lever



Note

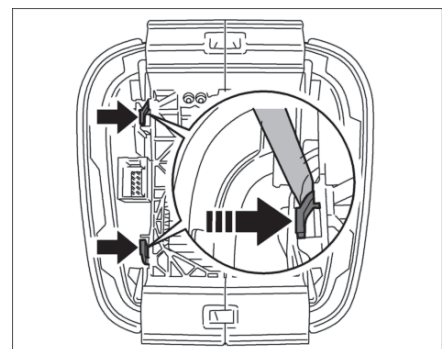
- Use a clean and soft working surface to disassemble the cover for the selector lever.



Note

- Only press the retaining lugs until the shade loosens from the upper part.
- Otherwise, the retaining lugs can break.

1. Release the lugs **-arrows-** on one side on the underside of the cover for the selector lever.



Releasing the shade

2. Tip shade up on this side → [Removing the shade](#) and remove.

Assembling cover for selector lever

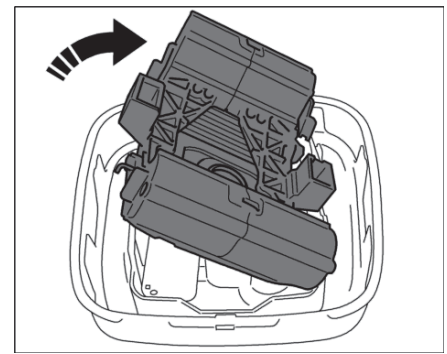
Assembling cover for selector lever



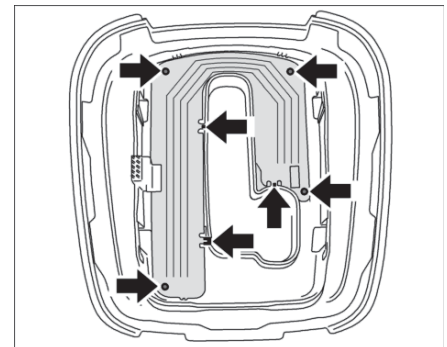
Note

- Use a clean and soft working surface to disassemble the cover for the selector lever.

1. Before assembly, the printed circuit board is to be inserted correctly **-arrows-** .

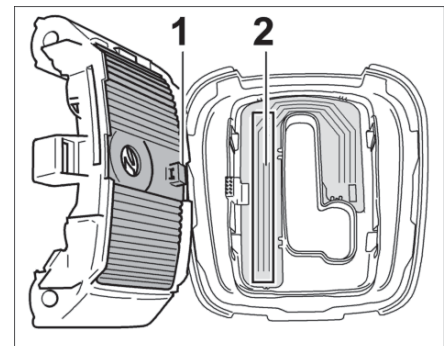


Removing the shade



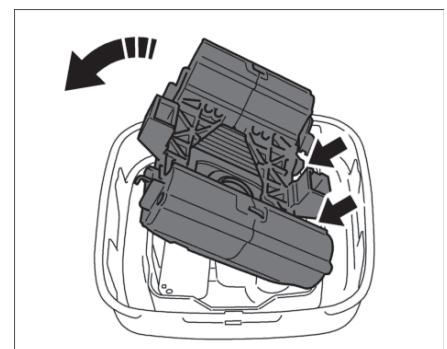
Fastening the printed circuit board

2. The shade must be inserted in the correct position, sliding contact **-1-** on grinding track **-2-** .



Position of upper part to lower part

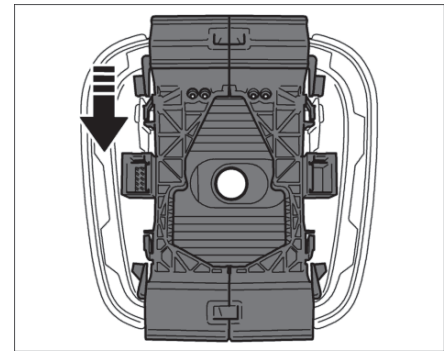
3. Fasten shade on the one side with the retaining lugs **-arrows-** .



Inserting the shade

4. Push shade onto the upper part → *Fastening the shade* , until it locks with an audible click.

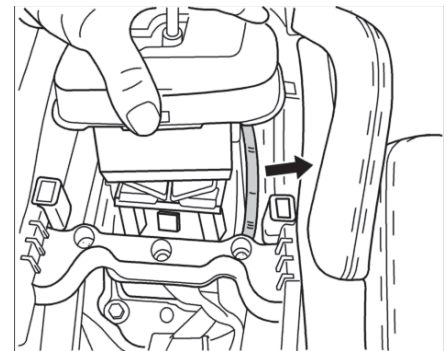
Subsequent work



Fastening the shade

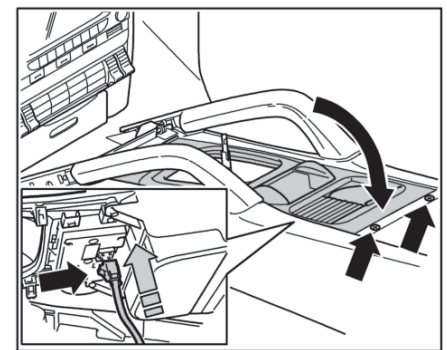
Subsequent work for cover of selector lever

1. Connect cable connection on underside of selector lever cover.
2. Install selector lever cover. Make sure that the wiring harness **-arrows-** is not pinched in the selector frame.



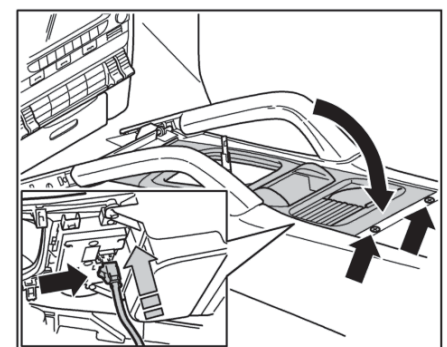
Cable lead to selector frame

3. Position cable connection **-inset-** on the underside of the centre console cover.



Fitting centre console cover

4. Insert centre console cover at the front and tip backwards **-curved arrow-** . Screw in two screws **-arrows on right-** .
5. Install selector knob. → 370419 Removing and installing selector knob - section on "Installing"



Fitting centre console cover

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- **Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.**
- **Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.**

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

Danger of losing text-figure correspondence when printing out.

- **For technical reasons, it can currently not be ruled out that the correspondence between text and associated figure can be lost when it is printed out, even though the display on the screen is correct.**
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→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

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ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

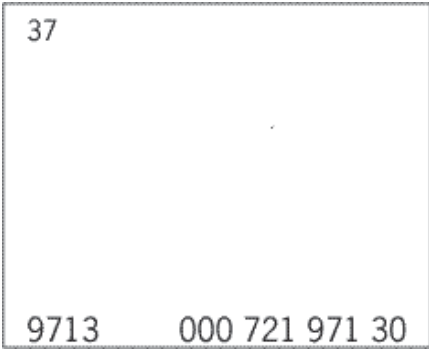
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37 15 15 Adjusting selector lever cable - as of MY 2003

- Preliminary work for selector lever cable
- Adjusting selector lever cable
- Subsequent work for selector lever cable

Tools

Designation	Type	Number	Explanation	
unlocking hook	special tool	9713		
special inserts model AB	special tool	NR.170		
accessory for the torque wrench: open ring wrench insert a/f 13 + adapter	special tool	NR.98-1		

				PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work for selector lever cable

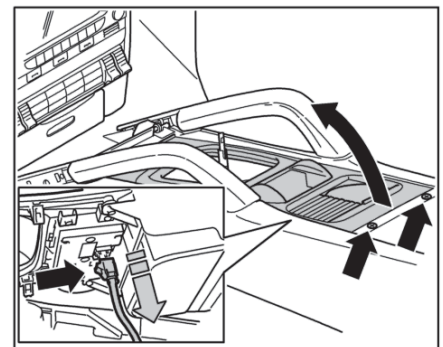
Preliminary work for selector lever cable

1. Remove selector knob. → 370419 Removing and installing selector knob - chapter on "removing"
2. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"

Adjusting selector lever cable

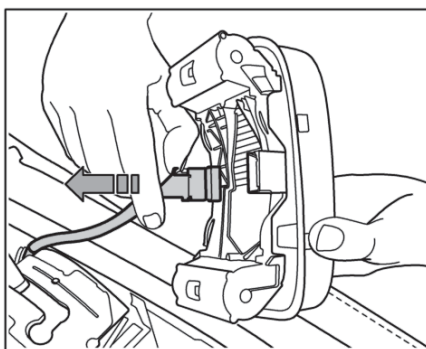
Adjusting selector lever cable

1. Pull latch (plastic pin) up and move selector lever to position P.
2. Remove cover of centre console. To do this unscrew two screws **-arrows-** , separate plug connection **-inset-** , tip cover up and back and remove.

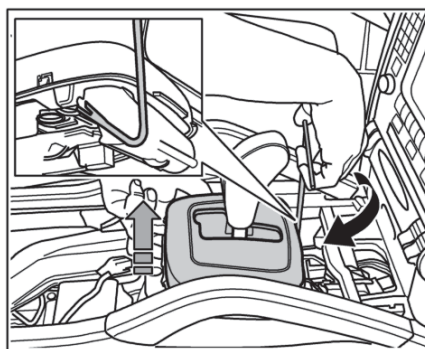


Centre console cover

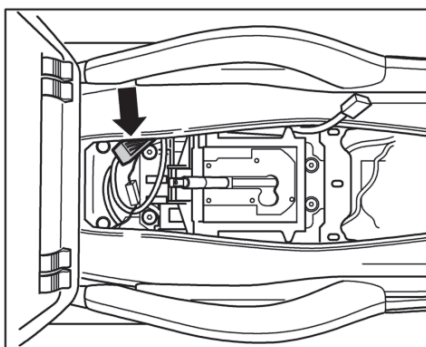
3. Remove selector lever cover with special tool **unlocking hook 9713**. To do this hook into the left and right of the unlocking bracket **-inset-** from the front and press outwards. Pull the cover upwards slightly at the same time.
4. Unlock the rear unlocking brackets in the same way.
5. Remove selector lever cover and separate cable connection.
6. Remove the transverse strut of the centre console **-arrows-** .



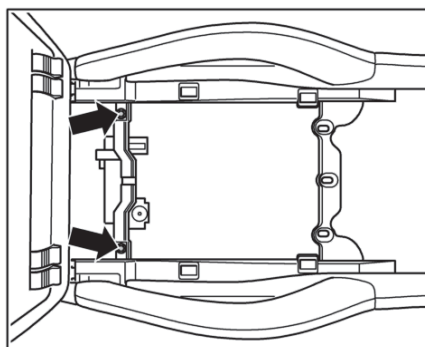
Cable plug for selector frame cover



Releasing selector frame cover



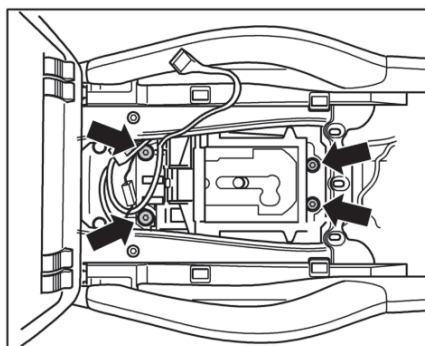
Cable connection for centre console



Transverse strut for centre console

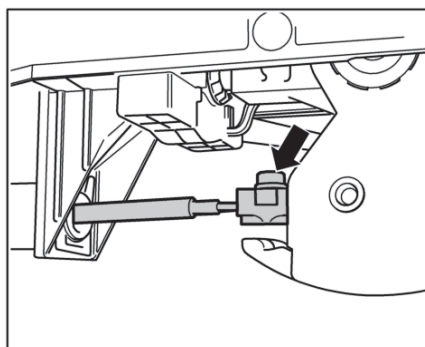
7. Pull off electrical plug connections **-arrow-** .

8. Unscrew selector frame screws **-arrows-** .



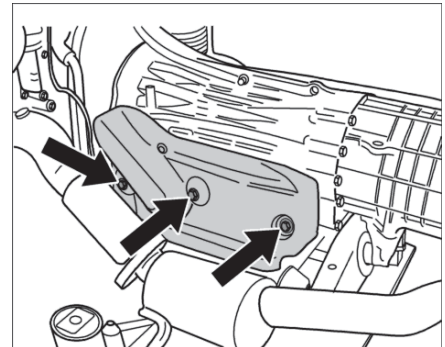
Screw connection of selector frame

9. Undo selector lever cable screw connections on the selector frame **-arrow-** using the **special inserts model AB NR.170** tool.



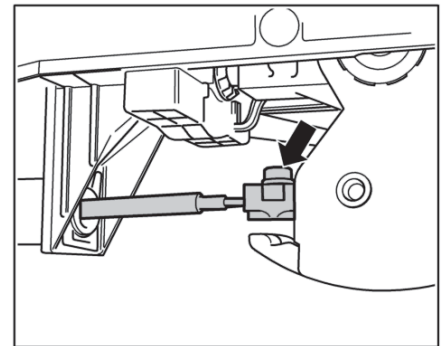
Selector lever cable to selector frame

10. Remove shield on the transmission. To do this, unscrew three fastening screws **-arrows-** .



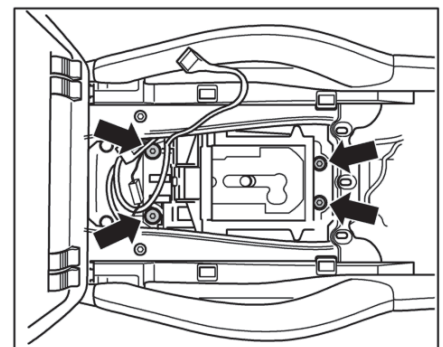
Shield to left of transmission

11. Move shift lever on the transmission to position P, the highest position.
12. Screw in selector lever cable screw connections on the selector frame **-arrow-** using the **special inserts model AB NR.170** tool and the **accessory for the torque wrench: open ring wrench insert a/f 13 + adapter NR.98-1**. → **Tightening torque: 7.5 ftlb.**



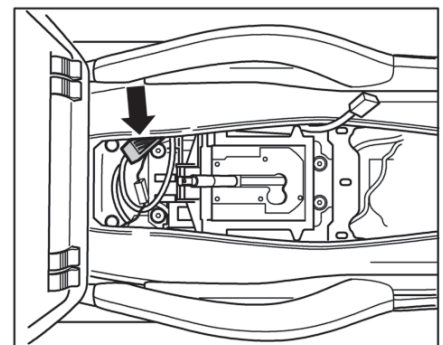
Selector lever cable to selector frame

13. Screw in selector frame screws **-arrows-**. → **Tightening torque: 4.5 ftlb.**



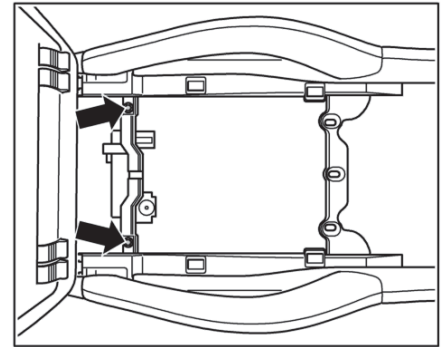
Screw connection of selector frame

14. Position electric plug connection **-arrow-** on the selector frame.



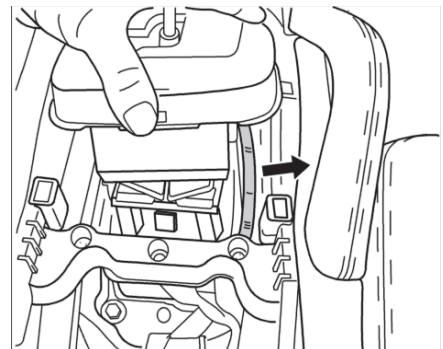
Centre console cable

15. Install the transverse strut of the centre console **-arrows-** .
16. Position cable connection on the underside of the selector lever cover.



Transverse strut for centre console

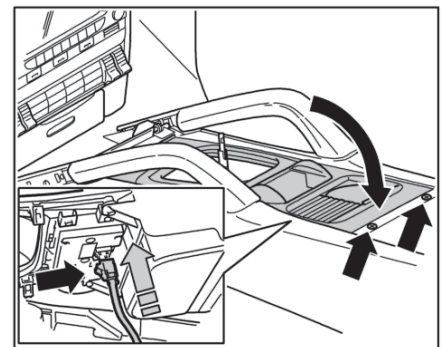
17. Install selector lever cover. Make sure that the wiring harness **-direction of arrow-** is not pinched in the selector frame.



Wiring harness to selector frame

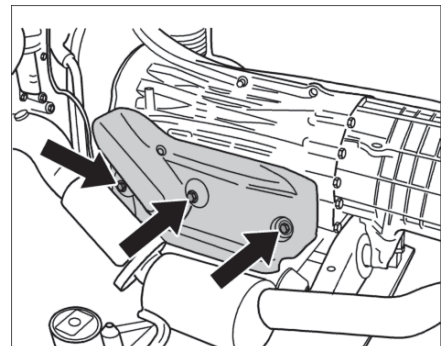
18. Position cable connection on the underside **-inset-** of the centre console cover.
19. Insert centre console cover at the front and tip backwards. Screw in two screws **-right arrows-** .
20. Functional test of gear selecting system:

- Will the vehicle start?
- Do all the selector lever positions work?



Centre console cover

21. Install shield on the transmission. To do this, screw in three fastening screws **-arrows-** . → **Tightening torque: 7.5 ftlb.**



Shield to left of transmission

Subsequent work for selector lever cable

Reworking selector lever cable

1. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"
 2. Install selector knob. → 370419 Removing and installing selector knob - chapter on "Installing"
-

9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
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AVERTISSEMENT

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37 15 19 Removing and installing selector lever cable - as of MY 2003

- [Preliminary work for selector lever cable](#)
- [Removing selector lever cable](#)
- [Installing selector lever cable](#)
- [Subsequent work for selector lever cable](#)

Tools

Designation	Type	Number	Explanation	
universal disassembly tool	special tool	NR.21		

Preliminary work for selector lever cable

Preliminary work for selector lever cable

1. Move selector lever to position D.
2. Remove selector frame. → 370819 Removing and installing selector frame - removing

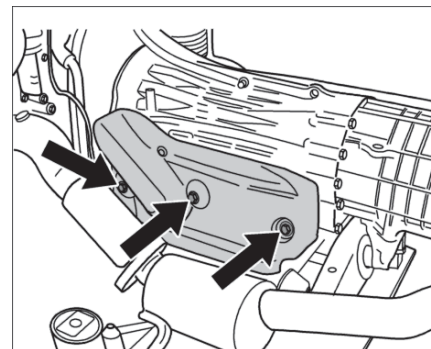
Removing selector lever cable

Removing selector lever cable

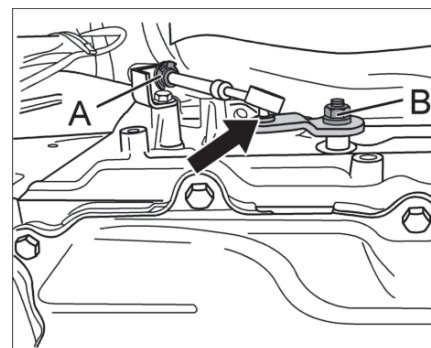


Note

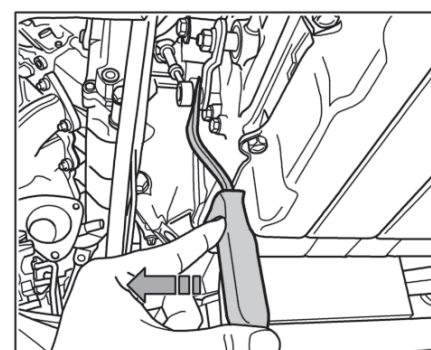
- When a new selector lever cable is used, this should be connected directly to the old cable when it is removed. This ensures that it is routed correctly.
1. Remove shield on the transmission. To do this, unscrew three fastening screws **-arrow-**.
 2. Remove tab washer **-A-** on the cable.
 3. Unscrew selector lever cable from the ball joint with **universal disassembly tool NR.21**.
 4. Pull selector lever cable up and out through the lower part of the selector frame.



Shield to left of transmission



Selector lever cable connection to transmission



Removing selector lever cable on transmission

Installing selector lever cable

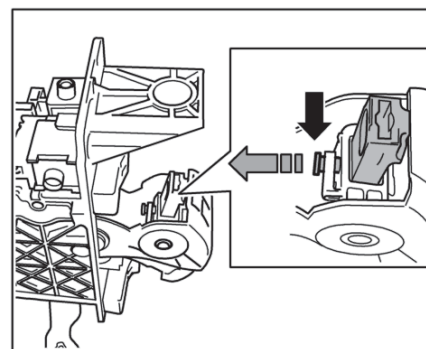
Removing and installing cable adjustment



Note

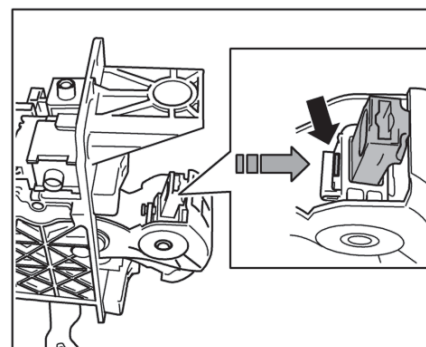
- When a new selector support is used, the cable adjustment of the selector cable must be modified.

1. Remove pins **-direction of arrow-** and take out cable adjustment.



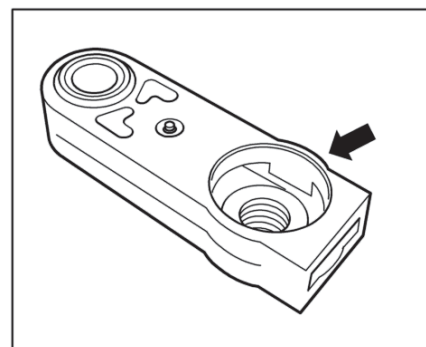
Removing the cable adjustment

2. Insert cable adjustment on the new selector support and install pins **-direction of arrow-** .



Installing the cable adjustment

3. When doing so, ensure that the opening for the adjusting screw **-arrow-** is turned upwards.



Cable adjustment

Installing selector lever cable



Note

- When a new selector lever cable is used, this should be connected to the old cable immediately during removal. This ensures that it is routed correctly.



Note

- The cable adjustment must be changed when a new selector lever cable is used.

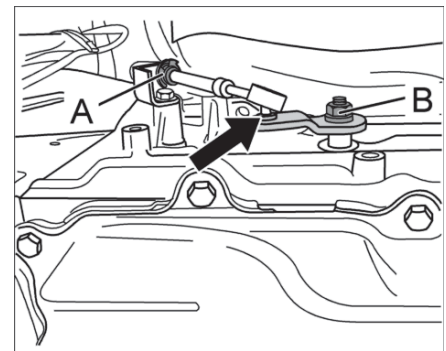
1. Install selector lever cable through the lower part of the selector frame.
2. Press rubber sleeve on the selector lever cable into the lower part of the selector frame.



Note

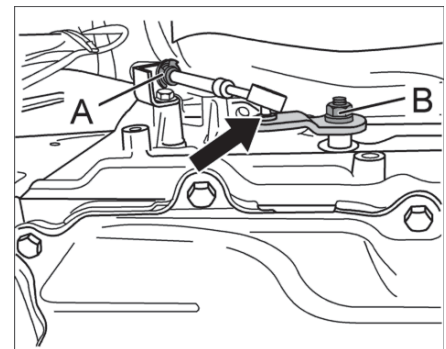
- Ensure that the tab washer is seated correctly.

3. Attach tab washer **-A-** to the cable holder on the transmission side.



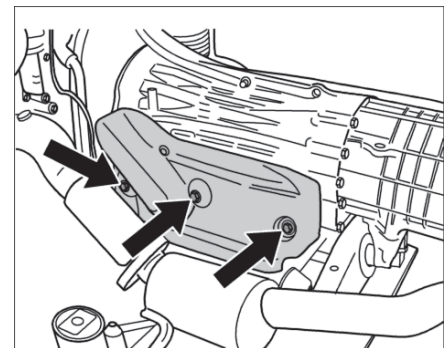
Selector lever cable connection to transmission

4. Attach cable to the ball joint **-arrow-** .



Selector lever cable connection to transmission

5. Install shield on the transmission. To do this, screw in three fastening screws **-arrow-** .



Shield to left of transmission

Subsequent work for selector lever cable

Reworking selector lever cable

1. Install selector frame. → 370819 Removing and installing selector frame - installing

9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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37 30 19 Removing and installing the Tiptronic control unit - as of MY 2003

- Preliminary work
- Removing Tiptronic control unit
- Installing Tiptronic control unit
- Coding Tiptronic control unit
- Subsequent work

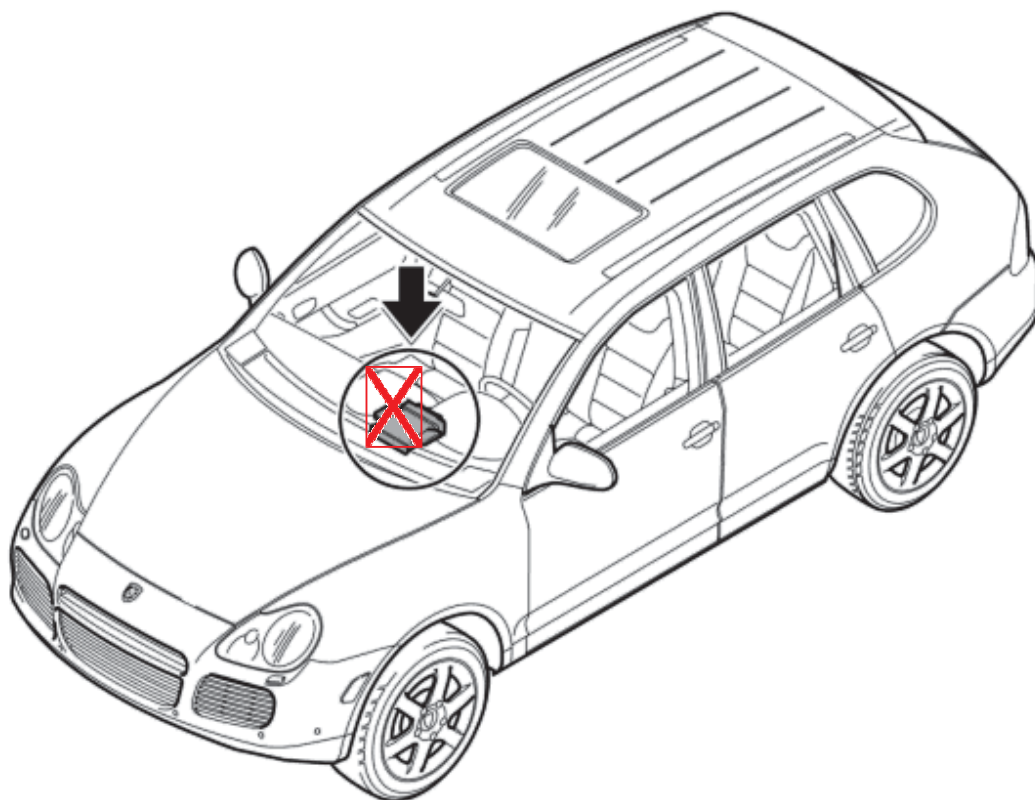
Preliminary work

Preliminary work

1. The ignition key must be removed before removing the connector from the control unit.
2. Move right front seat all the way back and up.

Removing Tiptronic control unit

Installation Location:



Installation position



Note

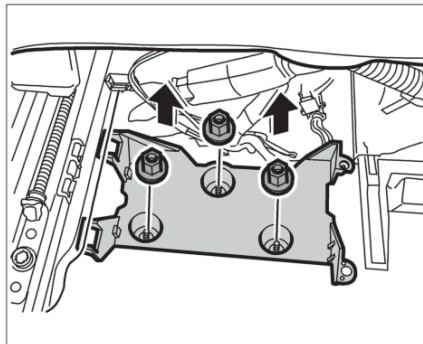
- The control unit is located under the right front seat.
1. If the Tiptronic control unit is replaced, observe the points under coding the control unit. → 373019 Removing and installing Tiptronic control unit - chapter on "Coding"
 2. Unclip right front seat trim and remove drawer.
 3. Unscrew the fastening screw for the support.



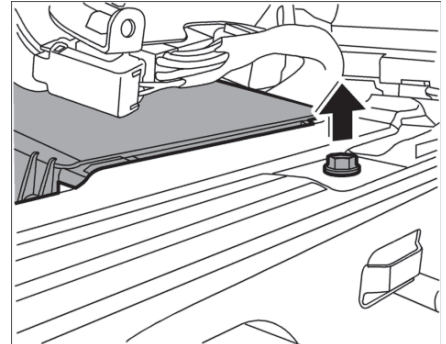
Note

- Only for vehicles with telephone

4. Unscrew the three fastening nuts and remove support for telephone control unit.
5. Move seat all the way forward and remove ignition key.

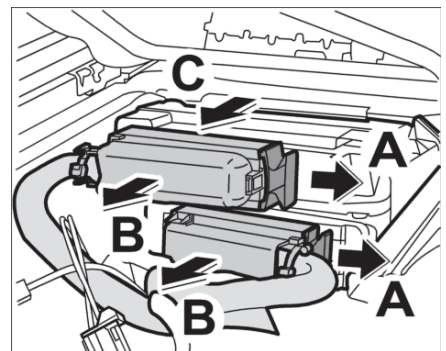


Unscrewing fastening nuts

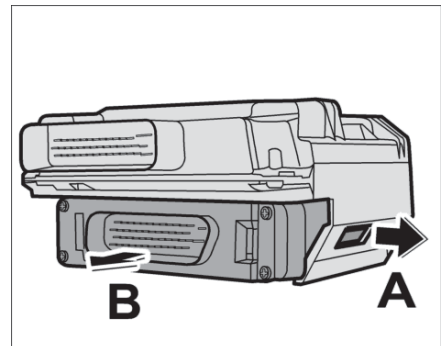


Unscrewing fastening screw for support

6. Release the two connectors **-A-** and remove them **-B-**.
7. Remove support with the two control units **-C-**.



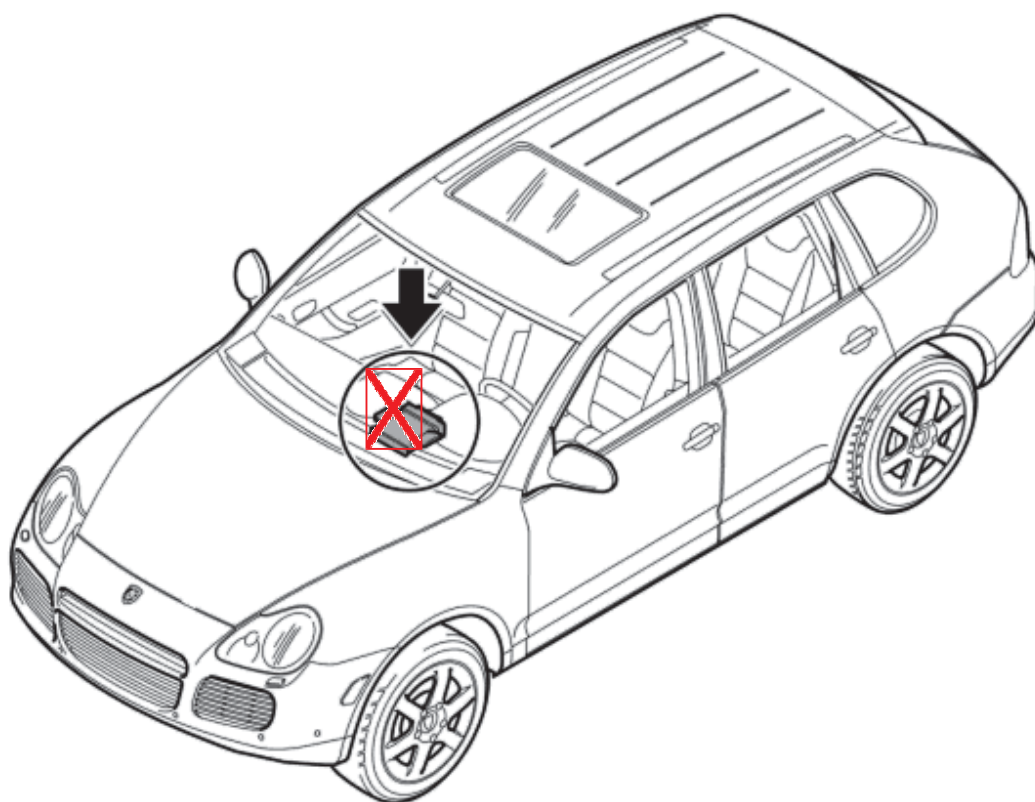
Releasing and removing connector



Release locking tabs and remove control unit

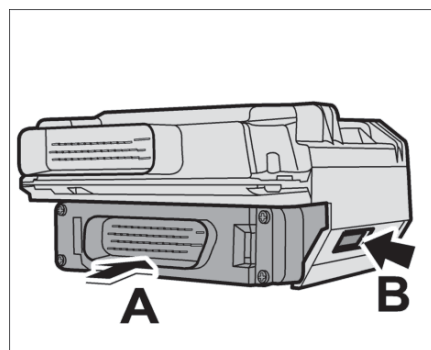
Installing Tiptronic control unit

Installation Location:



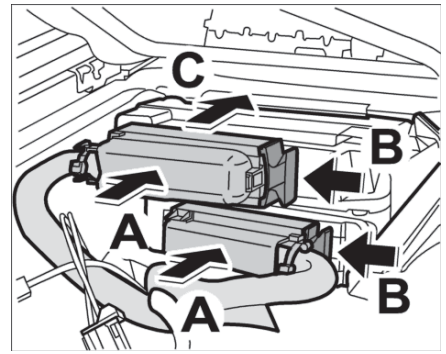
Installation position

1. Insert control unit into the support **-A-** until the locking tabs **-B-** are felt to engage.



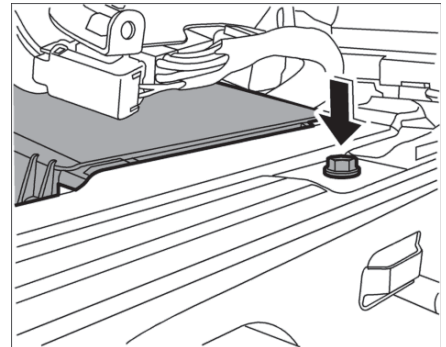
Inserting and locking control unit

2. Connect the two connectors **-A-** and push in the locking mechanism **-B-** until it is felt to engage.
3. Place the support with the two control units in installation position **-C-**.



Connecting and locking the connectors

4. Move seat all the way back and tighten the support with the fastening screw.
5. If the Tiptronic control unit is replaced, observe the points under coding the control unit. → 373019 Removing and installing Tiptronic control unit - chapter on "Coding"

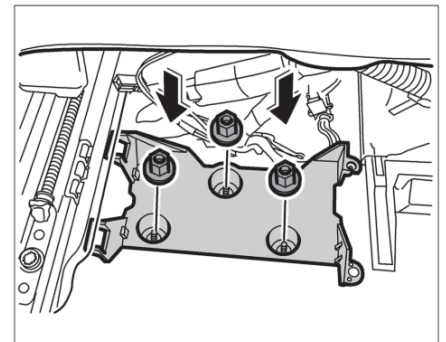


Tightening fastening screw



Note

- Only for vehicles with telephone
6. Position the support for the telephone control unit and screw down using the three fastening nuts.



Tightening fastening nuts

Coding Tiptronic control unit



Note

- The adaptation values must be reset using the Porsche System Tester when the transmission is renewed/replaced.
- If a new control unit is installed, it must adapt first. Poor shifting quality can therefore be expected in the adaptation phase.
- After the test drive, let the engine run for 10 minutes at idle speed. This ensures that all adaptation values are stored in the control unit.
- The instructions of the Porsche System Tester have highest priority.

- The procedure described here has been structured generally; changes or additions may be made. It is based on Tester Software 16.0.
 - The Porsche System Tester instructions take precedence and in the event of a discrepancy these are the instructions that must be followed. Deviations may occur with later software versions.
 - During coding, it is essential to guarantee the power supply for the Porsche System Tester. It is essential to connect a battery charger with a current rating of at least 40 A to the vehicle battery.
 - Symbol for the Tab key = 
1. Connect the Porsche System Tester to the vehicle and start the System Tester. Switch on ignition.  Continue.
 2. Select vehicle type using the cursor keys.
 3. Using the  key, move from the vehicle type to the list of control units. Perform the automatic control unit search.
 4. Select Tiptronic with the cursor keys and press the  key.
 5. Select Control unit replacement with the cursor keys and press the  key.
 6. Select Read out values (codings) and press the  key.
 7. The message Coding read-out complete will appear on the screen of the Porsche System Tester .
 8. Switch off ignition and replace Tiptronic control unit. → 373019 Removing and installing Tiptronic control unit - chapter on "removing"
 9. Switch on ignition.
 10. After replacement of the control unit, the vehicle data is installed under the menu Write in data read out (see Section 6). Press the  key.
 11. System Tester displays Coding write-in complete. Press the  key.
 12. Exit the menu, switch off ignition, lock vehicle and read out fault memory once more.



Note

- If the data cannot be read out with the Porsche System Tester, the versions listed must be coded using the menu item "Codings".

Version	Coding	Note
Countries	RoW/USA Asia	Country-specific Japan, Korea, Taiwan

Subsequent work

Subsequent work

1. For vehicles with a telephone, install the telephone control unit. → 919019 Removing and installing control unit for telephone - chapter on "installing"
 2. Clip in right front seat trim and install drawer.
-

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- **Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.**
- **Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.**

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

Danger of losing text-figure correspondence when printing out.

- **For technical reasons, it can currently not be ruled out that the correspondence between text and associated figure can be lost when it is printed out, even though the display on the screen is correct.**
- **If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.**

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- **Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.**
- **Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.**

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- **Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.**
- **Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.**

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

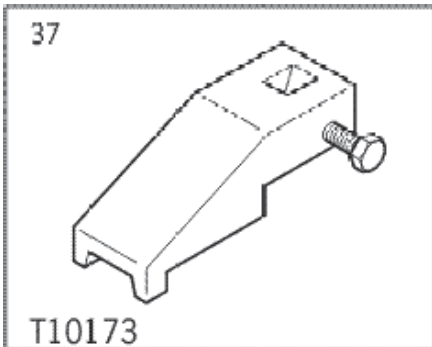
- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

37 31 15 Adjusting multi-functional switch - as of MY 2003

- Preliminary work for multi-functional switch
- Adjusting multi-functional switch
- Subsequent work

Tools

Designation	Type	Number	Explanation	
adjustment tool	special tool	T10173		

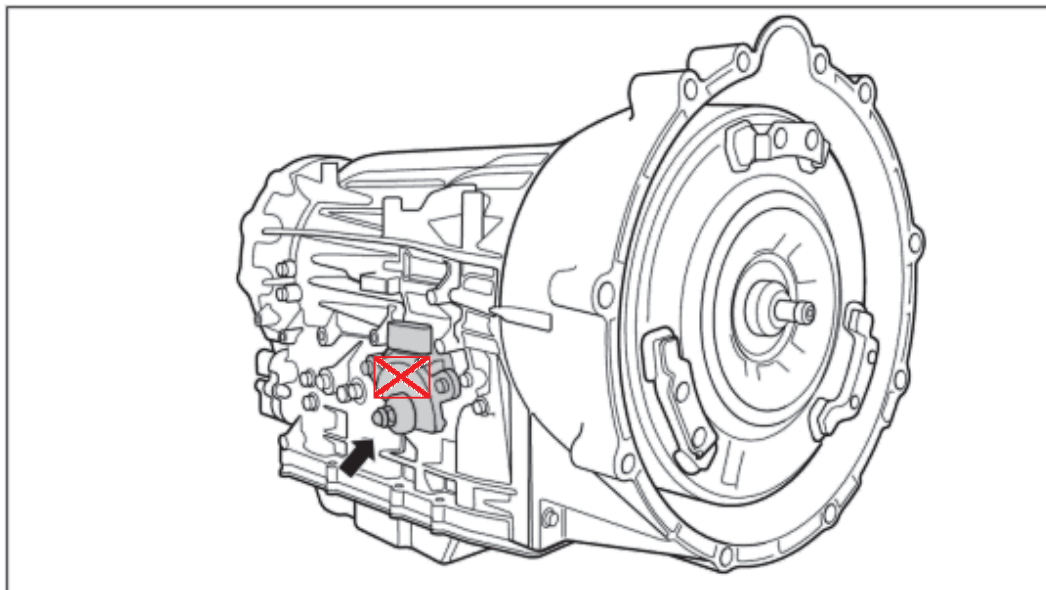
Preliminary work for multi-functional switch

Preliminary work for multi-functional switch

Adjusting multi-functional switch

Adjusting multi-functional switch

Installation Location:



Overview of multi-functional switch



Note

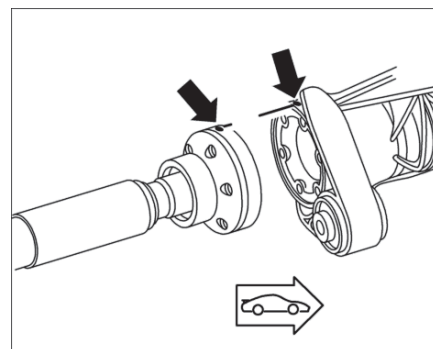
- To unscrew the cardan shaft bolts, a second fitter should sit in the vehicle and block the drive harness by actuating the foot brake.
- The colour markings, match points **-arrows-** , on the cardan shaft and on the all-wheel final drive flange must be aligned. This will neutralise the residual imbalance of the components.
- Apply another colour marking if necessary.



Note

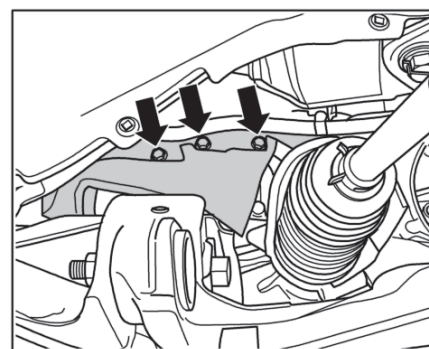
- Screws which are tightened with a torque angle must be replaced with new ones.

1. Move selector lever to position N.

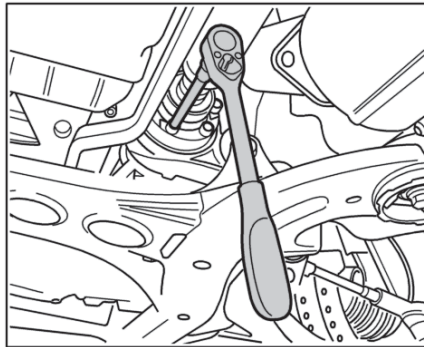


Front cardan shaft match points

2. Remove three shield screws **-arrows-** on the all-wheel final drive.



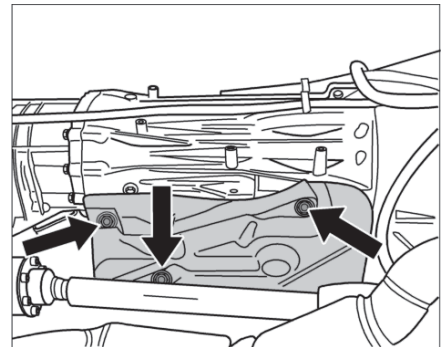
3. Remove cardan shaft from the front-axle final drive.



Cardan shaft to four-wheel final drive

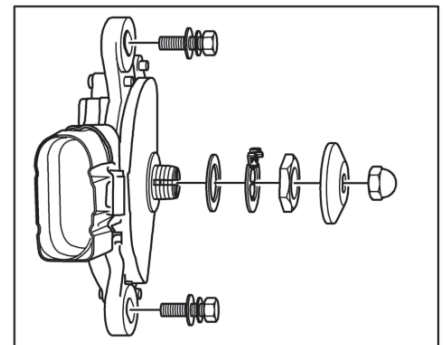
4. Remove shield on the transmission. To do this, unscrew three fastening screws **-arrow-**.
5. Pull out compact connector on multi-functional switch.

Shield on final four-wheel drive



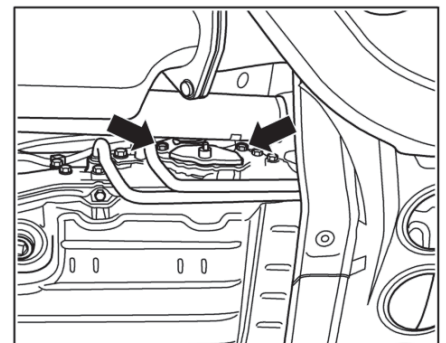
Shield to right side of transmission

6. Remove cap nut, cap, nut with tab washer and rubber washer on the multi-functional switch.



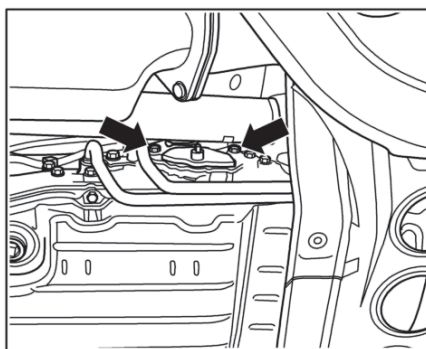
Assembling multi-functional switch

7. Loosen the fastening screws **-arrow-**.

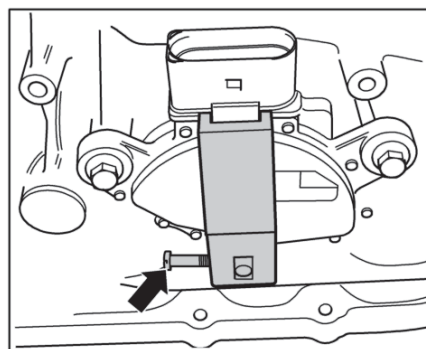


Fastening screws for multi-functional switch

8. Position special **adjustment tool T10173** on the shaft and fix to the shaft with screws **-arrow-**.

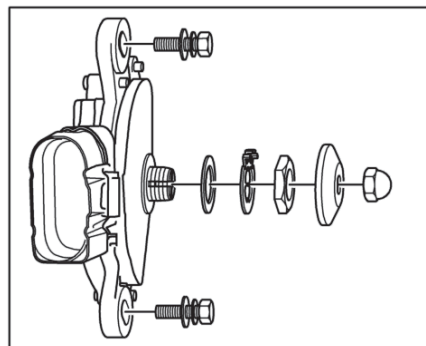


Fastening screws for multi-functional switch



Adjustment tool to multi-function switch

9. Screw in fastening screws **-arrow-** and remove special **adjustment tool T10173**. → **Tightening torque: 3.5 ftlb.**
10. Install cap nut, cap, nut with tab washer and rubber washer on the multi-functional switch. → **Tightening torque: 5 ftlb.** → **Tightening torque: 11 ftlb.**
11. Position compact connector on multi-functional switch.

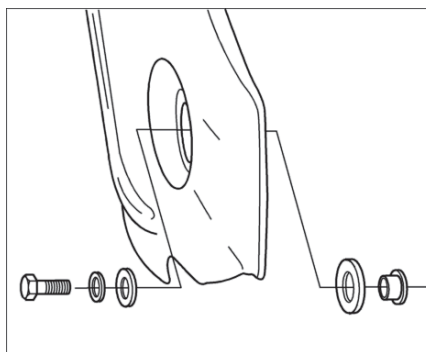


Assembling multi-functional switch



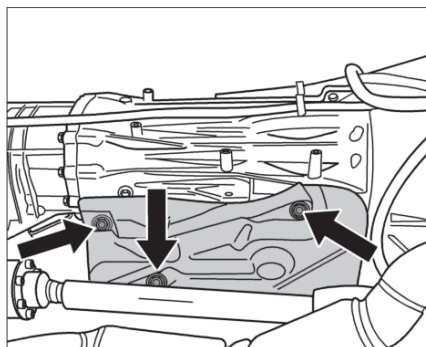
Note

- When installing the shield, ensure that all fastening parts → **Mounting element shield** are present and inserted correctly.

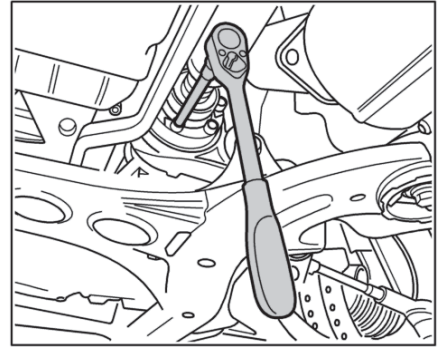


Mounting element shield

12. Install shield on the transmission. To do this, screw in three fastening screws **-arrow-**. → **Tightening torque: 7.5 ftlb.**



Shield to right side of transmission



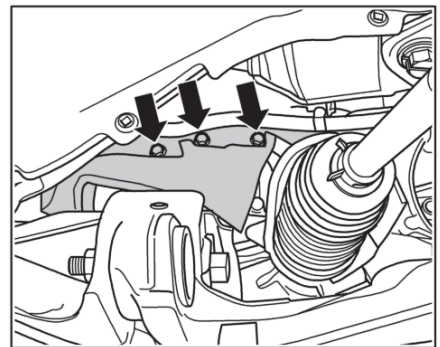
Cardan shaft to four-wheel final drive

13. Fix cardan shaft with new screws to the front-axle final drive. → **Initial tightening: 22 ftlb.** → **Final tightening: 90 Winkel-Grad**

14. Install shield fastening screws **-arrows-** on all-wheel final drive. → **Tightening torque: 7.5 ftlb.**

15. Functional test of gear selecting system:

- Will the vehicle start?
- Do all the selector lever positions work?



Shield on final four-wheel drive

Subsequent work

Reworking multi-function switch

1. Fit engine guard. → 108019 Removing and installing engine guard - installing

9PAAE1, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
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AVERTISSEMENT

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ADVERTENCIA

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37 31 19 Removing and installing multi-functional switch - as of MY 2003

- Preliminary work
- Removing multi-functional switch
- Installing multi-functional switch
- Subsequent work

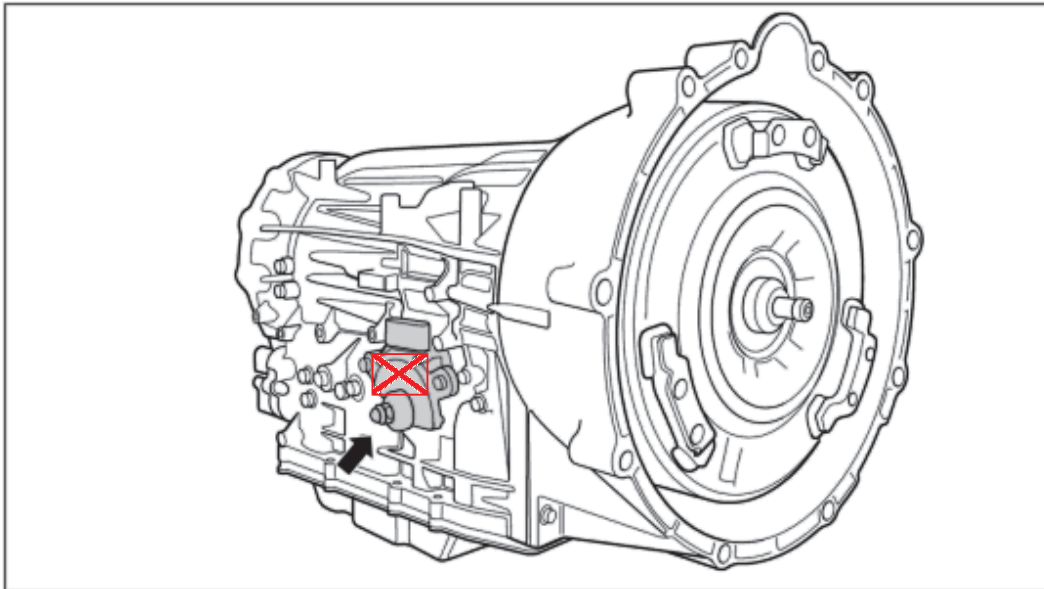
Preliminary work

Preliminary work for multi-functional switch

Removing multi-functional switch

Removing multi-functional switch

Installation Location:



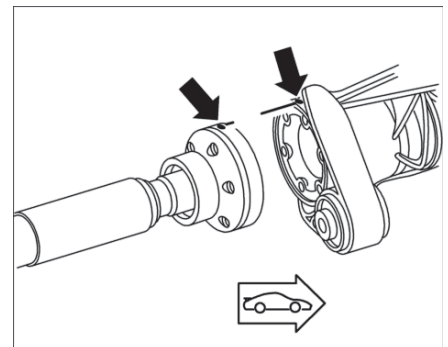
Overview of multi-functional switch



Note

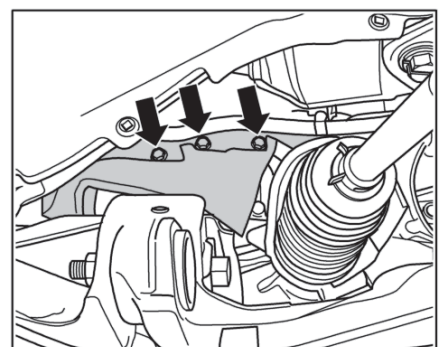
- To unscrew the cardan shaft bolts, a second fitter should sit in the vehicle and block the drive harness by actuating the foot brake.
- The colour markings, match points **-arrows-** , on the cardan shaft and on the all-wheel final drive flange must be aligned. This will neutralise the residual imbalance of the components.
- Apply another colour marking if necessary.

1. Move selector lever to position N.

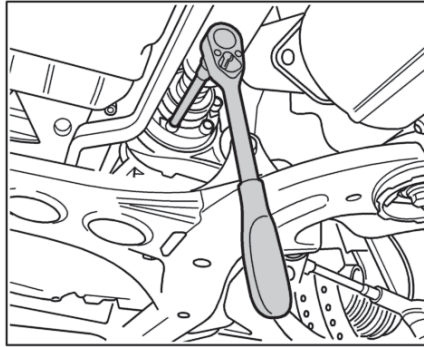


Front cardan shaft match points

2. Remove three shield screws **-arrows-** on the all-wheel final drive.



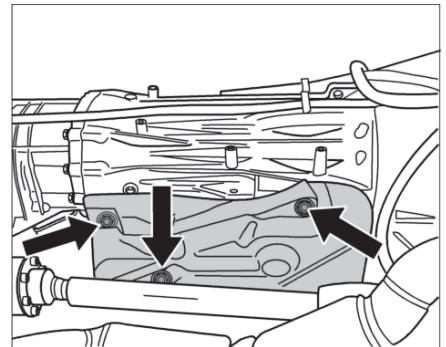
3. Remove cardan shaft from the front-axle final drive.



Cardan shaft to four-wheel final drive

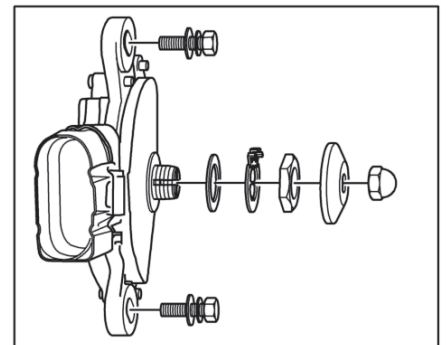
4. Remove shield on the transmission. To do this, unscrew three fastening screws -**arrow**- .
5. Pull off the cable plug on the multi-functional switch.

Final four-wheel drive shield



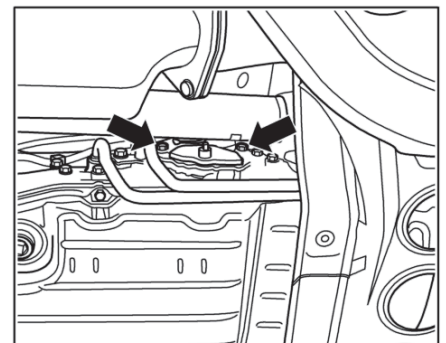
Shield to right side of transmission

6. Remove cap nut, cap, nut with tab washer and rubber washer on the multi-functional switch.



Assembling multi-functional switch

7. Unscrew fastening screws on the multi-functional switch -**arrow**- and remove switch.

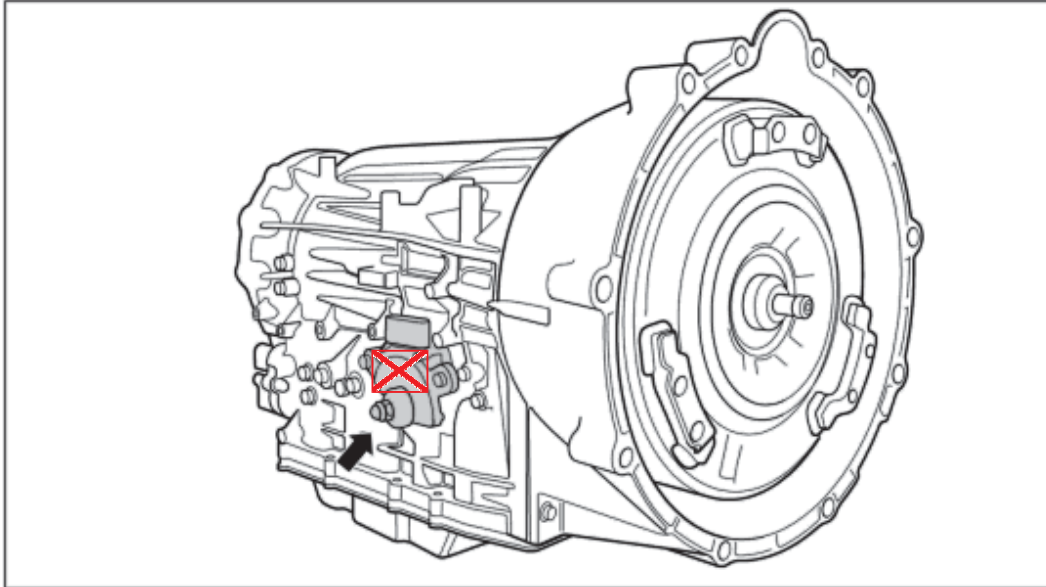


Fastening screws for multi-functional switch

Installing multi-functional switch

Installing multi-functional switch

Installation Location:



Overview of multi-functional switch



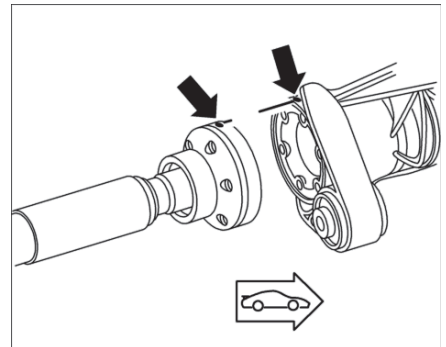
Note

- The colour markings, match points **-arrows-**, on the cardan shaft and on the all-wheel final drive flange must be aligned. This will neutralise the residual imbalance of the components.



Note

- Screws which are tightened with a torque angle must be replaced with new ones.



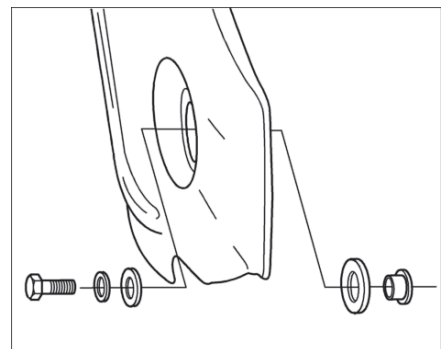
1. Put multi-functional switch on the selector shaft.
2. Adjust multi-functional switch . → 373115 Adjusting multi-functional switch



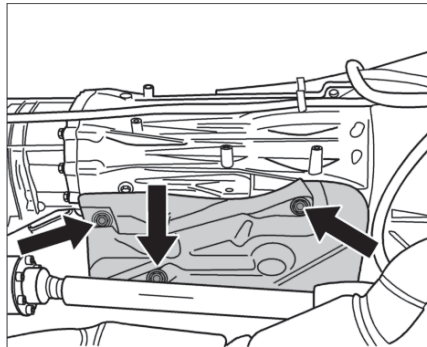
Note

- When installing the shield, ensure that all fastening parts → [Mounting element shield](#) are present and inserted correctly.

3. Connect cable plug to multi-functional switch.

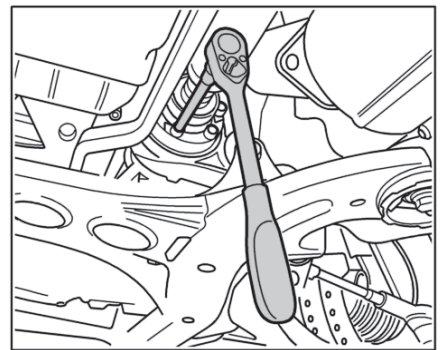


Mounting element shield



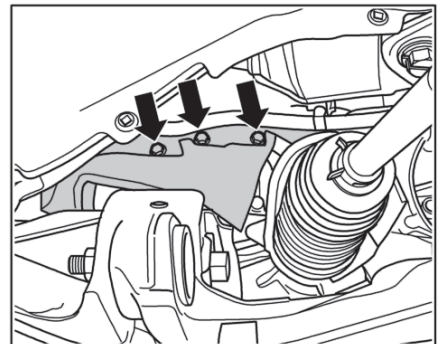
Shield to right side of transmission

4. Install shield on the transmission. To do this, screw in three fastening screws **-arrow-** . → **Tightening torque: 7.5 ftlb.**
5. Fix cardan shaft with new screws to the front-axle final drive. → **Initial tightening: 22 ftlb. → Final tightening: 90 Winkel-Grad**



Cardan shaft to four-wheel final drive

6. Install shield fastening screws **-arrows-** on all-wheel final drive. → **Tightening torque: 7.5 ftlb.**
7. Functional test of gear selecting system:
 - Will the vehicle start?
 - Do all the selector lever positions work?



Final four-wheel drive shield

Subsequent work

Reworking multi-function switch

1. Fit engine guard. → 108019 Removing and installing engine guard - installing

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23,
C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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AVERTISSEMENT

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→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

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ADVERTENCIA

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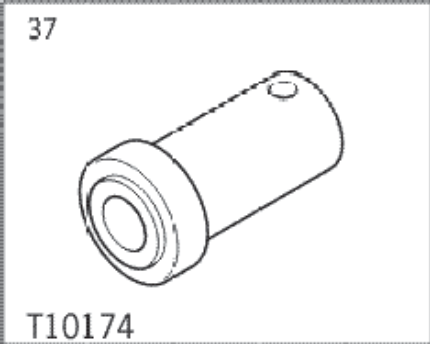
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→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

37 33 19 Removing and installing sealing ring for selector shaft - as of MY 2003

- Preliminary work
- Removing sealing ring for selector shaft
- Installing sealing ring for selector shaft
- Subsequent work

Tools

Designation	Type	Number	Explanation	
universal disassembly tool	special tool	NR.21		
pressure sleeve	special tool	T10174		

Preliminary work

Preliminary work for sealing ring for right selector shaft

1. Remove multi-functional switch. → 373119 Removing and installing multi-functional switch - section on "Removing" [9PAAE1 9PAAF1] → 373119 21 *Removing and installing multi-functional switch - section on "Removing" [9PAAJ1]*

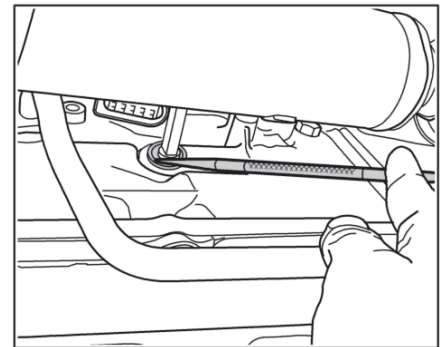
Preliminary work for sealing ring for left selector shaft

1. Remove engine guard . → 108019 Removing and installing engine guard - section on "Removing"

Removing sealing ring for selector shaft

Removing sealing ring for right selector shaft

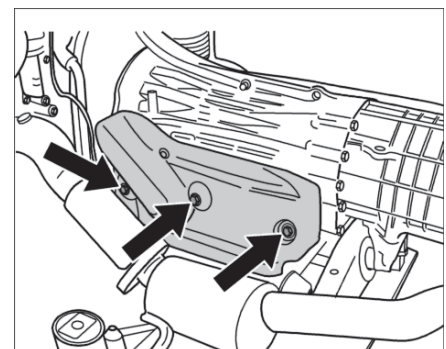
1. Remove sealing ring with sharp tool, such as a scribe. **-Graphic-**



Removing sealing ring for selector shaft

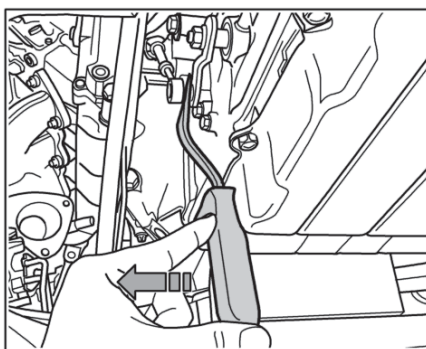
Removing sealing ring for left selector shaft

1. Remove shield on the transmission. To do this, unscrew three fastening screws **-Arrow-** .

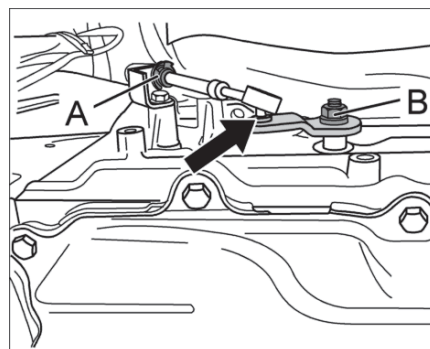


Left transmission shield

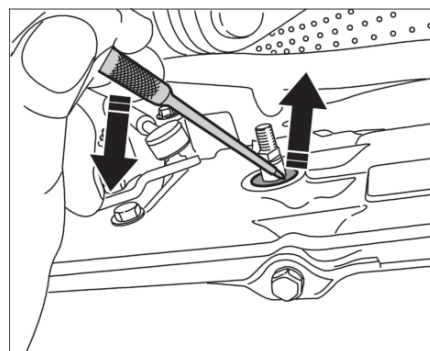
2. Remove tab washer **-A-** on the cable.
3. Unscrew selector lever cable from the ball joint with **universal disassembly tool NR.21**.
4. Push a sharp tool, e.g. scribe, into the sealing ring and remove it. **-Arrow-**



Removing selector cable from transmission



Selector lever cable to transmission

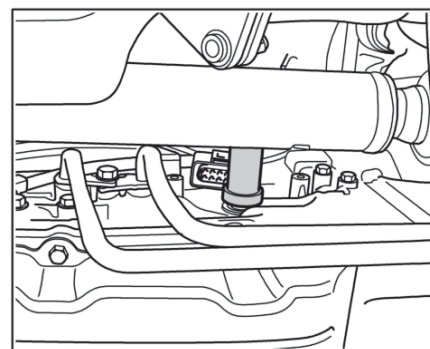


Removing left sealing ring

Installing sealing ring for selector shaft

Installing sealing ring for right selector shaft

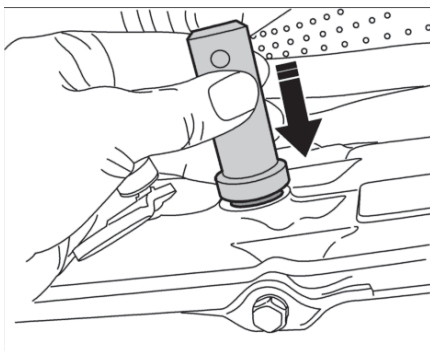
1. Press new sealing ring with special tool **pressure sleeve T10174** as far as the pressure sleeve on the transmission housing.



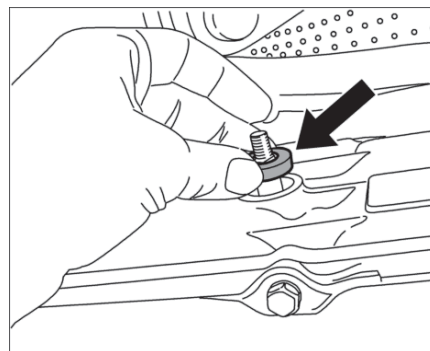
Installing sealing ring for selector shaft

Installing sealing ring for left selector shaft

1. Position new sealing ring **-arrow-** .
2. Press new sealing ring with special tool **pressure sleeve T10174** as far as the pressure sleeve on the transmission housing. **-arrow-**
3. Position selector lever on selector shaft and screw in fastening nut. → **Tightening torque: 11 ftlb.**

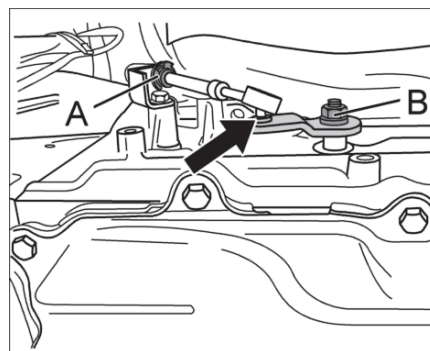


Installing sealing ring

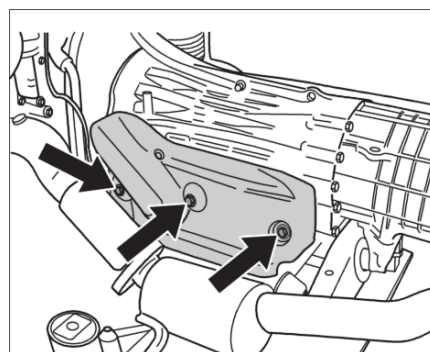


Positioning sealing ring

4. Attach tab washer **-A-** to the cable holder on the transmission side.
5. Press cable on the ball joint **-arrow-** .



Selector lever cable to transmission

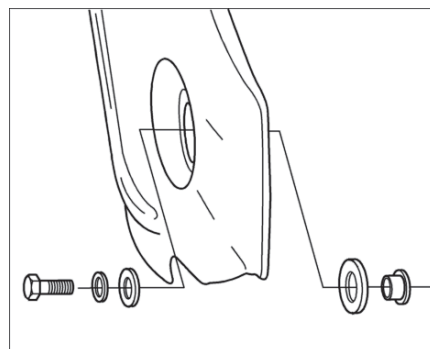


Left transmission shield



Note

- When installing the shield, ensure that all fastening parts **-figure-** are present and inserted correctly.
6. Install shield on the transmission. To do this, screw in three fastening screws **-arrow-** . → **Tightening torque: 7.5 ftlb.**



Sheetmetal panel screws

Subsequent work

Reworking for sealing ring for right selector shaft

1. Install multi-functional switch. → 373119 Removing and installing multi-functional switch - section on "Installing" [9PAAE1 9PAAF1]→ 373119 23 *Removing and installing multi-functional switch - section on "Installing" [9PAAJ1]*

Reworking for sealing ring for left selector shaft

1. Fit engine guard. → 108019 Removing and installing engine guard - section on "Installing"
-

9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
- Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

Danger of losing text-figure correspondence when printing out.

- For technical reasons, it can currently not be ruled out that the correspondence between text and associated figure can be lost when it is printed out, even though the display on the screen is correct.
- If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

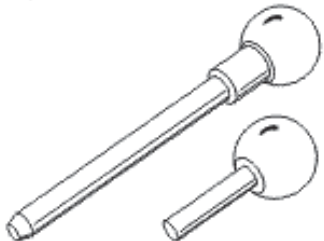
→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

37 35 19 Removing and installing transmission - as of MY 2003

- Preliminary work
- Removing transmission
- Installing transmission
- Subsequent work

Tools

Designation	Type	Number	Explanation	
(material)	special tool	00000	wooden block	PORSCHE siehe Handbuch Werkstattaufrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
fixing pin	special tool	95950		PORSCHE siehe Handbuch Werkstattaufrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
fixing pin	special tool	95951		

				15, 32  9595/1 000 721 959 51
insert	special tool	96870		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
insert bit	special tool	96880		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
centring pin	special tool	96890		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
socket wrench insert	special tool	97140		

				PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
universal disassembly tool	special tool	NR.21		

Preliminary work

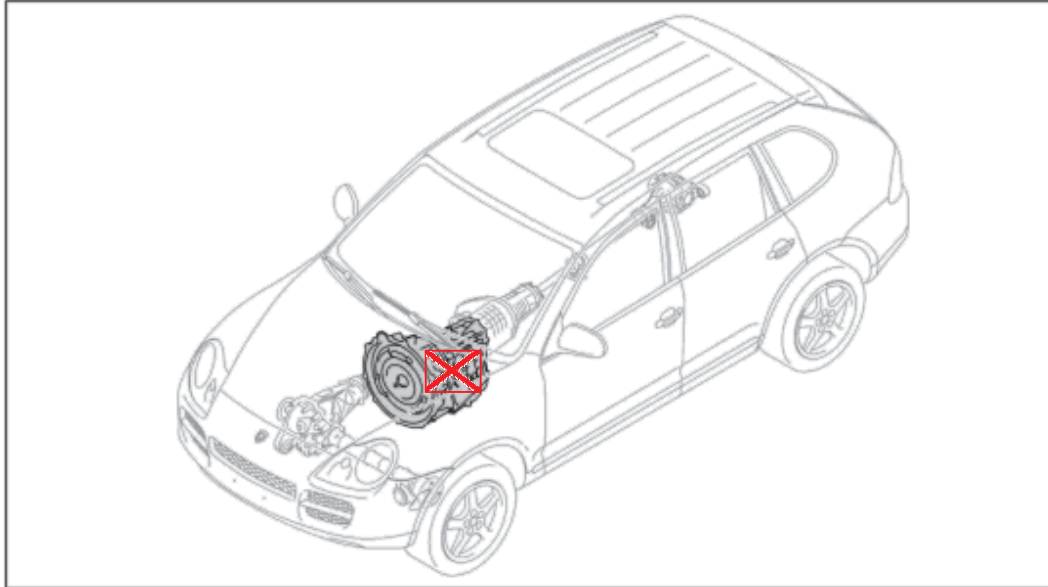
Preliminary work for removing transmission

1. Remove covers in engine compartment to the right and rear. → 700219 Removing and reinstalling front cover (engine compartment) - chapter on "Removing"
2. Remove Y-shaped pipe. → 243519 Removing and installing air box for throttle housing (Y-shaped pipe) - chapter on "Removing" [9PAAF1]→ 243519 Removing and installing air box for throttle housing (Y-shaped pipe) - chapter on "Removing" [9PAAE1]
3. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"
4. Remove exhaust system. → 260119 Removing and installing exhaust system - chapter on "removing"
5. Remove rear cardan shaft. → 393519 Removing and reinstalling rear cardan shaft - chapter on "Removing"
6. Remove front cardan shaft. → 390219 Removing and installing front cardan shaft - chapter on "Removing"
7. Remove catalytic converter on left side. → 267619 Removing and installing primary catalytic converter - chapter on "Removing" [9PAAE1]→ 267619 Removing and installing primary catalytic converter - chapter on "Removing" [9PAAF1]→ 267619 Removing and installing primary catalytic converter - Cayenne Turbo - chapter on "Removing" [9PAAE1]→ 267619 Removing and installing primary catalytic converter - Cayenne Turbo - chapter on "Removing" [9PAAF1]

Removing transmission

Removing transmission

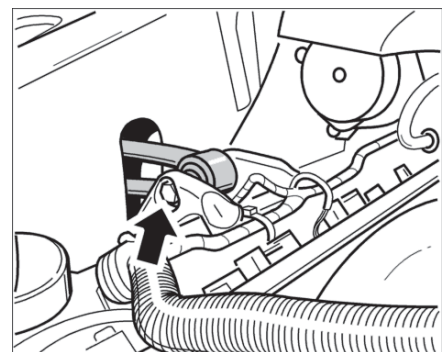
Installation Location:



Note

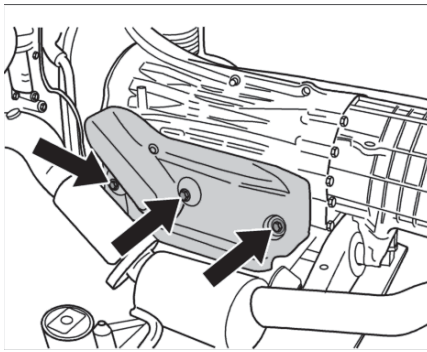
- The line connections on the transmission and the ends of the ATF lines must be closed off after the lines have been separated from the transmission!

1. Moving selector lever to position N
2. Remove torque converter support on engine side.

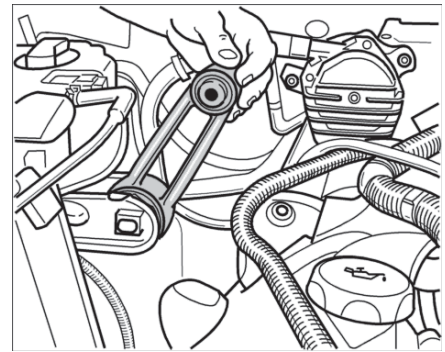


Torque converter support screw

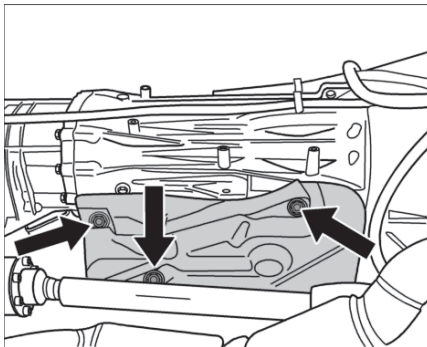
3. Remove shield on the left of the transmission. To do this, unscrew three fastening screws **-Arrow-**.
4. Remove shield on the right of the transmission. To do this, unscrew three fastening screws **-Arrow-**.
5. Remove transfer box. → 396519 Removing and installing transfer box - chapter on "Removing"
6. Support engine transmission aggregate on converter bell housing with a **(material) 00000** on the suspension subframe.



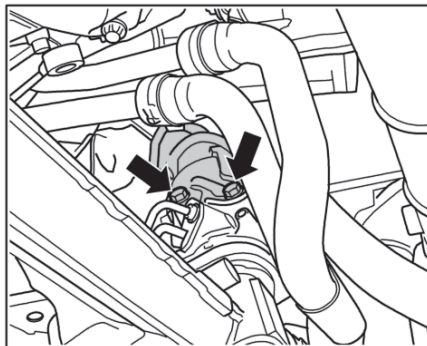
Left shield



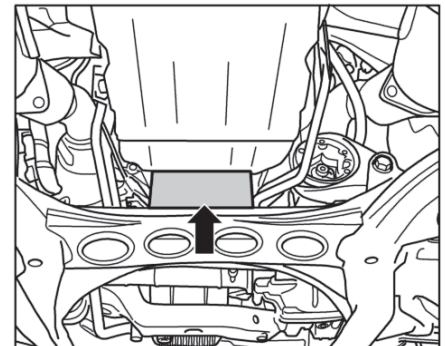
Torque converter support



Right shield



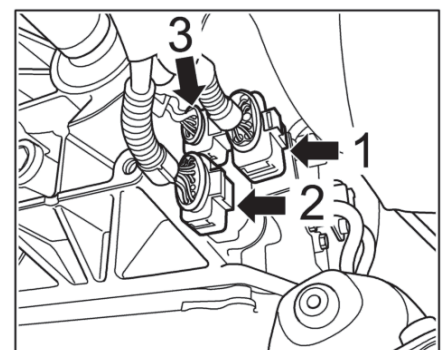
Shield panel to steering gear



Supporting the engine/transmission aggregate

7. Remove shield panel on the steering gear.

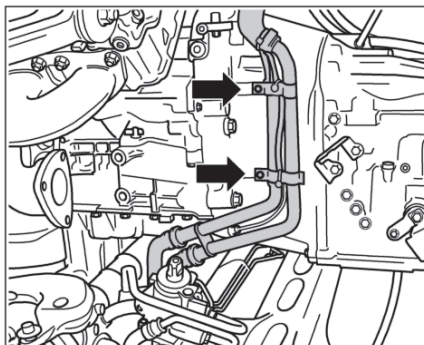
8. Remove plug connections on the Tiptronic transmission -1,2,3- .



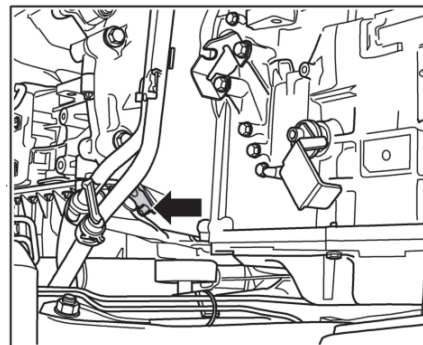
Tiptronic plug connections

9. Remove reference mark sender on the converter bell housing -Arrow- .

10. Unscrew coolant pipe holder bolts **-Arrows-** on the converter bell housing.

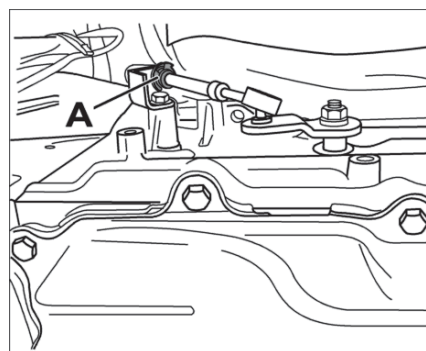


Coolant pipes to converter bell housing



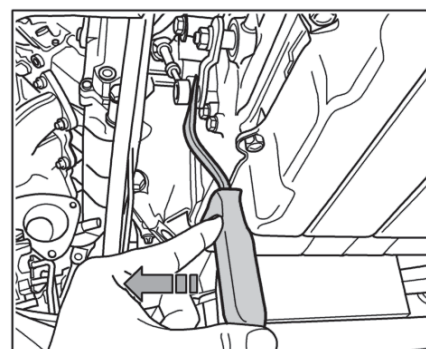
Reference mark sender

11. Remove retaining clip **-A-** on the holder.



Selector lever cable connection

12. Unscrew selector lever cable from the ball joint with **universal disassembly tool NR.21**.



Removing selector cable

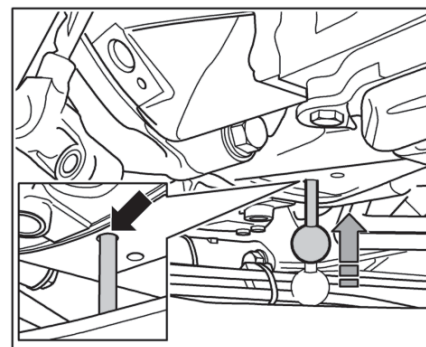


Note

- A second fitter is required to unscrew or screw in the converter screws.
- The converter screws must be replaced.

13. Remove converter screws. Observe the following steps for this purpose.

14. Turn crankshaft clockwise with special tool **socket wrench insert 97140**.

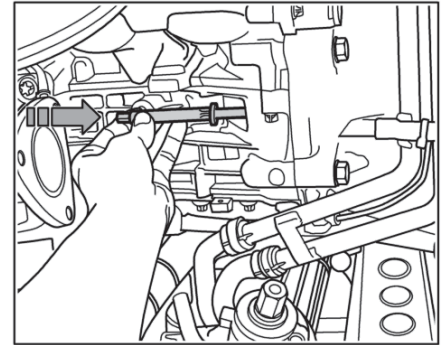


Disconnecting converter screws

15. Insert special tool **fixing pin 95950** into the front bore on the converter bell housing **-Arrow-** and hold

upwards with light pressure until it engages when the crankshaft is turned.

16. Position special tool **insert bit 96880** on converter screw through opening in the engine block, connect bit snap-on head and special **insert 96870** one after the other.
17. Remove special tool **fixing pin 95950** before undoing the converter screws.
18. Unscrew converter screw and twist out.
19. Complete the steps described above for the other five screws.



Opening for converter screws

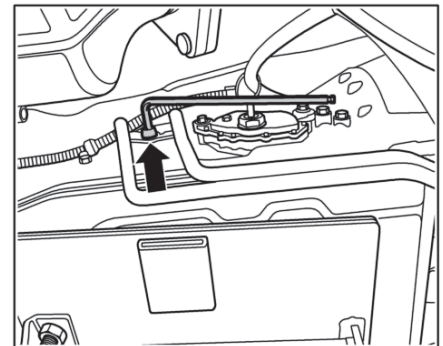


WARNING

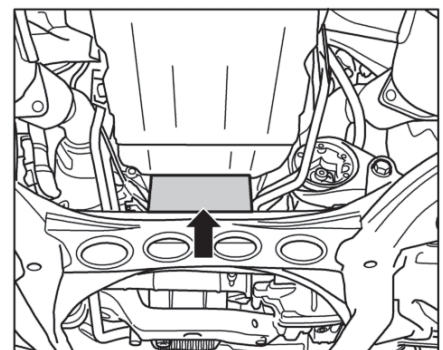
Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)

20. Release ATF lines and lock connections.
21. Lift transmission with transmission jack and mounting plate on the ATF pan and secure with belts.
22. Remove **(material) 00000** base.

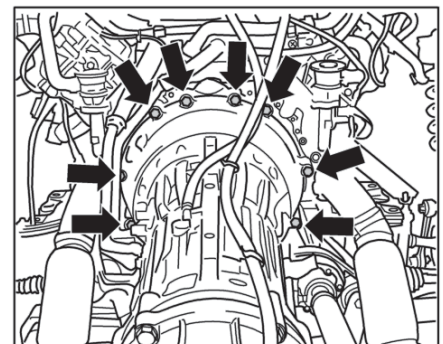


ATF line to transmission



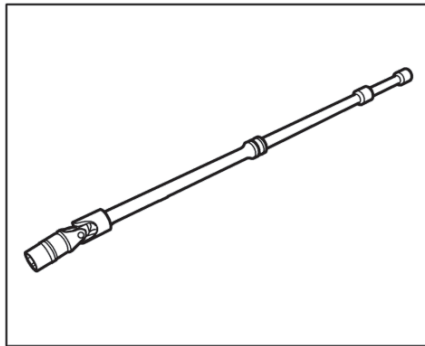
Supporting the engine/transmission aggregate

23. Unscrew engine transmission flange screws **-Arrow-** and two screws on the underside.



24. Unhinge bleeder line on the upper side of the transfer box whilst lowering.

25. Gradually extend transmission.



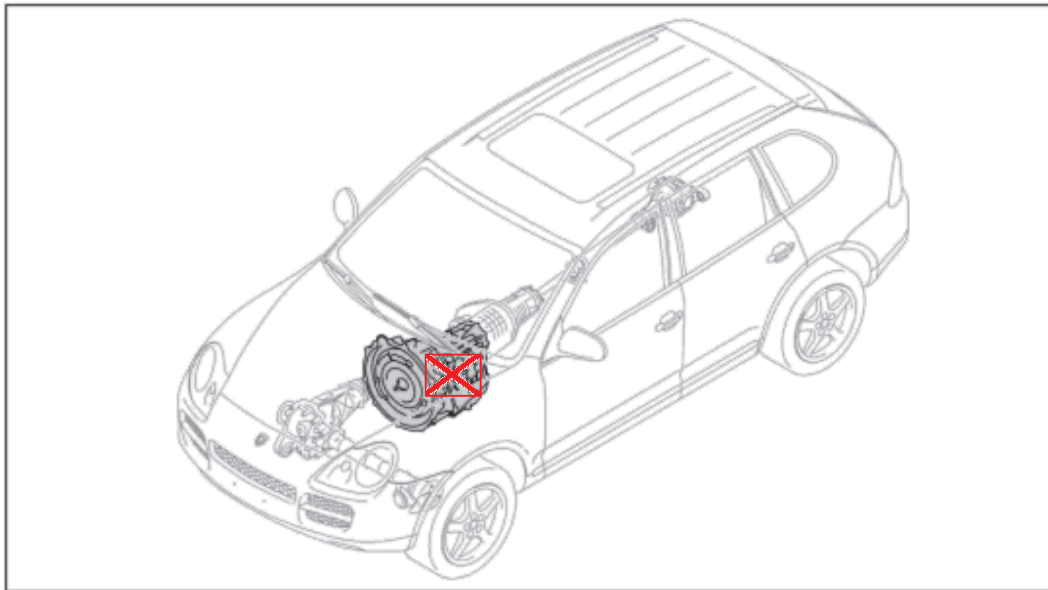
Fastening screws for securing transmission to engine

Tool recommendation

Installing transmission

Installing transmission

Installation Location:



Note

- A second fitter is required to unscrew or screw in the converter screws.
- The converter screws must be replaced.



Note

- The adaptation values must be reset using the Porsche System Tester when the transmission is renewed/replaced. → Removing and installing Tiptronic control unit



Note

- Because of the limited space between the engine and the radiator, the fixing pin can only be inserted at one point.
- Insert special tool in front of the fixing point in the belt pulley and then turn towards the fixing point. To remove, turn engine back slightly and remove fixing pin.

1. Fix crankshaft with special tool **fixing pin 95951**.

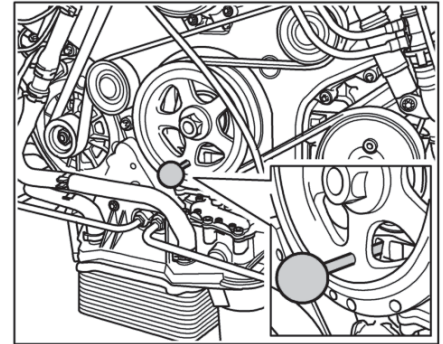
2. Insert special tool **centring pin 96890** in converter.

3. Gradually run in transmission. Thread centring pin through and replace bleeder line.

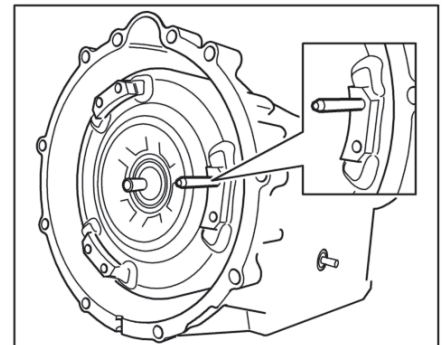
4. Screw in engine transmission flange screws **-Arrow-** and two screws on the underside. → **Tightening torque: 59 ftlb.**

5. Remove special tool **centring pin 96890** through opening in the engine block.

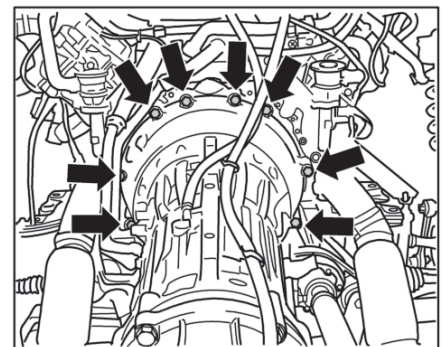
6. Support transmission with a **(material) 00000** between converter bell housing and suspension subframe.



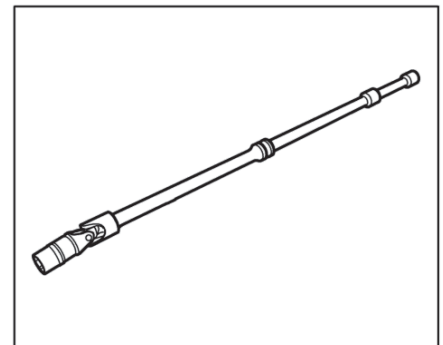
Disconnecting the crankshaft



Converter centring pin



Fastening screws for securing transmission to engine



Tool recommendation



ATTENTION

Damage to converter screws due to excessive tightening torque.

→ Observe adjusting value for torque wrench. 65 Nm (48 ftlb.) on torque wrench = 85 Nm (63 ftlb.) on the screw.

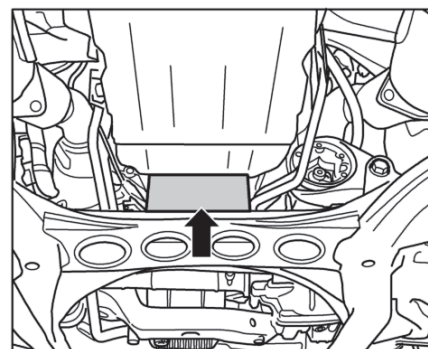
7. Screw in new converter screws:

8. Place screws on special tool **insert bit 96880** and screw in first screw.
9. Position bit snap-on head and special tool **insert 96870** and tighten screws. → **Tightening torque : 63 ftlb.**
10. Remove special tool **fixing pin 95951** on the crankshaft.
11. Turn crankshaft clockwise with special tool **socket wrench insert 97140**.

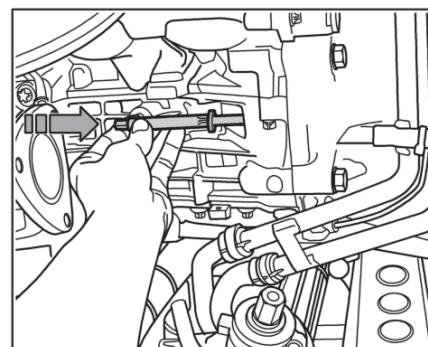
12. Insert special tool **fixing pin 95950** into the opening on the converter bell housing **-Arrow-** and hold with light pressure until it engages when the crankshaft is turned.

13. Pull out special tool **fixing pin 95950** before tightening to the specified tightening torque.

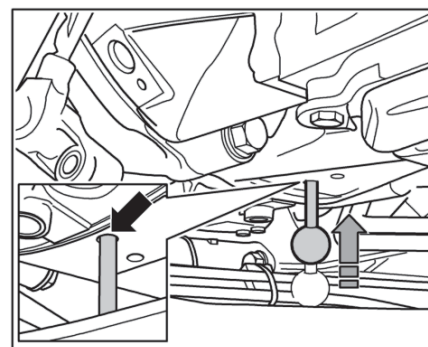
14. Complete the steps described above for the other screws.



Supporting the engine/transmission aggregate



Opening for converter screws



Disconnecting converter screws



WARNING

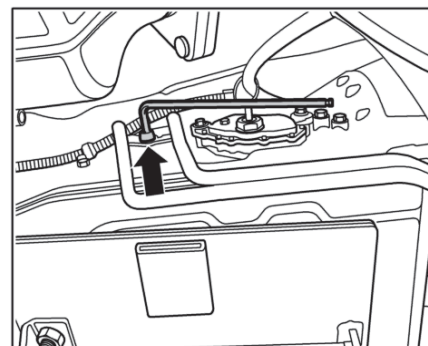
Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)

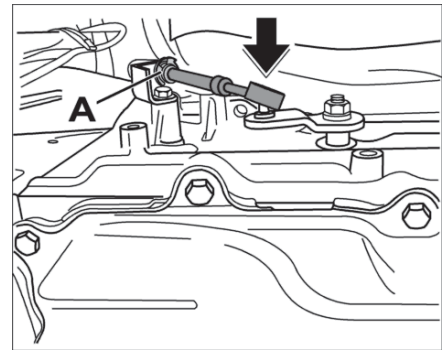
15. Position ATF lines on transmission and screw on tightly. → **Tightening torque: 19 ftlb.**

16. Replace converter lever cable on holder and insert safety clip **-A-**.

17. Press selector lever cable on to ball head **-Arrow-**.

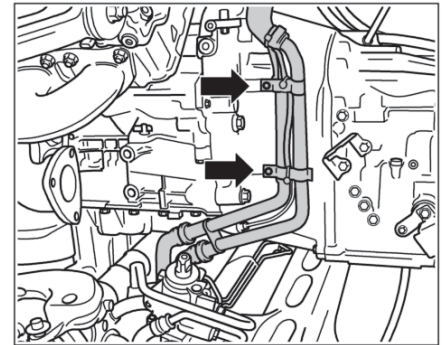


ATF line to transmission



Selector lever cable connection

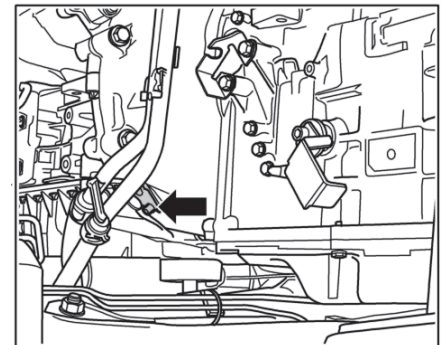
18. Screw in fastening screws for coolant pipe holder -**Arrow**- on the converter bell housing. → **Tightening torque: 6.5 ftlb.**



Coolant pipes to converter bell housing

19. Install reference mark sender on the converter bell housing -**Arrow**- . → **Tightening torque: 7.5 ftlb.**

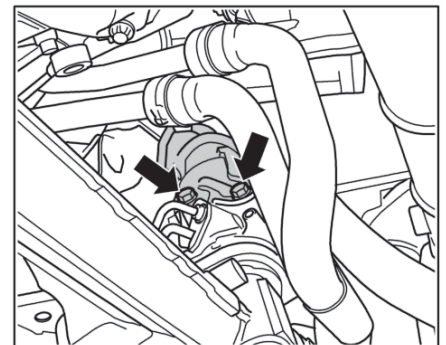
20. Install catalytic converters on left side. → 267619 Removing and installing primary catalytic converter - chapter on "Installing" [9PAAE1]→ 267619 Removing and installing primary catalytic converter - chapter on "Installing" [9PAAF1]→ 267619 Removing and installing primary catalytic converter - Cayenne Turbo - chapter on "Installing" [9PAAE1]→ 267619 Removing and installing primary catalytic converter - Cayenne Turbo - chapter on "Installing" [9PAAF1]



Reference mark sender to converter bell housing

21. Move oxygen sensor cable behind catalytic converter upwards.

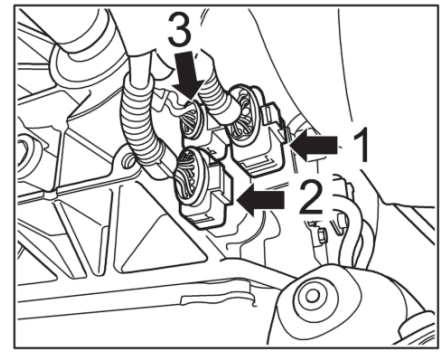
22. Install shield panel on the steering gear. → **Tightening torque: 7.5 ftlb.**



Shield panel to steering gear

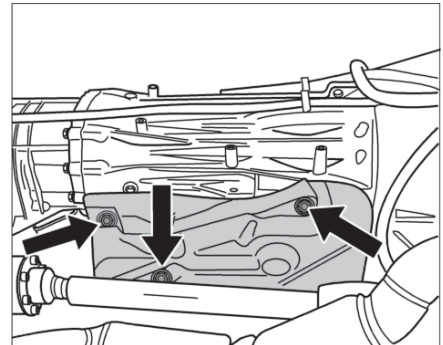
23. Connect plug connections on the Tiptronic transmission -**1,2,3**- .

24. Install transfer box → Removing and installing transfer box.



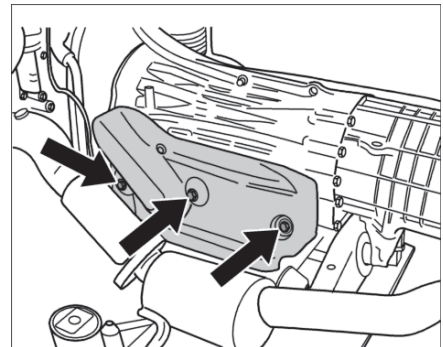
Tiptronic plug connections

25. Install shield on the right of the transmission. To do this, screw in three fastening screws **-Arrow-** . → **Tightening torque: 7.5 ftlb.**



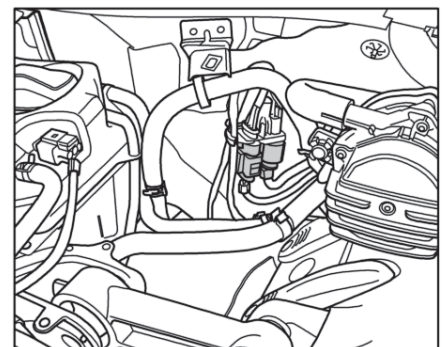
Right shield

26. Install shield on the left of the transmission. To do this, screw in three fastening screws **-Arrow-** . → **Tightening torque: 7.5 ftlb.**



Left shield

27. Connect oxygen sensor cable to the radiator tank.



Cable for oxygen sensors

28. Flange torque converter support on engine side. → **Tightening torque: 44 ftlb.**

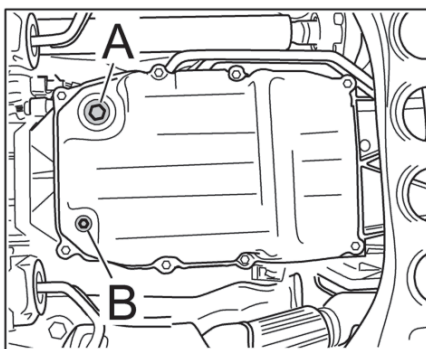


WARNING

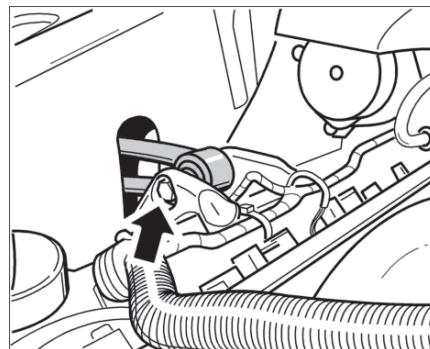
Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)

29. Unscrew ATF control screw **-A-** and fill in ATF until a constant discharge is visible at the lifting tube.



ATF pan check screw/filler screw



Torque converter support screw

30. Screw in ATF check screw **-A-** . → **Tightening torque: 52 ftlb.**

Subsequent work

Reworking for installing transmission

1. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"
2. Install front cardan shaft. → 390219 Removing and installing front cardan shaft - chapter on "Installing"
3. Install rear cardan shaft. → 393519 Removing and reinstalling rear cardan shaft - chapter on "Installing"
4. Install the exhaust system. → 260119 Removing and installing exhaust system - chapter on "Installing"
5. Install engine compartment cover on right and rear. → 700219 Removing and reinstalling front cover (engine compartment) - chapter on "Installing"
6. Check and if necessary, top up the ATF. → 370235 Checking and topping up the ATF

9PAAE1, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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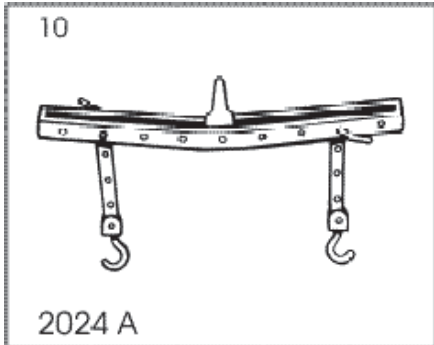
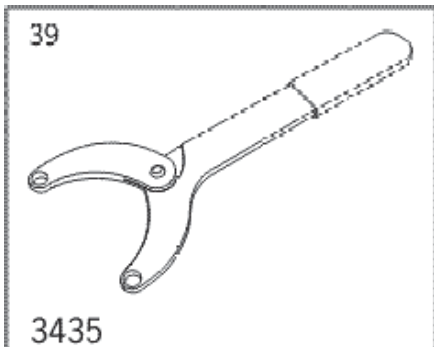
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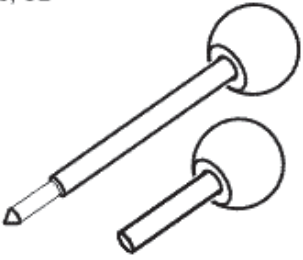
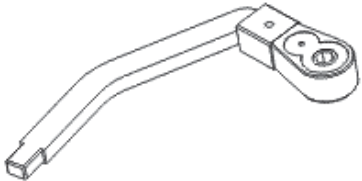
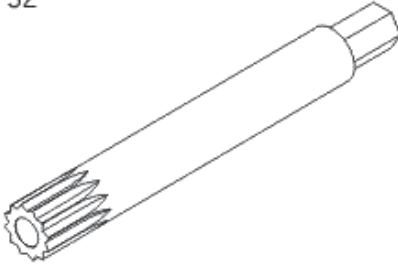
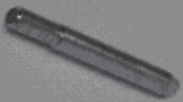
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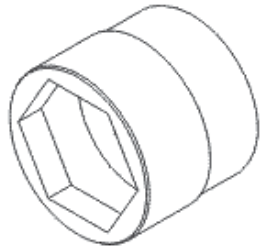
37 35 27 Removing and refitting transmission - as of MY 2003

- Preliminary work
- Removing transmission
- Refitting transmission
- Subsequent work

Tools

Designation	Type	Number	Explanation	
suspending device	special tool	2024 A		
counterer	special tool	3435		
fixing pin	special tool	9595		

				15, 32  9595 000 721 959 50
insert	special tool	9687		32  9687 000 721 968 70
Insert bit	special tool	9688		32  9688 000 721 968 80
centring pin	special tool	9689		
socket wrench insert	special tool	9714		

				03  9714 000 721 971 40

Preliminary work

Preliminary work for removing the transmission



Note

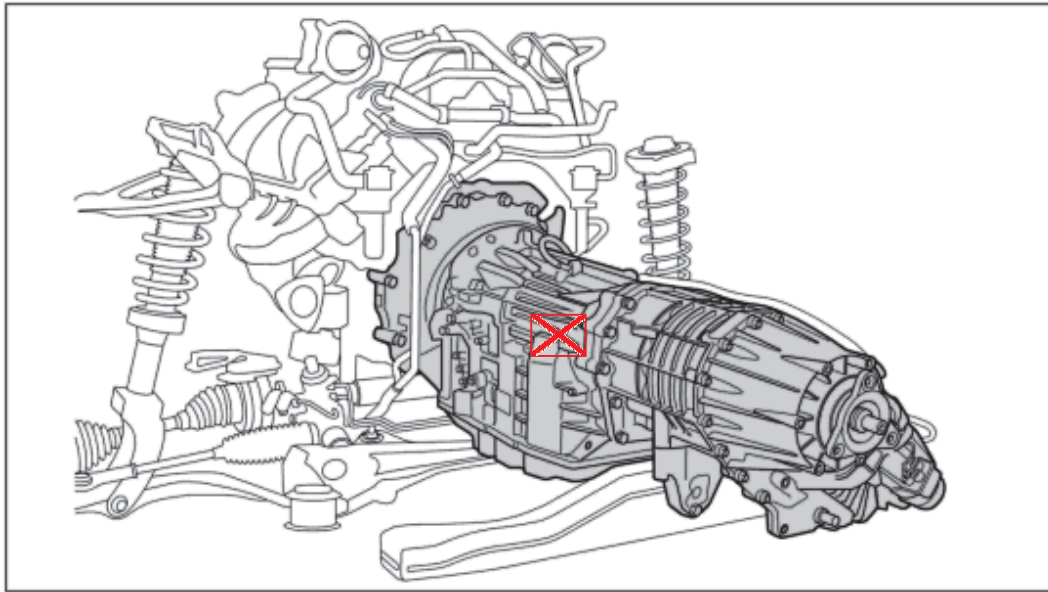
- *The adaptation values must be reset using the Porsche System Tester when the transmission is renewed/replaced. → 373019 Removing and installing Tiptronic control unit - chapter on "removing"*

1. Unscrew two screws on the underside of the converter bell housing in the installed transmission.

Removing transmission

Removing transmission

Installation Location:



Overview of removing/refitting the transmission



Note

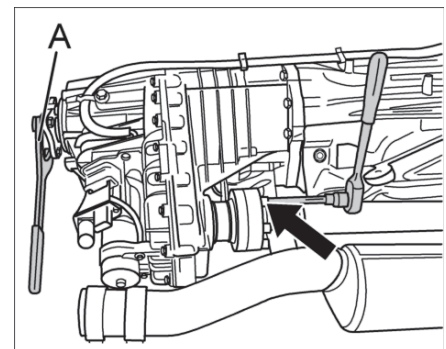
- Shift lever on the transmission is in position P. Move lever up fully.



Note

- A second fitter is required!

1. Unscrew cardan shaft bolts **-Arrow-** to the transfer box. Counter with special **counterer 3435** on triangular flange **-A-**.



Front cardan shaft to transfer box

2. Remove shield fastening screws on the right of the transmission.



WARNING

Danger of scalding and chemical burns from hot ATF

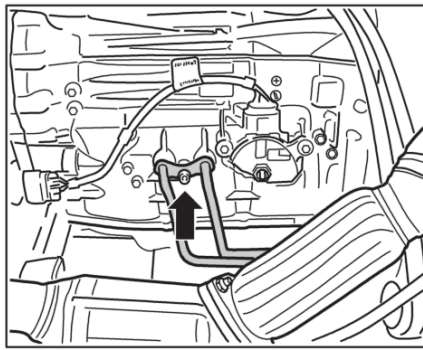
- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)



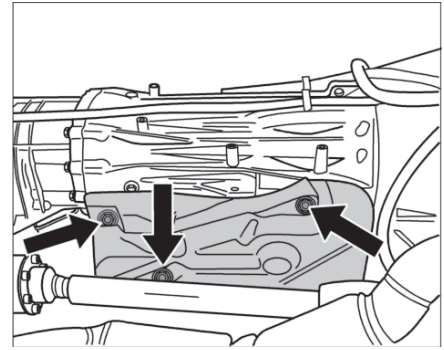
Note

- The line connections on the transmission and the ends of the ATF lines should be closed off after the lines have been separated from the transmission!

3. Disconnect ATF lines from the transmission. To do this, unscrew screw **-Arrow-** and remove lines.

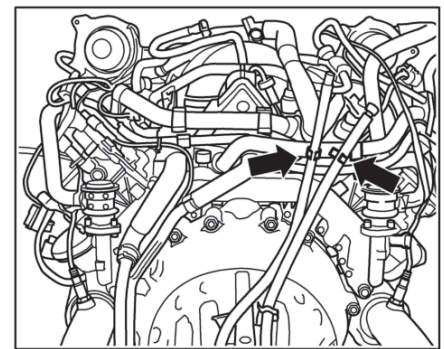


ATF line to transmission



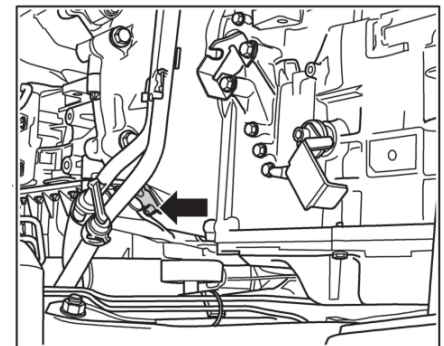
Right shield

4. Release bleeder lines from the retainers **-Arrow-** on the engine.
5. Remove catalytic converter on left side. → 267619 Removing and installing starting catalytic converter - chapter on "Removing" [9PAAE1] → 267619 Removing and installing starting catalytic converter - chapter on "Removing" [9PAAF1 9PAAJ1]



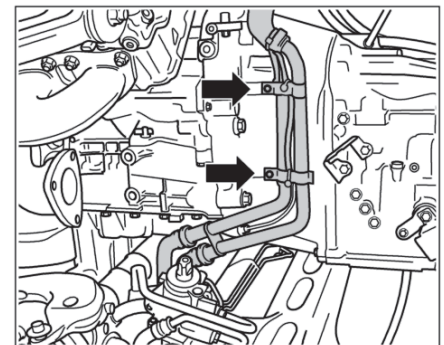
Vent lines

6. Remove reference mark sender on the converter bell housing **-Arrow-**.

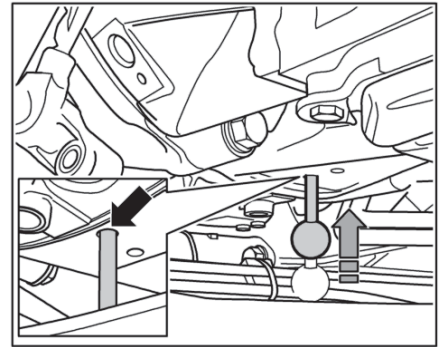


Reference mark sender

7. Unscrew two coolant pipe screws on converter bell housing **-Arrow-**.
8. Remove converter bolts:
9. Turn crankshaft clockwise with special tool **socket wrench insert 9714**.

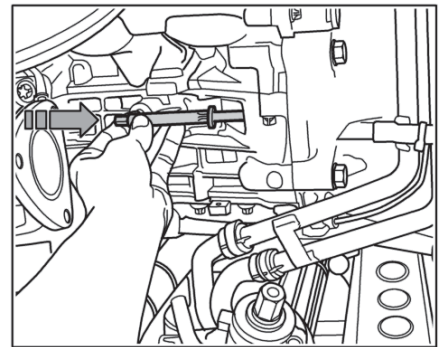


Coolant pipes to converter bell housing



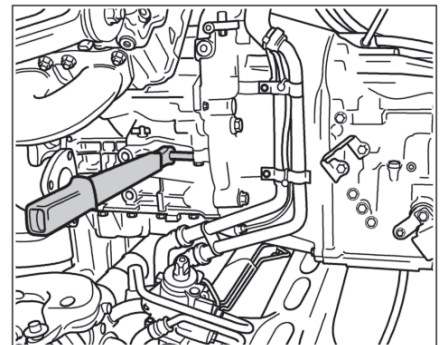
Disconnecting converter screws

10. Insert special tool **fixing pin 9595** into the front bore on the converter bell housing **-Arrow-** and hold upwards with light pressure until it engages when the crankshaft is turned.
11. Insert special tool **Insert bit 9688** through opening in the engine block on converter screw. Connect special tool **insert 9687**.



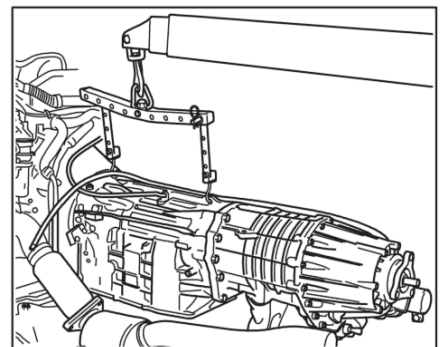
Opening for converter screws

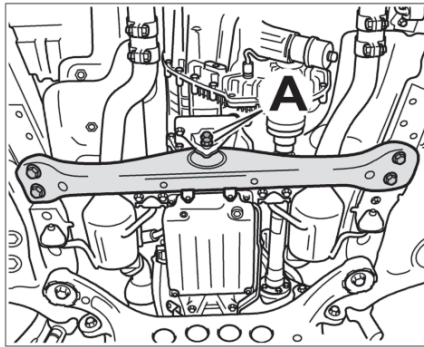
12. Unscrew converter screw and twist out.
13. Complete the steps described above for the other five screws.



Fastening converter screws

14. Attach transmission with holder **suspending device 2024 A** on workshop crane.

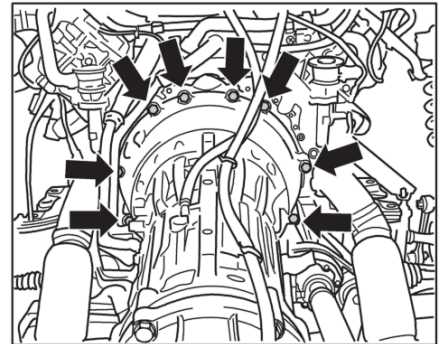




Transmission to workshop crane

Transmission cross member

15. Raise transmission a few centimetres and notch transmission cross member B **-A-** .
16. Unscrew engine transmission flange screws **-Arrows-** and two screws on the underside.

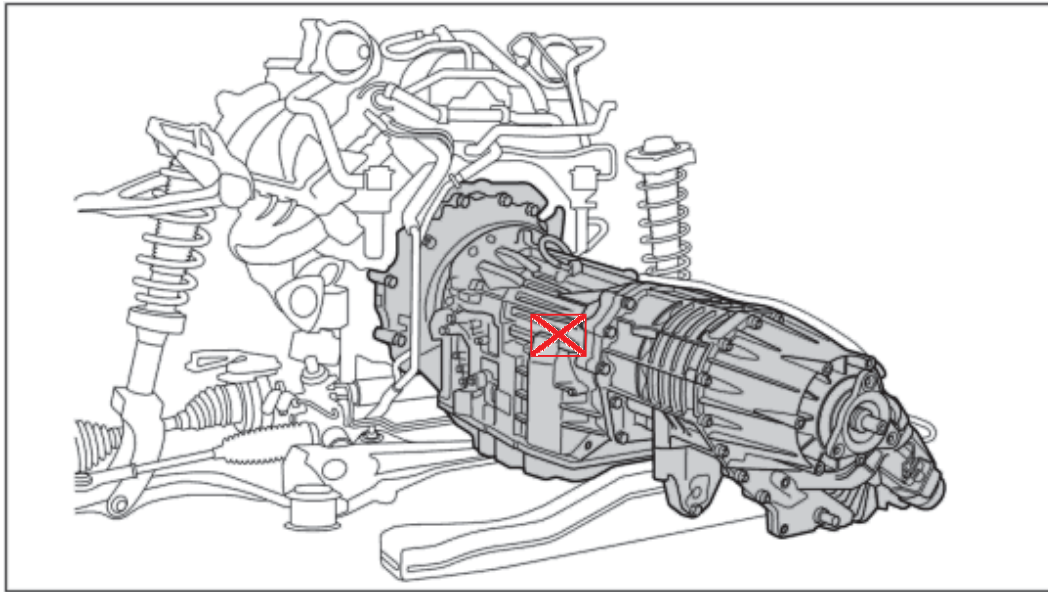


Fastening screws for securing transmission to engine

Refitting transmission

Refitting transmission

Installation Location:



Overview of removing/refitting the transmission



WARNING

Danger of scalding and chemical burns from hot ATF

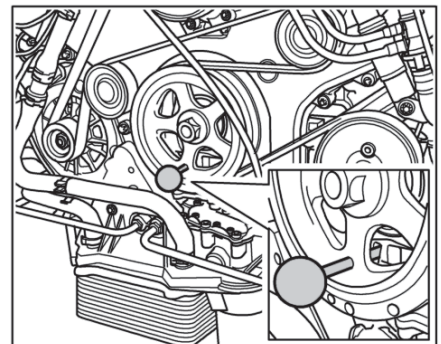
- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)



Note

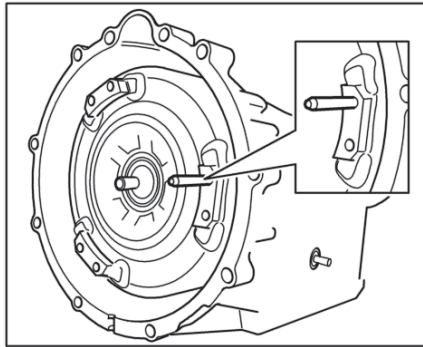
- Since locking is not possible after removal, the cardan shaft can only be tightened to the specified torque after the engine has been installed.
- Screws which are tightened with a torque angle must be replaced with new ones.

1. Fix engine to the crankshaft with special tool **fixing pin 9595**.

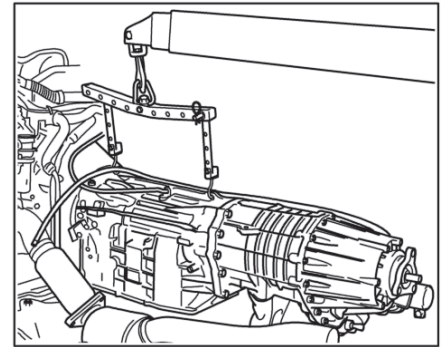


Disconnecting the crankshaft

2. Attach transmission with holder **suspending device 2024 A** on workshop crane.



Torque converter centring pin



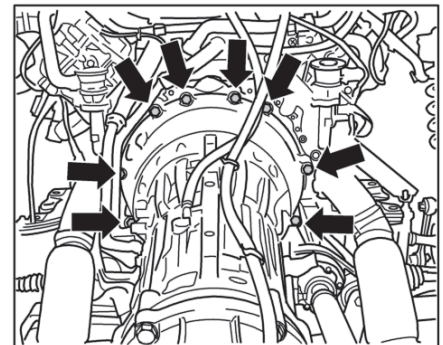
Transmission to workshop crane

3. Insert special tool **centring pin 9689** in converter.
4. Fit the transmission onto the engine.
5. Screw in engine transmission flange screws **-Arrows-** . → **Tightening torque: 59 ftlb.**



Note

- *Screws which are tightened with a torque angle must be replaced with new ones.*



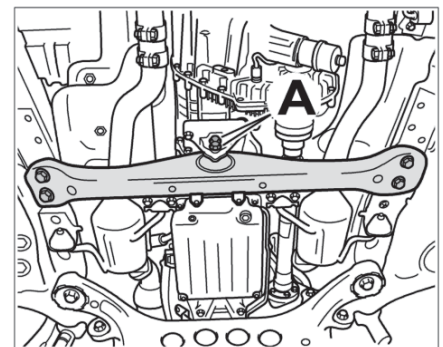
Transmission to engine screw connection

6. Raise transmission a few centimeters and install transmission cross member on holder **-A-** . → **Initial tightening: 37 ftlb. → Final tightening: 90 Winkel-Grad**
7. Disassemble workshop crane and holder **suspending device 2024 A**.
8. Remove special tool **centring pin 9689** through opening in the engine block.



Note

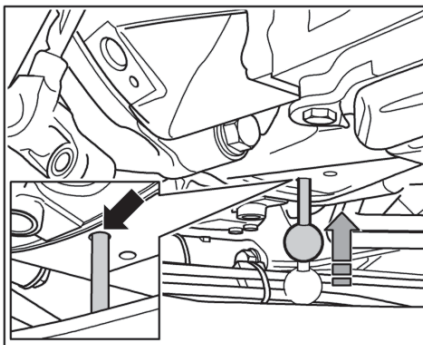
- *A second fitter is required.*
- *Replace converter screws.*



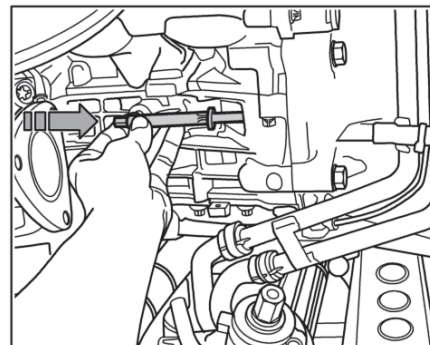
Transmission cross member

9. Screw in new converter screws:
10. Place screw on special tool **insert bit 9688** and screw in screw.
11. Position bit snap-on head and special tool **insert 9687** and screw in screw, but do not tighten.
12. Turn crankshaft clockwise with special tool **socket wrench insert 9714**.

13. Insert special tool **fixing pin 9595** into the front bore on the converter bell housing **-Arrow-** and hold with light pressure until it engages when the crankshaft is turned. This sets the position for the next screw.



14. Complete the steps described above for the other five screws.

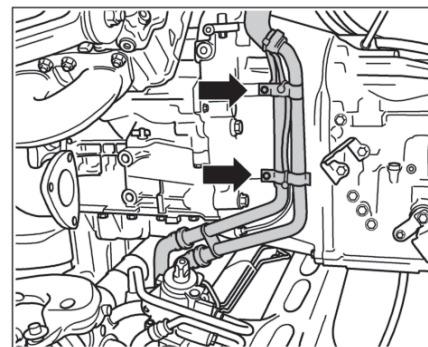


15. Remove special tool **fixing pin 9595** before tightening the converter screws to the specified torque. → **Tightening torque: 63 ftlb.**

Disconnecting converter screws

Opening for converter screw on engine

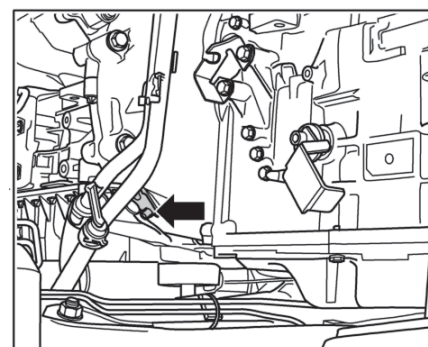
16. Fasten coolant pipe on the converter bell housing **-Arrow-**. → **Tightening torque: 6.5 ftlb.**



Coolant pipes to converter bell housing

17. Install reference mark sender on the converter bell housing **-Arrow-**. → **Tightening torque: 7.5 ftlb.**

18. Install catalytic converters on left side. → 267619 Removing and installing primary catalytic converter - Cayenne Turbo - chapter on "Installing" [9PAAE1] → 267619 Removing and installing primary catalytic converter - Cayenne Turbo - chapter on "Installing" [9PAAF1 9PAAJ1] → 267619 Removing and installing primary catalytic converter - chapter on "Installing" [9PAAE1] → 267619 Removing and installing primary catalytic converter - chapter on "Installing" [9PAAF1 9PAAJ1]



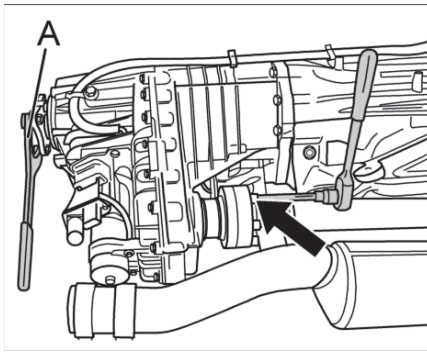
Reference mark sender

19. Press bleeder lines in the retainers **-Arrow-** on the engine.

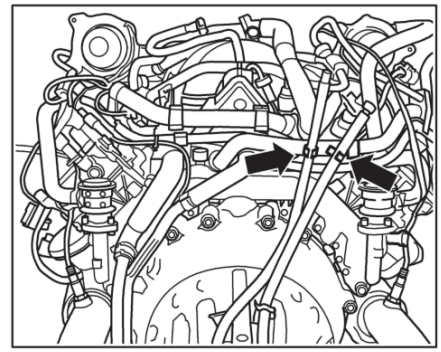
20. Tighten the fastening screws in cardan shaft **-Arrow-** to the transfer box.

21. Fasten ATF lines with new sealing rings on the transmission. → **Tightening torque: 19 ftlb.**

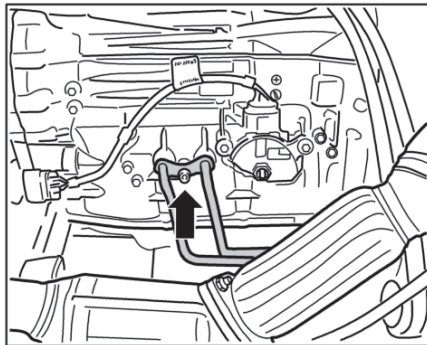
Subsequent work



Front cardan shaft to transfer box



Bleeder lines to engine holder



ATF line to transmission

Reworking for refitting



Note

- The adaptation values must be reset using the Porsche System Tester when the transmission is renewed/replaced. → 373019 Removing and installing Tiptronic control unit - chapter on "removing"

1. Install engine → 100123 Installing M48/00 engine
2. Screw in two screws on the underside of the converter bell housing in the installed transmission.
3. Screw in front cardan shaft bolts. → **Initial tightening: 22 ftlb.** → **Final tightening: 90 Winkel-Grad**
4. Check and if necessary, top up the ATF. → 370235 Checking and topping up ATF - chapter on "refilling"

9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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37 35 TW Technical data on 6-speed Tiptronic transmission - as of MY 2003

- [Technical values](#)

Technical values

Technical data



Note

- *In order to protect the converter components against excessive centrifugal forces when idle, the engine speed in the selector lever positions P and N is limited to 4,000 rpm.*

TypeA 48.00 / A 48.50 / A 48.20

Equipment6-speed / 6-speed / 6-speed

Installed inCayenne S / Cayenne Turbo / Cayenne

Model year2003 / 2003 / 2004

DesignFully automatic 6-speed planetary gear set

Transmission ratios

1st gear4.148

2nd gear2.370

3rd gear1.556

4th gear1.155

5th gear0.859

6th gear0.686

Reverse gear3.394

Filling capacities A 48.00



Note

- *Modified ATF filling capacities in the transmission in combination with new control units.*
- *Observe → " Technische Information 01/04 Gruppe 3" and numbers on transmission and control unit.*

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Automatic transmission	New filling for transmission	Filling capacity	9 litre		
Automatic transmission	Change quantity	Filling capacity	8.5 litre		

Filling capacities A 48.00



Note

- *Modified ATF filling capacities in the transmission in combination with new control units.*
- *Observe → " Technische Information 01/04 Gruppe 3" and numbers on transmission and control unit.*

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Automatic transmission	New filling for transmission	Filling capacity	10.1 litre		
Automatic transmission	Change quantity	Filling capacity	9.6 litre		

9PAAE1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
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→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

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- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

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→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

37 55 19 Removing and installing ATF pan - as of MY 2003

- Preliminary work
- Removing ATF pan
- Installing ATF pan
- Subsequent work

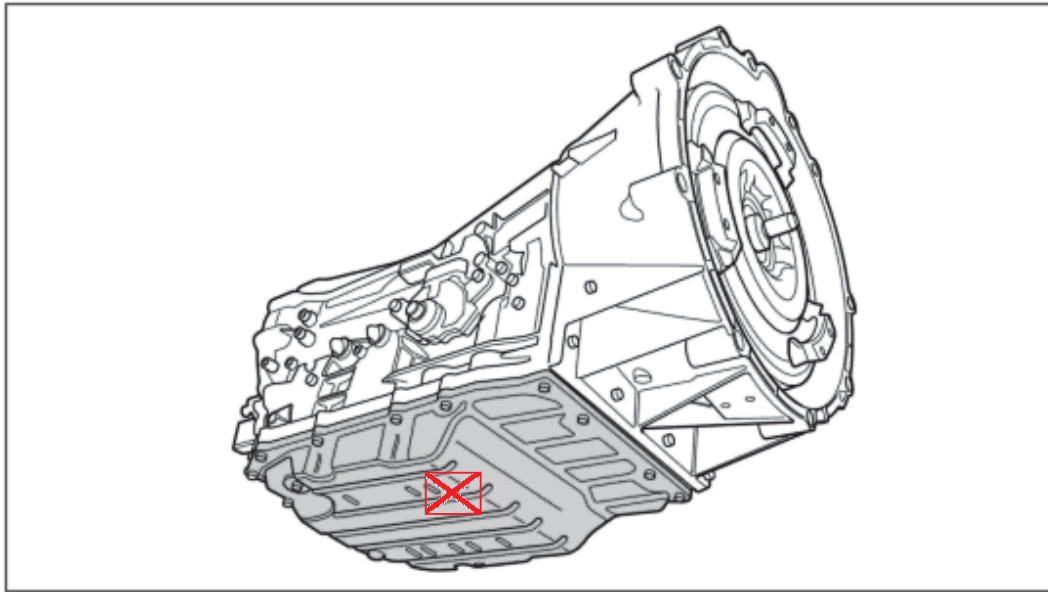
Preliminary work

Preliminary work for ATF pan

Removing ATF pan

Removing ATF pan

Installation Location:



Overview of ATF pan

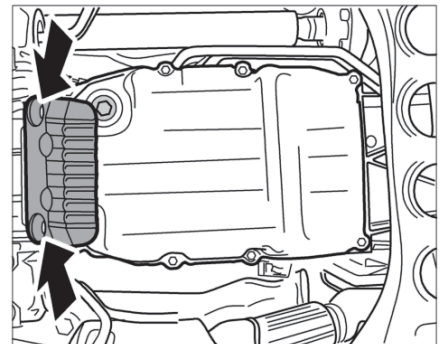


WARNING

Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)

1. Remove cover of ATF pan. To do this, loosen the two fastening screws **-arrows-**.

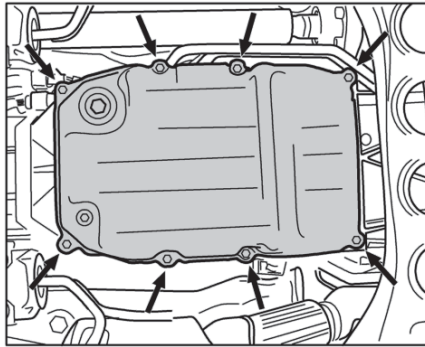


Shield to transmission

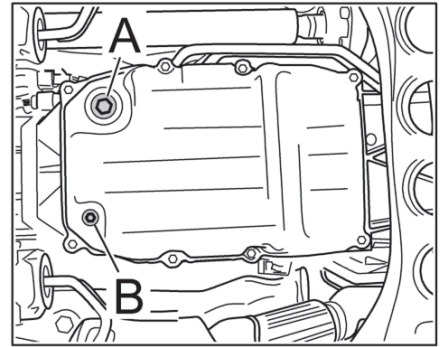
2. Place collection pan under the transmission. Unscrew oil drain plug **-B-** and drain ATF.
3. Screw in oil drain plug **-B-** with new sealing ring. → **Tightening torque: 21 ftlb.**
4. Unscrew screws **-arrows-** on the ATF pan and remove pan.

Installing ATF pan

Installing ATF pan

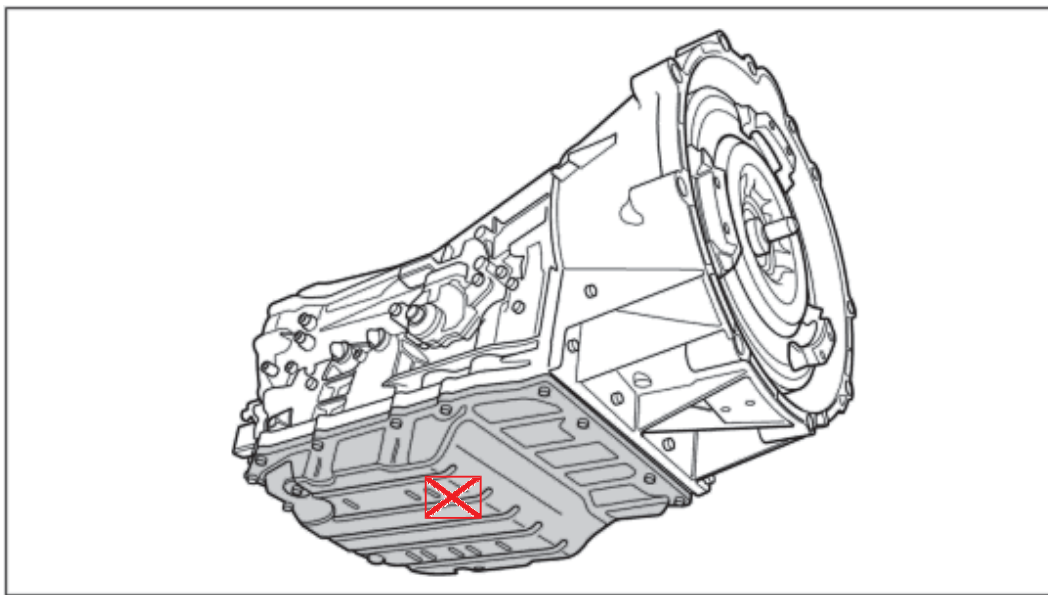


ATF pan



Check screw and oil drain plug

Installation Location:

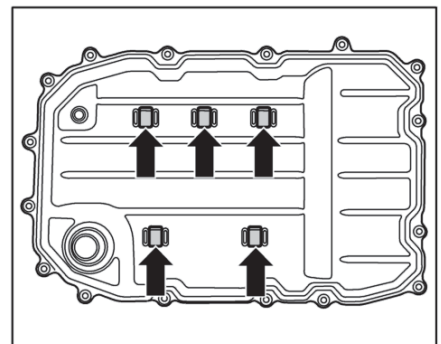


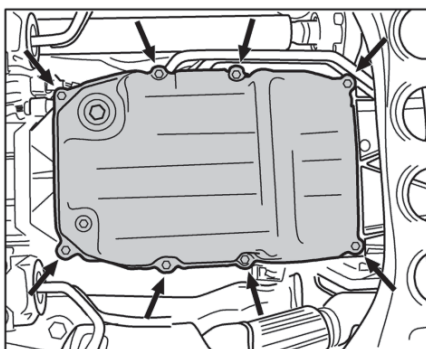
Overview of ATF pan



Note

- Make sure that the gasket has been positioned correctly on the bulb of the oil pan edge.
1. Place new gasket on the ATF pan.
 2. Check position of the magnets -arrows- in the oil pan.





Magnets in the ATF pan

ATF pan

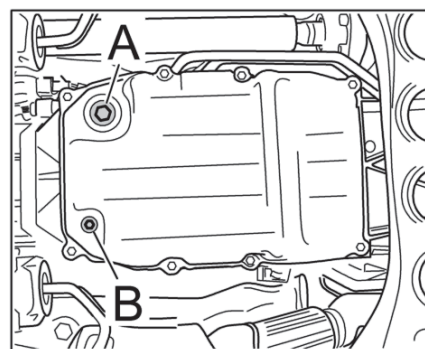
3. Position ATF pan and screw in screws **-arrows-** . → **Tightening torque: 4.5 ftlb.**



WARNING

Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
 - Wear personal protective gear (goggles, gloves)
4. Unscrew oil inspection plug **-A-** and fill ATF until constant emission is visible.
 5. Screw in oil inspection plug again **-A-** with new sealing ring. → **Tightening torque: 52 ftlb.**



Oil inspection plug and oil drain plug

Subsequent work

Reworking ATF pan



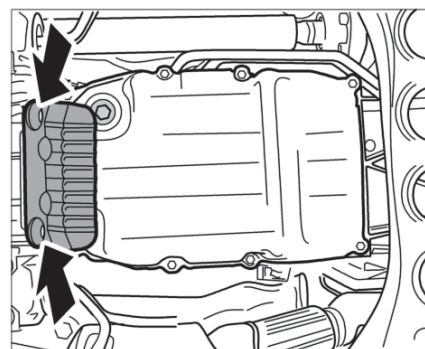
Note

- *Modified ATF filling capacities in the transmission in combination with new control units.*
 - *Observe → " Technische Information 01/04 Gruppe 3" and numbers on transmission and control unit.*
1. Check and if necessary, top up the ATF. → 370235 Checking and topping up the ATF
 2. Install shield on ATF pan. To do this, tighten the two fastening screws **-arrows-** . → **Tightening torque: 7.5 ftlb.**
 3. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15,
C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32,
C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



Shield to transmission



WARNUNG

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37 58 19 Removing and installing ATF filter - as of MY 2003

- Preliminary work
- Removing ATF filter
- Installing ATF filter
- Subsequent work

Preliminary work

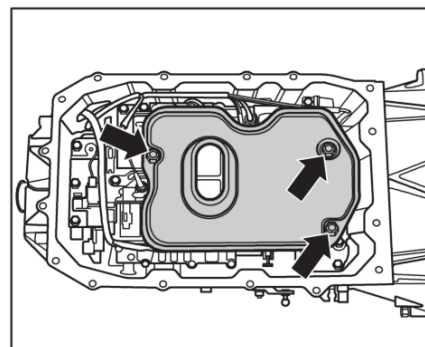
Preliminary work for ATF filter

1. Remove ATF pan. → 375519 Removing and installing ATF pan - "Removing" chapter

Removing ATF filter

Removing ATF filter

1. Unscrew three screws **-arrows-** on the ATF filter and remove filter.



Fastening of ATF filter

Installing ATF filter

Installing ATF filter



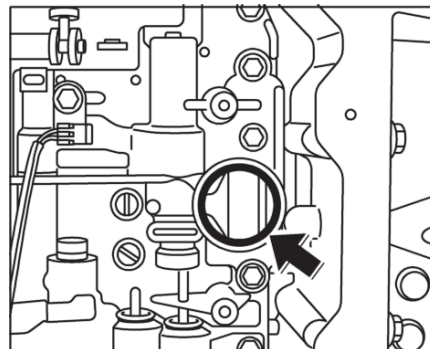
ATTENTION

Leaks between ATF filter and hydraulic control unit

- Sealing ring of ATF filter is being pinched.

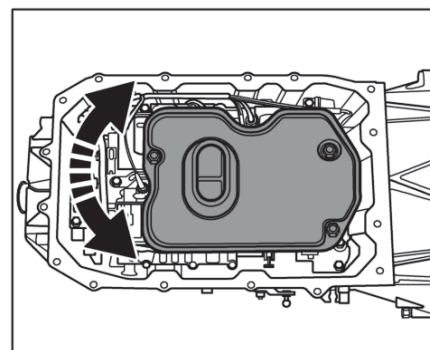
→ Turn slightly when installing the filter.

1. Coat new sealing ring **-arrow-** with ATF and insert in the hydraulic control unit.



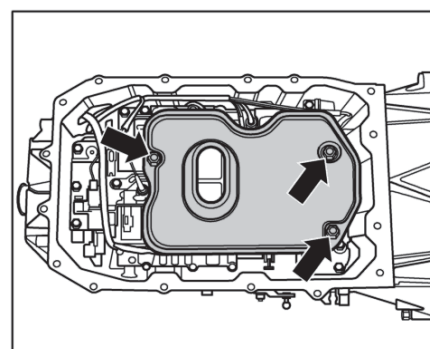
Inserting the sealing ring for ATF filter

2. Position ATF filter using a turning motion **-arrow movement-**.



Installing ATF filter

3. Position ATF filter and screw in screws **-arrows-**. → **Tightening torque: 7.5 ftlb.**



Fastening of ATF filter

Subsequent work

Reworking ATF filter

1. Install ATF pan. → 375519 Removing and installing ATF pan - installing
-

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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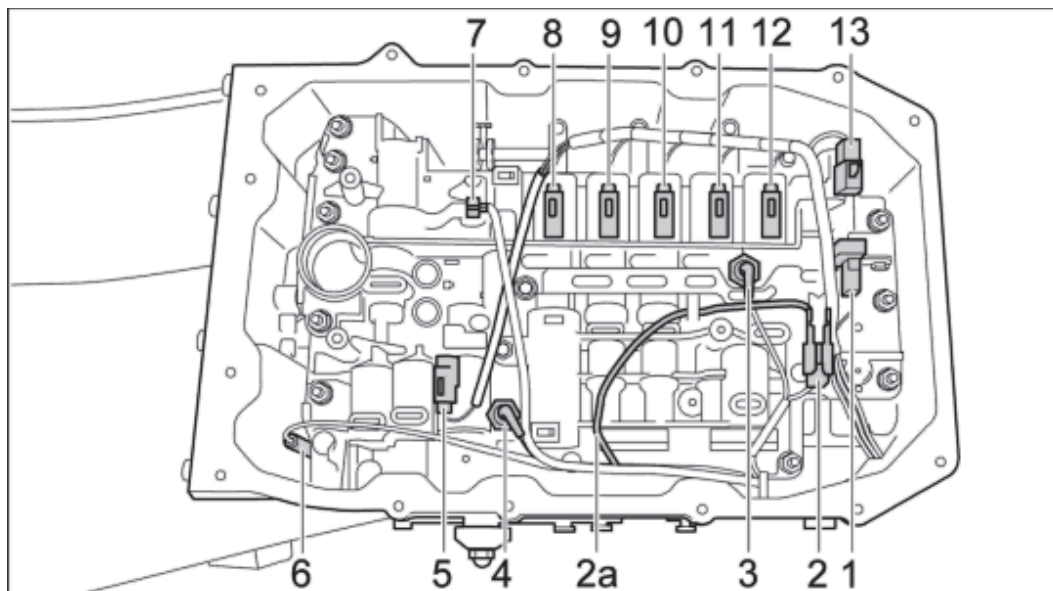
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38 18 19 Removing and installing wire harness in transmission - as of MY 2003

- [Information about wire harness](#)
- [Preliminary work for wire harness](#)
- [Removing wire harness in transmission](#)
- [Installing wire harness in transmission](#)
- [Subsequent work](#)

Information about wire harness

Information about wiring harness



Overview of wiring harness

- 1- - Shift solenoid valve (S1)
- 2- - Plug connection for output shaft speed inductive pickup
- 2a- - Cable routing for output shaft speed inductive pickup

- 3- - Oil pressure switch 2 for transmission (omit in MY 2006)
- 4- - Oil pressure switch 1 for transmission (omit in MY 2006)
- 5- - Shift solenoid valve UK (modulation pressure)
- 6- - Input shaft speed (turbine speed) inductive pickup
- 7- - ATF temperature sensor
- 8- - Modulation pressure solenoid valve (main)
- 9- - Shift solenoid valve C1 (modulation pressure)
- 10- - Shift solenoid valve C3 (modulation pressure)
- 11- - Shift solenoid valve B1 (modulation pressure)
- 12- - Shift solenoid valve C2 (modulation pressure)
- 13- - Shift solenoid valve (S2)

Preliminary work for wire harness

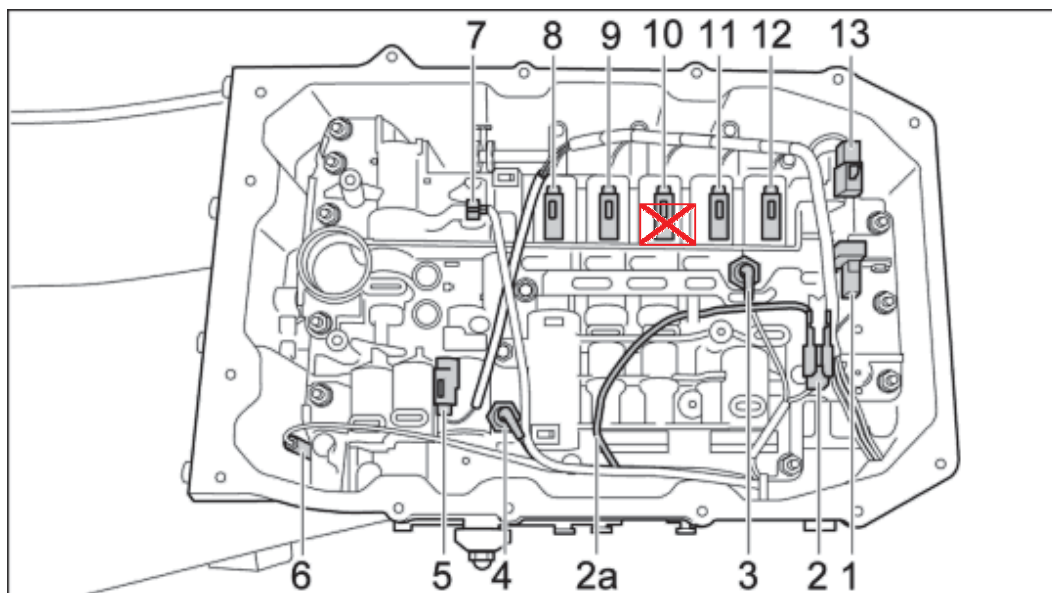
Preliminary work for wiring harness

1. Remove ATF filter. → 375819 Removing and installing ATF filter - chapter on "Removing"

Removing wire harness in transmission

Removing wire harness in transmission

Installation Location:



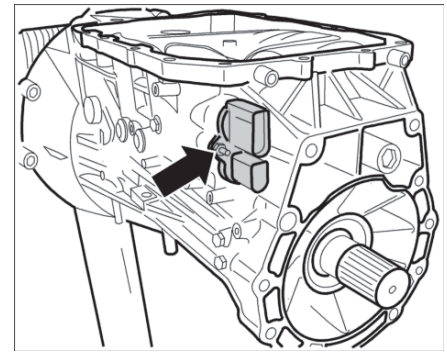
Overview of wire harness



Note

- The adaptation values of the Tiptronic control unit must be reset using the Porsche System Tester when replacing/renewing the wire harness. → 373019 Removing and installing Tiptronic control unit

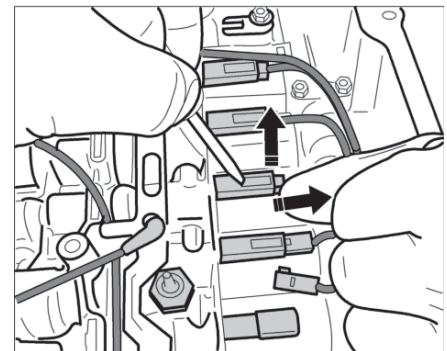
1. Remove fastening screw from both connectors **-Arrow-** .



Connector installation

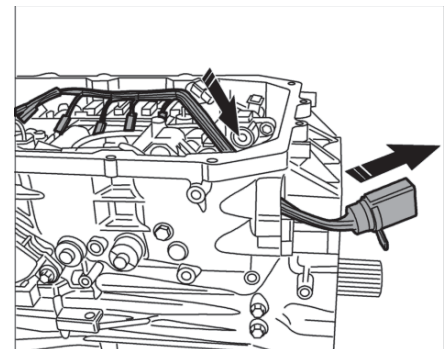
2. Pull off connectors **-Arrows-** on the solenoid valves **-8-12-** .

3. Pull off cable plugs **-1,5,13-** .



Solenoid valves

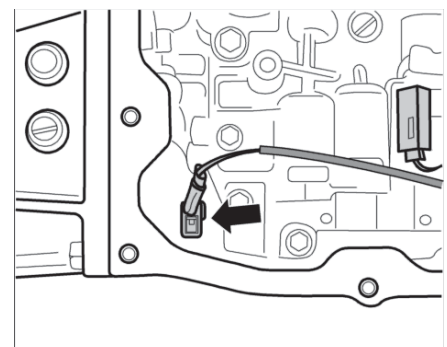
4. Remove wire harness for solenoid valves through opening in the housing **-Arrow-** .



Removing wire harness

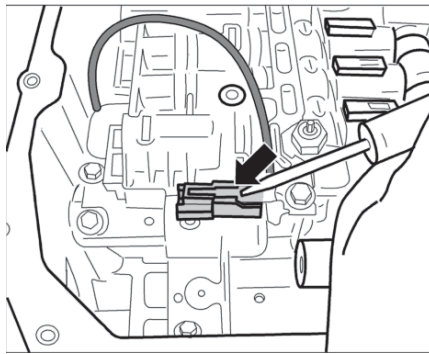
5. Pull off plug **-Arrow-** for input shaft inductive pickup **-6-** .

6. Pull off cable plugs from the oil pressure switches **-4,3-** .

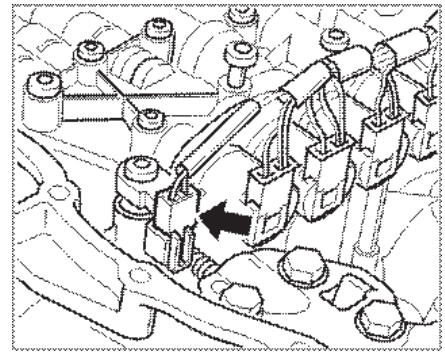


Cable plug for input shaft inductive pickup

7. Unscrew fastening screw **-Arrow-** for ATF temperature sensor **-7-** and remove sensor.

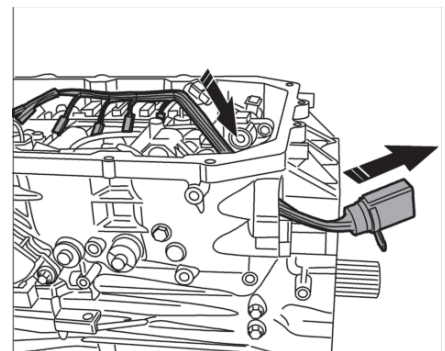


Cable plug for output shaft inductive pickup



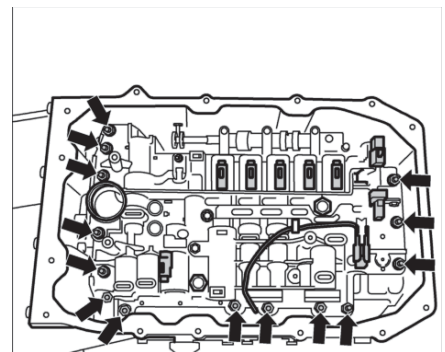
ATF temperature sensor

8. Pull off cable plug **-2-** for output shaft speed inductive pickup **-Arrow-** .
9. Remove wire harness for sensors through opening in the housing **-Arrow-** .



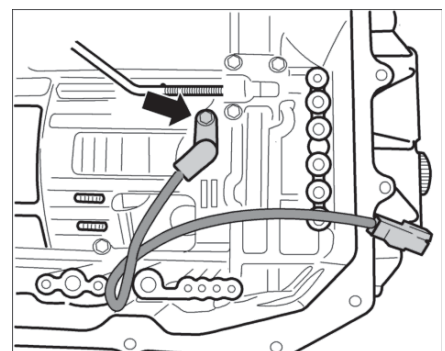
Removing wire harness

10. Remove electrohydraulic control unit. To do this, unscrew fastening screws **-Arrows-** and take out the control unit.



Fastening screws for control unit

11. Remove output shaft speed inductive pickup. To do this, unscrew fastening screw **-Arrow-** .

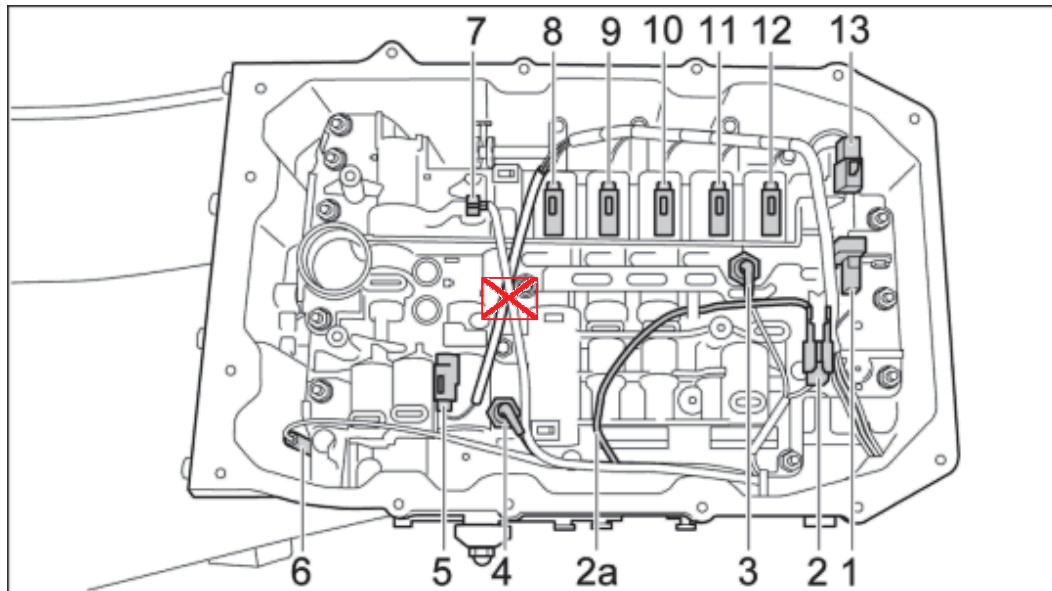


Output shaft inductive pickup

Installing wire harness in transmission

Installing wiring harness in transmission

Installation Location:

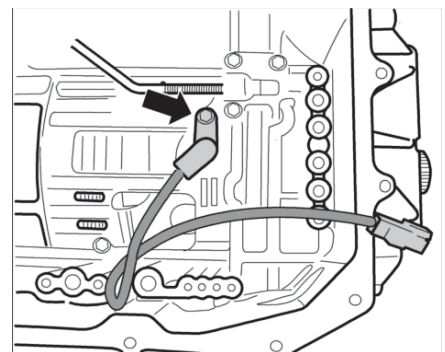


Overview of wiring harness



Note

- The adaptation values of the Tiptronic control unit must be reset using the Porsche System Tester when replacing/renewing the wire harness. → 373019 Removing and installing Tiptronic control unit
1. Install output shaft speed inductive pickup. To do this, screw in fastening screw **-arrow-**. → **Tightening torque: 7.5 ftlb.**

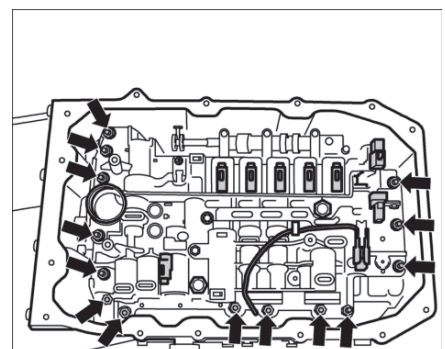


Output shaft inductive pickup



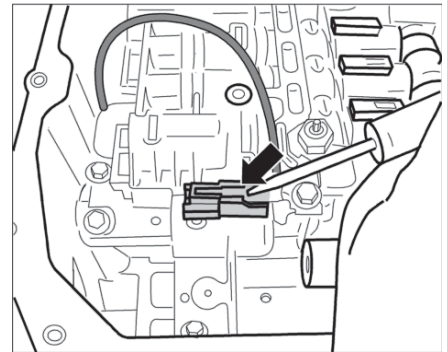
Note

- Screws which are tightened with a torque angle must be replaced with new ones.
2. Install electrohydraulic control unit and screw in new fastening screws **-arrows-**. → **Initial tightening: 6 ftlb.** → **Final tightening: 90 Winkel-Grad**



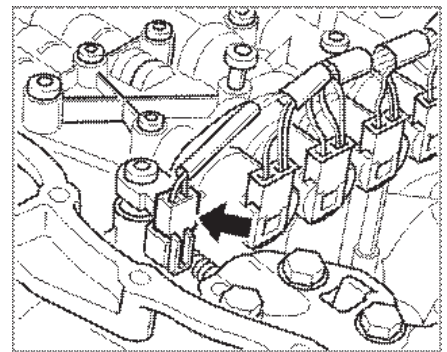
Fastening screws for control unit

3. Plug in cable plug **-2-** for output shaft speed inductive pickup. **-arrow-**
4. Install wire set for sensors through opening in the housing.



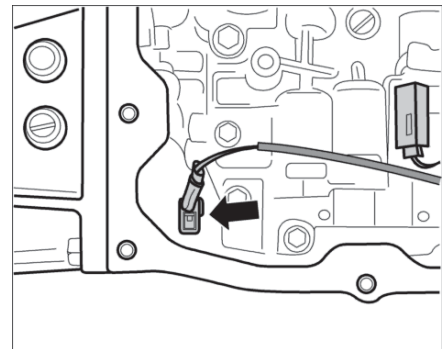
Cable plug for output shaft inductive pickup

5. Insert ATF temperature sensor **-7-** and screw in fastening screw **-arrow-** . → **Tightening torque: 7.5 ftlb.**



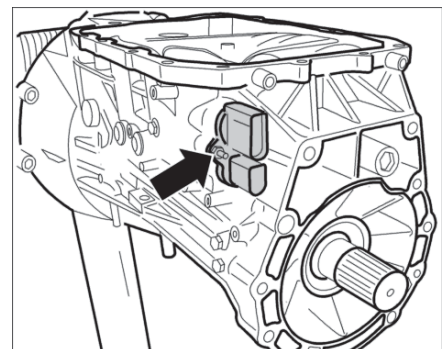
ATF temperature sensor

6. Plug in cable plug for oil pressure switch **-3,4-** and inductive pickup for input shaft **-6- -arrow-** .
7. Install wire set for solenoid valves through opening in the housing.
8. Push in the cable plug for the solenoid valves **-1,5,8-13-** .



Cable plug for input shaft inductive pickup

9. Screw in the fastening screw from both plugs **-arrow-** . → **Tightening torque: 7.5 ftlb.**

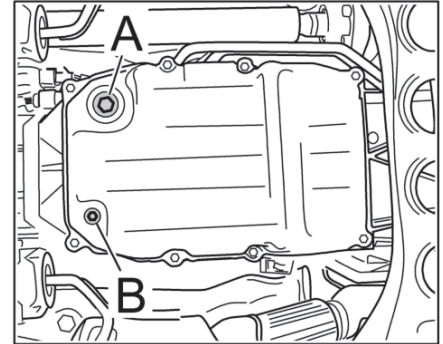


Plug installation

Subsequent work

Reworking wiring harness

1. Install ATF filter. → 375819 Removing and installing ATF filter - chapter on "Installing"
2. Unscrew ATF control screw **-A-** and fill in ATF until a constant discharge is visible at the lifting tube.
3. Screw in ATF control screw with a new sealing ring. → **Tightening torque: 52 ftlb.**
4. Check and if necessary, top up the ATF. → 370235 Checking and topping up the ATF



Oil inspection plug and oil drain plug

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

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ADVERTENCIA

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38 45 19 Removing and installing oil pressure switch - as of MY 2003

- Preliminary work for oil pressure switch
- Removing oil pressure switch
- Installing oil pressure switch
- Touching up the oil pressure switch

Preliminary work for oil pressure switch

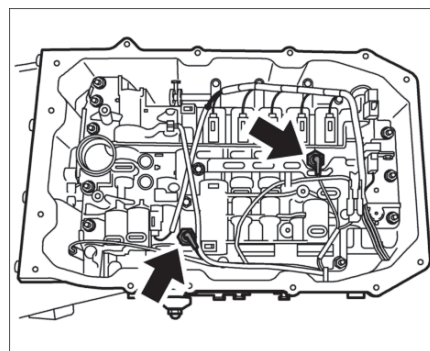
Preliminary work oil pressure switch

1. Remove ATF filter. → 375819 Removing and installing ATF filter - chapter on "Removing"

Removing oil pressure switch

Removing oil pressure switch

1. Pull off cable plugs from the two oil pressure switches.
2. Remove oil pressure switch.

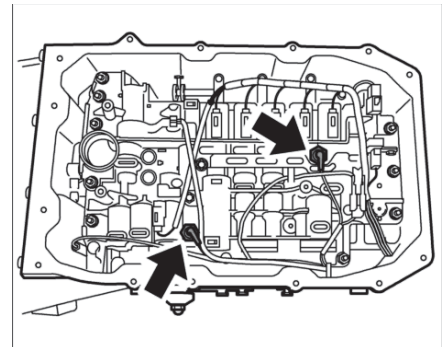


Oil pressure switch

Installing oil pressure switch

Installing oil pressure switch

1. Install oil pressure switch **-arrows-** . → **Tightening torque: 3.25 ftlb.**
2. Connect and engage cable plugs on the oil pressure switches.



Oil pressure switch

Touching up the oil pressure switch

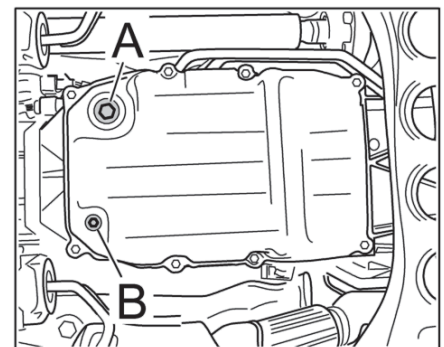
Reworking oil pressure switch

1. Install ATF filter. → 375819 Removing and installing ATF filter - chapter on "Installing"
2. Unscrew ATF control screw **-A-** and fill in ATF until a constant discharge is visible at the lifting tube.
3. Screw in ATF control screw **-A-** with new sealing ring. → **tightening torque: 51.8 ftlb.**



Note

- *Observe test conditions after opening cooler lines.*
4. Check and top up the ATF. → 370235 Check and top up the ATF - Chapter "Checking"



ATF inspection plug/drain plug

9PAAD1, 9PAAE1, 9PAAF1

as of MY 2003



WARNUNG

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38 60 19 Removing and installing ATF cooler - as of MY 2003

- Preliminary work
- Removing ATF cooler
- Installing ATF cooler
- Subsequent work

Preliminary work

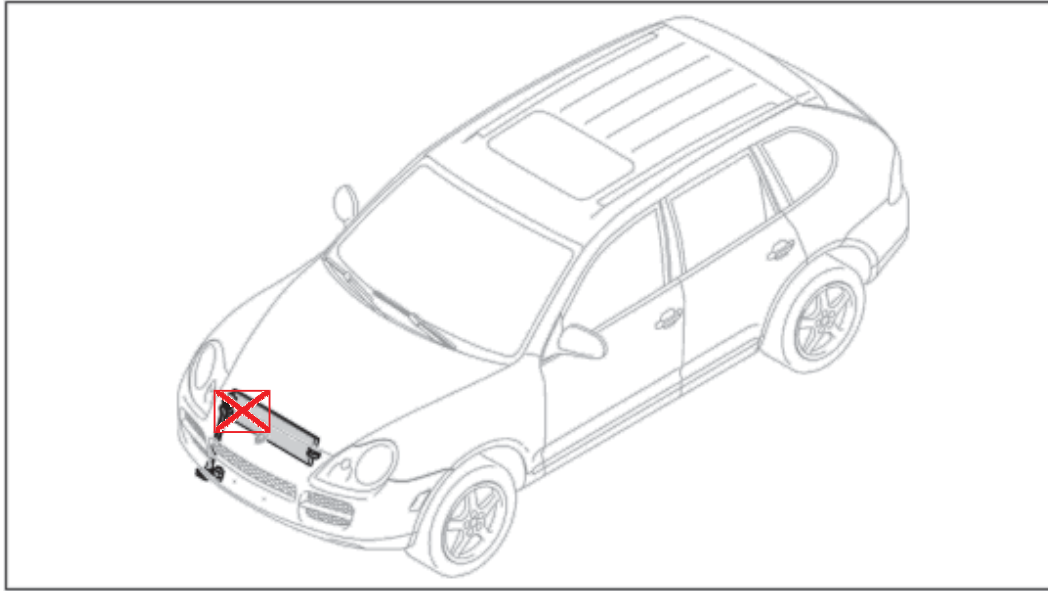
Preliminary work for ATF cooler

1. Remove lock mount. → 503819 Removing and installing lock mount - chapter on "Removing"

Removing ATF cooler

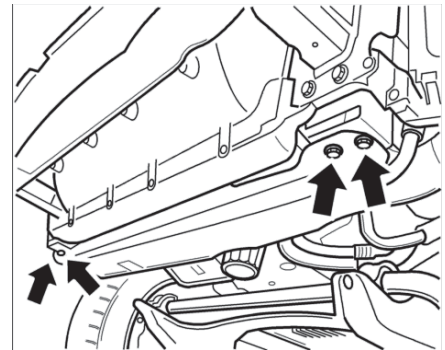
Removing ATF cooler

Installation Location:



Overview of ATF cooler

1. Remove the front transverse strut under the radiator. To do this, loosen the two fastening screws (M8 x 25) to the left and right.
2. Place oil collection pan under the ATF thermostat.



Transverse strut to body

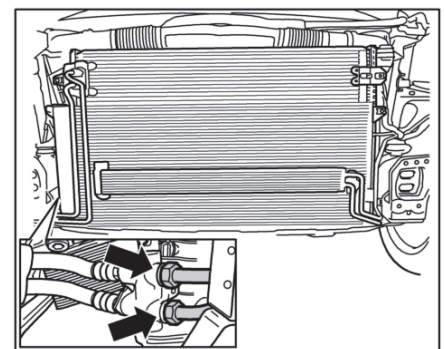


WARNING

Danger of scalding and chemical burns from hot ATF

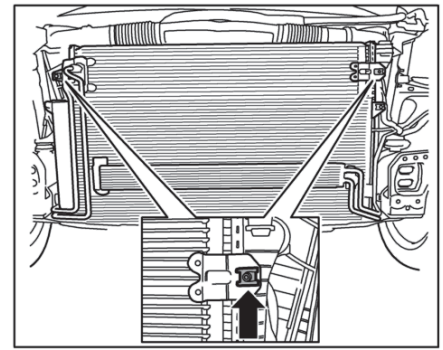
- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)

3. Unscrew nut on ATF line to thermostat **-arrow-** and drain ATF.
4. Close off line ends.
5. Remove retaining clip **-arrow-** on ATF cooler.
6. Remove ATF cooler.



ATF cooler

Installing ATF cooler



Retaining clip for ATF cooler

Installing ATF cooler

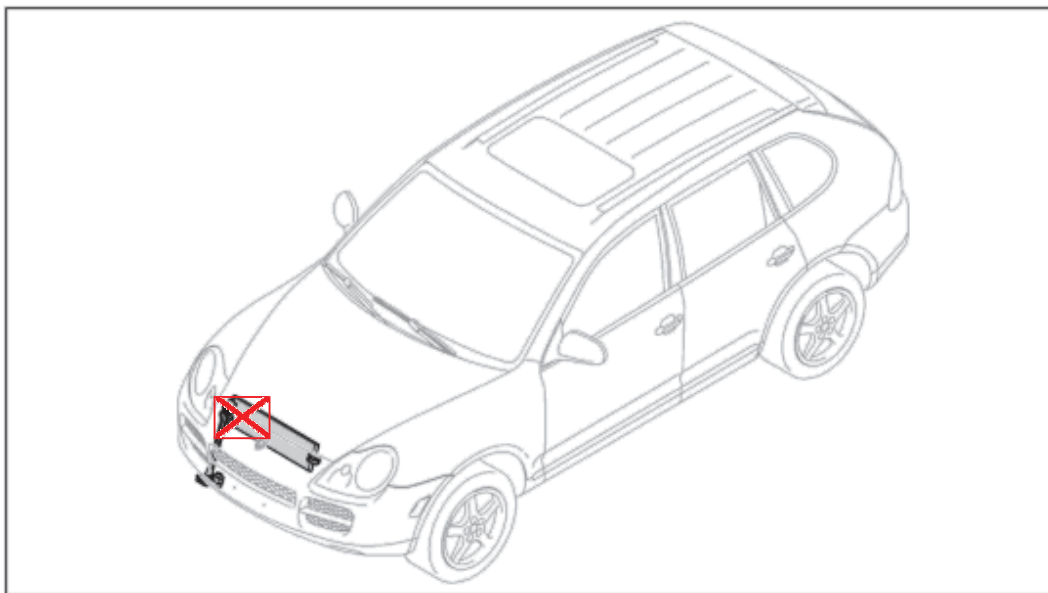


WARNING

Danger of scalding and chemical burns from hot ATF

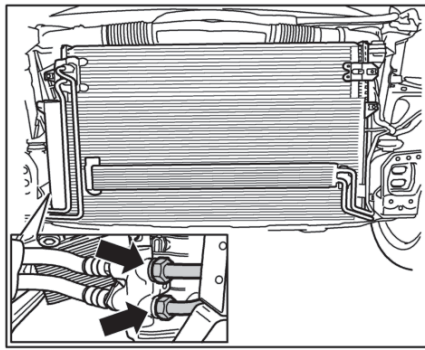
- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)

Installation Location:

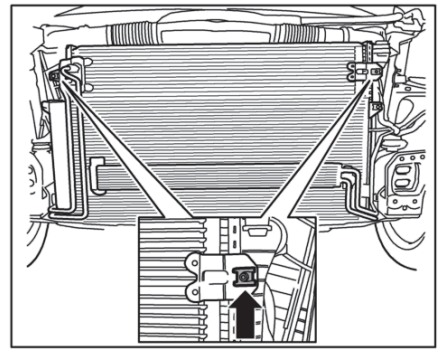


Overview of ATF cooler

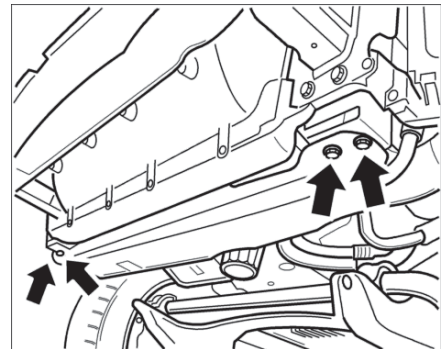
1. Position ATF cooler.
2. Install retaining clips **-arrow-** on ATF cooler.
3. Screw in ATF line nuts on thermostat **-arrow-** . → **Tightening torque: 22 ftlb.**
4. Install the front cross member under the radiators. To do this, tighten the four fastening screws. →



ATF cooler



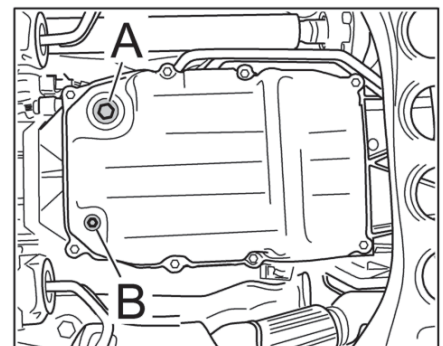
Retaining clip for ATF cooler



Transverse strut to body

Tightening torque: 17 ftlb.

5. Unscrew ATF control screw -A- and fill in ATF until a constant discharge is visible at the lifting tube.
6. Screw in ATF control screw with a new sealing ring. → **Tightening torque: 52 ftlb.**



Check screw and oil drain plug

Subsequent work

Reworking ATF cooler

1. Install lock mount. → 503819 Removing and installing lock mount - chapter on "Installing"
 2. Check and if necessary, top up the ATF. → 370235 Checking and topping up the ATF
 3. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"
-

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

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38 62 19 Removing and installing line for ATF cooling - as of MY 2003

- Preliminary work
- Removing line for ATF cooling
- Installing line for ATF cooling
- Subsequent work

Preliminary work

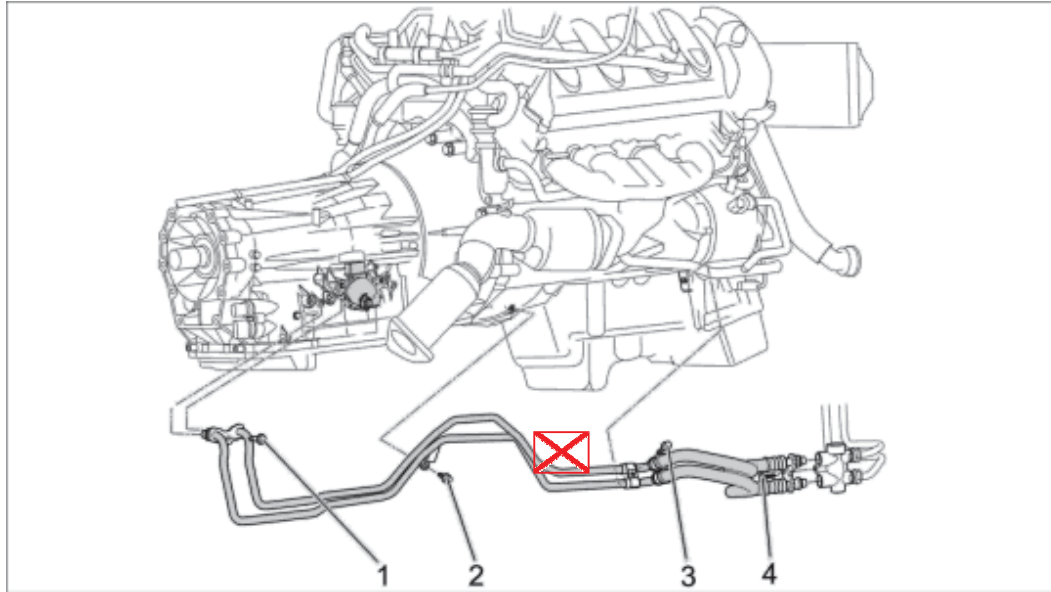
Preliminary work for line for ATF cooling

1. Remove front cardan shaft. → 390219 Removing and installing front cardan shaft - chapter on "Removing"

Removing line for ATF cooling

Removing line for ATF cooling

Installation Location:



Overview of ATF line

1. Place collecting pan underneath the vehicle.

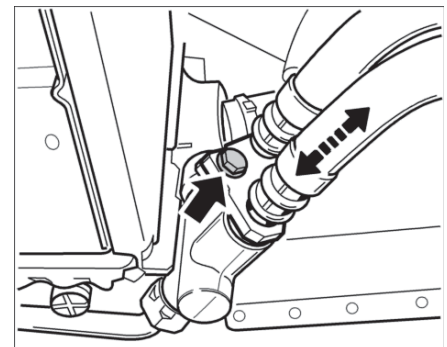


WARNING

Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)

2. Unscrew fastening screw **-arrow-** which fastens ATF line to the ATF thermostat and remove line.
3. Unscrew ATF line screw connection to engine oil pan and to transmission.



ATF line to ATF filter

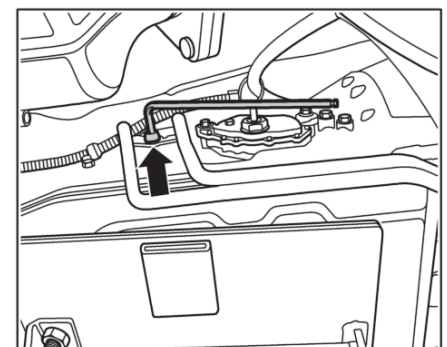


WARNING

Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)

4. Unscrew fastening screw securing ATF line to transmission **-arrow-** and remove lines.
5. Remove ATF line.

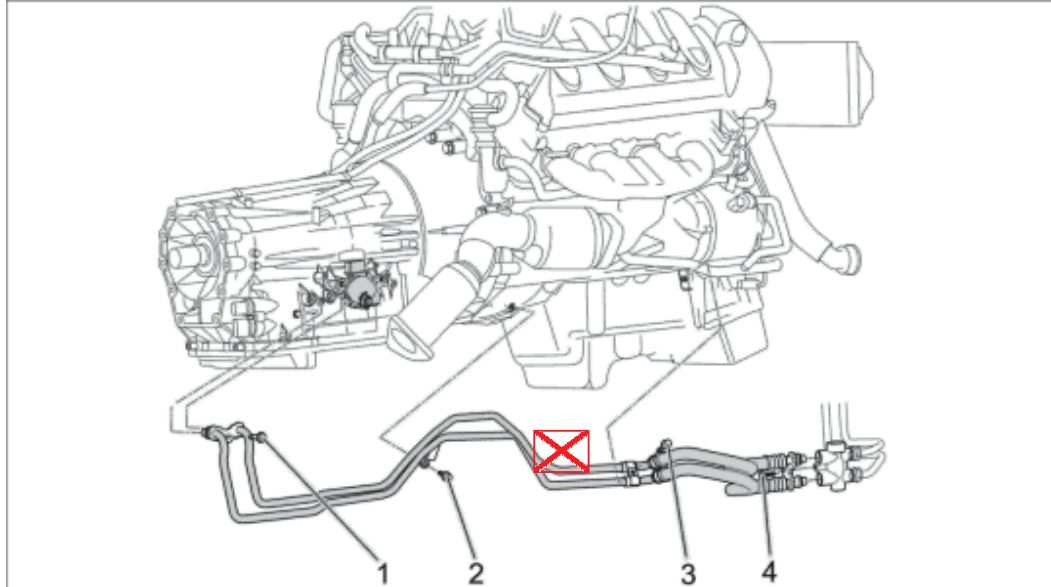


ATF line to transmission

Installing line for ATF cooling

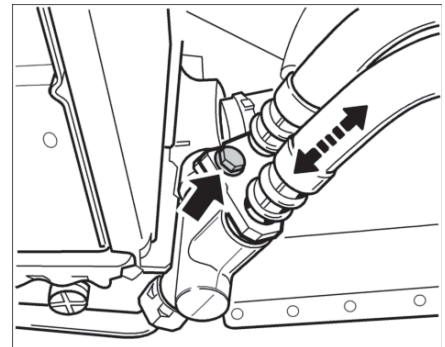
Installing line for ATF cooling

Installation Location:



Overview of ATF line

1. Install ATF line.
2. Screw in ATF line screw connection to engine oil pan → **Tightening torque: 7.5 ftlb.** and to transmission bell housing → **Tightening torque: 7.5 ftlb.** .
3. Screw in fastening screw **-arrow-** which fastens ATF line to ATF thermostat. → **Tightening torque: 7.5 ftlb.**



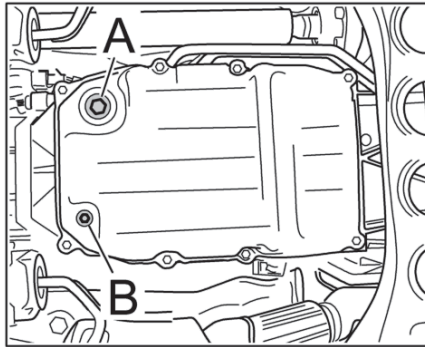
ATF line to ATF filter

4. Screw in fastening screw for securing ATF line to transmission **-arrow-** . → **Tightening torque: 19 ftlb.**
5. Unscrew ATF control screw **-A-** and fill in ATF until a constant discharge is visible at the lifting tube.
6. Screw in ATF control screw with a new sealing ring. → **Tightening torque: 52 ftlb.**

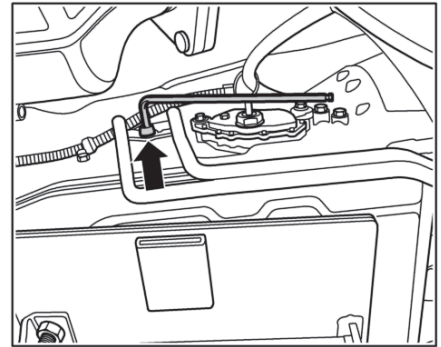
Subsequent work

Reworking for line for ATF cooling

1. Install engine carrier .
→ 103019 Removing and installing engine carrier - chapter on "Installing"
2. Install front cardan shaft.
→ 390219 Removing and installing front cardan shaft - chapter on "Installing"
3. Check and if necessary, top up the ATF. → 370235
Checking and topping up the ATF



Check screw and oil drain plug



ATF line to transmission

4. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

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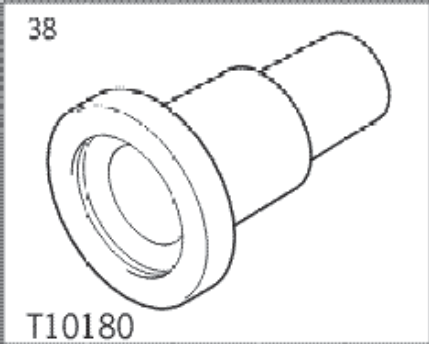
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38 70 19 Removing and installing sealing ring for output shaft - as of MY 2003

- Preliminary work
- Removing sealing ring for output shaft
- Installing sealing ring for output shaft
- Subsequent work

Tools

Designation	Type	Number	Explanation	
slide hammer kit	special tool	NR.168		
pressure piece	special tool	T10180		
protective sleeve	special tool	T10186		

Preliminary work

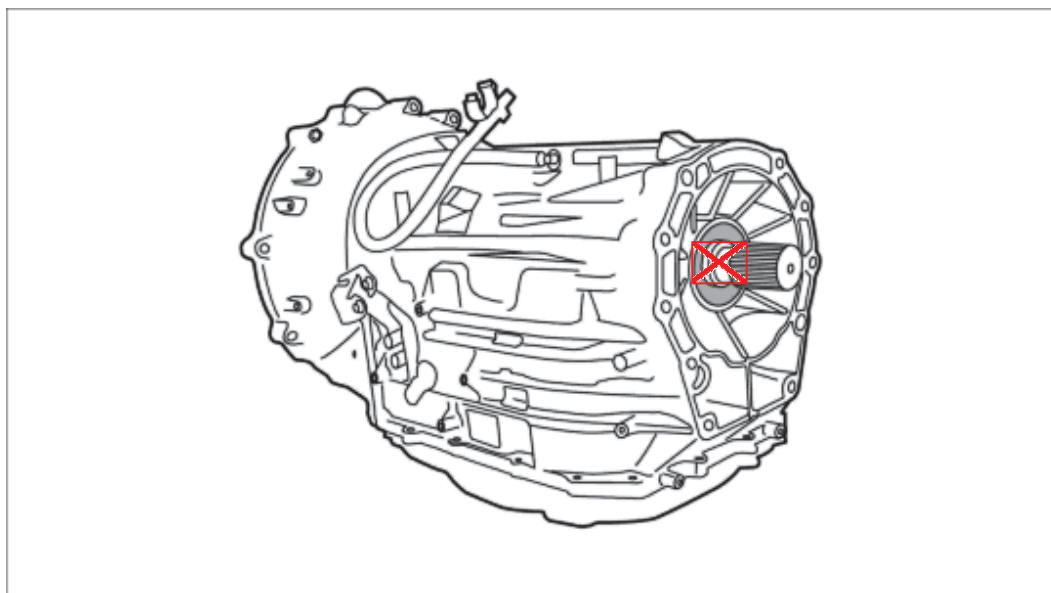
Preliminary work for sealing ring for output shaft

1. Remove transfer box. → 396519 Removing and installing transfer box - chapter on "Removing"

Removing sealing ring for output shaft

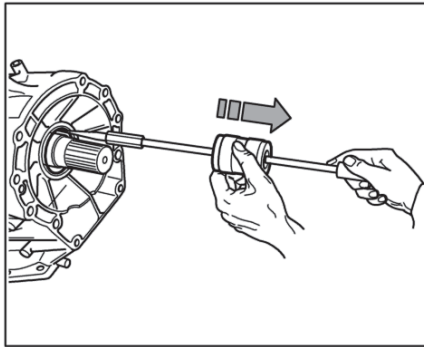
Removing sealing ring for output shaft

Installation Location:

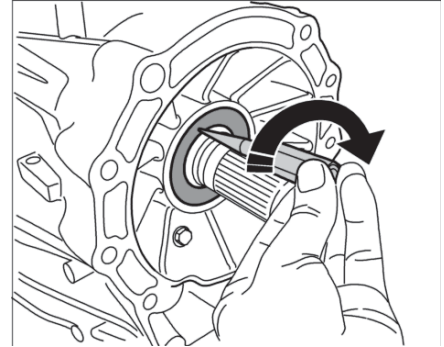


Overview of sealing ring

1. Screw countersunk head bolt and bolt adapter from **slide hammer kit NR.168** into sealing ring **-direction of arrow-** .



Removing sealing ring



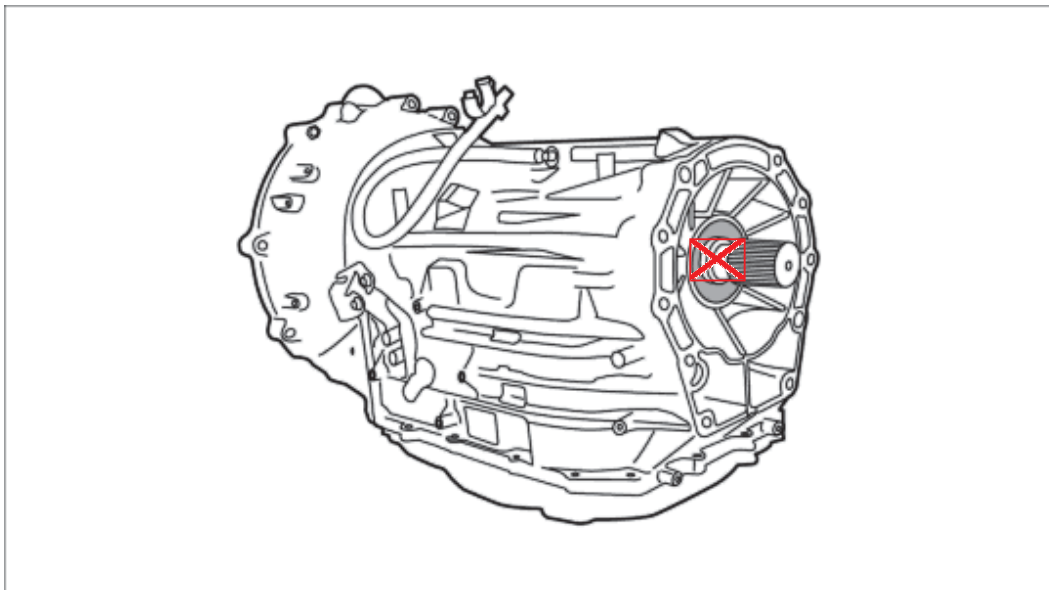
Screwing screws into sealing ring

2. Screw on slide hammer from **slide hammer kit NR.168** and remove sealing ring **-Bild-** .

Installing sealing ring for output shaft

Installing sealing ring for output shaft

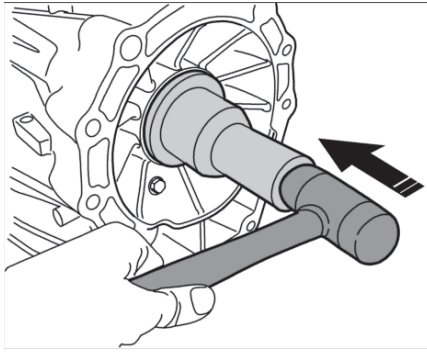
Installation Location:



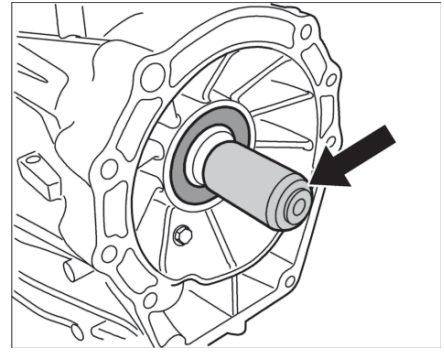
Overview of sealing ring

1. Push special tool **protective sleeve T10186** **-arrow-** onto output shaft.
2. Push on sealing ring.
3. Remove special tool **protective sleeve T10186** and drive in sealing ring flush using special tool **pressure piece T10180** **-arrow-** arrow .

Subsequent work



Driving in the sealing ring



Putting on protective sleeve

Reworking sealing ring for output shaft

1. Install transfer box. → 396519 Removing and installing transfer box - chapter on "Installing"

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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AVERTISSEMENT

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ATTENZIONE

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ADVERTENCIA

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38 75 19 Removing and installing ATF thermostat - as of MY 2003

- Preliminary work
- Removing ATF thermostat
- Installing ATF thermostat
- Subsequent work

Tools

Designation	Type	Number	Explanation	
material	special tool	00000	discharge chute	PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

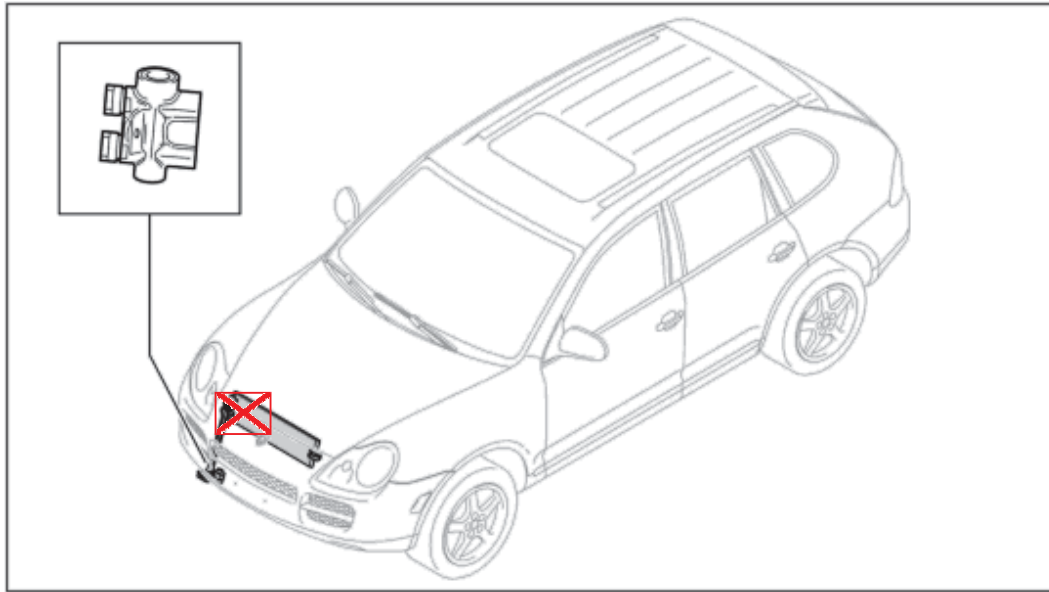
Preliminary work

Preliminary work for ATF thermostat

Removing ATF thermostat

Removing ATF thermostat

Installation Location:



Overview of ATF thermostat

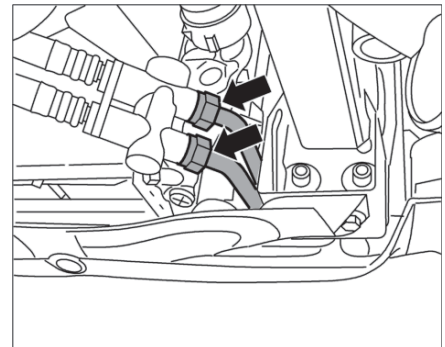
1. Place oil collecting container underneath the vehicle.



WARNING

Danger of scalding and chemical burns from hot ATF

- Allow ATF to cool down
- Wear personal protective gear (goggles, gloves)



ATF cooler line at thermostat



Note

- Counter when loosening the ATF lines.



Note

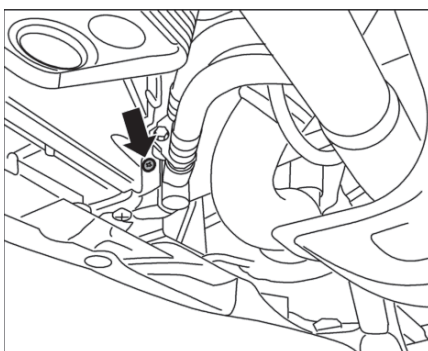
- To prevent oil from spreading into the body front section, a **material 00000** should be held underneath.

2. Undo ATF line screw connection on cooler side **-Arrow-** at the thermostat.
3. Unscrew ATF line fastening screw **-Arrow-** to thermostat
4. Unscrew ATF thermostat fastening screw **-Arrow-** to cooler.

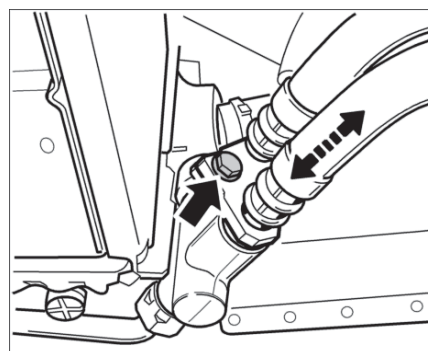


Note

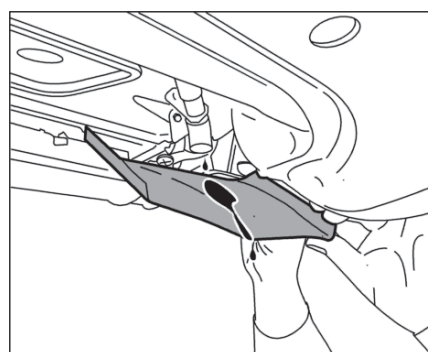
- To prevent oil from spreading into the body front section, a **material 00000** should be held underneath.



ATF thermostat on cooler



ATF line to thermostat



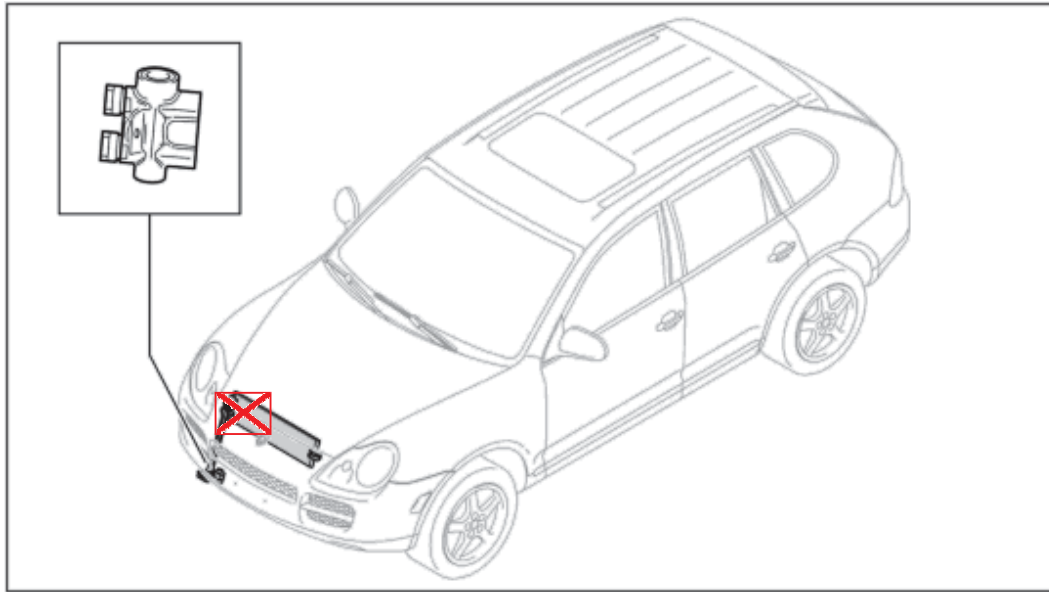
Discharge chute

5. Hold shop-made tool **(material) 00000 -figure-** under ATF thermostat.
6. Disconnect ATF lines from thermostat and drain off ATF.

Installing ATF thermostat

Installing ATF thermostat

Installation Location:



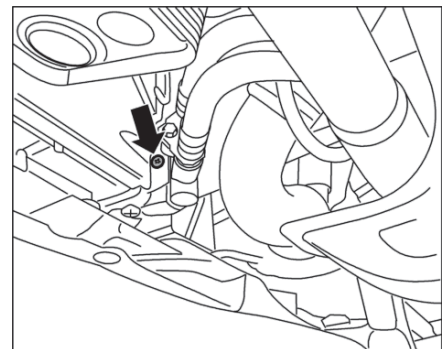
Overview of ATF thermostat



Note

- The sealing rings at the ends of the ATF lines on the transmission and cooler sides must be replaced before installation.

1. Replace sealing rings on the ATF lines and coat with ATF.
2. Connect transmission-side ATF lines to thermostat. Insert the upper line first.
3. Insert ATF cooler lines.
4. Tighten ATF thermostat fastening screw **-Arrow-** to cooler. → **Tightening torque: 2.5 ftlb.**



ATF thermostat on cooler

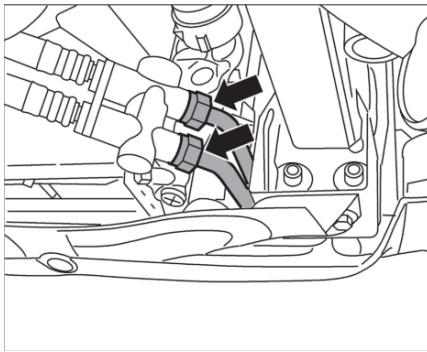
5. Tighten ATF line fastening screw **-Arrow-** to thermostat. → **Tightening torque: 7.5 ftlb.**



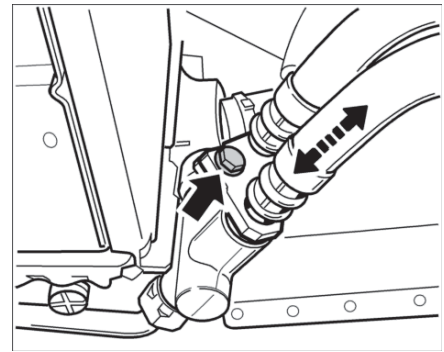
Note

- Counter when fastening the ATF lines.

6. Tighten ATF line screw connection on cooler side **-Arrow-** at the thermostat. → **Tightening torque: 22 ftlb.**

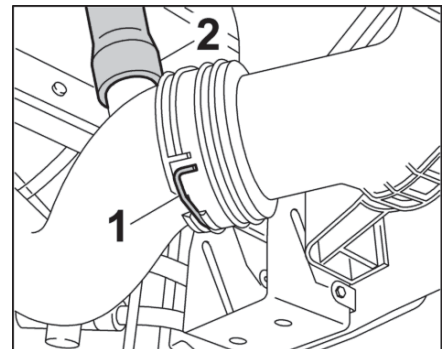


ATF cooler lines at thermostat



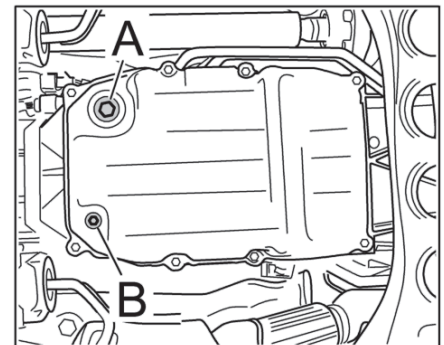
ATF line to thermostat

7. Insert locking clip **-1-** on charge air cooler suction line and push line on until it engages.



Disconnecting ambient air valve

8. Unscrew ATF control screw **-A-** and fill in ATF until a constant discharge is visible at the lifting tube.
9. Screw in ATF inspection plug **-A-** with new sealing ring. → **Tightening torque: 52 ftlb.**



Check screw and oil drain plug

Subsequent work

Subsequent work for ATF thermostat

1. Check and if necessary, top up the ATF. → 370235 Checking and topping up the ATF
2. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAD1, 9PAAE1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23,

C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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38 77 19 Removing and installing electrohydraulic control unit - as of MY 2003

- Preliminary work
- Removing the electrohydraulic control unit
- Installing the electrohydraulic control unit
- Subsequent work

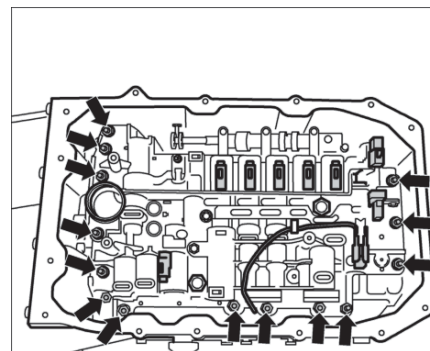
Preliminary work

Preliminary work for electrohydraulic control mechanism

1. Remove pipe set in transmission. → 381819 Removing and installing pipe set in transmission - chapter on "removing"

Removing the electrohydraulic control unit

1. Remove electrohydraulic control unit. To do this, unscrew fastening screws -arrows- and remove the control unit.



Control unit fastening screws

Installing the electrohydraulic control unit

Installing the electrohydraulic control unit



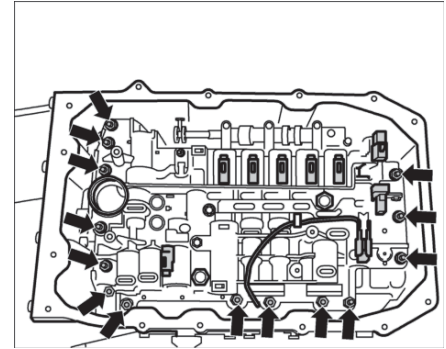
Note

- Screws which are tightened with a torque angle must be replaced with new ones.



Note

- The adaptation values of the Tiptronic control unit must be reset using the Porsche System Tester when replacing/exchanging the electrohydraulic control unit. → Removing and installing the Tiptronic control unit



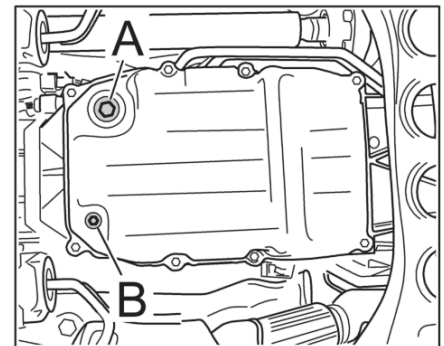
Control unit fastening screws

1. Install electrohydraulic control unit. To do this, screw in new fastening screws **-Pfeil-**. → **Initial tightening: 6 ftlb.** → **Final tightening: 90 degree angle**

Subsequent work

Subsequent work for electrohydraulic control mechanism

1. Install pipe set in transmission. → 381819 Removing and installing pipe set in transmission - chapter on "installing"
2. Unscrew ATF control screw **-A-** and fill in ATF until a constant discharge is visible at the lifting tube.
3. Screw in ATF inspection plug **-A-** with new sealing ring. → **Tightening torque: 52 ftlb.**
4. Check and if necessary, top up the ATF. → 370235 Checking and topping up the ATF



Check screw and oil drain plug

9PAAD1, 9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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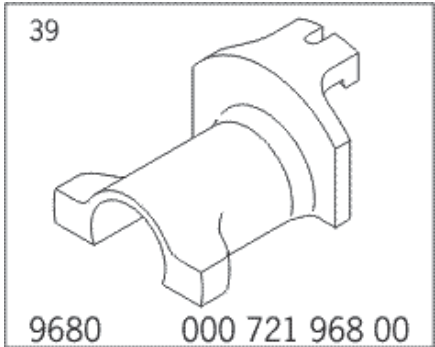
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39 01 19 Removing and installing rear final drive - as of MY 2003

- Preliminary work for rear final drive
- Removing rear final drive
- Installing rear final drive
- Subsequent work for rear final drive

Tools

Designation	Type	Number	Explanation	
centring tool	commercially available tool	9680		

Preliminary work for rear final drive

Preliminary work: Rear final drive

1. Remove exhaust system. → 260119 Removing and installing exhaust system - chapter on "removing"

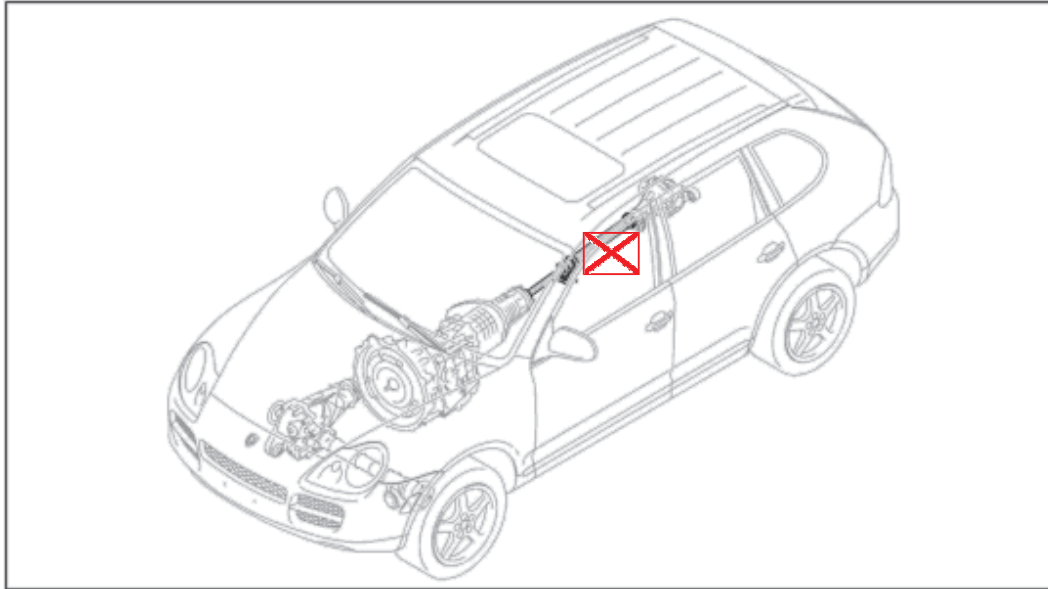
Preliminary work: Rear final drive

1. Remove exhaust system. → 260119 Removing and installing exhaust system - chapter on "removing"
2. Remove longitudinal interlock servo motor. → 397719 Removing and installing rear-differential lock servo motor - "Removing" section

Removing rear final drive

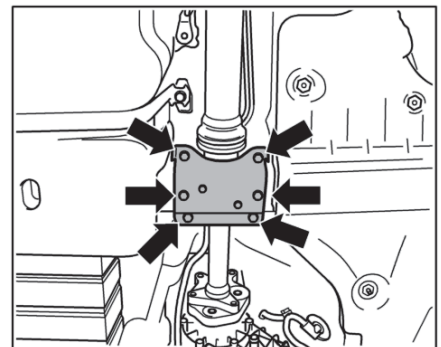
Removing rear final drive

Installation Location:

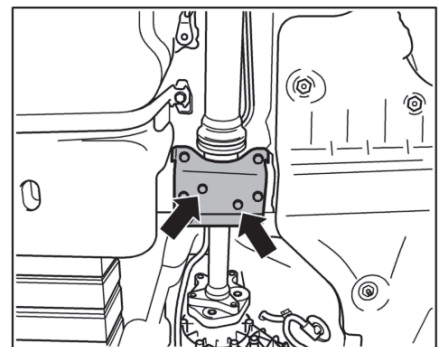


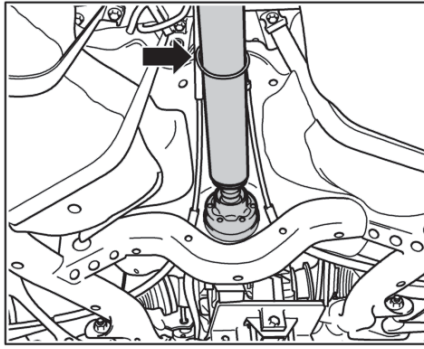
Overview of rear cardan shaft

1. Move selector lever to position N.
2. Loosen fastening screws for fixing cardan shaft centre bearing holder to body.



Cardan shaft support to body





Tying up rear cardan shaft

Centre bearing to cardan shaft holder



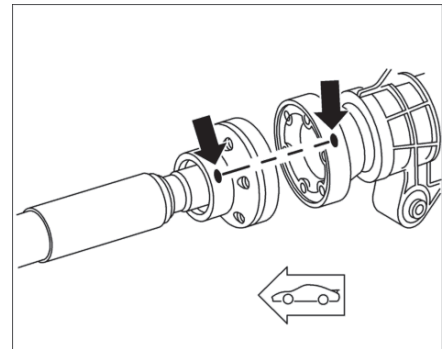
Note

- The colour marking, match point, on the cardan shaft and on the flange of the rear final drive must be installed in alignment -arrows-. This will neutralise the residual imbalance of the components.



Note

- To loosen the cardan shaft on the rear axle transmission, a second fitter should counter the fastening screws on the triangular flange of the transfer box.



Match points on the cardan shaft

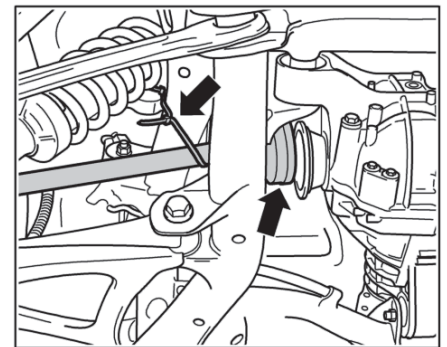
4. Remove cardan shaft from rear axle transmission and tie it up.



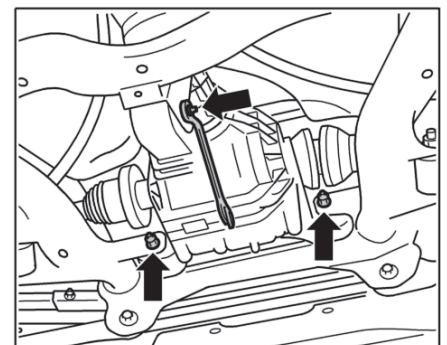
Note

- To loosen the drive shaft bolts on the rear axle transmission, a second fitter should sit in the vehicle and block the rear-axle final drive by actuating the foot brake.

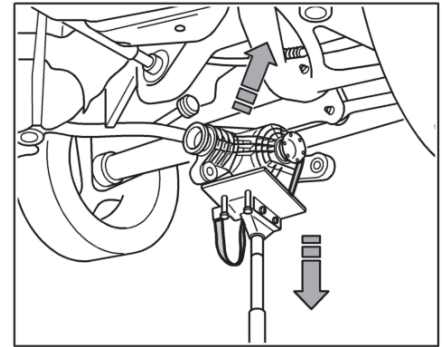
5. Remove both drive shafts on transmission side and tie up.
6. Support transmission jack and rear axle transmission with retaining band.
7. Unscrew fastening screws for final drive. To do this, counter with ring wrench.



Removing rear drive shaft

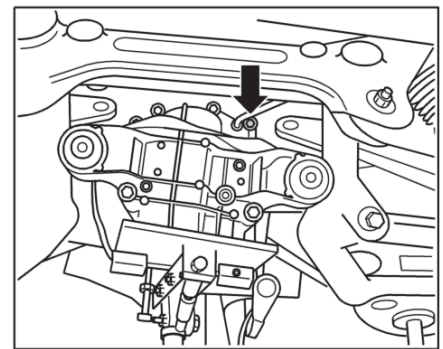


Mount for rear final drive



Removing rear final drive

8. Tip drive flange upwards **-arrow-** and gradually drain rear axle transmission. Remove bleeder line at the same time.
9. Remove transmission and pull off bleeder line → [Removing bleeder line](#).



Removing bleeder line

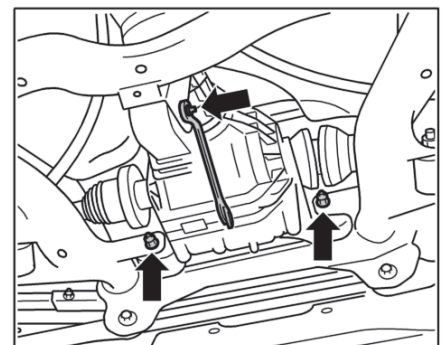
Installing rear final drive

Installing rear final drive



Note

- Screws which are tightened with a torque angle must be replaced with new ones.



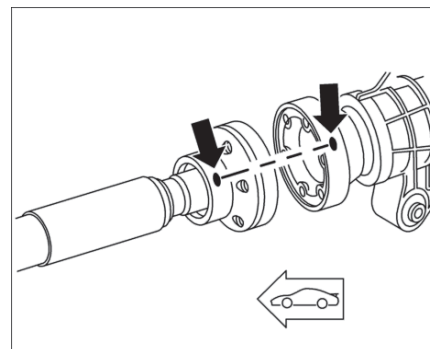
Mount for rear final drive



Note

- The colour marking, match point, on the cardan shaft and on the flange of the rear final drive must be installed in alignment **-arrows-**. This will neutralise the residual imbalance of the components.

1. Secure rear axle transmission on transmission jack with retainer band.



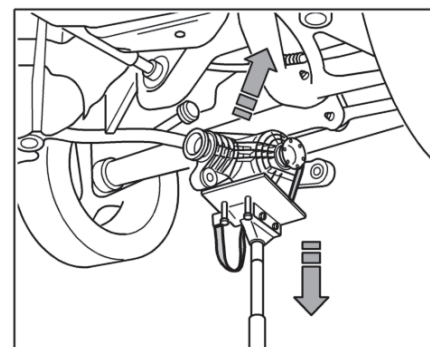
Match points on the cardan shaft

2. Run in rear axle differential by gradually tipping the drive flange upwards **-arrow-**. Connect bleeder line at the same time.
3. Screw in new fastening screws on final drive. To do this, counter with ring wrench. → **Initial tightening: 67 ftlb.** → **Final tightening: 67 °**



Note

- To tighten the drive shaft bolts on the rear final drive, a second fitter should sit in the vehicle and block the rear-wheel drive assembly by actuating the foot brake.



Installing transmission

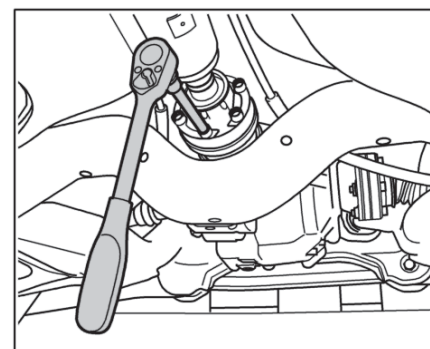
4. Attach drive shafts with new screws. → **42 Tightening torques for rear axle**



ATTENTION

Cardan shaft can be damaged by imbalance.

- Cardan shaft and flange not installed in original position.
- The colour marking, match point, on the cardan shaft and on the flange of the rear final drive must be installed in alignment. This will neutralise the residual imbalance of the components.



Cardan shaft to rear final drive



Note

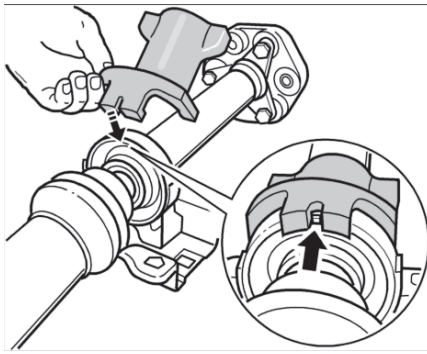
- To attach the cardan shaft to the rear final drive, a second fitter should counter the fastening screws on the triangular flange of the transfer box.

5. Attach cardan shaft with new screws.
6. Screw in fastening screws for fixing cardan shaft centre bearing holder to body. → **Tightening torque: 44 ftlb.**

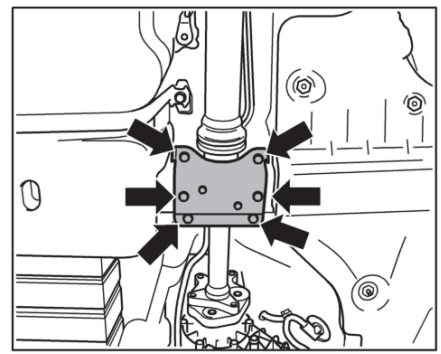


Note

- Centre bearing must be installed without tension.



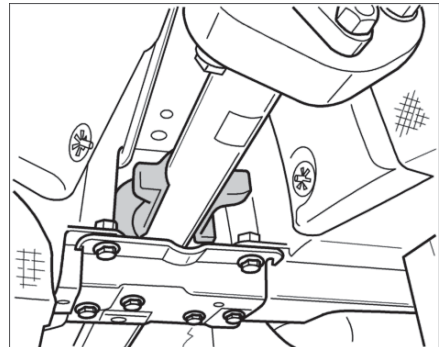
Alignment of special tool 9680



Cardan shaft support to body

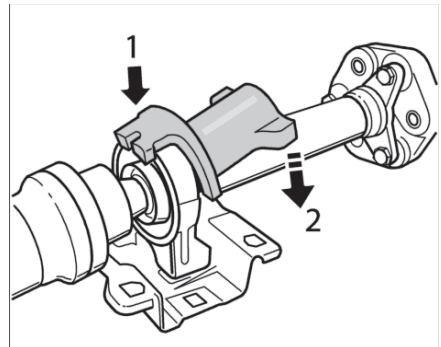
- Fit special tool **centring tool 9680 -Werkzeug in Einbaulage-** in the order specified.

7. Position special tool **centring tool 9680**.



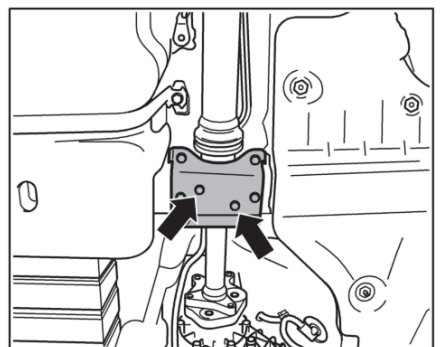
Installation position for special tool

8. Press on special tool **centring tool 9680** in sequence according to numbering **-1, 2-**.



Installation of special tool 9680

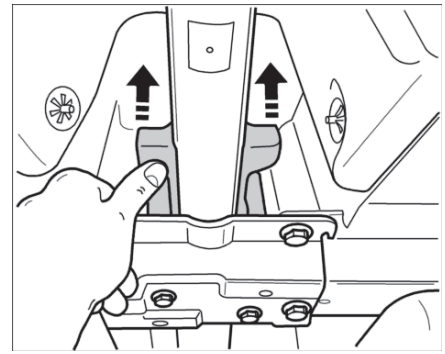
9. Tighten threaded joints **-arrow-** connecting support to centre bearing. → **Tightening torque: 15 ftlb.**



Cardan shaft support to centre bearing

10. Remove special tool **centring tool 9680**.

Subsequent work for rear final drive



Removal of special tool 9680

Subsequent work: Rear final drive

1. Install the exhaust system. → 260119 Removing and installing exhaust system - chapter on "Installing"

Subsequent work: Rear final drive

1. Install the exhaust system. → 260119 Removing and installing exhaust system - chapter on "Installing"
2. Install servo motor for rear-differential lock. → 397719 Removing and installing rear-differential lock servo motor - "Installing" section

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

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→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 02 19 Removing and installing front cardan shaft - as of MY 2003

- Preliminary work for front cardan shaft
- Removing front cardan shaft
- Installing front cardan shaft
- Subsequent work for front cardan shaft

Tools

Designation	Type	Number	Explanation	
material	special tool	00000	transmission jack	PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work for front cardan shaft

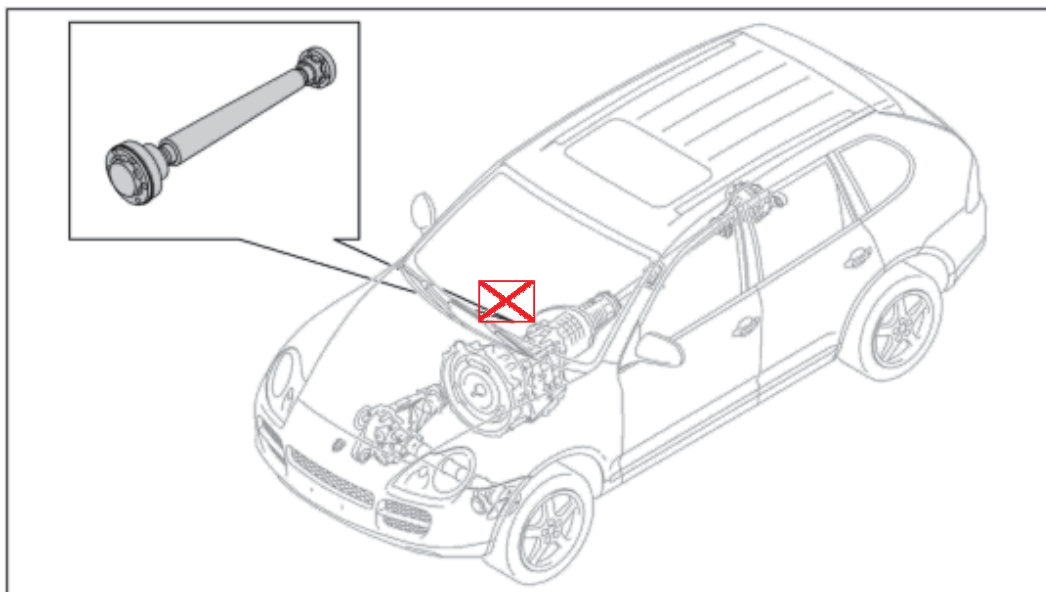
Preliminary work for front cardan shaft

1. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"

Removing front cardan shaft

Removing front cardan shaft

Installation Location:

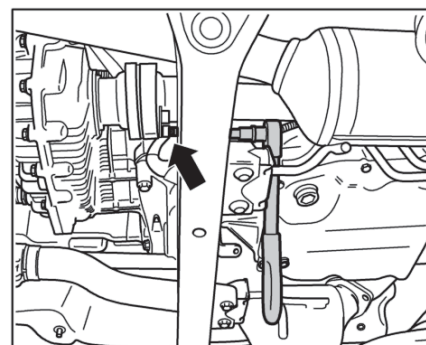


Overview of cardan shaft



Note

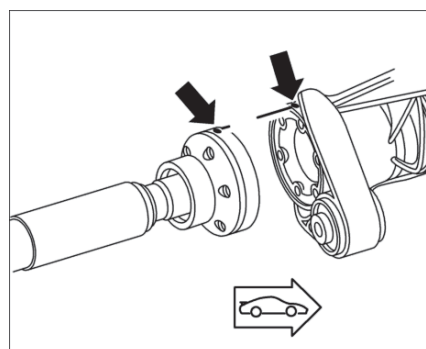
- To unscrew the cardan shaft bolts, a second fitter should sit in the vehicle and block the drive train by actuating the foot brake.
- The colour markings, match points **-arrows-** on the cardan shaft and on the all-wheel final drive flange must be aligned. This will neutralise the residual imbalance of the components.



Fastening of cardan shaft to transfer box

- Apply another colour marking if necessary.

1. Remove cardan shaft from the transfer box **-arrow-**.



Match points of front cardan shaft to front final drive

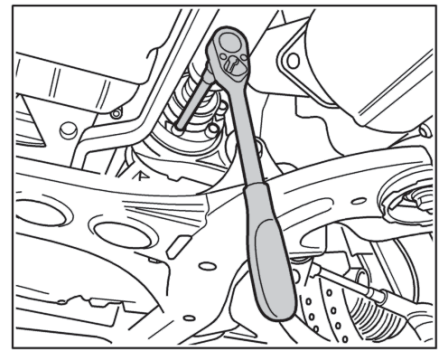


Note

- To unscrew the cardan shaft bolts, a second fitter should sit in the vehicle and block the drive train by

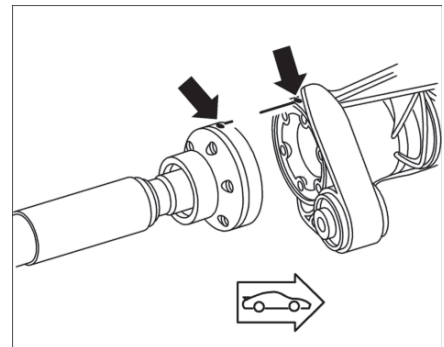
actuating the foot brake.

- The colour markings, match points **-arrows-** on the cardan shaft and on the all-wheel final drive flange must be aligned. This will neutralise the residual imbalance of the components.



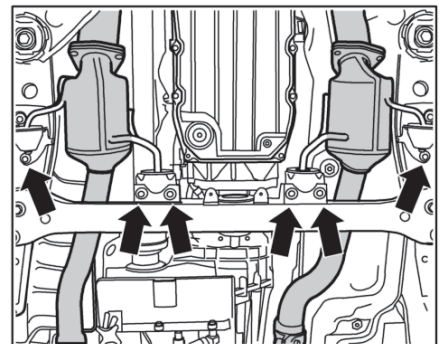
Front cardan shaft to all-wheel final drive

- Apply another colour marking if necessary.
2. Detach cardan shaft from final four wheel drive → *Front cardan shaft to all-wheel final drive* .
 3. Support transmission with **material 00000** and secure with retaining band.



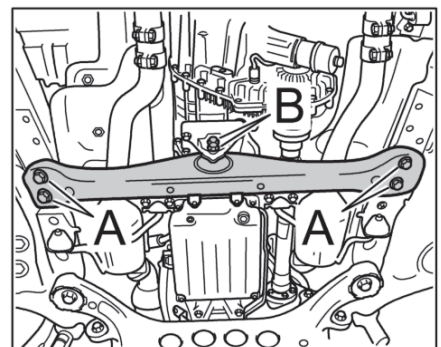
Match points of front cardan shaft to front final drive

4. Unscrew four exhaust system screws from cross member **-centre arrow-** and unscrew holder screws from body **-right arrow-** .



Exhaust system at cross member

5. Unscrew transmission cross member bolts from body **-A-** .
6. Unscrew two screws fastening cross member **-B-** to transfer box support and remove transmission cross member.



Transmission cross member

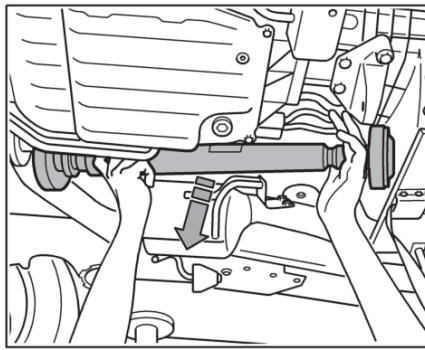
7. Undo exhaust clamp on the right side **-arrows-** and push it in the direction of the catalytic converter.



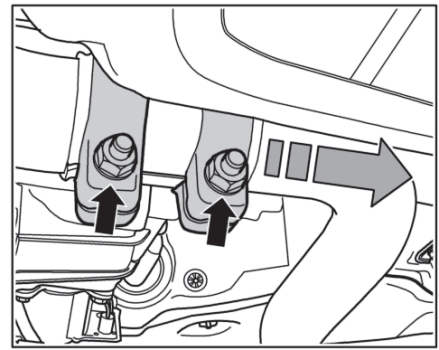
Note

If the cardan shaft is to remain removed, the transmission cross-member must be refitted.

8. Remove cardan shaft between ATF pan and exhaust system support **-arrow-**.



Removing cardan shaft

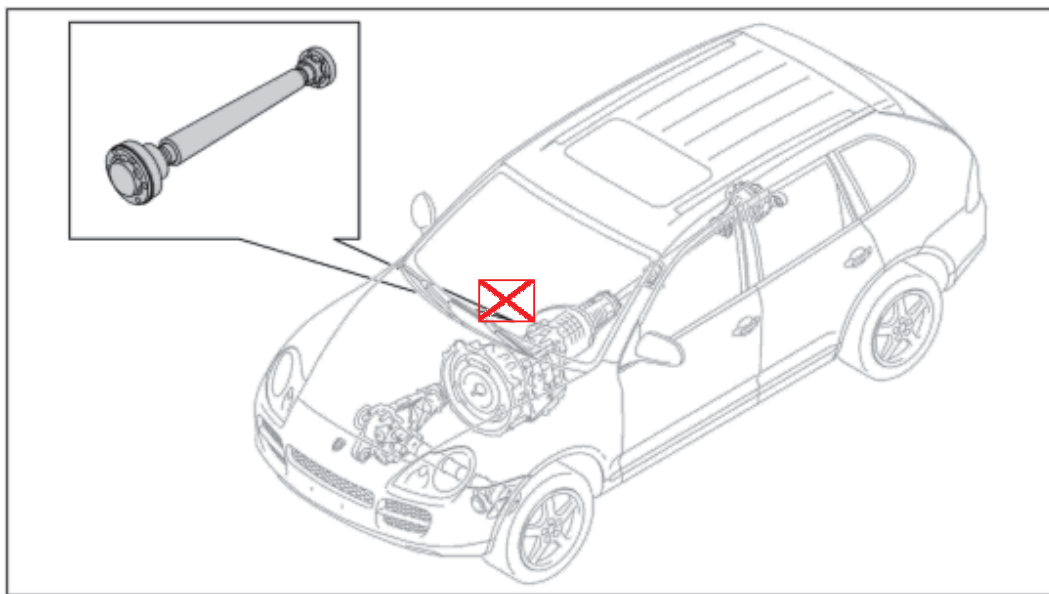


Exhaust clamp

Installing front cardan shaft

Installing front cardan shaft

Installation Location:



Overview of cardan shaft



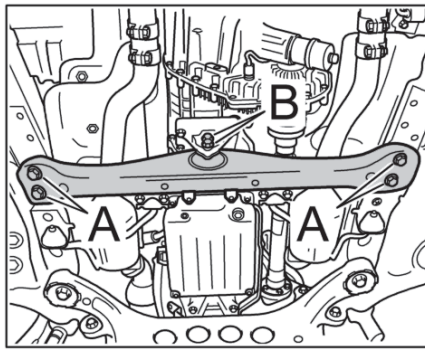
Note

- The transmission cross member must be disassembled before the cardan shaft is installed.
1. Install cardan shaft between ATF pan and exhaust system support.
 2. Fit new exhaust clamps **-arrows-**. The bolts must point downwards. Note tightening torque. → 260119 Removing and installing exhaust system
 3. Support transmission with transmission jack.

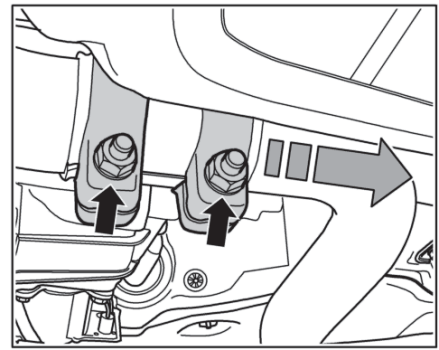


Note

- Screws which are tightened with a torque angle must be replaced with new ones.
4. Screw in new screws fastening cross member **-B-** to transfer box support. → **Initial tightening: 37 ftlb. → Final tightening: 90 degree angle**



Transmission cross member

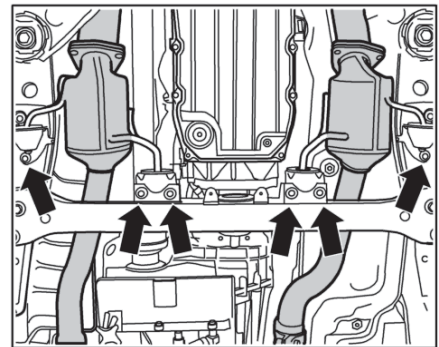


Exhaust clamp

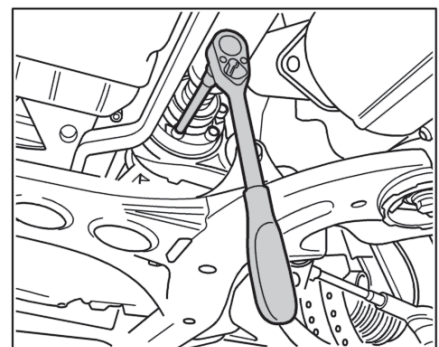


Note

- Screws which are tightened with a torque angle must be replaced with new ones.
5. Screw new cross member screws into body **-A-**. → **Initial tightening: 37 ftlb. → Final tightening: 90 degree angle**
 6. Fasten exhaust system to transmission cross member **-centre arrow-** and body **-outer arrow-**. Observe torques for exhaust system → 260119 Removing and installing exhaust system



Exhaust system at cross member



Front cardan shaft to all-wheel final drive



Note

- The colour markings, match points **-arrows-** on the cardan shaft and on the all-wheel final drive flange must be aligned. This will neutralise the residual imbalance of the components.



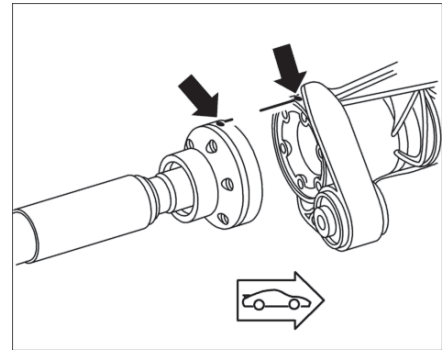
Note

- To tighten the cardan shaft bolts, a second fitter should sit in the vehicle and block the drive train by actuating the brake.

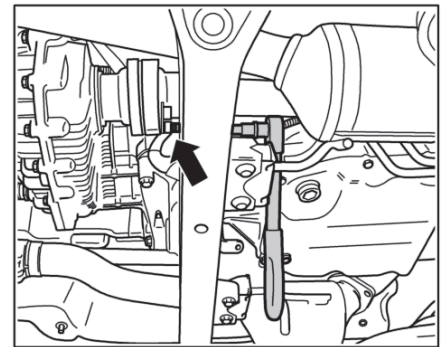


Note

- Screws which are tightened with a torque angle must be replaced with new ones.
7. Fix cardan shaft with new screws → *Front cardan shaft to all-wheel final drive* to the all-wheel final drive. → **Initial tightening: 22 ftlb.** → **Final tightening: 90 degree angle**
 8. Fix cardan shaft with new screws **-arrow-** to the transfer box. → **Initial tightening: 22 ftlb.** → **Final tightening: 90 degree angle**



Match points of front cardan shaft to front final drive



Front cardan shaft to transfer box

Subsequent work for front cardan shaft

Subsequent work for front cardan shaft

1. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAE1, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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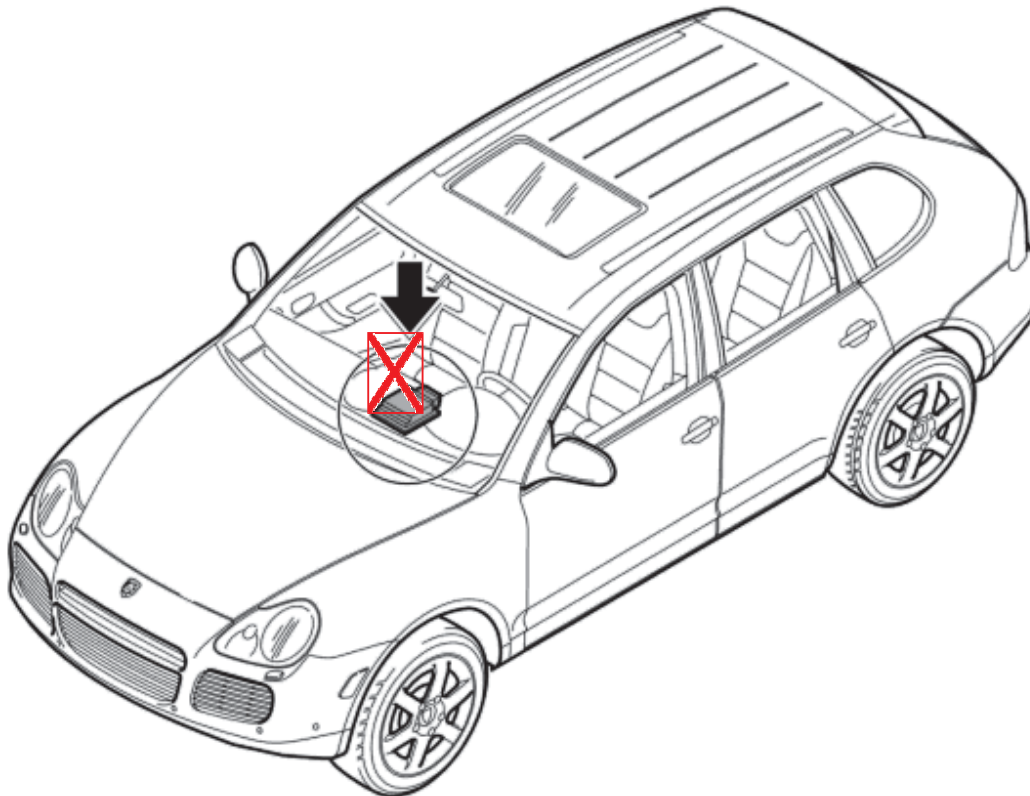
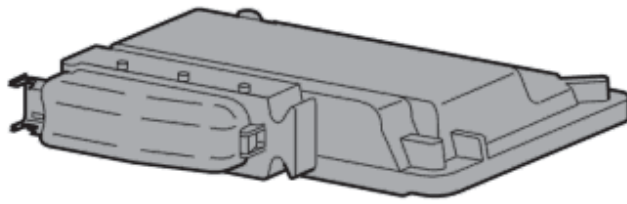
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39 13 19 Removing and installing transfer box control module - as of MY 2003

- [Removing transfer box control module](#)
- [Installing transfer box control module](#)

Removing transfer box control module

Installation Location:



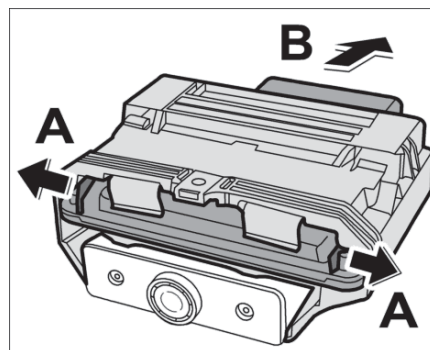
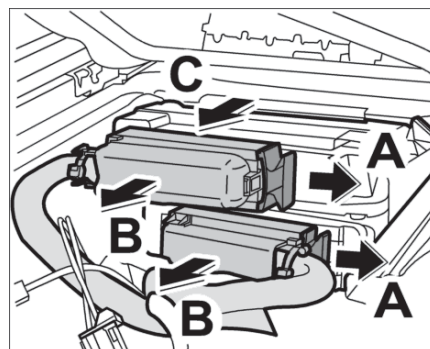
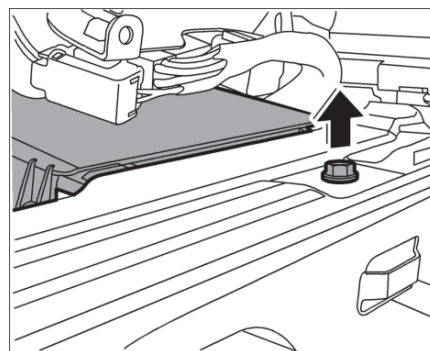
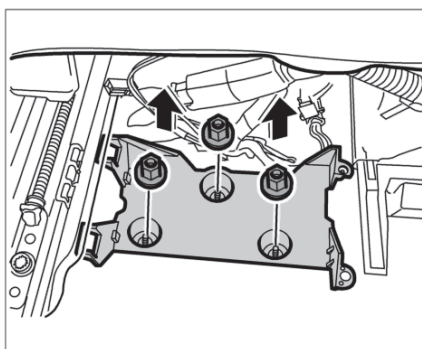
Note

- The control unit is located under the right front seat.
1. The ignition key must be removed before removing the connector from the control unit.
 2. Move right front seat all the way back and up.
 3. For vehicles with a telephone, remove the telephone control unit. → 919019 Removing and installing control unit for telephone - chapter on "removing"
 4. Unclip right front seat trim and remove drawer.
 5. Unscrew the fastening screw for the support.



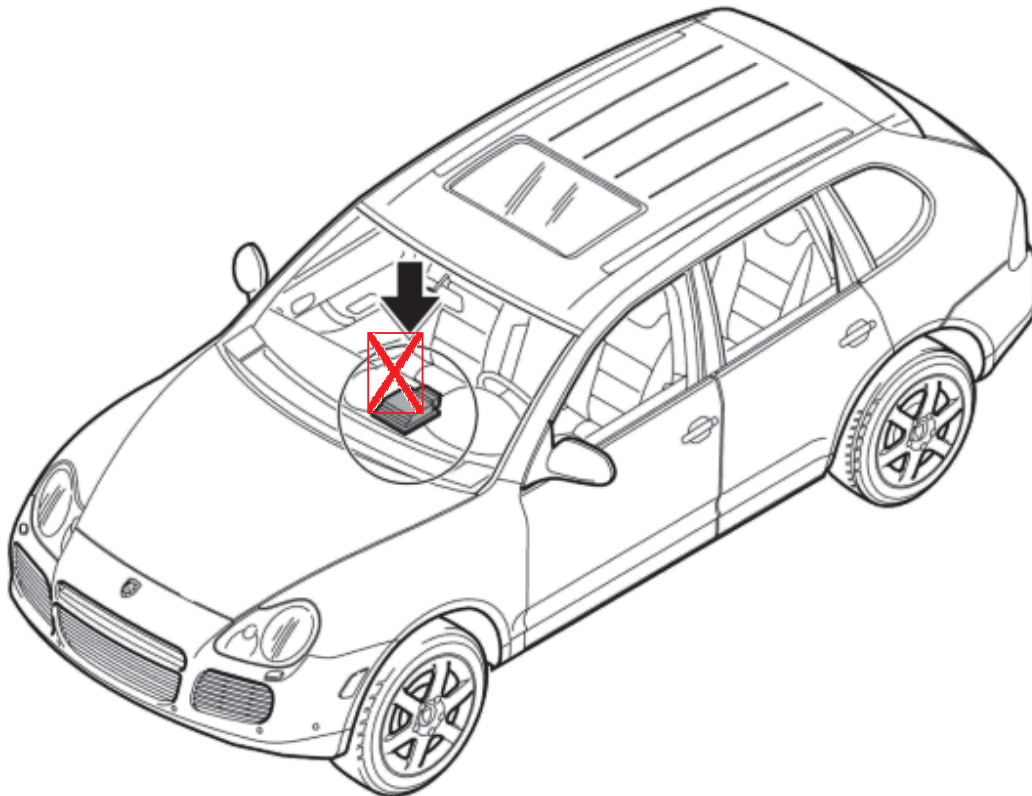
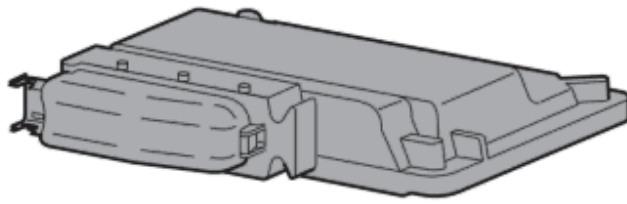
Note

- *Only for vehicles with telephone*
6. Unscrew the three fastening nuts and remove support for telephone control unit.
 7. Move seat all the way forward and remove ignition key.
 8. Release the two connectors **-A-** and pull them off **-B-** .
 9. Remove the support with the two control units **-C-** .

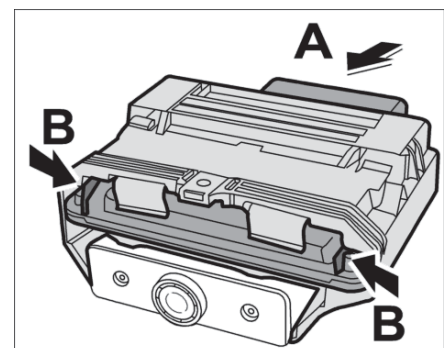


Installing transfer box control module

Installation Location:

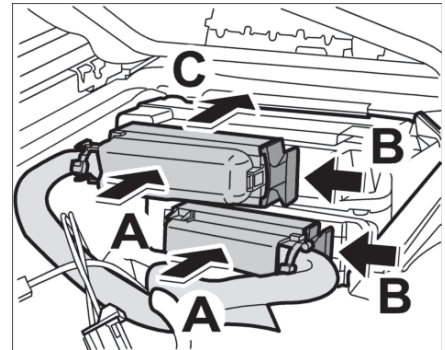
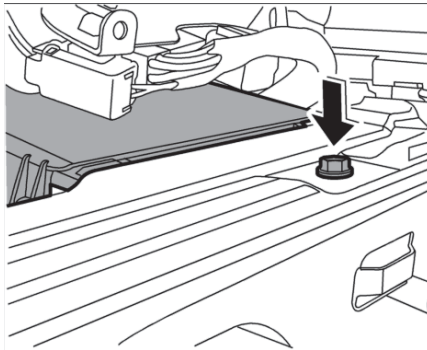


1. Insert the control unit **-A-** until the locking tabs **-B-** are felt to engage.



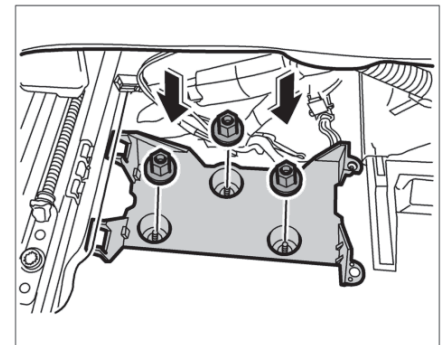
2. Insert the two connectors **-A-** and press in the locking mechanism **-B-** until it is felt to engage.
3. Place the support with the two control units in the installation position **-C-**.

4. Move seat all the way back and tighten the support with the fastening screw.



Note

- *Only for vehicles with telephone*
5. Position the support for the telephone control unit and screw down using the three fastening nuts.
6. For vehicles with a telephone, install the telephone control unit.
→ 919019 Removing and installing control unit for telephone - chapter on "installing"
7. Clip in right front seat trim and install drawer.



9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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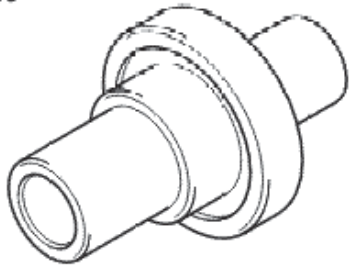
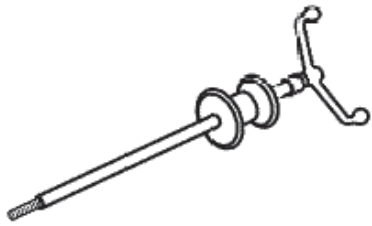
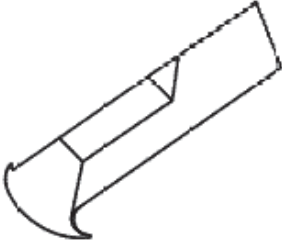
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39 22 19 Removing and installing sealing ring for output flange - as of MY 2003

- Preliminary work for sealing ring for output flange
- Removing sealing ring for output flange
- Installing sealing ring for output flange
- Subsequent work

Tools

Designation	Type	Number	Explanation	
shop-made tool	commercially available tool			 .gif
pressure piece	commercially available tool	t10181		

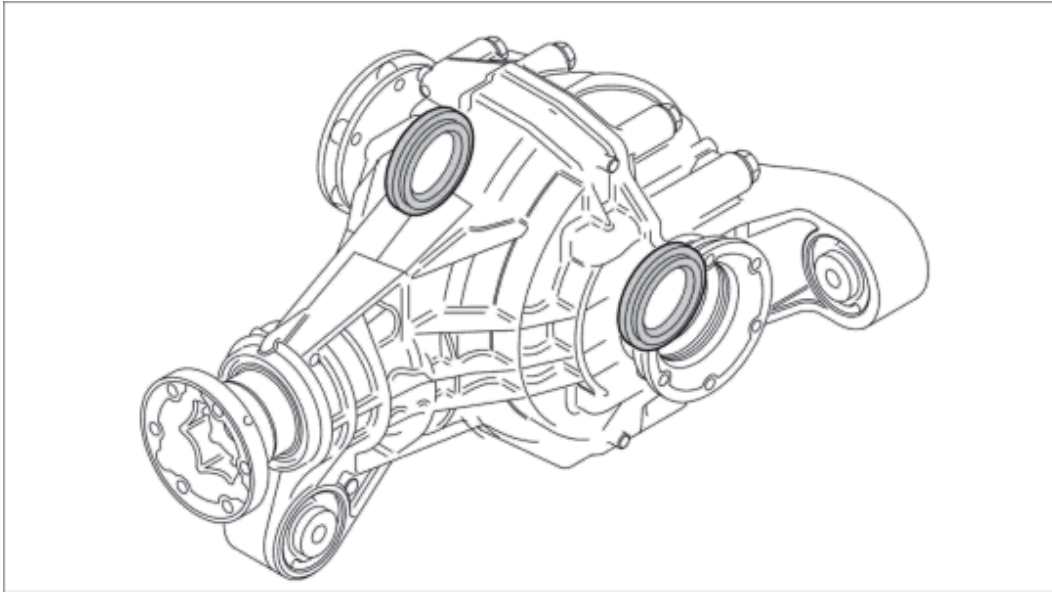
				39  T10181
striker	commercially available tool	vw 771/1		34, 40  VW 771/1
extraction tool	commercially available tool	vw 771/37		39  VW 771/37

Preliminary work for sealing ring for output flange

Preliminary work sealing ring for output flange

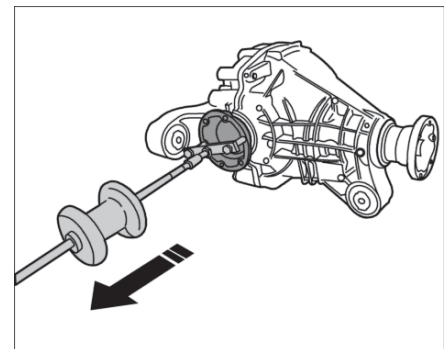
Removing sealing ring for output flange

Installation Location:

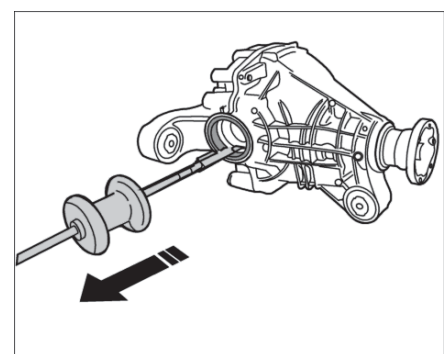


Overview of sealing rings

1. Remove output flange with special tool **striker vw 771/1** and **shop-made tool** .



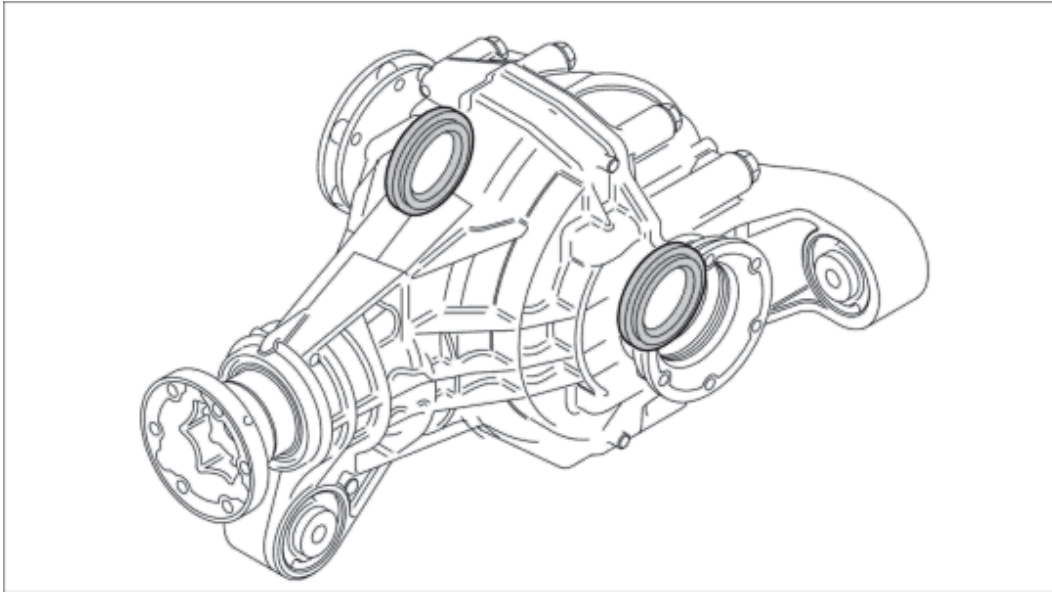
Removing output flange



Removing sealing ring

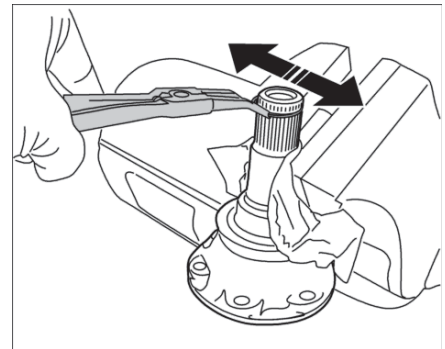
Installing sealing ring for output flange

Installation Location:



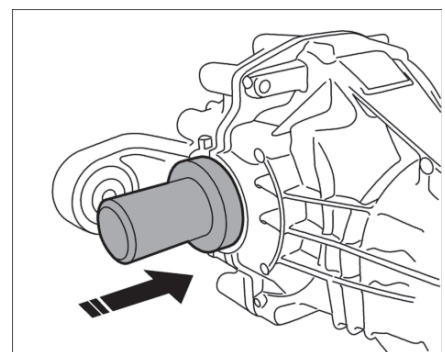
Overview of sealing rings

1. Replace circlip on flange shaft.



Replacing circlip

2. Drive in new sealing ring with special tool **pressure piece t10181** until the special tool touches the transmission housing.
3. Install output flange.



Installing sealing ring

Subsequent work

Reworking sealing ring for output flange

1. Install rear final drive. → 390119 Removing and installing rear final drive - "Installing" section [9PAAD1

9PAAD7]→ 390119 Removing and installing rear final drive - "Installing" section [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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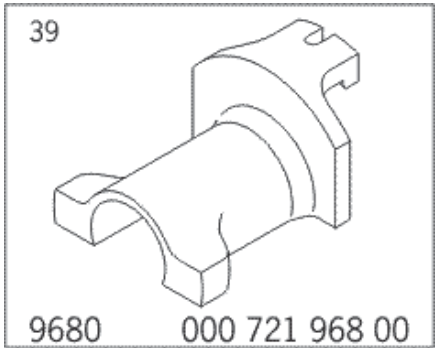
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39 35 19 Removing and installing rear cardan shaft - as of MY 2003

- [Preliminary work for rear cardan shaft](#)
- [Removing rear cardan shaft](#)
- [Installing rear cardan shaft](#)
- [Subsequent work](#)

Tools

Designation	Type	Number	Explanation	
centring tool	commercially available tool	9680		

Preliminary work for rear cardan shaft

Preliminary work - rear cardan shaft

1. Remove exhaust system after catalytic converter. → 260119 Removing and installing exhaust system - chapter on "Removing"

Removing rear cardan shaft

Removing rear cardan shaft



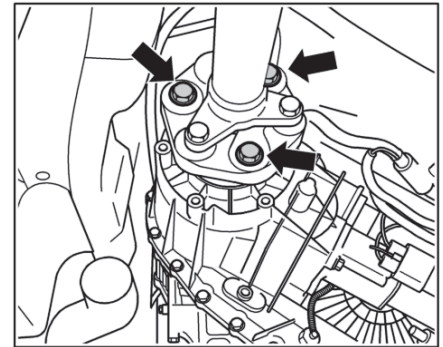
Note

- If the cardan shaft or transfer box has to be replaced, please ignore the next step.
- Marking the position of the cardan shaft with respect to the transfer box triangular flange serves only to prevent possible humming noises.



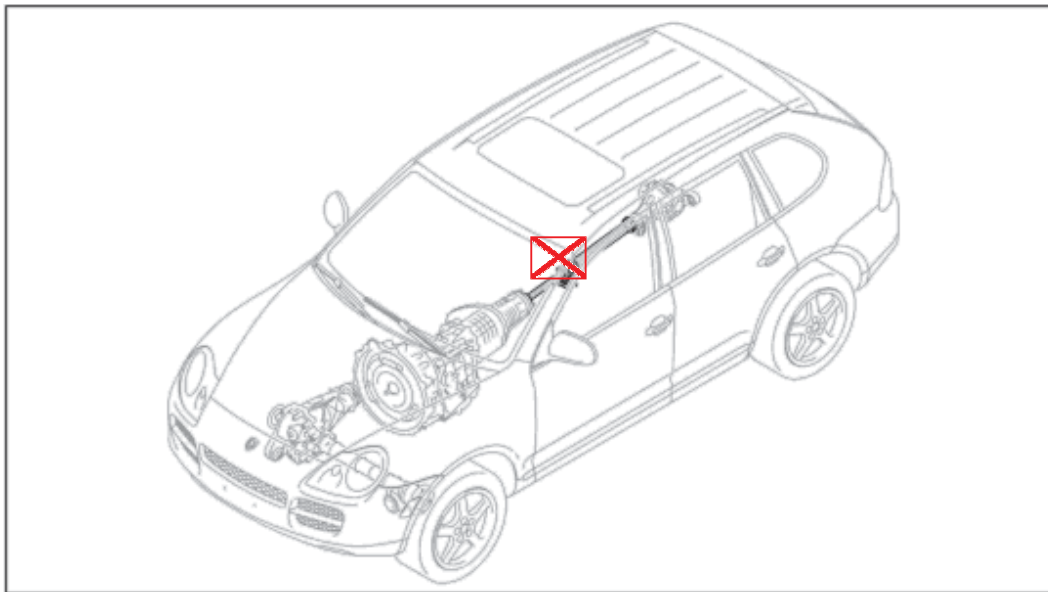
Note

- To loosen the cardan shaft on the rear axle transmission, a second fitter should counter the fastening screws **-arrows-** at the triangular flange of the transfer box.



Rear cardan shaft to transfer box

Installation Location:



Overview of cardan shaft

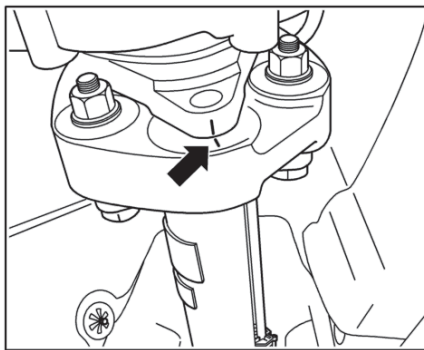
1. Move selector lever to position N.
2. The position of the cardan shaft **-arrows-** with respect to the rear axle transmission flange is marked with a white dot, match point, on both components.



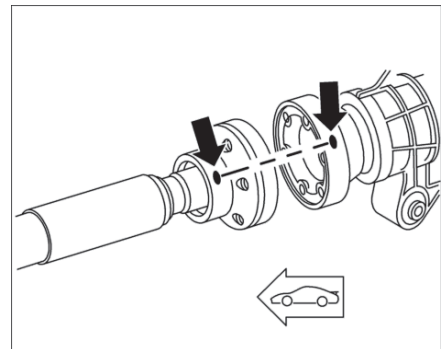
Note

- The colour marking, match point, on the cardan shaft and on the rear final drive flange must be aligned. This will neutralise the residual imbalance of the components.

3. Mark the position of the cardan shaft **-arrow-** with respect to the transfer box flange with a coloured pen.

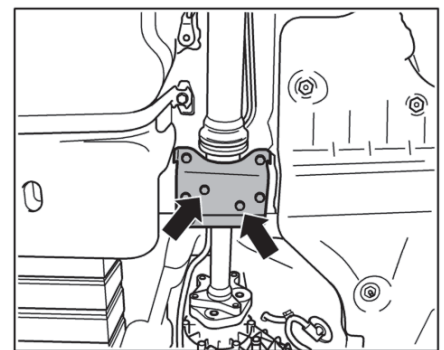


Mark for rear cardan shaft to transfer box



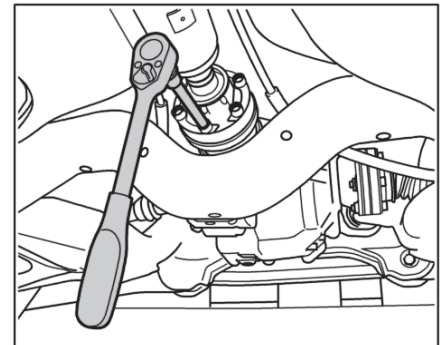
Match points for cardan shaft to final drive

4. Loosen fastening screws **-arrow-** securing cardan shaft support to centre bearing.



Cardan shaft support to centre bearing

5. Unscrew fastening screws on the cardan shaft at the rear axle transmission → *Cardan shaft to rear final drive* .



Cardan shaft to rear final drive

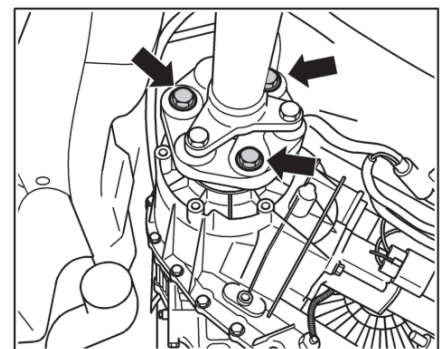


ATTENTION

Noises caused by damage in the drive line

- Faulty centre bearing; replace cardan shaft
- Do not loosen cardan shaft bolts using rubber/metal disc.

6. Unscrew fastening screws **-arrows-** on the cardan shaft at the transfer box. Counter with an open-ended wrench.



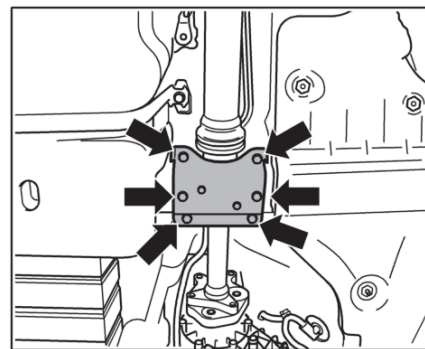
Cardan shaft to transfer box



ATTENTION

Cardan shaft can be damaged if not handled correctly

- Avoid repeated sagging or significant vertical traction.
- When one of the two flanges on the cardan shaft has been released, the centre bearing must be relaxed!
- Do not leave cardan shaft hanging. All three fastening points for transfer box, centre bearing and rear final drive must always be screwed in.
- The recommended procedures must be followed during installation, otherwise the position of the cardan shaft in its original place is no longer guaranteed. Possible result: premature failure of the centre bearing resulting in subsequent cardan shaft replacement.



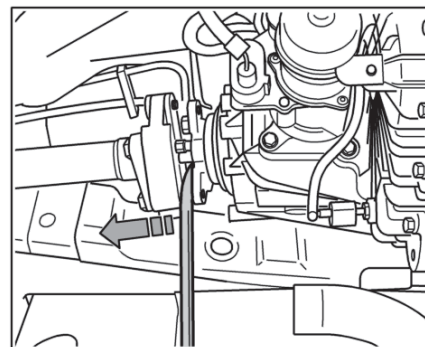
Cardan shaft centre bearing to body

7. Release cardan shaft centre bearing holder. To do this, unscrew six fastening screws **-arrows-**.
8. Carefully separate cardan shaft from transfer box → [Removing cardan shaft](#) and press backwards.



Note

- To prevent the cardan shaft from being damaged, a second mechanic is required to remove the equipment.

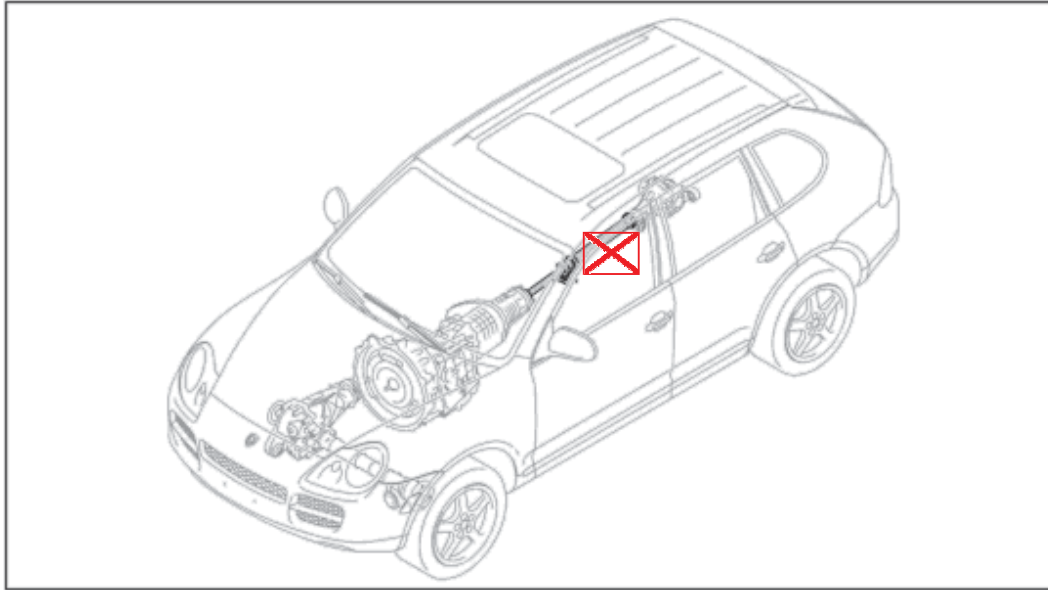


Removing cardan shaft

Installing rear cardan shaft

Installing rear cardan shaft

Installation Location:



Overview of rear cardan shaft



ATTENTION

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ATTENTION

Leakage due to damage to centring sleeve

- Ensure that no damage occurs during removal and installation.
- Centring sleeve should be greased slightly.
- Transfer box journal must be clean.



Note

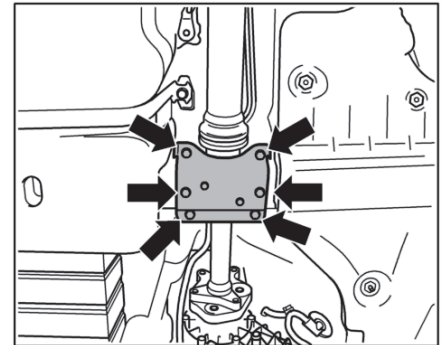
- *There is no colour marking on the flange to the transfer box for installing new components, transfer box or cardan shaft. As a result, positioning is not an issue.*
- *If none of the components are replaced, the mark you apply is a precautionary measure in order to avoid humming noises from the drive line.*



Note

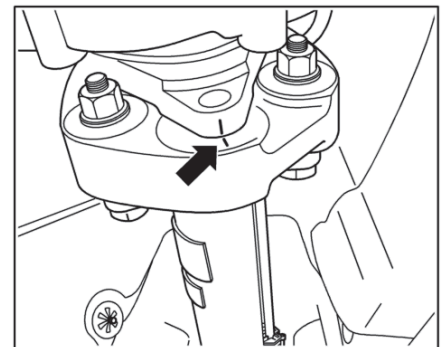
- To prevent the cardan shaft from being damaged, a second mechanic is required to install the equipment.

1. Install cardan shaft.
2. Pull cardan shaft joints apart so that they sit in the transmission flanges.
3. Screw in six screws **-arrow-** on the centre bearing holder but do not tighten.

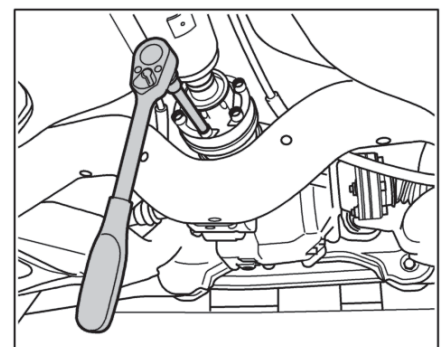


Cardan shaft centre bearing to body

4. Position the cardan shaft at the colour markings **-arrow-** again.



Marking on transfer box flange/cardan shaft



Cardan shaft to rear final drive



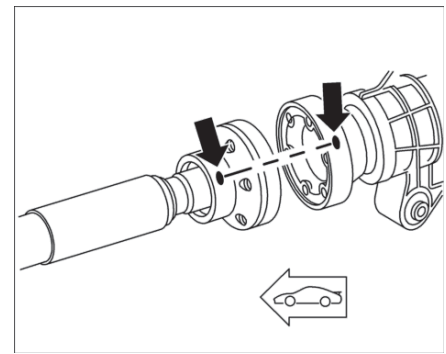
Note

- The colour marking, match point **-arrow-**, on the cardan shaft and on the flange of the rear final drive must be aligned. This will neutralise the residual imbalance of the components.

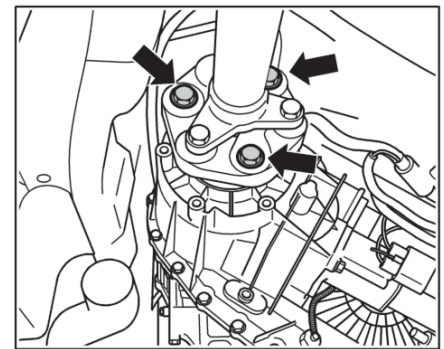


Note

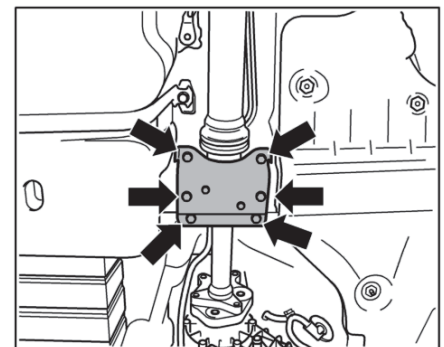
- To attach the cardan shaft to the rear axle transmission, a second fitter should counter the fastening screws on the triangular flange of the transfer box.
 - Screws which are tightened with a torque angle must be replaced with new ones.
5. Screw in new screws for cardan shaft flange at the rear axle transmission. → **Initial tightening: 22 ftlb.** → **Final tightening: 90 °**
 6. Tighten bolts connecting cardan shaft triangular flange to transfer box **-arrows-**. Counter with an open-ended wrench. → **Tightening torque: 56 ftlb.**
 7. Screw in fastening screws for securing cardan shaft centre bearing holder to body **-arrows-**. → **Tightening torque: 44 ftlb.**



Match points for cardan shaft to final drive



Cardan shaft to transfer box

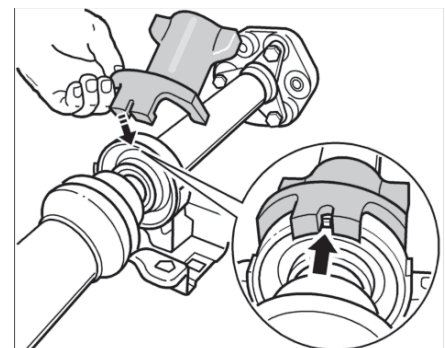


Cardan shaft centre bearing to body



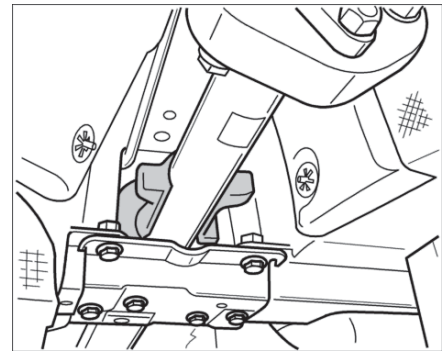
Note

- Centre bearing must be installed without tension.
8. Mount special tool centring tool 9680 **-arrow,inset-**.



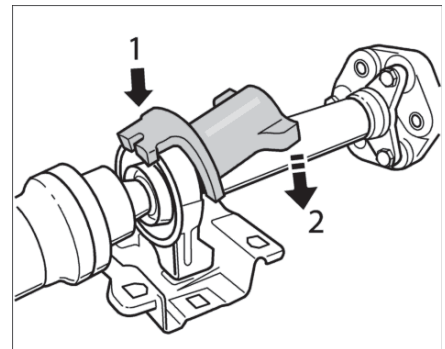
Mounting special tool 9680

- Fit special tool **centring tool 9680** → **Special tool in installation position** in the specified sequence.



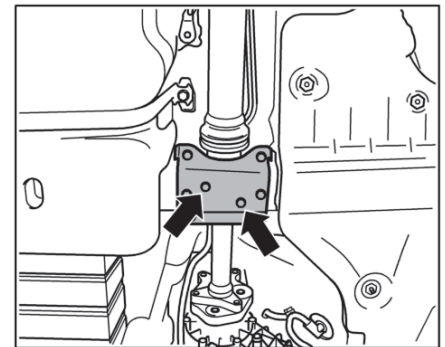
Special tool in installation position

9. Press on special tool **centring tool 9680** in sequence according to numbering **-1, 2-** .



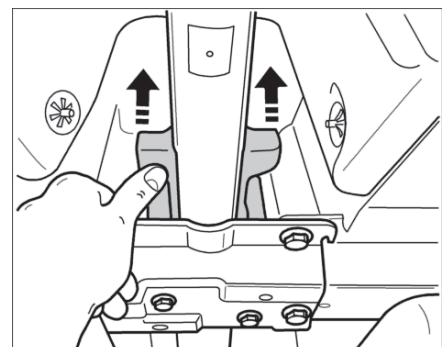
Pressing on special tool 9680

10. Tighten bolts **-arrow-** connecting holder to centre bearing. → **Tightening torque: 15 ftlb.**



Cardan shaft support to centre bearing

11. Remove special tool **centring tool 9680**. **-arrows-**



Removing special tool 9680

Subsequent work

Subsequent work - rear cardan shaft

1. Install the exhaust system. → 260119 Removing and installing exhaust system - chapter on "Installing"
-

9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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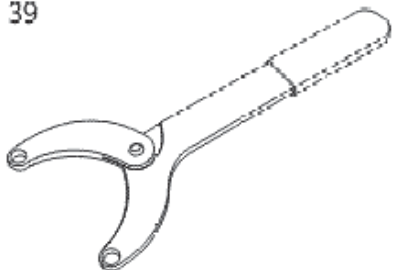
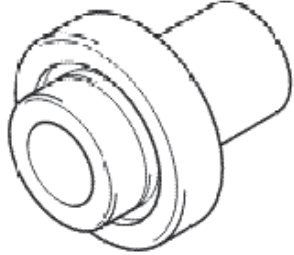
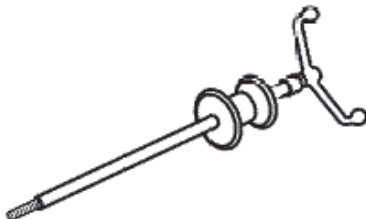
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39 55 19 Removing and installing sealing ring for cardan flange - as of MY 2003

- Preliminary work for cardan flange sealing ring
- Removing sealing ring for cardan flange
- Installing sealing ring for cardan flange
- Subsequent work for sealing ring for cardan flange

Tools

Designation	Type	Number	Explanation	
shop-made tool	commercially available tool			 .gif
counterer	commercially available tool	3435		

				39  3435
torque screwdriver for measuring friction moment	commercially available tool	89		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
pressure piece	special tool	T10183		39  T10183
striker	commercially available tool	vw 771/1		34, 40  VW 771/1
extraction tool	commercially available tool	vw 771/37		

Preliminary work for cardan flange sealing ring

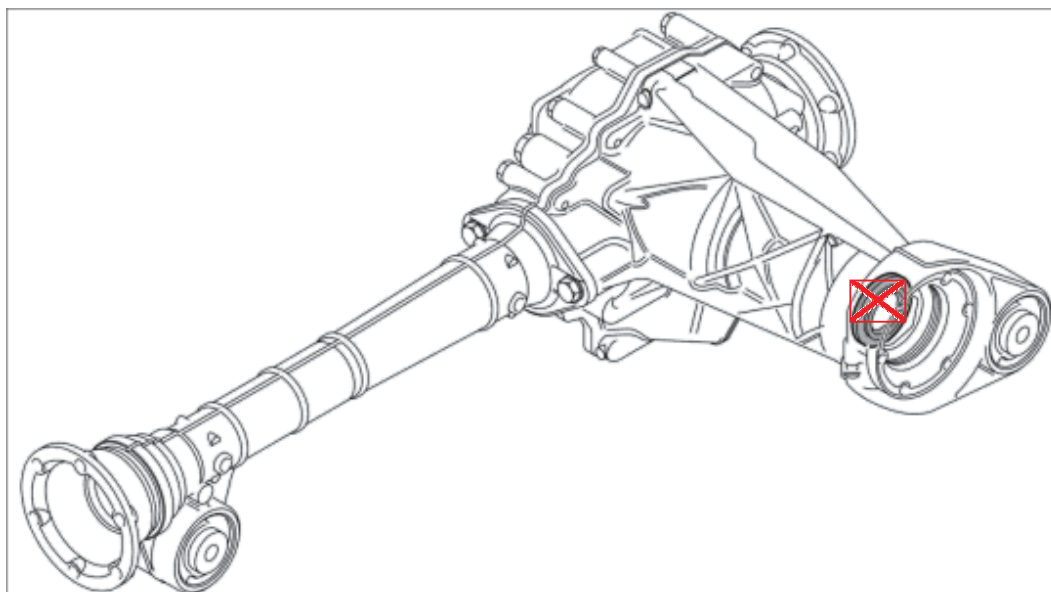
Preliminary work for cardan flange sealing ring

1. Remove engine guard → 108019 Removing and installing engine guard - chapter on "Removing".
2. Remove front cardan shaft → 390219 Removing and installing front cardan shaft - chapter on "Removing" [9PAAE1 9PAAF1 9PAAJ1]→ 390219 Removing and installing front cardan shaft - chapter on "Removing" [9PAAD1 9PAAD7 9PAAE7].

Removing sealing ring for cardan flange

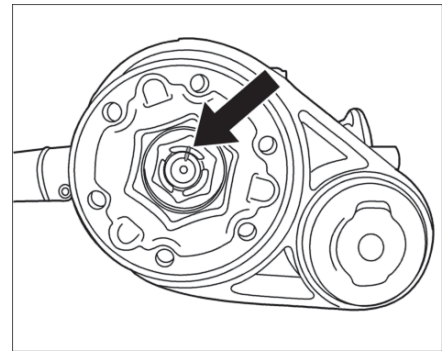
Removing sealing ring for cardan flange

Installation Location:



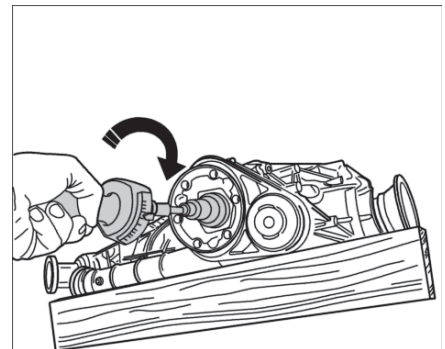
Overview of cardan flange sealing ring

1. Mark nut on drive flange with a coloured pen **-arrow-** .



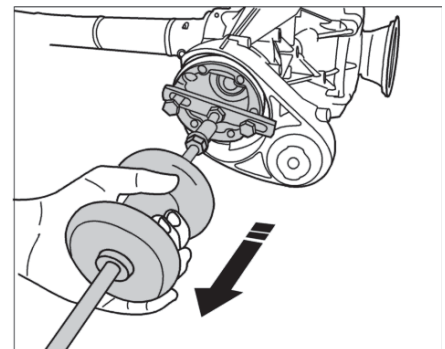
Marking nut

2. Determine rolling moment of axle transmission with special tool **torque screwdriver for measuring friction moment 89**. Push stop on special tool to zero and turn transmission several times. Note the displayed value.
3. Unscrew nut on drive flange. To do this, use the special tool **counterer 3435** to block the transmission → *Measuring rolling moment* .



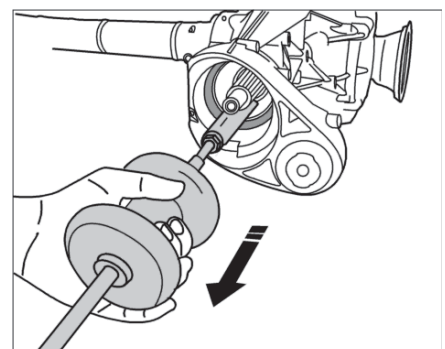
Measuring rolling moment

4. Remove drive flange with special tool **striker vw 771/1** and **shop-made tool** → *Removing drive flange* .



Removing drive flange

5. Remove sealing ring with special tool **striker vw 771/1** and **extraction tool vw 771/37**.

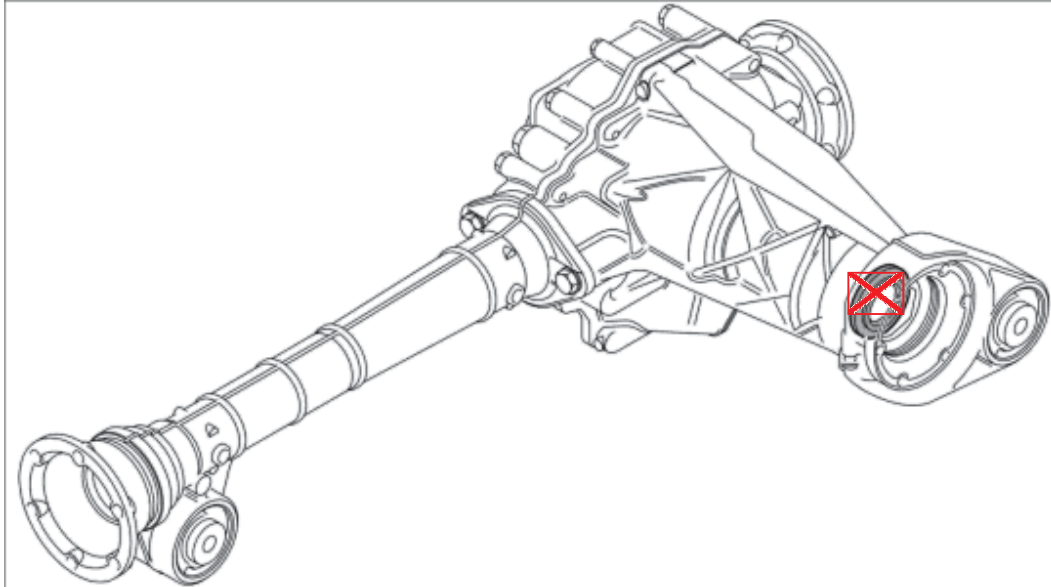


Removing sealing ring

Installing sealing ring for cardan flange

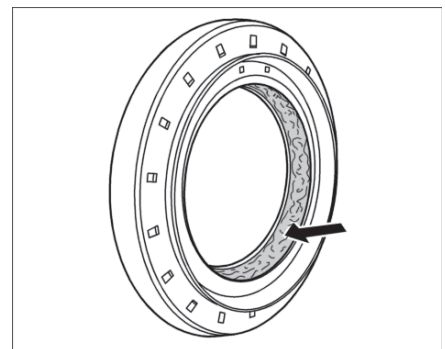
Installing sealing ring for cardan flange

Installation Location:



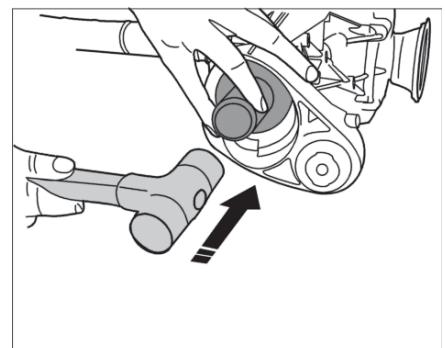
Overview of cardan flange sealing ring

1. Fill space between dust and sealing lips with grease.



Greased sealing ring

2. Drive sealing ring in as far as the mounting face with special tool **pressure piece T10183**.
3. Push in drive flange and tighten nut.



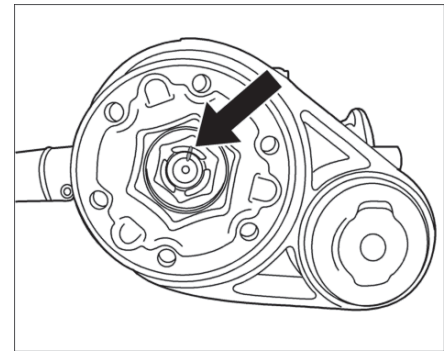
Driving in the sealing ring

4. Position marking on nut and drive shaft **-arrow-** again so that the rolling moment determined prior to removal is attained once again.



Note

- If the rolling moment has to be corrected, this should be done via the tightening torque of the nut.
5. Check rolling moment with special tool **torque screwdriver for measuring friction moment 89**.



Marking nut

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Rolling moment		Adjustment value	2.0 (1.5 ftlb.) Nm	+0.5 (0.5 ftlb.) Nm	

Subsequent work for sealing ring for cardan flange

Subsequent work on sealing ring for cardan flange

1. Install front cardan shaft → 390219 Removing and installing front cardan shaft - chapter on "Installing" [9PAAE1 9PAAF1 9PAAJ1]→ 390219 Removing and installing front cardan shaft - chapter on "Installing" [9PAAD1 9PAAD7 9PAAE7].
2. Carry out oil check. → 399035 Checking and topping up oil for all-wheel final drive - chapter on "Checking"
3. Install engine guard → 108019 Removing and installing engine guard - chapter on "Installing".

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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- Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.

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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

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ATTENZIONE

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→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

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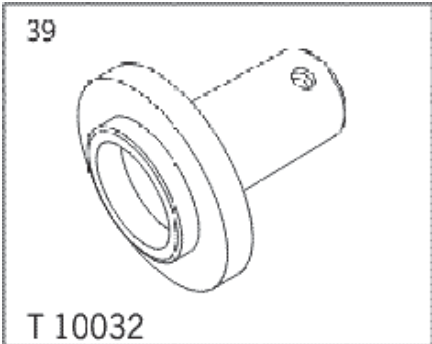
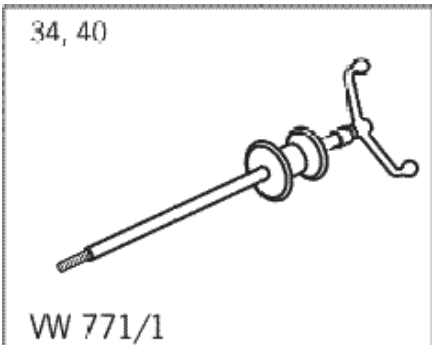
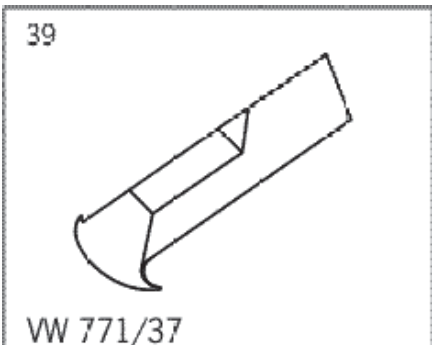
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39 59 19 Removing and installing sealing ring for output flange - as of MY 2003

- Preliminary work for output flange sealing ring
- Removing sealing ring for left and right output flange
- Installing sealing ring for left and right output flange
- Subsequent work for output flange sealing ring

Tools

Designation	Type	Number	Explanation	
shop-made tool	commercially available tool			 .gif
pressure piece	commercially available tool	t10032		

				
striker	commercially available tool	vw 771/1		
extraction tool	commercially available tool	vw 771/37		

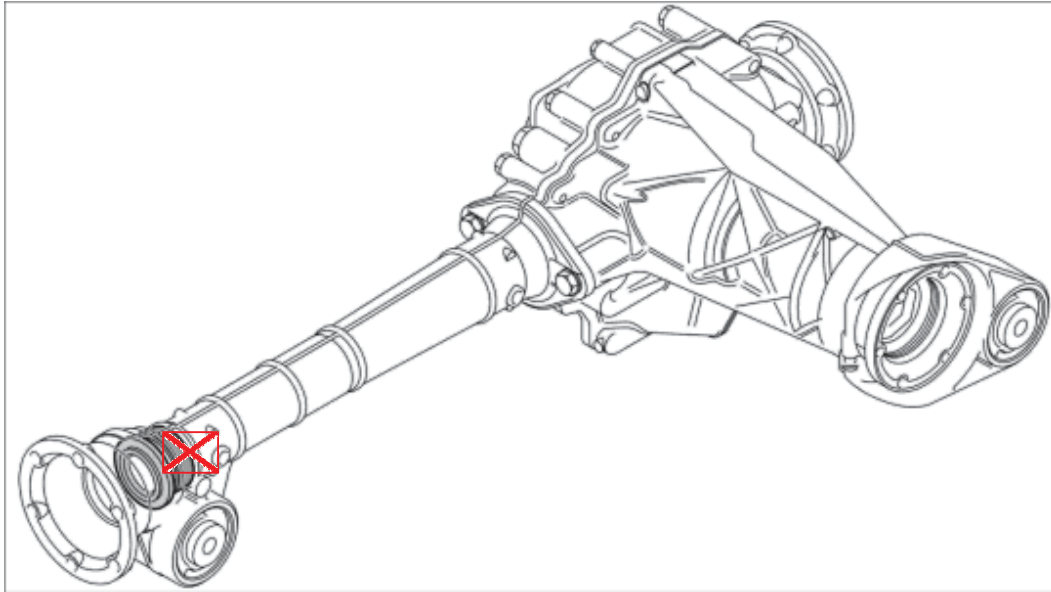
Preliminary work for output flange sealing ring

Preliminary work for output flange sealing ring

Removing sealing ring for left and right output flange

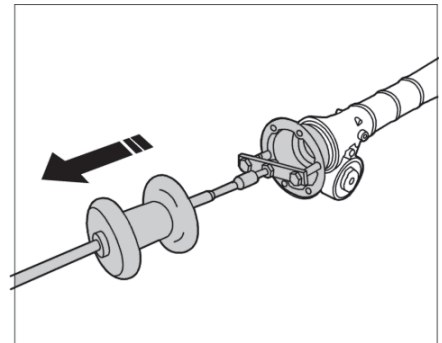
Removing sealing ring for left-hand output flange

Installation Location:

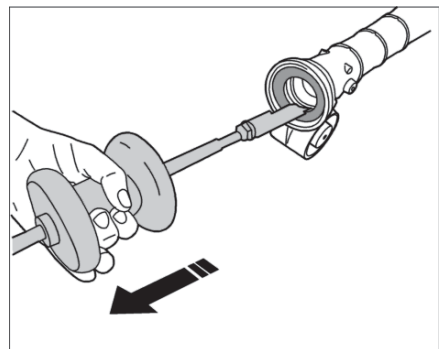


Overview of left sealing ring

1. Remove flanged shaft with special tool **striker vw 771/1** and **shop-made tool** .



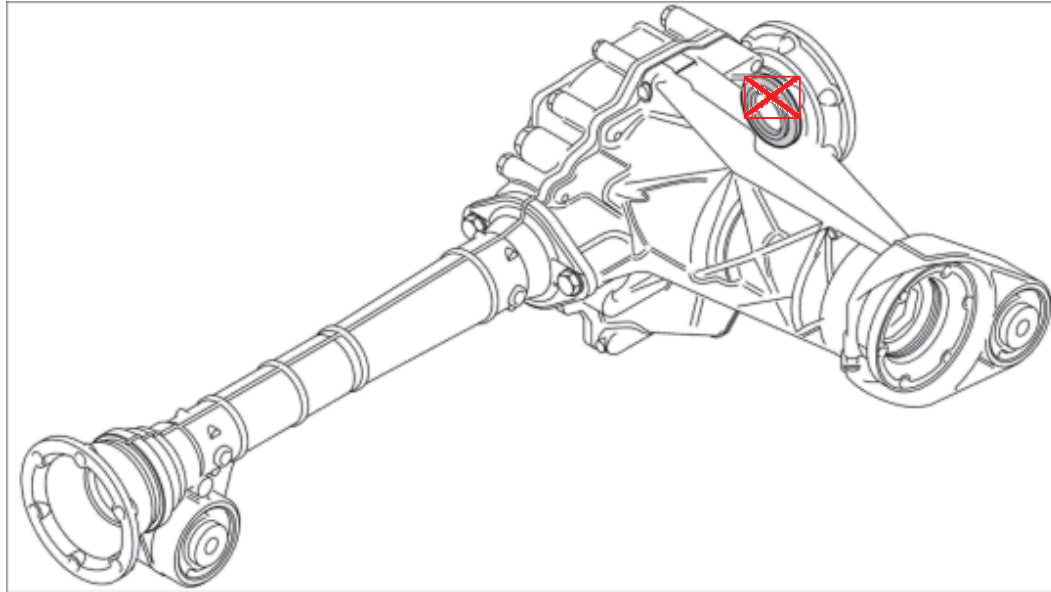
Removing flanged shaft



Removing sealing ring

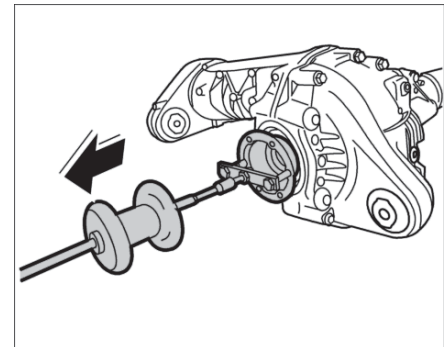
Removing sealing ring for right-hand output flange

Installation Location:



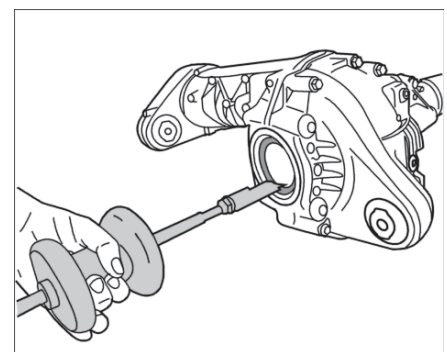
Overview of right sealing ring

1. Remove flanged shaft with special tool **striker vw 771/1** and **shop-made tool** .



Removing flanged shaft

2. Remove sealing ring with special tool **striker vw 771/1** and **extraction tool vw 771/37** attachment.

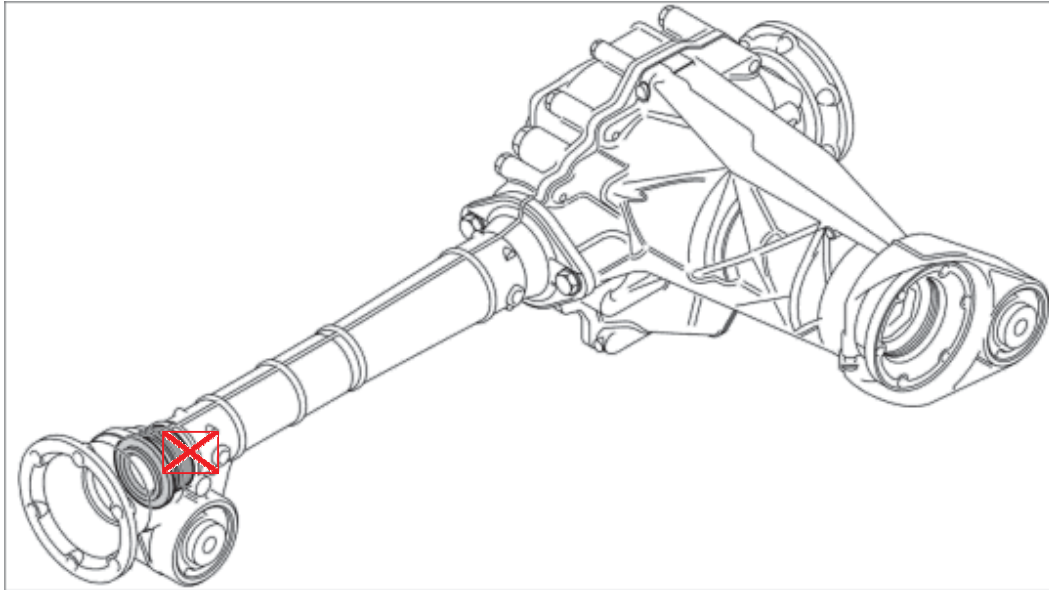


Removing sealing ring

Installing sealing ring for left and right output flange

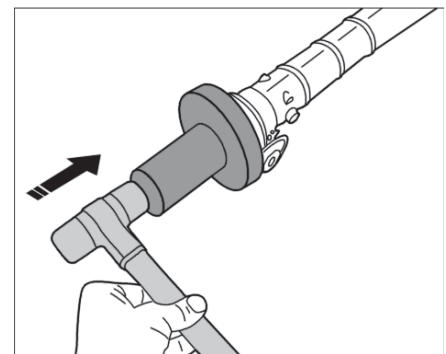
Installing sealing ring for left-hand output flange

Installation Location:



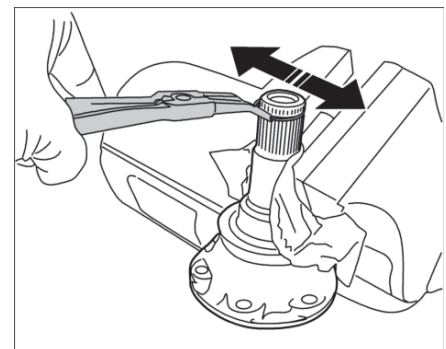
Overview of left sealing ring

1. Drive in sealing ring with special tool **pressure piece t10032**
→ *Installing sealing ring* until the special tool touches the transmission housing.



Installing sealing ring

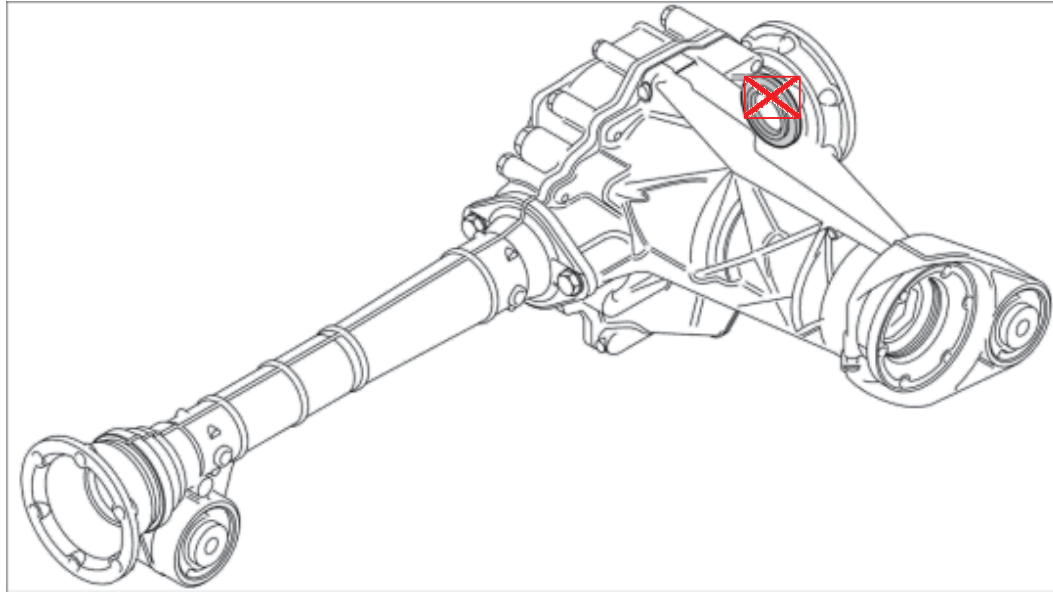
2. Replace circlip on end of long flanged shaft.



Example using the short flanged shaft

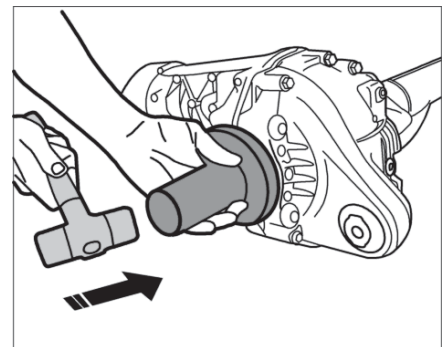
Installing sealing ring for right-hand output flange

Installation Location:



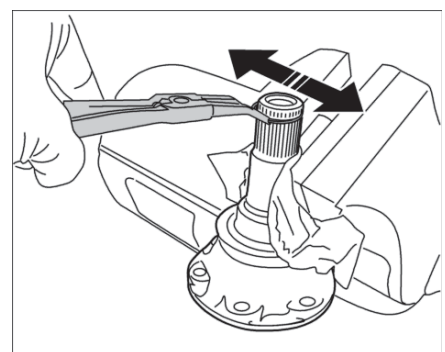
Overview of right sealing ring

1. Drive in sealing ring with special tool **pressure piece t10032** → *Installing sealing ring* until the special tool touches the transmission housing.



Installing sealing ring

2. Replace circlip on flanged shaft → *Replacing circlip* .
3. Push flanged shaft into transmission until it engages.



Replacing circlip

Subsequent work for output flange sealing ring

Subsequent work for output flange sealing ring

1. Install four-wheel final drive → 398819 Removing and installing four-wheel final drive - chapter on

"Installing".

2. Check oil for four-wheel final drive. → 399035 Checking and topping up oil for four-wheel final drive - chapter on "Checking"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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39 61 19 Removing and installing rubber mounting for four-wheel final drive - as of MY 2003

- Preliminary work for rubber mounting on four-wheel final drive
- Removing rubber mounting for four-wheel final drive
- Installing rubber mounting for four-wheel final drive
- Subsequent work for four-wheel final drive

Tools

Designation	Type	Number	Explanation	
workshop caliper gauge	commercially available tool	139		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
assembly fixture	special tool	9716 a/b		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
assembly fixture	commercially available tool	9716 a/b/c		

				PORSCHE siehe Handbuch Werkstattdausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work for rubber mounting on four-wheel final drive

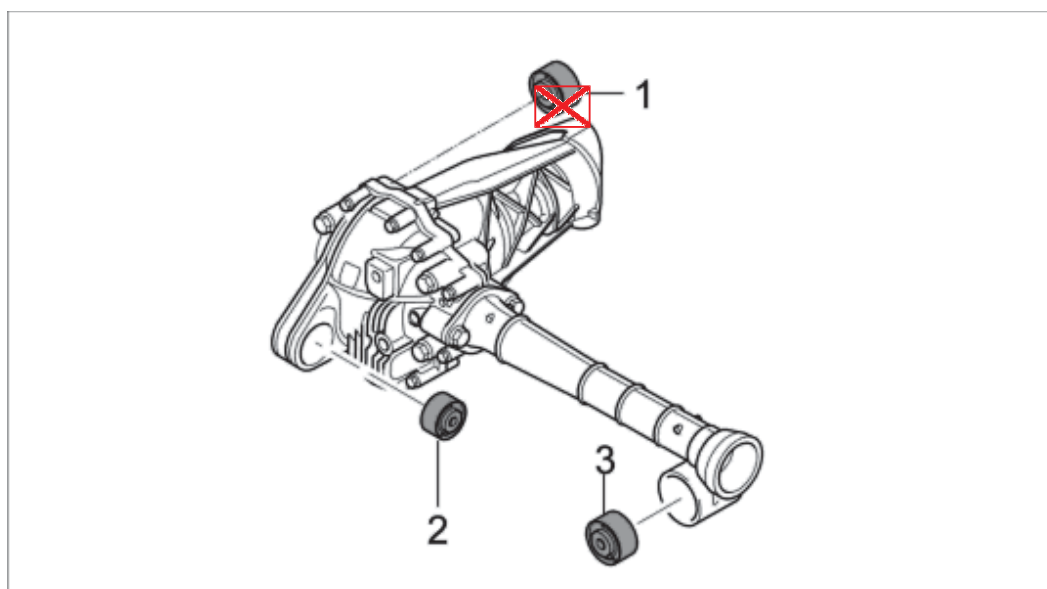
Preliminary work, rubber mounting on four-wheel final drive

1. Remove four-wheel final drive. → 398819 Removing and installing four-wheel final drive - "Removing" section

Removing rubber mounting for four-wheel final drive

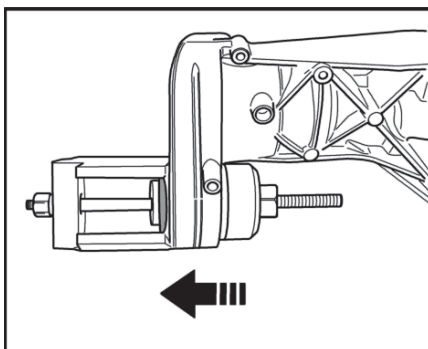
Removing rubber mounting for four-wheel final drive, drive side

Installation Location:

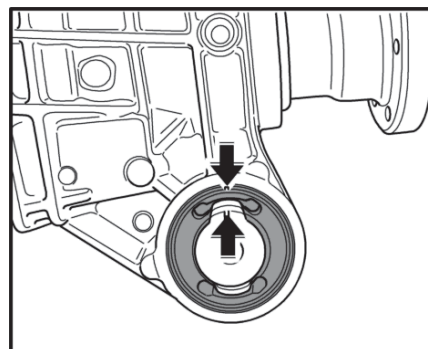


Rubber mounting, drive side -1-

1. Mark rubber mounting for transmission housing at the installation position **-arrow-** .



Removing rubber mounting, drive side

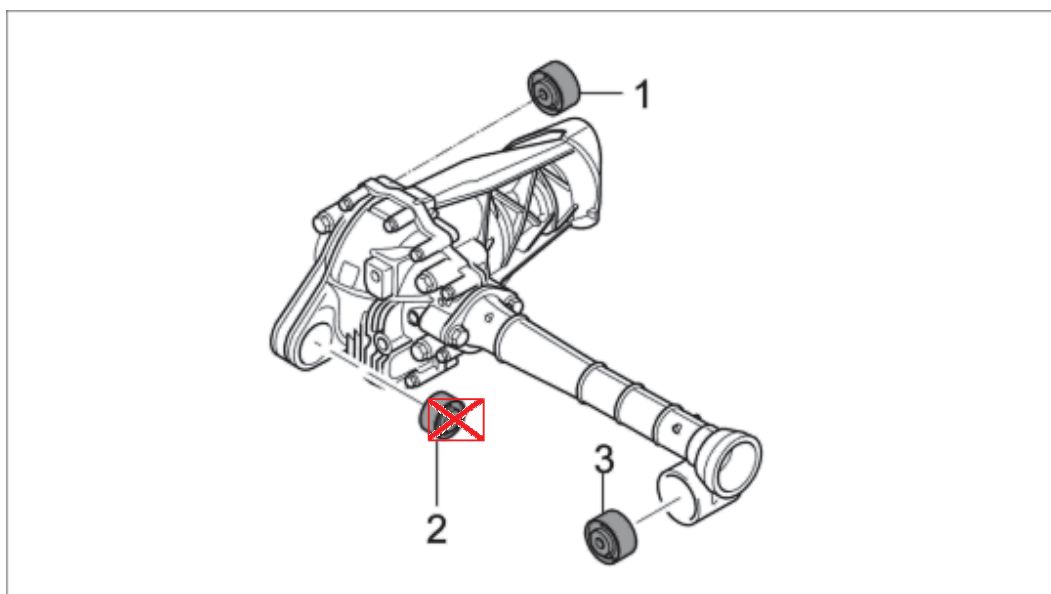


Marking for rubber mounting

2. Position special tool **assembly fixture 9716 a/b** on rubber mounting → *Removing rubber mounting, drive side* .
3. Remove rubber mounting on drive side **-arrow-** .

Removing rubber mounting for four-wheel final drive, right output side

Installation Location:

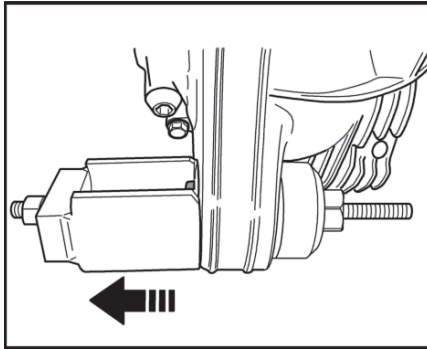


Rubber mounting for right output side **-2-**

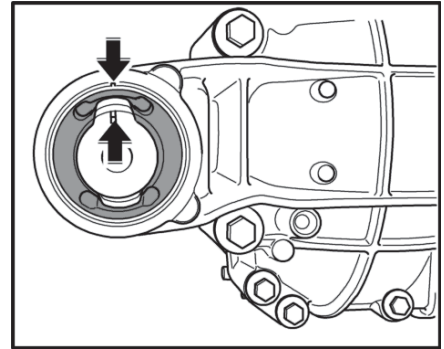
1. Mark rubber mounting for transmission housing at the installation position **-arrow-** .
2. Position special tool **assembly fixture 9716 a/b** on rubber mounting → *Removing right rubber mounting* .

Removing rubber mounting for four-wheel final drive, left output side

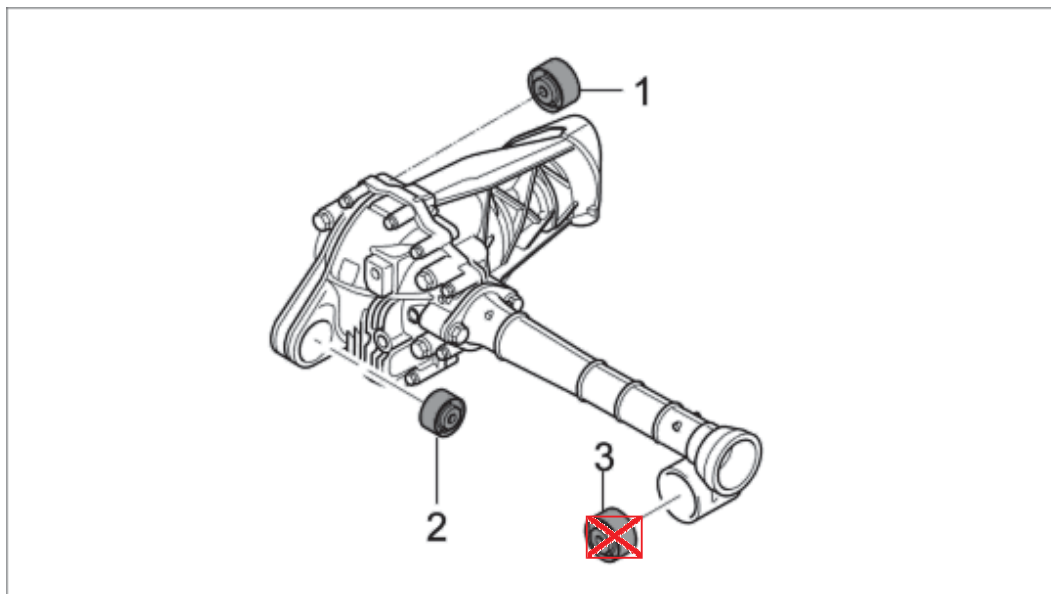
Installation Location:



Removing right rubber mounting

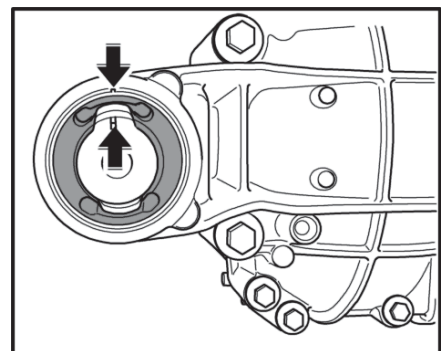


Marking for rubber mounting



Rubber mounting for left output side -3-

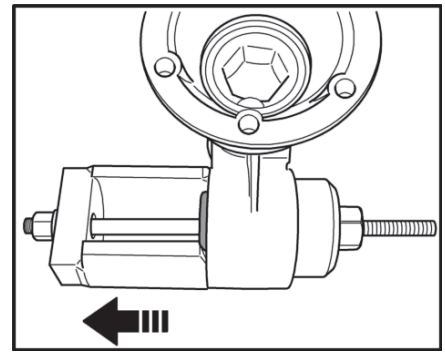
1. Mark rubber mounting for transmission housing at the installation position **-arrow-** .



Marking for rubber mounting

2. Position special tool **assembly fixture 9716 a/b** on rubber mounting → *Removing left rubber mounting* .
3. Remove left rubber mounting **-arrow-** .

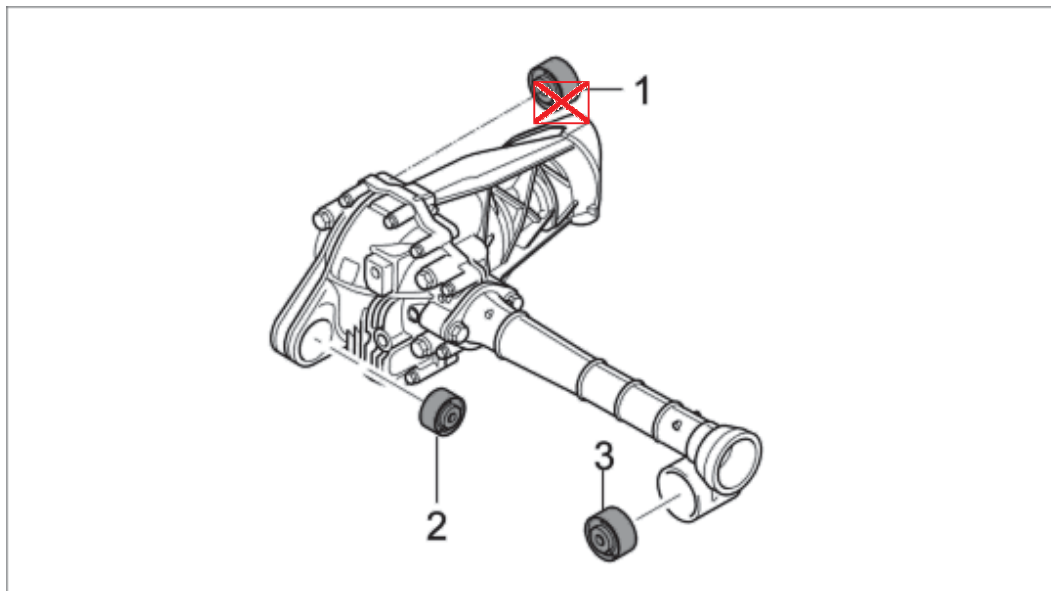
Installing rubber mounting for four-wheel final drive



Removing left rubber mounting

Installing rubber mounting for four-wheel final drive, drive side

Installation Location:



Rubber mounting, drive side -1-



Note

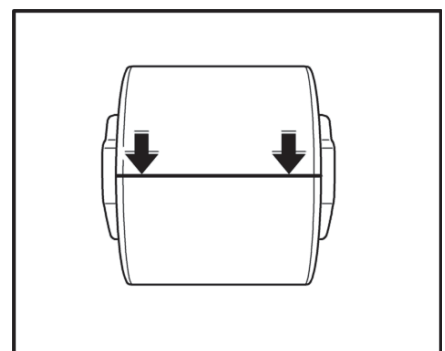
Noises in drive line

- *Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing*
- *Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing*

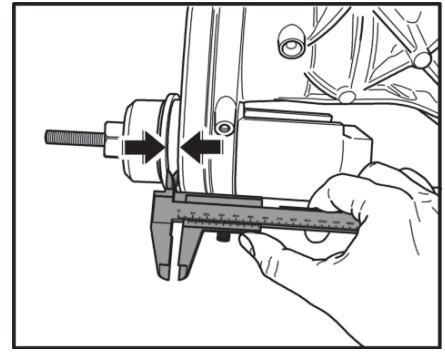
1. Mark centre of bulge in rubber mounting → [Marking for centre of rubber mounting](#) .

2. Position rubber mounting in housing using special tool **assembly fixture 9716 a/b/c**.

3. Pull in rubber mounting in direction of travel until installation position is reached. Measure distance between



Marking for centre of rubber mounting

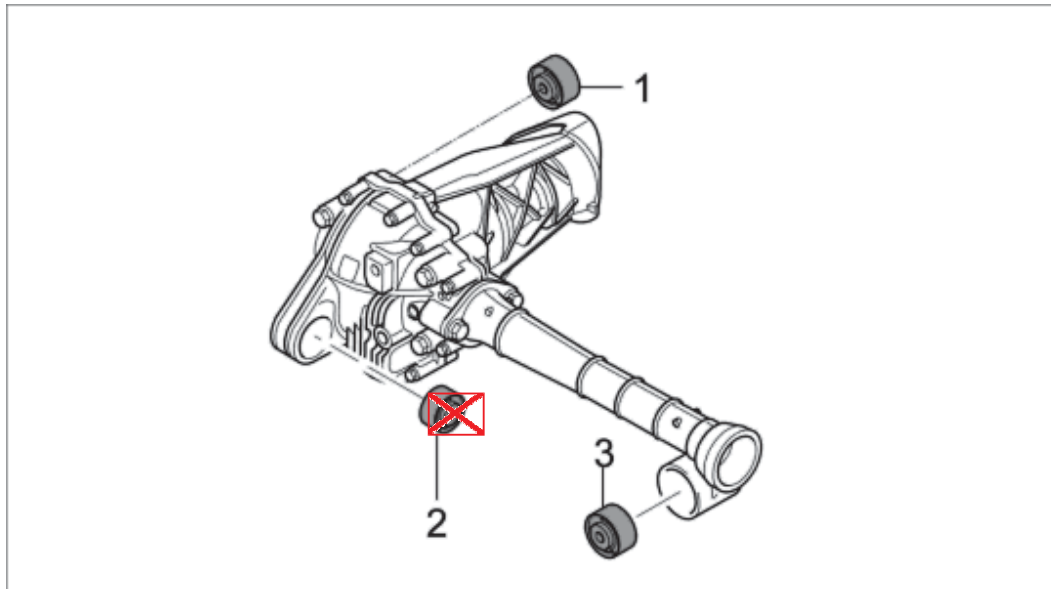


Installation position of rubber mounting

assembly fixture ring and housing using **workshop caliper gauge 139**. → **Distance: 7.5 mm +/-0.1 mm**

Installing rubber mounting for four-wheel final drive, right output side

Installation Location:



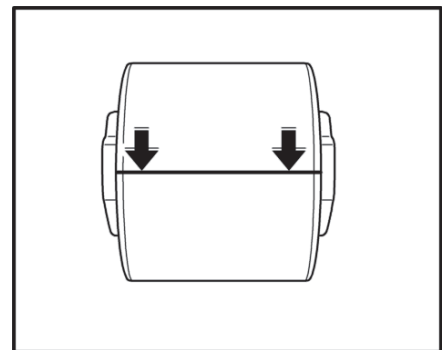
Rubber mounting for right output side -2-



Note

Noises in drive line

- Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing
- Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing



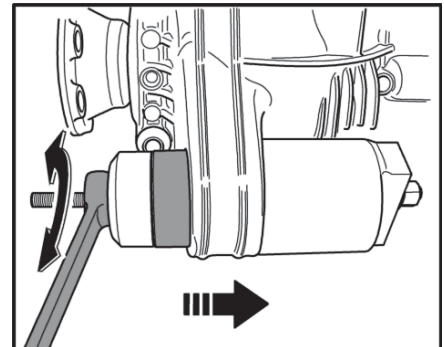
Marking for centre of rubber mounting



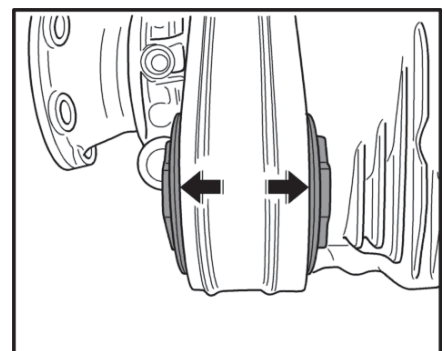
Note

Noises in drive line

- *Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing*
 - *Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing*
1. Mark centre of bulge in rubber mounting → [Marking for centre of rubber mounting](#) .
 2. Position special tool **assembly fixture 9716 a/b** on rubber mounting.
 3. Pull in rubber mounting until installation position is reached.



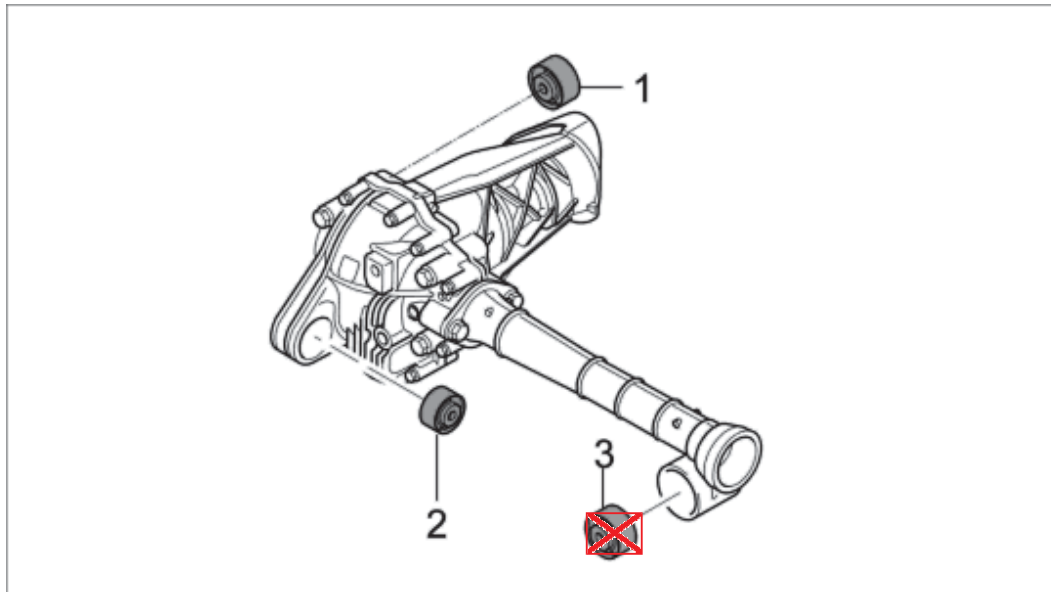
Installing rubber mounting



Installation position of rubber mounting

Installing rubber mounting for four-wheel final drive, left output side

Installation Location:



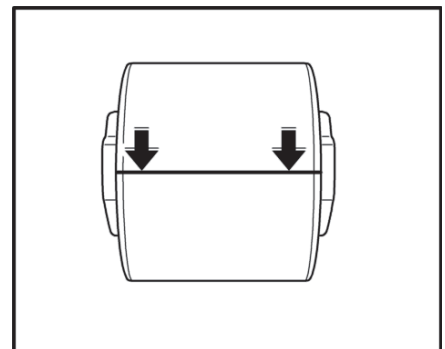
Rubber mounting for left output side -3-



Note

Noises in drive line

- Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing
- Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing



Marking for centre of rubber mounting



Note

Noises in drive line

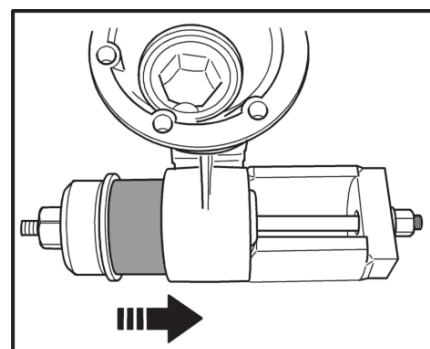
- Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing
- Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing

1. Mark centre of bulge in rubber mounting. **-arrows-**
2. Position special tool **assembly fixture 9716 a/b/c** on rubber mounting → *Positioning bearing* .
3. Press rubber mounting flush into housing. **-direction of arrow-**

Subsequent work for four-wheel final drive

Touching up, rubber mounting on four-wheel final drive

1. Install four-wheel final drive. → 398819 Removing and installing four-wheel final drive - "Installing" section



Positioning bearing

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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- If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.

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AVERTISSEMENT

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- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

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→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

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- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

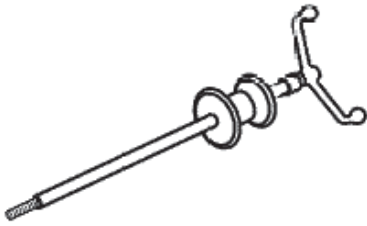
→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 61 19 Removing and installing rubber mounting for rear final drive - as of MY 2003

- Preliminary work
- Removing rubber mounting for rear final drive
- Installing rubber mounting for rear final drive
- Subsequent work

Tools

Designation	Type	Number	Explanation	
material	special tool	00000	shop-made tool	PORSCHE siehe Handbuch Werkstattdausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
assembly fixture	commercially available tool	9716 a/b		PORSCHE siehe Handbuch Werkstattdausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
assembly fixture	commercially available tool	9716 a/b/c		

				PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
striker	workshop equipment	VW 771/1		34, 40  VW 771/1

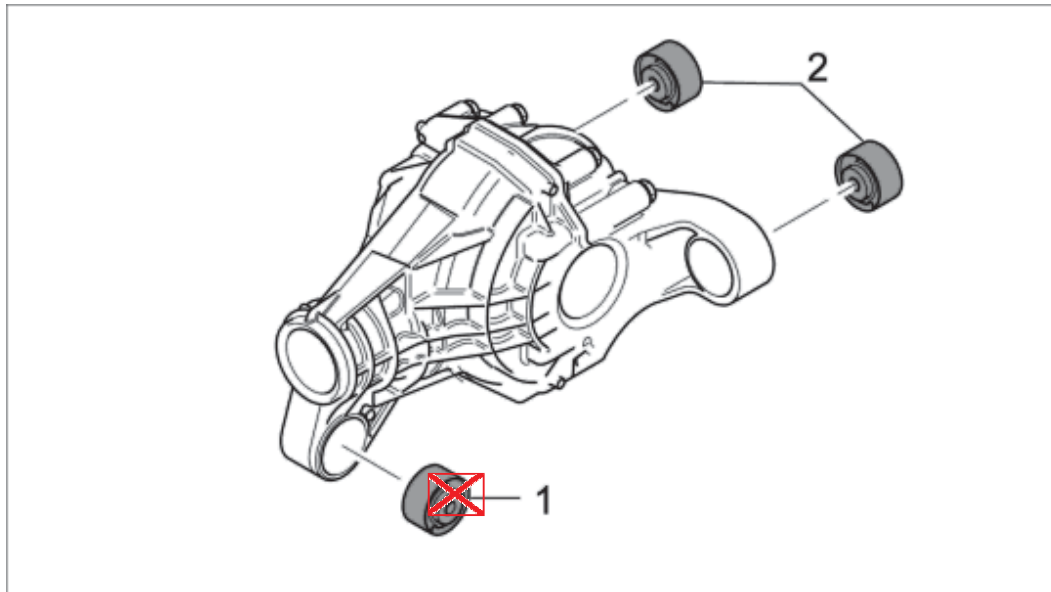
Preliminary work

Preliminary work, rubber mounting on rear final drive

Removing rubber mounting for rear final drive

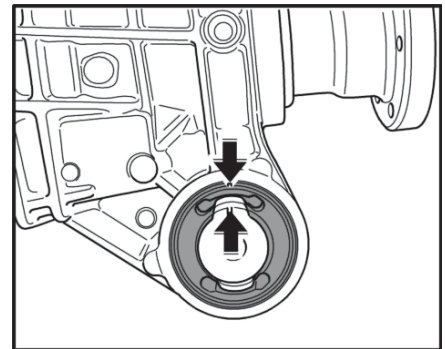
Removing rubber mounting for rear final drive, drive side

Installation Location:



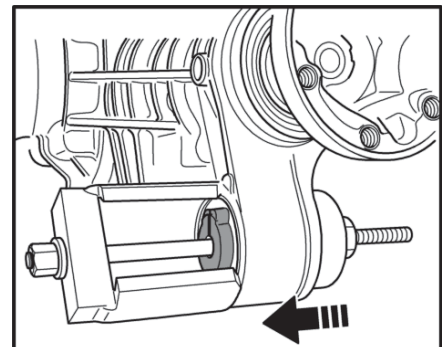
Rubber mounting, drive side **-1-**

1. Mark rubber mounting for transmission housing at the installation position **-arrow-** .



Marking for rubber mounting for housing

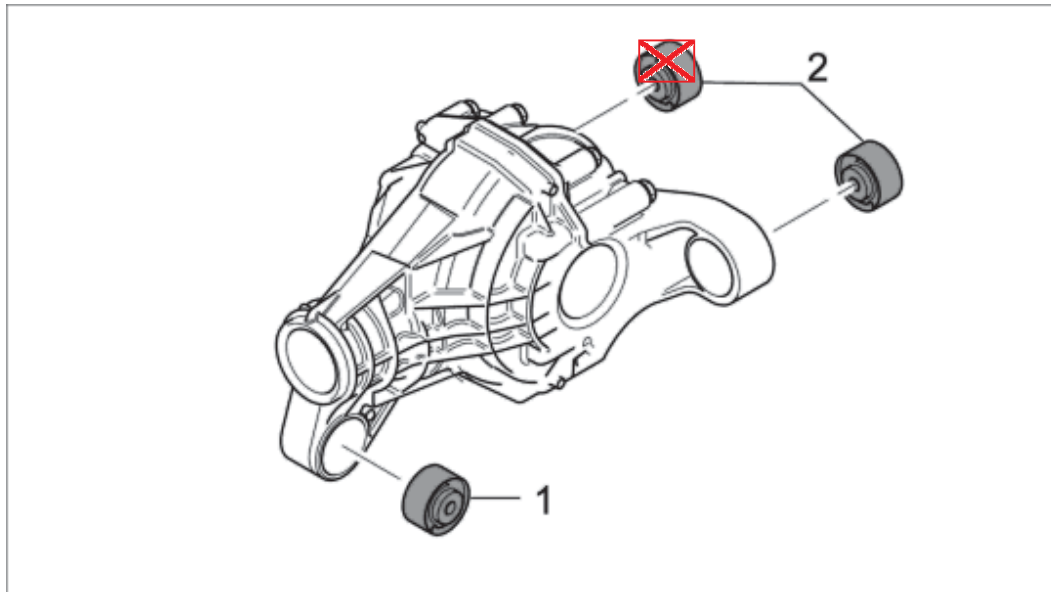
2. Position special tool **assembly fixture 9716 a/b** on rubber mounting
→ *Removal on drive side* .



Removal on drive side

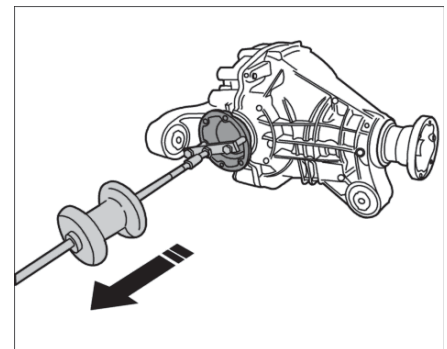
Removing rubber mounting for rear final drive, output side

Installation Location:



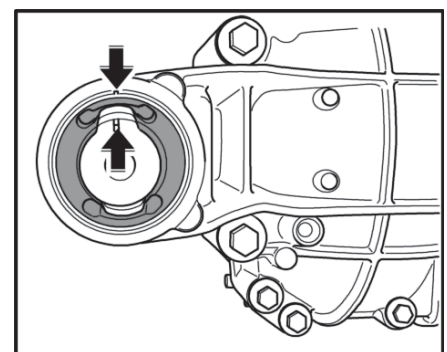
Rubber mounting for output side -2-

1. Remove output flange with special tool **striker VW 771/1** and **material 00000** -**direction of arrow**- .



Removing output flange

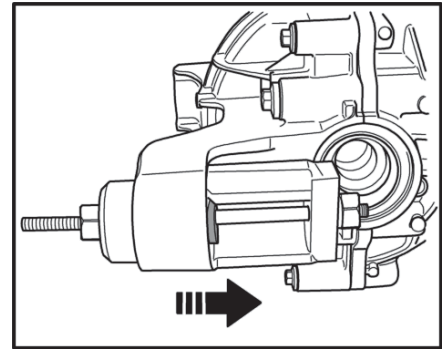
2. Mark rubber mounting for transmission housing at the installation position -**arrow**- .



Marking for rubber mounting

3. Position special tool **assembly fixture 9716 a/b** on rubber mounting → **Removing rubber mounting** .
4. Remove rubber mounting -**direction of arrow**- .

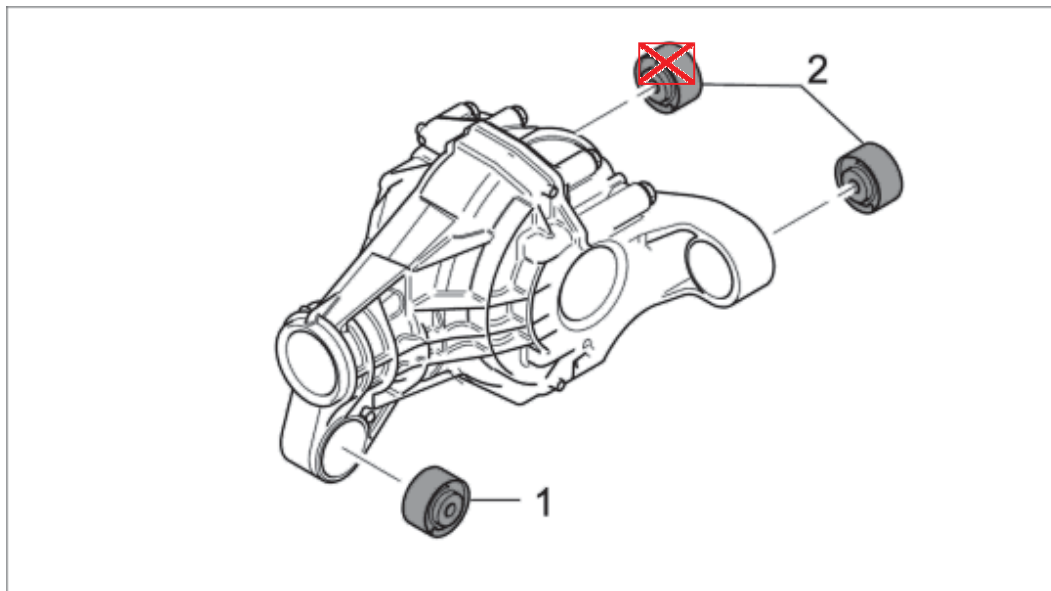
Installing rubber mounting for rear final drive



Removing rubber mounting

Installing rubber mounting for rear final drive, output side

Installation Location:



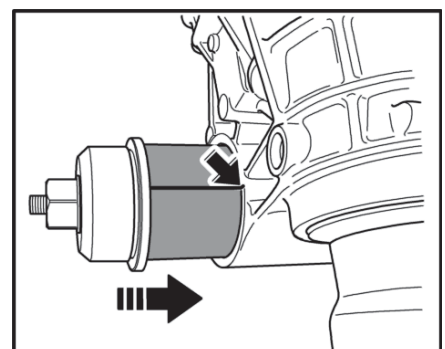
Rubber mounting for output side -2-



Note

Noises in drive line

- *Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing*
 - *Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing*
1. Position special tool **assembly fixture 9716 a/b/c** on rubber mounting and align the markings.
 2. Press rubber mounting flush → *see figure* into housing.



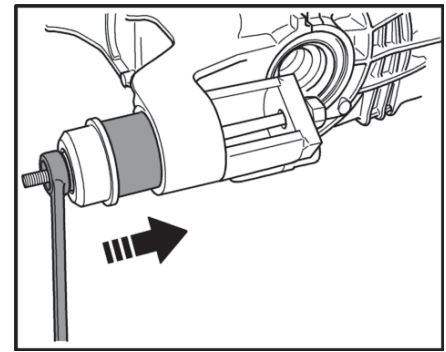


Note

Noises in drive line

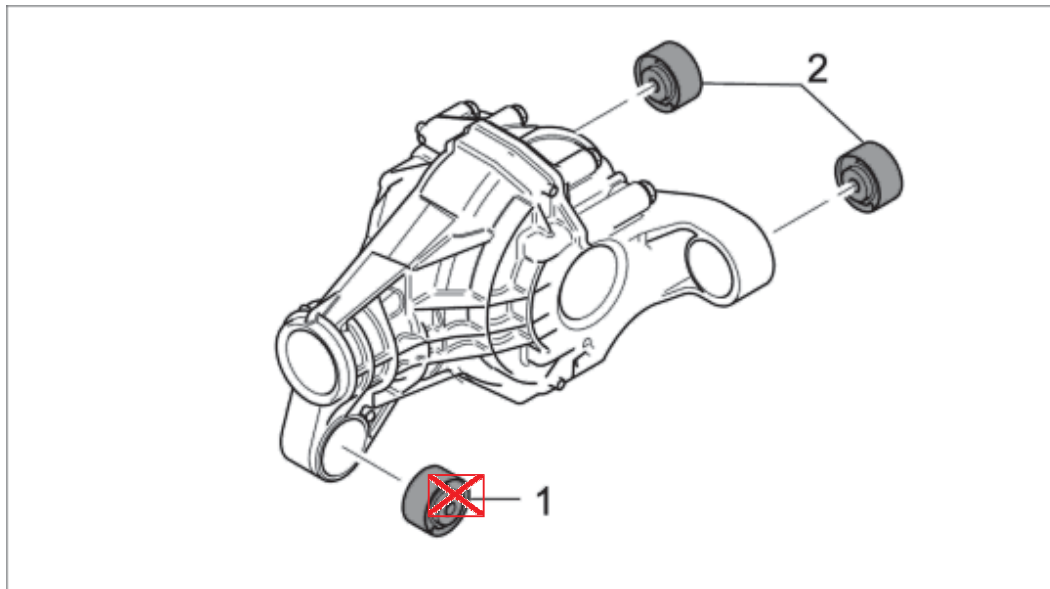
- *Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing*
- *Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing*

3. Install output flange.



Installing rubber mounting for rear final drive, drive side

Installation Location:



Rubber mounting, drive side -1-

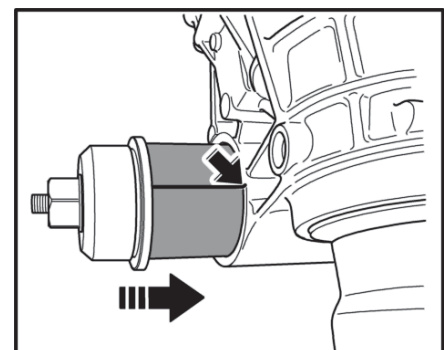


Note

Noises in drive line

- *Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing*
- *Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing*

1. Position special tool **assembly fixture 9716 a/b/c** on rubber mounting → [Installing rubber mounting on drive side](#) and align the markings.



Installing rubber mounting on drive side



Note

Noises in drive line

- *Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing*
 - *Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing*
2. Press rubber mounting flush **-direction of arrow-** into housing.

Subsequent work

Touching up, rubber mounting on rear final drive

1. Install rear final drive. → 390119 Removing and installing rear final drive - "Installing" section [9PAAD1 9PAAD7]→ 390119 Removing and installing rear final drive - "Installing" section [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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39 65 19 Removing and installing transfer box - as of MY 2003

- Preliminary work for transfer box
- Removing transfer box
- Installing transfer box
- Subsequent work for transfer box

Preliminary work for transfer box

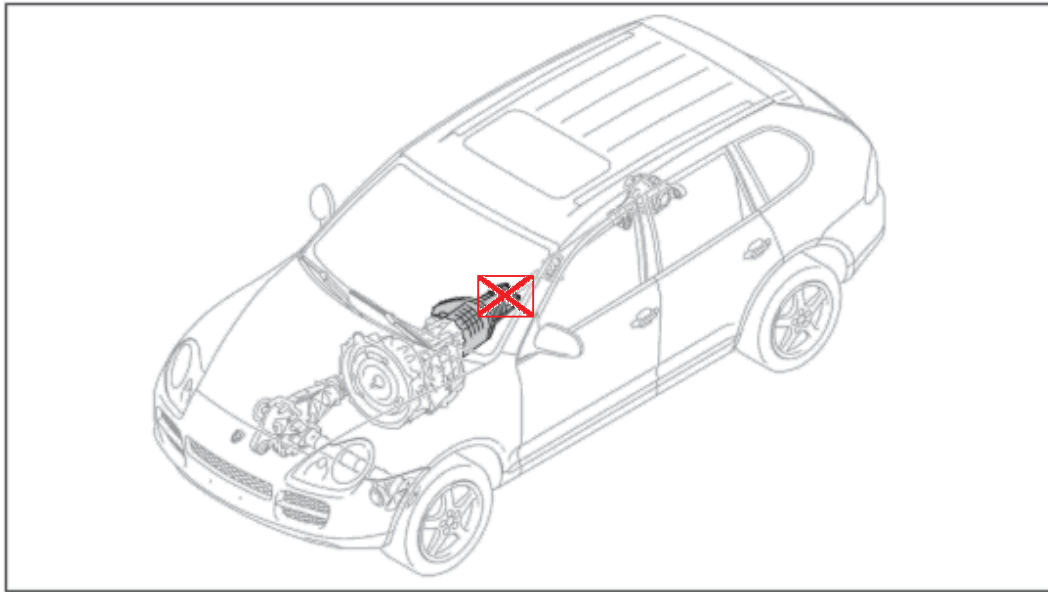
Preliminary work transfer box

1. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"

Removing transfer box

Removing transfer box

Installation Location:



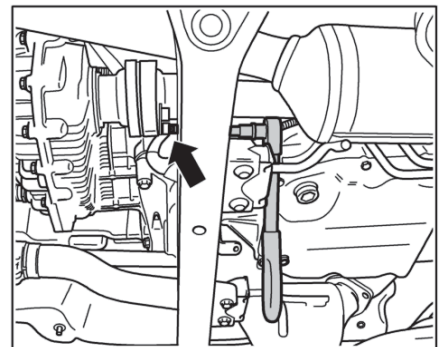
Overview of removing and installing transfer box



Note

- To unscrew the cardan shaft bolts, a second fitter should sit in the vehicle and block the drive train by actuating the foot brake.

1. Remove front cardan shaft on the transfer box and tie it up.



Front cardan shaft to transfer box

2. Remove cable plug on the servo motor **-1** , **2-** and release cable holder.

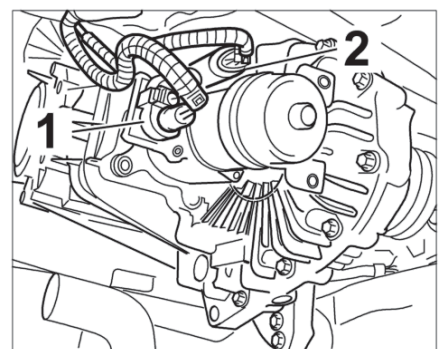


Note

Always observe the exact work sequence when installing/removing the transmission cross member.

3. Remove transmission cross member.

4. Support transmission with transmission jack and secure with retaining band.

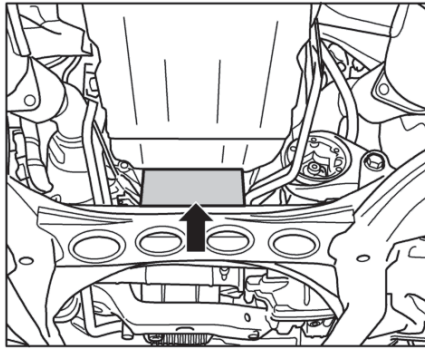


Cable plug on servo motor

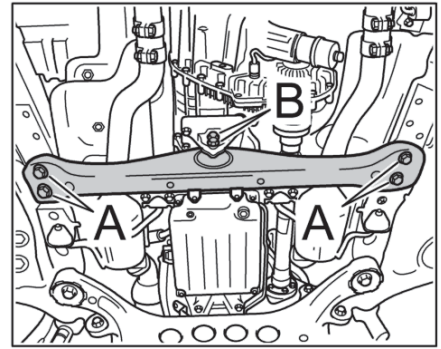
5. Unscrew bolts on body **-A-** .

6. Unscrew two transmission cross member screws **-B-** on transfer box holder.

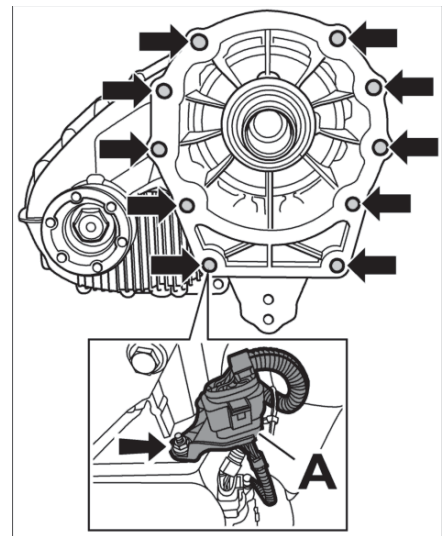
7. Place a wooden block **-arrow-** between the converter bell housing and suspension subframe.



Supporting transmission

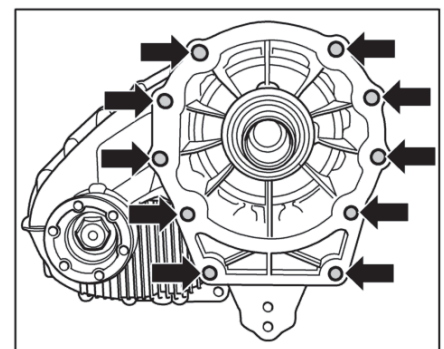


Transmission cross member



Tiptronic line holder

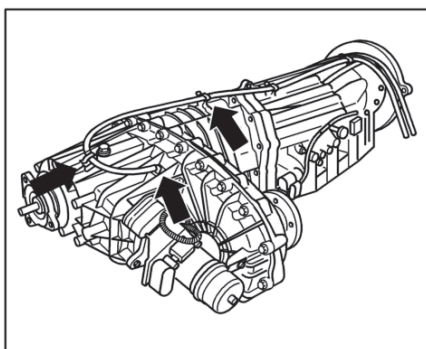
8. Unscrew fastening nut and push holder with Tiptronic line **-A-** away to the side.
9. Unscrew fastening screws **-arrows-** securing transfer box to main transmission.



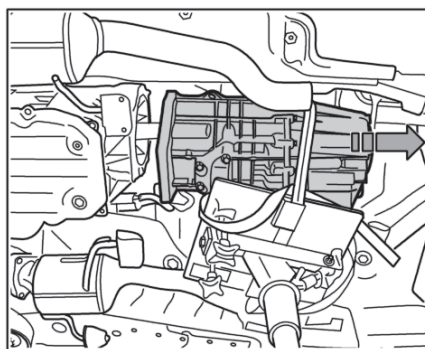
Transfer box to main transmission

10. Separate transfer box from main transmission.
11. Gradually drain transfer box. Pull out vent line **-arrows-** and remove it from the retainers on the upper side.

Installing transfer box



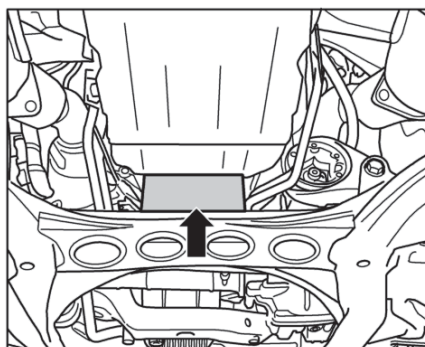
Vent line support



Removing transfer box

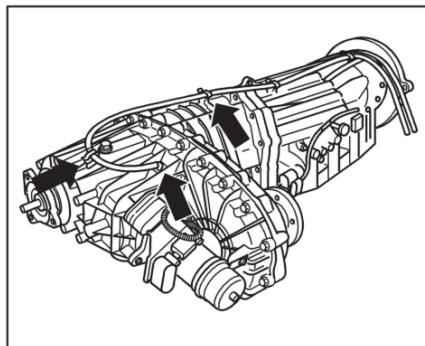
Installing transfer box

1. Support main transmission on converter bell housing with a wooden block **-arrow-** .



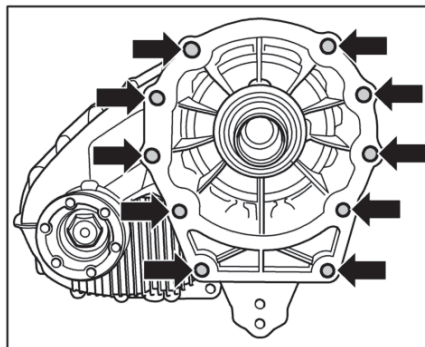
Supporting transmission

2. Gradually run in transfer box. Press vent line into holder **-arrow-** and attach to transfer box.



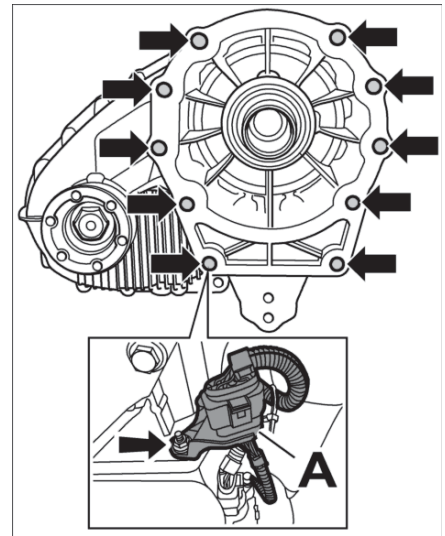
Vent line support

3. Screw in fastening screws on main transmission. → **Tightening torque: 33 ftlb.**



Transfer box to main transmission

4. Tighten holder **-A-** for Tiptronic line using fastening nut **-arrow-** . → **Tightening torque: 7.5 ftlb.**



Transfer box

5. Support transfer box with transmission jack and remove wooden block between converter bell housing and suspension subframe.



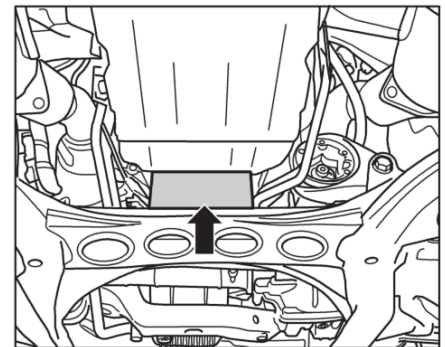
Note

Always observe the exact work sequence when installing/removing the transmission cross member.



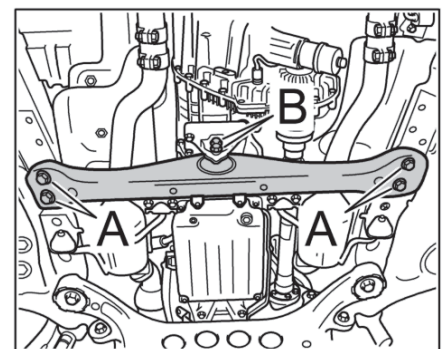
Note

- Screws which are tightened with a torque angle must be replaced with new ones.



Supporting transmission

6. Install transmission cross member.
7. Screw in two cross member screws -B- on transfer box holder. → **Initial tightening: 37 ftlb. → Final tightening: 90 °**
8. Screw in fastening screws for securing transmission cross member to body -A- . → **Initial tightening: 37 ftlb. → Final tightening: 90 °**



Transmission cross member

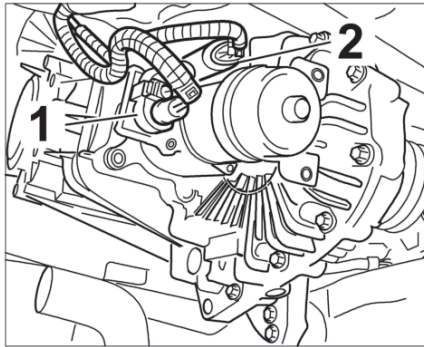


Note

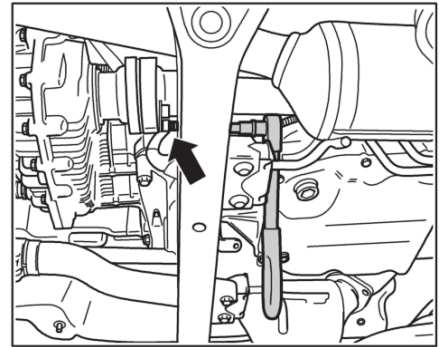
- Screws which are tightened with a torque angle must be replaced with new ones.

9. Connect front cardan shaft to transfer box. → **Initial tightening: 22 ftlb. → Final tightening: 90 °**

10. Connect cable plugs **-1 , 2-** to the transfer box and secure the cable holder.



Cable plug on servo motor



Front cardan shaft to transfer box

Subsequent work for transfer box

Reworking transfer box

1. Install cardan shaft. → 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAE1 9PAAE7 9PAAF1]→ 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAD1] → 393519 23 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAJ1]→ 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAD7]
2. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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ATTENZIONE

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ADVERTENCIA

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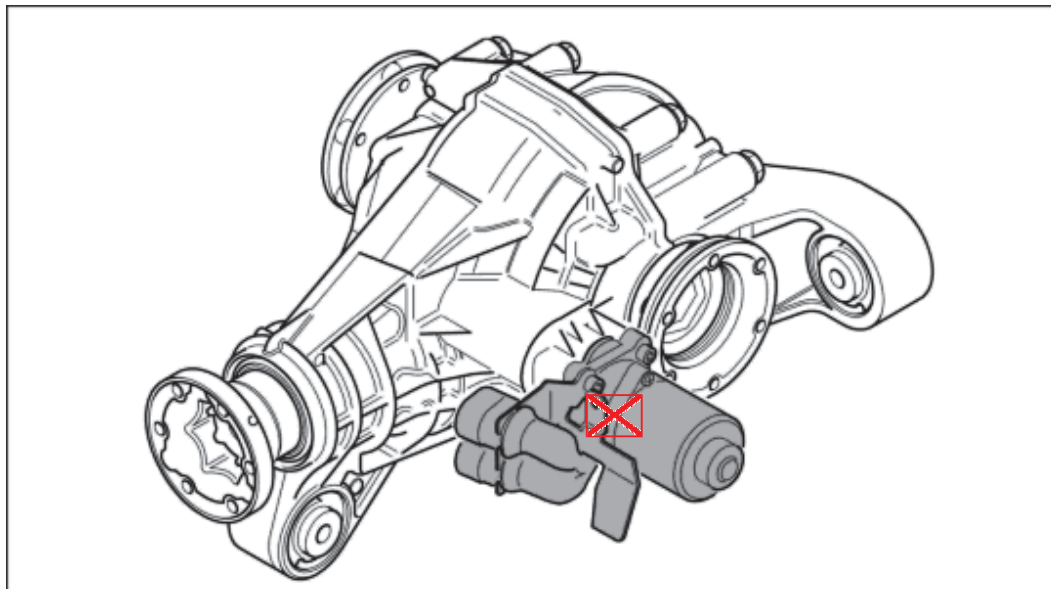
39 77 19 Removing and installing transverse lock servo motor - as of MY 2003

- [Removing transverse lock servo motor](#)
- [Installing transverse lock servo motor](#)
- [Subsequent work](#)

Removing transverse lock servo motor

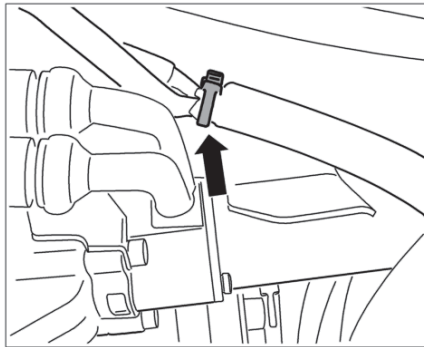
Removing transverse lock servo motor

Installation Location:

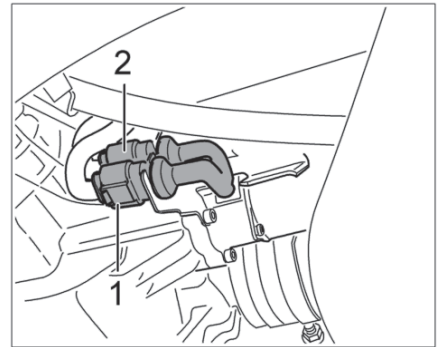


Overview of transverse lock servo motor

1. Pull cable plug -1, 2- off the servo motor.



Cable lead fastening



Electric plug on servo motor

2. Pull off fastening element **-arrow-** for cable lead and place lead aside.
3. Unscrew four fastening screws **-arrows-** on the servo motor.



ATTENTION

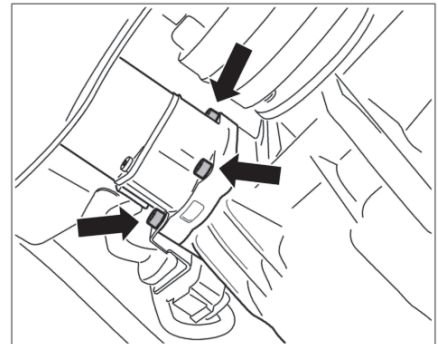
Emerging oil is harmful to the eyes.

→ Wear personal protective gear (e.g. safety goggles).



Note

- Avoid minor oil leaks when removing the servo motor.



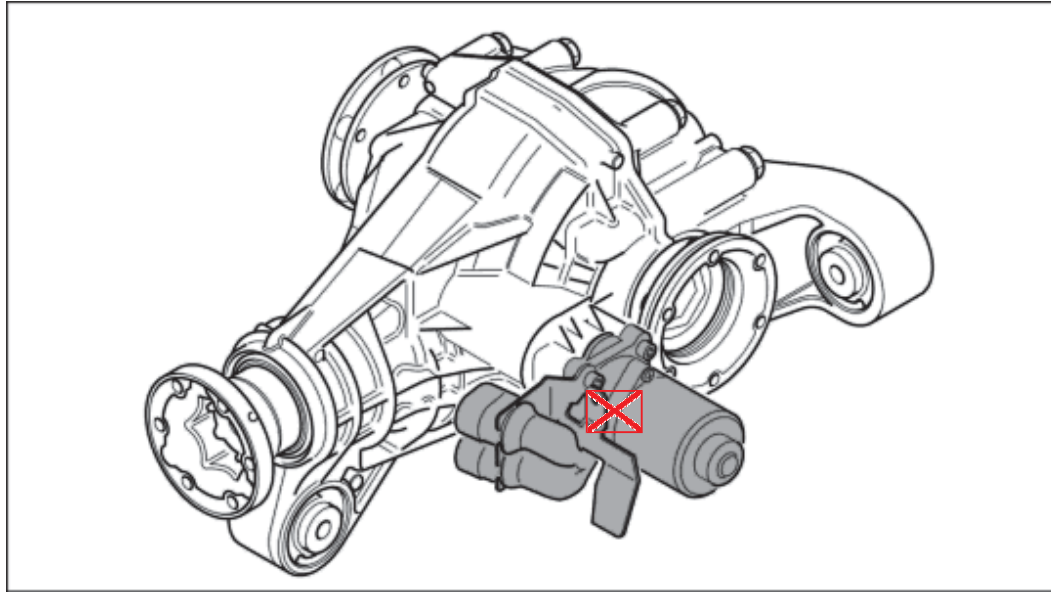
Servo motor fastening

4. Place oil collection container underneath.

Installing transverse lock servo motor

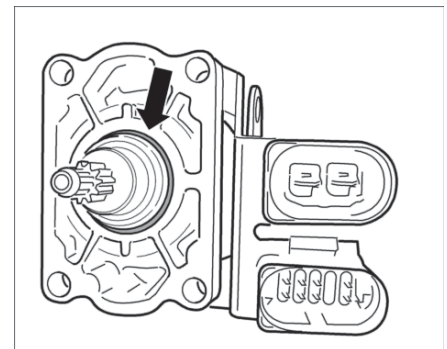
Installing transverse lock servo motor

Installation Location:



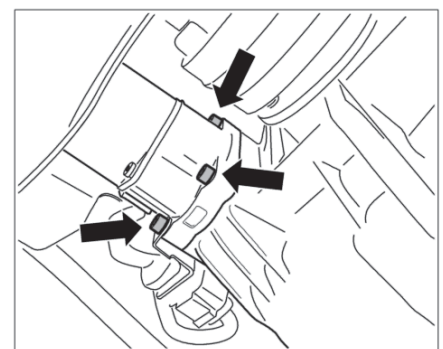
Overview of transverse lock servo motor

1. Replace sealing ring **-arrow-** on servo motor.
2. Install servo motor.



Sealing ring on servo motor

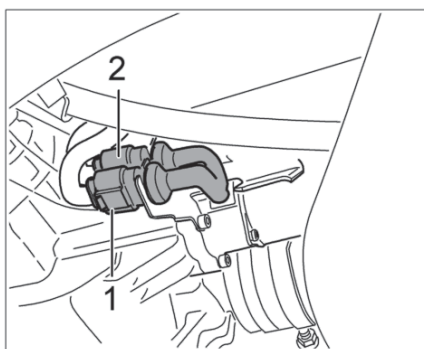
3. Screw in four screws **-arrows-** on servo motor. → **Tightening torque: 7.5 ftlb.**



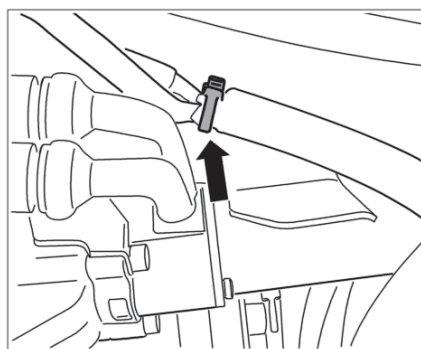
Servo motor fastening

4. Install fastening element **-arrow-** for cable lead.
5. Connect cable plug **-1, 2-** to servo motor.

Subsequent work



Electric plug on servo motor



Cable lead fastening

Subsequent work for servo motor for differential lock

1. Check the oil in the final drive. → 399035 Checking and topping up oil for rear final drive

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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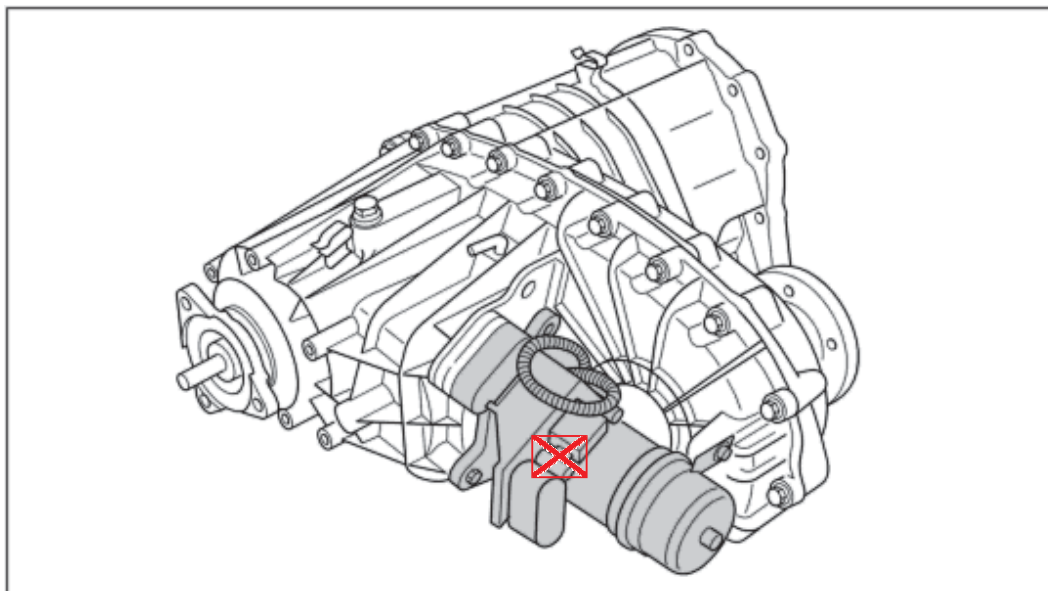
39 78 19 Removing and installing servo motor on transfer box - as of MY 2003

- [Removing servo motor on transfer box](#)
- [Installing servo motor on transfer box](#)

Removing servo motor on transfer box

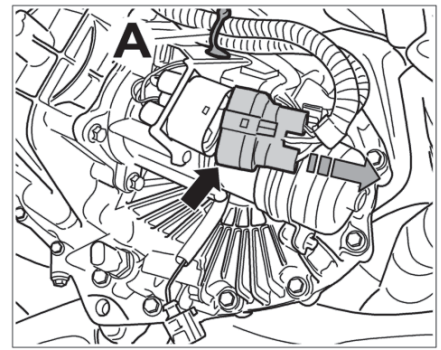
Removing servo motor on transfer box

Installation Location:



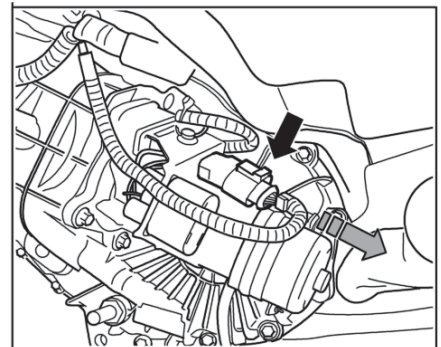
Overview of servo motor

1. Before beginning to work on the servo motor for the transfer box, engage the Low Range offroad driving program.
2. Disconnect Low Range cable plug **-arrow-** on the servo motor and loosen cable holder **-A-**.



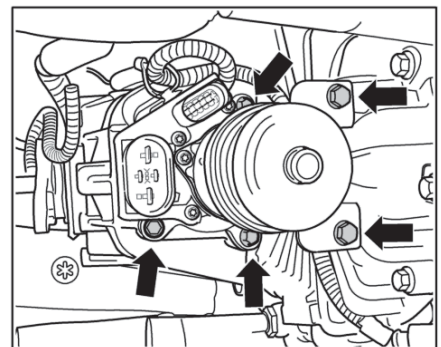
Low Range cable plug

3. Pull centre-differential lock cable plug **-arrow-** off the servo motor.



Centre-differential lock cable plug

4. Unscrew servo motor threaded joint on the transfer box.

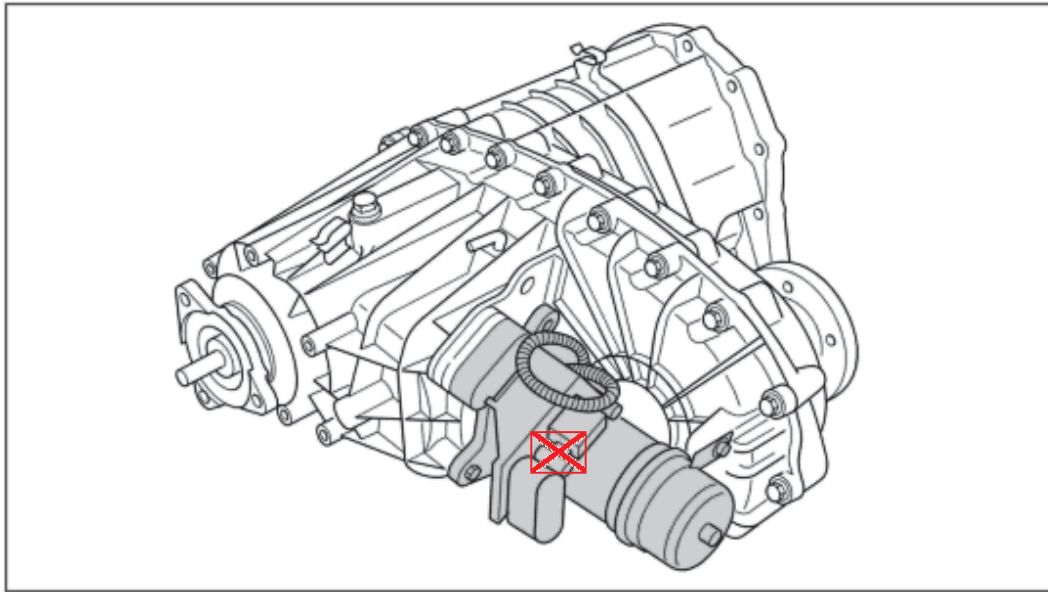


Threaded joint for servo motor

Installing servo motor on transfer box

Installing servo motor on transfer box

Installation Location:

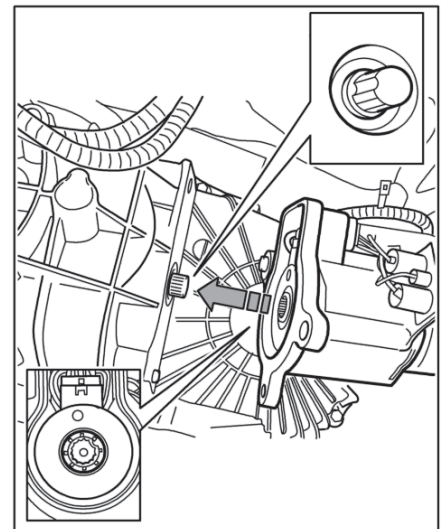


Overview of servo motor



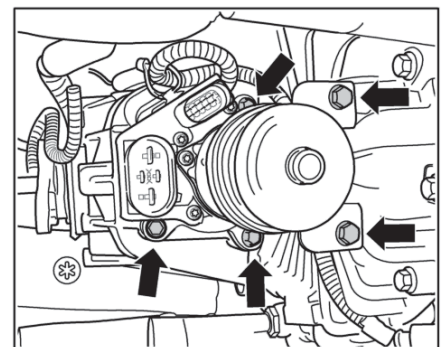
Note

- If a new servo motor is installed, it is supplied in Low Range position, offroad driving program.
1. Connect servo motor to the shaft on the transfer box. Position cutout of the shaft **-right inset-** to the servo motor **-left inset-**.
 2. Screw in servo motor threaded joint **-arrows-** on the transfer box. → **Tightening torque: 20 ftlb.**



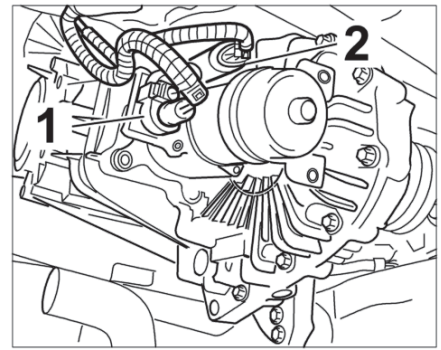
Positioning the servo motor

3. Screw in servo motor threaded joint support **-arrows-** on the transfer box. → **Tightening torque: 7.5 ftlb.**



Threaded joint for servo motor

4. Connect centre-differential lock cable plug **-2-**, Low Range **-1-** and secure cable holder.



Cable plug for servo motor

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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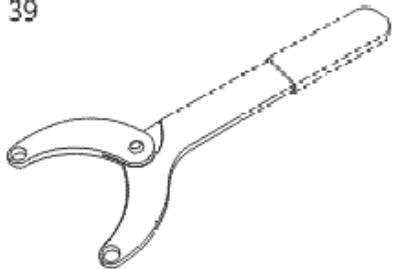
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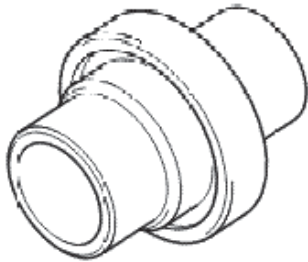
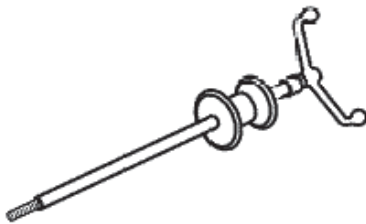
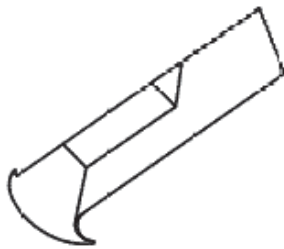
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39 82 19 Removing and installing sealing ring for cardan flange (rear final drive) - as of MY 2003

- Preliminary work for sealing ring for cardan flange
- Removing sealing ring for cardan flange
- Installing sealing ring for cardan flange
- Subsequent work for sealing ring for cardan flange

Tools

Designation	Type	Number	Explanation	
shop made tool	special tool	00000		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
arm bracket	special tool	3435		39  3435
torque screwdriver for measuring friction moment	commercially available tool	NR.89		

				PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
pressure piece	special tool	T10182		39  T10182
striker	workshop equipment	VW 771/1		34, 40  VW 771/1
extraction tool	workshop equipment	VW 771/37		39  VW 771/37

Preliminary work for sealing ring for cardan flange

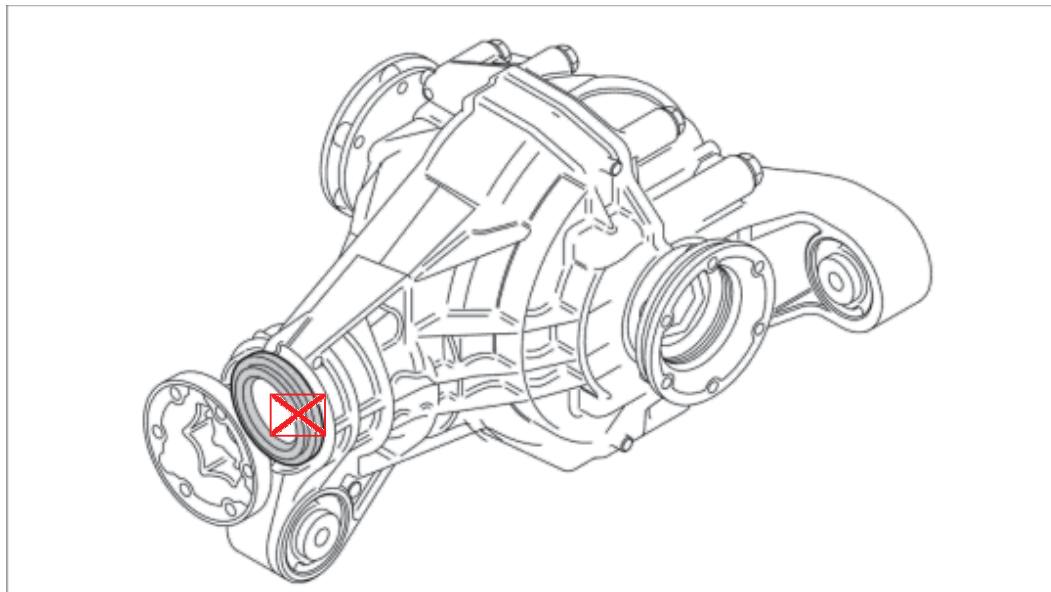
Preliminary work for sealing ring for cardan flange

1. Remove rear cardan shaft. → 390119 Removing and installing rear final drive - chapter on "Removing" [9PAAD1 9PAAD7] → 390119 Removing and installing rear final drive - chapter on "Removing" [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]

Removing sealing ring for cardan flange

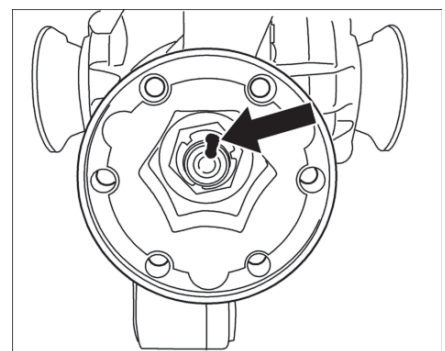
Removing sealing ring for cardan flange

Installation Location:



Overview of cardan flange sealing ring

1. Mark position of nut on drive flange **-arrow-** at shaft.



Marking of nut on drive flange

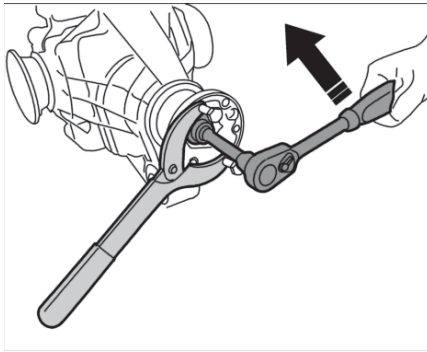
2. Check rolling moment of rear final drive with special tool **torque screwdriver for measuring friction moment NR.89** **-picture-** and note value.



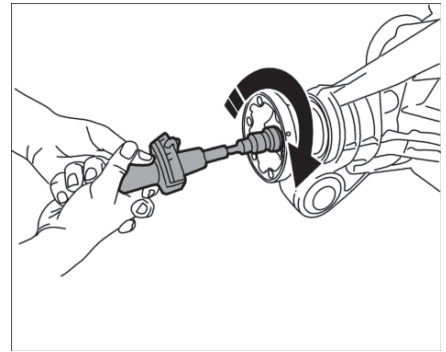
Note

- A second fitter is required for loosening/tightening the flange

3. Unscrew nut on drive flange.
To do this, block flange with
special tool **arm bracket**
3435.

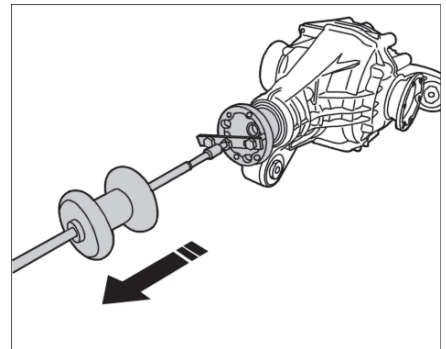


Loosening nut on drive flange

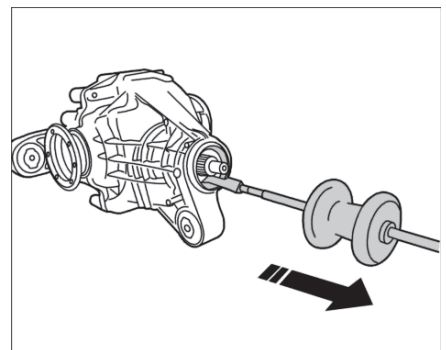


Checking rolling moment

4. Remove drive flange with special tool **shop made tool 00000** and
striker VW 771/1.



Removing drive flange

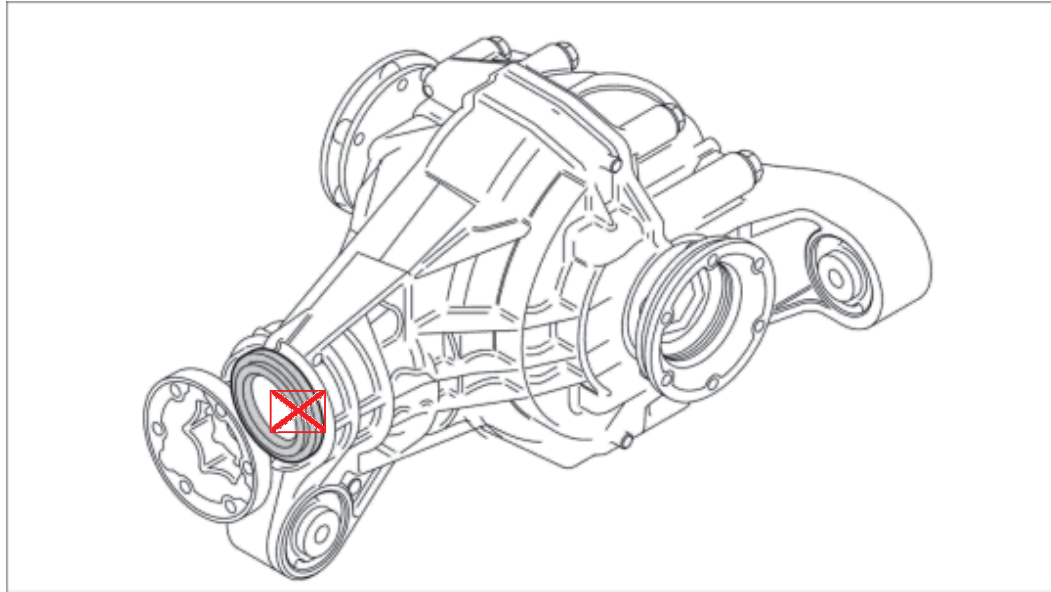


Removing sealing ring

Installing sealing ring for cardan flange

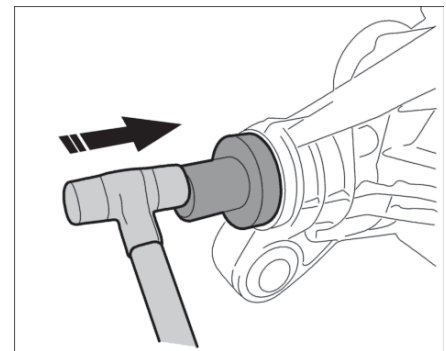
Installing sealing ring for cardan flange

Installation Location:



Overview of cardan flange sealing ring

1. Drive in sealing ring with special tool **pressure piece T10182** **-picture-** until special tool touches transmission housing.
2. Push in flange and screw in nut.

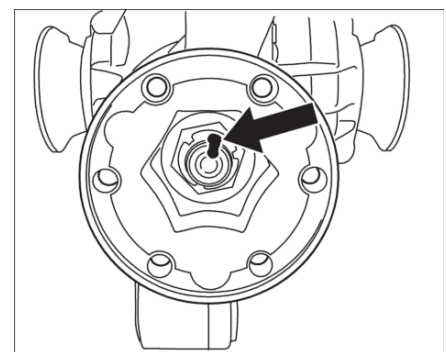


Installing sealing ring



Note

- A second fitter is required for loosening/tightening the flange
3. Position marking on nut and drive shaft **-arrow-** again so that the rolling moment determined prior to removal is reached once again.

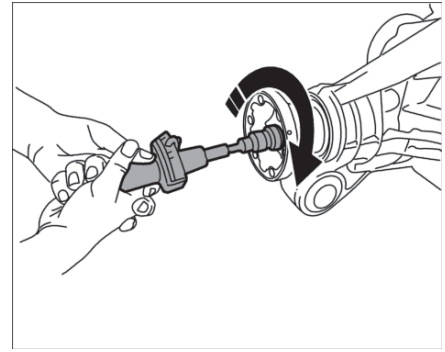


Marking nut on drive flange



Note

- If the rolling moment has to be corrected, this should be done via the tightening torque of the nut.
4. Check rolling moment with special tool **torque screwdriver for measuring friction moment NR.89**. → **Rolling moment: 2.0 ftlb. -0.2 ftlb. +0.2 ftlb.**



Checking rolling moment

Subsequent work for sealing ring for cardan flange

Touching up sealing ring for cardan flange

1. Install rear cardan shaft. → 390119 Removing and installing rear final drive - chapter on "Installing" [9PAAD1 9PAAD7] → 390119 Removing and installing rear final drive - chapter on "Installing" [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]
2. Check the oil in the final drive. → 399035 Inspecting and adding oil for rear final drive - chapter on "Checking"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

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WARNING

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AVERTISSEMENT

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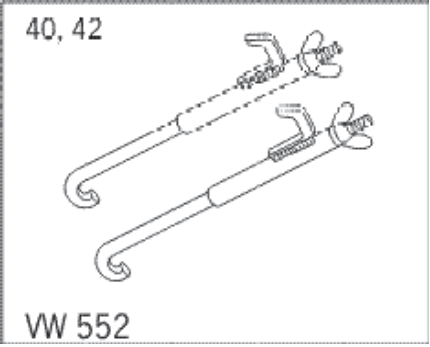
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39 88 19 Removing and installing four-wheel final drive - as of MY 2003

- Preliminary work for all-wheel final drive
- Removing four-wheel final drive
- Installing four-wheel final drive
- Subsequent work for four-wheel final drive

Tools

Designation	Type	Number	Explanation	
multiple-tooth socket wrench insert M12	commercially available tool	NR.31		
spring compressor	workshop equipment	VW 552		

Preliminary work for all-wheel final drive

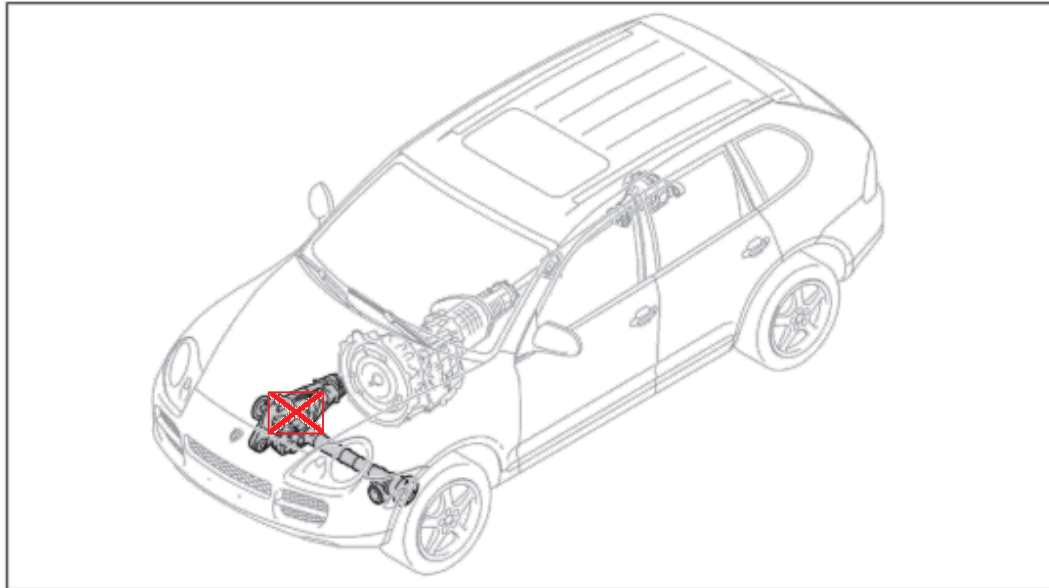
Preliminary work final four wheel drive

1. Remove right engine compartment cover → 700219 Remove and install front cover (engine compartment) - Chapter "Removing".
2. Support engine. → Support engine on the body [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]→ *Support engine on the body [9PAAD1 9PAAD7]* or → Supporting engine on the body [9PAAD1 9PAAD7]→ *Supporting engine on the body [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]*
3. Remove front wheels. → 440519 Remove and install wheel - Chapter "Removing"
4. Remove engine guard → 108019 Removing and installing engine guard - Chapter "Removing".
5. Remove front cardan shaft → 390219 Install and remove front cardan shaft - Chapter "Removing" [9PAAE1 9PAAF1 9PAAJ1]→ 390219 Install and remove front cardan shaft - Chapter "Removing" [9PAAD1 9PAAD7 9PAAE7].

Removing four-wheel final drive

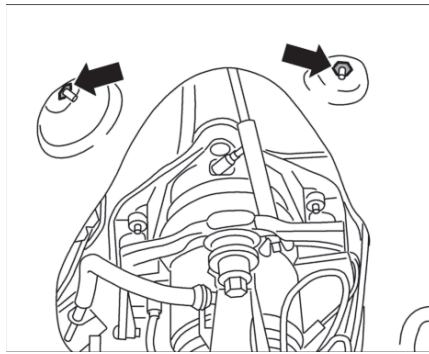
Removing four-wheel final drive

Installation Location:

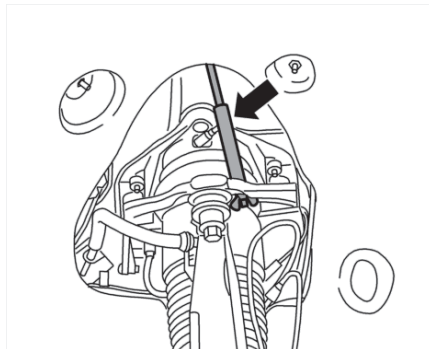


Overview of front-wheel drive

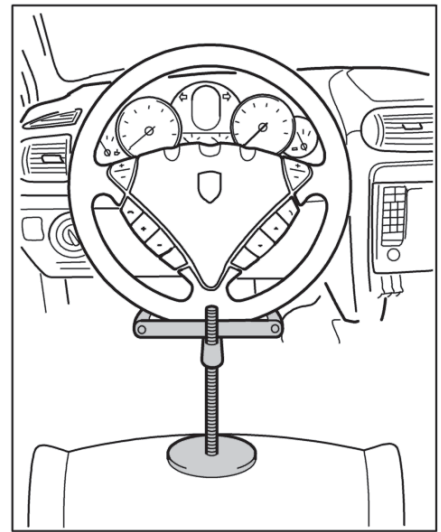
1. Clamp steering wheel in centre position with steering wheel holder **-figure-** .
2. Unscrew plastic nuts **-arrows-** on front right wheel housing liner.
3. Engage special tool **spring compressor VW 552** in top of wheel housing, behind wheel housing liner, and support the spring strut.



Wheel housing liner mount

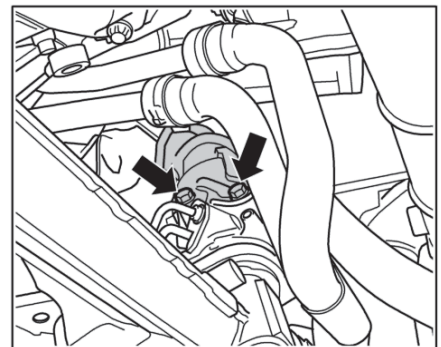


Installation position of spring compressor



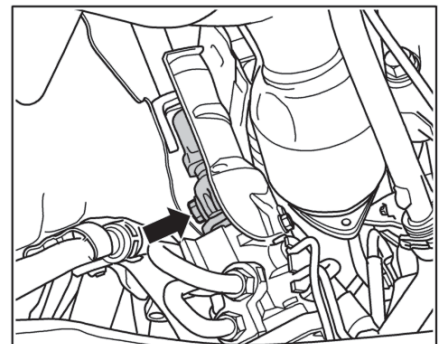
Steering wheel holder

4. Remove cover plate on the steering **-arrows-** .
5. Pull Servotronic plug off the steering gear.



Cover plate on steering

6. Unscrew bolted connection **-arrow-** securing universal joint to steering gear. Remove universal joint from steering gear.
7. Remove left and right drive shafts from four-wheel final drive using **multiple-tooth socket wrench insert M12 NR.31**.



Universal joint bolted connection

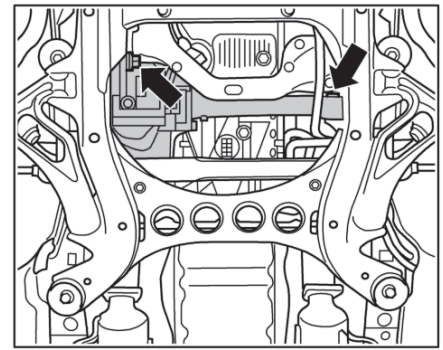
8. Undo fastening screws for four-wheel final drive and screw on drive flange.



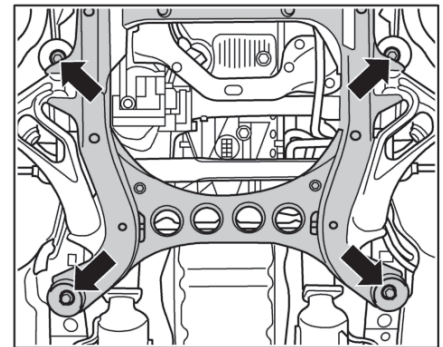
Note

- Supports 1, 2 and 3 must be fitted to the unit lifting platform.

9. Raise unit lifting platform until it bears against the front-axle carrier.



VAG bolts



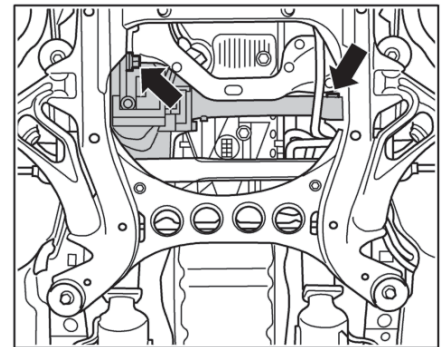
Bolts on front-axle carrier



Note

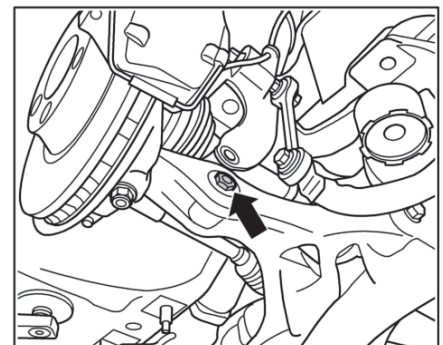
- Fastening screw **-left arrow-** at front right cannot be removed until the front-axle carrier is lowered.

10. Unscrew bolts **-arrows-** on front-axle carrier.



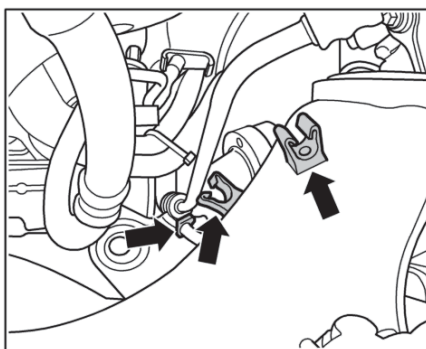
VAG bolts

11. Undo bolt connecting spring strut to trailing arm **-arrow-** .

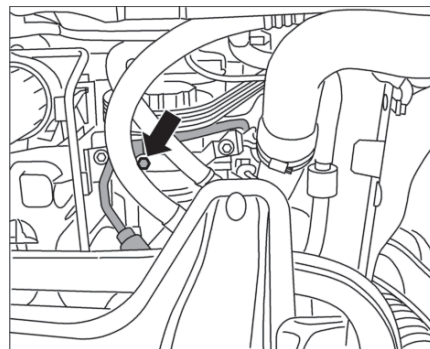


Bolt connecting spring strut to trailing arm

12. Unscrew servo line holders **-arrow-** from air-conditioning compressor and remove the line.



Servo line holders



Servo line holders

13. Disengage servo line from the front-axle carrier at the three holders **-arrows-** .

14. Loosen holders for coolant pipes **-arrow-** at the body.

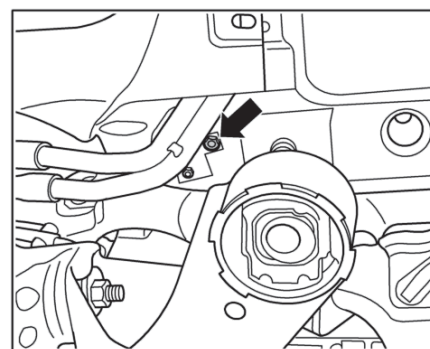


ATTENTION

Over-extension of drive shafts on running gear!

→ Do not pull front-axle carrier downwards.

15. Lower front-axle carrier with the unit lifting platform. Remove vent line from the final drive at the same time.



Coolant pipe holders



ATTENTION

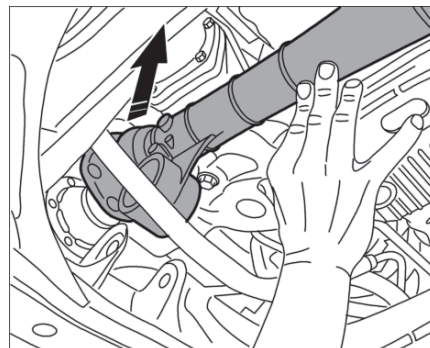
Risk of damage to ATF lines and pressure line for power steering.

- Protect ATF lines with water hose or similar.
- The servo line must not be crushed or stretched.



Note

- A second fitter is required for removing/installing the four-wheel final drive.



Pressing out drive shaft

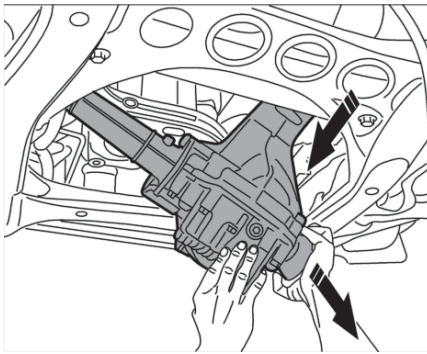
16. Press left drive shaft out of flange on final drive.

17. Lift transmission and press to the left.

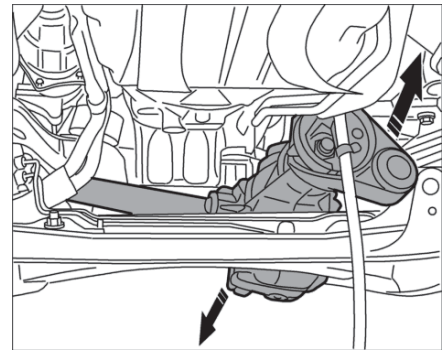
18. Tilt forward the transmission housing together with drive flange.

19. Remove four-wheel final drive downwards through the front-axle carrier.

Installing four-wheel final drive



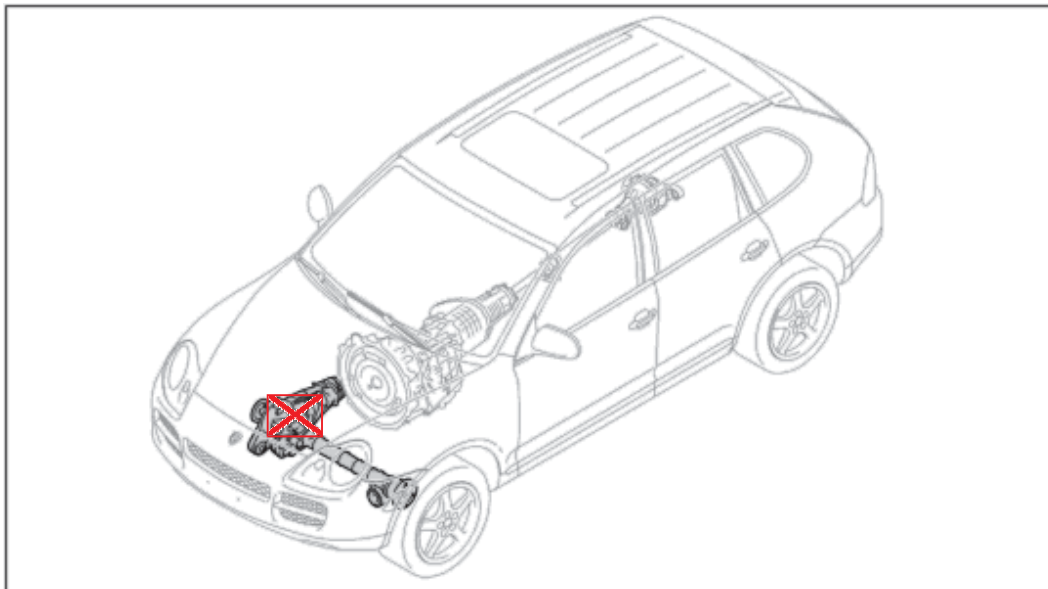
Removing four-wheel final drive



Movement sequence for four-wheel final drive

Installing the four-wheel final drive

Installation Location:



Overview of front-wheel drive



ATTENTION

Risk of damage to ATF lines and pressure line for power steering.

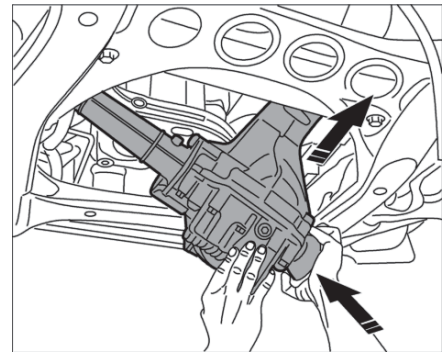
- Protect ATF lines with water hose or similar.
- The servo line must not be crushed or stretched.



Note

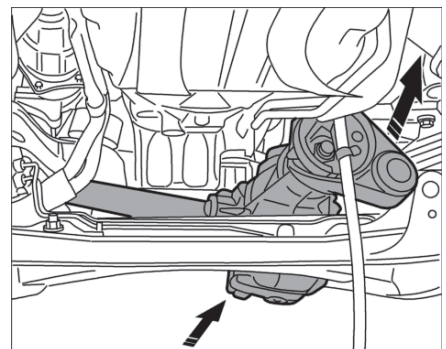
- A second fitter is required for removing/installing the four-wheel final drive.

1. Swivel left flange of final drive in over the front-axle carrier.



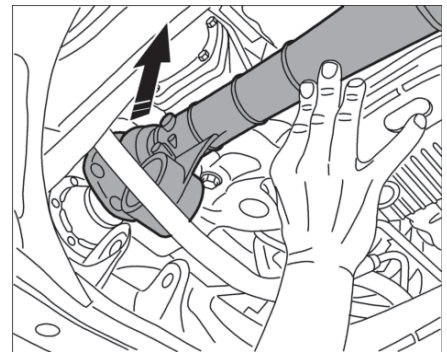
Installing four-wheel final drive

2. Rotate drive flange upwards and install final drive through the front-axle carrier.
3. Insert right drive shaft into output flange and place final drive into the mounts on the front-axle carrier.

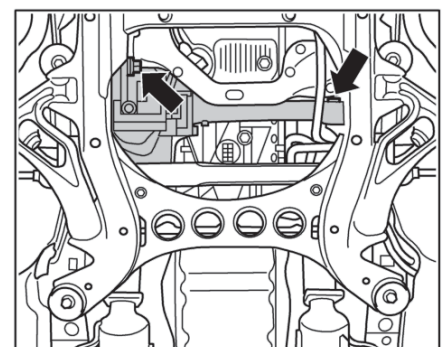


Movement sequence for installing four-wheel final drive

4. Fit left drive shaft by lifting the final drive output flange.



Fitting left drive shaft



VAG bolts



Note

- The front right fastening screw for the four-wheel final drive **-left arrow-** can only be screwed in with the front-axle carrier lowered.

5. Insert fastening screws **-arrows-** for four-wheel final drive and screw for drive flange.



Note

- Supports 1, 2 and 3 must be fitted to the unit lifting platform.

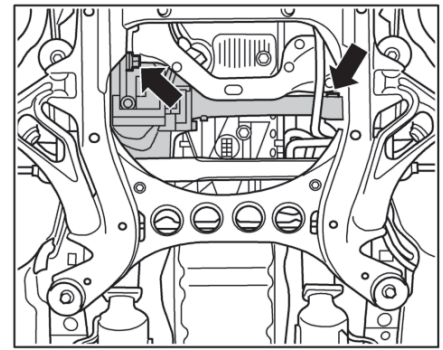
6. Raise front-axle carrier with unit lifting platform until it bears against the body. Position vent line at the same time.



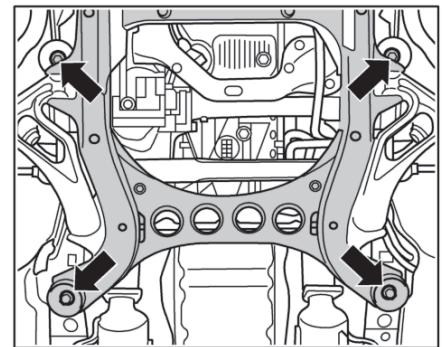
Note

- For details of tightening torques for running gear parts, see Group 4 (Running gear) → 40 Tightening torques for front axle.

7. Screw in bolts **-arrows-** on front-axle carrier.

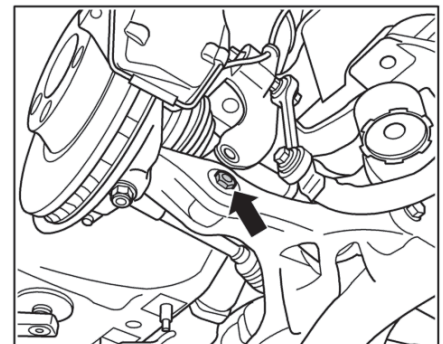


VAG bolts



Bolts on front-axle carrier

8. Screw in bolt **-arrow-** connecting spring strut to trailing arm.



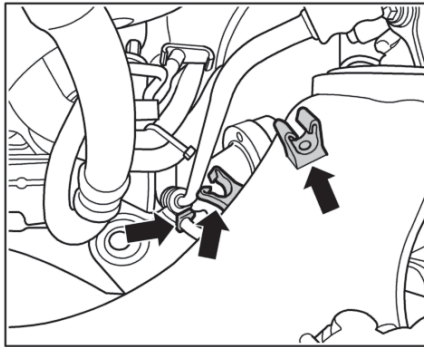
Bolt connecting spring strut to trailing arm

9. Fit holders **-arrow-** for coolant pipes to the body.
10. Engage servo line in the three holders **-arrows-** on the front-axle carrier.
11. Screw servo line holders **-arrow-** on to air-conditioning compressor and clip in the line.

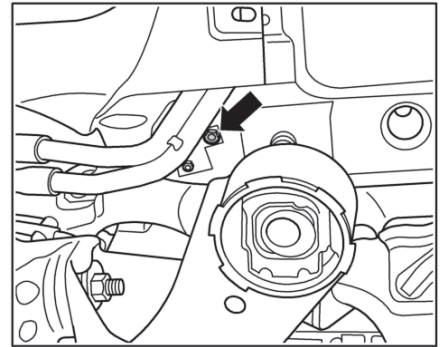


Note

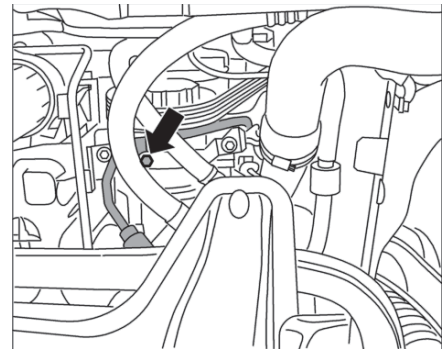
- Screws which are tightened with a torque angle must be replaced with new ones.



Servo line holders



Coolant pipe holders



Holder on air-conditioning compressor

12. Tighten fastening screw for four-wheel final drive. → **Initial tightening: 67 ftlb.** → **Final tightening: 90 °**

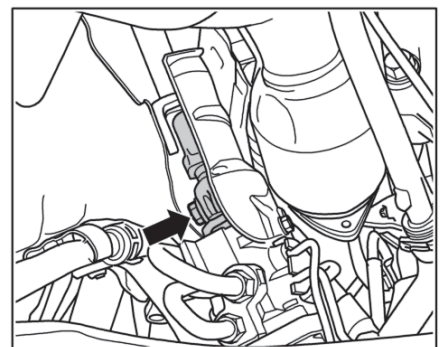


Note

- For details of tightening torques for running gear parts, see Group 4 (Running gear) → 40 Tightening torques for front axle.

13. Screw in drive shaft screws.

14. Connect steering column to steering gear. Screw in new screw.

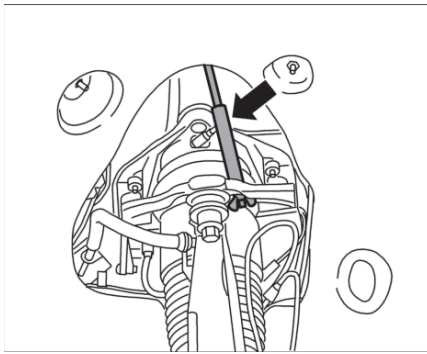


Steering column mounting

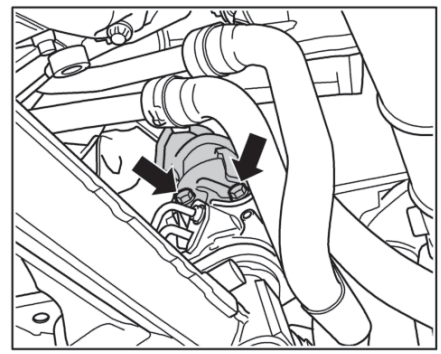
15. Install cover plate on the steering.

16. Connect Servotronic plug to the steering gear.

17. Remove special tool **spring compressor VW 552** from spring strut.

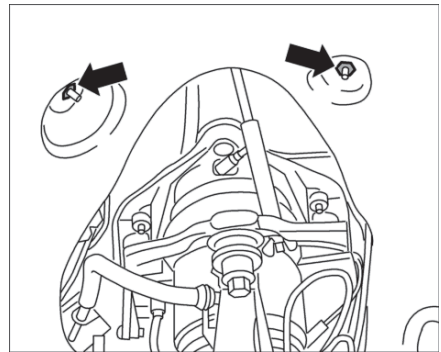


Installation position of spring compressor



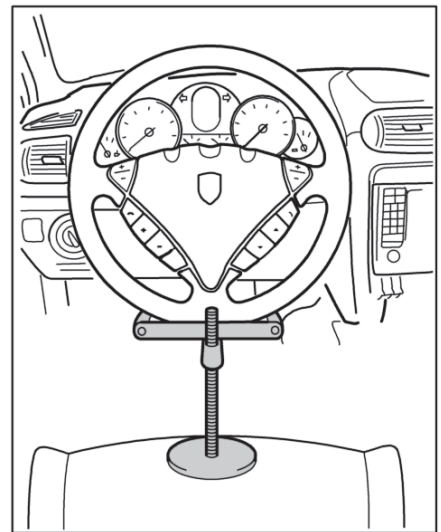
Cover plate on steering

18. Screw in plastic nuts **-arrows-** on front right wheel housing liner.



Wheel housing liner mount

19. Remove steering-wheel holder **-figure-** .



Steering wheel holder

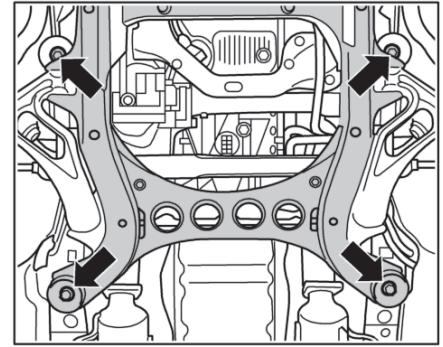


Note

- For details of tightening torques for running gear parts, see Group 4 (Running gear) → 40 Tightening torques for front axle.

20. Tighten bolts **-arrows-** on front-axle carrier.

Subsequent work for four-wheel final drive



Bolts on front-axle carrier

Subsequent work - final four wheel drive

1. Install front cardan shaft → 390219 Install and remove front cardan shaft - Chapter "Installing" [9PAAE1 9PAAF1 9PAAJ1] → 390219 Install and remove front cardan shaft - Chapter "Installing" [9PAAD1 9PAAD7 9PAAE7].
2. Remove engine support. → Support engine on the body [9PAAE1 9PAAE7 9PAAF1 9PAAJ1] → *Support engine on the body [9PAAD1 9PAAD7] or → Supporting engine on the body [9PAAD1 9PAAD7] → Supporting engine on the body [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]*
3. Install right engine compartment cover → 700219 Remove and install front cover (engine compartment) - Chapter "Installing".
4. Mount front wheels. → 440519 Remove and install wheel - Chapter "Installing"
5. Calibrate steering angle sensor → 456005 Initialise and calibrate steering angle sensor
6. Align front axle and adjust as required. → Suspension alignment complete
7. Install engine guard → 108019 Install and remove engine guard - Chapter "Installing".

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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39 90 35 Checking and topping up oil for transfer box - as of MY 2003

- [Checking oil for transfer box](#)
- [Topping up oil for transfer box](#)

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	NR.161		PORSCHE siehe Handbuch Werkstattausstattung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Checking oil for transfer box



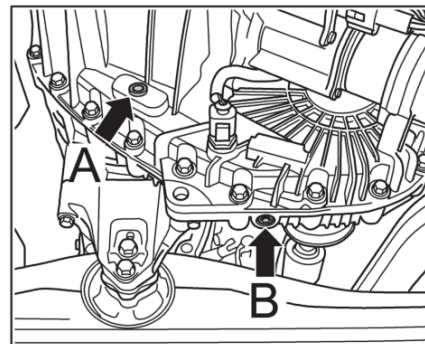
WARNING

Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)



Note



- The vehicle must stand horizontally.

Inspection/drain plug



Note

The oil level can only be checked after the vehicle has been idle for 45 minutes.

The engine must not be started during this time.

1. Unscrew oil inspection plug **-A-** .
2. The oil level is correct if the oil reaches the lower edge of the inspection window.



Note

Use only oil approved by Porsche.

3. If this is not the case, top up the oil. → 399035 Inspecting and adding oil for transfer box - chapter on "Filling"
4. Screw in oil inspection plug **-A-** with new sealing ring. → **Tightening torque: 15 ftlb.**

Topping up oil for transfer box

Filling oil for transfer box



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Risk of scalding from hot oil

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Note

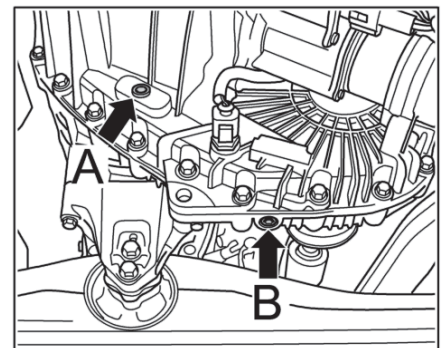
- The vehicle must stand horizontally!

1. Unscrew oil inspection plug **-A-** .



Note

Use only oil approved by Porsche.



Inspection/drain plug

2. Fill with oil using the **ATF filling device for filling transmission NR.161** to the lower edge of inspection plug **-A-** . Raise filling device.
 3. Screw in oil inspection plug **-A-** with new sealing ring. → **Tightening torque: 15 ftlb.**
-

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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- Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

Danger of losing text-figure correspondence when printing out.

- For technical reasons, it can currently not be ruled out that the correspondence between text and associated figure can be lost when it is printed out, even though the display on the screen is correct.
- If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 90 35 Checking and topping up oil for rear final drive - as of MY 2003

- [Checking oil for rear final drive](#)
- [Topping up oil for final drive](#)

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	NR.161		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Checking oil for rear final drive

Checking oil for rear final drive



WARNING

Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)



Note

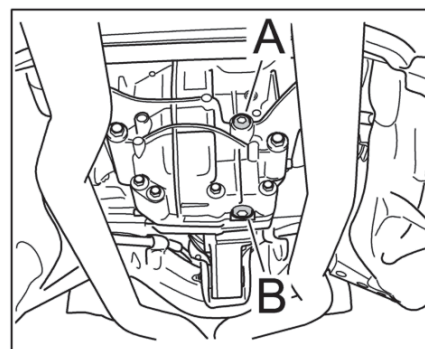
- *Vehicle must be horizontal in order to check fluid level in rear final drive.*
1. Unscrew oil inspection plug **-A-**.
 2. The oil level is correct if the oil reaches the lower edge of the inspection window.



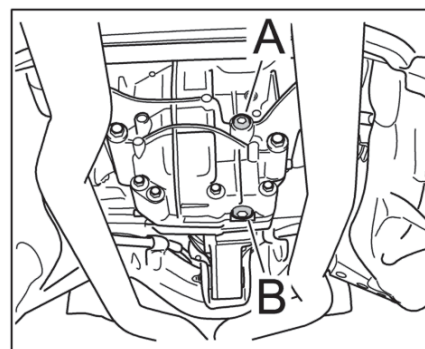
Note

Use only oil approved by Porsche.

3. If this is not the case, top up the oil. → 399035 Inspecting and adding oil for rear final drive - chapter on "Filling"
4. Screw in oil inspection plug **-A-** with new sealing ring. → **Tightening torque: 26 ftlb.**



Control/drain plug for rear final drive



Control/drain plug for rear final drive

Topping up oil for final drive

Topping up oil for final drive



WARNING

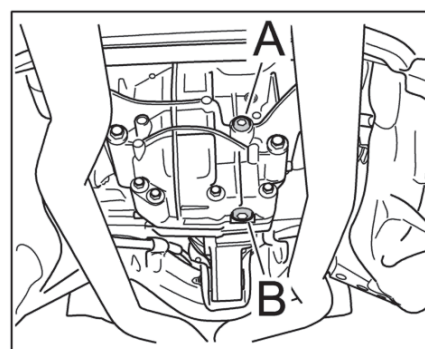
Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)



Note

- *Vehicle must be horizontal in order to fill rear final drive.*
1. Unscrew oil inspection plug **-A-**.



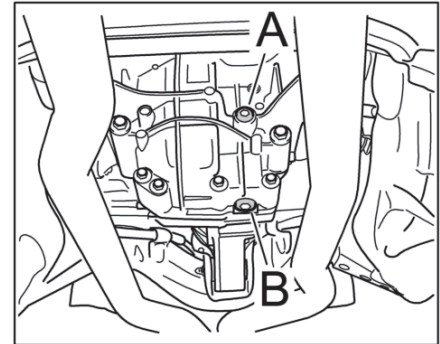
Control/drain plug for rear final drive



Note

Use only oil approved by Porsche.

2. Fill with oil using the **ATF filling device for filling transmission NR.161** to the lower edge of inspection plug **-A-**.
3. Screw in oil inspection plug **-A-** with new sealing ring. → **Tightening torque: 26 ftlb.**



Control/drain plug for rear final drive

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
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→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

Danger of losing text-figure correspondence when printing out.

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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 90 35 Checking and topping up oil for four-wheel final drive - as of MY 2003

- Preliminary work for oil for four-wheel final drive
- Checking oil for four-wheel final drive
- Topping up oil for four-wheel final drive
- Subsequent work for oil for four-wheel final drive

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	161		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
special inserts mod. AB	commercially available tool	170		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
accessory for the torque wrench: open ring wrench insert a/f 13 + adapter	commercially available tool	98-1		

				PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work for oil for four-wheel final drive

Preliminary work for oil for all-wheel final drive

1. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"

Checking oil for four-wheel final drive

Checking oil for all-wheel final drive



WARNING

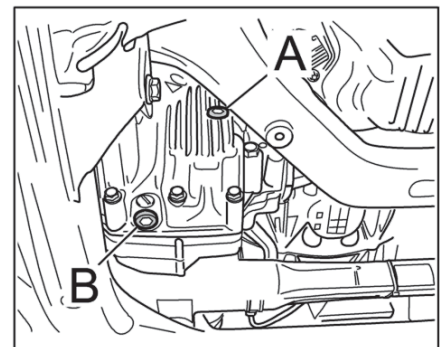
Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)



Note

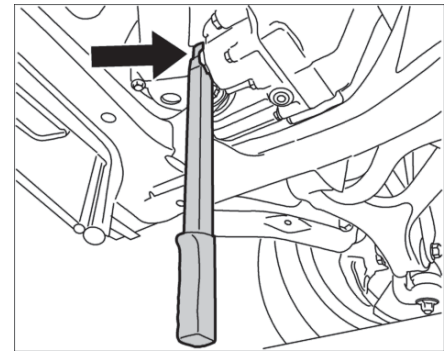
- Vehicle must be horizontal to check oil level in all-wheel final drive.



Oil inspection plug-filler screw

1. Unscrew oil inspection plug **-A-** with tool **special inserts mod. AB 170**.
2. The oil level is correct if the oil reaches the lower edge of the inspection window.
3. If this is not the case, top up the oil. → 399035 Checking and topping up oil for all-wheel final drive - chapter on "Filling"
4. Screw in oil inspection plug **-A-** with new sealing ring. To do this, use the special tool **special inserts model AB 170** and **accessory for the torque wrench: open ring wrench insert a/f 13 + adapter 98-1**. → **Tightening torque: 26 ftlb.**

Topping up oil for four-wheel final drive



Tightening to the specified torque

Filling oil for all-wheel final drive



WARNING

Risk of scalding from hot oil

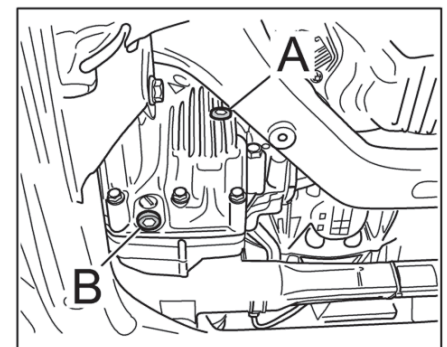
- Let the oil cool down
- Wear personal protective gear (goggles, gloves)



Note

- Vehicle must be horizontal in order to fill final drive.

1. Unscrew oil inspection plug **-A-** with tool **special inserts mod. AB 170**.

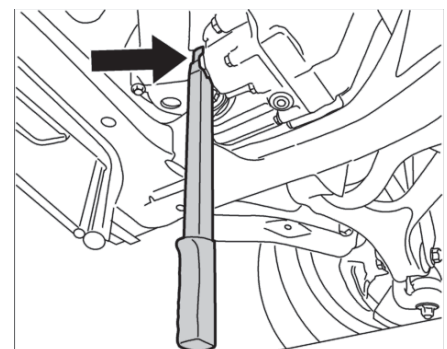


Oil inspection plug-filler screw



Note

- Use only oil approved by Porsche.
2. Fill with oil using the **ATF filling device for filling transmission 161** to the lower edge of inspection plug **-A-**.
 3. Screw in oil inspection plug **-A-** with new sealing ring. To do this, use the special tool **special inserts model AB 170** and **accessory for the torque wrench: open ring wrench insert a/f 13 + adapter 98-1**. → **Tightening torque: 26 ftlb.**



Tightening to the specified torque

Subsequent work for oil for four-wheel final drive

Touch up for oil for all-wheel final drive

1. Remove engine guard. → 108019 Removing and installing engine guard - chapter on "Installing"
-

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

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- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 90 55 Changing oil for four-wheel final drive - as of MY 2003

- Preliminary work for oil for four-wheel final drive
- Changing oil for four-wheel final drive
- Subsequent work for oil for four-wheel final drive

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	161		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
special inserts model AB	commercially available tool	170		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
accessory for torque wrench: open ring wrench insert a/f 13 + adapter	commercially available tool	98-1		

				PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work for oil for four-wheel final drive

Preliminary work oil for four-wheel final drive

1. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"

Changing oil for four-wheel final drive

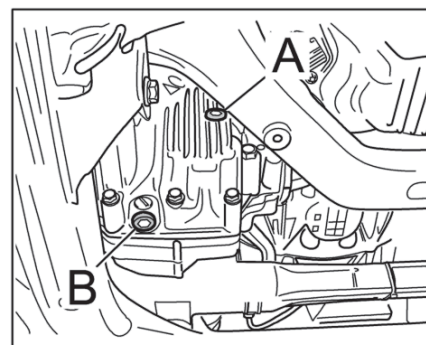
1. Place oil collecting container underneath the vehicle.



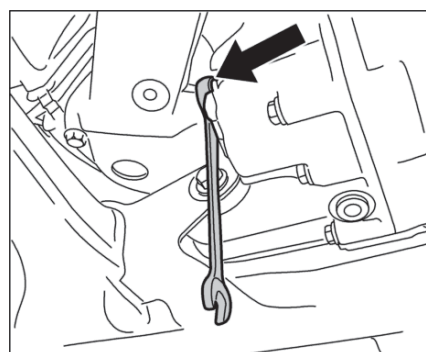
WARNING

Risk of scalding from hot oil

- Let the oil cool down
 - Wear personal protective gear (goggles, gloves)
2. Unscrew oil drain plug **-B-** and drain the oil.
 3. Screw in oil drain plug **-B-** with a new sealing ring. → **Tightening torque: 26 ftlb.**
 4. Unscrew oil inspection plug using the **special inserts model AB 170** tool.



Oil inspection and drain plug

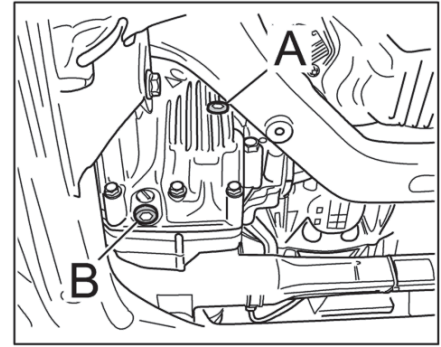


Tool for oil inspection plug

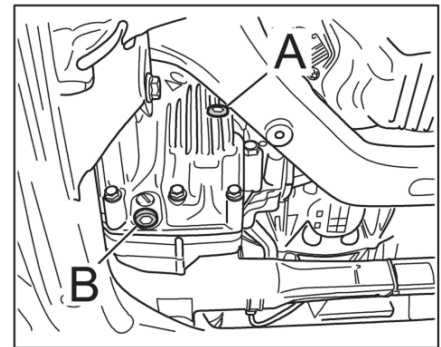


Note

- Use only oil approved by Porsche.
5. Using the **ATF filling device for filling transmission 161**, fill with oil up to the lower edge of the oil inspection plug **-A-**.
 6. Unscrew oil inspection plugs **-A-** using the **special inserts model AB tool 170 accessory for torque wrench: open ring wrench insert a/f 13 + adapter 98-1** and screw in a new sealing ring. → **Tightening torque: 26 ftlb.**



Oil inspection and drain plug



Oil inspection and drain plug

Subsequent work for oil for four-wheel final drive

Reworking oil for four-wheel final drive

1. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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WARNING

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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
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→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

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→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

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→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 90 55 Changing oil for rear final drive - as of MY 2003

- [Changing oil for rear final drive](#)

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	161		PORSCHE siehe Handbuch Werkstattaufrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Changing oil for rear final drive

Changing oil for rear final drive

1. Place oil collecting container underneath the vehicle.

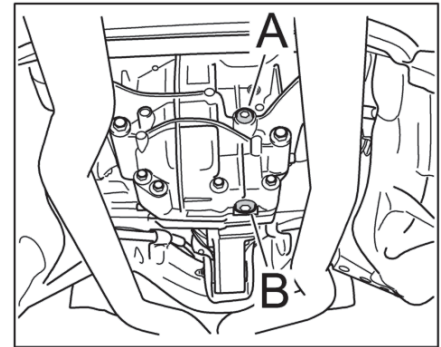


WARNING

Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)

2. Unscrew oil drain plug **-B-** and drain oil.



Oil inspection and drain plug

3. Screw in oil drain plug **-B-** with new sealing ring. → **Tightening torque: 26 ftlb.**



WARNING

Risk of scalding from hot oil

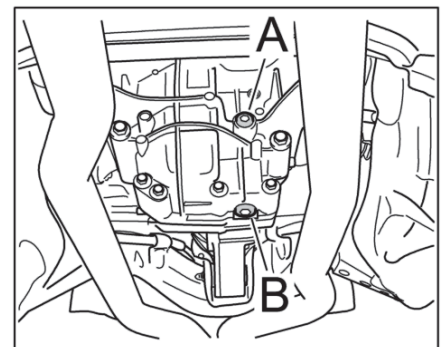
- Let the oil cool down
- Wear personal protective gear (goggles, gloves)

4. Unscrew oil inspection plug **-A-**.



Note

- Vehicle must be horizontal in order to fill rear final drive.
5. Fill with oil using the **ATF filling device for filling transmission 161** to the lower edge of inspection plug opening **-A-**. → **Tightening torque: 1.25 l +0.35 l**
 6. Screw in oil inspection plug **-A-** with new sealing ring. → **Tightening torque: 26 ftlb.**
 7. Check oil for rear final drive → 399035 Checking and topping up oil for rear final drive - chapter on "Checking"



Oil inspection and drain plug

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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ADVERTENCIA

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39 90 55 Changing oil for transfer box - as of MY 2003

- [Changing oil for transfer box](#)
- [Subsequent work for oil for transfer box](#)

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	161		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Changing oil for transfer box

Changing oil for transfer box

1. Slide oil collecting container under the vehicle.



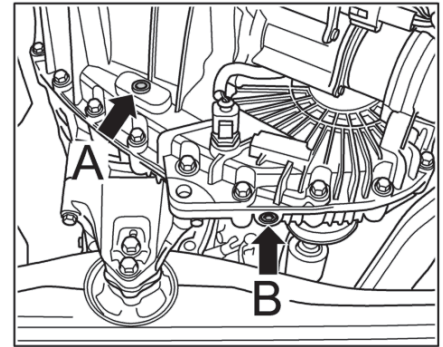
WARNING

Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)

2. Unscrew oil drain plug **-B-** and drain the oil.

- Screw in oil drain plug **-B-** with new sealing ring. → **Tightening torque: 15 ftlb.**



Oil inspection and drain plug

- Unscrew oil inspection plug **-A-**.



Note

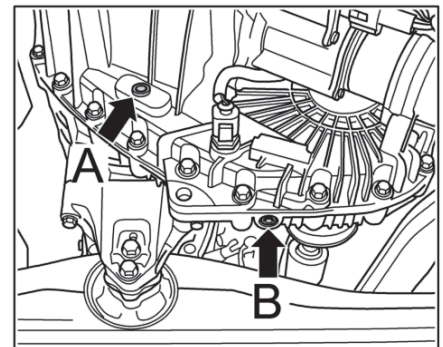
Vehicle must be horizontal in order to fill the transfer box.



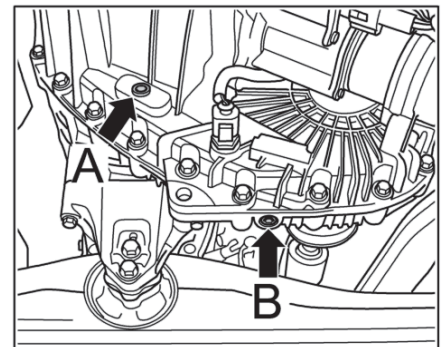
Note

Use only oil approved by Porsche.

- Fill with oil to the lower edge of the inspection plug opening **-A-** using the **ATF filling device for filling transmission 161**. Raise filling device.
- Screw in oil inspection plug **-A-** with a new sealing ring. → **Tightening torque: 15 ftlb.**



Oil inspection and drain plug



Oil inspection and drain plug

Subsequent work for oil for transfer box

Reworking oil for transfer box

- Check oil for transfer box. → 399035 Check and top up oil for transfer box - Chapter "Checking"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23,

C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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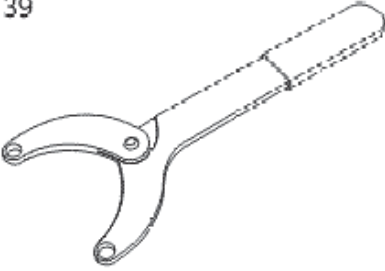
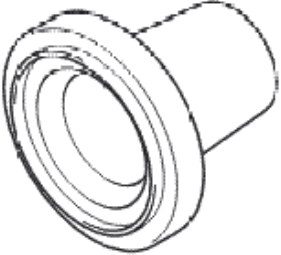
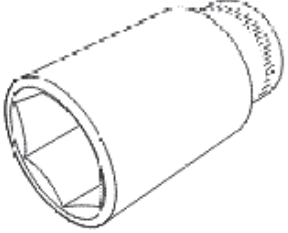
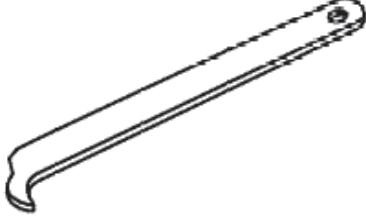
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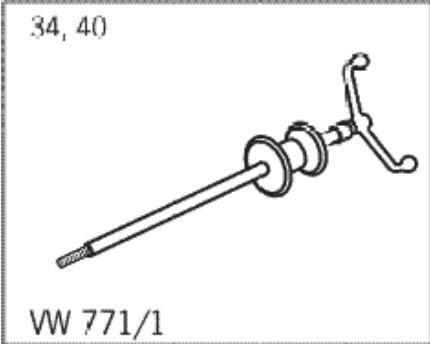
39 92 19 Removing and installing sealing ring for rear transfer box (output flange) - as of MY 2003

- Preliminary work sealing ring for transfer box
- Removing sealing ring for rear transfer box (output flange)
- Installing sealing ring for rear transfer box (output flange)
- Reworking sealing ring for transfer box

Tools

Designation	Type	Number	Explanation	
shop made tool	commercially available tool			 .gif
arm bracket	special tool	3435		

				39  3435
pressure piece	special tool	T10185		39  T10185
socket	special tool	T10204		39  T 10204
hook	workshop equipment	VW 681		34  VW 681
striker	commercially available tool	vw 771/1		

Preliminary work sealing ring for transfer box

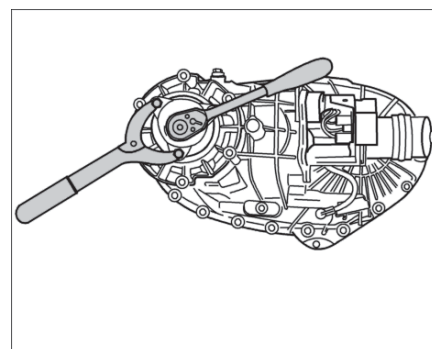
Preliminary work sealing ring for transfer box

1. Remove rear cardan shaft. → 393519 Removing and reinstalling rear cardan shaft - chapter on "Removing" [9PAAE1 9PAAE7 9PAAF1] → 393519 Removing and reinstalling rear cardan shaft - chapter on "Removing" [9PAAD1] → 393519 21 Removing and reinstalling rear cardan shaft - chapter on "Removing" [9PAAJ1] → 393519 Removing and reinstalling rear cardan shaft - chapter on "Removing" [9PAAD7]

Removing sealing ring for rear transfer box (output flange)

Removing sealing ring for rear output drive (output flange)

1. Remove nut of output flange with special tool **socket T10204**. To do this, secure with special tool **arm bracket 3435**.



Output flange nut

2. Remove round seal on output flange.
3. Remove flange with **shop made tool** and **striker vw 771/1**.

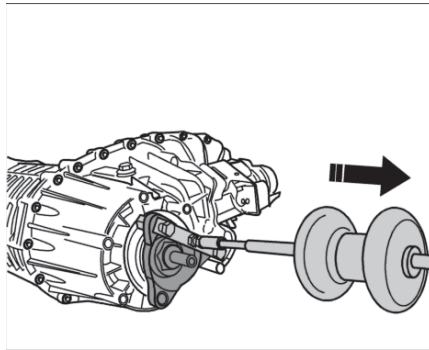


ATTENTION

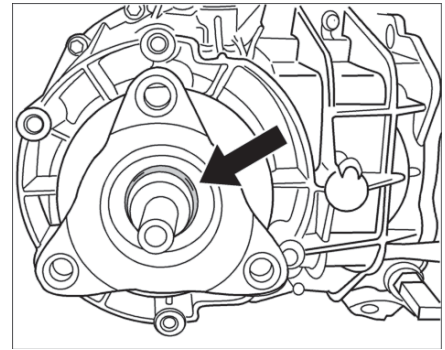
Leakage due to scores on the sealing face.

→

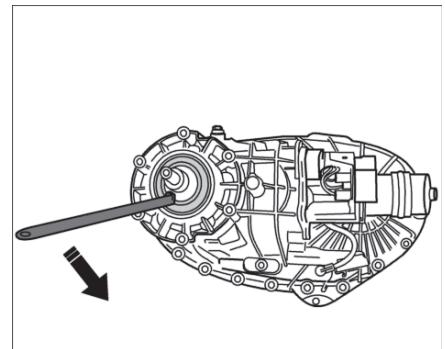
When removing the sealing ring, place the tip of the hook on the sealing ring only and not on the sealing



Removing output flange



Rubber ring for rear output drive



Removing sealing ring for rear output drive

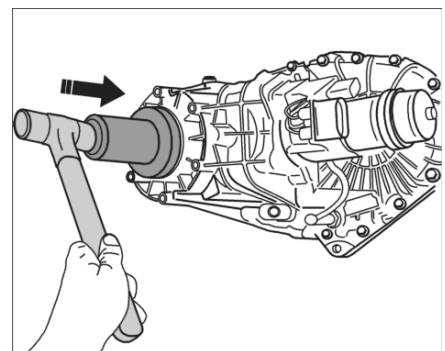
face.

4. Remove sealing ring with special tool **hook VW 681**.

Installing sealing ring for rear transfer box (output flange)

Installing sealing ring at rear of transfer box (output flange)

1. Drive in new sealing ring with special tool **pressure piece T10185** until the special tool touches the transmission housing.
2. Install output flange and, if necessary, drive in with a plastic hammer.



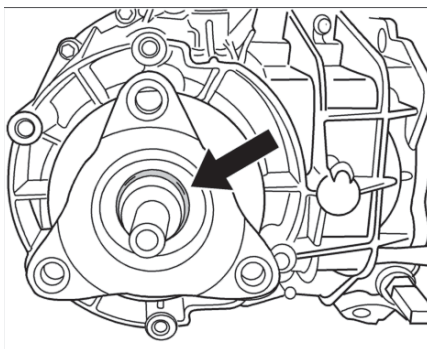
Driving in the sealing ring



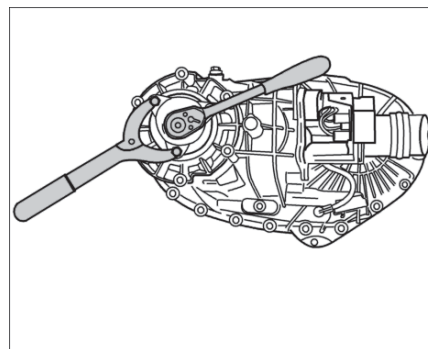
Note

- Ensure that the round seal is inserted.
- Replace nut on output flange.
- Fit nut using screw locking device.

3. Screw in output flange nut using special tool **socket T10204**. To do this, counter the flange with special tool **arm bracket 3435**. → **Tightening torque: 100 ftlb.**

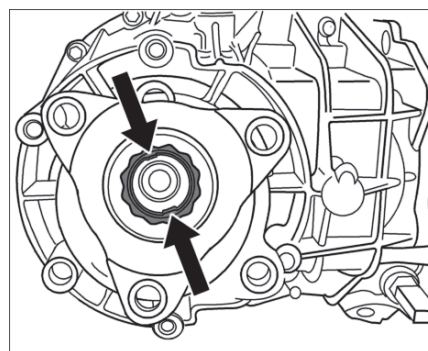


Rubber ring for rear output drive



Output flange nut

4. Caulk nuts at the recesses in the output shaft.



Caulking nuts

Reworking sealing ring for transfer box

Subsequent work for sealing ring for transfer box

1. Install cardan shaft. → 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAE1 9PAAE7 9PAAF1] → 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAD1] → 393519 23 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAJ1] → 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAD7]

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

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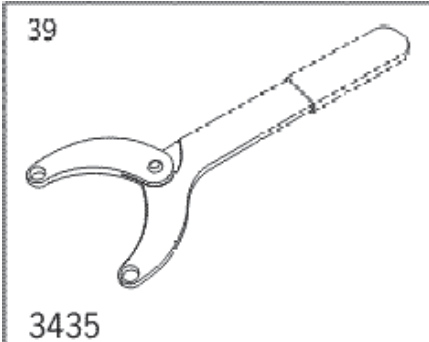
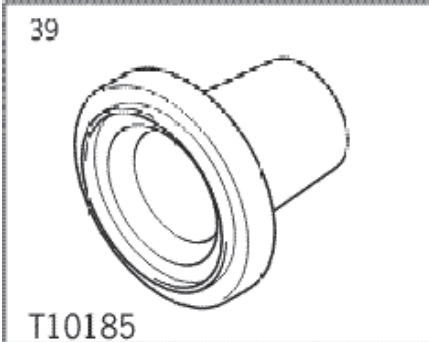
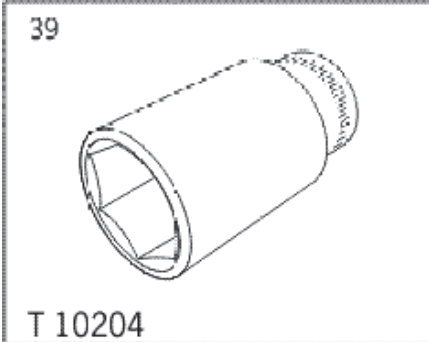
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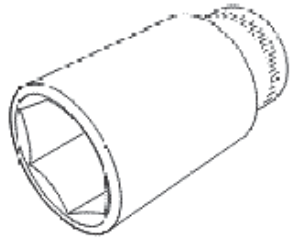
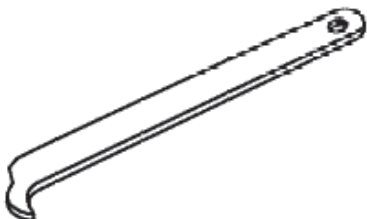
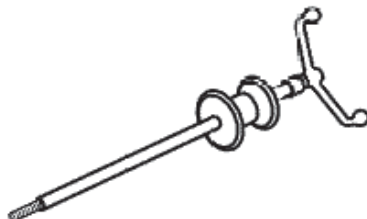
39 92 19 Removing and installing sealing ring for front transfer box output - as of MY 2003

- Preliminary work for transfer box sealing ring
- Removing sealing ring for front transfer box output
- Installing sealing ring for front transfer box output
- Subsequent work for transfer box sealing ring

Tools

Designation	Type	Number	Explanation	
shop made tool	commercially available tool			 .gif
material	special tool	00000	transmission jack	

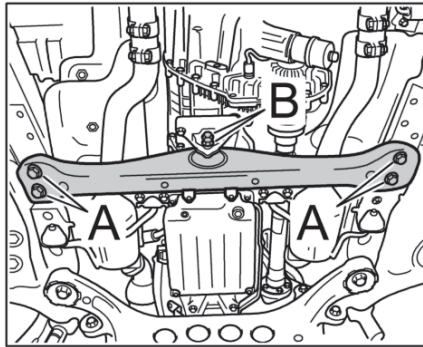
				PORSCHE siehe Handbuch Werkstattaufrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
arm bracket	commercially available tool	3435		39  3435
pressure piece	special tool	T10185		39  T10185
socket	commercially available tool	t10204		39  T 10204
socket	special tool	T10204		

				39  T 10204
hook	commercially available tool	vw 681		34  VW 681
striker	commercially available tool	vw 771/1		34, 40  VW 771/1

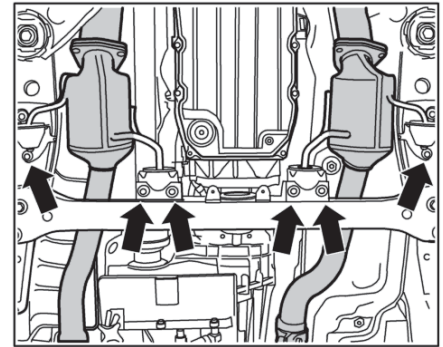
Preliminary work for transfer box sealing ring

Preliminary work sealing ring for transfer box

1. Remove front cardan shaft. → 390219 Removing and installing front cardan shaft - chapter on "Removing" [9PAAE1 9PAAF1 9PAAJ1] → 390219 Removing and installing front cardan shaft - chapter on "Removing" [9PAAD1 9PAAD7 9PAAE7]
2. Support transfer box with transmission jack.
3. Support transmission with **material 00000** and secure with retaining band.
4. Unscrew four exhaust system screws on the cross member **-centre arrow-** and unscrew screw connection holder on body **-right arrow-**.



Transmission cross member



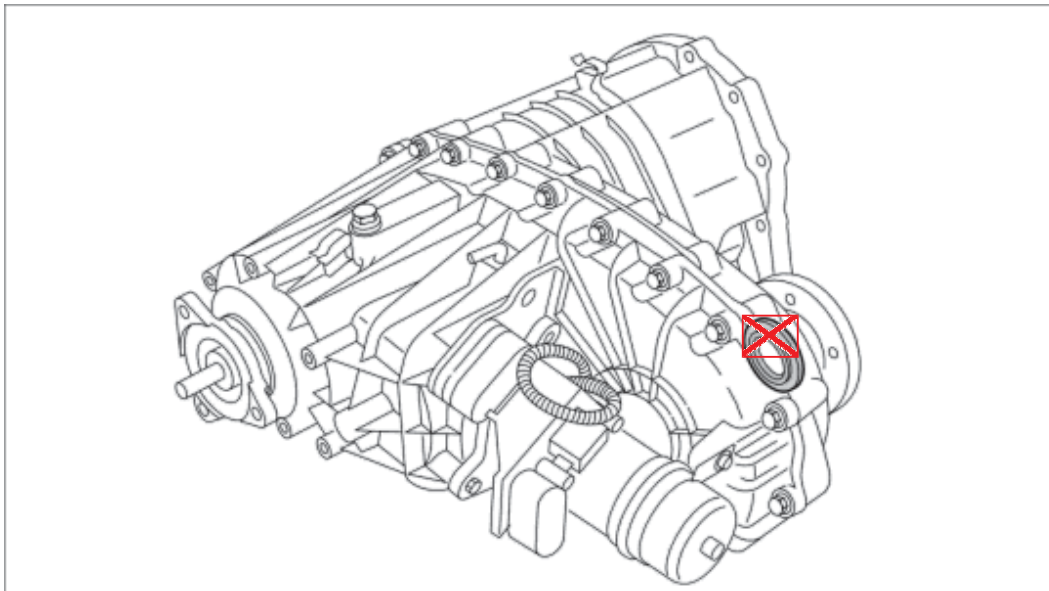
Exhaust system at cross member

5. Unscrew transmission cross member on body **-A-** .
6. Unscrew two screws on the cross member **-B-** on the transfer box holder and remove transmission cross member.

Removing sealing ring for front transfer box output

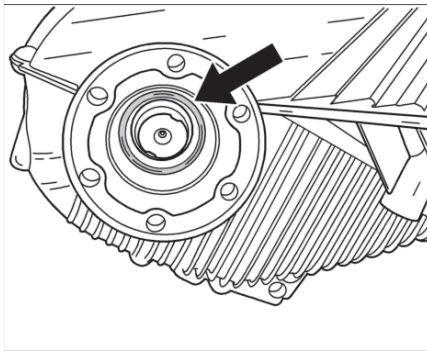
Removing sealing ring for front transfer box output

Installation Location:

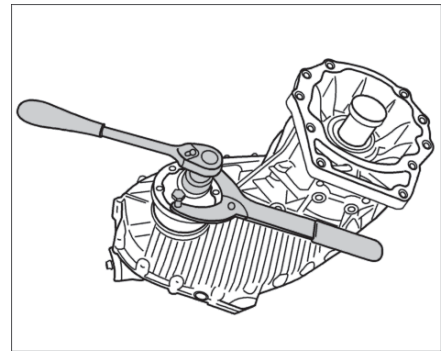


Overview of sealing ring for front transfer box output

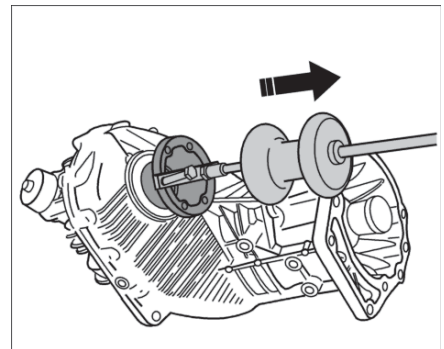
1. Unscrew collar nut of output flange with special tool **socket t10204**. To do this, block flange with special tool **arm bracket 3435**.
2. Remove round seal on output flange.
3. Remove output flange with **shop made tool** and **striker vw 771/1**.



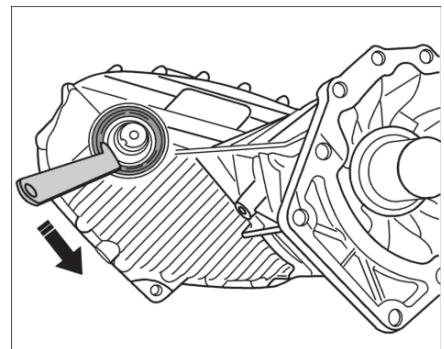
Round seal on output flange



Counterflange



Removing output flange

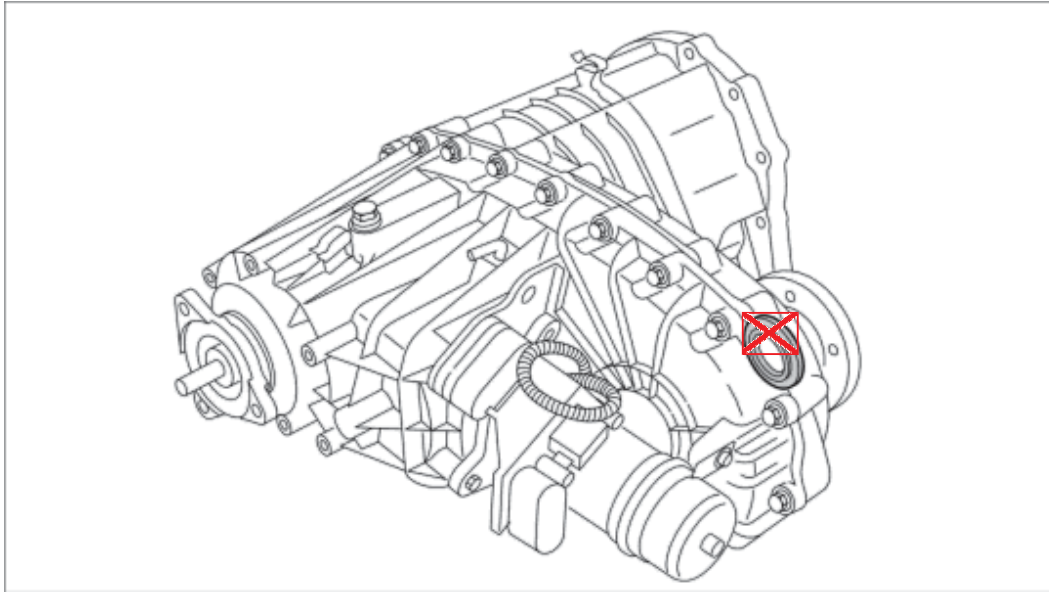


Removing sealing ring

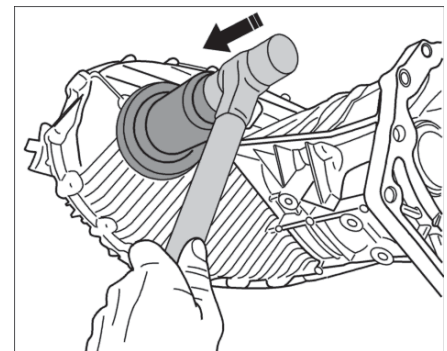
Installing sealing ring for front transfer box output

Installing sealing ring for front transfer box output

Installation Location:



Overview of sealing ring for front transfer box output

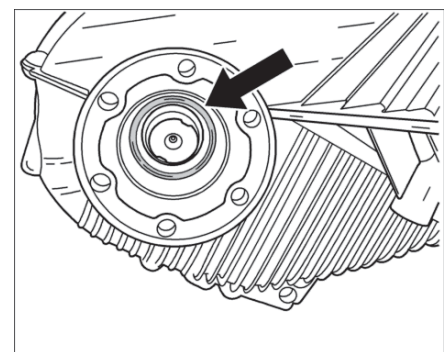


Driving in the sealing ring



Note

- Ensure that the round seal **-arrow-** is inserted.
 - Replace nut on output flange.
 - Fit nut using screw-locking compound, e.g. Loctite 648.
1. Drive in new sealing ring with special tool **pressure piece T10185**
→ **Driving in the sealing ring** until the special tool touches the transmission housing.
 2. Install output flange and, if necessary, drive in with a plastic hammer.



Round seal on output flange



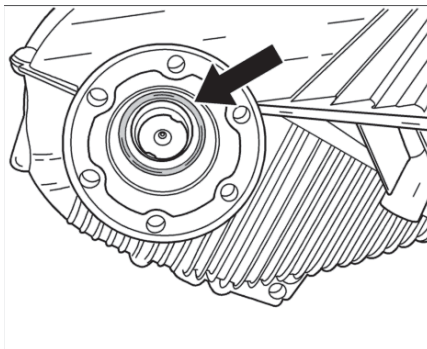
Note

- Ensure that the round seal **-arrow-** is inserted.

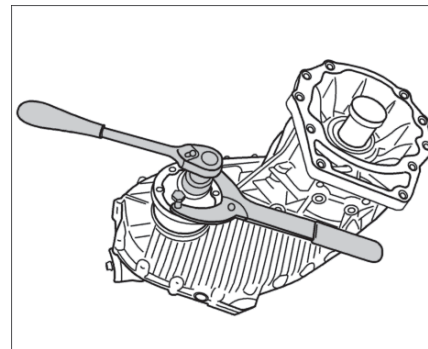
- Replace nut on output flange.

- Fit nut using screw-locking compound, e.g. Loctite 648.

3. Screw in new nut on output flange using special tool **socket T10204**. To do this, counter the flange with special tool **arm bracket 3435**. → **Tightening torque: 100 ftlb.**

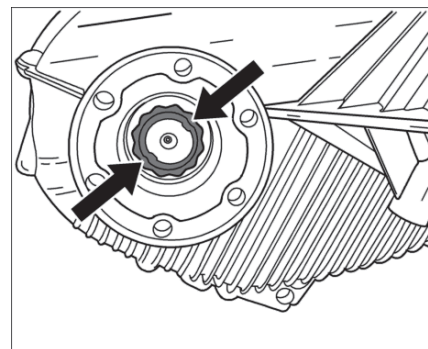


Round seal on output flange



Tightening nut on output flange

4. Caulk nuts at the recesses in the output shaft.

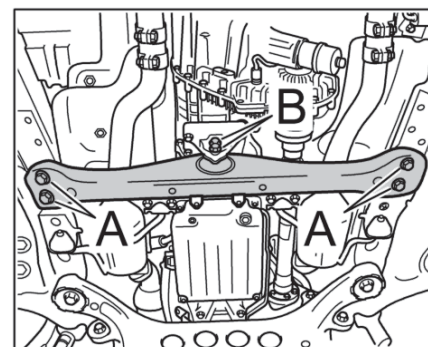


Caulking nuts

Subsequent work for transfer box sealing ring

Reworking sealing ring for transfer box

1. Install front cardan shaft. → 390219 Removing and installing front cardan shaft - chapter on "Installing" [9PAAE1 9PAAF1 9PAAJ1] → 390219 Removing and installing front cardan shaft - chapter on "Installing" [9PAAD1 9PAAD7 9PAAE7]
2. Screw in new transmission cross member screws **-B-** on transfer box holder. → **initial tightening: 37 ftlb.** → **final tightening: 90 degree of angle**
3. Screw in new cross member screws on body . **-A-** → **initial tightening: 37 ftlb.** → **final tightening: 90 degree of angle**

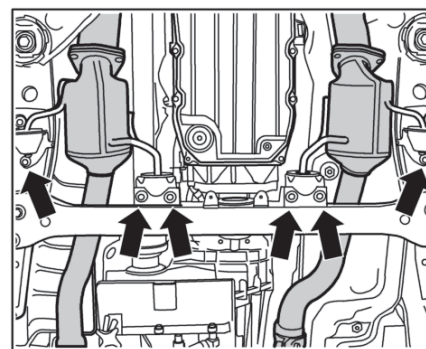


Transmission cross member

4. Fix exhaust system to transmission cross member **-centre arrow-** and body **-outer arrow-** . Observe torques → 260119 Remove and install exhaust system

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15,
C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32,
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Exhaust system at cross member



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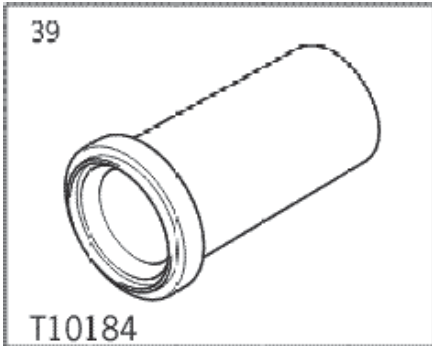
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39 92 19 Removing and installing sealing ring for transfer box input shaft - as of MY 2003

- Preliminary work sealing ring for input shaft transfer box
- Removing sealing ring for transfer box input shaft
- Installing sealing ring for transfer box input shaft
- Subsequent work

Tools

Designation	Type	Number	Explanation	
slide hammer kit	commercially available tool	168		
pressure piece	commercially available tool	t10184		

Preliminary work sealing ring for input shaft transfer box

Preliminary work sealing ring for transfer box

1. Remove transfer box. → 396519 Removing and installing transfer box - chapter on "Removing"

Removing sealing ring for transfer box input shaft

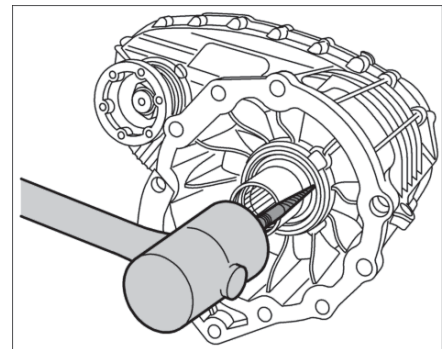
Removing sealing ring for transfer box input shaft



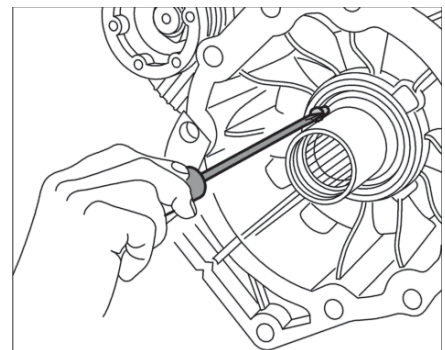
ATTENTION

Damage to input shaft bearing.

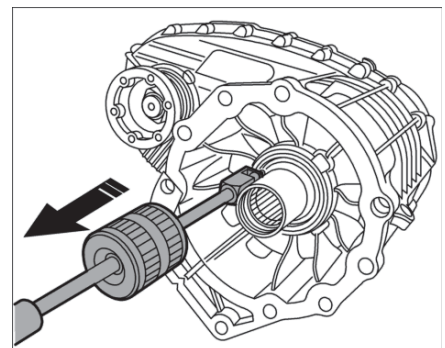
- Drive bevelled attachment in by approx. 2 mm.
 - Screw sheetmetal screw max. two turns into the sealing ring.
1. Using the bevelled attachment from the **slide hammer kit 168**, make a small hole **-figure-** in the sealing ring.
 2. Screw a suitable sheetmetal screw in by two turns.
 3. Remove sealing ring using special tool **slide hammer kit 168**.



Preparing for removal



Screwing in sheetmetal screw

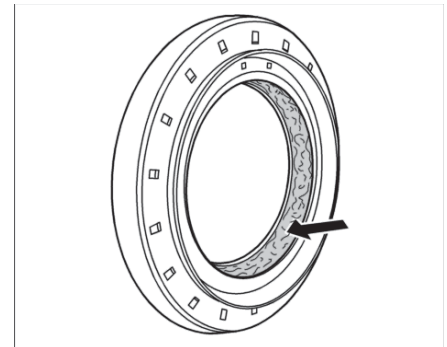


Removing sealing ring

Installing sealing ring for transfer box input shaft

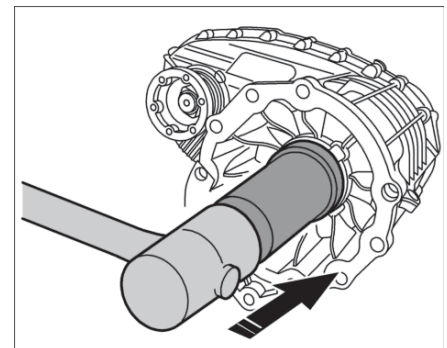
Installing sealing ring for transfer box input shaft

1. Fill the space between the dust and sealing lips on the new sealing ring with grease.



Preparing the sealing ring

2. Drive new sealing ring in flush using special tool **pressure piece t10184**.



Fitting sealing ring

Subsequent work

Reworking sealing ring for transfer box

1. Install transfer box. → 396519 Removing and installing transfer box - chapter on "Installing"
2. Check oil for transfer box. → 399035 Check and top up oil for transfer box - Chapter "Checking"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

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39 IN Information - as of MY 2003

Porsche Traction Management

Porsche Traction Management, or PTM, is a system which guarantees or improves the traction of the vehicle. Two controllable locks are available in the system.

It operates permanently and receives values from different sensors (e.g. steering-angle sensor, lateral acceleration sensor) from which the corresponding lock controls are obtained. In this way the optimum power is distributed to the drive wheels.

The locks are:

- Longitudinal lock (in the transfer box): Distributes the moment released by the gear via the cardan shafts to the front or rear axle gear.
- Longitudinal interlock (depending on the equipment in the rear final drive): Distributes the moment to the two rear driving wheels.

Porsche Traction Management

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It operates permanently and receives values from different sensors (e.g. steering-angle sensor, lateral acceleration sensor) from which the corresponding lock activations are obtained. In this way the optimum power is distributed to the drive wheels.

The locks are:

- Centre-differential lock (in the transfer box): Distributes the moment released by the gear via the cardan shafts to the front axle final drive or rear axle differential.
- Rear-differential lock (depending on the equipment in the rear final drive): Distributes the moment to the two rear driving wheels.

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The locks are:

- Centre-differential lock (in the transfer box): Distributes the moment released by the gear via the cardan shafts to the front axle final drive or rear axle differential.
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9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

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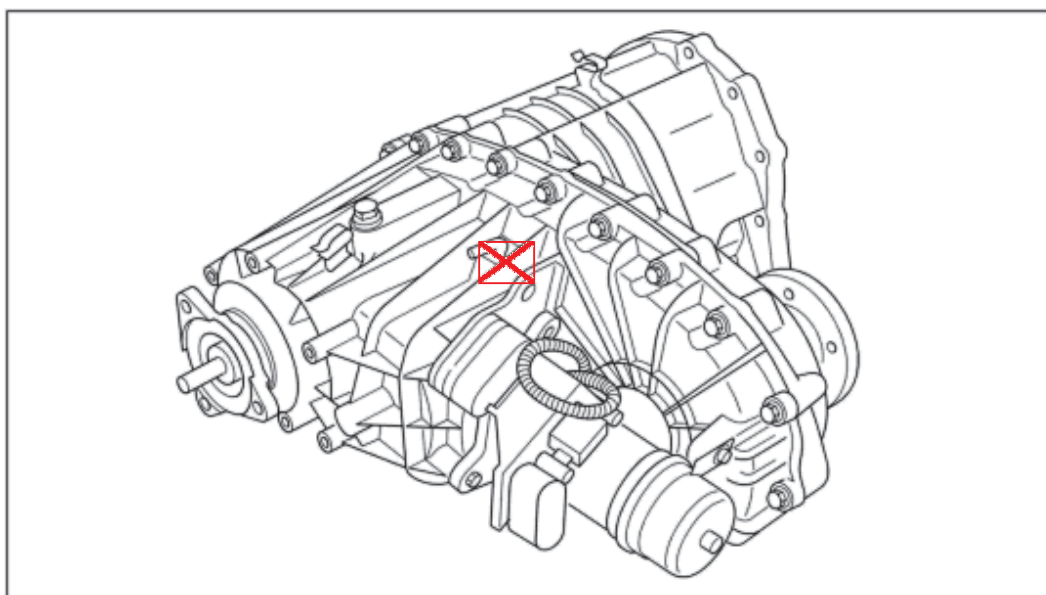
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39 Technical data - as of MY 2003

- [Technical data on transfer box](#)
- [Technical data on four-wheel final drive](#)
- [Technical data on rear final drive](#)

Technical data on transfer box

Installation Location:



View of transfer box

- **Type:** Z 48.20

Installed in: Cayenne

Model year: 2004

Low Range gearing: $i = 2.70$

Type: Two-stage planetary differential; planetary set

Filling capacity (new filling): → **Filling capacity: 0.85 l**

Filling capacity (change quantity): → **Filling capacity: 0.75 l**

- **Type:** Z 48.00

Installed in: Cayenne S

Model year: 2003

Low Range gearing: $i = 2.70$

Type: Two-stage planetary differential; planetary set

Filling capacity (new filling): → **Filling capacity: 0.85 l**

Filling capacity (change quantity): → **Filling capacity: 0.75 l**

- **Type:** Z 48.50

Installed in: Cayenne Turbo

Model year: 2003

Low Range gearing: $i = 2.70$

Type: Two-stage planetary differential; planetary set

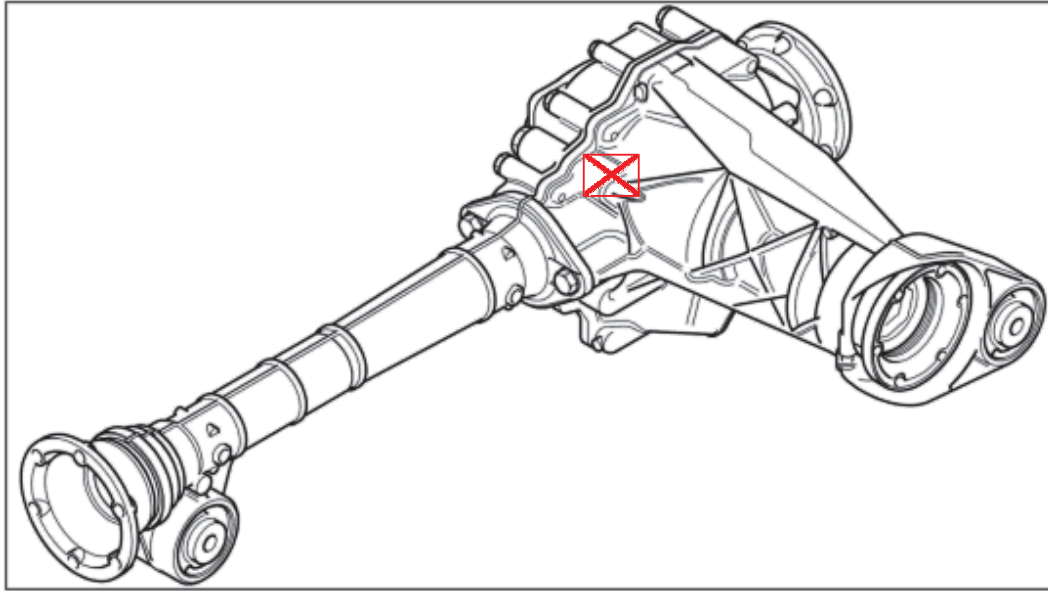
Filling capacity (new filling): → **Filling capacity: 0.85 l**

Filling capacity (change quantity): → **Filling capacity: 0.75 l**

Technical data on four-wheel final drive

Technical data on four-wheel final drive

Installation Location:



Overall view of front-axle final drive

- **Type:** V 48.20

Installed in: Cayenne

Model year: 2004

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 4.56$

Transmission ratio for manual transmission: $i = 4.10$

Bearing rolling moment: 2.0 - 2.4

Filling capacity (new filling): → **Filling capacity:** approx. 1.0 l

- **Type:** V 48.00

Installed in: Cayenne S

Model year: 2003

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 4.10$

Transmission ratio for manual transmission: $i = 3.70$

Bearing rolling moment: 2.0 - 2.4

Filling capacity (new filling): → **Filling capacity:** approx. 1.0 l

- **Type:** V 48.50

Installed in: Cayenne Turbo

Model year: 2003

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 3.70$

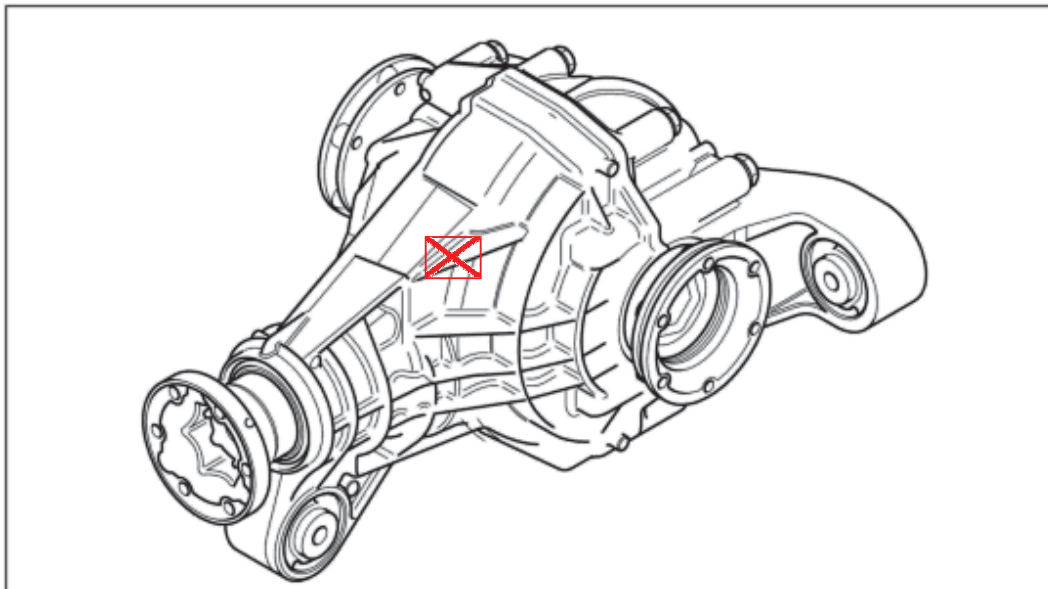
Bearing rolling moment: 2.0 - 2.4

Filling capacity (new filling): → **Filling capacity:** approx. 1.0 l

Technical data on rear final drive

Technical data on rear final drive

Installation Location:



Overall view of rear axle transmission

- **Type:** H 48.20

Installed in: Cayenne

Model year: 2004

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 4.56$

Transmission ratio for manual transmission: $i = 4.10$

Bearing rolling moment: → **Bearing rolling moment:** 1.7 ftlb. +0.2 ftlb.

Filling capacity for Tiptronic: → **Filling capacity:** approx. 1.4 l

Filling capacity for manual transmission: → Filling capacity: approx. 1.25 l

Filling capacity with rear-differential lock: → Filling capacity: approx. 1.6 l

- **Type:** H 48.00

Installed in: Cayenne S

Model year: 2003

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 4.10$

Transmission ratio for manual transmission: $i = 3.70$

Bearing rolling moment: → Bearing rolling moment: 1.7 ftlb. +0.2 ftlb.

Filling capacity for Tiptronic: → Filling capacity: approx. 1.4 l

Filling capacity for manual transmission: → Filling capacity: approx. 1.4 l

Filling capacity with rear-differential lock: → Filling capacity: approx. 1.6 l

- **Type:** H 48.50

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Model year: 2003

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 3.70$

Bearing rolling moment: → Bearing rolling moment: 1.7 ftlb. +0.2 ftlb.

Filling capacity for Tiptronic: → Filling capacity: approx. 1.4 l

Filling capacity for manual transmission: → Filling capacity: approx. 1.4 l

Filling capacity with rear-differential lock: → Filling capacity: approx. 1.6 l

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1

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ATTENZIONE

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ADVERTENCIA

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30 01 07 Bleeding the clutch system - as of MY 2003

- [Notes](#)

- [Procedure for bleeding](#)

Notes

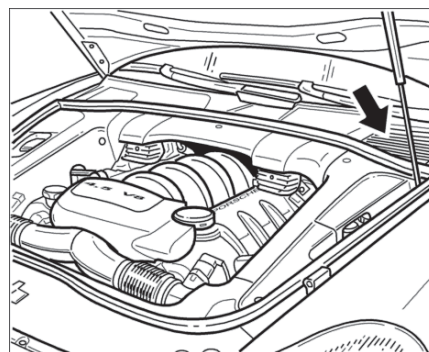


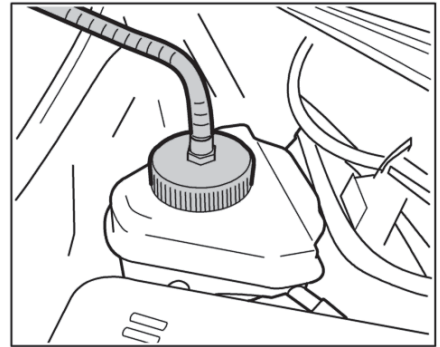
Note

- *The clutch system and brake system share a common reservoir.*
- *The clutch slave cylinder is located to the left of the transmission, at the top of the clutch bell-housing.*
- *Observe brake fluid quality. Use only new DOT 4 brake fluid.*
- *The brake fluid change interval is 2 years in conjunction with Super DOT 4 brake fluid.*
- *This brake fluid is available under the following part numbers: Container quantity: 1 litre = 000.043.203.66. 30 litres = 000.043.203.67.*

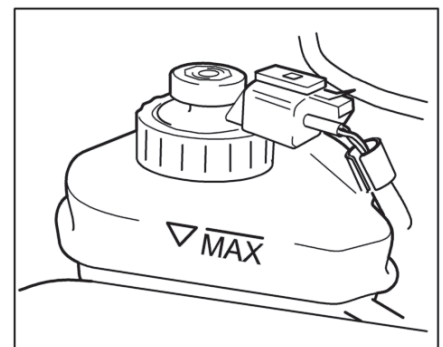
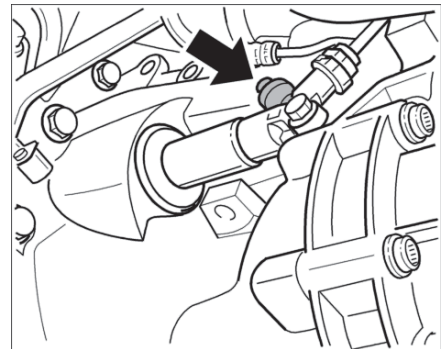
Procedure for bleeding

The shared reservoir for the brake and clutch systems is located in the engine compartment, on the left under the cowl panel cover **-arrow-** in the plenum panel.





1. Open the reservoir and connect the bleeding device → [see figure](#) . Switch on the bleeding device and set the bleeding pressure to approx. 2.0 bar.
2. Remove engine guard. → 108019 Removing and installing engine guard.
3. Use a transparent hose and a collecting bottle to check the escaping brake fluid accurately for cleanliness, freedom from air bubbles and to determine the brake fluid used. Attach the hose of the collecting bottle to the bleeder valve.
4. Open the bleeder valve **-arrow-** (approx. three turns!) until brake fluid emerges. Press the clutch pedal three times and wait for approx. 30 seconds. Press the clutch pedal three times again (2 workers required).
5. Repeat the procedure as often as required until clear, bubble-free brake fluid emerges.
6. Tighten the bleeder valve to the specified tightening torque (3.5 ± 0.5 ftlb.) and remove the bleeder hose from the clutch slave cylinder. Fit dust cap and remove bleeder hose from reservoir.
7. Screw cap on reservoir. Once the vehicle has been filled and bled, the brake fluid level in the reservoir must be between the MIN and MAX markings. Adjust the brake fluid level if necessary. → [see figure](#)
8. Fit engine guard → 108019 Removing and installing engine guard.



9PAAD7, 9PAAE7

as of MY 2003



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
- Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.

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- If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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ADVERTENCIA

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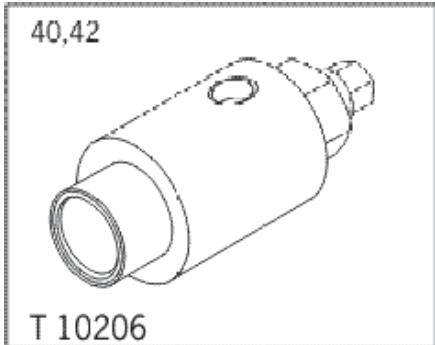
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30 05 19 Removing and installing the clutch pedal - as of MY 2004

- Preliminary work
- Removing
- 23
- Subsequent work

Tools

Designation	Type	Number	Explanation	
pliers	special tool	T10206		

Preliminary work



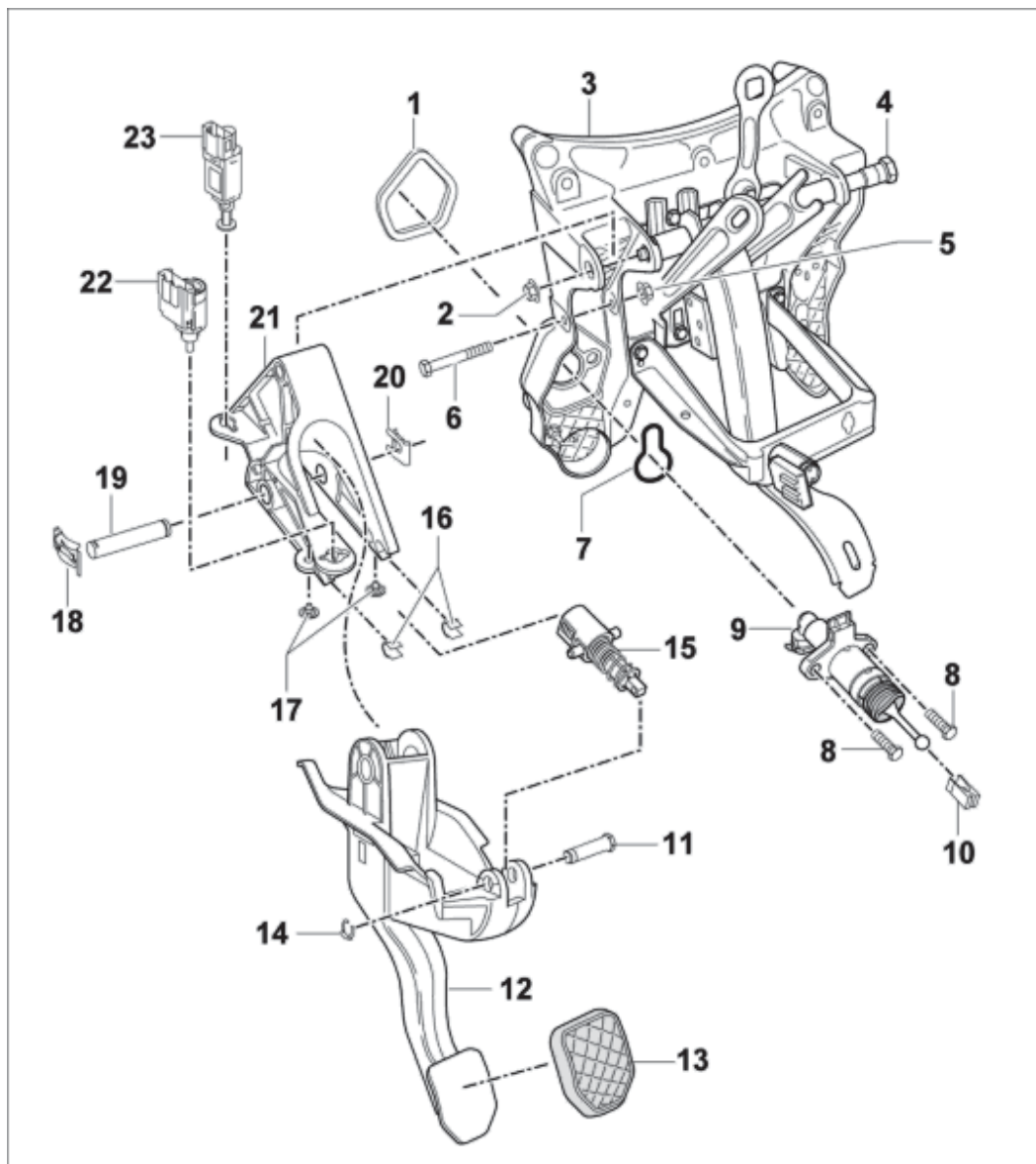
Note

For better accessibility, remove the lower cover on the driver's side under the steering column.

1. Move the driver's seat back. Pull the steering wheel all the way out and put it in the highest position (better access to pedals).
2. Remove and install cover under dashboard. → 702219 Removing and installing cover under dashboard
3. Remove and install trim panel under dashboard. → 701919 Removing and installing trim panel under dashboard

Removing

Removing clutch pedal

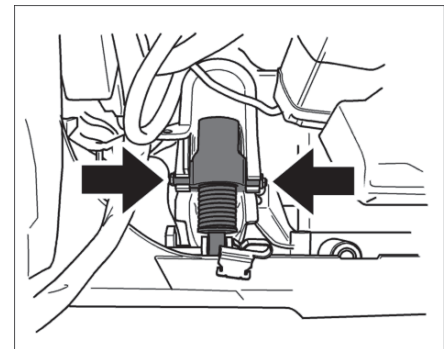


Overview of pedals

- 1 - Seal
- 2 - Hexagon nut
- 3 - Mounting saddle
- 4 - Pin
- 5 - Hexagon nut
- 6 - Hexagon-head bolt
- 7 - Seal

- 8 - Fixing clip
- 9 - Master cylinder
- 10 - Mounting
- 11 - Bolt
- 12 - Clutch pedal
- 13 - Cap
- 14 - Lock (mechanical)
- 15 - Clutch power spring
- 16 - Bearing shell
- 17 - Rubber stop
- 18 - Lock (mechanical)
- 19 - Pin
- 20 - Lock (mechanical)
- 21 - Mounting saddle for clutch pedal
- 22 - Switch
- 23 - Switch

1. Remove the **-clutch power spring from clutch pedal (arrows)-** . Compress the clutch power spring (depress pedal lightly). As it becomes free, secure the hole in the bolt of the clutch power spring with a cotter pin or similar.



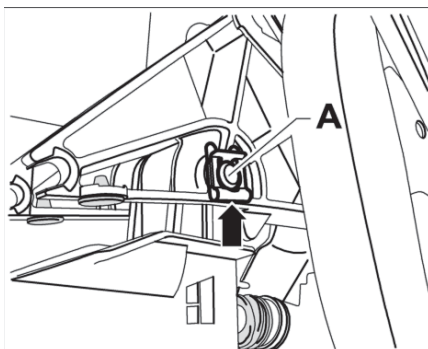
Mount for clutch power spring

2. Depress the pedal and pivot the clutch power spring from front to rear through 180° (against direction of travel) **-arrow-** and unclip from the bearings. **-Item 15-**

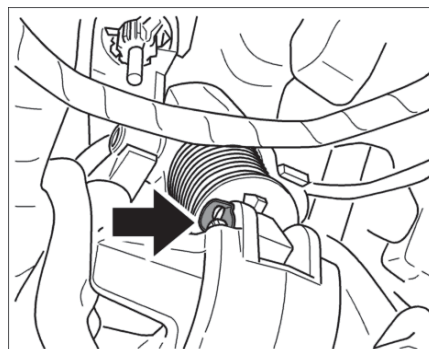


Pivoting out clutch power spring

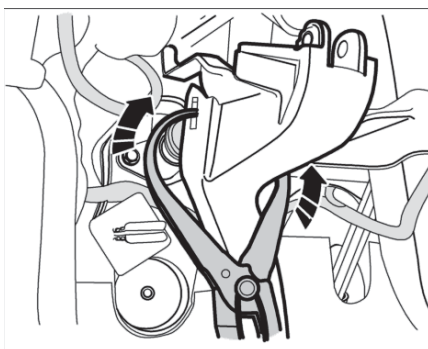
3. Remove **-lock on bolt of clutch power spring (arrow)-** . If necessary, carefully drive the bolt out with a hammer and drift and take out the clutch power spring. **-Item 11-**
4. Remove lock on pin (clutch pedal shaft) **-arrow-** . **-Item 20-**
5. The left lock remains on the pin (clutch pedal shaft). **-arrow-** Push the pin all the way to the left. If necessary, release and lay aside the wiring harness. **-Item 18, 19-**



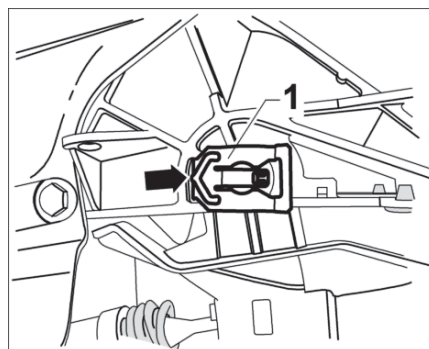
Right lock on pin, clutch pedal



Left lock of clutch power spring



Disengaging clutch pedal

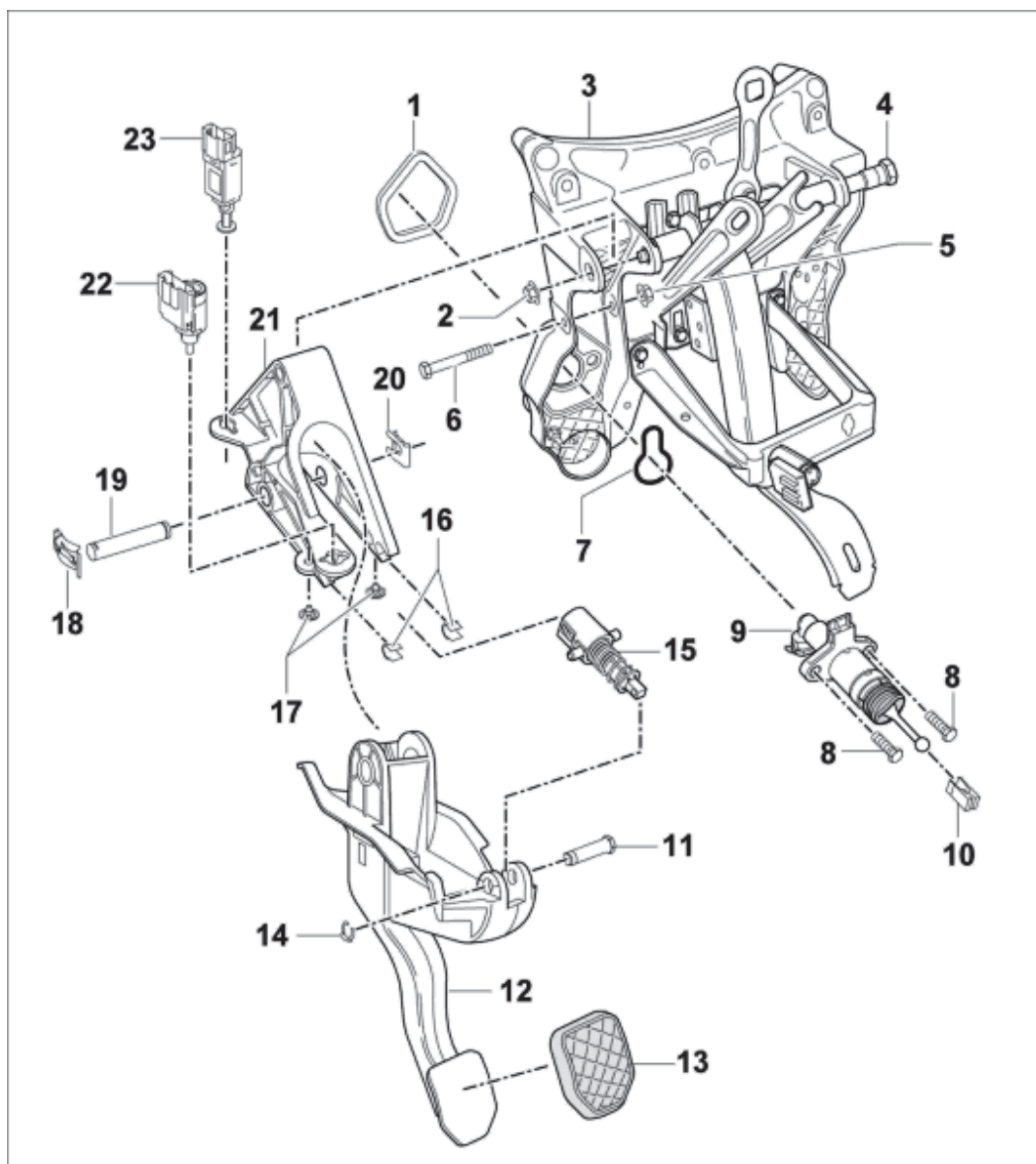


Left lock on pin, clutch pedal

6. Detach pushrod of master cylinder from pedal. To do this, insert the **pliers T10206** into cut-outs on clutch pedal. Remove clutch pedal. **-Item 12-**

23

Installing clutch pedal



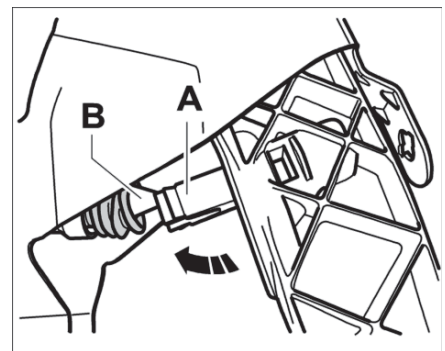
Overview of pedals

- 1 - Seal
- 2 - Hexagon nut
- 3 - Mounting saddle
- 4 - Pin
- 5 - Hexagon nut
- 6 - Hexagon-head bolt
- 7 - Seal
- 8 - Fixing clip
- 9 - Master cylinder
- 10 - Mounting
- 11 - Bolt
- 12 - Clutch pedal
- 13 - Cap

- 14 - Lock (mechanical)
- 15 - Clutch power spring
- 16 - Bearing shell
- 17 - Rubber stop
- 18 - Lock (mechanical)
- 19 - Pin
- 20 - Lock (mechanical)
- 21 - Mounting saddle for clutch pedal
- 22 - Switch
- 23 - Switch

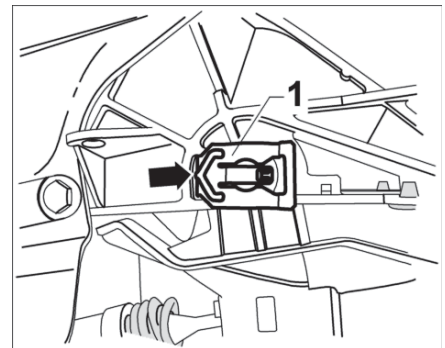
Installation is in reverse order.

1. When the clutch pedal locks into place, the lugs on the right and left must click in audibly. To do this, push the clutch pedal firmly in the direction of travel on the mounting. **-Position 10-** Now turn the pedal to the right and left (2 x click). → [Locking the clutch pedal into place](#)



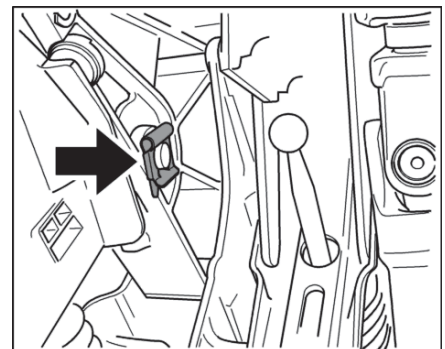
Locking the clutch pedal into place

2. Insert the pin (clutch pedal shaft) **-item 19-** from the left. Make sure that the lock is inserted in the correct position in order to prevent twisting the shaft in the mounting saddle/clutch pedal. **-arrow-**

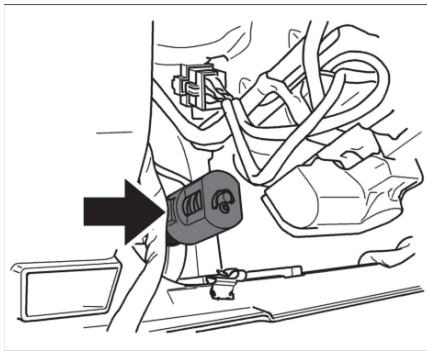


Pin for left lock, clutch pedal

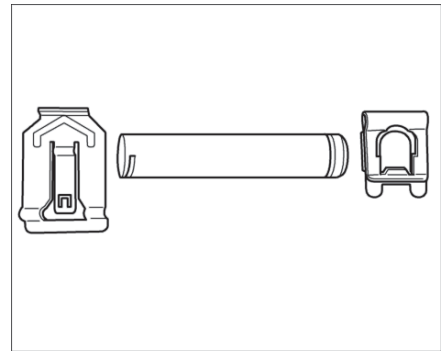
3. Mount the lock of the pin from the clutch pedal **-item 20-** on the right (the brake pedal is removed in the picture here for the sake of clarity).



4. The lock must be able to be inserted in the right groove. → [Locks for clutch pedal pins](#)

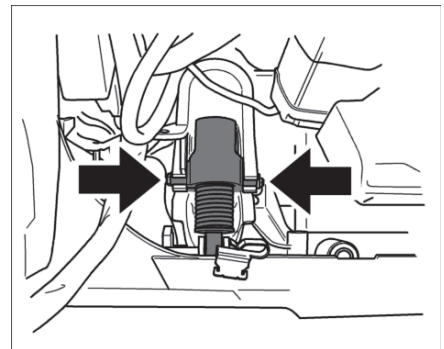


Clutch power spring



Locks for clutch pedal pins

5. Insert clutch power spring. → *Clutch power spring* Insert the bolt in the correct position so that the hexagon cannot twist. The lock must be inserted into the groove from the bolt.
6. Press the clutch pedal and the swivel the clutch power spring 180° to the front and insert in the bearing. **-arrows-** Remove cotter pin.



Clutch power spring mount

Subsequent work

1. → 701919 Removing and reinstalling trim panel under dashboard
2. → 702219 Removing and reinstalling cover under dashboard diagnostic socket, clip in the connector.

9PAAD7, 9PAAE7

as of MY 2004

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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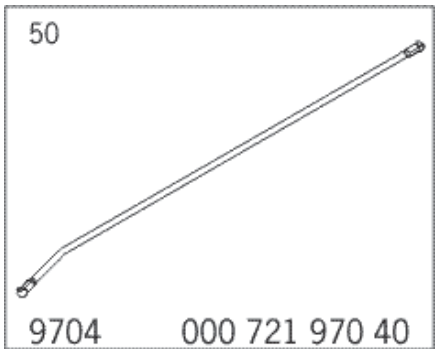
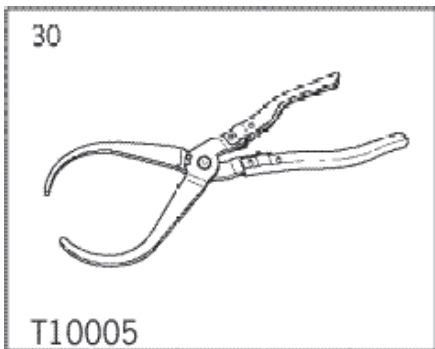
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30 20 19 Removing and installing master cylinder - as of MY 2003

-
- [General warning notes](#)
-
-

Tools

Designation	Type	Number	Explanation	
bonnet stay	special tool	9704		
pliers	VW-tool	T10005		

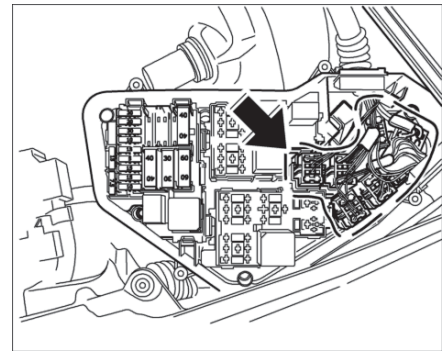
Preliminary work



Note

The clutch master cylinder is installed under the brake booster, accessible from the plenum panel in the engine compartment.

1. Disconnect the battery → 90 *Work instructions after disconnecting the battery.*
2. Open bonnet and position it with the **bonnet stay 9704** → 664419 Removing and installing cowl panel cover .
3. Remove engine design cover → 700219 Removing and installing front cover (engine compartment).
4. Remove cowl panel cover → 664419 Removing and installing cowl panel cover.
5. Remove left plenum panel partition.
6. Partly remove fuse carrier, including six connectors, on the left in the plenum panel and lay to one side -**arrow**- → 9784 *fuse carrier.*



General warning notes

Warning notes



ATTENTION

Increased risk of accidents when working with brake fluid.

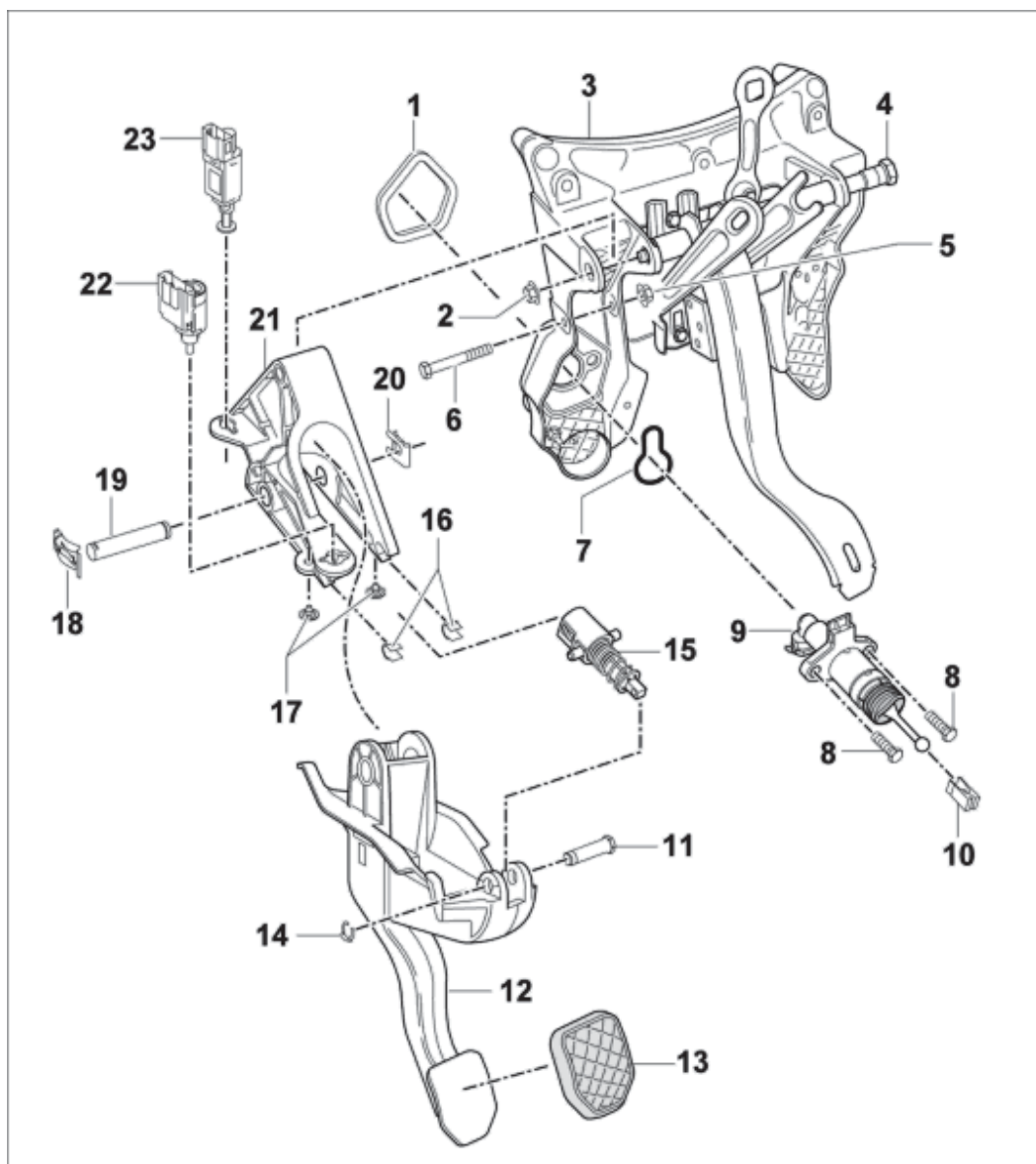
- Possible danger of damage or injury.
- Brake fluid on electrical contacts (even thinned brake fluid) leads to corrosion and may cause faults in the system.

→ Wear protective goggles and gloves.

→ IMMEDIATELY remove any escaped brake fluid. CAREFULLY rinse again with water and dry if necessary. Look out for fuse carrier!

Removing

Overview of pedals

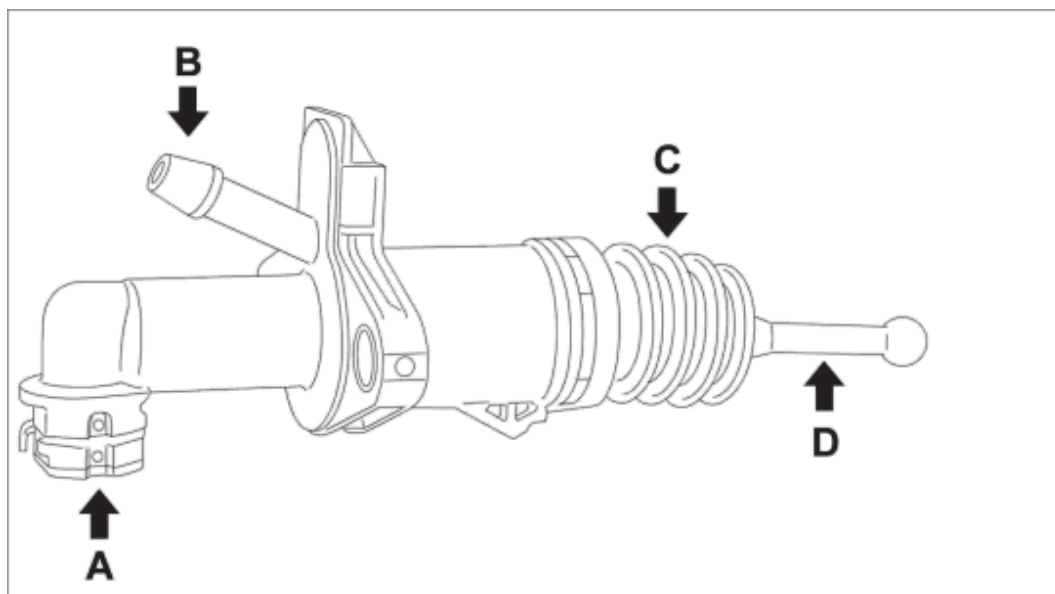


Overview of pedals excluding stop light switch

- 1- - Seal
- 2- - Hexagon nut
- 3- - Mounting saddle
- 4- - Pin
- 5- - Hexagon nut
- 6- - Hexagon-head bolt
- 7- - Seal
- 8- - Fixing clip/screw
- 9- - Master cylinder
- 10- - Mounting
- 11- - Bolt
- 12- - Clutch pedal
- 13- - Cap

- 14- - Lock (mechanical)
- 15- - Clutch power spring
- 16- - Bearing shell
- 17- - Rubber stop
- 18- - Lock (mechanical)
- 19- - Pin
- 20- - Lock (mechanical)
- 21- - Mounting saddle for clutch pedal
- 22- - Switch (clutch pedal switch)
- 23- - Switch (interlock)

Installation position of clutch master cylinder



Clutch master cylinder

- A- - Pressure line connection to clutch slave cylinder
- B- - Supply
- C- - Dust boot
- D- - Pushrod

1. Remove brake fluid by suction below MIN mark in reservoir.

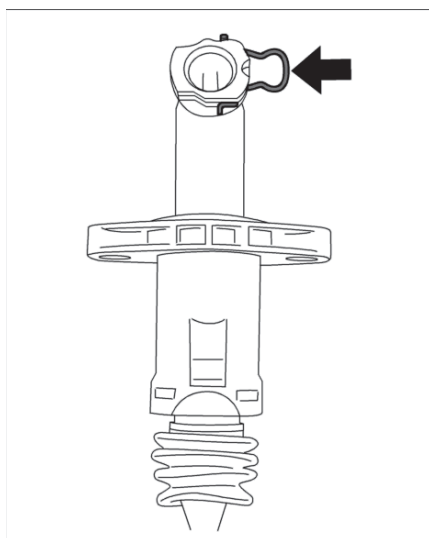


Note

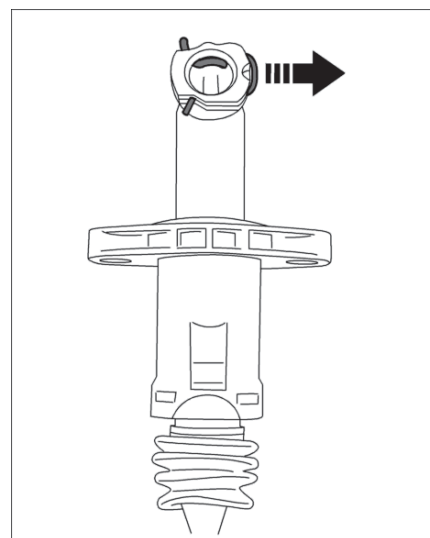
Brake fluid is hygroscopic! Seal all lines immediately with suitable plugs.

Brake fluid will flow from the lines. Protect body in the area under the clutch master cylinder (e.g. with a cleaning cloth).

2. Loosen pressure line from clutch master cylinder to slave cylinder -A-. To do this, remove safety clip to the stop using a screwdriver -direction of arrow- .

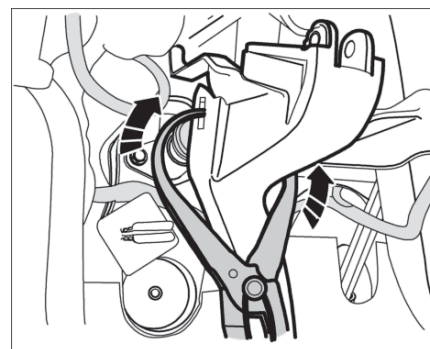


Opening safety clip for pressure line connection of clutch master cylinder



Removing safety clip for pressure line connection from clutch master cylinder

3. Open safety clip. The pressure line can now be pulled off **-arrow-** .
4. Remove lines on brake fluid reservoir and clutch master cylinder **-B-** (pull strongly!).
5. Remove clutch pedal → 300519 Removing and installing clutch pedal . To do this, detach pushrod of master cylinder from pedal. Insert **pliers T10005** in the cut-outs on clutch pedal. Remove clutch pedal **-12-** .
6. Remove fixing clips on clutch master cylinder. Carefully remove clutch master cylinder with a cleaning cloth (soiling of passenger compartment with brake fluid!).



Disengaging clutch pedal

Installing



Note

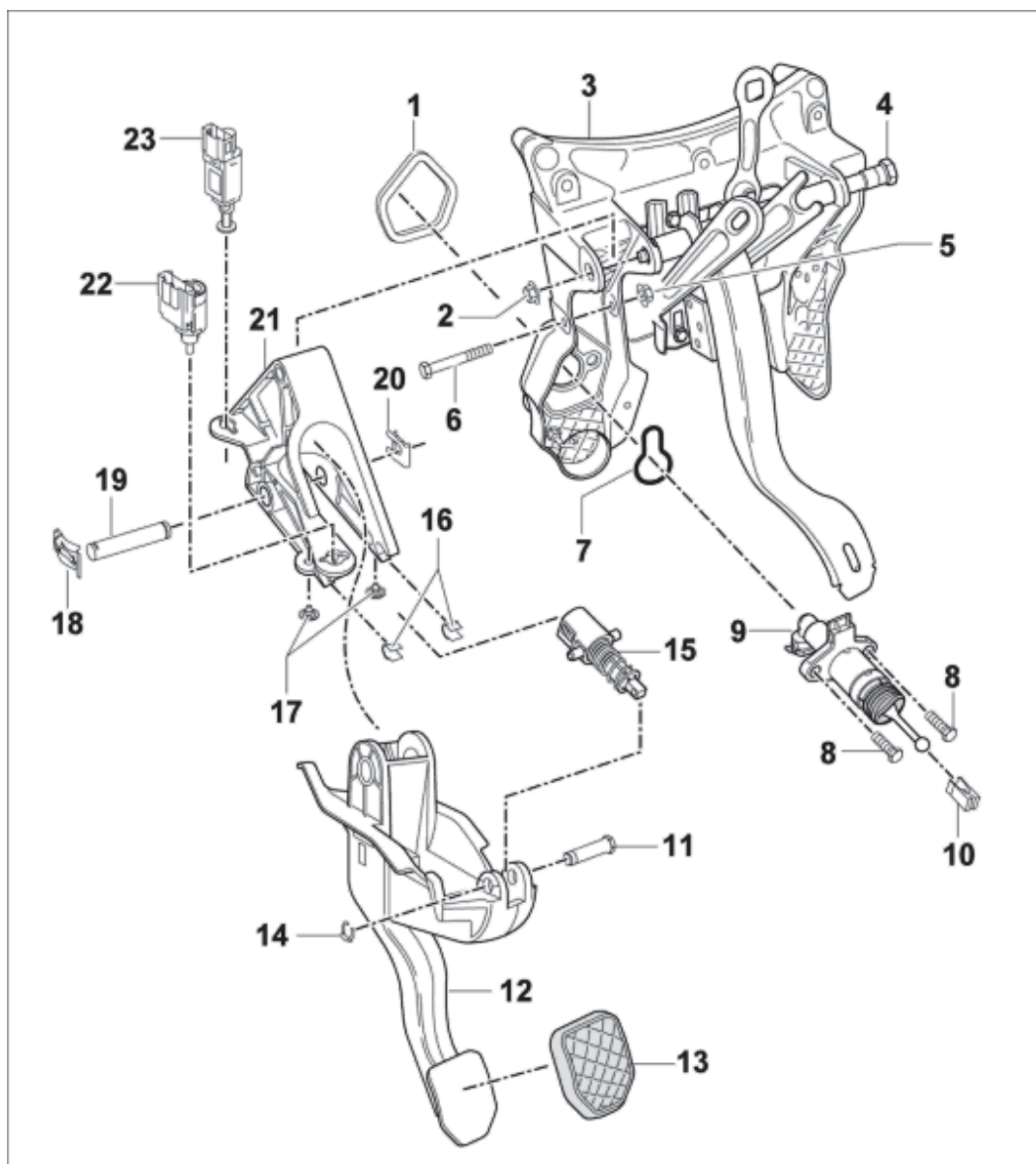
Use a new line from the brake fluid reservoir to the clutch slave cylinder.

If the switches **-22 - 23-** have been removed from the mounting saddle of the clutch pedal **-21-** they must be replaced and their operation checked.

Replace all seals and sealing rings.

- *Remove plugs from the lines.*

Overview of pedals

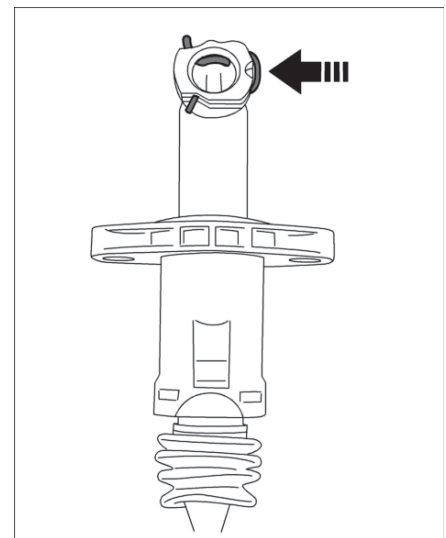


Overview of pedals excluding stop light switch

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- 2 - Hexagon nut
- 3 - Mounting saddle
- 4 - Pin
- 5 - Hexagon nut
- 6 - Hexagon-head bolt
- 7 - Seal
- 8 - Fixing clip/screw
- 9 - Master cylinder
- 10 - Mounting
- 11 - Bolt
- 12 - Clutch pedal
- 13 - Cap

- 14** - Lock (mechanical)
- 15** - Clutch power spring
- 16** - Bearing shell
- 17** - Rubber stop
- 18** - Lock (mechanical)
- 19** - Pin
- 20** - Lock (mechanical)
- 21** - Mounting saddle for clutch pedal
- 22** - Switch (clutch pedal switch)
- 23** - Switch (interlock)

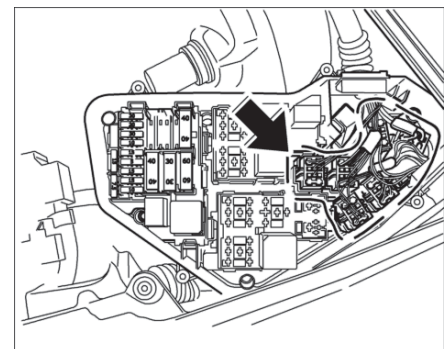
1. Fit master cylinder with fixing clip.
2. Fit clutch pedal → 300519 Removing and installing clutch pedal .
3. Fit pressure line to clutch master cylinder. Engage safety clip **-direction of arrow-** .
4. Connect line between brake fluid reservoir and clutch master cylinder (top and bottom).
5. Fill brake fluid reservoir with brake fluid. The brake fluid level must not exceed the MAX mark.



Engaging safety clip for pressure line connection from clutch master cylinder

Subsequent work

1. Fit fuse box and clip in the six connectors. **-arrow-**
2. Fit left plenum panel partition, ensuring correct seating of gaskets and correct routing of wiring harness.
3. Fit cowl panel cover → 664419 Removing and installing cowl panel cover.
4. Install engine design cover → 700219 Removing and installing front cover (engine compartment).
5. Bleed the clutch → 300107 Bleeding the clutch system.
6. Connect the battery → 90 *Work instructions after disconnecting the*



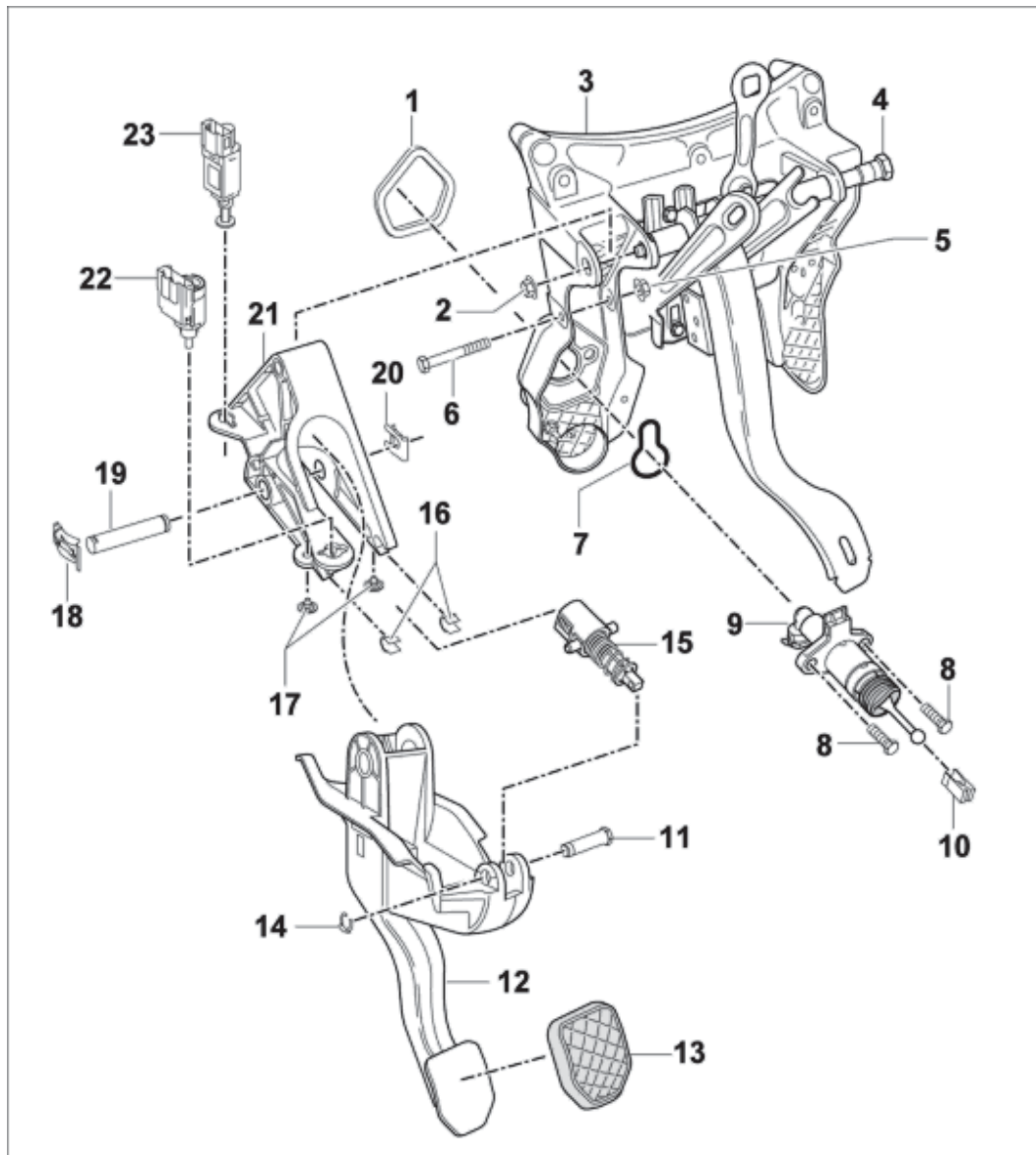
battery.



Note

If clutch switches 22-23 on the mounting saddle for clutch pedal 21 have been removed, they must be replaced. Afterwards check operation of new clutch switches.

Check operation of both clutch switches **-22-23-** (see below: first switch (clutch pedal switch), second switch (interlock)).



Overview of pedals excluding stop light switch

- 1 - Seal
- 2 - Hexagon nut
- 3 - Mounting saddle
- 4 - Pin
- 5 - Hexagon nut

- 6 - Hexagon-head bolt
- 7 - Seal
- 8 - Fixing clip/screw
- 9 - Master cylinder
- 10 - Mounting
- 11 - Bolt
- 12 - Clutch pedal
- 13 - Cap
- 14 - Lock (mechanical)
- 15 - Clutch power spring
- 16 - Bearing shell
- 17 - Rubber stop
- 18 - Lock (mechanical)
- 19 - Pin
- 20 - Lock (mechanical)
- 21 - Mounting saddle for clutch pedal
- 22 - Switch (clutch pedal switch)
- 23 - Switch (interlock)

1. First switch (clutch pedal switch) -22-

Connect System Tester and select >> PSM << system. In the menu >> Input signals/clutch switches << read out the switch states.

From end-position 1 of the clutch pedal (pedal not depressed!) to a pedal travel of 11 mm -A- the switch (clutch pedal switch) must be at >> Not actuated << in the System Tester. Measured using a steel rule at the tread plate of the clutch pedal - second worker required.

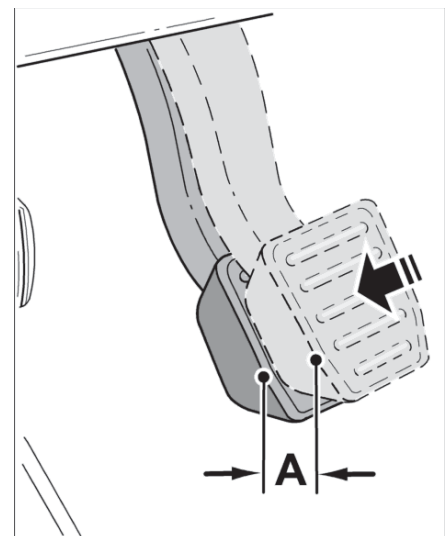
Depress clutch pedal over (!) 11 mm pedal travel:

- Now the switch (clutch switch) must switch to >> Actuated << .

If the switch (clutch pedal switch) does not operate, the installation position must be checked. If that does not succeed, then follow the troubleshooting procedure in the Technical Manual >> Group 0, Diagnostic Repair Group 40-66, PSM Fault Code 650 << .

2. Second switch (interlock) -23-

Connect System Tester and select >> Kessy << system. In the menu >> Input signals/clutch switches (interlock) << read out the switch states.



Depress clutch pedal (rest position) up to 11 mm from end-position 1

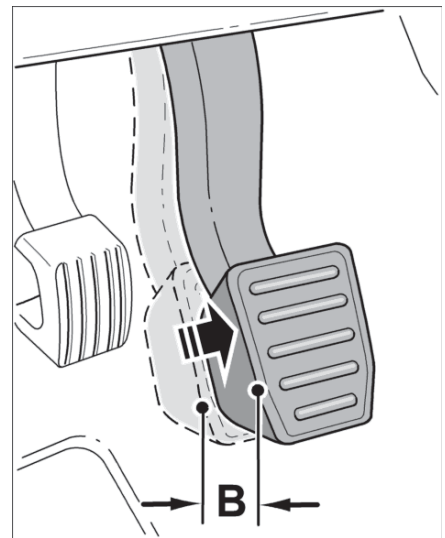
From end-position 2 of the clutch pedal (pedal fully depressed!) minus 20 mm -B- the switch (interlock) must be at >> Actuated << in the System Tester. Measured using a steel rule at the tread plate of the clutch pedal - second worker required.

Depress clutch pedal up to 20 mm before (!) end-position2:

- Up to that point the switch (interlock) must be at >> Not actuated << in the System Tester.

If the switch (interlock) does not switch over, the installation position must be checked. If that does not succeed,

then follow the troubleshooting procedure in the Technical Manual >>
Group 0, Diagnostic Repair Group 91-97, Kessy Fault Code 650 << .



Clutch pedal end-position 2 (fully depressed) minus 20 mm depression

9PAAD7, 9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

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ADVERTENCIA

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30 30 19 Removing and installing clutch slave cylinder - as of MY 2003

- Preliminary work
- Technical values
- Removing clutch slave cylinder
- Installing clutch slave cylinder
- Subsequent work

Preliminary work

Preliminary work for clutch slave cylinder

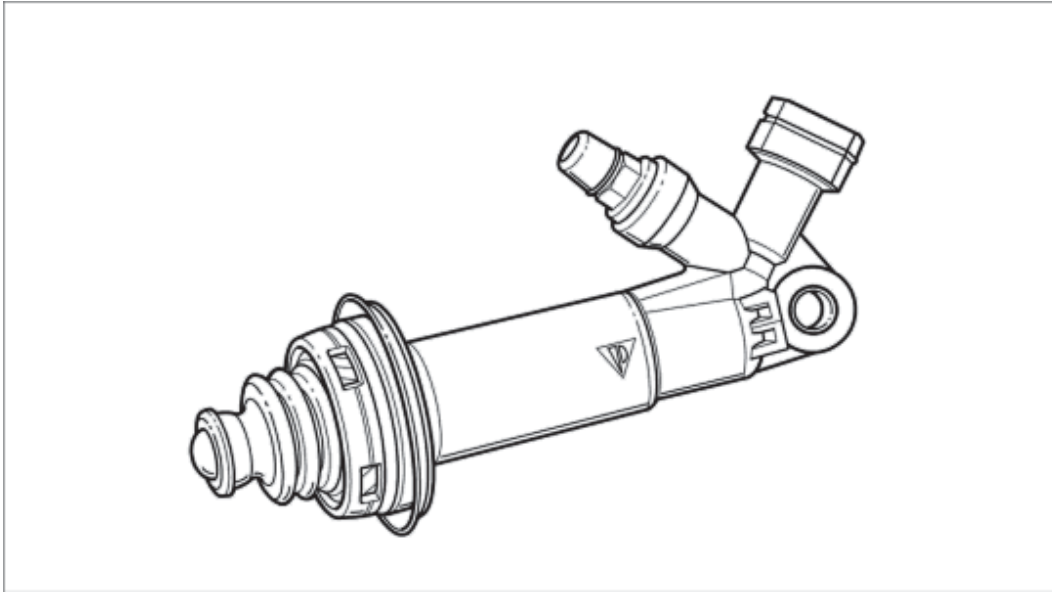
1. Raise the vehicle. → 40 *Lifting the vehicle*
2. Remove engine guard. → 108019 Removing and installing engine guard - chapter on "removing"

Technical values

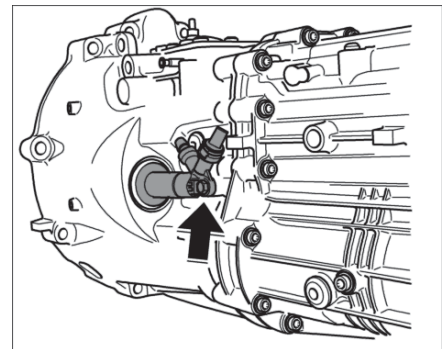
Tightening torques

Removing clutch slave cylinder

Installation Location:

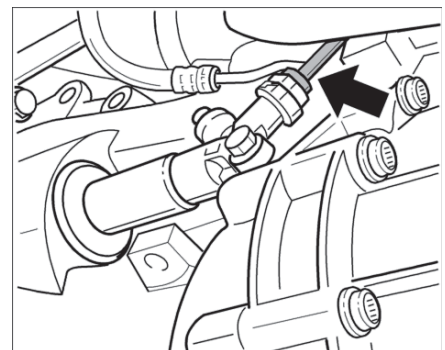


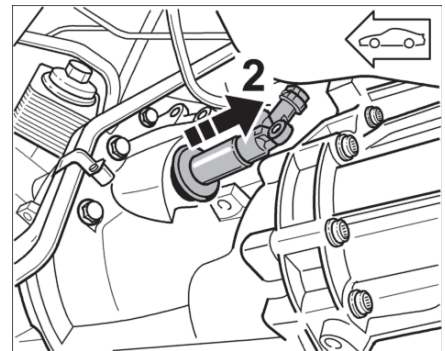
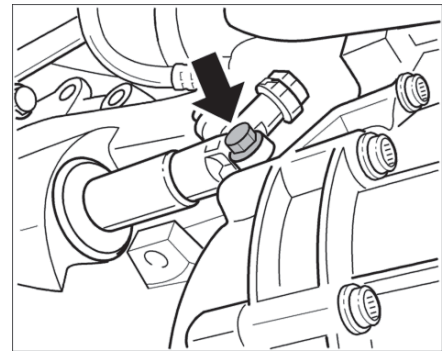
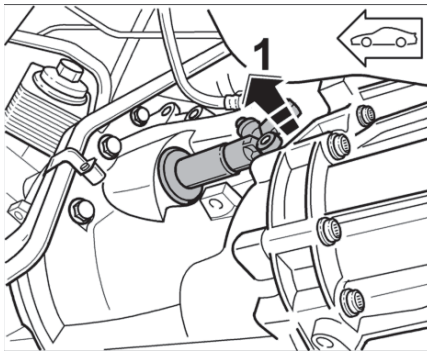
The clutch slave cylinder **-arrow-** is located to the left of the transmission, at the centre section of the clutch bell-housing (shown here on removed transmission).



Note

- Once the lead is separated from the clutch slave cylinder, the clutch pedal must not be pressed until re-installation is complete.
 - During removal, do not bend the clutch slave cylinder more than 3° from the installation position. Greater deflections of the pushrod can damage the clutch slave cylinder and cause brake fluid to run into the bellows.
1. Unclip the line **-arrow-** on the clutch slave cylinder (remove retaining spring) and seal using a suitable plug. Pay attention to the seal on the line. This can remain stuck in the clutch slave cylinder. Carefully remove the seal and replace with a new one, if necessary.
 2. Remove the fastening screw **-arrow-** of the clutch slave cylinder.
 3. Press the clutch slave cylinder carefully outwards **-Arrow 1-**. During removal, do not bend the clutch slave cylinder more than 3° from the installation position.
 4. Remove the clutch slave cylinder to the rear **-Arrow 2-** without tilting it. Wipe off any emerging brake fluid

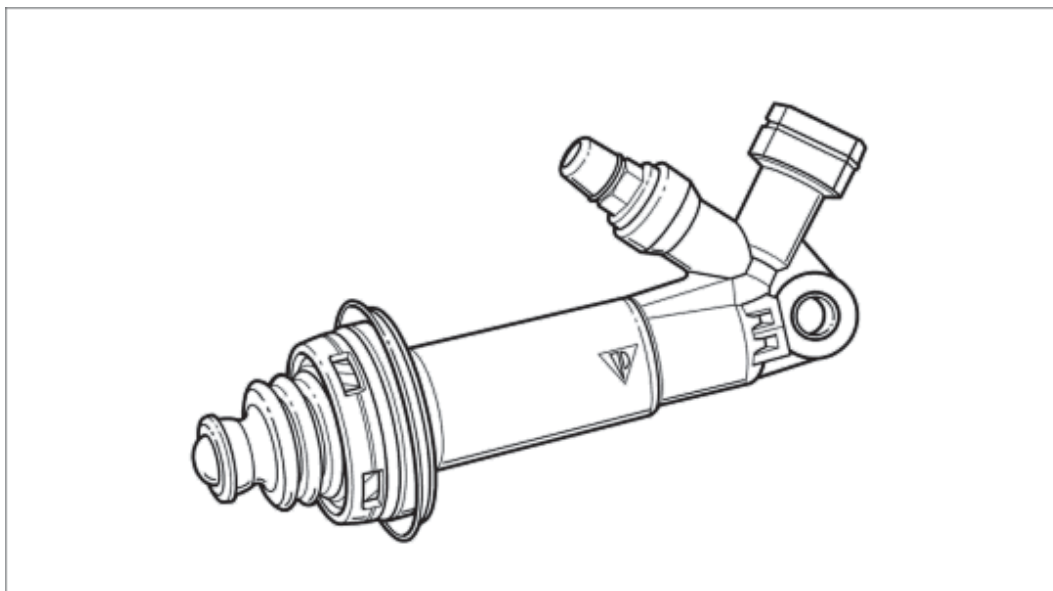




with a lint-free cloth.

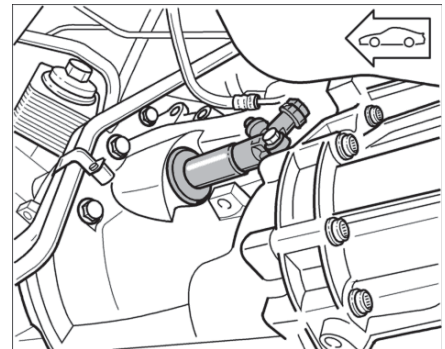
Installing clutch slave cylinder

Installation Location:



Note

- *Drain the clutch slave cylinder fully before installation. Check the bellows for ingress of fluid and clean with a lint-free cloth if necessary.*
 - *Pay attention to the seal of the clutch slave cylinder. This may have been left behind in the clutch slave cylinder during removal.*
 - *During installation, do not bend the pushrod of the clutch slave cylinder more than 3° from the installation position. Greater deflections of the pushrod can damage the clutch slave cylinder.*
 - *Make sure the clutch slave cylinder is positioned correctly during installation.*
 - *Check that the pushrod of the clutch slave cylinder is definitely centred in the release lever.*
 - *Ensure that the cap is seated correctly on the pushrod.*
1. Remove the seal from the clutch slave cylinder and fit it in the correct position on the line. Use a new seal, if necessary.
 2. Insert the clutch slave cylinder carefully (do not tilt) and mount with the fastening screw. Tightening torque: 17 ± 1.5 ftlb.
 3. Remove the plug from the line and clip the line into the clutch slave cylinder. Ensure the retaining spring is seated correctly.
 4. Bleed the clutch system → 300107 Bleeding the clutch system.



Subsequent work

Subsequent work for clutch slave cylinder

1. Remove engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAD7, 9PAAE7

as of MY 2003



WARNUNG

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ADVERTENCIA

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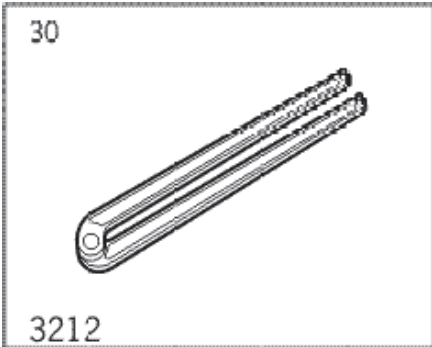
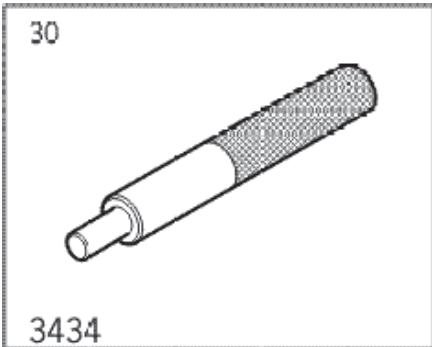
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30 50 19 Removing and installing clutch - as of MY 2003

- Preliminary work for clutch
- Removing clutch
- Installing clutch
- Subsequent work for clutch

Tools

Designation	Type	Number	Explanation	
2-hole nut turner	commercially available tool	3212		
centring mandrel	special tool	3434		

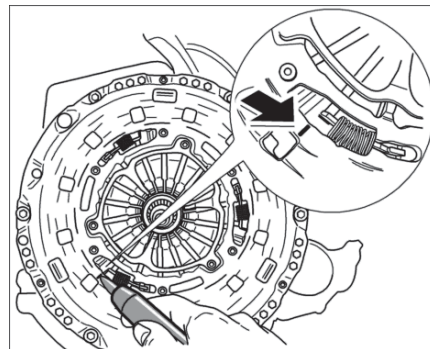
Preliminary work for clutch

Preliminary work for clutch

1. Remove manual transmission. → 343519 Removing and installing transmission - chapter on "removing" [9PAAD7]→ 343519 Removing and installing transmission - chapter on "removing" [9PAAE7]

Removing clutch

1. Mark position of clutch adjuster on the clutch pressure plate using a coloured pen **-arrow-** .



Clutch adjuster marking



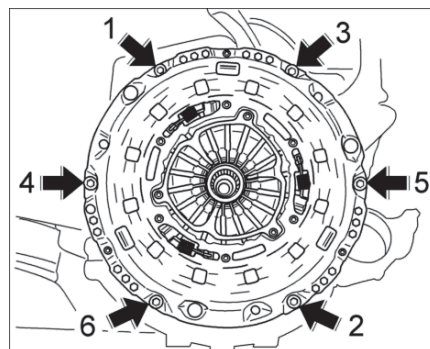
ATTENTION

Clutch grabbing

- Clutch pressure plate may warp if screws are not loosened and tightened evenly.

→ Loosen and tighten the clutch pressure plate in the specified order.

2. Unscrew the fastening screws on the clutch in the specified order **-1 to 6-** in several stages. Loosen each screw by half a turn at a time.
3. Remove clutch.



Clutch tightening sequence

Installing clutch

Installing clutch

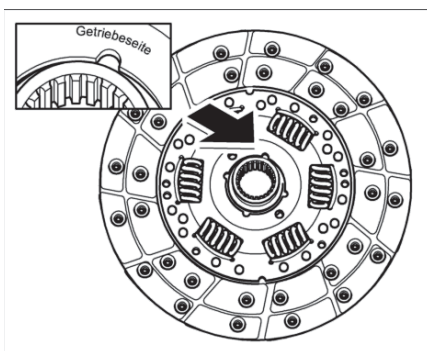


Note

When installing the clutch plate, observe the correct installation position. Please note marking **-arrow inset-** on clutch plate.

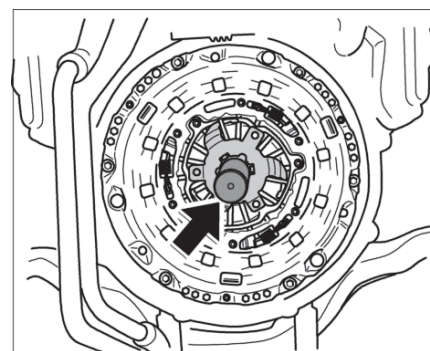


Note

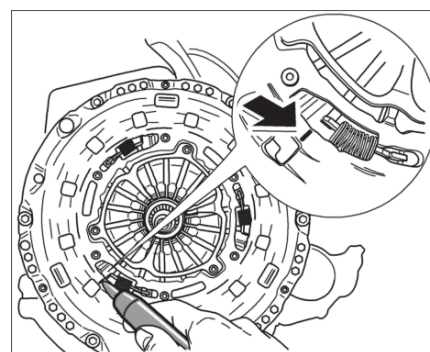


Clutch plate marking

- If the marking **-arrow-** for the clutch adjuster no longer lines up after reassembly, the clutch must be replaced.



Centring the coupling plate

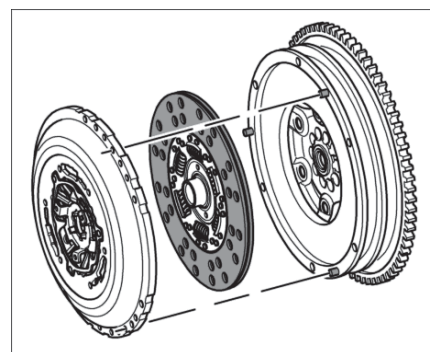


Marking the clutch adjuster



Note

- The clutch pressure plate must be positioned on the three dowel pins → **Fitting clutch plate** of the double-mass flywheel.
1. Position clutch plate and pressure plate on engine using special tool centring mandrel 3434 **-arrow-**.

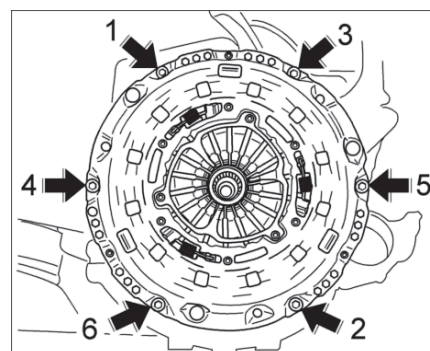


Fitting clutch plate



Note

- Replace clutch fastening screws.



Clutch tightening sequence

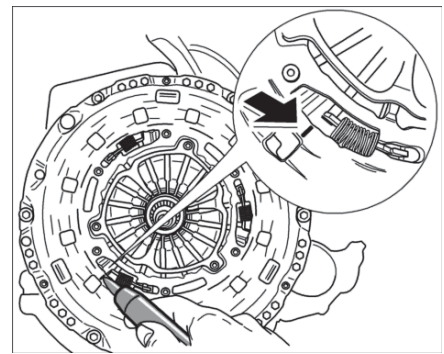


Note

- If the marking **-arrow-** for the clutch adjuster no longer lines up after reassembly, the clutch must be

replaced.

2. Screw in clutch fastening screws in the specified order **-1 to 6-** in several stages. Tighten each screw by half a turn at a time. → **Tightening torque: 17 ftlb.**
3. Remove special tool **centring mandrel 3434**.



Marking the clutch adjuster

Installing a new clutch

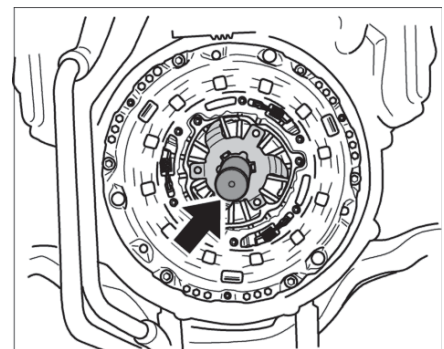


ATTENTION

Danger of injury from releasing clutch set.

- Due to preloading of the clutch set, parts of the coupling may fly out.

- Locking hook on new clutch set was removed prematurely.
- Secure clutch pressure plate. Then remove locking hook.

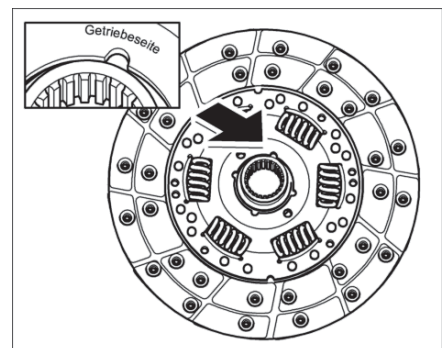


Centring the coupling plate



Note

When installing the clutch plate, observe the correct installation position. Please note marking **-arrow inset-** on clutch plate.



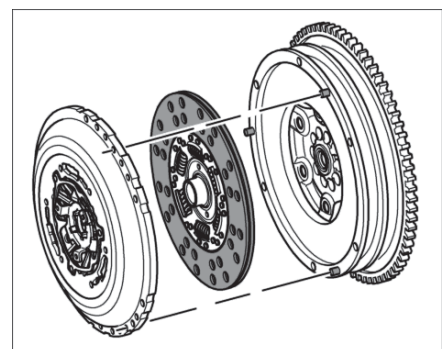
Clutch plate marking



Note

- The clutch pressure plate must be positioned on the three dowel pins → **Fitting clutch plate** of the double-mass flywheel.

1. Position new clutch set on engine using special tool **centring mandrel 3434** **-arrow-** .

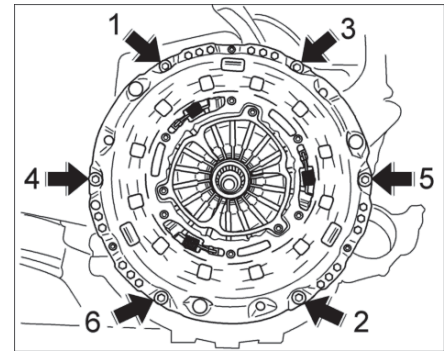


Fitting clutch plate



Note

- Replace clutch fastening screws.
2. Screw in clutch fastening screws in the specified order **-1 to 6-** in several stages. Tighten each screw by half a turn at a time. → **Tightening torque: 17 ftlb.**



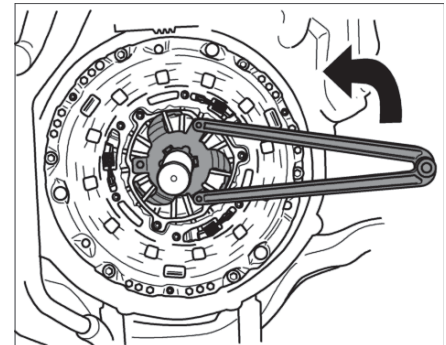
Clutch tightening sequence



ATTENTION

Danger of injury from releasing clutch set.

- Due to preloading of the clutch set, parts of the coupling may fly out.
- Locking hook on new clutch set was removed prematurely.
 - Secure clutch pressure plate. Then remove locking hook.
3. Unscrew locking hook with special tool **2-hole nut turner 3212** in an anti-clockwise direction **-arrow-** and remove it.
 4. Remove special tool **centring mandrel 3434**.



Removing locking hooks

Subsequent work for clutch

Subsequent work for clutch

1. Install manual transmission. → 343519 Removing and installing transmission - chapter on "installing" [9PAAD7] → 343519 Removing and installing transmission - chapter on "installing" [9PAAE7]

9PAAD7, 9PAAE7

as of MY 2003



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30 56 01 Checking clutch for wear - as of MY 2003

- Preliminary work
- Checking clutch for wear

Tools

Designation	Type	Number	Explanation	
material	special tool	00000		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work

Preliminary work for clutch wear

1. Remove transmission. → 343519 Removing and installing transmission - chapter on "removing" [9PAAD7]
→ 343519 Removing and installing transmission - chapter on "removing" [9PAAE7]

Checking clutch for wear

1. Measure clutch wear at one of the three clutch adjusters. To do this, measure using **material 00000** between adjuster and clutch pressure plate **-arrow inset-** .
 - Distance when new: ? 16 mm.

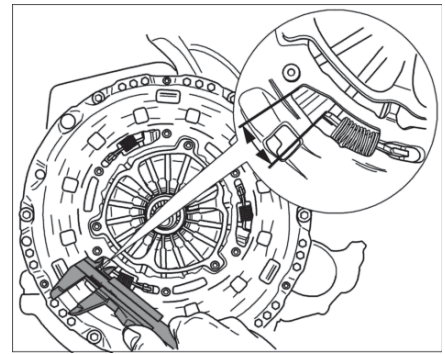
- Replace clutch if distance ≤ 8 mm.

Clutch is OK:

2. Install transmission. → 343519 Removing and installing transmission - chapter on "installing" [9PAAD7] → 343519 Removing and installing transmission - chapter on "installing" [9PAAE7]

Clutch is defective:

3. Replace clutch. → 300519 Removing and installing the clutch pedal



Measuring clutch wear

9PAAD7, 9PAAE7

as of MY 2003



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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- **Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.**

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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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ATTENZIONE

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34 01 35 Checking and topping up transmission oil - as of MY 2003

- Preliminary work
- Checking transmission oil
- Topping up transmission oil
- Subsequent work

Tools

Designation	Type	Number	Explanation	
oil filler for ATF	commercially available tool			

Preliminary work

Preliminary work for transmission oil

1. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"

Checking transmission oil

Checking transmission oil



WARNING

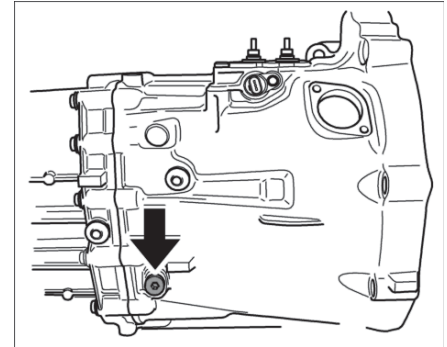
Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)

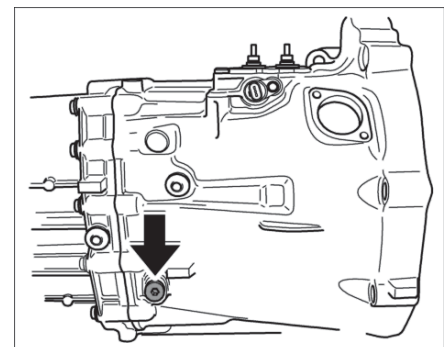


Note

- Secure vehicle to prevent it rolling away.
 - To check transmission oil the vehicle must be horizontal.
1. Unscrew oil inspection plug **-arrow-** .
 2. The oil level is correct if the oil reaches the lower edge of the inspection window.
If this is not the case, add more transmission oil. → 340135 Checking and topping up transmission oil - chapter on "refilling"
 3. Screw in oil inspection plug **-arrow-** with new sealing ring. →
Tightening torque: 26 ftlb.



Oil inspection plug



Oil inspection plug

Topping up transmission oil

Topping up transmission oil



WARNING

Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)



Note

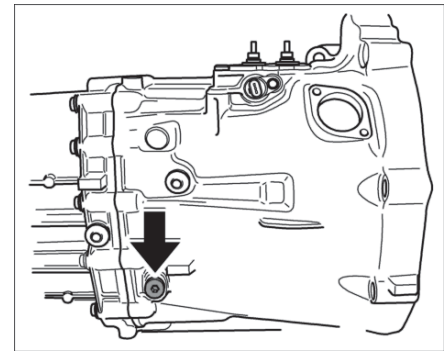
- Secure vehicle to prevent it rolling away.
- To check transmission oil the vehicle must be horizontal.

1. Unscrew oil inspection plug **-arrow-** .



Note

Use only oil approved by Porsche.



Oil inspection plug

2. Fill in oil using **oil filler for ATF** up to lower edge of oil inspection plug **-arrow-** .
3. Screw in oil inspection plug **-arrow-** with new sealing ring. → **Tightening torque: 26 ftlb.**

Subsequent work

Subsequent work for transmission oil

1. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAD7, 9PAAE7

as of MY 2003



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

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ATTENZIONE

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ADVERTENCIA

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34 01 55 Changing transmission oil - as of MY 2003

- [Preliminary work](#)
- [Changing transmission oil](#)
- [Subsequent work](#)

Tools

Designation	Type	Number	Explanation	
oil filler for ATF	commercially available tool			 .gif

Preliminary work

Preliminary work for transmission oil

1. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"

Changing transmission oil

Changing transmission oil

1. Place oil collecting container underneath the vehicle.



WARNING

Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)



Note

- Secure vehicle to prevent it rolling away.
- Vehicle must be horizontal in order to change transmission oil.

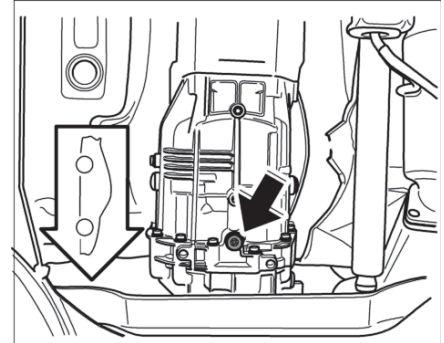
2. Unscrew oil drain plug **-arrow-** and drain transmission oil.
3. Screw in oil drain plug **-arrow-** with new sealing ring. → **Tightening torque: 26 ftlb.**
4. Unscrew oil inspection plug **-arrow-**.



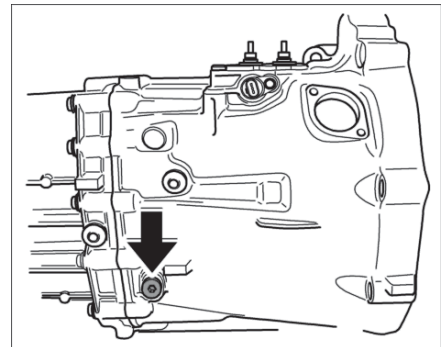
Note

Use only oil approved by Porsche.

5. Fill in oil using **oil filler for ATF** up to lower edge of inspection window **-arrow-**. → **Change quantity: 1.8 litre**
6. Screw in oil inspection plug **-arrow-** with new sealing ring. → **Tightening torque: 26 ftlb.**



Oil drain plug



Oil inspection plug

Subsequent work

Subsequent work for transmission oil

1. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAD7, 9PAAE7

as of MY 2003



WARNUNG

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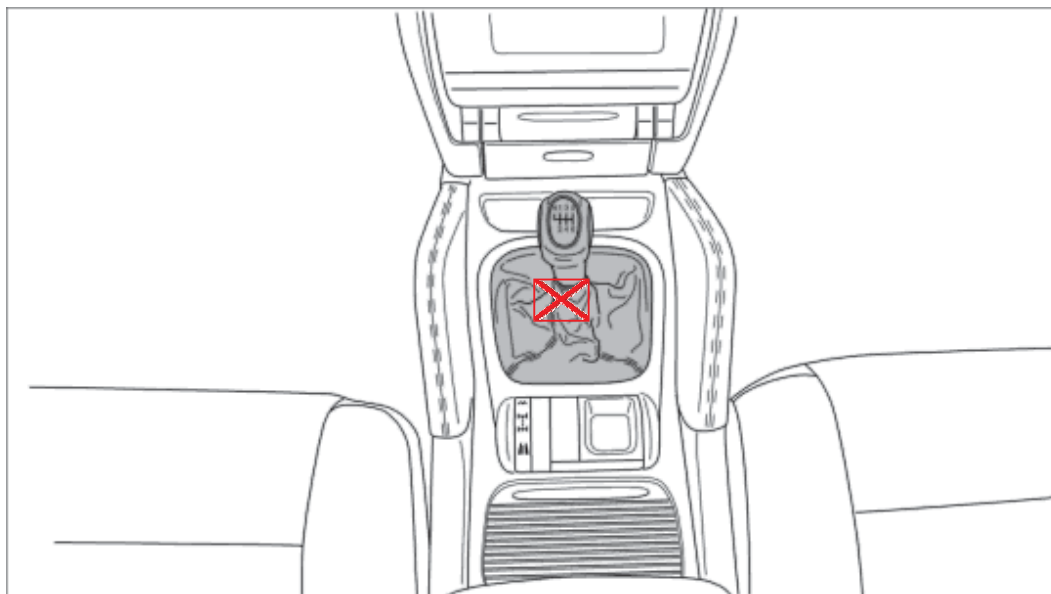
34 04 19 Removing and installing shift lever knob - as of MY 2003

- [Removing shift lever knob](#)
- [Installing shift lever knob](#)

Removing shift lever knob

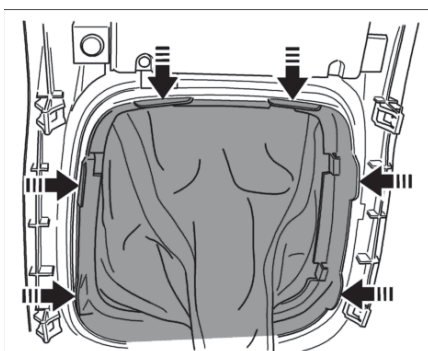
Removing shift lever knob

Installation Location:

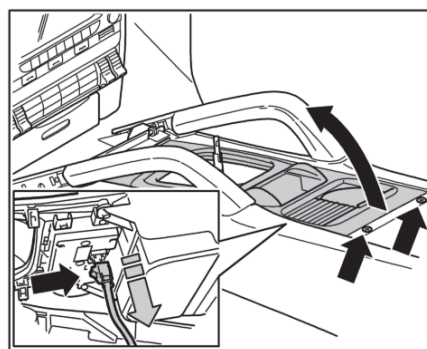


Overview of shift-lever knob

1. Put shift-lever knob in neutral position.
2. Unscrew fastening screws on centre console cover **-right arrows-** , tip cover up and back **-curved arrow-** and separate cable connection **-inset-** .

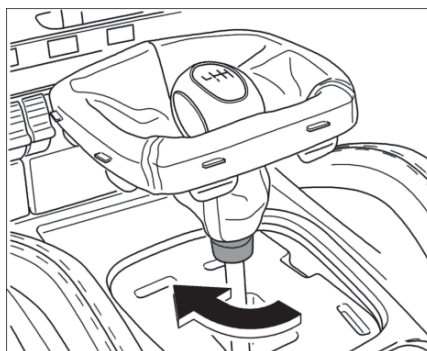


Leather boot



Centre console cover

3. Press leather boot out of centre console cover from below **-arrows-** .
4. Unlock shift-lever knob. To do this, turn the grooved end piece on the gearshift lever clockwise by a quarter of a turn until it engages.

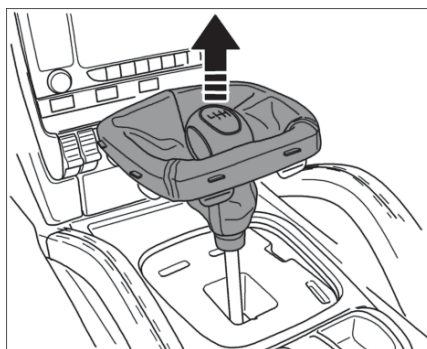


Unlocking the shift-lever knob



Note

- Do not pull shift-lever knob off by pulling on the leather boot.

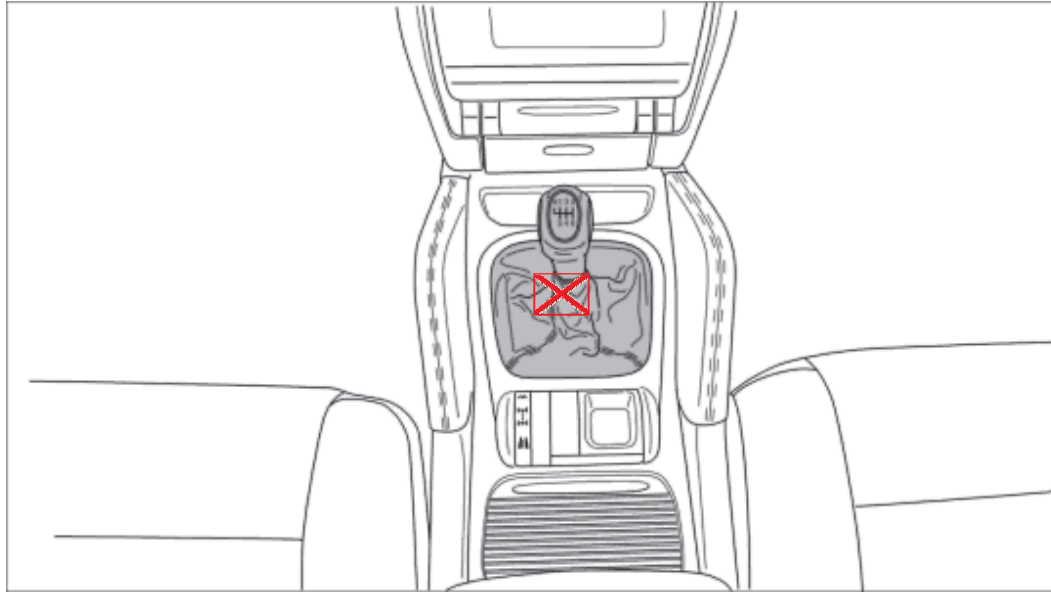


Removing the shift-lever knob

Installing shift lever knob

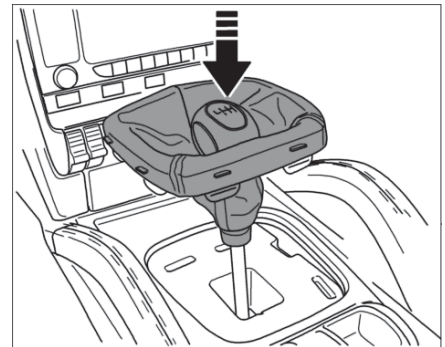
Installing shift lever knob

Installation Location:



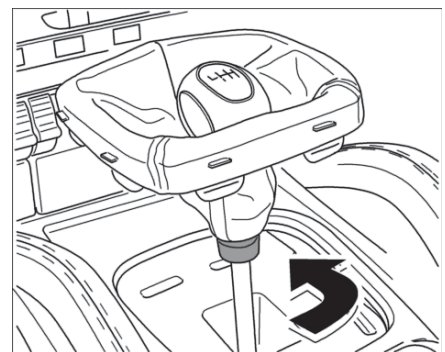
Overview of shift-lever knob

1. Insert the shift lever knob from above until it engages.



Assembling the shift-lever knob

2. Lock shift-lever knob. To do this, turn the grooved end piece on the gearshift lever anti-clockwise by a quarter of a turn until it engages.

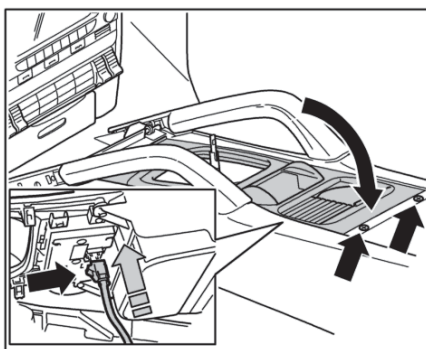


Locking the shift-lever knob

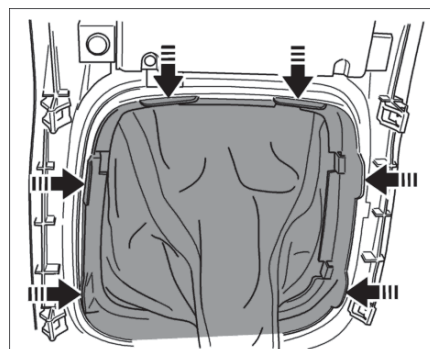
3. Fit leather boot into centre console cover from above.
4. Position cable connection **-inset-** on the underside of the centre console cover.
5. Tip centre console cover backwards **-curved arrow-** and screw in fastening screws **-right arrows-**.

9PAAD7, 9PAAE7

as of MY 2003



Centre console cover



Leather boot



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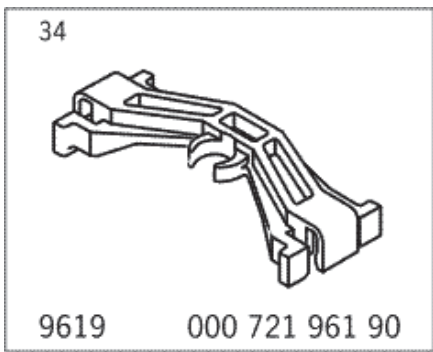
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34 08 19 Removing and installing top section of gearshift bracket - as of MY 2003

- Preliminary work for top section of gearshift bracket
- Removing top section of gearshift bracket
- Installing top section of gearshift bracket
- Subsequent work for top section of gearshift bracket

Tools

Designation	Type	Number	Explanation	
locking bridge	commercially available tool	9619		

Preliminary work for top section of gearshift bracket

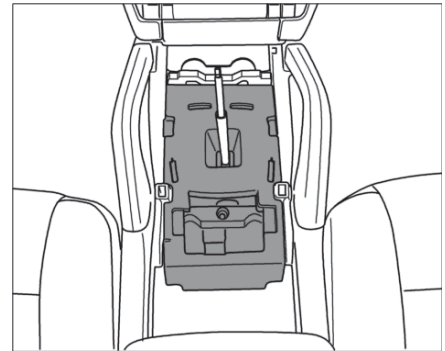
Preliminary work for top section of gearshift bracket

1. Remove shift lever knob. → 340419 Removing and installing shift lever knob - chapter on "removing"

Removing top section of gearshift bracket

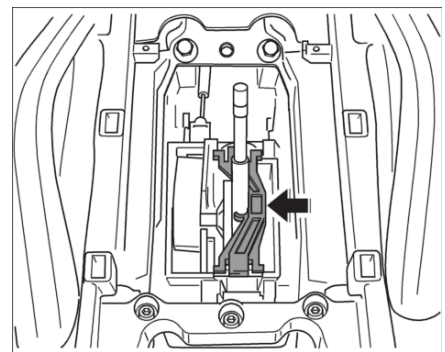
Removing top section of gearshift bracket

1. Remove centre console trim panel.
2. Remove foam mat → *Foam mat* .



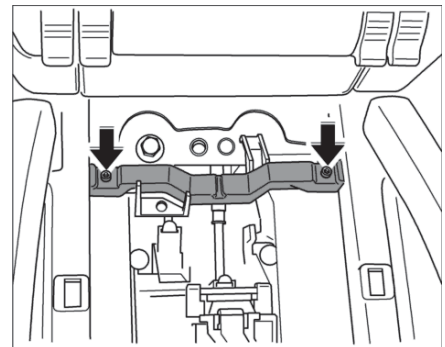
Foam mat

3. Lock gearshift lever in neutral position using special tool **locking bridge 9619** -*arrow*- .



Locking the gearshift lever

4. Remove transverse strut on centre console -*arrows*- .



Transverse strut for centre console

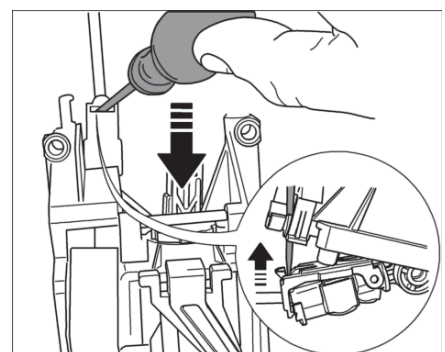


ATTENTION

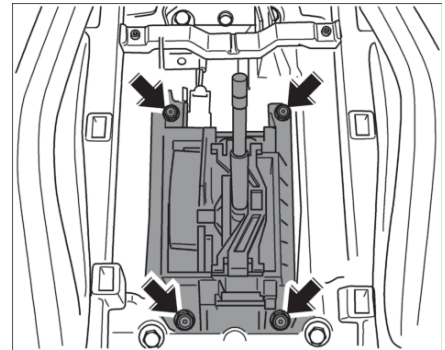
Plate on fastening part breaks off.

- Unlocking causes plate to become overstretched.
- Only bend fastening part as far as release.

5. Pull shift and selector cable off gearshift bracket. To do this, release the fastening parts using a screwdriver -*arrows*- .
6. Remove special tool **locking bridge 9619**.



Removing shift and selector cables



Gearshift bracket

7. Unscrew fastening screws **-arrows-** on top section of gearshift bracket.
8. Remove top section of gearshift bracket.

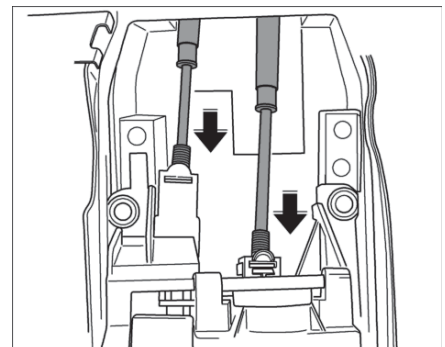
Installing top section of gearshift bracket

Installing top section of gearshift bracket

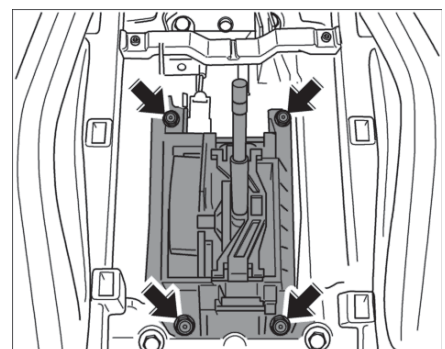


Note

- *Transmission must be in neutral position!*
1. Install top section of gearshift bracket. Insert shift and selector cable into fastening part **-arrows-**.
 2. Screw in fastening screws **-arrows-** on top section of gearshift bracket. → **Tightening torque: 6.5 ftlb.**



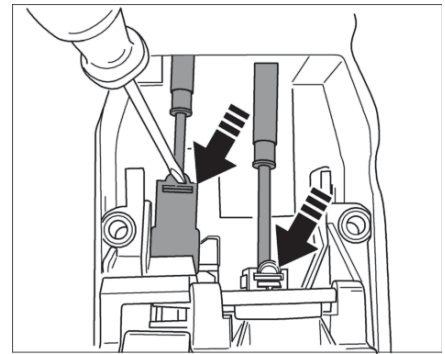
Inserting shift and selector cables



Gearshift bracket

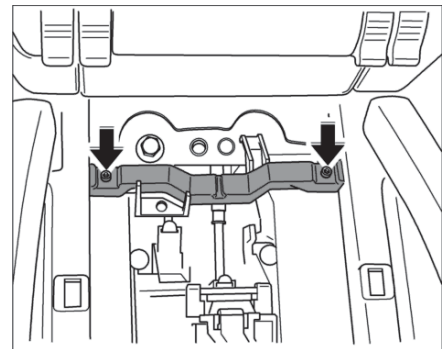
3. Lock shift and selector cable by pressing on the fastening parts **-arrows-**.
4. Function test for shift mechanism:

- Position of gearshift lever?
- Possible to shift through all gears, including reverse gear?



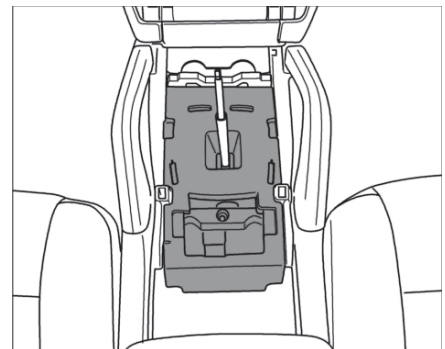
Locking the shift and selector cable

5. Install the transverse strut of the centre console -arrows- .



Transverse strut for centre console

6. Insert foam mat → *Foam mat* .
7. Insert centre console trim panel.



Foam mat

Subsequent work for top section of gearshift bracket

Touching up top section of gearshift bracket

1. Install shift lever knob. → 340419 Removing and installing shift lever knob - chapter on "installing"

9PAAD7, 9PAAE7

as of MY 2003



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

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ADVERTENCIA

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34 12 19 Removing and installing shift and selector cables - as of MY 2004

- Preliminary work for shift and selector cables
- Removing shift and selector cables
- Installing shift and selector cables
- Subsequent work

Tools

Designation	Type	Number	Explanation	
material	special tool	00000	transmission jack	PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
disassembly tool, universal	commercially available tool	21		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work for shift and selector cables

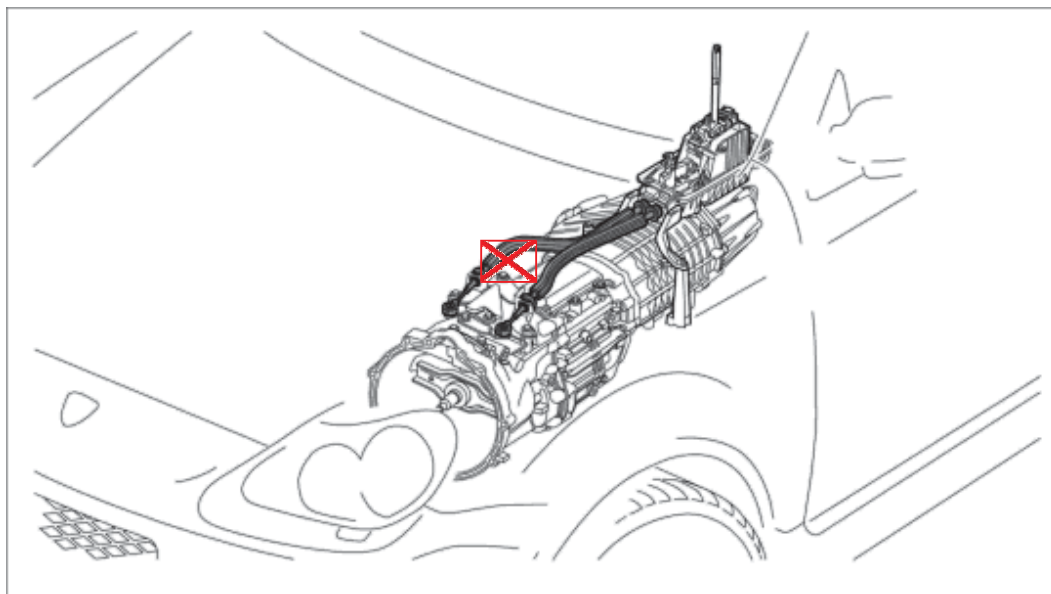
Preliminary work for shift and selector cables

1. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"
2. Remove rear cardan shaft. → 393519 Removing and reinstalling rear cardan shaft - chapter on "Removing" [9PAAE7]→ 393519 Removing and reinstalling rear cardan shaft - chapter on "Removing" [9PAAD7]
3. Remove top section of gearshift bracket. → 340819 Removing and reinstalling top section of gearshift bracket - chapter on "Removing"

Removing shift and selector cables

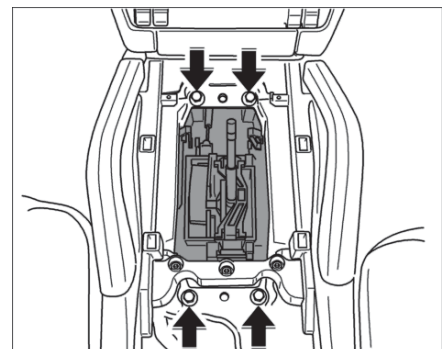
Removing shift and selector cables

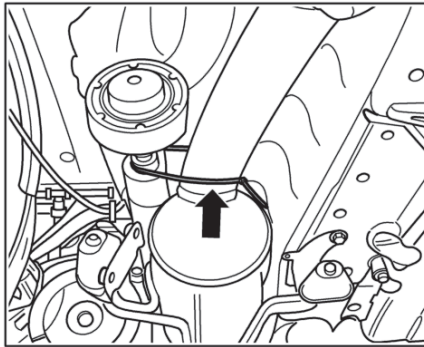
Installation Location:



Overview of shift and selector cables

1. Unscrew threaded joint on bottom section of gearshift bracket
-arrows- .

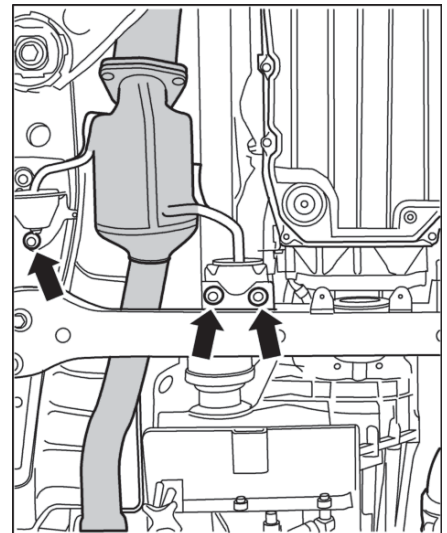




Mount of gearshift bracket to body

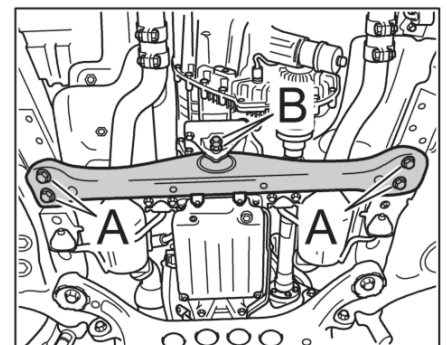
Attaching the cardan shaft

2. Remove front cardan shaft on the transfer box and tie it up at the side **-arrow-** .
3. Lower the transmission:
4. Loosen fastening screws securing exhaust system support **-centre arrows-** to transmission cross member.
5. Support transfer box with **material 00000**.



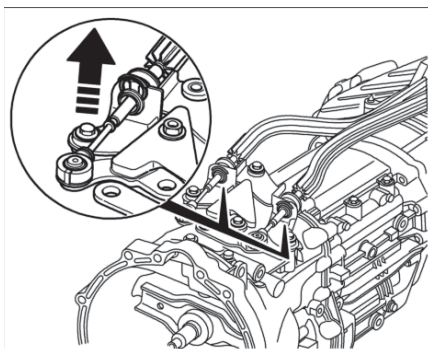
Catalytic converter

6. Unscrew four screws **-A-** on transmission cross member.

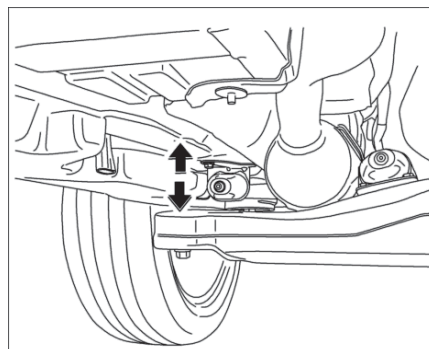


Transmission cross member

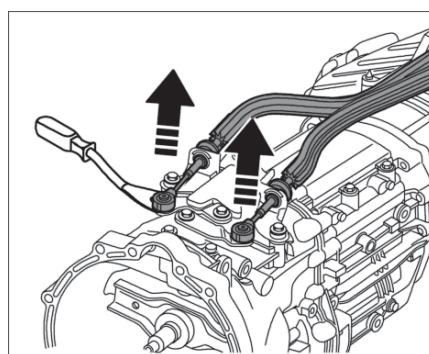
7. Lower transmission cross member by approx. 55 mm **-arrow-** .
8. Remove safety clips **-arrows-** on support.



Removing safety clips for manual transmission

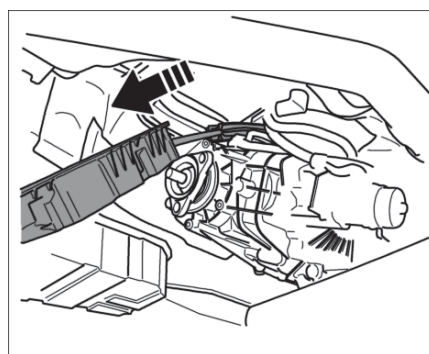


Distance from transmission cross member to body



Removing shift and selector cables

9. Release shift and selector cable attachment using **disassembly tool, universal 21** on gearshift lever **-arrows-** .
10. Guide the shift and selector cables out of the support.
11. Remove bottom section of gearshift bracket with installed shift and selector cables backwards over the transfer box → **Removing bottom section of gearshift bracket** .

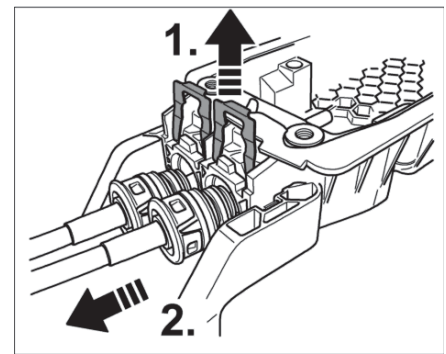


Removing bottom section of gearshift bracket

12. Remove safety clips on bottom section of gearshift bracket **-1st arrow-** , then remove operating cables **-2nd arrow-** .

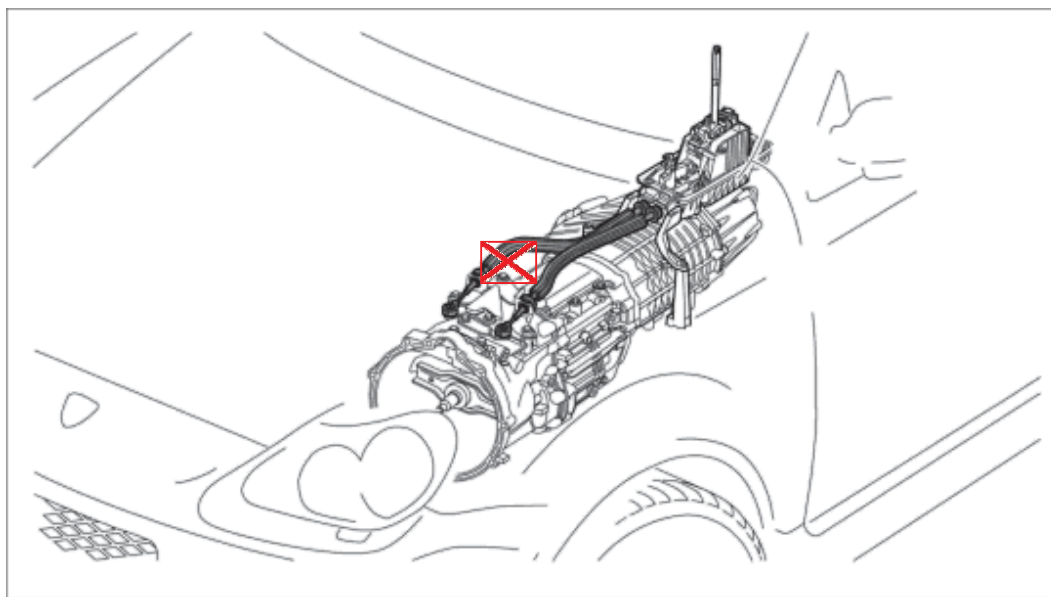
Installing shift and selector cables

Installing shift and selector cables

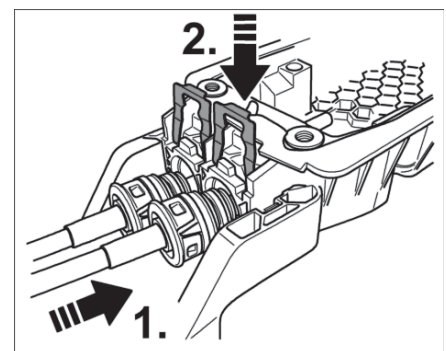


Removing operating cables from bottom section of gearshift bracket

Installation Location:



Overview of shift and selector cable



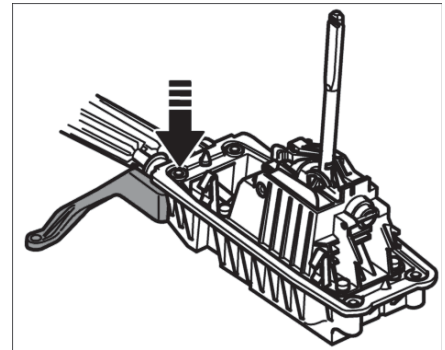
Installing safety clips



Note

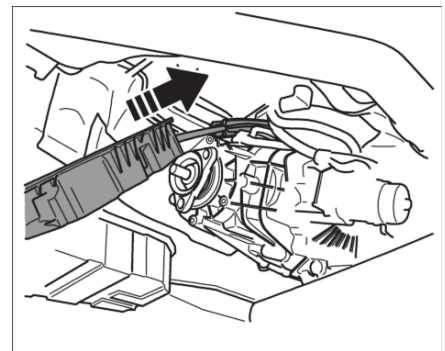
- If present: remove assembly aids from production **-arrow-**. These were only needed for the first installation in order to align the gearshift bracket.

1. Insert shift and selector cables in bottom section of gearshift bracket **-1st arrow-** , then fit safety clips **-2nd arrow-** .



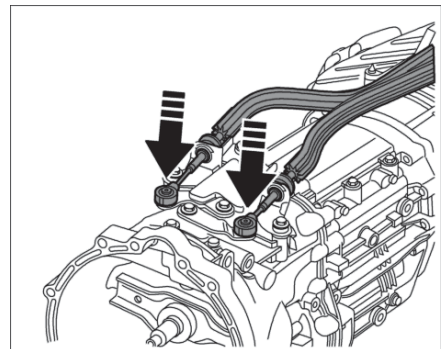
Assembly aid on bottom section of gearshift bracket

2. Insert bottom section of gearshift bracket with installed shift and selector cables over the transfer box → *Installing gearshift bracket* .
3. Guide the shift and selector cables into the support.



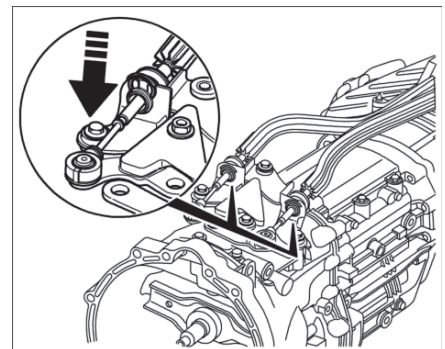
Installing gearshift bracket

4. Pressing the ends of the shift and selector cables onto the ball head joint on the selector lever **-arrows-**

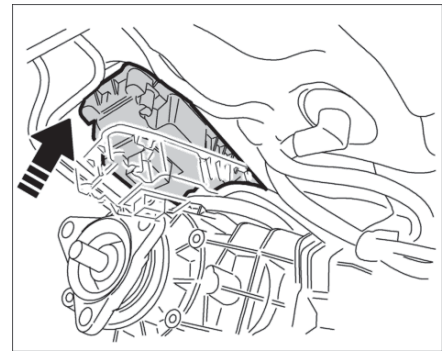


Assembly of shift and selector cable at transmission

5. Press rubber boots into the support and fit safety clips **-arrow-** .



Assembly of safety clips on transmission



Positioning the bottom section of gearshift bracket

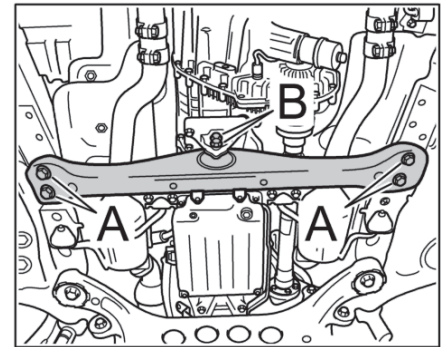
6. Lift up transfer box with cross member. Position bottom section of gearshift bracket in transmission tunnel **-arrow-**.



Note

- Screws which are tightened with a torque angle must be replaced with new ones.

7. Screw in new fastening screws **-A-** for transmission cross member.



Transmission cross member

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Transmission cross member	to body	Initial tightening	37 ftlb.		
Transmission cross member	to body	Final tightening	67 °		

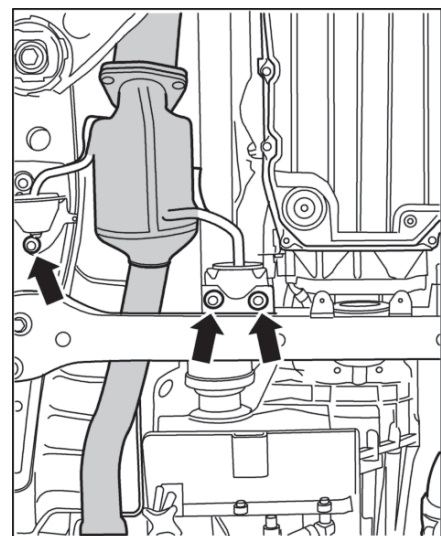
8. Screw in two fastening screws to secure exhaust system support to transmission cross member **-centre arrows-**. → **Tightening torque: 17 ftlb.**



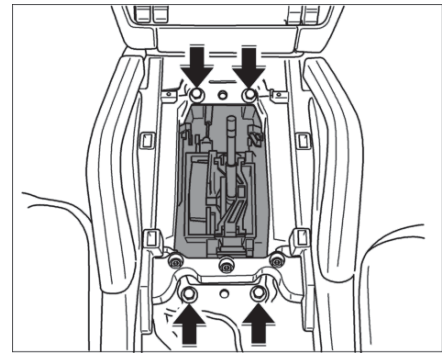
Note

- Screws which are tightened with a torque angle must be replaced with new ones.

9. Fix front cardan shaft to transfer box with new screws. → **Initial tightening: 22 ftlb. → Final tightening: 90 °**



Catalytic converter



Mount of gearshift bracket to body

10. Screw in threaded joint on bottom section of gearshift bracket **-arrows-** . → **Tightening torque: 18 ftlb.**

Subsequent work

Touching up for shift and selector cables

1. Install rear cardan shaft. → 393519 Removing and reinstalling rear cardan shaft - chapter on "Installing" [9PAAE7] → 393519 Removing and reinstalling rear cardan shaft - chapter on "Installing" [9PAAD7]
2. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"
3. Install top section of gearshift bracket. → 340819 Removing and reinstalling top section of gearshift bracket - chapter on "Installing"
4. Function test for shift mechanism:
 - Position of gearshift lever?
 - Possible to shift through all gears, including reverse gear?

9PAAD7, 9PAAE7

as of MY 2004

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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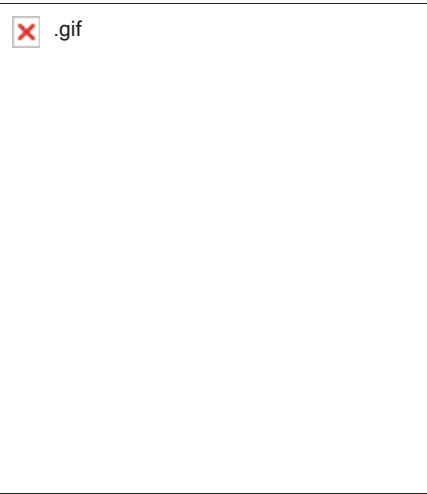
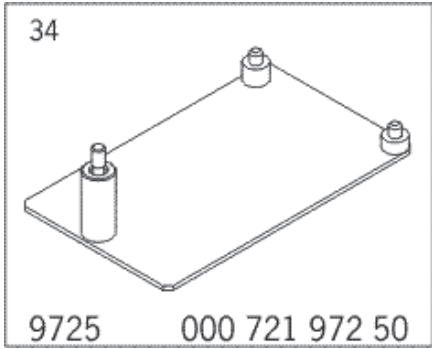
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34 35 19 Removing and installing transmission - as of MY 2003

- [Preliminary work for transmission](#)
- [Removing transmission](#)
- [Installing transmission](#)
- [Subsequent work for transmission](#)

Tools

Designation	Type	Number	Explanation	
plate	commercially available tool			
plate	commercially available tool	9725		

removal tool, universal	commercially available tool	nr.21		

Preliminary work for transmission

Preliminary work for transmission

1. Disconnect battery. → Work instructions after disconnecting battery
2. Remove centre console cover. → 681719 Removing and installing centre console - "Removing" chapter
3. Remove shift lever knob. → 340419 Removing and installing shift lever knob - chapter on "removing"
4. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"
5. Remove rear cardan shaft. → 393519 Removing and reinstalling rear cardan shaft - chapter on "Removing"
6. Remove front cardan shaft. → 390219 Removing and installing front cardan shaft - chapter on "Removing"
7. Remove clutch slave cylinder. → 303019 Removing and installing clutch slave cylinder - "Removing" chapter

Removing transmission

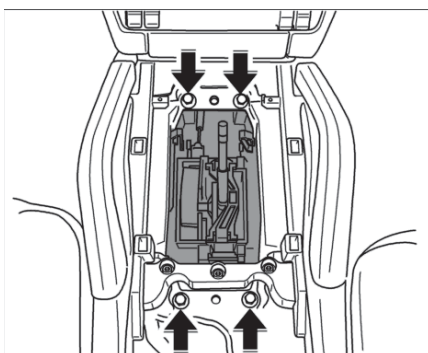
Removing transmission



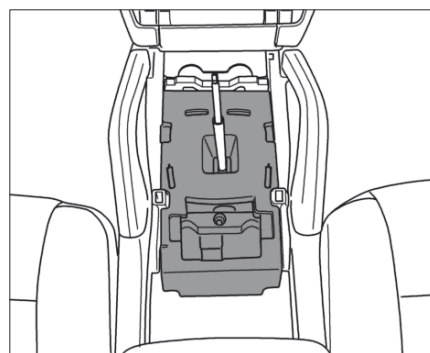
Note

- *The cables do not have to be separated from the transmission in order to remove the transmission.*

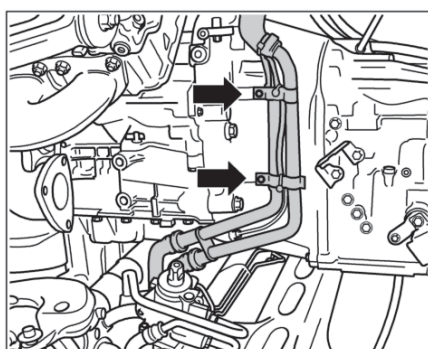
1. Remove insulating mat.
2. Unscrew fastening screws for securing bottom section of gearshift bracket to body.
3. Remove reference mark sender on the transmission bell housing.
4. Unscrew coolant pipe support threaded joint on the transmission bell housing.
5. Pull off cable plug for neutral switch.



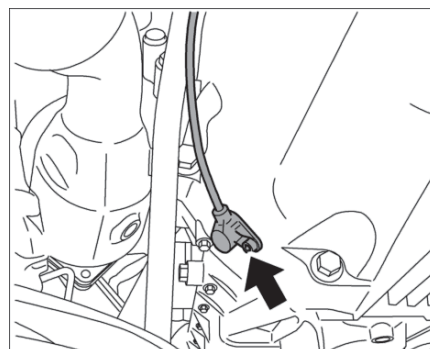
Threaded joint on bottom section of gearshift bracket



Centre console sound absorber

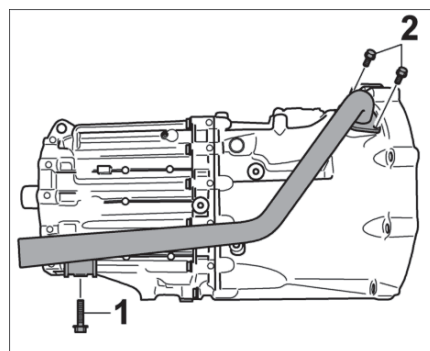


Support for coolant pipes



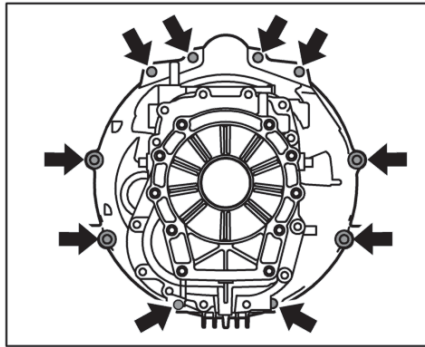
Reference mark sender

6. Pull off cable plug for back-up light switch.
7. Remove transfer box → 396519 Removing and installing transfer box - chapter on "Removing".
8. Remove breather pipe. To do so, undo the fastening screws **-1 and 2-** on the transmission.

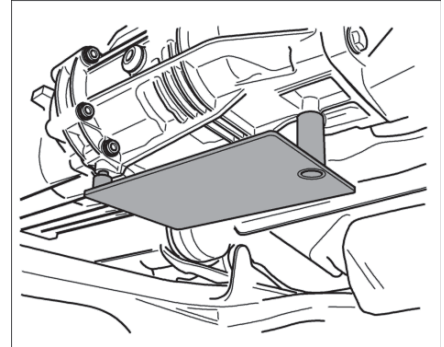


Clutch bell-housing breather pipe

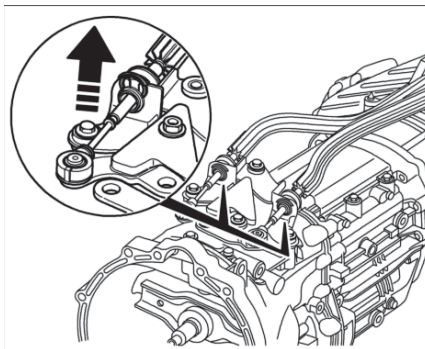
9. Support manual transmission with special tool **plate** and **transmission jack**.
10. Unscrew fastening screws **-arrows-** for securing transmission to engine.
11. Push out transmission. Pull off vent line for the transfer box.
12. Remove circlips **-inset-** on support on the transmission.
13. Remove shift and selector cables from support using special tool **removal tool, universal nr.21**. Remove



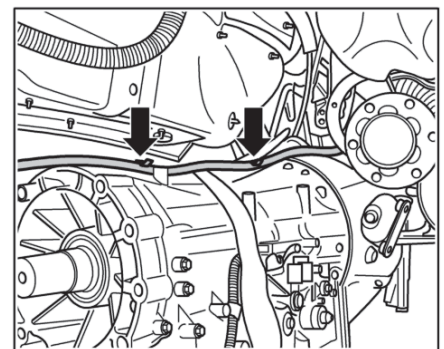
Fastening points for securing transmission to engine



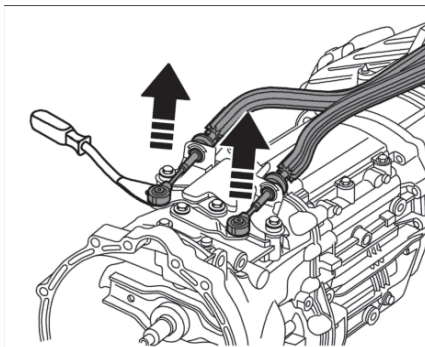
Plate



Disassembly of circlips



Vent line support



Removal

selector support with cables.

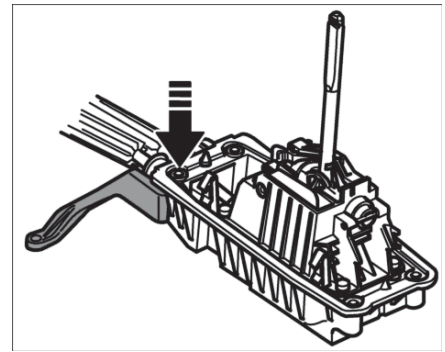
Installing transmission

Installing transmission



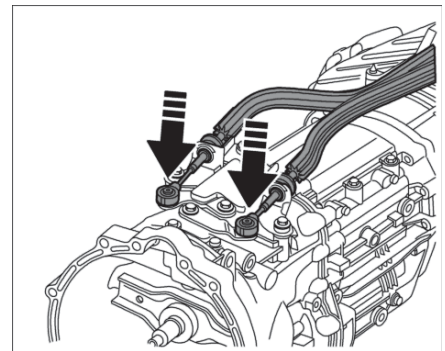
Note

- If present: Remove assembly aids from production on the bottom section of the selector console **-arrow-**. These were only needed for the first installation in order to align the shift console.



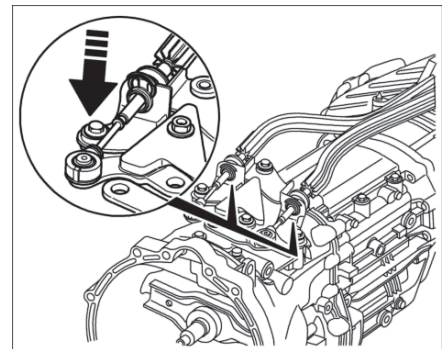
Assembly aid on bottom section of gearshift bracket

1. Fasten the shift and selector cables to the ball head joint on the support.



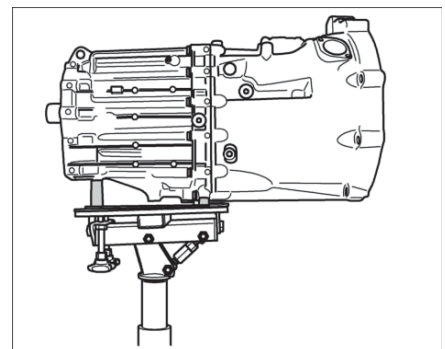
Assembly of shift and selector cables

2. Install snap rings **-enlarged view-** on support bracket on the transmission.



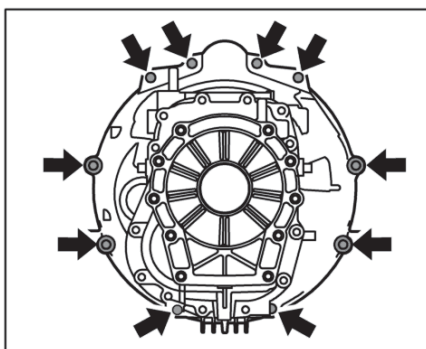
Assembly of circlips

3. Raise manual transmission with special tool **plate** and **transmission jack** .

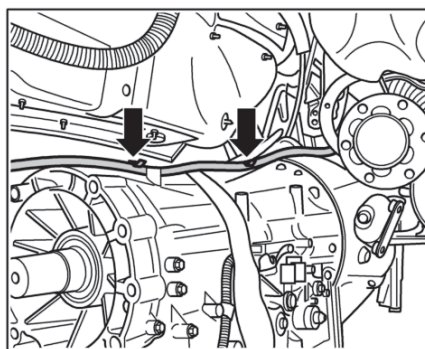


Transmission on transmission jack

4. Run in transmission. Connect vent line for the transfer box.

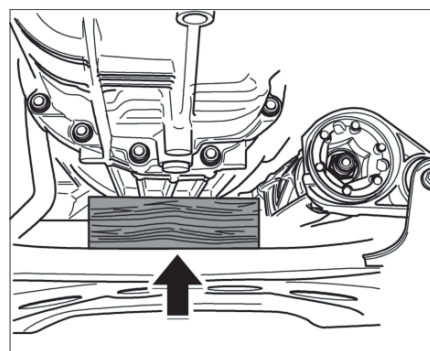


Mount engine to transmission



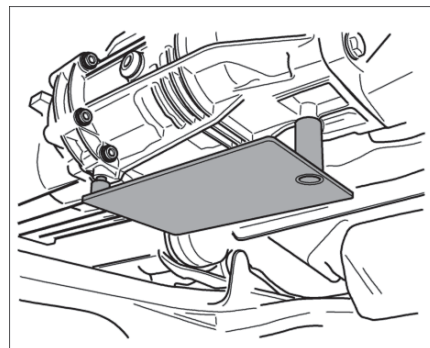
Vent line support

5. Screw in fastening screws for securing transmission to engine. → **Tightening torque: 59 ftlb.**
6. Support transmission with a **wooden block** on the suspension subframe.



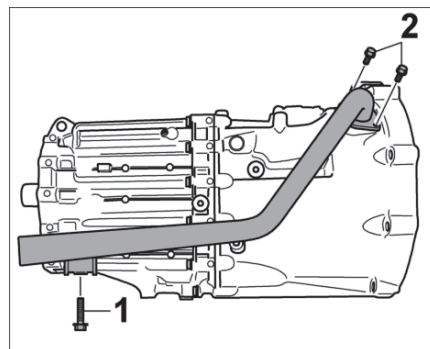
Supporting transmission

7. Remove special tool **plate 9725**.



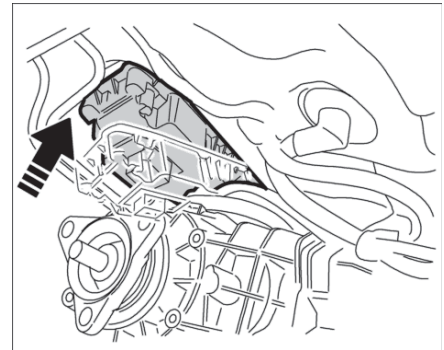
Plate

8. Install breather pipe. To do so, screw in the fastening screws **-1,2-** on the transmission. → **Tightening torque: 17 ftlb.** → **Tightening torque: 6.5 ftlb.**



Clutch bell-housing breather pipe

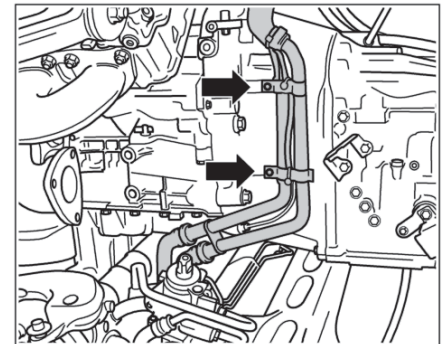
9. Install transfer box. → 396519 Removing and installing transfer box - chapter on "Installing" Insert gearshift



Inserting gearshift bracket

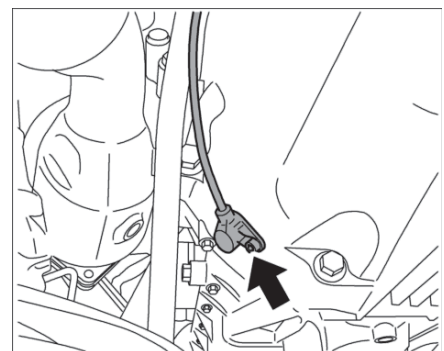
bracket into the opening in the centre tunnel from below.

10. Attach cable plug for back-up light switch.
11. Push on cable plug for neutral switch.
12. Screw in fastening screws for coolant pipe support to the transmission bell housing.



Support for coolant pipes

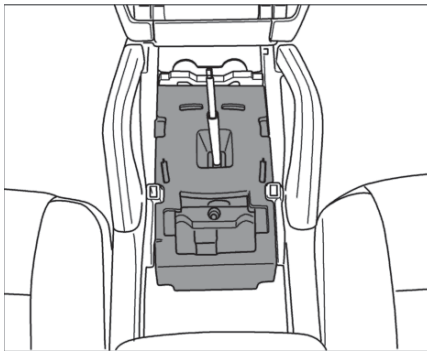
13. Install reference mark sender on the transmission bell housing.



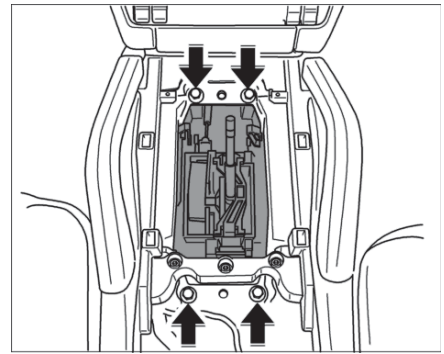
Reference mark sender

14. Screw in fastening screws for securing bottom section of gearshift bracket to body. → **Tightening torque: 18 ftlb.**
15. Install insulating mat.
16. Install centre console trim. → 681719 Removing and installing centre console - "Installing" chapter

Subsequent work for transmission



Insulating mat for centre console



Threaded joint on bottom section of gearshift bracket

Touch up for transmission

1. Install clutch slave cylinder. → 303019 Removing and installing clutch slave cylinder - "Installing" chapter
2. Install front cardan shaft. → 390219 Removing and installing front cardan shaft - chapter on "Installing"
3. Install rear cardan shaft. → 393519 Removing and reinstalling rear cardan shaft - chapter on "Installing"
4. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"
5. Install shift lever knob. → 340419 Removing and installing shift lever knob - section on "Installing"
6. Connect the battery. → Work instructions after disconnecting the battery

9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

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ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

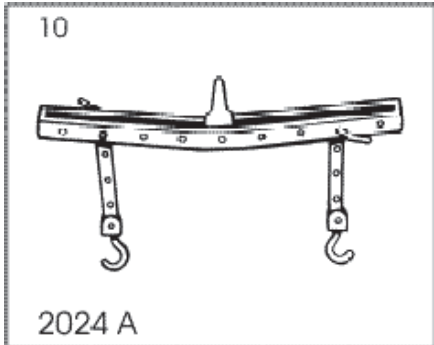
- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

34 35 27 Removing and refitting transmission - as of MY 2003

- Preliminary work
- Removing transmission
- Refitting transmission
- Subsequent work

Tools

Designation	Type	Number	Explanation	
suspending device	commercially available tool	2024 a		
removal tool, universal	commercially available tool	nr.21		

Preliminary work

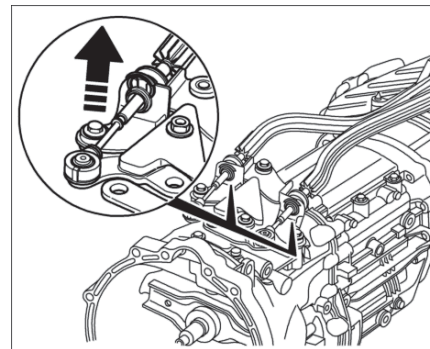
Preliminary work for removing the transmission

1. Remove engine. → 100121 Removing engine

Removing transmission

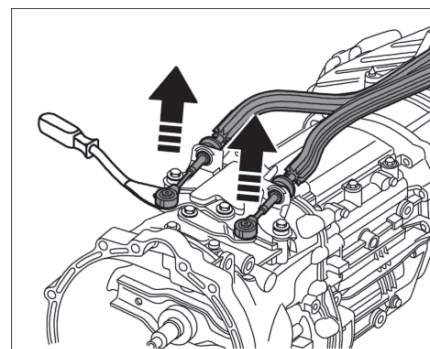
Removing transmission

1. Remove circlips **-inset-** on support on the transmission.



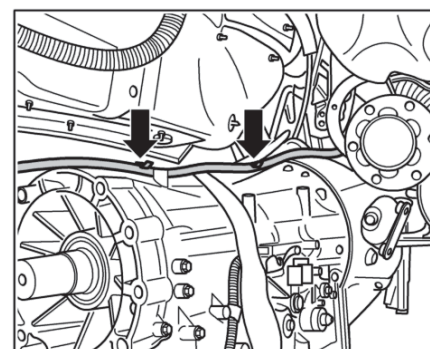
Disassembly of circlips

2. Remove shift and selector cables from support using special tool **removal tool, universal nr.21**. Remove selector support with cables.



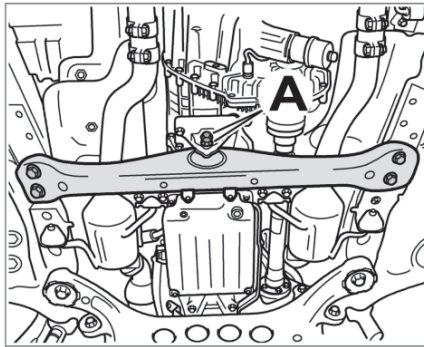
Disassembly of shift and selector cables

3. Loosen vent line from supports and remove.

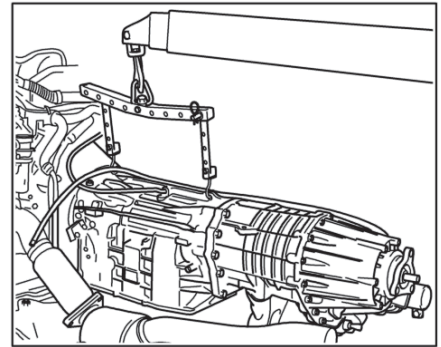


Vent line support

4. Fasten transmission with support **suspending device 2024 a** on workshop crane.
5. Raise transmission a few centimetres and notch transmission cross member. **-A-**

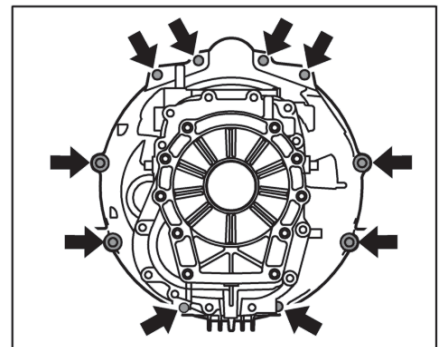


Transmission cross member



Transmission to workshop crane

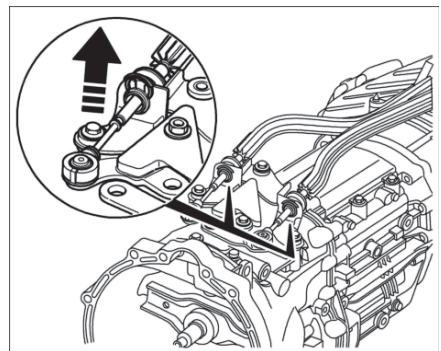
6. Unscrew fastening screws for securing transmission to engine.
7. Uncouple transmission from engine.
8. Unscrew fastening screws for transfer box and remove the transmission.



Transmission to engine threaded joint point

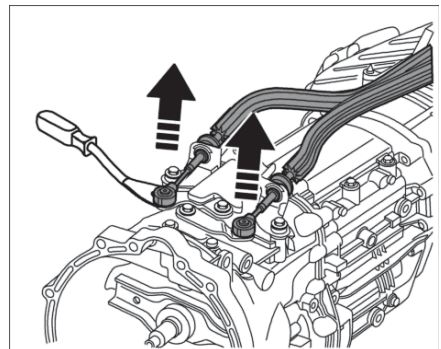
Removing transmission

1. Remove circlips **-inset-** on support on the transmission.

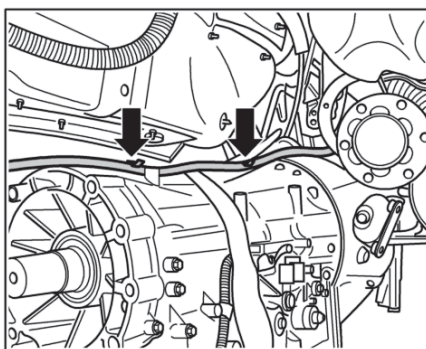


Disassembly of circlips

2. Remove shift and selector cables from support using special tool **removal tool, universal nr.21**. Remove selector support with cables.



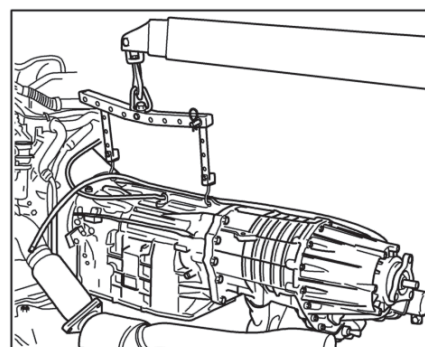
Disassembly of shift and selector



cables

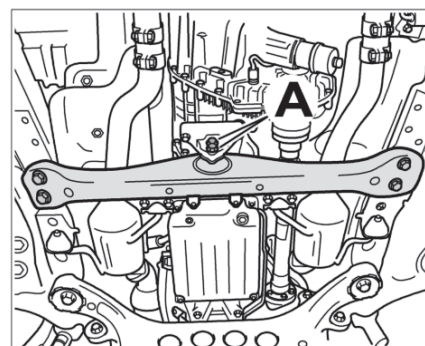
Vent line support

3. Loosen vent line from supports and remove.
4. Attach transmission with support **suspending device 2024 a** on workshop crane.



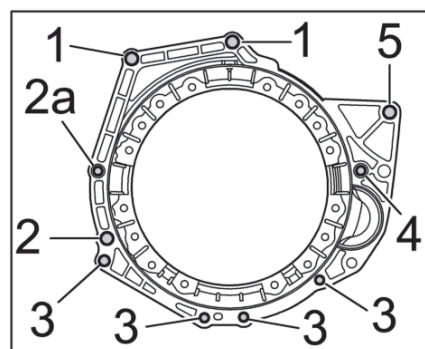
Transmission to workshop crane

5. Raise transmission a few centimetres and notch transmission cross member B **-A-**.



Transmission cross member

6. Unscrew fastening screws for securing transmission to engine. This involves unscrewing four screws on the engine side and six on the transmission side.
7. Remove transmission

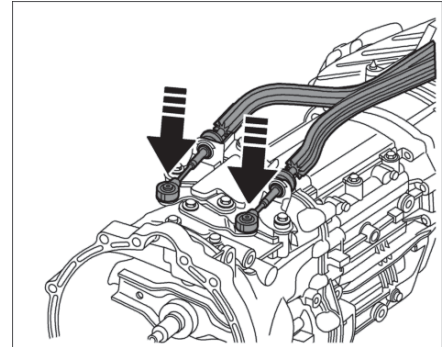


Transmission to V6 engine threaded joint points

Refitting transmission

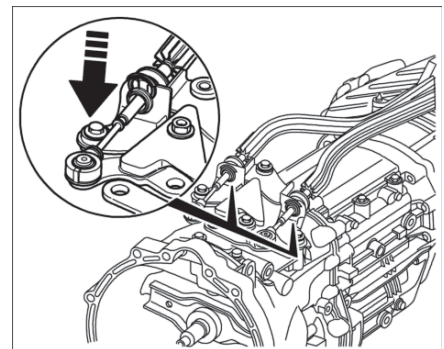
Refitting transmission

1. Refit the transfer box onto the transmission.
2. Fasten the shift and selector cables to the ball head joint on the support.



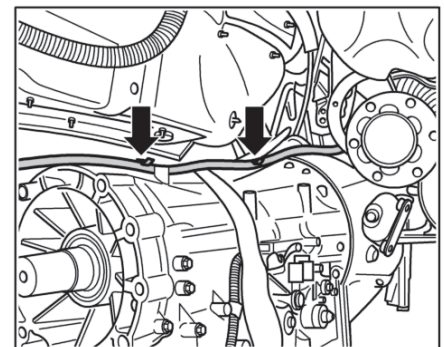
Assembly of shift and selector cables

3. Install circlips **-inset-** on support on the transmission.



Assembly of circlips

4. Connect the vent line for the transfer box on the transmission.



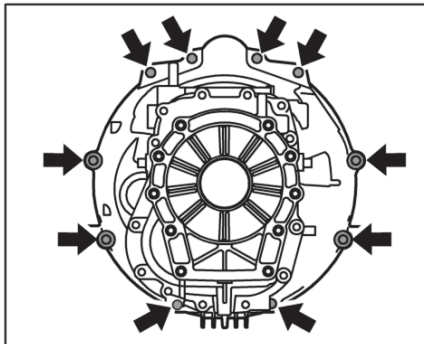
Vent line support

5. Fasten transmission with support **suspending device 2024 a** on workshop crane.
6. Fit the transmission onto the engine.
7. Screw in fastening screws for securing transmission to engine. → **Tightening torque: 59 ftlb.**

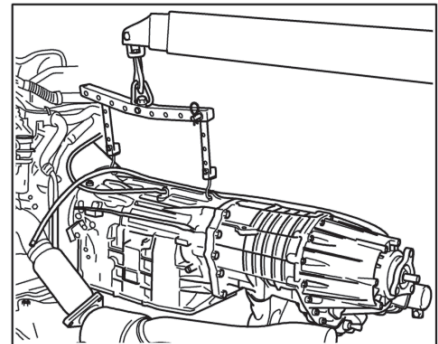


Note

- Screws which are tightened with a torque angle must be replaced with new ones.

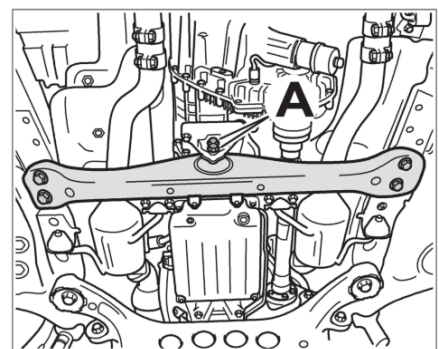


Transmission to engine threaded joint point



Transmission to workshop crane

8. Raise transmission a few centimetres and install transmission cross member on support. **-A-** → **Initial tightening: 37 ftlb.** → **Final tightening: 90 °**
9. Remove support **suspending device 2024 a** from the transmission.



Transmission cross member

Subsequent work

Touching up for removing transmission

1. Install engine. → 100123 Installing engine.

9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

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ATTENZIONE

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34 35 IN Technical data on manual transmission - as of MY 2003

- [Technical data on manual transmission](#)

Technical data on manual transmission

Technical data

TypeG 48.00 / G48.20

Installed inCayenne / Cayenne S

Model yearas of 2004

Type6-speed manual transmission

Transmission ratios

1. gear4.68

2. gear2.53

3. gear1.69

4. gear1.22

5. gear1.00

6. gear0.84

Reverse gear4.27

Manual transmission filling capacities

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Filling capacity	New filling	Filling capacity	1.8 l		
Filling capacity	Change quantity	Filling capacity	1.8 l		

9PAAD7, 9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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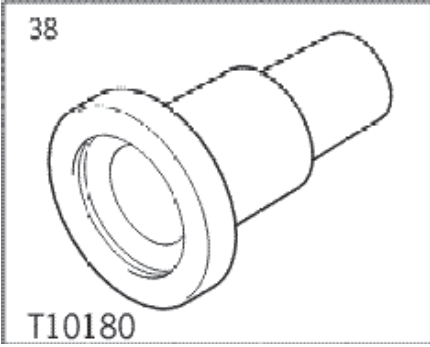
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34 49 19 Removing and installing countershaft cap - as of MY 2003

- Preliminary work for countershaft cap
- Removing countershaft cap
- Installing countershaft cap
- Touching up countershaft cap

Tools

Designation	Type	Number	Explanation	
slide hammer kit	commercially available tool	nr.168		
pressure piece	commercially available tool	t10180		

Preliminary work for countershaft cap

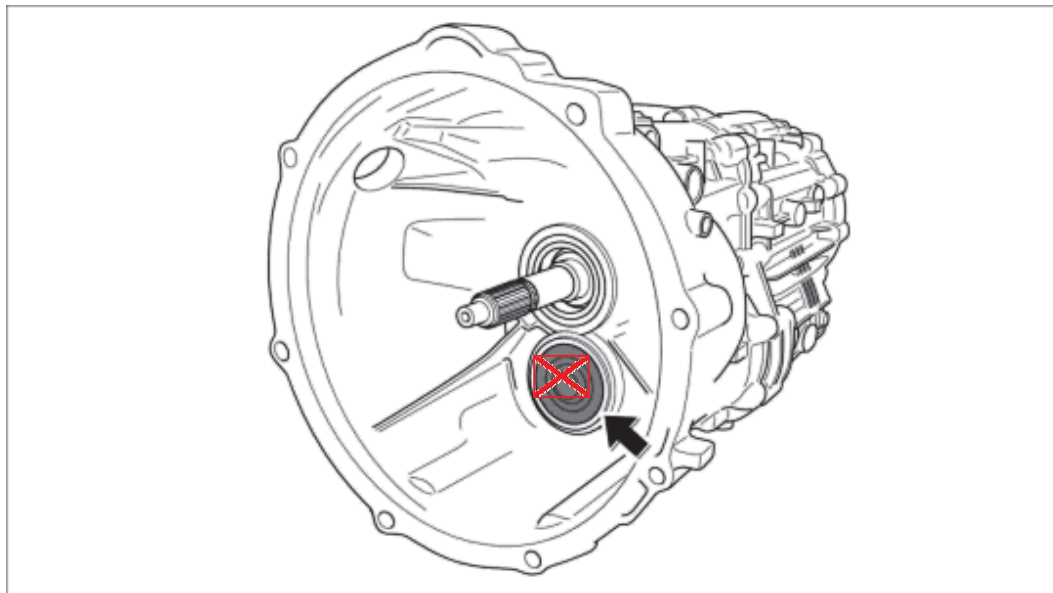
Preliminary work countershaft cap

1. Remove transmission. → 343519 Removing and installing transmission - chapter on "removing" [9PAAD7]
→ 343519 Removing and installing transmission - chapter on "removing" [9PAAE7]

Removing countershaft cap

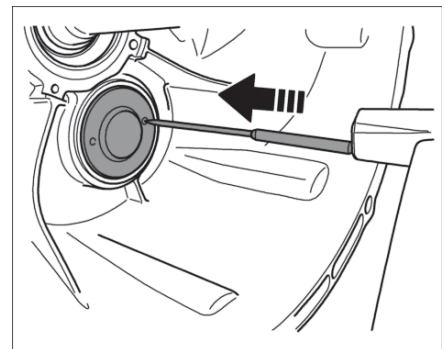
Removing countershaft cap

Installation Location:



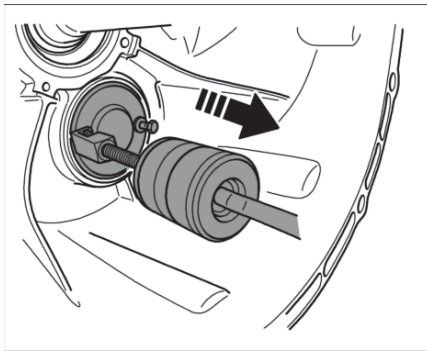
Overview of cap

1. Drive two small holes **-figure-** - offset by 180 degrees - into the sealing ring.

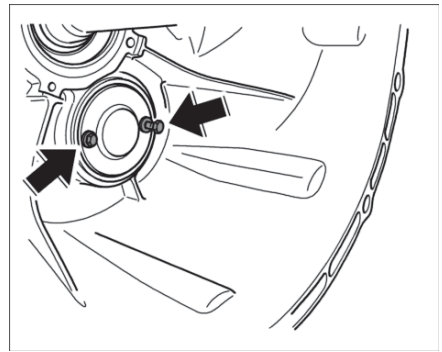


Preparatory work for removing sealing ring

2. Screw two sheetmetal screws into the holes in the cap.
3. Remove cap using **slide hammer kit nr.168**.



Removing sealing ring

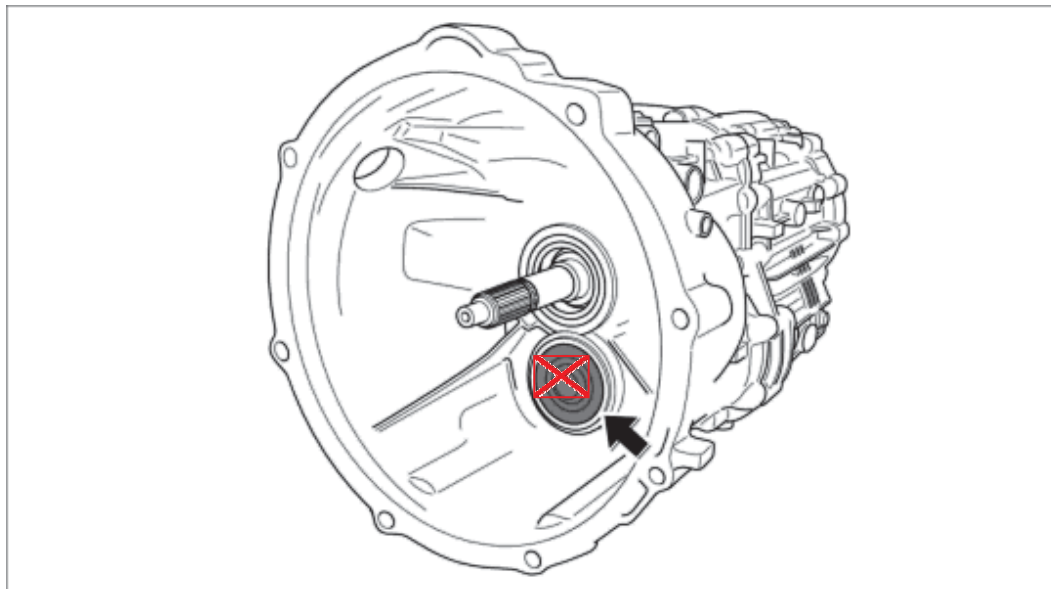


Screwing in sheetmetal screws

Installing countershaft cap

Installing countershaft cap

Installation Location:



Overview of cap

1. Drive new cap in flush using special tool **pressure piece t10180**.

Touching up countershaft cap

Reworking countershaft cap

1. Install transmission. → 343519 Removing and installing transmission - chapter on "installing" [9PAAD7]
→ 343519 Removing and installing transmission - chapter on "installing" [9PAAE7]
2. Check transmission oil . → 340135 Check and top up transmission oil - Chapter "Checking"

9PAAD7, 9PAAE7

as of MY 2003



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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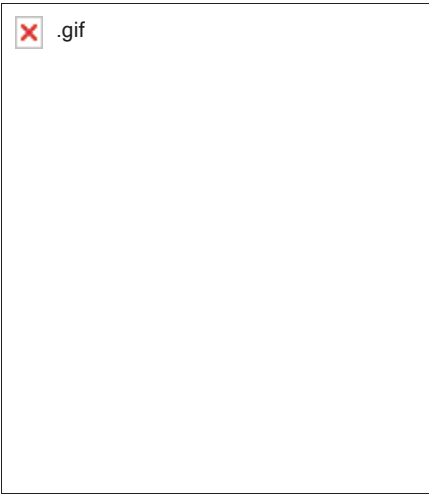
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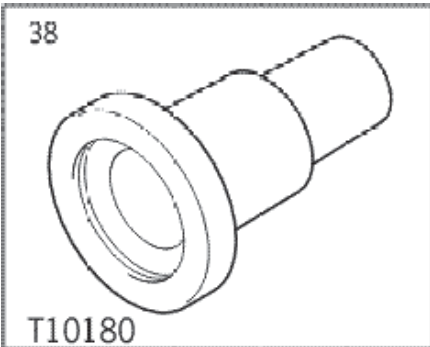
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35 50 19 Removing and installing sealing ring for drive shaft - as of MY 2003

- Preliminary work for drive shaft
- Removing sealing ring for drive shaft
- Installing sealing ring for drive shaft
- Touching up for sealing ring for drive shaft

Tools

Designation	Type	Number	Explanation	
sheetmetal screws	commercially available tool			
slide hammer kit	commercially available tool	nr.168		

				
pressure piece	commercially available tool	t10180		

Preliminary work for drive shaft

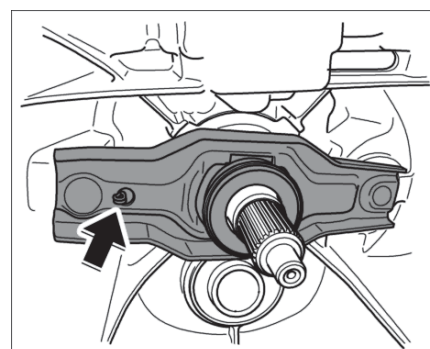
Preliminary work for sealing ring for manual transmission

1. Remove transmission. → 343519 Removing and installing transmission - chapter on "Removing" [9PAAD7]
→ 343519 Removing and installing transmission - chapter on "Removing" [9PAAE7]

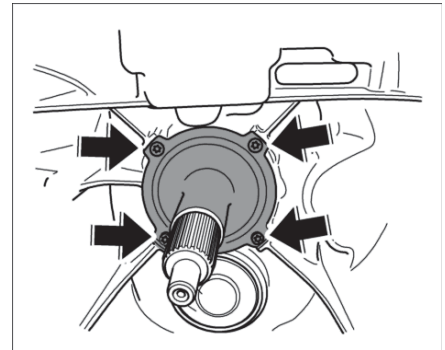
Removing sealing ring for drive shaft

Removing sealing ring for drive shaft

1. Remove clutch lever with release bearing. To do this, press the retaining spring **-arrow-** out of the opening in the clutch lever.



Clutch lever



Guide tube screws

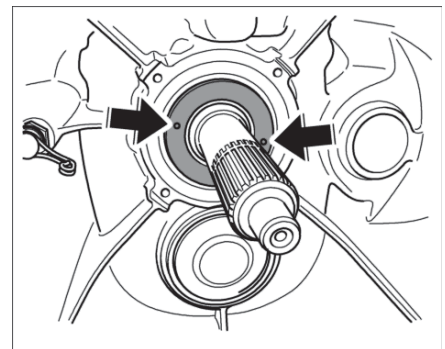
2. Remove guide tube for release bearing. To do this, unscrew four fastening screws **-arrow-** .



Note

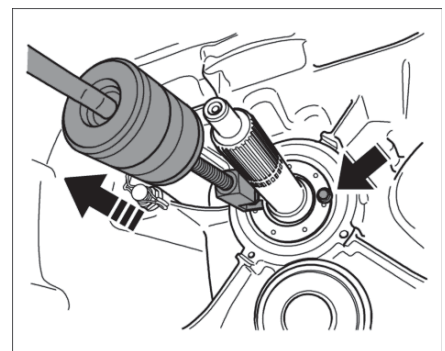
- There are two depressions in the sealing ring **-arrows-** . The sheetmetal screws for removing the sealing ring are screwed in here.

3. Screw two **sheetmetal screws** into the sealing ring.



Depression in sealing ring

4. Remove sealing ring using **slide hammer kit nr.168**.

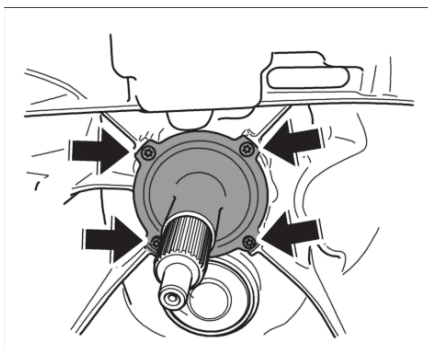


Removing sealing ring

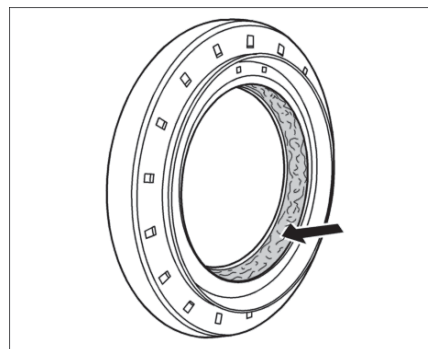
Installing sealing ring for drive shaft

Installing sealing ring for drive shaft

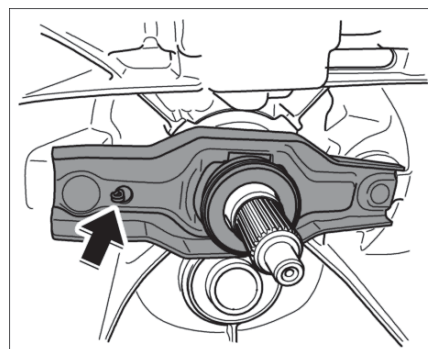
1. Fill the space between the dust and sealing lips on the new sealing ring with grease).
2. Drive new sealing ring in flush with special tool **pressure piece t10180**.
3. Install guide tube for release bearing. To do this, screw in four fastening screws **-arrow-** .



Guide tube screws



Preparing sealing ring



Clutch lever

4. Install clutch lever with release bearing. To do this, the retaining spring **-arrow-** must be engaged in the opening in the clutch lever.

Touching up for sealing ring for drive shaft

Subsequent work for sealing ring for drive shaft

1. Install transmission. → 343519 Removing and installing transmission - chapter on "installing" [9PAAD7]
→ 343519 Removing and installing transmission - chapter on "installing" [9PAAE7]

9PAAD7, 9PAAE7

as of MY 2003



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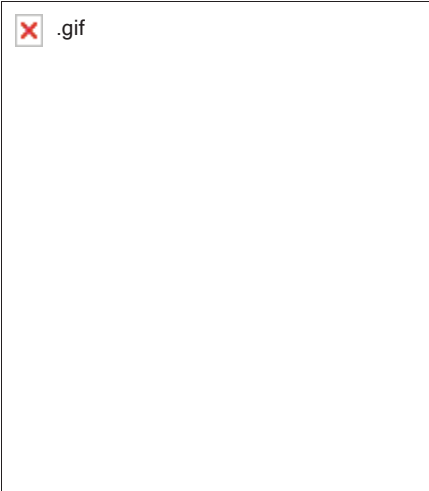
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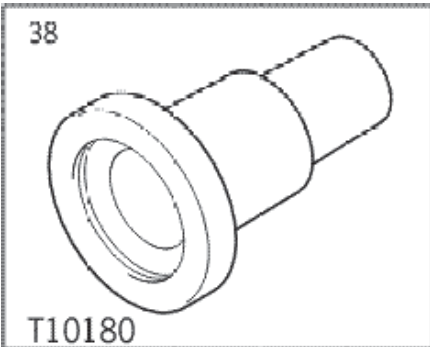
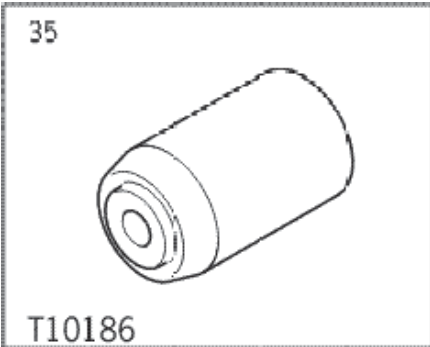
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35 53 19 Removing and installing sealing ring for output shaft - as of MY 2003

- Preliminary work for sealing ring for output shaft
- Removing sealing ring for output shaft
- Installing sealing ring for output shaft
- Subsequent work

Tools

Designation	Type	Number	Explanation	
sheetmetal screws	commercially available tool			
slide hammer kit	commercially available tool	nr.168		

				
pressure piece	commercially available tool	t10180		
protective sleeve	commercially available tool	t10186		

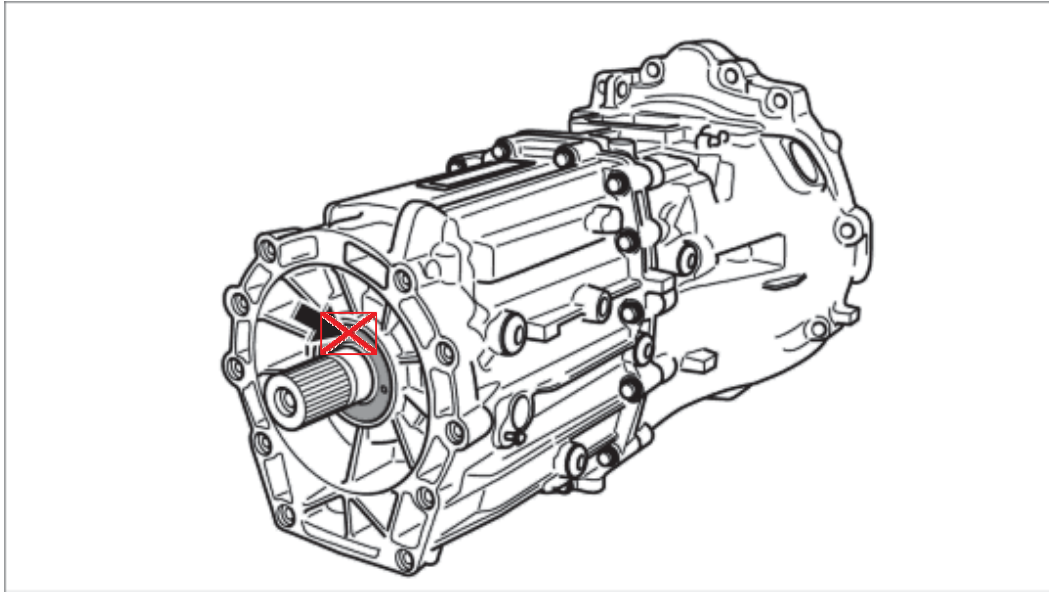
Preliminary work for sealing ring for output shaft

Preliminary work for sealing ring for output shaft

Removing sealing ring for output shaft

Removing sealing ring for output shaft

Installation Location:

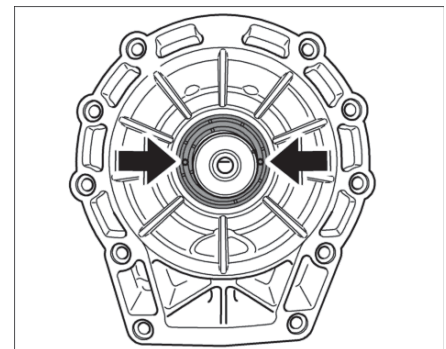


Overview of output-shaft sealing ring



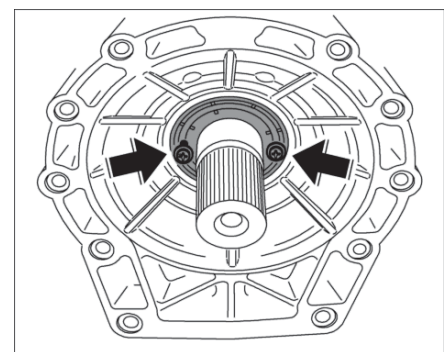
Note

- There are two depressions in the sealing ring. **-arrows-** The sheetmetal screws for removing the sealing ring are screwed in here.



Depression in sealing ring

1. Screw two **sheetmetal screws** into the sealing ring.

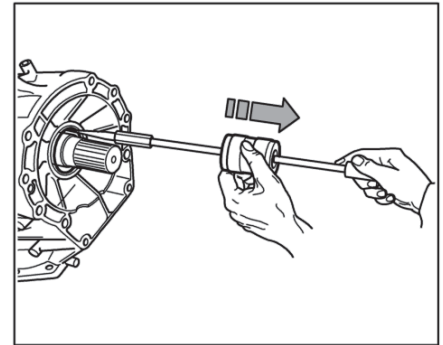


Preliminary work for removing the sealing ring

2. Remove sealing ring using **slide hammer kit nr.168**.

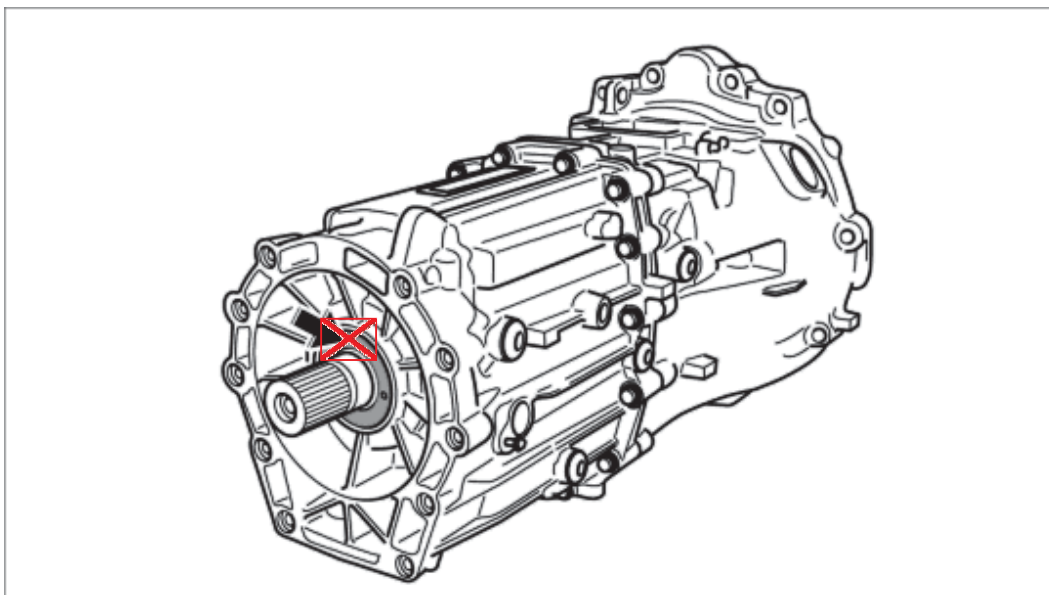
Installing sealing ring for output shaft

Installing sealing ring for output shaft



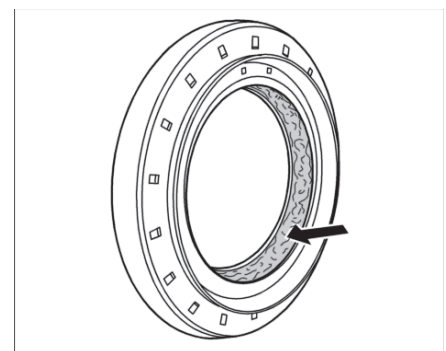
Removing sealing ring

Installation Location:



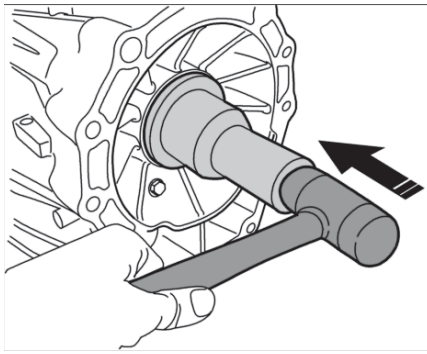
Overview of output-shaft sealing ring

1. Fill the space between the dust and sealing lips on the new sealing ring with grease).

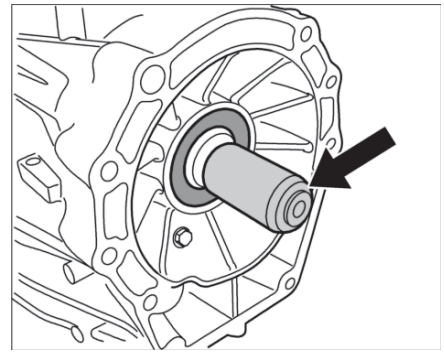


Preparing sealing ring

2. Push special tool **protective sleeve t10186** -arrow- onto the output shaft.
3. Push on sealing ring.
4. Remove special tool **protective sleeve t10186** and drive sealing ring in flush using special tool **pressure**



Installing sealing ring



Protective sleeve on output shaft

piece t10180 -arrow- .

Subsequent work

Subsequent work for sealing ring for output shaft

1. Install transfer box. → 396519 Removing and installing transfer box - chapter on "Installing"
2. Check transmission oil. → 340135 Checking and topping up transmission oil - chapter on "Checking"

9PAAD7, 9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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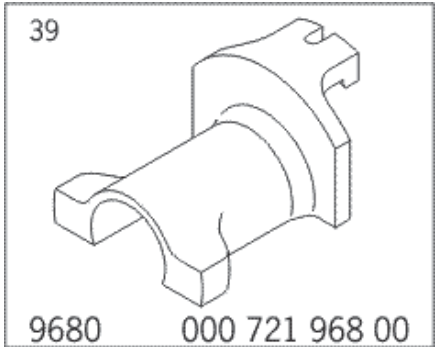
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39 01 19 Removing and installing rear final drive - as of MY 2003

- Preliminary work for rear final drive
- Removing rear final drive
- Installing rear final drive
- Subsequent work for rear final drive

Tools

Designation	Type	Number	Explanation	
centring tool	commercially available tool	9680		

Preliminary work for rear final drive

Preliminary work: Rear final drive

1. Remove exhaust system. → 260119 Removing and installing exhaust system - chapter on "removing"

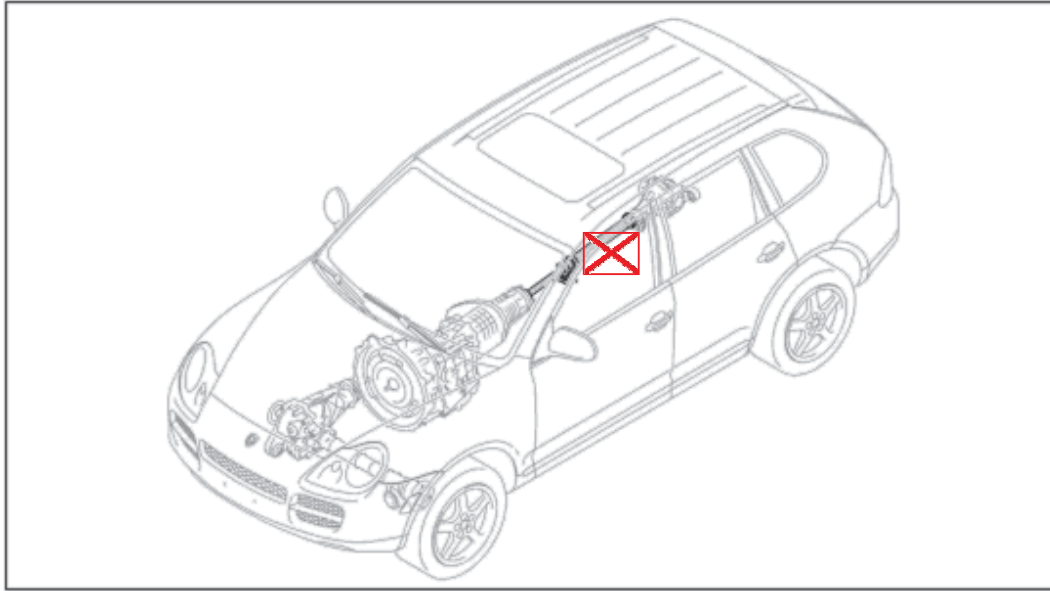
Preliminary work: Rear final drive

1. Remove exhaust system. → 260119 Removing and installing exhaust system - chapter on "removing"
2. Remove longitudinal interlock servo motor. → 397719 Removing and installing rear-differential lock servo motor - "Removing" section

Removing rear final drive

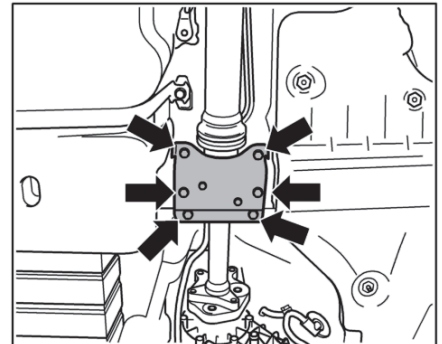
Removing rear final drive

Installation Location:

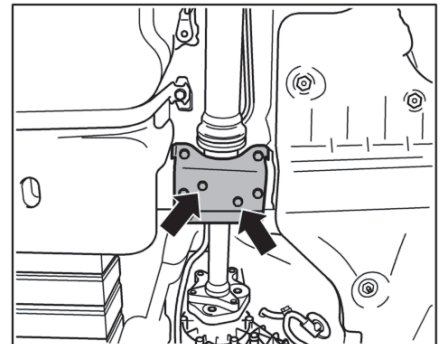


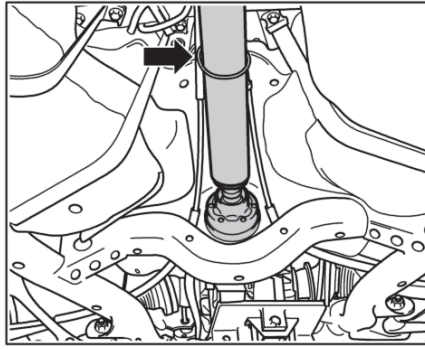
Overview of rear cardan shaft

1. Move selector lever to position N.
2. Loosen fastening screws for fixing cardan shaft centre bearing holder to body.



Cardan shaft support to body





Tying up rear cardan shaft

Centre bearing to cardan shaft holder



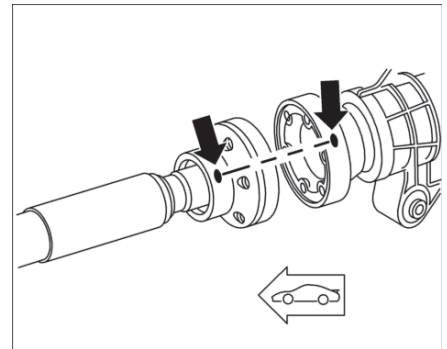
Note

- The colour marking, match point, on the cardan shaft and on the flange of the rear final drive must be installed in alignment -arrows-. This will neutralise the residual imbalance of the components.



Note

- To loosen the cardan shaft on the rear axle transmission, a second fitter should counter the fastening screws on the triangular flange of the transfer box.



Match points on the cardan shaft

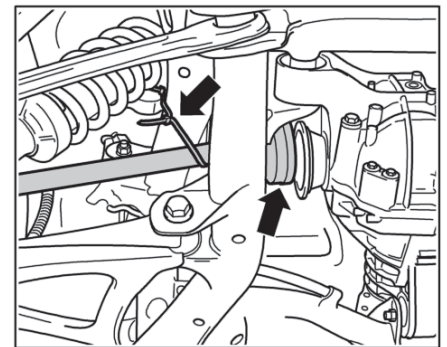
4. Remove cardan shaft from rear axle transmission and tie it up.



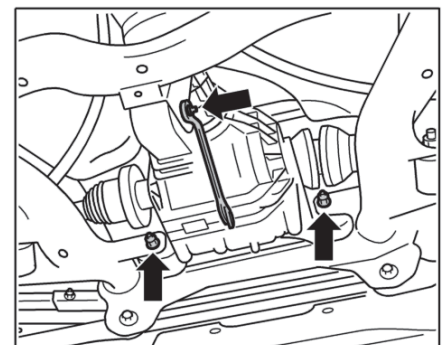
Note

- To loosen the drive shaft bolts on the rear axle transmission, a second fitter should sit in the vehicle and block the rear-axle final drive by actuating the foot brake.

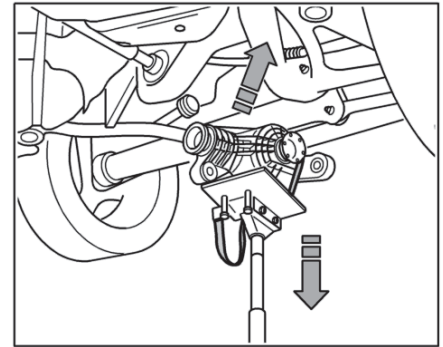
5. Remove both drive shafts on transmission side and tie up.
6. Support transmission jack and rear axle transmission with retaining band.
7. Unscrew fastening screws for final drive. To do this, counter with ring wrench.



Removing rear drive shaft

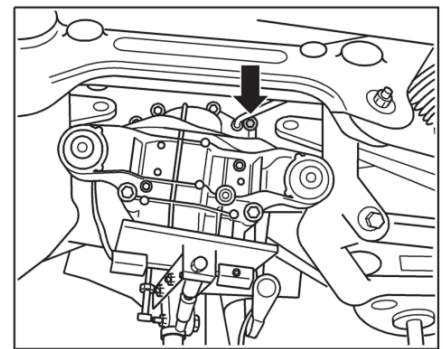


Mount for rear final drive



Removing rear final drive

8. Tip drive flange upwards **-arrow-** and gradually drain rear axle transmission. Remove bleeder line at the same time.
9. Remove transmission and pull off bleeder line → [Removing bleeder line](#) .



Removing bleeder line

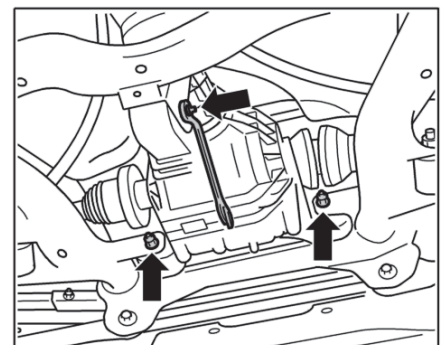
Installing rear final drive

Installing rear final drive



Note

- Screws which are tightened with a torque angle must be replaced with new ones.



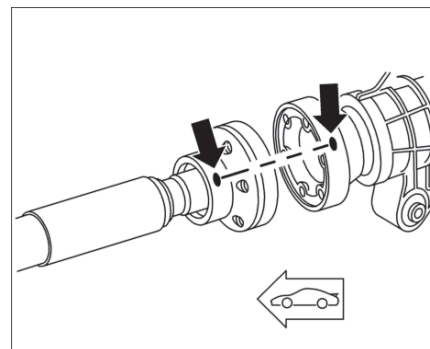
Mount for rear final drive



Note

- The colour marking, match point, on the cardan shaft and on the flange of the rear final drive must be installed in alignment **-arrows-** . This will neutralise the residual imbalance of the components.

1. Secure rear axle transmission on transmission jack with retainer band.



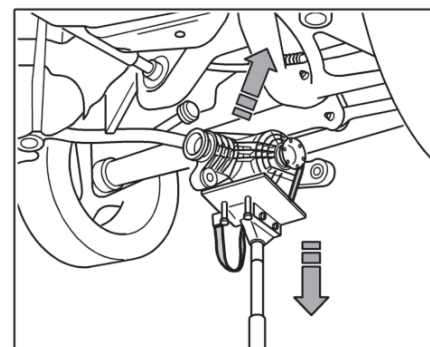
Match points on the cardan shaft

2. Run in rear axle differential by gradually tipping the drive flange upwards **-arrow-**. Connect bleeder line at the same time.
3. Screw in new fastening screws on final drive. To do this, counter with ring wrench. → **Initial tightening: 67 ftlb.** → **Final tightening: 67 °**



Note

- To tighten the drive shaft bolts on the rear final drive, a second fitter should sit in the vehicle and block the rear-wheel drive assembly by actuating the foot brake.



Installing transmission

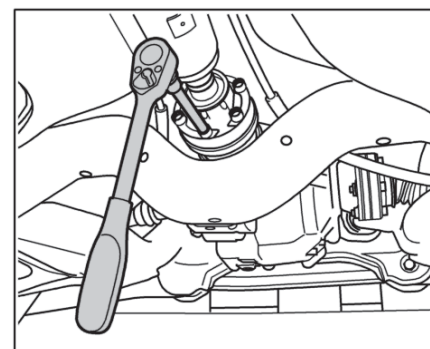
4. Attach drive shafts with new screws. → **42 Tightening torques for rear axle**



ATTENTION

Cardan shaft can be damaged by imbalance.

- Cardan shaft and flange not installed in original position.
- The colour marking, match point, on the cardan shaft and on the flange of the rear final drive must be installed in alignment. This will neutralise the residual imbalance of the components.



Cardan shaft to rear final drive



Note

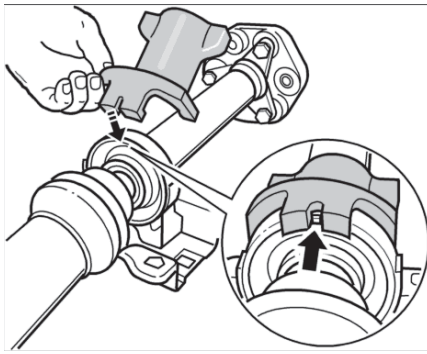
- To attach the cardan shaft to the rear final drive, a second fitter should counter the fastening screws on the triangular flange of the transfer box.

5. Attach cardan shaft with new screws.
6. Screw in fastening screws for fixing cardan shaft centre bearing holder to body. → **Tightening torque: 44 ftlb.**

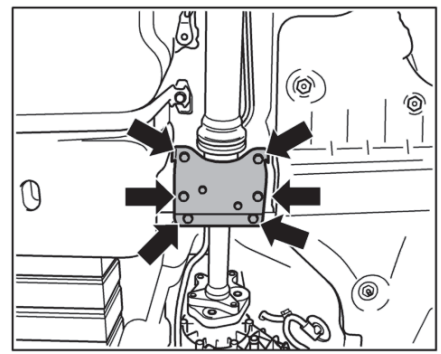


Note

- Centre bearing must be installed without tension.



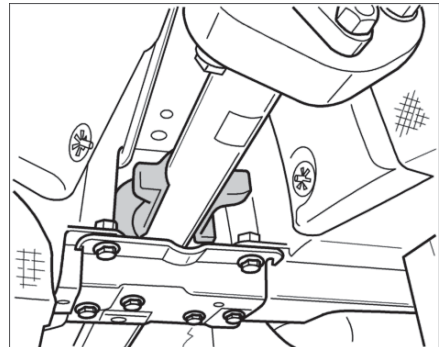
Alignment of special tool 9680



Cardan shaft support to body

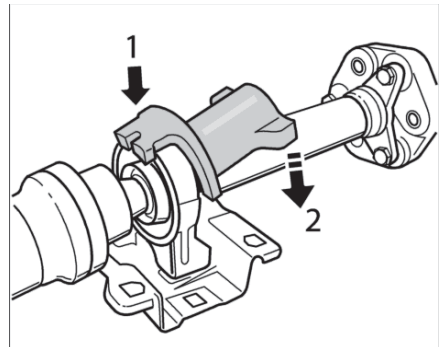
- Fit special tool **centring tool 9680 -Werkzeug in Einbaulage-** in the order specified.

7. Position special tool **centring tool 9680**.



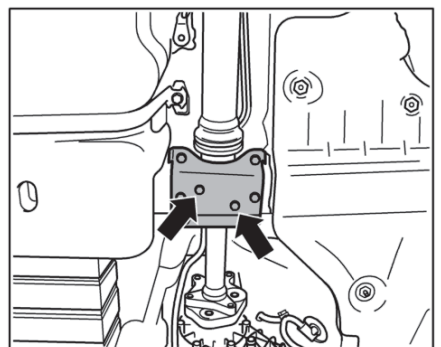
Installation position for special tool

8. Press on special tool **centring tool 9680** in sequence according to numbering **-1, 2-**.



Installation of special tool 9680

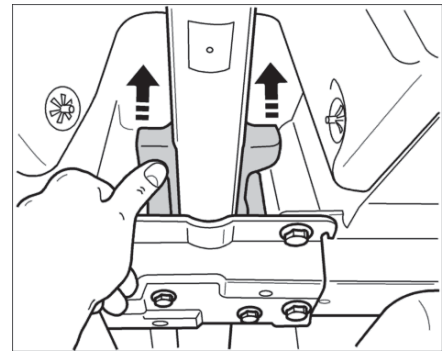
9. Tighten threaded joints **-arrow-** connecting support to centre bearing. → **Tightening torque: 15 ftlb.**



Cardan shaft support to centre bearing

10. Remove special tool **centring tool 9680**.

Subsequent work for rear final drive



Removal of special tool 9680

Subsequent work: Rear final drive

1. Install the exhaust system. → 260119 Removing and installing exhaust system - chapter on "Installing"

Subsequent work: Rear final drive

1. Install the exhaust system. → 260119 Removing and installing exhaust system - chapter on "Installing"
2. Install servo motor for rear-differential lock. → 397719 Removing and installing rear-differential lock servo motor - "Installing" section

9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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39 02 19 Removing and installing front cardan shaft - as of MY 2003

- Preliminary work for front cardan shaft
- Removing front cardan shaft
- Installing front cardan shaft
- Subsequent work for front cardan shaft

Preliminary work for front cardan shaft

Preliminary work for front cardan shaft

1. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"

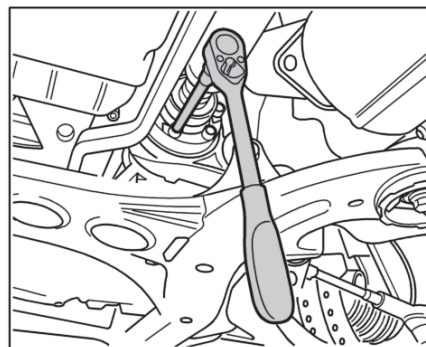
Removing front cardan shaft

Removing front cardan shaft



Note

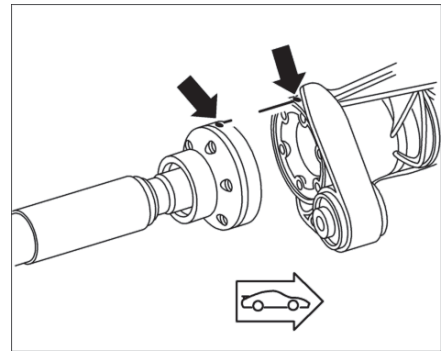
- To unscrew the cardan shaft bolts, a second fitter should sit in the vehicle and block the drive train by actuating the foot brake.
- The colour markings, match points **-arrows-** on the cardan shaft and on the all-wheel final drive flange must be aligned. This will neutralise the residual imbalance of the components.



Front cardan shaft to all-wheel final drive

- Apply another colour marking if necessary.

1. Detach cardan shaft from final four wheel drive → *Front cardan shaft to all-wheel final drive* .

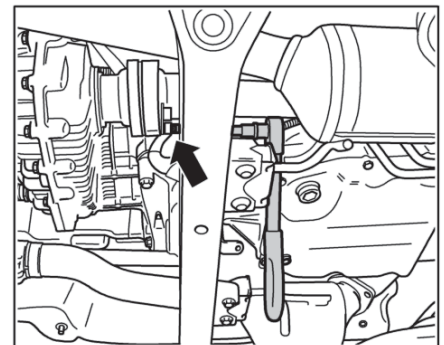


Match points of front cardan shaft to front final drive

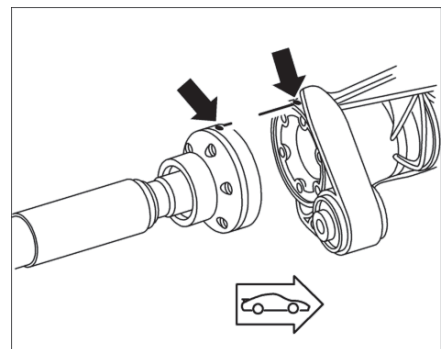


Note

- To unscrew the cardan shaft bolts, a second fitter should sit in the vehicle and block the drive train by actuating the foot brake.
 - The colour markings, match points **-arrows-** on the cardan shaft and on the all-wheel final drive flange must be aligned. This will neutralise the residual imbalance of the components.
 - Apply another colour marking if necessary.
2. Remove cardan shaft from the transfer box → *Front cardan shaft to transfer box*.
 3. Swivel the cardan shaft forwards over the suspension subframe and remove it.



Front cardan shaft to transfer box



Match points of front cardan shaft to front final drive

Installing front cardan shaft

Installing front cardan shaft



Note

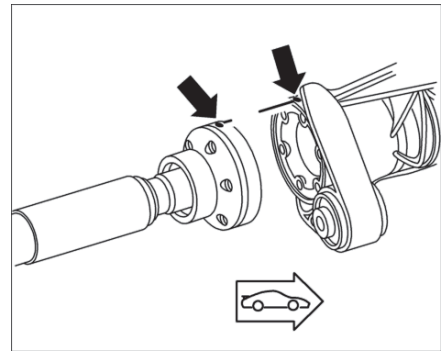
- To tighten the cardan shaft bolts, a second fitter should sit in the vehicle and block the drive train by actuating the brake.
- Screws which are tightened with a torque angle must be replaced with new ones.



Note

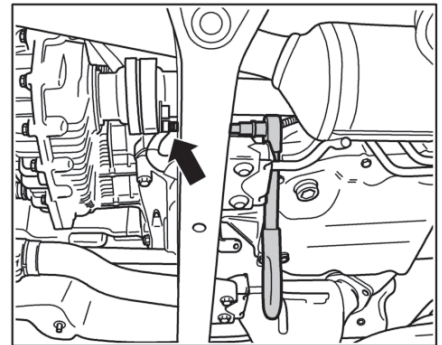
- The colour markings, match points **-arrows-** on the cardan shaft and on the all-wheel final drive flange must be aligned. This will neutralise the residual imbalance of the components.

1. Swivel the cardan shaft over the suspension subframe and install it.



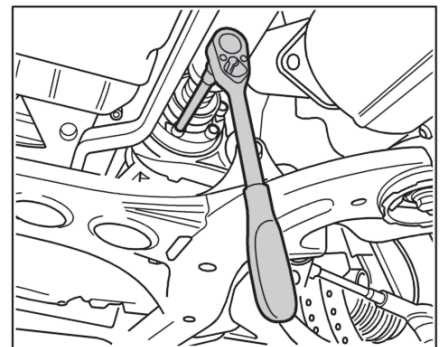
Match points of front cardan shaft to front final drive

2. Fix cardan shaft with new screws **-arrow-** to the transfer box. → **Initial tightening: 22 ftlb. → Final tightening: 90 degree angle**



Front cardan shaft to transfer box

3. Fix cardan shaft with new screws → **Cardan shaft to all-wheel final drive** to the all-wheel final drive. → **Initial tightening: 22 ftlb. → Final tightening: 90 degree angle**



Cardan shaft to all-wheel final drive

Subsequent work for front cardan shaft

Subsequent work for front cardan shaft

1. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAD1, 9PAAD7, 9PAAE7

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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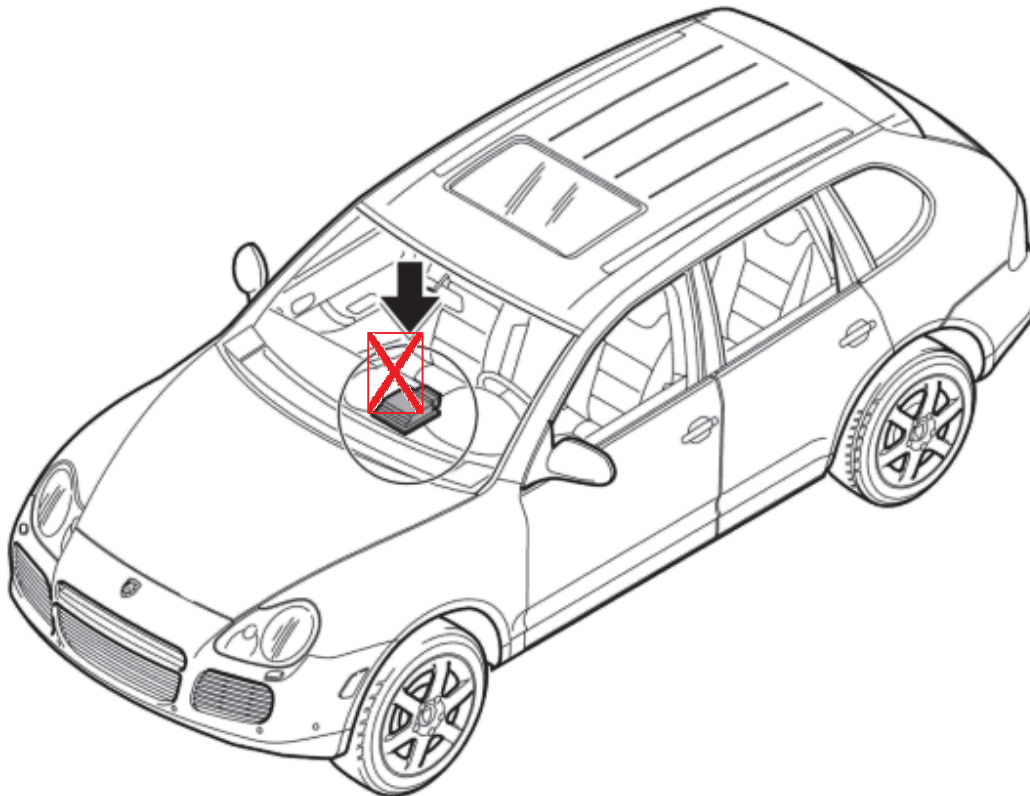
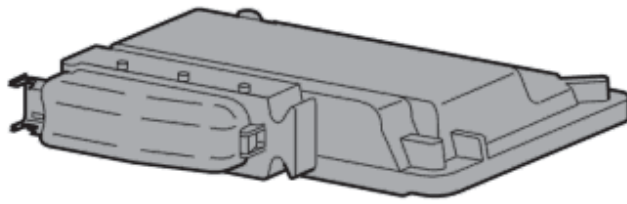
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39 13 19 Removing and installing transfer box control module - as of MY 2003

- [Removing transfer box control module](#)
- [Installing transfer box control module](#)

Removing transfer box control module

Installation Location:



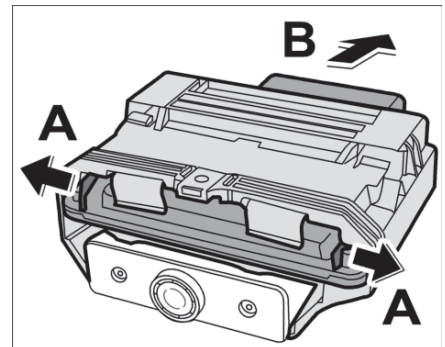
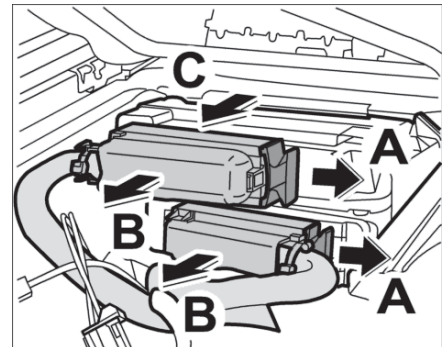
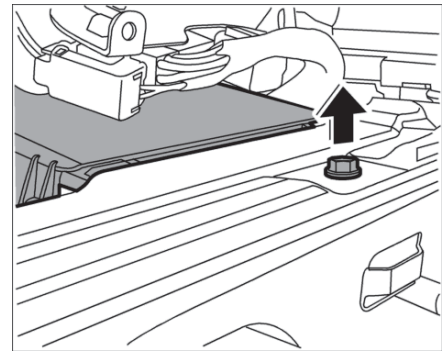
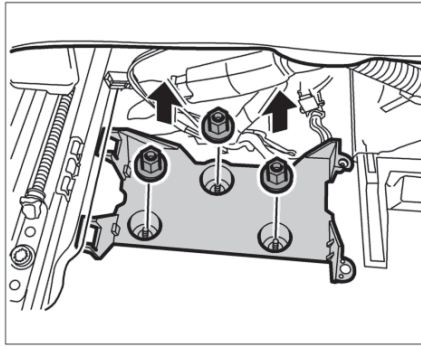
Note

- The control unit is located under the right front seat.
1. The ignition key must be removed before removing the connector from the control unit.
 2. Move right front seat all the way back and up.
 3. For vehicles with a telephone, remove the telephone control unit. → 919019 Removing and installing control unit for telephone - chapter on "removing"
 4. Unclip right front seat trim and remove drawer.
 5. Unscrew the fastening screw for the support.



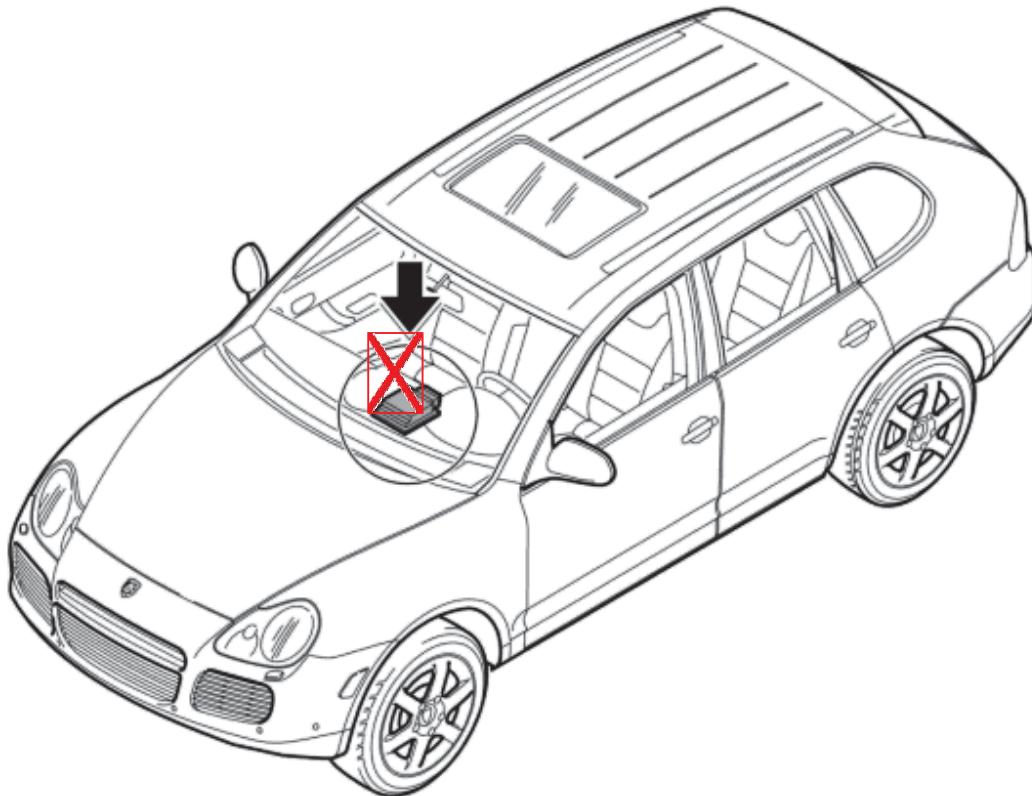
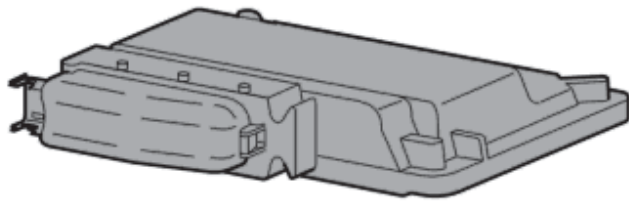
Note

- *Only for vehicles with telephone*
6. Unscrew the three fastening nuts and remove support for telephone control unit.
 7. Move seat all the way forward and remove ignition key.
 8. Release the two connectors **-A-** and pull them off **-B-** .
 9. Remove the support with the two control units **-C-** .

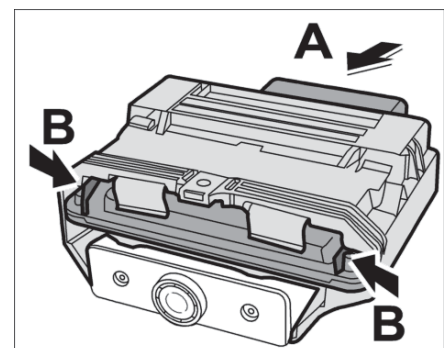


Installing transfer box control module

Installation Location:

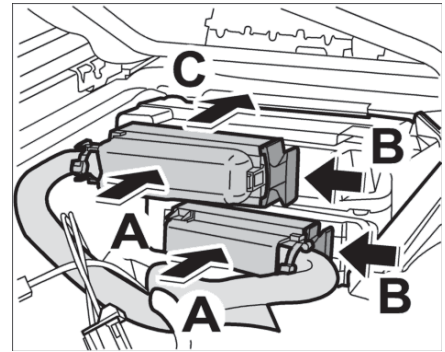
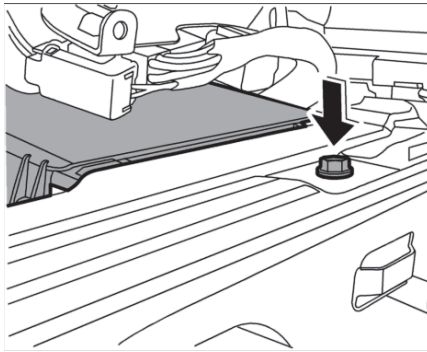


1. Insert the control unit **-A-** until the locking tabs **-B-** are felt to engage.



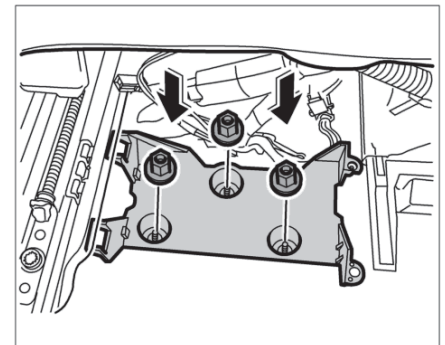
2. Insert the two connectors **-A-** and press in the locking mechanism **-B-** until it is felt to engage.
3. Place the support with the two control units in the installation position **-C-**.

4. Move seat all the way back and tighten the support with the fastening screw.



Note

- *Only for vehicles with telephone*
5. Position the support for the telephone control unit and screw down using the three fastening nuts.
6. For vehicles with a telephone, install the telephone control unit.
→ 919019 Removing and installing control unit for telephone - chapter on "installing"
7. Clip in right front seat trim and install drawer.



9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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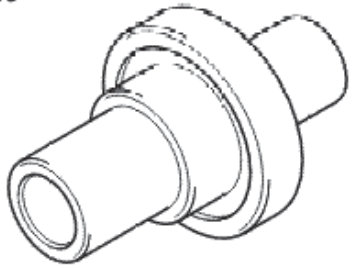
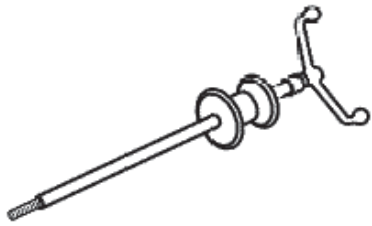
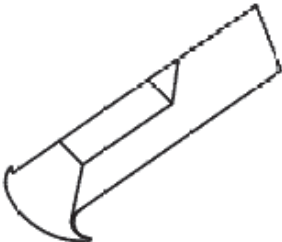
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39 22 19 Removing and installing sealing ring for output flange - as of MY 2003

- Preliminary work for sealing ring for output flange
- Removing sealing ring for output flange
- Installing sealing ring for output flange
- Subsequent work

Tools

Designation	Type	Number	Explanation	
shop-made tool	commercially available tool			 .gif
pressure piece	commercially available tool	t10181		

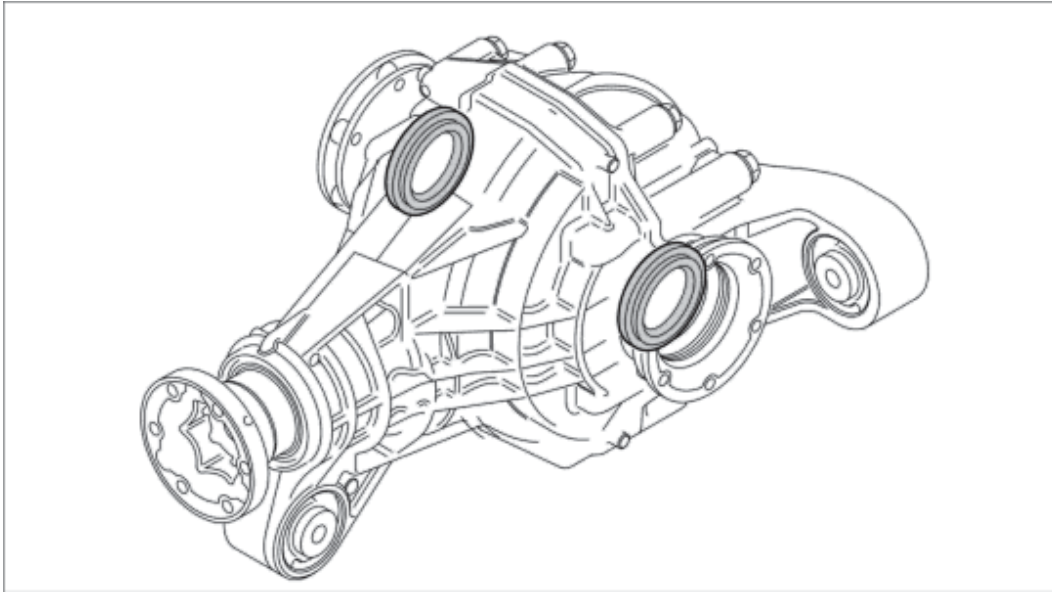
				39  T10181
striker	commercially available tool	vw 771/1		34, 40  VW 771/1
extraction tool	commercially available tool	vw 771/37		39  VW 771/37

Preliminary work for sealing ring for output flange

Preliminary work sealing ring for output flange

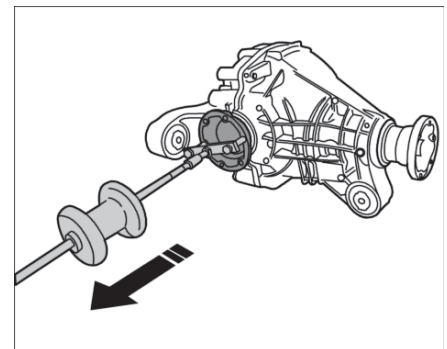
Removing sealing ring for output flange

Installation Location:

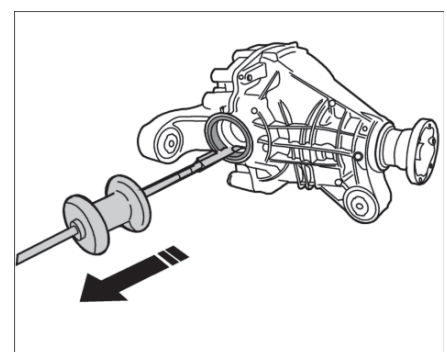


Overview of sealing rings

1. Remove output flange with special tool **striker vw 771/1** and **shop-made tool** .



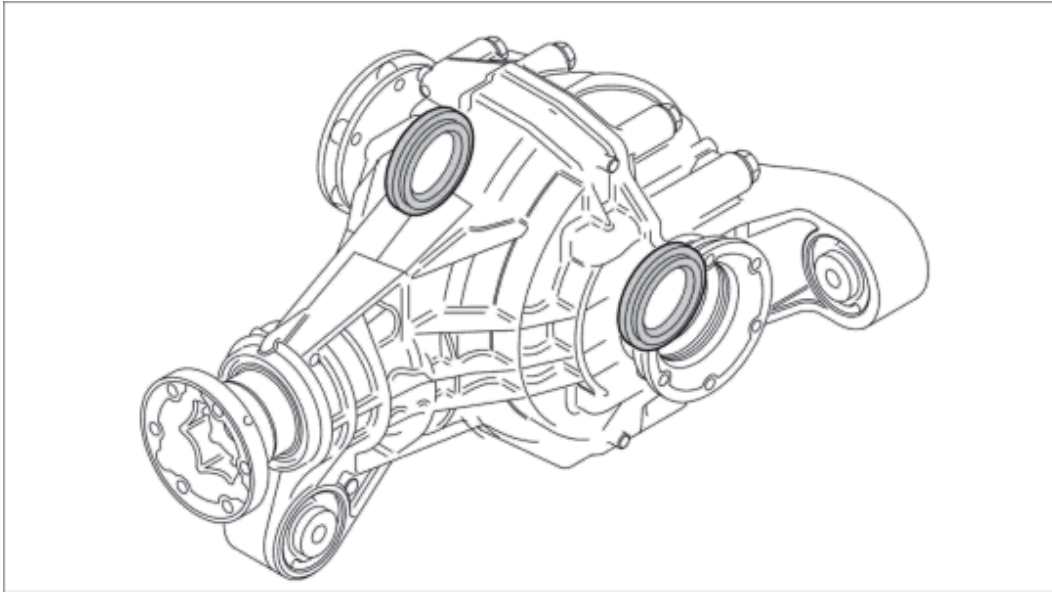
Removing output flange



Removing sealing ring

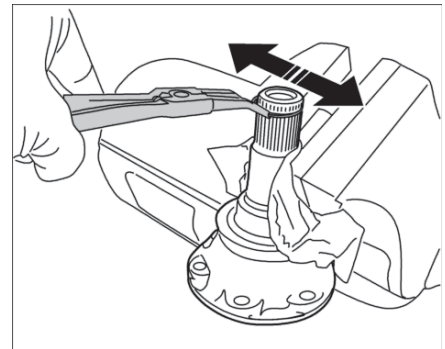
Installing sealing ring for output flange

Installation Location:



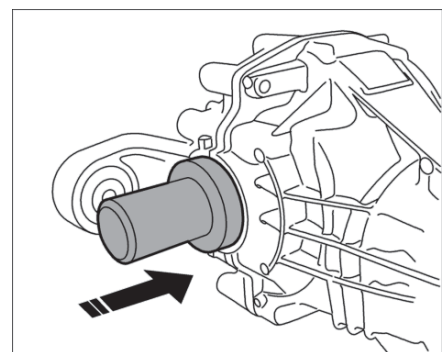
Overview of sealing rings

1. Replace circlip on flange shaft.



Replacing circlip

2. Drive in new sealing ring with special tool **pressure piece t10181** until the special tool touches the transmission housing.
3. Install output flange.



Installing sealing ring

Subsequent work

Reworking sealing ring for output flange

1. Install rear final drive. → 390119 Removing and installing rear final drive - "Installing" section [9PAAD1

9PAAD7]→ 390119 Removing and installing rear final drive - "Installing" section [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

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ADVERTENCIA

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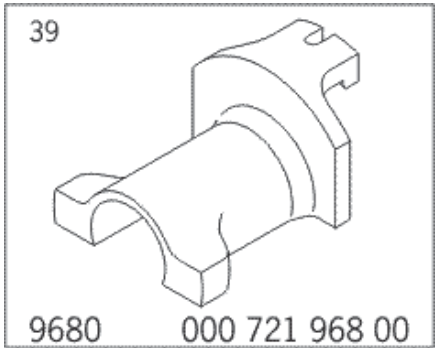
- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 35 19 Removing and installing rear cardan shaft - as of MY 2003

- Preliminary work for rear cardan shaft
- Removing rear cardan shaft
- Installing rear cardan shaft
- Subsequent work

Tools

Designation	Type	Number	Explanation	
centring tool	commercially available tool	9680		

Preliminary work for rear cardan shaft

Preliminary work - rear cardan shaft

1. Remove exhaust system after catalytic converter. → 260119 Removing and installing exhaust system - chapter on "Removing"

Removing rear cardan shaft

Removing rear cardan shaft



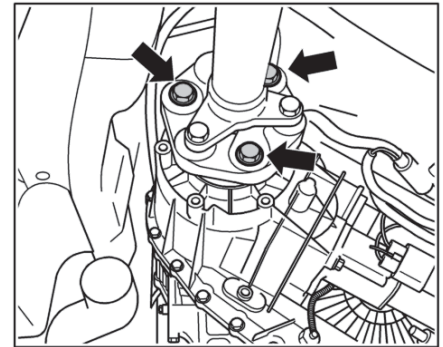
Note

- If the cardan shaft or transfer box has to be replaced, please ignore the next step.
- Marking the position of the cardan shaft with respect to the transfer box triangular flange serves only to prevent possible humming noises.



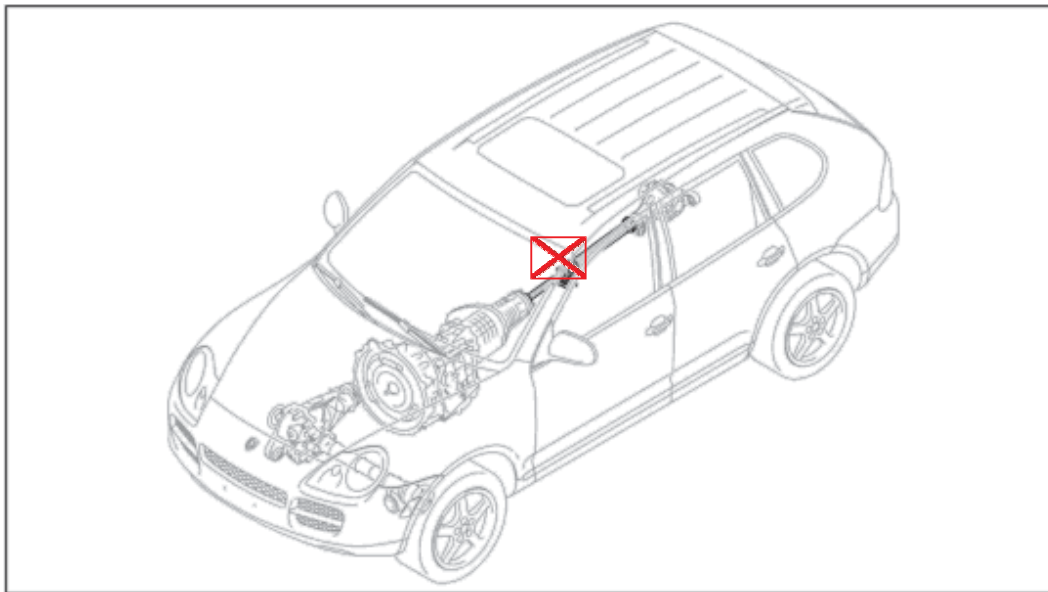
Note

- To loosen the cardan shaft on the rear axle transmission, a second fitter should counter the fastening screws **-arrows-** at the triangular flange of the transfer box.



Rear cardan shaft to transfer box

Installation Location:



Overview of cardan shaft

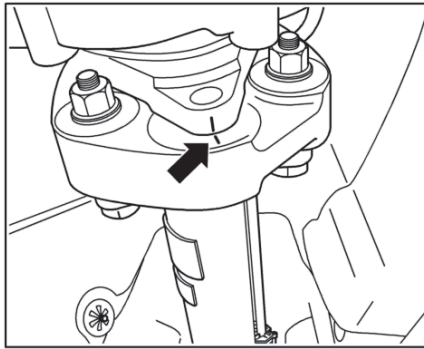
1. Move selector lever to position N.
2. The position of the cardan shaft **-arrows-** with respect to the rear axle transmission flange is marked with a white dot, match point, on both components.



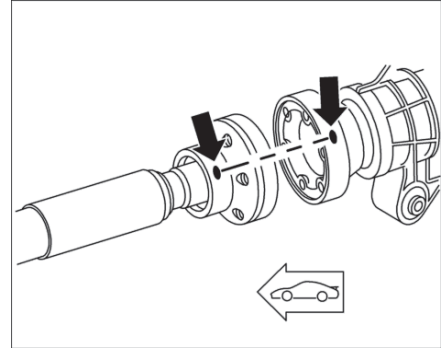
Note

- The colour marking, match point, on the cardan shaft and on the rear final drive flange must be aligned. This will neutralise the residual imbalance of the components.

3. Mark the position of the cardan shaft **-arrow-** with respect to the transfer box flange with a coloured pen.

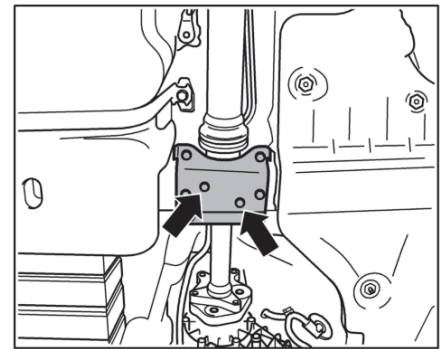


Mark for rear cardan shaft to transfer box



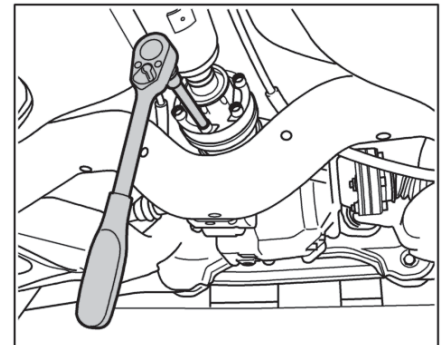
Match points for cardan shaft to final drive

4. Loosen fastening screws **-arrow-** securing cardan shaft support to centre bearing.



Cardan shaft support to centre bearing

5. Unscrew fastening screws on the cardan shaft at the rear axle transmission → *Cardan shaft to rear final drive* .



Cardan shaft to rear final drive

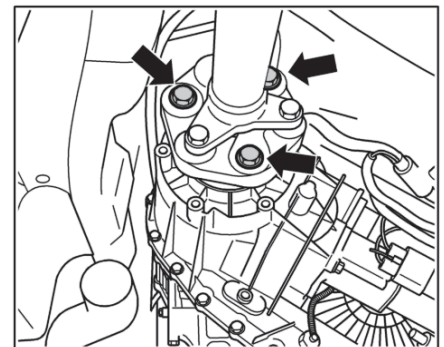


ATTENTION

Noises caused by damage in the drive line

- Faulty centre bearing; replace cardan shaft
- Do not loosen cardan shaft bolts using rubber/metal disc.

6. Unscrew fastening screws **-arrows-** on the cardan shaft at the transfer box. Counter with an open-ended wrench.



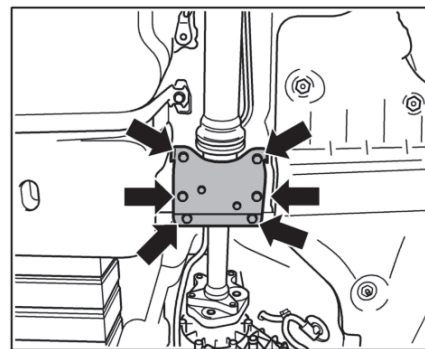
Cardan shaft to transfer box



ATTENTION

Cardan shaft can be damaged if not handled correctly

- Avoid repeated sagging or significant vertical traction.
- When one of the two flanges on the cardan shaft has been released, the centre bearing must be relaxed!
- Do not leave cardan shaft hanging. All three fastening points for transfer box, centre bearing and rear final drive must always be screwed in.
- The recommended procedures must be followed during installation, otherwise the position of the cardan shaft in its original place is no longer guaranteed. Possible result: premature failure of the centre bearing resulting in subsequent cardan shaft replacement.



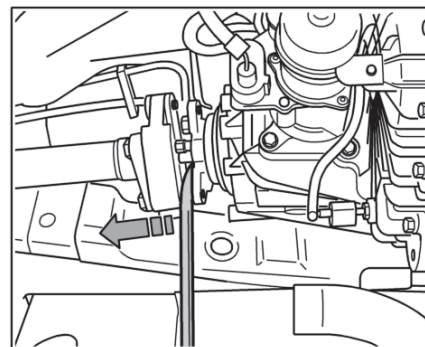
Cardan shaft centre bearing to body

7. Release cardan shaft centre bearing holder. To do this, unscrew six fastening screws **-arrows-**.
8. Carefully separate cardan shaft from transfer box → [Removing cardan shaft](#) and press backwards.



Note

- To prevent the cardan shaft from being damaged, a second mechanic is required to remove the equipment.

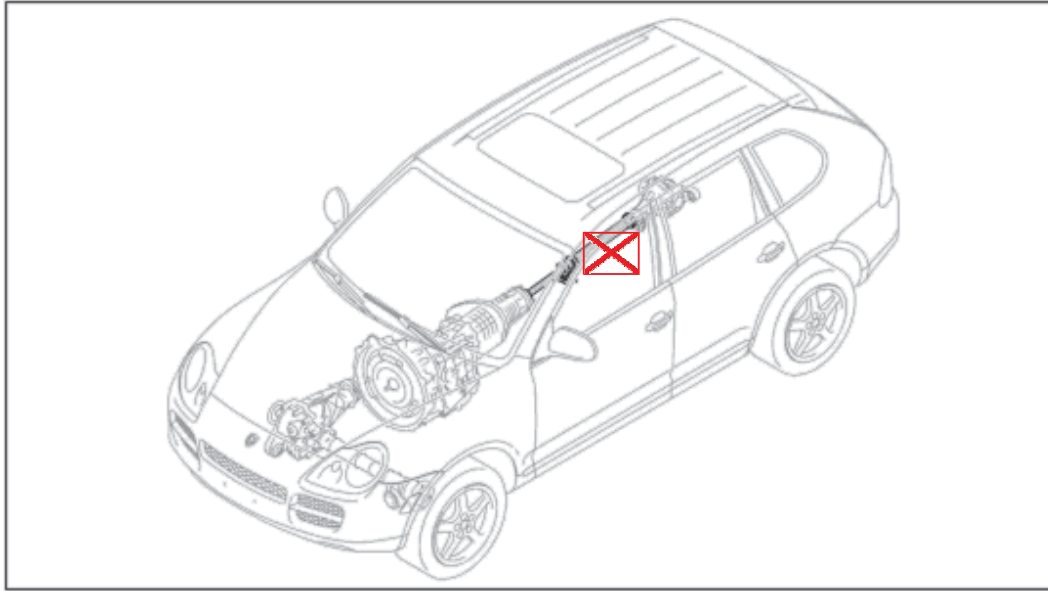


Removing cardan shaft

Installing rear cardan shaft

Installing rear cardan shaft

Installation Location:



Overview of rear cardan shaft



ATTENTION

Cardan shaft can be damaged if not handled correctly

- Avoid repeated sagging or significant vertical traction.
- When one of the two flanges on the cardan shaft has been released, the centre bearing must be relaxed!
- Do not leave cardan shaft hanging. All three fastening points for transfer box, centre bearing and rear final drive must always be screwed in.
- The recommended procedures must be followed during installation, otherwise the position of the cardan shaft in its original place is no longer guaranteed. Possible result: premature failure of the centre bearing resulting in subsequent cardan shaft replacement.



ATTENTION

Leakage due to damage to centring sleeve

- Ensure that no damage occurs during removal and installation.
- Centring sleeve should be greased slightly.
- Transfer box journal must be clean.



Note

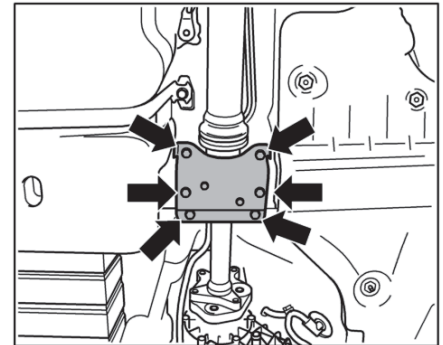
- *There is no colour marking on the flange to the transfer box for installing new components, transfer box or cardan shaft. As a result, positioning is not an issue.*
- *If none of the components are replaced, the mark you apply is a precautionary measure in order to avoid humming noises from the drive line.*



Note

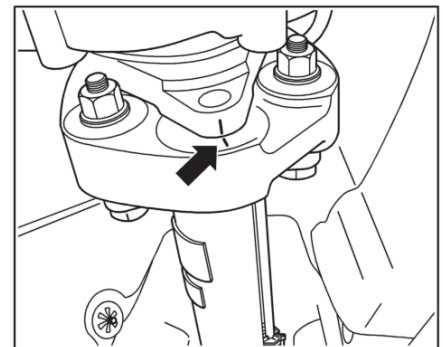
- To prevent the cardan shaft from being damaged, a second mechanic is required to install the equipment.

1. Install cardan shaft.
2. Pull cardan shaft joints apart so that they sit in the transmission flanges.
3. Screw in six screws **-arrow-** on the centre bearing holder but do not tighten.

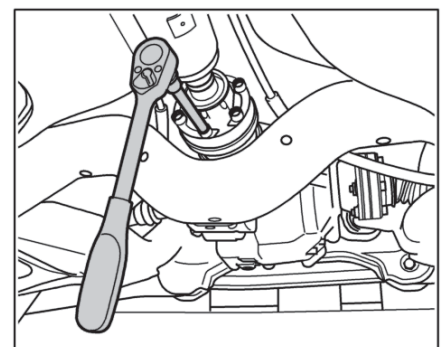


Cardan shaft centre bearing to body

4. Position the cardan shaft at the colour markings **-arrow-** again.



Marking on transfer box flange/cardan shaft



Cardan shaft to rear final drive



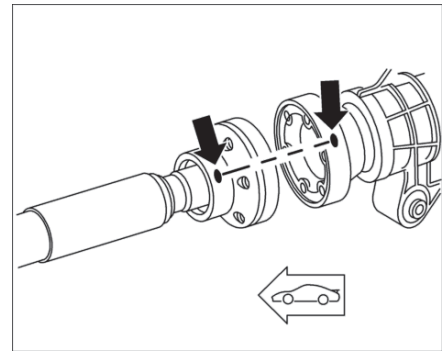
Note

- The colour marking, match point **-arrow-**, on the cardan shaft and on the flange of the rear final drive must be aligned. This will neutralise the residual imbalance of the components.

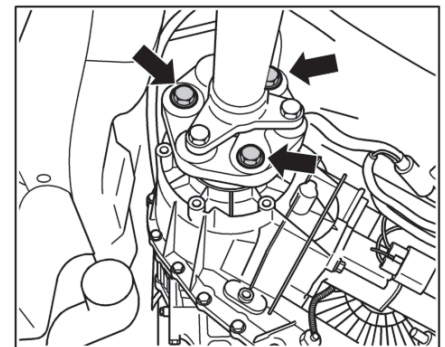


Note

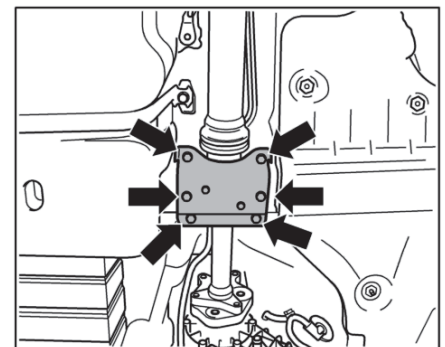
- To attach the cardan shaft to the rear axle transmission, a second fitter should counter the fastening screws on the triangular flange of the transfer box.
 - Screws which are tightened with a torque angle must be replaced with new ones.
5. Screw in new screws for cardan shaft flange at the rear axle transmission. → **Initial tightening: 22 ftlb.** → **Final tightening: 90 °**
 6. Tighten bolts connecting cardan shaft triangular flange to transfer box **-arrows-**. Counter with an open-ended wrench. → **Tightening torque: 56 ftlb.**
 7. Screw in fastening screws for securing cardan shaft centre bearing holder to body **-arrows-**. → **Tightening torque: 44 ftlb.**



Match points for cardan shaft to final drive



Cardan shaft to transfer box

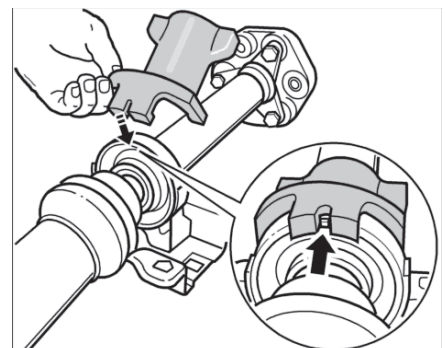


Cardan shaft centre bearing to body



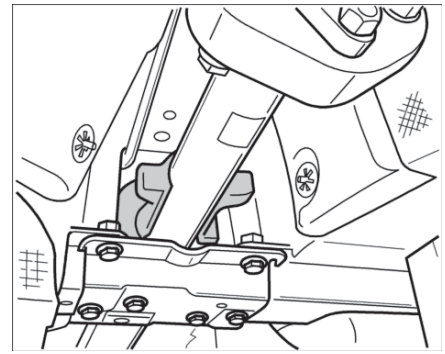
Note

- Centre bearing must be installed without tension.
8. Mount special tool centring tool 9680 **-arrow,inset-**.



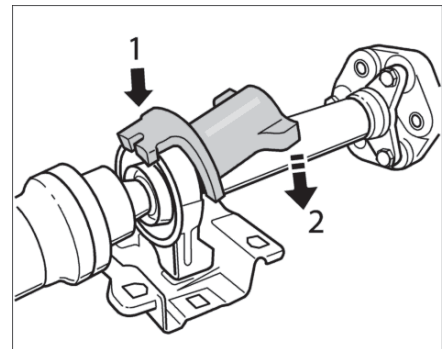
Mounting special tool 9680

- Fit special tool **centring tool 9680** → **Special tool in installation position** in the specified sequence.



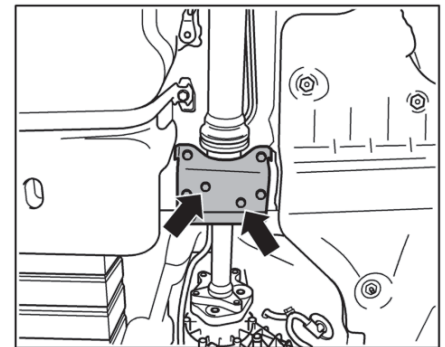
Special tool in installation position

9. Press on special tool **centring tool 9680** in sequence according to numbering **-1, 2-** .



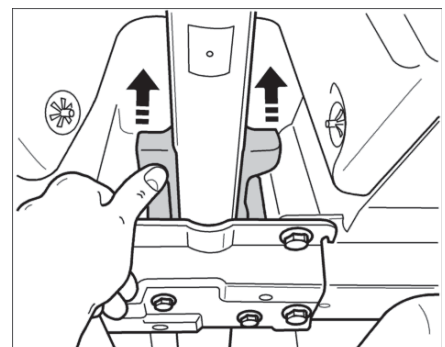
Pressing on special tool 9680

10. Tighten bolts **-arrow-** connecting holder to centre bearing. → **Tightening torque: 15 ftlb.**



Cardan shaft support to centre bearing

11. Remove special tool **centring tool 9680**. **-arrows-**



Removing special tool 9680

Subsequent work

Subsequent work - rear cardan shaft

1. Install the exhaust system. → 260119 Removing and installing exhaust system - chapter on "Installing"
-

9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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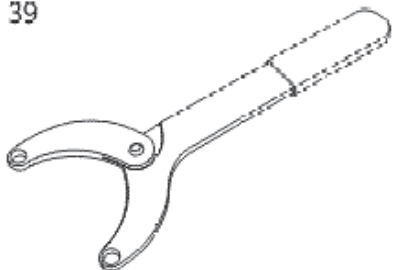
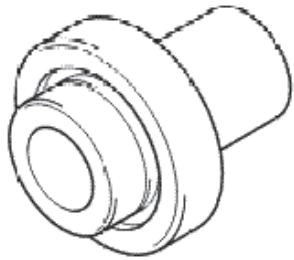
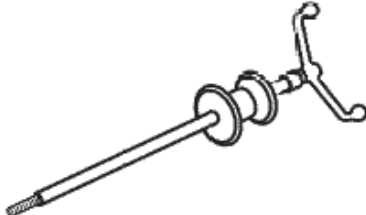
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39 55 19 Removing and installing sealing ring for cardan flange - as of MY 2003

- Preliminary work for cardan flange sealing ring
- Removing sealing ring for cardan flange
- Installing sealing ring for cardan flange
- Subsequent work for sealing ring for cardan flange

Tools

Designation	Type	Number	Explanation	
shop-made tool	commercially available tool			 .gif
counterer	commercially available tool	3435		

				39  3435
torque screwdriver for measuring friction moment	commercially available tool	89		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
pressure piece	special tool	T10183		39  T10183
striker	commercially available tool	vw 771/1		34, 40  VW 771/1
extraction tool	commercially available tool	vw 771/37		

Preliminary work for cardan flange sealing ring

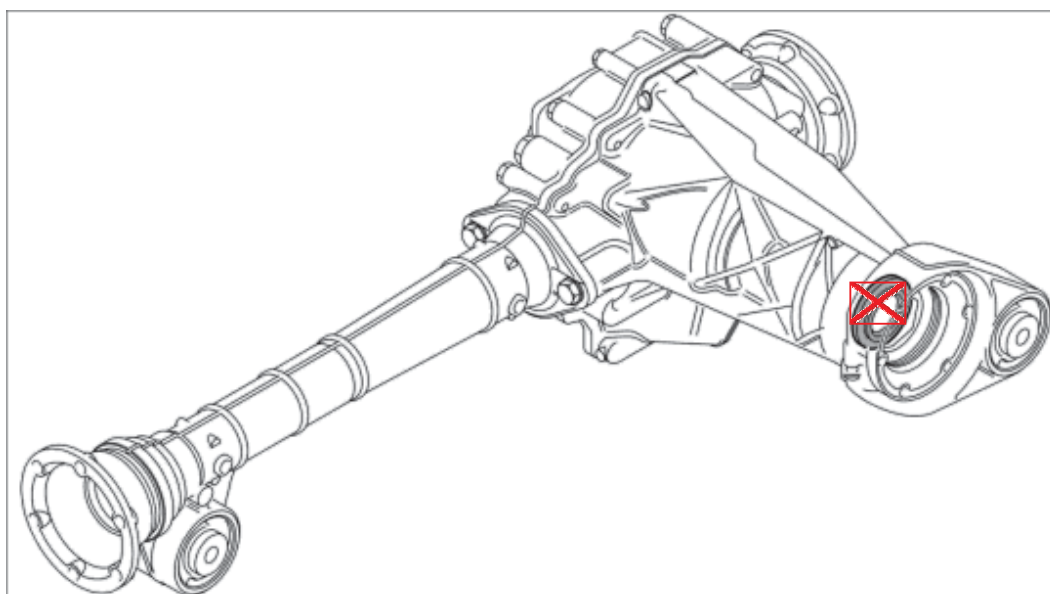
Preliminary work for cardan flange sealing ring

1. Remove engine guard → 108019 Removing and installing engine guard - chapter on "Removing".
2. Remove front cardan shaft → 390219 Removing and installing front cardan shaft - chapter on "Removing" [9PAAE1 9PAAF1 9PAAJ1]→ 390219 Removing and installing front cardan shaft - chapter on "Removing" [9PAAD1 9PAAD7 9PAAE7].

Removing sealing ring for cardan flange

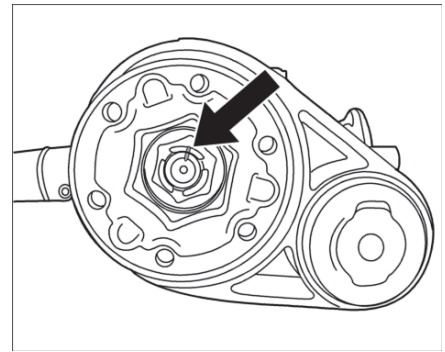
Removing sealing ring for cardan flange

Installation Location:



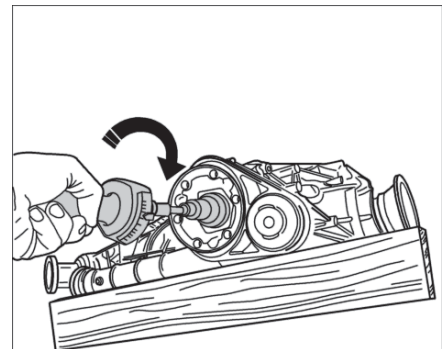
Overview of cardan flange sealing ring

1. Mark nut on drive flange with a coloured pen **-arrow-** .



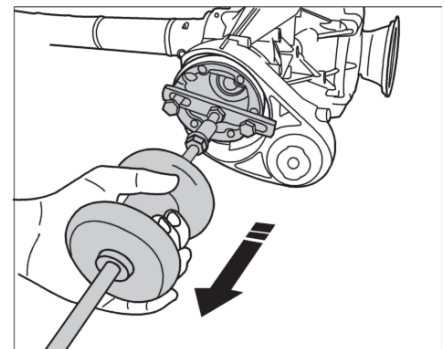
Marking nut

2. Determine rolling moment of axle transmission with special tool **torque screwdriver for measuring friction moment 89**. Push stop on special tool to zero and turn transmission several times. Note the displayed value.
3. Unscrew nut on drive flange. To do this, use the special tool **counterer 3435** to block the transmission → *Measuring rolling moment* .



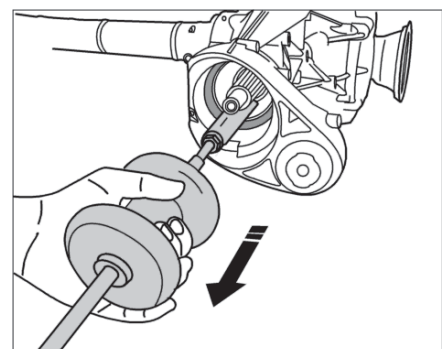
Measuring rolling moment

4. Remove drive flange with special tool **striker vw 771/1** and **shop-made tool** → *Removing drive flange* .



Removing drive flange

5. Remove sealing ring with special tool **striker vw 771/1** and **extraction tool vw 771/37**.

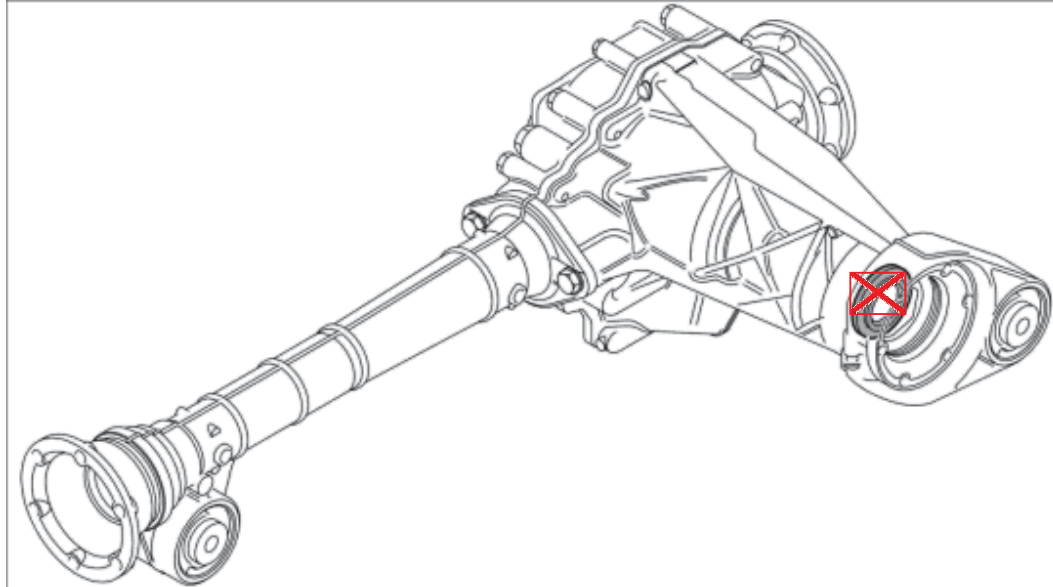


Removing sealing ring

Installing sealing ring for cardan flange

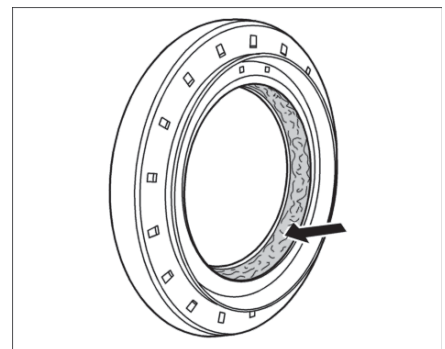
Installing sealing ring for cardan flange

Installation Location:



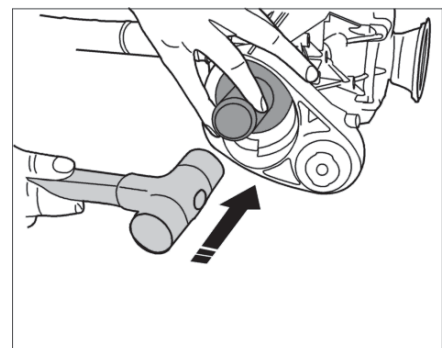
Overview of cardan flange sealing ring

1. Fill space between dust and sealing lips with grease.



Greased sealing ring

2. Drive sealing ring in as far as the mounting face with special tool **pressure piece T10183**.
3. Push in drive flange and tighten nut.



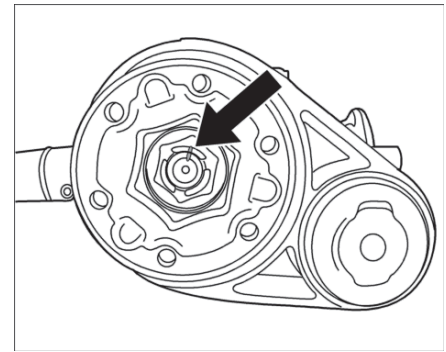
Driving in the sealing ring

4. Position marking on nut and drive shaft **-arrow-** again so that the rolling moment determined prior to removal is attained once again.



Note

- If the rolling moment has to be corrected, this should be done via the tightening torque of the nut.
5. Check rolling moment with special tool **torque screwdriver for measuring friction moment 89**.



Marking nut

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Rolling moment		Adjustment value	2.0 (1.5 ftlb.) Nm	+0.5 (0.5 ftlb.) Nm	

Subsequent work for sealing ring for cardan flange

Subsequent work on sealing ring for cardan flange

1. Install front cardan shaft → 390219 Removing and installing front cardan shaft - chapter on "Installing" [9PAAE1 9PAAF1 9PAAJ1]→ 390219 Removing and installing front cardan shaft - chapter on "Installing" [9PAAD1 9PAAD7 9PAAE7].
2. Carry out oil check. → 399035 Checking and topping up oil for all-wheel final drive - chapter on "Checking"
3. Install engine guard → 108019 Removing and installing engine guard - chapter on "Installing".

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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AVERTISSEMENT

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- **Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.**
- **Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.**

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- **Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.**
- **Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.**

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

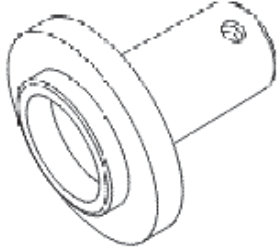
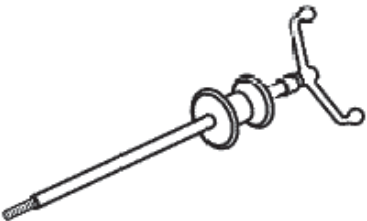
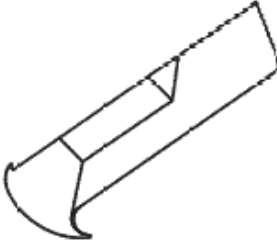
→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 59 19 Removing and installing sealing ring for output flange - as of MY 2003

- Preliminary work for output flange sealing ring
- Removing sealing ring for left and right output flange
- Installing sealing ring for left and right output flange
- Subsequent work for output flange sealing ring

Tools

Designation	Type	Number	Explanation	
shop-made tool	commercially available tool			
pressure piece	commercially available tool	t10032		

				39  T 10032
striker	commercially available tool	vw 771/1		34, 40  VW 771/1
extraction tool	commercially available tool	vw 771/37		39  VW 771/37

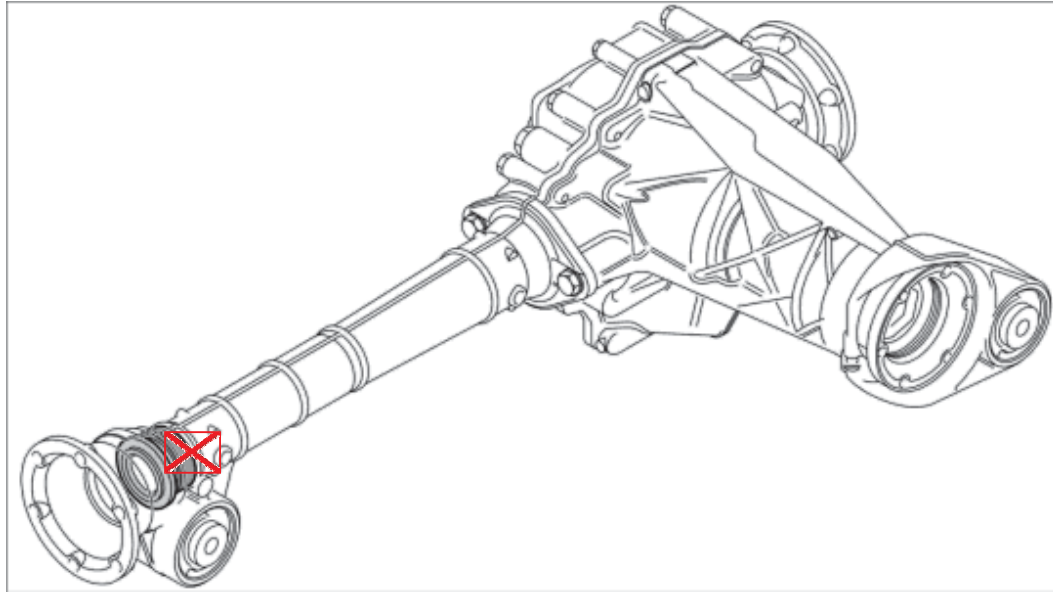
Preliminary work for output flange sealing ring

Preliminary work for output flange sealing ring

Removing sealing ring for left and right output flange

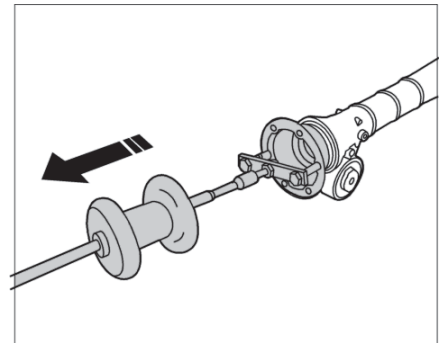
Removing sealing ring for left-hand output flange

Installation Location:

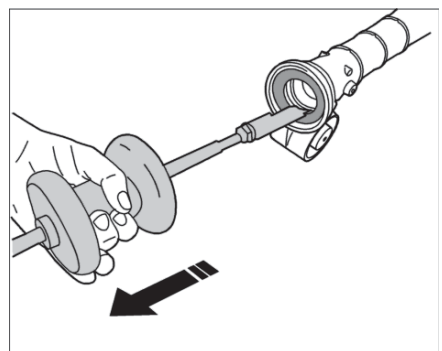


Overview of left sealing ring

1. Remove flanged shaft with special tool **striker vw 771/1** and **shop-made tool** .



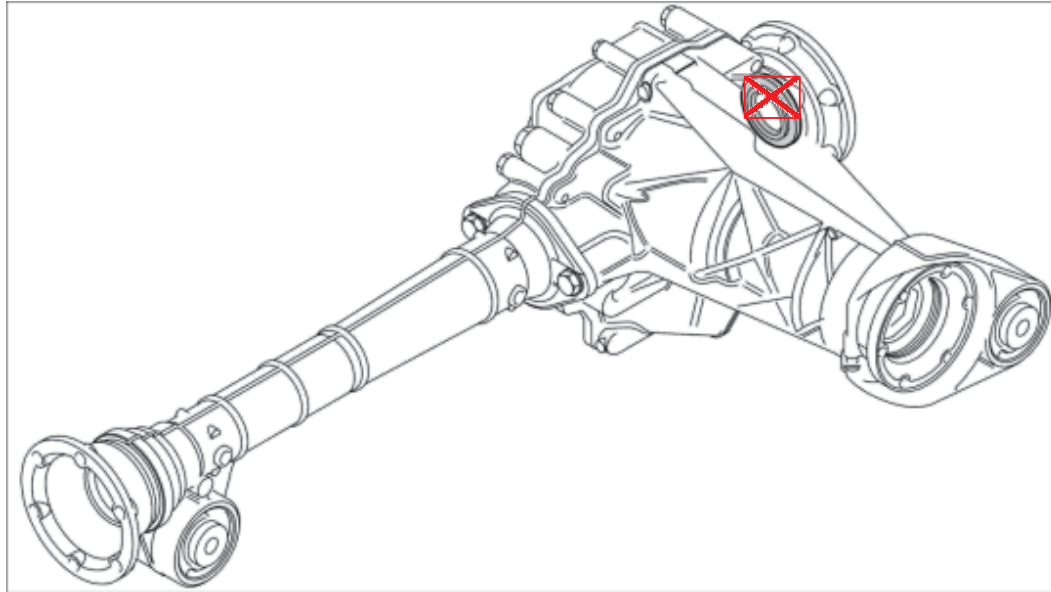
Removing flanged shaft



Removing sealing ring

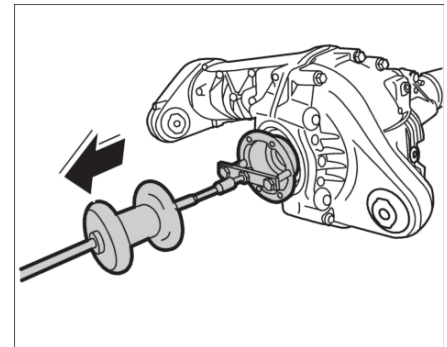
Removing sealing ring for right-hand output flange

Installation Location:



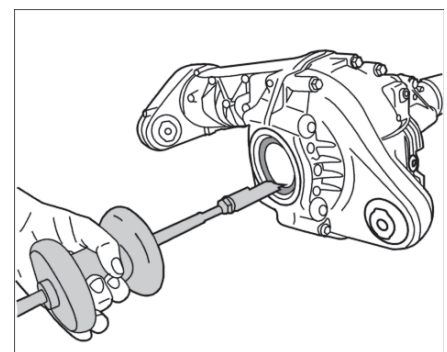
Overview of right sealing ring

1. Remove flanged shaft with special tool **striker vw 771/1** and **shop-made tool** .



Removing flanged shaft

2. Remove sealing ring with special tool **striker vw 771/1** and **extraction tool vw 771/37** attachment.

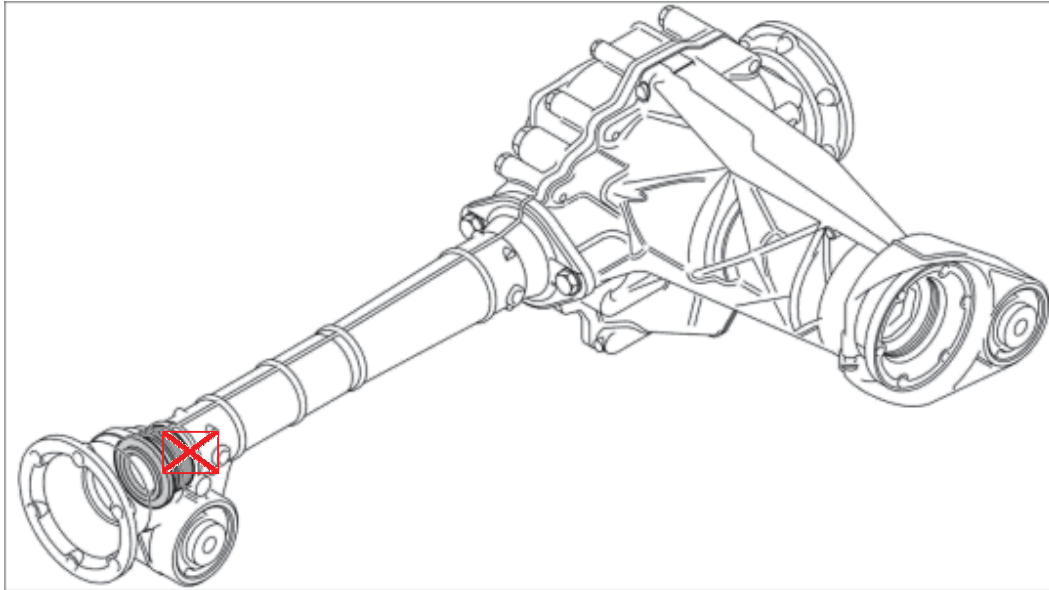


Removing sealing ring

Installing sealing ring for left and right output flange

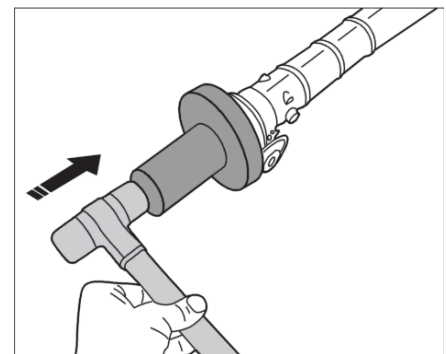
Installing sealing ring for left-hand output flange

Installation Location:



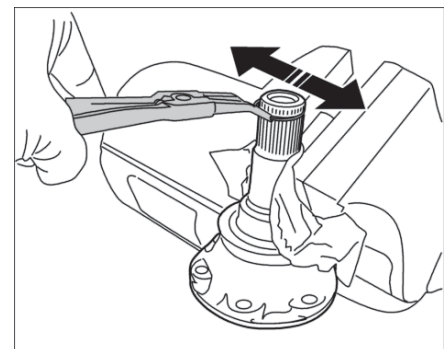
Overview of left sealing ring

1. Drive in sealing ring with special tool **pressure piece t10032**
→ *Installing sealing ring* until the special tool touches the transmission housing.



Installing sealing ring

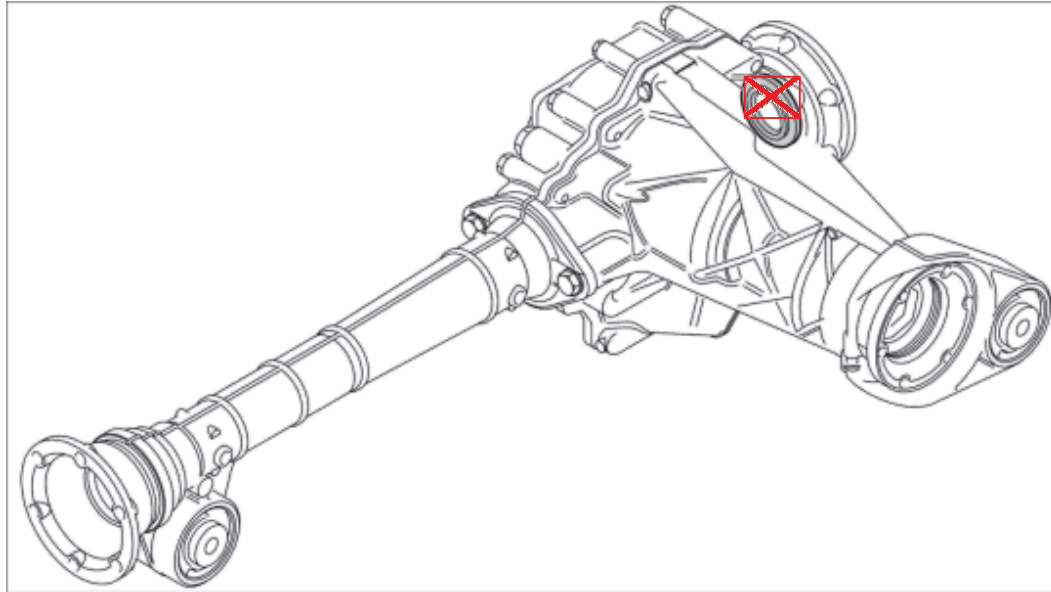
2. Replace circlip on end of long flanged shaft.



Example using the short flanged shaft

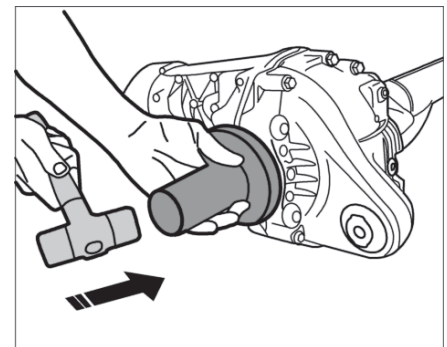
Installing sealing ring for right-hand output flange

Installation Location:



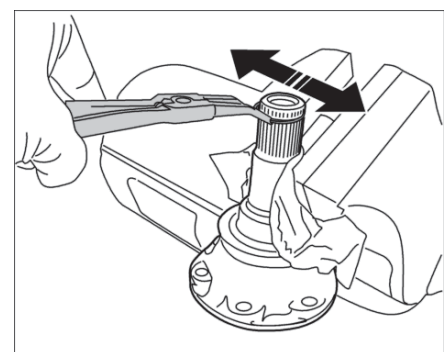
Overview of right sealing ring

1. Drive in sealing ring with special tool **pressure piece t10032** → *Installing sealing ring* until the special tool touches the transmission housing.



Installing sealing ring

2. Replace circlip on flanged shaft → *Replacing circlip* .
3. Push flanged shaft into transmission until it engages.



Replacing circlip

Subsequent work for output flange sealing ring

Subsequent work for output flange sealing ring

1. Install four-wheel final drive → 398819 Removing and installing four-wheel final drive - chapter on

"Installing".

2. Check oil for four-wheel final drive. → 399035 Checking and topping up oil for four-wheel final drive - chapter on "Checking"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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39 61 19 Removing and installing rubber mounting for four-wheel final drive - as of MY 2003

- Preliminary work for rubber mounting on four-wheel final drive
- Removing rubber mounting for four-wheel final drive
- Installing rubber mounting for four-wheel final drive
- Subsequent work for four-wheel final drive

Tools

Designation	Type	Number	Explanation	
workshop caliper gauge	commercially available tool	139		PORSCHE siehe Handbuch Werkstattdausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
assembly fixture	special tool	9716 a/b		PORSCHE siehe Handbuch Werkstattdausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
assembly fixture	commercially available tool	9716 a/b/c		

				PORSCHE siehe Handbuch Werkstattdausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work for rubber mounting on four-wheel final drive

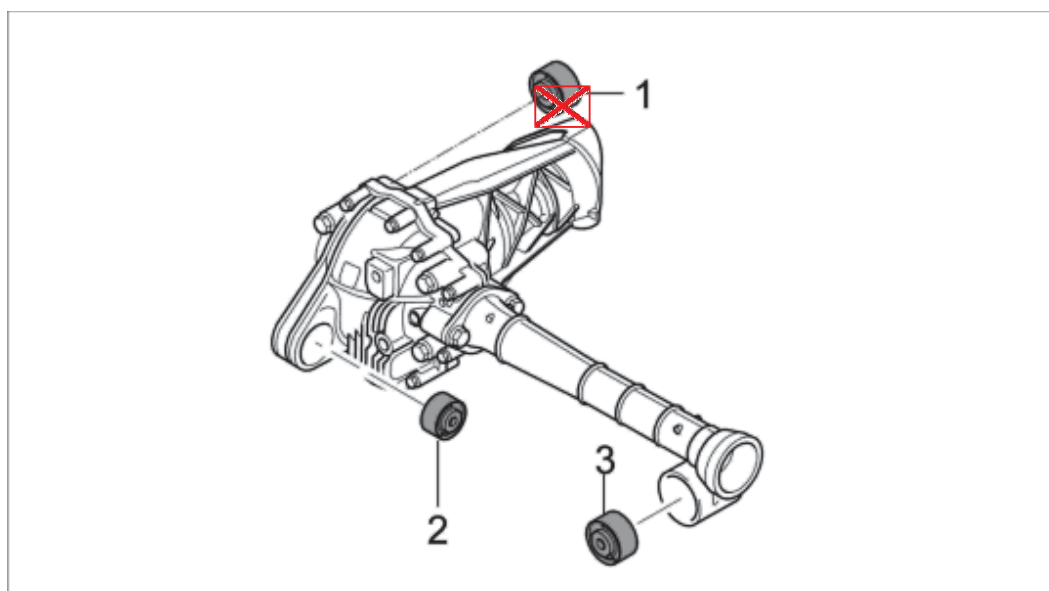
Preliminary work, rubber mounting on four-wheel final drive

1. Remove four-wheel final drive. → 398819 Removing and installing four-wheel final drive - "Removing" section

Removing rubber mounting for four-wheel final drive

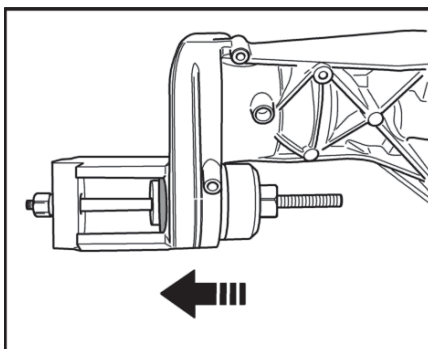
Removing rubber mounting for four-wheel final drive, drive side

Installation Location:

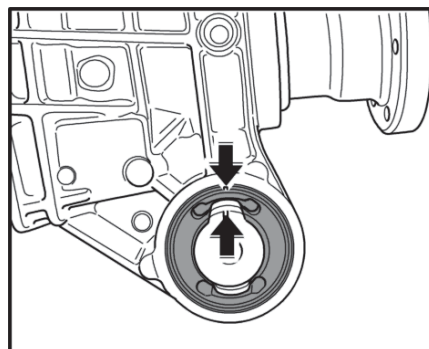


Rubber mounting, drive side -1-

1. Mark rubber mounting for transmission housing at the installation position **-arrow-** .



Removing rubber mounting, drive side

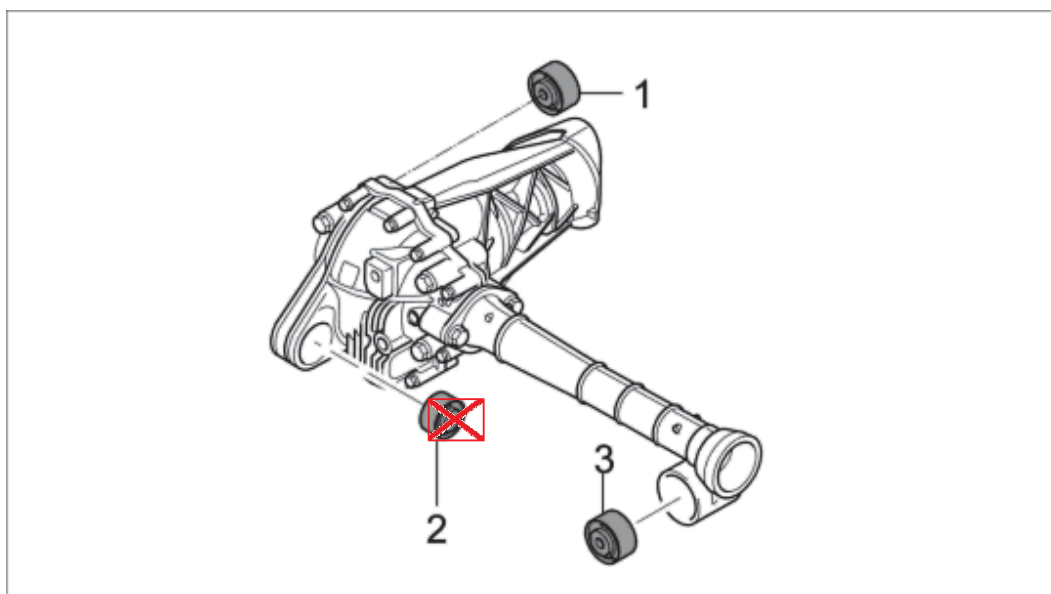


Marking for rubber mounting

2. Position special tool **assembly fixture 9716 a/b** on rubber mounting → *Removing rubber mounting, drive side* .
3. Remove rubber mounting on drive side **-arrow-** .

Removing rubber mounting for four-wheel final drive, right output side

Installation Location:

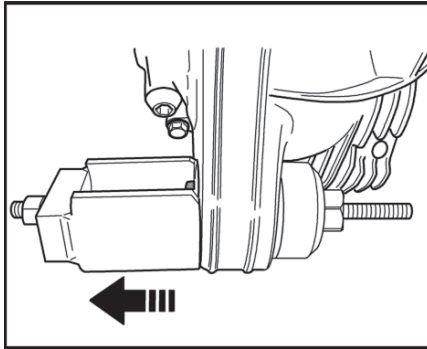


Rubber mounting for right output side **-2-**

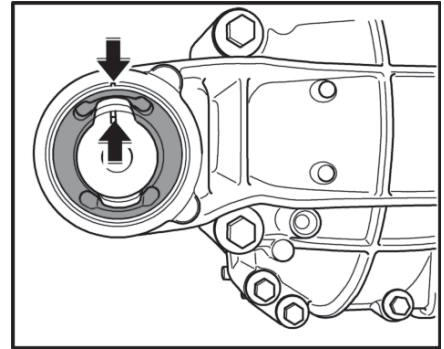
1. Mark rubber mounting for transmission housing at the installation position **-arrow-** .
2. Position special tool **assembly fixture 9716 a/b** on rubber mounting → *Removing right rubber mounting* .

Removing rubber mounting for four-wheel final drive, left output side

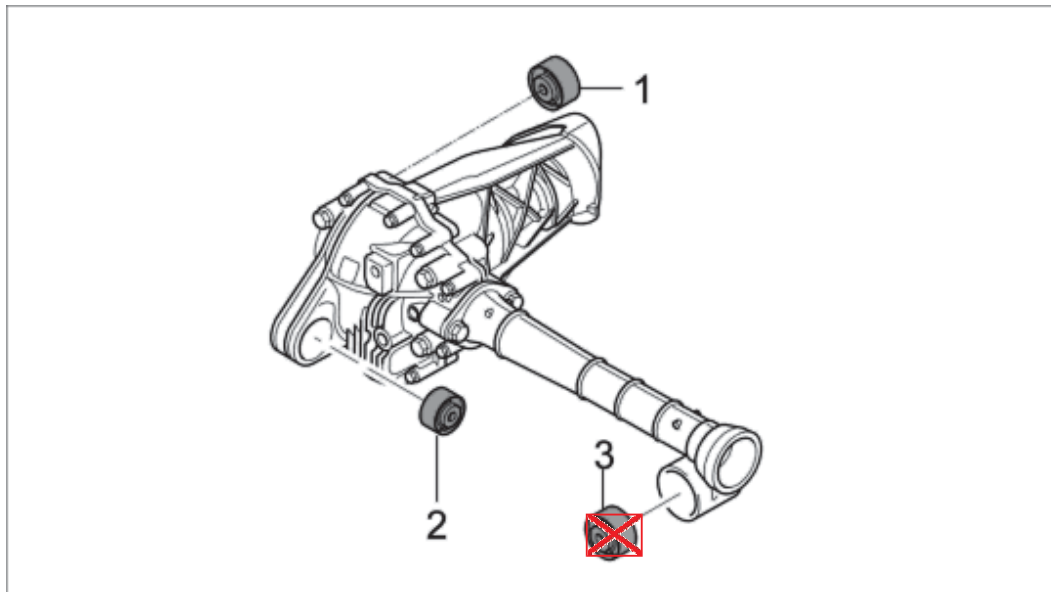
Installation Location:



Removing right rubber mounting

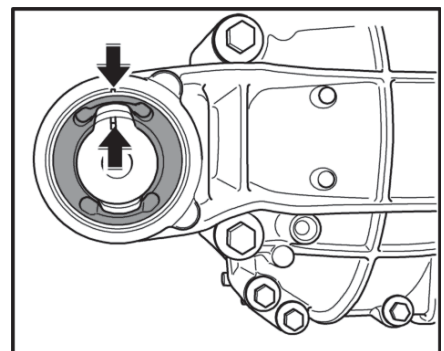


Marking for rubber mounting



Rubber mounting for left output side -3-

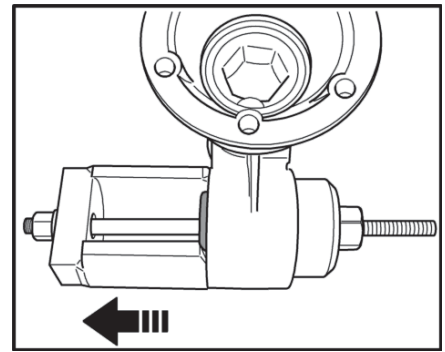
1. Mark rubber mounting for transmission housing at the installation position **-arrow-** .



Marking for rubber mounting

2. Position special tool **assembly fixture 9716 a/b** on rubber mounting → *Removing left rubber mounting* .
3. Remove left rubber mounting **-arrow-** .

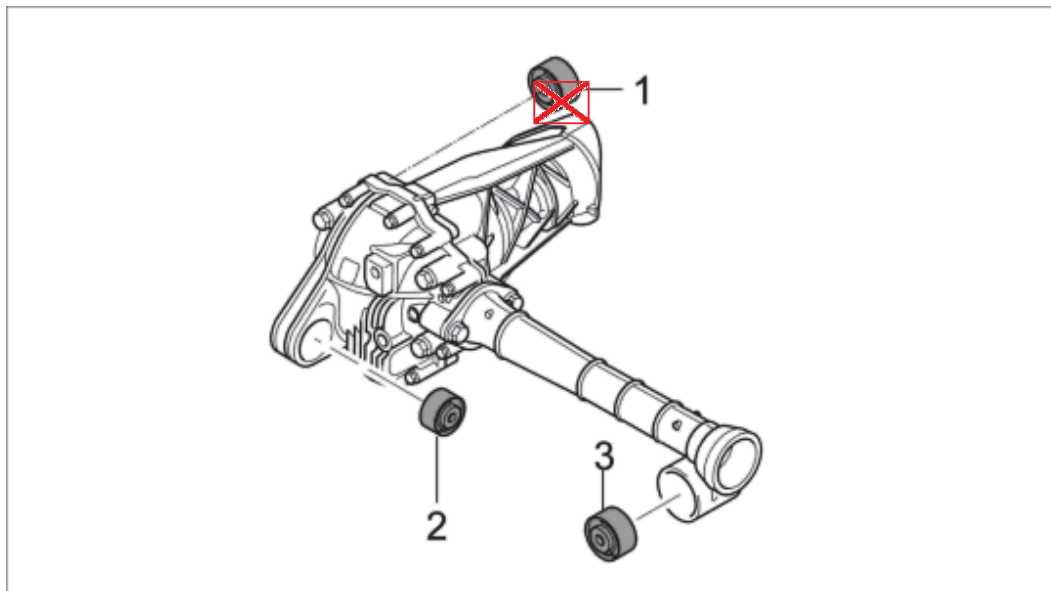
Installing rubber mounting for four-wheel final drive



Removing left rubber mounting

Installing rubber mounting for four-wheel final drive, drive side

Installation Location:



Rubber mounting, drive side -1-



Note

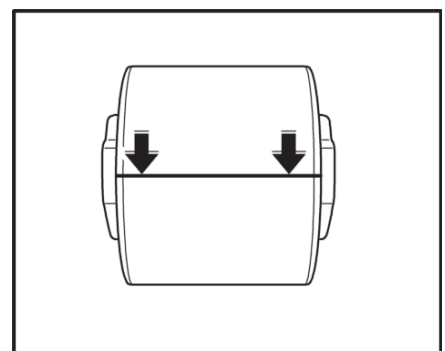
Noises in drive line

- Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing
- Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing

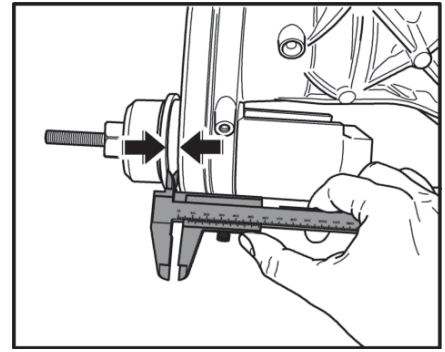
1. Mark centre of bulge in rubber mounting → [Marking for centre of rubber mounting](#) .

2. Position rubber mounting in housing using special tool **assembly fixture 9716 a/b/c**.

3. Pull in rubber mounting in direction of travel until installation position is reached. Measure distance between



Marking for centre of rubber mounting

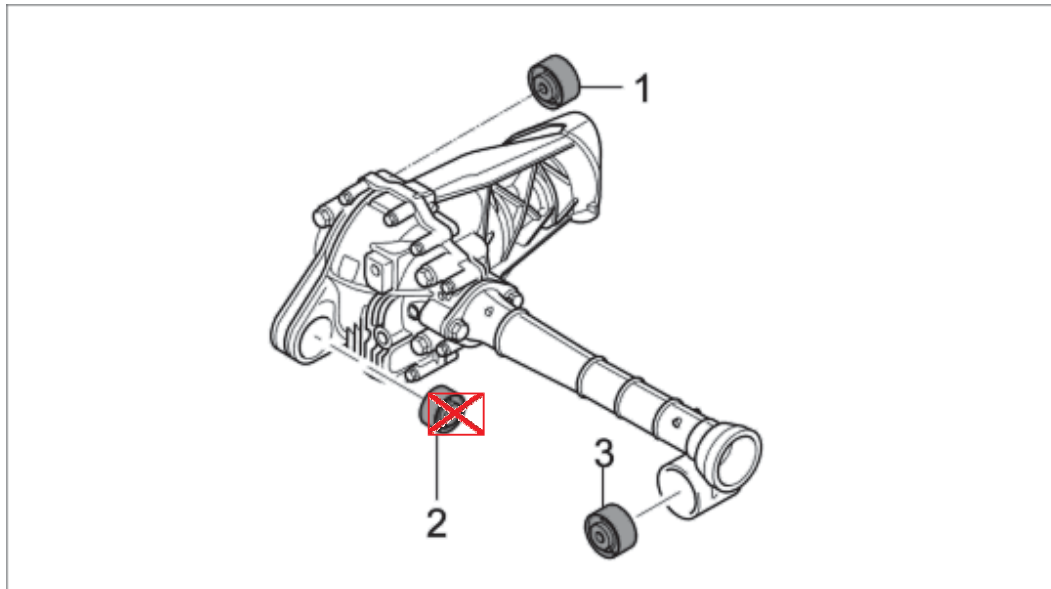


Installation position of rubber mounting

assembly fixture ring and housing using **workshop caliper gauge 139**. → **Distance: 7.5 mm +/-0.1 mm**

Installing rubber mounting for four-wheel final drive, right output side

Installation Location:



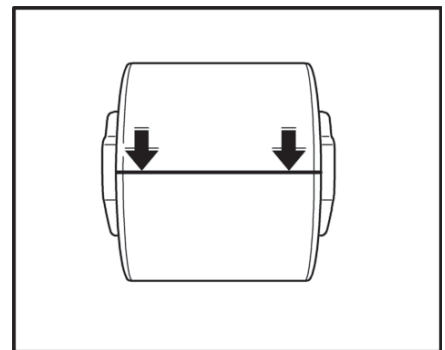
Rubber mounting for right output side -2-



Note

Noises in drive line

- Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing
- Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing



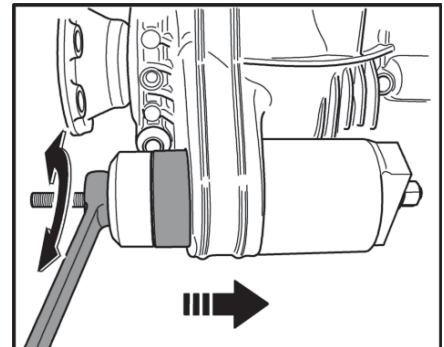
Marking for centre of rubber mounting



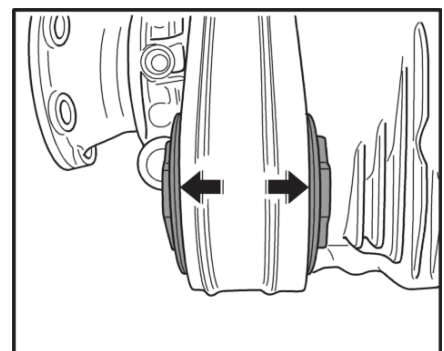
Note

Noises in drive line

- *Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing*
 - *Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing*
1. Mark centre of bulge in rubber mounting → [Marking for centre of rubber mounting](#) .
 2. Position special tool **assembly fixture 9716 a/b** on rubber mounting.
 3. Pull in rubber mounting until installation position is reached.



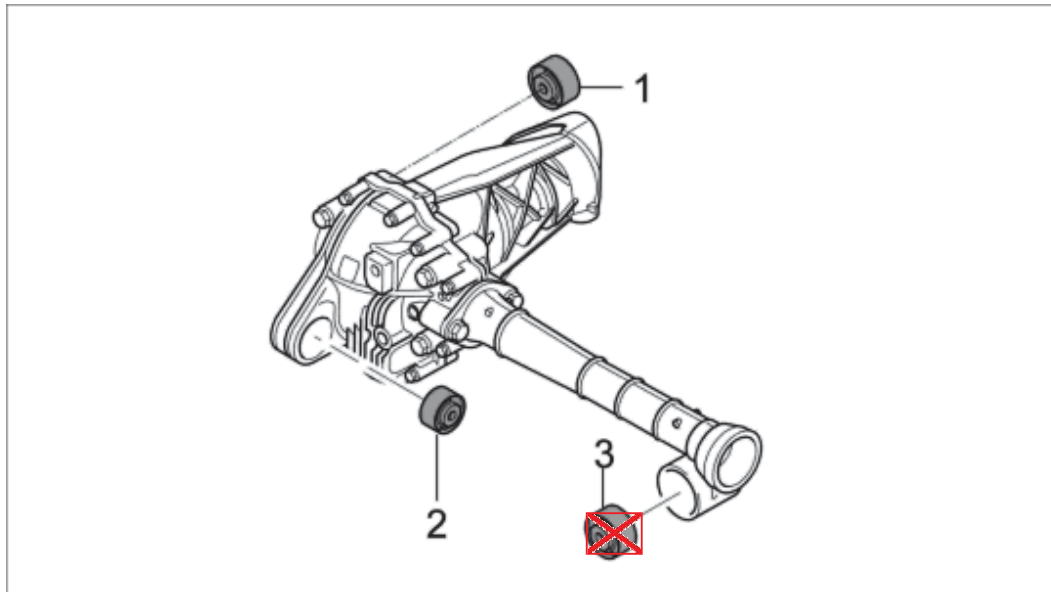
Installing rubber mounting



Installation position of rubber mounting

Installing rubber mounting for four-wheel final drive, left output side

Installation Location:



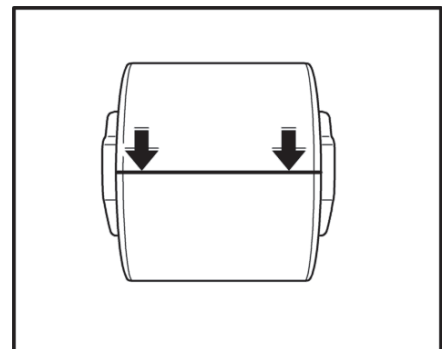
Rubber mounting for left output side -3-



Note

Noises in drive line

- Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing
- Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing



Marking for centre of rubber mounting



Note

Noises in drive line

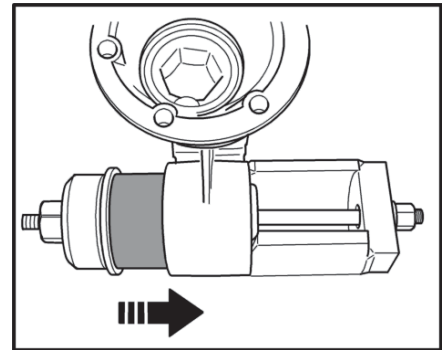
- Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing
- Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing

1. Mark centre of bulge in rubber mounting. **-arrows-**
2. Position special tool **assembly fixture 9716 a/b/c** on rubber mounting → *Positioning bearing* .
3. Press rubber mounting flush into housing. **-direction of arrow-**

Subsequent work for four-wheel final drive

Touching up, rubber mounting on four-wheel final drive

1. Install four-wheel final drive. → 398819 Removing and installing four-wheel final drive - "Installing" section



Positioning bearing

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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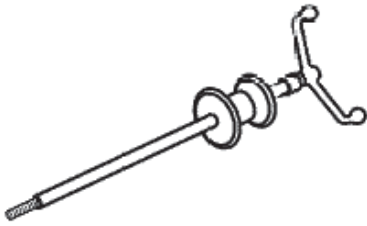
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39 61 19 Removing and installing rubber mounting for rear final drive - as of MY 2003

- Preliminary work
- Removing rubber mounting for rear final drive
- Installing rubber mounting for rear final drive
- Subsequent work

Tools

Designation	Type	Number	Explanation	
material	special tool	00000	shop-made tool	PORSCHE siehe Handbuch Werkstattdausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
assembly fixture	commercially available tool	9716 a/b		PORSCHE siehe Handbuch Werkstattdausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
assembly fixture	commercially available tool	9716 a/b/c		

				PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
striker	workshop equipment	VW 771/1		34, 40  VW 771/1

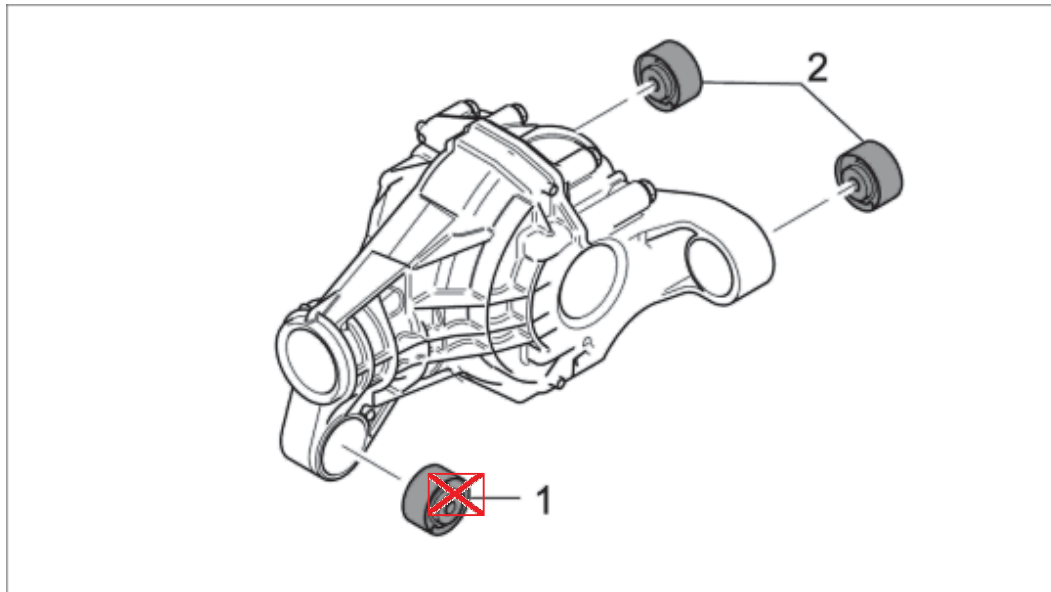
Preliminary work

Preliminary work, rubber mounting on rear final drive

Removing rubber mounting for rear final drive

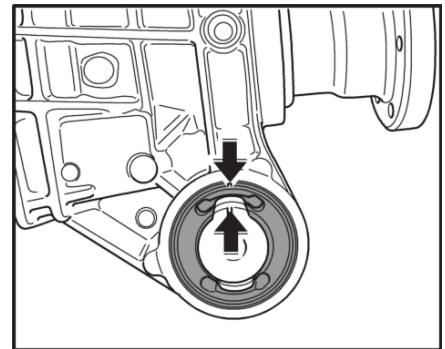
Removing rubber mounting for rear final drive, drive side

Installation Location:



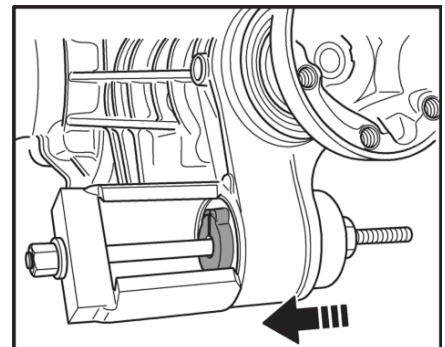
Rubber mounting, drive side **-1-**

1. Mark rubber mounting for transmission housing at the installation position **-arrow-** .



Marking for rubber mounting for housing

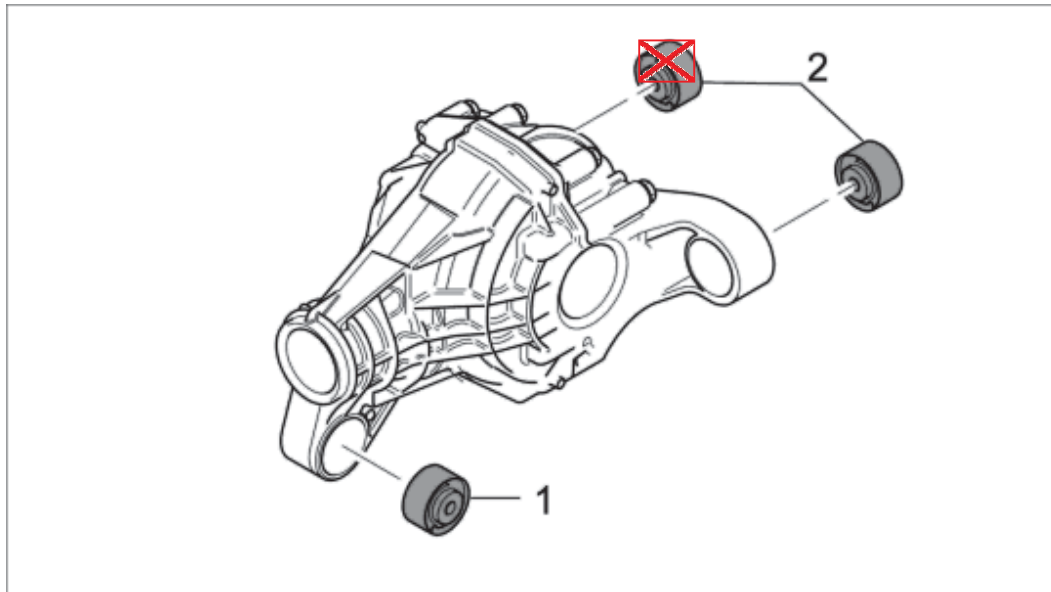
2. Position special tool **assembly fixture 9716 a/b** on rubber mounting
→ *Removal on drive side* .



Removal on drive side

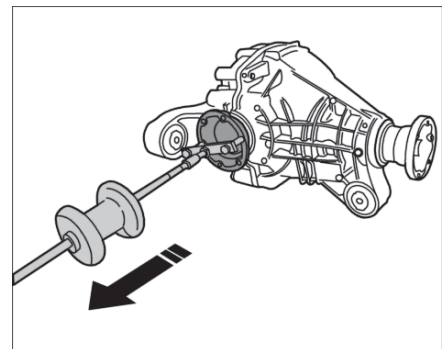
Removing rubber mounting for rear final drive, output side

Installation Location:



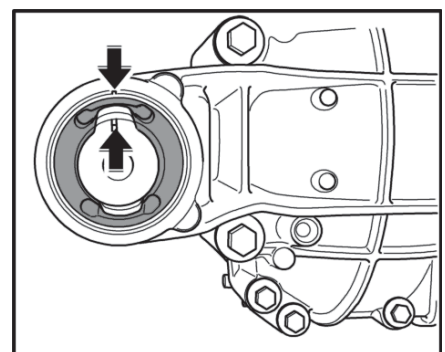
Rubber mounting for output side -2-

1. Remove output flange with special tool **striker VW 771/1** and material **00000** -direction of arrow- .



Removing output flange

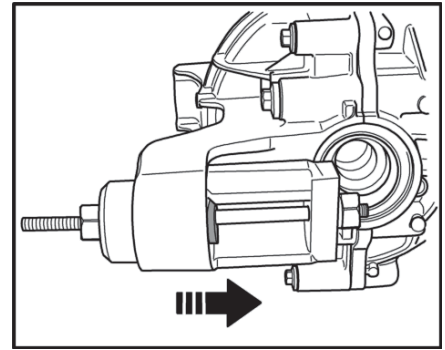
2. Mark rubber mounting for transmission housing at the installation position -arrow- .



Marking for rubber mounting

3. Position special tool **assembly fixture 9716 a/b** on rubber mounting → *Removing rubber mounting* .
4. Remove rubber mounting -direction of arrow- .

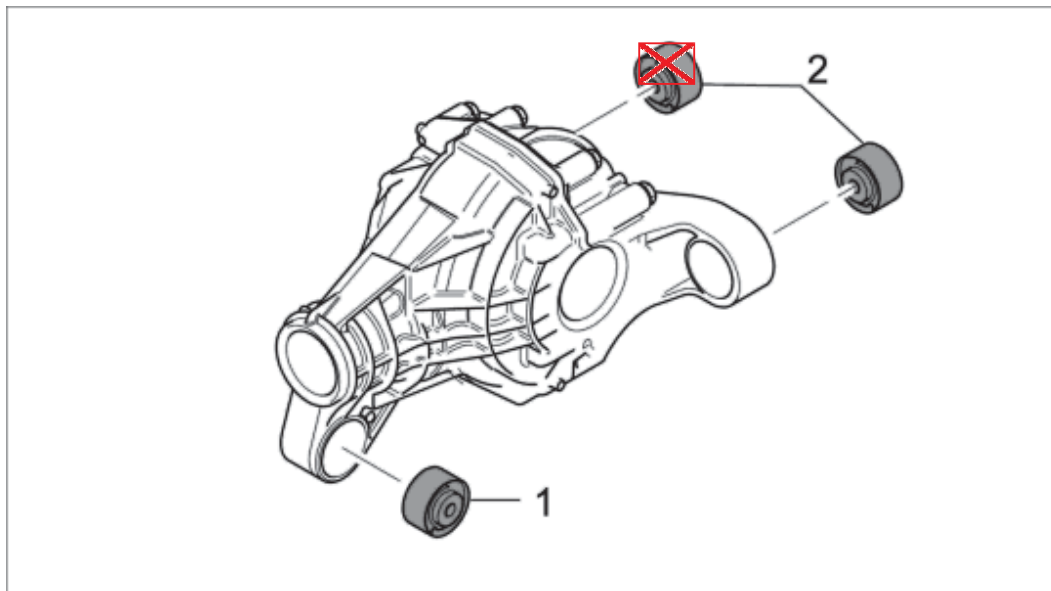
Installing rubber mounting for rear final drive



Removing rubber mounting

Installing rubber mounting for rear final drive, output side

Installation Location:



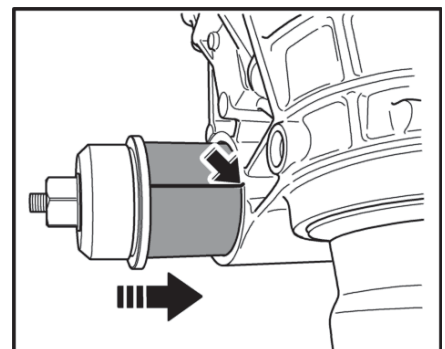
Rubber mounting for output side -2-



Note

Noises in drive line

- *Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing*
 - *Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing*
1. Position special tool **assembly fixture 9716 a/b/c** on rubber mounting and align the markings.
 2. Press rubber mounting flush → *see figure* into housing.



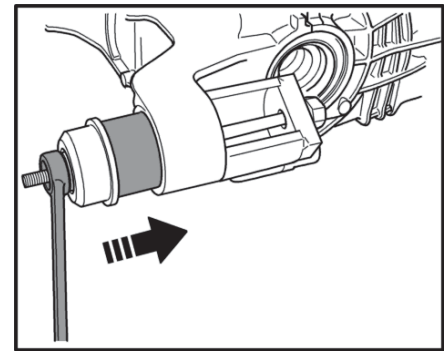


Note

Noises in drive line

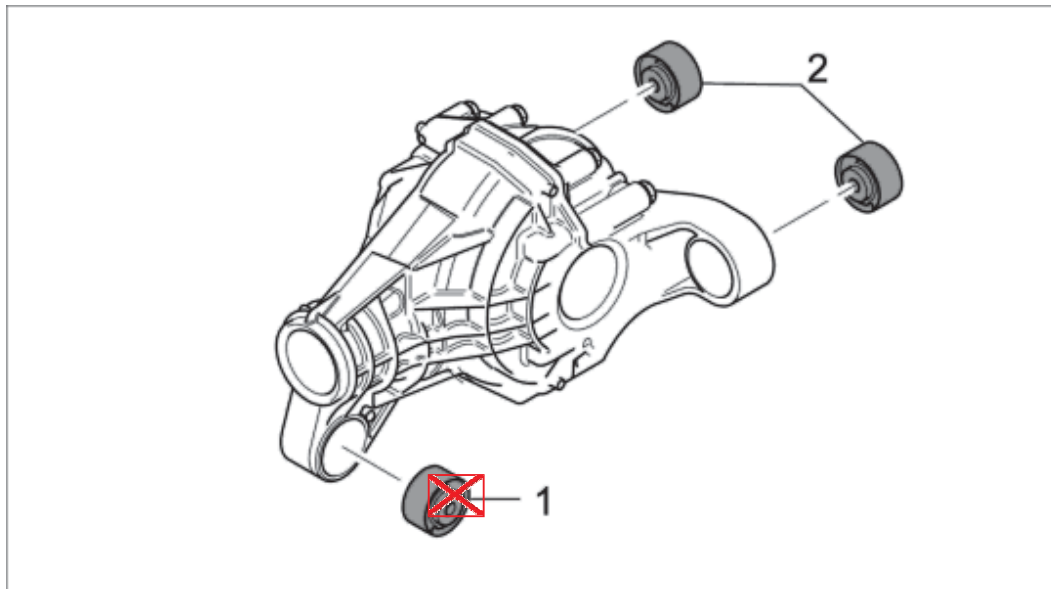
- Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing
- Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing

3. Install output flange.



Installing rubber mounting for rear final drive, drive side

Installation Location:



Rubber mounting, drive side -1-

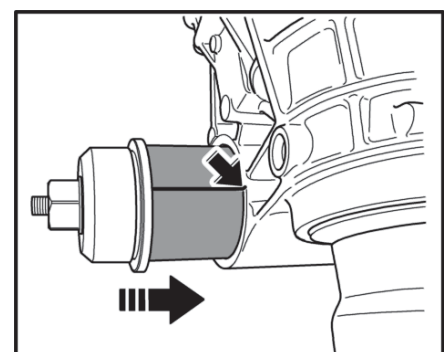


Note

Noises in drive line

- Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing
- Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing

1. Position special tool **assembly fixture 9716 a/b/c** on rubber mounting → [Installing rubber mounting on drive side](#) and align the markings.



Installing rubber mounting on drive side



Note

Noises in drive line

- *Installation position of rubber mounting bulge is incorrect Rubber mounting bulge must be installed vertically into housing*
 - *Installation position of mount in housing is incorrect Pay attention to installation dimension of mount to housing*
2. Press rubber mounting flush **-direction of arrow-** into housing.

Subsequent work

Touching up, rubber mounting on rear final drive

1. Install rear final drive. → 390119 Removing and installing rear final drive - "Installing" section [9PAAD1 9PAAD7]→ 390119 Removing and installing rear final drive - "Installing" section [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
- Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

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- If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
- Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 65 19 Removing and installing transfer box - as of MY 2003

- Preliminary work for transfer box
- Removing transfer box
- Installing transfer box
- Subsequent work for transfer box

Preliminary work for transfer box

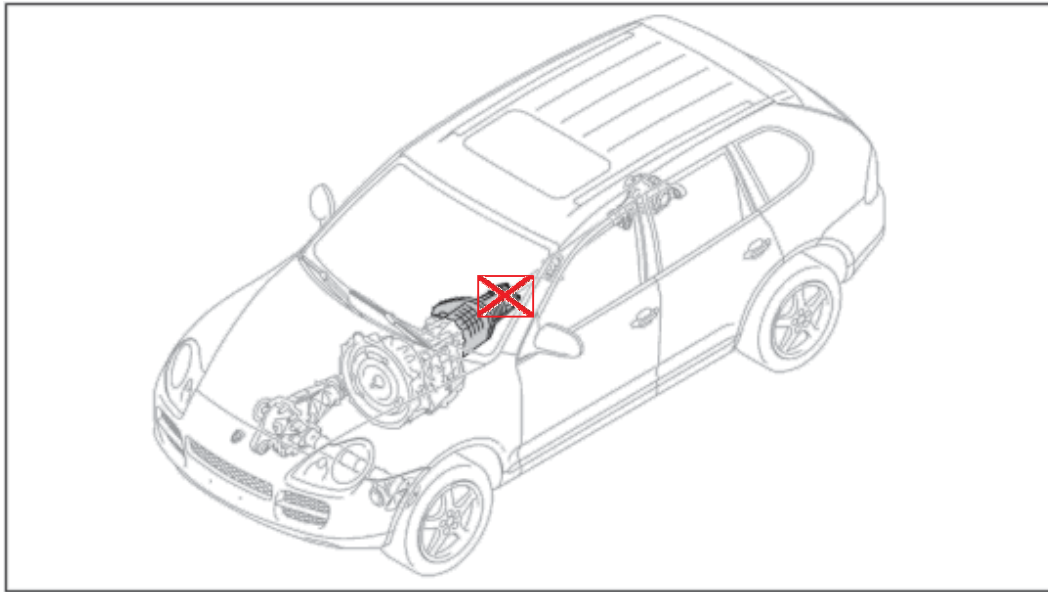
Preliminary work transfer box

1. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"

Removing transfer box

Removing transfer box

Installation Location:



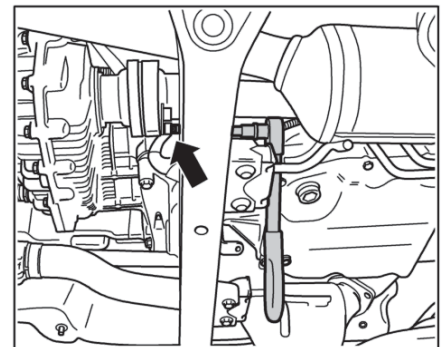
Overview of removing and installing transfer box



Note

- To unscrew the cardan shaft bolts, a second fitter should sit in the vehicle and block the drive train by actuating the foot brake.

1. Remove front cardan shaft on the transfer box and tie it up.



Front cardan shaft to transfer box

2. Remove cable plug on the servo motor **-1** , **2-** and release cable holder.

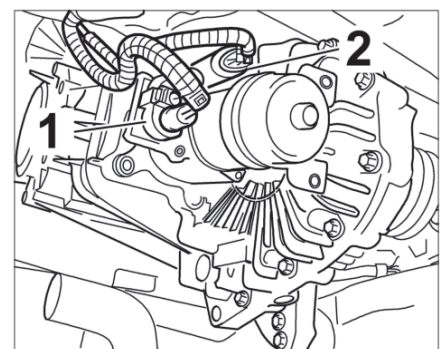


Note

Always observe the exact work sequence when installing/removing the transmission cross member.

3. Remove transmission cross member.

4. Support transmission with transmission jack and secure with retaining band.

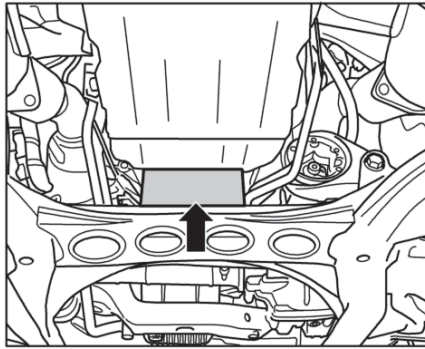


Cable plug on servo motor

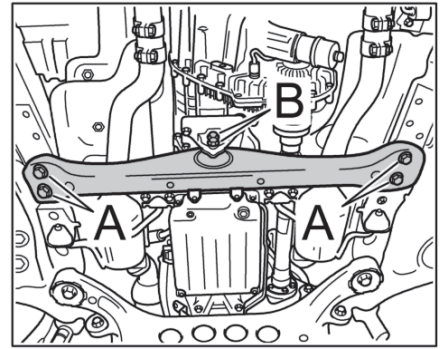
5. Unscrew bolts on body **-A-** .

6. Unscrew two transmission cross member screws **-B-** on transfer box holder.

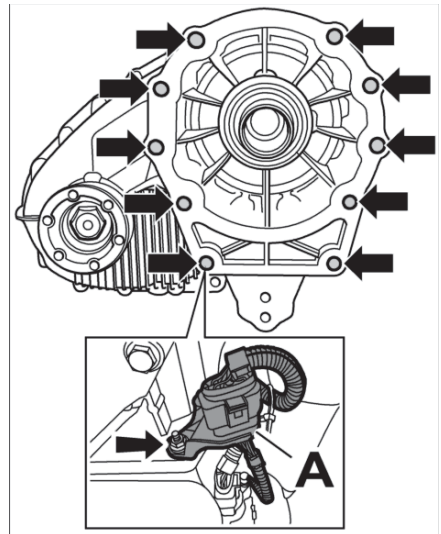
7. Place a wooden block **-arrow-** between the converter bell housing and suspension subframe.



Supporting transmission

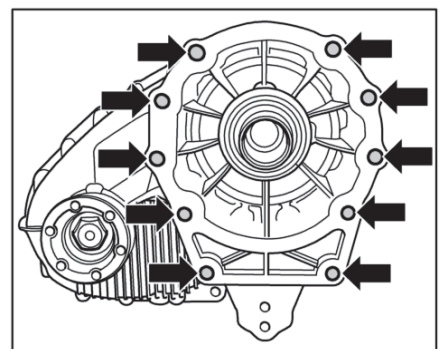


Transmission cross member



Tiptronic line holder

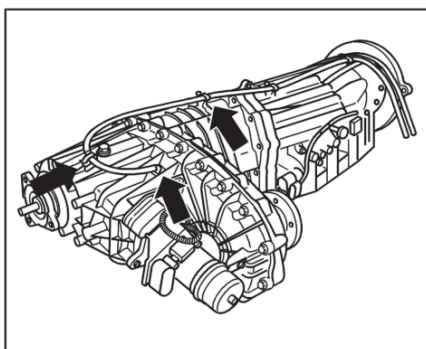
8. Unscrew fastening nut and push holder with Tiptronic line **-A-** away to the side.
9. Unscrew fastening screws **-arrows-** securing transfer box to main transmission.



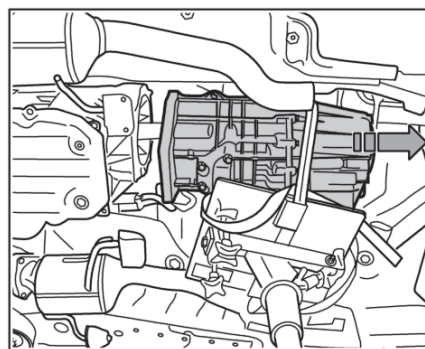
Transfer box to main transmission

10. Separate transfer box from main transmission.
11. Gradually drain transfer box. Pull out vent line **-arrows-** and remove it from the retainers on the upper side.

Installing transfer box



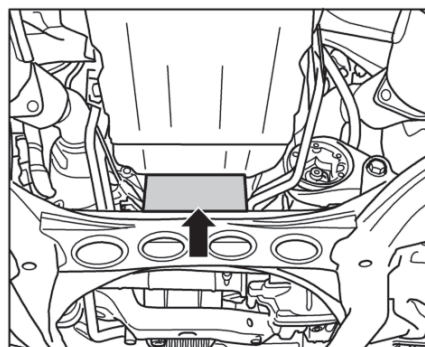
Vent line support



Removing transfer box

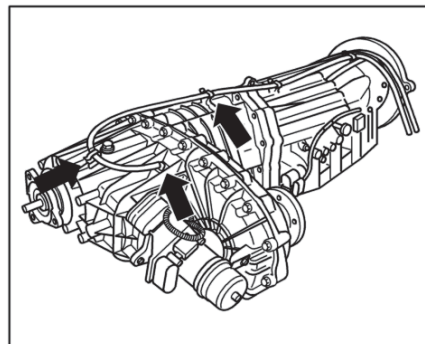
Installing transfer box

1. Support main transmission on converter bell housing with a wooden block **-arrow-** .



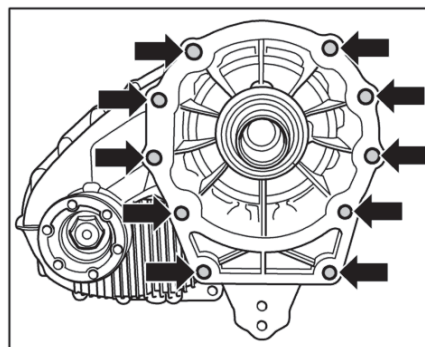
Supporting transmission

2. Gradually run in transfer box. Press vent line into holder **-arrow-** and attach to transfer box.



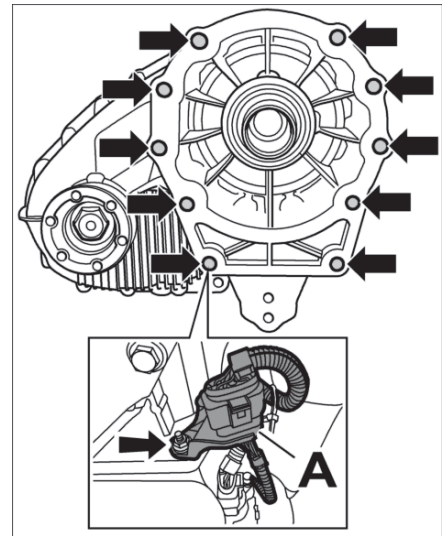
Vent line support

3. Screw in fastening screws on main transmission. → **Tightening torque: 33 ftlb.**



Transfer box to main transmission

4. Tighten holder **-A-** for Tiptronic line using fastening nut **-arrow-** . → **Tightening torque: 7.5 ftlb.**



Transfer box

5. Support transfer box with transmission jack and remove wooden block between converter bell housing and suspension subframe.



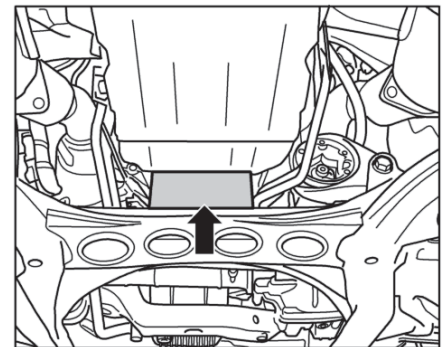
Note

Always observe the exact work sequence when installing/removing the transmission cross member.



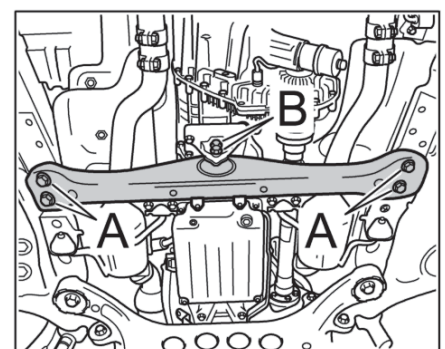
Note

- Screws which are tightened with a torque angle must be replaced with new ones.



Supporting transmission

6. Install transmission cross member.
7. Screw in two cross member screws -B- on transfer box holder. → **Initial tightening: 37 ftlb. → Final tightening: 90 °**
8. Screw in fastening screws for securing transmission cross member to body -A- . → **Initial tightening: 37 ftlb. → Final tightening: 90 °**



Transmission cross member

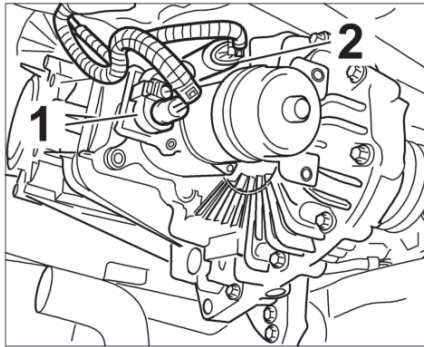


Note

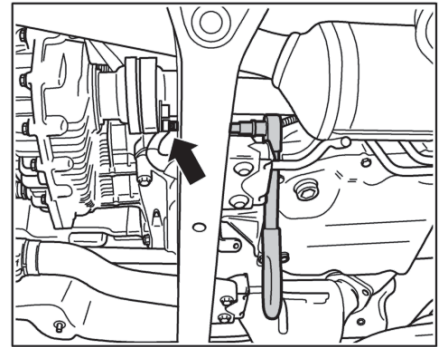
- Screws which are tightened with a torque angle must be replaced with new ones.

9. Connect front cardan shaft to transfer box. → **Initial tightening: 22 ftlb. → Final tightening: 90 °**

10. Connect cable plugs **-1 , 2-** to the transfer box and secure the cable holder.



Cable plug on servo motor



Front cardan shaft to transfer box

Subsequent work for transfer box

Reworking transfer box

1. Install cardan shaft. → 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAE1 9PAAE7 9PAAF1]→ 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAD1] → 393519 23 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAJ1]→ 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAD7]
2. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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AVERTISSEMENT

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ATTENZIONE

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ADVERTENCIA

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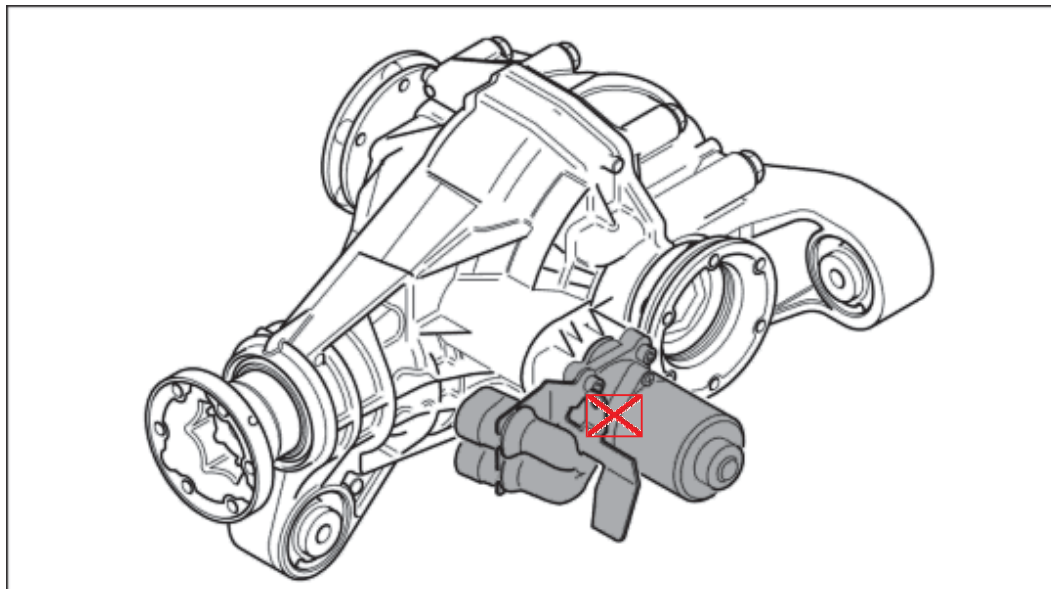
39 77 19 Removing and installing transverse lock servo motor - as of MY 2003

- [Removing transverse lock servo motor](#)
- [Installing transverse lock servo motor](#)
- [Subsequent work](#)

Removing transverse lock servo motor

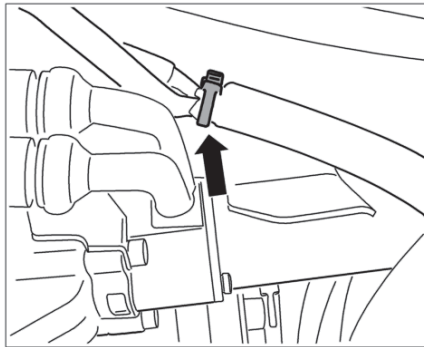
Removing transverse lock servo motor

Installation Location:

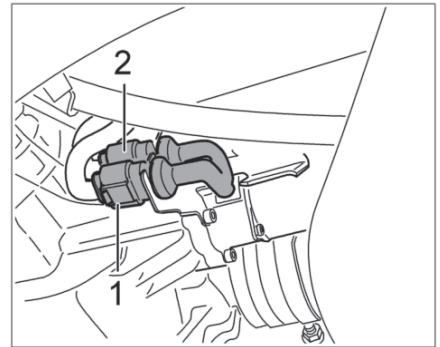


Overview of transverse lock servo motor

1. Pull cable plug -1, 2- off the servo motor.



Cable lead fastening



Electric plug on servo motor

2. Pull off fastening element **-arrow-** for cable lead and place lead aside.
3. Unscrew four fastening screws **-arrows-** on the servo motor.



ATTENTION

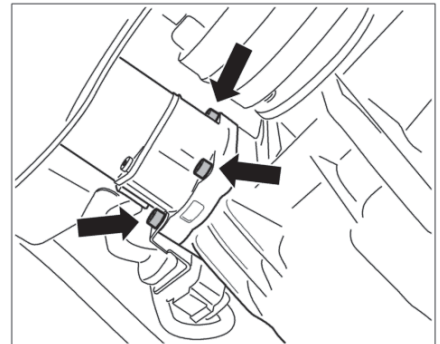
Emerging oil is harmful to the eyes.

→ Wear personal protective gear (e.g. safety goggles).



Note

- Avoid minor oil leaks when removing the servo motor.



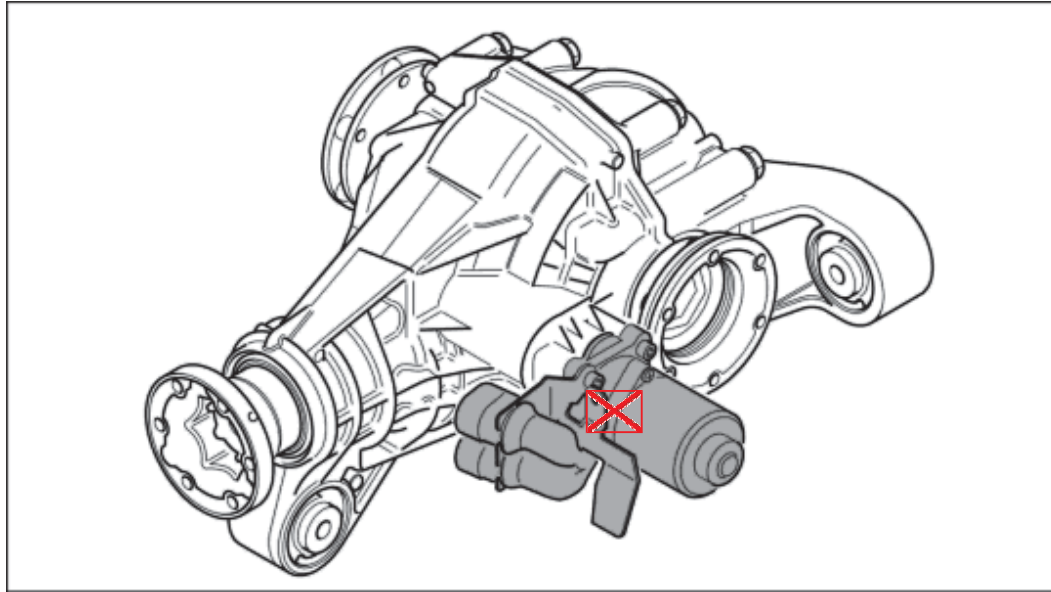
Servo motor fastening

4. Place oil collection container underneath.

Installing transverse lock servo motor

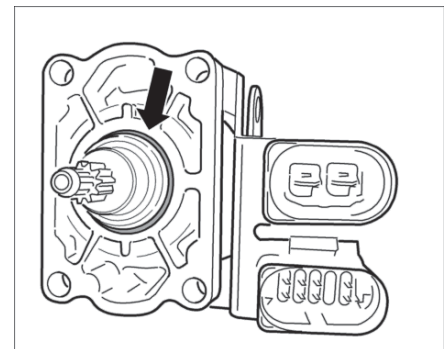
Installing transverse lock servo motor

Installation Location:



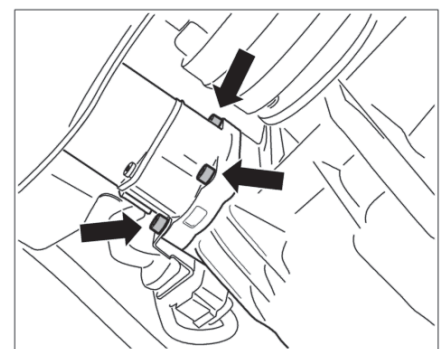
Overview of transverse lock servo motor

1. Replace sealing ring **-arrow-** on servo motor.
2. Install servo motor.



Sealing ring on servo motor

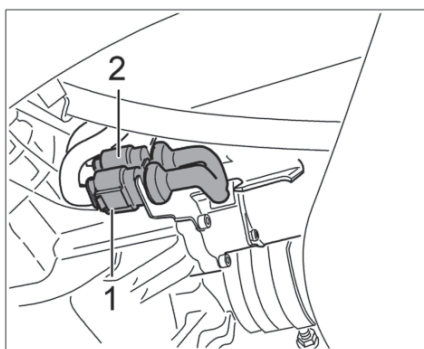
3. Screw in four screws **-arrows-** on servo motor. → **Tightening torque: 7.5 ftlb.**



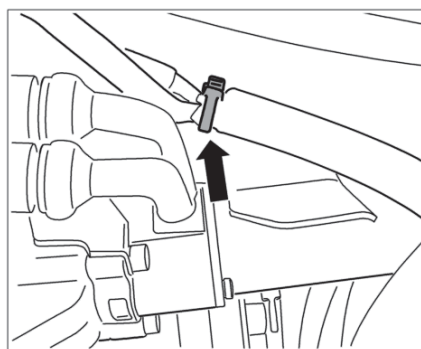
Servo motor fastening

4. Install fastening element **-arrow-** for cable lead.
5. Connect cable plug **-1, 2-** to servo motor.

Subsequent work



Electric plug on servo motor



Cable lead fastening

Subsequent work for servo motor for differential lock

1. Check the oil in the final drive. → 399035 Checking and topping up oil for rear final drive

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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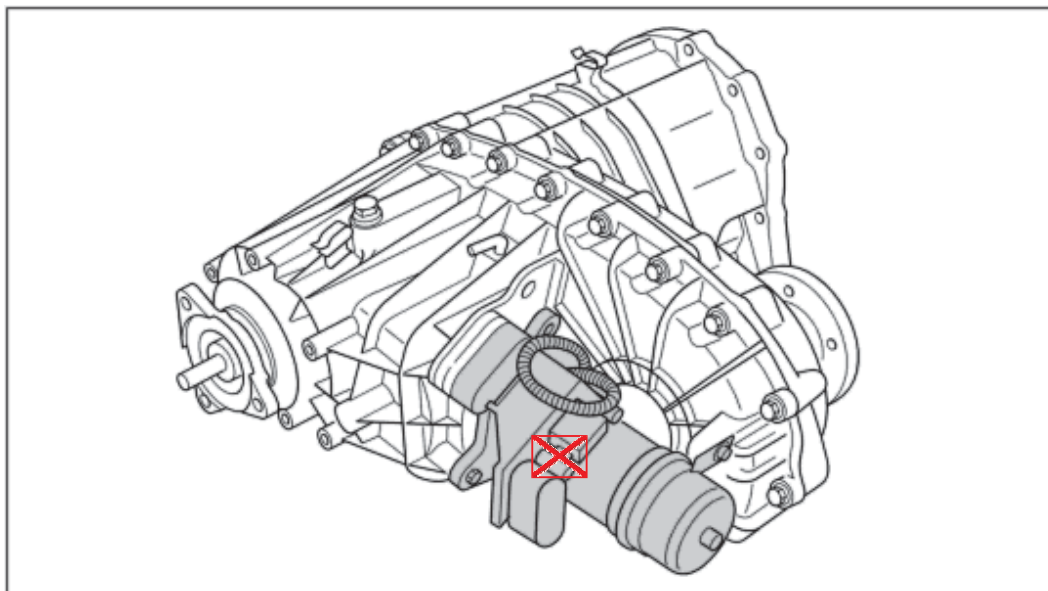
39 78 19 Removing and installing servo motor on transfer box - as of MY 2003

- [Removing servo motor on transfer box](#)
- [Installing servo motor on transfer box](#)

Removing servo motor on transfer box

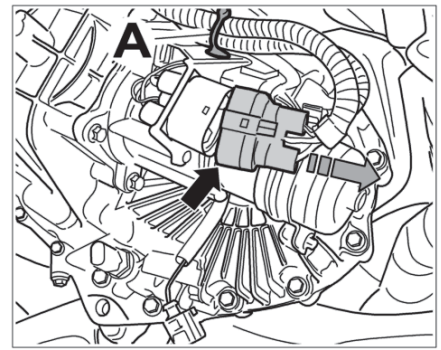
Removing servo motor on transfer box

Installation Location:



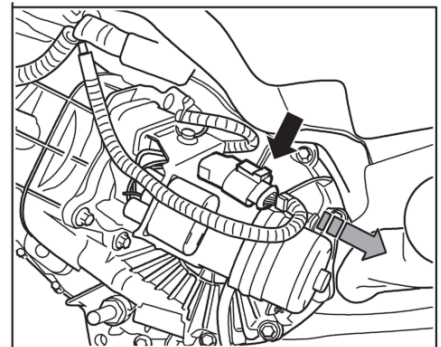
Overview of servo motor

1. Before beginning to work on the servo motor for the transfer box, engage the Low Range offroad driving program.
2. Disconnect Low Range cable plug **-arrow-** on the servo motor and loosen cable holder **-A-**.



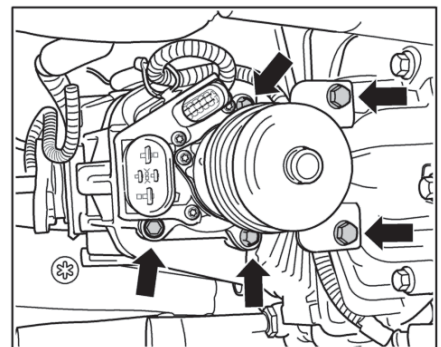
Low Range cable plug

3. Pull centre-differential lock cable plug **-arrow-** off the servo motor.



Centre-differential lock cable plug

4. Unscrew servo motor threaded joint on the transfer box.

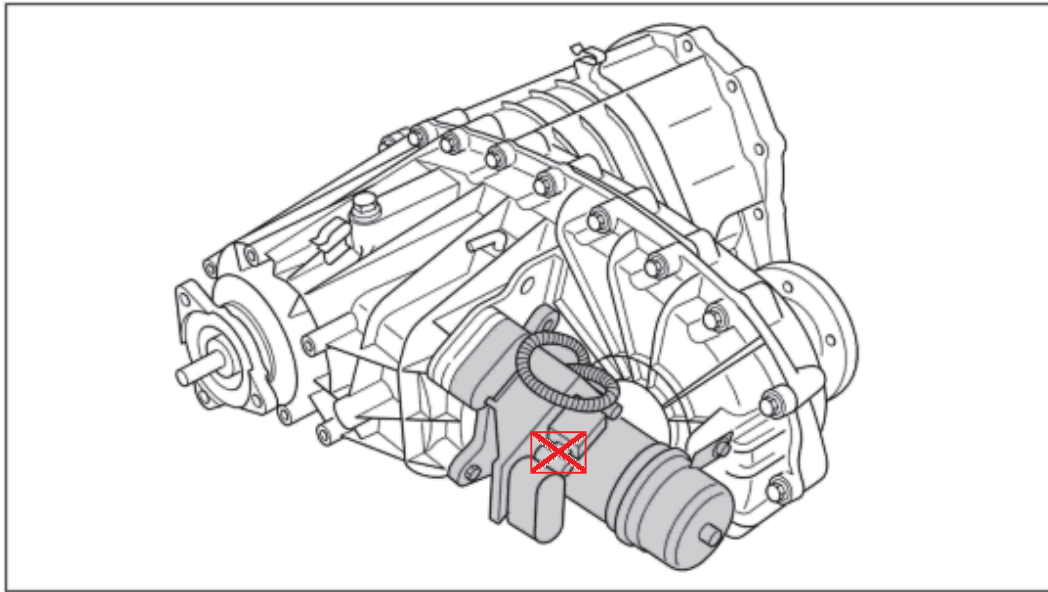


Threaded joint for servo motor

Installing servo motor on transfer box

Installing servo motor on transfer box

Installation Location:

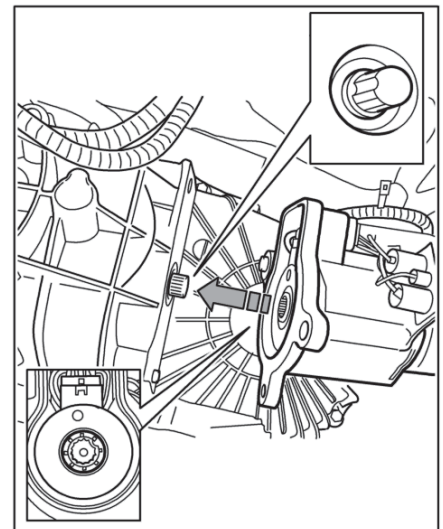


Overview of servo motor



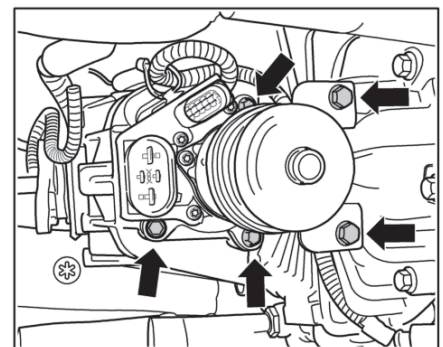
Note

- If a new servo motor is installed, it is supplied in Low Range position, offroad driving program.
1. Connect servo motor to the shaft on the transfer box. Position cutout of the shaft **-right inset-** to the servo motor **-left inset-**.
 2. Screw in servo motor threaded joint **-arrows-** on the transfer box. → **Tightening torque: 20 ftlb.**



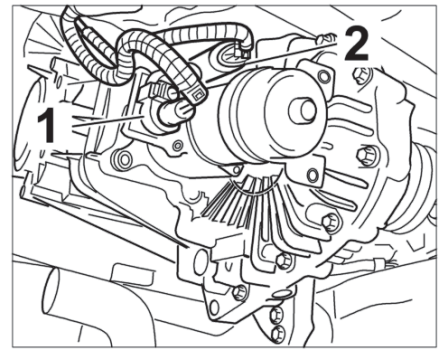
Positioning the servo motor

3. Screw in servo motor threaded joint support **-arrows-** on the transfer box. → **Tightening torque: 7.5 ftlb.**



Threaded joint for servo motor

4. Connect centre-differential lock cable plug **-2-**, Low Range **-1-** and secure cable holder.



Cable plug for servo motor

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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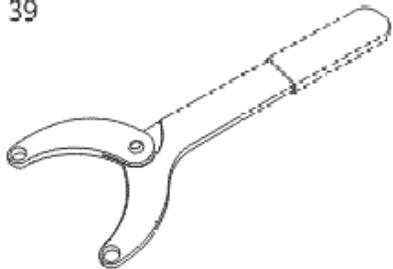
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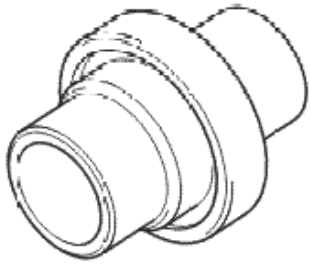
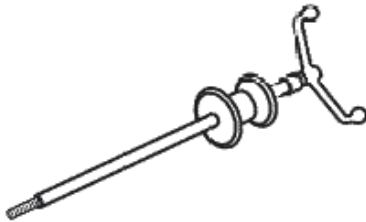
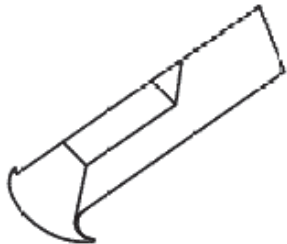
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39 82 19 Removing and installing sealing ring for cardan flange (rear final drive) - as of MY 2003

- Preliminary work for sealing ring for cardan flange
- Removing sealing ring for cardan flange
- Installing sealing ring for cardan flange
- Subsequent work for sealing ring for cardan flange

Tools

Designation	Type	Number	Explanation	
shop made tool	special tool	00000		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
arm bracket	special tool	3435		39  3435
torque screwdriver for measuring friction moment	commercially available tool	NR.89		

				PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Véase Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
pressure piece	special tool	T10182		39  T10182
striker	workshop equipment	VW 771/1		34, 40  VW 771/1
extraction tool	workshop equipment	VW 771/37		39  VW 771/37

Preliminary work for sealing ring for cardan flange

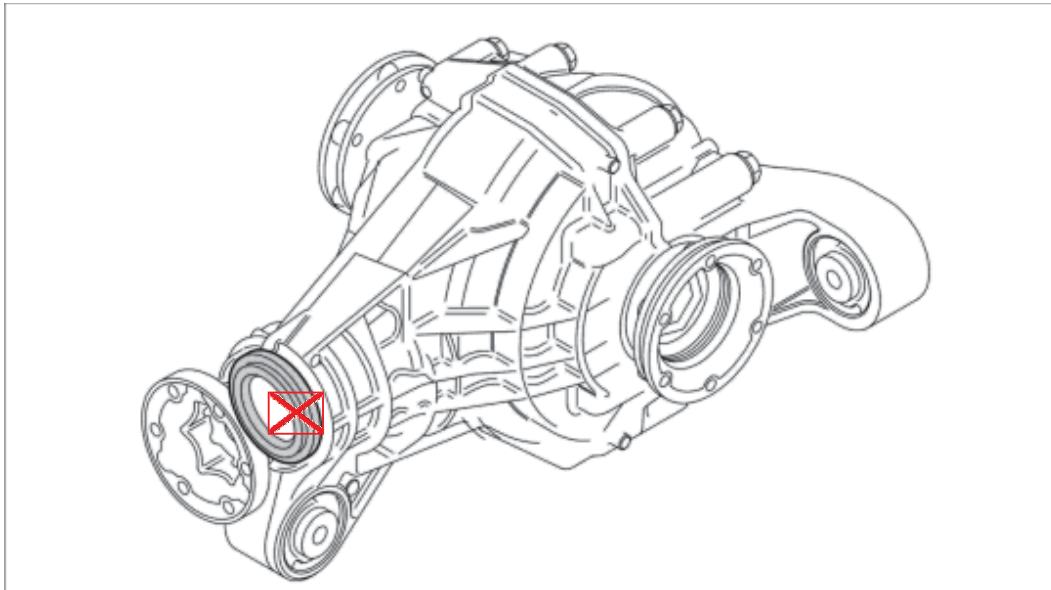
Preliminary work for sealing ring for cardan flange

1. Remove rear cardan shaft. → 390119 Removing and installing rear final drive - chapter on "Removing" [9PAAD1 9PAAD7] → 390119 Removing and installing rear final drive - chapter on "Removing" [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]

Removing sealing ring for cardan flange

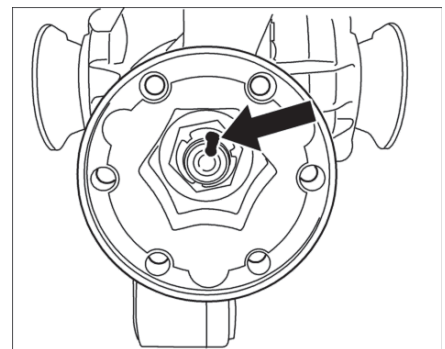
Removing sealing ring for cardan flange

Installation Location:



Overview of cardan flange sealing ring

1. Mark position of nut on drive flange **-arrow-** at shaft.



Marking of nut on drive flange

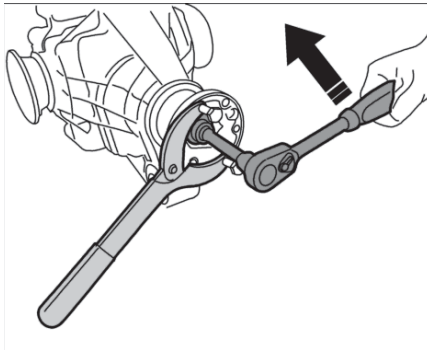
2. Check rolling moment of rear final drive with special tool **torque screwdriver for measuring friction moment NR.89** **-picture-** and note value.



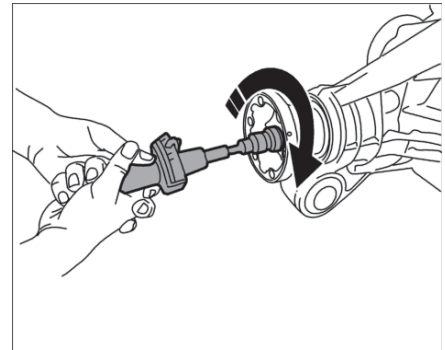
Note

- A second fitter is required for loosening/tightening the flange

3. Unscrew nut on drive flange.
To do this, block flange with
special tool **arm bracket**
3435.

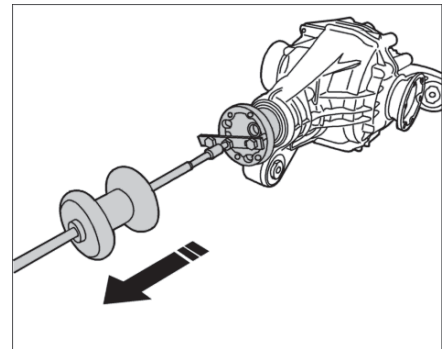


Loosening nut on drive flange

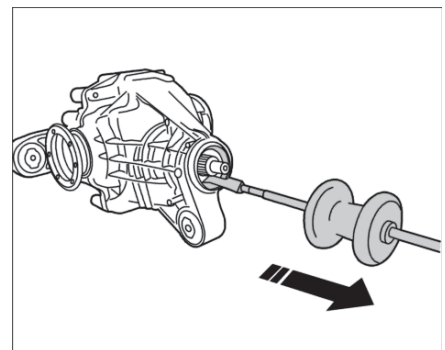


Checking rolling moment

4. Remove drive flange with special tool **shop made tool 00000** and
striker VW 771/1.



Removing drive flange

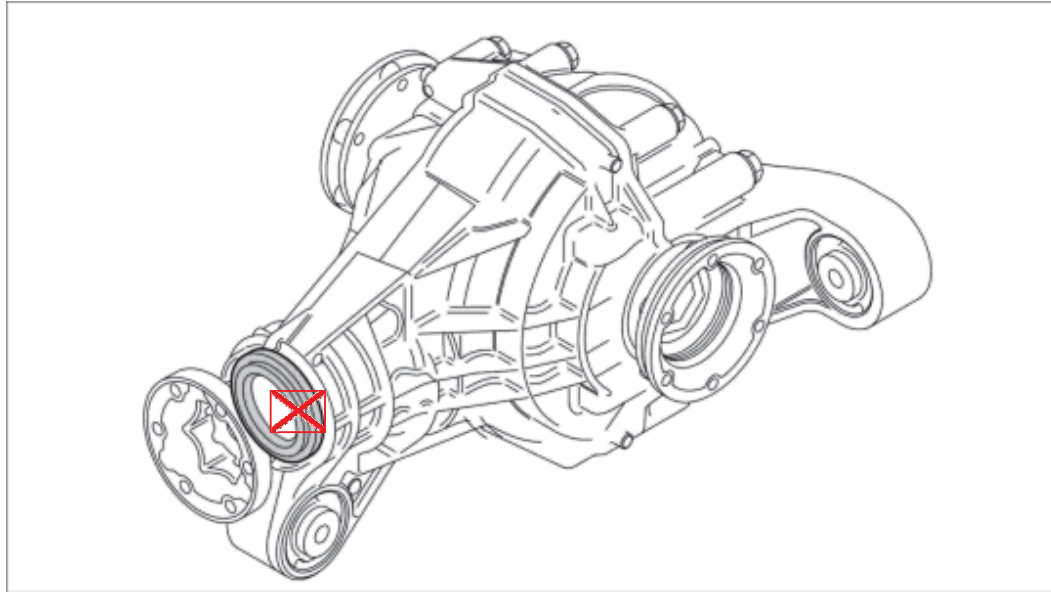


Removing sealing ring

Installing sealing ring for cardan flange

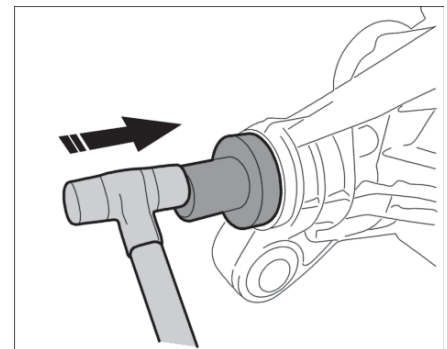
Installing sealing ring for cardan flange

Installation Location:



Overview of cardan flange sealing ring

1. Drive in sealing ring with special tool **pressure piece T10182** **-picture-** until special tool touches transmission housing.
2. Push in flange and screw in nut.

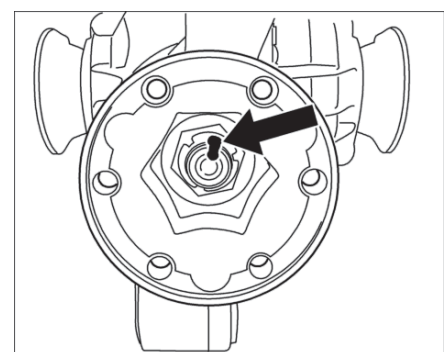


Installing sealing ring



Note

- A second fitter is required for loosening/tightening the flange
3. Position marking on nut and drive shaft **-arrow-** again so that the rolling moment determined prior to removal is reached once again.

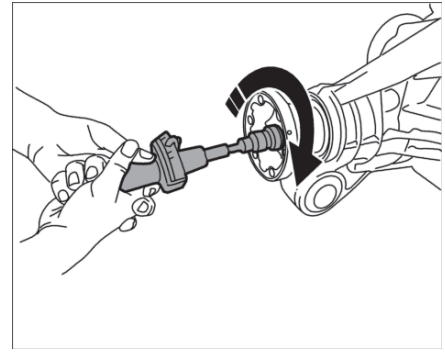


Marking nut on drive flange



Note

- If the rolling moment has to be corrected, this should be done via the tightening torque of the nut.
4. Check rolling moment with special tool **torque screwdriver for measuring friction moment NR.89**. → **Rolling moment: 2.0 ftlb. -0.2 ftlb. +0.2 ftlb.**



Checking rolling moment

Subsequent work for sealing ring for cardan flange

Touching up sealing ring for cardan flange

1. Install rear cardan shaft. → 390119 Removing and installing rear final drive - chapter on "Installing" [9PAAD1 9PAAD7] → 390119 Removing and installing rear final drive - chapter on "Installing" [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]
2. Check the oil in the final drive. → 399035 Inspecting and adding oil for rear final drive - chapter on "Checking"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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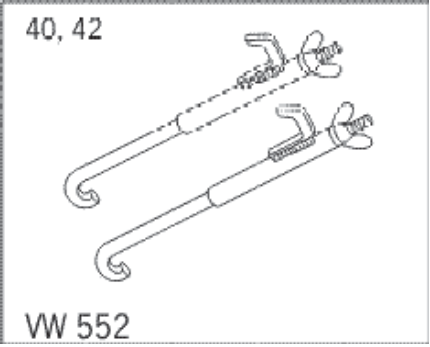
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39 88 19 Removing and installing four-wheel final drive - as of MY 2003

- Preliminary work for all-wheel final drive
- Removing four-wheel final drive
- Installing four-wheel final drive
- Subsequent work for four-wheel final drive

Tools

Designation	Type	Number	Explanation	
multiple-tooth socket wrench insert M12	commercially available tool	NR.31		
spring compressor	workshop equipment	VW 552		

Preliminary work for all-wheel final drive

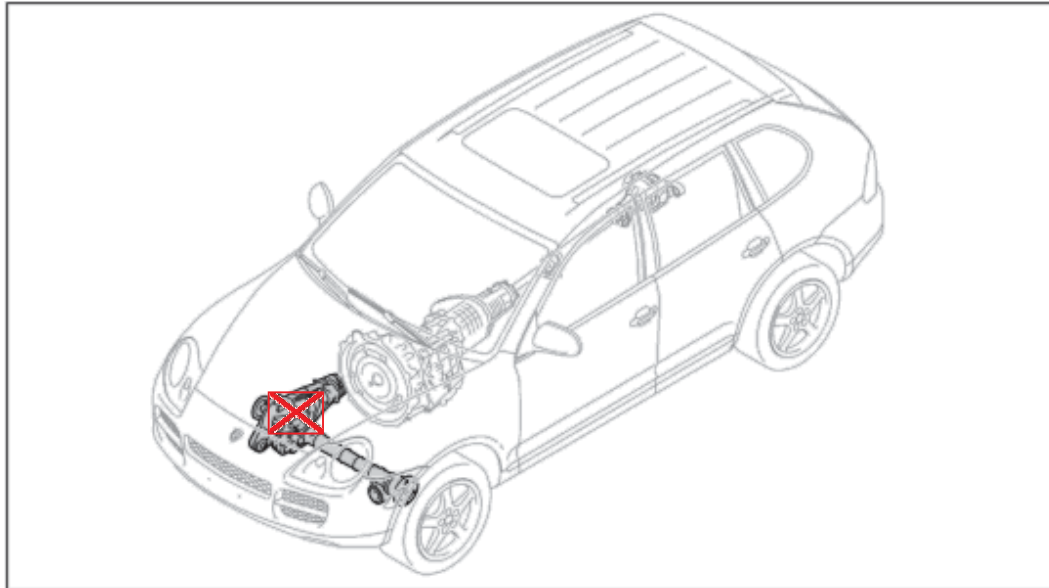
Preliminary work final four wheel drive

1. Remove right engine compartment cover → 700219 Remove and install front cover (engine compartment) - Chapter "Removing".
2. Support engine. → Support engine on the body [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]→ *Support engine on the body [9PAAD1 9PAAD7]* or → Supporting engine on the body [9PAAD1 9PAAD7]→ *Supporting engine on the body [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]*
3. Remove front wheels. → 440519 Remove and install wheel - Chapter "Removing"
4. Remove engine guard → 108019 Removing and installing engine guard - Chapter "Removing".
5. Remove front cardan shaft → 390219 Install and remove front cardan shaft - Chapter "Removing" [9PAAE1 9PAAF1 9PAAJ1]→ 390219 Install and remove front cardan shaft - Chapter "Removing" [9PAAD1 9PAAD7 9PAAE7].

Removing four-wheel final drive

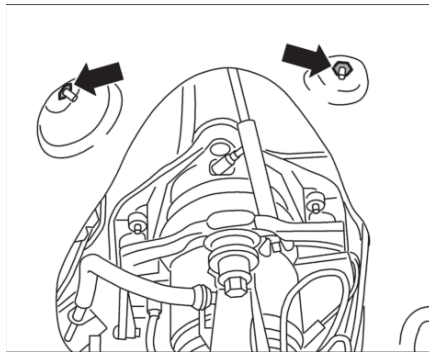
Removing four-wheel final drive

Installation Location:

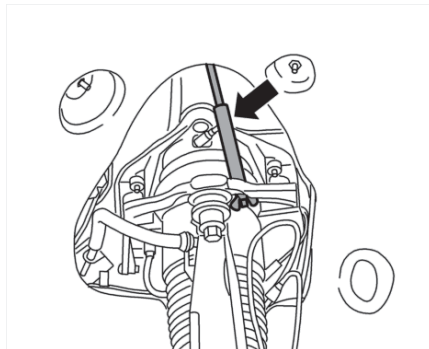


Overview of front-wheel drive

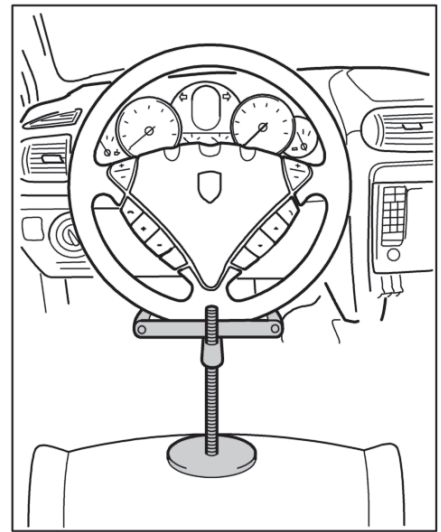
1. Clamp steering wheel in centre position with steering wheel holder **-figure-** .
2. Unscrew plastic nuts **-arrows-** on front right wheel housing liner.
3. Engage special tool **spring compressor VW 552** in top of wheel housing, behind wheel housing liner, and support the spring strut.



Wheel housing liner mount

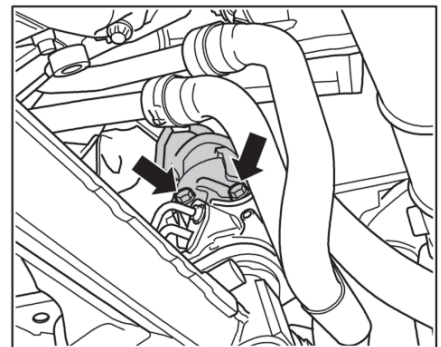


Installation position of spring compressor



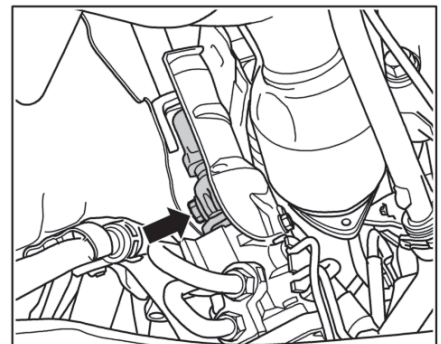
Steering wheel holder

4. Remove cover plate on the steering **-arrows-** .
5. Pull Servotronic plug off the steering gear.



Cover plate on steering

6. Unscrew bolted connection **-arrow-** securing universal joint to steering gear. Remove universal joint from steering gear.
7. Remove left and right drive shafts from four-wheel final drive using **multiple-tooth socket wrench insert M12 NR.31**.



Universal joint bolted connection

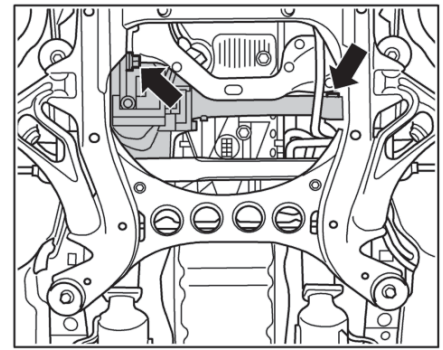
8. Undo fastening screws for four-wheel final drive and screw on drive flange.



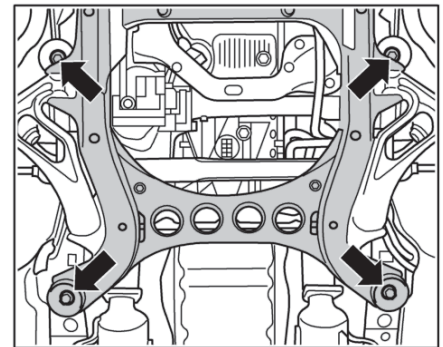
Note

- Supports 1, 2 and 3 must be fitted to the unit lifting platform.

9. Raise unit lifting platform until it bears against the front-axle carrier.



VAG bolts



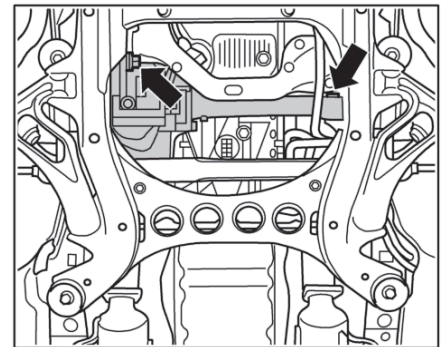
Bolts on front-axle carrier



Note

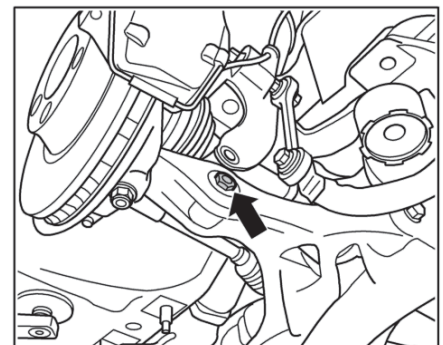
- Fastening screw **-left arrow-** at front right cannot be removed until the front-axle carrier is lowered.

10. Unscrew bolts **-arrows-** on front-axle carrier.



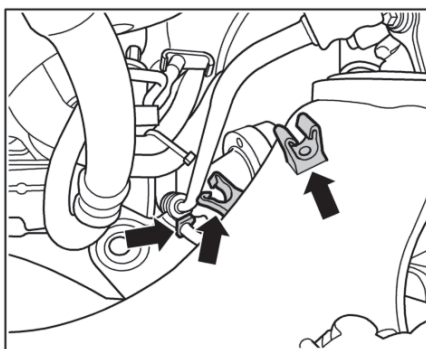
VAG bolts

11. Undo bolt connecting spring strut to trailing arm **-arrow-** .

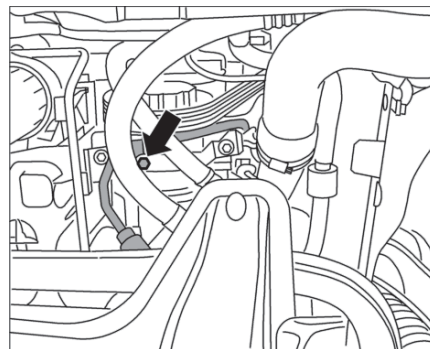


Bolt connecting spring strut to trailing arm

12. Unscrew servo line holders **-arrow-** from air-conditioning compressor and remove the line.



Servo line holders



Servo line holders

13. Disengage servo line from the front-axle carrier at the three holders **-arrows-** .

14. Loosen holders for coolant pipes **-arrow-** at the body.

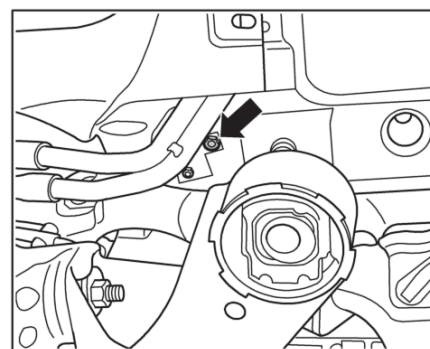


ATTENTION

Over-extension of drive shafts on running gear!

→ Do not pull front-axle carrier downwards.

15. Lower front-axle carrier with the unit lifting platform. Remove vent line from the final drive at the same time.



Coolant pipe holders



ATTENTION

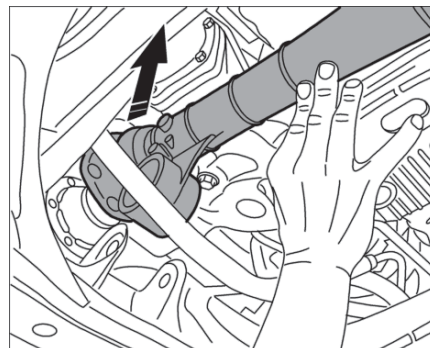
Risk of damage to ATF lines and pressure line for power steering.

- Protect ATF lines with water hose or similar.
- The servo line must not be crushed or stretched.



Note

- A second fitter is required for removing/installing the four-wheel final drive.



Pressing out drive shaft

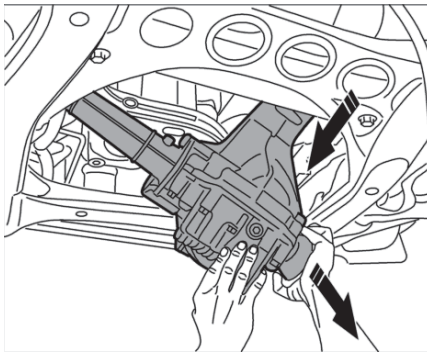
16. Press left drive shaft out of flange on final drive.

17. Lift transmission and press to the left.

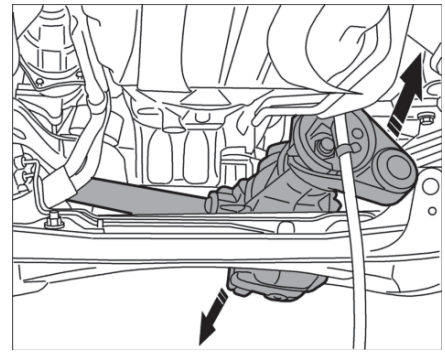
18. Tilt forward the transmission housing together with drive flange.

19. Remove four-wheel final drive downwards through the front-axle carrier.

Installing four-wheel final drive



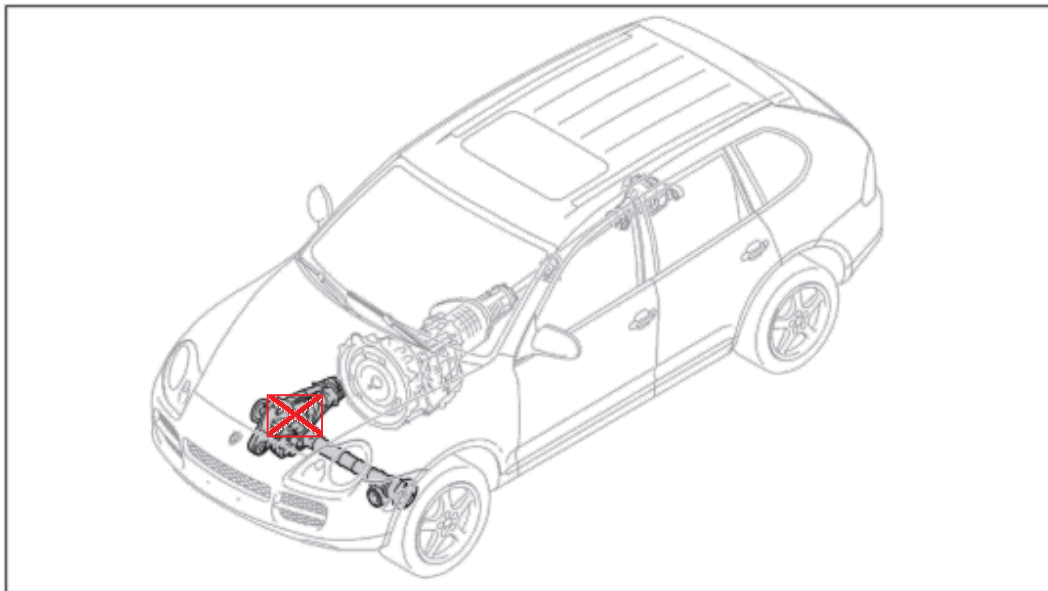
Removing four-wheel final drive



Movement sequence for four-wheel final drive

Installing the four-wheel final drive

Installation Location:



Overview of front-wheel drive



ATTENTION

Risk of damage to ATF lines and pressure line for power steering.

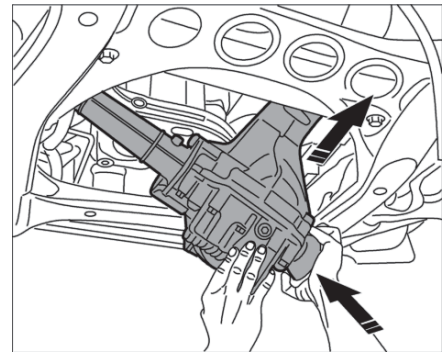
- Protect ATF lines with water hose or similar.
- The servo line must not be crushed or stretched.



Note

- A second fitter is required for removing/installing the four-wheel final drive.

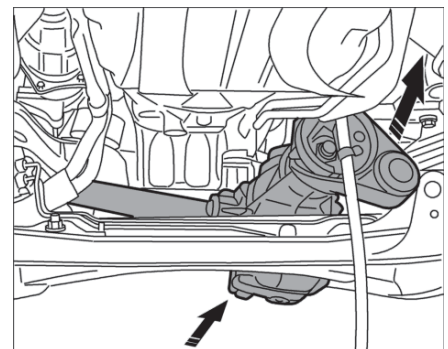
1. Swivel left flange of final drive in over the front-axle carrier.



Installing four-wheel final drive

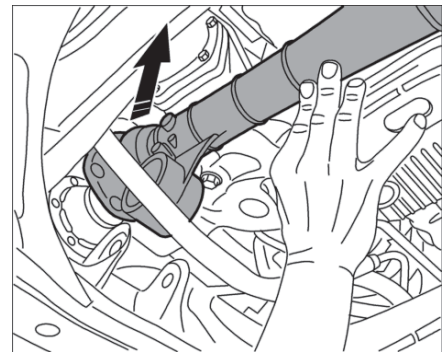
2. Rotate drive flange upwards and install final drive through the front-axle carrier.

3. Insert right drive shaft into output flange and place final drive into the mounts on the front-axle carrier.

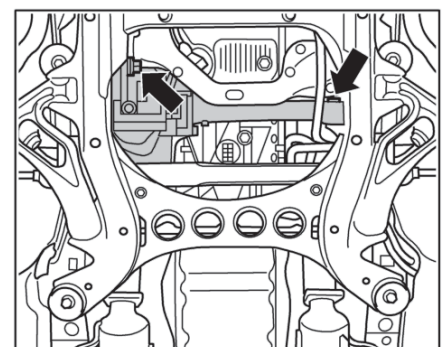


Movement sequence for installing four-wheel final drive

4. Fit left drive shaft by lifting the final drive output flange.



Fitting left drive shaft



VAG bolts



Note

- The front right fastening screw for the four-wheel final drive **-left arrow-** can only be screwed in with the front-axle carrier lowered.

5. Insert fastening screws **-arrows-** for four-wheel final drive and screw for drive flange.



Note

- Supports 1, 2 and 3 must be fitted to the unit lifting platform.

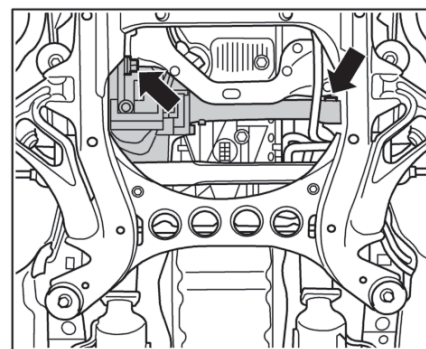
6. Raise front-axle carrier with unit lifting platform until it bears against the body. Position vent line at the same time.



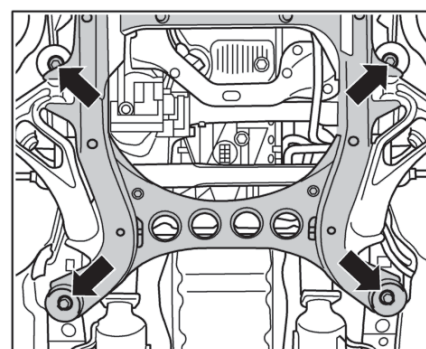
Note

- For details of tightening torques for running gear parts, see Group 4 (Running gear) → 40 Tightening torques for front axle.

7. Screw in bolts **-arrows-** on front-axle carrier.

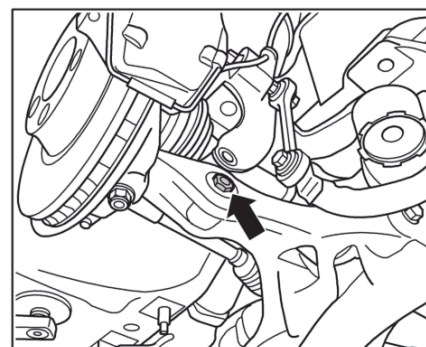


VAG bolts



Bolts on front-axle carrier

8. Screw in bolt **-arrow-** connecting spring strut to trailing arm.



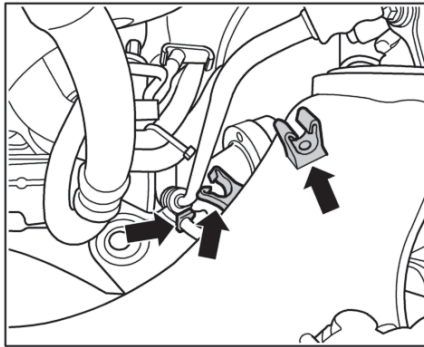
Bolt connecting spring strut to trailing arm

9. Fit holders **-arrow-** for coolant pipes to the body.
10. Engage servo line in the three holders **-arrows-** on the front-axle carrier.
11. Screw servo line holders **-arrow-** on to air-conditioning compressor and clip in the line.

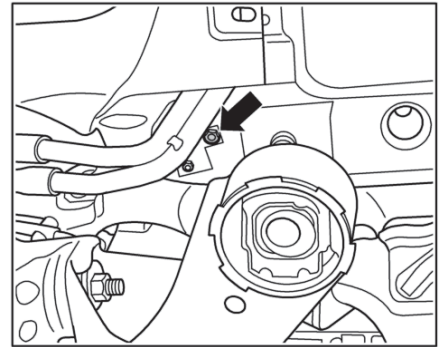


Note

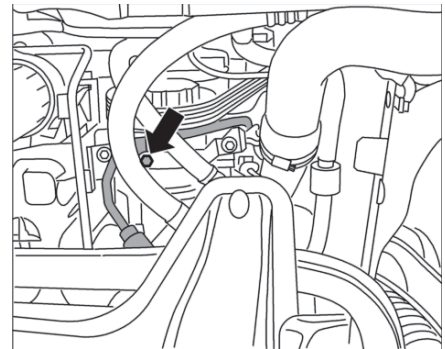
- Screws which are tightened with a torque angle must be replaced with new ones.



Servo line holders



Coolant pipe holders



Holder on air-conditioning compressor

12. Tighten fastening screw for four-wheel final drive. → **Initial tightening: 67 ftlb.** → **Final tightening: 90 °**

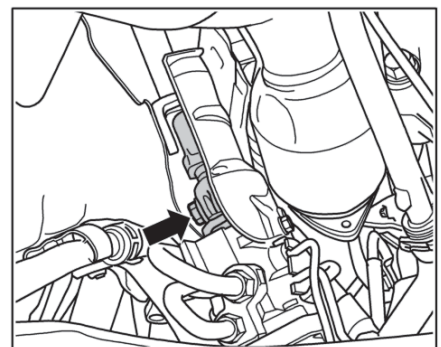


Note

- For details of tightening torques for running gear parts, see Group 4 (Running gear) → 40 Tightening torques for front axle.

13. Screw in drive shaft screws.

14. Connect steering column to steering gear. Screw in new screw.

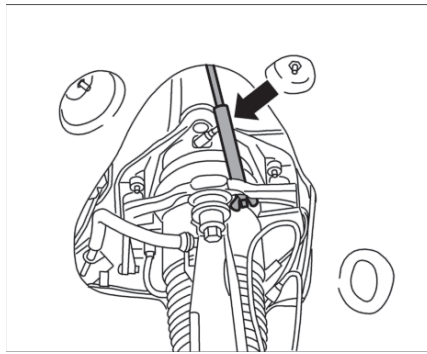


Steering column mounting

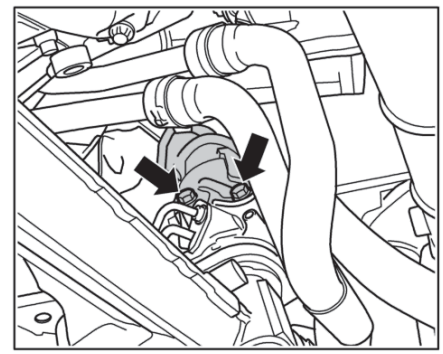
15. Install cover plate on the steering.

16. Connect Servotronic plug to the steering gear.

17. Remove special tool **spring compressor VW 552** from spring strut.

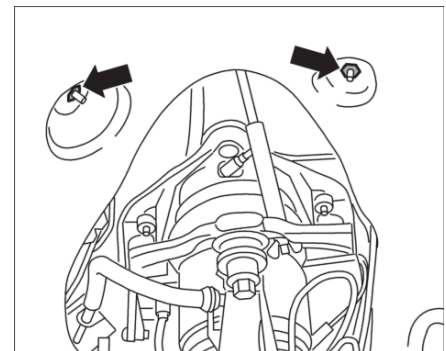


Installation position of spring compressor



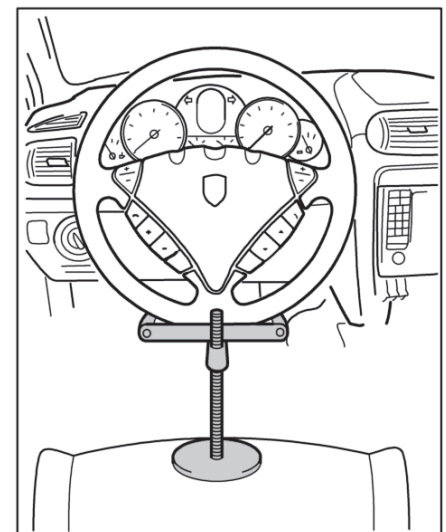
Cover plate on steering

18. Screw in plastic nuts **-arrows-** on front right wheel housing liner.



Wheel housing liner mount

19. Remove steering-wheel holder **-figure-** .



Steering wheel holder

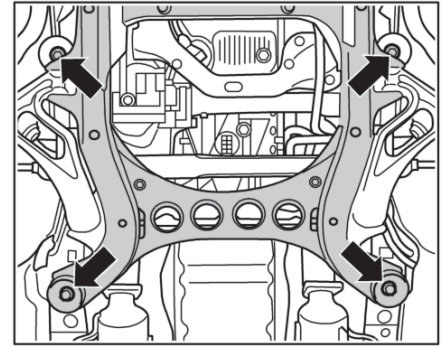


Note

- For details of tightening torques for running gear parts, see Group 4 (Running gear) → 40 Tightening torques for front axle.

20. Tighten bolts **-arrows-** on front-axle carrier.

Subsequent work for four-wheel final drive



Bolts on front-axle carrier

Subsequent work - final four wheel drive

1. Install front cardan shaft → 390219 Install and remove front cardan shaft - Chapter "Installing" [9PAAE1 9PAAF1 9PAAJ1] → 390219 Install and remove front cardan shaft - Chapter "Installing" [9PAAD1 9PAAD7 9PAAE7].
2. Remove engine support. → Support engine on the body [9PAAE1 9PAAE7 9PAAF1 9PAAJ1] → *Support engine on the body [9PAAD1 9PAAD7]* or → Supporting engine on the body [9PAAD1 9PAAD7] → *Supporting engine on the body [9PAAE1 9PAAE7 9PAAF1 9PAAJ1]*
3. Install right engine compartment cover → 700219 Remove and install front cover (engine compartment) - Chapter "Installing".
4. Mount front wheels. → 440519 Remove and install wheel - Chapter "Installing"
5. Calibrate steering angle sensor → 456005 Initialise and calibrate steering angle sensor
6. Align front axle and adjust as required. → Suspension alignment complete
7. Install engine guard → 108019 Install and remove engine guard - Chapter "Installing".

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

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ATTENZIONE

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ADVERTENCIA

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39 90 35 Checking and topping up oil for transfer box - as of MY 2003

- [Checking oil for transfer box](#)
- [Topping up oil for transfer box](#)

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	NR.161		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Checking oil for transfer box



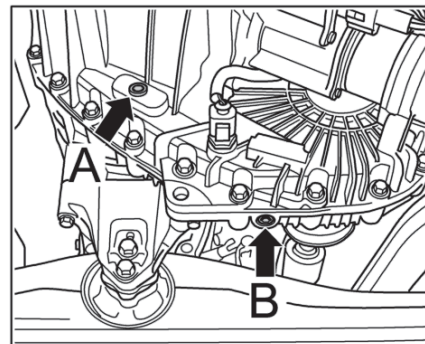
WARNING

Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)



Note



- The vehicle must stand horizontally.

Inspection/drain plug



Note

The oil level can only be checked after the vehicle has been idle for 45 minutes.

The engine must not be started during this time.

1. Unscrew oil inspection plug **-A-** .
2. The oil level is correct if the oil reaches the lower edge of the inspection window.



Note

Use only oil approved by Porsche.

3. If this is not the case, top up the oil. → 399035 Inspecting and adding oil for transfer box - chapter on "Filling"
4. Screw in oil inspection plug **-A-** with new sealing ring. → **Tightening torque: 15 ftlb.**

Topping up oil for transfer box

Filling oil for transfer box



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Note

The oil level can only be checked after the vehicle has been idle for 45 minutes.

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Note

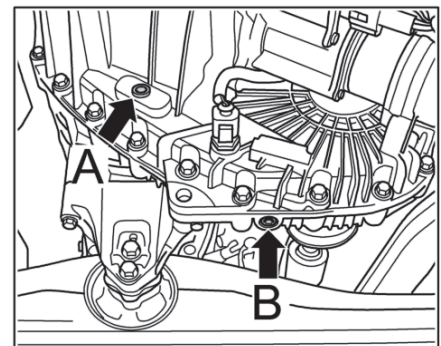
- The vehicle must stand horizontally!

1. Unscrew oil inspection plug **-A-** .



Note

Use only oil approved by Porsche.



Inspection/drain plug

2. Fill with oil using the **ATF filling device for filling transmission NR.161** to the lower edge of inspection plug **-A-** . Raise filling device.
 3. Screw in oil inspection plug **-A-** with new sealing ring. → **Tightening torque: 15 ftlb.**
-

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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39 90 35 Checking and topping up oil for rear final drive - as of MY 2003

- [Checking oil for rear final drive](#)
- [Topping up oil for final drive](#)

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	NR.161		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Checking oil for rear final drive

Checking oil for rear final drive



WARNING

Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)



Note

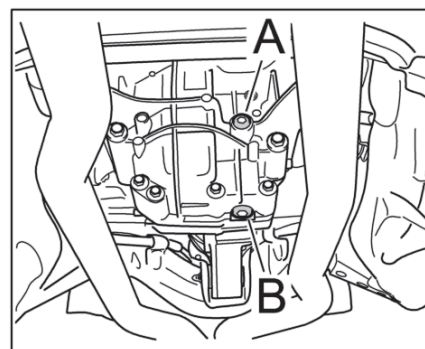
- Vehicle must be horizontal in order to check fluid level in rear final drive.
1. Unscrew oil inspection plug **-A-**.
 2. The oil level is correct if the oil reaches the lower edge of the inspection window.



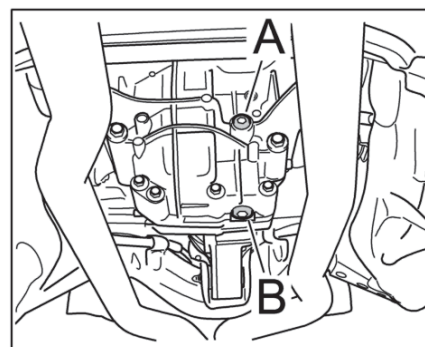
Note

Use only oil approved by Porsche.

3. If this is not the case, top up the oil. → 399035 Inspecting and adding oil for rear final drive - chapter on "Filling"
4. Screw in oil inspection plug **-A-** with new sealing ring. → **Tightening torque: 26 ftlb.**



Control/drain plug for rear final drive



Control/drain plug for rear final drive

Topping up oil for final drive

Topping up oil for final drive



WARNING

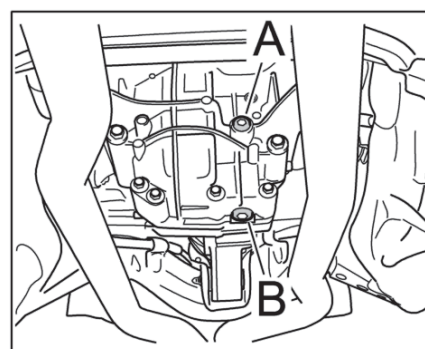
Risk of scalding from hot oil

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- Wear personal protective gear (goggles, gloves)



Note

- Vehicle must be horizontal in order to fill rear final drive.
1. Unscrew oil inspection plug **-A-**.



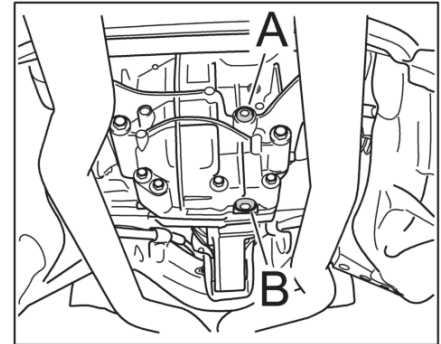
Control/drain plug for rear final drive



Note

Use only oil approved by Porsche.

2. Fill with oil using the **ATF filling device for filling transmission NR.161** to the lower edge of inspection plug **-A-** .
3. Screw in oil inspection plug **-A-** with new sealing ring. → **Tightening torque: 26 ftlb.**



Control/drain plug for rear final drive

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

- **Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.**
- **Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.**

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 90 35 Checking and topping up oil for four-wheel final drive - as of MY 2003

- Preliminary work for oil for four-wheel final drive
- Checking oil for four-wheel final drive
- Topping up oil for four-wheel final drive
- Subsequent work for oil for four-wheel final drive

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	161		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
special inserts mod. AB	commercially available tool	170		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
accessory for the torque wrench: open ring wrench insert a/f 13 + adapter	commercially available tool	98-1		

				PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work for oil for four-wheel final drive

Preliminary work for oil for all-wheel final drive

1. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"

Checking oil for four-wheel final drive

Checking oil for all-wheel final drive



WARNING

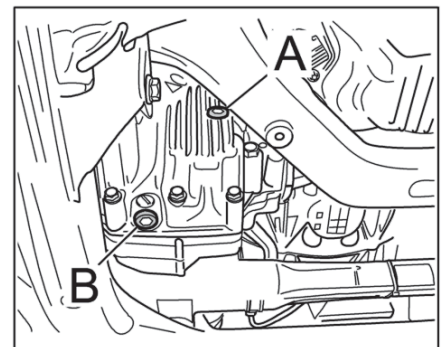
Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)



Note

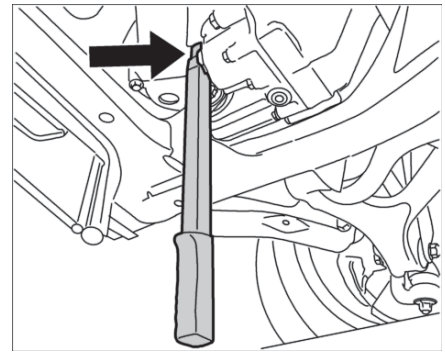
- Vehicle must be horizontal to check oil level in all-wheel final drive.



Oil inspection plug-filler screw

1. Unscrew oil inspection plug **-A-** with tool **special inserts mod. AB 170**.
2. The oil level is correct if the oil reaches the lower edge of the inspection window.
3. If this is not the case, top up the oil. → 399035 Checking and topping up oil for all-wheel final drive - chapter on "Filling"
4. Screw in oil inspection plug **-A-** with new sealing ring. To do this, use the special tool **special inserts model AB 170** and **accessory for the torque wrench: open ring wrench insert a/f 13 + adapter 98-1**. → **Tightening torque: 26 ftlb.**

Topping up oil for four-wheel final drive



Tightening to the specified torque

Filling oil for all-wheel final drive



WARNING

Risk of scalding from hot oil

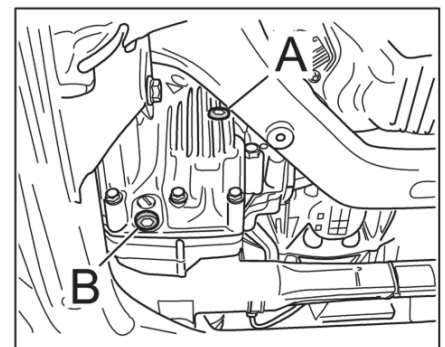
- Let the oil cool down
- Wear personal protective gear (goggles, gloves)



Note

- Vehicle must be horizontal in order to fill final drive.

1. Unscrew oil inspection plug **-A-** with tool **special inserts mod. AB 170**.

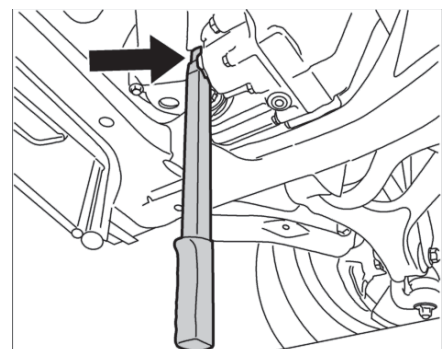


Oil inspection plug-filler screw



Note

- Use only oil approved by Porsche.
2. Fill with oil using the **ATF filling device for filling transmission 161** to the lower edge of inspection plug **-A-**.
 3. Screw in oil inspection plug **-A-** with new sealing ring. To do this, use the special tool **special inserts model AB 170** and **accessory for the torque wrench: open ring wrench insert a/f 13 + adapter 98-1**. → **Tightening torque: 26 ftlb.**



Tightening to the specified torque

Subsequent work for oil for four-wheel final drive

Touch up for oil for all-wheel final drive

1. Remove engine guard. → 108019 Removing and installing engine guard - chapter on "Installing"
-

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- **Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.**
- **Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.**

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

Danger of losing text-figure correspondence when printing out.

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→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

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→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

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- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 90 55 Changing oil for four-wheel final drive - as of MY 2003

- Preliminary work for oil for four-wheel final drive
- Changing oil for four-wheel final drive
- Subsequent work for oil for four-wheel final drive

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	161		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
special inserts model AB	commercially available tool	170		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
accessory for torque wrench: open ring wrench insert a/f 13 + adapter	commercially available tool	98-1		

				PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work for oil for four-wheel final drive

Preliminary work oil for four-wheel final drive

1. Remove engine guard . → 108019 Removing and installing engine guard - chapter on "removing"

Changing oil for four-wheel final drive

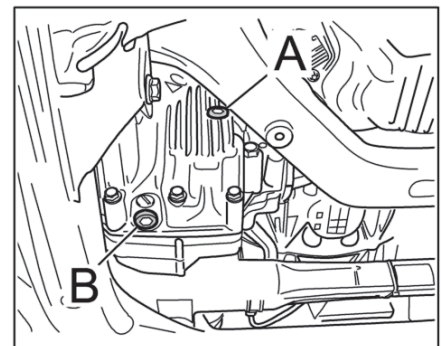
1. Place oil collecting container underneath the vehicle.



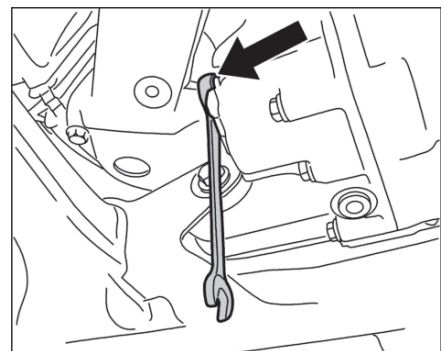
WARNING

Risk of scalding from hot oil

- Let the oil cool down
 - Wear personal protective gear (goggles, gloves)
2. Unscrew oil drain plug **-B-** and drain the oil.
 3. Screw in oil drain plug **-B-** with a new sealing ring. → **Tightening torque: 26 ftlb.**
 4. Unscrew oil inspection plug using the **special inserts model AB 170** tool.



Oil inspection and drain plug

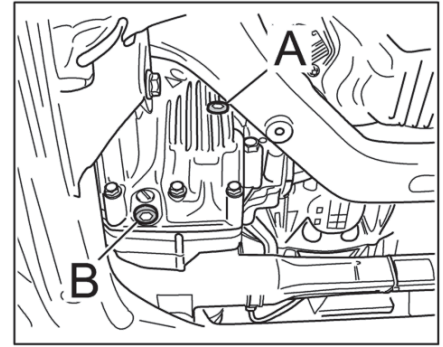


Tool for oil inspection plug

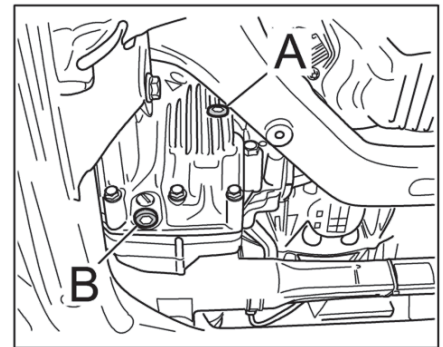


Note

- Use only oil approved by Porsche.
5. Using the **ATF filling device for filling transmission 161**, fill with oil up to the lower edge of the oil inspection plug **-A-**.
 6. Unscrew oil inspection plugs **-A-** using the **special inserts model AB tool 170 accessory for torque wrench: open ring wrench insert a/f 13 + adapter 98-1** and screw in a new sealing ring. → Tightening torque: 26 ftlb.



Oil inspection and drain plug



Oil inspection and drain plug

Subsequent work for oil for four-wheel final drive

Reworking oil for four-wheel final drive

1. Fit engine guard. → 108019 Removing and installing engine guard - chapter on "installing"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- **Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.**
- **Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.**

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



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AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

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→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

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→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 90 55 Changing oil for rear final drive - as of MY 2003

- [Changing oil for rear final drive](#)

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	161		PORSCHE siehe Handbuch Werkstattaufrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Changing oil for rear final drive

Changing oil for rear final drive

1. Place oil collecting container underneath the vehicle.

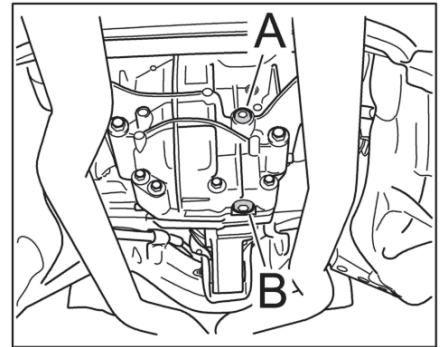


WARNING

Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)

2. Unscrew oil drain plug **-B-** and drain oil.



Oil inspection and drain plug

3. Screw in oil drain plug **-B-** with new sealing ring. → **Tightening torque: 26 ftlb.**



WARNING

Risk of scalding from hot oil

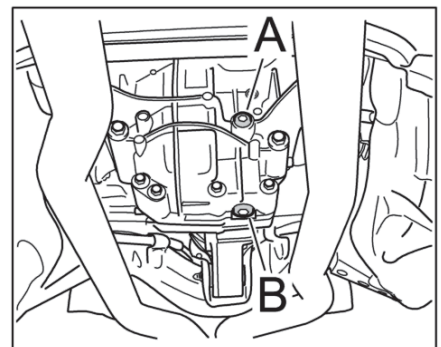
- Let the oil cool down
- Wear personal protective gear (goggles, gloves)

4. Unscrew oil inspection plug **-A-**.



Note

- Vehicle must be horizontal in order to fill rear final drive.
5. Fill with oil using the **ATF filling device for filling transmission 161** to the lower edge of inspection plug opening **-A-**. → **Tightening torque: 1.25 l +0.35 l**
 6. Screw in oil inspection plug **-A-** with new sealing ring. → **Tightening torque: 26 ftlb.**
 7. Check oil for rear final drive → 399035 Checking and topping up oil for rear final drive - chapter on "Checking"



Oil inspection and drain plug

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

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AVERTISSEMENT

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ATTENZIONE

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ADVERTENCIA

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→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

39 90 55 Changing oil for transfer box - as of MY 2003

- [Changing oil for transfer box](#)
- [Subsequent work for oil for transfer box](#)

Tools

Designation	Type	Number	Explanation	
ATF filling device for filling transmission	commercially available tool	161		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Changing oil for transfer box

Changing oil for transfer box

1. Slide oil collecting container under the vehicle.



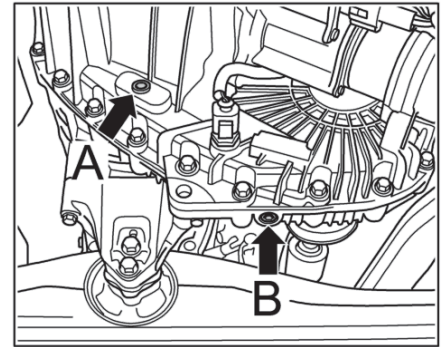
WARNING

Risk of scalding from hot oil

- Let the oil cool down
- Wear personal protective gear (goggles, gloves)

2. Unscrew oil drain plug **-B-** and drain the oil.

- Screw in oil drain plug **-B-** with new sealing ring. → **Tightening torque: 15 ftlb.**



Oil inspection and drain plug

- Unscrew oil inspection plug **-A-**.



Note

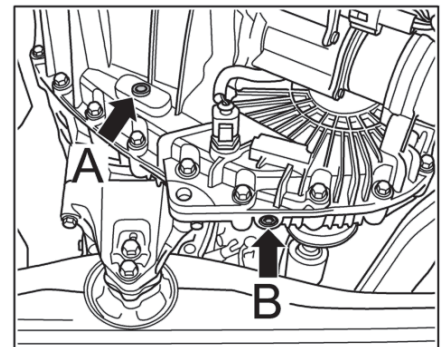
Vehicle must be horizontal in order to fill the transfer box.



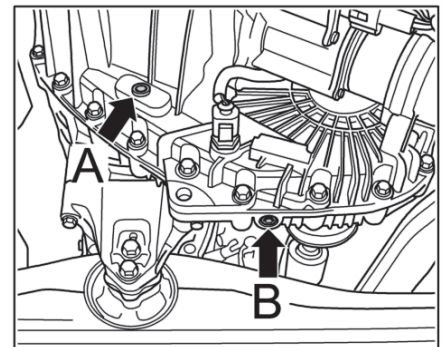
Note

Use only oil approved by Porsche.

- Fill with oil to the lower edge of the inspection plug opening **-A-** using the **ATF filling device for filling transmission 161**. Raise filling device.
- Screw in oil inspection plug **-A-** with a new sealing ring. → **Tightening torque: 15 ftlb.**



Oil inspection and drain plug



Oil inspection and drain plug

Subsequent work for oil for transfer box

Reworking oil for transfer box

- Check oil for transfer box. → 399035 Check and top up oil for transfer box - Chapter "Checking"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23,

C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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- **Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.**

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- **If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.**

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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ATTENZIONE

Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

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ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

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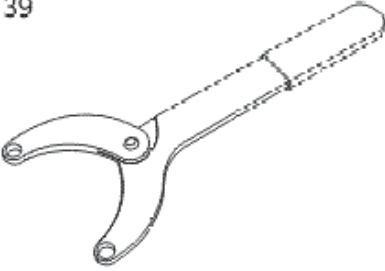
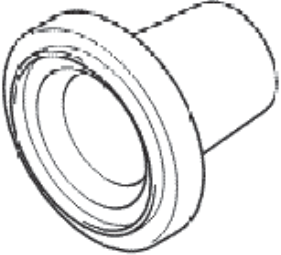
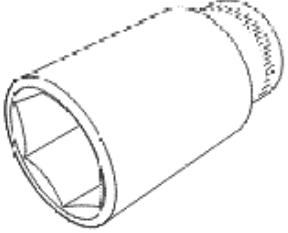
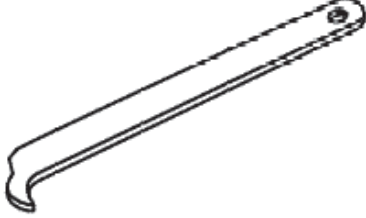
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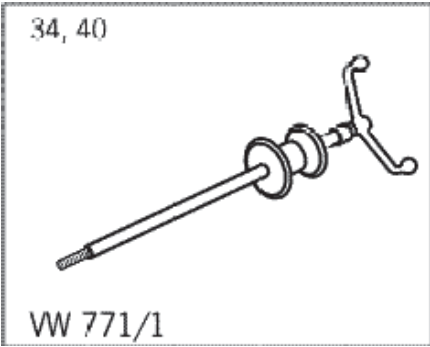
39 92 19 Removing and installing sealing ring for rear transfer box (output flange) - as of MY 2003

- Preliminary work sealing ring for transfer box
- Removing sealing ring for rear transfer box (output flange)
- Installing sealing ring for rear transfer box (output flange)
- Reworking sealing ring for transfer box

Tools

Designation	Type	Number	Explanation	
shop made tool	commercially available tool			
arm bracket	special tool	3435		

				39  3435
pressure piece	special tool	T10185		39  T10185
socket	special tool	T10204		39  T 10204
hook	workshop equipment	VW 681		34  VW 681
striker	commercially available tool	vw 771/1		

Preliminary work sealing ring for transfer box

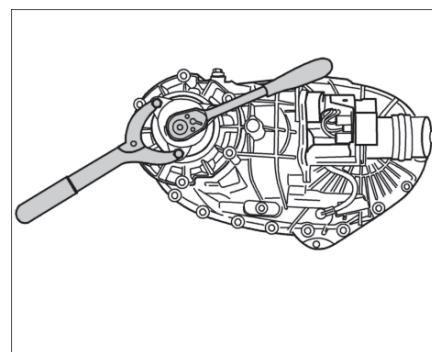
Preliminary work sealing ring for transfer box

1. Remove rear cardan shaft. → 393519 Removing and reinstalling rear cardan shaft - chapter on "Removing" [9PAAE1 9PAAE7 9PAAF1] → 393519 Removing and reinstalling rear cardan shaft - chapter on "Removing" [9PAAD1] → 393519 21 Removing and reinstalling rear cardan shaft - chapter on "Removing" [9PAAJ1] → 393519 Removing and reinstalling rear cardan shaft - chapter on "Removing" [9PAAD7]

Removing sealing ring for rear transfer box (output flange)

Removing sealing ring for rear output drive (output flange)

1. Remove nut of output flange with special tool **socket T10204**. To do this, secure with special tool **arm bracket 3435**.



Output flange nut

2. Remove round seal on output flange.
3. Remove flange with **shop made tool** and **striker vw 771/1**.

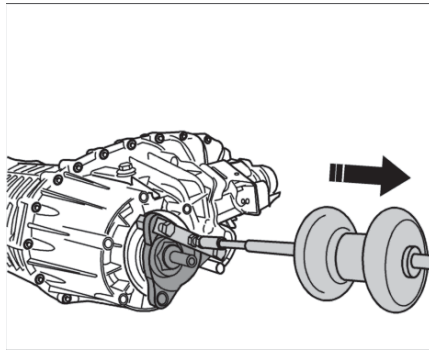


ATTENTION

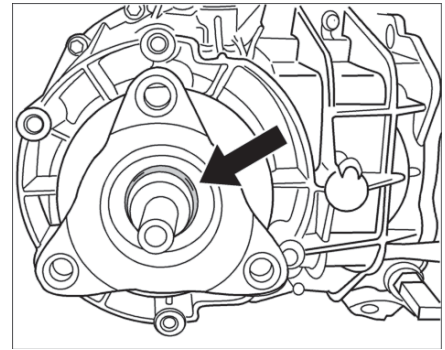
Leakage due to scores on the sealing face.

→

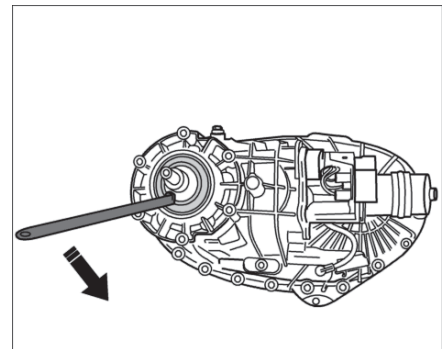
When removing the sealing ring, place the tip of the hook on the sealing ring only and not on the sealing



Removing output flange



Rubber ring for rear output drive



Removing sealing ring for rear output drive

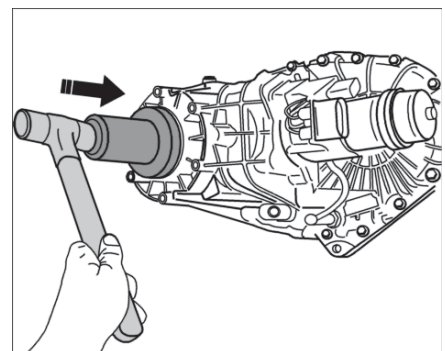
face.

4. Remove sealing ring with special tool **hook VW 681**.

Installing sealing ring for rear transfer box (output flange)

Installing sealing ring at rear of transfer box (output flange)

1. Drive in new sealing ring with special tool **pressure piece T10185** until the special tool touches the transmission housing.
2. Install output flange and, if necessary, drive in with a plastic hammer.



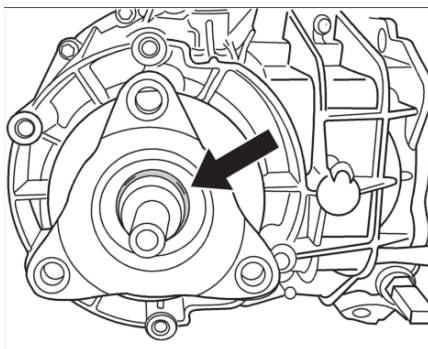
Driving in the sealing ring



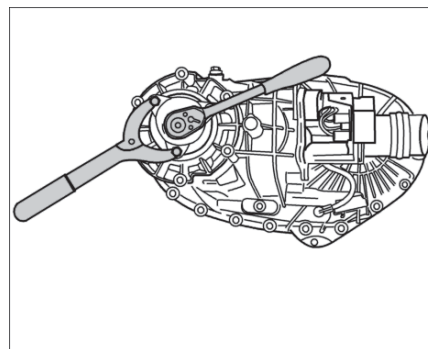
Note

- Ensure that the round seal is inserted.
- Replace nut on output flange.
- Fit nut using screw locking device.

3. Screw in output flange nut using special tool **socket T10204**. To do this, counter the flange with special tool **arm bracket 3435**. → **Tightening torque: 100 ftlb.**

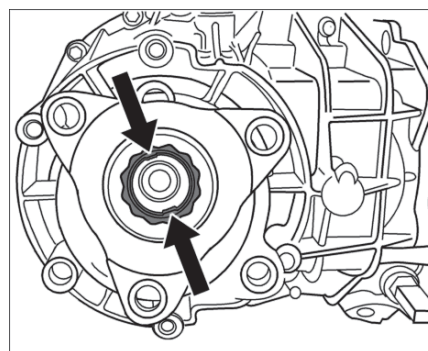


Rubber ring for rear output drive



Output flange nut

4. Caulk nuts at the recesses in the output shaft.



Caulking nuts

Reworking sealing ring for transfer box

Subsequent work for sealing ring for transfer box

1. Install cardan shaft. → 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAE1 9PAAE7 9PAAF1] → 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAD1] → 393519 23 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAJ1] → 393519 Removing and installing rear cardan shaft - chapter on "Installing" [9PAAD7]

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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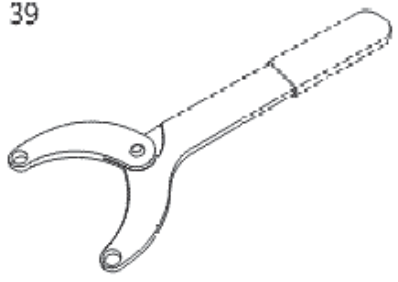
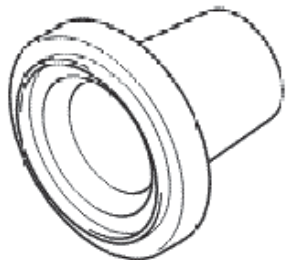
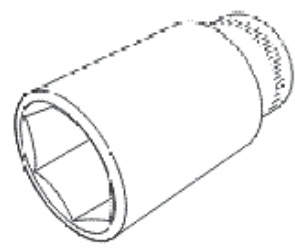
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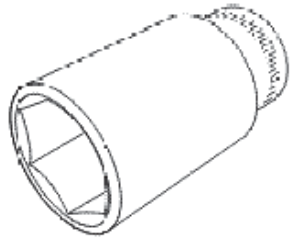
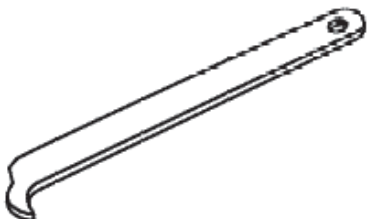
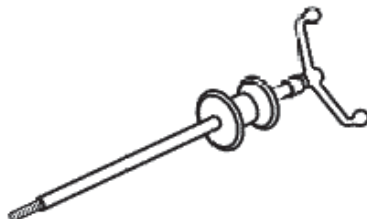
39 92 19 Removing and installing sealing ring for front transfer box output - as of MY 2003

- Preliminary work for transfer box sealing ring
- Removing sealing ring for front transfer box output
- Installing sealing ring for front transfer box output
- Subsequent work for transfer box sealing ring

Tools

Designation	Type	Number	Explanation	
shop made tool	commercially available tool			 .gif
material	special tool	00000	transmission jack	

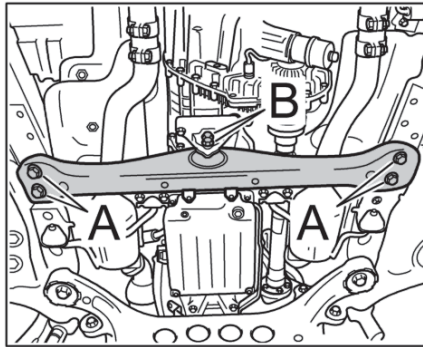
				PORSCHE siehe Handbuch Werkstattaufrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
arm bracket	commercially available tool	3435		39  3435
pressure piece	special tool	T10185		39  T10185
socket	commercially available tool	t10204		39  T 10204
socket	special tool	T10204		

				39  T 10204
hook	commercially available tool	vw 681		34  VW 681
striker	commercially available tool	vw 771/1		34, 40  VW 771/1

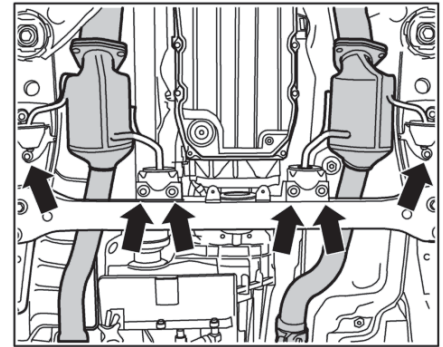
Preliminary work for transfer box sealing ring

Preliminary work sealing ring for transfer box

1. Remove front cardan shaft. → 390219 Removing and installing front cardan shaft - chapter on "Removing" [9PAAE1 9PAAF1 9PAAJ1] → 390219 Removing and installing front cardan shaft - chapter on "Removing" [9PAAD1 9PAAD7 9PAAE7]
2. Support transfer box with transmission jack.
3. Support transmission with **material 00000** and secure with retaining band.
4. Unscrew four exhaust system screws on the cross member **-centre arrow-** and unscrew screw connection holder on body **-right arrow-**.



Transmission cross member



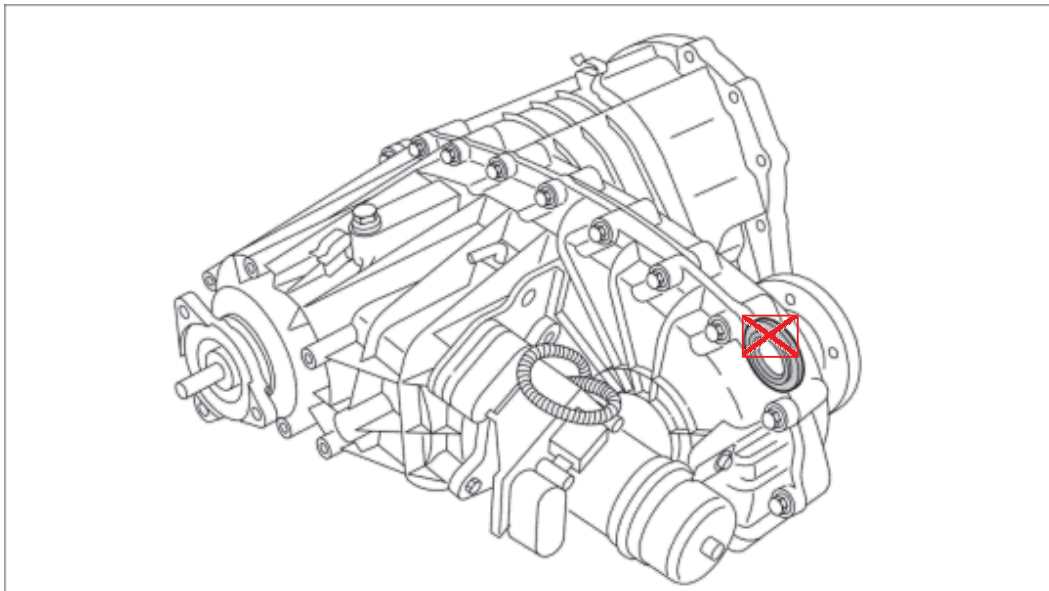
Exhaust system at cross member

5. Unscrew transmission cross member on body **-A-** .
6. Unscrew two screws on the cross member **-B-** on the transfer box holder and remove transmission cross member.

Removing sealing ring for front transfer box output

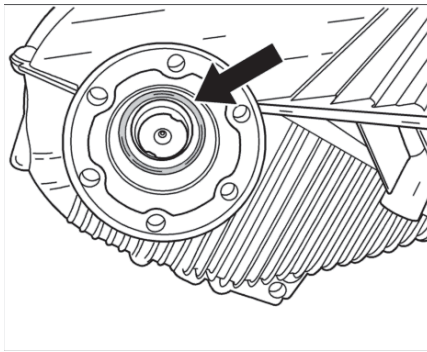
Removing sealing ring for front transfer box output

Installation Location:

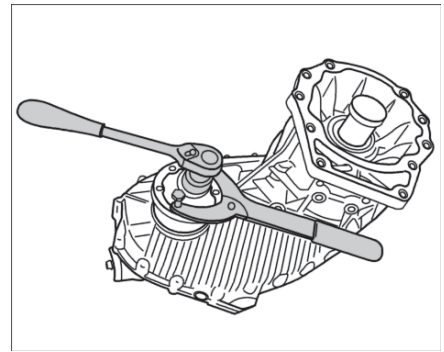


Overview of sealing ring for front transfer box output

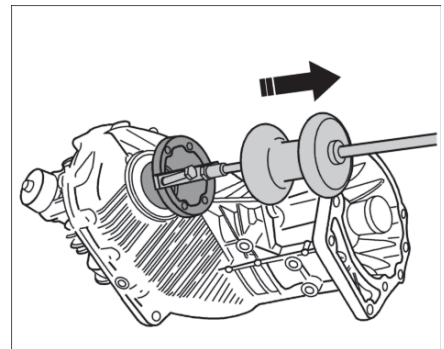
1. Unscrew collar nut of output flange with special tool **socket t10204**. To do this, block flange with special tool **arm bracket 3435**.
2. Remove round seal on output flange.
3. Remove output flange with **shop made tool** and **striker vw 771/1**.



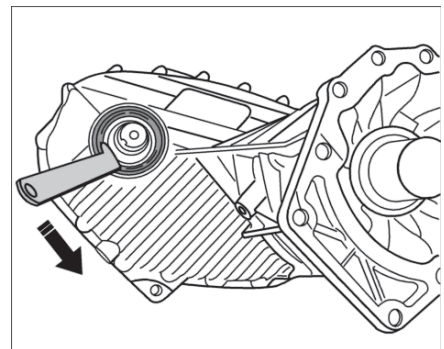
Round seal on output flange



Counterflange



Removing output flange

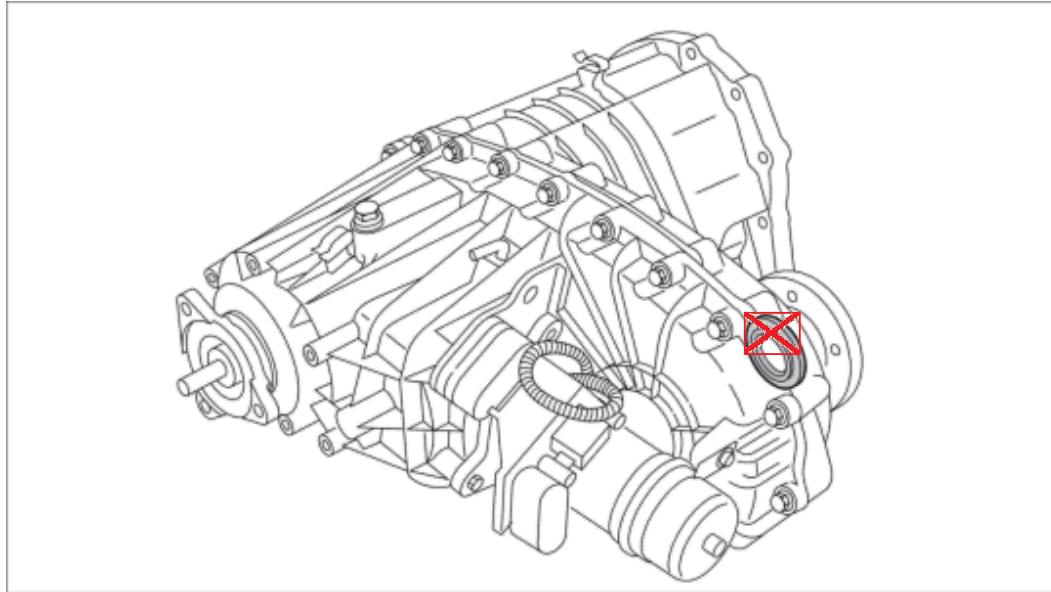


Removing sealing ring

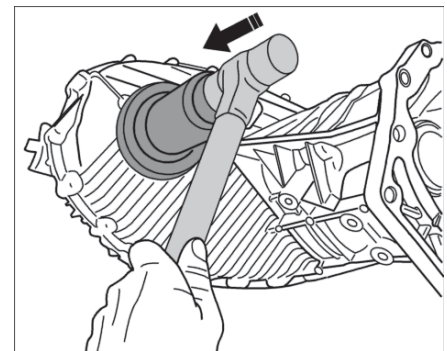
Installing sealing ring for front transfer box output

Installing sealing ring for front transfer box output

Installation Location:



Overview of sealing ring for front transfer box output

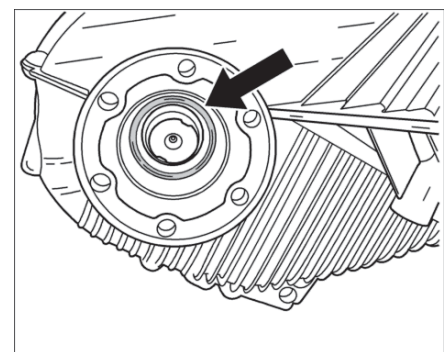


Driving in the sealing ring



Note

- Ensure that the round seal **-arrow-** is inserted.
 - Replace nut on output flange.
 - Fit nut using screw-locking compound, e.g. Loctite 648.
1. Drive in new sealing ring with special tool **pressure piece T10185**
→ **Driving in the sealing ring** until the special tool touches the transmission housing.
 2. Install output flange and, if necessary, drive in with a plastic hammer.



Round seal on output flange



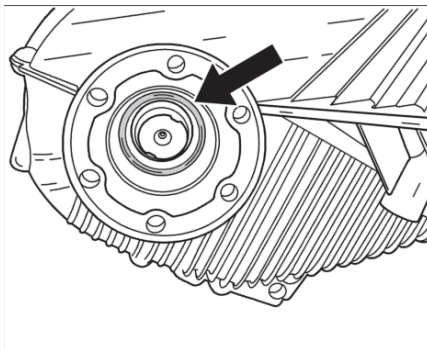
Note

- Ensure that the round seal **-arrow-** is inserted.

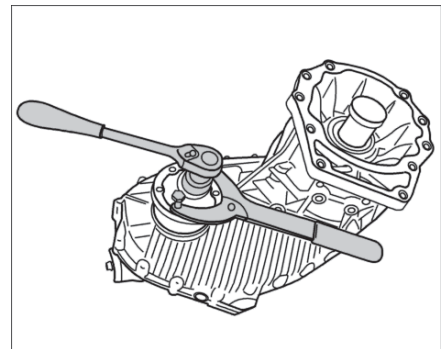
- Replace nut on output flange.

- Fit nut using screw-locking compound, e.g. Loctite 648.

3. Screw in new nut on output flange using special tool **socket T10204**. To do this, counter the flange with special tool **arm bracket 3435**. → **Tightening torque: 100 ftlb.**

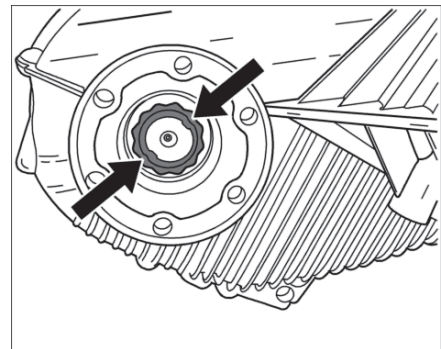


Round seal on output flange



Tightening nut on output flange

4. Caulk nuts at the recesses in the output shaft.

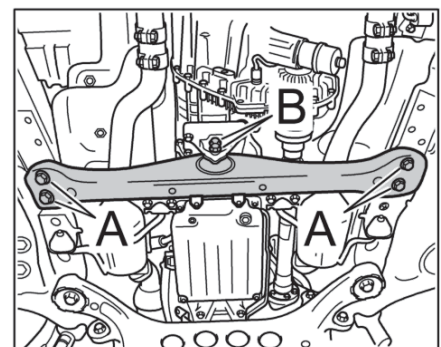


Caulking nuts

Subsequent work for transfer box sealing ring

Reworking sealing ring for transfer box

1. Install front cardan shaft. → 390219 Removing and installing front cardan shaft - chapter on "Installing" [9PAAE1 9PAAF1 9PAAJ1] → 390219 Removing and installing front cardan shaft - chapter on "Installing" [9PAAD1 9PAAD7 9PAAE7]
2. Screw in new transmission cross member screws **-B-** on transfer box holder. → **initial tightening: 37 ftlb.** → **final tightening: 90 degree of angle**
3. Screw in new cross member screws on body **-A-** → **initial tightening: 37 ftlb.** → **final tightening: 90 degree of angle**

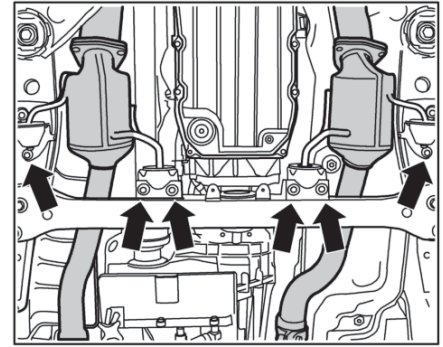


Transmission cross member

4. Fix exhaust system to transmission cross member **-centre arrow-** and body **-outer arrow-**. Observe torques → 260119 Remove and install exhaust system

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15,
C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32,
C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



Exhaust system at cross member



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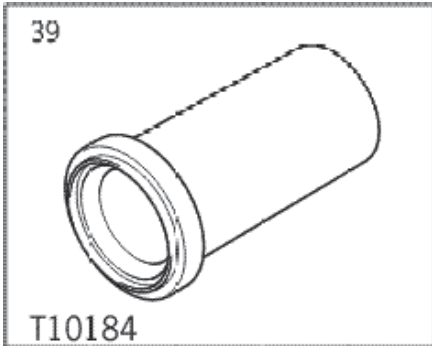
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39 92 19 Removing and installing sealing ring for transfer box input shaft - as of MY 2003

- Preliminary work sealing ring for input shaft transfer box
- Removing sealing ring for transfer box input shaft
- Installing sealing ring for transfer box input shaft
- Subsequent work

Tools

Designation	Type	Number	Explanation	
slide hammer kit	commercially available tool	168		
pressure piece	commercially available tool	t10184		

Preliminary work sealing ring for input shaft transfer box

Preliminary work sealing ring for transfer box

1. Remove transfer box. → 396519 Removing and installing transfer box - chapter on "Removing"

Removing sealing ring for transfer box input shaft

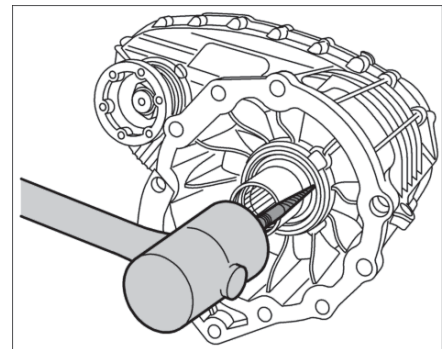
Removing sealing ring for transfer box input shaft



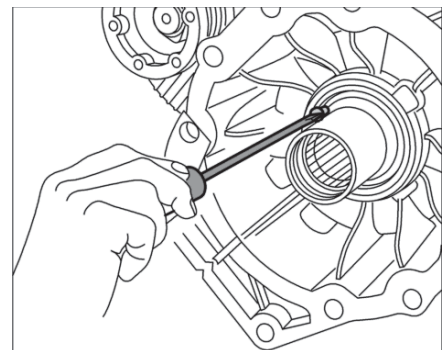
ATTENTION

Damage to input shaft bearing.

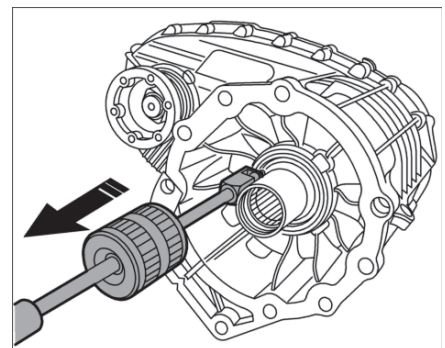
- Drive bevelled attachment in by approx. 2 mm.
 - Screw sheetmetal screw max. two turns into the sealing ring.
1. Using the bevelled attachment from the **slide hammer kit 168**, make a small hole **-figure-** in the sealing ring.
 2. Screw a suitable sheetmetal screw in by two turns.
 3. Remove sealing ring using special tool **slide hammer kit 168**.



Preparing for removal



Screwing in sheetmetal screw

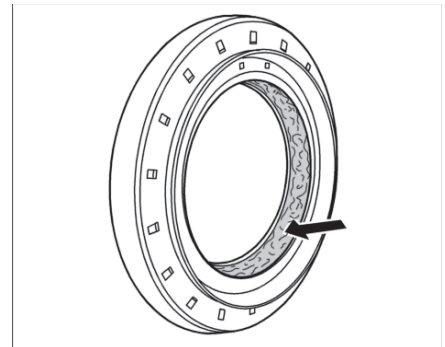


Removing sealing ring

Installing sealing ring for transfer box input shaft

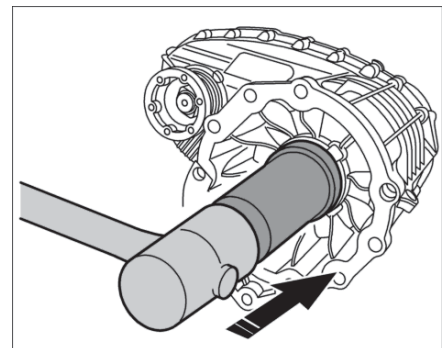
Installing sealing ring for transfer box input shaft

1. Fill the space between the dust and sealing lips on the new sealing ring with grease.



Preparing the sealing ring

2. Drive new sealing ring in flush using special tool **pressure piece t10184**.



Fitting sealing ring

Subsequent work

Reworking sealing ring for transfer box

1. Install transfer box. → 396519 Removing and installing transfer box - chapter on "Installing"
2. Check oil for transfer box. → 399035 Check and top up oil for transfer box - Chapter "Checking"

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

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39 IN Information - as of MY 2003

Porsche Traction Management

Porsche Traction Management, or PTM, is a system which guarantees or improves the traction of the vehicle. Two controllable locks are available in the system.

It operates permanently and receives values from different sensors (e.g. steering-angle sensor, lateral acceleration sensor) from which the corresponding lock controls are obtained. In this way the optimum power is distributed to the drive wheels.

The locks are:

- Longitudinal lock (in the transfer box): Distributes the moment released by the gear via the cardan shafts to the front or rear axle gear.
- Longitudinal interlock (depending on the equipment in the rear final drive): Distributes the moment to the two rear driving wheels.

Porsche Traction Management

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It operates permanently and receives values from different sensors (e.g. steering-angle sensor, lateral acceleration sensor) from which the corresponding lock activations are obtained. In this way the optimum power is distributed to the drive wheels.

The locks are:

- Centre-differential lock (in the transfer box): Distributes the moment released by the gear via the cardan shafts to the front axle final drive or rear axle differential.
- Rear-differential lock (depending on the equipment in the rear final drive): Distributes the moment to the two rear driving wheels.

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- Centre-differential lock (in the transfer box): Distributes the moment released by the gear via the cardan shafts to the front axle final drive or rear axle differential.
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9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

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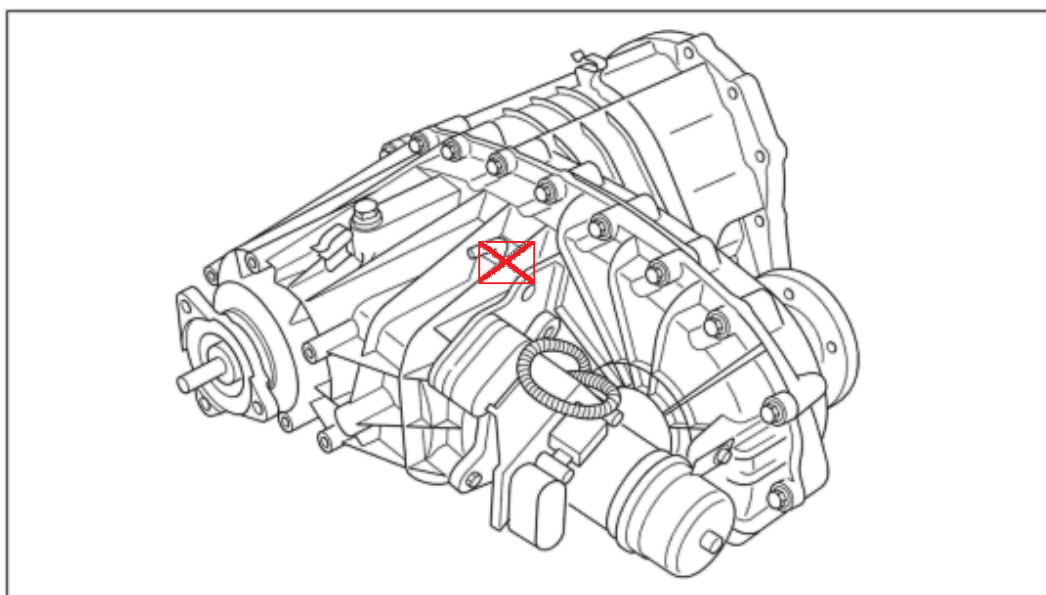
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39 Technical data - as of MY 2003

- [Technical data on transfer box](#)
- [Technical data on four-wheel final drive](#)
- [Technical data on rear final drive](#)

Technical data on transfer box

Installation Location:



View of transfer box

- **Type:** Z 48.20

Installed in: Cayenne

Model year: 2004

Low Range gearing: $i = 2.70$

Type: Two-stage planetary differential; planetary set

Filling capacity (new filling): → **Filling capacity: 0.85 l**

Filling capacity (change quantity): → **Filling capacity: 0.75 l**

- **Type:** Z 48.00

Installed in: Cayenne S

Model year: 2003

Low Range gearing: $i = 2.70$

Type: Two-stage planetary differential; planetary set

Filling capacity (new filling): → **Filling capacity: 0.85 l**

Filling capacity (change quantity): → **Filling capacity: 0.75 l**

- **Type:** Z 48.50

Installed in: Cayenne Turbo

Model year: 2003

Low Range gearing: $i = 2.70$

Type: Two-stage planetary differential; planetary set

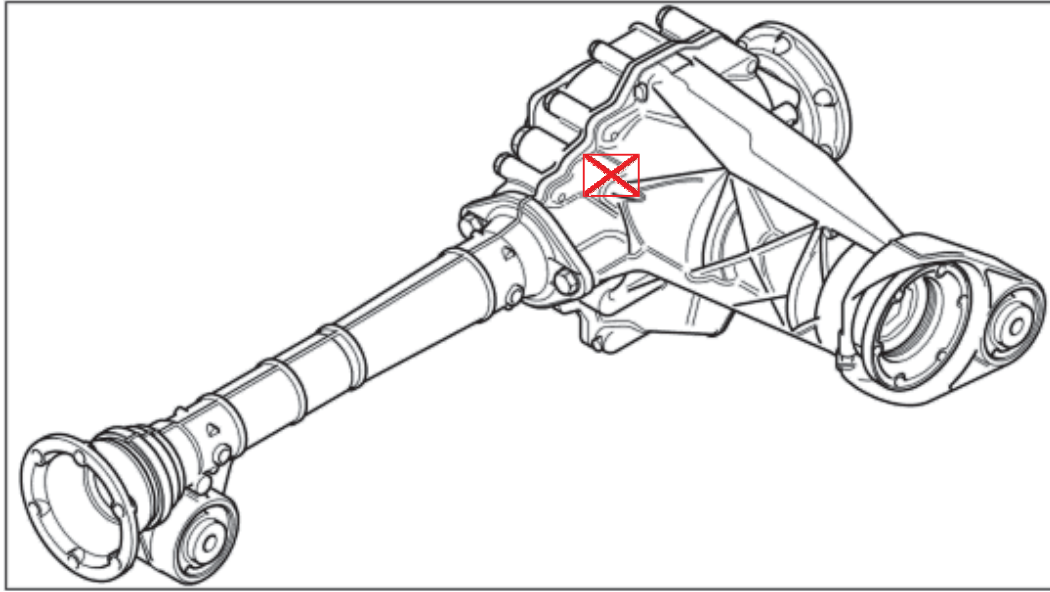
Filling capacity (new filling): → **Filling capacity: 0.85 l**

Filling capacity (change quantity): → **Filling capacity: 0.75 l**

Technical data on four-wheel final drive

Technical data on four-wheel final drive

Installation Location:



Overall view of front-axle final drive

- **Type:** V 48.20

Installed in: Cayenne

Model year: 2004

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 4.56$

Transmission ratio for manual transmission: $i = 4.10$

Bearing rolling moment: 2.0 - 2.4

Filling capacity (new filling): → **Filling capacity:** approx. 1.0 l

- **Type:** V 48.00

Installed in: Cayenne S

Model year: 2003

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 4.10$

Transmission ratio for manual transmission: $i = 3.70$

Bearing rolling moment: 2.0 - 2.4

Filling capacity (new filling): → **Filling capacity:** approx. 1.0 l

- **Type:** V 48.50

Installed in: Cayenne Turbo

Model year: 2003

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 3.70$

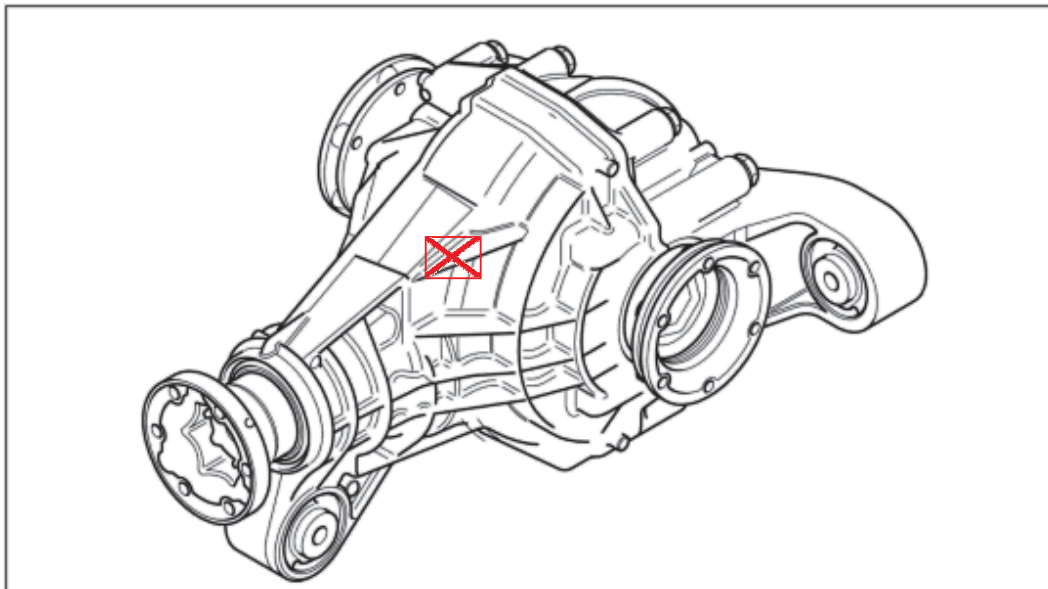
Bearing rolling moment: 2.0 - 2.4

Filling capacity (new filling): → **Filling capacity:** approx. 1.0 l

Technical data on rear final drive

Technical data on rear final drive

Installation Location:



Overall view of rear axle transmission

- **Type:** H 48.20

Installed in: Cayenne

Model year: 2004

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 4.56$

Transmission ratio for manual transmission: $i = 4.10$

Bearing rolling moment: → **Bearing rolling moment:** 1.7 ftlb. +0.2 ftlb.

Filling capacity for Tiptronic: → **Filling capacity:** approx. 1.4 l

Filling capacity for manual transmission: → Filling capacity: approx. 1.25 l

Filling capacity with rear-differential lock: → Filling capacity: approx. 1.6 l

- **Type:** H 48.00

Installed in: Cayenne S

Model year: 2003

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 4.10$

Transmission ratio for manual transmission: $i = 3.70$

Bearing rolling moment: → Bearing rolling moment: 1.7 ftlb. +0.2 ftlb.

Filling capacity for Tiptronic: → Filling capacity: approx. 1.4 l

Filling capacity for manual transmission: → Filling capacity: approx. 1.4 l

Filling capacity with rear-differential lock: → Filling capacity: approx. 1.6 l

- **Type:** H 48.50

Installed in: Cayenne Turbo

Model year: 2003

Type: Bevel wheel gear

Transmission ratio for Tiptronic: $i = 3.70$

Bearing rolling moment: → Bearing rolling moment: 1.7 ftlb. +0.2 ftlb.

Filling capacity for Tiptronic: → Filling capacity: approx. 1.4 l

Filling capacity for manual transmission: → Filling capacity: approx. 1.4 l

Filling capacity with rear-differential lock: → Filling capacity: approx. 1.6 l

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

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40 TW Tightening torques for front axle - as of MY 2003

- Tightening torques

Tightening torques

Suspension subframe

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Threaded connection, suspension subframe to front body, M14 x 1.5 x 150	Always replace screws and lock nuts after removal.	Initial tightening	89 ftlb.		
Threaded connection, suspension subframe to front body, M14 x 1.5 x 150	Always replace screws and lock nuts after removal.	Final tightening	180 °		
Threaded connection, suspension subframe to rear body, M14 x 1.5 x 115	Always replace screws and lock nuts after removal.	Initial tightening	89 ftlb.		
Threaded connection, suspension subframe to rear body, M14 x 1.5 x 115	Always replace screws and lock nuts after removal.	Final tightening	180 °		

Axle strut

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Threaded connection, upper trailing arm to mounting saddle, M10 x 70	Always replace screws and lock nuts after removal.	Initial tightening	37 ftlb.		
Threaded connection, upper trailing arm to mounting saddle, M10 x 70	Always replace screws and lock nuts after removal.	Final tightening	90 °		

Threaded connection securing upper trailing arm to pivot bearing, M12 x 1.5	Replace screws and lock nuts after removal.	Tightening torque	63 ftlb.		
HBA screw connection with steel springs, M5 x 10		Tightening torque	3.5 ftlb.		
Level regulator screw connection with air springs, M5 x 10		Tightening torque	3.5 ftlb.		
Threaded connection securing lower trailing arm to suspension subframe, M14 x 1.5 x 105	Replace screws and lock nuts after removal.	Tightening torque	133 ftlb.		
Threaded connection securing lower trailing arm to pivot bearing, M14 x 1.5	Replace screws and lock nuts after removal.	Tightening torque	78 ftlb.		

Steering gear

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Threaded connection, steering gear to suspension subframe, M12 x 1.5	Always replace screws and lock nuts after removal.	Initial tightening	67 ftlb.		
Threaded connection, steering gear to suspension subframe, M12 x 1.5	Always replace screws and lock nuts after removal.	Final tightening	90 °		
Threaded connection securing tie rod to pivot bearing, M14 x 1.5	Replace screws and lock nuts after removal.	Tightening torque	67 ftlb.		
Tie rod to tie rod end screw connection, M14 x 1.5	Lock nut	Tightening torque	52 ftlb.		
Heat shield screw connection, M6 x 16		Tightening torque	7.5 ftlb.		
Tie rod to steering rack screw connection, M18 x 1.5	Axial joint	Initial tightening	74 ftlb.		
Tie rod to steering rack screw connection, M18 x 1.5	Axial joint	Final tightening	10 °		
Pressure line to steering gear screw connection a/f 17	a/f - wrench size	Tightening torque	22 ftlb.	±2 ftlb.	
Return line to steering gear screw connection a/f 17	a/f - wrench size	Tightening torque	22 ftlb.	±2 ftlb.	
Steering column to mounting bracket screw connection, M8 x 28		Tightening torque	17 ftlb.		
Steering column to mounting bracket screw connection, M8 x 10 x 45		Tightening torque	17 ftlb.		
Expansion/return line screw connection, M6 x 12		Tightening torque	7.5 ftlb.		

Steering wiring

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Steering column to mounting bracket screw connection, M8 x 10 x 45		Tightening torque	17 ftlb.		
Steering column to mounting bracket screw connection, M8 x 28		Tightening torque	17 ftlb.		
Universal joint to steering gear screw connection, M10 x 35	Use bolt once only.	Initial tightening	26 ftlb.		
Universal joint to steering gear screw connection, M10 x 35	Use bolt once only.	Final tightening	90 °		
Steering wheel to steering column screw connection, M18 x 1.5 x 26	Use one bolt only.	Tightening torque	37 ftlb.	±4.5 ftlb.	
Screw connection for attaching handle to steering column, M5 x 8		Tightening torque	3.5 ftlb.		
Fastening sealing ring/seal to firewall		Tightening torque	3 ftlb.		

Wheel carrier (pivot bearing)

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Speed sensor to wheel carrier screw connection, M6 x 16		Tightening torque	6 ftlb.		
Brake cover plate to wheel carrier screw connection, M8 x 12		Tightening torque	15 ftlb.		
Threaded connection securing brake calliper to wheel carrier, M16 x 1.5 x 48	Replace screws and fastening nuts after removal.	Tightening torque	200 ftlb.		
Brake hose holder to wheel carrier screw connection, M6 x 12		Tightening torque	6.5 ftlb.		
Cable retainer to wheel carrier screw connection, M8 x 14		Tightening torque	22 ftlb.		
Brake disc to wheel hub screw connection, M12 x 1.5 x 16		Tightening torque	10.5 ftlb.		

¹⁾ Replace screws and fastening nuts whenever removed.

Spring strut

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Spring strut to trailing arm screw connection M14 x 1.5 x 102		Initial tightening	111 ftlb.		

Spring strut to trailing arm screw connection M14 x 1.5 x 102		Final tightening	90 °		
Spring strut bracket to piston rod screw connection, M12 x 1.5		Tightening torque	44 ftlb.		
Mounting saddle screw connection M8		Tightening torque	22 ftlb.		
Mounting saddle to body screw connection, M10 x 37		Initial tightening	37 ftlb.		
Mounting saddle to body screw connection, M10 x 37		Final tightening	90 °		
Residual pressure restraint valve screw connection		Tightening torque	2 ftlb.		

Anti-roll bar/suspension/stabiliser (connecting link)

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Threaded connection securing anti-roll bar to suspension subframe, M10 x 62	Replace screws and lock nuts after removal.	Tightening torque	44 ftlb.		
Threaded connection, anti-roll bar to suspension/stabilizer (connecting link), M12 x 1.5	Always replace screws and lock nuts after removal.	Tightening torque	81 ftlb.		
Threaded connection, suspension/stabiliser (connecting link) to spring strut, M12 x 1.5	Always replace screws and lock nuts after removal.	Tightening torque	81 ftlb.		

Off-road stabiliser (ORS)

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Threaded connection securing stabiliser to rear-axle suspension subframe, M10 x 25		Tightening torque	44 ftlb.		
Threaded connection, anti-roll bar to suspension/stabilizer (connecting link), M12 x 1.5	Always replace screws and lock nuts after removal.	Tightening torque	81 ftlb.		
Threaded connection, suspension/stabiliser (connecting link) to wheel carrier/damper strut	See spring strut				
Union nuts to pipes screw connection		Tightening torque	10.5 ftlb.	±0.5 ftlb.	
Disconnection points to pipes screw connection		Tightening torque	10.5 ftlb.	±0.5 ftlb.	
Threaded connection securing line connections to left actuator	in direction of travel	Tightening torque	30 ftlb.	±1.5 ftlb.	

Threaded connection securing line connections to right actuator	in direction of travel	Tightening torque	15 ftlb.	±1.5 ftlb.	
Threaded connection securing control unit to lines		Tightening torque	10.5 ftlb.	±0.5 ftlb.	
Threaded connection securing control unit to accumulator, M14 x 1.5		Tightening torque	33 ftlb.	±3.5 ftlb.	
Pressure sensor to control unit screw connection, M10 x 1		Tightening torque	15 ftlb.	±1.5 ftlb.	
Control unit bracket screw connection		Tightening torque	7.5 ftlb.		
Threaded connection securing sensor to actuator	Replace screws and lock nuts after removal.	Tightening torque	2 ftlb.		
Bleeder valve screw connection		Tightening torque	5 ftlb.		

Drive shaft

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Threaded connection, drive shaft to front-axle transmission flange, M10 x 52 x 26	Always replace screws and lock nuts after removal.	Initial tightening	37 ftlb.		
Threaded connection, drive shaft to front-axle transmission flange, M10 x 52 x 26	Always replace screws and lock nuts after removal.	Final tightening	90 °		
Threaded connection securing drive shaft to wheel hub, M24 x 1.5	Replace screws and lock nuts after removal.	Tightening torque	370 ftlb.		

Differential

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Threaded connection, differential to suspension subframe, M12 x 1.5 x 90	Always replace screws and lock nuts after removal.	Initial tightening	67 ftlb.		
Threaded connection, differential to suspension subframe, M12 x 1.5 x 90	Always replace screws and lock nuts after removal.	Final tightening	90 °		
Threaded connection securing crash panel to differential, M6 x 12	Replace screws and lock nuts after removal.	Tightening torque	6 ftlb.		

Wheel

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Threaded connection securing wheel to wheel hub, M14 x 1.5 x 51	Do not grease screw.	Tightening torque	118 ftlb.		
Threaded connection securing wheel to spare wheel holder, M14 x 1.5 x 51	Do not grease screw.	Tightening torque	111 ftlb.		

¹⁾ Do not grease screws.

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

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40 V0 Lifting the vehicle - as of MY 2003

- Preliminary work

Preliminary work

Raising the vehicle



DANGER

Risk of injury due to vehicles slipping or tilting off lifting platforms.

- Risk of injury due to vehicles slipping or tilting off lifting platforms may be caused by improper alignment of the lifting platform arms or support plates, and by raising, supporting or removing units on raised vehicles.
- Align the vehicle evenly between the lifting platform columns.
- Lift the vehicle only at the take-up points provided.
- Check that the support plates are seated correctly by raising the vehicle slightly and performing a visual inspection.
- In order to ensure that the vehicle is not lifted off the support plates during assembly work, the vehicle must be secured on the lifting platform, or the shift in the centre of gravity must be offset by a corresponding load in the vehicle, when units are removed or supported.
- In addition, the guidelines of the lifting platform manufacturers and the legal accident prevention regulations and those of the mutual indemnity association (VGB 14) must be observed.



ATTENTION

Danger of material damage if the vehicle is raised incorrectly.

- Lifting or supporting the vehicle at unsuitable take-up points can lead to material damage on the vehicle.
- Raising the vehicle in the sill area will lead to the deformation of body parts and to leakage in the underbody area.

→ Lift the vehicle only at the approved take-up points.

When driving into the platform lift, pay attention to work to be carried out. i.e. if work has to be carried out in the front footwell, the vehicle should be positioned in such a way that the front doors can be opened far enough.

If the vehicle is a Cayenne with air suspension/level control, observe the following instructions.

Adjusting car to normal level

If air suspension accumulators of the air suspension are filled, only the ignition has to be switched on. If air pressure in accumulators is too low, compressor comes on and loads battery. In this case, a constanter (charging unit) must be connected or the engine must be started.

Stop the vehicle and apply the brake.

Close vehicle doors.

Tap the right-hand rocker switch on the center console in the appropriate direction until vehicle has reached normal level. The middle indicator light next to the rocker switch is permanently on. If a further indicator light should come on, a different level is adjusted.

Switching off level control

To do this:

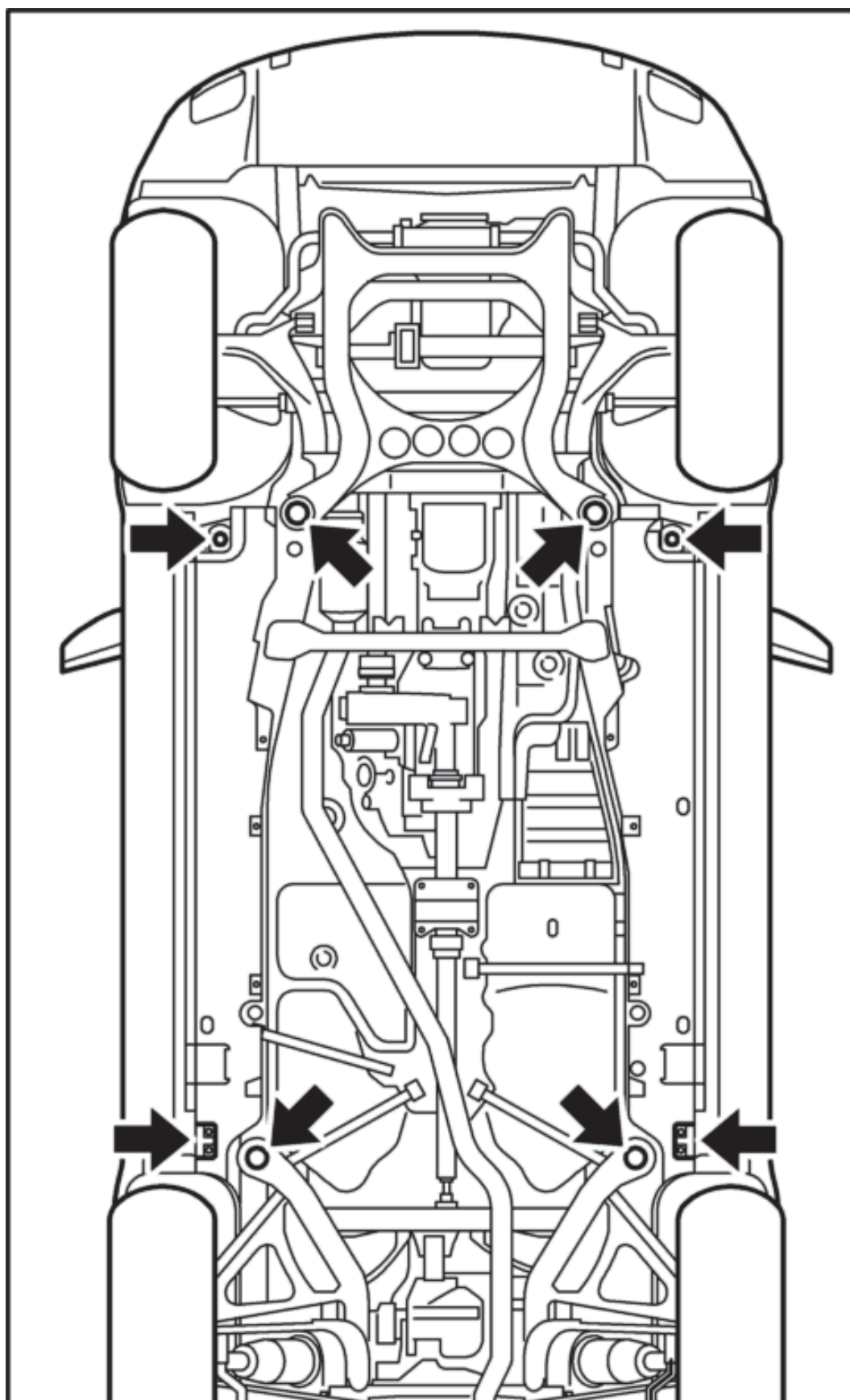
- Adjust car to normal level.
- Switch on ignition.
- Push → **time value: 5 s +5 s** forwards.

The message Control switched off appears in the variable control display of the instrument panel.

Switch on level control

To do this:

- Switch on ignition.
- Push → **time value: 5 s +5 s** forwards, or
- set off with the vehicle. Level control comes on automatically.



Information for vehicles with Off-Road Stabiliser system (ORS)

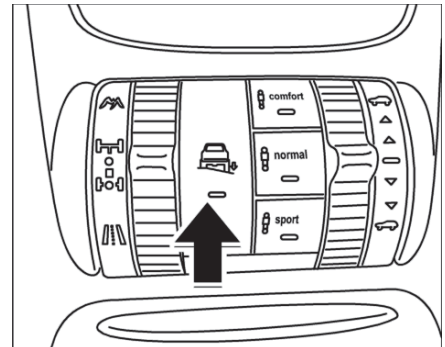
The off-road stabiliser system can be identified by the **-Button (arrow)-** on the centre console.



WARNING

The Offroad Stabilizer System (ORS) operates at an overpressure of up to 165 bar.

- If the ORS is not depressurised, movements may occur on the wheel carrier under certain circumstances (e.g. the off-road stabilisers are disengaged when the vehicle is lifted, the switch on the centre console is pressed and the wheel carrier is also lifted). The stabilizer can close quickly. Thus there is the danger of crushing in the area of the stabilizers and wheel carriers.



- The ORS must be depressurised before working on it. To do this, close the Porsche System Tester and select in the menu >> Offroad Stabi (ORS) >> Drive links >> clock valve VA or valve HA <<. The valve clocks (audibly) until the procedure is finished.
- Before working on the vehicle, ensure that the ORS is engaged. The indicator light on the centre console button must be OFF . If the indicator light is on, follow the following procedure: Switch on the ignition and engage the road driving programme >> High Range <<. The stabilizers must audibly engage. Now lift the vehicle.

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

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40 IN Tests/notes for all-wheel drive - as of MY 2003

- [Information](#)

Information

Balancing wheels on vehicle

Electronic fine balancing (static balancing) of the wheels on the vehicle (after stationary balancing) is not required (status July 2002).

Power test

Performance tests on roller-type test stand are not approved by Porsche!

Brake test

Brake tests may only be carried out in the road driving programme (High Range) on 1-axle roller-type test stands with four-wheel drive function. Requirements:

Transmission in neutral during test (before starting the rollers).

The following limit values must not be exceeded:

Test speed: max. 7.5 km/h.

Test duration: max. 20 seconds.

Observe specifications in the operating instructions provided by the relevant manufacturer of the axle roller-type test stand!

Parking brake test

The foot-operated parking brake may only be tested on the roller brake tester with the ignition switched off and selector lever position N selected.

Towing Tiptronic vehicles



WARNING

No power assistance for the towed vehicle when the engine is not running.

- **A lot more force has to be used when braking and steering!**

→ Always tow with extreme caution, and at low speeds. Observe the Driver's Manual.



Note

- *There is insufficient transmission lubrication when the engine is not running.*

Select position N.

Switch ignition on (otherwise steering lock will engage and brake light and indicator light won't function).

Do not exceed top speed of 50 km/h.

Maximum towing distance 50 km.

If, owing to circumstances, vehicle has to be towed with raised axle, the cardan shaft of the axle whose wheels are turning must be removed.

In the case of long towing distances, vehicle must be transported on a trailer.

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

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40 IN Overview of Cayenne running gear with steel springs - as of MY 2003

- [Information](#)

Information

Front axle

A wide-base double control arm axle is used for the front axle of the Cayenne, with wheels suspended individually on double control arms and spring struts with vibration dampers inside.

Steering

Rack-and-pinion steering gear with hydraulic support and - depending on the model - Servotronic for supporting the steering auxiliary forces when travelling slowly. Steering wheel longitudinally adjustable and with height adjustment in the corresponding model.

Rear axle

A multi-link axle is used for the rear axle of the Cayenne, with wheels suspended individually on control arms and vibration dampers inside. The Porsche-specific vehicle handling features of driving comfort and sportiness were important considerations during development.

Wheel rims and tires

The chart of tyres and wheels should be taken from Technical Information Group 4.

Brakes

Hydraulic dual-circuit brake system with diagonal brake circuit division. Vacuum brake booster, internally ventilated brake discs with six-piston AI monobloc brake calipers at front axle and four-piston AI monobloc brake calipers at rear axle.

Standard PSM with ABS, ASR (TC+MSR), ABD, lock control (lengthways)

Parking brake (foot-operated parking brake): drum brake acting mechanically on both rear wheels.

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

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40 IN Cayenne system overview - as of MY 2003

- [Information](#)

Information

General

The development team is expected to meet various requirements in developing the Cayenne, e.g. sporty vehicle handling, tough off-road mission and full suitability for everyday use with maximum driving safety. Through overall vehicle fine-tuning of the individual systems, such as axles, steering, tyres, aerodynamics and drive design, very good vehicle handling features were implemented in both on-road and off-road operations with the following technical specifications:

- Single-wheel suspension with steel springs using a large-base double control arm front axle and a multi-link rear axle (standard for Cayenne S)
- Level control system with full-supporting air suspension on both axles and electronically regulated shock absorbers (standard for Cayenne Turbo, optional for Cayenne and Cayenne S)
- Tube-type stabilizers on front and rear axle or hydraulically disengagable off-road stabilizers (optional for all Cayenne models as part of Porsche Traction Management Plus)
- Rack-and-pinion steering gear with hydraulic assistance or speed-dependent Servotronic steering assistance (optional)
- Extensive range of wheels and tyres, high-performance summer tyres, winter tyres, All Season tyres and All Terrain tyres.
- Tyre pressure monitoring system - RDK (optional)
- Operating brakes customised to suit driving dynamics
- Porsche Stability Management (PSM)
- Porsche Traction Management (PTM) or optional Advanced Off-Road technical package with PTM Plus.

System	Explanation
PSM (Porsche Stability Management)	ABS Anti-lock Brake System ABD Automatic Brake Differential ASR Anti-slip control EBD Electronic Brake Distributor MSR Engine drag torque control FDR Driving dynamics control
PTM (Porsche Traction Management)	Permanent four-wheel drive 38/62 %

PTM Plus	Electronically regulated longitudinal lock Reduction gear In addition to the PTM specifications: Electronically regulated rear axle block
Air springs with level control and vertical adjustment	Full-supporting air-spring struts with integrated shock absorbers Air supply consisting of accumulators and sensors
PASM (Porsche Active Suspension Management)	Air suspension Vibration damper with situation-dependent and continuous shock-absorption regulation with three codes (Comfort, Normal, Sport)
ORS (off-road Stabilizer System)	Enables a greater restriction of the axles when when driving off-road

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

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40 AW Safety notes and information when repairing the running gear - as of MY 2003

- [General warning notes](#)

General warning notes

Fitting vehicle parts



WARNING

Material damage. When mounting specifications are not observed, the long-term behaviour of screw-connections is not ensured.

- There can be limitations on the service life or function of the components.
- All parts used on the running gear are subject to a close visual inspection.
- Only use approved original Porsche parts.
- Replace self-locking nuts.
- The prescribed tightening torque must be strictly observed.
- Observe grease specification (for example, on steering shaft).
- Ensure that ball joint rod conical seats are clean when fitting. Clean bevel pinions with a lint-free cloth. Do not use cleaning agent.

Spring struts/coil springs



ATTENTION

There will be alterations in handling due to installing incorrect parts.

- Prior mechanical damage to coil springs due to incorrect handling by the customer or in the workshop can cause the coil springs to break, even at a later point in time.
- When installing new coil springs/spring struts, make sure they are assigned correctly according to the Spare Parts Catalogue.
- When removing and installing coil springs, only use suitable or specified tools/spring compressors.

- No welding, sanding, or separating work in the area of coil springs/spring struts. Cover coil springs/spring struts.

Wheel rims and tires



WARNING

Increased risk of accidents as a result of damage to wheels/tyres if handled improperly.

- Injuries due to the high tyre seating pressure required (max. 4 bar! this value must not be exceeded!), cannot be ruled out.
- Welding on light-alloy wheels can cause bulges, which can cause them to break if they are used.

- Tyres must be filled in the filling cage.
- If the tyres do not jump over at the max. 4 bar, the tyres must be pressed off again, and lubricated with new tyre paste and then fitted.
- Straightening and welding work on light alloy wheels is not permissible.



Note

- *Newly mounted tyres require a bedding-in period to remove the vulcanisation layer.*
- *Customers must be informed that the full performance of new tyres is achieved only after a distance of 100 to 200 km (60 to 120 miles) has been driven. Avoid extreme driving manoeuvres (acceleration, braking) during this time.*

Working on vehicles with PSM



DANGER

Risk of accident due to incorrect functioning of steering angle sensor if it is uncalibrated or incorrectly calibrated.

- There is a risk of accidents causing physical damage to persons or objects in the PSM testing area.
- After working on wheel suspension parts, when replacing the steering-angle sensor, and after changing the wheel alignment values, calibrate the steering angle sensor with the front wheels in straight-ahead position using the PIWIS tester.
- Check the actual value of the steering angle sensor after a suspension alignment where no changes were made to the wheel alignment values.

Brake system



WARNING

Increased risk of accidents and damage to the vehicle if braking effect is impaired by using non type-specific original Porsche spare parts, if the brake pads and/or brake discs are replaced too late.

- There can be limitations on the service life or function of the components.
- Use only the type-specific brake pads (correct brake pad quality) in the Porsche Spare Parts Catalogue.

When installing a new expanding spring, mount a new retaining pin and new retainer (safety bracket) or retaining pin screw on the brake calliper.

- After repairs to the brake system, the brake pressure must be built up again by applying the brake pedal several times.
- The brake pads must be replaced when the brake pad warning indicator lights up, but no later than when there is a residual pad thickness of 2 mm.
- Replace brake discs in good time (observe minimum brake disc thickness and surface condition).



Note

- *Observe brake fluid quality. Use only new DOT 4 brake fluid.*
- *The brake-fluid change interval using Super DOT4 brake fluid is two years.*
- *This brake fluid is available under the following part numbers: Container quantity: 1 litre = 000.043.203.66. 30 litres = 000.043.203.67.*

Handling air bag systems



WARNING

A triggering of the airbag (malfunction in the airbag system) caused by improper work on airbag components cannot be ruled out.

- **In the case of malfunction, an unsuitable steering wheel holder can cause injury or damage during suspension alignment work.**
- Use only steering wheel holders which do not project into the area of the airbag unit during suspension alignment work.
 - Observe safety regulations for airbag vehicles.

Steering



WARNING

Risk of accidents accompanied by danger of injury and damage to the vehicle due to incorrect handling of Pentosin CHF 11 S.

- **It is possible that the reservoir can overflow while driving if too much Pentosin CHF 11 S is added. Overflowing onto hot components can cause fires.**
 - **If coolant hoses come into contact with Pentosin CHF 11 S for a longer period of time, they will swell.**
- Observe the MAX. marking.
 - Multiple steering operations (manoeuvring) with the engine switched off change the fluid level in the reservoir. The engine must be run for approx. 20 seconds immediately prior to the fluid level check.
 - If coolant hoses come into contact with Pentosin CHF 11 S, thoroughly clean them with water IMMEDIATELY and replace if necessary.



Note

- *Rack-and-pinion steering gear and servo pump must not be repaired or dismantled.*

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23,
C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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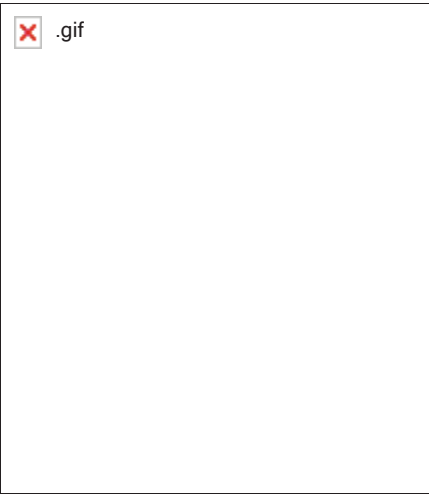
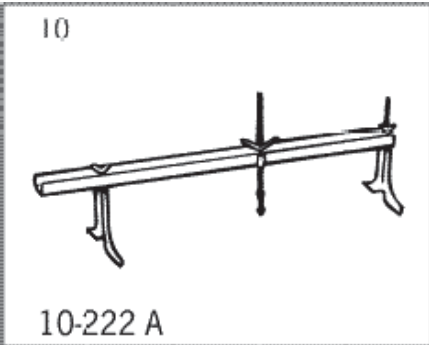
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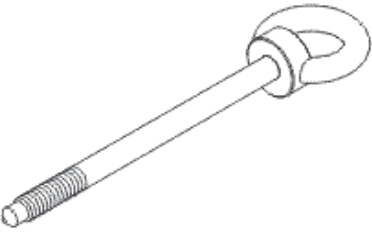
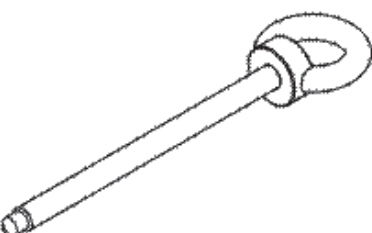
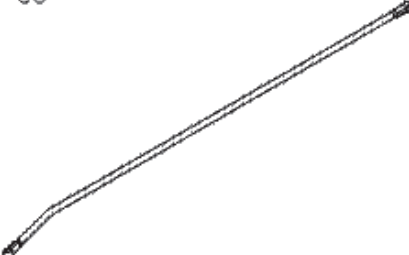
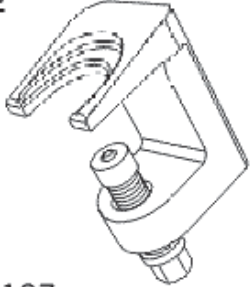
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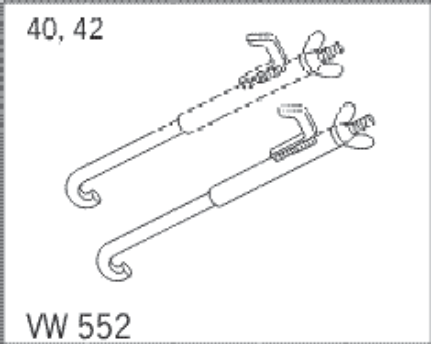
40 06 19 Removing and installing front-axle carrier - as of MY 2003

- Preliminary work
- Tools
- Removing front-axle carrier
- Installing front-axle carrier
- Subsequent work

Tools

Designation	Type	Number	Explanation	
mounting frame	commercially available tool			
Safety device	special tool	10-222 A		

Transport eyebolt	special tool	9700		10  9700 000 721 970 00
transport eyebolt	special tool	97000		10  9700 000 721 970 00
bonnet stay	special tool	97040		50  9704 000 721 970 40
press-out tool	special tool	T10187		40,42  T 10187
spring compressor	special tool	VW 552		

Preliminary work

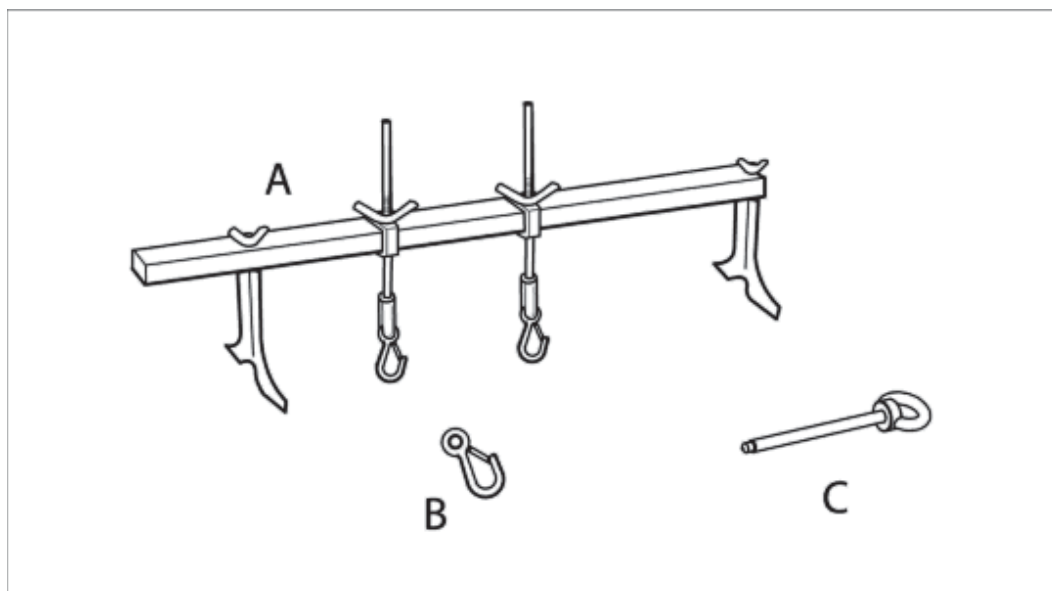
Preliminary work

In vehicles with level adjustment: Switch off level adjustment. → Lifting the vehicle

Raise the vehicle at the support points provided for this purpose. → Lifting the vehicle

Tools

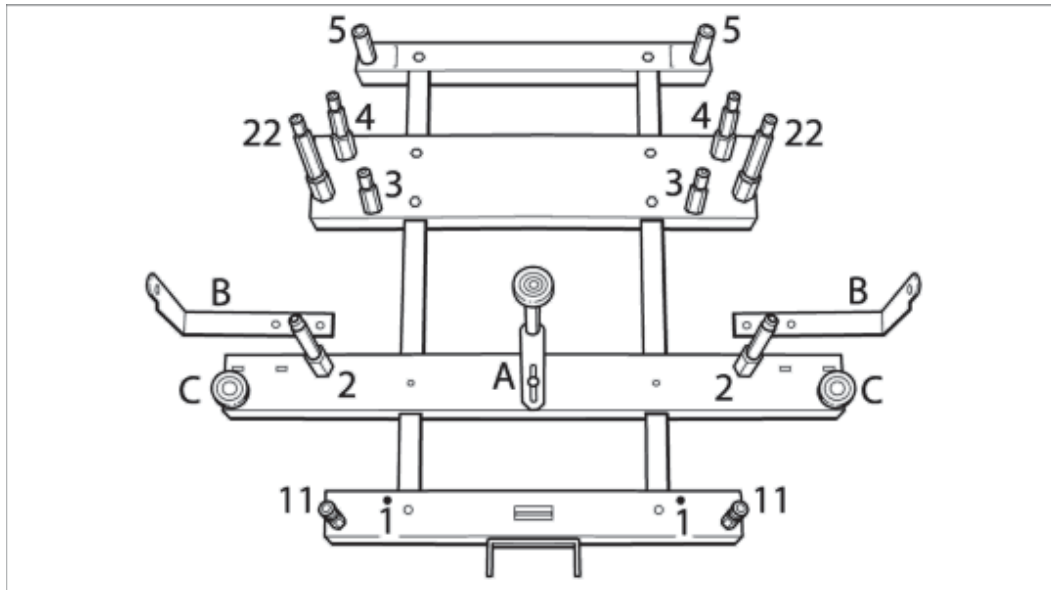
Tools



-A- - Safety device 10-222 A

-B- - Spring hook or chain - for extending the threaded rods

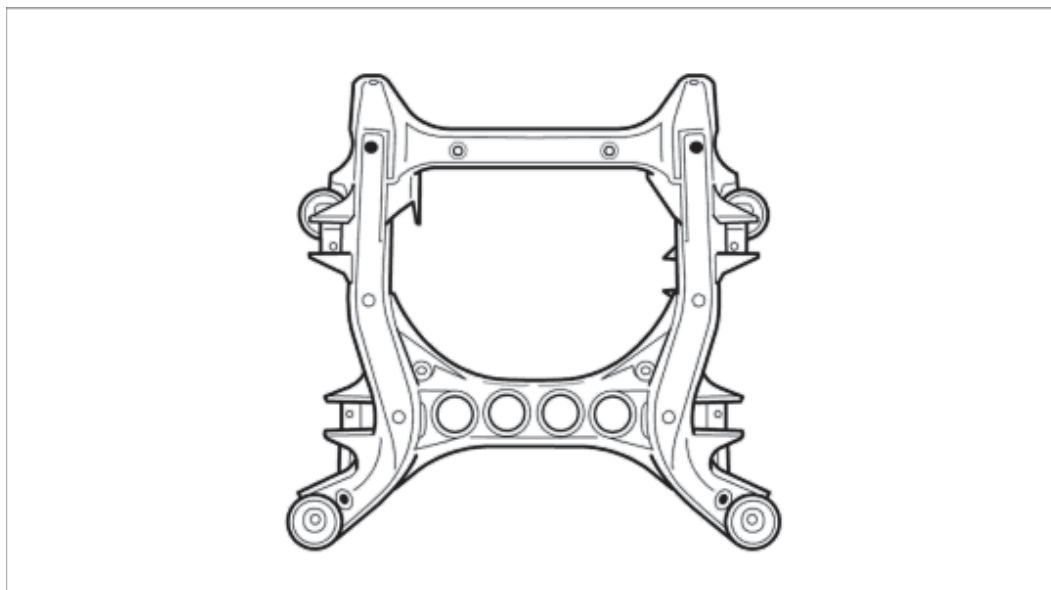
-C- - Transport eyebolt 9700



- A- - Mounting frame
- 1- - Mount - for mounting the front-axle carrier
- 3- - Mount - for mounting the front-axle carrier
- 4- - Positioning guide - for positioning the mounting frame

Removing front-axle carrier

Removing front-axle carrier - V8



ATTENTION

Increased risk of accidents when lowering in the front axle carrier.

- **Material damage and injury (e.g., crushing) can occur caused by improper work.**

- Wear protective gear, e.g. gloves.
- Position the mounting frame in the correct position on the lifting platform. Pull out front axle carrier carefully.
- Watch out for falling parts during removal on the mounting frame.



Note

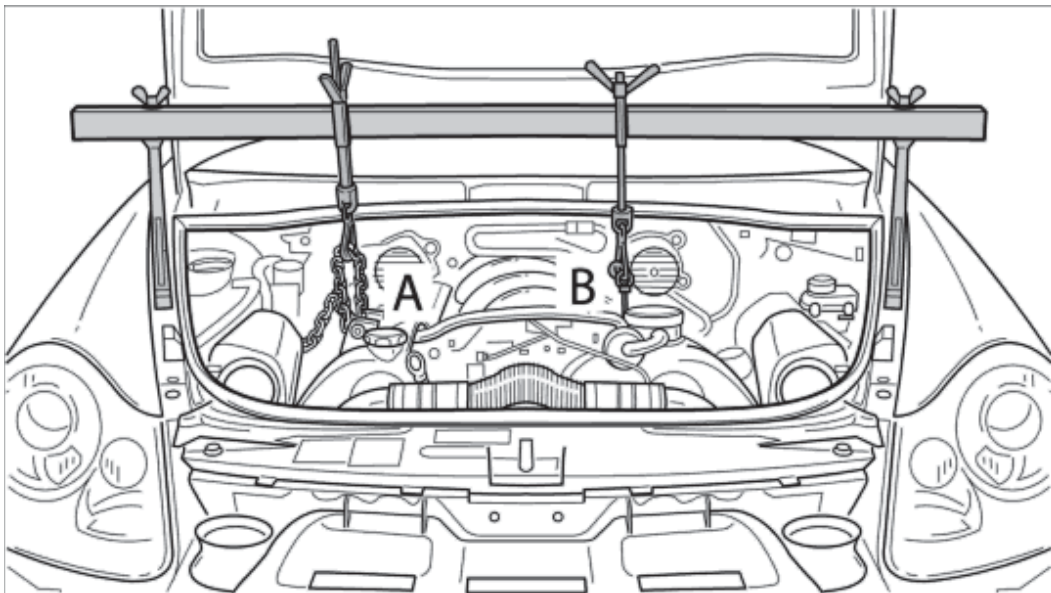
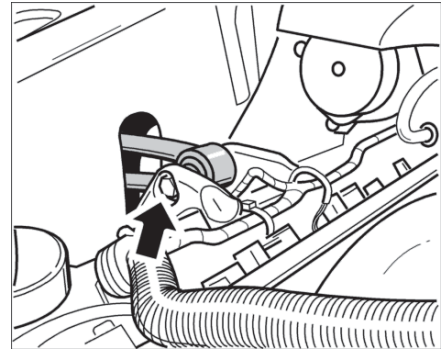
- *These removal and installation instructions apply to vehicles with level adjustment and steel springs. The points relating to level adjustment are not relevant for vehicles with steel springs.*

1. Open the engine compartment lid and secure with the **bonnet stay 97040**.
2. Remove engine design covers.



Note

- *Point 3 is not necessary for a 6-cylinder engine. There is a perforated plate at both the front right and rear left of the engine for transporting and raising to the safety device.*
3. Remove **-torque support-** from the engine. Then **-arrow-** re-insert fastening screw arrow.
 4. Position the **safety device 10-222 A** correctly and fit the chain to the fastening bracket **-A-**. Fit the **transport eyebolt 97000** for securing the engine **-B-** (the bore for the transport eyebolt is located between cylinder 6 and 7 on the left cylinder bank).



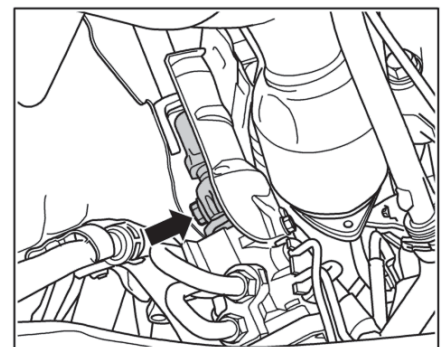
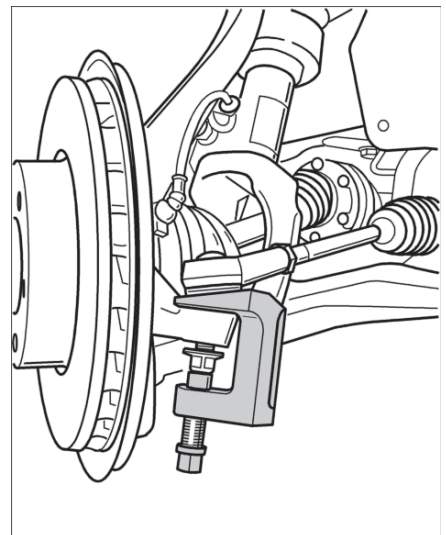
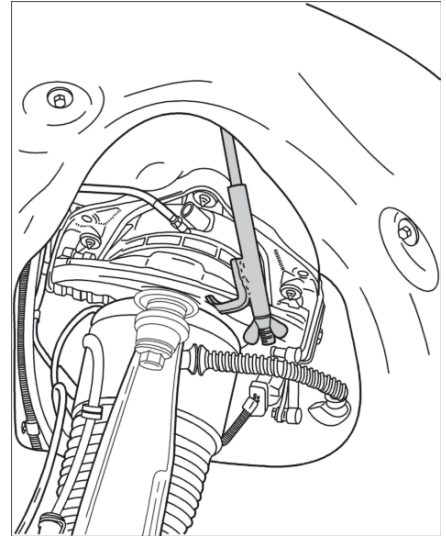
5. Remove the front wheels. → 440519 Removing and installing wheel - section on "Removing"

6. Remove engine guard. → 108019 Removing and installing engine guard - section on "Removing"



Note

- The spring struts are not removed in order to remove the front axle carrier.
 - Fix upper axle strut. The lower control arms are loosened on the front axle carrier and remain with the spring struts in the vehicle.
7. Fix upper axle struts with **spring compressor VW 552**. This involves tensioning the axle strut slightly because otherwise the top ball joint can be damaged. When doing this, engage the **-connecting piece-** into the top opening of the wheel well (double panel, under the wheel housing cover) and into the axle strut (do not disconnect the air spring connection!).
8. For easier removal of the outer tie rod end, swivel the relevant wheel carrier so that the tie rod extends fully. Remove the **-outer tie-rod joints-** using **press-out tool T10187**. When pressing out, screw fastening nut on flush (protects the ball joint thread).
9. The screw in the steering shaft is removed from the wheel well. Release the coolant hoses from the holders on the body. Release the **-steering column screw (arrow)-** from the steering gear.
10. Remove the hydraulic lines from the steering gear (collect hydraulic fluid in a suitable container). Remove the heat shield of the steering, if necessary.
11. Mark the installation position of the cardan shaft and remove it from the front-axle final drive. Make sure that the cardan shaft does not become kinked (tie it up). → 390219 Removing and installing front cardan shaft - section on "Removing" [9PAAE1 9PAAF1] → 390219 Removing and installing front cardan shaft - section on "Removing" [9PAAE7]
12. Remove drive shafts from the front-axle final drive. Make sure that the drive shafts do not become kinked (tie them up).



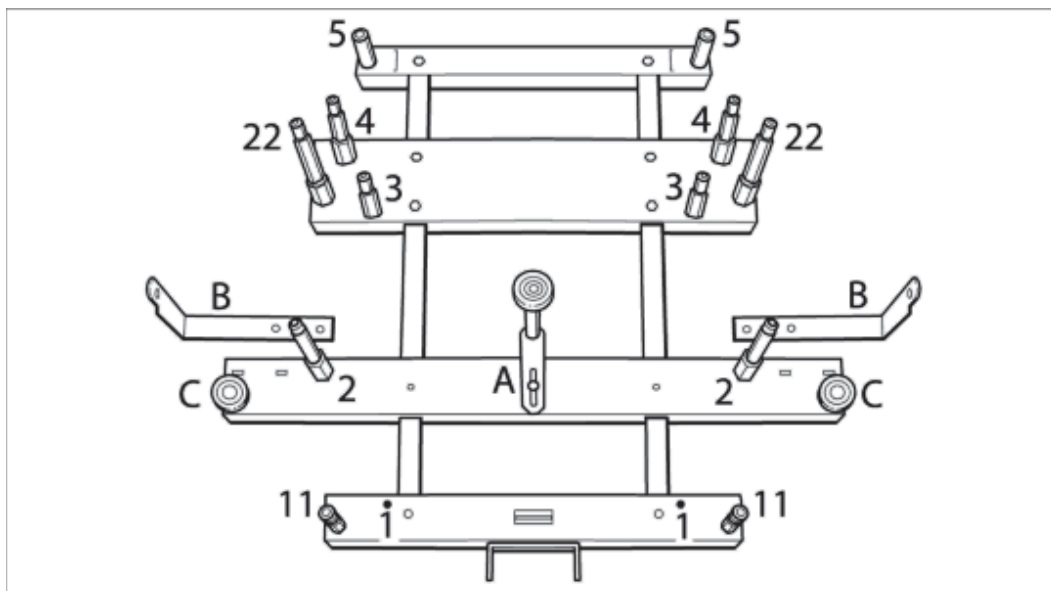
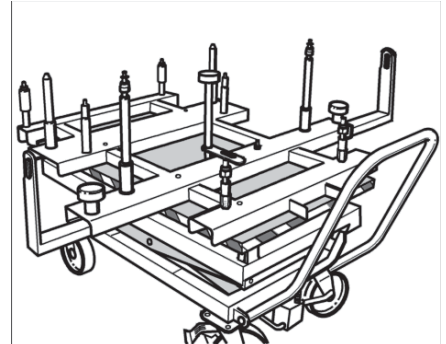
13. Remove lower control arms from the front axle carrier.

14. Remove stabiliser mount.



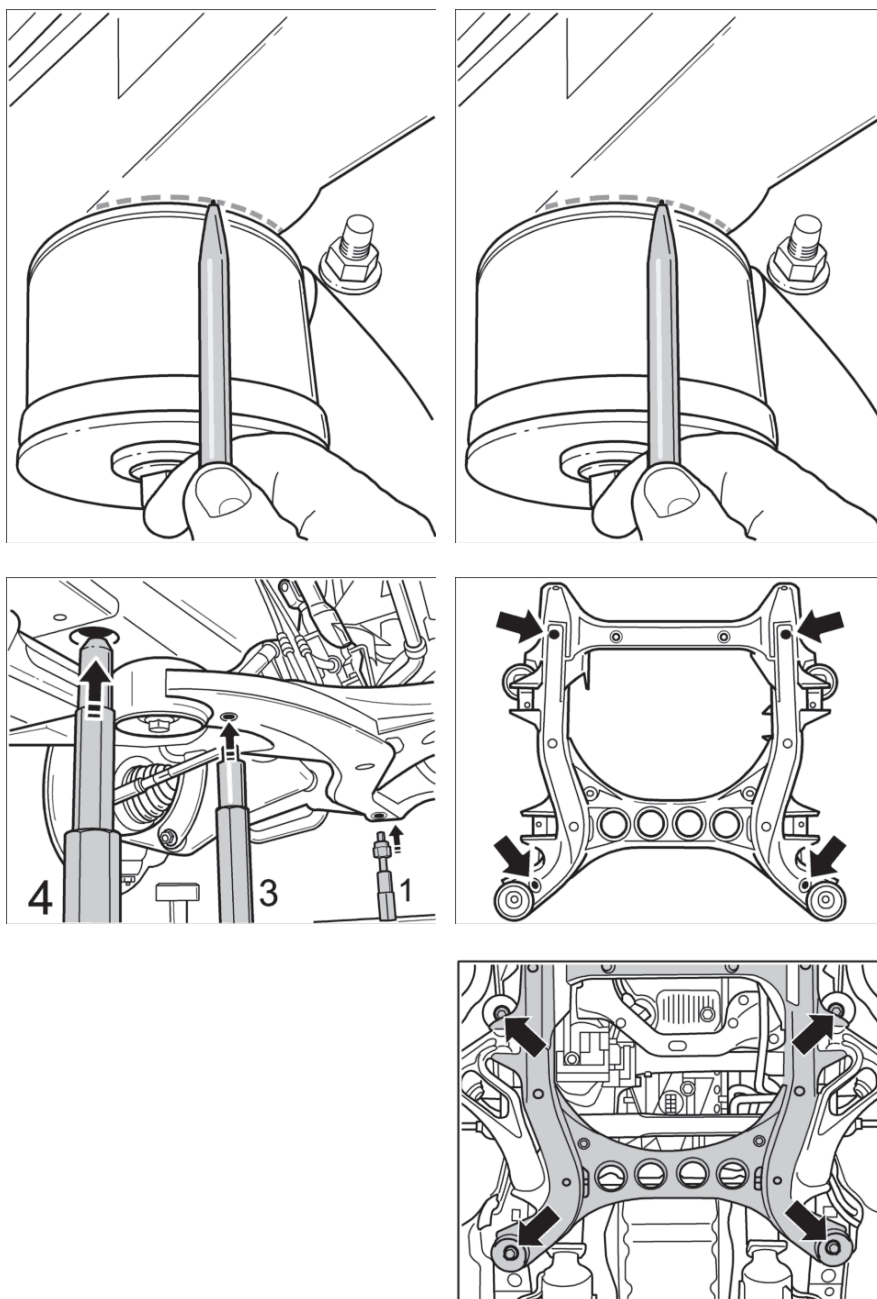
Note

- The mounting points for the front axle carrier (1 and 3), both right and left, and the two positioning guides (4) that are pushed into the body are required for removing the front axle carrier. The other mounting points can be removed.
- The mounting points 1/11 (designation on the guide pin) are fitted into **-Position 1-**. Double codes (e.g. 11, 22) are also used for mounting the rear axle.



Mounting frame

- A second worker is required in order to avoid damaging adjacent components when lowering the front axle carrier.
 - For installation, it is a good idea to mark the installation position of the front axle carrier diagonally at at least two places on the body. To do this, place the marks vertically with respect to the floor of the body using a felt-tip pen (e.g. mark along the front-axle carrier mount with the pen).
15. Position the **-workshop trolley-** with the correctly positioned **mounting frame** under the front axle carrier.
16. Mark the installation position of the front axle carrier diagonally at at least two places on the body.
17. The **-arrow-** show the mounting points for the mounting frame in the front axle carrier (view from below here).
18. Position the front axle carrier into the mounting points provided **-(arrows)-** (points 4 in the body).
19. Remove the 4 fastening screws **-(arrows)-** of the front axle carrier.



20. Lower the front axle carrier with steering, final drive and stabiliser. Be careful not to damage adjacent parts (e.g. cardan shaft, oil pan, body).

21. Remove accessories from the front axle carrier (steering, final drive, stabiliser). Get another worker to help.

Installing front-axle carrier

Installing front-axle carrier - V8



ATTENTION

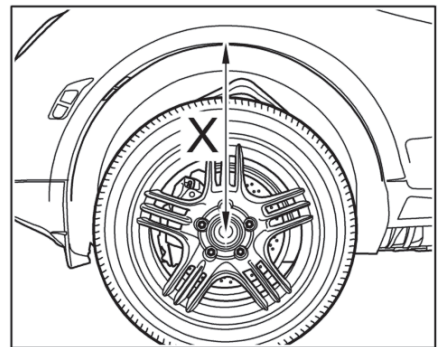
Increased risk of accidents when running in the front axle carrier.

- Material damage and injury can occur.
 - Material damage and injury if the wheel carrier is raised improperly.
- Position the mounting frame correctly on the lifting platform and carefully install the front axle carrier.
- Do not raise the wheel suspension higher than the normal vehicle position (vehicle resting on wheels). When raising the suspension, use a suitable intermediate layer (hard rubber) .
- Do not damage the brake cover plate.
- Watch out for falling parts during installation on the mounting frame.
- The steering angle sensor must be calibrated following repairs.

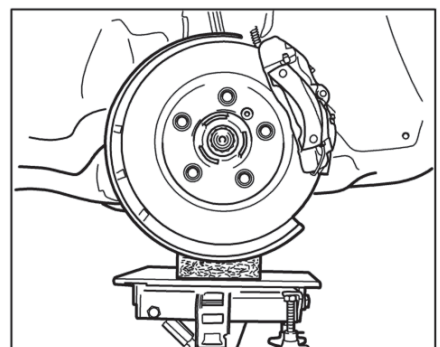


Note

- Before installing, give the parts a visual check.
- Note previously applied markings on the front axle carrier and on the cardan shaft.
- A second worker is required in order to avoid damaging adjacent components when fitting the front axle carrier.
- When fitting the ball joints, ensure that the bevel pinions are clean! Remove dirt or grease on bevel pinions, e.g. with a lint-free cloth. Do not use cleaning agent/solvent.
- Replace all fastening nuts and all expansion screws (screws which are fitted with torque angle tightening procedure).
- The entire threaded parts of the axle must be tightened in vehicle position. Vehicle position means: vehicle standing on the wheels, or the wheel suspension is raised using a universal vehicle lift. **-Dimension X-** , corresponds to vehicle position. → **Check dimension: 502 mm +/-10 mm**



- Do not raise the wheel suspension higher than the normal vehicle position (vehicle resting on wheels). When raising the suspension, use a suitable **-intermediate layer (hard rubber)-** . Do not damage the brake cover plate.
- Bleed power-assisted steering → Test and assembly work on power steering.
- Observe correct tightening torques .
- Align vehicle → Suspension alignment, complete.

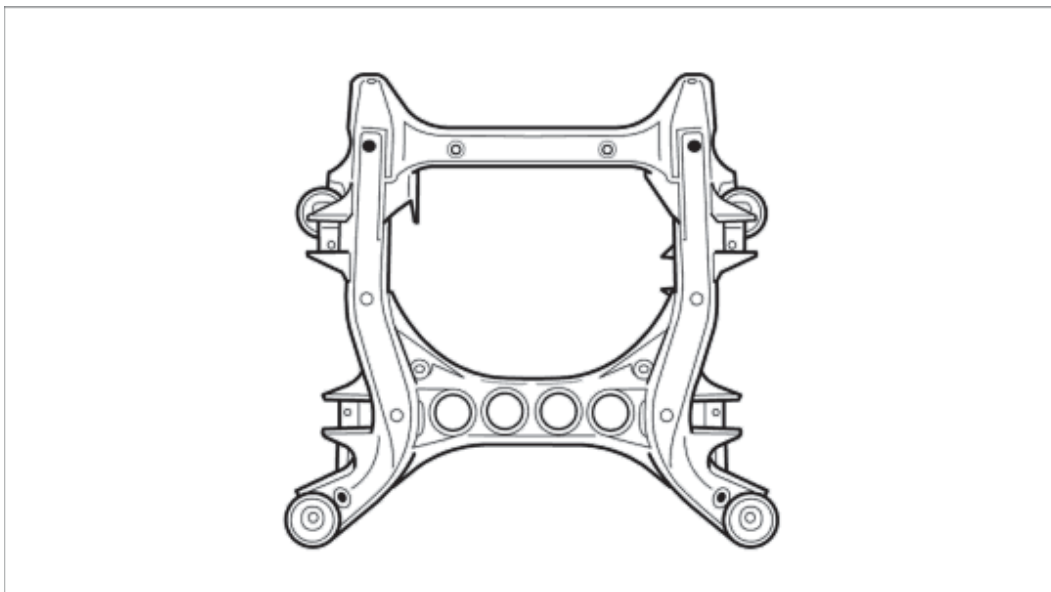
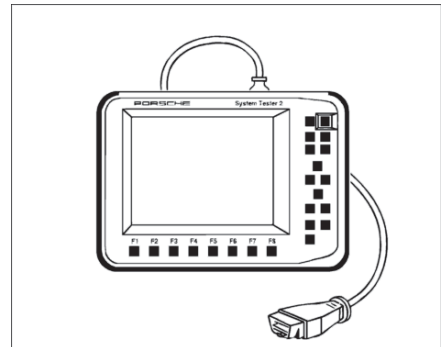


- Use the **-Porsche System Tester-** to calibrate the steering-angle sensor → *Initialising and calibrating steering-angle sensor.*
- Perform a function test.

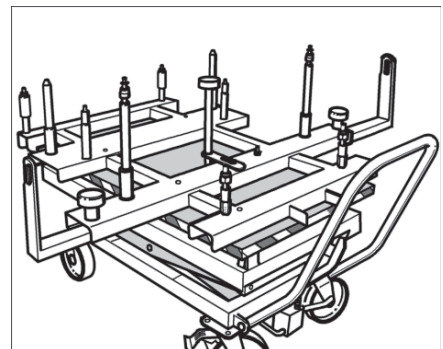
Install in reverse order.

These removal and installation instructions apply to vehicles with level adjustment and steel springs. The points relating to level adjustment are not relevant for vehicles with steel springs.

1. Position the **-front-axle carrier-** on the mounting frame.

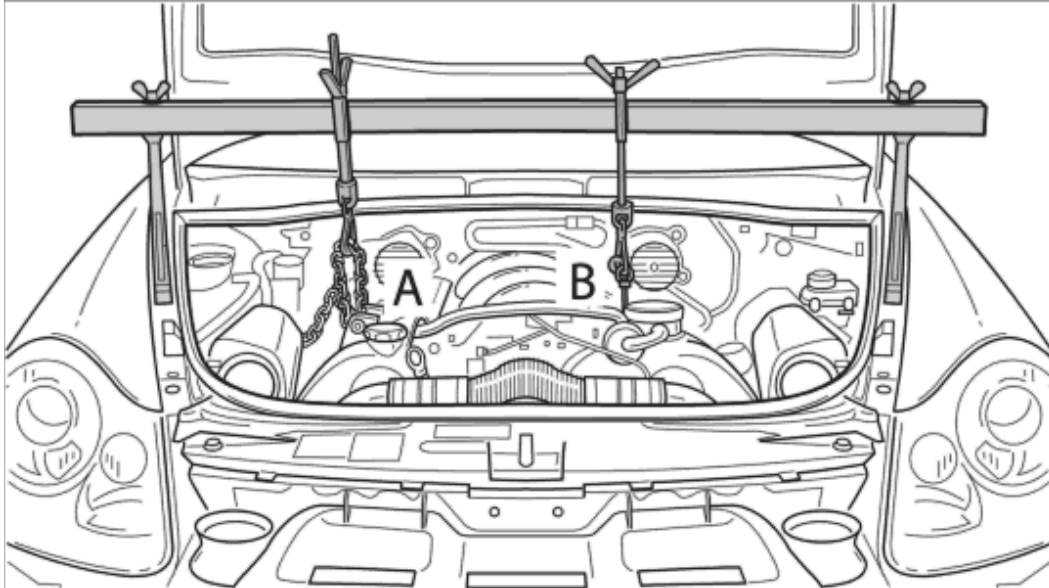


2. Pre-fit the accessories on the front axle carrier (steering, final drive, anti-roll bar). Get another worker to help.
3. Position the front axle carrier back in the original, marked installation position and be careful not to damage adjacent parts.
4. Tighten the four fastening screws to the prescribed tightening torque.
5. Remove the **-workshop trolley-** with the **mounting frame** and secure the water hose holders.
6. Fit the steering gear to the steering column and connect the hydraulic lines.
7. Fit the cardan shaft at the points marked. → 390219 Removing and installing front cardan shaft - section on "Installing" [9PAAE1 9PAAF1] → 390219 Removing and installing front cardan shaft - section on "Installing" [9PAAE7]
8. Install the drive shafts.
9. Fit the tie rod ends. The tightening torque for the fastening nut for attaching the tie rod end is 70 Nm (52 ftlb.).

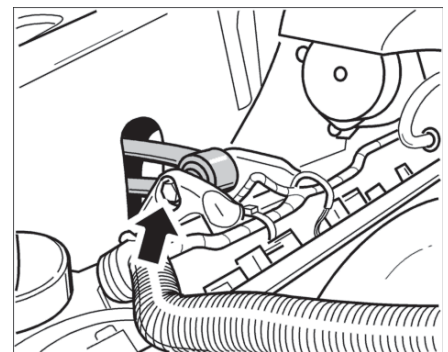


Front axle carrier

10. Fit the engine guard → 108019 Removing and installing the engine guard - section on "Installing" and the front wheels → 440519 Removing and installing wheel - section on "Installing".
11. Remove the **safety device 10-222 A**. To do this, remove the **transport eyebolt 97000 -B-** and the chain **-A-**, which is used to secure the engine.



12. Fit the **-torque support-**.
13. Bleed power-assisted steering → Test and assembly work on power steering.
14. Fit engine design covers and radiator tank cover.



Subsequent work

Subsequent work

Switch on level adjustment → Lifting the vehicle.

Align the vehicle → Suspension alignment, complete and calibrate it → Initialising and calibrating steering-angle sensor.

9PAAE1, 9PAAE7, 9PAAF1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

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AVERTISSEMENT

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ATTENZIONE

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ADVERTENCIA

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40 11 55 Replacing bearings for carrier - as of MY 2003

- Preliminary work
- General warning notes
- Tools and materials
- Replacing
- Subsequent work

Tools

Designation	Type	Number	Explanation	
Counter support, 0 - 40 mm	commercially available tool	NR.106		
Internal puller	commercially available tool	NR.108		PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
Separating device, 12 - 115 mm ø	commercially available tool	NR.111		

				
assembly fixture	VW-tool	T10301		PORSCHE siehe Handbuch Werkstattaufrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照

Preliminary work

Preliminary work

1. Switch off level adjustment. → 40 *Lifting the vehicle*

On vehicles with ORS, depressurise the system using the PIWIS Tester.

- Before working on the vehicle, ensure that the ORS is engaged. The indicator light on the centre console button must be OFF. If the indicator light is on, follow the following procedure: Switch on the ignition and engage the road driving programme >> High Range <<. The anti-roll bars must engage audibly.
 - Before working on the ORS, always depressurise the system! To do this, close the PIWIS Tester and select >> Offroad Stabi (ORS) >> Drive links >> Clock FA valve or RA valve <<. The valve clocks (audibly) until the procedure is finished (approx. 20 seconds).
2. Lift the vehicle. → 40 *Lifting the vehicle*
 3. Remove underbody protection. → 50 *Underbody protection*

General warning notes

Warning notes for ORS



WARNING

Risk of accidents! The Offroad Stabilizer System (ORS) operates at an overpressure of up to 165 bar. Under certain conditions, motions can occur on the wheel carrier (e.g. if the Offroad stabilizers are disengaged when lifting, the button is pressed on the centre console, and the wheel carrier is also raised). The stabilizer can close quickly.

- **Danger of crushing in the area of the stabilizers and wheel carriers. Risk of injury and material damage due to raising the wheel carrier incorrectly.**
- Before working on the vehicle, ensure that the ORS is engaged. The indicator light on the centre console button must be OFF. If the indicator light is on, follow the following procedure: Switch on the ignition and engage the road driving programme >> High Range <<. The anti-roll bars must engage audibly.
- Before working on the ORS, always depressurise the system! To do this, close the PIWIS Tester and select >> Offroad Stabi (ORS) >> Drive links >> Clock FA valve or RA valve <<. The valve clocks (audibly) until the procedure is finished (approx. 20 seconds).



ATTENTION

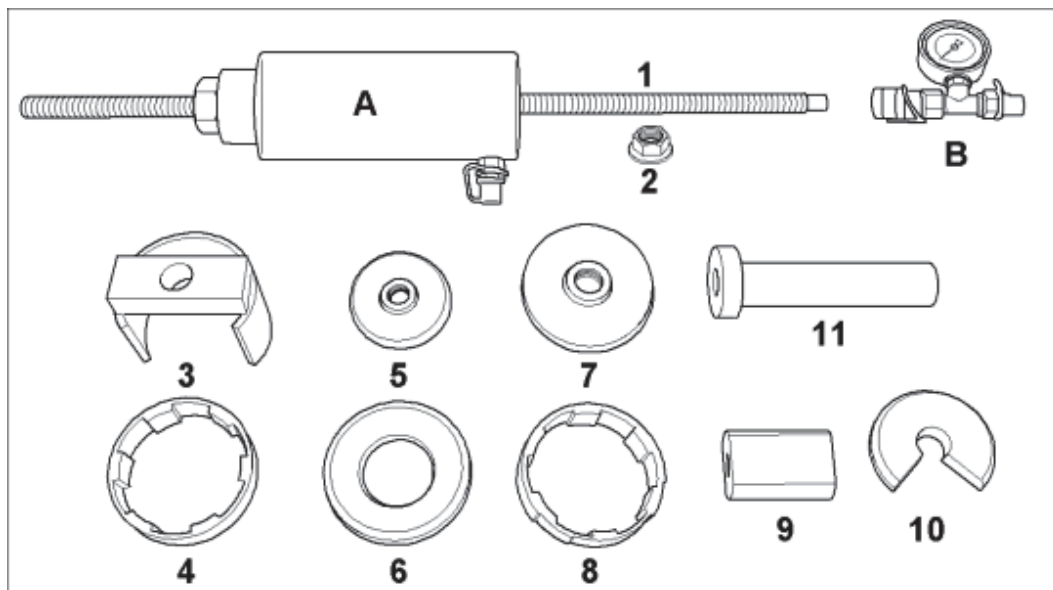
Danger of injury due to falling tools.

- **Danger of crushing and deformation**
- Always use industrial footwear, goggles and protective gloves.

Tools and materials

Tools

Tool overview for suspension subframe bearings **assembly fixture T10301**



Tool overview for suspension subframe bearings

-A- - → Hydraulic cylinder VAS 6178 (The hydraulic cylinder is used together with the → foot pump VAS 6179 and the → pressure gauge with connecting cable VAS 6179/1 **-B-** .)

- 1- - Threaded rod (Inserted into the tubular piston cylinder -A- .)
- 2- - Threaded nut (Screwed onto the threaded rod -1- .)
- 3- - Pipe (For pressing out the suspension subframe bearings.)
- 4- - Ring (For pressing out the suspension subframe bearings.)
- 5- - Press-out plate (For pressing out the suspension subframe bearings.)
- 6- - Pressure piece (For pressing in the suspension subframe bearings.)
- 7- - Press-in plate (For pressing in the suspension subframe bearings.)
- 8- - Ring (For pressing out the suspension subframe bearings.)
- 9- - Spacer sleeve (For pressing out the suspension subframe bearings together with pipe -3- .)
- 10- - Pressure piece (For pressing in the suspension subframe bearings.)
- 11- - Spacer sleeve (For pressing in the suspension subframe bearings.)

Counter support, 0 - 40 mm NR.106

Internal puller NR.108

Separating device, 12 - 115 mm ø NR.111

Replacing

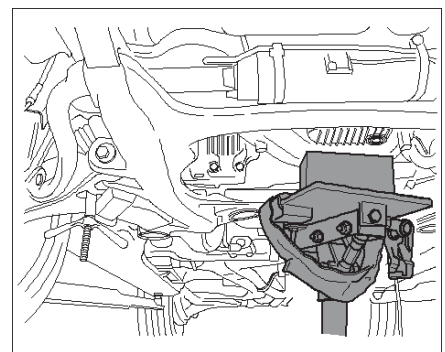
Replacing bearings for carrier, front FA



Note

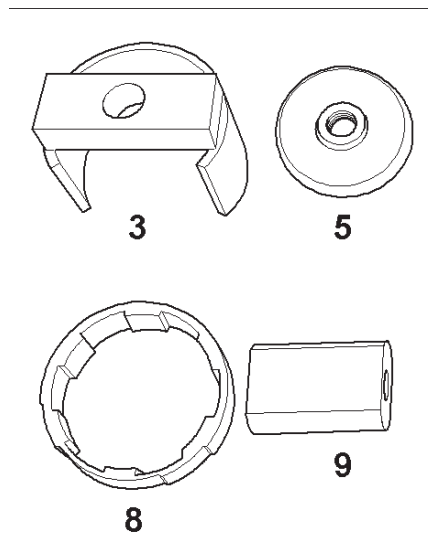
If a suspension subframe bearing is replaced, the other bearings must also be checked for cracks or other signs of damage.

1. Loosen the anti-roll bar from the connecting link on both sides. (Do not loosen the anti-roll bar for the rear front-axle bearings!)
2. Move the gear support under the engine transverse bar and lift it slightly using a suitable base (e.g. hard rubber support). (The gear support is not needed for the rear front-axle bearings).

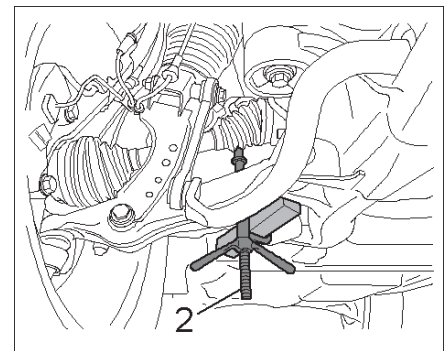


Positioning the lift

3. Engage the spindle at the eyelet on the engine transverse bar at the side where you want to replace the bearing. Guide the spindle through the lower trailing arm and tighten the spindle slightly so that the spindle is slightly tensioned.
4. Loosen the suspension subframe bearing on both sides, carefully lower the gear support (loosen the spindle carefully at the same time) until you get the clearance needed for using the press-out tool.



Tools for pressing out front-axle bearings at the front



Fitting the spindle

5. Press out suspension subframe bearing.



Note

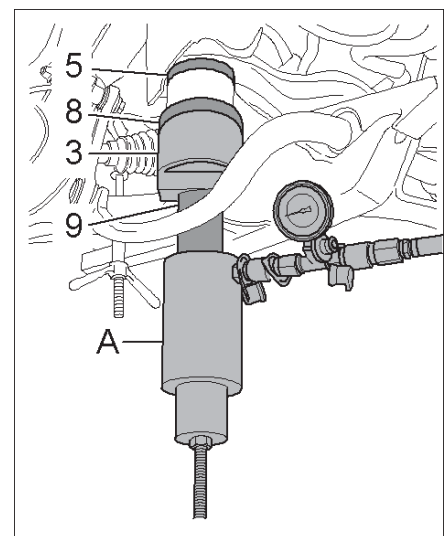
Hold the hydraulic cylinder VAS 6178 tightly while pressing it out.

6. Attach the tools as shown in the illustration and press out the bearing.



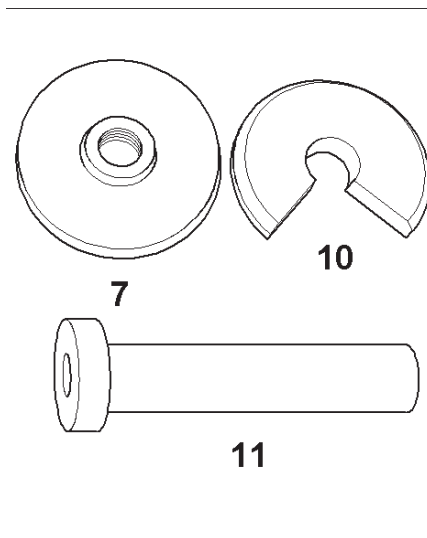
Note

When replacing bearings, please make sure that one arrow is pointing in the direction of travel while the other arrow is pointing away from the direction of travel.

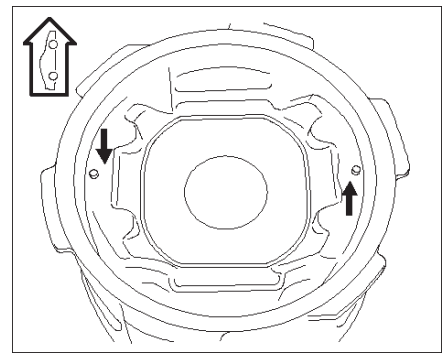


Pressing out front-axle bearing at the front

7. Fit suspension subframe bearing and pay attention to installation position.
8. Press in suspension subframe bearing. To avoid damaging the bearing, the maximum → **Pressure: 10 kN +/-5 Sekunde** must not be exceeded at the stop (10 kN = 350 bar). This conversion applies only to the hydraulic cylinder VAS 6178. The conversion depends on the diameter of the cylinder in question.
9. Attach the tools as shown in the illustration and press in the bearing.



Tools for pressing in front-axle bearings at the front



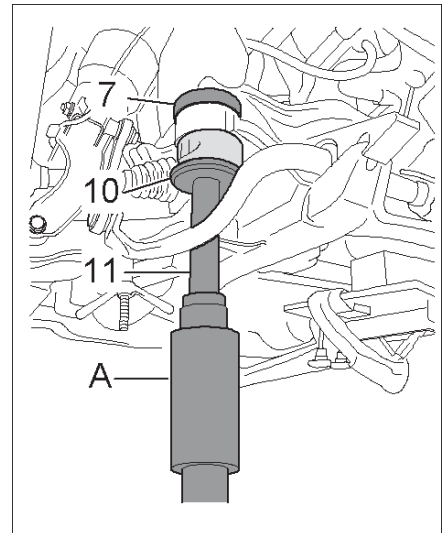
Marking on suspension subframe bearing



Note

Observe correct tightening torques.

10. Carefully lift the suspension subframe until the installation position is reached. Fit threaded joint on suspension subframe bearing.
11. Mount anti-roll bar on the connecting link.
12. Remove the spindle.



Pressing in front-axle bearing at the front

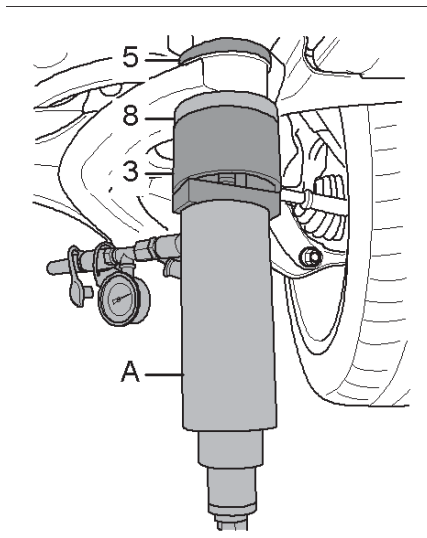
Replacing bearings for carrier, rear FA



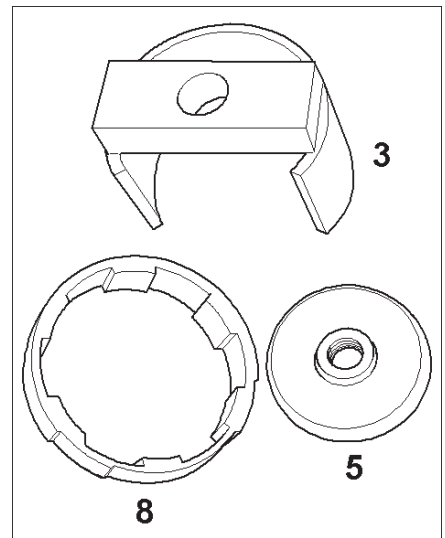
Note

If a suspension subframe bearing is replaced, the other bearings must also be checked for cracks or other signs of damage.

1. Engage the spindle at the eyelet on the engine transverse bar at the side where you want to replace the bearing. Guide the spindle through the lower trailing arm and tighten the spindle slightly so that the spindle is slightly tensioned.
2. Loosen the suspension subframe bearings on both sides. Loosen the spindle carefully until there is sufficient clearance for using the press-out tool.
3. Press out suspension subframe bearing.



Pressing out front-axle bearing at the rear



Tools for pressing out front-axle bearings at the rear

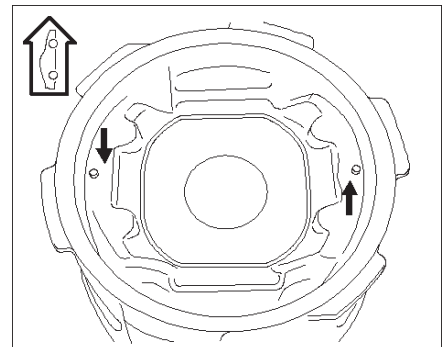
4. Attach the tools as shown in the illustration and press out the bearing.



Note

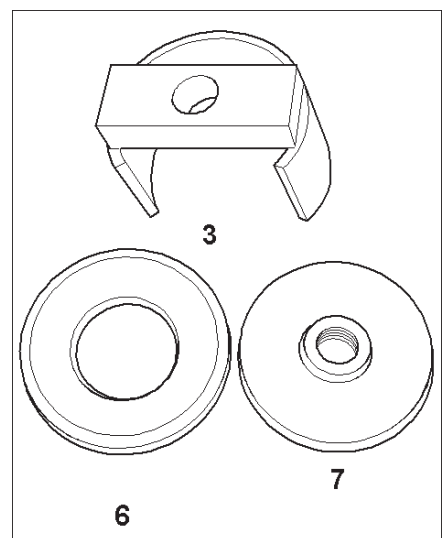
When replacing bearings, please make sure that one arrow is pointing in the direction of travel while the other arrow is pointing away from the direction of travel.

Fit suspension subframe bearing and pay attention to installation position.



Marking on suspension subframe bearing

5. Press in suspension subframe bearing. To avoid damaging the bearing, the maximum → **Pressure: 10 kN +/-5 Sekunde** must not be exceeded at the stop (10 kN = 350 bar). This conversion applies only to the hydraulic cylinder VAS 6178. The conversion depends on the diameter of the cylinder in question.



Tools for pressing in front-axle bearings at the rear

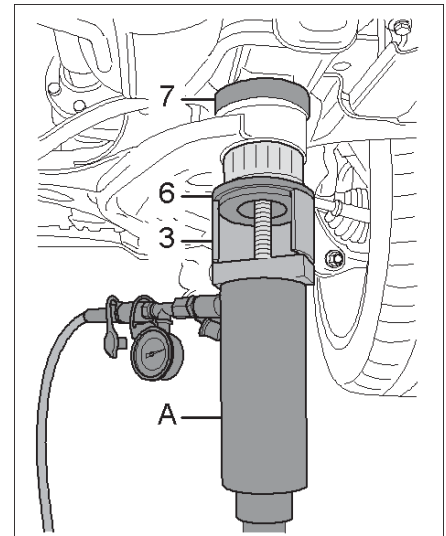
6. Connect the tools together as shown in the illustration.



Note

Observe correct tightening torques.

7. Carefully lift the suspension subframe until the installation position is reached. Fit threaded joint on suspension subframe bearing.
8. Remove the spindle.



Tools for pressing in front-axle bearings at the rear

Subsequent work

Subsequent work

1. Fit underbody protection. → 50 *Underbody protection*

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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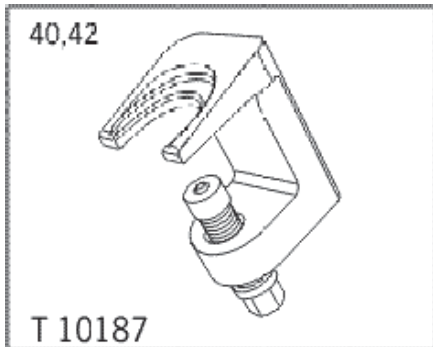
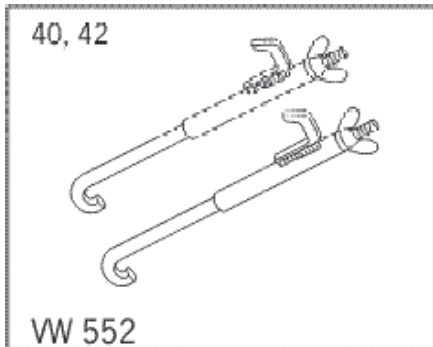
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40 15 19 Removing and installing top axle strut - Steel spring - as of MY 2003

- Preliminary work
- Tools
- Removing upper axle strut
- Installing upper axle strut
- Subsequent work

Tools

Designation	Type	Number	Explanation	
press-out tool	special tool	T10187		
spring compressor	workshop equipment	VW 552		

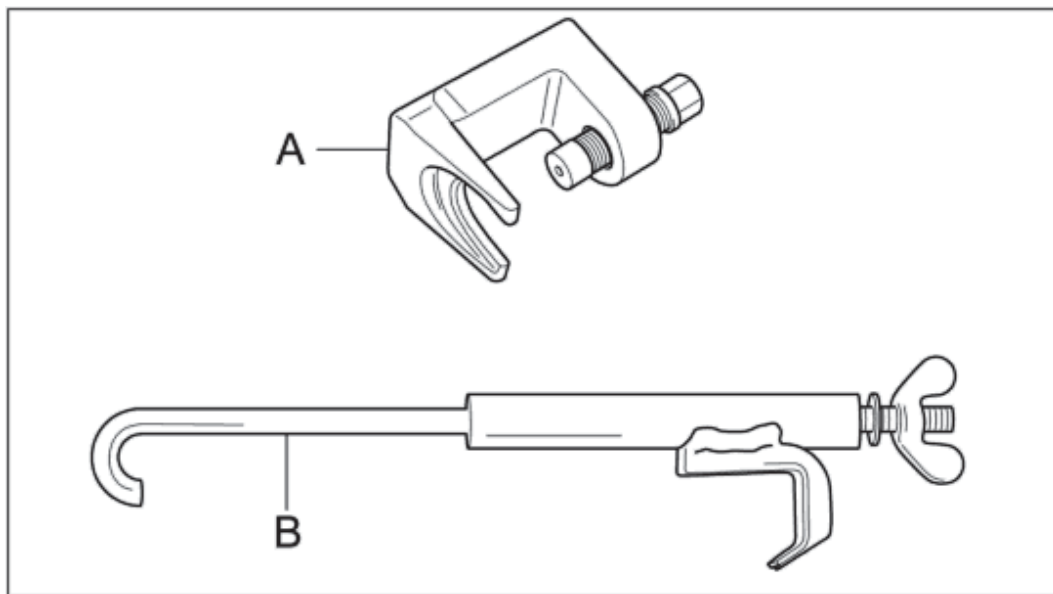
Preliminary work

Preliminary work

Remove the wheel. → 440519 Removing and installing wheel - chapter on "Removing"

Tools

Trailing arm tools



- A- - press-out tool T10187 - to press out the ball joint on the wheel carrier.
- B- - spring compressor VW 552 - for slightly tensioning the upper trailing arm.

Removing upper axle strut

Removing upper trailing arm



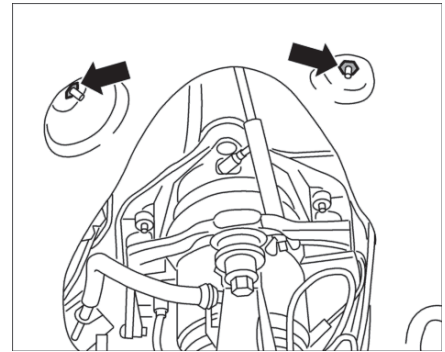
ATTENTION

Increased risk of accidents if the wheel carrier is raised improperly!

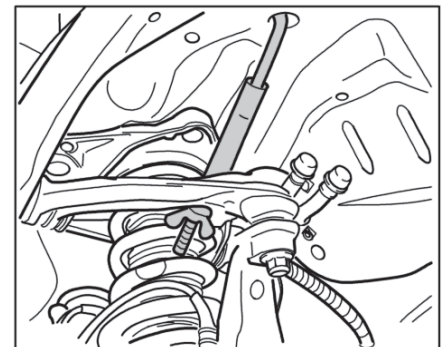
- Injuries and material damage are possible.

- Do not raise the wheel suspension higher than the normal vehicle position (vehicle resting on wheels).
- When raising the suspension, use a suitable intermediate layer (hard rubber) .
- Do not damage the brake cover plate.

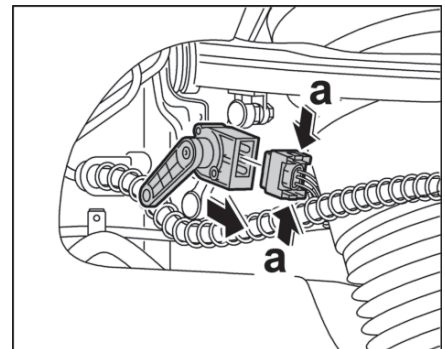
1. Unscrew plastic nuts **-arrows-** on front wheel housing liner.



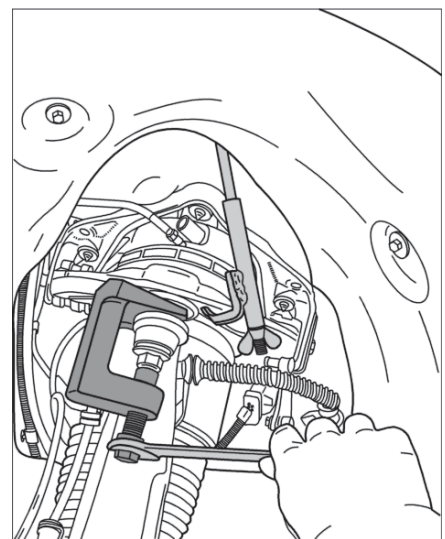
2. Fix upper axle strut with **spring compressor VW 552**. This involves tensioning axle strut slightly because top ball joint can otherwise get damaged. When doing this, the **-Spring compressor-** is pushed through the hole in the axle strut, engaged in the upper opening of the wheel well (double panel) and in the axle strut and tightened with the nut. This is only necessary if the same control arm is reinstalled.



3. Unlock plug from HBA **-A-** and remove **-arrow-** .



4. Release fastening nut and press ball joint rod off with the **press-out tool T10187**.
5. Remove spring strut. → 408519 Removing and installing front spring strut (steel springs) - chapter on "Removing" [9PAAD1 9PAAD7 9PAAE1 9PAAE7]→ 408519 21 Removing and installing front spring strut (steel springs) - chapter on "Removing" [9PAAF1 9PAAJ1]
6. Unscrew fastening screws at the sides and remove axle strut.
7. If control arm does not have to be used again, HBA sensor must be fitted on new control arm.



Installing upper axle strut

Installing upper trailing arm



ATTENTION

Increased risk of accidents if the wheel carrier is raised improperly!

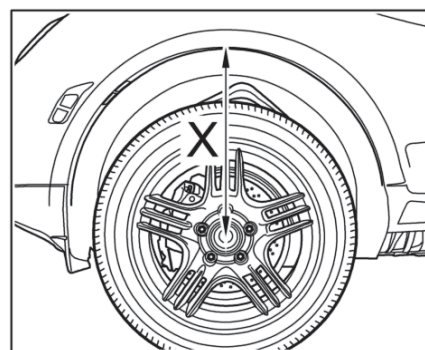
- Injuries and material damage are possible.

- Do not raise the wheel suspension higher than the normal vehicle position (vehicle resting on wheels).
- When raising the suspension, use a suitable intermediate layer (hard rubber) .
- Do not damage the brake cover plate.

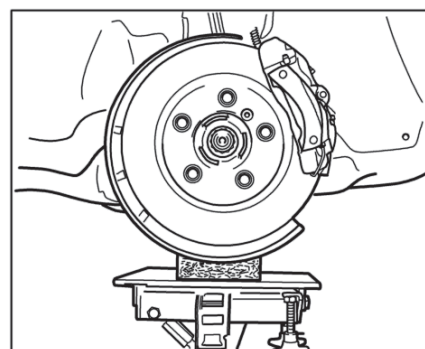


Note

- The entire threaded parts of the axle must be tightened in vehicle position. Vehicle position means: vehicle standing on the wheels, or the wheel suspension is being raised with a universal vehicle lift.
-Dimension X- , from → **Control value: 502 mm +/-10 mm** corresponds to the vehicle position.



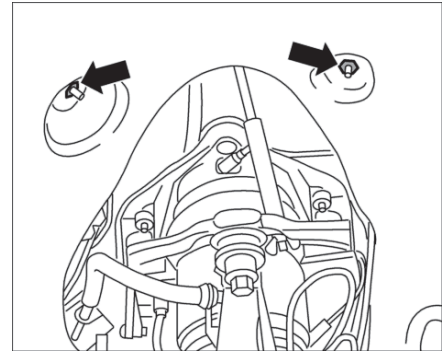
- Use an intermediate layer (hard rubber). Do not damage the brake cover plate.
- Screws are Dacromet-coated and must not be greased.
- Grease the toothing of the drive shaft slightly with aluminium paste Optimoly TA.
- Do not leave drive shafts hanging from the joint stop. Support wheel carriers.
- Use new screws and fastening nuts.



- Make sure the bevel pinions from the ball joints are clean. Clean with a lint-free cloth as necessary. Do not use cleaning agent.
- Observe correct tightening torques. → Tightening torques for front axle

1. Install HBA sensor and tighten at tightening torque. → 40 Tightening torques for front axle.
2. Insert upper trailing arm and fastening bolts. Fit lock nuts and tighten to specified tightening torque. → Tightening torques for front axle
3. Install spring strut → 408519 Removing and installing front spring strut (steel springs) - chapter on "Installing" [9PAAD1 9PAAD7 9PAAE1 9PAAE7]→ 408519 23 Removing and installing front spring strut (steel springs) - chapter on "Installing" [9PAAF1 9PAAJ1].

4. Insert wheel carrier in the ball joint, fit lock nuts, and tighten to specified tightening torque. → Tightening torques for front axle
5. Attach HBA connector.
6. Tighten plastic nuts **-arrow-** on front wheel housing liner.



Subsequent work

Subsequent work for trailing arm

Fit the wheel → 440519 Removing and installing wheel - chapter on "Installing" and tighten to specified tightening torque. → Tightening torques for front axle

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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ATTENZIONE

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- Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.
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→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



ADVERTENCIA

Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.

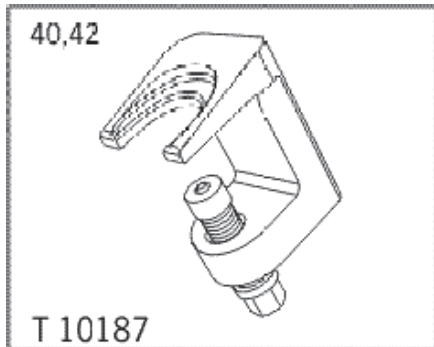
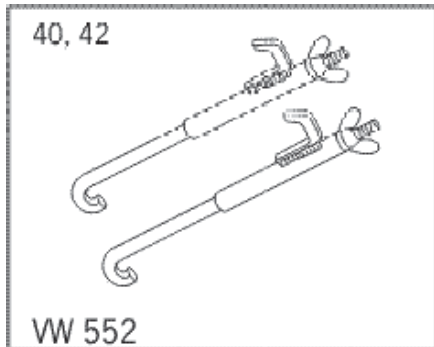
- Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

40 17 19 Removing and installing bottom axle strut - as of MY 2003

- Preliminary work
- Tools
- Removing lower axle strut
- Installing lower axle strut
- Subsequent work

Tools

Designation	Type	Number	Explanation	
press-out tool	special tool	T10187		
spring compressor	workshop equipment	VW 552		

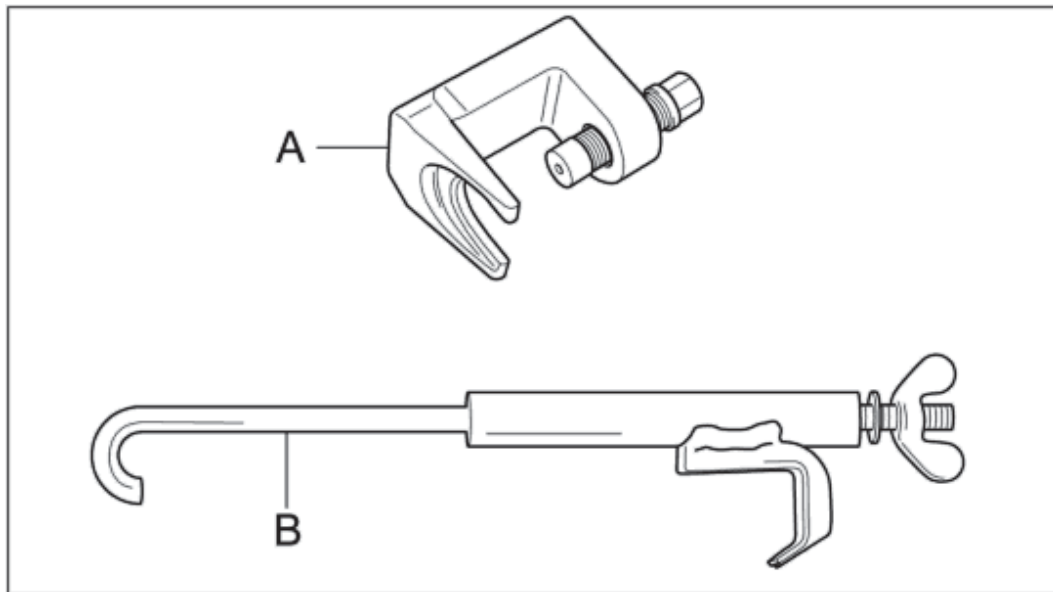
Preliminary work

Preliminary work

Remove the wheel. → 440519 Removing and installing wheel - chapter on "Removing"

Tools

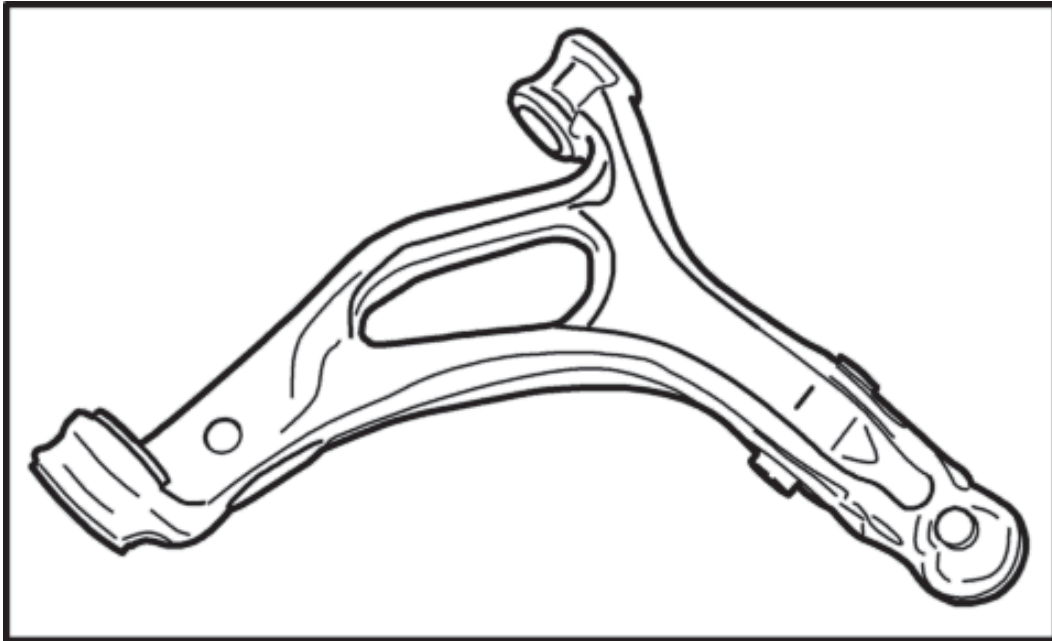
Trailing arm tools



- A- - press-out tool T10187 - to press out the ball joint on the wheel carrier.
- B- - spring compressor VW 552 - for slightly tensioning the upper trailing arm.

Removing lower axle strut

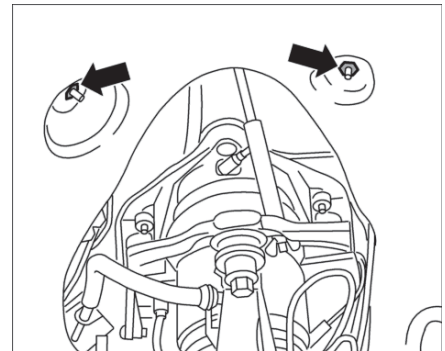
Removing lower trailing arm



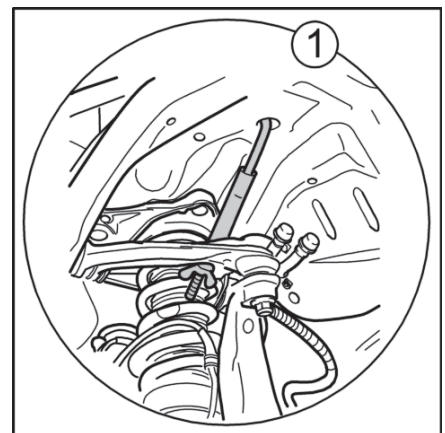
ATTENTION

Increased risk of accidents if the wheel carrier is raised improperly!

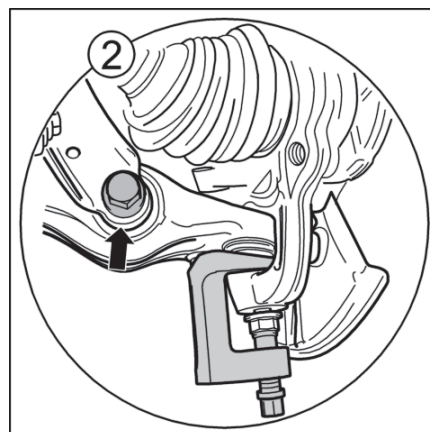
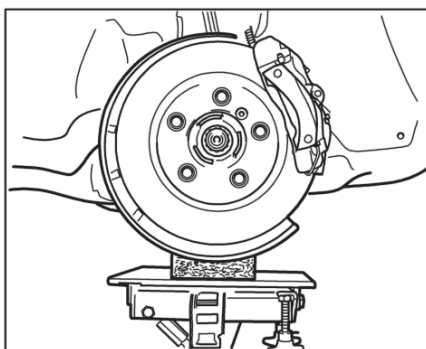
- Injuries and material damage are possible.
- Do not raise the wheel suspension higher than the normal vehicle position (vehicle resting on wheels).
- When raising the suspension, use a suitable intermediate layer (hard rubber) .
- Do not damage the brake cover plate.



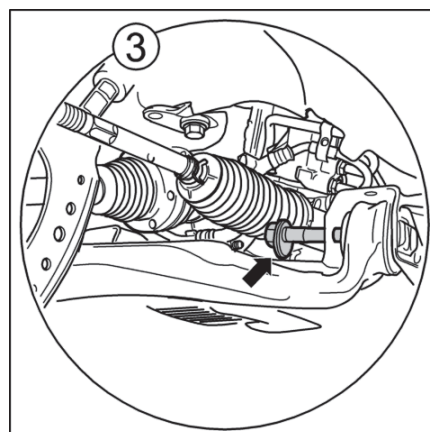
1. Unscrew plastic nuts **-arrows-** on front wheel housing liner.
2. Fix upper axle strut **-Inset 1-** with **spring compressor VW 552**. This involves tensioning axle strut slightly because top ball joint can otherwise get damaged. When doing this, the **-Spring compressor-** is pushed through the hole in the axle strut, engaged in the upper opening of the wheel well (double panel) and in the axle strut and tightened with the nut.



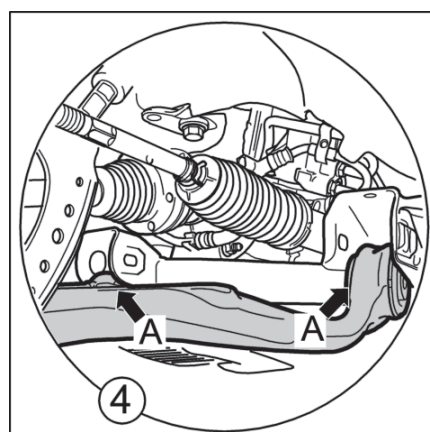
3. Loosen the fastening nuts → *see figure* from the bottom ball joint and press off with the **press-out tool T10187**. When doing this, leave fastening nut flush on ball journal, so as not to damage thread.



4. Remove the lower fastening screw of the spring strut **-arrow-** . For this purpose, lift wheel carrier with a suitable lift **-Lift with a rubber base-** (to prevent slipping) to the extent that the screw **-arrow-** can be unscrewed easily.
5. Mark eccentric screws **-arrow-** for adjusting camber and caster on subframe (facilitates fitting when reinstalling).



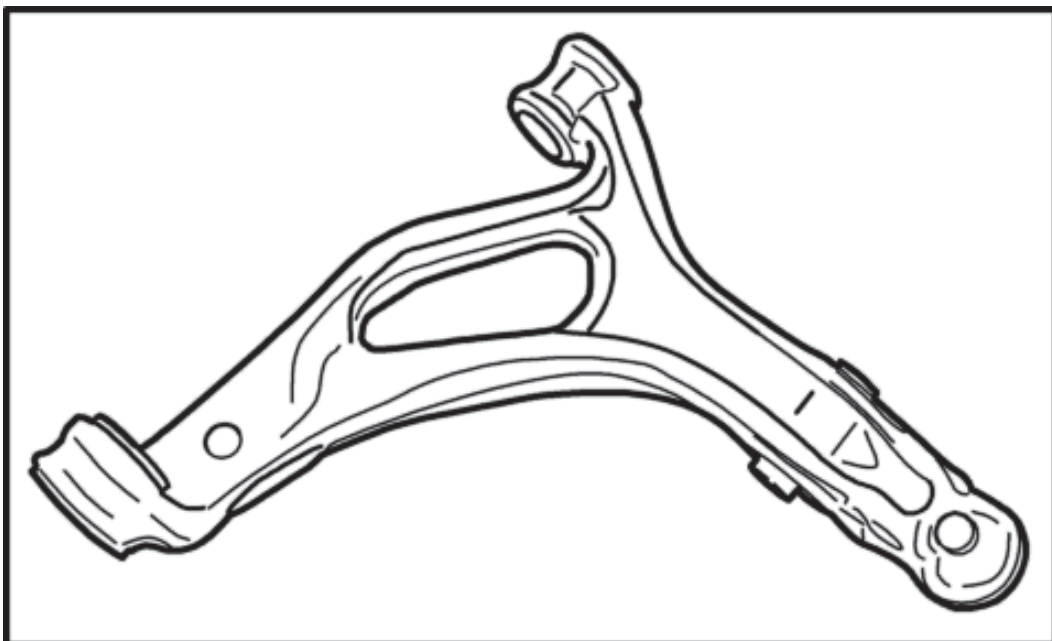
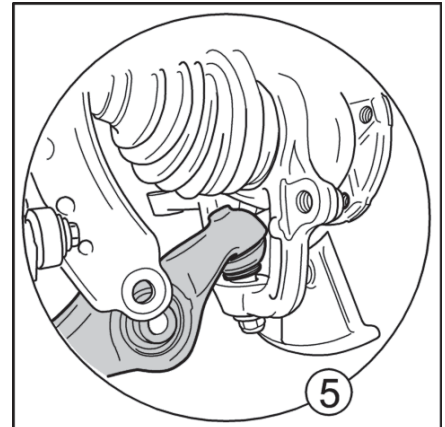
6. Then remove eccentric screws. When doing so, ensure that joint boot is not damaged by eccentric **-arrow-** . Pull (press) axle strut out of the subframe mounting points **-A-** .



7. Remove fastening nut **-Inset 5-** from ball joint. Tilt **-trailing arm-** down all the way and pull ball joint carefully out of the wheel carrier.

Installing lower axle strut

Installing lower trailing arm



ATTENTION

Increased risk of accidents if the wheel carrier is raised improperly!

- Injuries and material damage are possible.
- Do not raise the wheel suspension higher than the normal vehicle position (vehicle resting on wheels).
- When raising the suspension, use a suitable intermediate layer (hard rubber) .
- Do not damage the brake cover plate.

1. Install in reverse order.

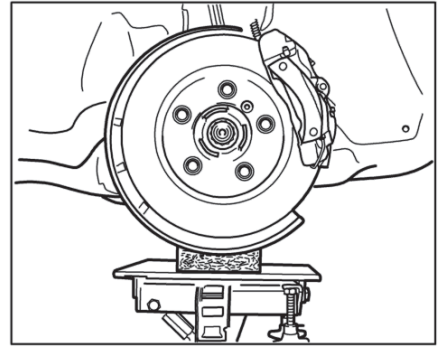
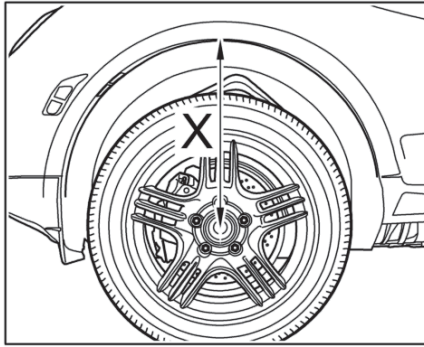


Note

- The entire threaded parts of the axle must be tightened in vehicle position. Vehicle position means: vehicle standing on the wheels, or the wheel suspension is being raised with a universal vehicle lift. **-Dimension X-** ,

from → **Control value: 502 mm $\pm$ 10 mm** corresponds to the vehicle position.

- Visually inspect all parts.
- Replace self-locking nuts.
- Replace all expansion screws (screws which are fitted with torque angle tightening procedure).



- Use correct tightening torques and torque angle.

Use an intermediate layer (hard rubber). Do not damage the brake cover plate.

Screws are Dacromet-coated and must not be greased.

Subsequent work

Subsequent work for trailing arm

Following this repair work, the vehicle suspension must be aligned. → Suspension alignment, complete

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



WARNUNG

Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.

- Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.
- Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrücke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrücke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



WARNING

Danger of losing text-figure correspondence when printing out.

- For technical reasons, it can currently not be ruled out that the correspondence between text and associated figure can be lost when it is printed out, even though the display on the screen is correct.
- If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

- Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.
- Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



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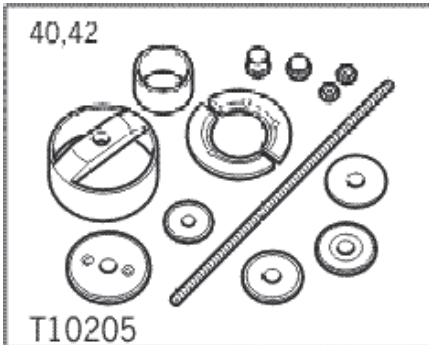
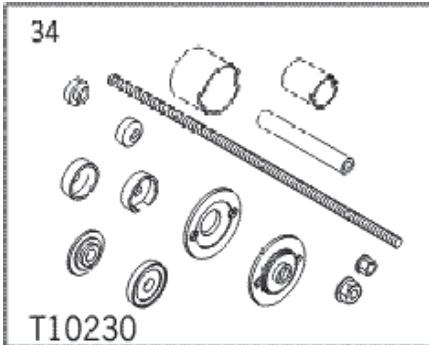
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40 20 55 Replacing bearing for trailing arm - as of MY 2003

-
-
-
-
- Subsequent work

Tools

Designation	Type	Number	Explanation	
Pressure head - attachments	special tool	T10205		
Assembly fixture	special tool	T10230		

Preliminary work

1. Raise the vehicle → 40 *Lifting the vehicle* and remove wheel → 440519 Removing and installing wheel - section on "Removing".
2. Remove lower trailing arm → 401719 Removing and installing lower trailing arm.

General warning notes



ATTENTION

Increased risk of accidents when working with hydraulic presses - danger of crushing, deformation of components.

- Risk of injury if the threaded rod in the tubular piston cylinder breaks because of pressure or traction.
- Possible danger of damage or injury.

- The worker must always stand away from the direction of pressure or traction on the threaded rod when using the tubular piston cylinder.
- Position pressure pieces correctly and ensure that they are seated properly.
- Watch out for falling parts when working with hydraulic presses.
- Danger of injury and material damage if the wheel carrier is raised incorrectly.
- Do not damage the brake cover plate.



ATTENTION

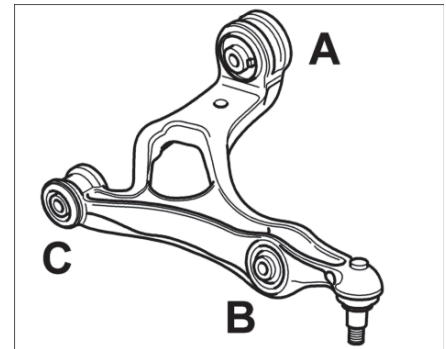
Increased risk of accidents if the wheel carrier is raised improperly!

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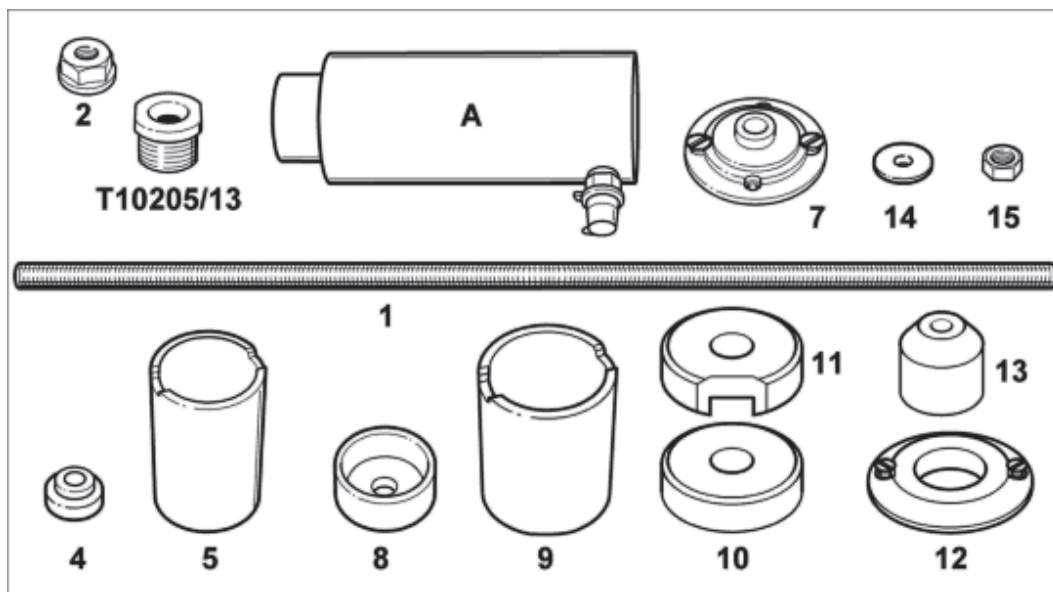
Tools and materials

Lower trailing arm → *Lower trailing arm with rubber-metal mounts A, B, C* .

Tool set T10230 → *Tool set T10230* .



Lower trailing arm with rubber-metal mounts A, B, C



Tool set T10230

Item	Designation	Source	Explanation
-A-	Tubular piston cylinder VAS 6178	→ "See Workshop Equipment Manual, Chapter 3.4"	The tubular piston cylinder is used with the pneumatic hydraulic pump VAS 6179 → "see Workshop Equipment Manual, Chapter 3.4"
	Assembly fixture T10230	→ "See Workshop Equipment Manual, Chapter 2.2.3 "	Tool set for pressing hydraulic mount/rubber-metal mount in and out, consisting of No. 1-15.
→ Tool set T10230			
-1-	Threaded rod - assembly fixture T10230	→ "See Workshop Equipment Manual,	Used in the tubular piston cylinder VAS 6178 -A- .

-2-	Nut with collar - assembly fixture T10230	Chapter 2.2.3" → "See Workshop Equipment Manual, Chapter 2.2.3 "	Screwed onto the threaded rod -1- .
-4-	Pressure piece 40 - assembly fixture T10230	→ "See Workshop Equipment Manual, Chapter 2.2.3 "	For pressing out the bearing -C- .
-5-	Pipe 56 - assembly fixture T10230	→ "See Workshop Equipment Manual, Chapter 2.2.3 "	For pressing out the bearing -B, C- .
-7-	Adjusting washer - assembly fixture T10230	→ "See Workshop Equipment Manual, Chapter 2.2.3 "	Screwed into the tubular piston cylinder VAS 6178 -A- with two countersunk screws. For pressing out bearing -A, B, C- . For pressing in bearing -C- .
-8-	Support - assembly fixture T10230	→ "See Workshop Equipment Manual, Chapter 2.2.3 "	For pressing in the bearing -C- .
-9-	Pipe 72 - assembly fixture T10230	→ "See Workshop Equipment Manual, Chapter 2.2.3 "	For pressing out the bearing -A- .
-10-	Pressure piece 60 - assembly fixture T10230	→ "See Workshop Equipment Manual, Chapter 2.2.3 "	For pressing in the bearing -B- .
-11-	Support - assembly fixture T10230	→ "See Workshop Equipment Manual, Chapter 2.2.3 "	For pressing in the bearing -A- .
-12-	Ring - assembly fixture T10230	→ "See Workshop Equipment Manual, Chapter 2.2.3 "	Screwed into the tubular piston cylinder VAS 6178 -A- with two countersunk screws. For pressing in the bearing -A, B- .
-13-	Pressure piece 45 - assembly fixture T10230	→ "See Workshop Equipment Manual, Chapter 2.2.3 "	For pressing out the bearing -B- .
-T10205/13-	Pressure head - attachments T10205		Pressure head from

		assembly fixture T10205 (!); screwed into the tubular piston cylinder VAS 6178 - A - .
-14-	Washer - assembly fixture T10230	Placed on the threaded rod - 1 - .
-15-	Nut - assembly fixture T10230	Commercially available M14 nut. Screwed onto the threaded rod - 1 - .

Replacing



Note

If a hydraulic mount/rubber-metal mount is installed, it must be fitted in the correct position. In other words: the "cut-outs" must be fitted horizontally, in vehicle position ($\pm 5^\circ$). Additional instruction in relation to the hydraulic mount -**B**- : always fit the wide face of the core of the mount towards the centre of the vehicle. Vehicle position = vehicle standing on its wheels.

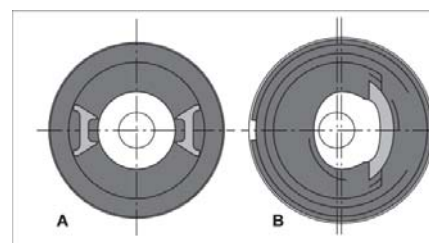
- Position the tubular piston cylinder and pre-tension slightly to prevent the pressure pieces from slipping out of place. Check the position of the pressure pieces again.
- Maximum assembling force must not exceed 60 kN at the stop.
- The three rubber-metal mounts -**A,B,C**- must be replaced once the trailing arm is removed.

The pressure pieces and the tubular piston cylinder VAS 6178 are used for removal. This involves screwing pressure head T10205/13 into the tubular piston cylinder. T10230/2 is screwed on to the threaded rod and positioned in T10205/13 for pressing bearings in and out. Nut T10230/15 and washer T10230/14 are screwed onto the opposite end of the threaded rod .

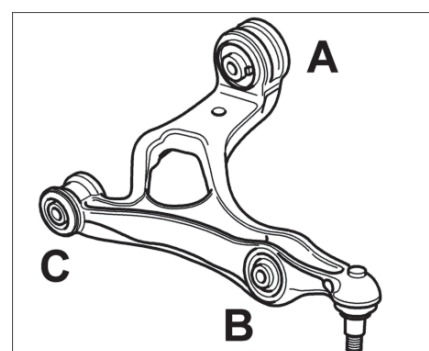
The following pressure pieces and nuts are required for bearings -**A**- :

Pressing out → [Tools for pressing out hydraulic/rubber-metal mounts](#)

- T10230/2
- T 10230/7
- T10230/9
- T10230/10
- T10230/14



Cut-outs of trailing-arm bearing in installation position



Lower trailing arm with rubber-metal mounts A, B, C

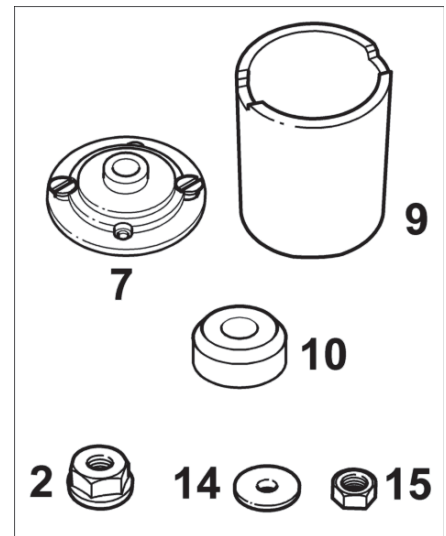
- T10230/15



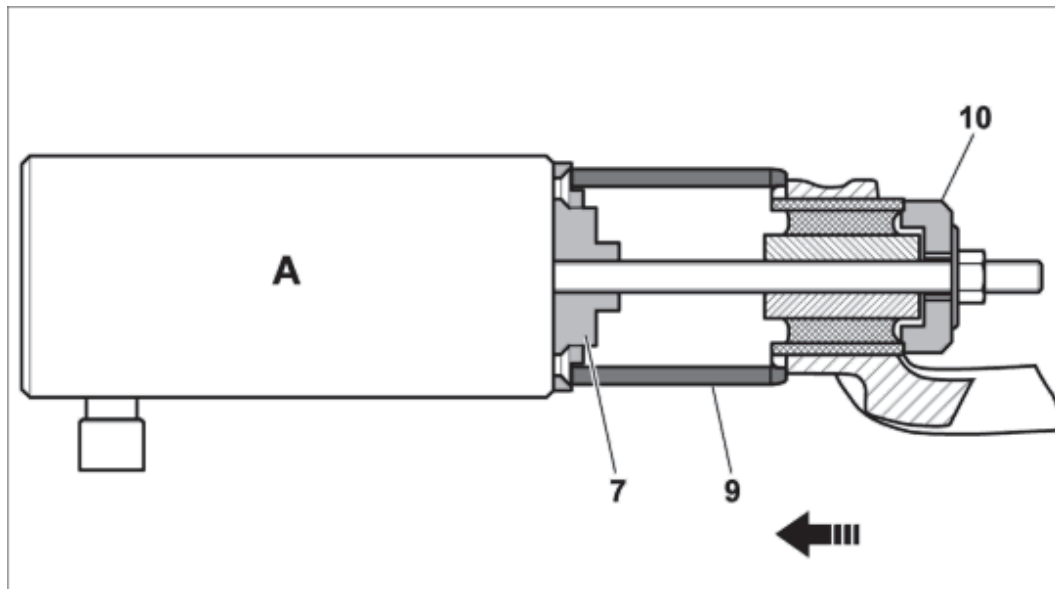
Note

When using the pressure pieces, the direction arrow shows the direction for pressing the rubber-metal mounts in or out on the trailing arm.

The pressure pieces are used as follows → [Arrangement of tools for pressing out hydraulic/rubber-metal mounts](#) .



Tools for pressing out hydraulic/rubber-metal mounts



Arrangement of tools for pressing out hydraulic/rubber-metal mounts

Pressing in → [Tools for pressing in hydraulic/rubber-metal mounts](#)

- T10230/2
- T10230/11
- T10230/12
- T10230/14
- T10230/15



Note

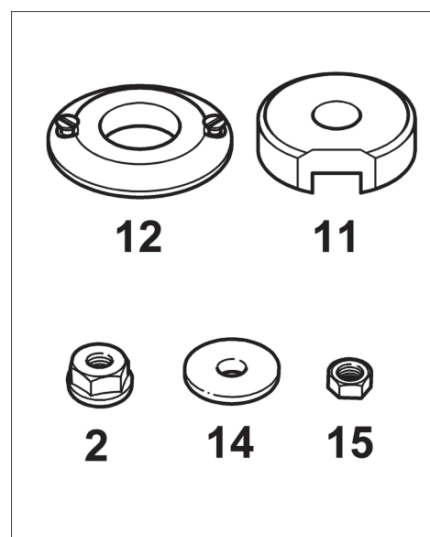
When using the pressure pieces, the direction arrow shows the direction for pressing the rubber-metal mounts in or out on the trailing arm.



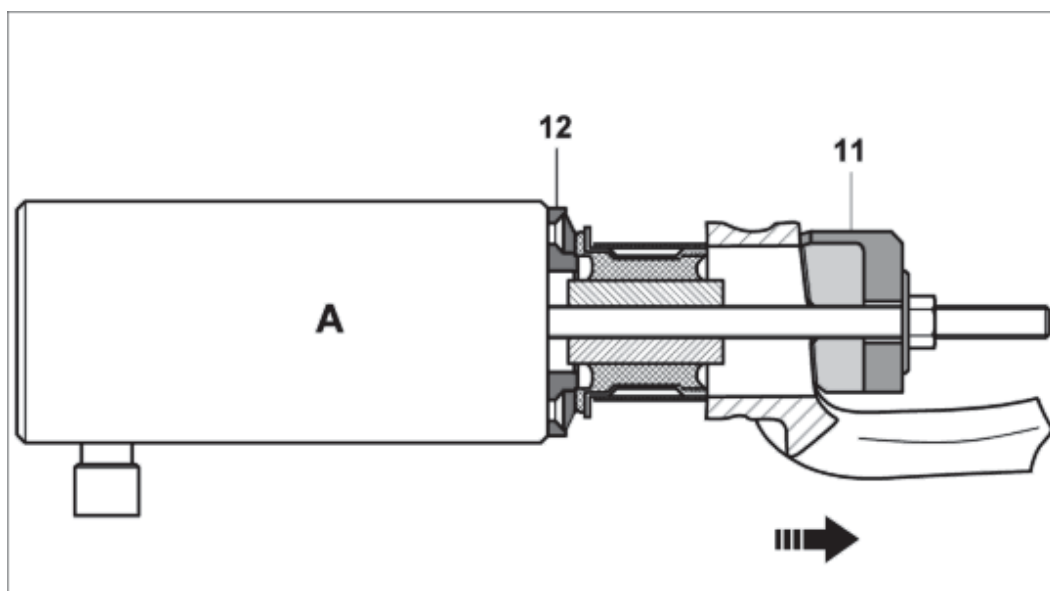
Note

When pressing the mounts in, make sure that pressure piece 11, in particular, is positioned correctly. Pressure piece 11 must not cover up the bore for the bearing in the control arm!

The pressure pieces are used as follows → [Arrangement of tools for pressing in hydraulic/rubber-metal mounts](#) .



Tools for pressing in hydraulic/rubber-metal mounts



Arrangement of tools for pressing in hydraulic/rubber-metal mounts

The following pressure pieces and nuts are required for bearings **-B-** :

Pressing out → [Tools for pressing out spring-strut mounts](#)

- T10230/2
- T10230/5
- T10230/7
- T10230/13
- T10230/14
- T10230/15

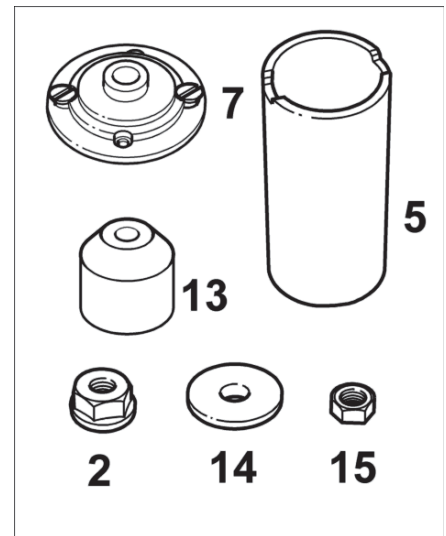


Note

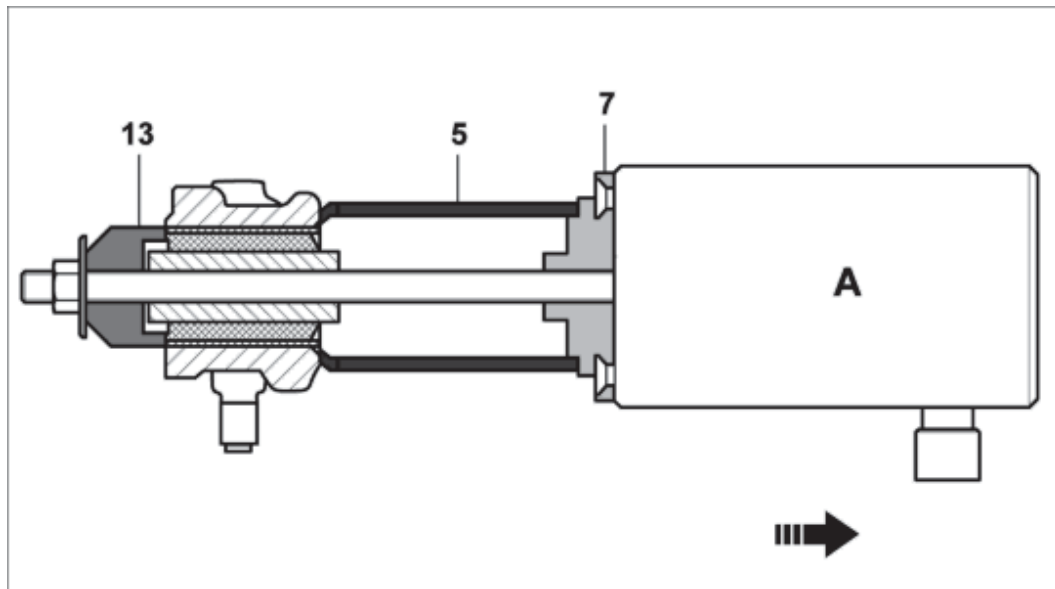
When using the pressure pieces, the direction arrow shows the direction for pressing the rubber-metal mounts in

or out on the trailing arm.

The pressure pieces are used as follows → [Arrangement of tools for pressing out spring-strut mounts](#) .



Tools for pressing out spring-strut mounts



Arrangement of tools for pressing out spring-strut mounts

Pressing in → [Tools for pressing in spring-strut mounts](#)

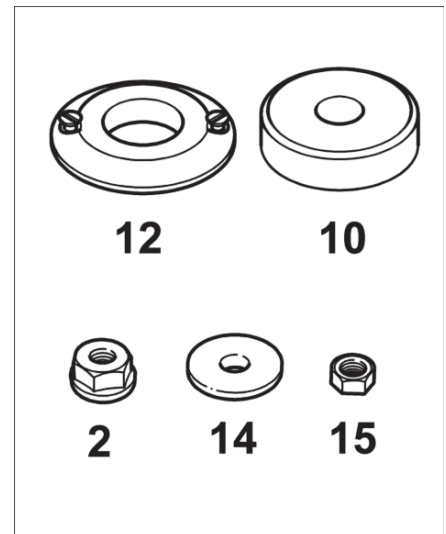
- T10230/2
- T10230/10
- T10230/12
- T10230/14
- T10230/15



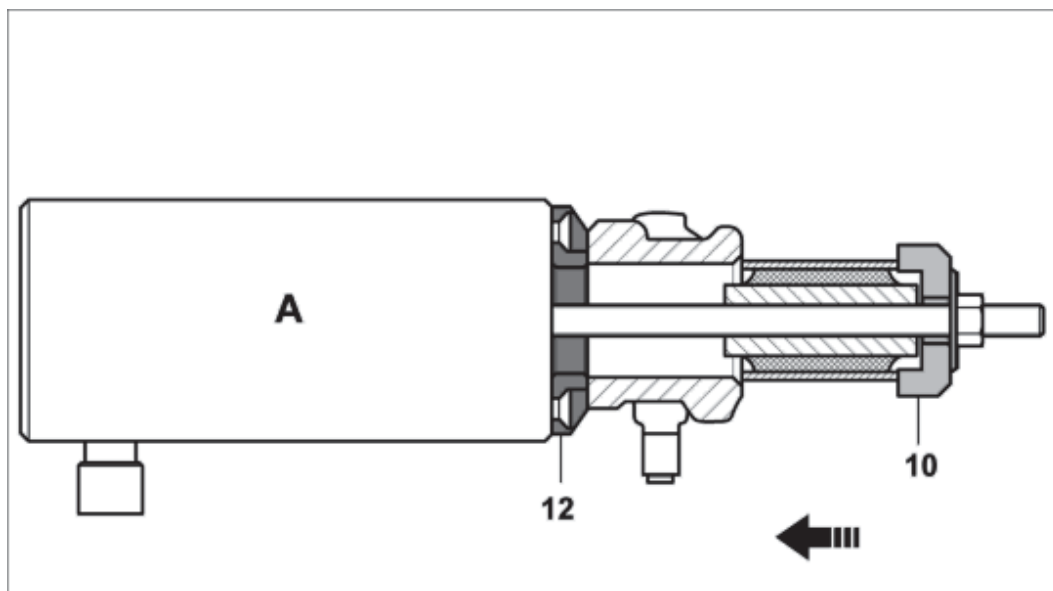
Note

When using the pressure pieces, the direction arrow shows the direction for pressing the rubber-metal mounts in or out on the trailing arm.

The pressure pieces are used as follows → [Arrangement of tools for pressing in spring-strut mounts](#) .



Tools for pressing in spring-strut mounts



Arrangement of tools for pressing in spring-strut mounts

The following pressure pieces and nuts are required for bearings **-C-** :

Pressing out → *Tools for pressing out rubber-metal mounts*

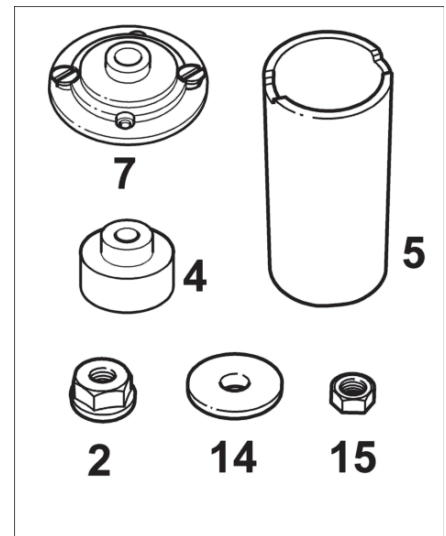
- T10230/2
- T10230/4
- T10230/5
- T10230/7
- T10230/14
- T10230/15



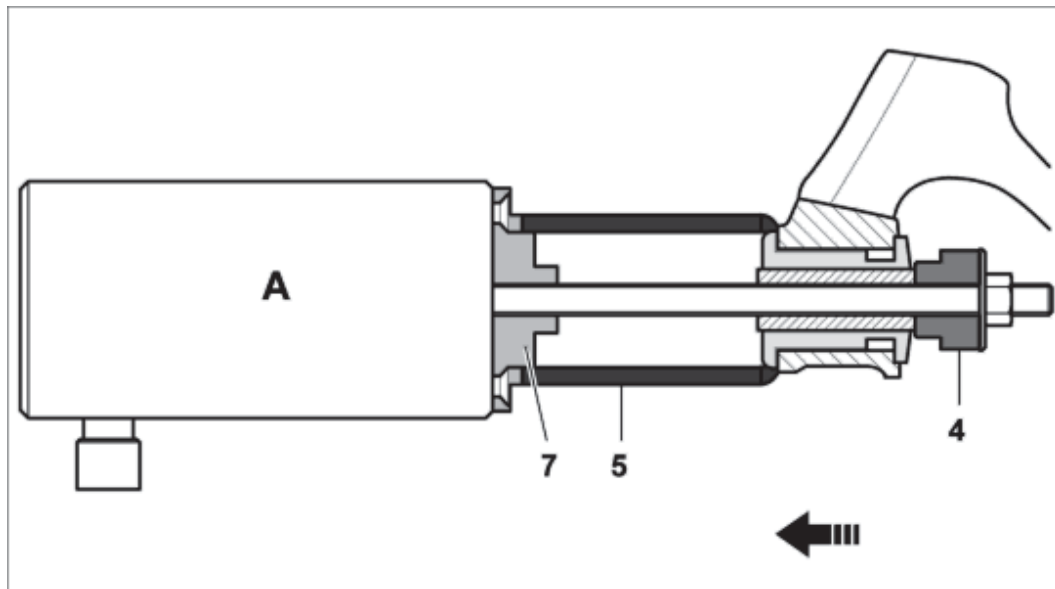
Note

When using the pressure pieces, the direction arrow shows the direction for pressing the rubber-metal mounts in or out on the trailing arm.

The pressure pieces are used as follows → [Arrangement of tools for pressing out rubber-metal mounts](#) .



Tools for pressing out rubber-metal mounts



Arrangement of tools for pressing out rubber-metal mounts

Pressing in → [Tools for pressing in rubber-metal mounts](#)

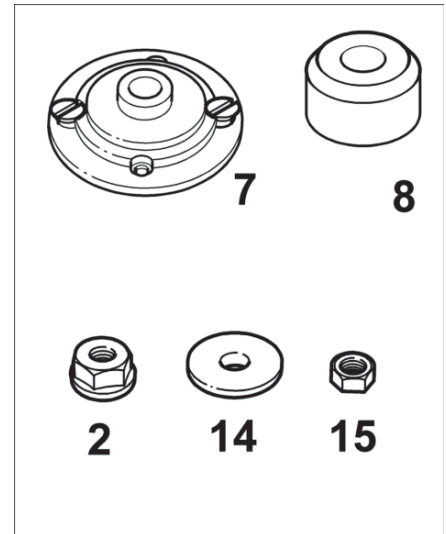
- T10230/2
- T10230/7
- T10230/8
- T10230/14
- T10230/15



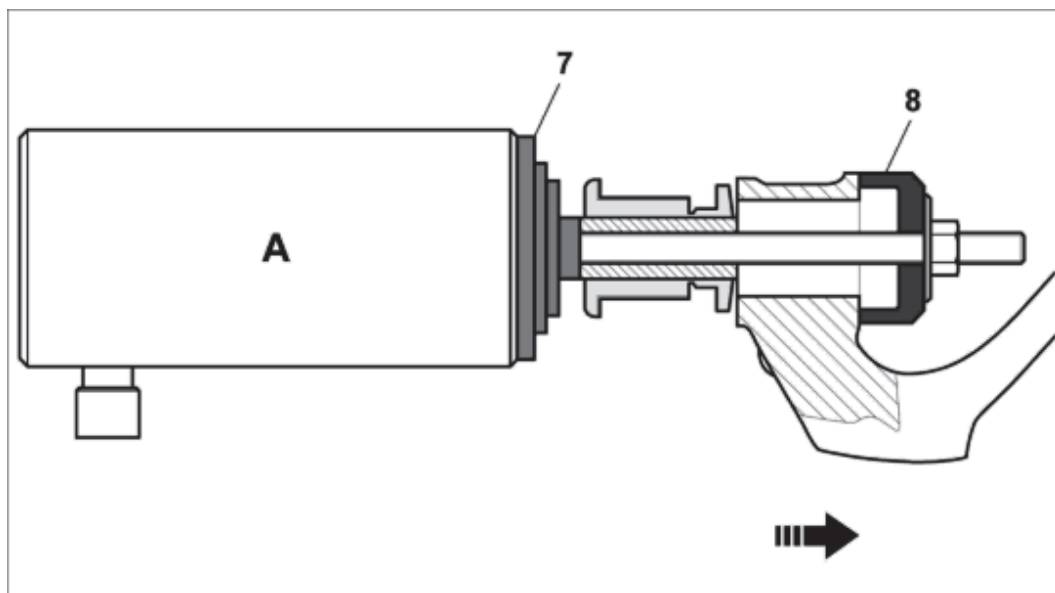
Note

When using the pressure pieces, the direction arrow shows the direction for pressing the rubber-metal mounts in or out on the trailing arm.

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Tools for pressing in rubber-metal mounts



Arrangement of tools for pressing in rubber-metal mounts

Subsequent work

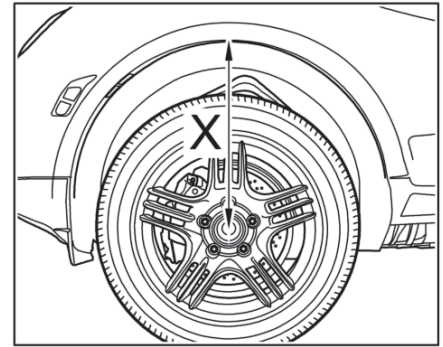
Subsequent work



Note

- The entire threaded joints of the axle must be tightened in vehicle position. Vehicle position means: vehicle standing on the wheels, or the wheel suspension is raised with a universal vehicle lift. Dimension **-X-**, from → **Control value: 502 mm +/-10 mm** corresponds to vehicle position.

- Carry out a visual inspection of all parts.
- Replace self-locking nuts.
- Replace all expansion screws (screws which are fitted with torque angle tightening procedure).
- Observe correct tightening torques and torque angle → Tightening torques for front axle.
- Make sure the bevel pinions from the ball joints are clean. Clean with a lint-free cloth as necessary. Do not use cleaning agent.



1. Install lower trailing arm → 401719 Removing and installing lower trailing arm.
2. Fit wheel → 440519 Removing and installing wheel.
3. Carry out suspension alignment → 44 Suspension alignment, complete.

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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40 24 19 Removing and installing control unit for off-road stabilizer - as of MY 2003

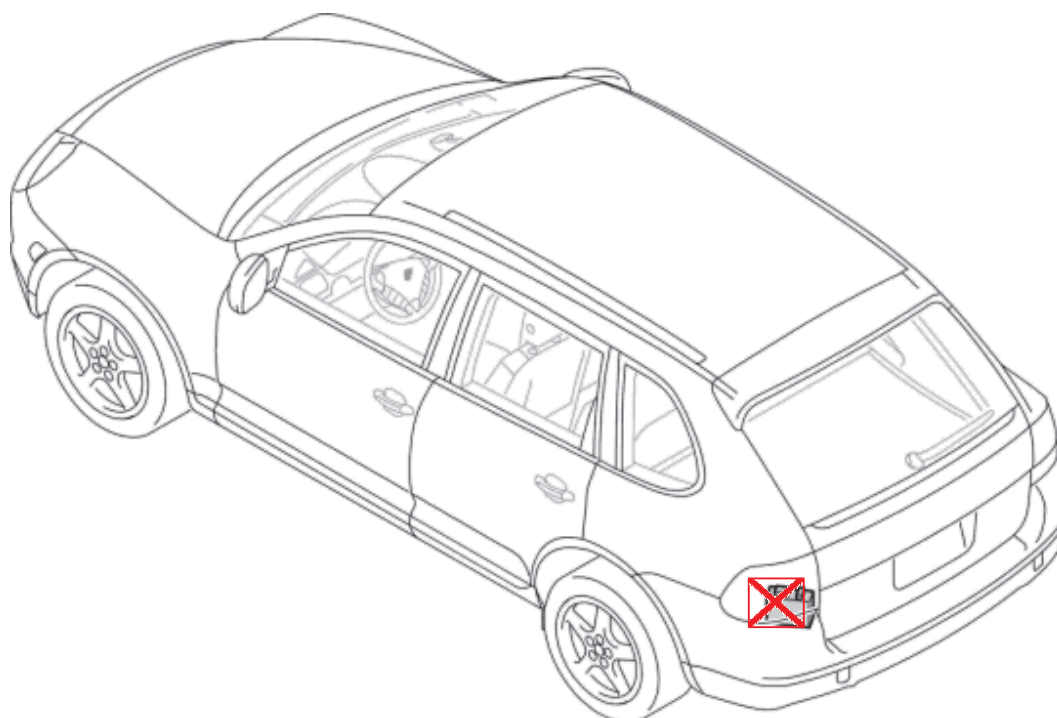
- [Removing control unit for off-road stabilizer](#)
- [Installing control unit for off-road stabilizer](#)
- [Coding the control unit for off-road stabilizer](#)

Removing control unit for off-road stabilizer

Removing control unit for off-road stabilizer

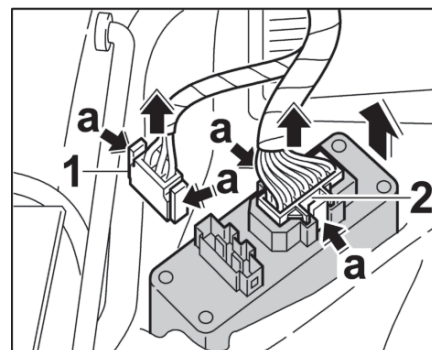
- *The control unit for the Offroad stabilizer is located in the luggage compartment under the loadspace floor beside the collapsible spare wheel.*

Installation Location:



Overview of control unit for off-road stabilizer

1. Open luggage compartment lid and raise loadspace floor.
2. Release plug **-1-** and remove from control unit **-Arrows a-**.
3. Release plug **-2-** and remove from control unit **-Arrows a-**.
4. Remove control unit from the plastic mount.



Pull plug off the control unit.

Installing control unit for off-road stabilizer

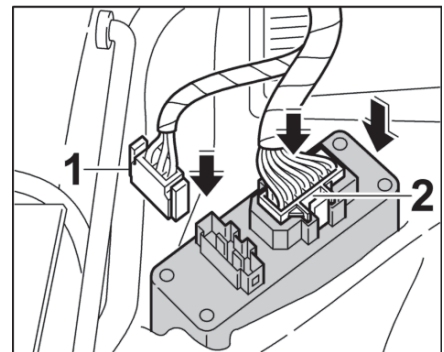
Installing control unit for off-road stabilizer

1. Insert the control unit in the plastic mount.
2. Insert plug **-2-** into the control unit until it clicks into place.
3. Insert plug **-1-** into the control unit until it clicks into place.



Note

- If a new control unit has been installed for the Offroad stabilizer, continue with → 402419 Removing and installing control unit for Offroad stabilizer - "Coding" section.



Insert plug into control unit

Coding the control unit for off-road stabilizer

Coding control unit for off-road stabilizer



Note

- The Porsche System Tester instructions take precedence and in the event of a discrepancy these are the instructions that must be followed. Deviations may occur with later software versions.
- The procedure described here has been structured in general terms; different text or additions may appear in the Porsche System Tester.

1. Connect the Porsche System Tester to the vehicle and start the System Tester. Switch on ignition.
2. Select ORS control unit .
3. Select "Coding" .
4. Select Porsche version and code with the key.
5. Quit the menu using .
6. Read out fault memory.

If faults are present in the fault memory, which cannot be deleted or if the faults are displayed repeatedly, proceed according to Rep.-Gr. 4024 Diagnosis Manual - ORS.

9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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40 25 19 Removing and installing control unit for off-road stabiliser - as of MY 2003

- Preliminary work
- Removing control unit for off-road stabiliser
- Installing control unit for off-road stabiliser
- Subsequent work

Tools

Designation	Type	Number	Explanation	
removal tool, universal	commercially available tool	NR.21		

Preliminary work

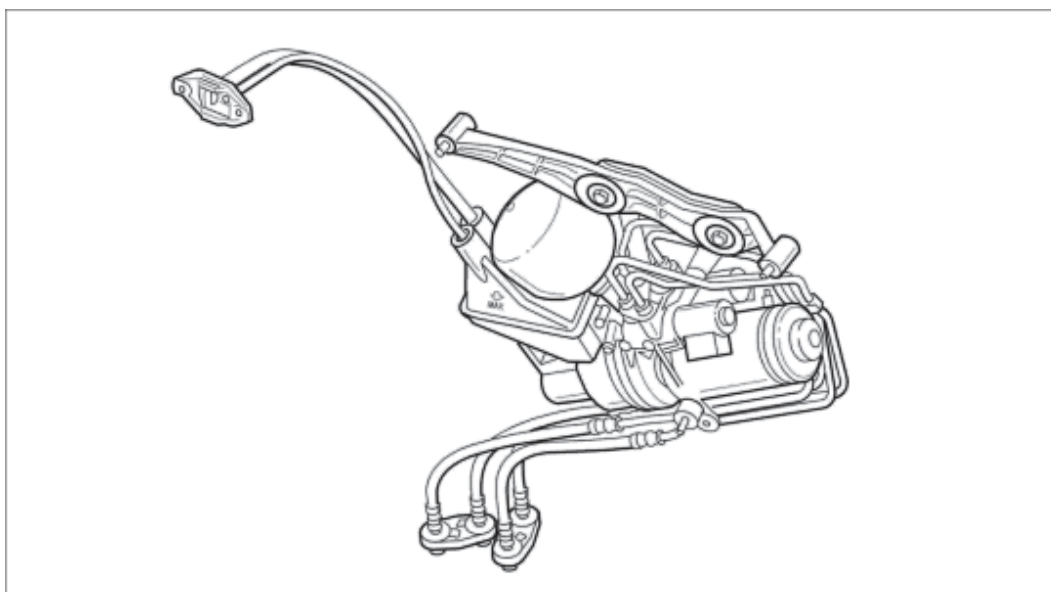
Preliminary work

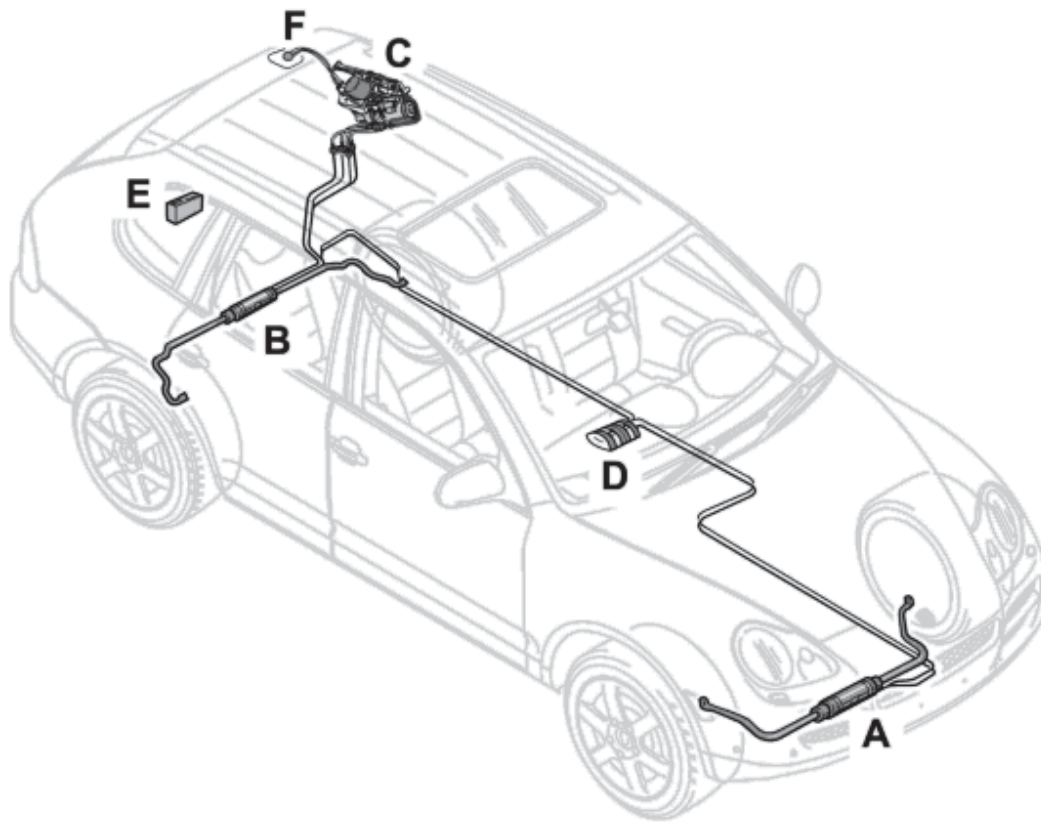
Lift the vehicle.

→ Lifting the vehicle [9PAAD1 9PAAD7 9PAAE1 9PAAE7 9PAAF1]→ *Lifting the vehicle* [9PAAJ1]

Removing control unit for off-road stabiliser

Removing control unit for off-road stabiliser





- A - Front anti-roll bar
- B - Rear anti-roll bar
- C - Hydraulic unit - control unit
- D - Operator control unit
- E - Control unit
- F - Oil dipstick



WARNING

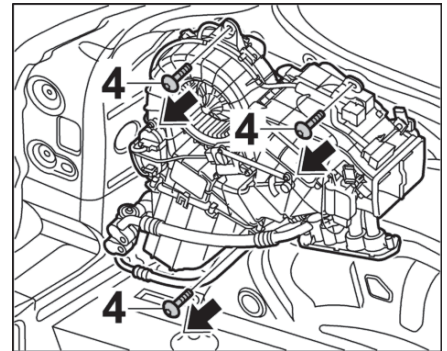
The Offroad Stabilizer System (ORS) operates at an overpressure of up to 165 bar. If the ORS is not depressurised, movements may occur on the wheel carrier under certain circumstances (e.g. the off-road stabilisers are disengaged when the vehicle is lifted, the switch on the centre console is pressed and the wheel carrier is also lifted).

- The stabilizer can close quickly. Thus there is the danger of crushing in the area of the stabilizers

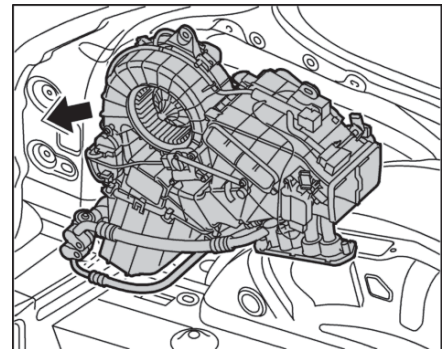
and wheel carriers. Danger of injury and material damage if the wheel carrier is raised incorrectly.

- Before working on the vehicle, ensure that the ORS is engaged. The indicator light on the centre console button must be OFF . If the indicator light is on, follow the following procedure: Switch on the ignition and engage the road driving programme >> High Range <<. The stabilizers must audibly engage.
- Before working on the ORS, depressurise the system. To do this, close the Porsche System Tester and select in the menu >> Offroad Stabi (ORS) >> Drive links >> clock valve VA or valve HA <<. The valve clocks (audibly) until the procedure is finished.
- Do not raise the wheel suspension higher than the normal vehicle position (vehicle resting on wheels). When raising the suspension, use a suitable intermediate layer (hard rubber) .
- Do not damage the brake cover plate.

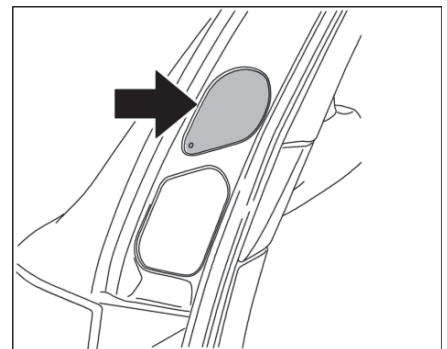
1. Connect the Porsche System Tester and depressurise the system. To do this, select the menu items >> Off-road Stabiliser (ORS) >> Drive links >> Set front-axle or rear-axle valve <<. The valve clocks (audibly) until the procedure is finished.
2. Open the luggage-compartment lid and remove the rear left side-panel lining → 700319 Removing and installing rear luggage compartment side-panel lining - section on "Removing".
3. If the vehicle has a four-zone air-conditioning system, loosen the fastening screws -4- on it.



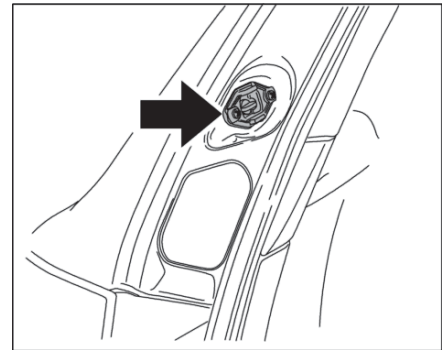
4. Place the four-zone air-conditioning system → [see figure](#) aside without opening the circuit → 881019 Removing and installing auxiliary air-conditioning unit - section on "Removing".



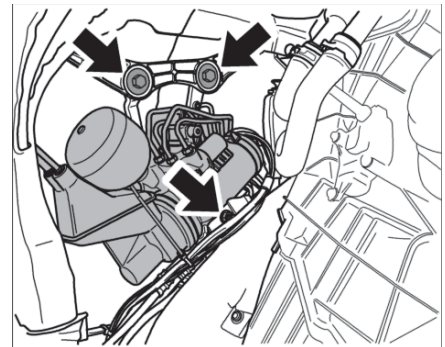
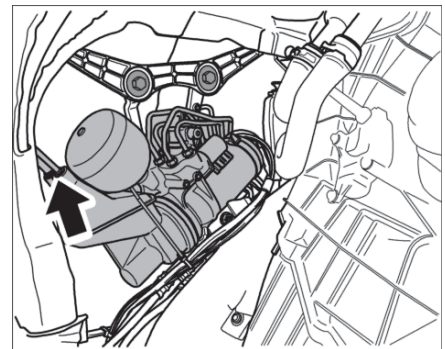
5. Remove the cover -[arrow](#)- of the oil dipstick.



6. Remove the 2 fastening screws **-arrow-** .



7. Pull the oil dipstick along with the filler tube and vent tube **-arrow-** out of the expansion tank. Press the relevant plastic ring on the fluid tank down evenly using the **removal tool, universal NR.21**.
8. The hydraulic lines are fed out through the luggage compartment floor panel. Loosen the lines from outside and ensure when removing the lines that the seals are not lost when passed through the body. If fluid emerges, place a lint-free cloth, for example, underneath. Clean the luggage compartment floor panel IMMEDIATELY if necessary.
9. Disconnect electric plugs.
10. Remove the three fastening screws on the control unit **-arrows-** and take out the control unit.



Installing control unit for off-road stabiliser

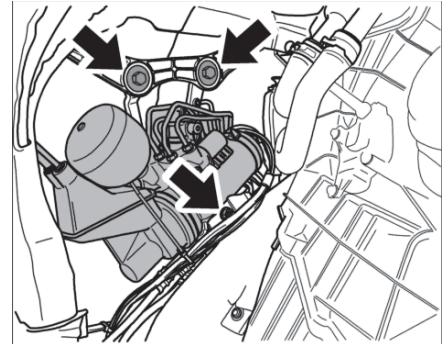
Installing control unit for off-road stabiliser



Note

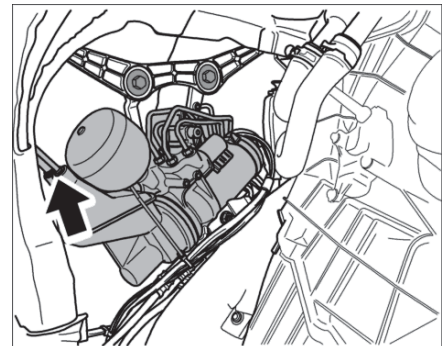
- Bleed the off-road stabiliser system (ORS).
- Visually inspect all parts.
- Replace self-locking nuts.
- Observe correct tightening torques. → Lifting the vehicle [9PAAD1 9PAAD7 9PAAE1 9PAAE7 9PAAF1]
→ Lifting the vehicle [9PAAJ1]

1. Insert the control unit.
2. Guide the hydraulic lines of the control unit carefully through the body and secure into position. Fit seals.
3. Fit the control unit into the take-up points provided **-arrows-** .



4. Insert filler neck with filler tube and vent tube and slide in as far as the wide section **-arrow-** . Insert oil dipstick.
5. Push on electric plugs.

To ensure that there are no leaks in the system, fill and bleed the off-road stabiliser system (ORS) before installing the four-zone air-conditioning system. Then perform a visual check for leaks on the control unit (expansion tank, sensor connections, etc.).



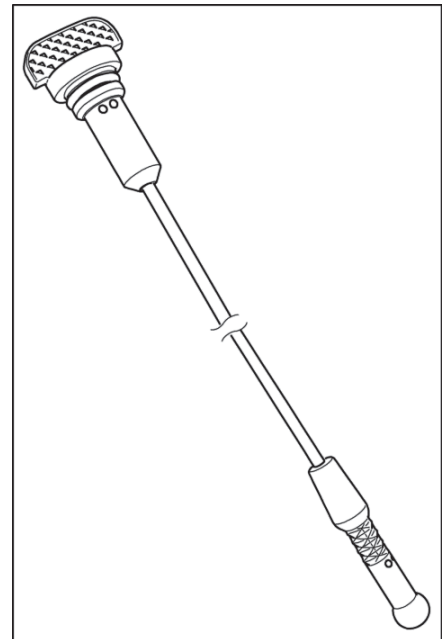
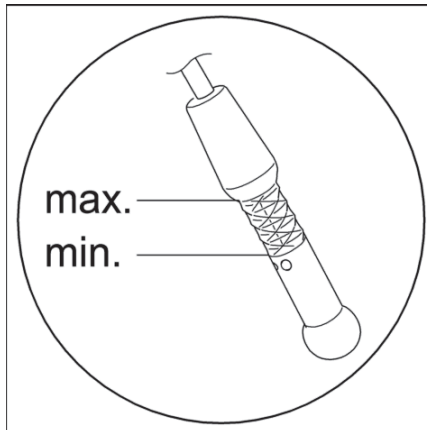
6. The off-road stabiliser system is filled with Pentosin CHF 11S using the dipstick opening → [see figure](#) → 407707 *Bleeding the Off-Road Stabiliser System (ORS)*.



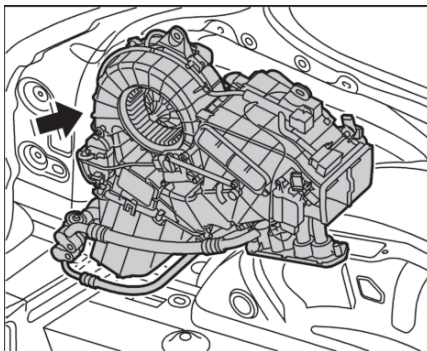
7. Bleed the off-road stabiliser system (ORS). → 407707 07 *Bleeding the Off-Road Stabiliser System (ORS)* - section on "Bleeding". The fluid level can be checked by reading the marking on the dipstick → [see figure](#) .
8. Do not top up above the max. marking → [see figure](#) . Fit the cover of the oil dipstick.
9. Insert and fit the four-zone air-conditioning system **-arrow-** → 881019 Removing and installing auxiliary air-conditioning unit - section on "Installing".

Subsequent work

Subsequent work



Fit left rear side trim panel.
 → 700319 Removing and installing
 rear luggage compartment side
 trim panel - section on "Installing"



9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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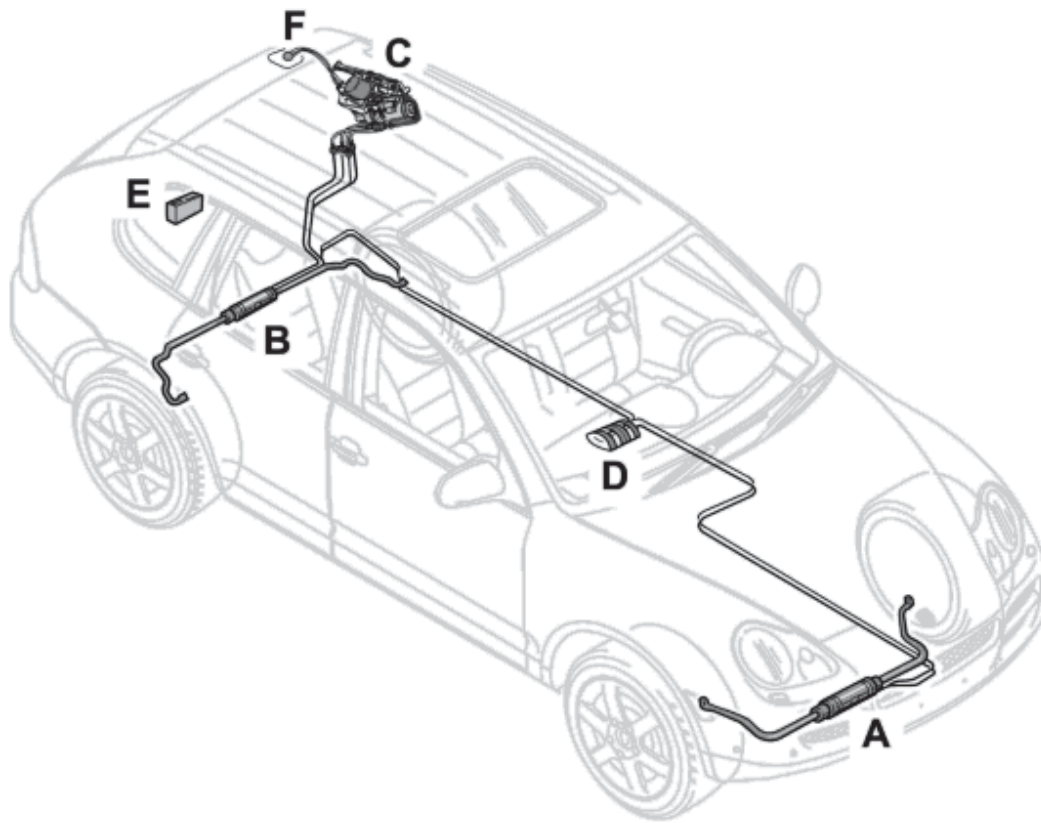
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40 26 01 Off-Road Stabiliser System (ORS) - Checking fluid level - as of MY 2003

- [Procedure for checking fluid level](#)

Procedure for checking fluid level

Off-Road Stabiliser System (ORS) - Checking fluid level



- A- - Front stabiliser
- B- - Rear stabiliser
- C- - Hydraulic unit
- D- - Operator control unit
- E- - Control unit
- F- - Oil dipstick

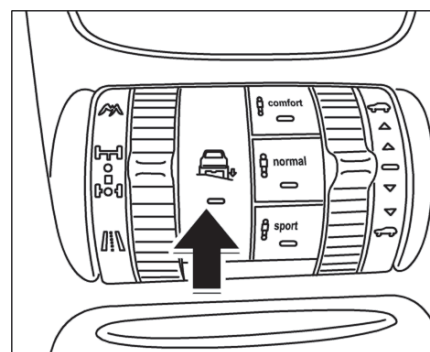
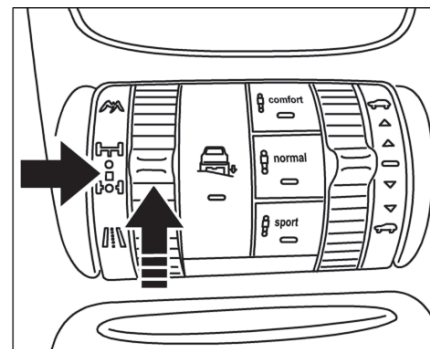
Disengaging and engaging the Offroad stabilizer



Note

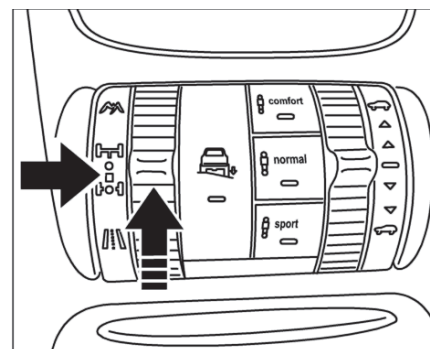
- Before the fluid level is checked, the Offroad stabilizer must be >> disengaged and engaged << four times.

- To obtain a correct measured result, it is necessary to depressurise the system. Only then will the correct fluid level be displayed.
1. To do this, switch on the ignition, and engage the off-road driving program Low Range. Depress the brake pedal and briefly press the rocker switch **-direction arrow-** forwards; the indicator light **-arrow-** comes on.
 2. Activate the Offroad stabilizer button four times. The indicator light **-arrow-** comes on. Only initiate the next switching operation when the off-road stabilizer has >> disengaged or engaged << audibly.
 3. Switch off the off-road driving program >> Low Range << again.



Depressurising the Offroad Stabilizer System (ORS)

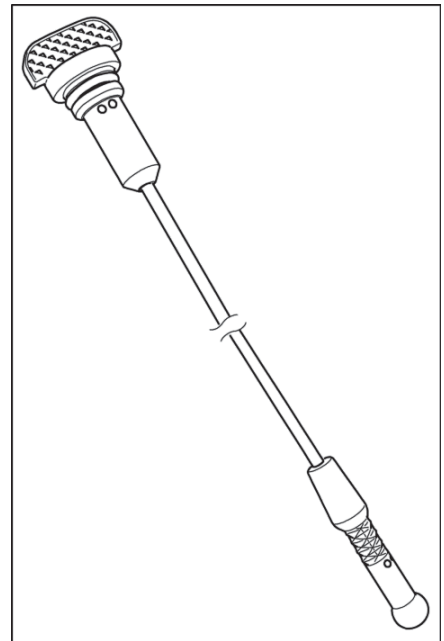
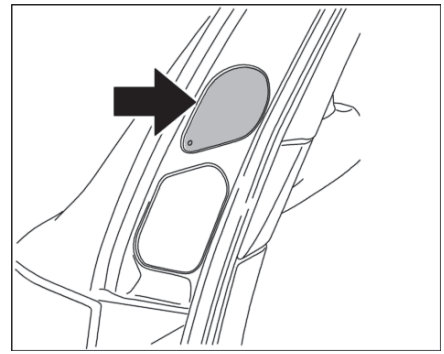
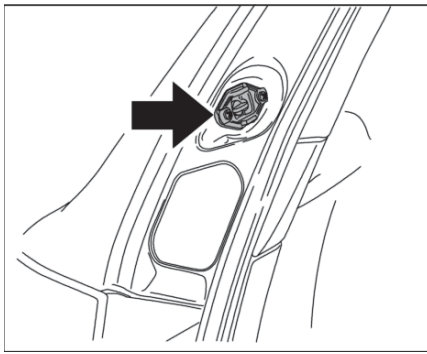
1. Connect the Porsche System Tester and switch on the ignition. Switch off the off-road driving program >> Low Range <<. To do this, use the rocker on the centre console **-direction arrow-** to select the corresponding driving program. The indicator light **-arrow-** must be OFF. In the menu, select >> Offroad Stabi (ORS) >> Drive links >> Clock valve VA or valve HA <<.
2. The solenoid valve clocks (audibly) until the overpressure has been equalized. The fluid level in the reservoir of control unit C of the Offroad stabilizer rises.
3. The valve no longer clocks. Now the correct fluid level can be read on the dipstick.
4. Reading and correcting the fluid level is described in the next chapter.
5. Unplug Porsche System Tester. After switching on the ignition again and engaging Low Range, the system adjusts automatically to the correct pressure.



Reading and correcting the fluid level

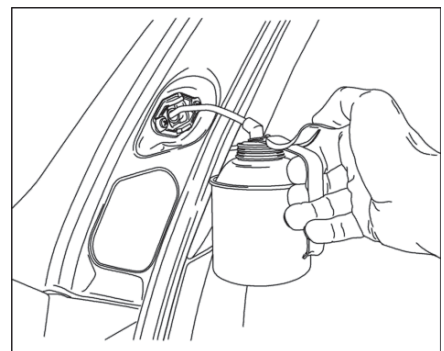
The reservoir is not freely accessible. It is filled using the dipstick opening. To do this, refill the amount of fluid necessary using suitable filling equipment. Pull out the dipstick several times and check the fluid level.

1. The dipstick is accessible below the upper cover **-arrow-**, rear left, in the centre of the D-pillar. Remove the cover.
2. The dipstick **-arrow-** inserted in the left D-pillar. Pull out the dipstick.
3. The fluid level must be between the markings on the dipstick. Do not top up above the → see figure Max.



mark.

4. The off-road stabiliser system is filled with Pentosin CHF 11S using the → [see figure](#) dipstick opening .
5. After the work is completed, insert the dipstick and fit the cover.



9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

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Danger of losing text-figure correspondence when printing out.

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→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



AVERTISSEMENT

Risque de perte de la correspondance texte-illustration lors de l'impression papier.

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Pericolo di perdita dell'abbinamento testo-immagine nella stampa.

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40 26 07 Bleeding the Off-Road Stabiliser System (ORS) - as of MY 2003

- [Procedure for bleeding](#)
- [Checking operation](#)

Procedure for bleeding

The Offroad Stabilizer System (ORS) must be bled when the system was opened (e.g., after removing the front and/or the rear axle, or after replacing spare parts for the system). Both stabilizers are bled at the same time when it is done.



WARNING

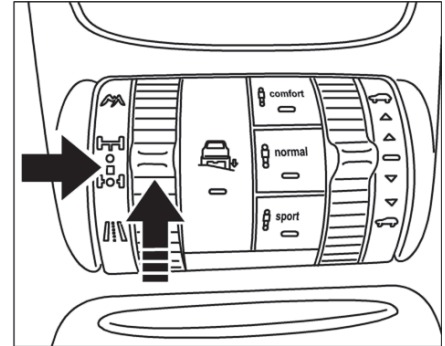
The Off-road Stabilizer System (ORS) operates at an overpressure of up to 165 bar. Under certain conditions, motions can occur on the wheel carrier (e.g., if the Off-road stabilizers are disengaged when lifting, the button is pressed on the centre console, and the wheel carrier is also raised).

- The stabilizer can close quickly. Thus there is the danger of crushing in the area of the stabilizers and wheel carriers.
- Before working on the vehicle, ensure that the ORS is engaged. The indicator light on the centre console button must be OFF. If the indicator light is on, follow the following procedure: Switch on the ignition and engage the road driving programme >> High Range <<. The stabilizers must audibly engage.
- Before working on the ORS, depressurise the system. To do this, close the Porsche System Tester and select in the menu >> Offroad Stabi (ORS) >> Drive links >> clock valve VA or valve HA <<. The valve clocks (audibly) until the procedure is finished.
- Wear protective gloves and goggles.

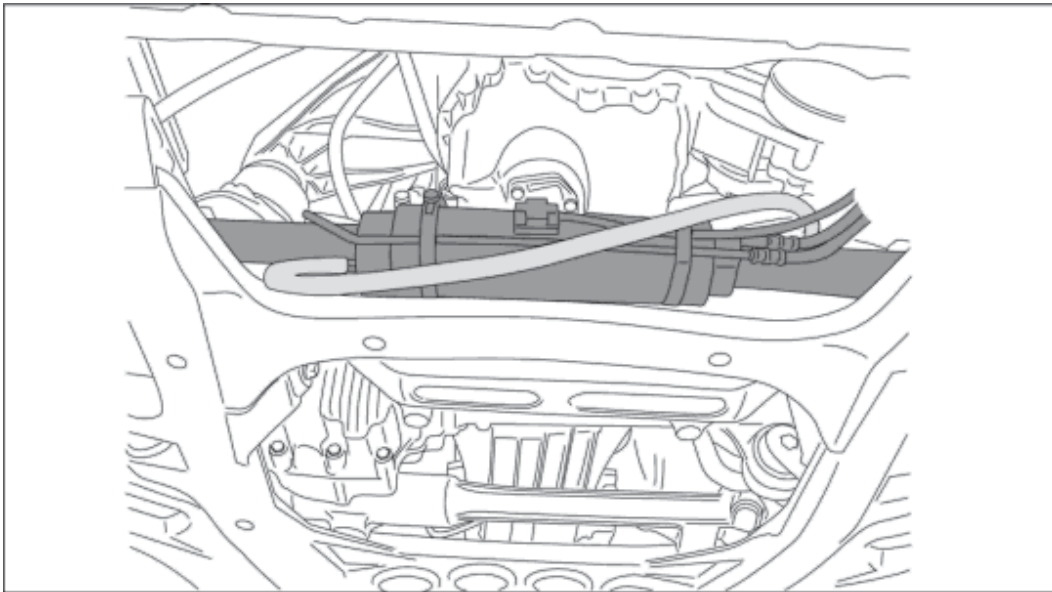


Note

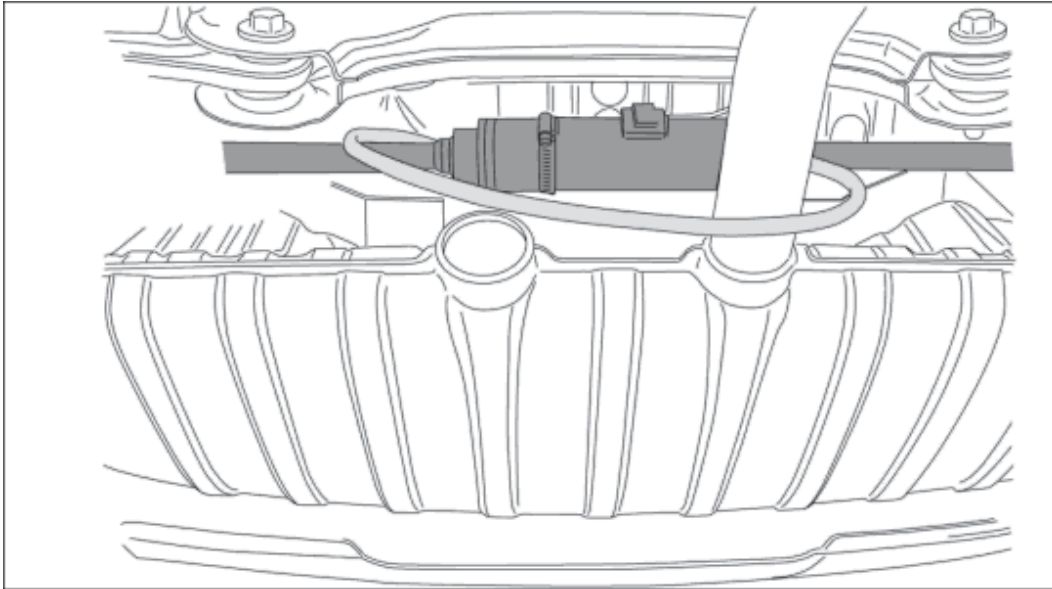
- The driving programs can be selected using the rocker switch on centre console. The **-arrow-** on the indicator light displays if the road driving programme >> High Range << (light OFF) or the offroad program >> Low Range << (light ON) is engaged.
1. Connect the bleeder valves of the actuator to the front axle with a suitable transparent hose and open approx. one turn.



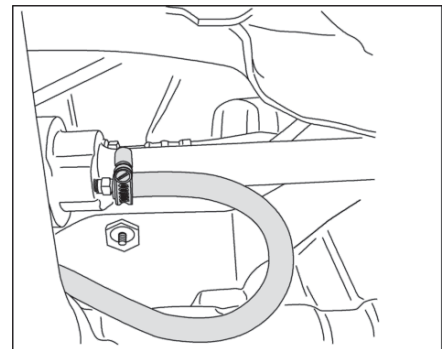
Front stabilizer, operator control unit



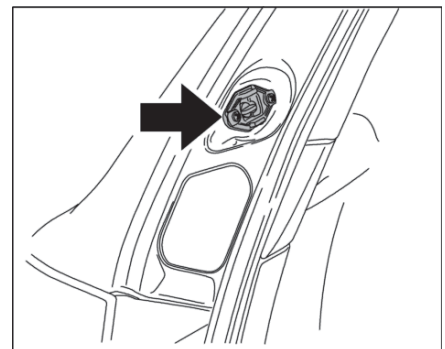
2. Connect the bleeder valves of the actuator to the rear axle with a suitable transparent hose and open approx. one turn.



3. To prevent the hoses from slipping from the bleeder valves, they must be fastened using screw-type hose clamps/tie wraps. Because of the high pressure occurring, they can become loose during the bleeding process.



4. Fill with Pentosin CHF 11S in the opening of the dipstick **-arrow-** . The opening is located at the left rear, in the centre of the D-pillar.



5. Pull out the dipstick and fill with Pentosin CHF 11S using suitable filling equipment.
6. Fill with Pentosin CHF 11S up to the Max. marking of the dipstick.



Note

- Connect the Porsche System Tester and switch on the hydraulic pump in the menu >> Offroad Stabi (ORS) >> Drive links >> Switch on electrical hydraulic pump <<<.
- Only allow the hydraulic pump to run for max. 10 seconds when switching it on for the first time following

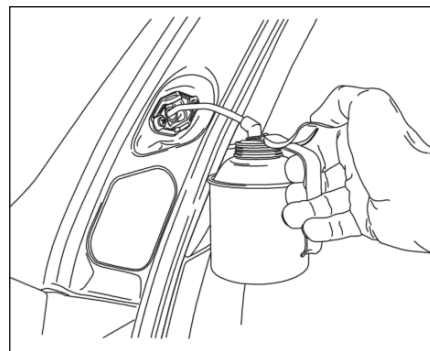
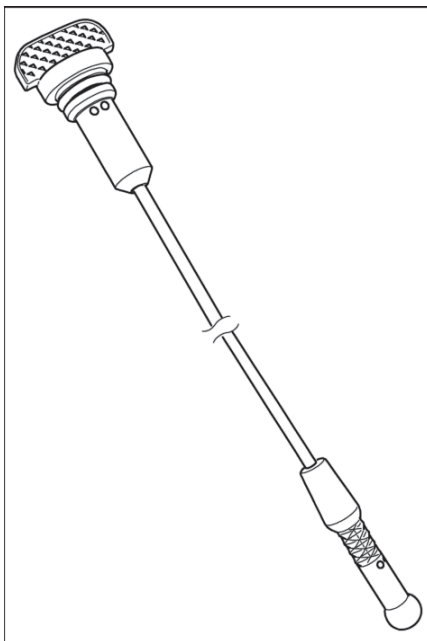
repairs.

Switch on the ignition, press the brake pedal, and engage High Range. Connect the Porsche System Tester and switch on the hydraulic pump for 10 seconds. The Pentosin CHF 11S is pumped through the lines.

Switch off the hydraulic pump. Check the fluid levels on the oil dipstick and top up to the Max. marking.

Switch on the hydraulic pump the 2nd time for 10 seconds. The Pentosin CHF 11S is pumped through the lines.

Switch off the hydraulic pump. Check the fluid levels on the oil dipstick and top up to the Max. marking.



Switch on the hydraulic pump the 3rd time. The Pentosin CHF 11S is pumped through the lines. Perform a visual inspection of the front and rear axle for lack of air bubbles.

Let the hydraulic pump run until air bubbles can no longer be seen on the hoses of the actuators. Let the hydraulic pump run for approximately an additional 1 minute. Only then it is ensured that the return line is also completely rinsed out.

Switch off the hydraulic pump. Check the fluid levels on the oil dipstick and if necessary, top up to the Max. marking.

Disconnect the Porsche System Tester, switch off the ignition, and close the bleeder valves of the actuators. Remove the hoses. To protect the bleeder valves, attach the protective caps.

Checking operation

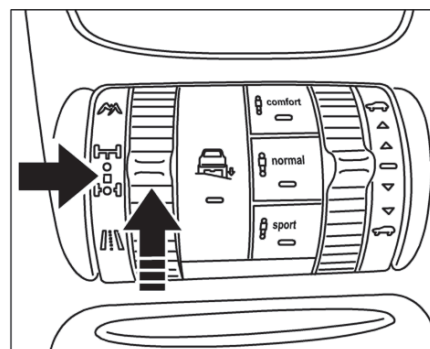
Checking operation



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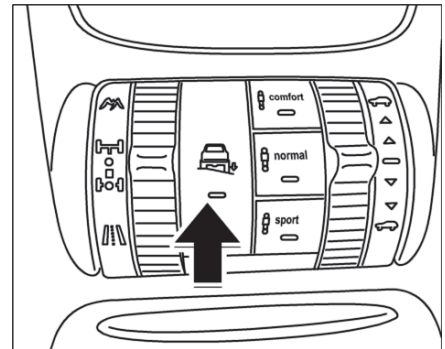
- After pressing the button on the centre console, the hydraulic pump starts (audibly). The stabilizers disengage or engage when a specific overpressure has been reached in the system. A time delay between activation until disengaging/engaging (audible) is normal.

Switch on the ignition, press the brake pedal, and engage Low Range. To do this, briefly press the rocker switch **-direction arrow-** forwards. The indicator light **-arrow-** comes on.

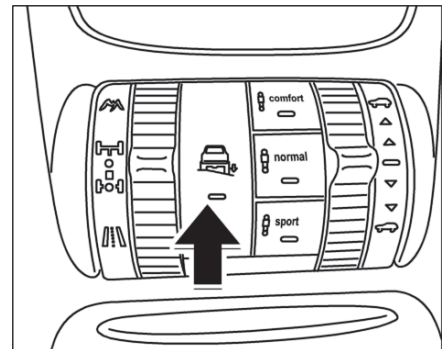


The stabilizers disengage. In other words: Press the button on the centre console. The button light **-arrow-** comes on.

In the instrument cluster (tachometer) the indicator light is on and the stabilizers disengage audibly.



Press the button again. The button light **-arrow-** goes out. The stabilizers engage again audibly and the indicator light in the instrument cluster goes off.



9PAAD1, 9PAAD7, 9PAAE1, 9PAAE7, 9PAAF1, 9PAAJ1

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99



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40 26 07 Bleeding the Off-Road Stabiliser System (ORS) - as of MY 2003

- [Preliminary work](#)
- [Procedure for bleeding](#)

Preliminary work

Raise vehicle → 40 *Lifting the vehicle*.

Procedure for bleeding

The Offroad Stabilizer System (ORS) must be bled when the system was opened (e.g., after removing the front and/or the rear axle, or after replacing spare parts for the system). Both stabilizers are bled at the same time when it is done.



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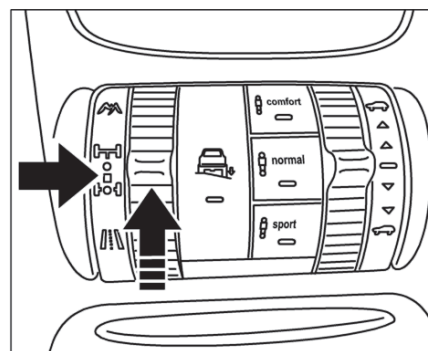
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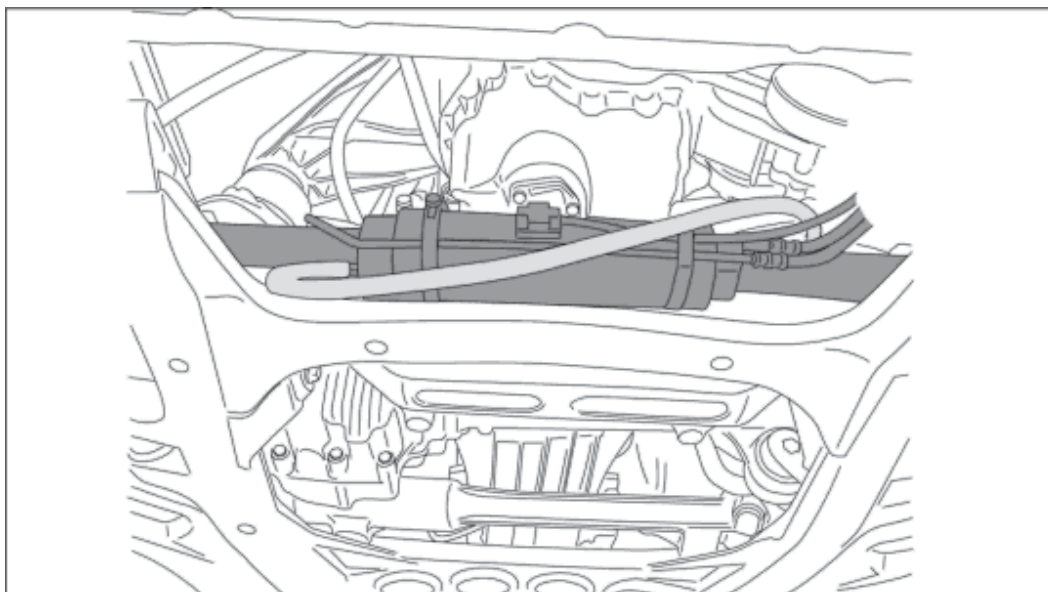
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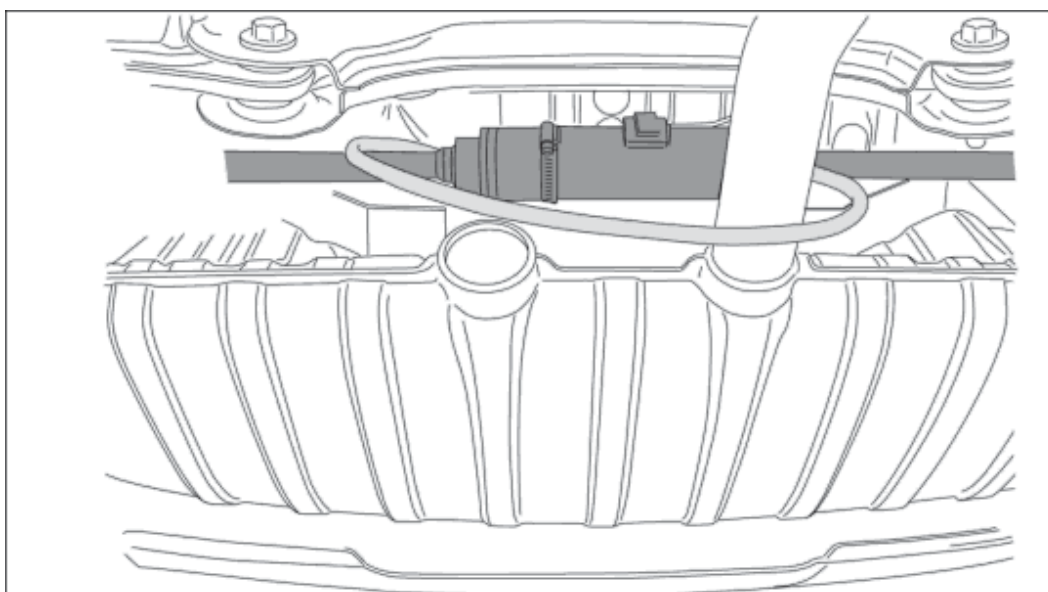
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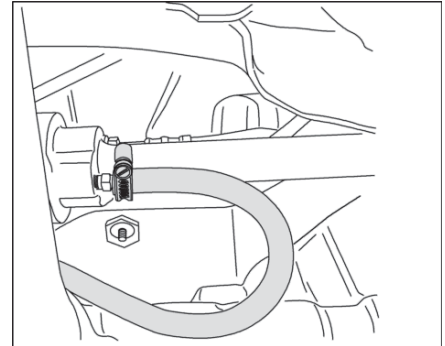
Front stabilizer, operator control unit



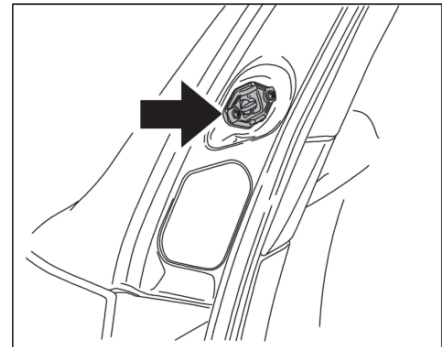
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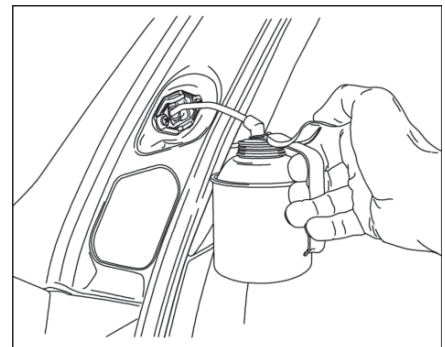
3. To prevent the hoses from slipping from the bleeder valves, they must be fastened using screw-type hose clamps/tie wraps. Because of the high pressure occurring, they can become loose during the bleeding process.



4. Fill with Pentosin CHF 11S in the opening of the dipstick **-arrow-**. The opening is located at the left rear, in the centre of the D-pillar.



5. Pull out the dipstick and fill with Pentosin CHF 11S using suitable filling equipment.



6. Fill with Pentosin CHF 11S up to the Max. marking of the dipstick.



Note

- Connect the Porsche System Tester and switch on the hydraulic pump in the menu >> Offroad Stabi (ORS) >> Drive links >> Switch on electrical hydraulic pump <<<.
- Only allow the hydraulic pump to run for max. 10 seconds when switching it on for the first time following repairs.

Switch on the ignition, press the brake pedal, and engage High Range. Connect the Porsche System Tester and switch on the hydraulic pump for 10 seconds. The Pentosin CHF 11S is pumped through the lines.

Switch off the hydraulic pump. Check the fluid levels on the oil dipstick and top up to the Max. marking.

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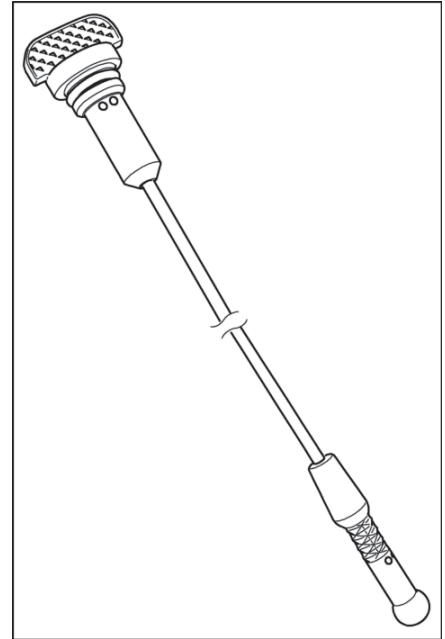
Switch off the hydraulic pump. Check the fluid levels on the oil dipstick and top up to the Max. marking.

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Let the hydraulic pump run until air bubbles can no longer be seen on the hoses of the actuators. Let the hydraulic pump run for approximately an additional 1 minute. Only then it is ensured that the return line is also completely rinsed out.

Switch off the hydraulic pump. Check the fluid levels on the oil dipstick and if necessary, top up to the Max. marking.

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Checking operation



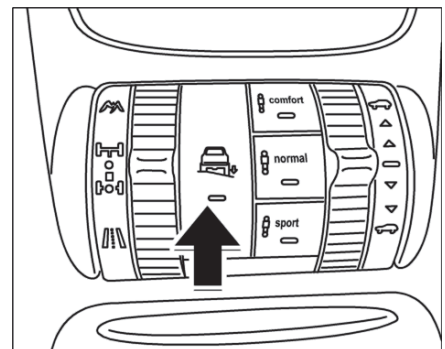
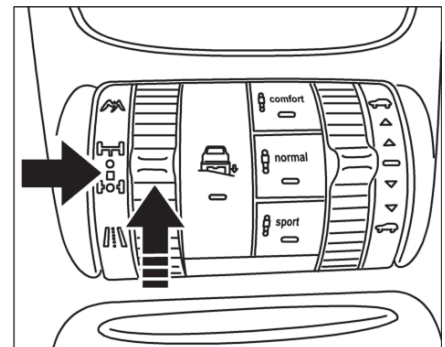
Note

- After pressing the button on the centre console, the hydraulic pump starts (audibly). The stabilizers disengage or engage when a specific overpressure has been reached in the system. A time delay between activation until disengaging/engaging (audible) is normal.

Switch on the ignition, press the brake pedal, and engage Low Range. To do this, briefly press the rocker switch **-direction arrow-** forwards. The indicator light **-arrow-** comes on.

The stabilizers disengage. In other words: Press the button on the centre console. The button light **-arrow-** comes on.

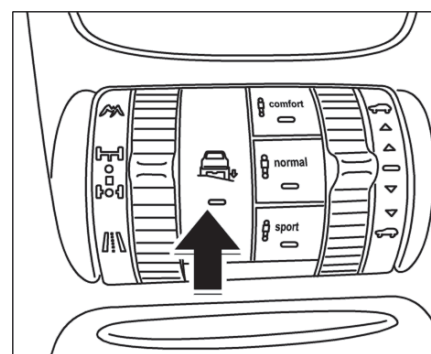
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Press the button again. The button light **-arrow-** goes out. The stabilizers engage again audibly and the indicator light in the instrument cluster goes off.

as of MY 2003

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15,
C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32,
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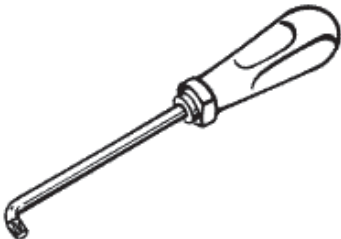
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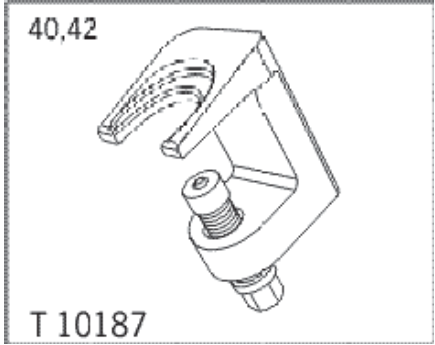
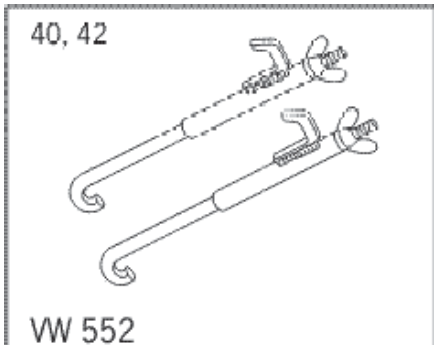
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40 41 19 Removing and installing front drive shaft - as of MY 2003

- Preliminary work
- Tools
- Removing front drive shaft
- Installing front drive shaft
- Subsequent work

Tools

Designation	Type	Number	Explanation	
Screwdriver	special tool	9546	Used to counter the ball joints (tie rod) during assembly and disassembly.	40, 42  9546 000 721 954 60
Universal drive shaft/wheel hub puller as of model '86	commercially available tool	NR.87-1	For pressing the drive shaft out of the wheel hub.	PORSCHE siehe Handbuch Werkstattausrüstung Voir le Manuel Equipement d'atelier Refer to the Workshop Equipment manual Vease Manual de Equipamiento de Taller Vedere il Manuale dell'attrezzatura d'officina ワークショップ・イクイップメント・マニュアルを参照
Press-out tool	special tool	T10187	For pressing out the ball joint on the wheel carrier.	

				
spring compressor	special tool	VW 552		

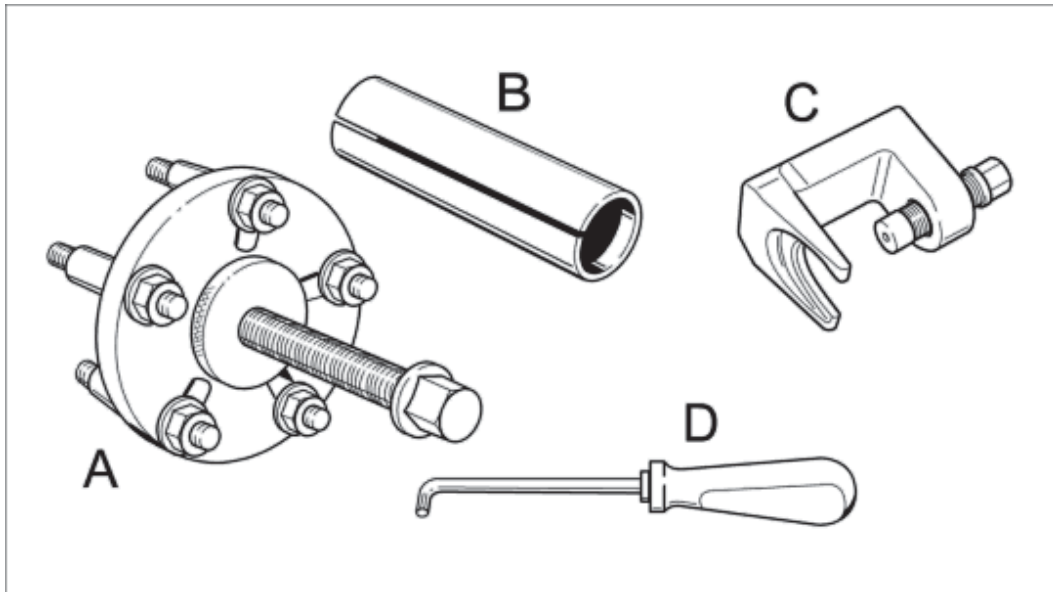
Preliminary work

Preliminary work

1. Release fastening nut for drive shaft.
2. Remove wheel. → 440519 Removing and installing wheel - section on "Removing"

Tools

Tools - Removing and installing front drive shaft



- A- - Universal drive shaft/wheel hub puller as of model '86 NR.87-1
- B- - Protective tube - To protect the drive shaft.
- C- - Press-out tool T10187
- D- - Screwdriver 9546

Removing front drive shaft

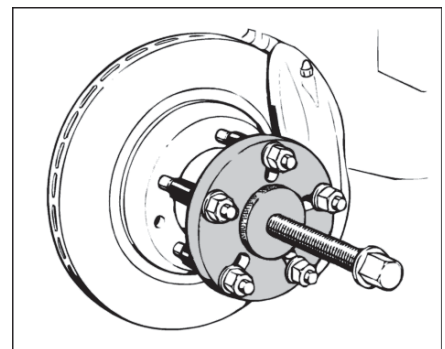
Removing front drive shaft



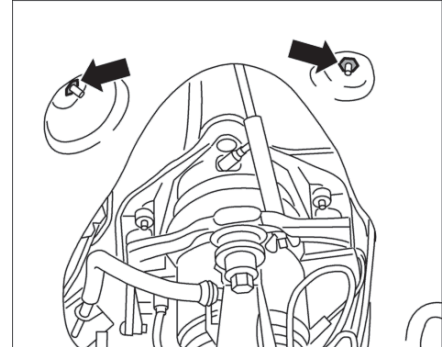
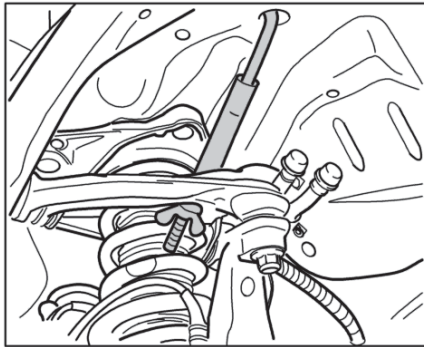
ATTENTION

Increased risk of accidents if the wheel carrier is raised improperly!

- Injuries and material damage are possible.
- Do not raise the wheel suspension higher than the normal vehicle position (vehicle resting on wheels).
- When raising the suspension, use a suitable intermediate layer (hard rubber) .
- Do not damage the brake cover plate.

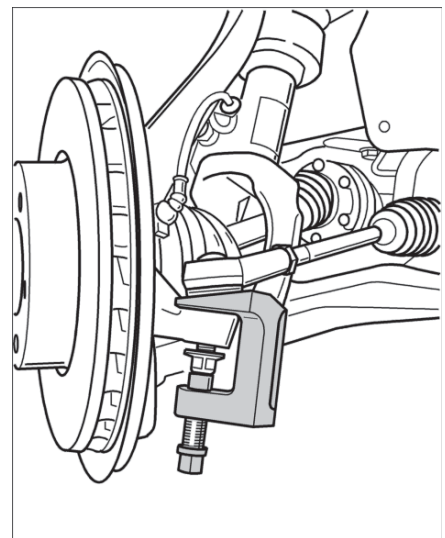


1. Push (press in) peg into the wheel hub with **universal drive shaft/wheel hub extractor as of model '86 NR.87-1**. → **Insertion length: 20 mm +5 mm**
2. Unscrew plastic nuts **-arrows-** on front wheel housing liner.
3. Fix **-upper trailing arm-** with **spring compressor VW 552** (vehicle in illustration with conventional suspension). This involves tensioning axle strut slightly because top ball joint can otherwise get damaged.

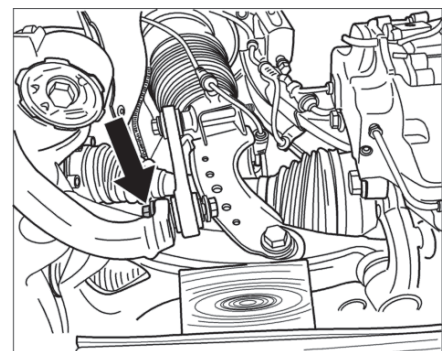


When doing this, the **-spring compressor-** is pushed through the hole in the axle strut, engaged in the upper opening of the wheel well (double panel) and in the axle strut and tightened with the nut. This is only necessary if the same control arm is reinstalled.

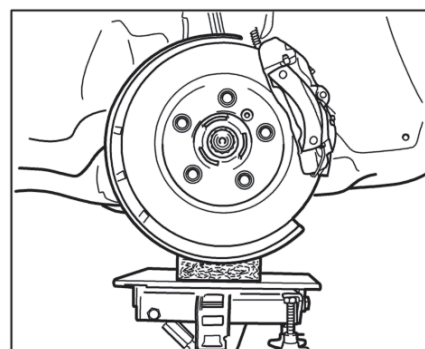
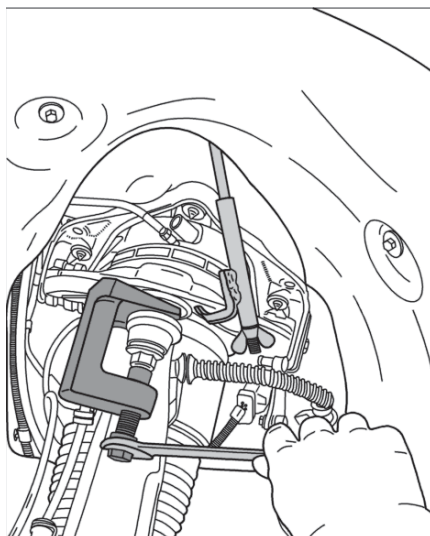
4. Press out tie rod on wheel carrier with **press-out tool T10187**.
→ *see figure* When pressing out, screw fastening nut on flush (protects the ball joint thread).
5. Release lower spring strut.



6. Remove the lower connecting rod **-arrow-** .



7. Raise wheel carrier with a suitable lift to the extent that connecting rod and fastening pins for spring strut at the bottom are easy to remove. Use a **-lift with a rubber base-** to prevent slipping.
8. Undo bolt connecting lower spring strut to axle strut **-arrow-** .
9. Unclip cable for wear monitor and release holder on wheel carrier.
10. Disconnect the cable on the ABS sensor.



11. Press out wheel carrier at the top with **press-out tool T10187**. → [see figure](#)
12. Push the protection over the drive shaft and release the drive shaft at the transmission.
13. 1. One worker must carefully pull upper wheel carrier out and turn the steering. 2. The second worker must carefully pull out drive shaft.

Installing front drive shaft

Installing front drive shaft



ATTENTION

Increased risk of accidents if the wheel carrier is raised improperly!

- Injuries and material damage are possible.

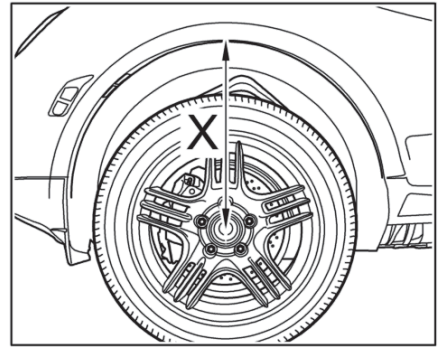
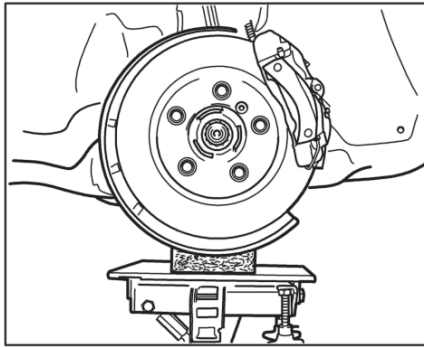
- Do not raise the wheel suspension higher than the normal vehicle position (vehicle resting on wheels).
- When raising the suspension, use a suitable intermediate layer (hard rubber) .
- Do not damage the brake cover plate.



Note

- The entire threaded parts of the axle must be tightened in vehicle position. Vehicle position means: vehicle standing on the wheels, or the wheel suspension is being raised with a universal vehicle lift. **-Dimension X-**, from → **Control value: 502 mm +/-10 mm** corresponds to the vehicle position.
- Use an intermediate layer (hard rubber) ! Do not damage the brake cover plate.
- Screws are Dacromet-coated and must not be greased.

- Grease axle nut with a little Optimoly TA aluminium paste only at mounting-face ring.
- Grease the toothing of the drive shaft slightly with aluminium paste Optimoly TA.
- Drive shafts must not be left hanging from the joint stop. Tie up.



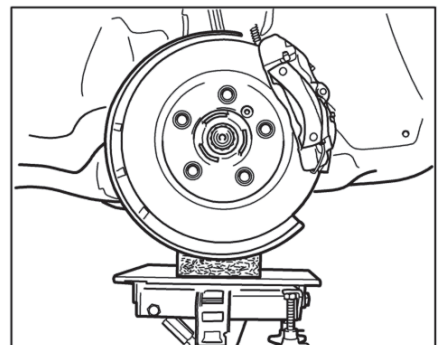
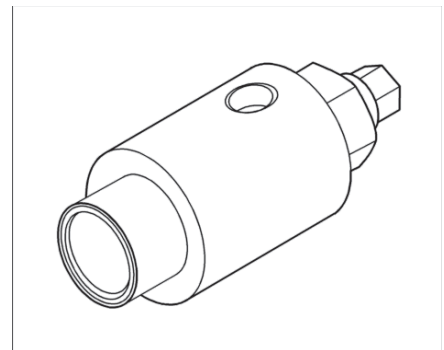
- Use new screws and fastening nuts.
- Make sure the bevel pinions from the ball joints are clean. Clean with a lint-free cloth as necessary. Do not use cleaning agent.
- Use correct tightening torques and torque angle. → Tightening torques for front axle

1. Grease toothing with a little Optimoly TA aluminium paste and insert drive shaft. When doing this, press inner joint together tightly.
2. Grease the mounting-face ring of the axle nut with a little Optimoly TA aluminium paste. Screw on the axle nuts in order to prevent the shaft from slipping out.



Note

- If it is not possible to push shaft in all the way, use **press-out tool T10187** to pull drive shaft in.
3. Insert upper wheel carrier and tie rod, mount using fastening nuts, then tighten to the specified torque. → Tightening torques for front axle Pay attention to inner joint of drive shaft.
 4. Raise wheel carrier with a suitable lift to the extent that connecting rod and fastening pins for spring strut at the bottom are easy to push in.
 5. Use a **-lift with a rubber base-** to prevent slipping.
 6. Engage cable for wear monitor and mount holder on wheel carrier.
 7. Connect the cable on the ABS sensor.



Subsequent work