

Workshop Manual

Arona 2018 ➤ , Ateca 2017 ➤ ,
Ibiza 2016 ➤ , Ibiza 2018 ➤ ,
Ibiza ST 2016 ➤ , León 2013 ➤ ,
León ST 2013 ➤ , Toledo 2013 ➤

3-cylinder petrol engine (1.0 l direct injection, 4 V,
turbocharger, EA211)

Engine ID	CHZ B	CHZL	CHZJ	DKJA	CHZ C	CHZ D	DKLA	DKLB	DKL D
	DKR A	DKR C	DKR F						

Edition 07.2018

List of Workshop Manual Repair Groups

Repair Group

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- 19 - Cooling
- 21 - Turbocharging/supercharging
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- 26 - Exhaust system
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Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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00 – Technical data

1 Safety information

(ERL003833; Edition 07.2018)

⇒ [“1.1 Safety regulations for working on fuel supply”, page 1](#)

⇒ [“1.2 Safety measures when working on vehicles with a start/stop system”, page 1](#)

⇒ [“1.3 Safety precautions when using testers and measuring instruments during a road test”, page 2](#)

⇒ [“1.4 Safety precautions when working on the cooling system”, page 2](#)

⇒ [“1.5 Safety precautions when working on ignition system”, page 2](#)

⇒ [“1.6 Safety precautions when working on exhaust system”, page 2](#)

1.1 Safety regulations for working on fuel supply

Risk of injury from highly pressurised fuel.

The fuel system is pressurised. Injury from fuel spray possible.

Before opening the fuel system:

- Wear protective goggles.
- Wear protective gloves.
- To release pressure, wrap a clean cloth around the connection and carefully loosen the connection.

Danger of fire caused by escaping fuel

When the battery is connected and the driver door opens, the door contact switch activates the fuel pump. Escaping fuel can ignite and cause a fire.

- Disconnect voltage supply to fuel pump before opening the fuel system.

1.2 Safety measures when working on vehicles with a start/stop system

Risk of injury due to unexpected motor start

If the vehicle's start/stop system is activated, the engine can start unexpectedly. Can be detected on a notification in the dash panel insert, whether the start-stop system is activated.

- Deactivate Start/Stop system by switching off the ignition.

1.3 Safety precautions when using testers and measuring instruments during a road test

There is a risk of injury due to unsafe test and measuring equipment.

When the front passenger airbag is triggered in an accident, insufficiently secured testing and measuring instruments become dangerous projectiles.

- Secure testing and measuring instruments on the rear seat.
- or
- Have a second person operate the test and measuring equipment on the rear seat.

1.4 Safety precautions when working on the cooling system

Danger of scalding by hot coolant

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and hot coolant.

- Wear protective gloves.
- Wear protective goggles.
- Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

1.5 Safety precautions when working on ignition system

Risk of injury due to electric shock

The ignition system is under high voltage when the engine is running. Touching the ignition system may result in an electric shock.

- Do not touch or disconnect ignition cables when the engine is running or being turned at starter speed.

WARNING

Risk of damage to components

- If the engine is washed or if electric cables are connected or disconnected while the engine is running, components may be damaged.
- Switch off the ignition before connecting or disconnecting electric cables.
- Switch off the ignition before washing the engine.

1.6 Safety precautions when working on exhaust system

Risk of poisoning due to chemical substances

Exhaust gas temperature senders may contain chemical substances. Risk of injury to the airways and poisonings.

- Never cut open or open the exhaust gas temperature sender.

Risk of injury due to hot condensate and particles in the exhaust system.

The exhaust system could contain hot condensate and/or particles. Risk of injury to the eyes, skin and airways, and risk of poisonings.

- While carrying out the cutting work on the exhaust system, protective gloves and glasses must be worn.
- While carrying out cutting work, a ventilation system or a sufficient ventilation must be provided.



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3-cylinder petrol engine (1.0 l direct injection, 4 V, turbocharger, EA211) - Edition 07.2018

2 Identification

⇒ **"2.1 Engine number/engine data", page 5**

2.1 Engine number/engine data

The engine code and the engine number can be found on the sticker -arrow- on the upper toothed belt guard.

The engine code is also on the vehicle data sticker and on the crankcase above the gearbox.

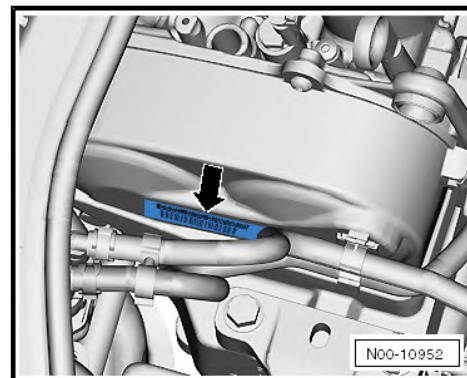
The engine number consists of up to nine characters (alphanumeric). The first part (3 identification letters max.) makes up the "engine code"; and the second part (6 characters) the "serial number". If more than 999,999 engines were produced with the same code letters, the first of the six digits is replaced by a letter.

Codes

Starting with the letter "C", new four digit engine codes have been introduced. The first 3 digits denote the mechanical design of the engine and are stamped on the engine as before. The fourth digit denotes the performance and torque rating of the engine and depends on the engine control unit - J623-. The four-digit engine code can be found on the identification plate, the vehicle data sticker and the engine control unit.

Attachment point for the sticker with the vehicle's data:

- ◆ Ateca ⇒ Maintenance ; Booklet KH1 ; vehicle data sticker
- ◆ Leon 2013 ⇒ Maintenance ; Booklet 501 ; Vehicle data sticker
- ◆ Ibiza 2018 ⇒ Maintenance ; Booklet KJ1 ; Vehicle data sticker
- ◆ Arona ⇒ Maintenance ; Booklet KJ1 ; vehicle data sticker
- ◆ Ibiza 2016 ⇒ Maintenance ; Booklet 603 ; Vehicle data sticker
- ◆ Toledo 2013 ⇒ Maintenance ; Booklet KG1 ; Vehicle data sticker



Engine data

Code	CHZB	CHZC	CHZD	CHZJ	CHZL	DKJA
Exhaust emission s fulfil	EU6 plus	EU6 plus	EU6 plus	EU6 plus	EU6 plus	EU6 plus
Displacement l	999	999	999	999	999	999
Power kW at rpm	70/5000	81/5500	85/5000	85/5000	70/5000	85/5000
Torque Nm at rpm	160/1500	200/1500	200/2000	200/2000	175/2000	200/2000
Cylinder bore Ø mm	74.5	74.5	74.5	74.5	74.5	74.5
Stroke mm	76.4	76.4	76.4	76.4	76.4	76.4
Compression ratio	10.5	10.5	10.5	10.5	10.5	10.5
RON at least	95	95	95	95	95	95
Injection system/ignition system	FSI	FSI	FSI	FSI	FSI	FSI
Exhaust gas recirculation	No	No	No	No	No	No
Exhaust gas temperature control	No	No	No	No	No	No
Turbocharging	Turbocharger	Turbocharger	Turbocharger	Turbocharger	Turbocharger	Turbocharger
Knock control	1 Sensor	1 Sensor	1 Sensor	1 Sensor	1 Sensor	1 Sensor
Supercharging air refrigeration	yes	yes	yes	yes	yes	yes

Volkswagen Technical Site: <http://vwts.ru> <http://vwts.info>

Code	CHZB	CHZC	CHZD	CHZJ	CHZL	DKJA
Lambda control	Probe before catalytic converter Probe after catalytic converter	Probe before catalytic converter Probe after catalytic converter	Probe before catalytic converter Probe after catalytic converter	Probe before catalytic converter Probe after catalytic converter	Probe before catalytic converter Probe after catalytic converter	Probe before catalytic converter Probe after catalytic converter
Camshaft timing adjustment	Inlet Exhaust	Inlet Exhaust	Inlet Exhaust	Inlet Exhaust	Inlet Exhaust	Inlet Exhaust
Intake manifold change-over	No	No	No	No	No	No
Secondary air system	No	No	No	No	No	No
Valves per cylinder	4	4	4	4	4	4
Firing order	1-2-3	1-2-3	1-2-3	1-2-3	1-2-3	1-2-3

Codes	DKRA	DKLA	DKLB	DKLD	DKRC	DKRF
Ex-haust emission standard	EU6 AG ¹	EU6 AG ¹	EU6 AG ¹	EU6 AG ¹	EU6 AG ¹	EU6 AG ¹
Displacement	999	999	999	999	999	999
Power kW at rpm	85/5000	70/5000	63/5000	70/5000	81/5000	85/5000
Torque Nm at rpm	200/2000	175/2000	175/1500	160/1500	200/2000	200/2000
Cylinder bore Ø mm	74.5	74.5	74.5	74.5	74.5	74.5
Stroke mm	76.4	76.4	76.4	76.4	76.4	76.4
Compression ratio	10.5	10.5	10.5	10.5	10.5	10.5
RON at least	95	95	95	95	95	95
Injection system/ignition system	FSI	FSI	FSI	FSI	FSI	FSI
Exhaust gas recirculation	No	No	No	No	No	No
Exhaust gas temperature control	No	No	No	No	No	No
Turbocharging	Turbocharger	Turbocharger	Turbocharger	Turbocharger	Turbocharger	Turbocharger
Knock control	1 Sensor	1 Sensor	1 Sensor	1 Sensor	1 Sensor	1 Sensor
Supercharging air refrigeration	yes	yes	yes	yes	yes	yes

Codes	DKRA	DKLA	DKLB	DKLD	DKRC	DKRF
Lambda control	Probe before catalytic converter Probe after catalytic converter	Probe before catalytic converter Probe after catalytic converter	Probe before catalytic converter Probe after catalytic converter	Probe before catalytic converter Probe after catalytic converter	Probe before catalytic converter Probe after catalytic converter	Probe before catalytic converter Probe after catalytic converter
Camshaft timing adjustment	Inlet Exhaust	Inlet Exhaust	Inlet Exhaust	Inlet Exhaust	Inlet Exhaust	Inlet Exhaust
Intake manifold change-over	No	No	No	No	No	No
Secondary air system	No	No	No	No	No	No
Valves per cylinder	4	4	4	4	4	4
Firing order	1-2-3	1-2-3	1-2-3	1-2-3	1-2-3	1-2-3



Note

¹ with OPF, Otto engine with particulate filter

3 Repair instructions

⇒ [“3.1 Rules for cleanliness”, page 10](#)

⇒ [“3.2 General information”, page 10](#)

⇒ [“3.3 General repair instructions”, page 11](#)

⇒ [“3.4 Foreign objects in engine”, page 11](#)

⇒ [“3.5 Contact corrosion.”, page 11](#)

⇒ [“3.6 Routing and attachment of lines”, page 12](#)

⇒ [“3.7 Fitting radiator and condensers”, page 12](#)

⇒ [“3.8 Checking vacuum system”, page 12](#)

3.1 Rules for cleanliness

Even slight soiling can cause faults. When carrying out work on the fuel supply system, the injection system and the turbocharger, the following cleanliness rules must be adhered to:

- ◆ Thoroughly clean connections and the surrounding areas with engine cleaner or brake cleaner, and dry the cleaned areas thoroughly.
- ◆ Immediately seal open lines and connections with clean plugs, for example plugs from engine bung set - VAS 6122- .
- ◆ Place removed parts on a clean surface and cover them over. Use lint-free cloths only.
- ◆ If repair work cannot be performed immediately, cover new parts which have been removed from their packing.
- ◆ Install only clean parts; do not remove new parts from packaging until immediately before installing. Do not use parts that have been stored outside of their packaging (e.g. in tool boxes).
- ◆ If system is open, do not work with compressed air. Try not to move the vehicle.
- ◆ Make sure that no fuel gets onto the fuel hoses. Should this occur, the fuel hoses must be cleaned immediately.
- ◆ Protect disconnected electrical connectors from dirt and water, and reconnect them only when dry.

3.2 General information

- ◆ The engine control unit is equipped with self-diagnosis. Interrogate the event memory before performing repairs and before fault finding. Also the vacuum hoses and connections must be checked (unmetered air).
- ◆ A voltage of at least 11.5 V is required for proper operation of the electrical components.
- ◆ Do not use sealant with silicone content. Traces of silicone components sucked into the engine are not burned and damage the lambda probe.
- ◆ The vehicles are fitted with a crash/fuel shut-off system. With a collision, the fire hazard of the vehicle reduces if the fuel pump is switched off via the fuel pump relay.
- ◆ At the same time, this system also improves the engine's starting performance. When the driver's door is opened, the fuel pump is activated for 2 seconds in order to build up pressure in the fuel system
⇒ [“1.1 Safety regulations for working on fuel supply”, page 1](#) .

3.3 General repair instructions

- ◆ Clean tools and workbench etc. before working on the injection system.
- ◆ If the high-pressure lines are not renewed, they must be labelled on removal.
- ◆ High-pressure pipes must always be re-installed on the same cylinder.
- ◆ Position high-pressure pipes so they are free of stress. First tighten all unions hand-tight and then tighten to torque.
- ◆ Never attempt to reshape high-pressure lines.
- ◆ When working on any parts of the high-pressure fuel system, tools may only be used for loosening and tightening pipe unions. All other components must always be removed and installed by hand without using tools or other equipment.
- ◆ New cable ties must be fitted in the same positions during installation as those which were undone or cut open during removal.
- ◆ Fuel hoses in engine compartment must only be secured with spring-type clips. O-type clips or screw-type clips must not be used.

3.4 Foreign objects in engine

- ◆ When performing assembly work on the engine, all open passages in the intake and exhaust systems must always be sealed with suitable plugs to prevent foreign particles from entering the engine. Use engine bung set - VAS 6122- .
- ◆ To prevent subsequent damage when a cylinder bank is damaged mechanically, check the intake and exhaust sections as well as the combustion chambers of the opposite cylinder bank for foreign bodies.



Note

*In the event of mechanical damage on turbocharger, proceed according to chapter
⇒ ["1.2 Removing and installing turbocharger", page 353](#) .*

3.5 Contact corrosion.

Contact corrosion can occur if unsuitable fasteners (e.g. bolts, nuts, washers, etc.) are used on the vehicle.

For this reason, only connecting elements with a special surface coating have been fitted.

In addition, rubber, plastic and adhesives are made of non-conductive materials.

If there is any doubt about the suitability of parts, a general rule is to use new parts ⇒ Electronic Parts Catalogue .

Please note:

- ◆ Use only genuine parts which are tested and compatible with aluminium.
- ◆ The use of genuine parts is always recommended.
- ◆ Damage resulting from contact corrosion is not covered by the warranty.

3.6 Routing and attachment of lines

- ◆ In order to rule out mix-ups and ensure that lines/wires/cables/hoses/pipes are all installed in their original position, the lines for e.g. the fuel, hydraulic and vacuum systems and for the activated charcoal filter system as well as electrical wires/cables must be marked appropriately before they are removed. Make sketches or take photographs if necessary.
- ◆ To avoid damaging pipes and wires, ensure adequate clearance from all moving or hot components in the engine compartment on account of the confined space.

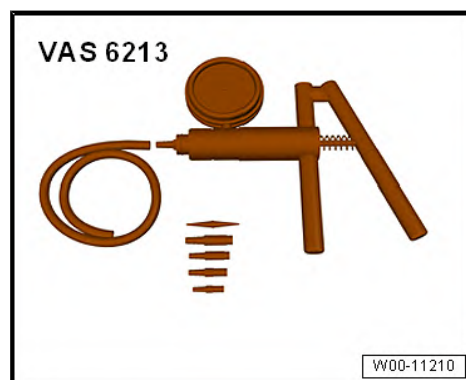
3.7 Fitting radiator and condensers

Even when correctly installed, radiator and condenser may show slight marks on plates. This does not mean that these components have been damaged. Minor indentations such as these are not a reason to renew either the radiator or condenser.

3.8 Checking vacuum system

Special tools and workshop equipment required

- ◆ Hand operated vacuum pump - VAS 6213-



Procedure

- Check all vacuum lines throughout entire vacuum system for:
 - ◆ Cracks
 - ◆ Marten bites
 - ◆ Crushing
 - ◆ Porous areas and other leaks
- Check vacuum line to solenoid valve and from solenoid valve to relevant component.
- If an entry is stored in the event memory, check all vacuum lines leading to the corresponding component and also check the remaining vacuum lines leading to other components.
- If pressure cannot be built-up using hand vacuum pump - VAS 6213- or pressure immediately drops again, check hand vacuum pump and connecting hoses for leaks.

10 – Removing and installing engine

1 Removing and installing engine

⇒ [“1.1 Removing engine”, page 13](#)

⇒ [“1.2 Separating engine and gearbox”, page 47](#)

⇒ [“1.3 Securing engine on engine and gearbox support”, page 50](#)

⇒ [“1.4 Installing engine”, page 52](#)

1.1 Removing engine

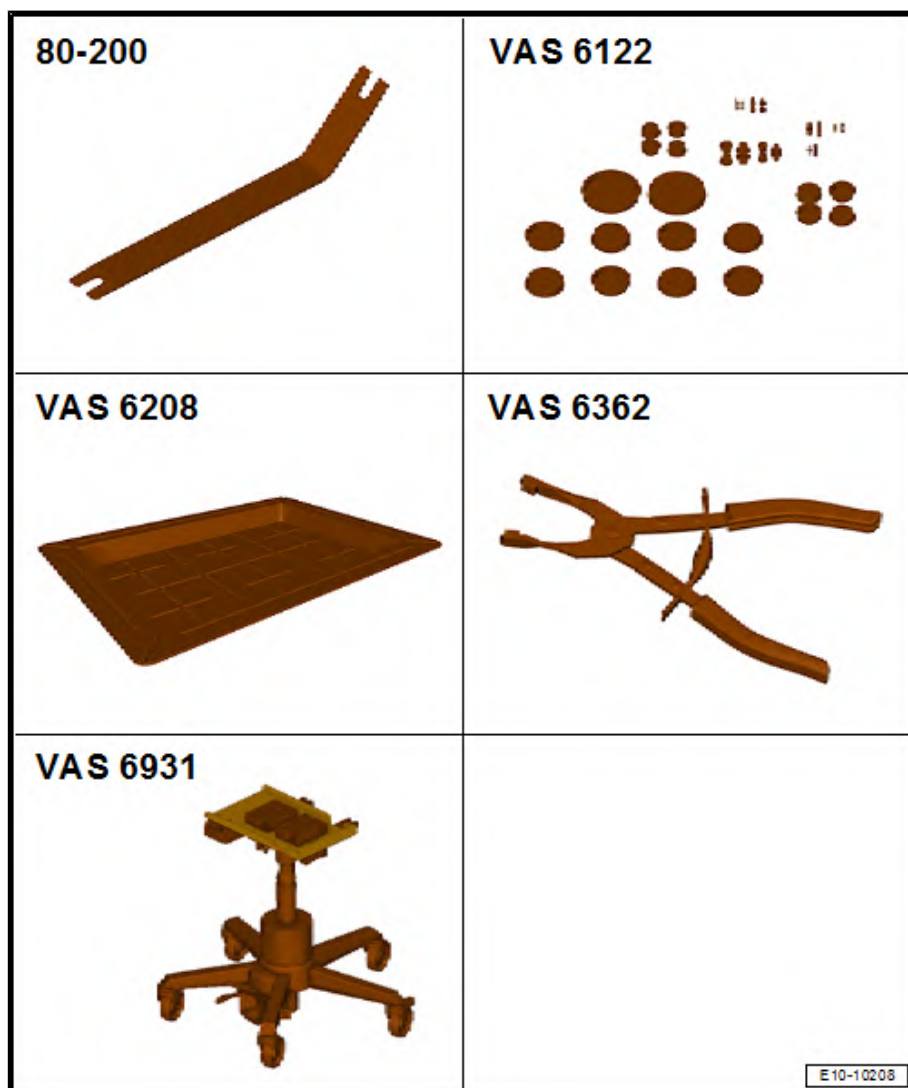
⇒ [“1.1.1 Removing engine; Ateca, Leon 2013”, page 13](#)

⇒ [“1.1.2 Removing engine, Ibiza 2018, Arona”, page 27](#)

⇒ [“1.1.3 Removing engine, Toledo 2013, Ibiza 2016”, page 38](#)

1.1.1 Removing engine; Ateca, Leon 2013

Special tools and workshop equipment required

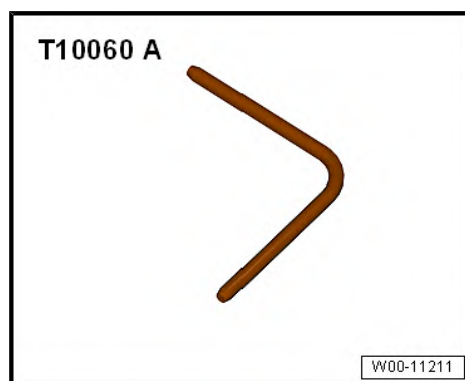


◆ Removal lever - 80-200-

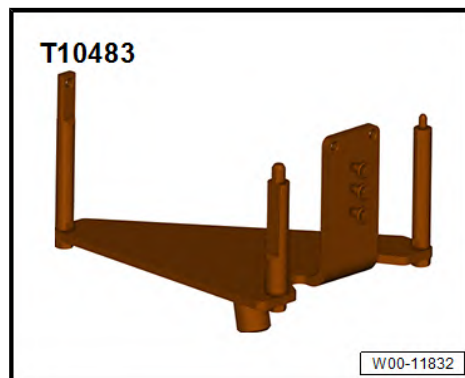
- ◆ Engine bung set - VAS 6122-
- ◆ Drip tray for workshop hoist - VAS 6208-
- ◆ Hose clip pliers - VAS 6362-
- ◆ Engine and gearbox jack - VAS 6931-
- ◆ Extension -2024 A /1- of lifting tackle - 2024 A-



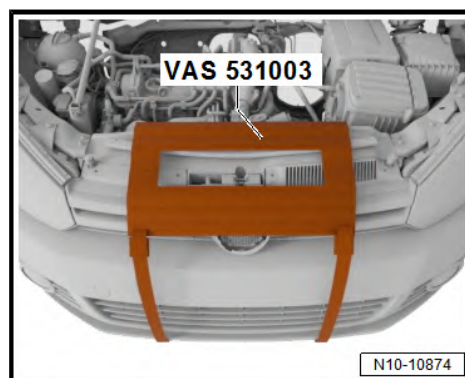
- ◆ Locking pin - T10060A-



- ◆ Engine support - T10483-



- ◆ Protective mat - VAS 531003-



- ◆ Commercially available stepladder
- ◆ Wing protector - VAS 6805-
- ◆ Front cover - VAS 6808-
- ◆ Safety glasses
- ◆ Safety gloves

Procedure



Note

- ◆ *The engine is removed downwards together with the gearbox.*
- ◆ *Attach cable ties in all the same places when installing.*
- ◆ *Fit heat shield sleeves in the same place when installing.*

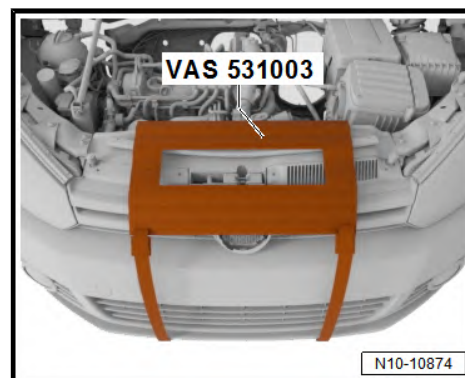
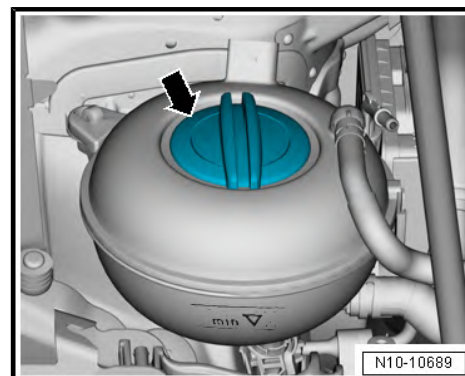


CAUTION

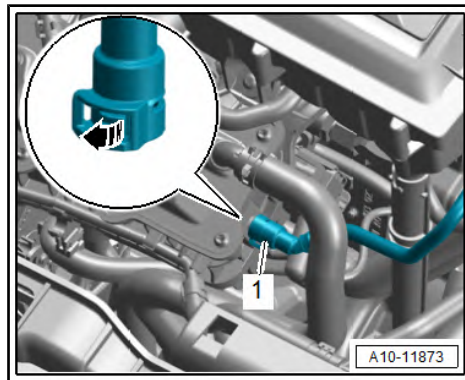
If the engine is hot, the coolant system is exposed to high pressure. Danger of scalding by steam and hot coolant.

Skin and other parts of the body may be scalded.

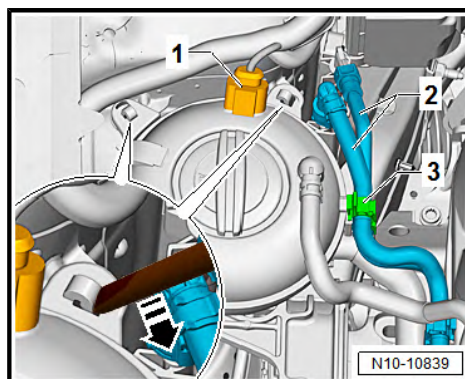
- Wear protective gloves.
 - Wear protective goggles.
 - Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.
-
- Open filler cap -arrow- of coolant expansion tank.
 - Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .
 - Remove radiator cowl with radiator fan
⇒ ["4.5.1 Removing and positioning the radiator cowl, Ateca, Leon 2013", page 335](#)
-
- Attach protective mat - VAS 531003- to vehicle as shown in illustration.



- Release catch -arrow- and disconnect vacuum hose -1-.



- Open locking mechanism -3- and free the lines -2- of the fuel supply system and the activated charcoal filter, quick-release couplings ⇒ Rep. gr. 20 ; Quick-release couplings; quick-release coupling: remove .
- Unplug electrical connector -1-.
- Seal open lines and unions with clean plugs from engine sealing plug set - VAS 6122- .
- Using a screwdriver, release fasteners -arrow- and move coolant expansion tank to one side.

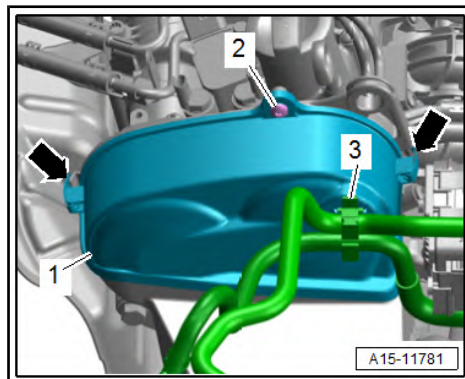


- Detach hoses from retainer -3-.

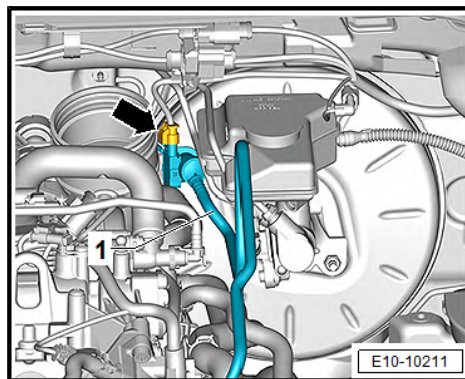


Note

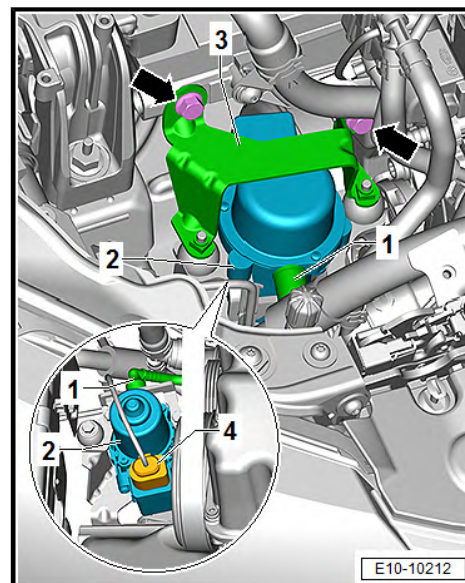
Ignore -positions 1, 2- and -arrows-.



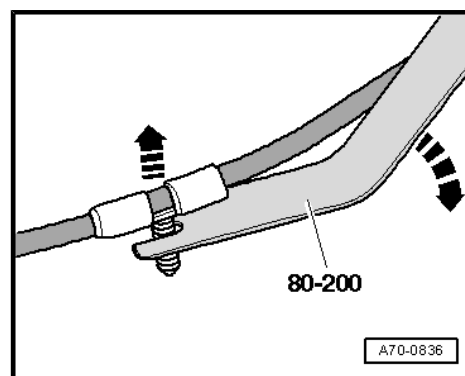
- Disconnect connector -arrow- from vacuum sender - G608- .
- Pull vacuum line -1- off brake servo.



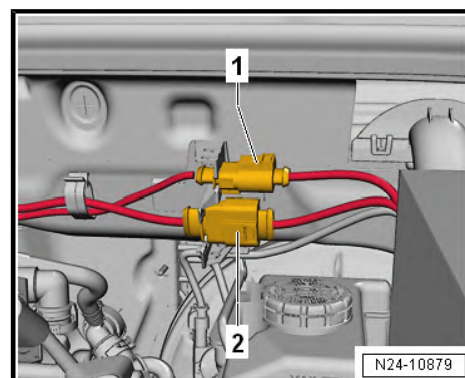
- Pull vacuum line -1- off vacuum pump for brakes - V192- -2- and remove.
- Remove bolts -arrows-.
- Pull connector -4- from the vacuum pump for brakes - V192- -2-.
- Remove bracket with the vacuum pump for brakes - V192- .



- For the work steps below, use removal lever - 80 - 200- to unclip the binding clips.

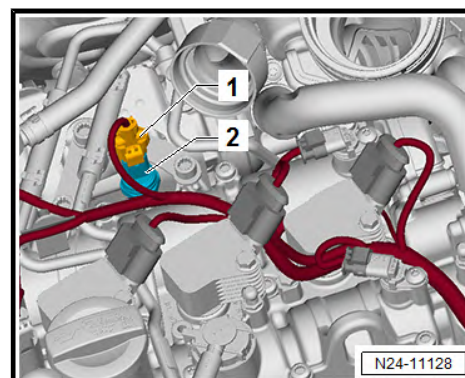


- Disconnect connectors -1- and -2-, and unclip wiring harness from retainer.
- Unclip line guides for lambda probes from vehicle.



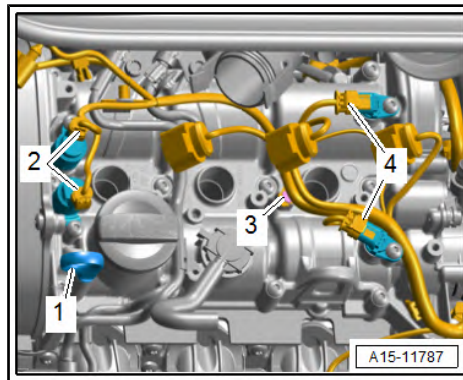
For vehicles with particulate filter

- Disconnect connector -1- from exhaust gas pressure sensor 1 - G450- -2-.

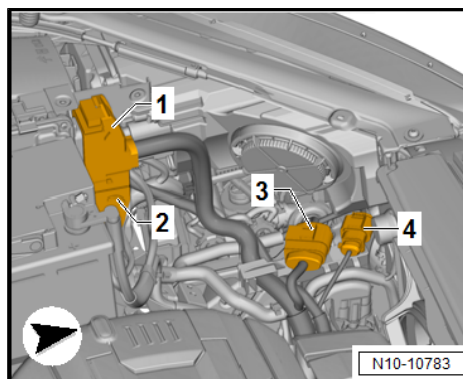


Continued for all vehicles

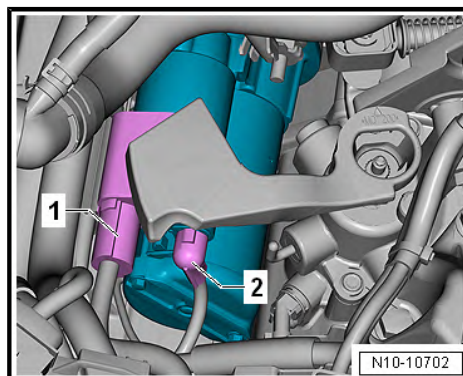
- Separate connectors:
- ◆ -2- for camshaft control valve 1 - N205- / for exhaust camshaft control valve 1 - N318-
- ◆ -4- for Hall sender - G40- / Hall sender 3 - G163-



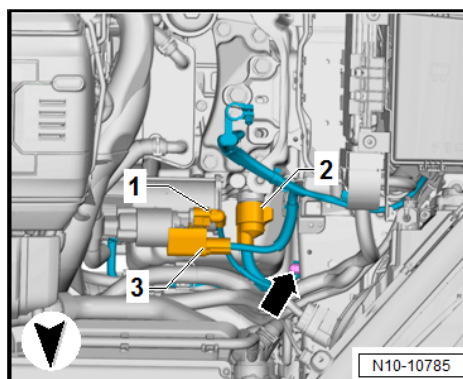
- Release and pull off electrical connectors -1- and -2- on the engine control unit - J623- .
- Remove electrical connectors -3- and -4- from retainer and disconnect.
- Lay wires to one side.



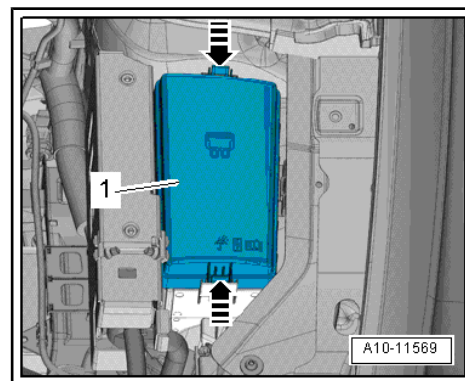
- Unplug electrical connector -2-.
- Push back cover for battery positive terminal -1-, and unbolt battery positive cable from starter solenoid switch.
- Unbolt earth wire from body.



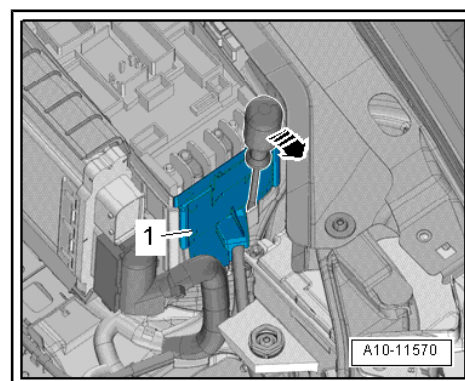
- Unscrew earth wire on body -arrow-.



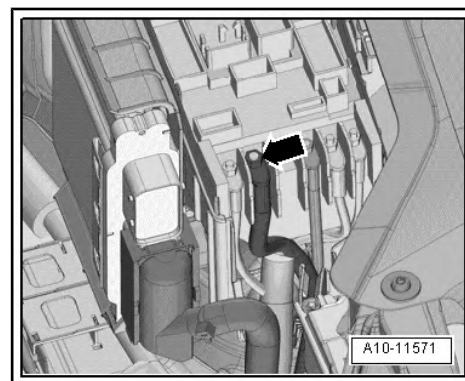
- Release catches -arrows- and detach cover -1- for electronics box in engine compartment.



- Release catch using a screwdriver -arrow- and detach cover -1- for electronics box in engine compartment upwards.



- Remove nut -arrow-, detach electrical wiring and move clear.
- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; battery; battery tray: remove and install .



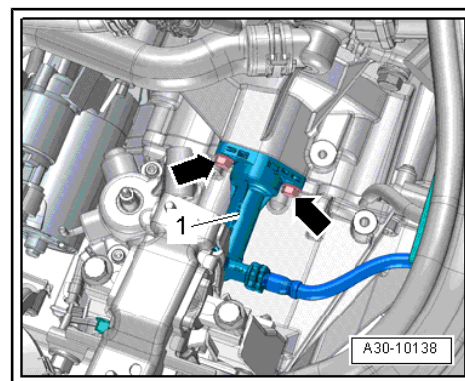
Vehicles with manual gearbox

- Remove gear selector cable and gate selector cable from gearbox, unbolt cable support bracket, and lay it to one side together with cables ⇒ Rep. gr. 34 ; Selector mechanism; Assembly overview - selector mechanism .
- Remove bolts -arrows-, detach clutch slave cylinder -1- and place to one side; do not open pipes.



Note

Do not press clutch pedal when clutch slave cylinder is removed.

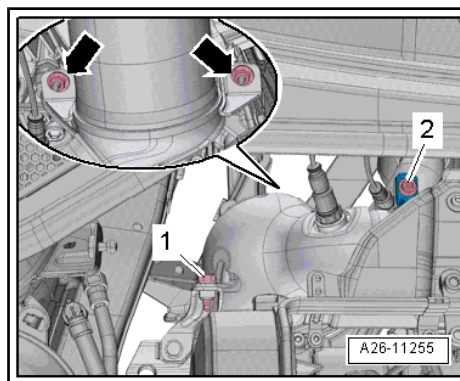


Vehicles with dual clutch gearbox

- Release and pull off connector for mechatronic unit for dual clutch gearbox - J743- ⇒ Rep. gr. 34 ; Mechatronic unit .
- Remove selector mechanism from gearbox ⇒ Rep. gr. 34 ; Selector mechanism; Removing and installing selector mechanism .

Continued for all vehicles

- Unscrew bolt -2- and remove screw-type clip.
- Unscrew bolt -1- and nuts -arrows-, and secure catalytic converter to vehicle.

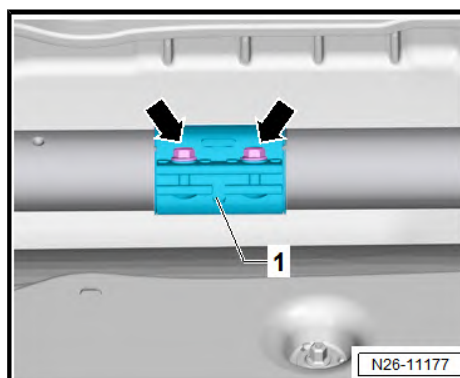


- Release the tightening clamp -1- and move it backwards.



Note

- ♦ Do not allow the decoupling element to kink by more than 10°. It could become damaged.
- ♦ Install decoupling element so that it is not under tension.
- ♦ Take care not to damage wire mesh on decoupling element.
- ♦ Do not remove protective packaging from replacement part until you are ready to fit the flexible joint



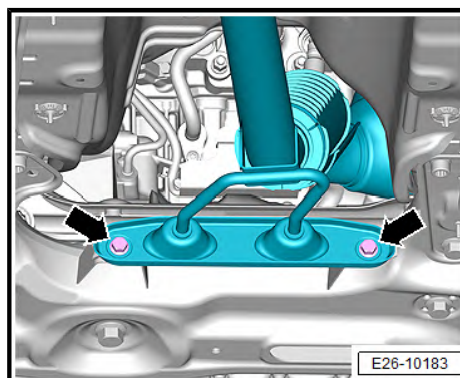
- Remove bolts -arrows-.



Note

When removing the catalytic converter from its installation location, ensure that the Lambda probes and their connections are not damaged.

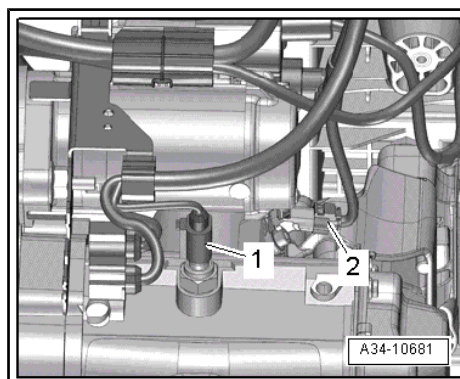
- Remove front wheels.



- Release electrical connector -2- and pull off.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Release and pull off connector -1- working from below.

Vehicles with air conditioner compressor

- Remove poly V-belt
⇒ [“1.2.2 Removing and installing poly V-belt, vehicles with air conditioner compressor”, page 114](#) .



CAUTION

Risk of freezing injury caused by refrigerant.

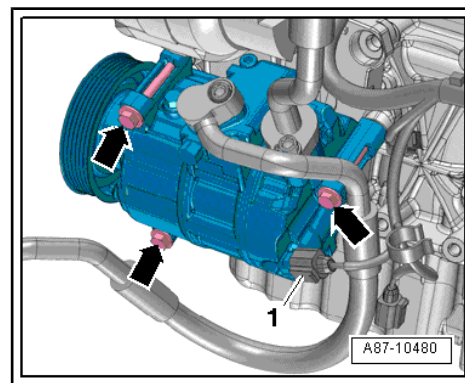
- Do not open refrigerant circuit of air conditioning system.

- Disconnect connector -1- on air conditioning compressor regulating valve - N280- .
- Unclip refrigerant lines from right longitudinal member.
- Unscrew bolts -arrows- for air conditioning compressor.

! NOTICE

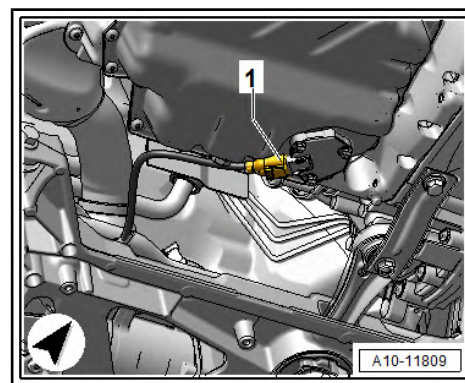
Risk of damage to refrigerant lines from rupture of inner foil.

- **Never bend refrigerant lines to a radius of less than 100 mm ($r < 100$ mm).**
- Remove air conditioner compressor with refrigerant lines connected, and tie it up on the right side.

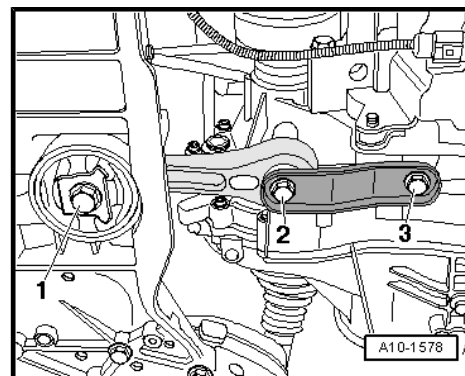


Continued for all vehicles

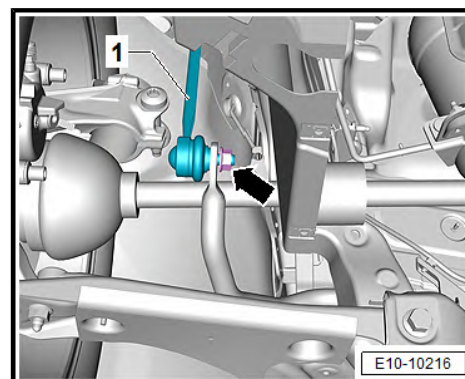
- Release and pull off connector -1- on oil level and oil temperature sender - G266- .



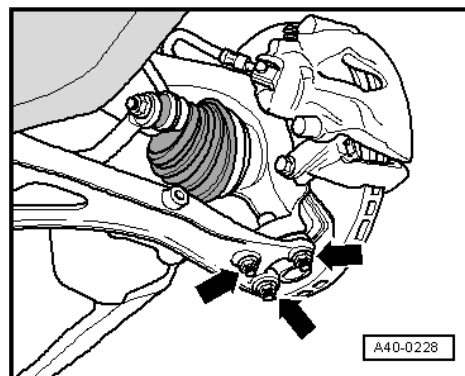
- Unscrew bolts -1, 2 and 3-, and remove pendulum support.



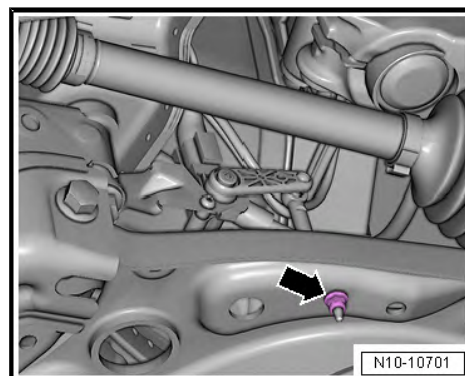
- Unscrew nuts for coupling rod -arrow- on left and right of anti-roll bar -1-.
- Remove right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Detach left drive shaft flange from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; removing and installing drive shaft .



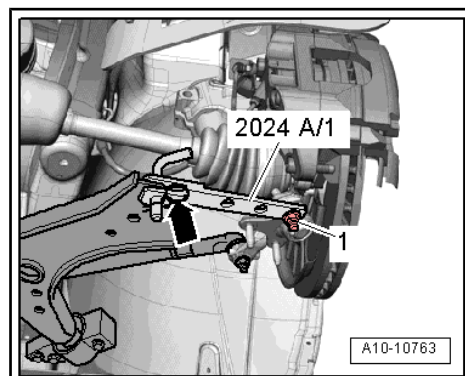
- Unscrew nuts -arrows- for swivel joint on left and right.



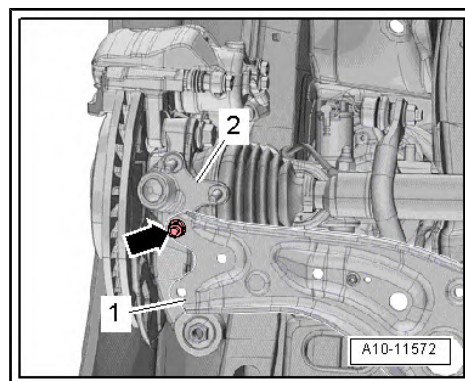
- If fitted, unscrew bolt -arrow- on bracket for front left vehicle level sender - G78- .
- Detach swivel joint from transverse link on left and right.



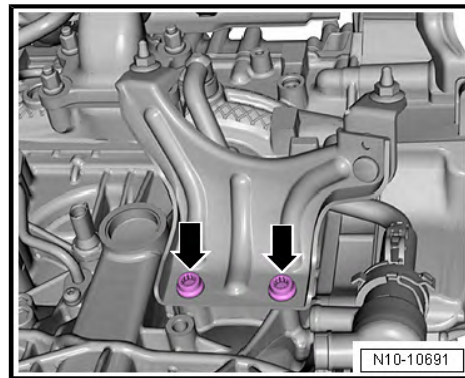
- Swivel left suspension strut outwards and support it with extension -2024 A /1- as shown in illustration.
- Secure dowel pin and swivel joint with locating pin -arrow- and nut -1-.



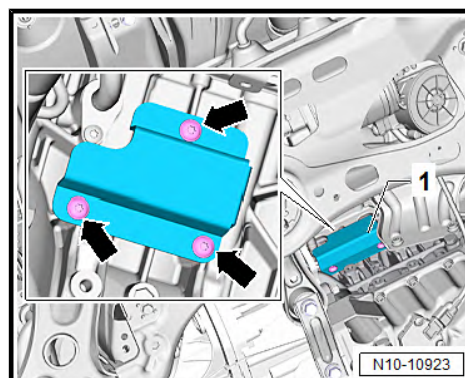
- Secure swivel joint -2- (right-side) to transverse link -1- with nut -arrow-, as shown in illustration.



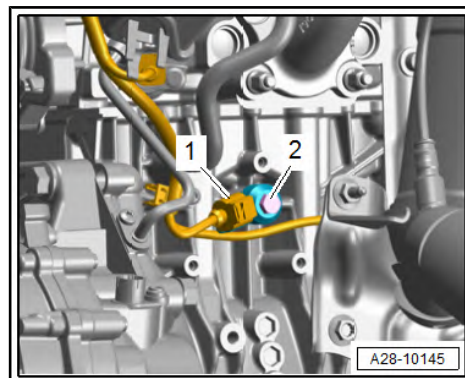
- Unscrew bolts -arrows- and remove bracket.



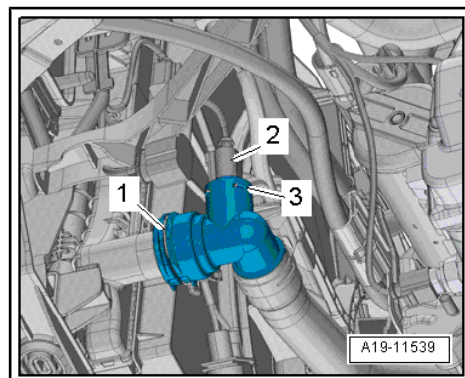
- Unscrew bolts -arrows- and remove heat shield -1-.



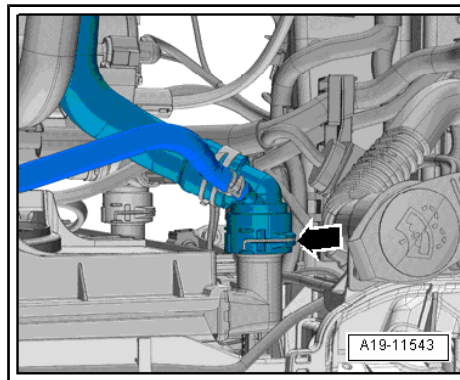
- Remove heat-shield sleeve
- Remove electrical connector -1- of the knock sensor 1 - G61- .



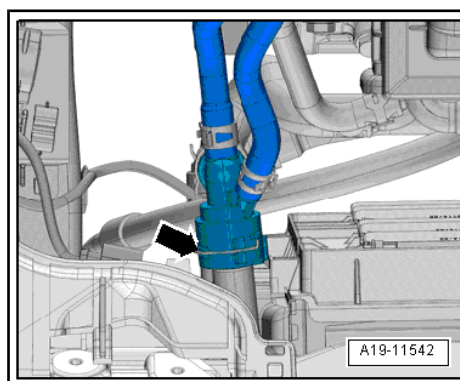
- Disconnect connector -2- on radiator outlet coolant temperature sender - G83- .
- Place drip tray for workshop hoist - VAS 6208- beneath engine.
- Drain coolant
⇒ ["1.3.1 Draining and adding coolant, Ateca, Leon 2013", page 260](#) .



- Lift the retaining clip -arrow-, remove the coolant hose at the top left from the radiator.

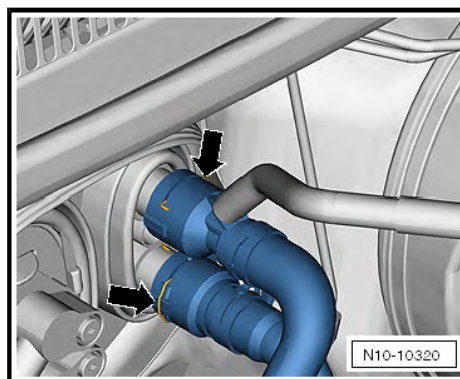


- Lift the retaining clip -arrow-, remove the coolant hose at the top right from the water radiator for the charge air cooling circuit.



Vehicles with no auxiliary heater

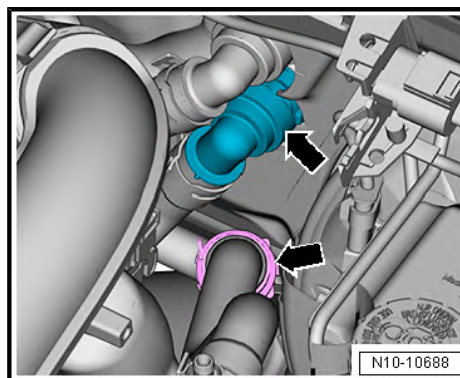
- Lift the retaining clips -arrows- and detach the coolant hoses from the heat exchanger for heater.



Vehicles with auxiliary heater

- Release retaining clip and hose clip and pull off both coolant hoses -arrows-.
- Hold coolant hoses downwards to allow coolant to drain.

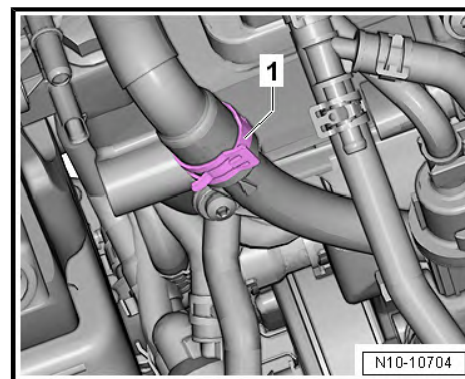
Continued for all vehicles



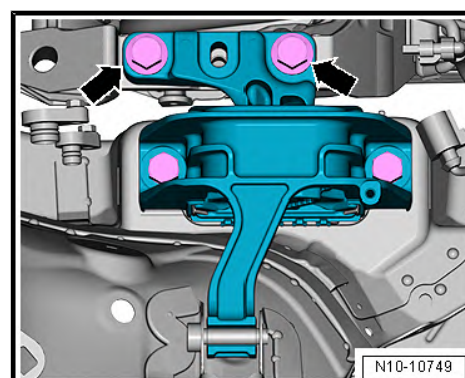


Note

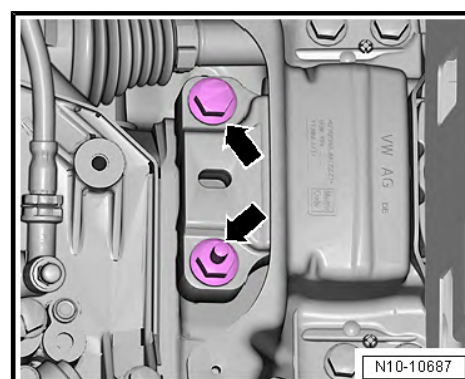
- ◆ *Place a cloth underneath to absorb escaping coolant.*
- ◆ *Remove clip -1-, remove coolant hose and remove the coolant expansion tank.*



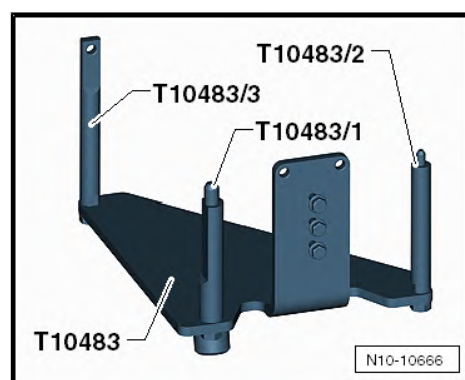
- Unscrew bolts -arrows- from engine mounting by 2 turns.



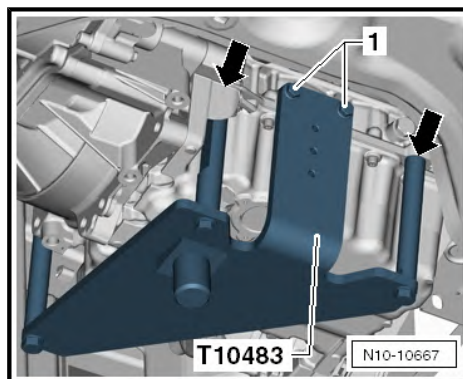
- Unscrew bolts -arrows- for gearbox mounting approx. 2 turns.
- Unscrew lower coolant hose on the »radiator« on the engine block.



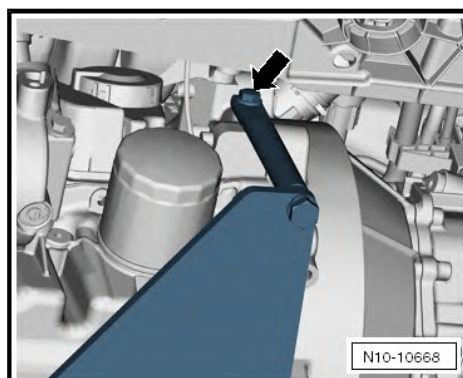
The engine support is required to lower the engine and gearbox module - T10483- with the adapters - T10483-/1, -/2 und -/3- .



- Push engine support - T10483- to stop into holes -arrows- in cylinder block.
- At first, tighten bolts -1- hand-tight.



- Initially, tighten bolts -arrow- by hand.

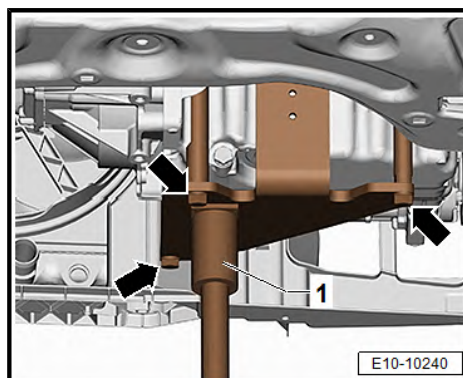


- Tighten bolts -arrows- to 20 Nm.
- Tighten all bolts of the engine bracket - T10483- on the cylinder block with 20 Nm.
- Fit engine and gearbox jack - VAS 6931- to engine support - T10483- , and raise engine/gearbox assembly slightly.

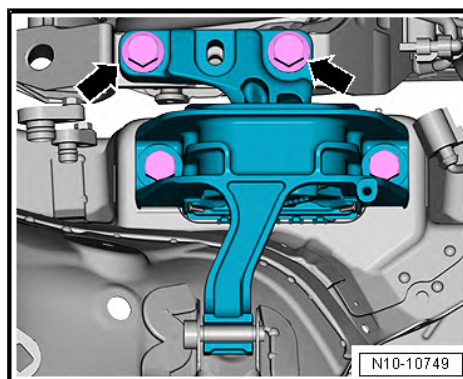


Note

Use a stepladder to unscrew the bolts for the assembly mounting.



- Unscrew bolts -arrows- for support arm of gearbox mounting completely.

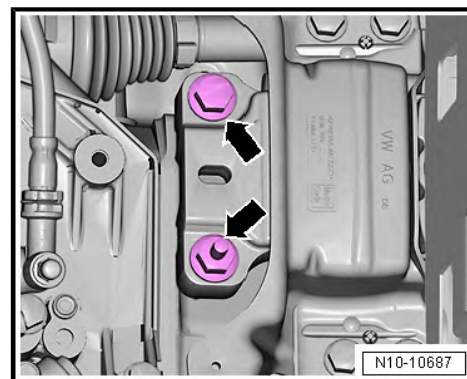


- Unscrew bolts -arrows- for gearbox mounting.



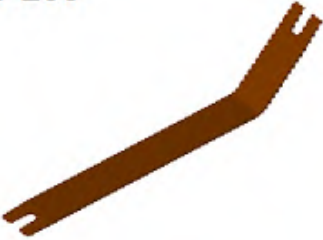
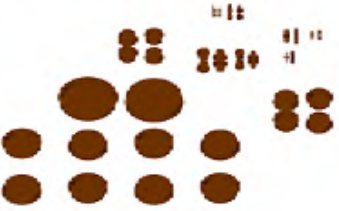
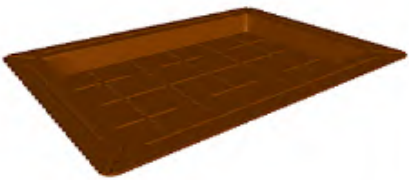
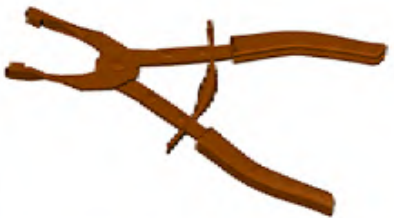

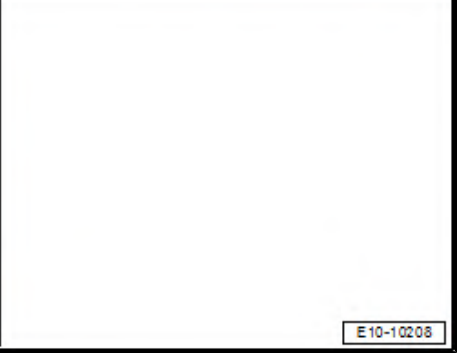
Note

- ◆ Risk of damage to the vacuum lines or electrical wiring as well as damage to the engine compartment.
 - ◆ Check that all vacuum lines and electrical wiring between engine, gearbox, subframe and body have been detached.
 - ◆ When lowering, carefully guide engine/gearbox assembly with assembly carrier out of engine compartment.
- Pull engine/gearbox assembly as far as possible towards the front, and lower it gradually.



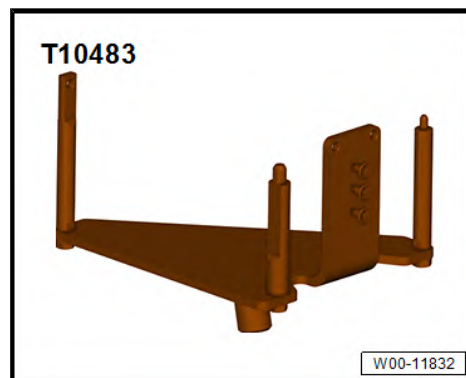
1.1.2 Removing engine, Ibiza 2018, Arona

Special tools and workshop equipment required

<p>80-200</p> 	<p>VAS 6122</p> 
<p>VAS 6208</p> 	<p>VAS 6362</p> 
<p>VAS 6931</p> 	

- ◆ Removal lever - 80-200-
- ◆ Engine bung set - VAS 6122-
- ◆ Drip tray for workshop hoist - VAS 6208-
- ◆ Hose clip pliers - VAS 6362-

- ◆ Engine and gearbox jack - VAS 6931- or -V.A.G 1383 A-
- ◆ Engine support - T10483-



- ◆ Tensioning strap - T10038-



- ◆ Protective mat - VAS 531003- (not illustrated)
- ◆ Commercially available stepladder
- ◆ Wing protector - VAS 6805-
- ◆ Front cover - VAS 6808-
- ◆ Safety glasses
- ◆ Safety gloves

Procedure



Note

- ◆ *The engine is removed downwards together with the gearbox.*
- ◆ *Attach cable ties in all the same places when installing.*
- ◆ *Fit heat shield sleeves in the same place when installing.*

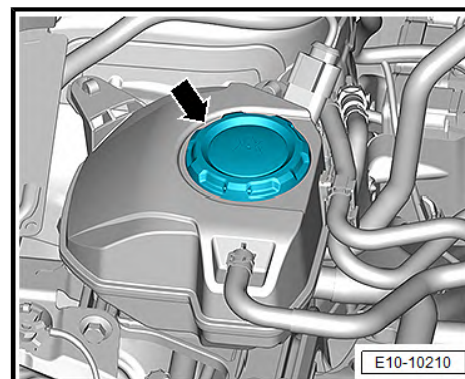
CAUTION

If the engine is hot, the coolant system is exposed to high pressure. Danger of scalding by steam and hot coolant.

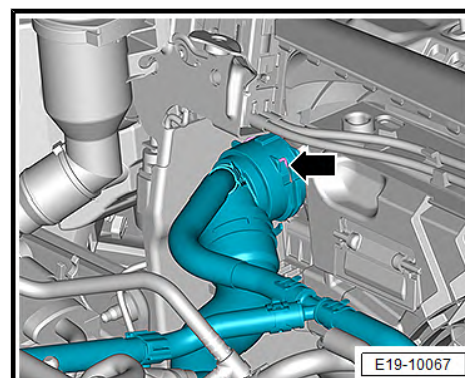
Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear protective goggles.
- Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

- Carefully open filler cap -arrow- on coolant expansion tank.
- Drain coolant
⇒ ["1.3.2 Draining and adding coolant, Ibiza 2018, Arona", page 265](#) .
- Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .
- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; battery; battery tray: remove and install .



- Lift the retaining clip -arrow-, remove the coolant hose at the top left from the radiator.



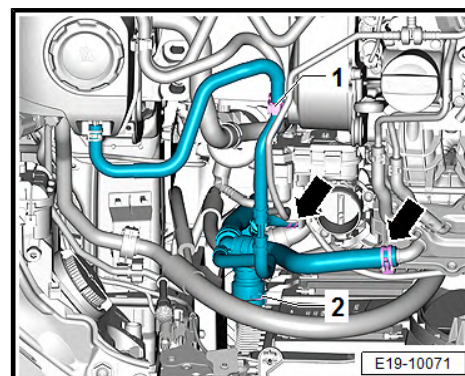
- Detach hoses from retainer -1-.



Note

The position -arrows- can be disregarded.

- Lift retaining clip -2- and separate coolant hose (bottom right) from water radiator for charge air cooling circuit.



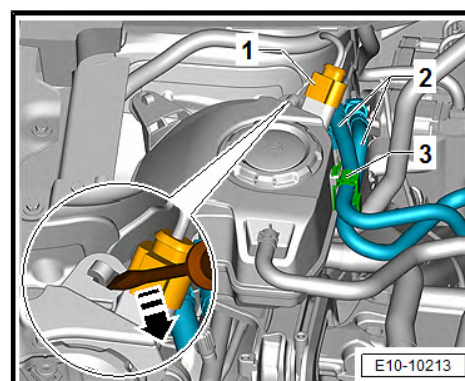
CAUTION

The fuel system is pressurised.

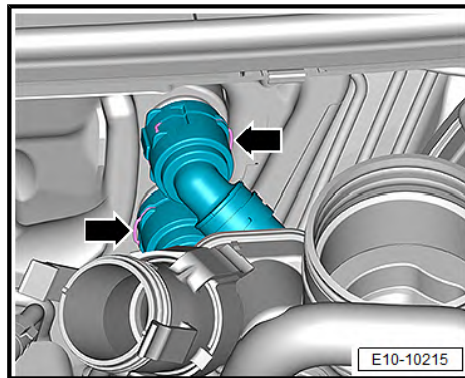
Danger of injury caused by fuel spray.

- Wear protective goggles.
- Wear protective gloves.
- To release pressure, wrap a clean cloth around the connection and carefully loosen the connection.

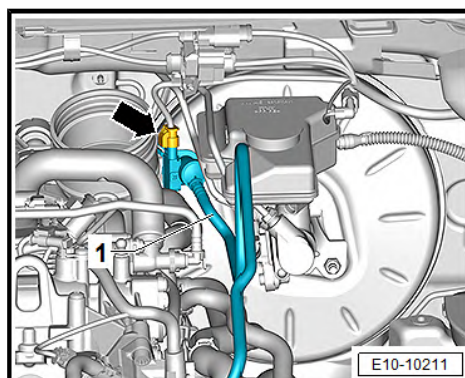
- Open locking mechanism -3- and free the lines -2- of the fuel supply system and the activated charcoal filter, quick-release couplings ⇒ Rep. gr. 20 ; Quick-release couplings; quick-release coupling: remove .
- Unplug electrical connector -1-.
- Seal open lines and unions with clean plugs from engine sealing plug set - VAS 6122- .
- Release catches in direction of -arrow- with a screwdriver and place coolant expansion tank on engine.
- Secure coolant hoses above engine.



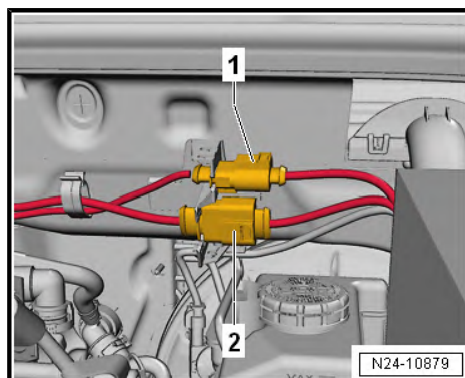
- Disconnect coolant hoses from heat exchanger for heater; lifting retaining clips -arrows- to do so.
- Hold coolant hoses down and allow coolant to drain, then connect hoses to the engine.



- Disconnect connector -arrow- from vacuum sender - G608- .
- Pull vacuum line -1- off brake servo.

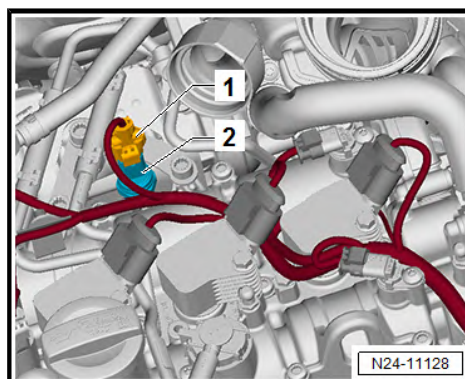


- Disconnect connectors -1- and -2-, and unclip wiring harness from retainer.
- Unclip line guides for lambda probes from vehicle.



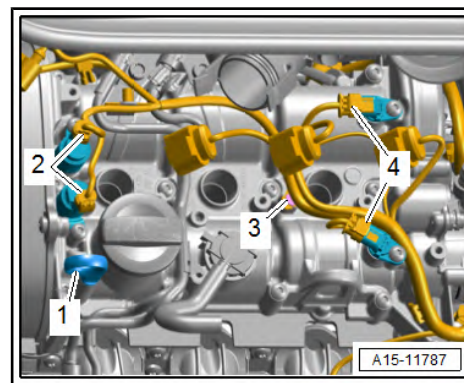
For vehicles with particulate filter

- Disconnect connector -1- from exhaust gas pressure sensor 1 - G450- -2-.

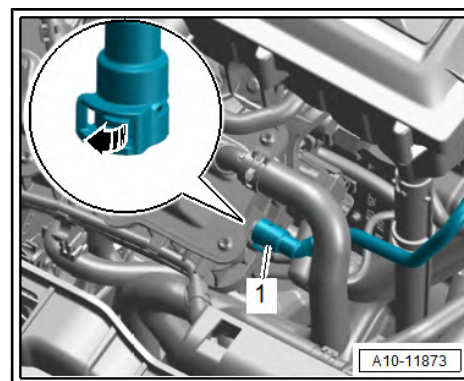


Continued for all vehicles

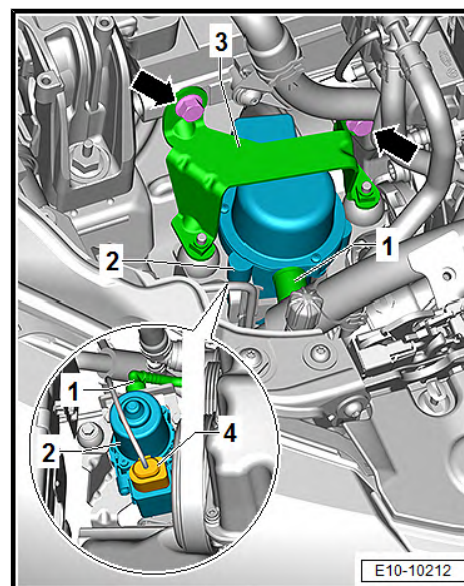
- Separate connectors:
- ◆ -2- for camshaft control valve 1 - N205- / for exhaust camshaft control valve 1 - N318-
- ◆ -4- for Hall sender - G40- / Hall sender 3 - G163-



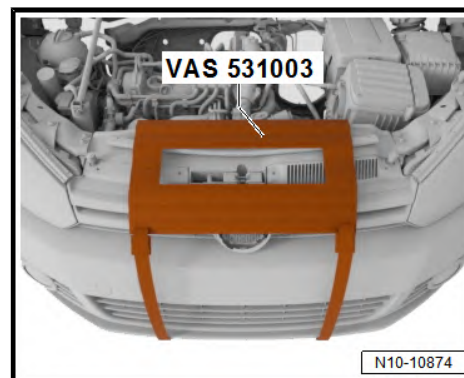
- Release catch -arrow- and disconnect vacuum hose -1-.



- Pull vacuum line -1- off vacuum pump for brakes - V192- -2- and remove.
- Remove bolts -arrows-.
- Pull connector -4- from the vacuum pump for brakes - V192- -2-.
- Remove bracket with the vacuum pump for brakes - V192- .
- Remove radiator cowl
⇒ ["4.5.2 Removing and positioning the radiator cowl, Arona, Ibiza 2018", page 336](#) .



- Cover radiator using protective mat - VAS 531003- .

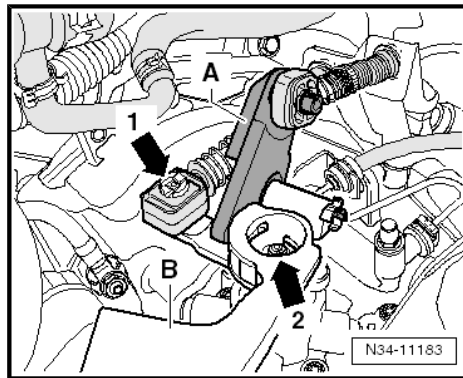


- Remove securing clip -1- for gear selector cable from gearbox selector lever -B-.



Note

Disregard item -2-.

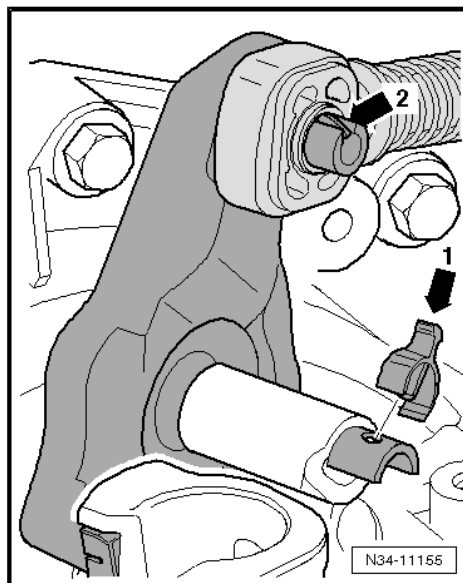


- Pull off clip -arrow 1- and remove gate relay lever together with cable end-piece.

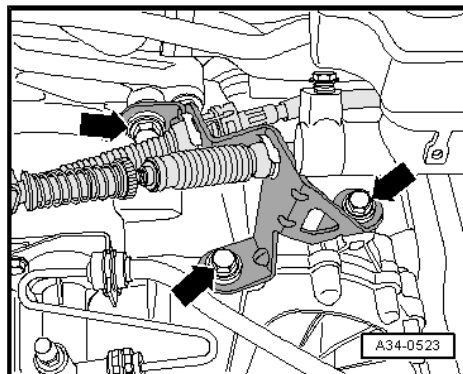


Note

Disregard item -2-.



- Unscrew bolts -arrows-, and tie up cable support bracket with cables.

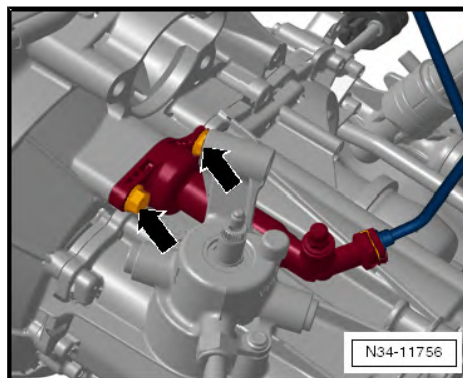


- Remove bolts -arrows-, detach clutch slave cylinder -1- and place to one side; do not open pipes.

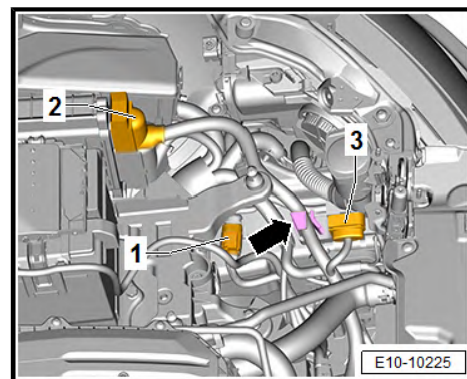


Note

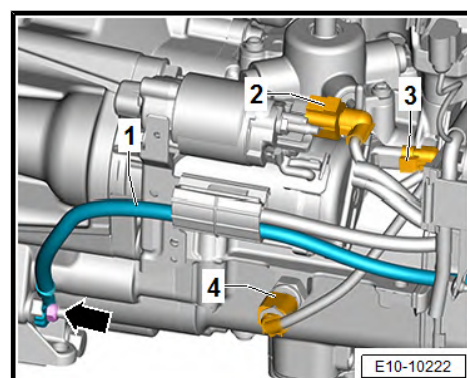
Do not press clutch pedal when clutch slave cylinder is removed.



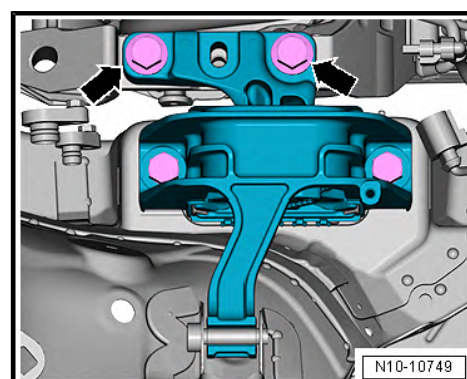
- Release and pull off electrical connector -2- on engine control unit - J623- .
- Disconnect electrical connectors -1- and -3-.
- Detach wiring harness from attachment -arrow-.
- Secure cables to engine using a cable tie.



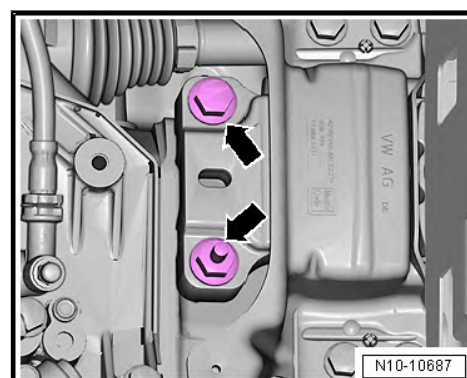
- Detach connectors -2-, -3- and -4-.
- Unscrew nut -arrow- for earth line -1-.
- Secure electrical wires on left longitudinal member using a cable tie.



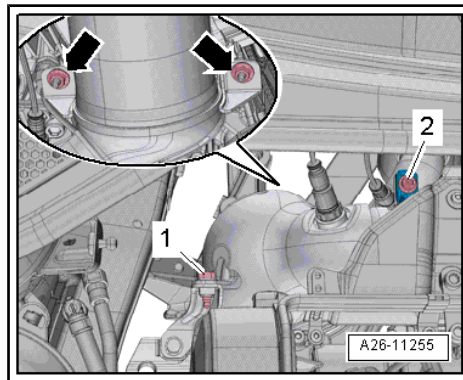
- Unscrew bolts -arrows- on engine mounting approx. 2 turns.



- Unscrew bolts -arrows- for gearbox mounting approx. 2 turns.



- Unscrew bolt -2-; remove screw-type clip.
- Remove bolt -1- and nuts -arrows-.



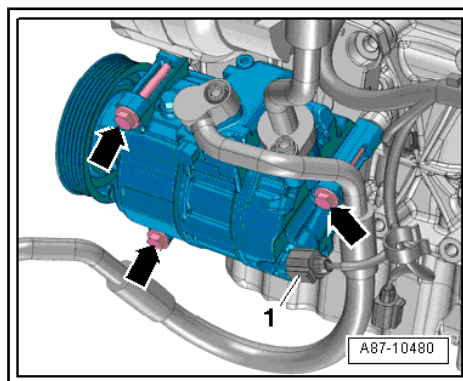
Vehicles with air conditioner compressor

- Remove poly V-belt
⇒ ["1.2.2 Removing and installing poly V-belt, vehicles with air conditioner compressor", page 114](#) .
- Disconnect connector -1- on air conditioning compressor regulating valve - N280- .

CAUTION

Risk of freezing injury caused by refrigerant.

- Do not open refrigerant circuit of air conditioning system.

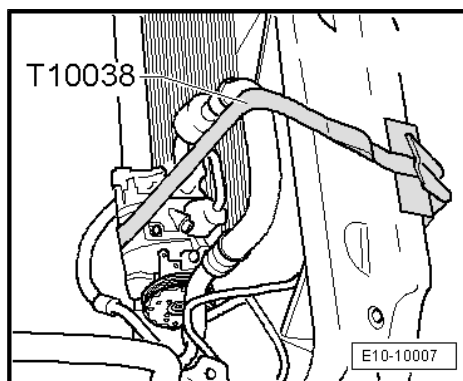


- Unclip refrigerant lines from right longitudinal member.
- Unscrew bolts -arrows- for air conditioning compressor.

NOTICE

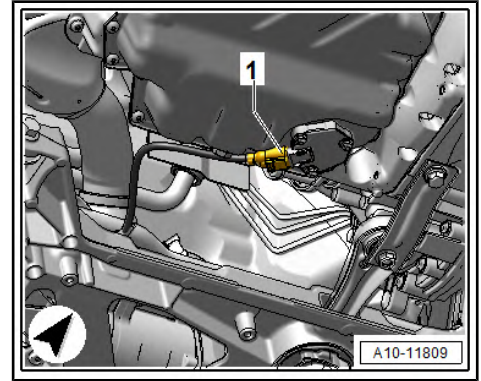
Risk of damage to refrigerant lines from rupture of inner foil.

- Never bend refrigerant lines to a radius of less than 100 mm ($r < 100 \text{ mm}$).
- Take off air conditioner compressor with connected coolant lines and fix with the support tool - T10038- to the right side of the lock carrier.

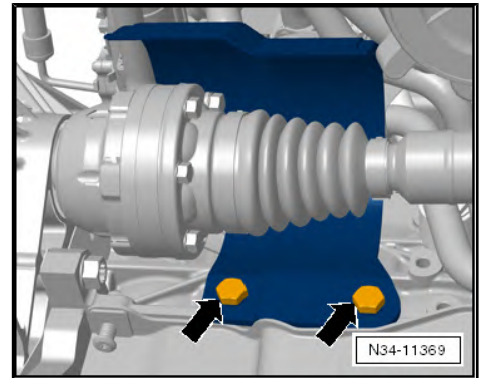


Continued for all vehicles

- Release and pull off connector -1- on oil level and oil temperature sender - G266- .
- If fitted, remove underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - underbody trim panels .



- If available, unscrew bolts -arrows-, and remove heat shield for right drive shaft.
- Remove drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shafts .

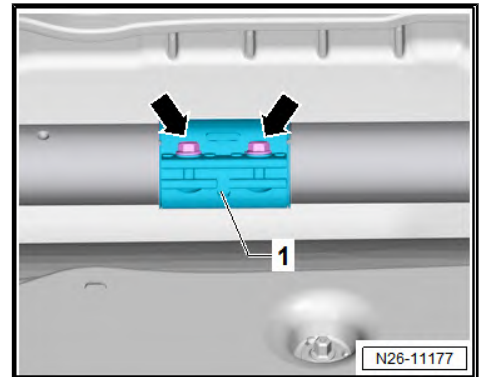


- Release the tightening clamp -1- and move it backwards.



Note

- ◆ Do not allow the decoupling element to kink by more than 10°. It could become damaged.
- ◆ Install decoupling element so that it is not under tension.
- ◆ Take care not to damage wire mesh on decoupling element.
- ◆ Do not remove protective packaging from replacement part until you are ready to fit the flexible joint

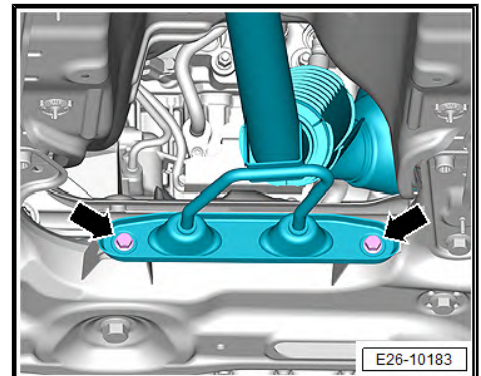


- Remove bolts -arrows-.

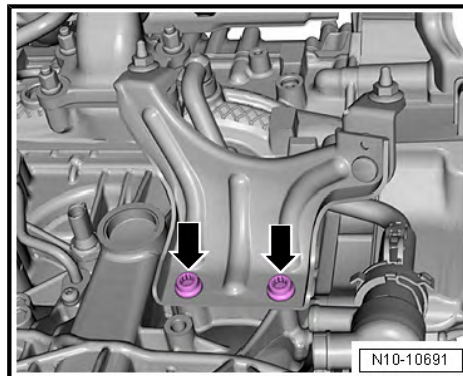


Note

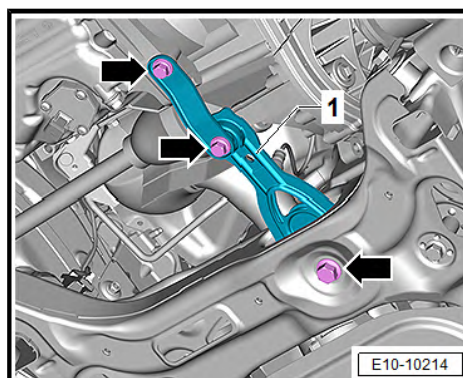
When removing the catalytic converter from its installation location, ensure that the Lambda probes and their connections are not damaged.



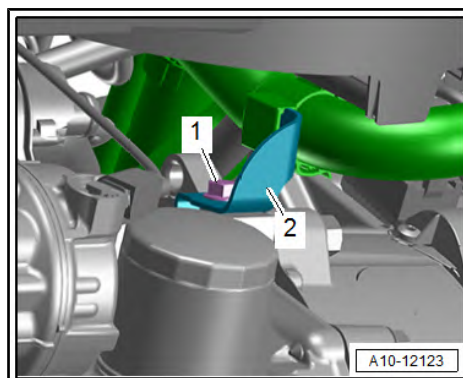
- Unscrew bolts -arrows- and remove bracket.
- Dismantle catalytic converter with front exhaust pipe and pull out between the tunnel of the underfloor rear and the sub-frame.



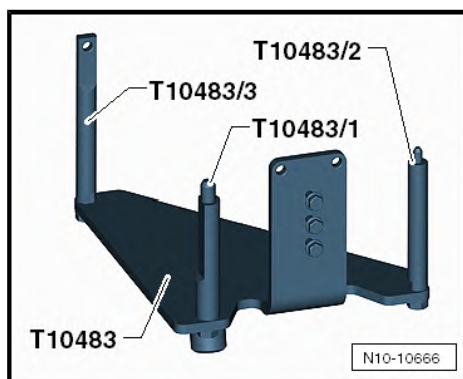
- Unscrew bolts -arrows-, and detach pendulum support -1-.



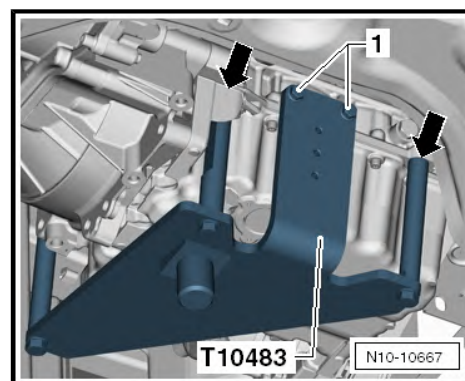
- Unscrew bolts -1- and press the holder -2- to one side.



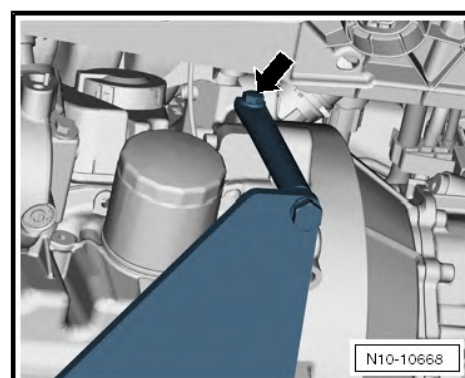
Engine support - T10483- with adapters - T10483-/1, -/2 and -/3- are required to lower engine and gearbox.



- Push engine support - T10483- to stop into holes -arrows- in cylinder block.
- At first, tighten bolts -1- hand-tight.



- Tighten bolt -arrow- hand initially.

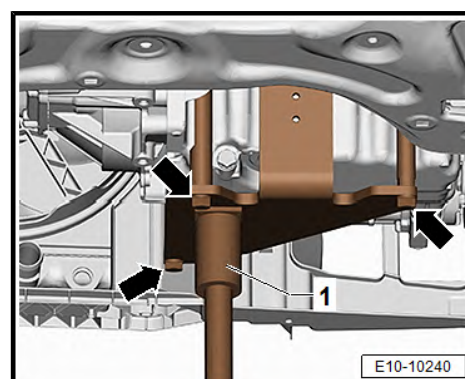


- Tighten bolts -arrows- to 20 Nm.
- Tighten all bolts of the engine bracket - T10483- on the cylinder block with 20 Nm.
- Fit engine and gearbox jack - VAS 6931- -1- to engine support - T10483- and raise engine/gearbox assembly slightly.

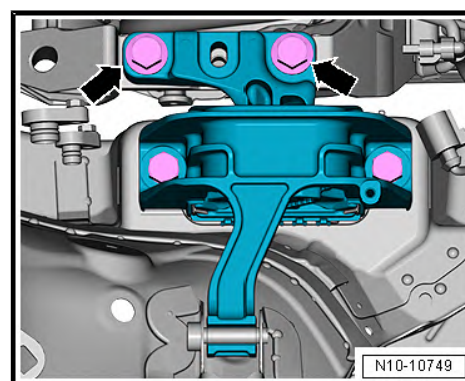


Note

Use a stepladder to unscrew the bolts for engine/gearbox mounting.



- Unscrew bolts -arrows- for support arm of gearbox mounting completely.

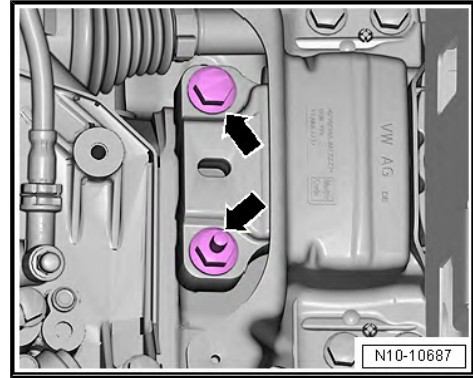


- Unscrew bolts -arrows- for gearbox mounting completely.



Note

- ♦ Risk of damage to the vacuum lines or electrical wiring as well as damage to the engine compartment.
 - ♦ Check that all vacuum lines and electrical wiring between engine, gearbox, subframe and body have been detached.
 - ♦ Carefully remove the engine/gearbox unit out of the engine bay whilst draining.
- Guide the engine/gearbox assembly as far forwards as possible and lower it slowly downwards.



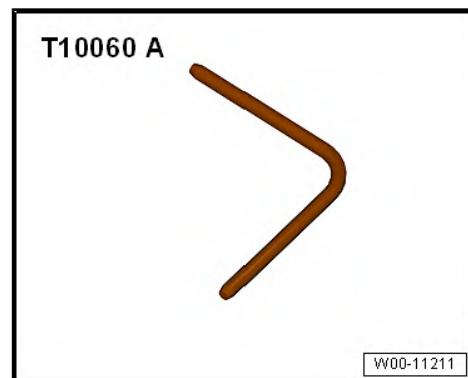
1.1.3 Removing engine, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required

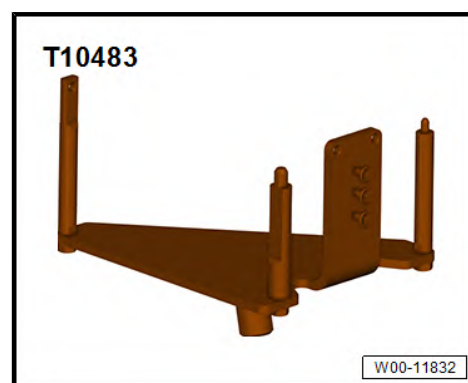
80-200 	VAS 6122
VAS 6208 	VAS 6362
VAS 6931 	

- ♦ Removal lever - 80-200-
- ♦ Engine bung set - VAS 6122-
- ♦ Drip tray for workshop hoist - VAS 6208-
- ♦ Hose clip pliers - VAS 6362-

- ◆ Engine and gearbox jack - VAS 6931- or -V.A.G 1383 A-
- ◆ Locking pin - T10060A-



- ◆ Engine support - T10483-



- ◆ Commercially available stepladder
- ◆ Protective mat - VAS 531003- (not illustrated)
- ◆ Safety glasses
- ◆ Safety gloves

Procedure



Note

- ◆ *The engine is removed downwards together with the gearbox.*
- ◆ *Attach cable ties in all the same places when installing.*
- ◆ *Fit heat shield sleeves in the same place when installing.*

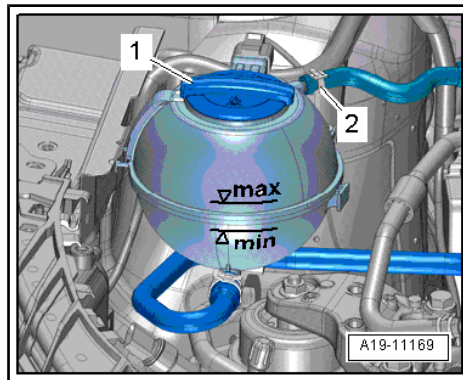
CAUTION

If the engine is hot, the coolant system is exposed to high pressure. Danger of scalding by steam and hot coolant.

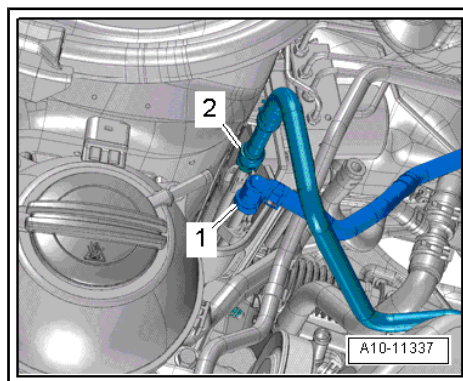
Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear protective goggles.
- Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

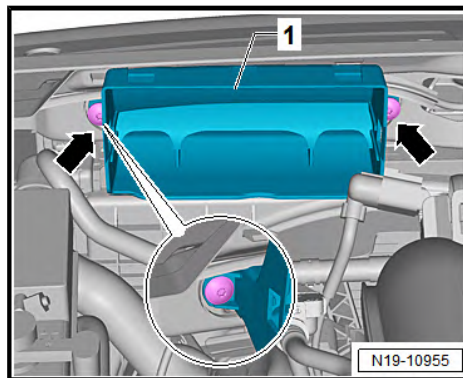
- Open filler cap -1- on coolant expansion tank.
- Loosen hose clip -2- and remove coolant hose.



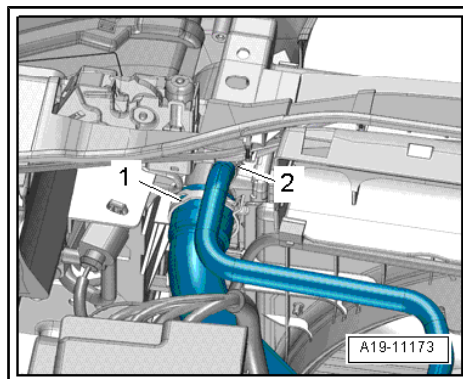
- Disconnect vacuum hose -1- from the activated charcoal filter, to do so press release buttons ⇒ Rep. gr. 20 ; push-on couplings; separating push-on couplings .
- Disconnect fuel supply line -2-, to do so press release buttons ⇒ Rep. gr. 20 ; push-on couplings; separating push-on couplings .
- Seal open lines and unions with clean plugs from engine sealing plug set - VAS 6122- .
- Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .
- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; battery; battery tray: remove and install .



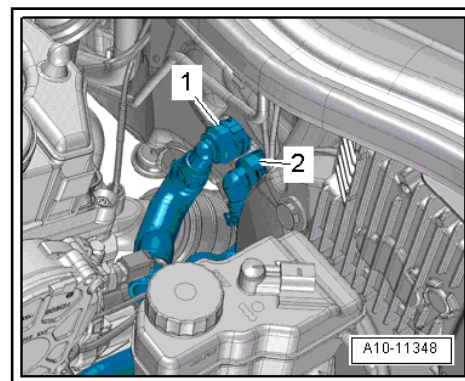
- Unscrew bolts -arrows- from mounting -1- for air duct.
- Pull out mounting for air duct.
- Drain coolant
⇒ ["1.3.3 Draining and adding coolant, Toledo 2013, Ibiza 2016", page 271](#) .



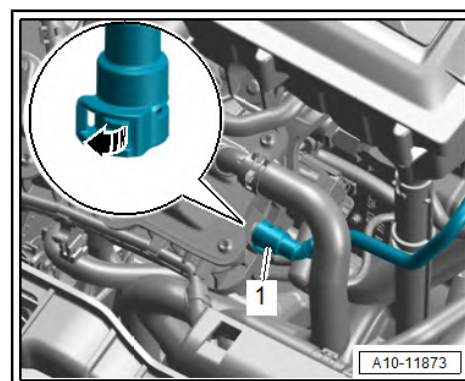
- Detach coolant hoses on top left of radiator. To do this, loosen hose clips -1 and 2- using hose clip pliers - VAS 6362- .



- Disconnect coolant hoses from heat exchanger for heater. Lift retaining clips -1, 2- to do this.



- Release catch -arrow- and disconnect vacuum hose -1-.

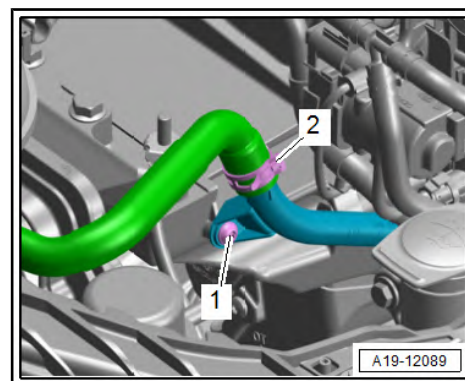


- Release hose clip -2- and remove coolant hose.

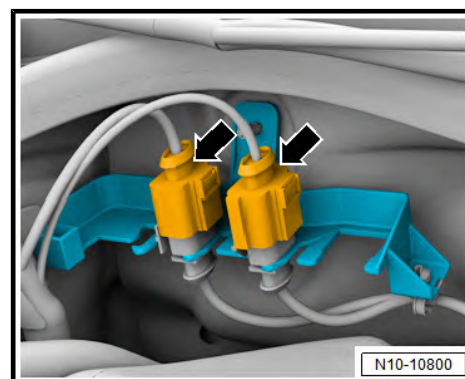


Note

Disregard -item 1-.

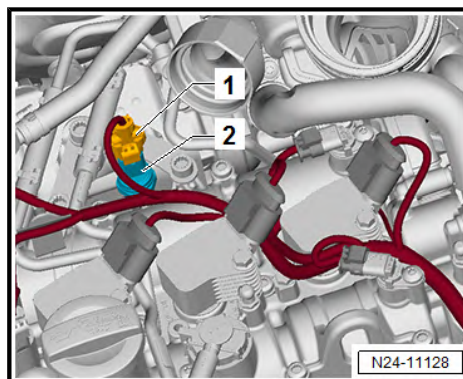


- Disconnect connectors -arrows-, and unclip wiring harness from retainer.
- Unclip line guides for lambda probes from vehicle.



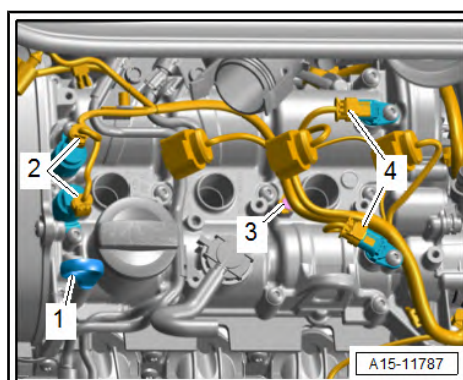
For vehicles with particulate filter

- Disconnect connector -1- from exhaust gas pressure sensor 1 - G450- -2-.

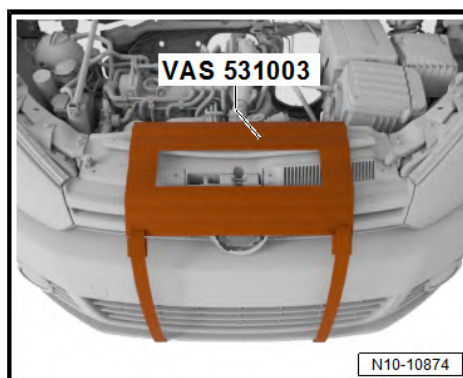


Continued for all vehicles

- Separate connectors:
- ♦ -2- for camshaft control valve 1 - N205- / for exhaust camshaft control valve 1 - N318-
- ♦ -4- for Hall sender - G40- / Hall sender 3 - G163-
- Remove radiator cowl
⇒ ["4.5.3 Radiator cowl - removing and installing, Toledo 2013, Ibiza 2016", page 339](#) .



- Cover radiator using protective mat - VAS 531003- .
- Remove front wheels.
- Remove gear selector cable and gate selector cable from gearbox, unbolt cable support bracket, and lay it to one side together with cables ⇒ Rep. gr. 34 ; Selector mechanism; Assembly overview - selector mechanism .



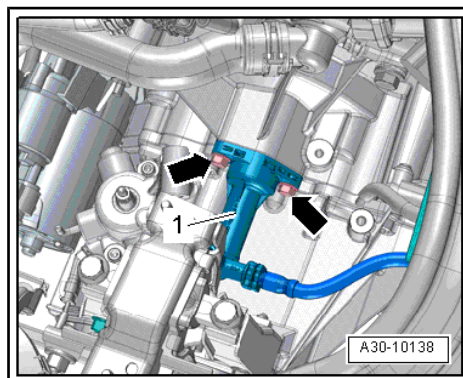
- Unscrew bolts -arrows-, remove clutch slave cylinder -1-, and lay it aside. Do not open hydraulic system.



Note

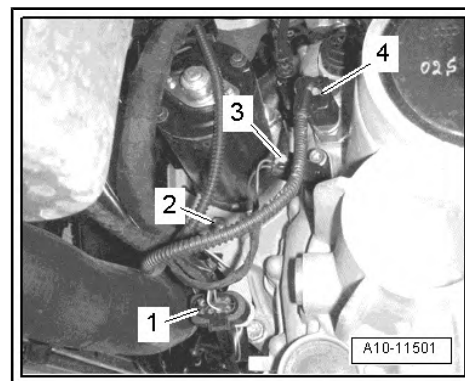
Do not press clutch pedal when clutch slave cylinder is removed.

- Disconnect connectors at front of gearbox:
- 2 - for starter
- 3 - for gearbox neutral position sender - G701-

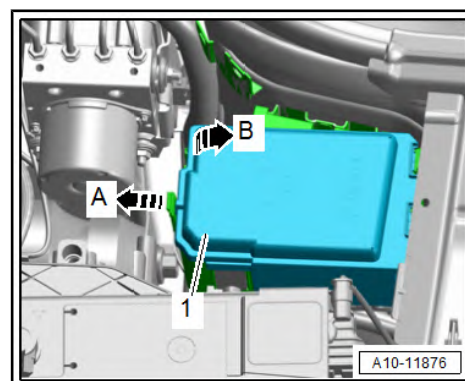


4 - for reversing light switch - F4-

- Remove electrical connector -1- from bracket and separate.



- Release catches -arrow A-.
- Open electronics box cover -1-, and remove it in direction of -arrow B-.
- Release and pull off lower connector -1- on engine control unit - J623- ➔ [“6 Engine \(motor\) control unit”, page 412](#) .

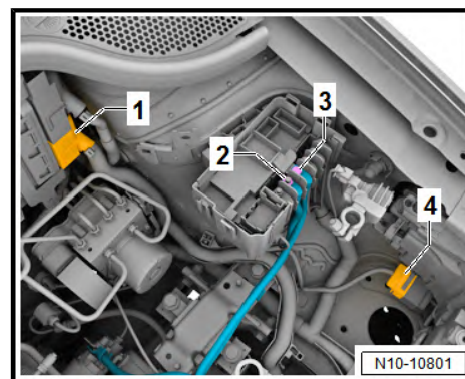


- Disconnect electrical connector -4-.
- Unscrew bolts -2 and 3-, remove wires, and lay them to one side.
- Detach engine wiring harness -arrows- using removal lever - 80-200- , and place it on engine.

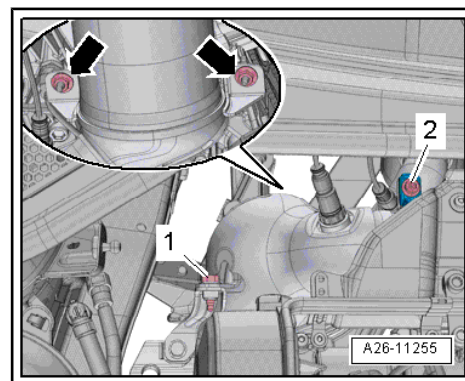


Note

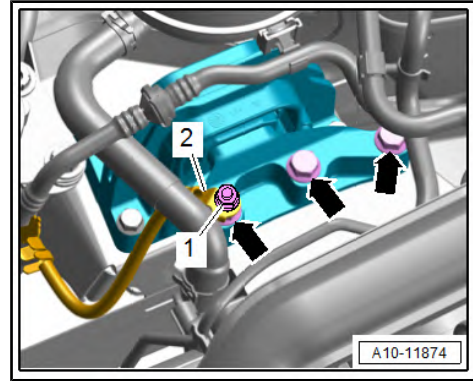
Disregard -item 1-.



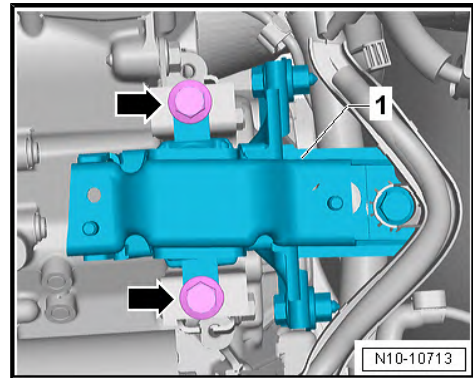
- Unscrew bolt -2-; remove screw-type clip.
- Unscrew bolt -1- and nuts -arrows-, and secure catalytic converter to vehicle.



- Unscrew nut -1-, and lay earth wire -2- to one side.
- Unscrew bolts -arrows- from engine mounting by 2 turns.



- Unscrew securing bolts -arrows- on gearbox mounting by approx. 2 turns.



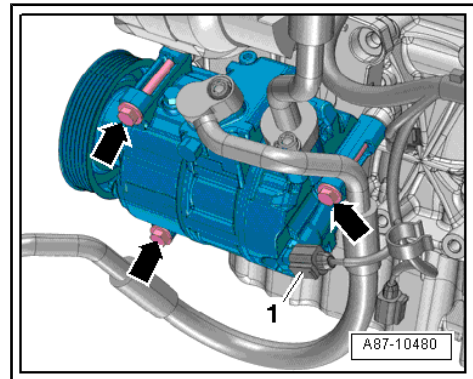
Vehicles with air conditioner compressor

- Remove poly V-belt
⇒ ["1.2.2 Removing and installing poly V-belt, vehicles with air conditioner compressor", page 114](#).
- Disconnect connector -1- on air conditioning compressor regulating valve - N280-.

CAUTION

Risk of freezing injury caused by refrigerant.

- Do not open refrigerant circuit of air conditioning system.

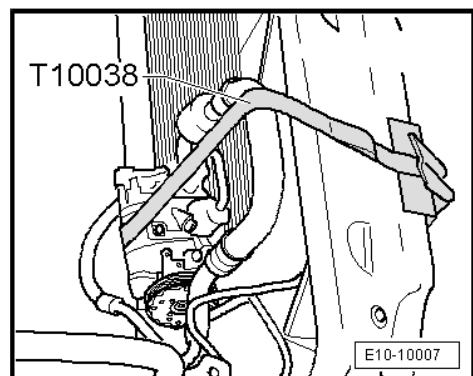


- Unscrew bolts -arrows- for air conditioning compressor.

NOTICE

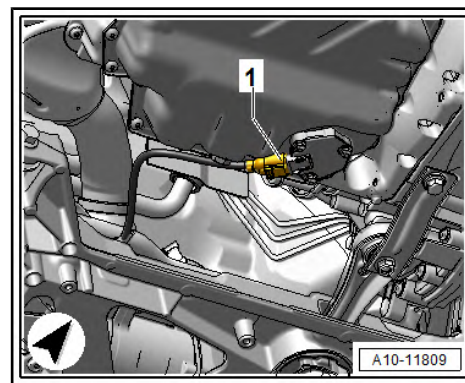
Risk of damage to refrigerant lines from rupture of inner foil.

- Never bend refrigerant lines to a radius of less than 100 mm ($r < 100 \text{ mm}$).
- Take off air conditioner compressor with connected coolant lines and fix with the support tool - T10038- to the right side of the lock carrier.



Continued for all vehicles

- Release and pull off connector -1- on oil level and oil temperature sender - G266- .

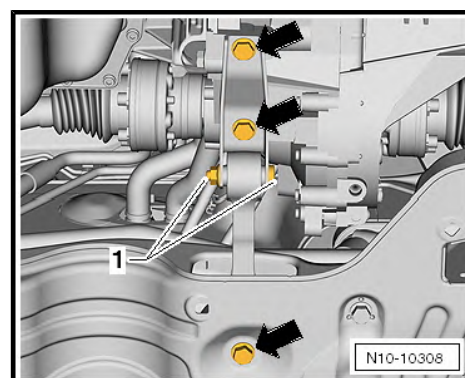


- Unscrew bolts -arrow- and remove pendulum support.

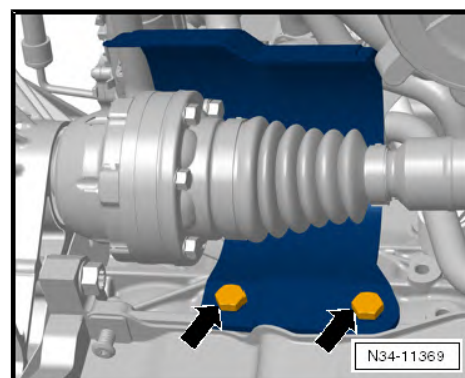


Note

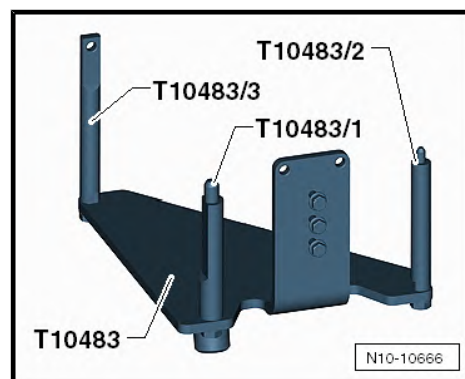
The threaded connection -1- must not be loosened.



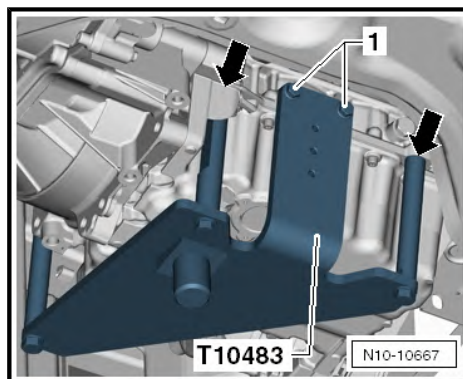
- If available, unscrew bolts -arrows-, and remove heat shield for right drive shaft.
- Remove right and left drive shafts ⇒ Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Unbolt retainer for wiring harness on »radiator end« from cylinder block.



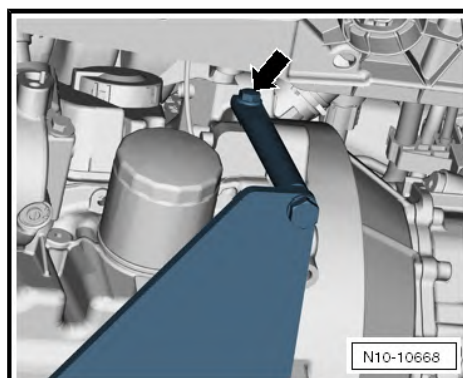
Engine support - T10483- with adapters - T10483-/1, -/2 and -/3- are required to lower engine and gearbox.



- Push engine support - T10483- to stop into holes -arrows- in cylinder block.
- At first, tighten bolts -1- hand-tight.



- Initially, tighten bolts -arrow- by hand.
- Tighten bolt -arrow- to 20 Nm.

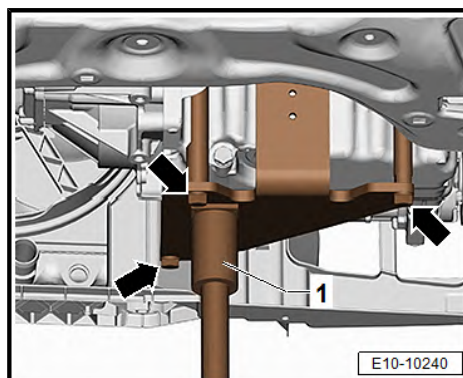


- Tighten all bolts -arrows- of the engine bracket - T10483- on the cylinder block with 20 Nm.
- Fit engine and gearbox jack - VAS 6931- to engine support - T10483- , and raise engine/gearbox assembly slightly.

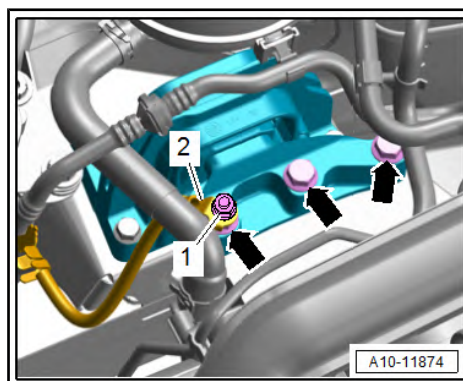


Note

Use a stepladder to unscrew the bolts for engine/gearbox mounting.



- Unscrew bolts -arrows- for support arm of gearbox mounting completely.

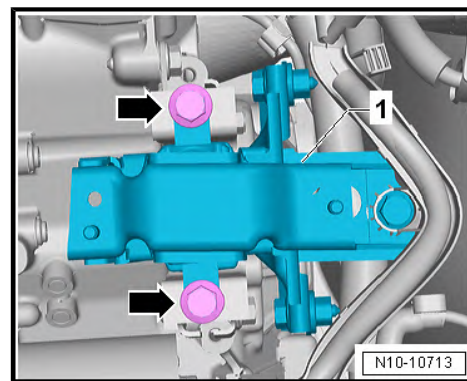


- Unscrew securing bolts -arrows- from gearbox mounting.



Note

- ◆ *Risk of damage to the vacuum lines or electrical wiring as well as damage to the engine compartment.*
 - ◆ *Check that all vacuum lines and electrical wiring between engine, gearbox, subframe and body have been detached.*
 - ◆ *Carefully remove the engine/gearbox unit out of the engine bay whilst draining.*
- Guide the engine/gearbox assembly as far forwards as possible and lower it slowly downwards.



1.2 Separating engine and gearbox

⇒ [“1.2.1 Separating engine and gearbox - vehicles with manual gearbox”, page 47](#)

⇒ [“1.2.2 Separate engine and gearbox - vehicles with dual clutch gearbox”, page 48](#)

1.2.1 Separating engine and gearbox - vehicles with manual gearbox

Special tools and workshop equipment required

- ◆ Hook - 10 - 222 A /12-



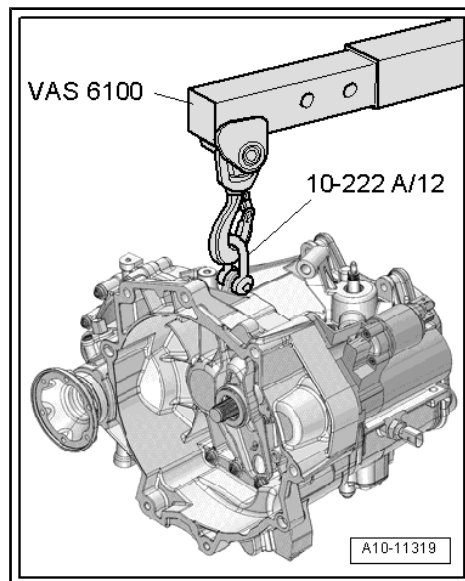
- ◆ Workshop hoist - VAS 6100-



Procedure

- Engine/gearbox assembly removed and attached to engine bracket - T10483- .
- Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter .

- Attach shackle - 10-222A/12- to gearbox.
- Attach workshop hoist - VAS 6100- to shackle - 10-222A/12- .



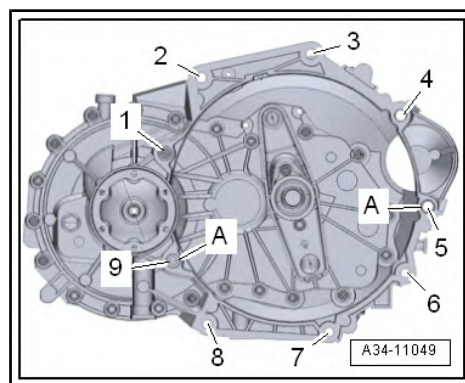
- Unscrew bolts -1, 2, 3- and -6 ... 9- from threaded connection between gearbox and engine.



Note

Ignore -items 4, 5- and -A-.

- Pull gearbox off engine.



1.2.2 Separate engine and gearbox - vehicles with dual clutch gearbox

Special tools and workshop equipment required

- ◆ Shackle - 10 - 222 A /12-



◆ Workshop hoist - VAS 6100-



Procedure

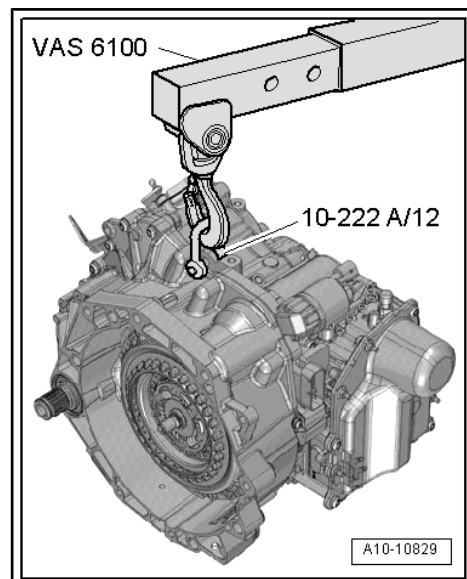
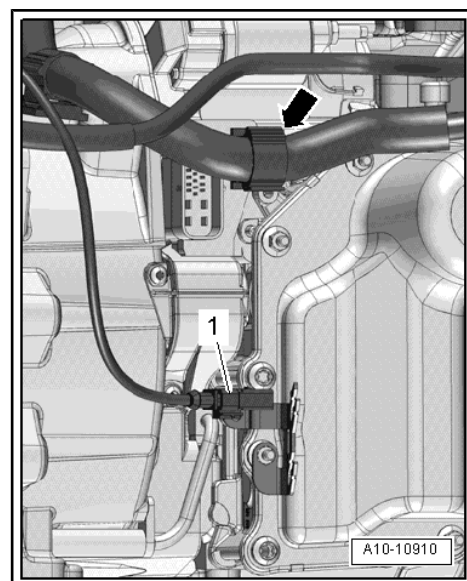
- Engine/gearbox assembly removed and attached to engine bracket - T10497- .
- Place wiring harness to one side -arrow-.



Note

Disregard -item 1-.

- Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter .
- Secure gearbox to workshop hoist - 10 - 222 A /12- using shackle - VAS 6100- .



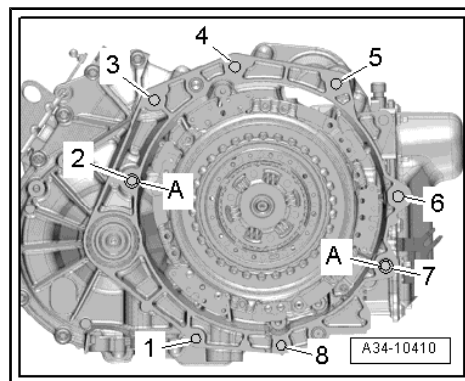
- Unscrew bolts -1 to 8- securing gearbox to engine.



Note

Disregard -item A-.

- Pull gearbox off engine.



1.3 Securing engine on engine and gearbox support

Special tools and workshop equipment required

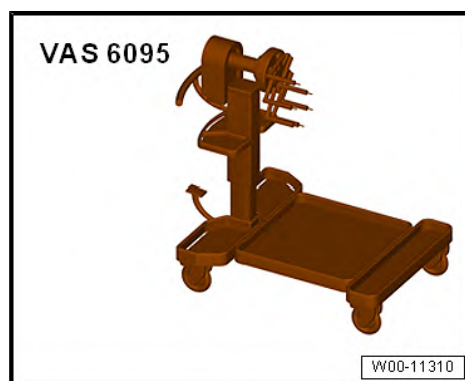
- ♦ Engine and gearbox support - VW 540-



- ♦ Lifting tackle - 2024 A-



- ♦ Engine and gearbox support - VAS 6095-



◆ Workshop hoist - VAS 6100-



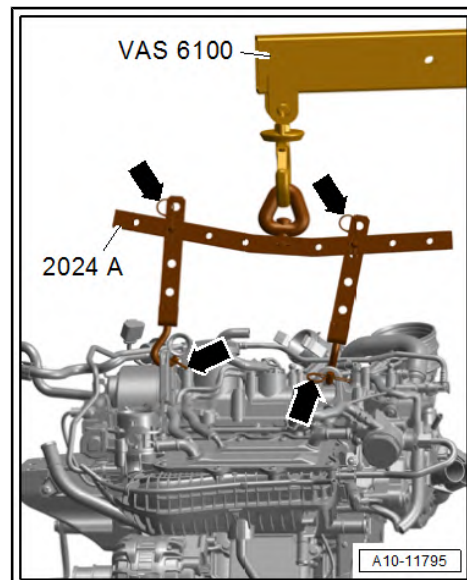
Procedure

- Engine removed ⇒ [“1.1 Removing engine”, page 13](#) .
- Gearbox detached from engine
⇒ [“1.2 Separating engine and gearbox”, page 47](#) .
- Attach lifting tackle - 2024 A- on engine and workshop hoist - VAS 6100- as shown in illustration.

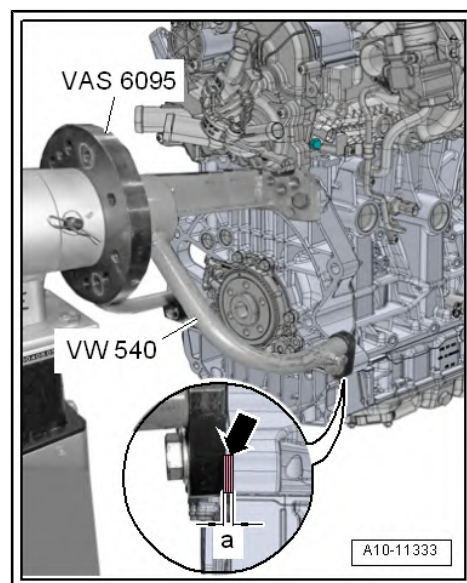


Note

- ◆ *Risk of accident due to loose components of lifting tackle.*
- ◆ *In order to match the lifting tackle to the centre of gravity of the engine, the holes in the hook rail must be allocated as shown in the illustration.*
- ◆ *The support hooks and retaining pins on the lifting tackle must be secured with locking pins -arrows-.*
- Lift engine off T10483 using workshop hoist - VAS 6100- .



- Secure engine to engine and gearbox support - VW 540- with engine and gearbox support - VAS 6095- , as shown in illustration.
- Insert spacers -arrow-.
- Dimension -a- = 10 mm.



1.4 Installing engine

⇒ ["1.4.1 Installing engine; Ateca, Leon 2013", page 52](#)

⇒ ["1.4.2 Installing engine, Ibiza 2018, Arona", page 57](#)

⇒ ["1.4.3 Installing engine, Toledo 2013, Ibiza 2016", page 62](#)

1.4.1 Installing engine; Ateca, Leon 2013

Special tools and workshop equipment required

◆ Engine and gearbox jack - VAS 6931-



◆ Hose clip pliers - VAS 6362-



◆ Engine support - T10483-



◆ Torque wrench - V.A.G 1332-



◆ Torque wrench - V.A.G 1331-



Procedure



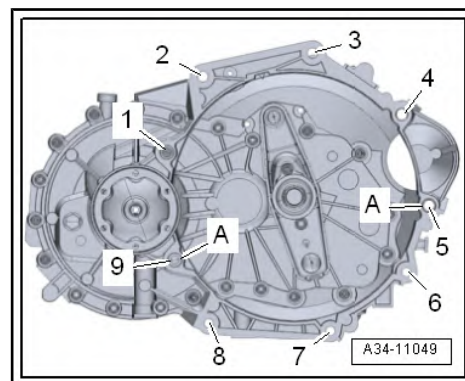
Note

- ◆ *If a further tightening angle is specified for certain bolts, these must be renewed.*
- ◆ *Renew self-locking nuts and bolts, and seals, O-rings and gaskets.*
- ◆ *Secure all hose connections with the hose clips corresponding to original equipment → Electronic Parts Catalogue .*
- ◆ *Fit heat shield sleeves in the same place when installing.*

- Install intermediate plate
⇒ Fig. ““Installing intermediate plate””, page 136 .

Vehicles with manual gearbox

- If there are no dowel sleeves -A- in the cylinder block for centring the engine and gearbox, insert new dowel sleeves.

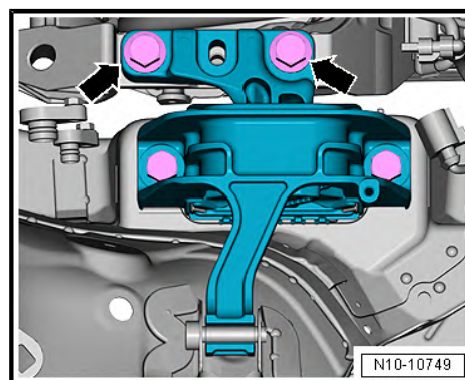
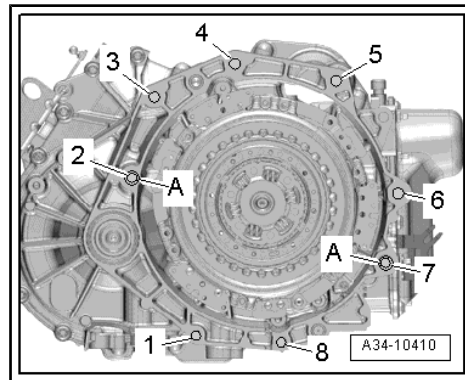


Vehicles with dual clutch gearbox:

- If there are no dowel sleeves -A- in the cylinder block for centring the engine and gearbox, insert new dowel sleeves.
- If no needle bearing is fitted in crankshaft, install needle bearing
⇒ ["3.2 Renewing needle bearing in crankshaft", page 145](#) .

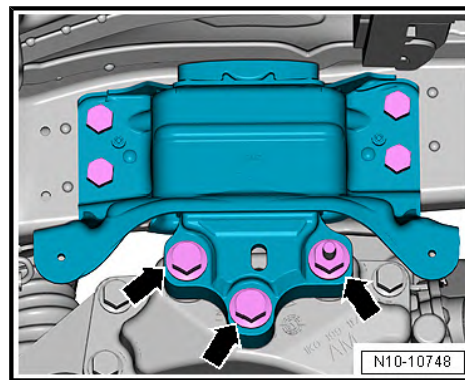
Continued for all vehicles

- Bolt gearbox to engine.
- Install gearbox support
⇒ ["2.1 Assembly overview - assembly mountings", page 67](#) .
- Take up engine/gearbox assembly with engine support T10483 .
- Guide engine/gearbox assembly into body.
- First screw in bolts -arrows- for support arm of engine mounting as far as stop by hand.



Vehicles with 3 gearbox securing bolts:

- Unscrew gearbox mounting bolts -arrows- one after the other, and renew them (if not already renewed when installing engine).

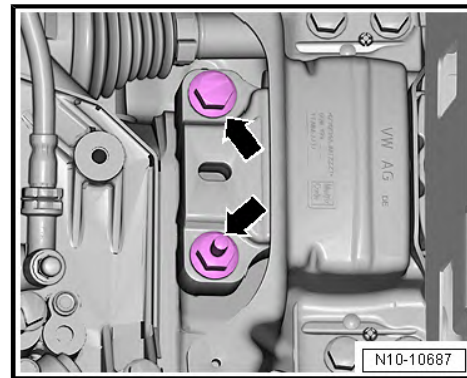


Vehicles with two gearbox securing bolts:

- Unscrew gearbox mounting bolts -arrows- one after the other, and renew them (if not already renewed when installing engine).

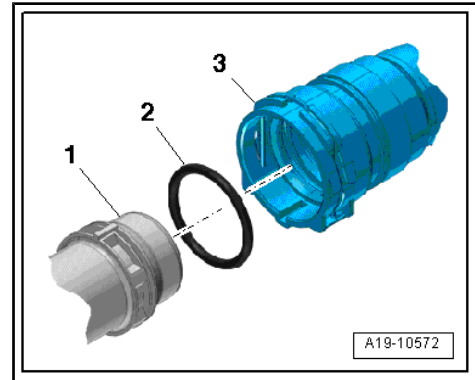
Continued for all vehicles:

- Remove engine bracket - T10483- from engine.
- Install starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Assembly overview - starter .
- Bleed clutch mechanism ⇒ Rep. gr. 30 ; Clutch mechanism; Bleeding clutch mechanism .
- Install cables with cable support bracket or selector lever cable ⇒ Rep. gr. 34 ; Selector mechanism; Assembly overview - selector cables .
- Install catalytic converter
⇒ [“2.2.1 Catalytic converter - removing and installing, Leon 2013, Ibiza 2018, Arona”, page 459](#) .
- Install drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .
- Install pendulum support
⇒ [“2.4.1 Removing and positioning pendulum support, Ateca, Leon 2013”, page 84](#) .
- Install transverse link, swivel joint and coupling rod ⇒ Running gear, axles, steering; Rep. gr. 40 ; Lower transverse link, swivel joint; Exploded view - lower transverse link, swivel joint .
- Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Assembly overview - drive unit of air conditioner compressor .
- Install poly V-belt
⇒ [“1.2.2 Removing and installing poly V-belt, vehicles with air conditioner compressor”, page 114](#) .
- Install radiator cowl
⇒ [“4.5.1 Removing and positioning the radiator cowl, Ateca, Leon 2013”, page 335](#) .
- Electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Install battery tray. ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray
- Observe required procedures after connecting battery ⇒ Electrical system; Rep. gr. 27 ; Disconnecting and reconnecting battery.
- Install throttle valve module - J338-
⇒ [“4.3 Removing and installing throttle valve module GX3 ”, page 402](#) .
- Install engine control unit - J623-
⇒ [“6 Engine \(motor\) control unit”, page 412](#) .



- Remove old O-ring -2- in coolant hose -3-.
- Moisten new O-ring with coolant and insert into coolant hose.
- Install wheel housing liners ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing; assembly overview - front wheel housing liner .
- Position front wheels.
- Install air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .

Checking engine oil level ⇒ [“1.2 Engine oil:”, page 237](#)



Note

- ◆ *Never use battery charging equipment for boost starting.*
- ◆ *Risk of damage to control units caused by overvoltage.*



Note

Do not reuse the dirty coolant.

- Add coolant ⇒ [page 262](#) .
- After renewing engine, the function “Misfiring adaptation” must be performed.
- To do this, select 01 - Reset misfiring adaptation on
⇒ Vehicle diagnostic tester in Guided functions mode.

Specified torques



Note

- ◆ *The specified torques are only valid for nuts and bolts which have been slightly greased, oiled, phosphate-treated or black-oxidized.*
- ◆ *Additional lubricant such as engine oil or gear oil may be used, but do not use lubricant containing graphite.*
- ◆ *Do not use degreased parts.*
- ◆ *Tolerance for specified torques ± 15%.*

Component		Nm.
Bolts and nuts	M6	9
	M7	15
	M8	20
	M10	40
	M12	65

- ◆ Assembly mountings
⇒ [“2.1.1 Assembly overview - assembly mountings, Ateca, Leon 2013”, page 67](#)
- ◆ Securing gearbox to engine ⇒ Rep. gr. 34 ; Removing and installing gearbox; Specified torques for gearbox .

Component	Specified torque
Securing bolt for securing vacuum pump to engine support	20 Nm
Securing bolts for heat shield of knock sensor 1 - G61-	12 Nm

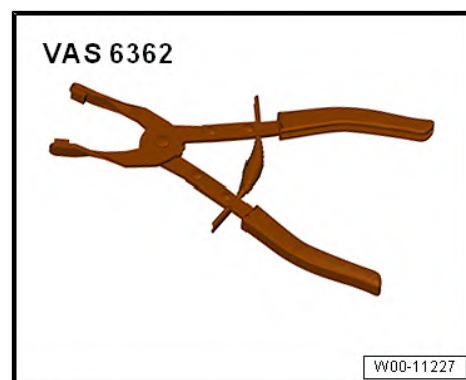
1.4.2 Installing engine, Ibiza 2018, Arona

Special tools and workshop equipment required

- ◆ Engine and gearbox jack - VAS 6931-



- ◆ Hose clip pliers - VAS 6362-



- ◆ Engine support - T10483-



◆ Torque wrench - V.A.G 1332-



◆ Torque wrench - V.A.G 1331-



Procedure



Note

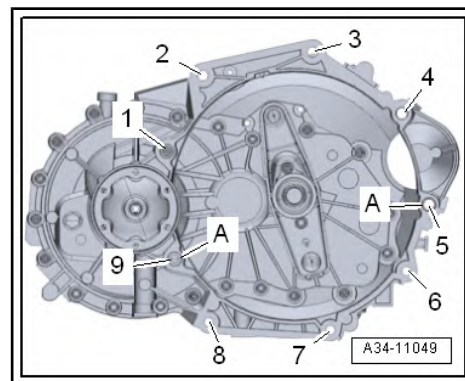
- ◆ *If a further tightening angle is specified for certain bolts, these must be renewed.*
- ◆ *Renew self-locking nuts and bolts, and seals, O-rings and gaskets.*
- ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*
- ◆ *Fit heat shield sleeves in the same place when installing.*

Procedure

- Installing intermediate plate
⇒ [Fig. "Installing intermediate plate", page 136](#)
- Clean input shaft splines and apply thin coat of grease for clutch plate splines .
- Check centring of clutch plate.
- Securely bolt gearbox to engine ⇒ Rep. gr. 34 ; Removing and installing gearbox; Installing gearbox .

Vehicles with manual gearbox

- If there are no dowel sleeves -A- in the cylinder block for centring the engine and gearbox, insert new dowel sleeves.

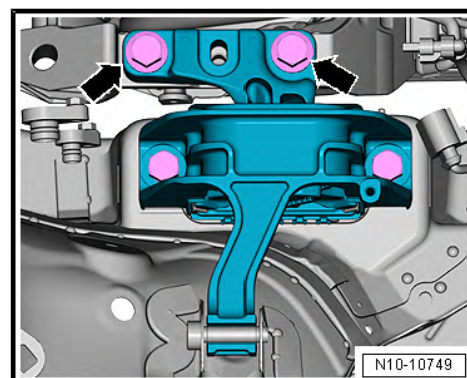
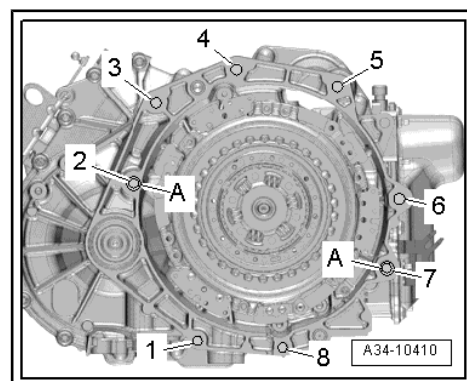


Vehicles with dual clutch gearbox:

- If there are no dowel sleeves -A- in the cylinder block for centring the engine and gearbox, insert new dowel sleeves.
- If no needle bearing is fitted in crankshaft, install needle bearing
⇒ ["3.2 Renewing needle bearing in crankshaft", page 145](#) .

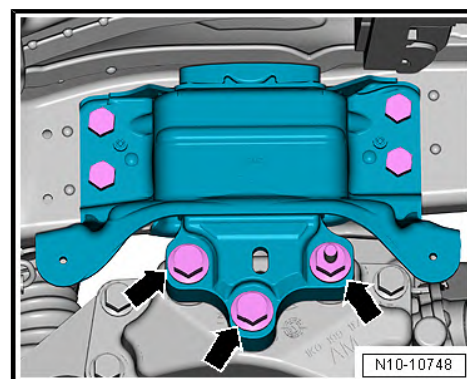
Continued for all vehicles

- Securely bolt gearbox to engine ⇒ Rep. gr. 34 ; Removing and installing gearbox ; Installing gearbox .
- Install gearbox support
⇒ ["1.5.1 Engine support- removing and installing, Leon 2013, Ibiza 2018, Arona", page 122](#) .
- Take up engine/gearbox assembly with engine support T10483 .
- Guide engine/gearbox assembly into body.
- First screw in bolts -arrows- for support arm of engine mounting as far as stop by hand.



Vehicles with 3 gearbox securing bolts:

- Unscrew gearbox mounting bolts -arrows- one after the other, and renew them (if not already renewed when installing engine).

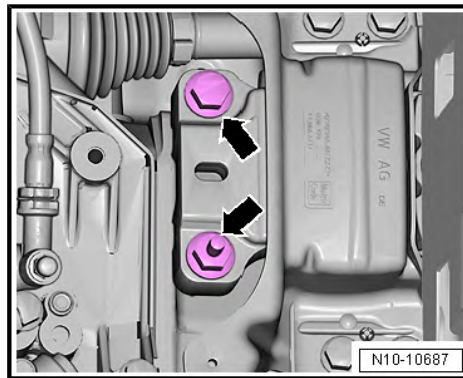


Vehicles with two gearbox securing bolts:

- Unscrew gearbox mounting bolts -arrows- one after the other, and renew them (if not already renewed when installing engine).
- Remove engine bracket - T10483- from engine.

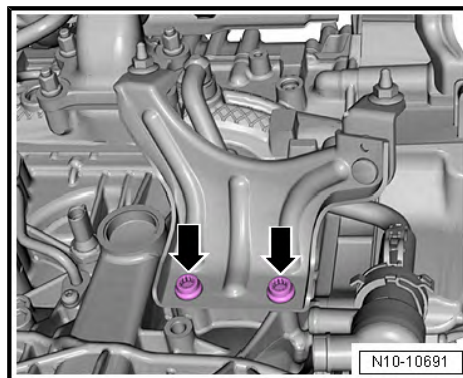
Vehicles with air conditioner compressor

- Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Assembly overview - drive unit of air conditioner compressor .
- Install poly V-belt
⇒ [“1.2.2 Removing and installing poly V-belt, vehicles with air conditioner compressor”, page 114](#) .

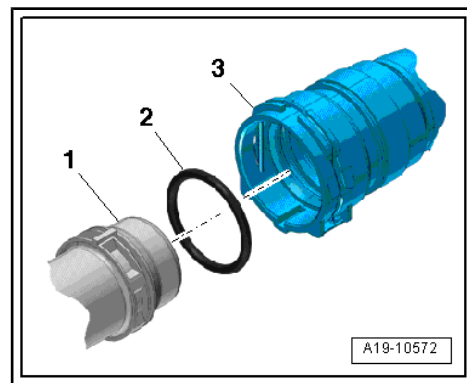


Continued for all vehicles

- Mount bracket for catalytic converter and tighten the bolts -arrows-
⇒ [Fig. “Installing catalytic converter - specified torque and tightening sequence””, page 456](#) .
- Install catalytic converter
⇒ [“2.2.1 Catalytic converter - removing and installing, Leon 2013, Ibiza 2018, Arona”, page 459](#) .
- Install drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Install pendulum support
⇒ [“2.4.2 Removing and installing pendulum support, Ibiza 2018, Arona”, page 85](#) .
- Install front wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres, wheel alignment, wheel change .
- Install starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Assembly overview - starter .
- Install clutch slave cylinder ⇒ Rep. gr. 30 ; Clutch mechanism; Removing and installing clutch slave cylinder .
- Install switch actuation: ⇒ Rep. gr. 34 ; Switch actuation; Exploded view - cables .
- Adjusting assembly mountings
⇒ [“2.6 Assembly mountings - adjusting, Ateca, Leon 2013, Ibiza 2018, Arona”, page 106](#) .
- Install radiator cowl
⇒ [“4.5.2 Removing and positioning the radiator cowl, Arona, Ibiza 2018”, page 336](#) .



- Remove old O-ring -2- in coolant hose -3-.
- Moisten new O-ring with coolant and insert into coolant hose.
- Assembly coolant hoses; observe markings on the hoses for the installation position and attachment of the spring-type clip.
- Electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Install engine control unit - J623-
⇒ ["6 Engine \(motor\) control unit", page 412](#) .
- Install battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Observe required procedures after connecting battery ⇒ Electrical system; Rep. gr. 27 ; Disconnecting and reconnecting battery.
- Connect coolant hoses ⇒ Fuel supply; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Install air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .
- Add coolant
⇒ ["1.3.2 Draining and adding coolant, Ibiza 2018, Arona", page 265](#) .
- Check oil level ⇒ ["1.2 Engine oil:", page 237](#)
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview – noise insulation .



Note

- ◆ *Never use battery charging equipment for boost starting.*
- ◆ *Risk of damage to control units caused by overvoltage.*

Note

Do not reuse the dirty coolant.

- Connect vehicle diagnostic tester ⇒ Maintenance ; Booklet KJ1 ; General; Connecting vehicle diagnostic tester .

- ◆ Delete entries in the event memory , [Guided Functions](#), [Read event memory](#).

Also after replacing the engine:

- ◆ Set misfiring self-adaptation [Test plan](#) [001 - Engine electronics](#), [Functions](#), [Repair groups](#), [28 - ignition system](#), [Detection of misfirings](#).
- ◆ Delete learnt values of the injection valves: [01 - Engine](#), [Guided functions](#), [Delete learnt values of the injection valves](#).

Specified torques

- ◆ Assembly mountings
⇒ ["2.1.2 Assembly overview - assembly mountings, Ibiza 2018, Arona", page 70](#)

- ◆ Securing gearbox to engine ⇒ Rep. gr. 34 ; Removing and installing gearbox; Specified torques for gearbox .
- ◆ ⇒ [“2.1.1 Assembly overview - emission control, Ateca, Leon 2013, Ibiza 2018, Arona”, page 455](#)
- ◆ ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Assembly overview - drive unit of air conditioner compressor
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .
- ◆ ⇒ Electrical system; Rep. gr. 27 ; Starter; Assembly overview - starter
- ◆ ⇒ Electrical system; Rep. gr. 27 ; Battery; Assembly overview - battery .

Component		Property class 8.8 Nm	Property class 10.9 Nm
Bolts and nuts	M4	2	3.5
	M5	4	7
	M6	8	12
	M8	20	30
	M10	40	55
	M12	70	100

Component	Specified torque
Securing bolt for securing vacuum pump to engine support	20 Nm
Screw heatshield for drive shaft	25 Nm
Securing bolts for heat shield of knock sensor 1 - G61-	12 Nm

1.4.3 Installing engine, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required

- ◆ Engine and gearbox jack - VAS 6931-



- ◆ Hose clip pliers - VAS 6362-



- ◆ Engine support - T10483-



- ◆ Torque wrench - V.A.G 1332-



- ◆ Torque wrench - V.A.G 1331-



Procedure



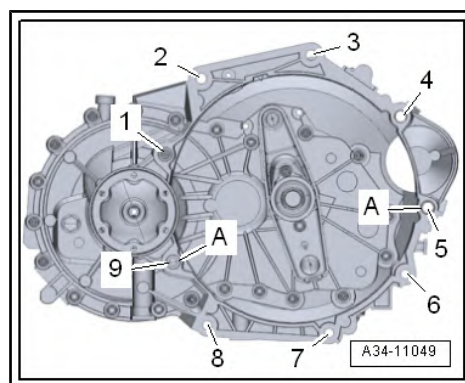
Note

- ◆ If a further tightening angle is specified for certain bolts, these must be renewed.
- ◆ Renew self-locking nuts and bolts, and seals, O-rings and gaskets.
- ◆ Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ *Electronic parts catalogue* .
- ◆ Fit heat shield sleeves in the same place when installing.

- Installing intermediate plate

Vehicles with manual gearbox:

- If there are no dowel sleeves -A- in the cylinder block for centring the engine and gearbox, insert new dowel sleeves.

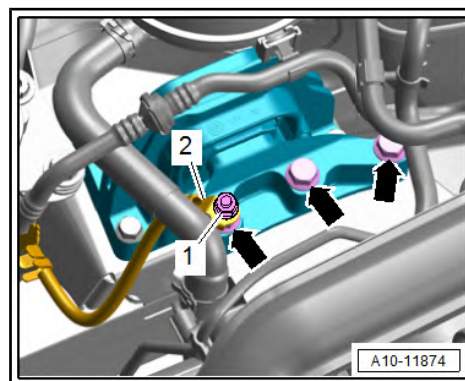
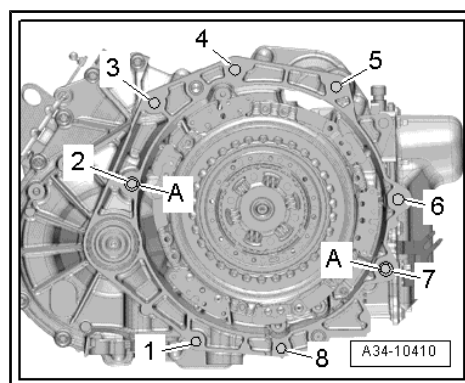


Vehicles with dual clutch gearbox:

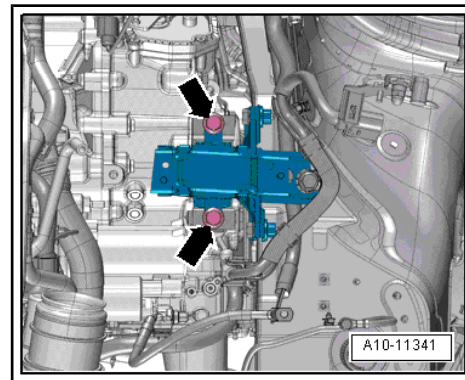
- If there are no dowel sleeves -A- in the cylinder block for centring the engine and gearbox, insert new dowel sleeves.
- If no needle bearing is fitted in crankshaft, install needle bearing
⇒ [“3.2 Renewing needle bearing in crankshaft”, page 145](#) .

Continued for all vehicles:

- Bolt gearbox to engine.
- Install gearbox support
⇒ [“2.1.3 Assembly overview - assembly mountings, Toledo 2013, Ibiza 2016”, page 72](#) .
- Take up engine/gearbox assembly with engine support T10483 .
- Guide engine/gearbox assembly into body.
- First screw bolts -arrows- for engine mountings into stop by hand.



- First screw bolts -arrows- for gearbox mountings into stop by hand.
 - Remove engine bracket - T10483- from engine.
 - Install starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Assembly overview - starter .
 - Bleed clutch mechanism ⇒ Rep. gr. 30 ; Clutch mechanism; Bleeding clutch mechanism .
 - Install cables with cable support bracket or selector lever cable ⇒ Rep. gr. 34 ; Selector mechanism; Assembly overview - selector cables .
 - Install catalytic converter
⇒ ["2.2.2 Catalytic converter - removing and installing, Toledo 2013, Ibiza 2016", page 461 .](#)
 - Install drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .
 - Install pendulum support
⇒ ["2.4.3 Pendulum support - removing and installing, Toledo 2013, Ibiza 2016", page 86 .](#)
 - Transverse link, swivel joint and coupling rod ⇒ running gear, axles, steering; Rep. gr. 40 ; Subframe; assembly overview - subframe .
 - Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Assembly overview - drive unit of air conditioner compressor .
 - Install poly V-belt
⇒ ["1.2.2 Removing and installing poly V-belt, vehicles with air conditioner compressor", page 114 .](#)
 - Install radiator cowl
⇒ ["4.5.3 Radiator cowl - removing and installing, Toledo 2013, Ibiza 2016", page 339 .](#)
 - Electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers and electronics boxes; Overview of fitting locations - relay carriers, fuse carriers and electronics boxes ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
 - Install battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Install battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Install throttle valve module - J338-
⇒ ["4.3 Removing and installing throttle valve module GX3 ", page 402 .](#)
 - Install engine control unit - J623-
⇒ ["6 Engine \(motor\) control unit", page 412 .](#)



- Remove old O-ring -2- in coolant hose -3-.
- Moisten new O-ring with coolant and insert into coolant hose.
- Position front wheels.
- Install air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .
- Check oil level ⇒ [“1.2 Engine oil.”, page 237](#)



Note

Do not reuse the dirty coolant.

- Add coolant ⇒ [page 273](#) .
- After renewing engine, the function “Misfiring adaptation” must be performed.
- To do this, select [\[01 - Reset misfiring adaptation\]](#) on
⇒ Vehicle diagnostic tester in [\[Guided functions\]](#) mode.

Specified torques

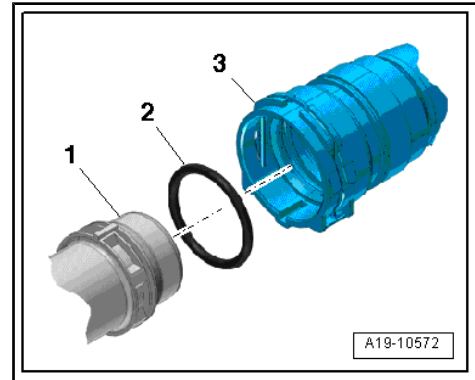


Note

- ◆ *The specified torques are only valid for nuts and bolts which have been slightly greased, oiled, phosphate-treated or black-oxidized.*
- ◆ *Additional lubricant such as engine oil or gear oil may be used, but do not use lubricant containing graphite.*
- ◆ *Do not use degreased parts.*
- ◆ *Tolerance for specified torques ± 15%.*

Component		Nm.
Bolts and nuts	M6	9
	M7	15
	M8	20
	M10	40
	M12	65

- ◆ Assembly mountings
⇒ [“2.1.3 Assembly overview - assembly mountings, Toledo 2013, Ibiza 2016”, page 72](#)
- ◆ Securing gearbox on engine ⇒ Rep. gr. 34 ; Removing and installing gearbox; Specified torques for gearbox .



2 Assembly mountings

- ⇒ [“2.1 Assembly overview - assembly mountings”, page 67](#)
- ⇒ [“2.2 Removing and installing motor mounting”, page 73](#)
- ⇒ [“2.3 Removing and installing gearbox mounting”, page 77](#)
- ⇒ [“2.4 Removing and installing pendulum support”, page 84](#)
- ⇒ [“2.5 Supporting engine in installation position”, page 87](#)
- ⇒ [“2.6 Assembly mountings - adjusting, Ateca, Leon 2013, Ibiza 2018, Arona”, page 106](#)
- ⇒ [“2.7 Assembly mounting setting - checking, Ateca, Leon 2013, Ibiza 2018, Arona”, page 108](#)

2.1 Assembly overview - assembly mountings

- ⇒ [“2.1.1 Assembly overview - assembly mountings, Ateca, Leon 2013”, page 67](#)
- ⇒ [“2.1.2 Assembly overview - assembly mountings, Ibiza 2018, Arona”, page 70](#)
- ⇒ [“2.1.3 Assembly overview - assembly mountings, Toledo 2013, Ibiza 2016”, page 72](#)

2.1.1 Assembly overview - assembly mountings, Ateca, Leon 2013

1 - Bolt

- ☐ Renew after removal
- ☐ Tightening sequence ➔ [page 69](#).

2 - Engine support

- ☐ Specified torque and tightening sequence ➔ [page 69](#)
- ☐ Removing and installing ➔ ["1.5.1 Engine support- removing and installing, Leon 2013, Ibiza 2018, Arona", page 122](#)
- ☐ Separate the engine support to free some space ➔ [page 124](#)

3 - Engine mounting

- ☐ With support arm
- ☐ Do not separate engine mounting and support arm
- ☐ Removing and installing ➔ ["2.2.1 Engine mounting - removing and installing, Ateca, Leon 2013", page 73](#)

4 - Bolt

- ☐ Renew after removal
- ☐ 40 Nm +90°

5 - Bolt

- ☐ Renew after removal
- ☐ 20 Nm +90°

6 - Bolt

- ☐ Depending on version
- ☐ 8 Nm

7 - Support

- ☐ Depending on version

8 - Bolt

- ☐ Renew after removal
- ☐ 60 Nm +90°

9 - Pendulum support

- ☐ Removing and installing ➔ ["2.4.1 Removing and positioning pendulum support, Ateca, Leon 2013", page 84](#)

10 - Bolt

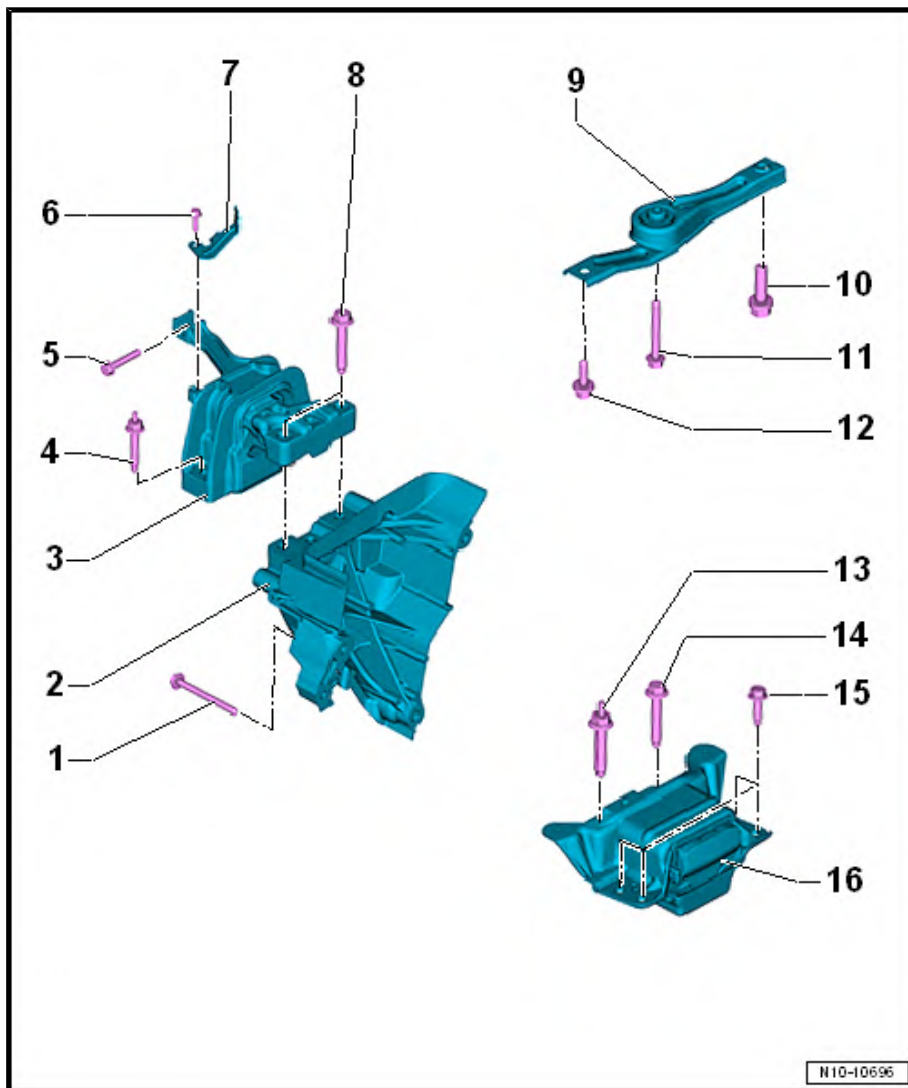
- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ➔ [page 69](#)

11 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ➔ [page 69](#)

12 - Bolts

- ☐ Renew after removal



- ☐ Specified torque and tightening sequence ⇒ [page 69](#)

13 - Bolt

- ☐ Renew after removal
- ☐ 60 Nm +90°

14 - Bolt

- ☐ 2 off
- ☐ Renew after removal
- ☐ 60 Nm +90°

15 - Bolt

- ☐ Renew after removal
- ☐ 50 Nm +90°

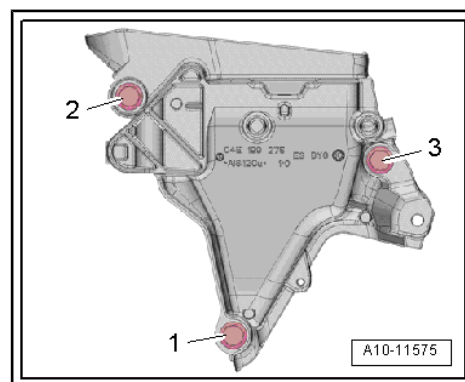
16 - Gearbox mounting

- ☐ With support arm
- ☐ Removing and installing
⇒ [“2.3.1 Engine mounting - removing and installing, Ateca, Leon 2013”, page 77](#)

Engine support - specified torque and tightening sequence

- Tighten bolts in the sequence shown:

Stage	Bolts	Specified torque/turning further angle
1.	-1 ... 3-	7 Nm
2.	-1 ... 3-	40 Nm
3.	-1 ... 3-	Turn 90° further



Pendulum support - specified torque and tightening sequence



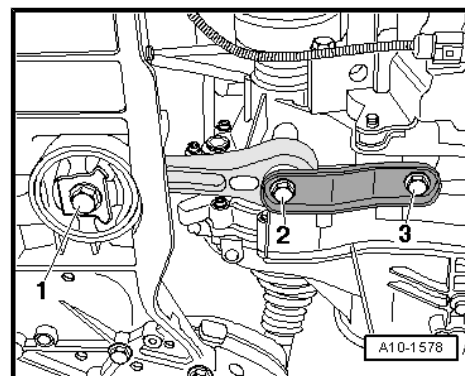
Note

Renew bolts that are tightened with specified further tightening angle.

- Tighten bolts in stages in the sequence shown.

Specified torques

Stage	Bolts	Specified torque/turning further angle
1.	-2- and -3-	50 Nm
2.	-1-	130 Nm
3.	-1-, -2- and -3-	Turn 90° further



2.1.2 Assembly overview - assembly mountings, Ibiza 2018, Arona

1 - Bolt

- ☐ 3 off
- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ⇒ [page 71](#)

2 - Engine support

- ☐ Removing and installing ⇒ ["1.5.1 Engine support- removing and installing, Leon 2013, Ibiza 2018, Arona", page 122](#)
- ☐ Specified torque and tightening sequence ⇒ [page 71](#)
- ☐ Separate the engine support to free some space ⇒ [page 124](#)

3 - Engine mounting

- ☐ Removing and installing ⇒ ["2.2.2 Removing and installing engine mounting, Ibiza 2018, Arona", page 74](#)

4 - Bolt

- ☐ Renew after removal
- ☐ 40 Nm +90°

5 - Bolt

- ☐ Renew after removal
- ☐ 20 Nm +90°

6 - Bolt

- ☐ Renew after removal
- ☐ 60 Nm +90°

7 - Pendulum support

- ☐ Removing and installing ⇒ ["2.4.2 Removing and installing pendulum support, Ibiza 2018, Arona", page 85](#)

8 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ⇒ [page 71](#)

9 - Bolt

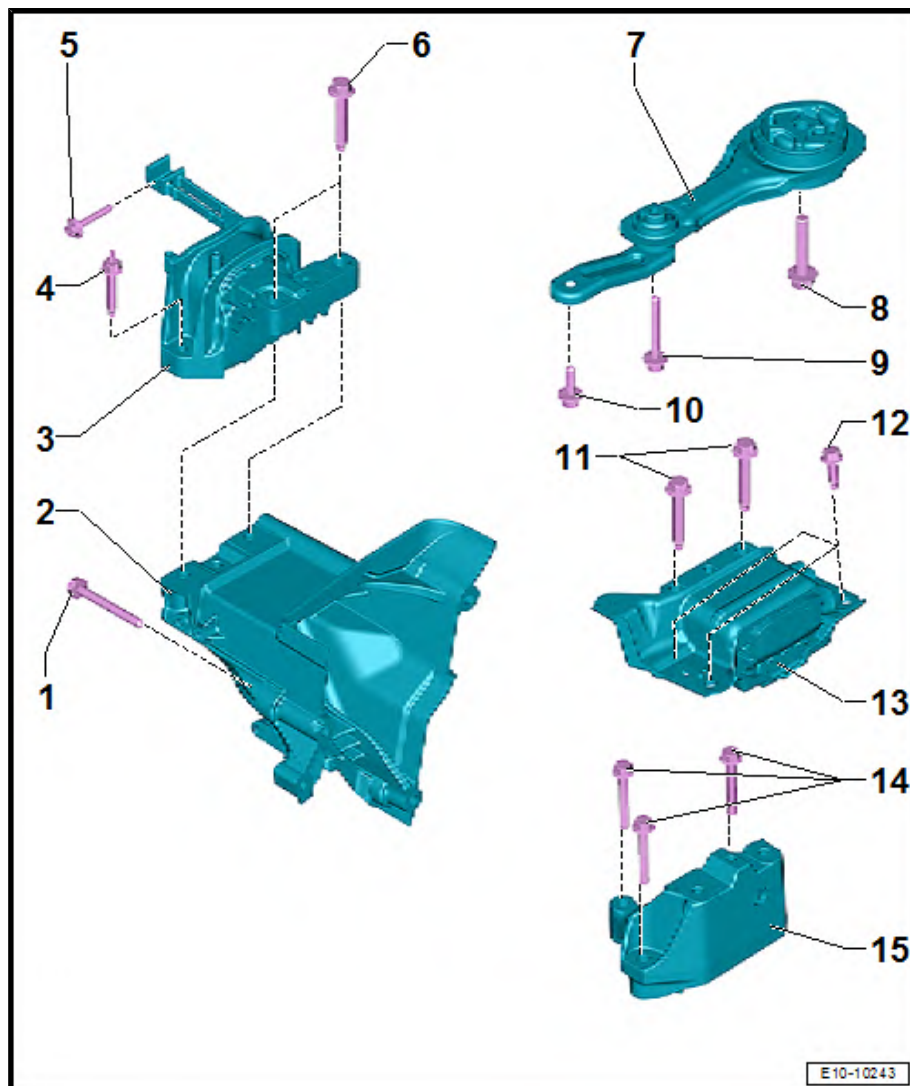
- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ⇒ [page 71](#)

10 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ⇒ [page 71](#)

11 - Bolt

- ☐ Renew after removal
- ☐ 60 Nm +90°



12 - Bolt

- ☐ Renew after removal
- ☐ 50 Nm +90°

13 - Gearbox mounting

- ☐ Removing and installing
⇒ [“2.3.2 Removing and installing gearbox mounting, Ibiza 2018, Arona”, page 80](#)

14 - Bolt

- ☐ Renew after removal
- ☐ 3 off
- ☐ 40 Nm +90°

15 - Gearbox bracket

Engine support - specified torque and tightening sequence

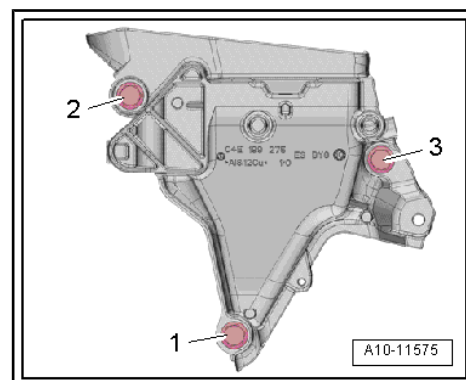


Note

Risk of damage to threads by starting bolts at an angle.

- Tighten bolts in stages in the sequence shown.

Stage	Bolts	Specified torque/turning further angle
1.	-1 ... 3-	7 Nm
2.	-1 ... 3-	40 Nm
3.	-1 ... 3-	Turn 90° further



Pendulum support - specified torque and tightening sequence

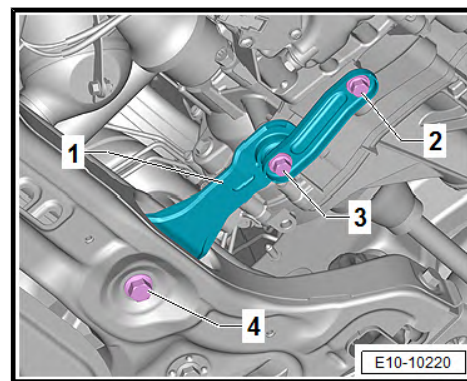


Note

If a further tightening angle is specified for certain bolts, these must be renewed.

- Tighten bolts in stages in the sequence shown:

Stage	Bolts	Specified torque/turning further angle
1.	-2- and -3-	50 Nm
2.	-4-	130 Nm
3.	-2-, -3- and -4-	Turn 90° further



2.1.3 Assembly overview - assembly mountings, Toledo 2013, Ibiza 2016

1 - Engine support

- ☐ Specified torque and tightening sequence
⇒ [page 73](#)

2 - Bolt

- ☐ Renew after removal
- ☐ Tightening sequence
⇒ [page 73](#) .

3 - Engine mounting

- ☐ With support arm
- ☐ Do not separate engine mounting and support arm
- ☐ Removing and installing
⇒ ["2.2.3 Engine mounting - removing and installing, Toledo 2013, Ibiza 2016", page 75](#)

4 - Bolt

- ☐ Renew after removal
- ☐ 20 Nm +90°

5 - Bolt

- ☐ Renew after removal
- ☐ 30 Nm +90°

6 - Centre hex stud

- ☐ Renew after removal
- ☐ 30 Nm +90°

7 - Earth strap

- ☐ Make sure the contact surfaces are free of dirt and corrosion
- ☐ Clean as necessary

8 - Nut

- ☐ For securing earth strap
- ☐ 20 Nm

9 - Bolt

- ☐ Renew after removal
- ☐ 40 Nm +90°

10 - Gearbox mounting

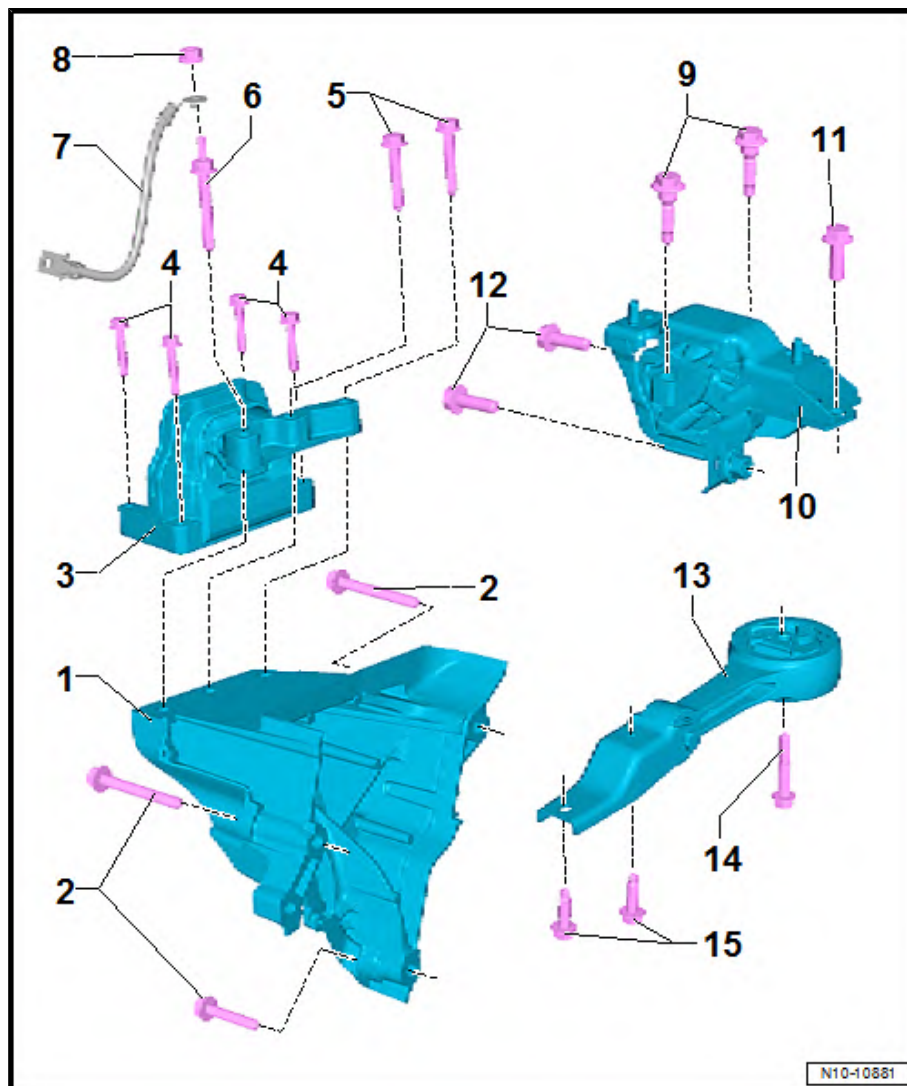
- ☐ With support arm
- ☐ Removing and installing
⇒ ["2.3.3 Gearbox mounting - removing and installing, Toledo 2013, Ibiza 2016", page 82](#)

11 - Bolt

- ☐ Renew after removal
- ☐ 50 Nm +90°

12 - Bolt

- ☐ Renew after removal
- ☐ 50 Nm +90°



13 - Pendulum support

- ☐ Removing and installing

⇒ ["2.4.3 Pendulum support - removing and installing, Toledo 2013, Ibiza 2016", page 86](#)

14 - Bolt

- ☐ Renew after removal
- ☐ 40 Nm +90°

15 - Bolt

- ☐ Renew after removal
- ☐ 30 Nm +90°

Engine support - specified torque and tightening sequence

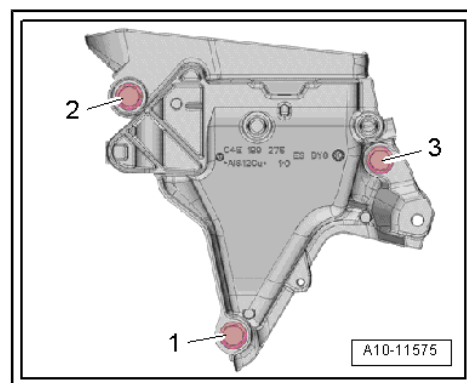


Note

- ◆ *If specified torque and tightening sequence are not adhered to, used bolts may become loose.*
- ◆ *If a further tightening angle is specified for certain bolts, these must be renewed.*

– Tighten bolts in stages in the sequence shown.

Stage	Bolts	Specified torque/turning further angle
1.	-1 ... 3-	7 Nm
2.	-1 ... 3-	40 Nm
3.	-1 ... 3-	Turn 90° further



2.2 Removing and installing motor mounting

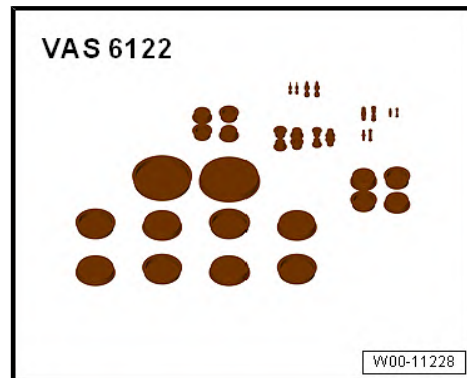
⇒ ["2.2.1 Engine mounting - removing and installing, Ateca, Leon 2013", page 73](#)

⇒ ["2.2.2 Removing and installing engine mounting, Ibiza 2018, Arona", page 74](#)

⇒ ["2.2.3 Engine mounting - removing and installing, Toledo 2013, Ibiza 2016", page 75](#)

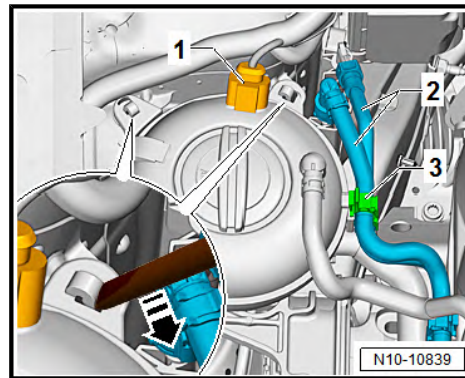
2.2.1 Engine mounting - removing and installing, Ateca, Leon 2013

Engine bung set - VAS 6122-



Removing

- Unplug electrical connector -1-.
- Open locking mechanism -3- and free the lines -2- of the fuel supply system and the activated charcoal filter, quick-release couplings ⇒ Rep. gr. 20 ; Quick-release couplings; quick-release coupling: remove .
- Seal open lines and unions with clean plugs from engine sealing plug set - VAS 6122- .
- Using a screwdriver, release fasteners -arrow- and move coolant expansion tank to one side.



Ateca

- Support engine in its installation position
⇒ [“2.5.1 Supporting engine in installation position, Ateca”, page 87](#) .

Leon 2013

- Support engine in its installation position
⇒ [“2.5.2 Supporting engine in installation position, Leon 2013”, page 91](#) .

Continued for all vehicles:

- Unscrew bolts -arrows- and remove engine mounting -1-.

Installing

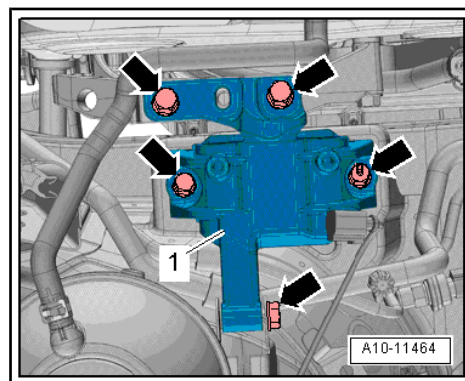
Install in reverse order of removal, observing the following:



Note

If a further tightening angle is specified for certain bolts, these must be renewed.

- Checking adjustment of assembly mountings
⇒ [“2.6 Assembly mountings - adjusting, Ateca, Leon 2013, Ibiza 2018, Arona”, page 106](#) .
- Remove support bracket.



Specified torques

- ♦ ⇒ [“2.1.1 Assembly overview - assembly mountings, Ateca, Leon 2013”, page 67](#)

2.2.2 Removing and installing engine mounting, Ibiza 2018, Arona

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



Removing

- Open catch -3- and lay lines -2- of fuel supply system and activated charcoal filter aside.
- Unplug electrical connector -1-.
- Release catches in direction of -arrow- with a screwdriver and move coolant expansion tank to one side.

Ibiza 2018

- Support engine in its installation position
⇒ [“2.5.3 Supporting engine in installation position, Ibiza 2018”, page 93](#) .

Arona

- Support engine in its installation position
⇒ [“2.5.4 Supporting engine in installation position, Arona”, page 97](#) .

Continued for all vehicles:

- Unscrew bolts -arrows- and remove engine mounting -1-.

Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Risk of damage to threads by starting bolts at an angle.*
- ◆ *Renew bolts that are tightened with turning further angle after each removal.*
- ◆ *Only remove support bracket - 10 - 222 A- when bolts on assembly mounting have been tightened to specified torque.*

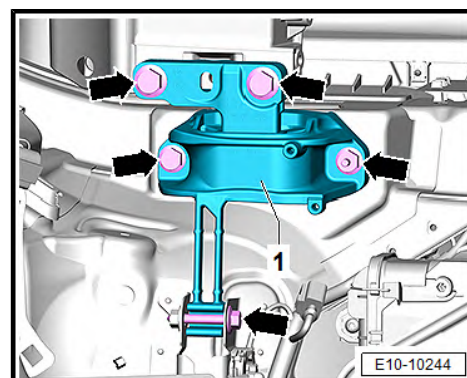
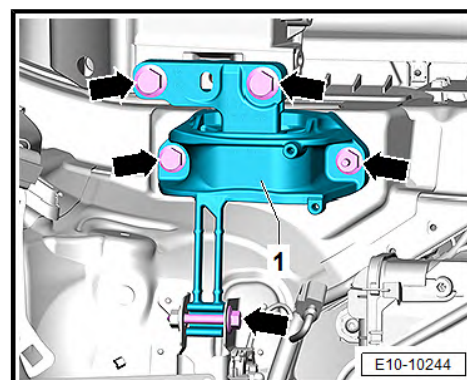
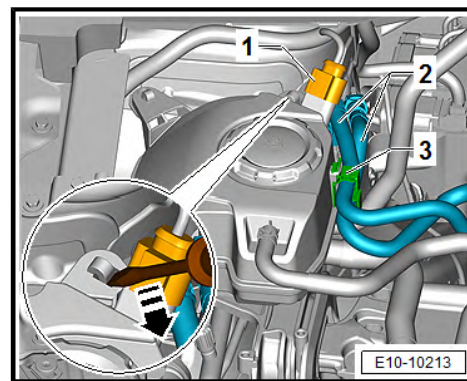
- First screw in bolts -arrows- for engine mounting -1- onto stop by hand.
- Tighten bolts -arrows-
⇒ [“2.1.2 Assembly overview - assembly mountings, Ibiza 2018, Arona”, page 70](#) .
- Checking adjustment of assembly mountings
⇒ [“2.7 Assembly mounting setting - checking, Ateca, Leon 2013, Ibiza 2018, Arona”, page 108](#) .

Specified torques

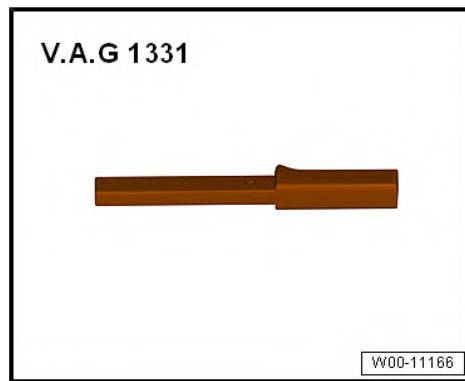
- ◆ ⇒ [“2.1.2 Assembly overview - assembly mountings, Ibiza 2018, Arona”, page 70](#)

2.2.3 Engine mounting - removing and installing, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required



◆ Torque wrench - V.A.G 1331-



◆ Torque wrench - V.A.G 1332-

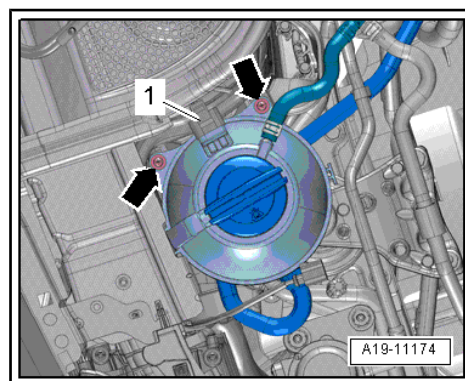


Removing

- Remove bolts -arrows-.
- Lift coolant expansion tank until connector is accessible.
- Disconnect connector -1- for coolant shortage indicator switch - F66- , and lay coolant expansion tank to one side.

Toledo 2013

- Support engine in its installation position
⇒ ["2.5.6 Supporting engine in installation position, Toledo 2013", page 103](#) .

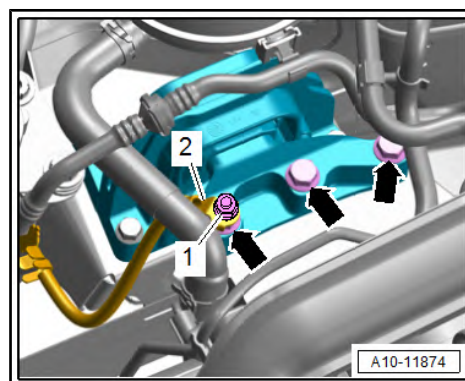


Ibiza 2016

- Support engine in its installation position
⇒ ["2.5.5 Supporting engine in installation position, Ibiza 2016", page 102](#) .

Continued for all vehicles:

- Unscrew nut -1-, and lay earth wire -2- to one side.
- Unscrew bolts -arrows- for gearbox mounting support arm.



- Unscrew bolts -arrows- and remove engine mounting -1-.

Installing



Note

- ◆ *If specified torque and tightening sequence are not adhered to, used bolts may become loose.*
- ◆ *If a further tightening angle is specified for certain bolts, these must be renewed.*

- Place engine mounting -1- onto longitudinal member.
- First screw in bolts -arrows- as far as stop by hand.
- Tighten bolts
⇒ [“2.1.3 Assembly overview - assembly mountings, Toledo 2013, Ibiza 2016”, page 72](#) .

- First screw in bolts -arrows- for support arm of engine mounting as far as stop by hand.
- Make sure support arm is not twisted when bolts are tightened.
- Tighten bolts -arrows-
⇒ [“2.1.3 Assembly overview - assembly mountings, Toledo 2013, Ibiza 2016”, page 72](#) .
- Fit earth strap -2- to stud, start nut -1-, and tighten it.
- Remove support bracket.

Carry out the remaining installation in reverse sequence, noting the following:

Specified torques

- ◆ Securing bolts and securing nuts
⇒ [“2.1.3 Assembly overview - assembly mountings, Toledo 2013, Ibiza 2016”, page 72](#)

2.3 Removing and installing gearbox mounting

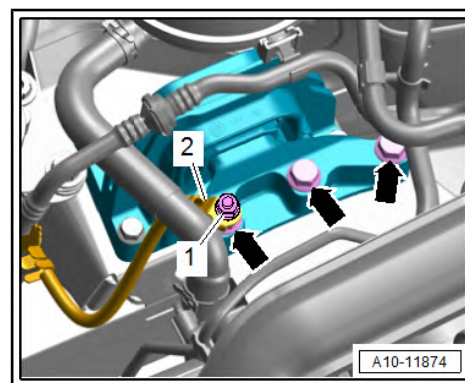
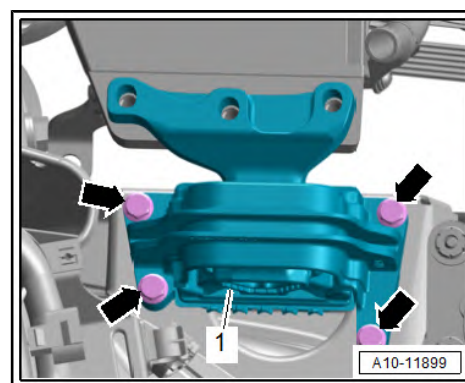
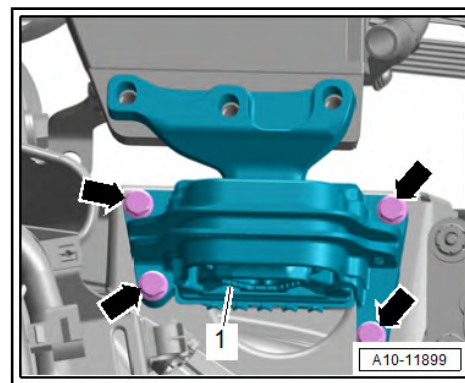
⇒ [“2.3.1 Engine mounting - removing and installing, Ateca, Leon 2013”, page 77](#)

⇒ [“2.3.2 Removing and installing gearbox mounting, Ibiza 2018, Arona”, page 80](#)

⇒ [“2.3.3 Gearbox mounting - removing and installing, Toledo 2013, Ibiza 2016”, page 82](#)

2.3.1 Engine mounting - removing and installing, Ateca, Leon 2013

Special tools and workshop equipment required



◆ Torque wrench - V.A.G 1331-



◆ Torque wrench - V.A.G 1332-



Removing

- Disconnect earth wire from battery terminal ⇒ Electrical system; Rep. gr. 27 ; Battery, Disconnecting and connecting battery .
- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; battery; battery tray: remove and install .

Ateca

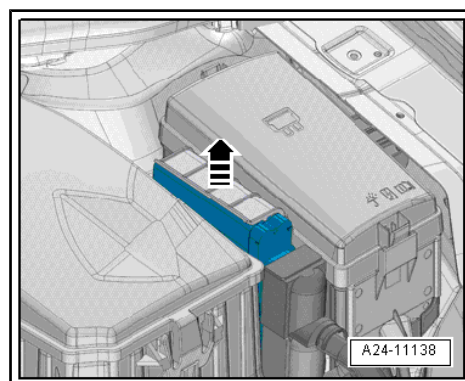
- Support engine in its installation position
⇒ ["2.5.2 Supporting engine in installation position, Leon 2013", page 91](#) .

Leon 2013

- Support engine in its installation position
⇒ ["2.5.2 Supporting engine in installation position, Leon 2013", page 91](#) .

Continued for all vehicles:

- Remove engine control unit
⇒ ["6 Engine \(motor\) control unit", page 412](#) .

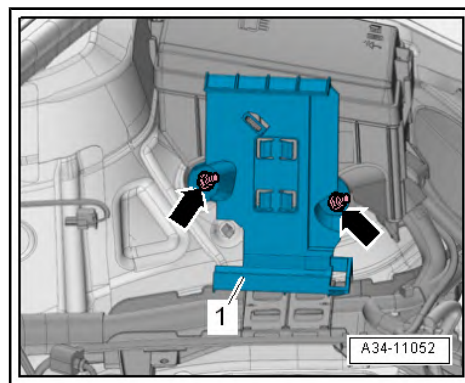


- Unscrew nuts -arrows- and remove bracket -1-.

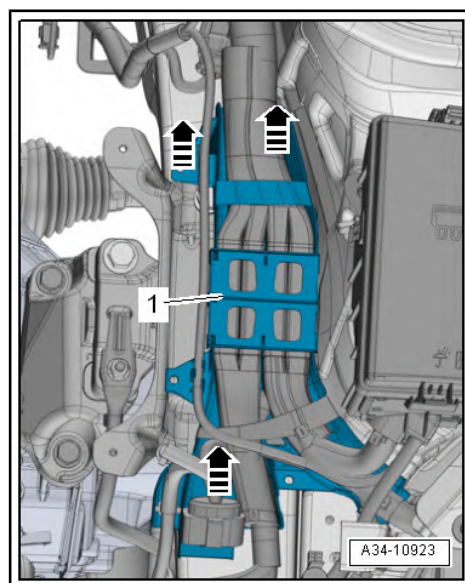


Note

Different types of brackets are fitted depending on version.



- Unclip wire guide -1- upwards -arrows-, and push it slightly to one side.



- Unscrew bolts -arrows- and remove gearbox mounting -1-.

Installing

Install in reverse order of removal, observing the following:



Note

- ♦ *Risk of damage to threads by starting bolts at an angle.*
- ♦ *Renew bolts that are tightened with turning further angle after each removal.*
- Lift gearbox with spindle of support bracket until gearbox support makes contact with support arm of gearbox mounting.
- Checking adjustment of assembly mountings
⇒ [“2.7 Assembly mounting setting - checking, Ateca, Leon 2013, Ibiza 2018, Arona”, page 108](#) .
- Install engine control unit
⇒ [“6 Engine \(motor\) control unit”, page 412](#) .
- Install battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Connect earth wire to battery terminal ⇒ Electrical system; Rep. gr. 27 ; Battery, Disconnecting and connecting battery .
- Detach support bracket - 10 - 222 A- from engine.

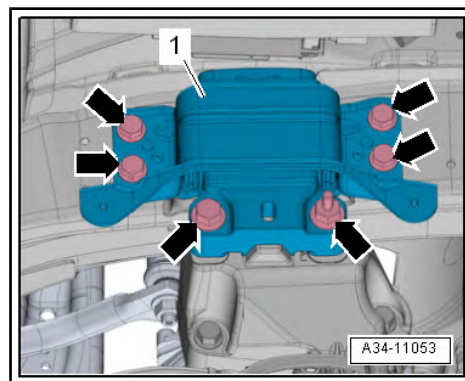
Specified torques

- ♦ ⇒ [“2.1.1 Assembly overview - assembly mountings, Ateca, Leon 2013”, page 67](#)
- ♦ ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray

2.3.2 Removing and installing gearbox mounting, Ibiza 2018, Arona

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



- ◆ Torque wrench - V.A.G 1332-



Removing

- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; battery; battery tray: remove and install .



Note

Different types of brackets are fitted depending on version.

Ibiza 2018

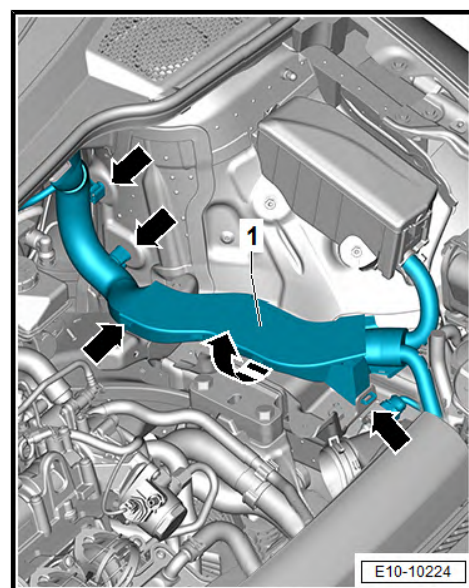
- Support engine in its installation position
⇒ [“2.5.3 Supporting engine in installation position, Ibiza 2018”, page 93](#) .

Arona

- Support engine in its installation position
⇒ [“2.5.4 Supporting engine in installation position, Arona”, page 97](#) .

Continued for all vehicles:

- Tighten spindle slightly to take up weight of engine/gearbox assembly; do not lift.
- Loosen line guide -1- from its fastening points -arrows-, slide upwards -in direction of arrow- and secure on one side.



- Unscrew bolts -arrows- and remove gearbox mounting -1-.

Installing

Install in reverse order of removal, observing the following:



Note

- ♦ *Risk of damage to threads by starting bolts at an angle.*
- ♦ *Renew bolts that are tightened with turning further angle after each removal.*
- ♦ *Only remove support bracket - 10 - 222 A- when bolts on assembly mounting have been tightened to specified torque.*
- Lift gearbox with spindle of support bracket until gearbox support makes contact with support arm of gearbox mounting.
- Checking adjustment of assembly mountings
⇒ [“2.7 Assembly mounting setting - checking, Ateca, Leon 2013, Ibiza 2018, Arona”, page 108](#) .
- Install battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Connect earth wire to battery terminal ⇒ Electrical system; Rep. gr. 27 ; Battery, Disconnecting and connecting battery .
- Detach support bracket - 10 - 222 A- from engine.

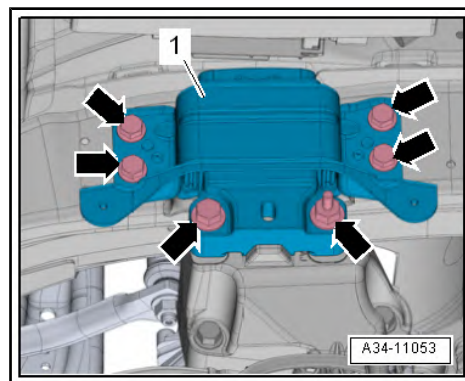
Specified torques

- ♦ ⇒ [“2.1.2 Assembly overview - assembly mountings, Ibiza 2018, Arona”, page 70](#)
- ♦ ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray

2.3.3 Gearbox mounting - removing and installing, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



◆ Torque wrench - V.A.G 1332-



Removing

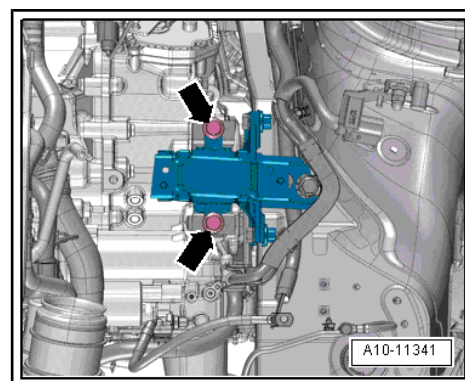
- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; battery; battery tray: remove and install .

Toledo 2013

- Support engine in its installation position
⇒ [“2.5.6 Supporting engine in installation position, Toledo 2013”, page 103](#) .

Ibiza 2016

- Support engine in its installation position
⇒ [“2.5.5 Supporting engine in installation position, Ibiza 2016”, page 102](#) .



Continued for all vehicles:

- Unscrew bolts -arrows- for gearbox mounting.
- Unscrew bolts -arrows A, B and C-, and remove gearbox mounting.

Installing

Install in reverse order of removal, observing the following:



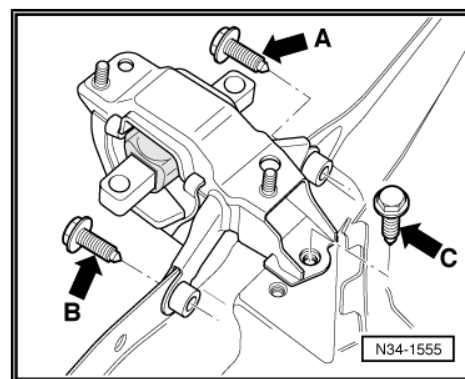
Note

- ◆ *If specified torque and tightening sequence are not adhered to, used bolts may become loose.*
- ◆ *If a further tightening angle is specified for certain bolts, these must be renewed.*

- Install battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .

Install battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .

- Remove support bracket.



Specified torques

- ◆ Gearbox mounting - specified torque and tightening sequence
⇒ [“2.1.3 Assembly overview - assembly mountings, Toledo 2013, Ibiza 2016”, page 72](#)

2.4 Removing and installing pendulum support

⇒ ["2.4.1 Removing and positioning pendulum support, Ateca, Leon 2013", page 84](#)

⇒ ["2.4.2 Removing and installing pendulum support, Ibiza 2018, Arona", page 85](#)

⇒ ["2.4.3 Pendulum support - removing and installing, Toledo 2013, Ibiza 2016", page 86](#)

2.4.1 Removing and positioning pendulum support, Ateca, Leon 2013

Special tools and workshop equipment required

◆ Torque wrench - V.A.G 1331-



◆ Torque wrench - V.A.G 1332-



Removing

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation component .
- Unscrew bolts -1, 2 and 3-, and remove pendulum support.

Installing

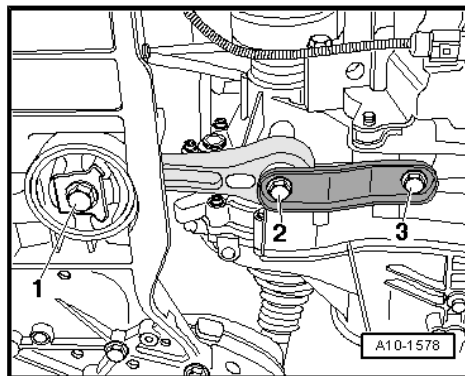
Install in reverse order of removal, observing the following:



Note

Renew bolts that are tightened with turning further angle after each removal.

- Bolt pendulum support first to gearbox and then to subframe.



Note

- ◆ *There are threaded holes, e.g. "Heli coil" in the bolting holes for the pendulum support.*
- ◆ *ID: shoulder on the first thread turn -arrow-.*
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview – noise insulation .

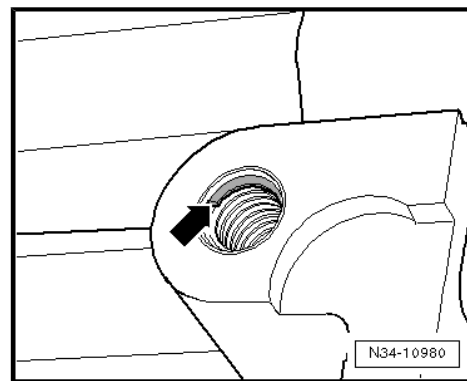
Specified torques

- ◆ ⇒ ["2.1.1 Assembly overview - assembly mountings, Ateca, Leon 2013", page 67](#)

2.4.2 Removing and installing pendulum support, Ibiza 2018, Arona

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



Removing

- Unscrew bolts -2-, -3- and -4- of pendulum support -1-.
- Pull out pendulum support -1- from subframe.

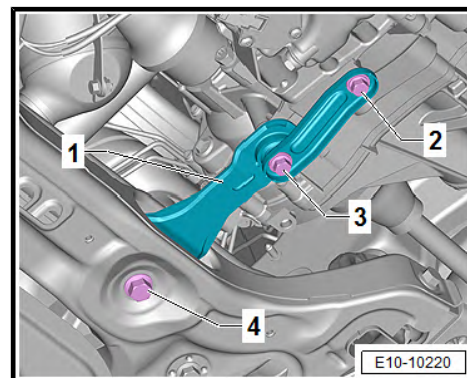
Installing

Install in reverse order of removal, observing the following:

Note

Renew bolts that are tightened with turning further angle after each removal.

- Bolt pendulum support first to gearbox and then to subframe.



**Note**

- ◆ *There are threaded holes, e.g. "Heli coil" in the bolting holes for the pendulum support.*
- ◆ *The shoulder on the first thread pitch -arrow- is an identifying feature.*

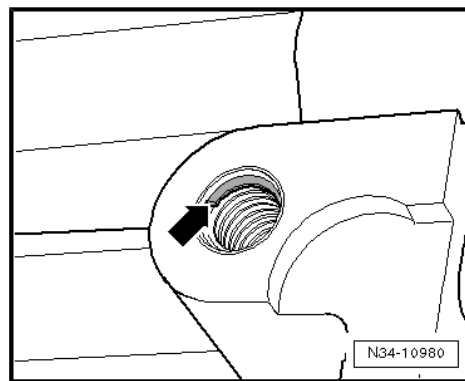
Specified torques

- ◆ ⇒ ["2.1.2 Assembly overview - assembly mountings, Ibiza 2018, Arona", page 70](#)

2.4.3 Pendulum support - removing and installing, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required

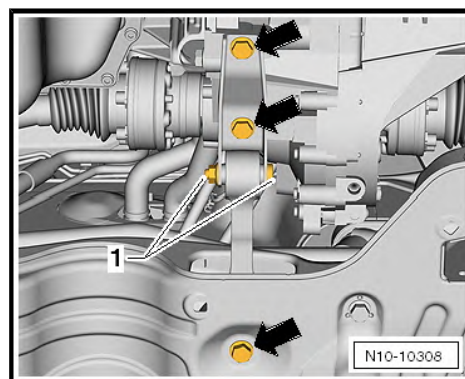
- ◆ Torque wrench - V.A.G 1332-

**Removing**

- If necessary, remove noise insulation. ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; assembly overview - underbody protection , Toledo ⇒ General body repairs, exterior; Rep. gr. 50 ; Body front; assembly overview - noise insulation .
- The threaded connection -1- must not be loosened.
- Unscrew bolts -arrow- and remove pendulum support.

Installing

Install in reverse order of removal, observing the following:

**Note**

- ◆ *If specified torque and tightening sequence are not adhered to, used bolts may become loose.*
- ◆ *If a further tightening angle is specified for certain bolts, these must be renewed.*
- Bolt pendulum support first to gearbox and then to subframe.

Specified torques

- ◆ ⇒ ["2.1.3 Assembly overview - assembly mountings, Toledo 2013, Ibiza 2016", page 72](#)

2.5 Supporting engine in installation position

⇒ [“2.5.1 Supporting engine in installation position, Ateca”, page 87](#)

⇒ [“2.5.2 Supporting engine in installation position, Leon 2013”, page 91](#)

⇒ [“2.5.3 Supporting engine in installation position, Ibiza 2018”, page 93](#)

⇒ [“2.5.4 Supporting engine in installation position, Arona”, page 97](#)

⇒ [“2.5.5 Supporting engine in installation position, Ibiza 2016”, page 102](#)

⇒ [“2.5.6 Supporting engine in installation position, Toledo 2013”, page 103](#)

2.5.1 Supporting engine in installation position, Ateca

Special tools and workshop equipment required

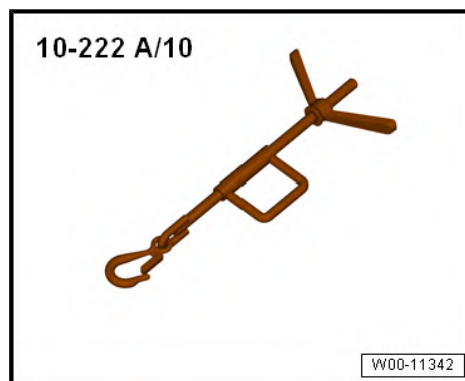
- ◆ Support bracket - 10 - 222 A-



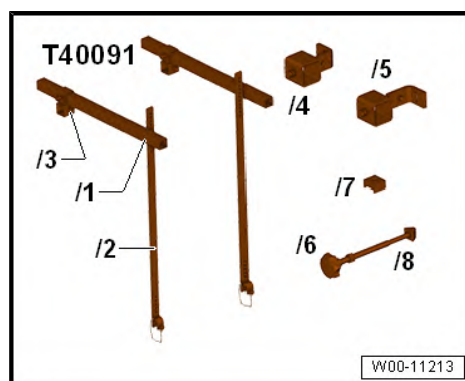
- ◆ Adapter - 10-222A/29-



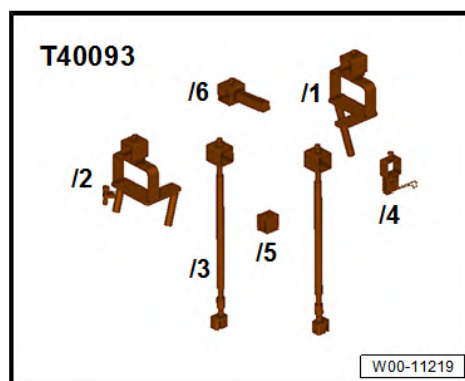
◆ Spindle - 10 - 222 A /10-



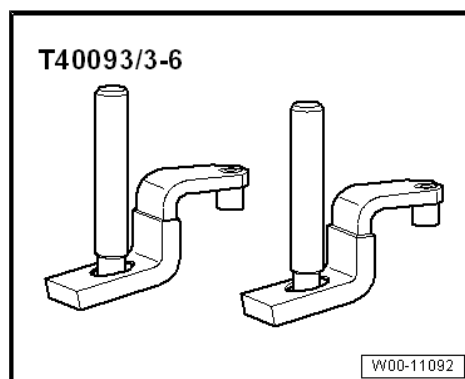
◆ Engine support basic set - T40091-



◆ -T40093/6- from engine support supplement set - T40093-

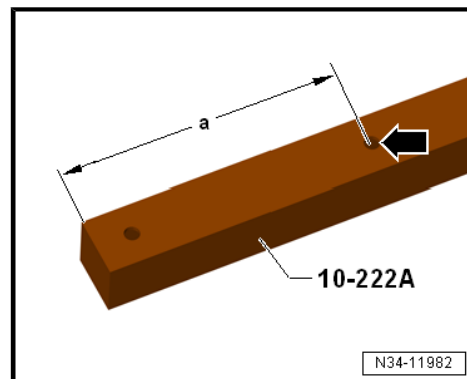


◆ Adapter - T40093/3-6A- (check, and renew if necessary
⇒ [page 89](#))



Preparing tools

- If adapter -10 - 222 A- does not yet have the hole -arrow-, it must now be drilled into it.
- Dimension -a- = 225 mm.
- Hole diam. = 12.5 mm.

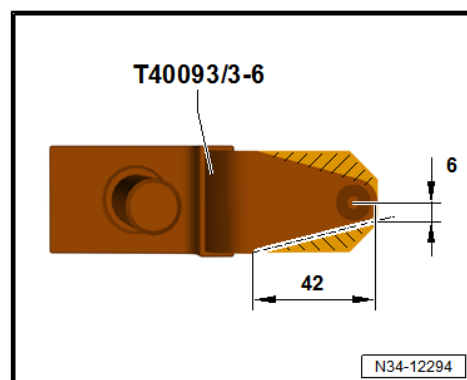


Check adapter - T40093/3-6- and renew if necessary.

- Cut out the marked area if necessary.
- Round off front edges.
- Protect adapter against corrosion.
- Then mark the adapter - T40093/3-6- with -T40093/3-6A- .

At a later point, support bracket - 10-222 A- will be fitted onto longitudinal members with adapters - T40093/3-6A- .

- To prevent damage to the longitudinal members, protect the front part of the adapters - T40093/3-6A- with textile adhesive tape ⇒ Electronic Parts Catalogue (ETKA Chemical Products) .



Procedure

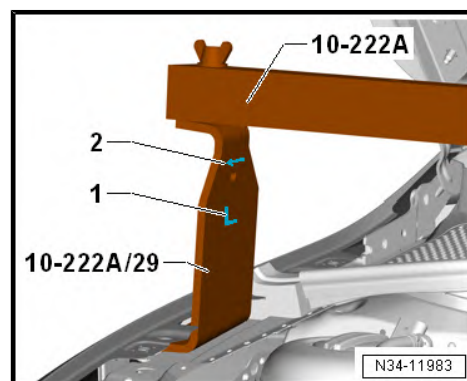
- Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .
- Remove air intake pipe
⇒ ["2.5 Removing and installing air pipe ", page 368](#) .
- Bolt adapter - 10 - 222 A /29- labelled »L« to right side of support bracket - 10-222 A- .



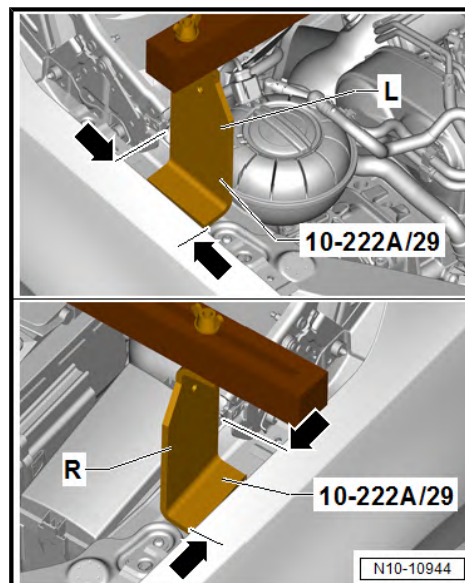
Note

"L" = -1- adapter - 10 - 222 A /29- is to be inserted on right side of vehicle.

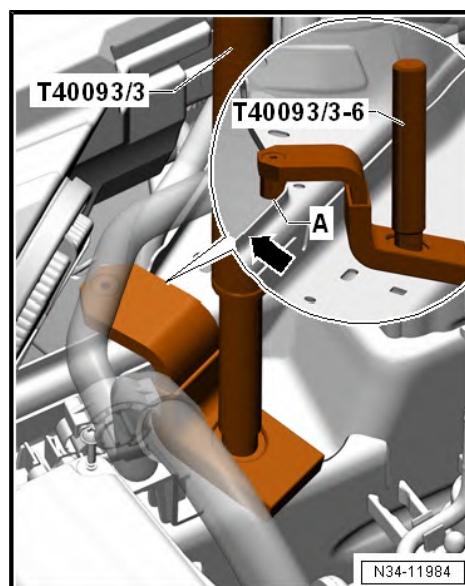
- Slide adapter - T40091/3- onto support bracket - 10 - 222 A- .
- Bolt adapter - 10 - 222 A /29- labelled »R« to left side of support bracket - 10-222 A- .



- Fit support bracket - 10 - 222 A- with adapters - 10 - 222 A / 29- onto upper wheel housing longitudinal member, as shown in illustration.



- Place the adapter - T40093/3-6- over the right longitudinal member.
- Bolt -A- must remain behind the rim -arrow-.
- Screw in spindle - T40093 /3- in the pins -A-.



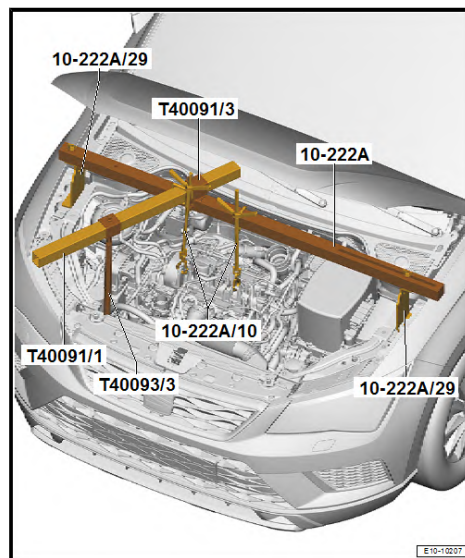
- Connect spindle from engine support supplement set - T40093 /3- via square section tube - 10-222 A- to engine support bracket - T40091/1- and tighten.
- Attach hook of spindles - 10-222A/10- to engine lifting eyes.
- Take up weight of engine/gearbox assembly on spindles, but do not lift it.

Installing

Installation is in the reverse sequence of removal.

Specified torques

- ◆ Securing bolts for air filter housing
⇒ ["3.1.1 Assembly overview - air filter housing, Ateca, Leon 2013", page 393](#)



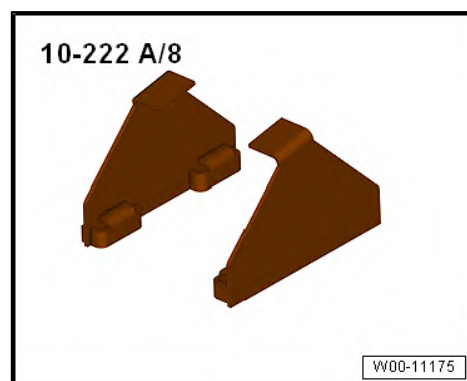
2.5.2 Supporting engine in installation position, Leon 2013

Special tools and workshop equipment required

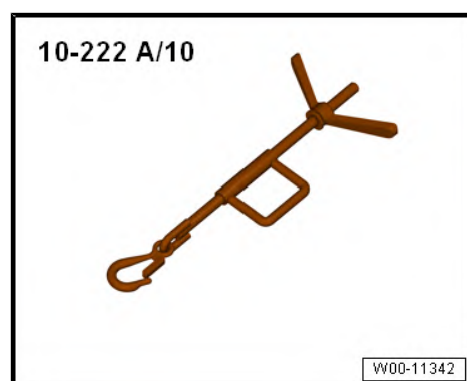
- ◆ Support bracket - 10 - 222 A-



- ◆ Adapter - 10-222A/13-



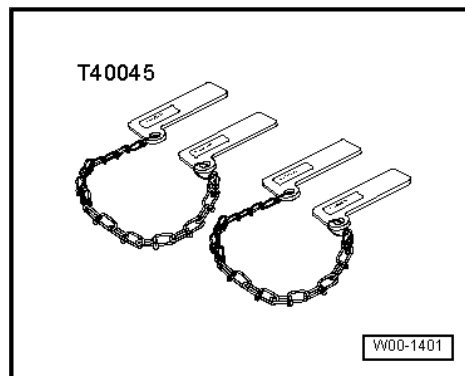
- ◆ Spindle - 10 - 222 A /10-



- ◆ Shackle - 10 - 222 A /12-



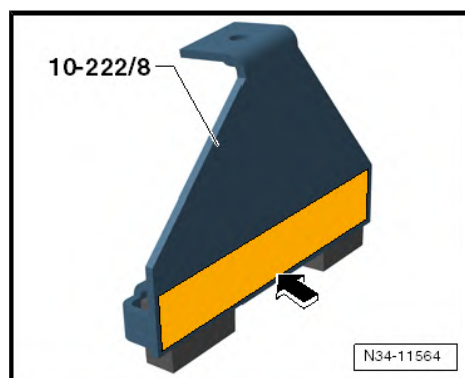
♦ Gauge - T40045-



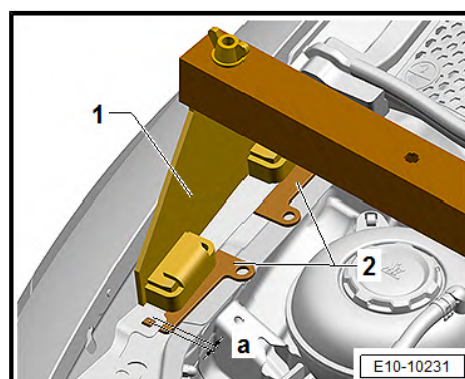
To prevent damage to edges of wings, cover lower areas of both adapters - 10 - 222 A /8- with woven adhesive tape -arrow- ➔ Electronic Parts Catalogue (ETKA) .

Procedure

- Remove air filter housing
➔ [“3.2 Removing and installing air filter housing”, page 397](#) .
- Remove air intake pipe
➔ [“2.5 Removing and installing air pipe ”, page 368](#) .



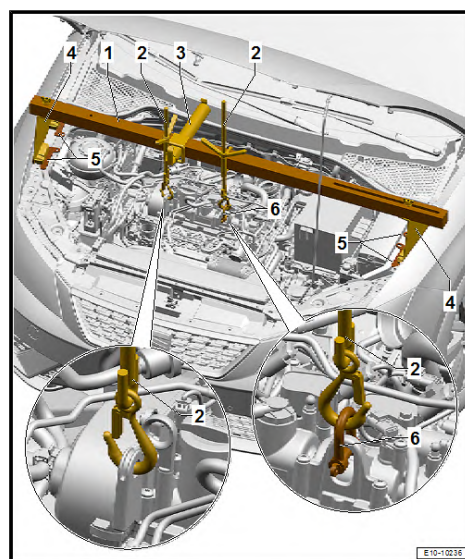
- Insert and align the gauges - T40045- -2- as shown in the illustration in the front longitudinal members right and left. When doing so, observe the height -a-.
- Attach the adapter - 10 - 222 A /8- -1- on left and right onto longitudinal members as shown in illustration.



- Insert the spindle - 10 - 222 A /10- -5- and adapter - 10 - 222 A /18- -3- into the support bracket - 10 - 222 A -.
- Screw in the adapter - 10 - 222 A /8- -4- into the engine interception device - 10-222 A- -1-.
- Insert the carrying device - 10 - 222 A- -1- and the adapter - 10 - 222 A /8- -4- on left and right onto longitudinal members as shown.

Observe the position and setting of the gauge - T40045- -5-
➔ [page 92](#) .

- Fit the shackle - 10 - 222 A /12- -6- in the left lifting eye of the engine.
- Suspend the karabiners of the spindles - 10 - 222 A /10- -2- into the right lifting eye of the engine and suspend the left shackle - 10 - 222 A /12- -6-.
- Tighten spindle to take up weight of engine/gearbox assembly; do not lift.



2.5.3 Supporting engine in installation position, Ibiza 2018

Special tools and workshop equipment required

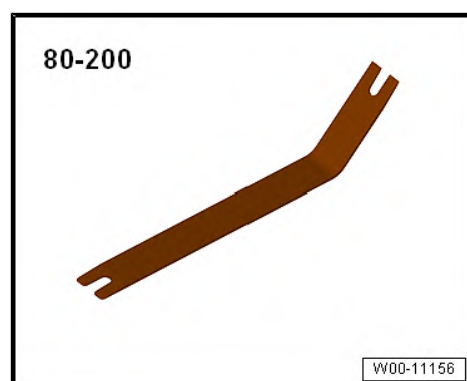
- ◆ Support bracket - 10 - 222 A-



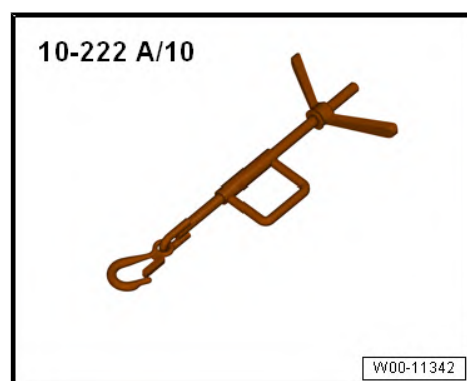
- ◆ Adapter - 10 222A/29-



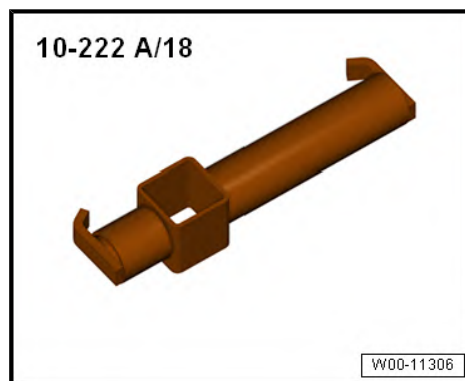
- ◆ Removal lever - 80 - 200-



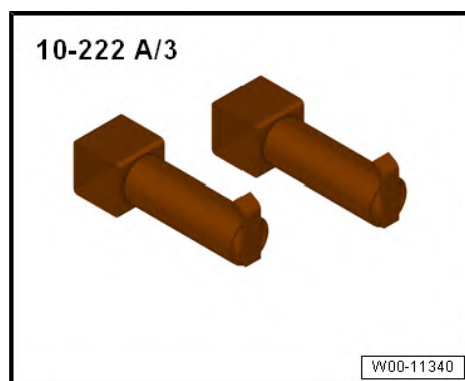
- ◆ Hook - 10 222A/10-



◆ Adapter - 10 - 222 A /18-



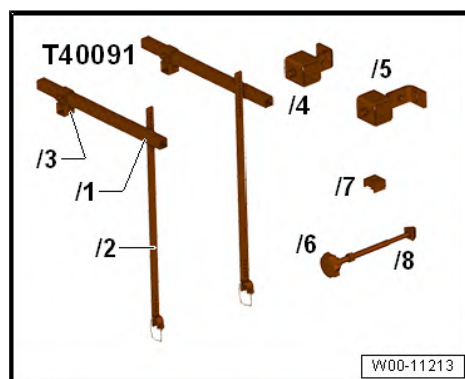
◆ Adapter - 10 222A/3-



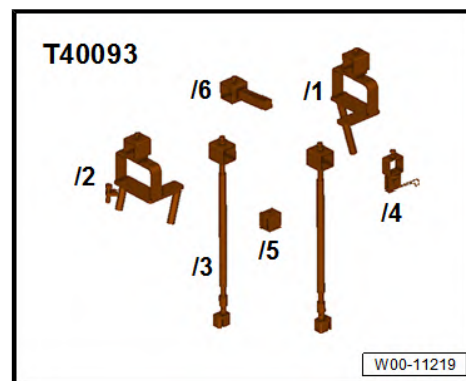
◆ Shackle - 10 - 222 A /12-



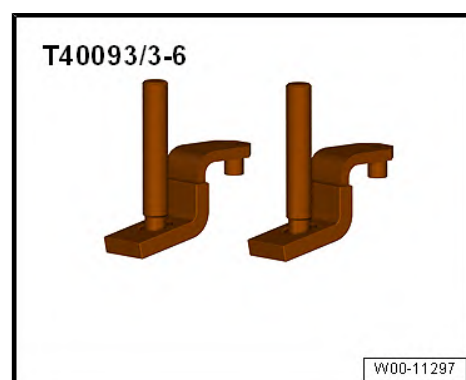
◆ Engine support basic set - T40091-



- ◆ -T40093/6- from engine support supplement set - T40093-

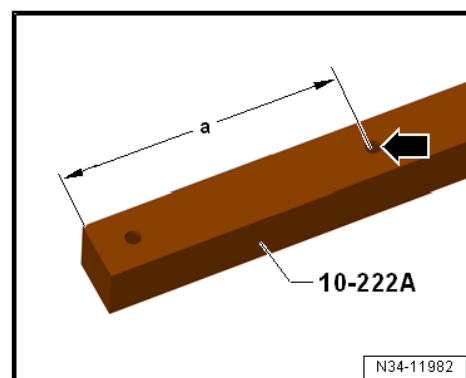


- ◆ Adapter - T40093/3-6A-



Check adapters - 10 - 222 A /4- and modify as necessary

- If adapter -10 - 222 A- does not yet have the hole -arrow-, it must now be drilled into it.
- Dimension -a- = 225 mm.
- Hole diam. = 12.5 mm.

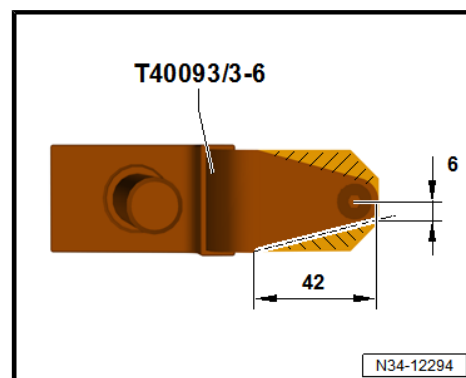


Check adapters - T40093/3-6- and modify as necessary

- If necessary, cut off the marked area.
- Round off front edges.
- Protect adapter against corrosion.
- Then, mark adapters - T40093/3-6- as -T40093/3-6A- .

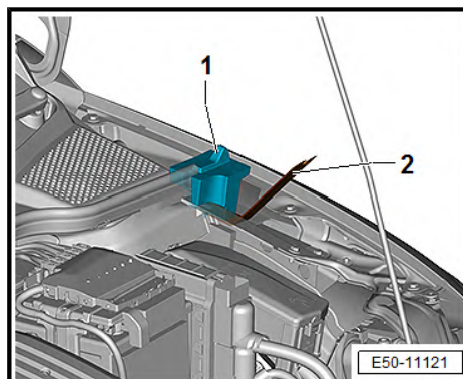
At a later point, support bracket - 10-222 A- will be fitted onto longitudinal members with adapters - T40093/3-6A- .

•

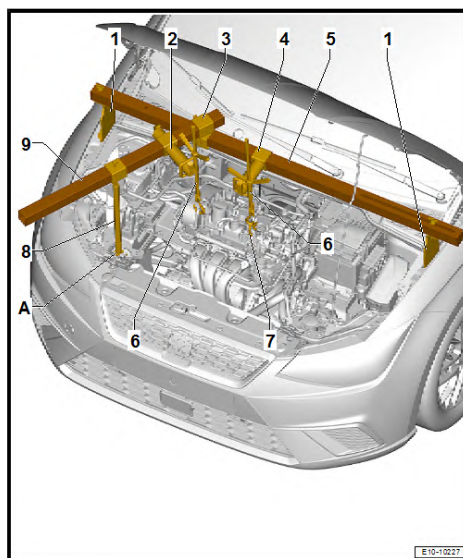


Procedure

- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .
- Remove air intake pipe
⇒ [“2.5 Removing and installing air pipe ”, page 368](#) .
- Remove the filler piece -1- on both sides with the removal lever - 80 200- -2-.



- Slide adapter - 10 - 222 A /3- -4- and adapter - T40091/3- -3- over the support bracket - 10 - 222 A- -5-.
- Secure support bracket - 10-222 A- -5- to adapters - 10 - 222 A /29- -1-.

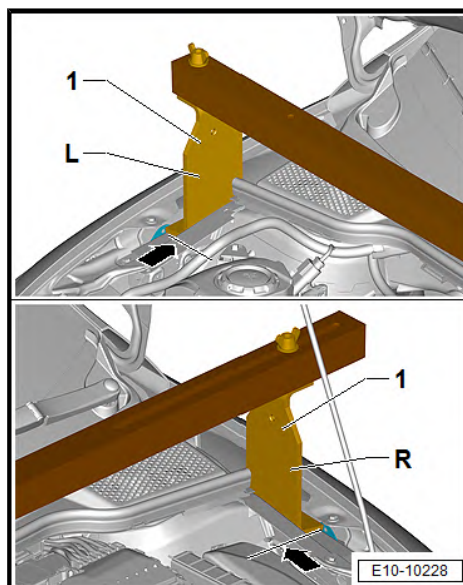


- ◆ Installation position: Attach the adapter - 10 - 222 A /29- on both sides of the vehicle between the edge of the wing bolted connections and the underlying plate for bolting the wing.

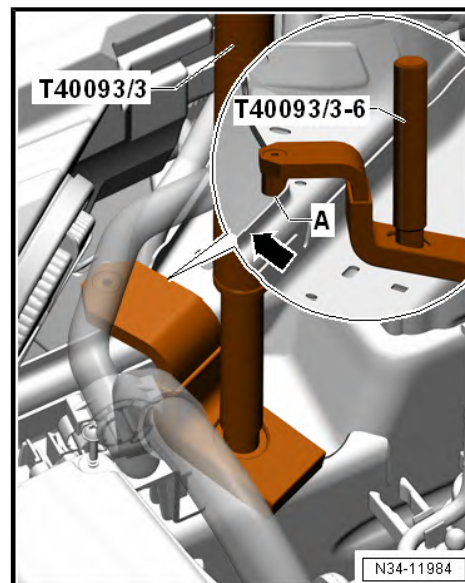
The adapter -L- is connected to the “right” side of the vehicle (the adapter -1- is guided into the wing ,recess, here the dimension -arrow- is selected as an orientation point)

The adapter “R” is connected to the “left” side of the vehicle (the adapter -1- is guided into the wing recess, here the dimension -arrow- is selected as an orientation point).

- If necessary, carefully unclip any pipes for air conditioning system in front area. Do not disconnect pipe/hose system ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit; System overview - refrigerant circuit .



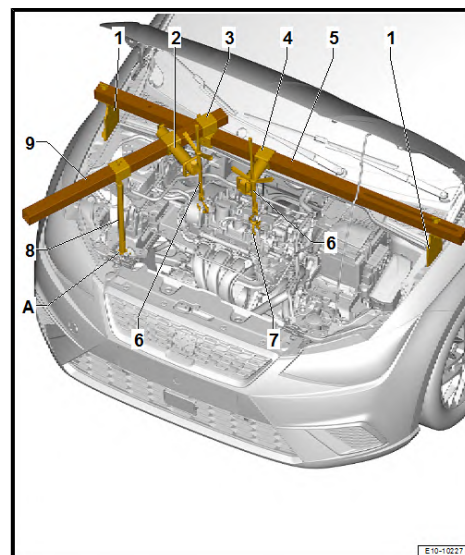
- Fit adapter -T40093/3-6A- with support - T40093/3- onto right longitudinal member.
- The adapter -T40093/3-6A- clicks into place with the dowel -A- behind the longitudinal member edge -arrow-.



- Bolt the spindle of the engine support supplement set - T40093 /3- -8- to the adapter - T40093/3-6- -A-.
- Connect spindle of the engine support supplement set - T40093 /3- -8- over the square section tube - T40091/1- -9- to the adapter - T40091/3- -3-; first guide the adapter - 10 - 222 A /18- -2- to the square section tube - T40091/1- -9-.
- Connect square tube - T40091/1- -9- to the adapter - T40091/3- -3-. Adjust and clamp.
- Suspend spindles - 10 - 222 A /10- -6- in the engine lifting lugs, on the left side if necessary using the shackle - 10 - 222 A /12- -7-.
- Take up weight of engine/gearbox assembly and support bracket on spindles .

Specified torques

- ◆ Securing bolts for air filter housing
⇒ ["3.1.2 Assembly overview - air filter housing, Ibiza 2018, Arona", page 395](#)
- ◆ ⇒ ["2.1 Assembly overview - charge air system", page 363](#)



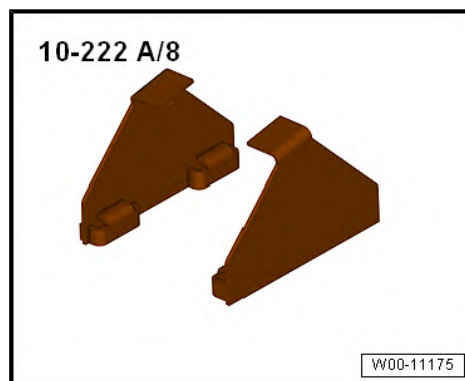
2.5.4 Supporting engine in installation position, Arona

Special tools and workshop equipment required

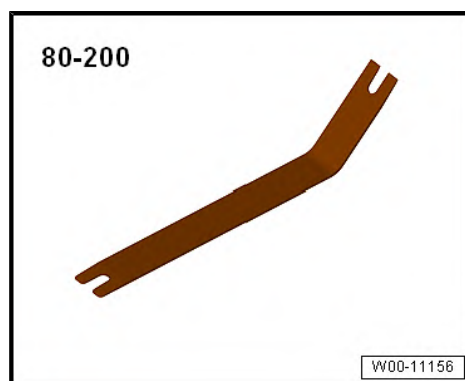
- ◆ Support bracket - 10 - 222 A-



◆ Adapter - 10 222A/8-



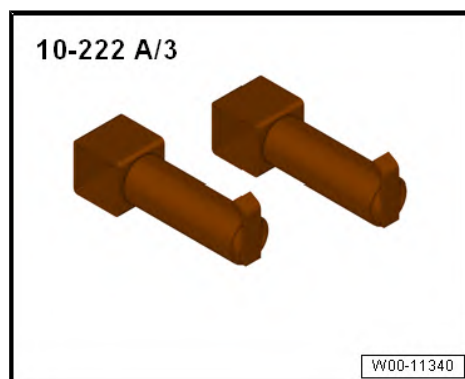
◆ Removal lever - 80 - 200-



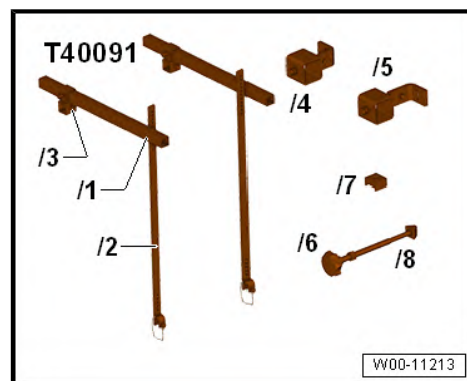
◆ Hook - 10 222A/10-



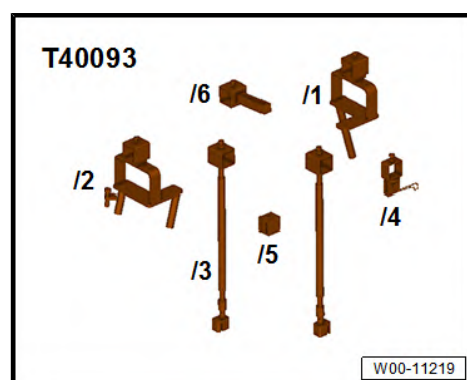
◆ Adapter - 10 222A/3-



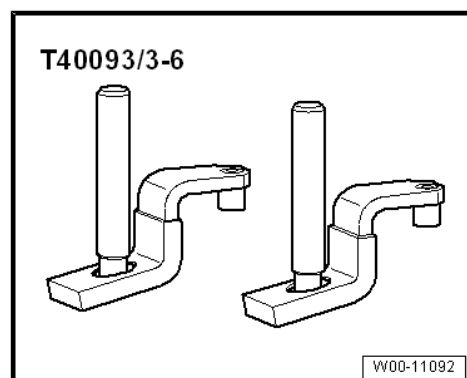
◆ Engine support basic set - T40091-



◆ -T40093/6- from engine support supplement set - T40093-

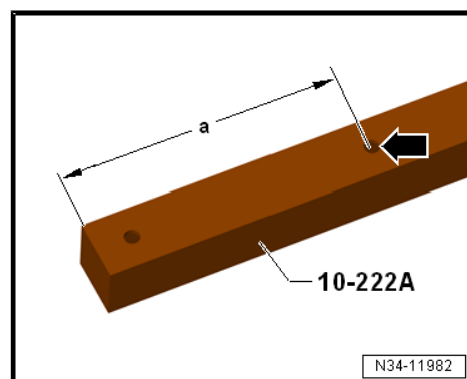


◆ Adapter - T40093/3-6A-



Check adapters - 10 - 222 A /4- and modify as necessary

- If adapter -10 - 222 A- does not yet have the hole -arrow-, it must now be drilled into it.
- Dimension -a- = 225 mm.
- Hole diam. = 12.5 mm.

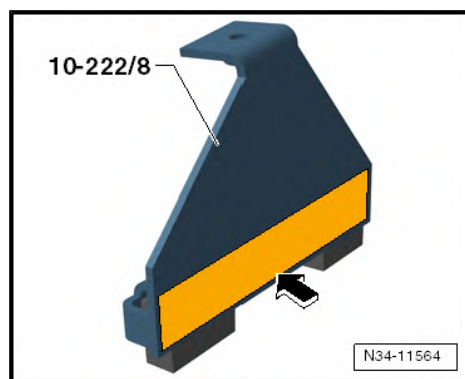
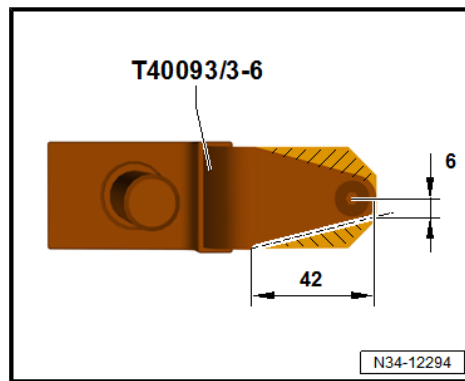


Check adapters - T40093/3-6- and modify as necessary

- If necessary, cut off the marked area.
- Round off front edges.
- Protect adapter against corrosion.
- Then, mark adapters - T40093/3-6- as -T40093/3-6A- .

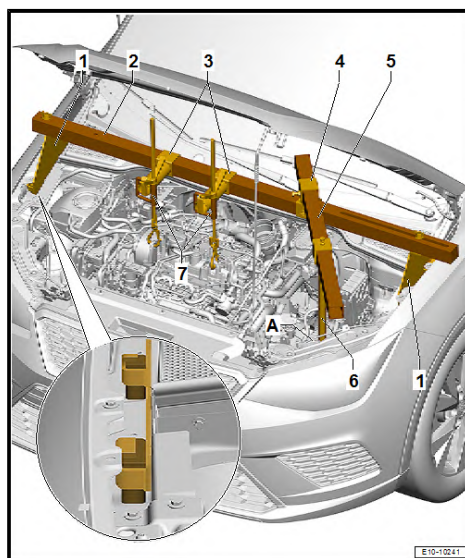
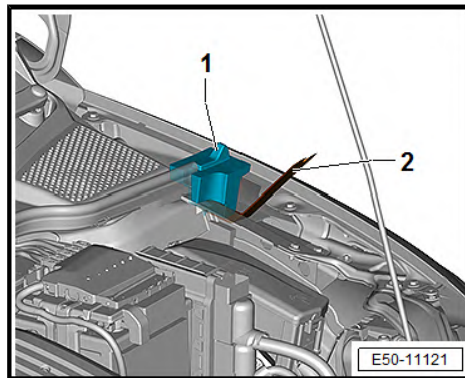
At a later point, support bracket - 10-222 A- will be fitted onto longitudinal members with adapters - T40093/3-6A- .

- To prevent damage to longitudinal members, cover front area of adapters - T40093/3-6A- with textile-reinforced adhesive tape ⇒ Electronic Parts Catalogue (ETKA chemical substances) .
- To not damage the edges of the wings, affix adhesive tape to both sides of the adapter - 10 - 222 A /8- to the lower section, -arrow- ⇒ Electronic parts catalogue (ETKA) .

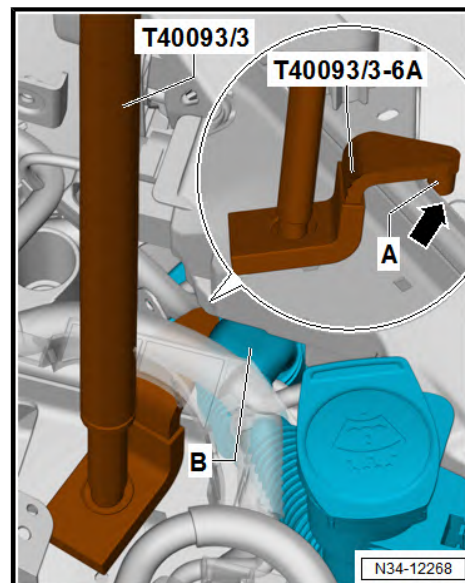


Procedure

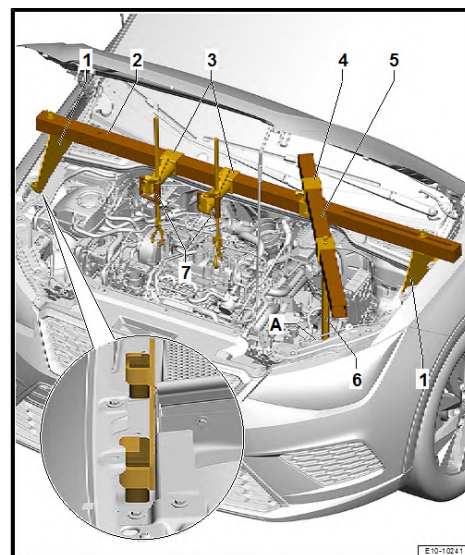
- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .
- Remove air intake pipe
⇒ [“2.5 Removing and installing air pipe ”, page 368](#) .
- Remove the filler piece -1- on both sides with the removal lever - 80 200- -2-.
- Slide the adapter - T40091/3- -4- and adapters - 10 - 222 A / 3- -3- over the support bracket - 10 - 222 A- -2-.
- Screw on support bracket - 10-222 A- -2- to adapters - 10 - 222 A /8- -1-.
- Insert support bracket - 10 - 222 A- -4- and the adapters - 10 - 222 A /8- -1- on both vehicles sides between the wing mounting edge and the mounting plate for wing located underneath.



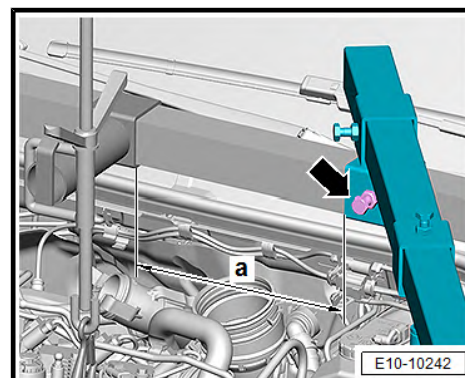
- If available, pull off the lines out of the front side of the right longitudinal member -arrow-.
- Place adapter - T40093/3-6A- on left longitudinal member right behind filler pipe for washer fluid reservoir -B-.
- If fitted, pull off electrical lines in front area of web on left longitudinal member.
- Bolt -A- must remain behind the rim -arrow-.



- Bolt the spindle of the engine support supplement set - T40093 /3- -6- to the adapter - T40093/3-6- -A-.



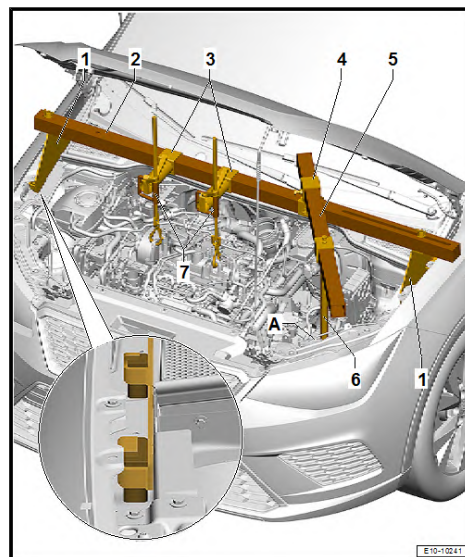
- In order to correctly affix the adapter - T40091/3- -4-, before the bolt -arrow- is tightened, the dimension -a = approx. 240 mm- must be used as a basis and then the bolt tightened.



- Connect, fit and tighten the spindle engine support supplement set - T40093 /3- -6- to the adapter - T40091/3- -4- over the square section tube - T40091/1- -5-.
- Hook the karabiners on the spindles - 10 - 222 A /10- -7- into the engine lifting eyes.
- Take up weight of engine/gearbox assembly and support bracket on spindles .

Specified torques

- ◆ Securing bolts for air filter housing
⇒ [“3.1.2 Assembly overview - air filter housing, Ibiza 2018, Arona”, page 395](#)
- ◆ ⇒ [“2.1 Assembly overview - charge air system”, page 363](#)



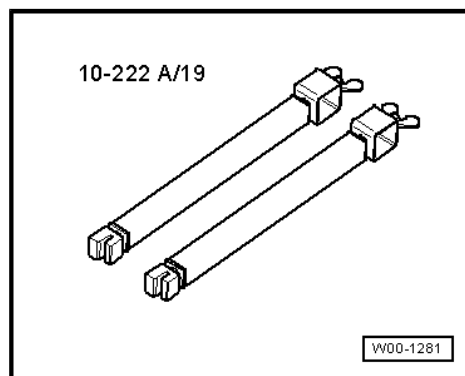
2.5.5 Supporting engine in installation position, Ibiza 2016

Special tools and workshop equipment required

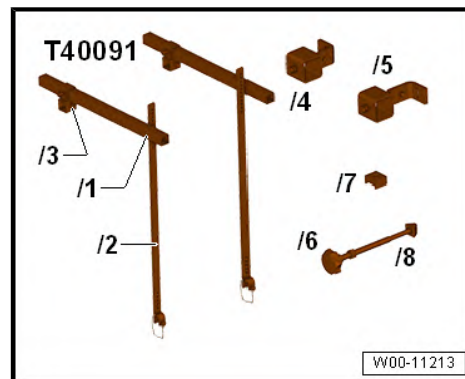
- ◆ Support bracket - 10 - 222 A-



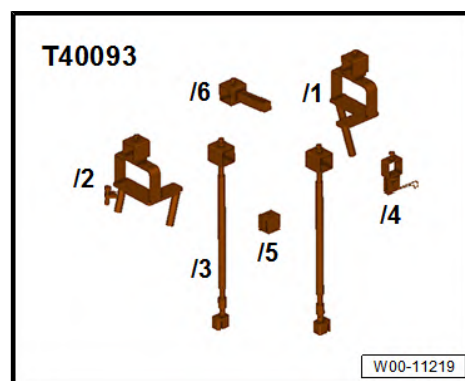
- ◆ Adapter - 10-222A/19-



◆ Engine support basic set - T40091-



◆ -T40093/6- from engine support supplement set - T40093-



Procedure

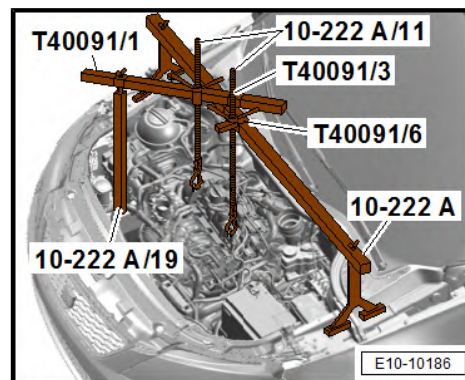
- Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .
- Remove air intake pipe
⇒ ["2.5 Removing and installing air pipe ", page 368](#) .
- Place support bracket - 10-222A- onto upper edges of right and left vertical plates and onto right longitudinal member.
- Attach hook of spindles - 10-222A/11- to engine lifting eyes.
- Take up weight of engine/gearbox assembly on spindles, but do not lift it.

Installing

Installation is in the reverse sequence of removal.

Specified torques

- ◆ Securing bolts for air filter housing
⇒ ["3.1.3 Assembly overview - air filter housing, Toledo 2013, Ibiza 2016", page 396](#)



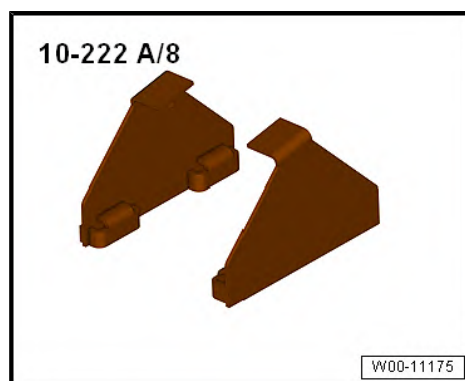
2.5.6 Supporting engine in installation position, Toledo 2013

Special tools and workshop equipment required

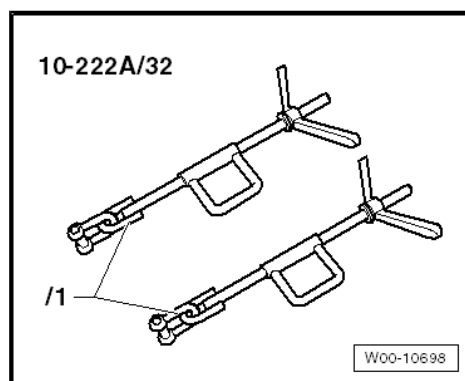
◆ Support bracket - 10 - 222 A-



◆ Adapter - 10 - 222 A /8-



◆ Adapter - 10 - 222 A /32-



◆ Tensioning strap - T10038-



To prevent damage to edges of wings, cover lower areas of both adapters - 10 - 222 A /8- with woven adhesive tape -arrow- ➔ Electronic Parts Catalogue (ETKA) .

Procedure

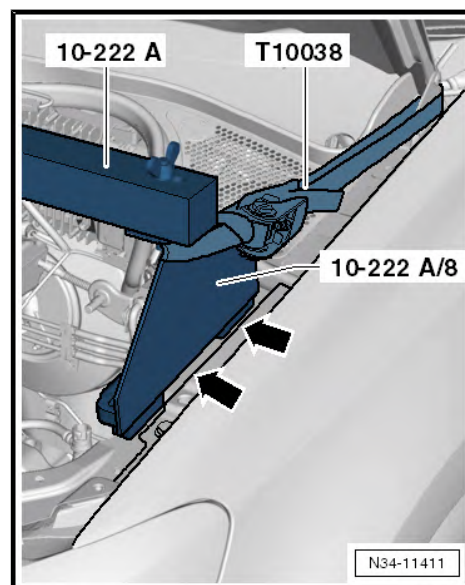
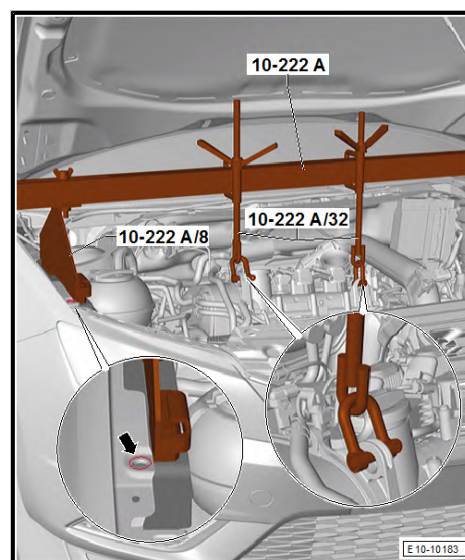
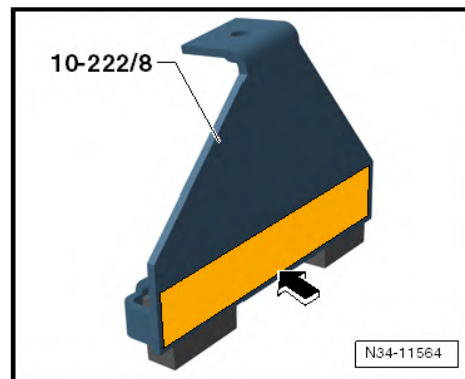
- Remove air filter housing
➔ ["3.2 Removing and installing air filter housing", page 397](#) .
- Remove seals from upper edge of wing.
- Slide adapter - 10 - 222 A /32- onto support bracket - 10 - 222 A- as shown in illustration.
- Mount adapter - 10 - 222 A /8- on engine support bracket - 10 - 222 A- .
- Lift up plenum chamber cover at sides.
- Position engine support bracket - 10 - 222 A- on left and right onto longitudinal members as shown in illustration.
- Fit adapter - 10 - 222 A /8- behind the hole -arrow- and align it.
- Mount adapter - 10 - 222 A /32- to mountings on engine as shown in illustration.
- Secure with tensioning strap - T10038- on both sides of bonnet hinges.
- Tighten spindle slightly to take up weight of engine/gearbox assembly; do not lift.

Installing

Installation is in the reverse sequence of removal.

Specified torques

- ◆ Securing bolts for air filter housing
➔ ["3.1.3 Assembly overview - air filter housing, Toledo 2013, Ibiza 2016", page 396](#)



2.6 Assembly mountings - adjusting, Ateca, Leon 2013, Ibiza 2018, Arona

Procedure

- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; battery; battery tray: remove and install .

Ateca

- Support engine in its installation position
⇒ ["2.5.1 Supporting engine in installation position, Ateca", page 87](#) .

Leon 2013

- Support engine in its installation position
⇒ ["2.5.2 Supporting engine in installation position, Leon 2013", page 91](#) .

Ibiza 2018

- Support engine in its installation position
⇒ ["2.5.3 Supporting engine in installation position, Ibiza 2018", page 93](#) .

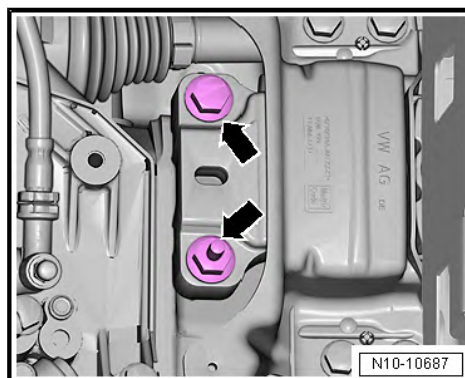
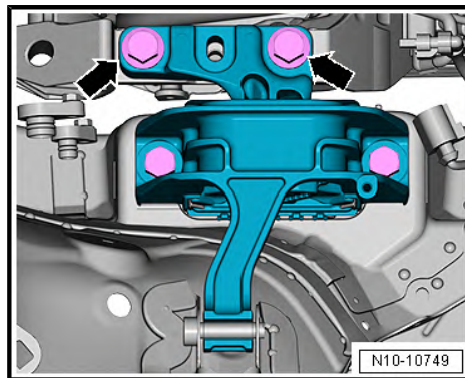
Arona

- Support engine in its installation position
⇒ ["2.5.4 Supporting engine in installation position, Arona", page 97](#) .

Continued for all vehicles:

- Unscrew engine mounting bolts -arrows- one after the other and renew them (if not already renewed when installing engine).
- First screw bolts in loosely.

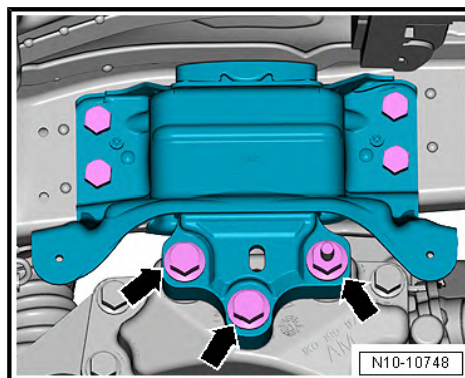
Vehicles with two gearbox securing bolts:



Vehicles with 3 gearbox securing bolts:

- Unscrew gearbox mounting bolts -arrows- one after the other, and renew them (if not already renewed when installing engine).
- First screw bolts in loosely.

Continued for all vehicles:



- Using assembly lever, adjust engine/gearbox assembly so that specifications listed below are attained:
- Distance -a- between engine support -2- and engine mounting -1- must be 10 mm.
- Side surface of engine support casting -2- must be located parallel to support arm of engine mounting -1-.
- Dimension -b- must be identical at front and rear.



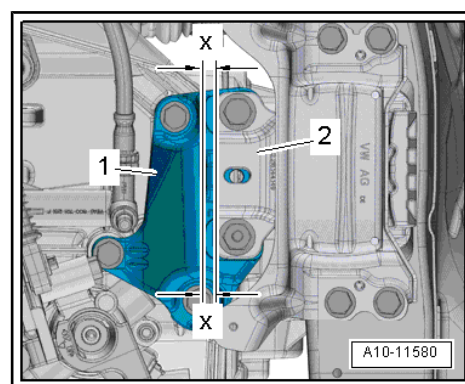
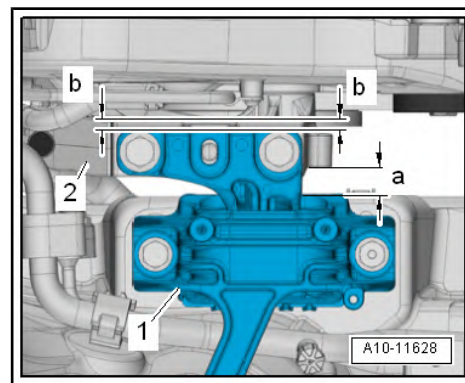
Note

Check distance -a- = 10 mm using, for example, a suitable rod.

- Tighten bolts of engine mounting.

Vehicles with two gearbox securing bolts:

- On the gearbox side, ensure that the edges of the support arm -2- and gearbox support -1- are parallel.
- Distance -x- = distance -x-.
- Tighten bolts for gearbox mounting.



Vehicles with 3 gearbox securing bolts:

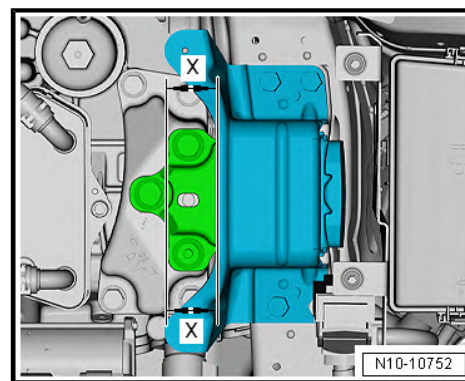
- On the gearbox side, ensure that the edges of the support arm and gearbox support are parallel.
- Distance -x- = distance -x-.

Installing:

Install in reverse order of removal, observing the following:

Specified torques

- ◆ ⇒ ["2.1 Assembly overview - charge air system", page 363](#)
- ◆ ⇒ Electrical system; Rep. gr. 27 ; Battery; Assembly overview - battery
- ◆ ⇒ ["3.1 Assembly overview - air filter housing", page 393](#)
- ◆ ⇒ ["2.1 Assembly overview - assembly mountings", page 67](#)



2.7 Assembly mounting setting - checking, Ateca, Leon 2013, Ibiza 2018, Arona

Procedure

The following dimensions must be attained:

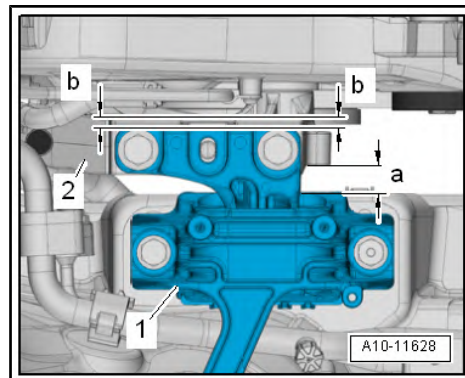
- Distance -a- between engine support -2- and engine mounting -1- must be 10 mm.
- Side surface of engine support casting -2- must be located parallel to support arm of engine mounting -1-.
- Dimension -b- must be identical at front and rear.



Note

For example, distance -a- = 10 mm can be checked with a metal rod of suitable size.

- If the distance measured is too large or small, the assembly mountings must be adjusted
⇒ ["2.6 Assembly mountings - adjusting, Ateca, Leon 2013, Ibiza 2018, Arona", page 106](#) .



13 – Crankshaft group

1 Cylinder block (pulley end)

⇒ [“1.1 Assembly overview - poly V-belt drive”, page 109](#)

⇒ [“1.2 Removing and installing poly-V belt”, page 113](#)

⇒ [“1.3 Removing and installing tensioner for poly V-belt”, page 116](#)

⇒ [“1.4 Removing and installing vibration damper”, page 118](#)

⇒ [“1.5 Removing and installing engine support”, page 122](#)

⇒ [“1.6 Renewing crankshaft oil seal - belt pulley end”, page 132](#)

1.1 Assembly overview - poly V-belt drive

⇒ [“1.1.1 Assembly overview - poly V-belt drive, vehicles without air conditioner compressor”, page 109](#)

⇒ [“1.1.2 Assembly overview - poly V-belt drive, vehicles with air conditioner compressor”, page 111](#)

1.1.1 Assembly overview - poly V-belt drive, vehicles without air conditioner compressor

1 - Bolt

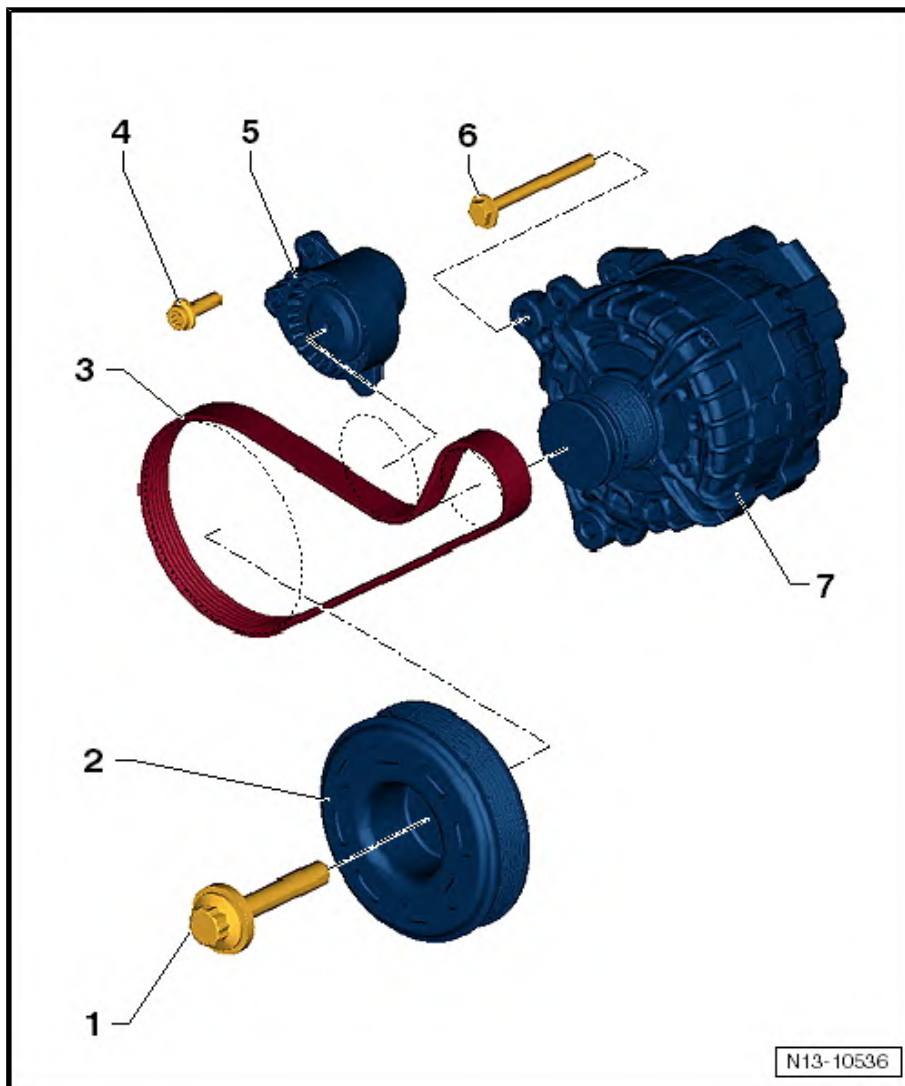
- ☐ Renew after removal
- ☐ Use counterhold - T10475- to loosen and tighten.
- ☐ 150 Nm +180°

2 - Vibration damper

- ☐ Removing and installing
⇒ ["1.4 Removing and installing vibration damper", page 118](#)

3 - Poly V-belt

- ☐ Check for wear
- ☐ Before removing, mark direction of rotation with chalk or felt-tipped pen
- ☐ The length of the poly V-belt must be determined depending on the design of the overrunning alternator pulley in accordance with the ⇒ Electronic Parts Catalogue (ETKA) .
- ☐ Do not kink
- ☐ Poly V-belt routing
⇒ [page 114](#)
- ☐ Removing and installing
⇒ ["1.2.1 Removing and installing poly V-belt, vehicles without air conditioner compressor", page 113](#)
- ☐ When installing, make sure it is properly seated on pulleys.



Volkswagen Technical Site: <http://vwts.ru> <http://vwts.info>

4 - Bolt

- ☐ Renew after removal
- ☐ 20 Nm +90°

5 - Tensioning device for poly V-belt

- ☐ Pivot with socket to slacken poly V-belt
- ☐ Lock with locking tool - T10060 A- .
- ☐ Removing and installing
⇒ ["1.3.1 Removing and installing tensioner for poly V-belt, vehicles without air conditioner compressor", page 116](#)

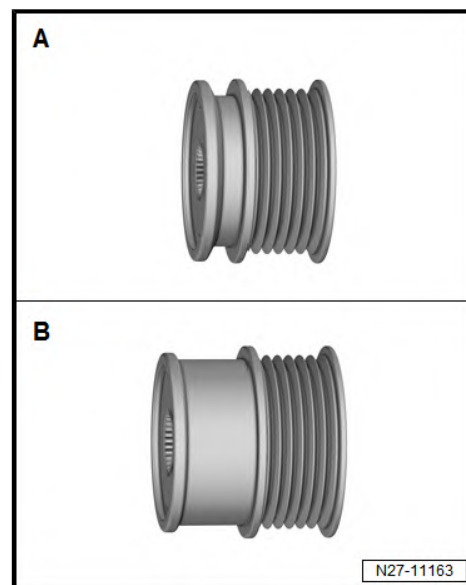
6 - Bolt

- ☐ Tightening torque ⇒ Electrical system; Rep. gr. 27 ; Alternator; Alternator: Exploded view

7 - Alternator

- ☐ removing and installing ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .
- ☐ With freewheel
- ☐ Depending on the type and version of the alternator different overrunning alternator pulleys -A- and -B- may be installed: correspondence ⇒ [page 111](#) .
- ☐ The length of the poly V-belt must be determined depending on the design of the overrunning alternator pulley in accordance with the ⇒ Electronic Parts Catalogue (ETKA) .

Allocation of overrunning alternator pulley



1.1.2 Assembly overview - poly V-belt drive, vehicles with air conditioner compressor

1 - Poly V-belt

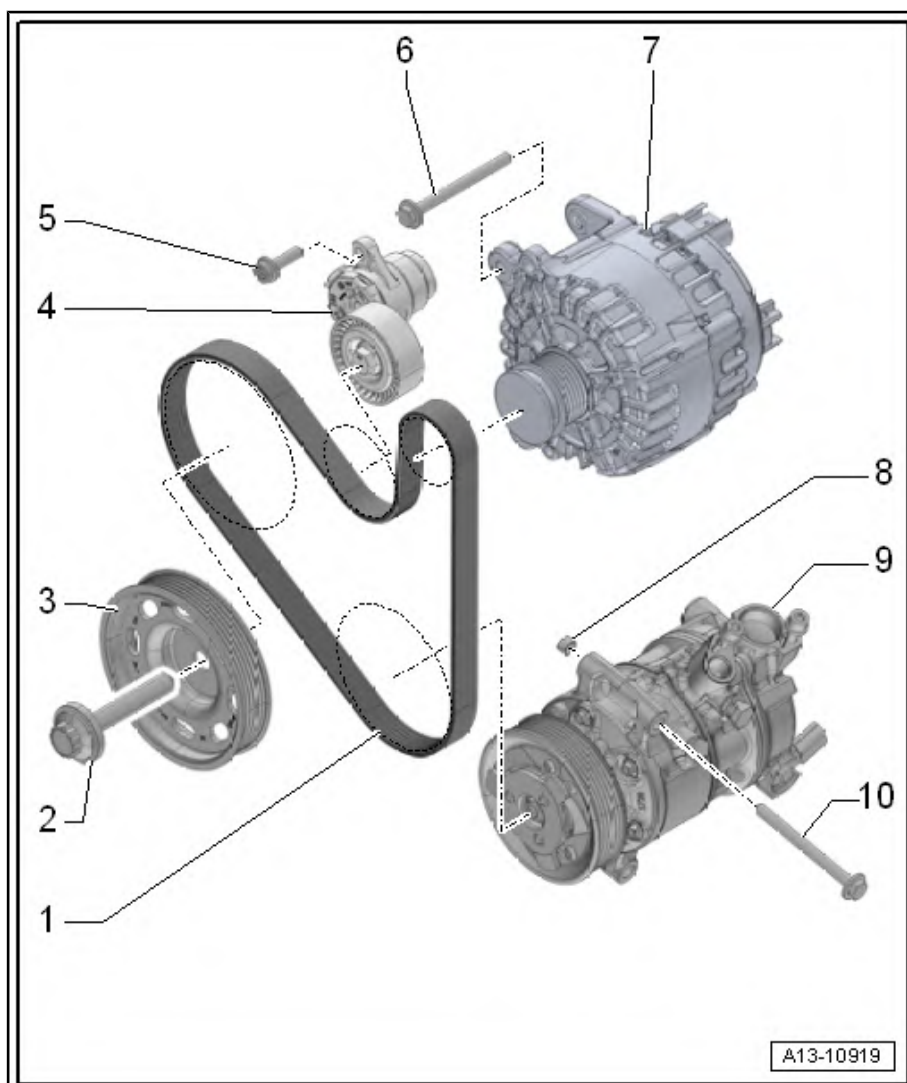
- ☐ Check for wear
- ☐ Before removing, mark direction of rotation with chalk or felt-tipped pen
- ☐ The length of the poly V-belt must be determined depending on the design of the overrunning alternator pulley in accordance with the ⇒ Electronic Parts Catalogue (ETKA) .
- ☐ Do not kink
- ☐ Poly V-belt routing
⇒ [page 115](#)
- ☐ Removing and installing
⇒ ["1.2.2 Removing and installing poly V-belt, vehicles with air conditioner compressor", page 114](#)
- ☐ When installing, make sure it is properly seated on pulleys.

2 - Bolt

- ☐ Renew after removal
- ☐ Use counterhold - T10475- to loosen and tighten.
- ☐ 150 Nm +180°

3 - Vibration damper

- ☐ Removing and installing
⇒ ["1.4 Removing and installing vibration damper", page 118](#)



4 - Tensioning device for poly V-belt

- ☐ Pivot with socket to slacken poly V-belt
- ☐ Lock with locking tool - T10060 A- .
- ☐ Removing and installing
⇒ ["1.3.2 Removing and installing tensioner for poly V-belt, vehicles with air conditioner compressor", page 117](#)

5 - Bolt

- ☐ Renew after removal
- ☐ 20 Nm +90°

6 - Bolt

- ☐ Tightening torque ⇒ Electrical system; Rep. gr. 27 ; Alternator; Alternator: Exploded view

7 - Alternator

- ☐ removing and installing ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .
- ☐ With freewheel
- ☐ Depending on the type and version of the alternator different overrunning alternator pulleys -A- and -B- may be installed: correspondence ⇒ [page 112](#) .
- ☐ The length of the poly V-belt must be determined depending on the design of the overrunning alternator pulley in accordance with the ⇒ Electronic Parts Catalogue (ETKA) .

8 - Dowel sleeve

- ☐ For air conditioner compressor.

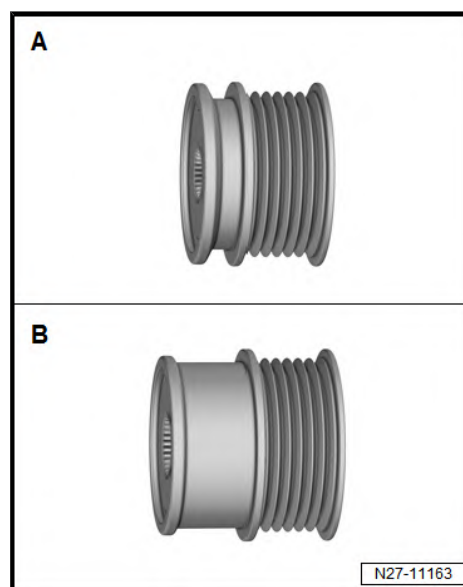
9 - Air conditioner compressor

- ☐ Do not unscrew or disconnect refrigerant lines
- ☐ Removing and installing ⇒ Heating, air conditioning system; Rep. gr. 87 ; Air conditioner compressor; Removing and installing air conditioner compressor from and to bracket

10 - Bolt

- ☐ Specified torque ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Assembly over-view - drive unit of air conditioner compressor .

Allocation of overrunning alternator pulley



1.2 Removing and installing poly-V belt

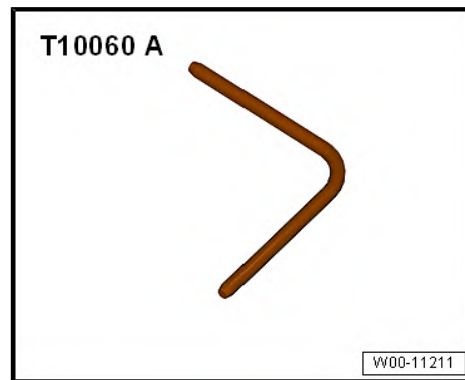
⇒ "1.2.1 Removing and installing poly V-belt, vehicles without air conditioner compressor", page 113

⇒ "1.2.2 Removing and installing poly V-belt, vehicles with air conditioner compressor", page 114

1.2.1 Removing and installing poly V-belt, vehicles without air conditioner compressor

Special tools and workshop equipment required

- ◆ Locking pin - T10060 A-



Removing

- Remove nose insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

Toledo 2013, Ibiza 2016

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; Underbody protection – assembly overview .

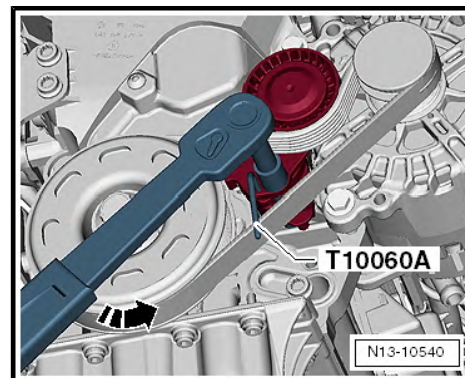
Continued for all vehicles



Note

If poly V-belt is to be reinstalled, mark direction of rotation on belt using chalk or felt tip pen before removing.

- To slacken poly V-belt turn tensioning device in direction of -arrow-.
- Lock tensioner with locking tool - T10060 A- .
- Remove poly V-belt.

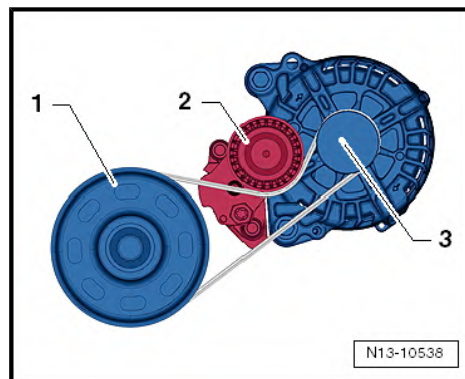


Installing

Install in reverse order of removal, observing the following:

- Fit poly V-belt as shown in illustration.

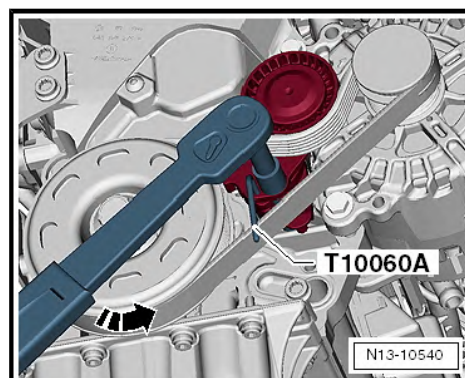
- 1 - Pulley
- 2 - Tensioning device for poly V-belt
- 3 - Alternator



- Turn tensioner in direction of -arrow- and remove retention tool - T10060 A- .
- Release tensioner.
- Check that poly V-belt is properly seated.
- Start engine and check that poly V-belt runs properly.

Specified torques

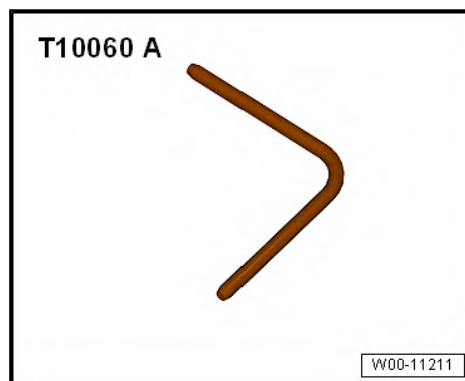
- ◆ Securing bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation
- ◆ Noise insulation assembly bolts, Toledo 213, Ibiza 2016 ⇒ General body works, exterior; Rep. gr. 50 ; Underbody protection; Assembly overview: underbody protection



1.2.2 Removing and installing poly V-belt, vehicles with air conditioner compressor

Special tools and workshop equipment required

- ◆ Locking pin - T10060 A-



Removing

- Remove nose insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

Toledo 2013, Ibiza 2016

Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; Underbody protection – assembly overview

Continued for all vehicles

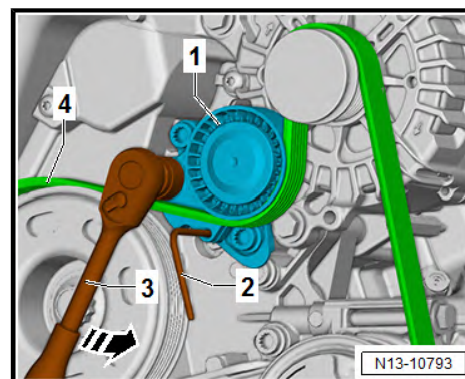


Note

If poly V-belt is to be reinstalled, mark direction of rotation on belt using chalk or felt tip pen before removing.

Version 1

- Fit tool -3- onto hexagon of tensioner -1-.
- To slacken poly V-belt push tool -3- in -direction of arrow-.
- Lock tensioning device -1- with locking pin - T10060 A- -2-.
- Remove poly V-belt -4-.

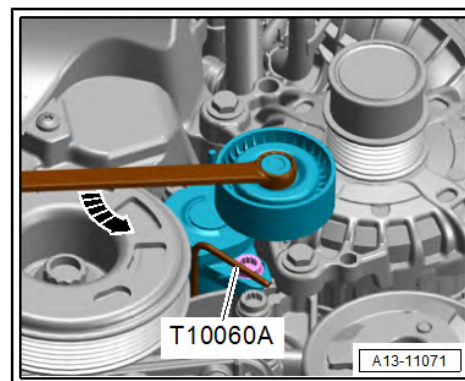


Version 2

- To slacken poly V-belt turn tensioning device in direction of -arrow-.

Continued for all vehicles

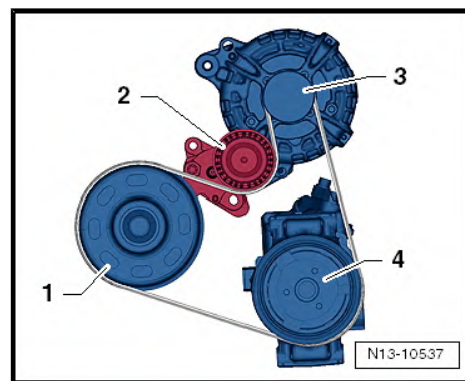
- Lock tensioner with locking tool - T10060 A- .
- Remove poly V-belt.



Installing

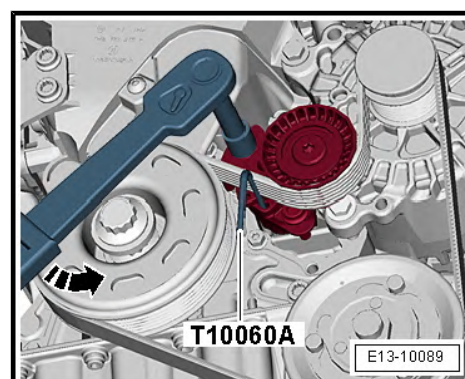
Install in reverse order of removal, observing the following:

- Fit poly V-belt as shown in illustration.
- 1 - Pulley
- 2 - Tensioning device for poly V-belt
- 3 - Alternator
- 4 - Air conditioner compressor



Version 1

- Turn tensioning device in -direction of arrow-, and pull out locking pin - T10060 A- .



Version 2

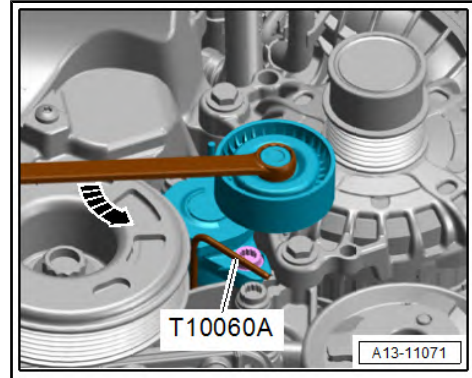
- Turn tensioning device in -direction of arrow-, and pull out locking pin - T10060 A- .

Continued for all vehicles

- Release tensioner.
- Check that poly V-belt is properly seated.
- Start engine and check that poly V-belt runs properly.

Specified torques

- ◆ Securing bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation
- ◆ Noise insulation assembly bolts, Toledo 213, Ibiza 2016 ⇒ General body works, exterior; Rep. gr. 50 ; Underbody protection; Assembly overview: underbody protection



1.3 Removing and installing tensioner for poly V-belt

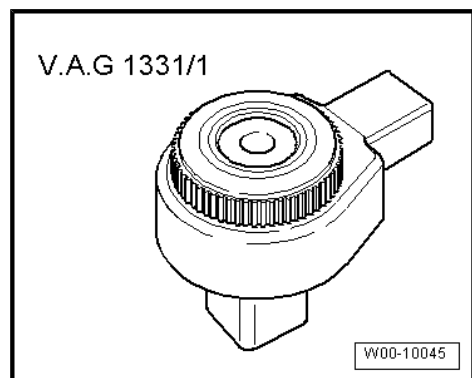
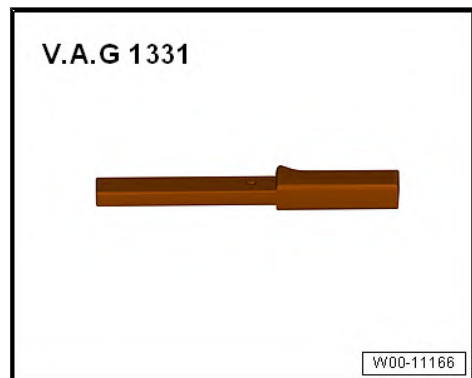
⇒ ["1.3.1 Removing and installing tensioner for poly V-belt, vehicles without air conditioner compressor", page 116](#)

⇒ ["1.3.2 Removing and installing tensioner for poly V-belt, vehicles with air conditioner compressor", page 117](#)

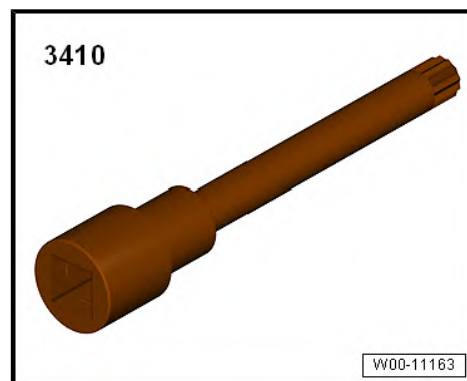
1.3.1 Removing and installing tensioner for poly V-belt, vehicles without air conditioner compressor

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-
- ◆ Ratchet 1/2" x 9-12" Ref.(735/10) - VAG 1331/1-



- ◆ Wrench - 3410-



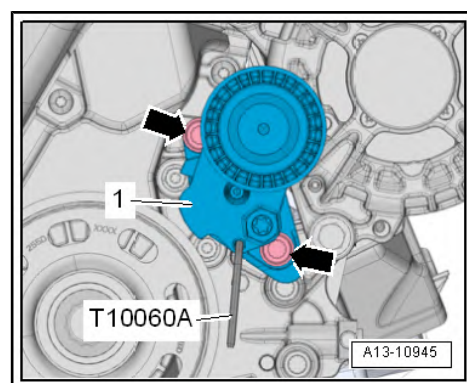
Removing

- Remove poly V-belt from tensioner
⇒ [“1.2.1 Removing and installing poly V-belt, vehicles without air conditioner compressor”, page 113](#) .
- Unscrew bolts -arrows- with special wrench - 3410- , detach tensioning device -1- from poly V-belt.

Installing

Install in reverse order of removal, observing the following:

- Install poly V-belt
⇒ [“1.2.1 Removing and installing poly V-belt, vehicles without air conditioner compressor”, page 113](#) .



Specified torques

- ◆ ⇒ [“1.1.1 Assembly overview - poly V-belt drive, vehicles without air conditioner compressor”, page 109](#)
- ◆ Securing bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation
- ◆ Noise insulation assembly bolts, Toledo 213, Ibiza 2016 ⇒ General body works, exterior; Rep. gr. 50 ; Underbody protection; Assembly overview: underbody protection

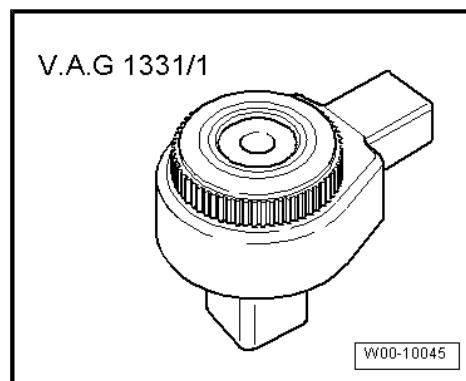
1.3.2 Removing and installing tensioner for poly V-belt, vehicles with air conditioner compressor

Special tools and workshop equipment required

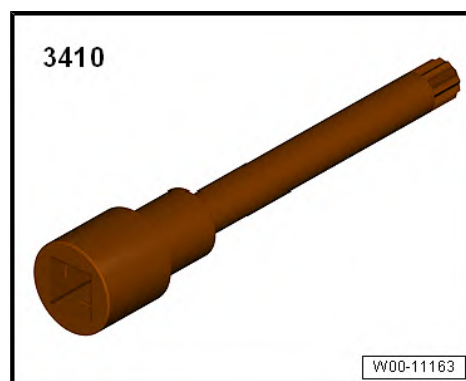
- ◆ Torque wrench - V.A.G 1331-



- ◆ Ratchet 1/2" x 9-12" Ref.(735/10) - VAG 1331/1-



- ◆ Wrench - 3410-



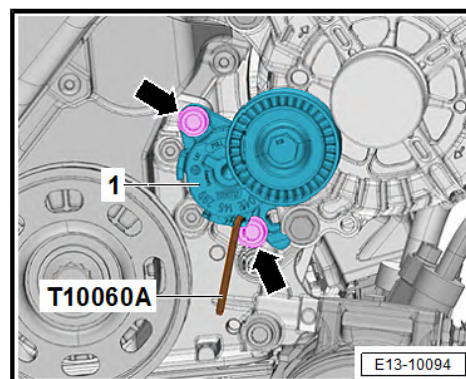
Removing

- Remove poly V-belt from tensioner
⇒ ["1.2.2 Removing and installing poly V-belt, vehicles with air conditioner compressor", page 114](#) .
- Unscrew bolts -arrows- with special wrench - 3410- , detach tensioning device -1- from poly V-belt.

Installing

Install in reverse order of removal, observing the following:

- Install poly V-belt
⇒ ["1.2.2 Removing and installing poly V-belt, vehicles with air conditioner compressor", page 114](#) .



Specified torques

- ◆ ⇒ ["1.1.2 Assembly overview - poly V-belt drive, vehicles with air conditioner compressor", page 111](#)
- ◆ Securing bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation
- ◆ Noise insulation assembly bolts, Toledo 213, Ibiza 2016 ⇒ General body works, exterior; Rep. gr. 50 ; Underbody protection; Assembly overview: underbody protection

1.4 Removing and installing vibration damper

Special tools and workshop equipment required

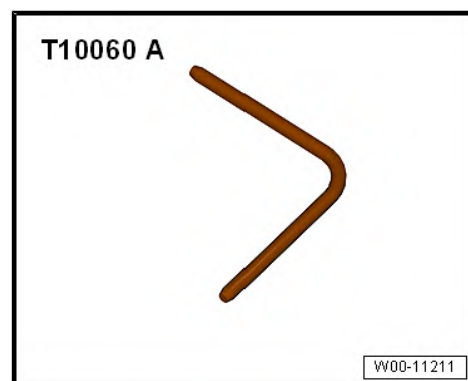
◆ Counter-hold tool - T10475-



◆ Torque wrench - V.A.G 1332-

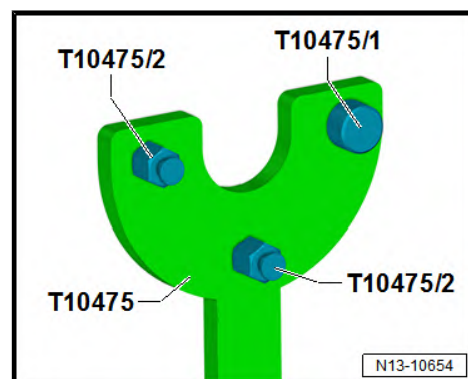


◆ Counter-hold tool - T10060A-



Removing

- Remove poly V-belt
⇒ [“1.2 Removing and installing poly-V belt”, page 113](#) .
- Move crankshaft and camshafts to »TDC position«
⇒ [“4.7 Setting piston to TDC position”, page 155](#) .
- Convert counterhold tool - T10475- with inserts -T10475/1- and -T10475/2- as shown in illustration.

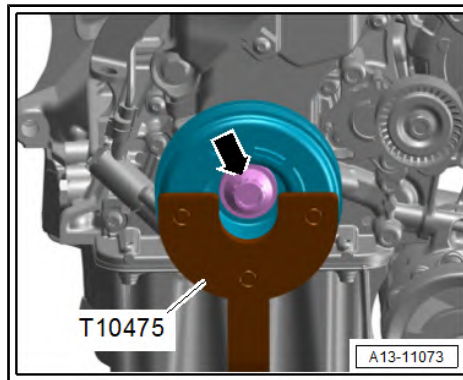


- Loosen bolt -arrow- for vibration damper using counterhold - T10475- .
- Remove bolt and take off vibration damper.



Note

- ◆ *To avoid disturbing valve timing, do not turn the crankshaft when the vibration damper has been removed.*
- ◆ *If the vibration damper cannot be reinstalled immediately, temporarily lock the crankshaft pulley in place using the centre bolt.*

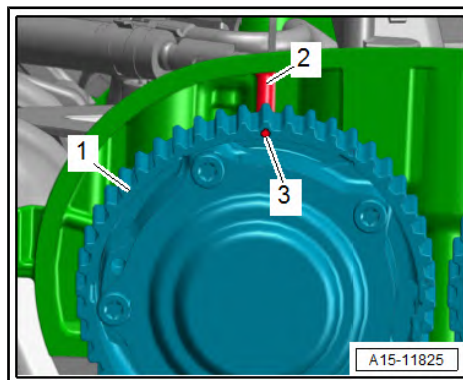
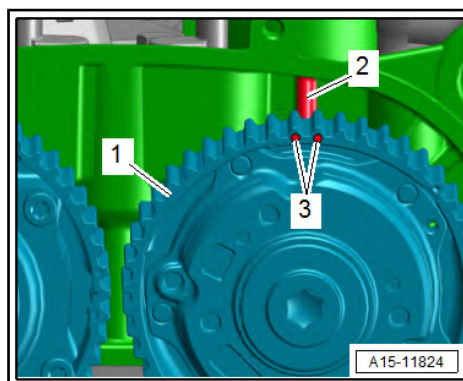


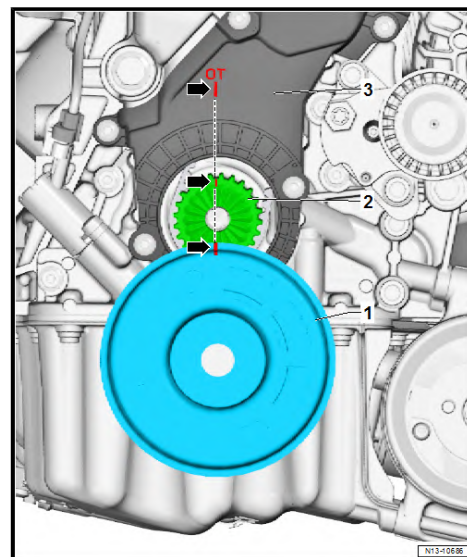
Installing



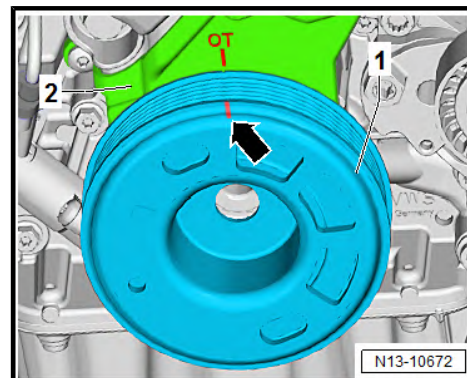
Note

- ◆ *If a further tightening angle is specified for certain bolts, these must be renewed.*
- ◆ *All contact surfaces between bolt, poly V-belt pulley and crankshaft sprocket must be free of oil and grease.*





- The markings -3- on the inlet cam actuator -1- must be properly aligned with web -2- on the camshaft housing.
- The marking -3- on the exhaust cam actuator -1- must be properly aligned with web -2- on the camshaft housing.
- Check the position of the crankshaft before fitting the vibration damper -1-.
- The marking on the crankshaft pulley -2- must be properly aligned with the »TDC marking« on the lower toothed belt guard -3-.
- The marking -arrow- on the vibration damper -1- must be properly aligned with the "TDC marking" on the lower toothed belt cover -2-.



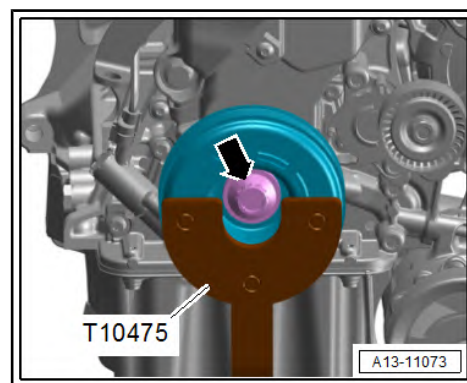
- Fit vibration damper, oil threads of bolt for vibration damper and screw it in to stop by hand.
- Tighten bolt -arrow- for vibration damper using counterhold - T10475- .

Carry out the remaining installation in reverse sequence, noting the following:

- Install poly V-belt
⇒ ["1.2 Removing and installing poly-V belt", page 113](#) .

Specified torques

- ◆ Securing bolt for vibration damper
⇒ ["1.1 Assembly overview - poly V-belt drive", page 109](#)
- ◆ Securing bolts of noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation
- ◆ Noise insulation assembly bolts, Toledo 2013, Ibiza 2016 ⇒ General body works, exterior; Rep. gr. 50 ; Underbody protection; Assembly overview: underbody protection



1.5 Removing and installing engine support

⇒ ["1.5.1 Engine support- removing and installing, Leon 2013, Ibiza 2018, Arona", page 122](#)

⇒ ["1.5.2 Engine supports - removing and installing, Toledo 2013, Ibiza 2016", page 127](#)

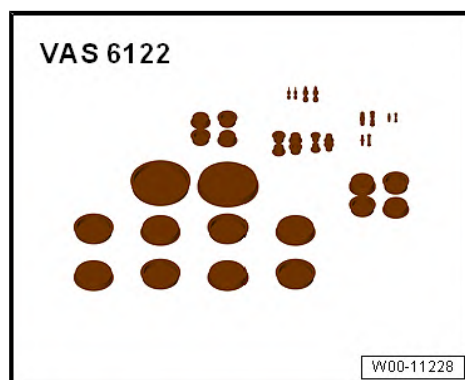
1.5.1 Engine support- removing and installing, Leon 2013, Ibiza 2018, Arona

Remove engine support ⇒ [page 122](#) .

Separate the engine support to free some space ⇒ [page 124](#)

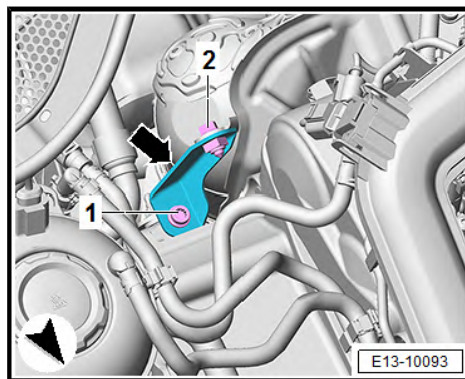
Special tools and workshop equipment required

- ♦ Engine bung set - VAS 6122-



Remove engine support.

- Remove engine mounting
⇒ ["2.2 Removing and installing motor mounting", page 73](#) .
- Unscrew bolts -1, 2- and remove bracket -arrow-.

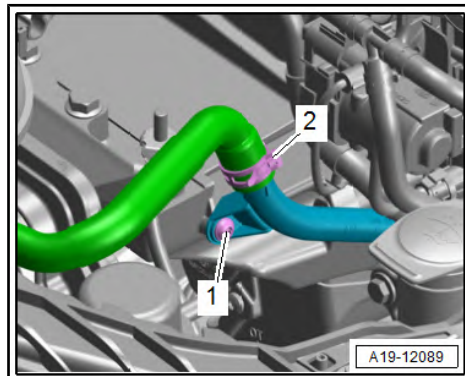


- Unscrew bolt -1-.

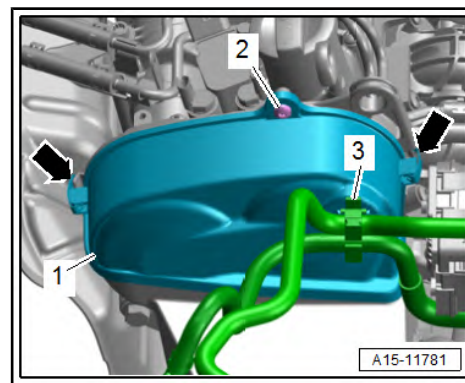


Note

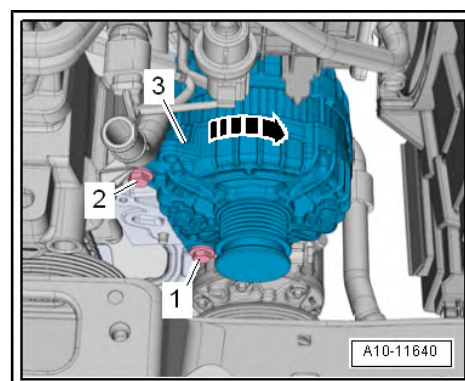
Disregard item -2-.



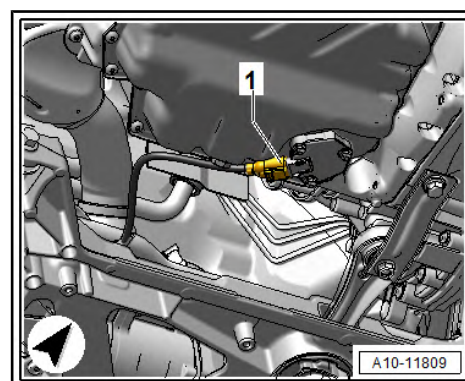
- Detach hoses from retainer -3-.
- Remove bolt -2-.
- Release clips -arrows-, and remove upper toothed belt guard -1-.
- Remove tensioner for poly V-belt
⇒ ["1.3 Removing and installing tensioner for poly V-belt", page 116](#).



- Loosen bolt -1-, but do not unscrew.
- Remove bolt -2-.
- Swivel alternator -3- in the direction of the arrow-.
- Remove pendulum support
⇒ ["2.4 Removing and installing pendulum support", page 84](#).



- Disconnect electrical connector -1- on oil level and oil temperature sender - G266-.

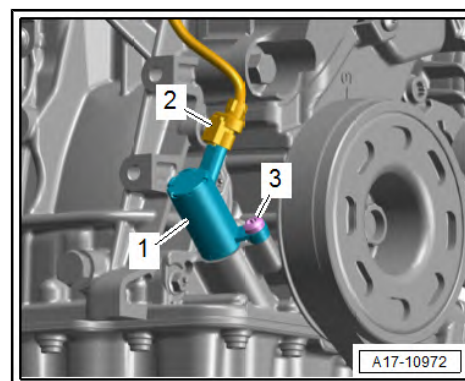


- Unplug electrical connector -2-.

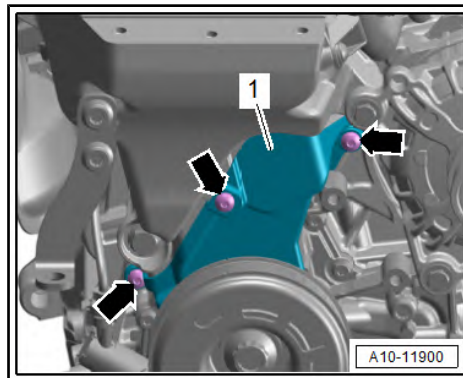


Note

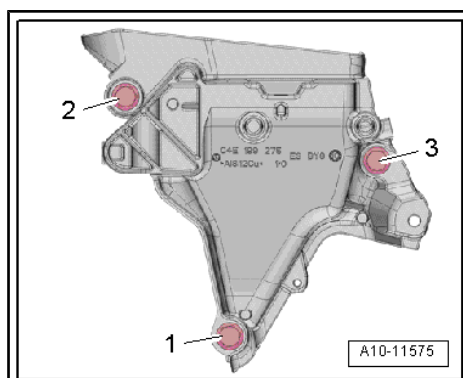
-Items 1, 3- can be disregarded.



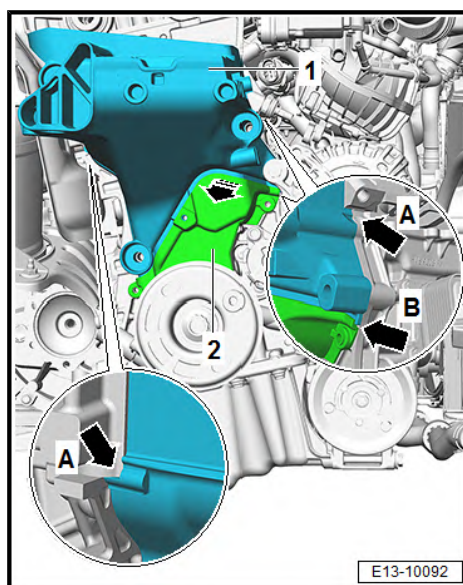
- Remove bolts -arrows- for toothed belt cover (bottom) -1-.



- Unscrew bolts -1, 2 and 3- and detach engine support upwards.

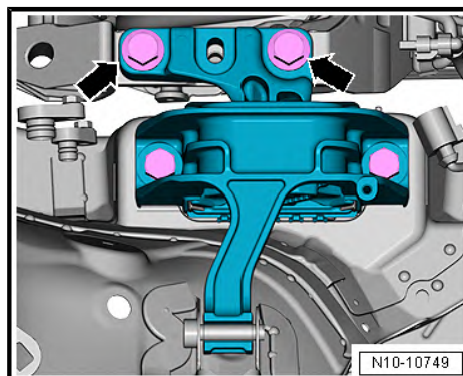


- Separate lower protector -2- -in the direction of the arrow- to free the assembly support -1-.
- Separate and free the engine support, follow points -arrows A, B-. Remove engine support upwards.

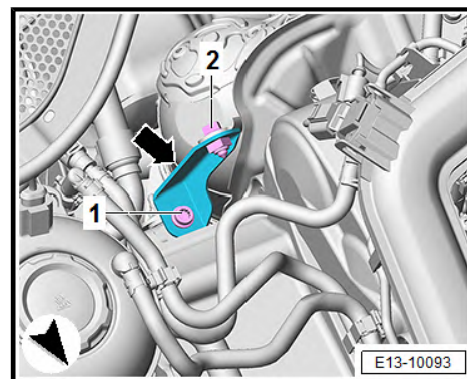


Separate the engine support to free some space

- Support engine in its installation position
⇒ ["2.5 Supporting engine in installation position", page 87](#).
- Unscrew the bolts -arrows- from the gearbox mounting.



- Unscrew bolts -1, 2- and remove bracket -arrow-.

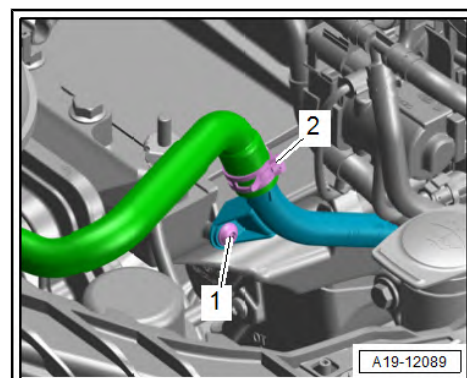


- Unscrew bolt -1-.

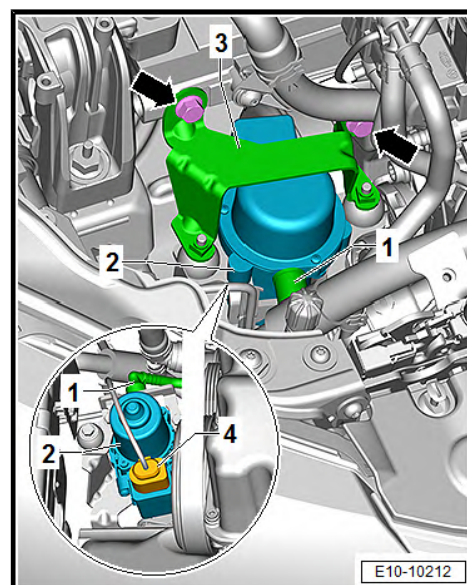


Note

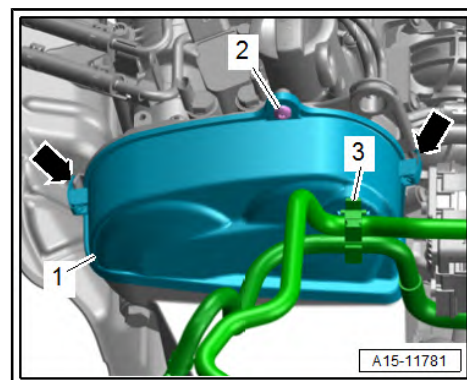
Disregard item -2-.



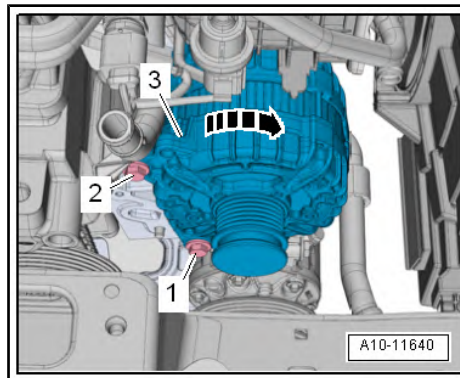
- Pull vacuum line -1- off vacuum pump for brakes - V192- -2- and remove.
- Remove bolts -arrows-.
- Pull connector -4- from the vacuum pump for brakes - V192- -2-.
- Remove bracket with the vacuum pump for brakes - V192- .



- Detach hoses from retainer -3-.
- Remove bolt -2-.
- Release clips -arrows-, and remove upper toothed belt guard -1-.
- Remove tensioner for poly V-belt
⇒ ["1.3 Removing and installing tensioner for poly V-belt", page 116](#) .



- Loosen bolt -1-, but do not unscrew.
- Remove bolt -2-.
- Swivel alternator -3- in the direction of the arrow.

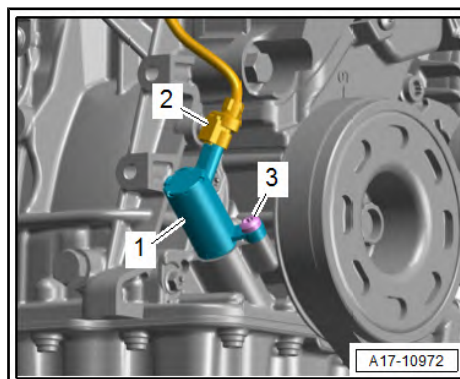


- Unplug electrical connector -2-.



Note

-Items 1, 3- can be disregarded.

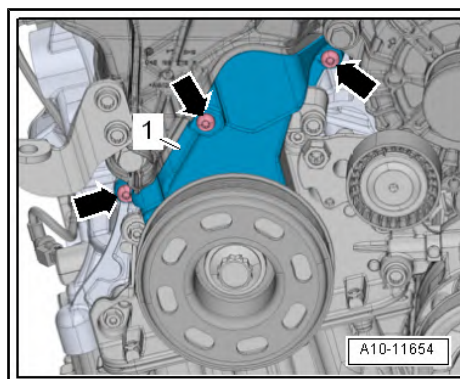


- Remove bolts -arrows- for toothed belt cover (bottom) -1-.

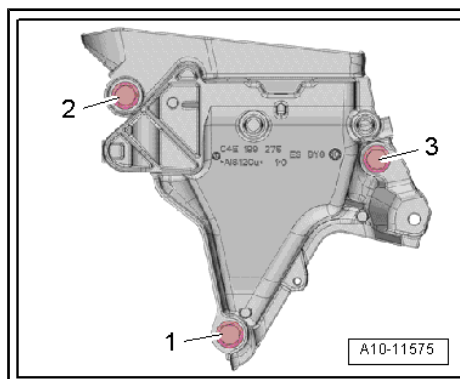


Note

-Items 1, 3- can be disregarded.



- Unscrew bolts -1, 2, 3-.



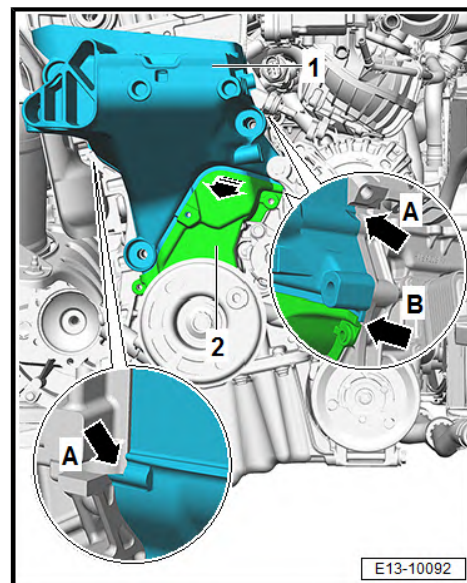
- Separate lower protector -2- -in the direction of the arrow- to free the assembly support -1-.
- Separate and free the engine support, following points -arrows A, B-, remove engine support upwards to make space in the upper area.

Installing

Install in reverse order of removal, observing the following:

Specified torques

- ◆ Securing bolts for engine mounting and console for engine mounting
⇒ ["2.1 Assembly overview - assembly mountings", page 67](#)
- ◆ Securing bolts for tensioning roller
⇒ ["1.1 Assembly overview - poly V-belt drive", page 109](#)
- ◆ Securing bolts for lower toothed belt guard
⇒ ["2.1 Assembly overview - toothed belt cover", page 173](#)
- ◆ Securing bolts for coolant pipe
⇒ ["3.1 Assembly overview - coolant pipes", page 302](#)
- ◆ Securing bolt for air filter housing
⇒ ["3.1 Assembly overview - air filter housing", page 393](#)
- ◆ Securing bolts for bracket
⇒ [Fig. "Installing catalytic converter - specified torque and tightening sequence", page 456](#)
- ◆ Securing bolts of alternator ⇒ Electrical system; Rep. gr. 27 ; Alternator; Assembly overview - alternator .
- ◆ Securing bolts of noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .



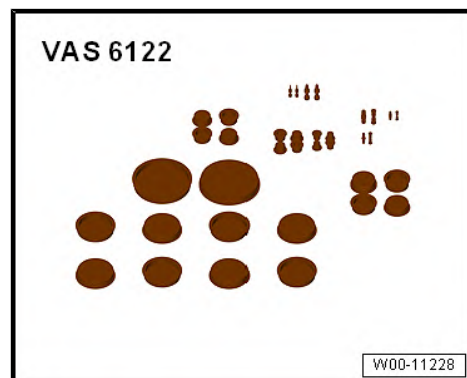
1.5.2 Engine supports - removing and installing, Toledo 2013, Ibiza 2016

Remove engine support ⇒ [page 128](#) .

Separate the engine support to free some space ⇒ [page 130](#) .

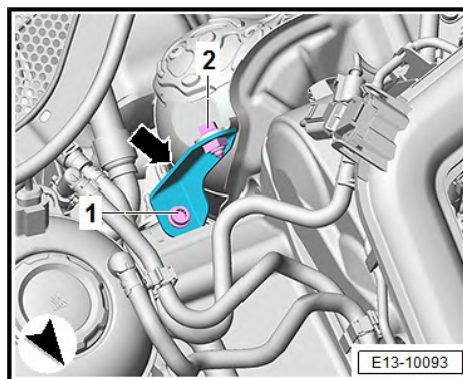
Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-



Remove engine support.

- Remove engine mounting
⇒ [“2.2.3 Engine mounting - removing and installing, Toledo 2013, Ibiza 2016”, page 75](#).
- Unscrew bolts -1, 2- and remove bracket -arrow-.

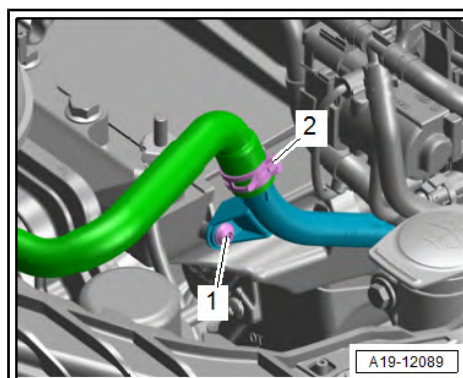


- Unscrew bolt -1-.

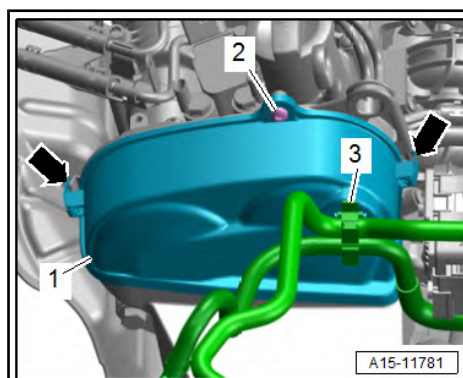


Note

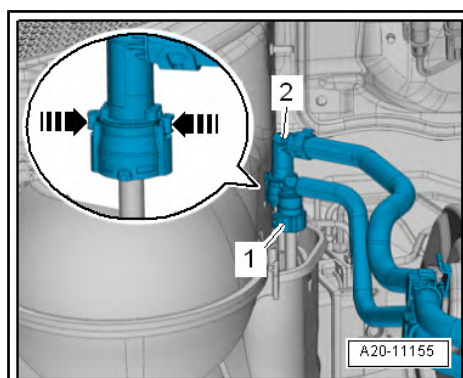
Disregard item -2-.



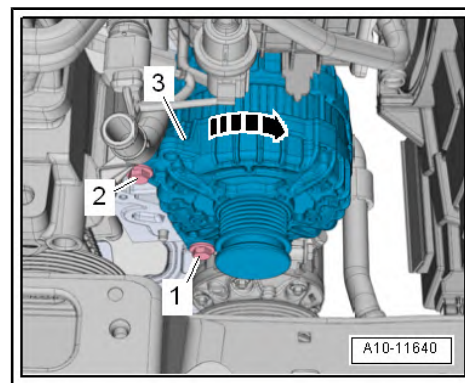
- Detach hoses from retainer -3-.
- Remove bolt -2-.
- Release clips -arrows-, and remove upper toothed belt guard -1-.
- Remove tensioner for poly V-belt
⇒ [“1.3 Removing and installing tensioner for poly V-belt”, page 116](#).



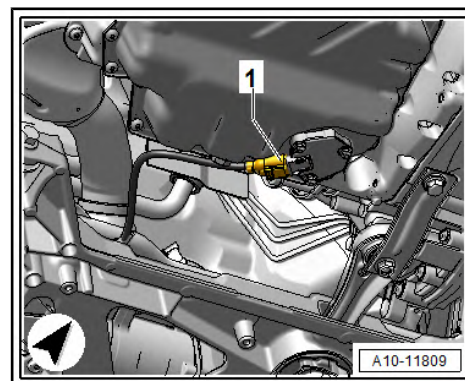
- Disconnect fuel supply line -1-; to do so, push connection piece downwards, then press release tabs -arrows-.
- Pull off connection piece, keeping release tabs depressed.
- Press release tab on hose -2- connected to activated charcoal filter.
- Disconnect hose and move it clear.
- Seal open lines and unions with clean plugs from engine sealing plug set - VAS 6122- .



- Loosen bolt -1-, but do not unscrew.
- Remove bolt -2-.
- Swivel alternator -3- in the direction of the arrow-.
- Remove pendulum support
⇒ ["2.4.3 Pendulum support - removing and installing, Toledo 2013, Ibiza 2016", page 86](#) .



- Disconnect electrical connector -1- on oil level and oil temperature sender - G266- .

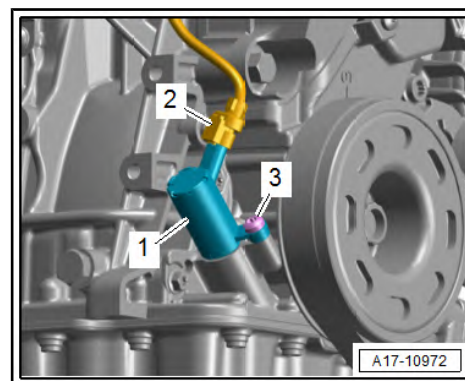


- Unplug electrical connector -2-.

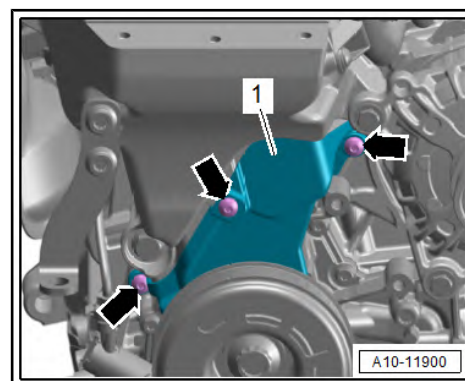


Note

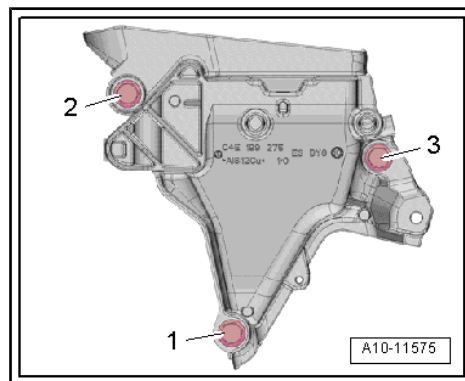
-Items 1, 3- can be disregarded.



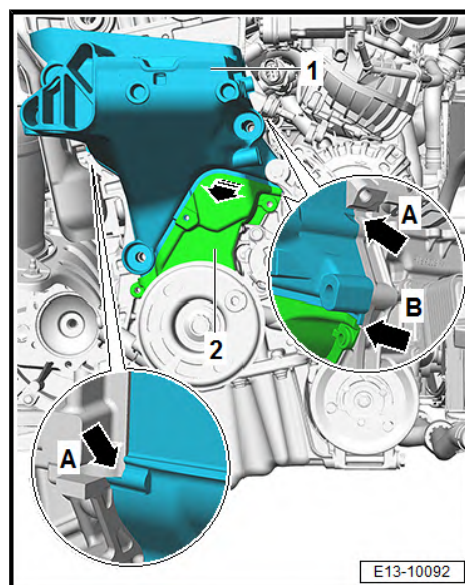
- Remove bolts -arrows- for toothed belt cover (bottom) -1-.



- Unscrew bolts -1, 2 and 3- and detach engine support upwards.

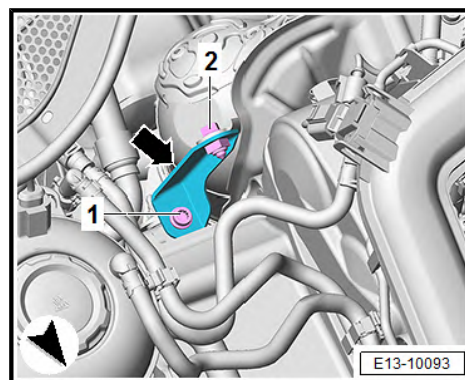


- Separate lower protector -2- in the direction of the arrow- to free the assembly support -1-.
- Separate and free the engine support, follow points -arrows A, B-. Remove engine support upwards.



Separate the engine support to free some space

- Remove engine mounting
⇒ [“2.2.3 Engine mounting - removing and installing, Toledo 2013, Ibiza 2016”, page 75](#) .

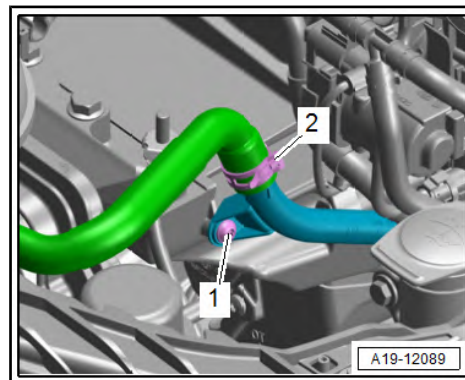


- Unscrew bolt -1-.

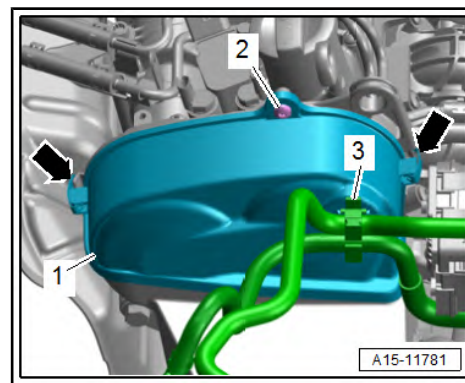


Note

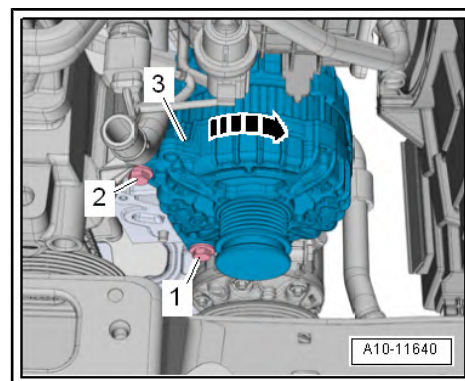
Disregard item -2-.



- Detach hoses from retainer -3-.
- Remove bolt -2-.
- Release clips -arrows-, and remove upper toothed belt guard -1-.
- Remove tensioner for poly V-belt
⇒ ["1.3 Removing and installing tensioner for poly V-belt", page 116](#).



- Loosen bolt -1-, but do not unscrew.
- Remove bolt -2-.
- Swivel alternator -3- in the direction of the arrow-.

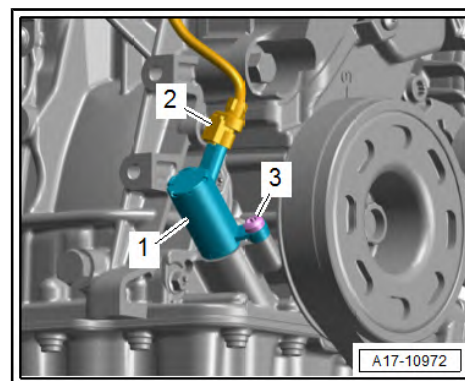


- Unplug electrical connector -2-.

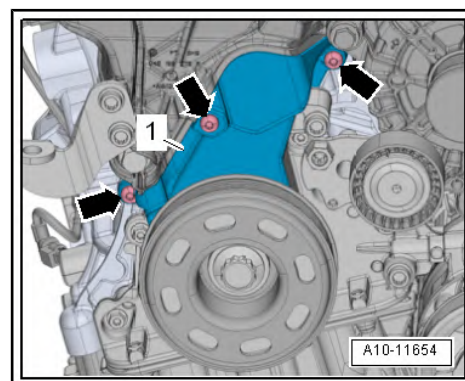


Note

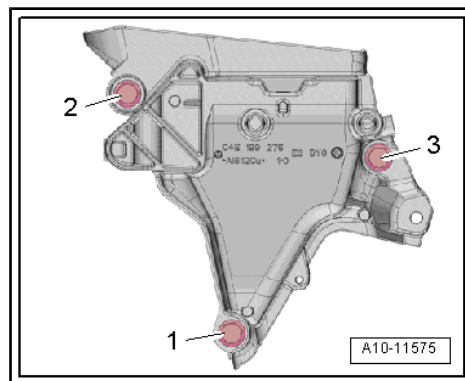
-Items 1, 3- can be disregarded.



- Remove bolts -arrows- for toothed belt cover (bottom) -1-.



- Unscrew bolts -1, 2, 3-.



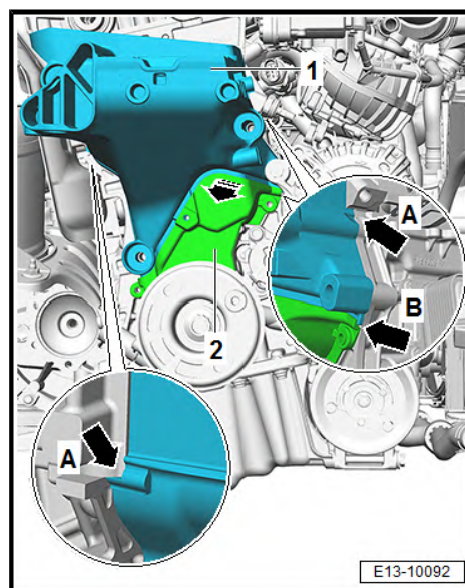
- Separate lower protector -2- in the direction of the arrow- to free the assembly support -1-.
- Separate and free the engine support, following points -arrows A, B-, remove engine support upwards to make space in the upper area.

Installing

Installation is in the reverse sequence of removal.

Specified torques

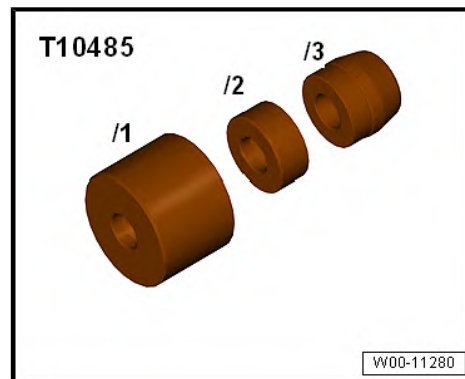
- ◆ Securing bolts for engine mounting and console for engine mounting
⇒ [“2.1.3 Assembly overview - assembly mountings, Toledo 2013, Ibiza 2016”, page 72](#)
- ◆ Securing bolts for tensioning roller
⇒ [“1.1 Assembly overview - poly V-belt drive”, page 109](#)
- ◆ Securing bolts for lower toothed belt guard
⇒ [“2.1 Assembly overview - toothed belt cover”, page 173](#)
- ◆ Securing bolts for coolant pipe
⇒ [“3.1 Assembly overview - coolant pipes”, page 302](#)
- ◆ Securing bolt for air filter housing
⇒ [“3.1.3 Assembly overview - air filter housing, Toledo 2013, Ibiza 2016”, page 396](#)
- ◆ Securing bolts for bracket
⇒ [“2.1 Assembly overview - emission control”, page 455](#)
- ◆ Securing bolts of alternator ⇒ Electrical system; Rep. gr. 27 ; Alternator; Assembly overview - alternator .
- ◆ Noise insulation assembly bolts ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; Assembly overview – underbody protection .



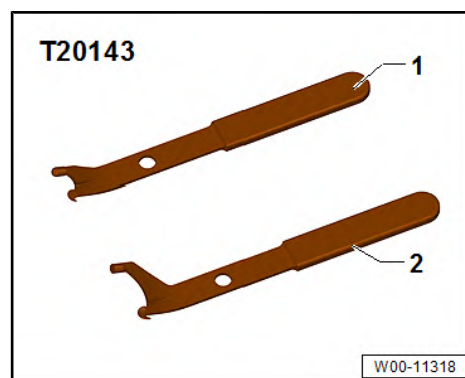
1.6 Renewing crankshaft oil seal - belt pulley end

Special tools and workshop equipment required

◆ Assembly tool - T10485-



◆ Puller hooks - T20143-



Procedure

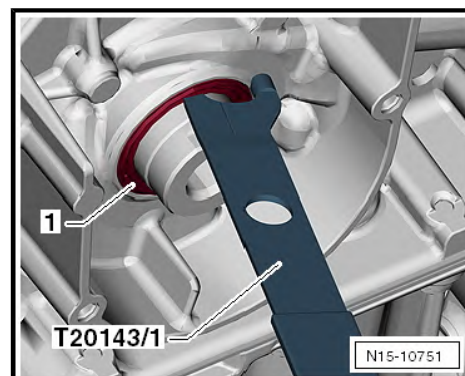
- Remove camshaft toothed belt
⇒ ["2.7 Removing toothed belt from camshaft", page 198](#) .



Note

To avoid disturbing valve timing, do not turn crankshaft out of "TDC" position when poly V-belt pulley is removed.

- Remove seal -1- using extractor hook - T20143/1- .



Installing

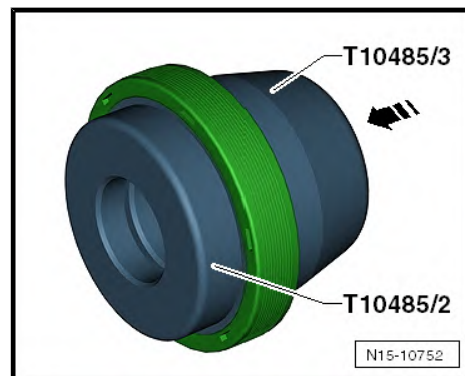
- Clean contact surface and sealing surface.



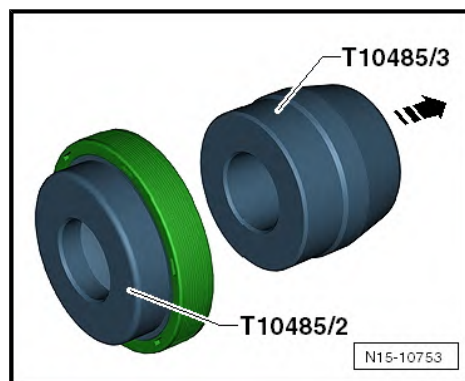
Note

Do not lubricate new oil seal.

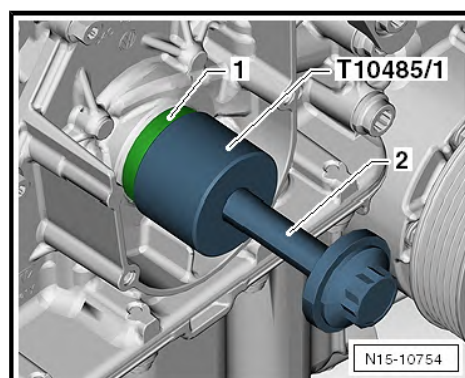
- Mount assembly sleeves - T10485/2- and -T10485/3- in -direction of arrow-.
- Installation position: The closed side of the oil seal faces the guide sleeve.
- Fit new seal in direction of -arrow- over fitting sleeve - T10485/3- onto assembly sleeve - T10485/2- .



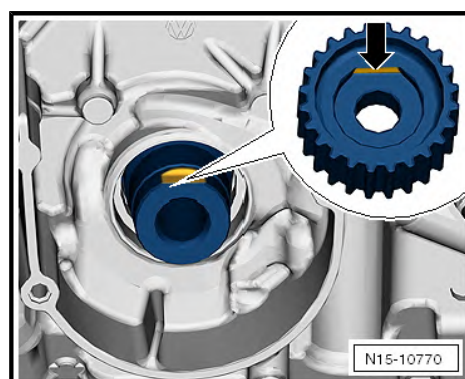
- Pull off assembly sleeve - T10485/3- in -direction of arrow-.



- Fit assembly sleeve - T10485/2- with seal -1- onto crankshaft journal.
- Draw in thrust piece - T10485/1- to stop with securing bolt of vibration damper -2-.



- Fit crankshaft sprocket onto crankshaft.
- Contact surface between poly V-belt pulley and crankshaft sprocket must be free of oil and grease.
- The machined surface -arrow- of crankshaft pulley must be positioned over the machined surface of the crankshaft journal.
- Install notched belt (adjusting valve timing)
⇒ ["2.7 Removing toothed belt from camshaft", page 198](#)



Note

After completing work, it is essential to make sure that the camshaft clamp - T10477- has been removed.

Assemble in reverse order of dismantling.

Specified torques

- ♦ Crankcase plug: 30 Nm.

2 Cylinder block, gearbox end

⇒ [“2.1 Assembly overview - cylinder block, gearbox end”, page 135](#)

⇒ [“2.2 Removing and installing flywheel”, page 136](#)

⇒ [“2.3 Removing and installing sealing flange on gearbox side”, page 137](#)

2.1 Assembly overview - cylinder block, gearbox end



Note

For assembly work, secure engine to engine and gearbox support
⇒ [“1.3 Securing engine on engine and gearbox support”, page 50](#).

1 - Bolt

- ☐ Renew after removal
- ☐ 60 Nm +90°

2 - Flywheel

- ☐ Removing and installing
⇒ [“2.2 Removing and installing flywheel”, page 136](#)
- ☐ Fitting possible in one position only.

3 - Engine speed sender - G28-

- ☐ Removing and installing
⇒ [“1.5 Removing and installing engine speed sender G28”, page 470](#)
- ☐ Assembly overview
⇒ [“1.1 Assembly overview - ignition system”, page 464](#)

4 - Bolt

- ☐ Specified torque
⇒ [Item 15 \(page 465\)](#)

5 - Locking pin

- ☐ 2 off

6 - Backing plate

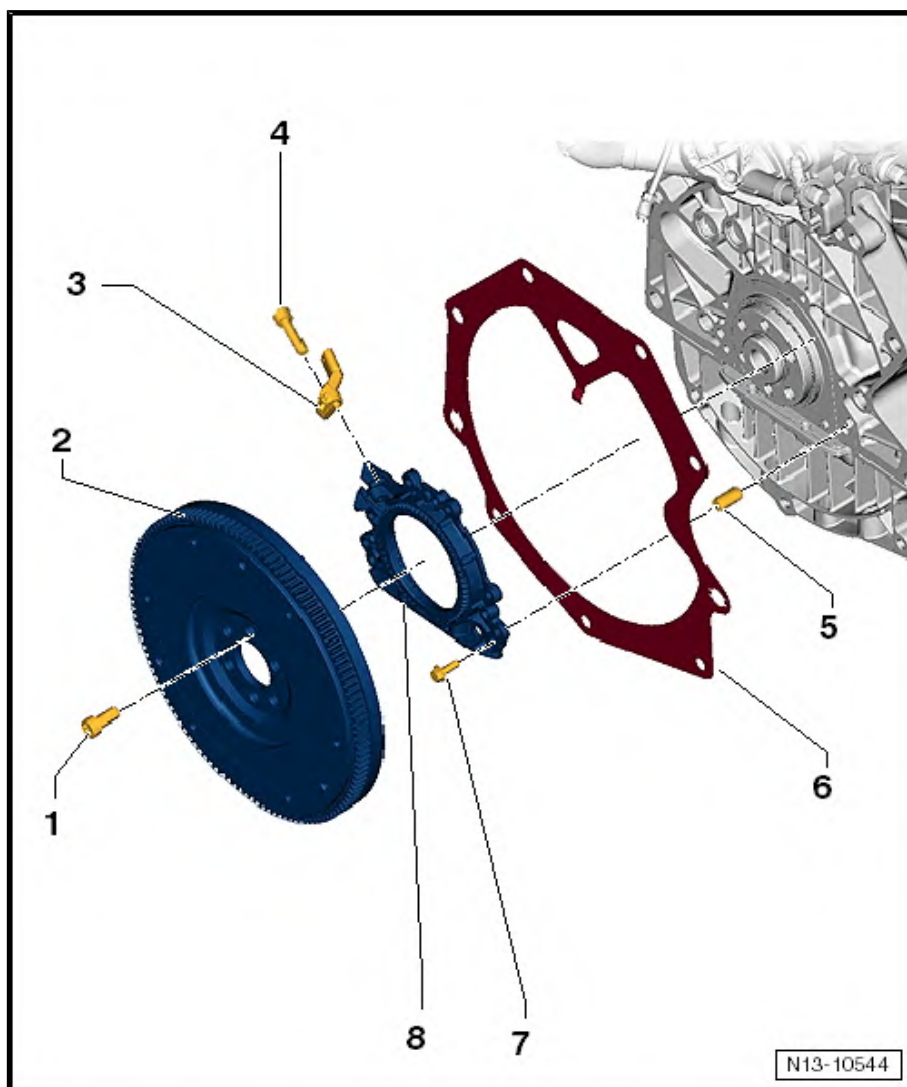
- ☐ Do not damage or bend when assembling.
- ☐ Installing ⇒ [page 136](#)

7 - Bolt

- ☐ Specified torque and tightening sequence
⇒ [page 136](#)

8 - Sealing flange with sender wheel and oil seal

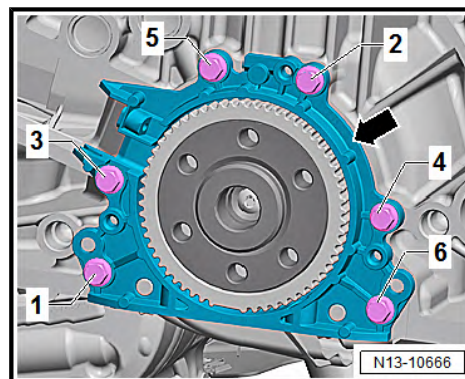
- ☐ Renew sealing flange complete with oil seal and sender wheel only.
- ☐ With seal.
- ☐ Renewing ⇒ [“2.3 Removing and installing sealing flange on gearbox side”, page 137](#)



Sealing flange on gearbox side - specified torque and tightening sequence

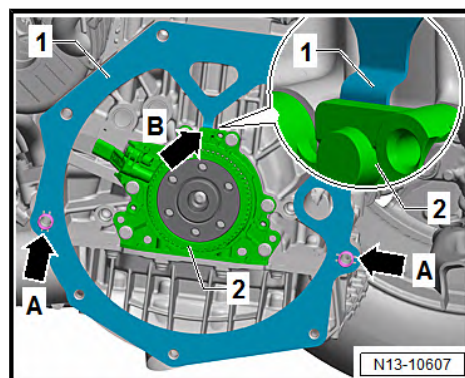
- Tighten bolts -1- to -6- in stages as follows:

Stage	Bolts	Specified torque
1.	-1- to -6-	Screw in by hand as far as stop
2.	-1- to -6-	In diagonal sequence and in stages; final torque 10 Nm



Installing intermediate plate

- Attach intermediate plate -1- to sealing flange -2- -arrow B-.
- Slide intermediate plate onto dowel sleeves -arrows A-.



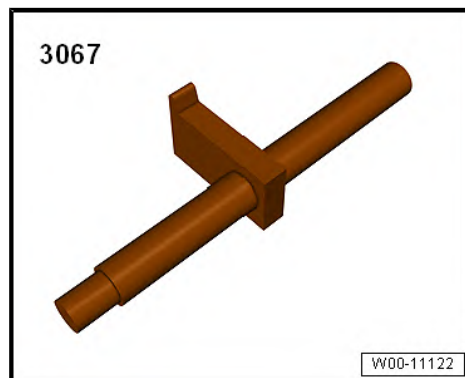
2.2 Removing and installing flywheel

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

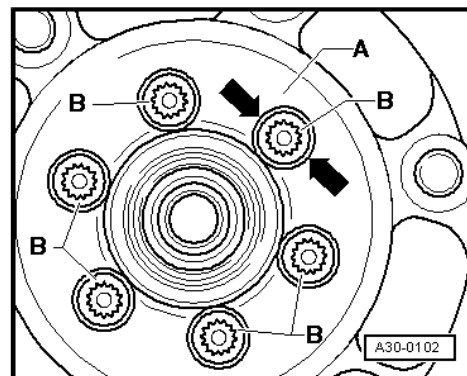


- ◆ Counter-hold tool - 3067-



Removing

- Gearbox removed ⇒ 5-speed manual transmission 0DF; Rep. gr. 34 ; Transmission: remove and install .
 - Clutch release plate removed ⇒ 5-speed manual transmission 0DF; Rep. gr. 30 ; Clutch; remove and install clutch .
 - Screw out bolts -B- not with an air wrench or power impact wrench but by hand.
 - When removing the bolts, make sure that the bolt heads do not come into contact with the flywheel.
 - Rotate dual-mass flywheel -A- so that bolts -B- align centrally with the holes -arrows-.
- Insert counterhold tool - 3067- into hole -item B- in cylinder block.
- Loosen and remove flywheel bolts.



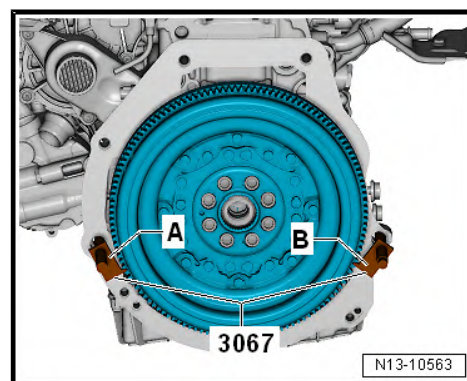
Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *If a further tightening angle is specified for certain bolts, these must be renewed.*
 - ◆ *Flywheel with sender wheel can only be fitted in one position.*
- Insert counter-hold tool - 3067- in hole in cylinder block -item A-.



Specified torques

- ◆ ⇒ ["2.1 Assembly overview - cylinder block, gearbox end", page 135](#)

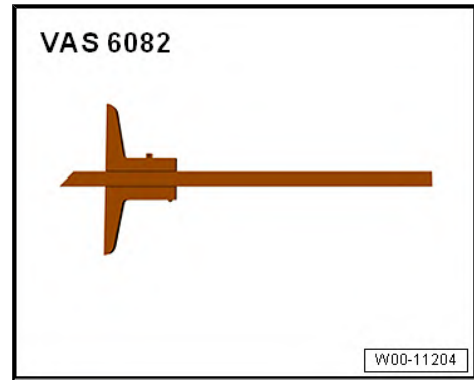
2.3 Removing and installing sealing flange on gearbox side

Special tools and workshop equipment required

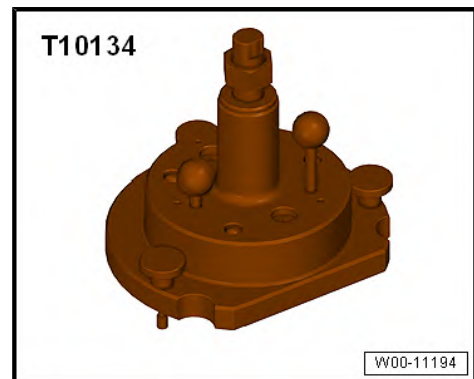
- ◆ Open ring spanner - V.A.G 1332/11-



- ◆ Depth gauge - VAS 6082-



- ◆ Assembly tool - T10134-



- ◆ Bolt M6×35 (qty. 3)
- ◆ Hexagon key

Procedure

Ateca, Leon 2013, Ibiza 2018, Arona

- Remove nose insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

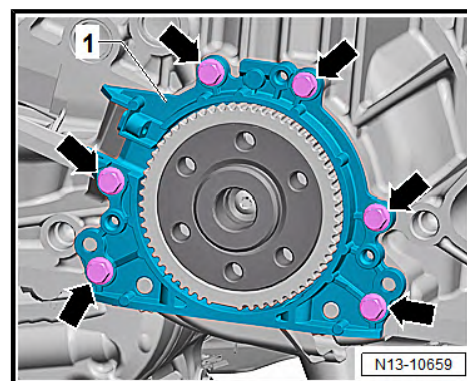
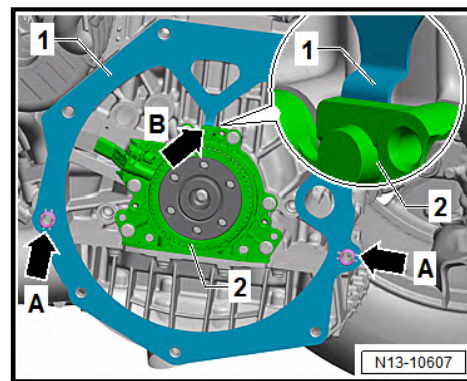
Toledo 2013, Ibiza 2016

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; Underbody protection – assembly overview .

Continued for all vehicles:

- Removing gearbox ⇒ Rep. gr. 34 ; Removing and installing gearbox .
- Remove clutch ⇒ Rep. gr. 30 ; Removing and installing clutch .
- Remove flywheel
⇒ ["2.2 Removing and installing flywheel", page 136](#) .

- Remove intermediate plate -1- from dowel sleeves -arrows A-.
- Guide intermediate plate -1- upwards.
- While doing so, pull retaining lug -arrow B- of intermediate plate -1- out of recess behind sealing flange.
- Turn crankshaft to “TDC” position
⇒ [“4.7 Setting piston to TDC position”, page 155](#) .
- Remove sump
⇒ [“1.3 Removing and installing sump”, page 237](#) .
- Remove engine speed sender - G28-
⇒ [“1.5 Removing and installing engine speed sender G28 ”, page 470](#) .
- Unscrew bolts -arrows- for sealing flange -1-.



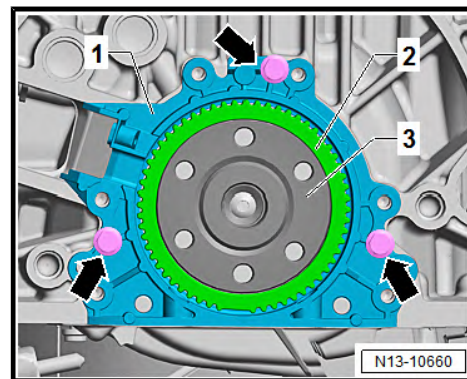
- To press off, screw 3 bolts M6x35 into sealing flange -1- -arrows-.



Note

The sealing flange -1- is pressed off the crankshaft -3- with the sender wheel -2-.

- Screw bolts alternately into sealing flange not more than 1/2 turn at a time.
- Remove sealing flange -1- together with sender wheel -2-.

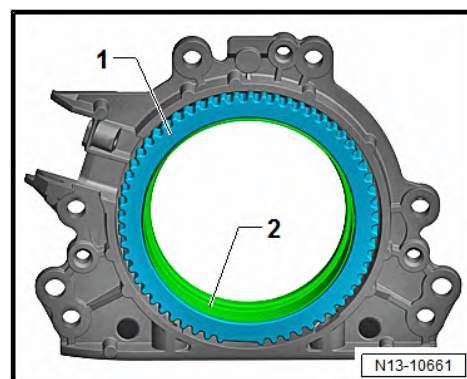


Pressing in sealing flange with sender ring



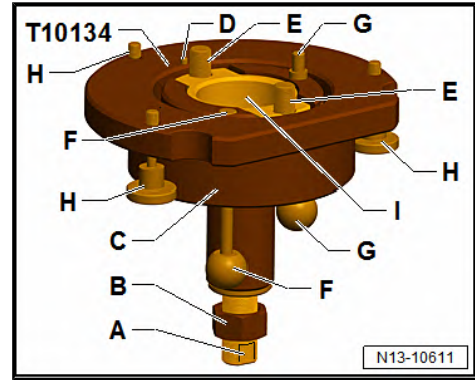
Note

- ◆ *The sealing flange with a PTFE seal is equipped with a sealing lip support ring -2-. This support ring serves as a fitting sleeve and must not be removed prior to installation.*
- ◆ *Sealing flange and sender wheel -1- must not be separated or turned after removal from packaging.*
- ◆ *The sender wheel -1- is held in its installation position on the locating pin of the assembly tool - T10134- ⇒ [page 140](#) .*
- ◆ *Sealing flange and oil seal form one unit and may only be renewed together with the sender wheel.*
- ◆ *The assembly tool - T10134- is held in its position relative to the crankshaft by a guide pin inserted into a hole in the crankshaft ⇒ [page 140](#) .*



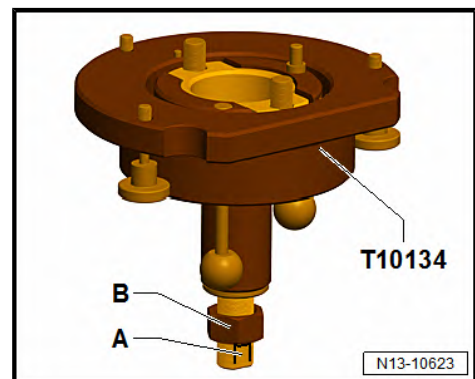
Set-up of assembly tool - T10134- :

- A - Clamping surface
- B - Nut
- C - Assembly housing
- D -
- Locking fluid
- E - Hexagon socket head bolt (qty. 2)
- F -
- Guide pin for diesel engines (red handle)
- G - Guide pin for diesel engines (black knob)
- H - Knurled screw (qty. 3)
- I - Inner side

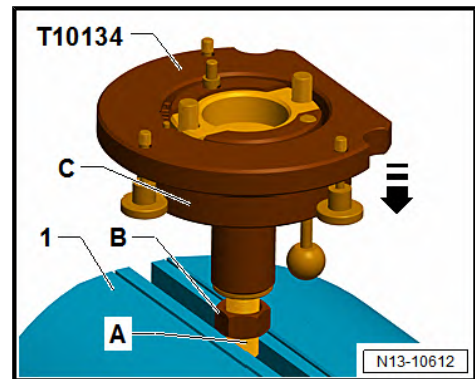


Fitting sealing flange with sender wheel on assembly tool - T10134- :

- Screw on nut -B- and stop just before it comes into contact with clamping surface -A- of threaded spindle.



- Clamp assembly device - T10134- at clamping surface -A- of threaded spindle in a vice -1-.
- Press assembly housing -C- downwards until it rests against nut -B-.
- The inner part of assembly tool and assembly housing must be at same height.

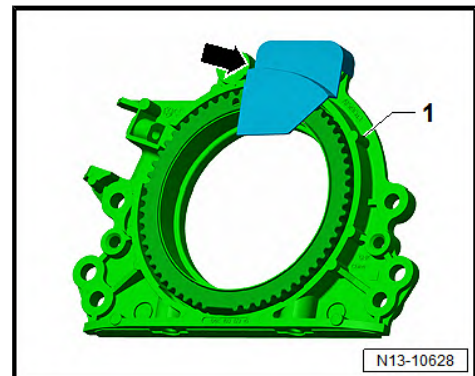


- If fitted, remove securing clip -arrow- from new sealing flange -1-.

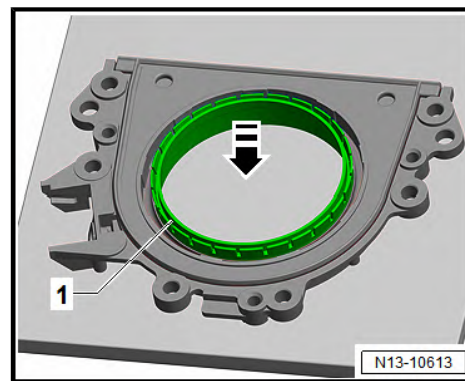


Note

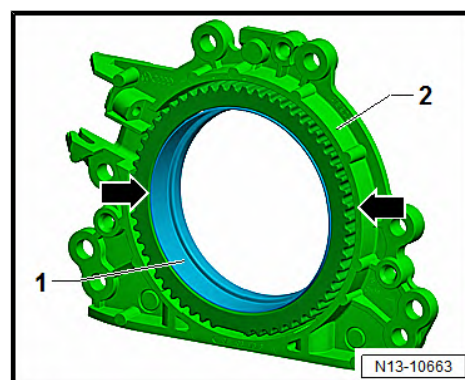
Do not take the sender wheel out of the sealing flange or rotate it out of position.



- Place sealing flange with front side facing down on a clean level surface.
- Push sealing lip support ring -1- downwards in -direction of arrow- until it rests against level surface.



- Upper edge of sealing lip support ring -1- and front edge of sealing flange -2- must align -arrows-.

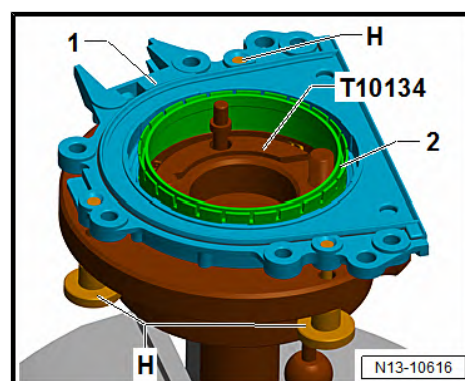
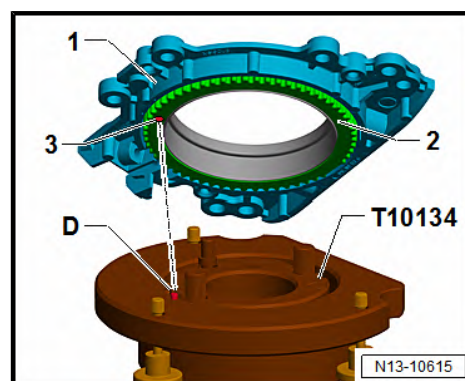


- Place sealing flange -1- with front side facing downwards onto assembly tool - T10134- , so that locating pin -D- is seated in hole -3- of sender wheel -2-.



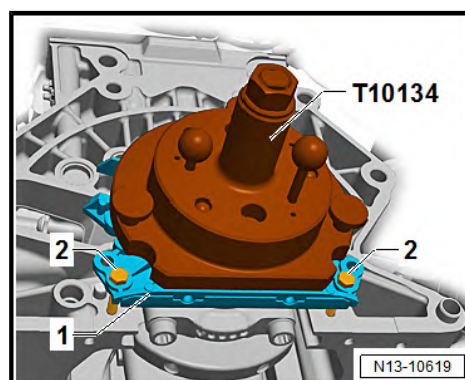
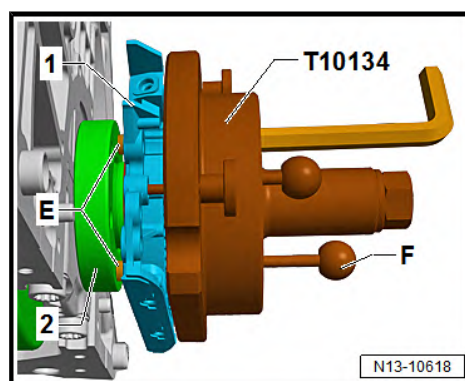
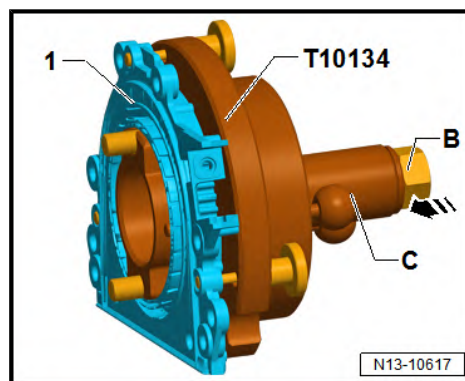
Note

- ♦ The sealing flange can be supplied in different versions.
- ♦ On some versions, the »TDC position hole« -3- is not in the requisite TDC position -D-.
- If the position -3- is not correct in relation to the locating pin -D-, carefully rotate the sender wheel -2- with support ring.
- The sealing flange must rest flat against the assembly tool.
- Screw knurled screws -H- into sealing flange -1-.
- Press sealing flange -1- and sealing lip support ring -2- against surface of assembly tool - T10134- whilst tightening the knurled screws.
- This prevents the locating pin from slipping out of the sender wheel hole.
- When installing sealing flange, ensure that sender wheel remains fixed in assembly tool.



Mounting assembly tool - T10134- with sealing flange -1- on crankshaft flange:

- The crankshaft flange must be free of grease and oil.
- Engine is at "TDC" position
⇒ ["4.7 Setting piston to TDC position", page 155](#) .
- Screw on nut -B- until it reaches end of threaded spindle.
- Press threaded spindle of assembly tool - T10134- in the direction of -arrow- until nut -B- makes contact with assembly housing -C-.
- Point the flat part of the installation socket towards the sealing surface of the engine block in contact with the oil sump.
- Attach assembly tool - T10134- together with sealing flange -1- to crankshaft flange -2-.
- To do this, screw hexagon socket head bolts -E- into crankshaft flange (approx. 5 full turns) using a hexagon key.
- Push guide pin for petrol engines (red knob) -F- into crankshaft flange.
- Screw in 2 M6x35 bolts -2- to guide the sealing flange -1- into the cylinder block.



Bolting assembly tool - T10134- onto crankshaft flange:

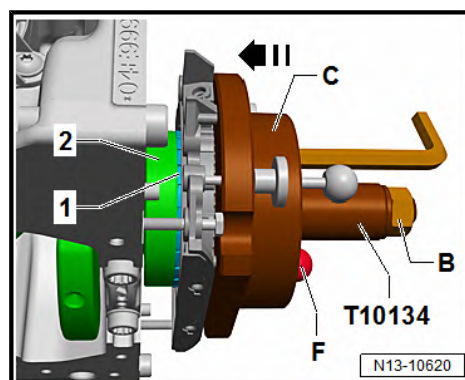
- Push assembly housing -C- by hand in direction of -arrow- until sealing lip support ring -1- rests against crankshaft flange -2-.
- Make sure that guide pin for petrol engines (red knob) -F- is properly seated in hole in crankshaft. This ensures that the sender wheel reaches its final installation position.



Note

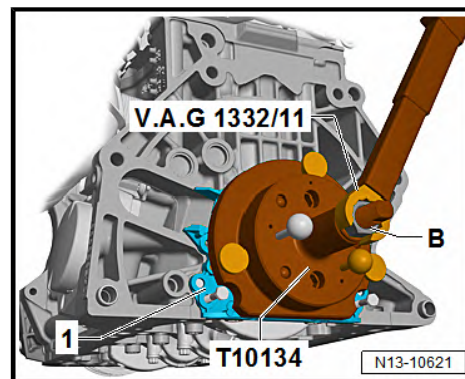
The guide pin for diesel engines (black knob) must not be inserted in threaded hole of crankshaft.

- Tighten the two hexagon socket head bolts of assembly tool hand-tight.
- Screw nut -B- onto threaded spindle by hand until it rests against assembly housing -C-.



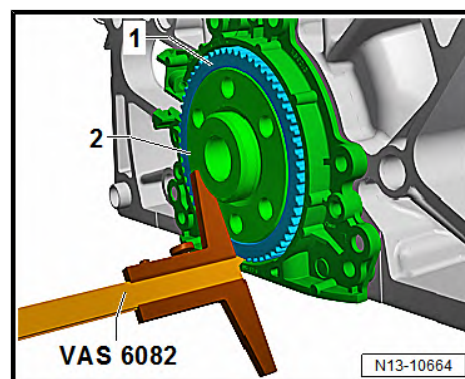
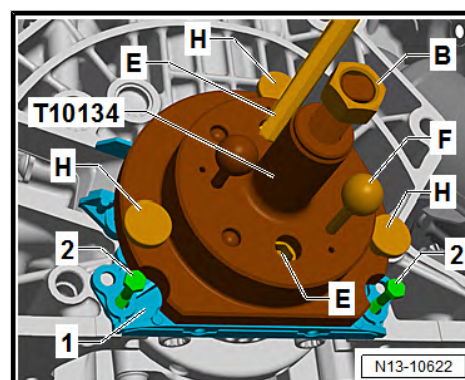
Pressing sender wheel onto crankshaft flange using assembly tool - T10134- :

- Tighten nut -B- of assembly tool - T10134- to 35 Nm.
- After nut has been tightened to 35 Nm, a small gap must still be present between cylinder block and sealing flange -1-.

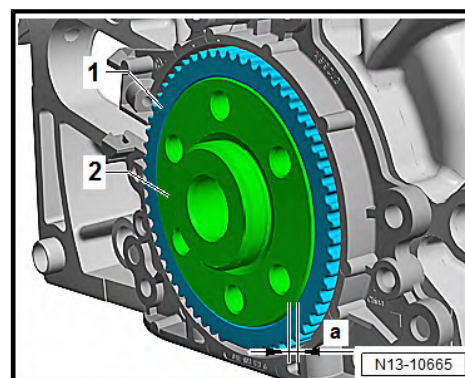


Checking sender wheel installation position on crankshaft:

- Screw on nut -B- until it reaches end of threaded spindle.
- Unscrew the two bolts -2- from cylinder block.
- Pull guide pin for petrol engines (red knob) -F- out of crankshaft flange.
- Unscrew knurled screws -H- from sealing flange -1-.
- Unbolt assembly tool - T10134- from crankshaft flange, unscrewing hexagon socket head bolts -E- from crankshaft flange.
- Remove sealing lip support ring.
- Position depth gauge - VAS 6082- on crankshaft flange -2-.

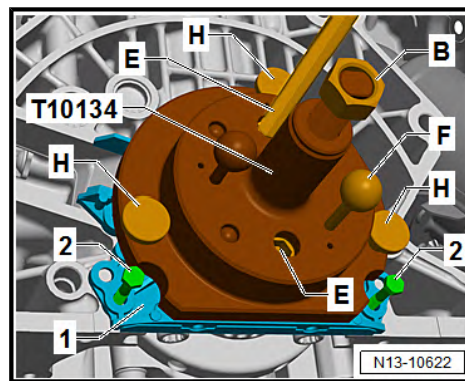


- Measure distance -a- between crankshaft flange -2- and sender wheel -1-.
- Specification: dimension -a- = 0.5 mm
- If measured value is too low, press sender wheel further in ➔ [page 144](#) .
- If specification is achieved, proceed with subsequent work steps ➔ [page 144](#) .



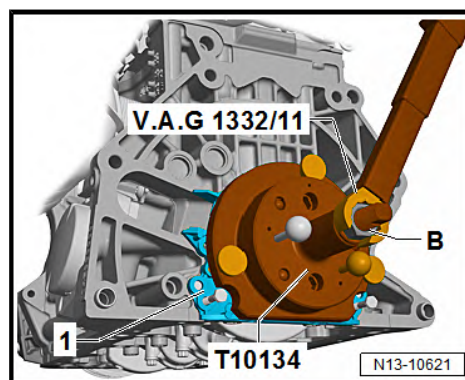
Re-pressing sender wheel:

- Secure assembly tool - T10134- on crankshaft flange -1-.
- Make sure that the locating pin of assembly tool - T10134- is properly seated in sender wheel hole.
- Tighten hexagon socket head bolts -E- by hand.
- Push assembly tool - T10134- by hand against sealing flange -1-.
- Screw nut -B- by hand onto threaded spindle until it rests against assembly tool - T10134- .
- Push guide pin for petrol engines (red knob) -F- into crankshaft flange.
- Screw knurled screws -H- into sealing flange -1-.
- To guide sealing flange, screw 2 M6 x 35 mm bolts -2- into cylinder block.
- Tighten nut -B- of assembly tool - T10134- to 40 Nm.
- Check sender wheel installation position on the crankshaft again ➔ [page 143](#) .
- If specification is not achieved, tighten nut of assembly tool - T10134- to 45 Nm.
- Check sender wheel installation position on the crankshaft again ➔ [page 143](#) .



Assembling:

- Tighten sealing flange bolts diagonally and alternately.
- Install oil pan
➔ ["1.3 Removing and installing sump", page 237](#) .
- Install intermediate plate ➔ [page 136](#) .
- Install flywheel
➔ ["2.2 Removing and installing flywheel", page 136](#) .
- Install gearbox ➔ Rep. gr. 34 ; Removing and installing gearbox .
- Check valve timing
➔ ["2.5 Checking valve timing", page 187](#) .



Specified torques

- ◆ ➔ [Fig. "Sealing flange on gearbox side - specified torque and tightening sequence", page 136](#)
- ◆ ➔ ["2.1 Assembly overview - cylinder block, gearbox end", page 135](#)
- ◆ Engine speed sender - G28-
➔ ["1.1 Assembly overview - ignition system", page 464](#)

3 Crankshaft

⇒ [“3.1 Crankshaft dimensions”, page 145](#)

⇒ [“3.2 Renewing needle bearing in crankshaft”, page 145](#)

3.1 Crankshaft dimensions



Note

- ◆ *Risk of deformation of bearing pedestals.*
- ◆ *The crankshaft must not be removed.*
- ◆ *Just loosening the main bearing caps will cause deformation of the cylinder block bearing seats.*
- ◆ *This deformation will cause a reduction of the bearing clearance.*
- ◆ *Even if the bearing shells are not renewed, bearing damage could occur due to a different bearing clearance.*
- ◆ *If the bearing cap bolts are loosened, the cylinder block must be renewed complete with the crankshaft.*
- ◆ *Measuring the main bearing clearance is not possible with normal workshop equipment.*

Honing dimension	Conrod journal Ø mm
Basic dimension	47.80 -0.022 -0.037

3.2 Renewing needle bearing in crankshaft

Only vehicles with a dual clutch gearbox

Special tools and workshop equipment required

- ◆ Counter support e.g. KUKKO 22-1 - VAS 251 621-



◆ Internal puller - VAS 251 635-



◆ Drift - VW 207 C-



Removing

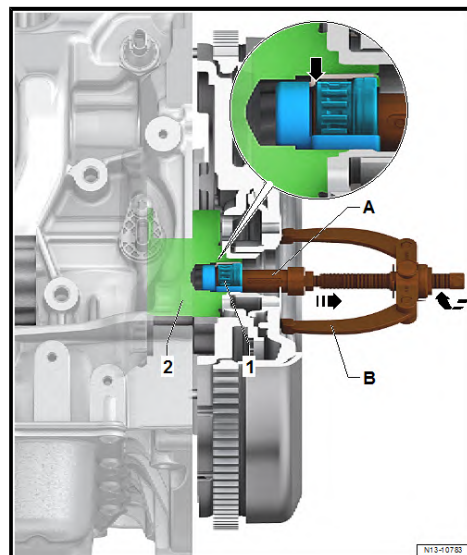
- Remove gearbox ⇒ Rep. gr. 34 ; Removing and installing gearbox; Removing gearbox .

Requirement:

- The front edges of the internal puller must not be chipped.

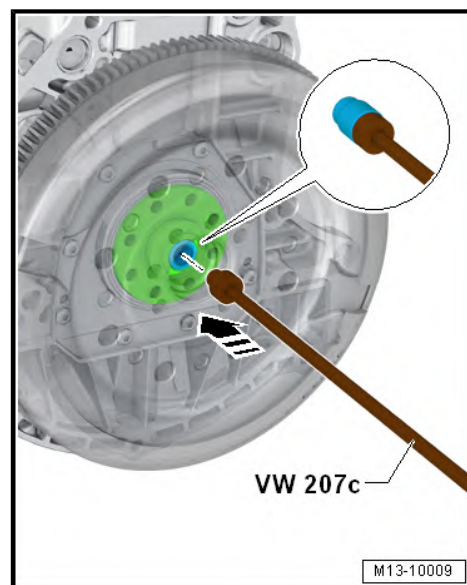
Pulling out needle roller bearing

- Pull out needle bearing -1- with internal puller - VAS 251 635- -A- and counter support, e.g. KUKKO 22-1 - VAS 251 621- -B- from crankshaft -2-.
- The internal puller must be positioned behind the needle roller and cage assembly -arrow-.



Installing

- Clean bearing seat in crankshaft and grease lightly.
- Drive needle bearing into crankshaft to installation depth using drift - VW 207 C- .

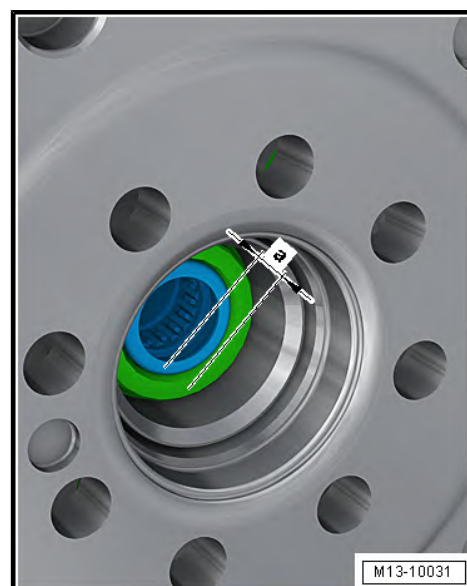


Installation depth: dimension -a- = 2.0 mm



Note

If the needle bearing is inadvertently driven in too far, it must be renewed because it will be damaged when it is pulled out again.



4 Pistons and conrods

⇒ [“4.1 Assembly overview - pistons and conrods”, page 148](#)

⇒ [“4.2 Removing and installing pistons”, page 150](#)

⇒ [“4.3 Checking pistons and cylinder bores”, page 151](#)

⇒ [“4.4 Separating new conrod”, page 152](#)

⇒ [“4.5 Checking radial clearance of conrods”, page 153](#)

⇒ [“4.6 Removing and installing oil spray jets”, page 153](#)

⇒ [“4.7 Setting piston to TDC position”, page 155](#)

4.1 Assembly overview - pistons and conrods



Note

All bearing points and running surfaces must be oiled before assembly.

1 - Retaining ring

- ☐ Renew after removal

2 - Piston pin

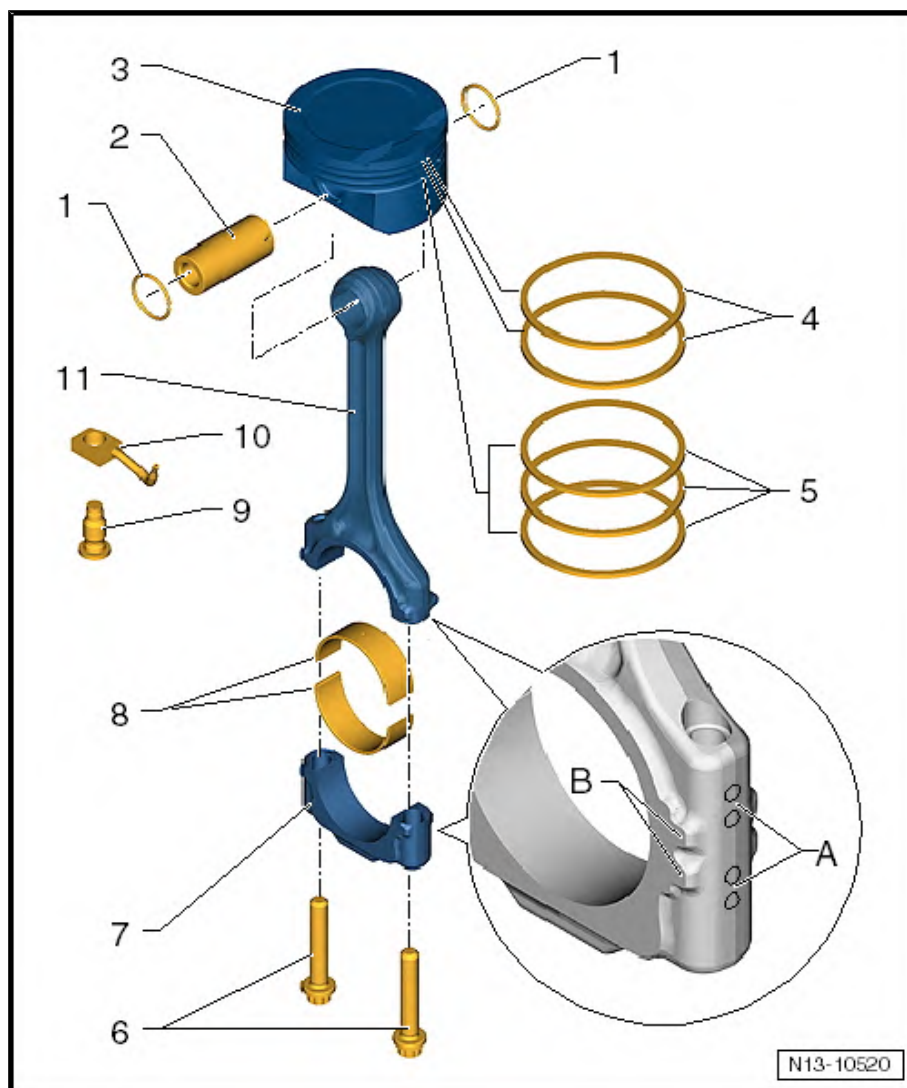
- ☐ If difficult to move, heat piston to 60 °C
- ☐ Removing and installing
⇒ [“4.2 Removing and installing pistons”, page 150](#)

3 - Piston

- ☐ Checking
⇒ [“4.3 Checking pistons and cylinder bores”, page 151](#)
- ☐ Mark installation position and cylinder number ⇒ [page 150](#) .
- ☐ Arrow on piston crown points to belt pulley end.
- ☐ Install using piston ring clamp.

4 - Compression rings

- ☐ Offset gaps by 120°
- ☐ Remove and fit compression rings using pliers adapted for piston rings
- ☐ “TOP” faces towards piston crown.
- ☐ Checking ring gap
⇒ [page 152](#) .
- ☐ Checking ring-to-groove clearance ⇒ [page 152](#) .



5 - Oil scraper rings

- ☐ Carefully remove and install 3-part oil scraper rings by hand
- ☐ Checking ring gap ⇒ [page 152](#) .
- ☐ Ring-to-groove clearance not measurable.

6 - Conrod bolt

- ☐ Renewing
- ☐ To measure radial clearance, tighten to corresponding specified torque but not further.
- ☐ Oil threads and contact surface
- ☐ 30 Nm +90°

7 - Conrod bearing cap

- ☐ Check fitting position
- ☐ The caps only fit in one position and only on the appropriate conrod due to the breaking procedure (cracking) separating the cap from the conrod.
- ☐ Mark with cylinder number prior to removal -A-.
- ☐ Installation position: the marking -B- points toward the belt pulley (if there is no marking, this must be made before removing).

8 - Bearing race

- ☐ Fitting position ⇒ [page 150](#)
- ☐ Do not interchange used bearing shells.
- ☐ Insert bearing shells centrally.

Checking radial clearance with Plastigage:

- ☐ New: 0.020 ... 0.060 mm
- ☐ Wear limit: 0.070 mm
- ☐ Do not rotate crankshaft when checking radial clearance.

9 - Pressure relief valve

- ☐ Opening pressure of pressure relief valve: 1.8 ... 2.2 bar
- ☐ 27 Nm

10 - Oil spray jet

- ☐ For piston cooling.
- ☐ Removing and installing ⇒ [page 153](#)

11 - Connecting rod

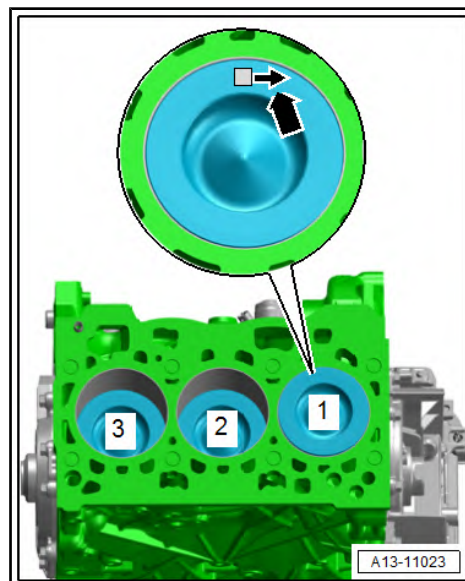
- ☐ Renew as set only.
- ☐ Mark with cylinder number -A-.
- ☐ Installation position: the marking -B- points toward the belt pulley (if there is no marking, this must be made before removing).
- ☐ Piston axial guided
- ☐ Separating new conrod ⇒ ["4.4 Separating new conrod", page 152](#) .

Installation position and allocation of piston to cylinder



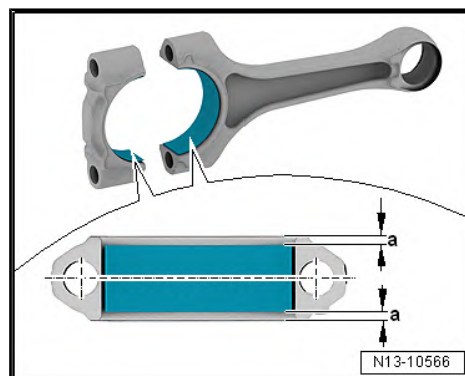
Note

- ◆ Risk of damage to piston crown.
- ◆ If worn pistons are to be reinstalled, mark their allocation to the cylinder on the piston crown. Use paint for this.
- ◆ Do not use indentation, scratches, notches, or similar to mark the piston crown.
- Arrow on piston crown points to pulley end -arrow-.



Bearing shells - installation position

- Centre bearing shells on conrod and in conrod bearing cap.
- Distance -a- = distance -a-.



4.2 Removing and installing pistons

Special tools and workshop equipment required

- ◆ Drift - VW 222 A-



- ◆ Piston ring clamp, commercially available

Removing

- Remove cylinder head
⇒ ["1.3 Removing and installing cylinder head", page 162](#) .
- Remove sump
⇒ ["1.3 Removing and installing sump", page 237](#) and baffle plate.
- Mark piston installation position and corresponding cylinder number.

- Mark installation position and matching of cylinder and conrod bearing cap to conrod ➔ [Item 7 \(page 149\)](#) .
- Remove conrod bearing cap and withdraw piston and conrod upwards.



Note

If the piston pin is difficult to move, heat the piston to approx. 60 ° C.

- Remove retaining ring from piston pin eye.
- Drive out piston pin using drift - VW 222 A- .

Installing

Install in reverse order of removal, observing the following:



Note

If a further tightening angle is specified for certain bolts, these must be renewed.

- Oil running surfaces of shell bearings.
- Install piston using commercially available piston ring clamp; note installation position ➔ [page 150](#) .
- Install conrod bearing cap, noting installation position ➔ [Item 7 \(page 149\)](#) .
- Install cylinder head ➔ [“1.3 Removing and installing cylinder head”, page 162](#) .
- Install oil pan ➔ [“1.3 Removing and installing sump”, page 237](#) .

Specified torques

- ◆ ➔ [“4.1 Assembly overview - pistons and conrods”, page 148](#)

4.3 Checking pistons and cylinder bores

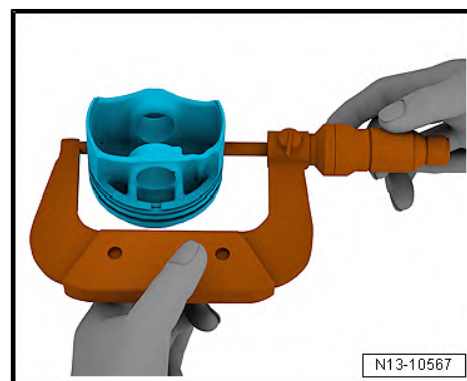
Special tools and workshop equipment required

- ◆ External micrometer 50-75 mm - VAS 6070-

Checking piston

- Using an external micrometre, measure approx. 10 mm from lower edge, offset 90° from piston pin axis.
- Maximum deviation from nominal dimension: 0.04 mm.

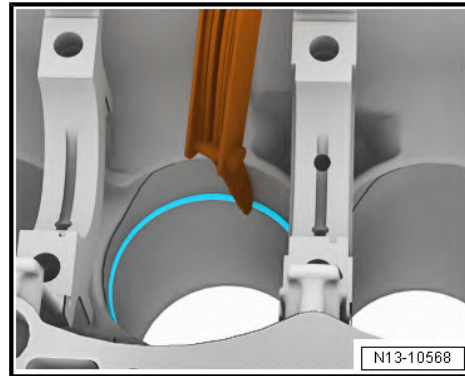
Piston diameter, mm	
Specification	74.42 ¹
<ul style="list-style-type: none"> • ¹) Dimensions not including coating (thickness 0.018 mm on each side). 	



Measuring piston ring gap

- Push piston ring at right angles to cylinder wall from above down into cylinder bore to approx. 15 mm from bottom end of cylinder.
- Push in using a piston without piston rings.

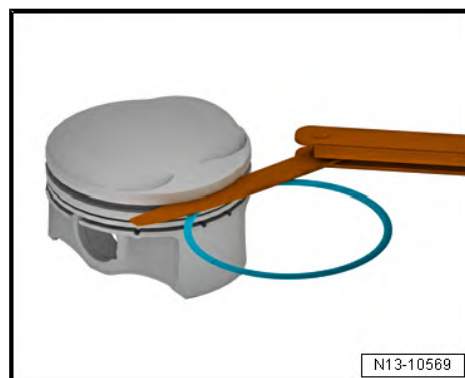
Piston ring	New mm	Wear limit mm
compression ring	0.20 + 0.15	1.0
Oil scraper ring	0.20 + 0.20	3.0



Measuring ring-to-groove clearance

- Clean annular groove of piston before check.

Piston ring	New mm	Wear limit mm
1st compression ring	0.05 ... 0.09	0.15
2nd compression ring	0.03 ... 0.07	0.15
Oil scraper rings	Cannot be measured	



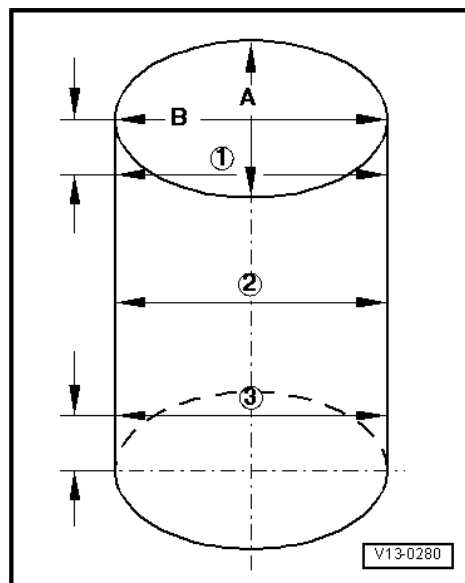
Checking cylinder bores

NOTICE

Risk of damage to the surface of the cylinder bore caused by incorrect machining.

- Do not machine cylinder bore (reboring, honing, grinding) with workshop equipment.
- Using cylinder gauge - VAS 6078- take measurements at 3 positions diagonally in lateral direction -A- and longitudinal direction -B-.
- Maximum deviation from nominal dimension: 0.05 mm.

Honing dimension	Inside diameter of cylinder in mm
Specification	74.5
Maximum dimension	74.515
Minimum dimensions	74.505



Note

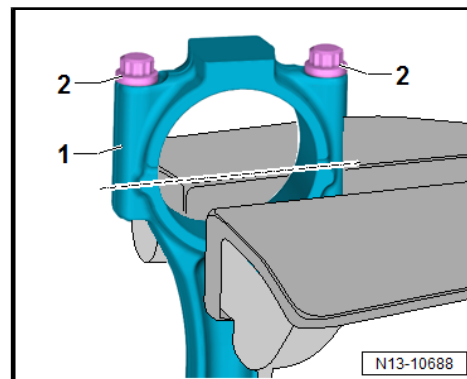
Cylinder bores must not be measured when cylinder block is mounted on engine and gearbox support - VAS 6095- , as measurements may be incorrect.

4.4 Separating new conrod

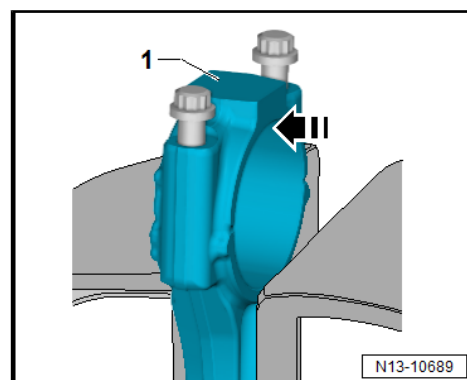
On a new conrod, it is possible that the breaking point has not fully separated. If the conrod bearing cap cannot be removed by hand, proceed as follows:

- Mark cylinder allocation of conrod ➔ [Item 11 \(page 149\)](#) .

- Clamp conrod -1- in a vice below the dashed line using aluminium vice clamps.
- Unscrew both bolts -2- about 5 turns.



- Using a plastic hammer, carefully knock against conrod bearing cap in -direction of arrow- until it is loose.



4.5 Checking radial clearance of conrods

Special tools and workshop equipment required

- ◆ Plastigage

Procedure

- Remove conrod bearing cap.
- Clean bearing cap and bearing journal.
- Place a length of Plastigage corresponding to the width of the bearing on the bearing journal or on the bearing shell.
- Fit conrod bearing cap and tighten it using old bolts
⇒ [Item 6 \(page 149\)](#) . When tightening, make sure not to rotate crankshaft.
- Remove conrod bearing cap again.
- Compare width of Plastigage with the measurement scale.
- Radial clearance: 0.028 to 0.065 mm
- Renew conrod bolts.

4.6 Removing and installing oil spray jets

Special tools and workshop equipment required

◆ Torque wrench - V.A.G 1331-



◆ Socket wrench - T10545-



Removing

- Remove sump
⇒ [“1.3 Removing and installing sump”, page 237](#) .
- Turn crankshaft via vibration damper securing bolt in direction of engine rotation until the respective bolt is accessible.

i Note

- ◆ *The crank web of the respective cylinder must be positioned so that the socket - T10545- can be inserted in the pressure relief valve as close to vertical as possible.*
- ◆ *Furthermore, the corners of the socket - T10545- and of the pressure relief valve must engage well.*

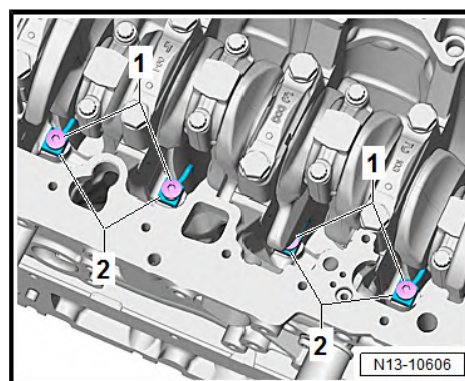
- Unscrew pressure relief valve -1- using hexagon bit - T10545- .
- Remove oil spray jets -2-.

Installing

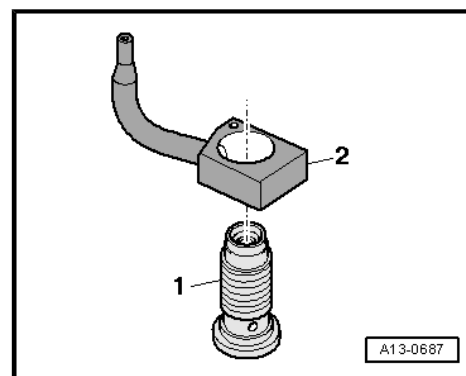
! NOTICE

Risk of damage to oil spray jets caused by deformation.

- Do not bend oil spray jets.



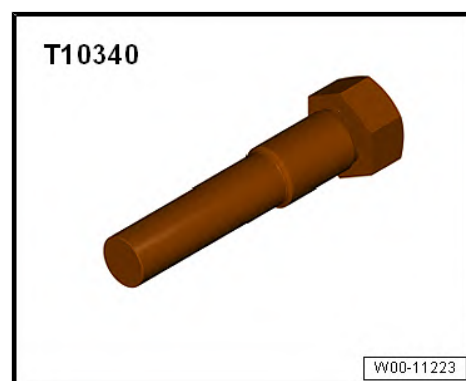
- 1 - Bolt with pressure relief valve, 27 Nm
 - 2 - Oil spray jet (for cooling of piston)
- Installation position: align leading edge of oil spray jet arrow with machined surface of cylinder block.
 - Install oil pan
⇒ ["1.3 Removing and installing sump", page 237](#) .
 - Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview – noise insulation .
 - Installing noise insulation: Toledo 2013, Ibiza 2016 ⇒ General body works, exterior; Rep. gr. 50 ; Underbody protection; Assembly overview: underbody protection



4.7 Setting piston to TDC position

Special tools and workshop equipment required

- ◆ Locating bolt - T10340-



Procedure

Setting piston from cylinder no. 1 to TDC position ⇒ [page 155](#)

Setting piston from cylinder no. 1 to TDC position for repair work on toothed belt drive and for setting valve timing ⇒ [page 156](#)

Setting piston from cylinder no. 1 to TDC position

Toledo 2013, Ibiza 2016

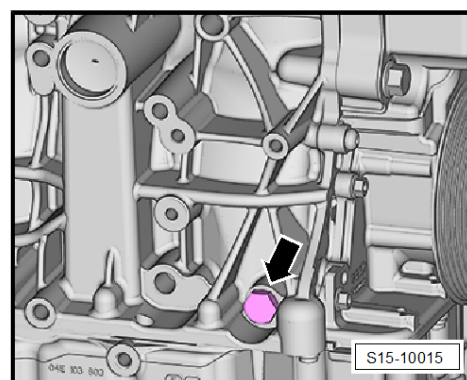
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; Underbody protection – assembly overview .

Ateca, Leon 2013, Ibiza 23018, Arona

- Remove nose insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

Continued for all vehicles

- Place a cloth underneath to catch any engine oil which may drain out.
- Lower vehicle onto floor.
- Unscrew plug -arrow- from back of cylinder block.



- Screw locking pin - T10340- -A- into cylinder block as far as stop and tighten to 30 Nm.
- Bolt head of locking pin - T10340- -A- must contact cylinder block when doing this.



Note

If the locking pin - T10340- -A- cannot be screwed in as far as stop, this indicates that the crankshaft is not in the correct position.

- Unscrew locking pin - T10340- -A-.
- Turn crankshaft 90° in direction of engine rotation.
- Screw locking pin - T10340- -A- into cylinder block as far as stop and tighten to 30 Nm.
- Rotate crankshaft in normal direction of rotation as far as stop. The locking pin - T10340- -A- now rests against the crank web.

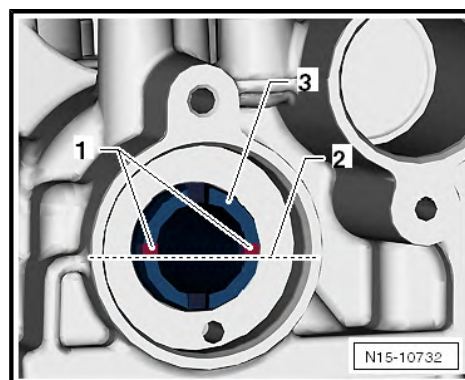
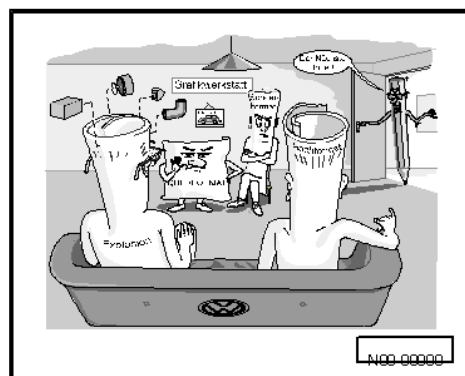
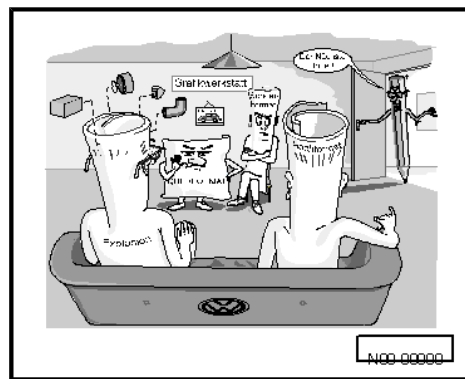


Note

Locking pin - T10340- -A- locks crankshaft in direction of engine rotation only.

Setting piston from cylinder no. 1 to TDC position for repair work on toothed belt drive and for setting valve timing

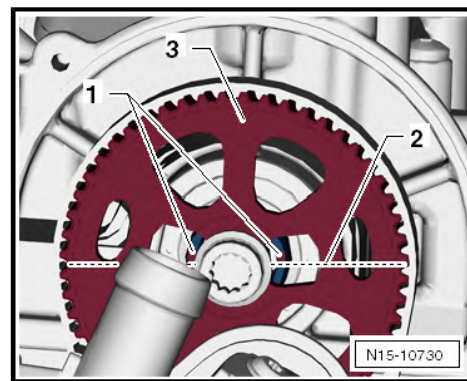
- Set piston for cylinder no. 1 to TDC position ⇒ [page 155](#) .
- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .
- Unclip wiring harness -3- and place to one side.
- Remove screws -1-.
- Place a cloth underneath to catch any oil which may drain out.
- Remove the plugs -5-.
- Pull off pipe -2-.
- Remove toothed belt cover -4-.



- Grooves -1- of intake camshaft -3- are positioned above the horizontal camshaft centre line -2-.
- Grooves -1- of exhaust camshaft are positioned above horizontal camshaft centre line -2-.
- The centre-line of the holes close to hub of the gear -3- is slightly above the grooves.

Specified torques

- ◆ ⇒ [“1.2 Assembly overview - camshaft housing”, page 160](#) .
- ◆ ⇒ [“2.1 Assembly overview - coolant pump, thermostat”, page 278](#) .
- ◆ ⇒ [“3.1 Assembly overview - air filter housing”, page 393](#) .



15 – Cylinder head, valve gear

1 Cylinder head

⇒ [“1.1 Assembly overview - cylinder head”, page 158](#)

⇒ [“1.2 Assembly overview - camshaft housing”, page 160](#)

⇒ [“1.3 Removing and installing cylinder head”, page 162](#)

⇒ [“1.4 Removing and installing camshaft housing”, page 166](#)

⇒ [“1.5 Checking compression”, page 170](#)

1.1 Assembly overview - cylinder head



Note

- ◆ *If an exchange cylinder head is installed, all the contact surfaces between the supporting elements, roller rocker fingers and the running surfaces of the cam must be oiled before the cylinder head cover is installed.*
- ◆ *Do not remove the plastic packing pieces for protecting the open valves until immediately before fitting cylinder head.*
- ◆ *If the cylinder head is renewed, the coolant and engine oil must be renewed as well.*

1 - Cylinder head gasket

- ☐ Renewing
⇒ "1.3 Removing and installing cylinder head", page 162
- ☐ Observe installation position: reference number of the cylinder head

2 - Cylinder head

- ☐ Removing and installing
⇒ "1.3 Removing and installing cylinder head", page 162
- ☐ Check for distortion
⇒ page 160 .

3 - Bolt

- ☐ Renew after removal
- ☐ pay attention to order for slackening ⇒ page 165
- ☐ Specified torque and tightening sequence
⇒ page 159

4 - Seal

- ☐ Renew after removal

5 - Camshaft case

- ☐ Removing and installing
⇒ "1.4 Removing and installing camshaft housing", page 166

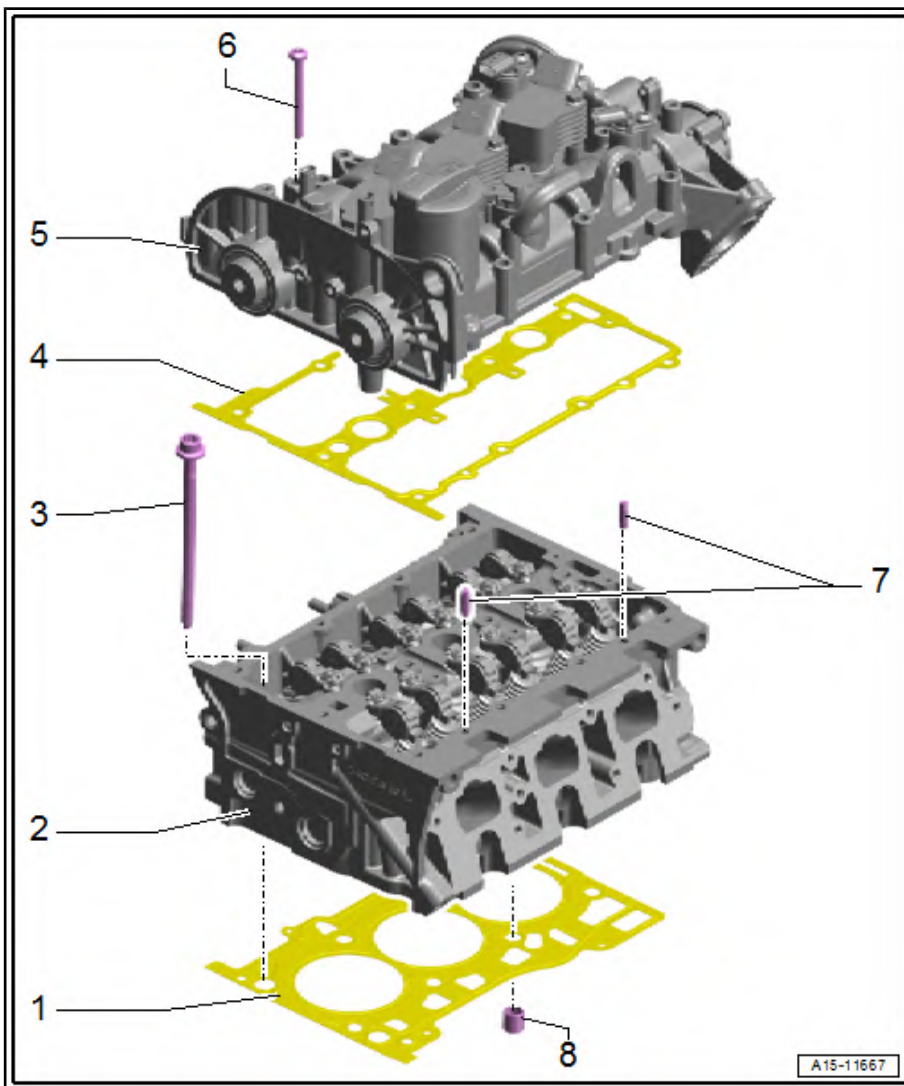
6 - Bolt

- ☐ Specified torque and tightening sequence
⇒ page 162

7 - Pins

8 - Dowel sleeve

- ☐ 2 off



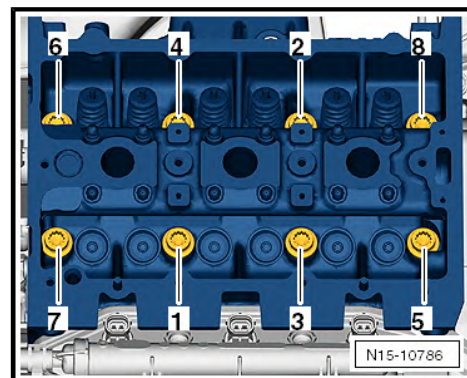
Cylinder head - specified torque and sequence



Note

The bolts that are subjected to a goniometric retightening must be replaced after being removed.

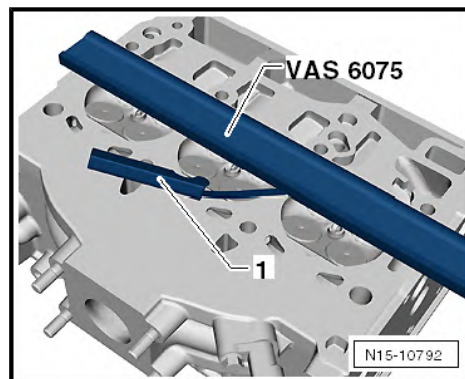
Bolt	Specified torque	Note
Stage 1	40 Nm	Renew bolts
Stage 2	Turn 90° further	with rigid spanner
Stage 3	Turn 90° further	with rigid spanner
Stage 4	Turn 90° further	with rigid spanner



– Tighten bolts in stages and in the sequence as shown:

Checking cylinder head for distortion

- Use straight edge 500 mm - VAS 6075- and feeler gauge to measure cylinder head for distortion at several points.
- Max. permissible distortion: 0.05 mm



1.2 Assembly overview - camshaft housing

1 - Seal

- ☐ Renew after removal

2 - Seal

- ☐ For inlet camshaft (pulley end)
- ☐ Renewing
⇒ ["3.3.1 Removing and installing camshaft oil seal, inlet camshaft", page 206](#)

3 - Seal

- ☐ For exhaust camshaft (pulley end)
- ☐ Renewing
⇒ ["3.3.2 Removing and installing camshaft oil seal, exhaust camshaft, pulley end", page 208](#)

4 - Camshaft case

- ☐ Removing and installing
⇒ ["1.4 Removing and installing camshaft housing", page 166](#)

5 - Bolt

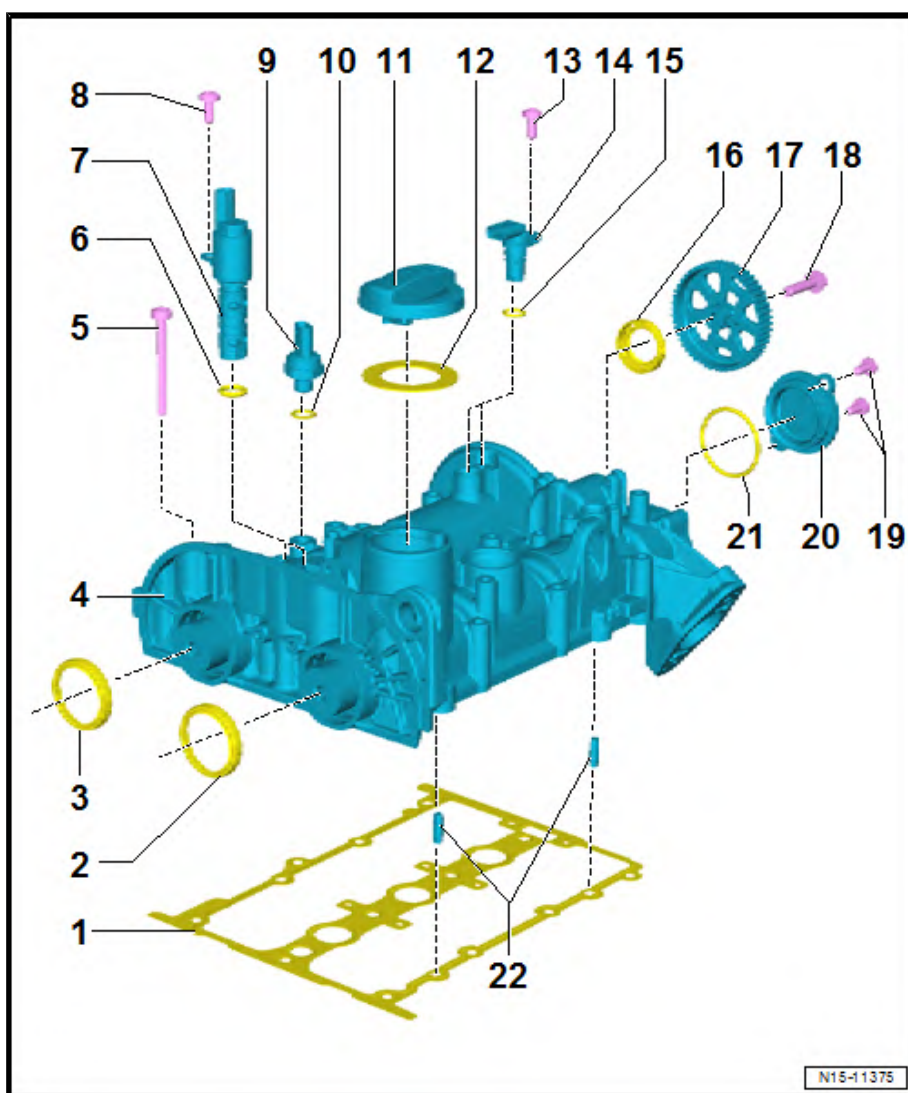
- ☐ Specified torque and tightening sequence
⇒ [page 162](#)
- ☐ Renew after removal

6 - O-ring

- ☐ Check O-ring for damage.
- ☐ O-ring not available as a separate part; renew together with camshaft control valve 1 - N205- if damaged.

7 - Camshaft adjustment valve

- ☐ Inlet side: camshaft control valve 1 - N205-
- ☐ Removing and installing
⇒ ["3.5 Removing and installing inlet camshaft control valve 1 N205 ", page 220](#)
- ☐ Exhaust side camshaft control valve 1 - N318-



- ☐ Removing and installing
⇒ [“3.6 Removing and installing exhaust camshaft control valve 1 N318”, page 221](#)

8 - Bolt

- ☐ 8 Nm

9 - Exhaust gas pressure sensor 1 - G450-

- ☐ only remove and install
- ☐ for engines with particulate filter
⇒ [“5.4 Removing and installing exhaust gas pressure sensor 1 G450”, page 410](#)
- ☐ Renew after removal
- ☐ 25 Nm

10 - Seal

- ☐ only for engines with particulate filter
- ☐ Only available in conjunction with exhaust gas pressure sensor 1 - G450-

11 - Seal

- ☐ For sealing cover

12 - Cap

13 - Hall sender

- ☐ Inlet side Hall sender - G40-
- ☐ Exhaust side Hall sender 3 - G163-
- ☐ Assembly overview ⇒ [“1.1 Assembly overview - ignition system”, page 464](#)

14 - Bolt

- ☐ 8 Nm

15 - O-ring

- ☐ Renew after removal

16 - Seal

- ☐ For exhaust camshaft, gearbox end
- ☐ Renewing
⇒ [“3.3.3 Removing and installing camshaft oil seal, exhaust camshaft, gearbox end”, page 209](#)

17 - Toothed belt pulley

- ☐ For coolant pump
- ☐ Removing and installing
⇒ [“2.7 Removing and installing toothed belt pulley for coolant pump”, page 294](#)

18 - Bolt

- ☐ Renewing
- ☐ 20 Nm +90°

19 - Cap

20 - Bolt

- ☐ 8 Nm

21 - O-ring

- ☐ Renew after removal

22 - Pins

Camshaft housing - specified torque and tightening sequence

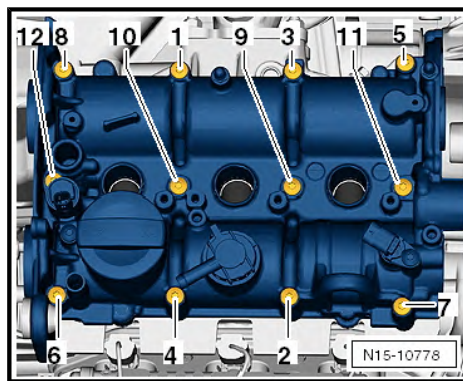


Note

The bolts (expansion bolts) that are subjected to a goniometric tightening must be replaced after being removed.

– Tighten bolts in stages and in the sequence as shown:

Component	Specified torque	Note
Bolts -1 ... 12-	10 Nm +180°	Renewing



1.3 Removing and installing cylinder head

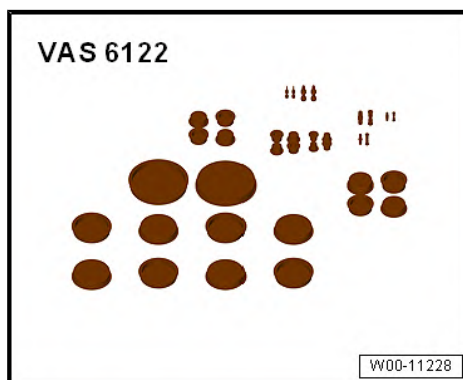
Special tools and workshop equipment required

◆ Torque wrench - V.A.G 1331-

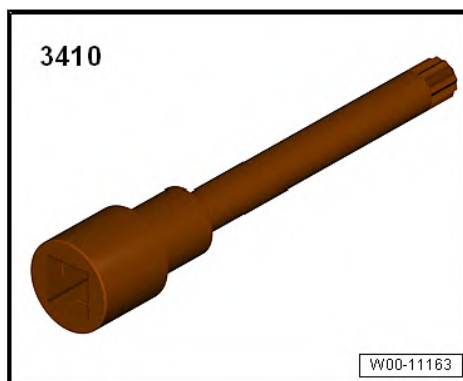


◆ Socket insert - T10545-

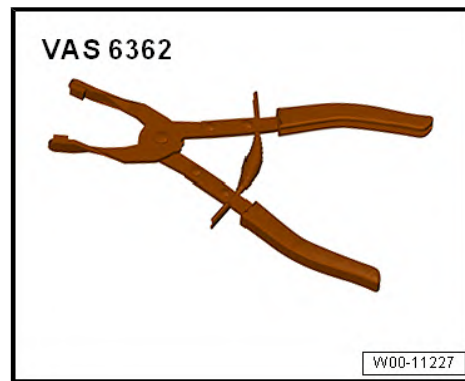
◆ Engine bung set - VAS 6122-



◆ Socket insert - 3410-



- ◆ Hose clip pliers - VAS 6362-

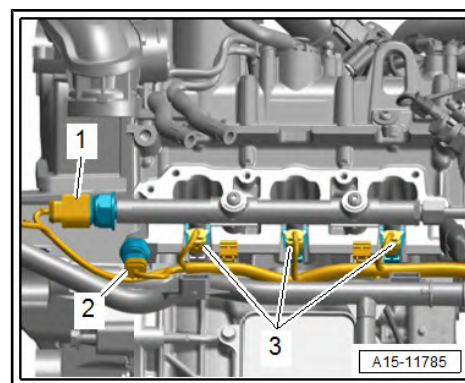


Removing



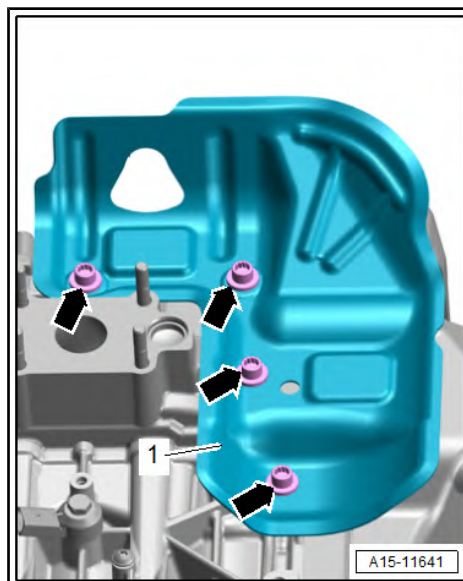
Note

- ◆ Seal open channels of intake and exhaust system with suitable plugs from engine bung set - VAS 6122- .
- ◆ Cover the openings in the gearbox with a cloth to prevent any coolant or other liquids from getting into the clutch housing.
- ◆ Fit the cable ties in the original position when installing.
- ◆ Attach all heat-shielding sleeves in the same places when installing.

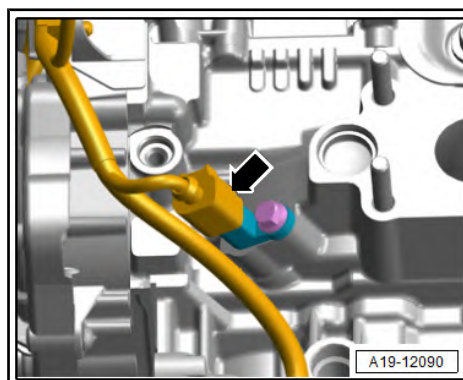


- Remove camshaft housing
⇒ ["1.4 Removing and installing camshaft housing", page 166](#) .
- Remove intake manifold
⇒ ["4.2 Removing and installing intake manifold", page 400](#) .
- Remove turbocharger
⇒ ["1.2 Removing and installing turbocharger", page 353](#) .
- Disconnect connectors:
 - 1 - On fuel pressure sender - G247-
 - 2 - On oil pressure sender - G10-
 - 3 - At injectors -N30- , -N31- and -N32-

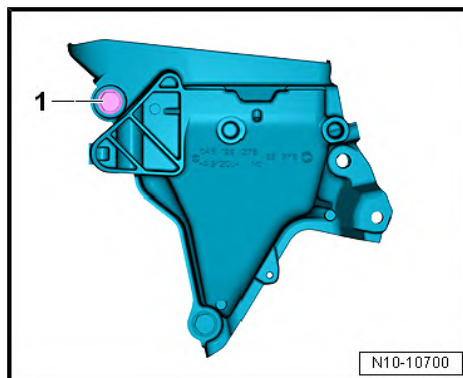
- Unscrew bolts -arrows- and remove heat shield -1-.



- Remove heat-shield sleeve
- Disconnect connector -arrow- for coolant temperature sender - G62- .



- Unscrew bolt -1- from engine support.



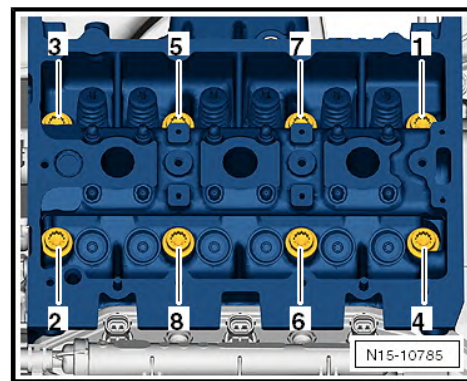
- Loosen cylinder head bolts in the sequence -1 ... 8-, and unscrew them.
- Take off cylinder head and set it down on a soft surface (foam plastic).

Installing

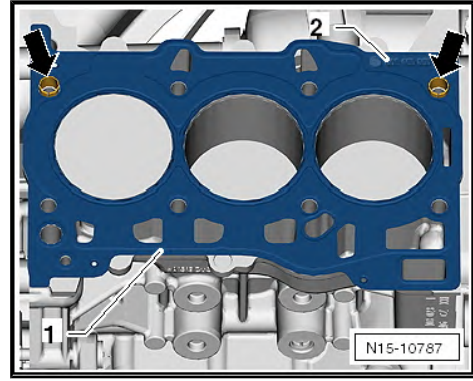


Note

- ◆ *Risk of damage to sealing surfaces.*
- ◆ *Carefully remove sealant residue from cylinder head and cylinder block.*
- ◆ *Ensure that no long scores or scratches are made on the surfaces, while doing so.*
- ◆ *Risk of damage to cylinder block.*
- ◆ *No oil or coolant must be allowed to remain in the blind holes for the cylinder head bolts in the cylinder block.*
- ◆ *Risk of leaks in cylinder head gasket.*
- ◆ *Carefully remove remains of emery and abrasives.*
- ◆ *Do not remove new cylinder head gasket from packaging until it is ready to be fitted.*
- ◆ *Handle the cylinder head gasket very carefully to prevent damage to the silicone coating or the indented area of the gasket.*
- ◆ *If a further tightening angle is specified for certain bolts, these must be renewed.*
- ◆ *Renew self-locking nuts, seals, gaskets and O-rings.*
- ◆ *When installing a replacement cylinder head, the contact surfaces between hydraulic compensation elements, roller rocker fingers and running surface of cams must be oiled before installing the camshaft housing.*
- ◆ *Secure all hose connections with hose clips according to production standard ⇒ Electronic Parts Catalogue .*
- ◆ *After fitting a new cylinder head or cylinder head gasket, change the coolant and engine oil.*



- Fit cylinder head gasket -1-.
- ◆ Pay attention to dowel sleeves -arrows- in cylinder block.
- ◆ Note the installation position of cylinder head gasket. Identification: part No. -2- should be legible from inlet side.
- If crankshaft has been rotated in the meantime: set No. 1 cylinder piston to top dead centre and then turn crankshaft back slightly.
- Fit cylinder head.
- Insert and cylinder head bolts and tighten hand-tight.
- Tighten bolts for cylinder head cover ⇒ [page 159](#) .



Note

After repair work it is not necessary to retighten the cylinder head bolts.

Carry out the remaining installation in reverse sequence, noting the following:

- Install turbocharger.
⇒ [“1.2 Removing and installing turbocharger”, page 353](#)
- Install camshaft housing
⇒ [“1.4 Removing and installing camshaft housing”, page 166](#) .
- Electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Change engine oil ⇒ [“1.2 Engine oil:”, page 237](#) .

- Fill cooling system with fresh coolant
⇒ [“1.3 Draining and adding coolant”, page 260](#) .

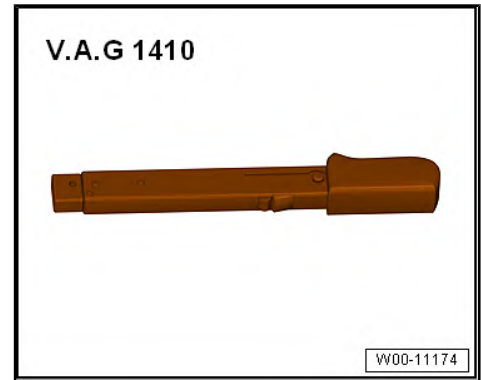
Specified torques

- ◆ ⇒ [“2.1 Assembly overview - assembly mountings”, page 67](#)
- ◆ ⇒ [“1.1 Assembly overview - cylinder head”, page 158](#)
- ◆ ⇒ [“1.1 Assembly overview - turbocharger”, page 351](#)
- ◆ ⇒ [“4.1 Assembly overview - intake manifold”, page 399](#)

1.4 Removing and installing camshaft housing

Special tools and workshop equipment required

- ◆ Torque wrench - VAG 1410-



i Note

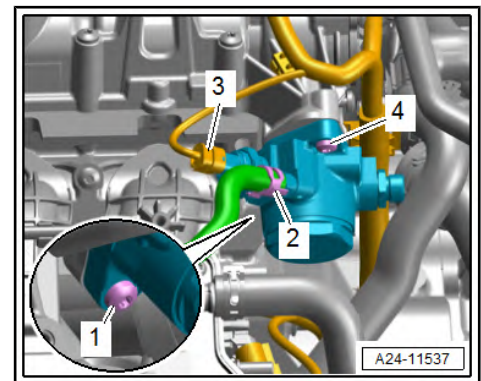
- ◆ *The camshafts cannot be removed.*
- ◆ *If repair is required, the camshaft housing and the camshafts need to be renewed as a complete unit.*

Removing

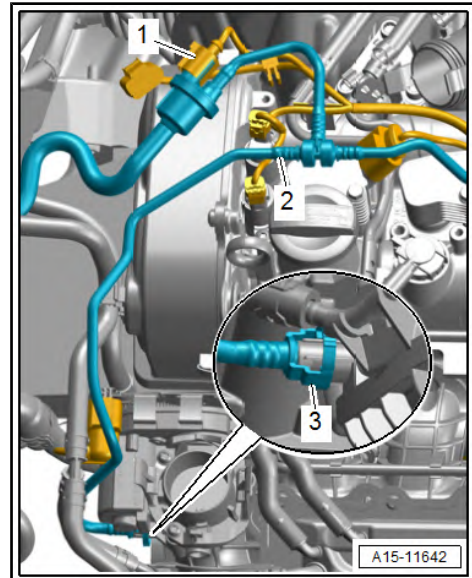
- Remove coolant pump
⇒ ["2.5 Removing and installing coolant pump", page 286](#) .
- Remove ignition coils
⇒ ["1.2 Removing and installing ignition coils with output stage", page 465](#) .
- Remove toothed belt from camshafts
⇒ ["2.7 Removing toothed belt from camshaft", page 198](#) .
- Remove high-pressure pipe
⇒ ["7.3 Removing and installing high-pressure pipe", page 427](#) .
- Disconnect connector -3-.
- Release hose clip -2- and disconnect hose.

i Note

-Items 1, 4- can be disregarded.

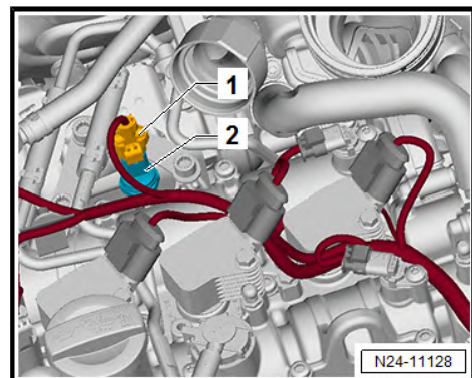


- Unplug electrical connector -1- at activated charcoal filter system solenoid valve 1 - N80- .
- Remove line -2- for activated charcoal filter system. To do this, press release button -3- on both sides.
- Push line -2- for activated charcoal filter system to right.



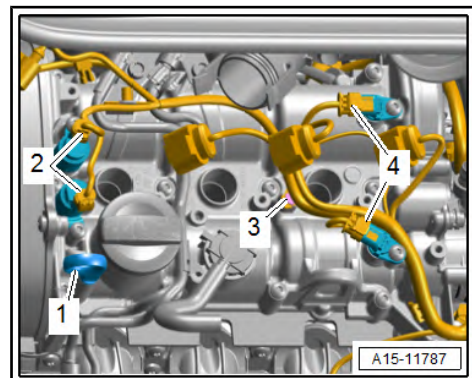
For vehicles with particulate filter

- Disconnect connector -1- from exhaust gas pressure sensor 1 - G450- -2-.



Continued for all vehicles

- Separate connectors:
 - ◆ -2- for camshaft control valve 1 - N205- / for exhaust camshaft control valve 1 - N318-
 - ◆ -4- for Hall sender - G40- / Hall sender 3 - G163-
- Unscrew bolt -3-, move wiring harness clear, and place it to left side.
- Pull out dipstick -1-.
- Remove bolts -arrows-.

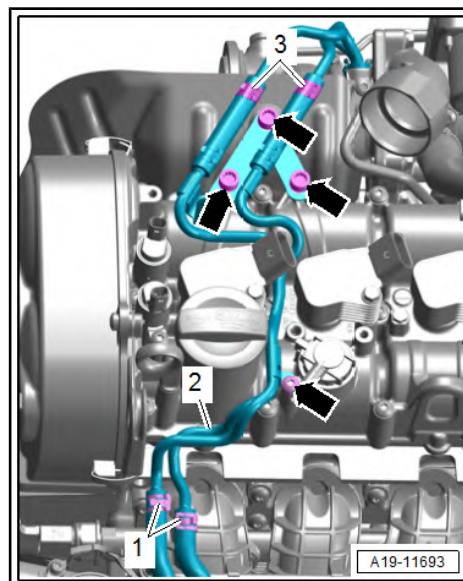


- Loosen the hose clips -3-, remove the coolant hoses.
- Swivel coolant lines -2- towards front.



Note

Item -1- does not need to be opened.



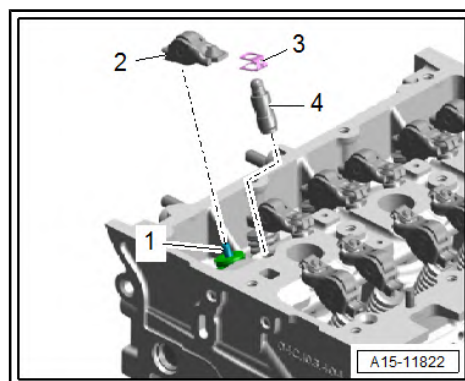
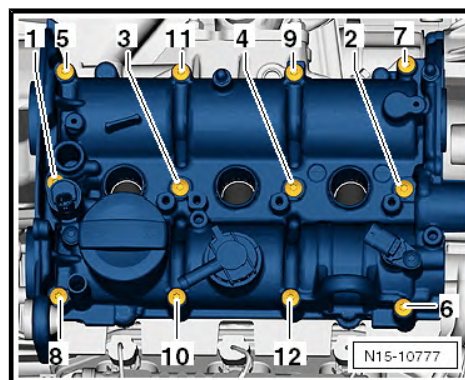
- Loosen bolts for camshaft housing in the sequence -1 to 12- and unscrew.
- Lift camshaft housing vertically off cylinder head.
- Remove seal.
- Mark allocation of roller rocker fingers and compensation elements for reinstallation.
- Remove roller rocker fingers together with compensation elements and place them on a clean surface.

Installing



Note

- ◆ *If a further tightening angle is specified for certain bolts, these must be renewed.*
- ◆ *Renew seal and O-ring after removal.*
- Check if all roller rocker fingers -2- are seated properly on end of valve stem -1- and if they are secured properly to the corresponding compensation elements -4- by means of securing clip -3-.
- Remove any oil and grease from sealing surfaces.

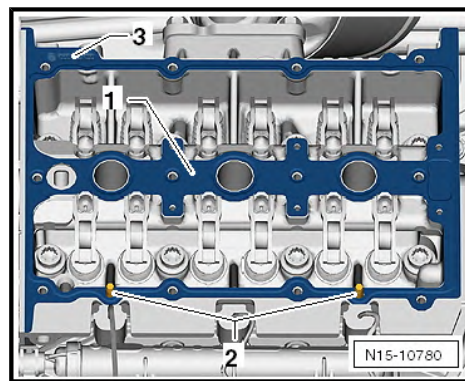


- Fit new gasket -1- onto dowel pins -2-.
- Part number -3- of gasket must be readable from above.
- Check »TDC« position of camshafts and crankshaft
⇒ ["4.7 Setting piston to TDC position", page 155](#) .



Note

- ◆ *Risk of roller rocker fingers slipping off valve stem ends and compensation elements.*
- ◆ *Slowly fit camshaft housing vertically from above onto cylinder head.*
- Fit camshaft housing onto dowel pins -arrows-.



Note

Note different bolt lengths.

- Tighten bolts for camshaft housing using the torque wrench - VAG 1410- . ⇒ [page 162](#)

Further assembly is carried out in the reverse order, note the following:

- Install high-pressure pipe
⇒ ["7.3 Removing and installing high-pressure pipe", page 427](#) .
- Install notched belt (adjusting valve timing)
⇒ ["2.6 Adjusting valve timing", page 189](#) .
- Install coolant pump
⇒ ["2.5 Removing and installing coolant pump", page 286](#) .
- Install ignition coils
⇒ ["1.2 Removing and installing ignition coils with output stage", page 465](#) .
- Electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Specified torques

- ◆ ⇒ ["3.1 Assembly overview - valve gear", page 204](#)
- ◆ ⇒ ["1.1 Assembly overview - turbocharger", page 351](#)
- ◆ ⇒ ["3.1 Assembly overview - air filter housing", page 393](#)
- ◆ ⇒ ["3.1 Assembly overview - coolant pipes", page 302](#)

1.5 Checking compression

Special tools and workshop equipment required

- ◆ Spark plug socket - 3122 B-



- ◆ Compression tester - V.A.G 1763-



Procedure

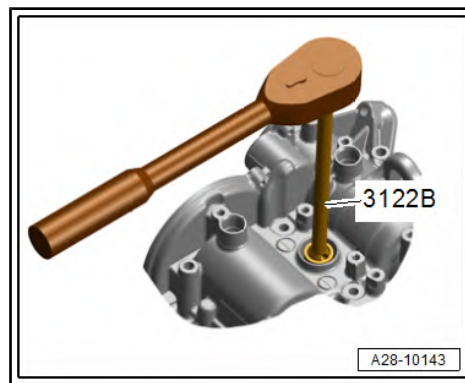
- Engine oil temperature at least 30 °C.
- Battery voltage: at least 12.5 V
- Remove ignition coils
⇒ [“1.2 Removing and installing ignition coils with output stage”](#),
[page 465](#) .
- Unscrew spark plugs using spark plug socket and extension - 3122 B- .
- Remove fuse for injectors. Fuse assignment ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Check compression with the compression tester - V.A.G 1763- ; Refer to the ⇒ operating instructions on how to operate the device.
- Have a second mechanic press down accelerator pedal completely and simultaneously operate starter until the tester no longer displays a pressure increase.
- Repeat procedure on each cylinder.

Compression pressures	bar
New	10.0 ... 15.0
Wear limits	7.0
Maximum difference between cylinders	3.0

Installing

Installation is carried out in the reverse order. When installing, note the following:

- Install spark plugs ⇒ [Item 1 \(page 464\)](#) .
- Install ignition coils
⇒ [“1.2 Removing and installing ignition coils with output stage”](#),
[page 465](#) .
- Clear any entries in event memory which may have been stored when checking ⇒ Vehicle diagnostic tester, Read event memory, then Generate readiness code.



2 Toothed belt drive

⇒ [“2.1 Assembly overview - toothed belt cover”, page 173](#)

⇒ [“2.2 Assembly overview - toothed belt”, page 174](#)

⇒ [“2.3 Removing and installing toothed belt”, page 176](#)

⇒ [“2.4 Preassembling and installing test tool VAS 611 007”, page 180](#)

⇒ [“2.5 Checking valve timing”, page 187](#)

⇒ [“2.6 Adjusting valve timing”, page 189](#)

⇒ [“2.7 Removing toothed belt from camshaft”, page 198](#)

⇒ [“2.8 Removing and installing tensioning roller”, page 203](#)

2.1 Assembly overview - toothed belt cover

1 - Lower toothed belt guard

2 - Bolt

□ 8 Nm

3 - Engine support

□ Specified torque and
tightening sequence
⇒ [page 69](#)

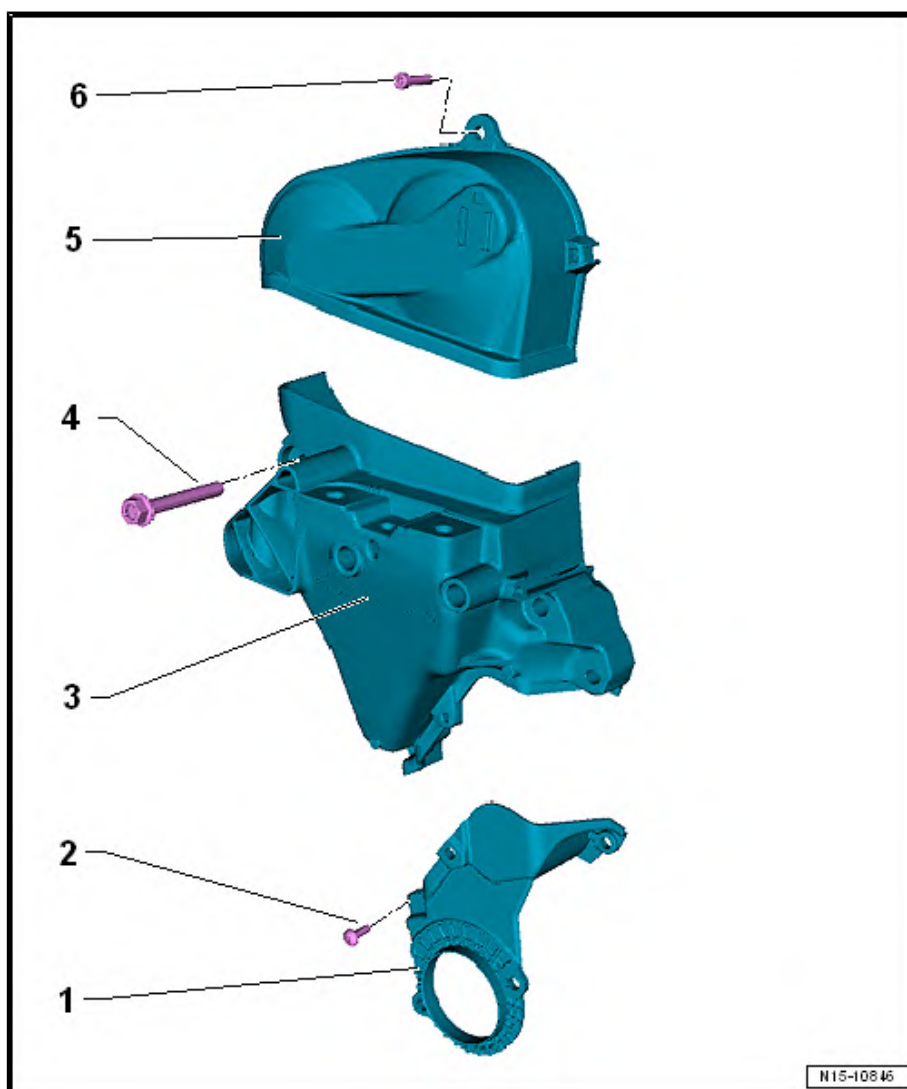
4 - Bolt

□ Specified torque and
tightening sequence
⇒ [page 69](#)

5 - Upper toothed belt guard

6 - Bolt

□ 8 Nm



2.2 Assembly overview - toothed belt

1 - Toothed belt

- ☐ Do not bend toothed belt further than the specified bend radius
⇒ [Fig. "Bend radius of toothed belt", page 203](#)
- ☐ Before removing, mark direction of rotation with chalk or felt-tipped marker pen.
- ☐ Check for wear
- ☐ Removing
⇒ ["2.3 Removing and installing toothed belt", page 176](#)
- ☐ Detaching from camshaft
⇒ ["2.7 Removing toothed belt from camshaft", page 198](#)
- ☐ Installing (adjusting valve timing)
⇒ ["2.6 Adjusting valve timing", page 189](#)

2 - Bolt

- ☐ 25 Nm
- ☐ When setting the specified torque on the torque wrench - VAS 6583- , the length indicated on the insert tool - T10500- must be entered in the torque wrench.

3 - Tensioning pulley

- ☐ Removing and installing
⇒ [page 203](#)

4 - Bolt

- ☐ Renew after removal
- ☐ 8 Nm +45°

5 - Cap

6 - O-ring

- ☐ Renew after removal

7 - Bolt

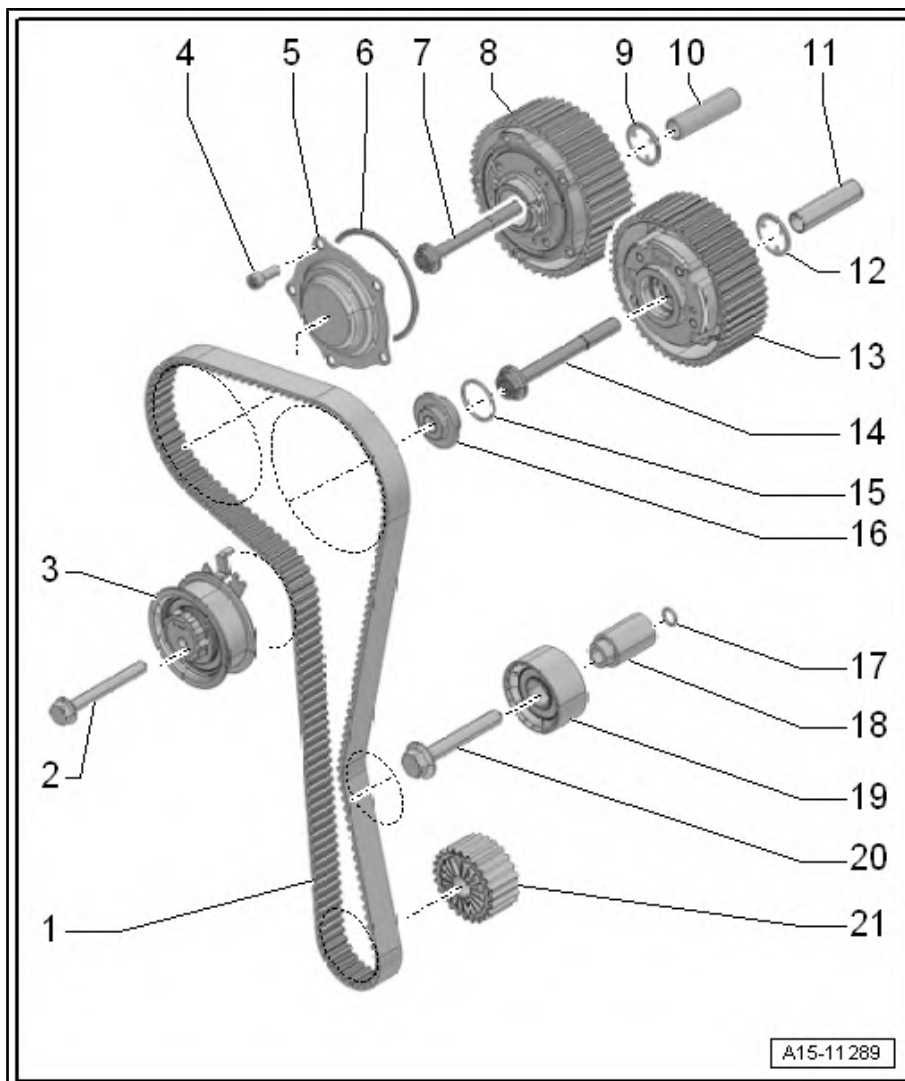
- ☐ Renew after removal
- ☐ 50 Nm +135°

8 - Exhaust camshaft toothed belt pulley

- ☐ With camshaft adjuster
- ☐ Removing and installing ⇒ [page 211](#)

9 - Diamond disk

- ☐ Renew after removal



Volkswagen Technical Site: <http://vwts.ru> <http://vwts.info>

10 - Guide bush

11 - Guide bush

12 - Diamond disk

- ☐ Renew after removal

13 - Inlet camshaft toothed belt pulley

- ☐ With camshaft adjuster
- ☐ Removing and installing ⇒ [page 211](#)

14 - Bolt

- ☐ Renew after removal
- ☐ 50 Nm +135°

15 - O-ring

- ☐ Renew after removal

16 - Plug

- ☐ 20 Nm

17 - O-ring

- ☐ Locking device, contained within the scope of delivery ⇒ [Item 19 \(page 175\)](#)
- ☐ Renew after removal

18 - Spacer sleeve

- ☐ Supplied with item "19".

19 - Idler roller

20 - Bolt

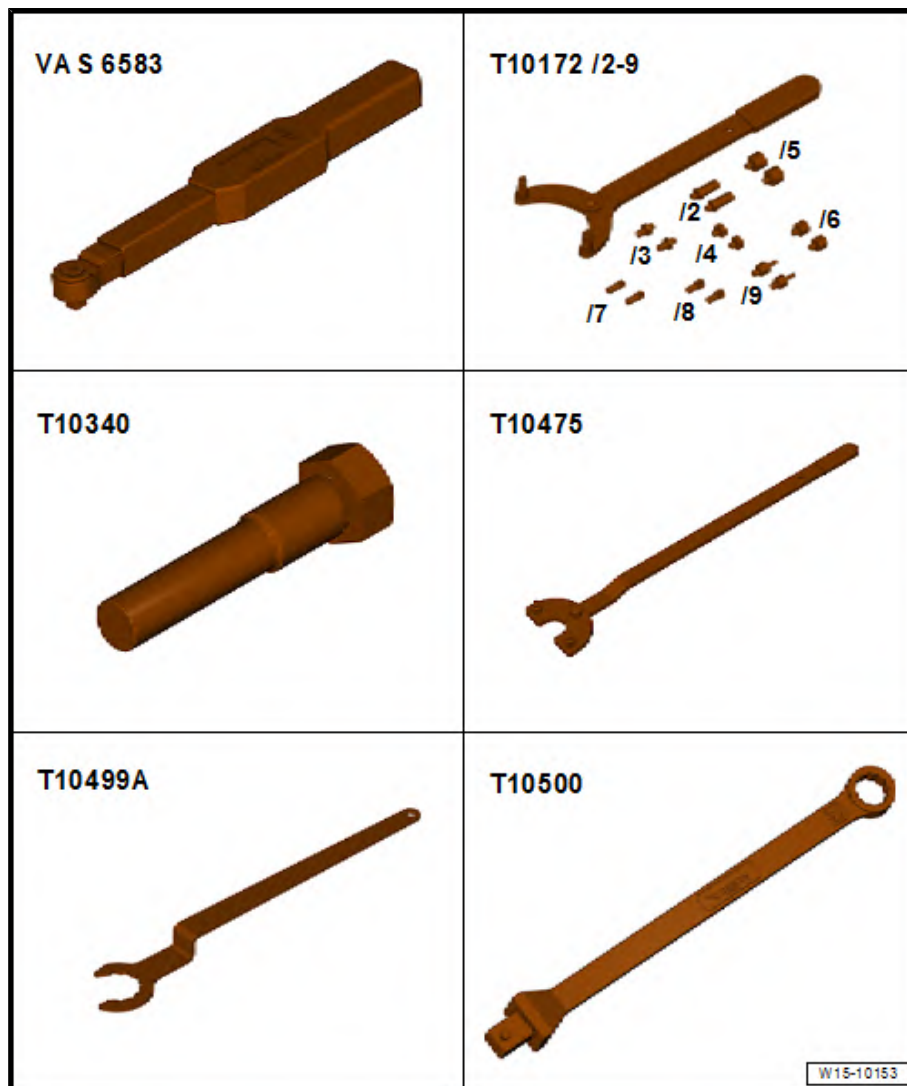
- ☐ 40 Nm

21 - Crankshaft toothed belt pulley

- ☐ Contact surface between toothed belt pulley and crankshaft must be free from oil
- ☐ Fitting possible in one position only.

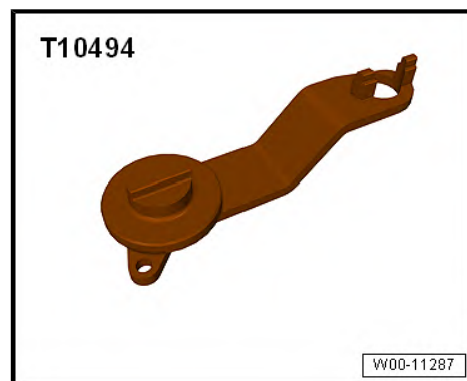
2.3 Removing and installing toothed belt

Special tools and workshop equipment required



- ◆ Torque wrench - VAS 6583-
- ◆ Securing bolt - T10340-
- ◆ Counter-hold tool - T10475-
- ◆ Special wrench, 30 mm - T10499A-
- ◆ Open end spanner insert, AF 13 - T10500-

- ◆ Camshaft clamp - T10494-



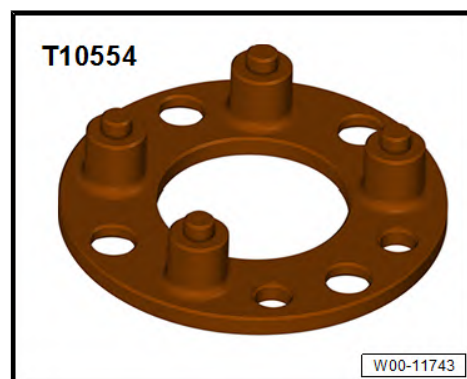
- ◆ Assembly tool - T10476A-



- ◆ Counterhold - T10172A- with adapter -T10172/2-



- ◆ Counter-hold tool - T10554-



◆ Torx screw insert T 30 - T10405-

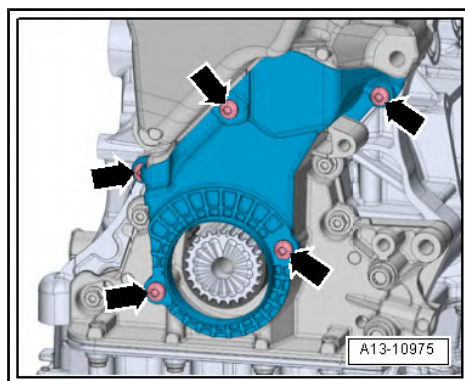
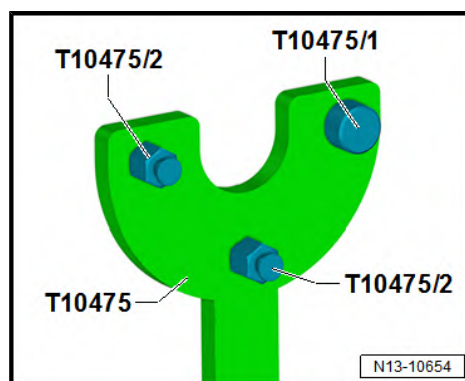


Convert counter-hold tool - T10475- :

- Convert counter-hold tool - T10475- with adapter - T10475/1- and adapters - T10475/2- as shown in illustration.

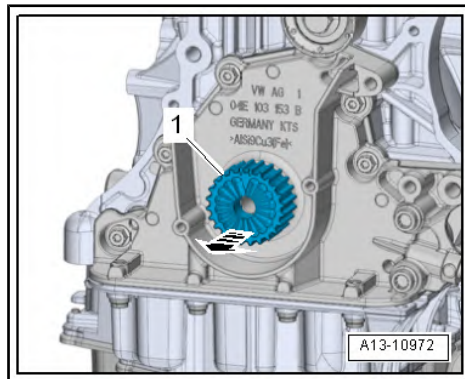
Removing

- Mark direction of rotation of toothed belt with coloured felt tip marker pen.
- When loosening and tightening the securing bolts, the camshaft sprockets must in any case be secured with the counter-hold tool - T10172A- .
- The camshaft clamp - T10494- must not be subjected to load when camshaft pulleys are being tightened.
- Detach toothed belt from camshaft
⇒ [“2.7 Removing toothed belt from camshaft”, page 198](#) .
- Remove vibration damper
⇒ [“1.4 Removing and installing vibration damper”, page 118](#) .
- Unscrew bolts -arrows-, and remove lower toothed belt guard.



- Detach crankshaft pulley -1- -arrow-.

Installing

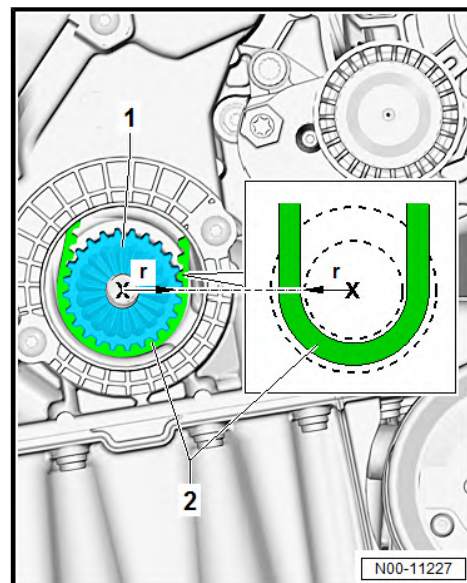


Bend radius of toothed belt

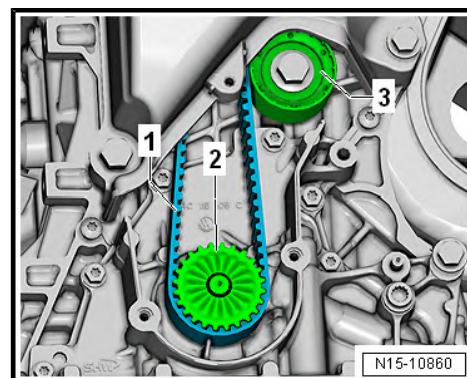
! NOTICE

Risk of damage to toothed belt by bending it excessively. The toothed belt is made of glass fibre fabric which will be damaged if it is bent excessively.

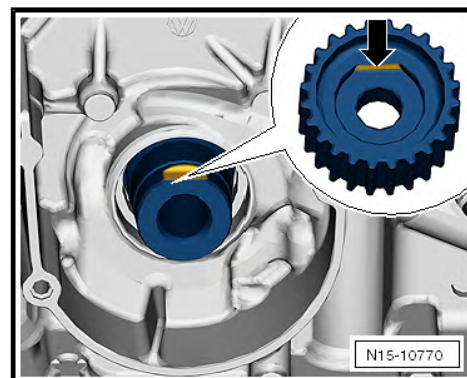
- Never bend toothed belt to a radius less than $r = 25$ mm.



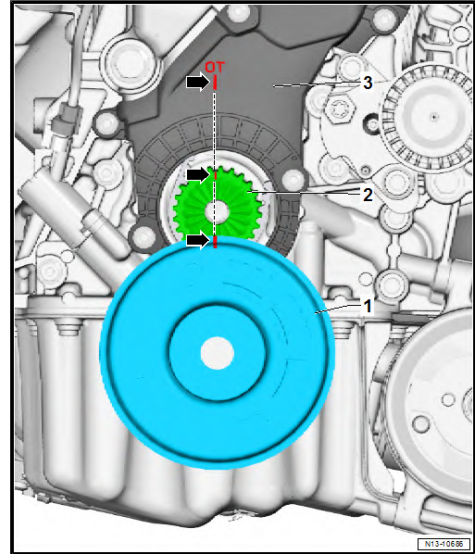
- Fit toothed belt -1- together with crankshaft pulley -2- onto crankshaft journal.



- Fit crankshaft sprocket onto crankshaft.



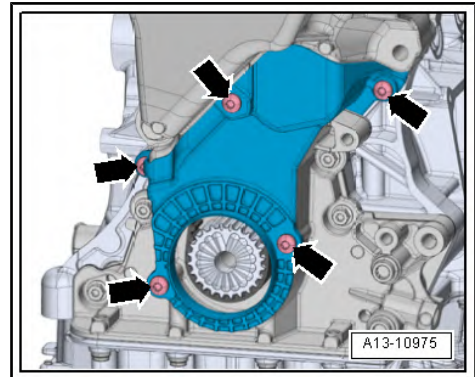
- Contact surface between poly V-belt pulley and crankshaft sprocket must be free of oil and grease.
- The machined surface -arrow- of crankshaft pulley must be positioned over the machined surface of the crankshaft journal.
- Check the position of the crankshaft before fitting the vibration damper -1-.
- The marking on the crankshaft pulley -2- must be properly aligned with the »TDC marking« on the lower toothed belt guard -3-.
- Fit toothed belt on crankshaft pulley.
- Pull toothed belt upwards through engine support.



- Install toothed belt cover (bottom section) -arrows-.
- Install vibration damper
⇒ ["1.4 Removing and installing vibration damper", page 118](#).
- Adjust valve timing ⇒ ["2.6 Adjusting valve timing", page 189](#).

Specified torques

- ◆ Crankshaft pulley centre bolt - vibration damper
⇒ ["1.1 Assembly overview - poly V-belt drive", page 109](#)
- ◆ Securing bolts for toothed belt guard
⇒ ["2.1 Assembly overview - toothed belt cover", page 173](#)



2.4 Preassembling and installing test tool - VAS 611 007-

⇒ ["2.4.1 Preassembling test tool VAS 611 007", page 180](#)

⇒ ["2.4.2 Installing test tool VAS 611 007", page 183](#)

⇒ ["2.4.3 Teaching in test tool VAS 611 007 electronically and performing basic setting", page 185](#)

2.4.1 Preassembling test tool - VAS 611 007-

Special tools and workshop equipment required

- ◆ Test tool - VAS 611 007-



Procedure

Test tool - VAS 611 007-

A - Angle sensor - VAS 611 007/1-

- ☐ Specified torque brake:
11 Nm

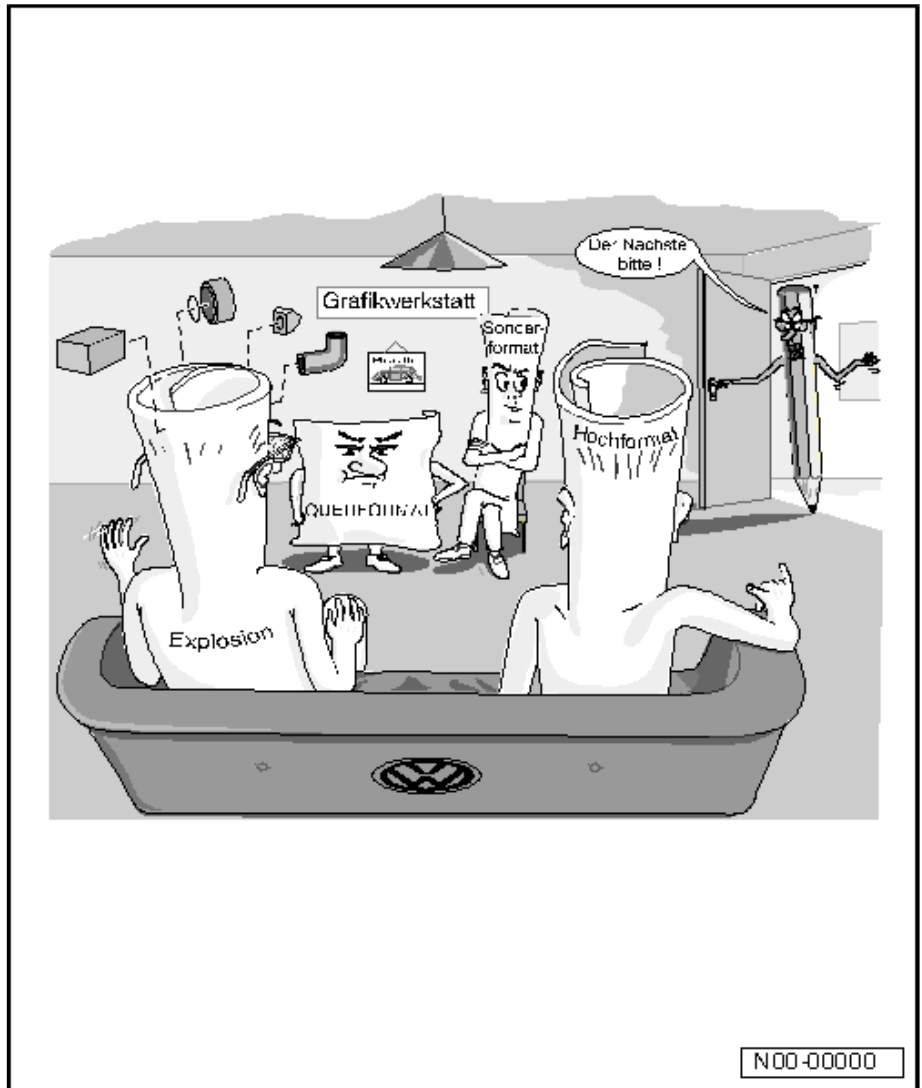
B - Lock ring - VAS 611 007/2-

C - Clamping ring - VAS 611 007/3-

D - Adapter for camshaft housing - VAS 611 007/8-

E - Adapter for angle sensor - VAS 611 007/9- and adapter for angle sensor - VAS 611 007/10-

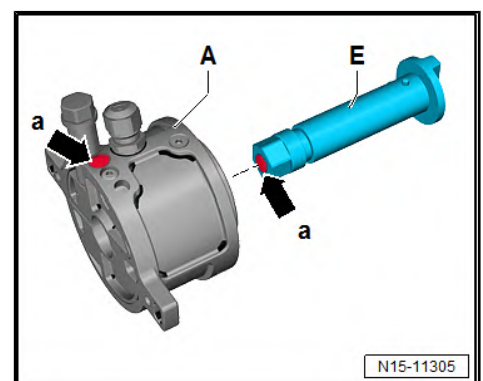
- ☐ Adapter for angle sensor - VAS 611 007/9- blue
- ☐ Adapter for angle sensor - VAS 611 007/10- red



N00-00000

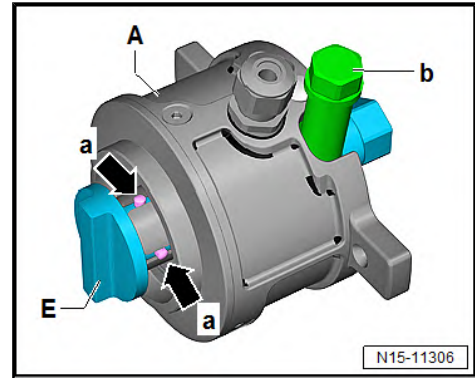
Preassembling test tool - VAS 611 007-

- Before inserting adapter for angle sensor - VAS 611 007/9- and adapter for angle sensor - VAS 611 007/10- -E- in angle sensor - VAS 611 007/1- -A-, verify correct allocation in accordance with colour coding -a-.
- Insert adapter for angle sensor - VAS 611 007/9- and adapter for angle sensor - VAS 611 007/10- -E- in angle sensor - VAS 611 007/1- -A-.

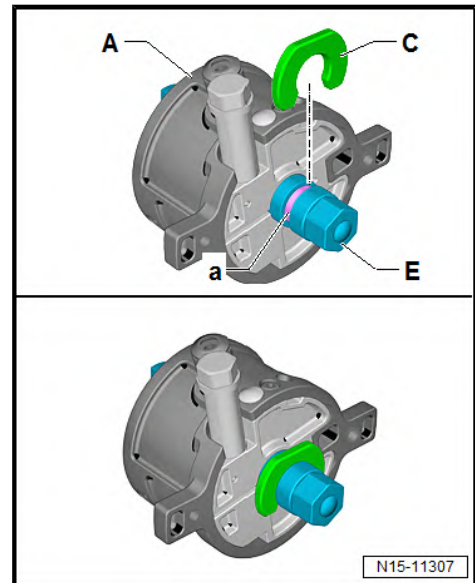


N15-11305

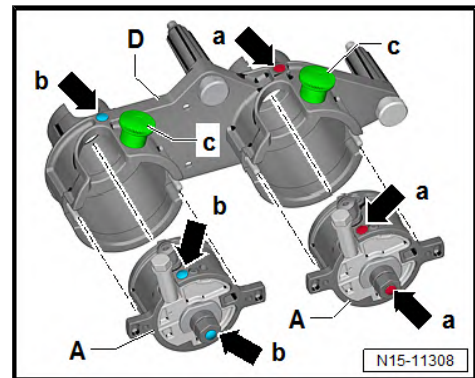
- Note position of dowel pins -a- when installing.
- Adapter for angle sensor - VAS 611 007/9- and adapter for angle sensor - VAS 611 007/10- -E- only fit in one position.
- Make sure that brake -b- is released. Do not apply force.
- Insert adapter for angle sensor - VAS 611 007/9- and adapter for angle sensor - VAS 611 007/10- -E- as far as stop in angle sensor - VAS 611 007/1- -A-.



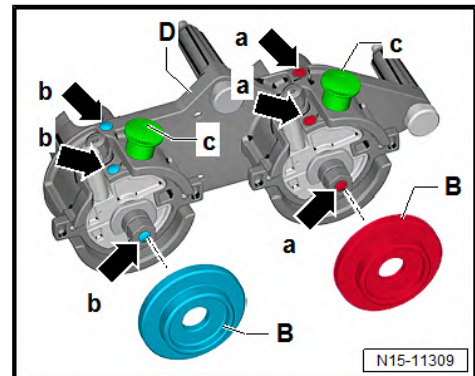
- Secure clamping ring - VAS 611 007/3- -C- in groove -a- from adapter for angle sensor - VAS 611 007/9- and adapter for angle sensor - VAS 611 007/10- -E-.



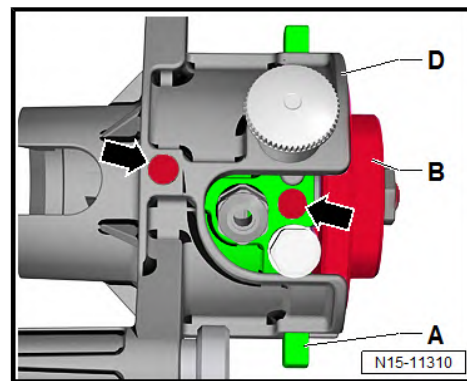
- Insert angle sensor - VAS 611 007/1- -A- with red colour coding on side marked red -arrows a- of adapter for camshaft housing - VAS 611 007/8- -D-. To do this, release locking pins -c- by pulling them upwards.
- Insert angle sensor - VAS 611 007/1- -A-, and push it in until locking pin can be heard to engage.
- Repeat procedure with angle sensor - VAS 611 007/1- -A- with blue colour coding -arrows b-.



- Screw in locking ring - VAS 611 007/2- red and blue -B- approx. 2 turns. Note colour coding -arrows a- and -arrows b- when doing this.



- Screw in lock ring - VAS 611 007/2- -B- max. 2 turns by hand.
- Make sure that the shaft is free to move.
- Adapter for angle sensor - VAS 611 007/9- and adapter for angle sensor - VAS 611 007/10- should turn easily.



2.4.2 Installing test tool - VAS 611 007-

Special tools and workshop equipment required

- ◆ Test tool - VAS 611 007-



Procedure

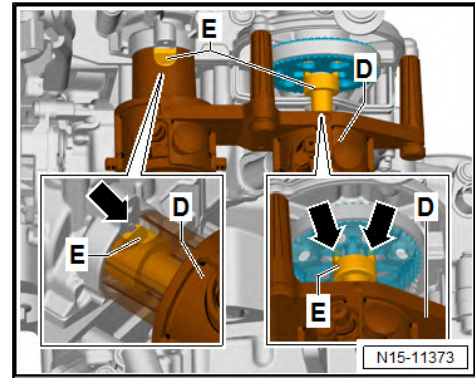
- Preassemble test tool - VAS 611 007-
⇒ [“2.4.1 Preassembling test tool VAS 611 007 ”, page 180](#) .
- Teach-in test tool - VAS 611 007- electronically and perform basic setting ⇒ [page 185](#)
- Turn adapter for angle sensor - VAS 611 007/9- and adapter for angle sensor - VAS 611 007/10- until display is set to approx. 0°.
- Perform the preliminary work for checking the valve timing
⇒ [“2.5 Checking valve timing”, page 187](#) .
- Make sure that the piston in cylinder no. 1 is at TDC position
⇒ [“4.7 Setting piston to TDC position”, page 155](#) .
- Make sure that brakes on angle sensor - VAS 611 007/1- are released on both sides ⇒ [page 182](#) .



Note

Before positioning the test tool - VAS 611 007- against the camshaft housing, the grooves of the camshafts must be checked for damage.

- Align adapter for angle sensor -E- by hand with grooves of camshafts -arrows-.
- Check proper alignment through recess, and adapt position by turning.

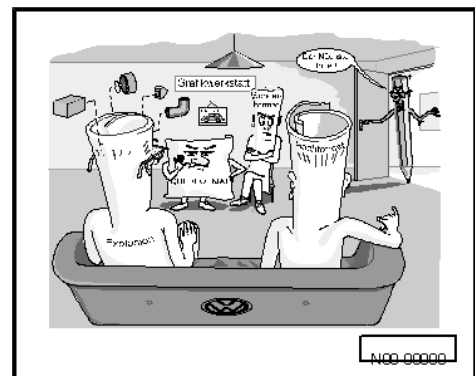
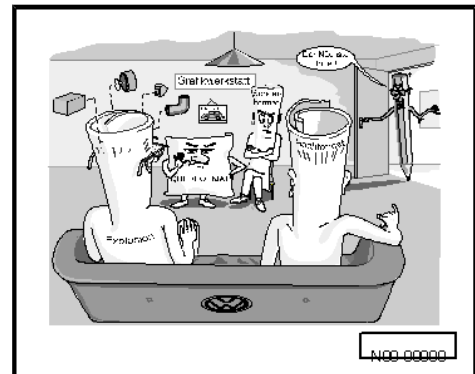


- Fit adapter for camshaft housing - VAS 611 007/8- -D- to camshaft housing, and slide it on.
- Tighten knurled screws -arrows a- alternately by hand.
- Make sure that adapter for camshaft housing - VAS 611 007/8- -D- is properly seated.



Note

- ♦ *If the adapter for camshaft housing - VAS 611 007/8- -D- hits against the housing of the coolant pump, the basic setting is incorrect.*
- ♦ *Correcting the setting or valve timing is not possible in this case.*
- ♦ *The coolant pump must be removed and reset.*
⇒ ["2.5 Removing and installing coolant pump", page 286](#)
- Test tool - VAS 611 007- must rest flush against camshaft housing.
- Make sure that brakes on angle sensor - VAS 611 007/1- are released on both sides ⇒ [page 182](#) .
- Tighten locking ring - VAS 611 007/2- -B- on both sides evenly by hand. When doing this, ensure that camshaft housing adapter - VAS 611 007/8- -D- always lies flat against camshaft housing -1-.

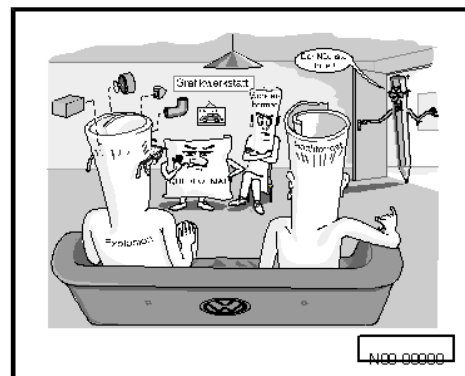


- Camshaft housing adapter - VAS 611 007/8- -D- should not lift off of camshaft housing -1-.

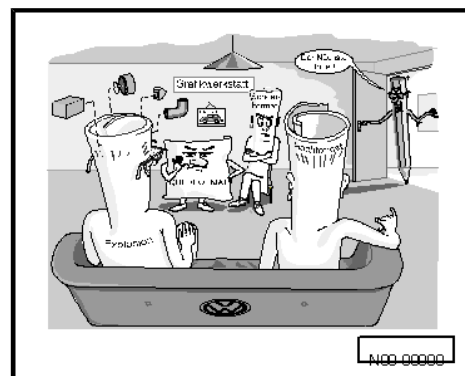


Note

The correct preload is achieved when the camshaft housing adapter - VAS 611 007/8- lies flat -a- against the camshaft housing.



- Make sure that brakes -a- are released on both sides.



2.4.3 Teaching in test tool - VAS 611 007- electronically and performing basic setting

Special tools and workshop equipment required

- ◆ Test tool - VAS 611 007-

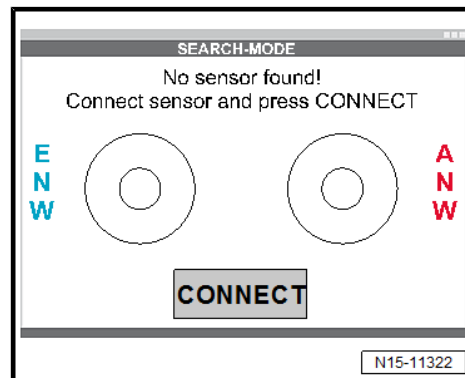


Procedure

- Connect electronic measuring equipment of test tool - VAS 611 007- ⇒ Operating manual .
- Perform software installation of test tool - VAS 611 007- ⇒ Operating manual .
- Start test program ⇒ Operating manual .

If angle sensors are not connected, message shown in illustration is displayed.

- Connect test tool - VAS 611 007- , and press **CONNECT**.



If test tool - VAS 611 007- is connected, display is as shown:

ANW - Exhaust camshaft, red

ENW - Inlet camshaft, blue

- Turn adapter for angle sensor - VAS 611 007/10- red -E- for exhaust camshaft.

If OK is displayed, exhaust camshaft has been taught-in.

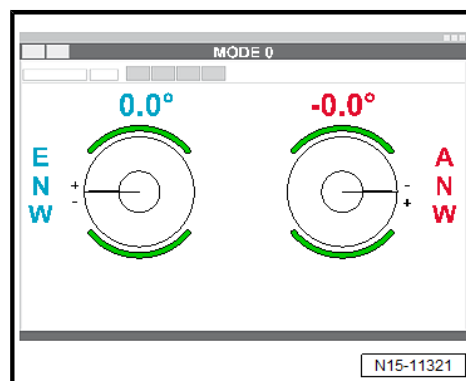
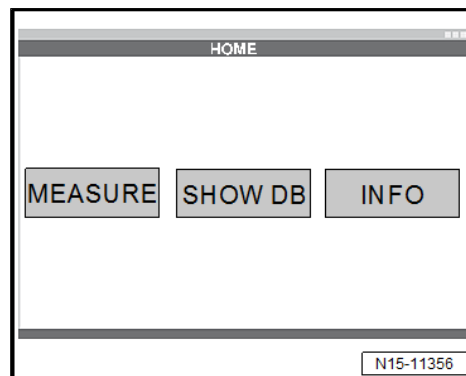
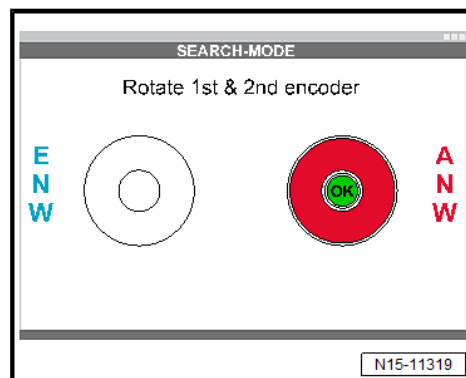
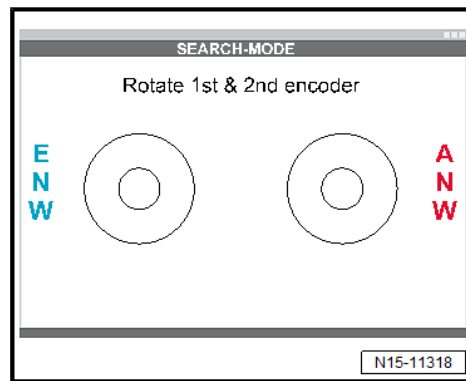
- Turn adapter for angle sensor - VAS 611 007/9- blue -E- for intake camshaft.

If display is as shown in illustration, exhaust camshaft has been taught-in.

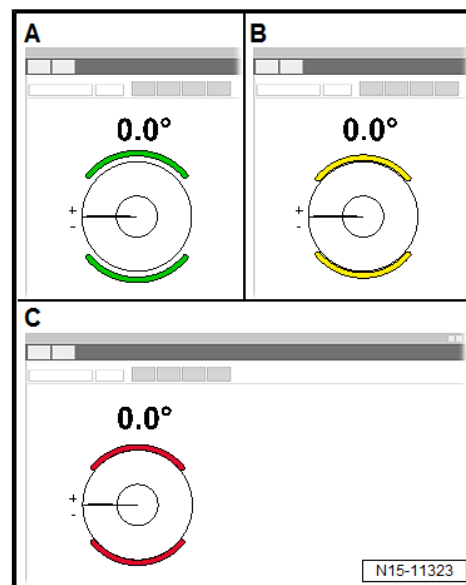
- Select function **MEASURE**.

If angle display is as follows:

- Check valve timing
⇒ [“2.5 Checking valve timing”, page 187](#) .



- Make sure that brake indicator on display is green.
 - It must not be yellow or red.
- A - Green, brake is released
- B - Yellow, brake is applied
- C - Red, brake has been tightened to torque



2.5 Checking valve timing

Special tools and workshop equipment required

- ◆ Test tool - VAS 611 007-

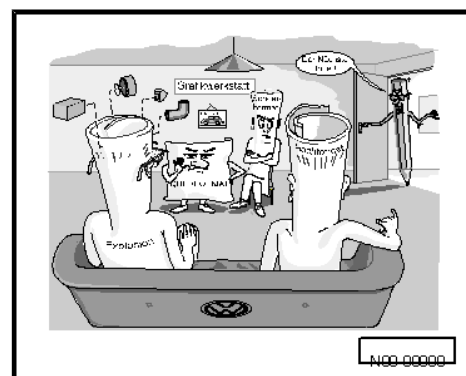


Procedure

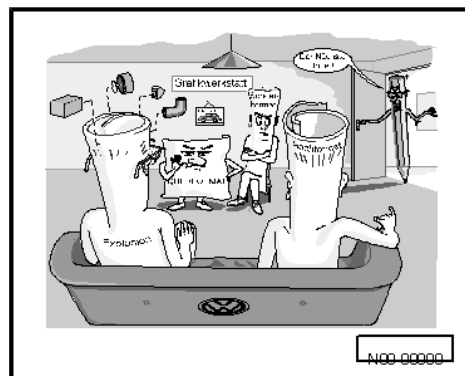
- Toothed belt installed.

Preparations

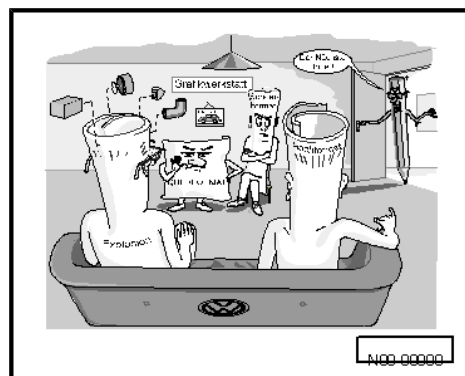
- Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .
- Drain coolant
⇒ ["1.3 Draining and adding coolant", page 260](#) .
- Loosen bolts -2-.
- Remove cover for thermostat housing -1-.



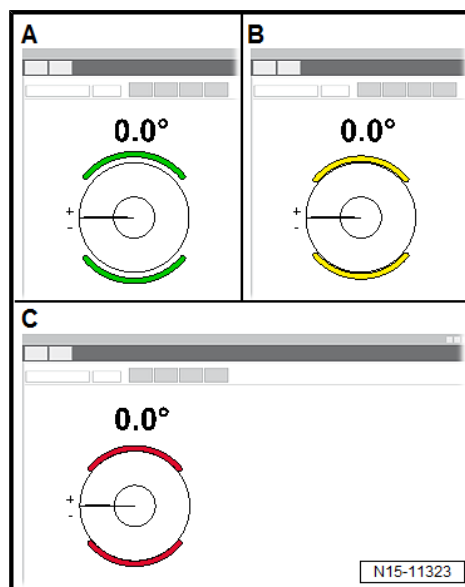
- Unclip wiring harness -3- and place to one side.
- Remove screws -1-.
- Place a cloth underneath to catch any oil which may drain out.
- Remove the plugs -5-.
- Pull off pipe -2-.
- Remove toothed belt cover -4-.



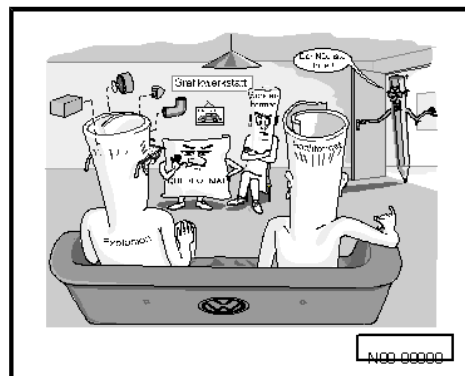
- Set piston for cylinder no. 1 to TDC position
⇒ ["4.7 Setting piston to TDC position", page 155](#) .
- Preassemble test tool - VAS 611 007-
⇒ ["2.4.1 Preassembling test tool VAS 611 007", page 180](#) .
- Install test tool - VAS 611 007-
⇒ ["2.4.2 Installing test tool VAS 611 007", page 183](#) .
- Make sure that brakes -a- are released on both sides.



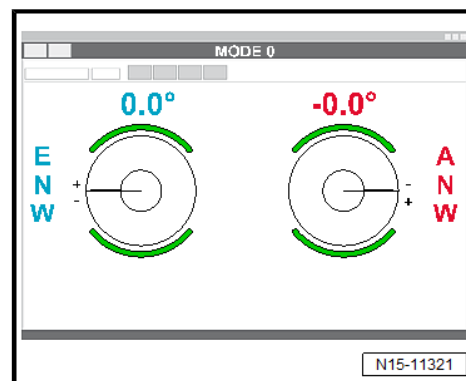
- Make sure that brake indicator on display is green -A-.
- It must not be yellow or red.



- Unscrew locking pin - T10340- -A-.
- Turn crankshaft 2 turns in direction of rotation of engine.
- Screw in locking pin - T10340- -A-.
- Set piston for cylinder no. 1 to TDC position
⇒ ["4.7 Setting piston to TDC position", page 155](#) .



- Read valve timing angles on display, and compare values with specifications.



Specified values

Inlet camshaft	Exhaust camshaft
+1.1° ±1.5°	+0.8° ±1.5°

! NOTICE

Adjust valve timing as precisely as possible. The settings must be as close to the specifications as possible.

The valve timing must not be outside the tolerance limits.

- If necessary, adjust timing
⇒ [“2.6 Adjusting valve timing”, page 189](#) .

Assembly is carried out in the reverse order. Observe the following:

- Add coolant ⇒ [“1.3 Draining and adding coolant”, page 260](#) .

Specified torques

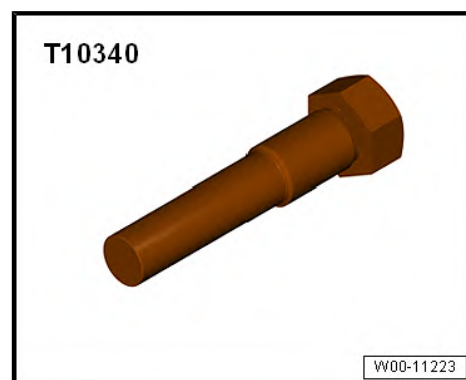
- ◆ ⇒ [“2.1 Assembly overview - coolant pump, thermostat”, page 278](#)
- ◆ ⇒ [“3.1 Assembly overview - air filter housing”, page 393](#)

Component	Specified torque
Bolt for TDC hole in cylinder block	30 Nm

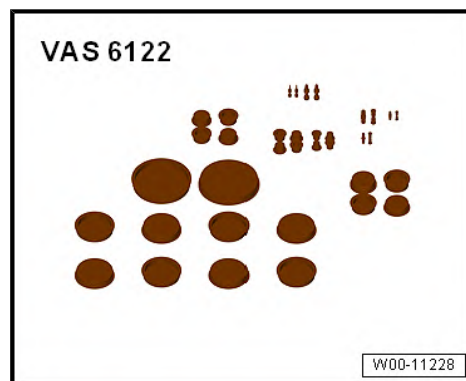
2.6 Adjusting valve timing

Special tools and workshop equipment required

- ◆ Locating bolt - T10340-



♦ Engine bung set - VAS 6122-



Procedure

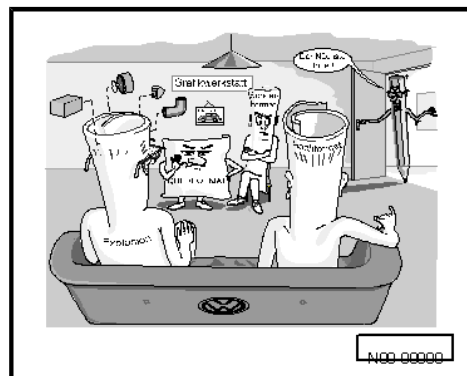
- Toothed belt installed.
- Do not relieve tension from toothed belt, and do not remove toothed belt from camshafts when adjusting valve timing. Only loosen camshaft adjuster.
- Check valve timing ⇒ [“2.5 Checking valve timing”, page 187](#) .
- Loosen camshaft adjuster on intake side
⇒ [“3.4.1 Removing and installing camshaft adjuster for inlet camshaft”, page 211](#) .
- Loosen camshaft adjuster on exhaust side
⇒ [“3.4.2 Removing and installing camshaft adjuster for exhaust camshaft”, page 215](#) .



NOTICE

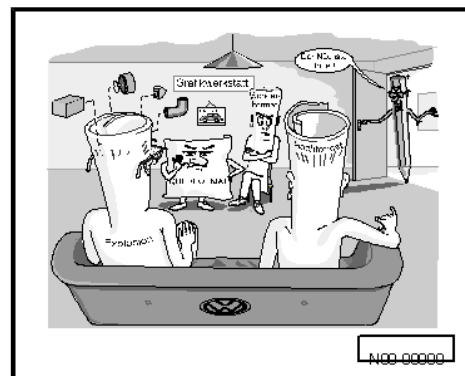
Risk of damage to engine caused by incorrect valve timing.

- Do not turn crankshaft out of TDC position.
- Place a cloth under the camshaft adjusters and over tensioning roller to catch the engine oil which runs out.
- The contact points between the toothed belt and components such as camshaft pulleys, crankshaft pulley, tensioning roller and idler pulley must be free of oil.
- Catch any engine oil which runs out immediately, and remove it.
- Remove any engine oil which ran out from camshaft adjusters after the engine has been cranked.
- Make sure that the piston in cylinder no. 1 is at TDC position
⇒ [“4.7 Setting piston to TDC position”, page 155](#) .
- Renew bolts -3- and -4- and screw in loosely
⇒ [“3.4 Removing and installing camshaft adjuster”, page 211](#) .
- It should still be possible to turn camshaft adjusters -1- and -2- on camshafts.

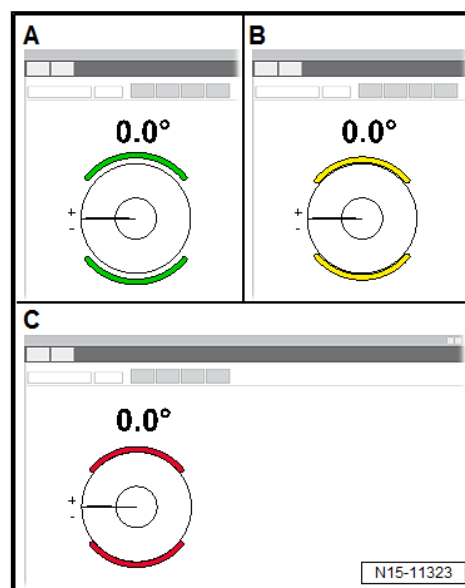


Setting camshafts to 0°

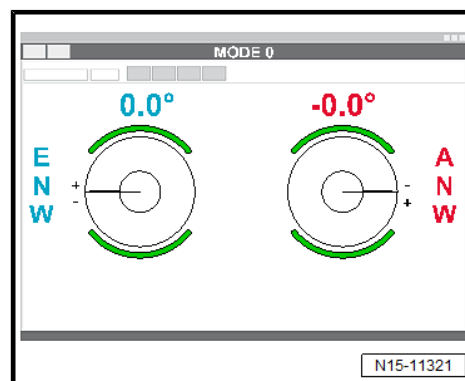
- Make sure that bolts -a- for brakes are released on both sides.



- Make sure that brake indicator on display is green -A-.
- It must not be yellow or red.



- Set both camshafts to 0.0°.

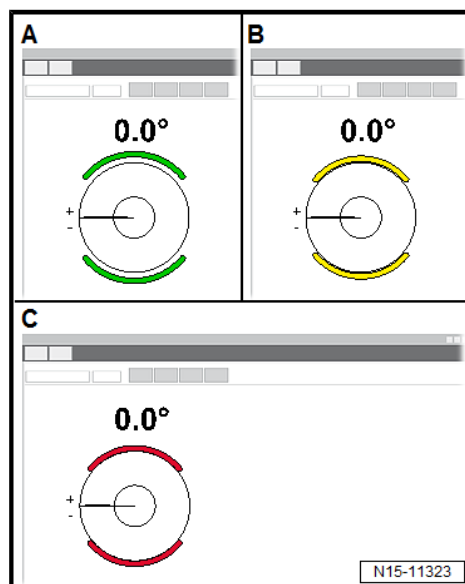
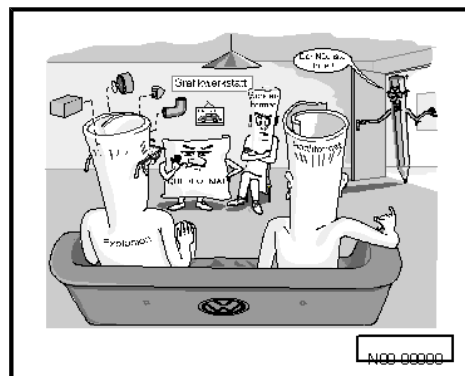


- To do this, turn camshafts with adapter for angle sensor - VAS 611 007/5- -E-.
- Hold camshafts via adapter for angle sensor - VAS 611 007/9- and adapter for angle sensor - VAS 611 007/10- -E- in 0.0° position with a wrench.

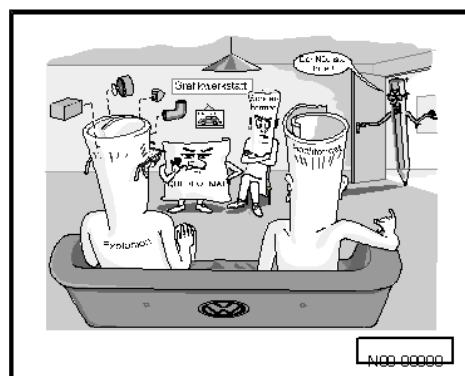


Note

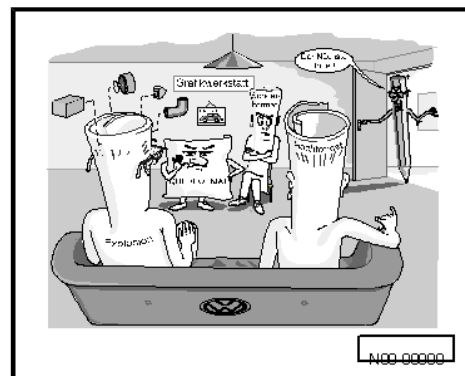
- ♦ *The camshafts tend to turn.*
 - ♦ *Use a hexagon key to hold the camshafts in 0.0° position.*
 - ♦ *Always remove the hexagon key after the camshafts have been tightened.*
- Tighten brakes after adjustment has been completed.
 - Tighten bolts -a- for brakes to 11 Nm on both sides.
 - Make sure that brake indicator on display is red -C-.
 - It must not be yellow or green.



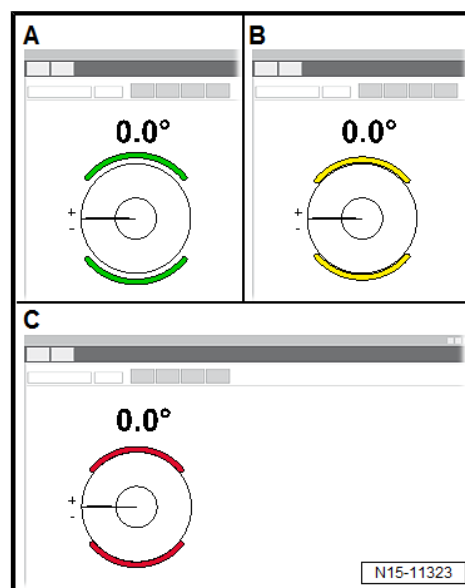
- Unscrew locking pin - T10340- -A-.
- Tighten intake camshaft adjusted using pre-tension procedure
⇒ [“3.4.1 Removing and installing camshaft adjuster for inlet camshaft”, page 211](#) .
- Tighten camshaft adjuster on exhaust camshaft to specified initial torque
⇒ [“3.4.2 Removing and installing camshaft adjuster for exhaust camshaft”, page 215](#) .



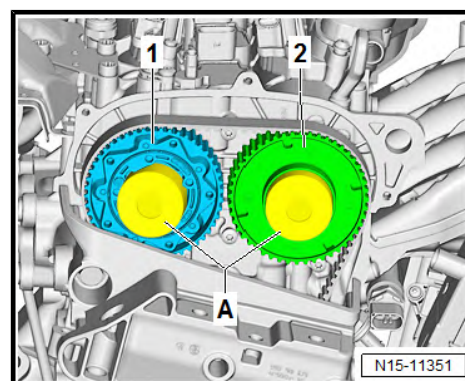
- Make sure that bolts -a- for brakes are released on both sides.



- Make sure that brake indicator on display is green -A-.
- It must not be yellow or red.



- Seal camshaft adjusters -1- and -2- using suitable plugs -A- from engine bung set - VAS 6122- .
- Fit a piece of paper -A- into plugs to catch the engine oil.
- The plug for the camshaft adjuster -1- on exhaust side must be pushed in slightly.
- Turn crankshaft 2 turns in direction of rotation of engine.



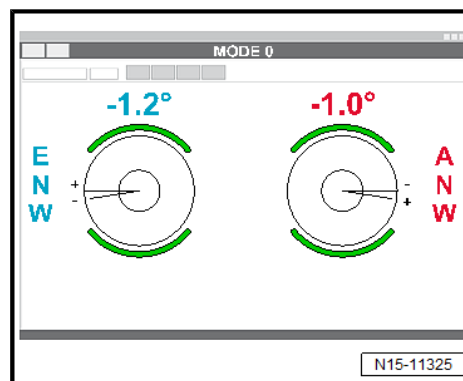
Determining correction angle

- Screw in locking pin - T10340- .
- Set piston for cylinder no. 1 to TDC position
⇒ [“4.7 Setting piston to TDC position”, page 155](#) .
- Read valve timing on display and write down values. The illustration shows values as an example.



Note

- ◆ The correction angle is determined for each individual vehicle.
- ◆ The value read after the engine has been cranked is used for determining the correction angle.
- ◆ Note the algebraic signs of the values.
- ◆ The correction angle results from the difference between the specification and the value which has been read after the crankshaft has been cranked twice.
- ◆ The correction angle is used to adjust the valve timing.



Example:

Angle in °	Inlet camshaft	Exhaust camshaft
Value read after turning crankshaft 2 turns in direction of engine rotation	-1.2°	-1.0°
Specified angle	+1.1°±1.5°	+0.8°±1.5°
Determined correction angle	+2.3°	+1.8°

Read value ± correction angle = specification

Computational example for intake camshaft: $-1.2^\circ + 2.3^\circ = 1.1^\circ$

Computational example for exhaust camshaft: $-1.0^\circ + 1.8^\circ = +0.8^\circ$

- Set determined correction angle for camshafts.

Setting valve timing with correction angle

- Place a cloth underneath camshaft adjuster to catch any engine oil which runs out.
- Remove plug taken from engine bung set - VAS 6122- from camshaft adjusters.
- Remove paper from plugs and camshaft adjusters.
- Clean camshaft adjusters with a cleaning cloth, and remove as much engine oil as possible.
- Loosen camshaft adjuster on intake side
⇒ [“3.4.1 Removing and installing camshaft adjuster for inlet camshaft”, page 211](#) .
- Loosen camshaft adjuster on exhaust side
⇒ [“3.4.2 Removing and installing camshaft adjuster for exhaust camshaft”, page 215](#) .

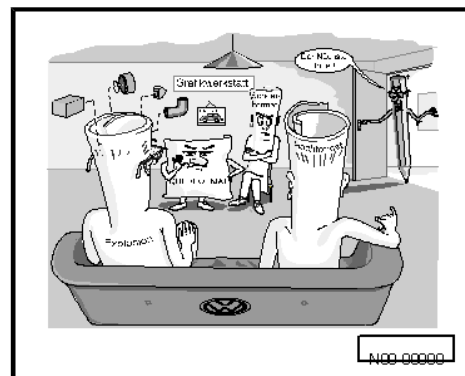


NOTICE

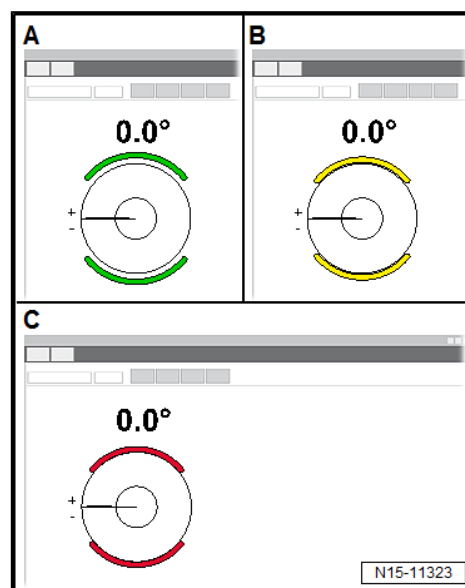
Risk of damage to engine caused by incorrect valve timing.

- Do not turn crankshaft out of TDC position.

- Make sure that the piston in cylinder no. 1 is at TDC position
⇒ ["4.7 Setting piston to TDC position", page 155](#) .
- Make sure that bolts -a- for brakes are released on both sides.



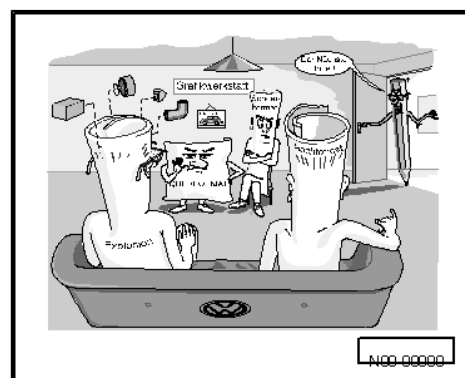
- Make sure that brake indicator on display is green -A-.
- It must not be yellow or red.



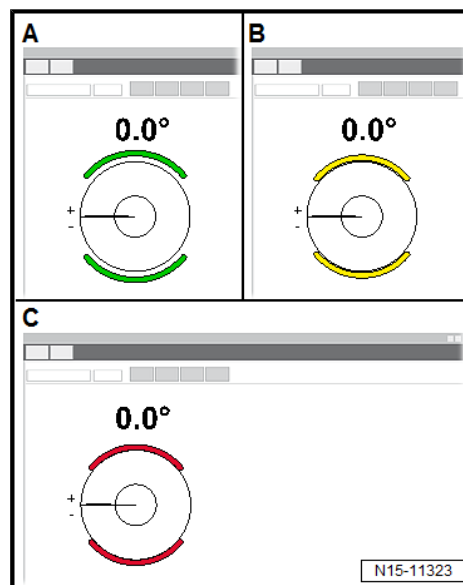
- Set the two camshafts to the determined correction angle
⇒ [page 194](#) .
- To do this, turn camshafts with adapter for angle sensor - VAS 611 007/9- and adapter for angle sensor - VAS 611 007/10-E-.

If the valve timing has been set:

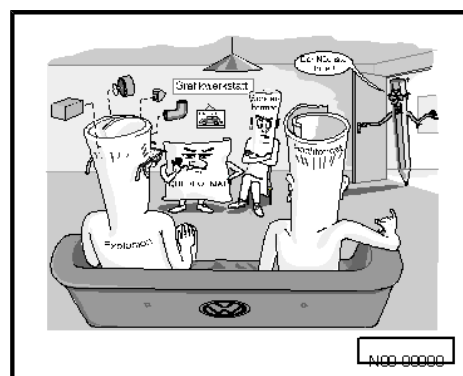
- Tighten bolts -a- for brakes to 11 Nm on both sides.



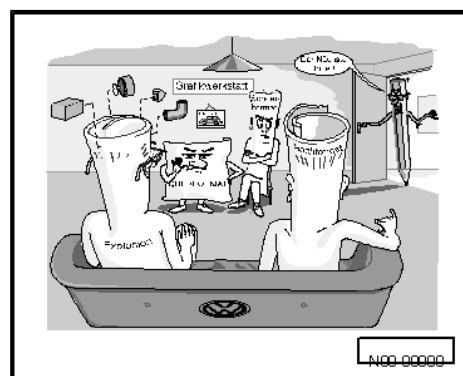
- Make sure that brake indicator on display is red -C-.
- It must not be yellow or green.



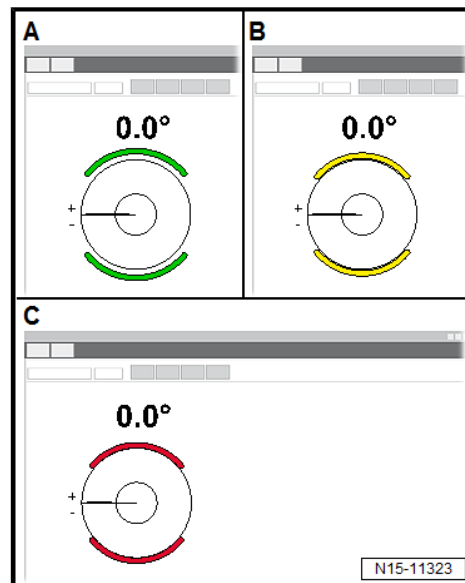
- Unscrew locking pin - T10340- -A-.
- Tighten intake camshaft adjusted using pre-tension procedure
⇒ ["3.4.1 Removing and installing camshaft adjuster for inlet camshaft", page 211](#) .
- Tighten camshaft adjuster on exhaust camshaft to specified initial torque
⇒ ["3.4.2 Removing and installing camshaft adjuster for exhaust camshaft", page 215](#) .



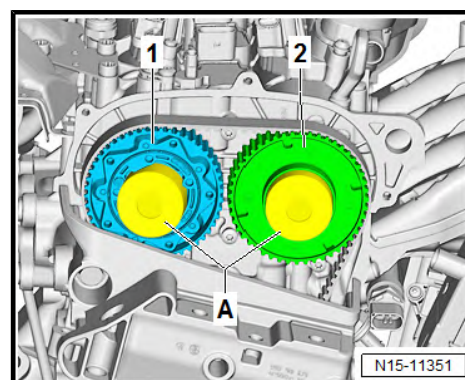
- Release brakes -a- on both sides.



- Make sure that brake indicator on display is green -A-.
- It must not be yellow or red.



- Seal camshaft adjusters -1- and -2- using suitable plugs -A- from engine bung set - VAS 6122- .
- Fit a new piece of paper into plugs -A- to catch the engine oil.
- The plug for the camshaft adjuster -1- on exhaust side must be pushed in slightly.
- Turn crankshaft 2 turns in direction of rotation of engine.
- Screw in locking pin - T10340- .
- Set piston for cylinder no. 1 to TDC position
⇒ [“4.7 Setting piston to TDC position”, page 155](#) .
- Check valve timing ⇒ [“2.5 Checking valve timing”, page 187](#) .



! NOTICE

Adjust valve timing as precisely as possible. The settings must be as close to the specifications as possible.

The valve timing must not be outside the tolerance limits.

- Read valve timing, and compare it with specifications.

Specified angle in °

Inlet camshaft	Exhaust camshaft
+1.1° ±1.5°	+0.8° ±1.5°

- If necessary, adjust timing again
⇒ [“2.6 Adjusting valve timing”, page 189](#) .

Assembly is carried out in the reverse order. Observe the following:

- Unscrew locking pin - T10340- .
- Make sure that brakes are released on both sides.
- Tighten camshaft adjuster on intake camshaft to specified final torque
⇒ [“3.4.1 Removing and installing camshaft adjuster for inlet camshaft”, page 211](#) .
- Tighten camshaft adjuster on exhaust camshaft to specified final torque

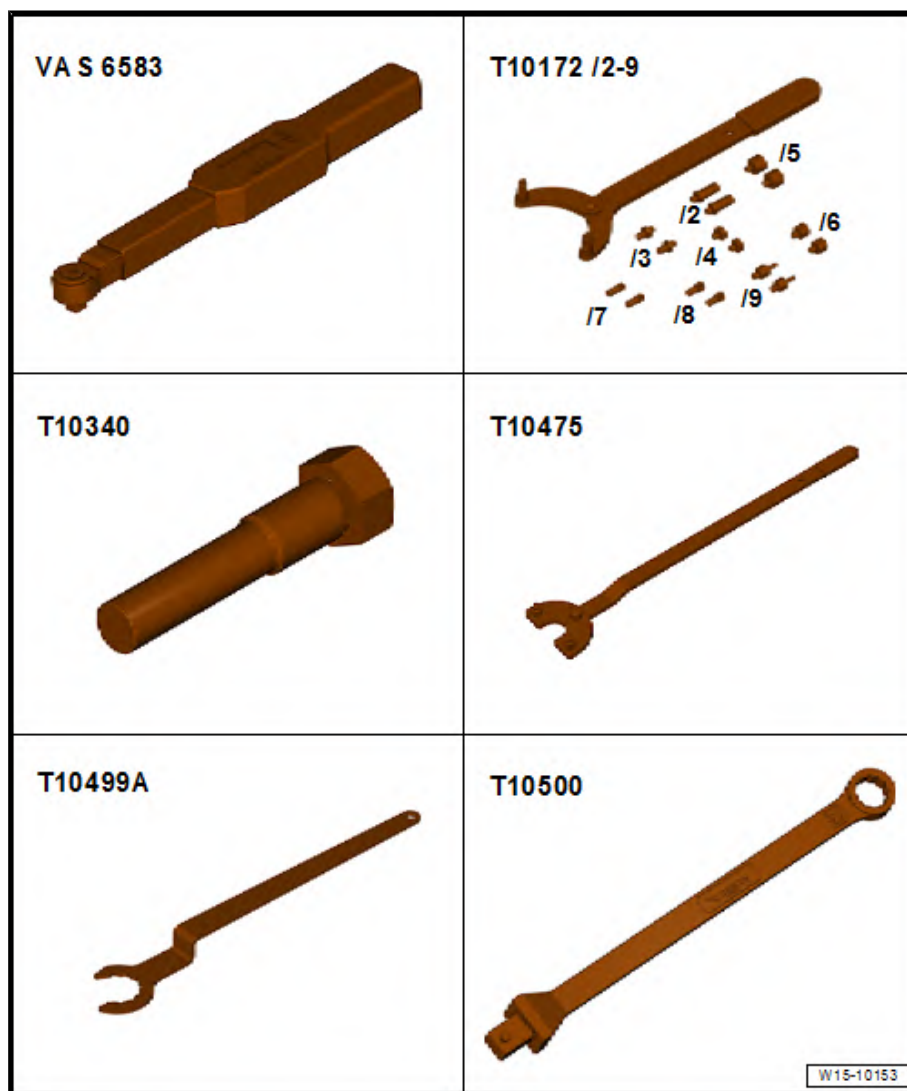
⇒ [“3.4.2 Removing and installing camshaft adjuster for exhaust camshaft”, page 215](#) .

Specified torques

- ◆ ⇒ [“2.2 Assembly overview - toothed belt”, page 174](#)
- ◆ ⇒ [“3.1 Assembly overview - valve gear”, page 204](#)
- ◆ ⇒ [“2.1 Assembly overview - coolant pump, thermostat”, page 278](#)
- ◆ ⇒ [“3.1 Assembly overview - air filter housing”, page 393](#)

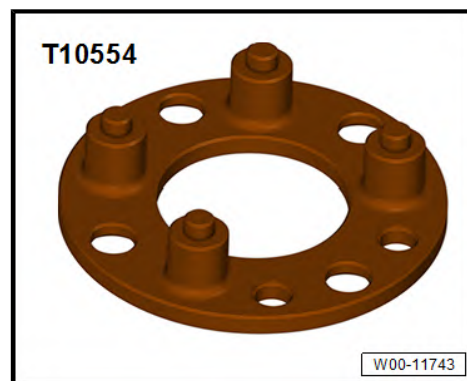
2.7 Removing toothed belt from camshaft

Special tools and workshop equipment required



- ◆ Torque wrench - VAS 6583-
- ◆ Counter-hold tool - T10172A-
- ◆ Counter-hold tool - T10475-
- ◆ Special wrench, 30 mm - T10499A-
- ◆ Open end spanner insert, AF 13 - T10500-

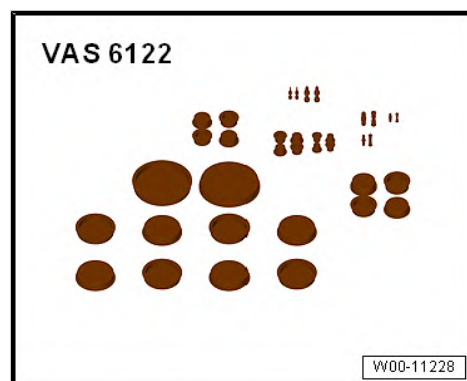
- ◆ Counter-hold tool - T10554-



- ◆ Camshaft clamp - T10494-

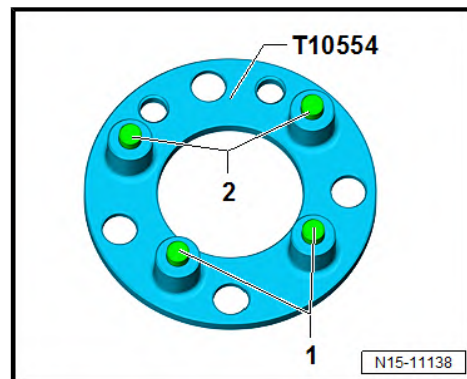


- ◆ Engine bung set - VAS 6122-

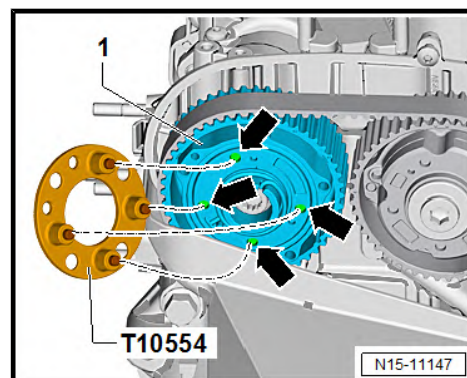


Exhaust camshaft

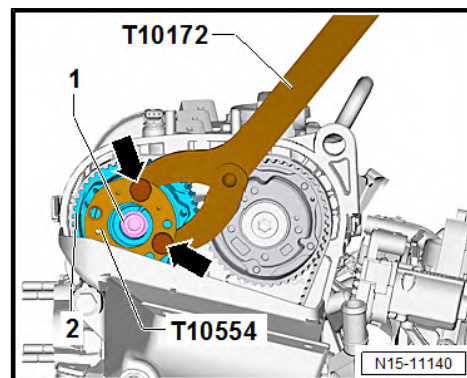
- Guide in counter-hold tool - T10554- between camshaft adjuster and engine support.
- To do this, initially guide through counter-hold tool - T10554- between pins -2- on camshaft adjuster.



- Turn counter-hold tool - T10554- so that it can be inserted into holes -arrows- as shown in illustration.
- Fit counter-hold tool - T10554- so that it rests flat against camshaft adjuster -1-.

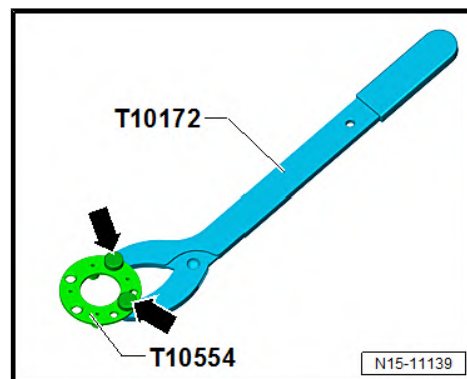


- Loosen bolt -1- one turn. Hold camshaft pulley in place using counter-hold tool - T10554- and counter-hold tool - T10172A- .

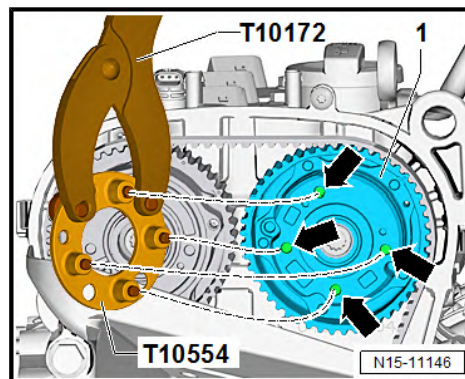


Inlet camshaft

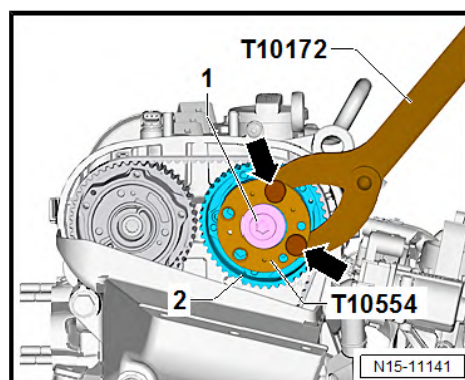
- Assemble tools as shown in illustration.
- Bolt on counter-hold tool - T10172A- and counter-hold tool - T10554- with knurled screws -arrows-.



- Fit counter-hold tool - T10554- with counter-hold tool - T10172A- to camshaft pulley -1- as shown in illustration.
- The pins must be inserted properly into holes -arrows-.
- Fit counter-hold tool - T10554- so that it rests flat against camshaft adjuster -1-.
- Secure camshaft against turning with counterhold - T10554- and counterhold - T10172A- .

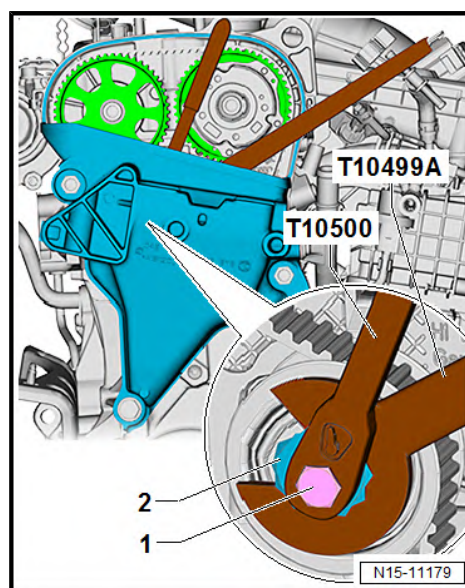


- Unscrew plug -1- for camshaft pulley on inlet camshaft.
- Use counter-hold tool - T10554- with counter-hold tool - T10172A- to do this.
- Loosen bolt -1- one turn. Hold camshaft pulley in place using counter-hold tool - T10554- and counter-hold tool - T10172A- .



Continuation for both sides:

- Fit special wrench, 30 mm - T10499A- on eccentric adjuster -2- of tensioning roller.
- Loosen bolt -1- using insert tool, 13 mm - T10500- .
- Release tensioning roller on eccentric adjuster -2- using special wrench, 30 mm - T10499A- .
- Remove toothed belt from camshaft pulleys.



Bend radius of toothed belt

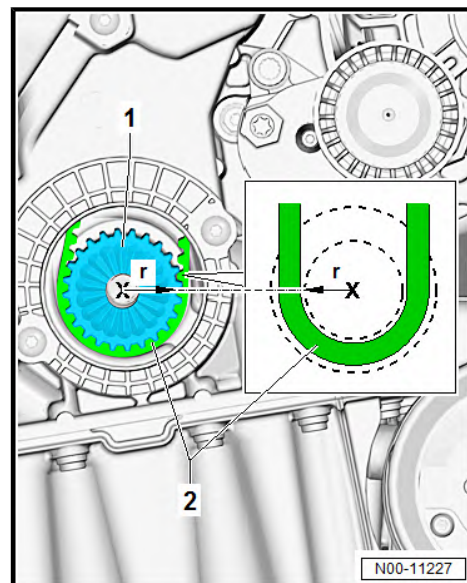
! NOTICE

Risk of damage to toothed belt by bending it excessively. The toothed belt is made of glass fibre fabric which will be damaged if it is bent excessively.

- Never bend toothed belt to a radius less than $r = 25$ mm.
- The bend radius -r- on the toothed belt -2- should therefore not be below 25 mm (approx. half the diameter of gear -1- on crankshaft).
- Install toothed belt ⇒ [“2.6 Adjusting valve timing”, page 189](#) .

Specified torques

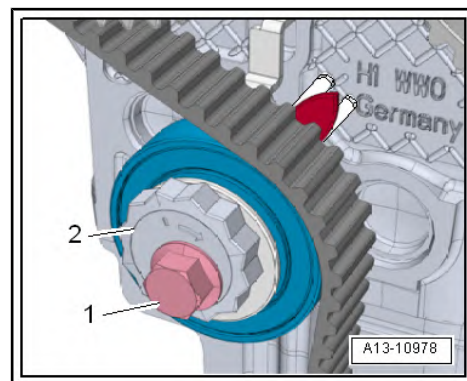
- ◆ ⇒ [“2.2 Assembly overview - toothed belt”, page 174](#)
- ◆ ⇒ [“3.1 Assembly overview - valve gear”, page 204](#)
- ◆ ⇒ [“3.1 Assembly overview - crankcase breather system”, page 247](#)
- ◆ ⇒ [“1.1 Assembly overview - turbocharger”, page 351](#)
- ◆ ⇒ [“2.1 Assembly overview - charge air system”, page 363](#)



2.8 Removing and installing tensioning roller

Removing

- Remove camshaft adjuster for inlet camshaft ⇒ [page 211](#) .
- Detach toothed belt from the tensioning roller.
- Unscrew bolt -1-.
- Remove tensioning roller -2-.



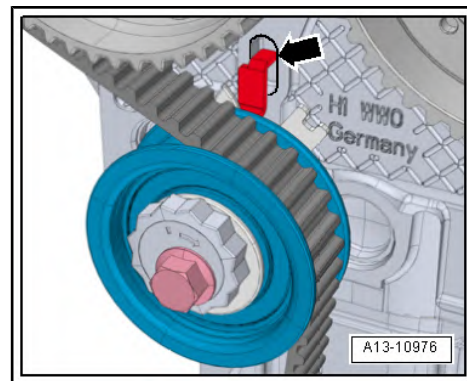
Installing

Install in reverse order of removal, observing the following:

- Install tensioning roller.
- The sheet-metal tab -arrow- of the tensioning roller must engage in the cast notch in the cylinder head.
- Install camshaft adjuster for inlet camshaft ⇒ [page 211](#) .

Specified torques

- ◆ ⇒ [“2.2 Assembly overview - toothed belt”, page 174](#)
- ◆ ⇒ [“1.2 Assembly overview - camshaft housing”, page 160](#)
- ◆ ⇒ [“2.1 Assembly overview - charge air system”, page 363](#)



3 Valve gear

⇒ [“3.1 Assembly overview - valve gear”, page 204](#)

⇒ [“3.2 Measuring axial play of camshaft”, page 205](#)

⇒ [“3.3 Removing and installing camshaft oil seal”, page 206](#)

⇒ [“3.4 Removing and installing camshaft adjuster”, page 211](#)

⇒ [“3.5 Removing and installing inlet camshaft control valve 1 N205”, page 220](#)

⇒ [“3.6 Removing and installing exhaust camshaft control valve 1 N318”, page 221](#)

⇒ [“3.7 Removing and installing valve stem seals”, page 221](#)

3.1 Assembly overview - valve gear

1 - Inlet valve

- ☐ Do not rework, only lap-ping-in is permitted.
- ☐ Valve dimensions
⇒ [“4.3 Valve dimensions”, page 232](#)
- ☐ Checking valve guides
⇒ [“4.1 Checking valve guides”, page 231](#)

2 - Outlet valve

- ☐ Do not rework, only lap-ping-in is permitted.
- ☐ Valve dimensions
⇒ [“4.3 Valve dimensions”, page 232](#)
- ☐ Checking valve guides
⇒ [“4.1 Checking valve guides”, page 231](#)

3 - Cylinder head

- ☐ Removing and installing
⇒ [“1.3 Removing and installing cylinder head”, page 162](#)
- ☐ Check for distortion
⇒ [page 160](#).

4 - Valve stem seal

- ☐ Renewing
⇒ [“3.7 Removing and installing valve stem seals”, page 221](#)

5 - Valve springs

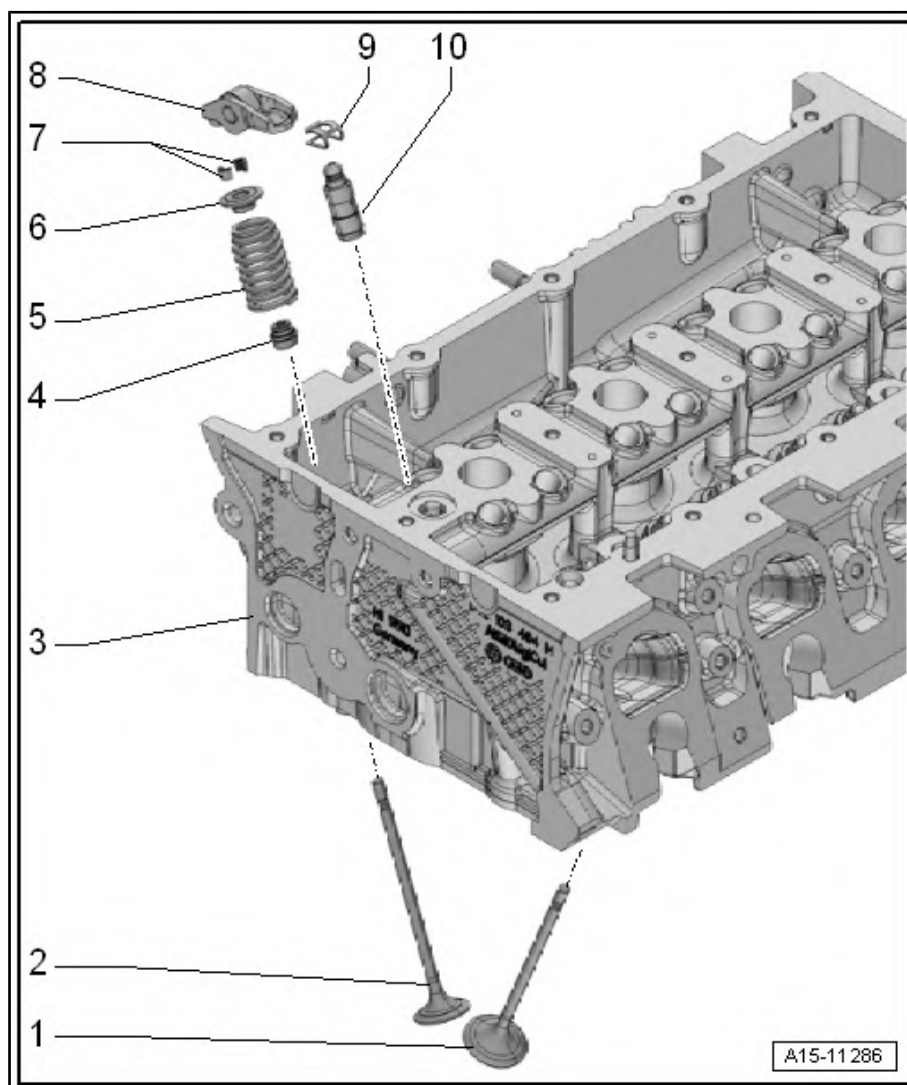
- ☐ Fitting position
⇒ [page 205](#)

6 - Valve spring plate

7 - Cotteners

8 - Roller rocker fingers

- ☐ Removing and installing ⇒ [“1.4 Removing and installing camshaft housing”, page 166](#)
- ☐ Mark installation position for re-installation.
- ☐ Check roller bearing for ease of movement.



A15-11 286

- ☐ Lubricate contact surfaces before installing.

9 - Securing clip

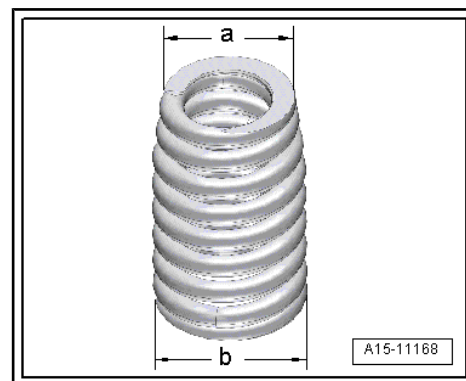
- ☐ For hydraulic compensation element

10 - Hydraulic compensation element

- ☐ Do not interchange
- ☐ Oil contact surface

Installation position: valve springs

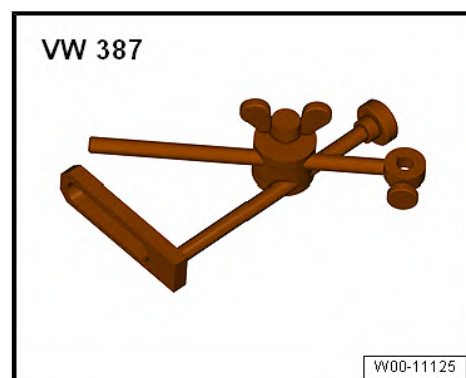
- The end with smaller diameter -a- must face towards valve spring plate.
- The end with larger diameter -b- must face towards cylinder head.



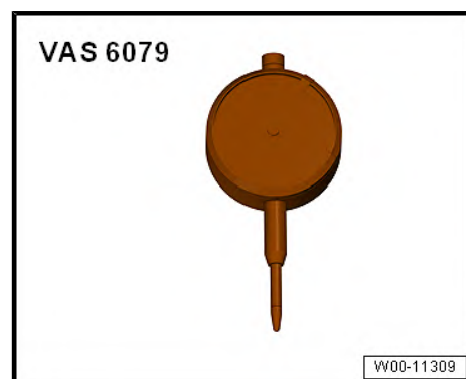
3.2 Measuring axial play of camshaft

Special tools and workshop equipment required

- ◆ Universal dial gauge bracket - VW 387-



- ◆ Dial gauge - VAS 6079-

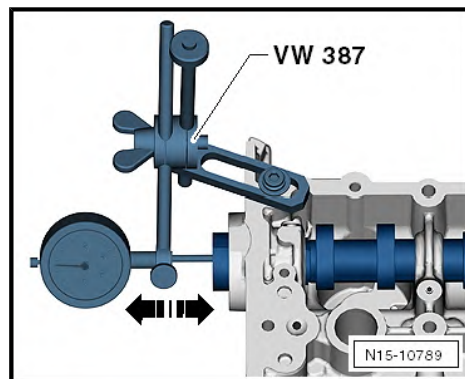


Procedure

- Remove camshaft housing ➔ [page 166](#) .
- Secure universal dial gauge bracket - VW 387- with dial gauge - VAS 6079- to camshaft housing, as shown in illustration.
- Press camshaft against dial gauge by hand.
- Set dial gauge to "0".
- Prise camshaft off dial gauge and read off value.

Axial clearance:

- Wear limit: 0.25 mm



3.3 Removing and installing camshaft oil seal

➔ ["3.3.1 Removing and installing camshaft oil seal, inlet camshaft", page 206](#)

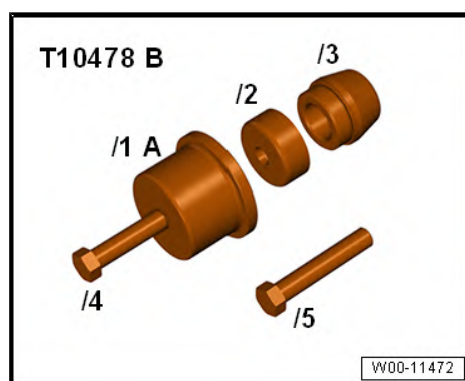
➔ ["3.3.2 Removing and installing camshaft oil seal, exhaust camshaft, pulley end", page 208](#)

➔ ["3.3.3 Removing and installing camshaft oil seal, exhaust camshaft, gearbox end", page 209](#)

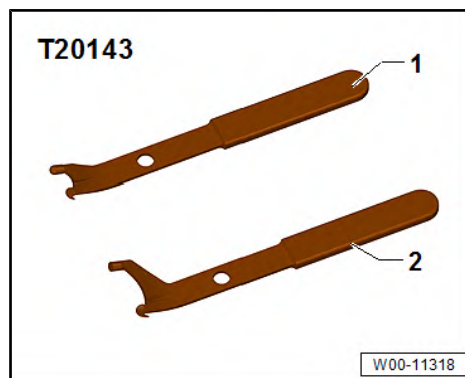
3.3.1 Removing and installing camshaft oil seal, inlet camshaft

Special tools and workshop equipment required

- ◆ Assembly tool - T10478 B-

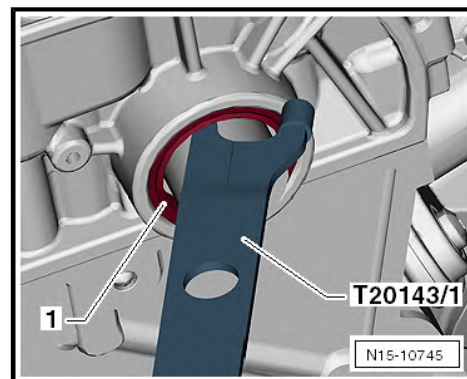


- ◆ Puller hooks - T20143-



Removing

- Remove toothed belt from camshafts ➔ [page 198](#) .
- Remove camshaft adjuster for inlet camshaft ➔ [page 211](#) .
- Pull out oil seal -1- using extractor tool -T20143/1- .



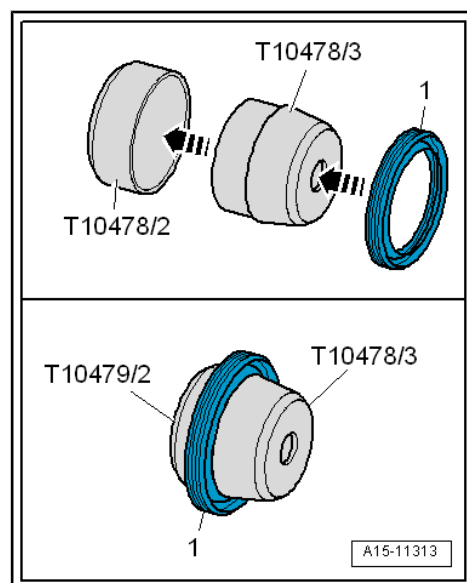
Installing



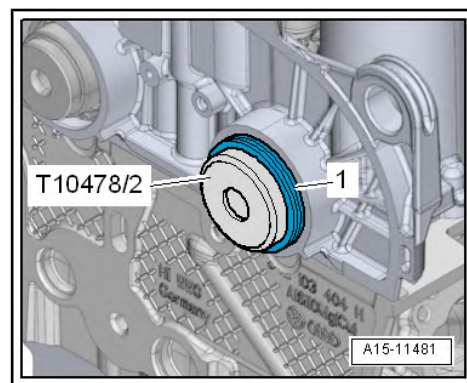
Note

Do not lubricate new oil seal.

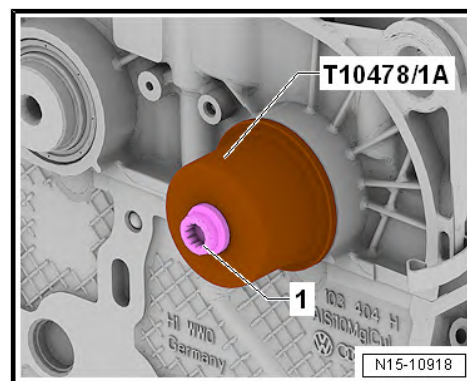
- Slide oil seal -1- over fitting sleeve -T10478/3- onto guide sleeve -T10478/2- .
- Installation position: The closed side of the oil seal faces the guide sleeve.
- Separate fitting sleeve and guide sleeve.



- Fit guide sleeve -T10478/2- with oil seal -1- onto camshaft.



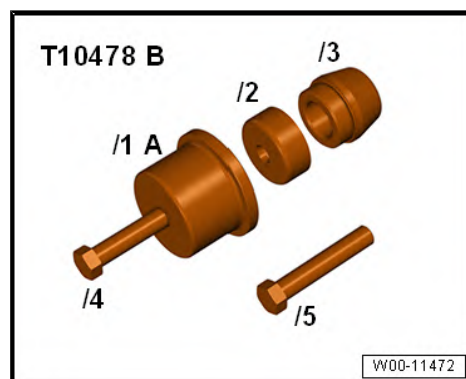
- Draw in seal to stop using thrust piece -T10478/1A- and bolt -1- for camshaft pulley.
- Install toothed belt ➔ ["2.6 Adjusting valve timing", page 189](#) .



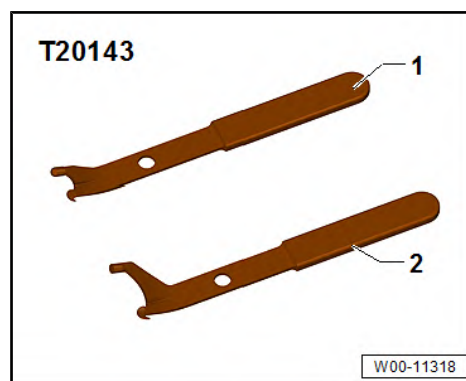
3.3.2 Removing and installing camshaft oil seal, exhaust camshaft, pulley end

Special tools and workshop equipment required

- ◆ Assembly tool - T10478 B-

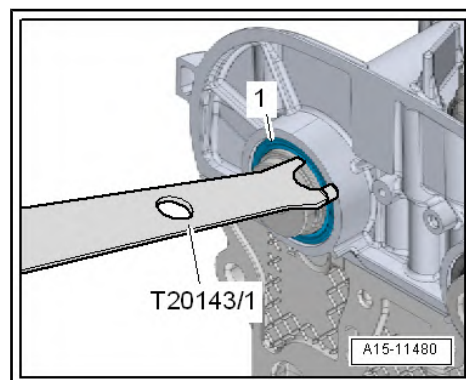


- ◆ Puller hooks - T20143-



Removing

- Remove toothed belt from camshafts
⇒ ["2.7 Removing toothed belt from camshaft", page 198](#) .
- Separate the engine support to free some space
⇒ ["1.5 Removing and installing engine support", page 122](#) .
- Remove camshaft adjuster for exhaust camshaft
⇒ [page 215](#) .
- Pull out oil seal -1- using extractor tool -T20143/1- .



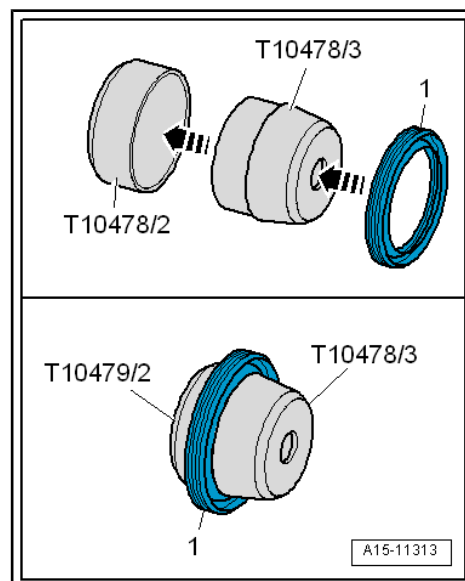
Installing



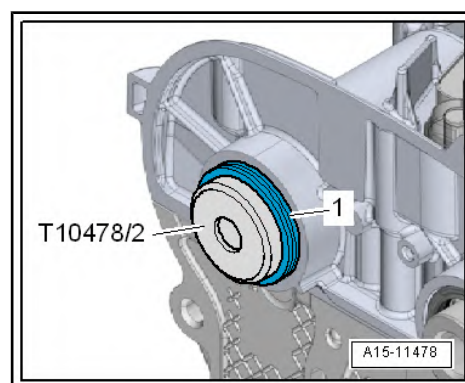
Note

Do not lubricate new oil seal.

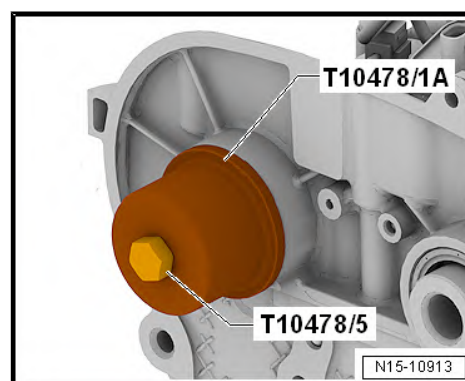
- Slide oil seal -1- over fitting sleeve -T10478/3- onto guide sleeve -T10478/2- .
- Installation position: The closed side of the oil seal faces the guide sleeve.
- Separate fitting sleeve and guide sleeve.



- Fit guide sleeve -T10478/2- with oil seal -1- onto camshaft.



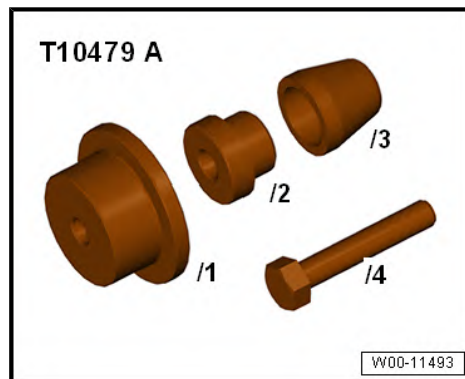
- Pull in thrust piece -T10478/1A- with bolt -T10478/5- as far as stop.
- Install toothed belt ➔ ["2.6 Adjusting valve timing", page 189](#) .
- Installing engine support ➔ [page 122](#) .



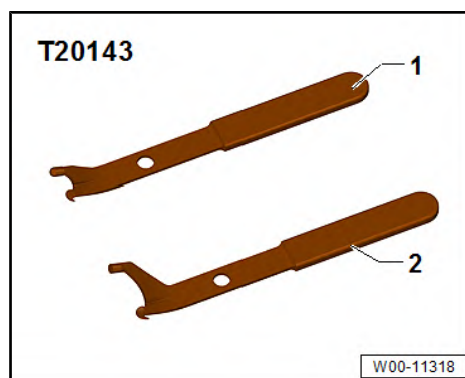
3.3.3 Removing and installing camshaft oil seal, exhaust camshaft, gearbox end

Special tools and workshop equipment required

◆ Assembly tool - T10479A-

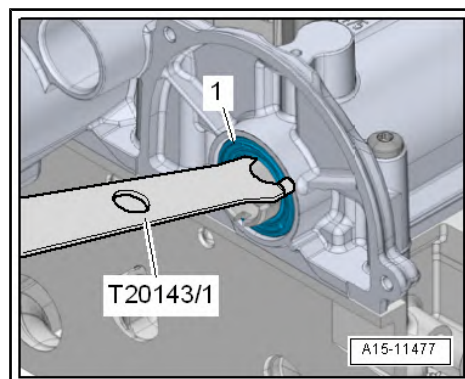


◆ Puller hooks - T20143-



Removing

- Remove pump gear of the coolant pump
⇒ [“2.7 Removing and installing toothed belt pulley for coolant pump”, page 294](#) .
- Carefully slide extractor tool -T20143/1- between camshaft and oil seal -1-.
- Pry out oil seal.

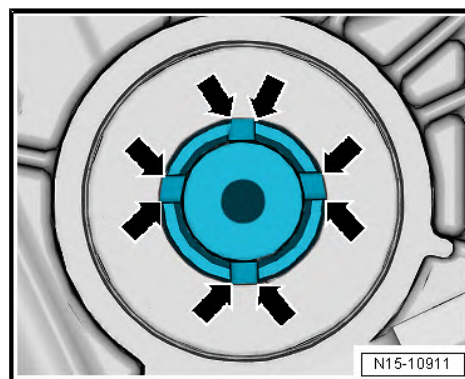


Installing

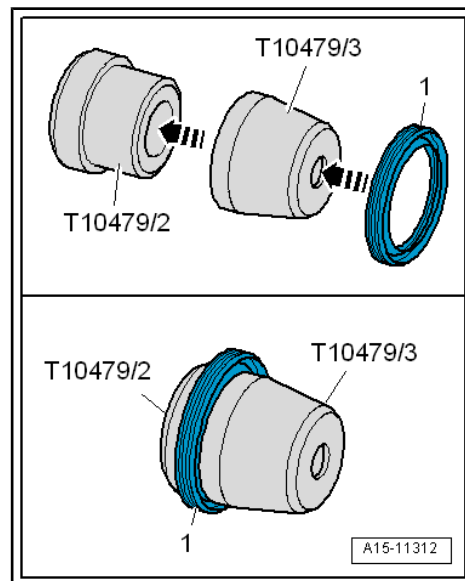
- Remove any burrs in outer area of grooves in exhaust camshaft -arrows- using fine sandpaper “220 ... 1000 grade”.



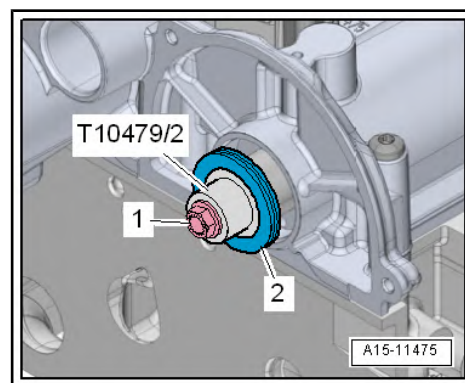
Do not lubricate new oil seal.



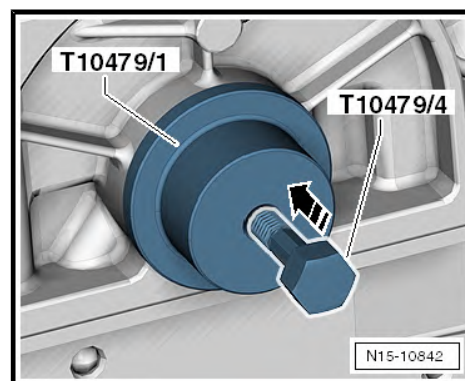
- Slide seal -1- over fitting sleeve - T10479/3- onto guide sleeve - T10479/2- .
- Installation position: The closed side of the oil seal faces the guide sleeve - T10479/2- .
- Separate fitting sleeve - T10479/3- and guide sleeve - T10479/2- .
- Fit guide sleeve - T10479/2- together with oil seal centrally on camshaft.



- Secure guide sleeve onto camshaft using bolt -1- for coolant pump drive sprocket.
- Slide oil seal onto camshaft and unbolt guide sleeve.



- Using press tool -T10479/1- and screw -T10479/4- press the shaft seal to the stop.
- Install pump gear of the coolant pump.
⇒ ["2.7 Removing and installing toothed belt pulley for coolant pump", page 294](#)



3.4 Removing and installing camshaft adjuster

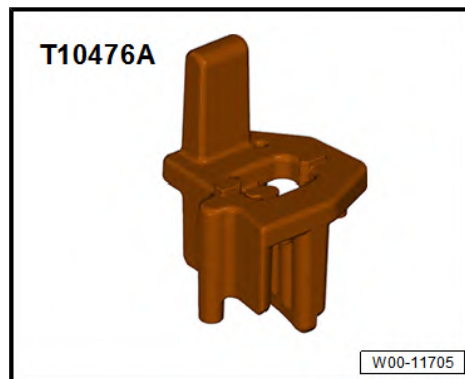
⇒ ["3.4.1 Removing and installing camshaft adjuster for inlet camshaft", page 211](#)

⇒ ["3.4.2 Removing and installing camshaft adjuster for exhaust camshaft", page 215](#)

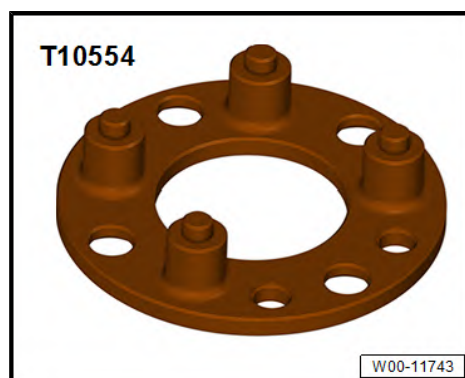
3.4.1 Removing and installing camshaft adjuster for inlet camshaft

Special tools and workshop equipment required

◆ Assembly tool - T10476A-



◆ Counter-hold tool - T10554-

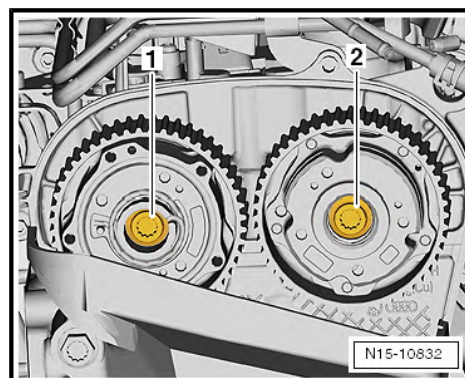


◆ Counter-hold tool - T10172A-



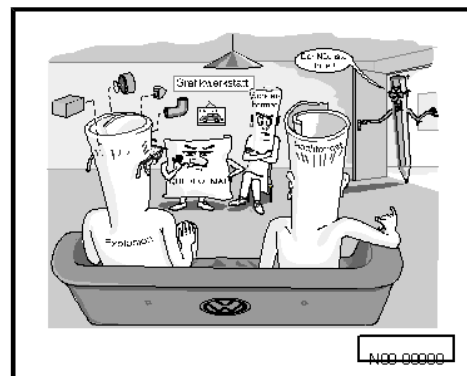
Removing

- Set engine to “TDC for cylinder no. 1”
⇒ [“4.7 Setting piston to TDC position”, page 155](#) .
- Remove toothed belt from camshafts ⇒ [page 198](#) .
- Secure camshaft against turning with counterhold - T10554- and counterhold - T10172A- .
- Unscrew bolt -2- for camshaft adjuster of inlet camshaft.
- Remove camshaft adjuster of inlet camshaft.
- Seal camshaft adjusters immediately using suitable plug from engine bung set - VAS 6122- .



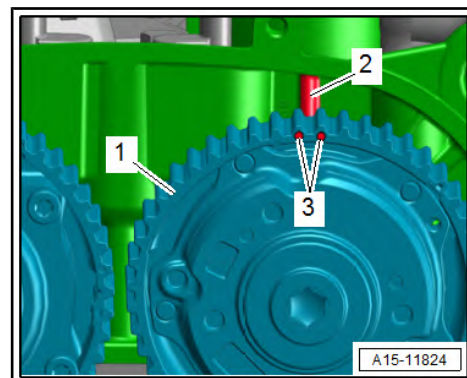
Installing

- Install camshaft adjuster.
- Renew bolts -3- and -4- for camshaft adjusters, and screw them in loosely.
- It should just be possible to turn camshaft pulleys -1- and -2- on camshafts but no rocking is permissible.
- Camshafts are located in “TDC” position.
- The camshaft pulleys are properly aligned with each other.
- Crankshaft is in “TDC position”.

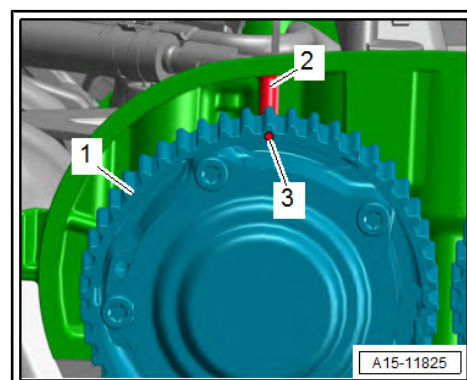


Note

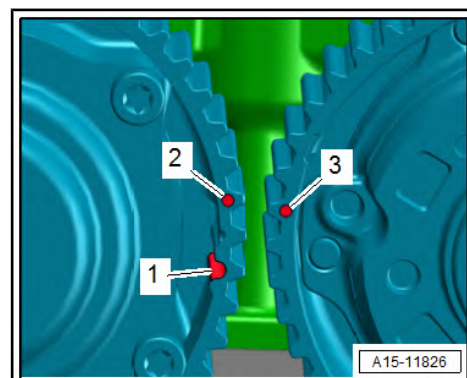
- ◆ *Renew bolts that are tightened with turning further angle.*
- ◆ *Renew O-ring of plug if damaged.*
- ◆ *Ensure that the guide sleeve ⇒ [Item 11 \(page 175\)](#) is reinstalled.*
- Centre marks -3- of inlet camshaft pulley -1- relative to web -2- on camshaft housing.



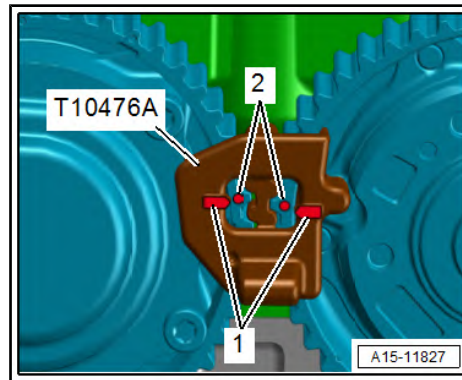
- Centre marks -3- of exhaust camshaft pulley -1- relative to web -2- on camshaft housing.



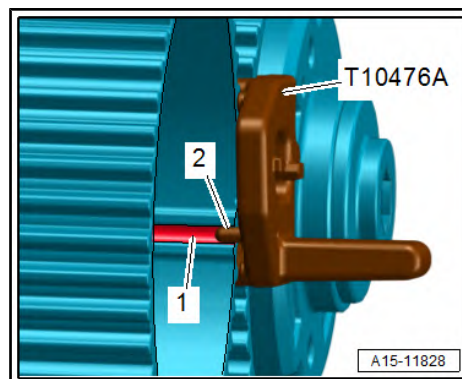
- The items -2- and -3- must be slightly offset.
- Groove -1- is used to check whether the assembly tool - T10476A- has been inserted correctly.



- Insert assembly tool - T10476A- between camshaft pulleys.
- The markings -1- on the assembly tool - T10476A- must be aligned with markings -2- on the camshaft pulleys.



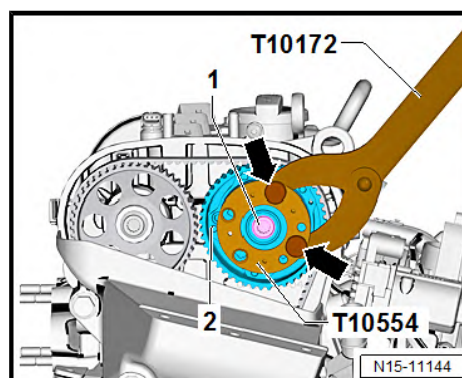
- Insert assembly tool - T10476A- to stop.
- Dowel pin -2- of assembly tool - T10476A- must engage in groove of exhaust camshaft pulley -1-.
- Fit toothed belt onto camshafts
⇒ [“2.7 Removing toothed belt from camshaft”, page 198](#) .



Pretighten

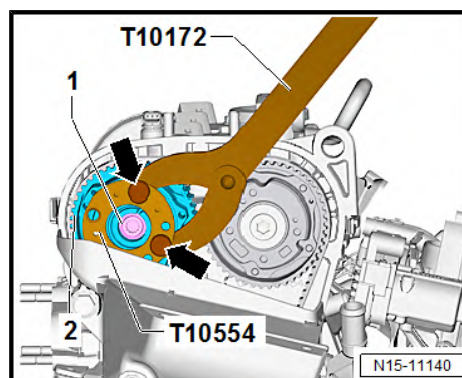
- Hold the inlet camshaft with the counterhold tool - T10554- and the counterhold tool - T10172A- in this position.
- Tighten bolt -1- in two rounds with specified tightening torque.

Stage	Securing bolt for camshaft adjuster, inlet side	Specified torque
1.	-1-	18 Nm
2.	-1-	50 Nm



- Hold exhaust camshaft in position using counterhold tool - T10554- and counterhold tool - T10172A- .
- Tighten bolt -1- in two rounds with specified tightening torque.

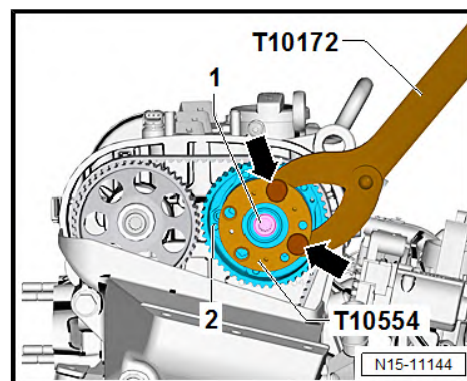
Stage	Securing bolt for camshaft adjuster, outlet side	Specified torque
1.	-1-	18 Nm
2.	-1-	50 Nm



End torque

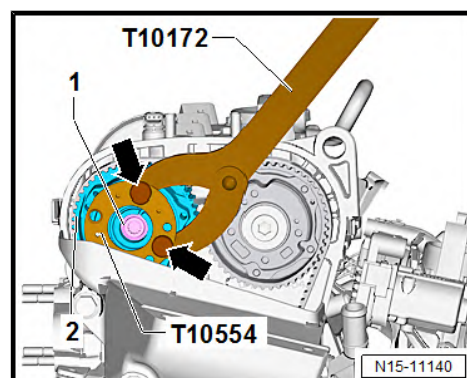
- Tighten bolt -1- for camshaft adjuster to final specified torque.

Stage	Securing bolt for camshaft adjuster, inlet side	Angle to turn bolts
1.	-1-	135°



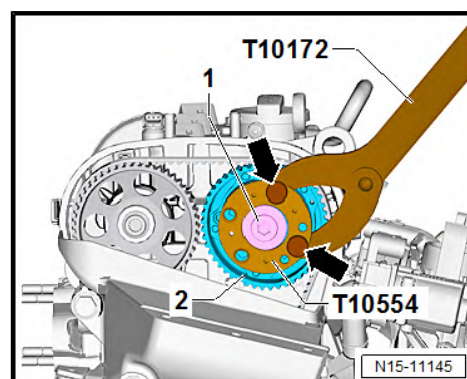
- Tighten securing bolt for camshaft adjuster on exhaust side -1- to final torque setting.

Stage	Locking pin camshaft adjuster exhaust side	Angle to turn bolts
1.	-1-	135°



- Hold the inlet camshaft with the counterhold tool - T10554- and the counterhold tool - T10172A- in this position.
- Screw in plug -1- and tighten to specified torque.

Stage	Plug camshaft adjuster intake side	Specified torque
1.	-1-	20 Nm



Installing

Assembly is carried out in the reverse order. Observe the following:



Note

Remove camshaft fixing and fixing bolt for crankshaft before the engine revolves.

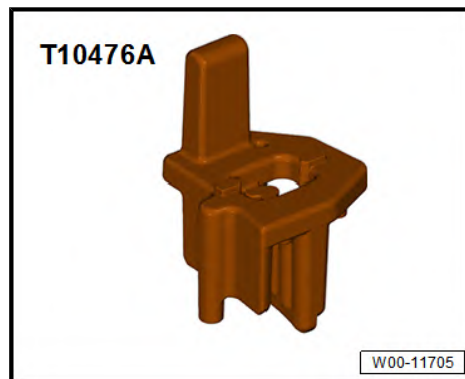
Specified torques

- ◆ ⇒ ["2.2 Assembly overview - toothed belt", page 174](#)
- ◆ ⇒ ["3.1 Assembly overview - valve gear", page 204](#)

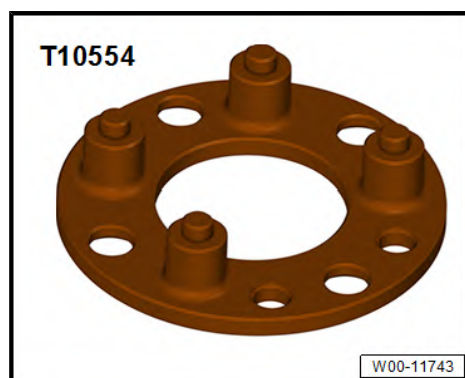
3.4.2 Removing and installing camshaft adjuster for exhaust camshaft

Special tools and workshop equipment required

◆ Assembly tool - T10476A-



◆ Counter-hold tool - T10554-

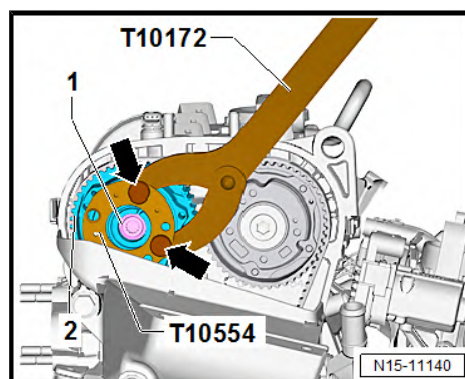


◆ Counter-hold tool - T10172A-



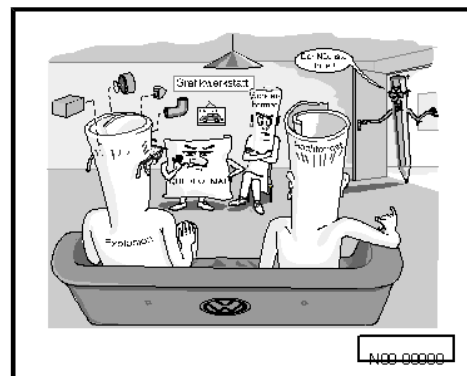
Removing

- Set engine to "TDC for cylinder no. 1"
⇒ ["4.7 Setting piston to TDC position", page 155](#) .
- Remove toothed belt from camshafts ⇒ [page 198](#) .
- Secure camshaft against turning with counterhold - T10554- and counterhold - T10172A- .
- Unscrew bolt -1- for camshaft adjuster of exhaust camshaft.
- Separate the engine support to free some space
⇒ ["1.5 Removing and installing engine support", page 122](#) .
- Remove camshaft adjuster of exhaust camshaft.
- Seal camshaft adjusters immediately using suitable plug from engine bung set - VAS 6122- .



Installing

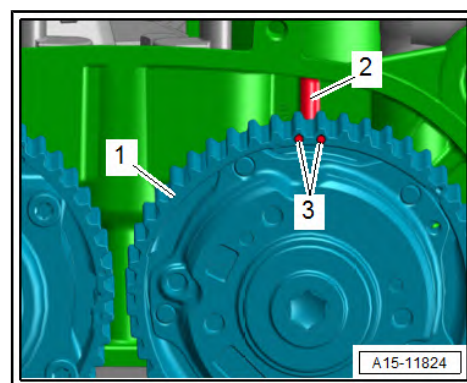
- Install camshaft adjuster.
- Renew bolts -3- and -4- for camshaft adjusters, and screw them in loosely.
- It should just be possible to turn camshaft pulleys -1- and -2- on camshafts but no rocking is permissible.
- Camshafts are located in “TDC” position.
- The camshaft pulleys are properly aligned with each other.
- Crankshaft is in “TDC position”.



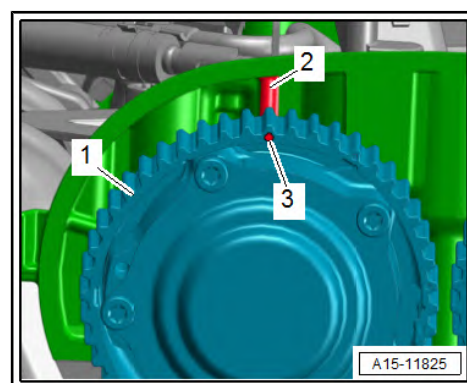
Note

- ◆ *It should just be possible to turn camshaft pulleys on camshafts but no rocking is permissible.*
- ◆ *Renew bolts that are tightened with turning further angle.*
- ◆ *Renew O-ring of plug if damaged.*
- ◆ *Ensure that the guide sleeve ➔ [Item 10 \(page 175\)](#) is reinstalled.*

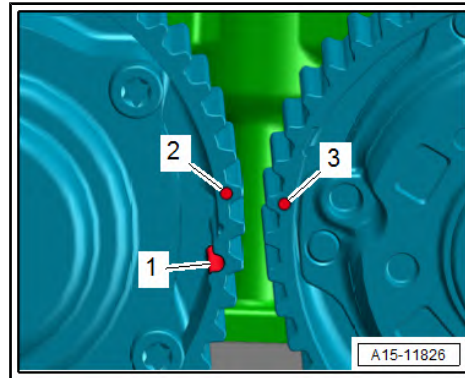
- Centre marks -3- of inlet camshaft pulley -1- relative to web -2- on camshaft housing.



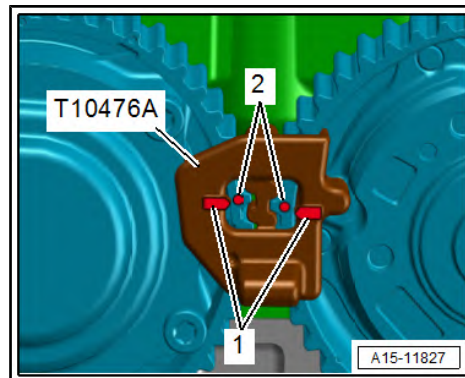
- Centre marks -3- of exhaust camshaft pulley -1- relative to web -2- on camshaft housing.



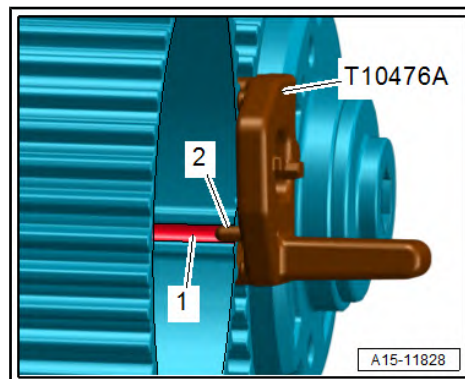
- The items -2- and -3- must be slightly offset.
- Groove -1- is used to check whether the assembly tool - T10476A- has been inserted correctly.



- Insert assembly tool - T10476A- between camshaft pulleys.
- The markings -1- on the assembly tool - T10476A- must be aligned with markings -2- on the camshaft pulleys.



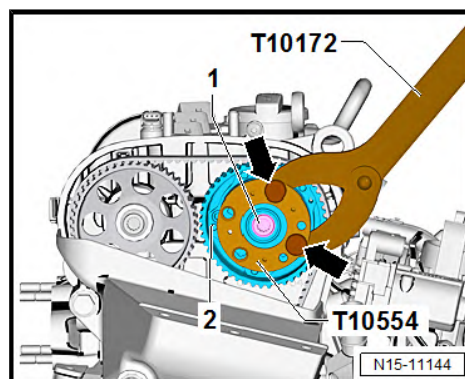
- Insert assembly tool - T10476A- to stop.
- Dowel pin -2- of assembly tool - T10476A- must engage in groove of exhaust camshaft pulley -1-.
- Fit toothed belt onto camshafts
⇒ [“2.7 Removing toothed belt from camshaft”, page 198](#) .



Pretighten

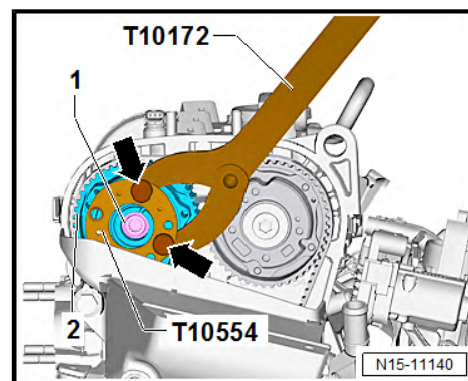
- Hold the inlet camshaft with the counterhold tool - T10554- and the counterhold tool - T10172A- in this position.
- Tighten bolt -1- in two rounds with specified tightening torque.

Stage	Securing bolt for camshaft adjuster, inlet side	Specified torque
1.	-1-	18 Nm
2.	-1-	50 Nm



- Hold exhaust camshaft in position using counterhold tool - T10554- and counterhold tool - T10172A- .
- Tighten bolt -1- in two rounds with specified tightening torque.

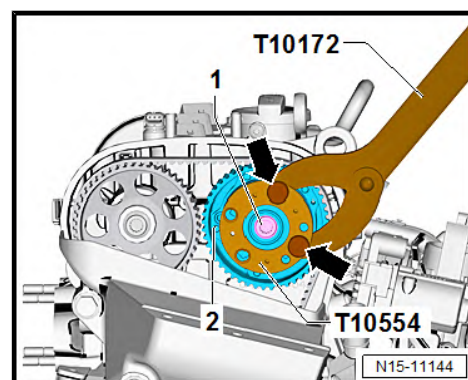
Stage	Securing bolt for camshaft adjuster, outlet side	Specified torque
1.	-1-	18 Nm
2.	-1-	50 Nm



End torque

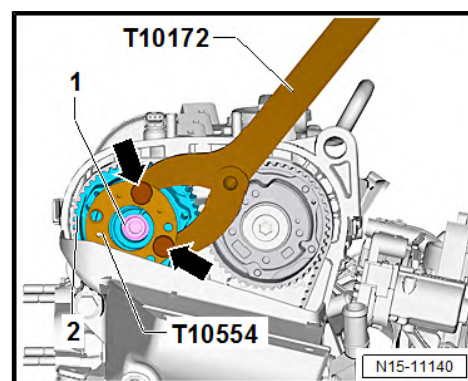
- Tighten bolt -1- for camshaft adjuster to final specified torque.

Stage	Securing bolt for camshaft adjuster, inlet side	Angle to turn bolts
1.	-1-	135°



- Tighten securing bolt for camshaft adjuster on exhaust side -1- to final torque setting.

Stage	Locking pin camshaft adjuster exhaust side	Angle to turn bolts
1.	-1-	135°



- Hold the inlet camshaft with the counterhold tool - T10554- and the counterhold tool - T10172A- in this position.
- Screw in plug -1- and tighten to specified torque.

Stage	Plug camshaft adjuster in- take side	Specified torque
1.	-1-	20 Nm

Installing

Installation is carried out in the reverse order. When installing, note the following:



Note

Remove camshaft fixing and fixing bolt for crankshaft before the engine revolves.

Specified torques

- ♦ ⇒ [“2.2 Assembly overview - toothed belt”, page 174](#)
- ♦ ⇒ [“3.1 Assembly overview - valve gear”, page 204](#)
- ♦ ⇒ [“2.1 Assembly overview - assembly mountings”, page 67](#)

3.5 Removing and installing inlet camshaft control valve 1 - N205-

Removing

- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .
- Removing and installing air intake pipe
⇒ [“2.5 Removing and installing air pipe ”, page 368](#) .
- Disconnect relevant connector -2- or -3-.
- Unscrew bolt -1- and remove exhaust camshaft control valve 1 - N318- .
- Unscrew bolt -4-, and remove inlet camshaft control valve 1 - N205- .

Installing

Install in reverse order of removal, observing the following:

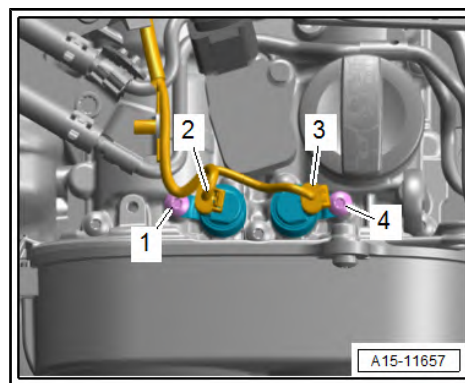
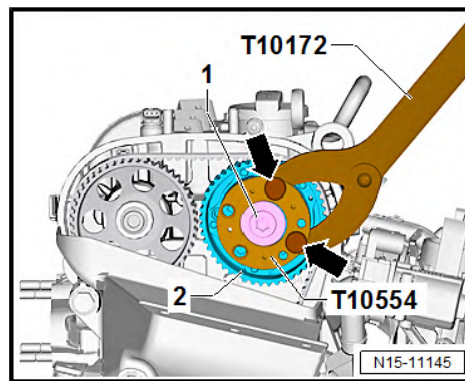


Note

Renew O-ring.

Specified torques

- ♦ ⇒ [“3.1 Assembly overview - valve gear”, page 204](#)
- ♦ ⇒ [“3.1 Assembly overview - air filter housing”, page 393](#)
- ♦ ⇒ [“2.1 Assembly overview - charge air system”, page 363](#)



3.6 Removing and installing exhaust camshaft control valve 1 - N318-

Removing

- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .
- Removing and installing air intake pipe
⇒ [“2.5 Removing and installing air pipe ”, page 368](#) .
- Disconnect relevant connector -2- or -3-.
- Unscrew bolt -1- and remove exhaust camshaft control valve 1 - N318- .
- Unscrew bolt -4-, and remove inlet camshaft control valve 1 - N205- .

Installing

Install in reverse order of removal, observing the following:

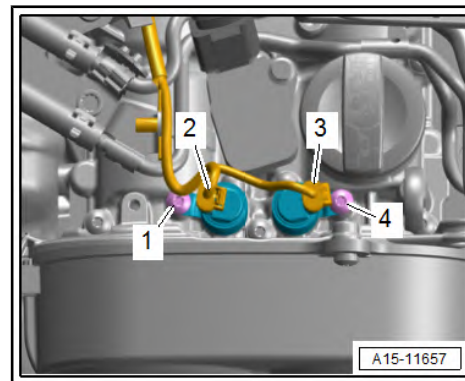


Note

- ◆ Check O-ring for damage.
- ◆ If it is damaged, renew it together with camshaft control valve 1 - N205- .
- ◆ The O-ring cannot be renewed individually.

Specified torques

- ◆ ⇒ [“3.1 Assembly overview - valve gear”, page 204](#)
- ◆ ⇒ [“3.1 Assembly overview - air filter housing”, page 393](#)
- ◆ ⇒ [“2.1 Assembly overview - charge air system”, page 363](#)



3.7 Removing and installing valve stem seals

⇒ [“3.7.1 Removing and installing valve stem seals \(cylinder head installed\)”, page 221](#)

⇒ [“3.7.2 Removing and installing valve stem seals \(cylinder head removed\)”, page 226](#)

3.7.1 Removing and installing valve stem seals (cylinder head installed)

Special tools and workshop equipment required

- ◆ Spark plug socket - 3122 B-



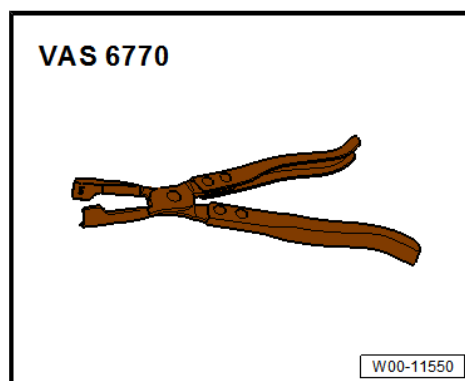
- ◆ Removal and installation device for valve cotters - VAS 5161A- with guide plate - VAS 5161A/32- .



- ◆ Valve stem seal fitting tool - 3365-



- ◆ Valve stem pliers - VAS 6770-



- ◆ Adapter - VAS 5161A/35- (not illustrated)

Procedure

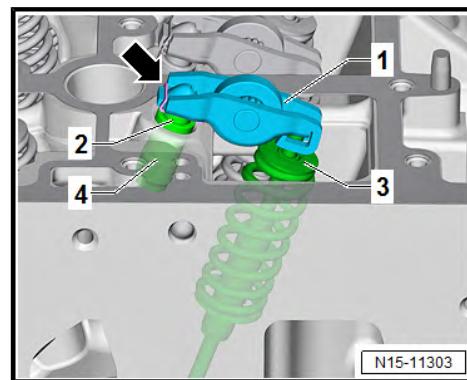
- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead: Plenum chamber cover: removing and installing .
- Remove plenum chamber bulkhead ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing bulkhead .

Toledo 2013, Ibiza 2016

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 55 ; front lid, rear lid, central locking; rust under wiper: remove and install .
- Remove engine control unit
⇒ ["6 Engine \(motor\) control unit", page 412](#) .
- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 55 ; front lid, rear lid, central locking; noise insulation covering plenum chamber cover: remove and install .

Continued for all vehicles

- Remove camshaft housing
⇒ ["1.4 Removing and installing camshaft housing"](#),
[page 166](#) .
- Remove turbocharger
⇒ ["1.2 Removing and installing turbocharger"](#), [page 353](#) .
- Unscrew spark plugs with spark plug socket and extension - 3122 B- .
- Remove lambda probe 1 before catalytic converter - GX10-
⇒ ["8.2.1 Lambda probe- removing and installing, Leon 2013, Ibiza 2018, Arona"](#), [page 431](#) .
- Mark allocation of roller rocker fingers -1-, hydraulic compensation element -4- and valves -3- for reinstallation.

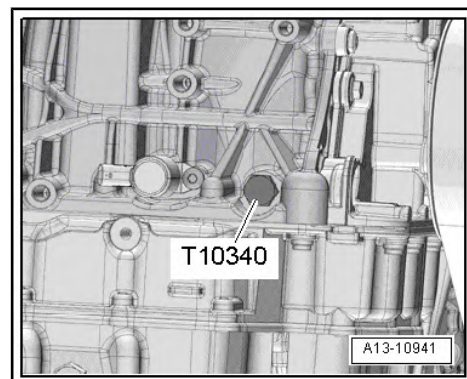


- Unscrew locking pin - T10340- .
- Set piston of respective cylinder to "bottom dead centre".

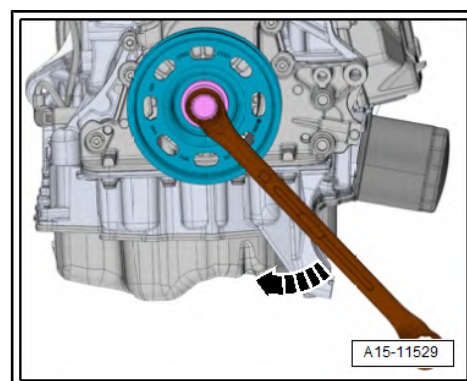


Note

- ◆ *The pistons of cylinders no. 1 and no. 4 are at »TDC« position after the camshaft housing has been removed.*
- ◆ *The pistons of cylinders no. 2 and no. 3 are at »bottom dead centre« position after the camshaft housing has been removed.*
- ◆ *Crank engine via crankshaft half a turn in direction of engine rotation. The pistons for cylinders no. 1 and no. 4 are at »bottom dead centre« position.*
- ◆ *When cranking the engine, hold and guide the toothed belt by hand to prevent it from being damaged.*



- Insert a screwdriver with a shaft length of at least 250 mm into spark plug hole so that it contacts piston crown.
- Turn crankshaft in direction of engine rotation -arrow- until piston of respective cylinder is at "BDC".

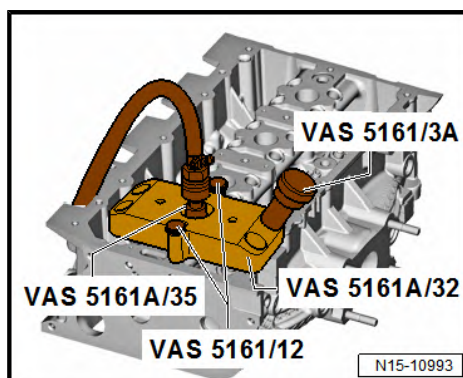


The screwdriver moves in the -direction of the arrow-.

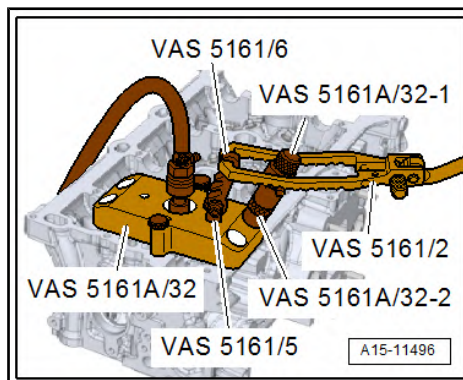
- The "BDC" has been reached before the screwdriver starts moving back in opposite direction.



- Fit guide plate -VAS 5161A/32- onto cylinder head and secure with knurled screws -VAS 5161/12- .
- Screw adapter - VAS 5161A/35- with seal hand-tight into the corresponding spark plug thread.
- Connect adapter to compressed air supply using a commercially available union and apply pressure continuously.
- Minimum pressure: 6 bar
- Insert punch -VAS 5161/3A- into guide plate. Use a plastic hammer to knock loose the firmly seated valve cotters.



- Screw toothed piece -VAS 5161/6- with hooking fork - VAS 5161/5- into guide plate.
- Slide sleeve -VAS 5161A/32-1- onto assembly cartridge and insert cartridge into guide plate -VAS 5161A/32-2- .
- Attach pressure fork -VAS 5161/2- to toothed piece and press assembly cartridge down.
- At the same time, turn knurled screw of assembly cartridge clockwise until tips engage in valve cotters.
- Move knurled screw back and forth to press apart valve cotters and capture them in assembly cartridge.
- Release pressure fork.
- Remove installation cartridge.
- Unbolt guide plate and move to side.
- The compressed air hose remains connected.
- Remove valve spring and valve spring plate.

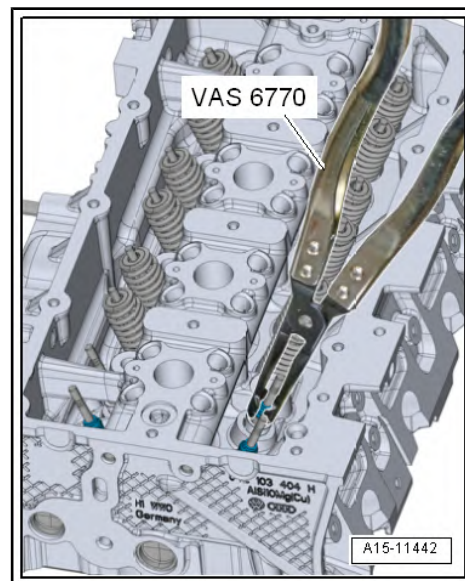


- Pull off valve stem seal using valve stem pliers - VAS 6770- .

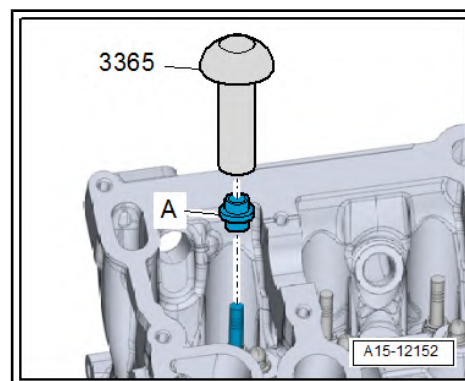


Note

- ◆ *Slowly push valve stem seals as far as stop.*
- ◆ *Seal oil passages of cylinder head with a lint-free cloth.*

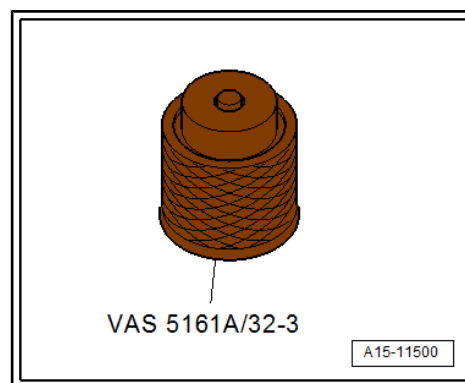


- Lightly oil sealing lip of valve stem seal -A-.
- Carefully press valve stem oil seal -A- onto valve guide using valve stem seal fitting tool - 3365- .



If valve cotters have been removed from assembly cartridge:

- First, insert valve cotters into insertion device - VAS 5161 A/ 32-3- .
- Press down spring washer until three grooves are visible.
- Fit valve cotters into grooves.
- Larger diameter of valve cotters face upwards.
- Press the assembly cartridge - VAS 5161A/32-1- onto the insertion device - VAS 5161A/32-3- from above and pick up valve cotters.
- Insert valve spring and valve spring plate. For installation position of valve spring refer to ➔ [page 205](#) .
- To do this, move knurled screw back and forth to press apart valve cotters and capture them in assembly cartridge.



- Bolt guide plate -VAS 5161A/32- onto cylinder head again.
- Insert assembly cartridge -VAS 5161A/32-1- with sleeve -VAS 5161A/32-2- into guide plate.
- Press pressure fork downwards and pull knurled screw upwards, turning it clockwise and anticlockwise. The valve cones are mounted in this way.
- Reduce pressure on pressure fork whilst pulling on knurled screw.
- Repeat procedure on each valve.

Installing

Assembly is carried out in the reverse order, note the following:

- Install turbocharger
⇒ ["1.2 Removing and installing turbocharger", page 353](#) .
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover . Installing bulkhead of plenum chamber cover
⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing bulkhead .

Toledo 2013, Ibiza 2016

- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 55 ; front lid, rear lid, central locking; rust under wiper: remove and install
- Install engine control unit
⇒ ["6 Engine \(motor\) control unit", page 412](#) .
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 55 ; front lid, rear lid, central locking; plenum chamber cover noise insulation covering; remove and install

Continued for all vehicles

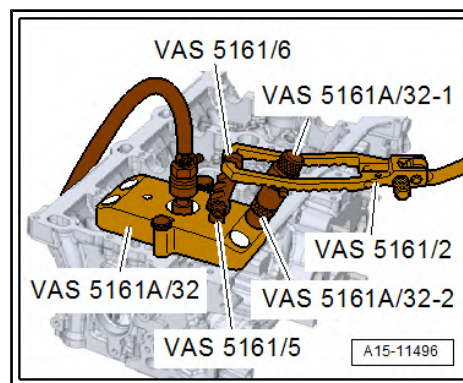
- Install camshaft housing
⇒ ["1.4 Removing and installing camshaft housing", page 166](#) .
- Install spark plugs
⇒ ["1.1 Assembly overview - ignition system", page 464](#) .

Specified torques

- ◆ ⇒ ["1.1 Assembly overview - turbocharger", page 351](#)
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview: drive shaft

3.7.2 Removing and installing valve stem seals (cylinder head removed)

Special tools and workshop equipment required



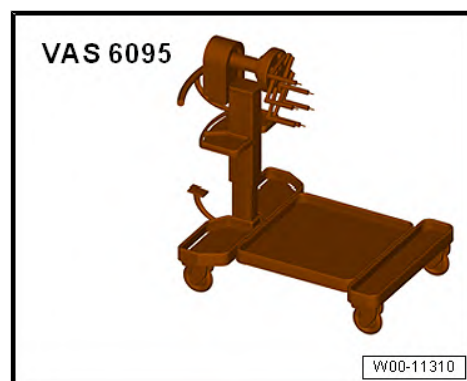
- ◆ Valve stem seal fitting tool - 3365-



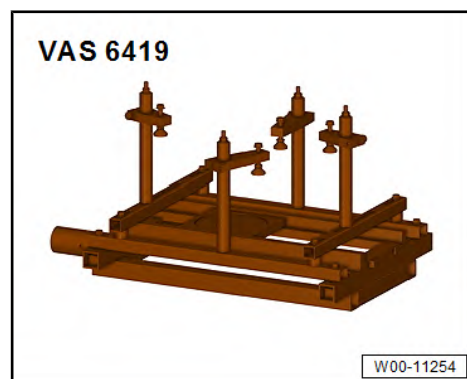
- ◆ Removal and installation device for valve cotters - VAS 5161 A- with set -VAS 5161/32-



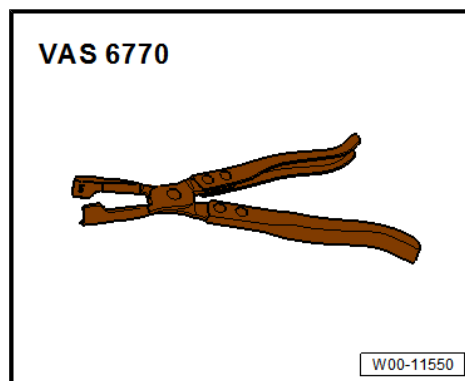
- ◆ Engine and gearbox support - VAS 6095-



- ◆ Cylinder head tensioning device - VAS 6419-

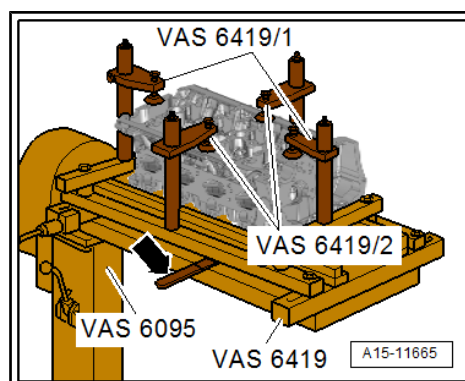


◆ Valve stem pliers - VAS 6770-

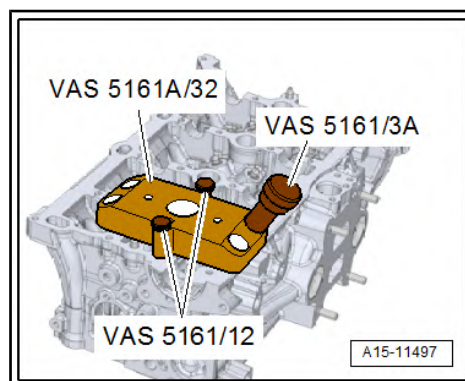


Procedure

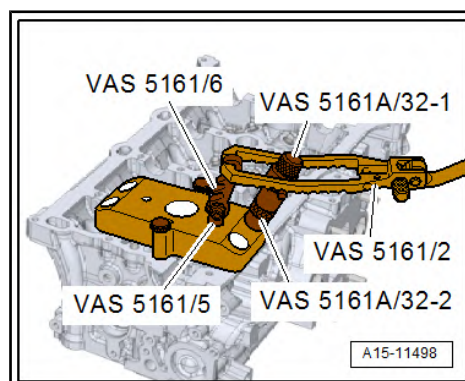
- Insert cylinder head clamping device - VAS 6419- into engine and gearbox support - VAS 6095- .
- Tension cylinder head on cylinder head tensioning device as shown in illustration.
- Connect cylinder head clamping device to compressed air.
- Use lever -arrow- to slide air cushion under combustion chamber from which valve stem oil seal is to be removed.
- Allow compressed air to flow into air cushion until it lies against valve disc.



- Fit guide plate -VAS 5161 A/32- onto cylinder head. Secure using knurled screws -VAS 5161/12- .
- Insert punch -VAS 5161/3A- into guide plate. Use a plastic hammer to knock loose the firmly seated valve cotters.



- Screw toothed piece -VAS 5161/6- with hooking fork - VAS 5161/5- into guide plate.
- Slide sleeve -VAS 5161 A/32-1- onto assembly cartridge and insert cartridge into guide plate -VAS 5161 A/32-2- .
- Attach pressure fork -VAS 5161/2- to toothed piece and press assembly cartridge down.
- At the same time, turn knurled screw of assembly cartridge clockwise until tips engage in valve cotters.
- Move knurled screw back and forth to press apart valve cotters and capture them in assembly cartridge.
- Release pressure fork.
- Remove installation cartridge.
- Unbolt guide plate and move to side.
- Remove valve spring and valve spring plate.

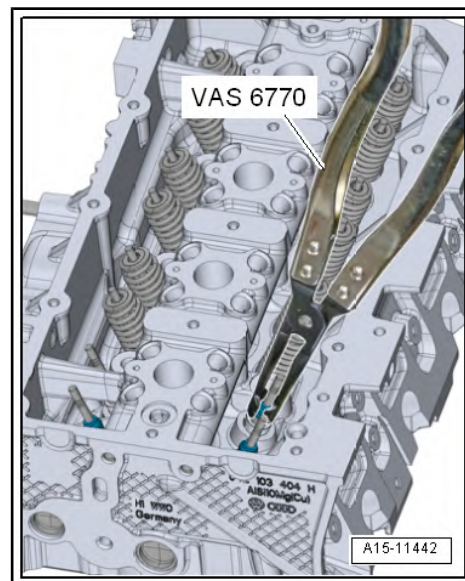


- Pull off valve stem seal using valve stem pliers - VAS 6770- .

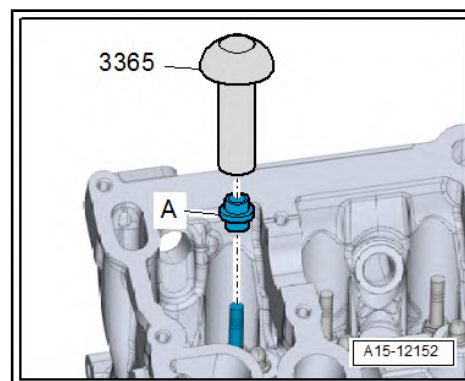


Note

- ◆ *There is a risk of damage when installing the valve stem seals.*
- ◆ *Fit plastic sleeve -A-, enclosed with new valve stem seals -B-, onto valve stem.*

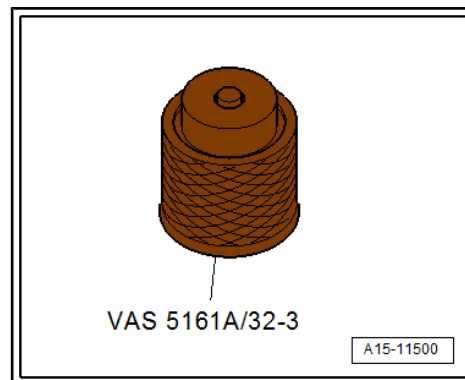


- Lightly oil sealing lip of valve stem seal -A-.
- Carefully press valve stem oil seal -A- onto valve guide using valve stem seal fitting tool - 3365- .

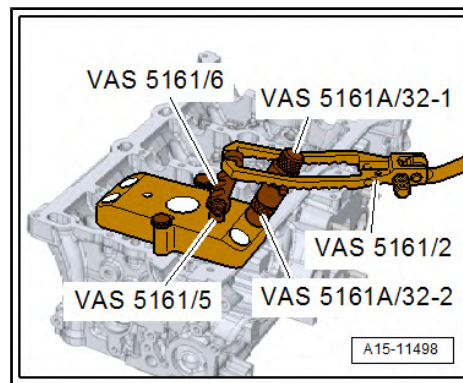


If valve cotters have been removed from assembly cartridge:

- First, insert valve cotters into insertion device - VAS 5161 A/ 32-3- .
- Press down spring washer until three grooves are visible.
- Fit valve cotters into grooves.
- Larger diameter of valve cotters face upwards.
- Release the spring washer. The spring force pushes the washer back upwards and holds the valve cotters in place.
- Press assembly cartridge onto insertion device from above and pick up valve cotters.
- Insert valve spring and valve spring plate. For installation position of valve spring refer to ➔ [page 205](#) .
- To do this, move knurled screw back and forth to press apart valve cotters and capture them in assembly cartridge.



- Bolt guide plate -VAS 5161 A/32- onto cylinder head again.
- Insert assembly cartridge -VAS 5161 A/32-1- with sleeve -VAS 5161 A/32-2- into guide plate.
- Press pressure fork downwards and pull knurled screw upwards, turning it clockwise and anticlockwise. The valve cones are mounted in this way.
- Reduce pressure on pressure fork whilst pulling on knurled screw.
- Repeat procedure on each valve.
- Install cylinder head
⇒ ["1.3 Removing and installing cylinder head", page 162](#) .



4 Inlet and exhaust valves

⇒ ["4.1 Checking valve guides", page 231](#)

⇒ ["4.2 Checking valves", page 231](#)

⇒ ["4.3 Valve dimensions", page 232](#)

4.1 Checking valve guides

Special tools and workshop equipment required

◆ Universal dial gauge bracket - VW 387-

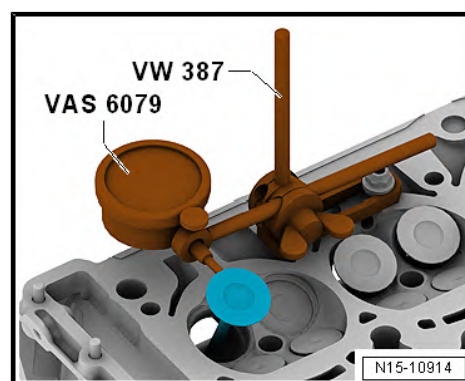


◆ Dial gauge - VAS 6079-



Test sequence

- Insert a new valve in the guide. End of valve stem must be at same height as guide. On account of differing stem diameters, only use inlet valve in inlet valve guide and exhaust valve in exhaust valve guide.
- Determine rock.
- Wear limit: 0.5 mm.
- If the wear limit is exceeded, repeat the measurement with new valves.
- Renew cylinder head if the wear limit is still exceeded.



Note

Valve guides cannot be exchanged.

4.2 Checking valves

- Check for scoring on valve stems and valve seat surfaces.
- Exchange valve if significant scoring can be seen.

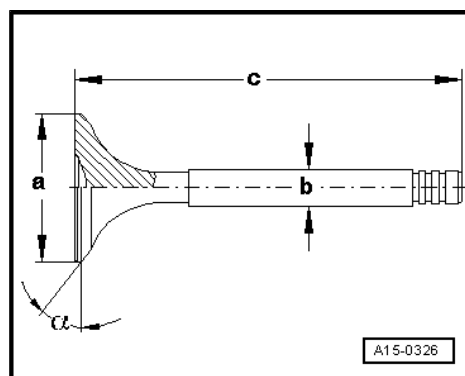
4.3 Valve dimensions



Note

Never rework the inlet and exhaust valves. Only lapping-in is permitted.

Dimension		Inlet valve	Outlet valve
Ø a	mm	28.5	25.0
Ø b	mm	4.973	4.963
c	mm	110.25	110.09
α	°	45	30



17 – Lubrication

1 Sump, oil pump

⇒ [“1.1 Assembly overview - sump/oil pump”, page 233](#)

⇒ [“1.2 Engine oil:”, page 237](#)

⇒ [“1.3 Removing and installing sump”, page 237](#)

⇒ [“1.4 Removing and installing oil pump”, page 242](#)

⇒ [“1.5 Removing and installing oil level and oil temperature sender G266”, page 244](#)

1.1 Assembly overview - sump/oil pump



Note

- ◆ *If large quantities of metal chips and abraded material are found during engine repair, this may indicate that the crankshaft bearings or conrod bearings are damaged. In order to prevent subsequent damage, please carry out the following work after the repair: carefully clean the oil channels; the oil nozzles, the engine cooler and the oil filter.*
- ◆ *Oil jets and pressure release valve*
⇒ [“4.6 Removing and installing oil spray jets”, page 153](#)

1 - Sump

- ☐ Removing and installing
⇒ ["1.3 Removing and installing sump", page 237](#)
- ☐ Tighten loosened connecting union for oil filter
⇒ [Fig. "Tightening connecting union for oil filter", page 236](#)

2 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence
⇒ [page 235](#)

3 - Seal

- ☐ Renew in the case of oil drain plug with non-captive seal

4 - Oil drain plug

- ☐ With captive seal on new vehicles
⇒ [page 235](#)
- ☐ To be renewed on 1st oil change ⇒ [page 236](#)
- ☐ Oil drain plug with non-captive seal installed on first oil change is to be reused ⇒ [page 236](#)
- ☐ 30 Nm

5 - Oil intake tube

- ☐ Clean strainer if soiled

6 - Bolt

- ☐ 8 Nm

7 - Seal

- ☐ Renew after removal

8 - Seal

- ☐ Renewing ⇒ ["1.6 Renewing crankshaft oil seal - belt pulley end", page 132](#)

9 - Bolt

- ☐ Specified torque and tightening sequence ⇒ [page 235](#)

10 - Oil pump

- ☐ Removing and installing ⇒ ["1.4 Removing and installing oil pump", page 242](#)

11 - Dowel sleeve

- ☐ 2 off

12 - Seal

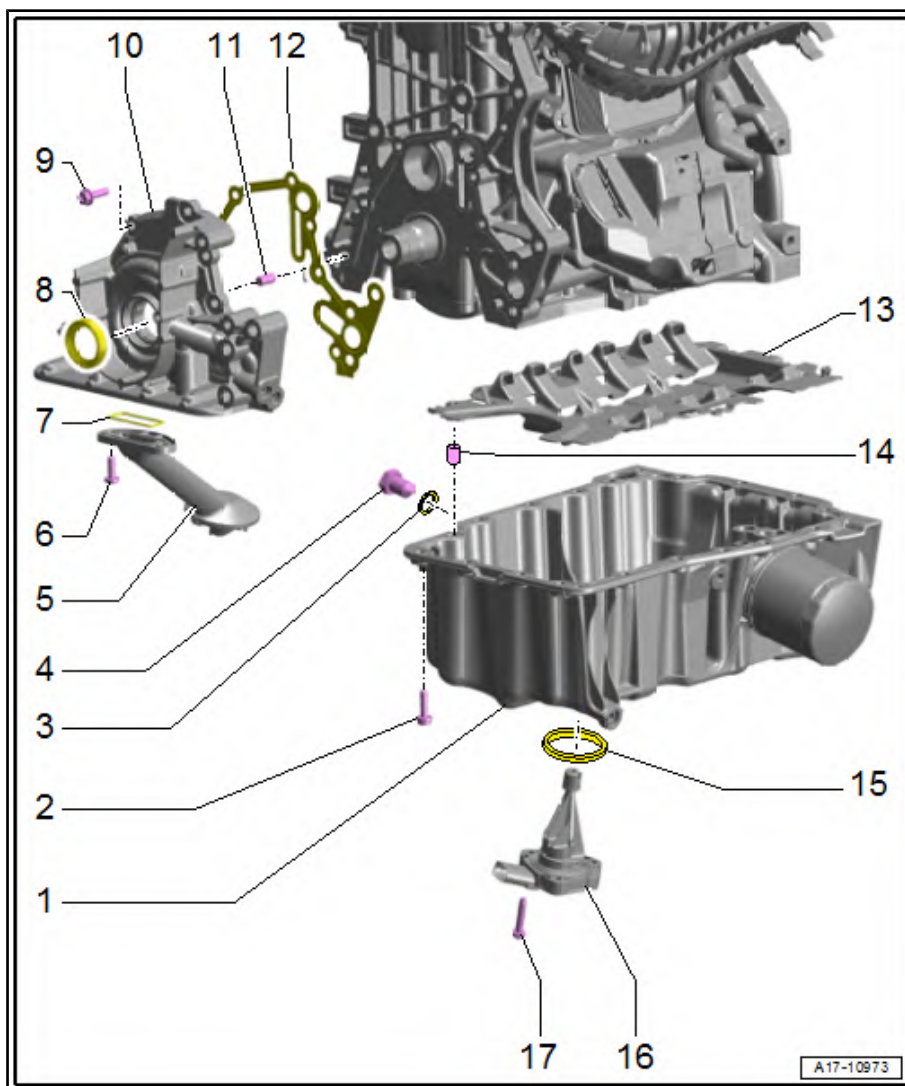
- ☐ Renew after removal

13 - Baffle plate

14 - Dowel pin

15 - Seal

- ☐ Renew after removal



16 - Oil level and oil temperature sender - G266-

- ❑ Removing and installing

⇒ "1.5 Removing and installing oil level and oil temperature sender G266 ", page 244

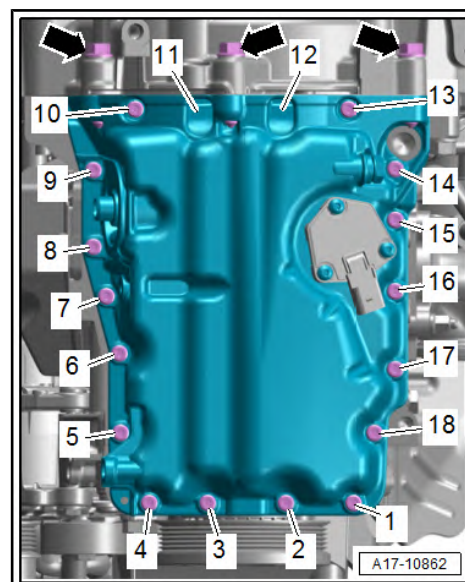
17 - Bolt

- ❑ 9 Nm

Sump - specified torque and tightening sequence

- Tighten bolts in stages in the sequence shown.

Stage	Bolts	Specified torque
1.	-1 ... 18-	Screw in to stop by hand.
2.	-1 ... 18-	12 Nm



Oil pump - specified torque and tightening sequence

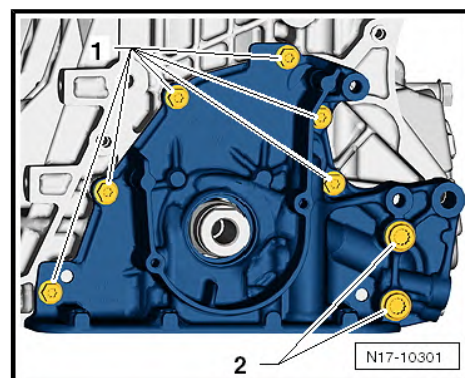


Note

If a further tightening angle is specified for certain bolts, these must be renewed.

- Tighten bolts in stages in the sequence shown.

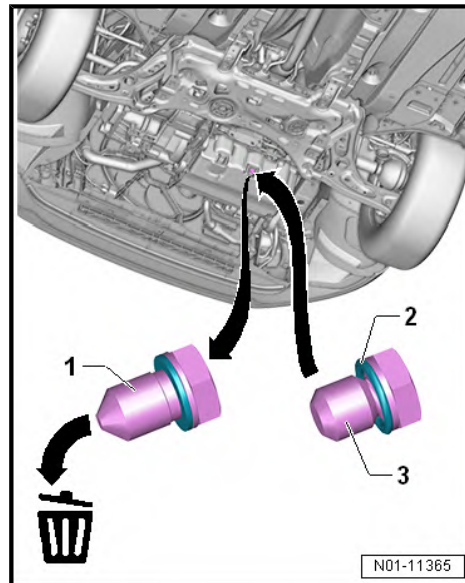
Stage	Bolts	Specified torque/turning further angle
1.	-1, 2-	8 Nm
2.	-1-	Turn 90° further
3.	-2-	20 Nm



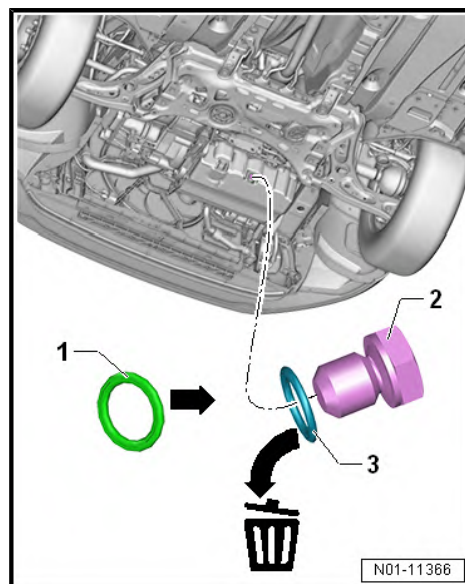
Oil drain plug with captive seal (factory-installed)

- On first oil change, oil drain plug with captive seal -1- is disposed of.
- Fit new oil drain plug -3- with renewable seal -2-.

Oil drain plug with renewable seal (all future oil change services)



- Unscrew oil drain plug -2-, and dispose of old seal -3-.
- New oil seal -1- can be renewed individually when oil is changed in the future.

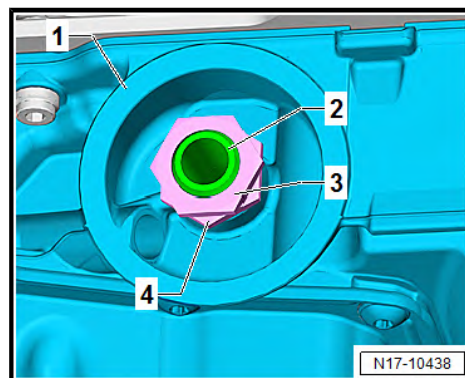


Tightening connecting union for oil filter

- If the connecting union -2- in the top section of sump -1- is loose, retighten it as described below.

Use only the two nuts -3 and 4- for this procedure.

- Hexagon nut , qty. 2, ⇒ Electronic Parts Catalogue (ETKA)
- Screw nuts -3- and -4- onto connecting union -2-, and counter lock them.
- Tighten connecting union -2- via nut -3-.
- Loosen the two nuts and remove them, taking care not to loosen the connecting union.



Specified torques

Threaded sleeve	Specified torque
-2-	50 Nm

1.2 Engine oil:



Note

- ◆ *Risk of catalytic converter damage!*
- ◆ *Oil level must not be above "max." mark.*

Oil fill levels, oil specifications:

- ◆ Ateca ⇒ Maintenance ; Booklet KH1 ; Engine oil: capacities and specifications
- ◆ Leon 2013 ⇒ Maintenance ; Booklet 501 ; Engine oil: capacities and specifications
- ◆ Ibiza 2018 ⇒ Maintenance ; Booklet KJ1 ; Engine oil: capacities and specifications
- ◆ Arona ⇒ Maintenance ; Booklet KJ1 ; Engine oil: capacities and specifications
- ◆ Ibiza 2016 ⇒ Maintenance ; Booklet 603 ; Engine oil: capacities and specifications
- ◆ Toledo 2013 ⇒ Maintenance ; Booklet KG1 ; Engine oil: capacities and specifications

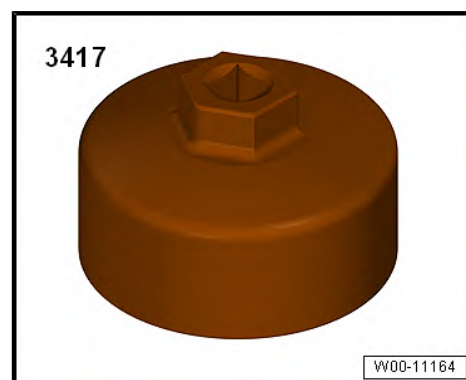
Checking engine oil level:

- ◆ Ateca ⇒ Maintenance ; Booklet KH1 ; Engine oil level: check
- ◆ Leon 2013 ⇒ Maintenance ; Booklet 501 ; Engine oil level: check
- ◆ Ibiza 2018 ⇒ Maintenance ; Booklet KJ1 ; Engine oil level: check
- ◆ Arona ⇒ Maintenance ; Booklet KJ1 ; Engine oil level: check
- ◆ Ibiza 2016 ⇒ Maintenance ; Booklet 603 ; Engine oil level: check
- ◆ Toledo 2013 ⇒ Maintenance ; Booklet KG1 ; Engine oil level: check

1.3 Removing and installing sump

Special tools and workshop equipment required

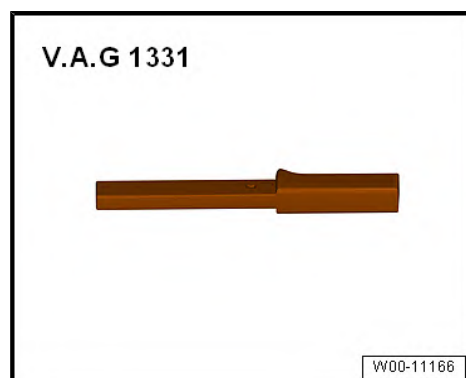
- ◆ Oil filter tool - 3417-



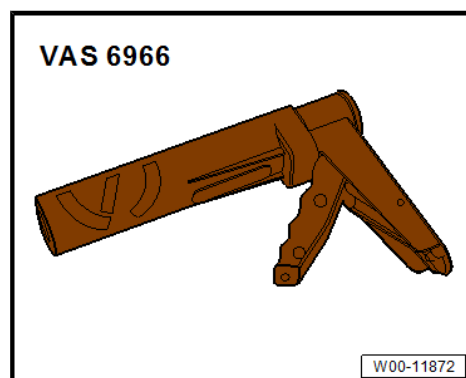
- ◆ Socket insert - T10058-



- ◆ Torque wrench - V.A.G 1331-



- ◆ Applicator gun - VAS 6966-



- ◆ Hand drill with plastic brush attachment
- ◆ Scraper
- ◆ Silicone sealant ⇒ Electronic parts catalogue (ETKA)

Removing



Note

Observe ⇒ [page 10](#) when working on the lubrication system!

- Draining engine oil ⇒ [“1.2 Engine oil:”, page 237](#)

Vehicles with air conditioner.



NOTICE

Risk of damage to refrigerant lines from rupture of inner foil.

- Never bend refrigerant lines to a radius of less than 100 mm ($r < 100$ mm).

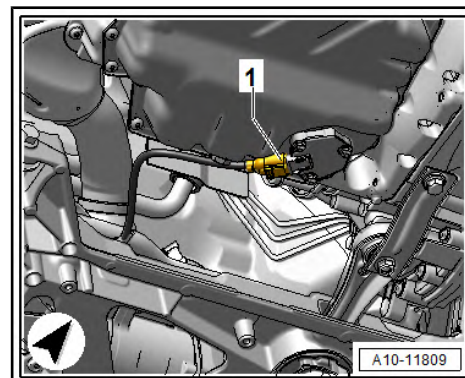
i Note

The air conditioning system lines must not be opened.

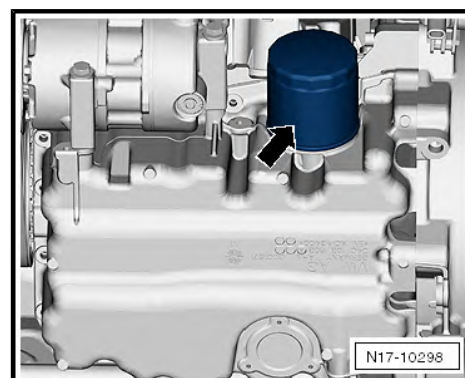
- Remove poly V-belt
⇒ [“1.2 Removing and installing poly-V belt”, page 113](#) .
- Removing air conditioner compressor: Heating, Air conditioning⇒ Air conditioner compressor; Rep. gr. 87 ; ; removing and installing A/C compressor .
- Secure AC compressor to lock carrier.

Continued for all vehicles

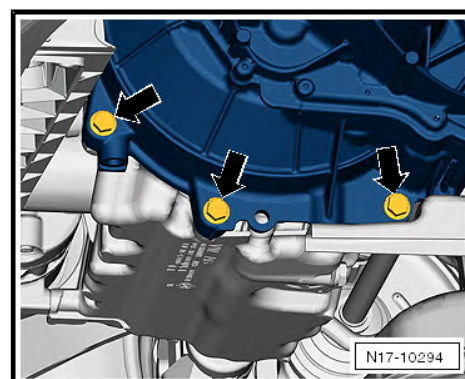
- Disconnect electrical connector -1- on oil level and oil temperature sender - G266- .



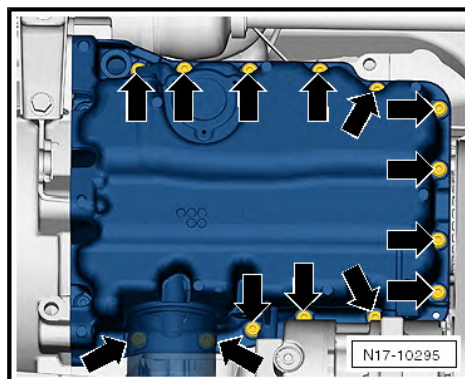
- Remove oil filter housing -arrow- with the oil filter tool - 3417- .



- Remove securing bolts -arrows- for gearbox.



- Unscrew all sump securing bolts -arrows-.

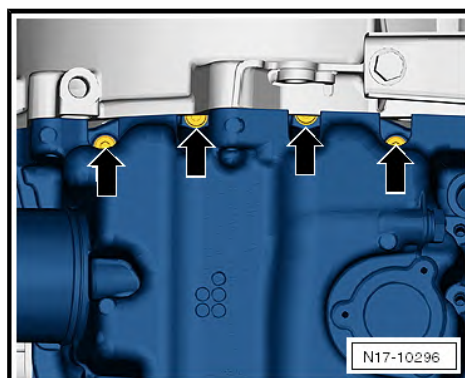


- Unscrew sump securing bolts on gearbox side -arrows- using Allen key, long reach - T10058- .

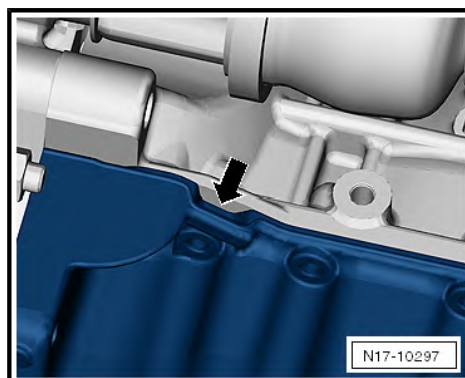


Note

- ◆ *The sump is sealed with liquid sealant.*
- ◆ *When hardened, the sealant has a high adhesive strength.*
- ◆ *Carefully separate sump from cylinder block.*



- Carefully detach sump from cylinder block at recess -arrow- using assembly lever.
- Remove sump. Loosen sump with light blows of a rubber headed hammer if necessary.
- Remove sealant residues from cylinder block with a flat scraper.



Note

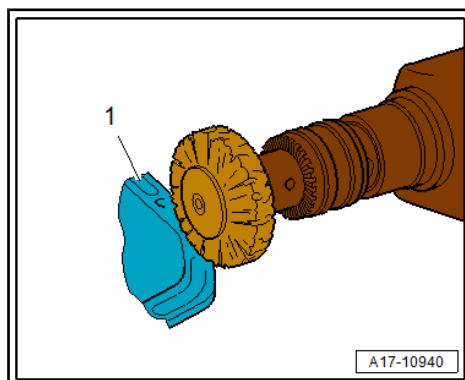
To prevent particles from entering the lubrication system, cover the open parts of the engine.

Installing

CAUTION

Risk of eye injury caused by sealant residue.

- **Wear protective goggles.**
- Remove sealant residue from sump using rotating plastic brush.
- Remove any oil and grease from sealing surfaces.

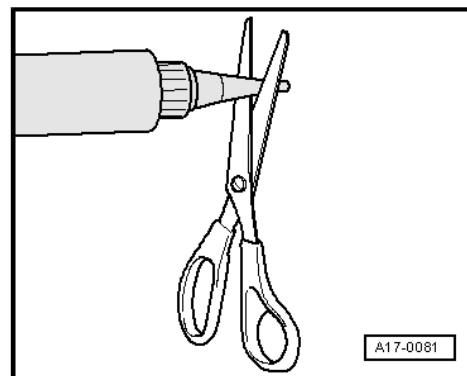




Note

Observe expiry date of sealant.

- Cut off tube nozzle at front marking (Ø of nozzle approx. 2 mm).

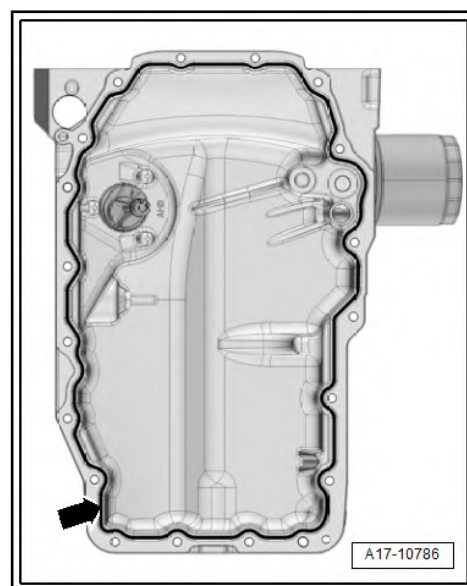


- Apply sealant in a bead -arrow- to clean sealing surface of bottom section of sump using applicator gun - VAS 6966- .



Note

- ◆ *Risk of blocking lubrication system with excess sealant.*
- ◆ *Do not apply sealant bead thicker than specified.*

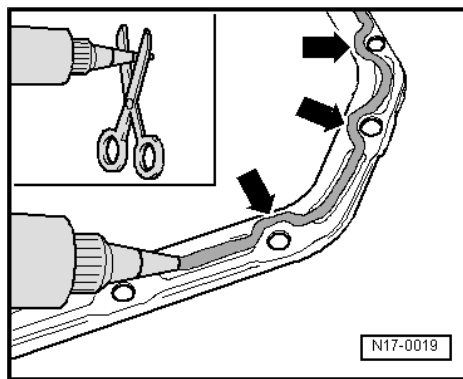


- Thickness of sealant bead: 2 ... 3 mm
- run along inner side of bolt holes -arrows-.



Note

- ◆ Apply the sealant bead with particular care around the sealing flange.
- ◆ The sump must be installed within 5 minutes after applying the sealant.
- Position oil sump and tighten bolts . ➔ [page 235](#)
- Install oil filter ➔ [page 254](#) .



Note

Allow sealant to cure for approx. 30 minutes after installing lower part of sump. Only then fill with engine oil.

- Fill with engine oil and check oil level
➔ [“1.2 Engine oil:”, page 237](#) .



Note

The oil level must not be above the max. marking on the dipstick - danger of damage to the catalytic converter!

Specified torques

- ◆ Securing bolts for air conditioner compressor ➔ Heating, air conditioning system; Rep. gr. 87 ; Air conditioner compressor; Removing and installing air conditioner compressor
- ◆ ➔ [“1.1 Assembly overview - sump/oil pump”, page 233](#)
- ◆ ➔ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation
- ◆ Noise insulation assembly bolts, Toledo 213, Ibiza 2016 ➔ General body works, exterior; Rep. gr. 50 ; Underbody protection; Assembly overview: underbody protection

1.4 Removing and installing oil pump

Removing

- Remove alternator ➔ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .
- Remove toothed belt
➔ [“2.3 Removing and installing toothed belt”, page 176](#) .
- Remove sump
➔ [“1.3 Removing and installing sump”, page 237](#) .
- Remove the seal
➔ [“1.6 Renewing crankshaft oil seal - belt pulley end”, page 132](#) .

- Unscrew bolts -1 and 2-, and pull oil pump in a straight line off dowel pins.
- Remove seal.

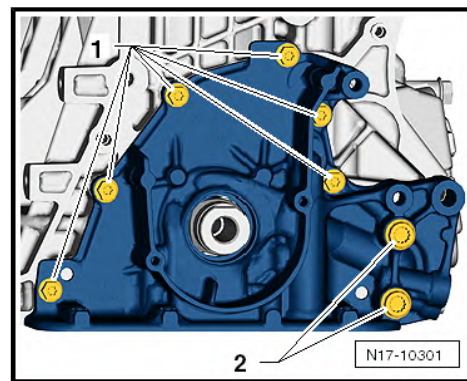
Installing

Install in reverse order of removal, observing the following:

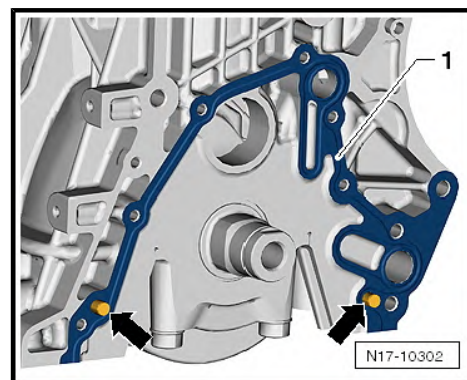


Note

- ◆ *Renew bolts that are tightened with turning further angle after each removal.*
- ◆ *Renew seal.*



- Check whether dowel pins -arrows- for centring oil pump and cylinder block are present. Renew any missing dowel pins.
- Fit new gasket -1-.



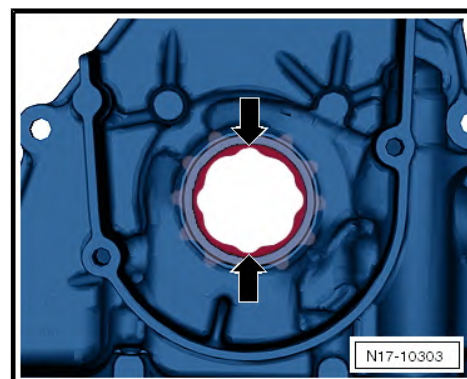
- To check oil pump for ease of movement, turn bearing -arrows- with one finger.



Note

Renew oil pump if sluggish.

- Rotate oil pump gear to a position where 2 opposing notches -arrows- are aligned vertically.
- Fit oil pump, and tighten bolts ⇒ [page 235](#) .
- Install new crankshaft oil seal on belt pulley end
⇒ [“1.6 Renewing crankshaft oil seal - belt pulley end”, page 132](#) .
- Install oil pan
⇒ [“1.3 Removing and installing sump”, page 237](#) .
- Install toothed belt
⇒ [“2.3 Removing and installing toothed belt”, page 176](#) .
- Install alternator ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .
- Connect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Replenish engine oil and check oil level
⇒ [“1.2 Engine oil.”, page 237](#)



Specified torques

- ◆ Securing bolts for sump
⇒ [“1.1 Assembly overview - sump/oil pump”, page 233](#)
- ◆ Securing bolts of alternator ⇒ Rep. gr. 27 ; Alternator; Assembly overview - alternator .

1.5 Removing and installing oil level and oil temperature sender - G266-

Removing

- Drain oil ⇒ ["1.2 Engine oil:", page 237](#)
- Disconnect connector -3-.
- Unscrew bolts -1- and remove oil level and oil temperature sender - G266- -item 4-.

Installing

Install in reverse order of removal, observing the following:



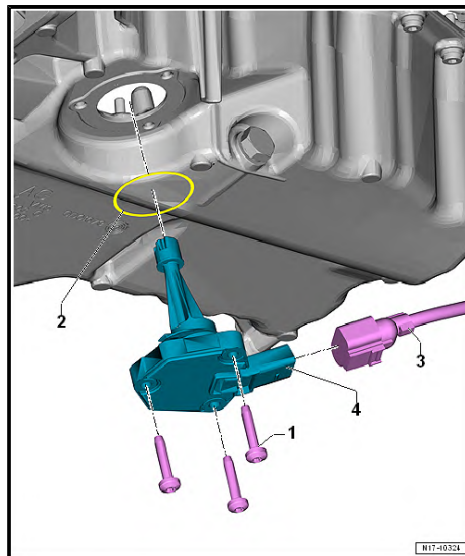
Note

Renew oil seal -2-. Moisten seal with oil before installing.

- Replenish engine oil and check oil level
⇒ ["1.2 Engine oil:", page 237](#)

Specified torques

- ◆ ⇒ ["1.1 Assembly overview - sump/oil pump", page 233](#)



2 Engine oil cooler

⇒ [“2.1 Assembly overview - engine oil cooler”, page 245](#)

⇒ [“2.2 Removing and installing engine oil cooler”, page 246](#)

2.1 Assembly overview - engine oil cooler

1 - Bolt

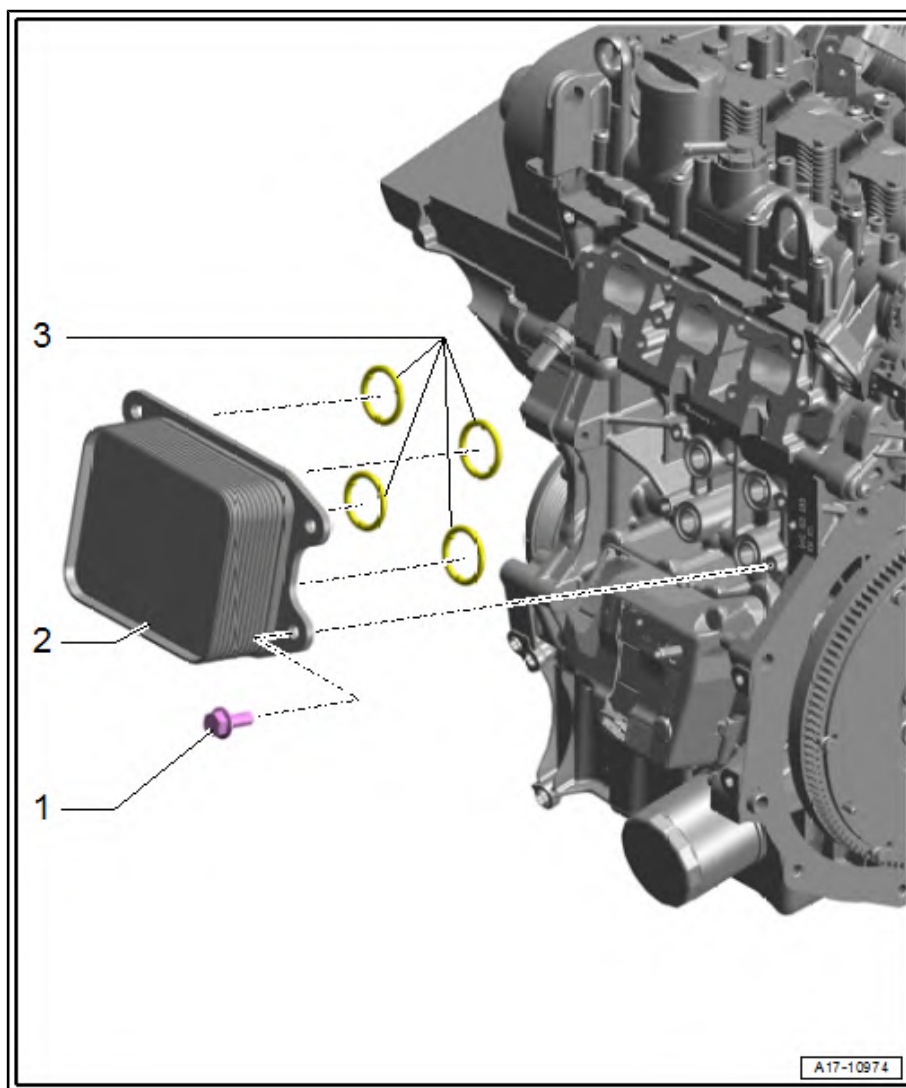
- ☐ Renew after removal
- ☐ 8 Nm +90°

2 - Engine oil cooler

- ☐ See note
⇒ [“2.2 Removing and installing engine oil cooler”, page 246](#) .
- ☐ Removing and installing
⇒ [“2.2 Removing and installing engine oil cooler”, page 246](#)
- ☐ Renew coolant after replacing
⇒ [“1.3 Draining and adding coolant”, page 260](#)

3 - Seals

- ☐ Renew after removal



2.2 Removing and installing engine oil cooler

Removing

- Remove intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 400](#) .
- Unscrew bolts -arrows- and detach engine oil cooler -1-.

Installing

Install in reverse order of removal, observing the following:

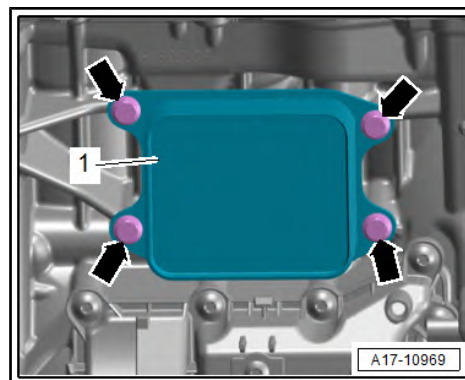


Note

- ◆ *Renew seals.*
- ◆ *Do not reuse the dirty coolant.*
- Install intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 400](#) .
- Add coolant ⇒ [“1.3 Draining and adding coolant”, page 260](#) .

Specified torques

- ◆ Securing bolts for engine oil cooler
⇒ [“2.1 Assembly overview - engine oil cooler”, page 245](#)
- ◆ Securing bolts for intake manifold
⇒ [“4.1 Assembly overview - intake manifold”, page 399](#)



3 Crankcase ventilation

⇒ [“3.1 Assembly overview - crankcase breather system”, page 247](#)

⇒ [“3.2 Removing and installing oil separator”, page 248](#)

3.1 Assembly overview - crankcase breather system

1 - Bolt

- ☐ Self-locking
- ☐ Renewing
- ☐ 9 Nm

2 - Oil separator

- ☐ Removing and installing
⇒ [“3.2 Removing and installing oil separator”, page 248](#)
- ☐ Renew if damaged

3 - Cover

- ☐ For oil separator

4 - Hose

- ☐ For crankcase ventilation.

5 - O-ring

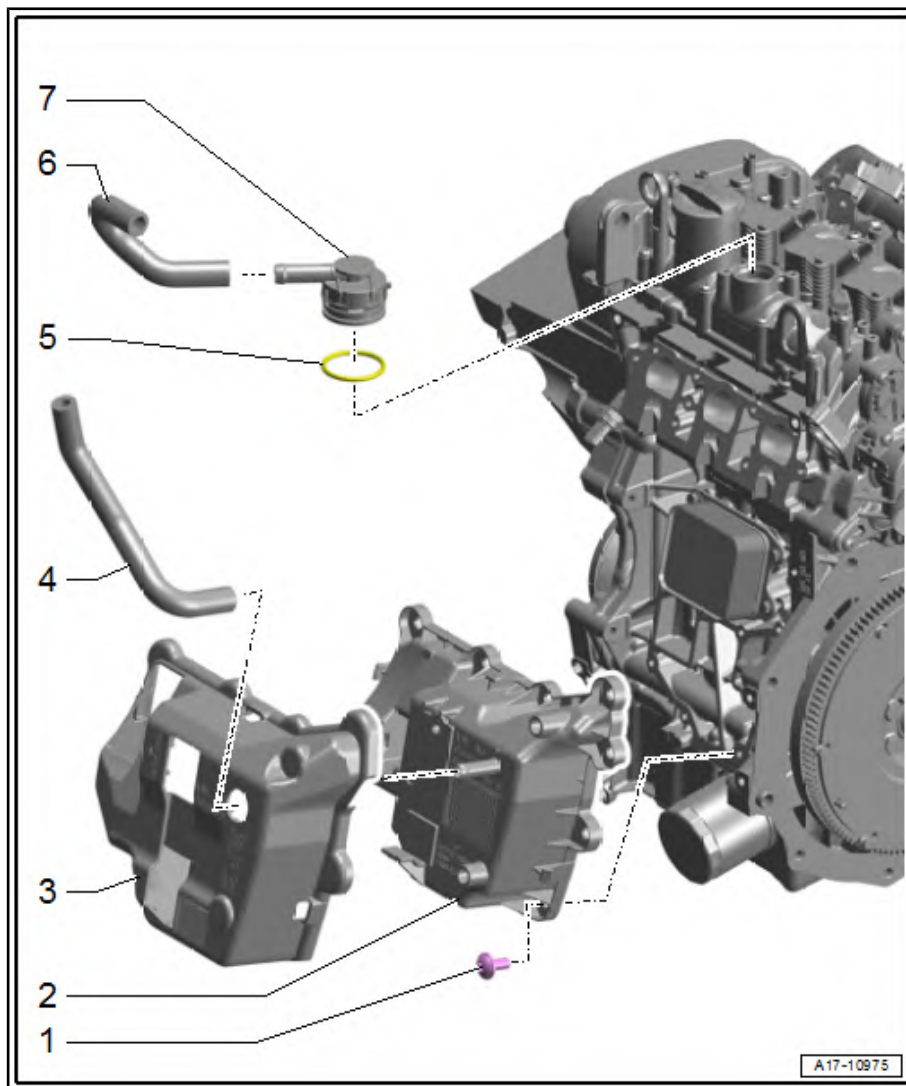
- ☐ Renewing
- ☐ Moisten with oil before installing

6 - Hose

- ☐ For crankcase ventilation.

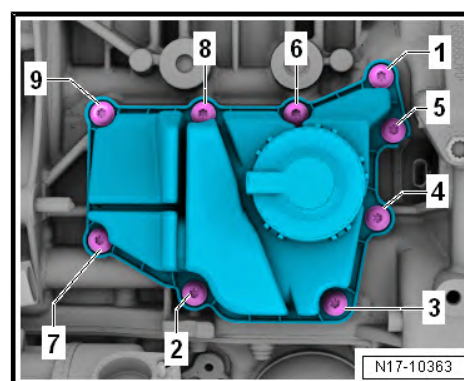
7 - Union

- ☐ Check for correct positioning.



Oil separator - specified torque and sequence

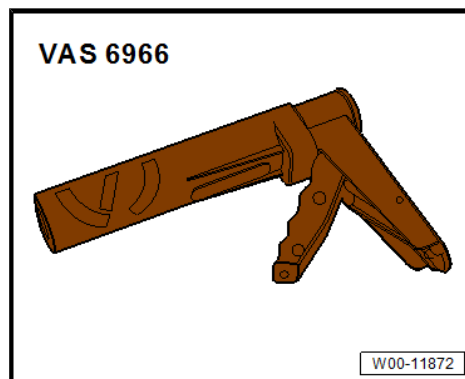
- Tighten bolts in the order -1 ... 9- to 9 Nm.



3.2 Removing and installing oil separator

Special tools and workshop equipment required

- ◆ Applicator gun - VAS 6966-



- ◆ Hand drill with plastic brush attachment
- ◆ Safety glasses
- ◆ Studs M6 x 20 mm
- ◆ Sealant ⇒ Electronic parts catalogue (ETKA)

Removing

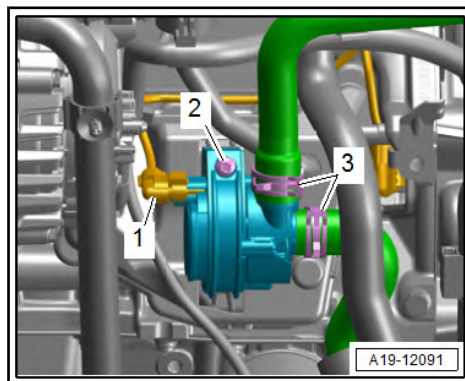
- Remove nose insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

Toledo 2013, Ibiza 2016

Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; Underbody protection – assembly overview

Continued for all vehicles

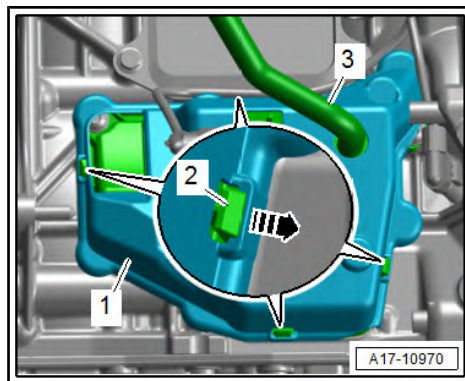
- Remove alternator ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .
- Unplug electrical connector -1-.
- Remove bolt -2- and press continued coolant circulation pump - V51- to the side.



Note

-Item 3- should be disregarded.

- Pull off crankcase breather hose -3-.
- Release fasteners -2- on cover -1- for oil separator in direction of -arrow-, and remove cover.



- Loosen and unscrew bolts in the sequence -9 ... 1-.
- Carefully release oil separator from bonded joint.



Note

- ◆ *Danger of contaminating lubrication system!*
- ◆ *Cover open parts of engine.*

Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Danger of leaks due to damaged sealing surfaces*
- ◆ *Do not clean sealing surfaces with a flat scraper or similar mechanical means.*

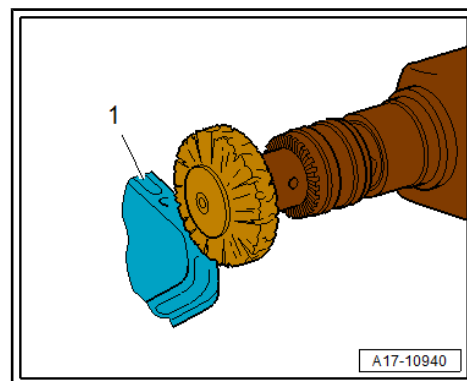
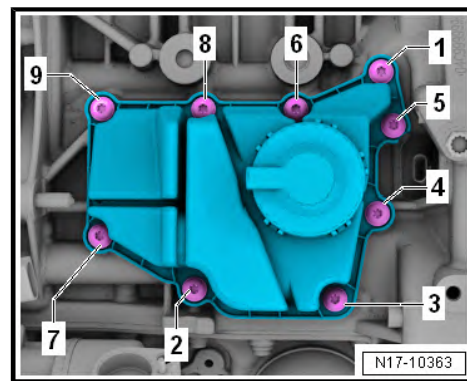


CAUTION

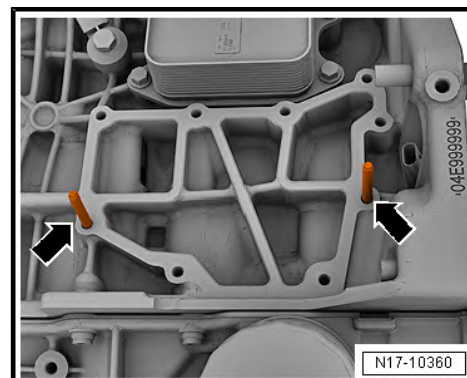
Risk of eye injury caused by sealant residue.

- **Wear protective goggles.**

- Remove sealant residue from oil separator -1- and cylinder block using rotating plastic brush.
- Remove any oil and grease from sealing surfaces.



- Screw 2 studs a few turns into holes -arrows-.





Note

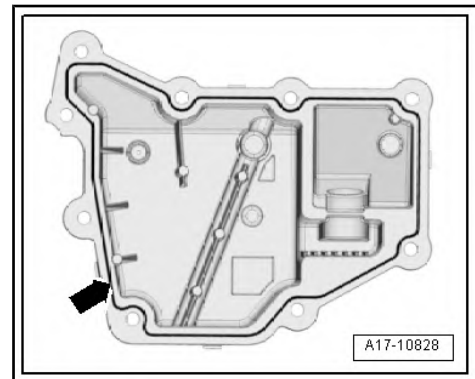
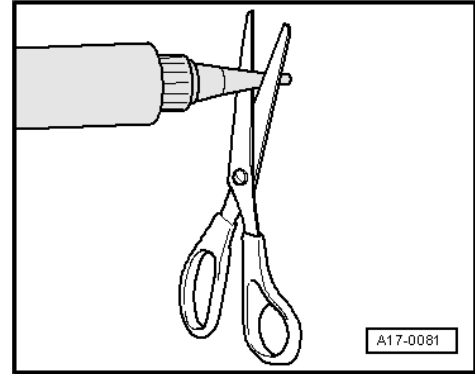
Observe expiry date of sealant.

- Cut off tube nozzle at front marking (Ø of nozzle approx. 2 mm).



Note

- ♦ Risk of blocking lubrication system with excess sealant.
- ♦ Do not apply sealant bead thicker than specified.
- Thickness of sealant bead: 2 ... 3 mm
- The oil separator must be installed within 5 minutes after applying the sealant.
- Apply bead of sealant -arrow- onto clean sealing surface of oil separator using applicator gun - VAS 6966- as illustrated.

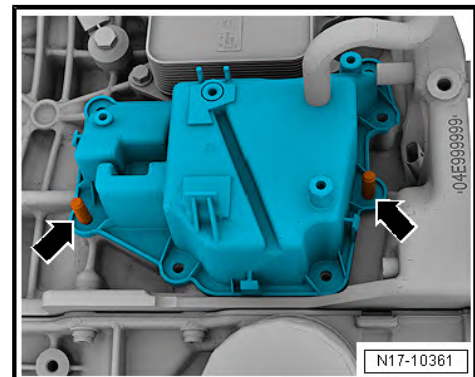


- Fit oil separator onto studs, and position it on crankcase.
- Unscrew studs.
- Tighten securing bolts in sequence given to specified torque
⇒ [page 247](#) .

Continue installation in reverse order of removal.

Specified torques

- ♦ Securing bolts of alternator ⇒ Rep. gr. 27 ; Alternator; Assembly overview - alternator .
- ♦ ⇒ [“2.2 Assembly overview - electric coolant pump”, page 280](#)
- ♦ Securing bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation
- ♦ Noise insulation assembly bolts, Toledo 213, Ibiza 2016 ⇒ General body works, exterior; Rep. gr. 50 ; Underbody protection; Assembly overview: underbody protection



4 Oil filter, oil pressure switch

⇒ [“4.1 Assembly overview - oil filter, oil pressure switch”, page 251](#)

⇒ [“4.2 Removing and installing oil pressure sender G10”, page 252](#)

⇒ [“4.3 Checking oil pressure and oil pressure switch”, page 253](#)

⇒ [“4.4 Removing and installing oil filter housing”, page 254](#)

⇒ [“4.5 Removing and installing oil pressure regulating valve N428”, page 254](#)

4.1 Assembly overview - oil filter, oil pressure switch

1 - Oil filter

- ☐ See note
⇒ [“1.1 Assembly overview - sump/oil pump”, page 233](#).
- ☐ Removing and installing
⇒ [“4.4 Removing and installing oil filter housing”, page 254](#)
- ☐ Tighten loosened connecting union for oil filter
⇒ [Fig. “Tightening connecting union for oil filter”, page 236](#)

2 - Threaded sleeve

- ☐ If connecting union for oil filter in sump became loose ⇒ [page 252](#)

3 - Oil pressure sender - G10-

- ☐ Switch pressure 0.3 to 0.6 bar
- ☐ Insulation, black
- ☐ Check in [Guided fault finding](#) ⇒ Vehicle diagnostic tester
- ☐ Removing and installing
⇒ [“4.2 Removing and installing oil pressure sender G10”, page 252](#)
- ☐ Renew after removal
- ☐ 10 Nm +45°

4 - Seal

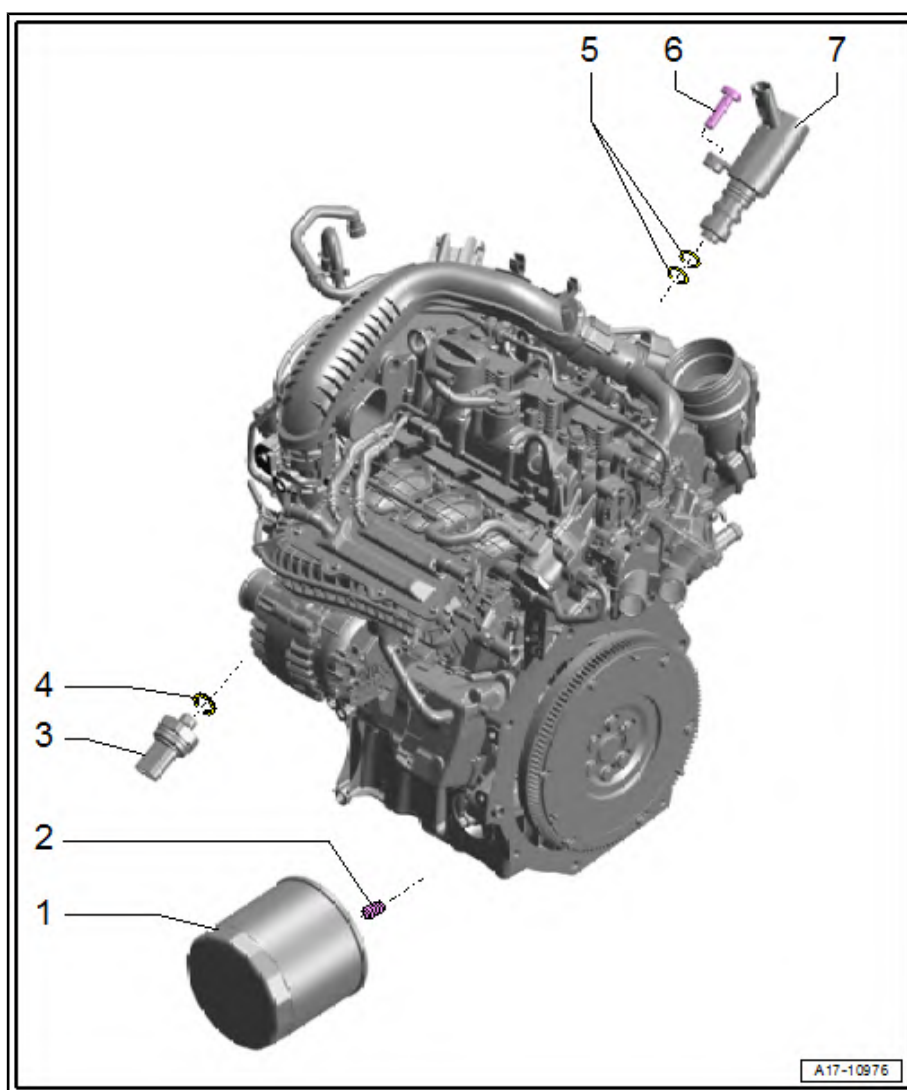
- ☐ Renew after each removal ⇒ Electronic Parts Catalogue

5 - O-rings

- ☐ No replacement part
- ☐ In case of leakage, renew valve ⇒ [Item 7 \(page 252\)](#)

6 - Bolt

- ☐ 8 Nm



7 - Valve for oil pressure control - N428-

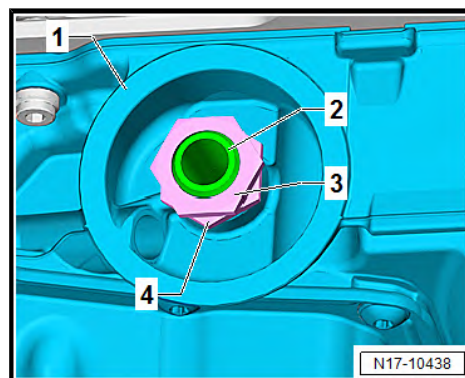
- ☐ Removing and installing
⇒ ["4.5 Removing and installing oil pressure regulating valve N428", page 254](#)
- ☐ Renew valve for oil pressure control - N428- if there is swarf in the engine oil system ⇒ Electronic parts catalogue

Tightening connecting union for oil filter

- If the connecting union -2- in the top section of sump -1- is loose, retighten it as described below.

Use only the two nuts -3 and 4- for this procedure.

- Hexagon nut , qty. 2, ⇒ Electronic Parts Catalogue
- Screw nuts -3- and -4- onto connecting union -2-, and counter lock them.
- Tighten connecting union -2- via nut -3-.
- Loosen the two nuts and remove them, taking care not to loosen the connecting union.



Specified torque

Threaded sleeve	Specified torque
-2-	50 Nm

4.2 Removing and installing oil pressure sender - G10-

Special tools and workshop equipment required

- ◆ 24 mm jointed spanner - T40175-



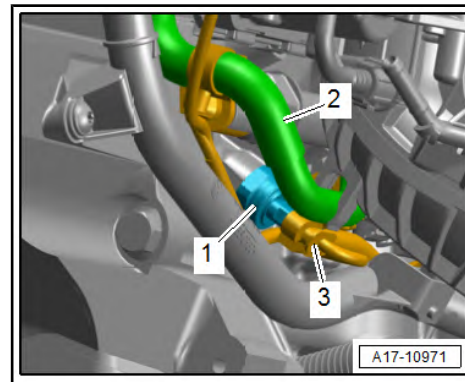
Removing



Note

Attach all heat-shielding sleeves in the same places when installing.

- Remove alternator ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .
- Lay fuel hose -2- at intake manifold to one side.
- Disconnect connector -3-.
- Place a cloth underneath to catch escaping engine oil.
- Unscrew oil pressure sender - G10- -1- using U/J extension and socket, 24 mm - T40175- .



Installing

Install in reverse order of removal, observing the following:



Note

- ♦ *Always renew the seal of the oil pressure sender - G10- after disassembly.⇒ Electronic parts catalogue*
- ♦ *Insert the new oil pressure sender - G10- immediately in the bore to avoid loss of oil.*
- Check oil level ⇒ [“1.2 Engine oil:”, page 237](#)

Specified torques

- ♦ Specified torque for oil pressure switch
⇒ [“4.1 Assembly overview - oil filter, oil pressure switch”, page 251](#)
- ♦ Securing bolts of alternator ⇒ Rep. gr. 27 ; Alternator; Assembly overview - alternator .

4.3 Checking oil pressure and oil pressure switch



Note

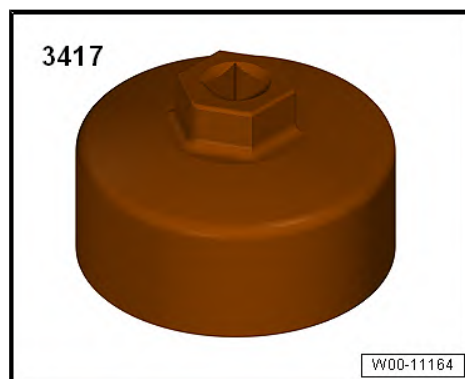
- ♦ *The oil pressure sender - G10- is installed to the engine.*
- ♦ *The oil pressure sender - G10- can be diagnosed.*
- ♦ *The oil pressure sender is checked using the ⇒ Vehicle diagnostic tester.*
- ♦ *Any issues are stored in the event memory.*
- ♦ *The oil pressure sender is fitted with a captive seal.*
- ♦ *The seal is not designed for repeated use. The oil pressure sender must always be renewed after removing.*
- ♦ [Diagnostics](#)
- ♦ [01 - Engine](#)
- ♦ [0001 - Engine control unit](#)
- ♦ [0001 - Electrical components](#)

◆ Oil pressure sensor G10

4.4 Removing and installing oil filter housing

Special tools and workshop equipment required

- ◆ Oil filter tool - 3417-

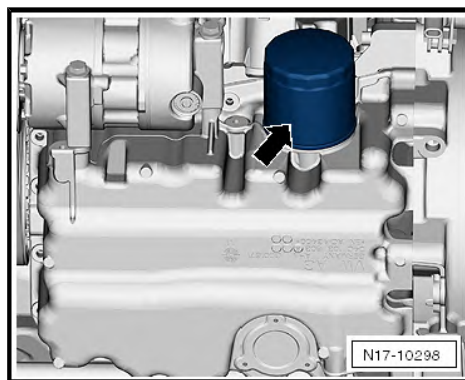


Removing

- Drain engine oil ➔ [“1.2 Engine oil:”, page 237](#) .
- Remove oil filter -arrow- with oil filter tool - 3417- .

Installing

- Fill oil filter with engine oil and tighten it to specified torque using oil filter tool - 3417- ➔ [page 254](#) .



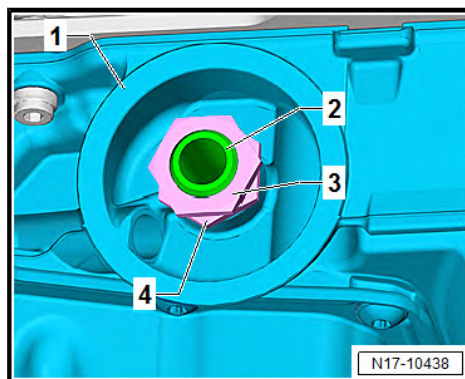
Note

If connecting union -2- in sump -1- became loose, retighten it as described below ➔ [page 252](#)

- Fill with engine oil and check oil level ➔ [“1.2 Engine oil:”, page 237](#) .

Specified torque for oil filter

Component	Specified torque	Conditions
Oil filter	20 Nm	Coat gasket with engine oil.



4.5 Removing and installing oil pressure regulating valve - N428-

Removing

Note

Attach all heat-shielding sleeves in the same places when installing.

- Detach heat insulation sleeves.

- Unplug electrical connector -2-.



Note

Place a cloth underneath to catch escaping engine oil.

- Unscrew bolt -3-, and pull off valve for oil pressure control - N428- -1-.

Installing

Install in reverse order of removal, observing the following:

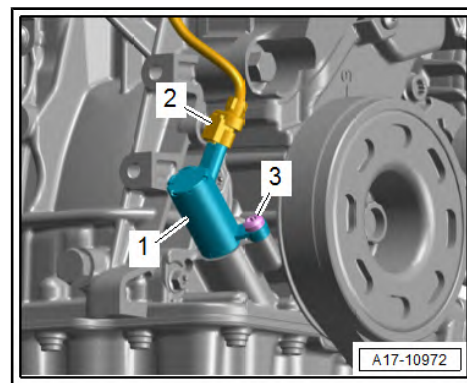


Note

- ◆ *In case of leaks, valve for oil pressure control - N428- must be renewed.*
- ◆ *Seals are not available separately.*

Specified torques

- ◆ ⇒ [“4.1 Assembly overview - oil filter, oil pressure switch”, page 251](#)
- ◆ ⇒ [“2.1 Assembly overview - emission control”, page 455](#)



19 – Cooling

1 Cooling system/coolant

⇒ [“1.1 Connection diagram - coolant hoses”, page 256](#)

⇒ [“1.2 Checking cooling system for leaks”, page 257](#)

⇒ [“1.3 Draining and adding coolant”, page 260](#)

1.1 Connection diagram - coolant hoses



Note

- ◆ Blue = large coolant circuit.
- ◆ Red = small coolant circuit.
- ◆ Orange = Charge air cooling circuit.
- ◆ Brown = heater circuit.
- ◆ The arrows point in the direction of coolant flow.

1 - Radiator for charge air cooling circuit

2 - Back-pressure valve

3 - Intercooler

- ☐ In the intake manifold

4 - Cylinder head and crank-case

5 - Coolant expansion tank

- ☐ With filler cap

6 - Cap

- ☐ For coolant expansion tank
- ☐ Design may vary depending on model year
- ☐ Check pressure relief valve ⇒ [page 259](#)

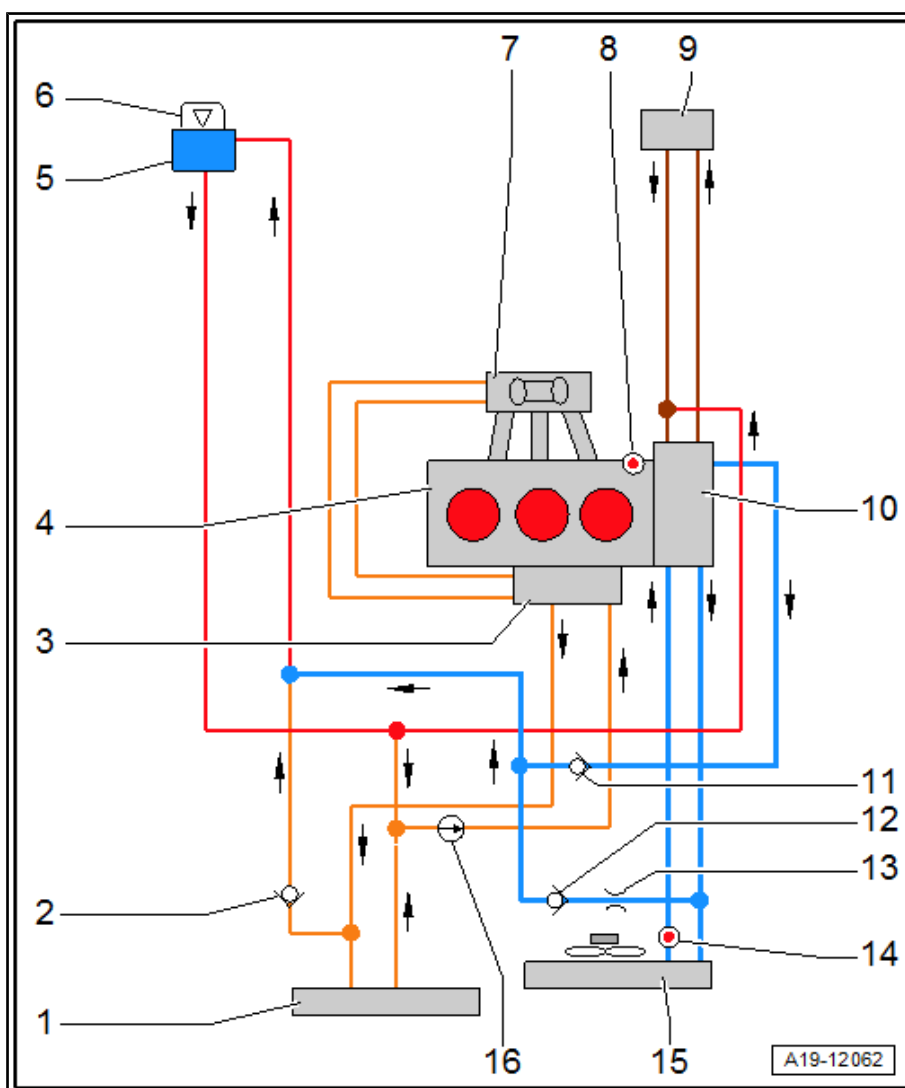
7 - Turbocharger

8 - Coolant temperature sender - G62-

9 - Heat exchanger for heater

10 - Coolant pump

- ☐ With thermostat housing

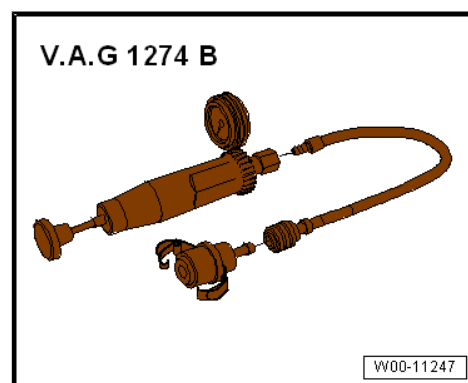


- 11 - Back-pressure valve
- 12 - Back-pressure valve
- 13 - Restrictor
- 14 - Radiator outlet coolant temperature sender - G83-
- 15 - Radiator for engine coolant
- 16 - Continued coolant circulation pump - V51-

1.2 Checking cooling system for leaks

Special tools and workshop equipment required

- ◆ Cooling system tester - V.A.G 1274 B-



- ◆ Adapter for cooling system tester - V.A.G 1274/8-



- ◆ Adapter for cooling system tester - V.A.G 1274/9-



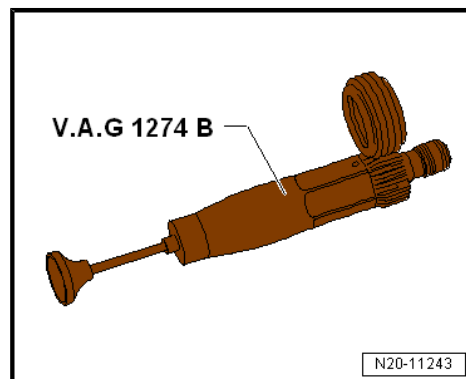


Note

To perform the leakage test correctly, first run a self-test on the cooling system tester - V.A.G 1274 B- .

Self test of cooling system tester - V.A.G 1274 B-

- Operate cooling system tester - V.A.G 1274 B- several times.



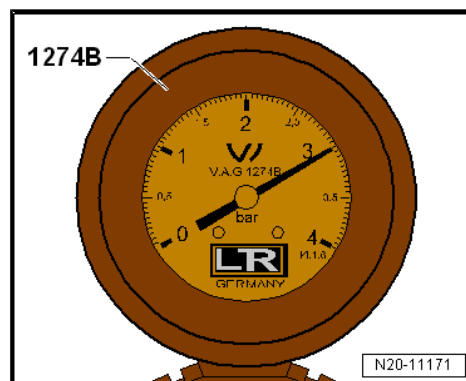
- Build up a pressure of 3.0 bar on cooling system tester .
- Observe pressure on pressure gauge of cooling system tester for 30 seconds.

If no pressure builds up or if the pressure drops again:

The cooling system tester - V.A.G 1274 B- is leaking and should not be used.

Checking cooling system for leaks

- Engine at operating temperature.



CAUTION

If the engine is hot, the coolant system is exposed to high pressure. Danger of scalding by steam and hot coolant.

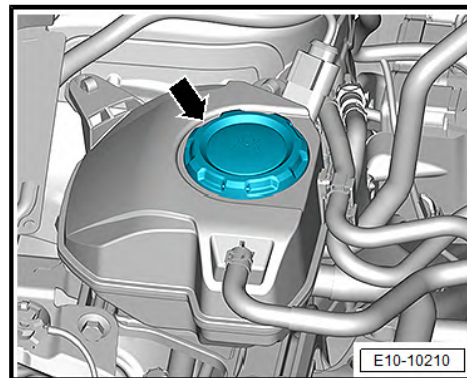
Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear protective goggles.
- Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

Procedure

Ibiza 2018, Arona

- Carefully open filler cap -arrow- on coolant expansion tank.



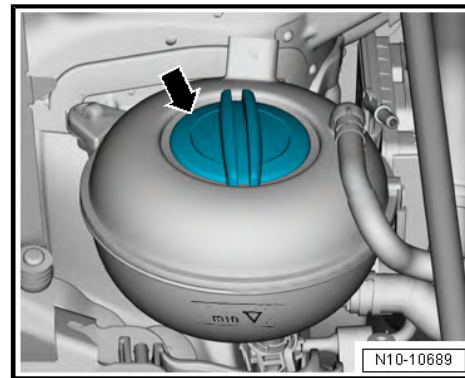
Ateca, Leon 2013



Note

Different caps might be installed depending on the model year.

- Open filler cap -arrow- of coolant expansion tank.



Toledo 2013, Ibiza 2016

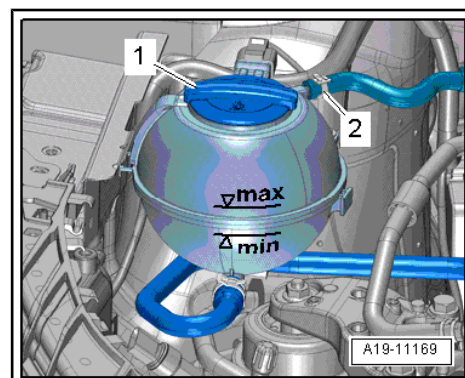
- Open filler cap -1- on coolant expansion tank.



Note

Disregard item -2-.

Continued for all vehicles

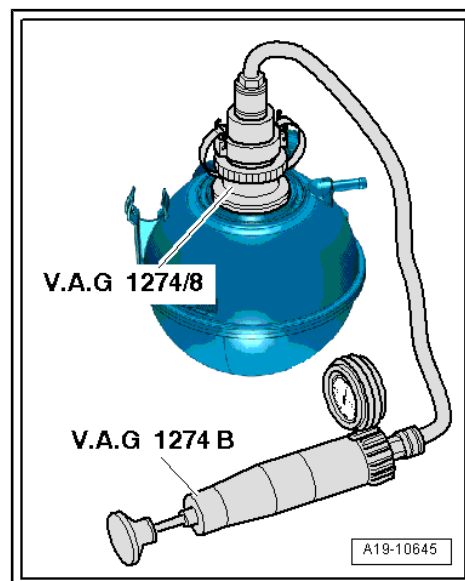


- Fit cooling system tester - V.A.G 1274 B- with adapter - V.A.G 1274/8- to coolant expansion tank.
- Using hand pump on tester, build up a pressure of approx. 1.5 bar.
- The pressure must not drop by more than 0.2 bar within 10 minutes.
- If pressure drops by more than 0.2 bar, locate leaks and rectify faults.



Note

- ♦ *The pressure drop by more than 0.2 bar within 10 minutes is caused by the coolant which cools down.*
- ♦ *The colder the engine, the lower the pressure loss.*
- ♦ *If necessary, repeat the check while the engine is cold.*



Check pressure relief valve in cap.

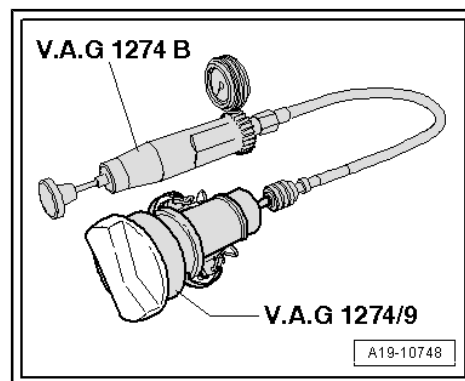
- Fit cooling system tester - V.A.G 1274 B- with adapter - V.A.G 1274/9- onto coolant filler cap.
- Build up pressure using hand pump of cooling system tester.

Blue cap

- ♦ The pressure relief valve should open at a pressure of 1.4 bar.

Black cap

- ♦ The pressure relief valve must open at a pressure of 1.6 ... 1.8 bar.



1.3 Draining and adding coolant

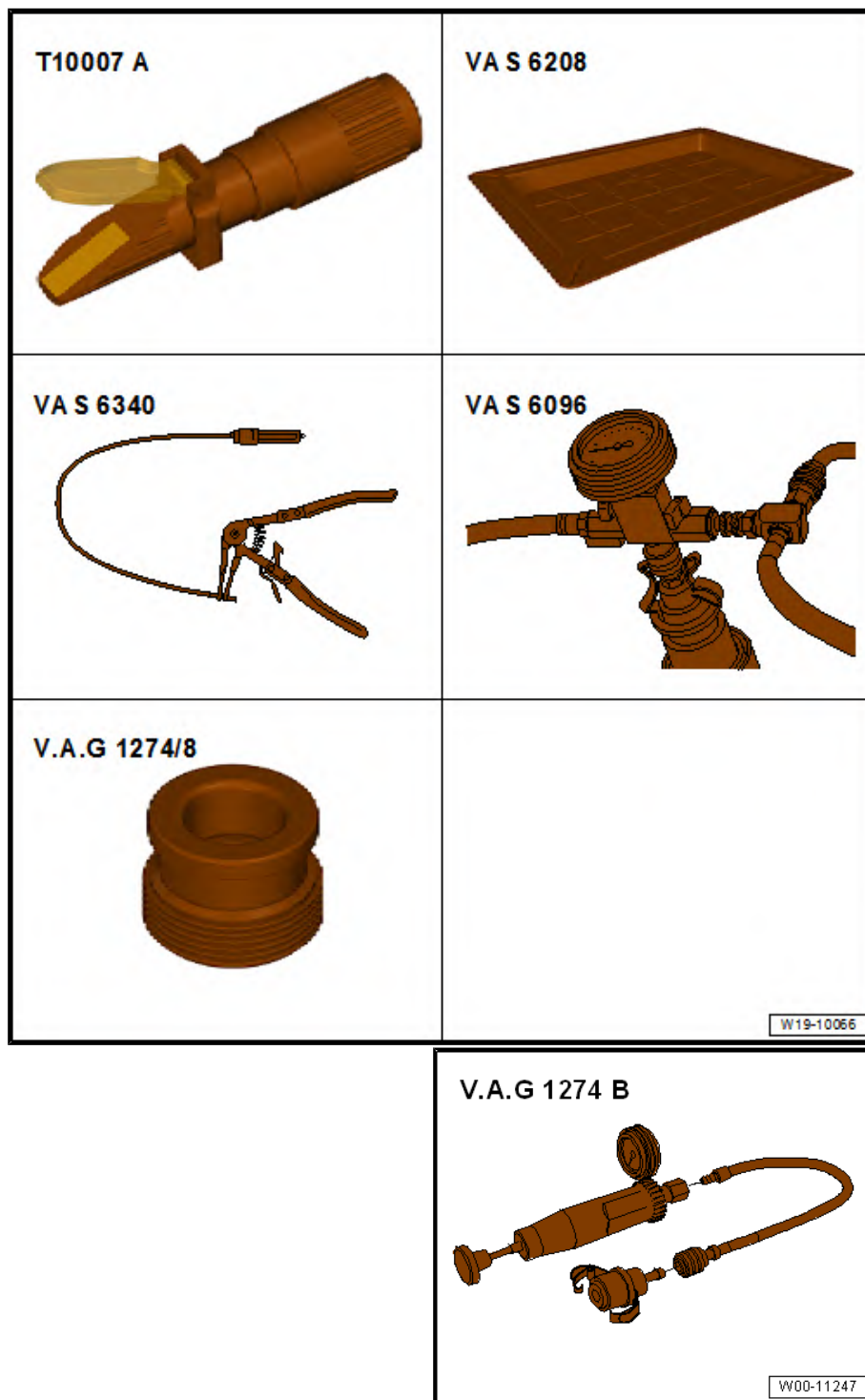
⇒ ["1.3.1 Draining and adding coolant, Ateca, Leon 2013", page 260](#)

⇒ ["1.3.2 Draining and adding coolant, Ibiza 2018, Arona", page 265](#)

⇒ ["1.3.3 Draining and adding coolant, Toledo 2013, Ibiza 2016", page 271](#)

1.3.1 Draining and adding coolant, Ateca, Leon 2013

Special tools and workshop equipment required



- ◆ Refractometer - T10007A-
- ◆ Drip tray for workshop hoist - VAS 6208-
- ◆ Hose clamp pliers - VAS 6340-
- ◆ Coolant system charge unit - VAS 6096-
- ◆ Adapter for cooling system tester - V.A.G 1274/8-
- ◆ Cooling system tester - V.A.G 1274 B-
- ◆ Safety glasses
- ◆ Safety gloves

Draining

CAUTION

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and hot coolant.

Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear protective goggles.
- Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

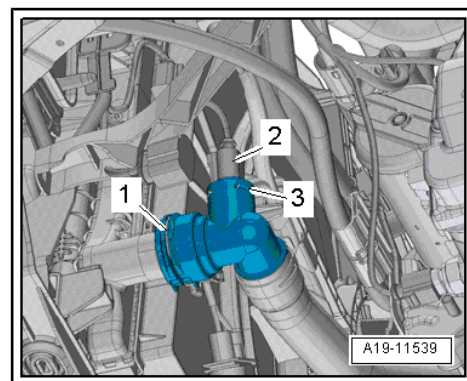
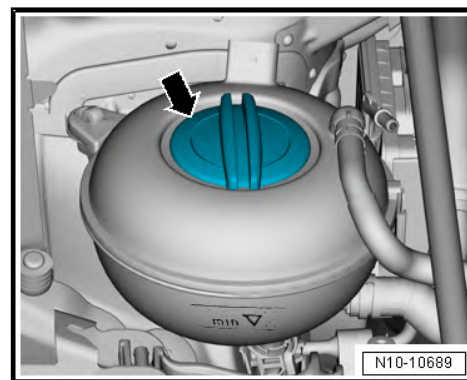
- Carefully open filler cap -arrow- on coolant expansion tank.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



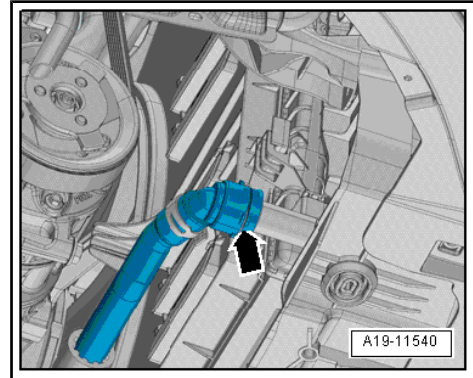
Note

Collect drained coolant in a clean container for re-use or disposal.

- Place drip tray for workshop hoist - VAS 6208- beneath engine.
- Disconnect connector -2- on radiator outlet coolant temperature sender - G83- .
- Loosen retaining clip -1-, remove lower left coolant hose from radiator and drain off coolant.



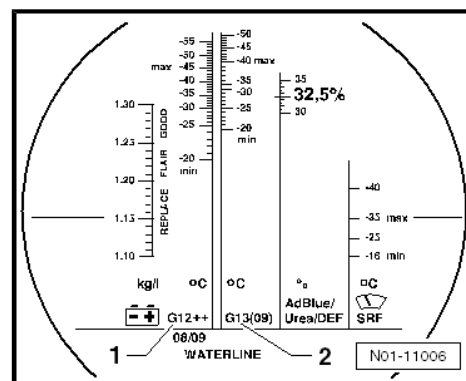
- Release retaining clip -arrow-, remove lower right coolant hose from radiator for charge air cooling circuit and drain off remaining coolant.

Filling



Note

- ◆ The water used for mixing has a major influence on the effectiveness of the coolant. Because the water quality differs from country to country and even from region to region, the quality of the water to be used in the cooling system has been specified by Volkswagen. Distilled water fulfils all requirements. Therefore, always use only distilled water when mixing coolant for topping up or renewing coolant.
- ◆ Use only coolant additives which conform with the ⇒ *Electronic parts catalogue (ETKA)*. Other coolant additives may reduce corrosion protection substantially. The resulting damage could lead to loss of coolant and subsequent severe damage to the motor.
- ◆ Mixed in the proper proportions, coolant inhibits frost and corrosion damage as well as scaling. It also raises the boiling point of coolant. For this reason, the cooling system must be filled all-year-round with coolant additives.
- ◆ Because of its high boiling point, the coolant improves engine reliability under heavy loads, particularly in countries with tropical climates.
- ◆ Use **ONLY** refractometer - T10007A- for determining current anti-freeze value.
- ◆ The frost protection must be effective down to at least -25 °C, and approx. -36 °C in cold countries. The effectiveness of the frost protection may only be increased if a higher level of frost protection is required due to the climate. It may, however, be increased only to a maximum of -48°C. Otherwise, the cooling effect will be impaired.
- ◆ Do not reduce the coolant concentration by adding water even in warmer seasons and in warmer countries. Frost protection must be guaranteed down to at least -25 °C.
- ◆ Read off anti-freeze figures for respective replenished coolant additives.
- ◆ The temperature read off the refractometer - T10007A- corresponds the »ice flocculation point«. Flakes of ice may start forming in the coolant at this temperature.
- ◆ Never reuse old coolant.
- ◆ Use only a water/coolant additive mixture as a slip agent for coolant hoses.



Coolant mixture ratio

Frost protection to	Coolant additive concentration	Coolant additive ¹⁾	Distilled water ¹⁾
-25 °C	40 %	3.2 l	4.8 l
-36 °C	50 %	4.0 l	4.0 l

¹⁾ The quantity of coolant can vary depending on the vehicle equipment.

- Coolant ⇒ *Electronic parts catalogue*

Procedure

- Reconnect coolant hoses with plug-in connectors
⇒ [page 306](#).

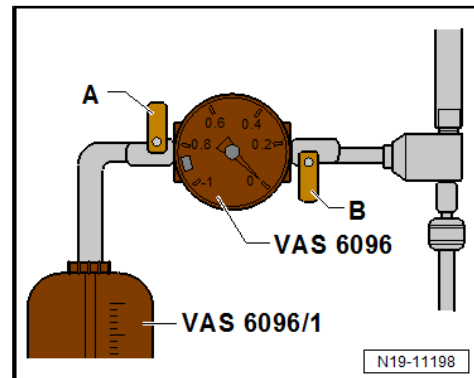
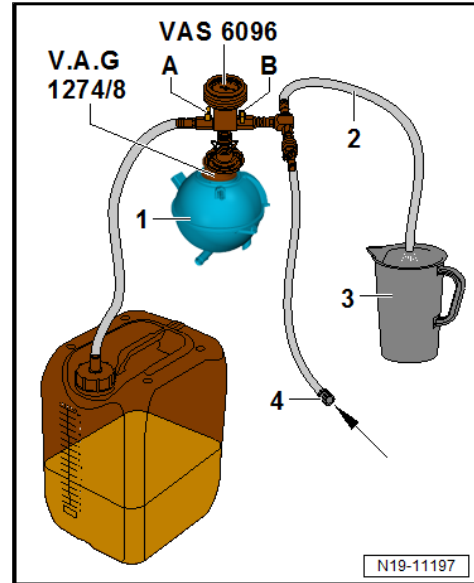
- Fill coolant reservoir of -VAS 6096- with at least 8 litres of pre-mixed coolant in correct mixture ratio:
- Screw adapter for cooling system tester - V.A.G 1274/8- onto coolant expansion tank.
- Mount cooling system charge unit - VAS 6096- on adapter - V.A.G 1274/8- .
- Feed vent hose -2- into a small container -3-.



Note

Exhaust air takes a slight quantity of coolant along with it; this should be collected.

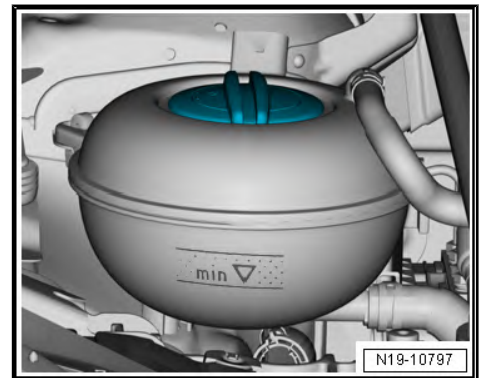
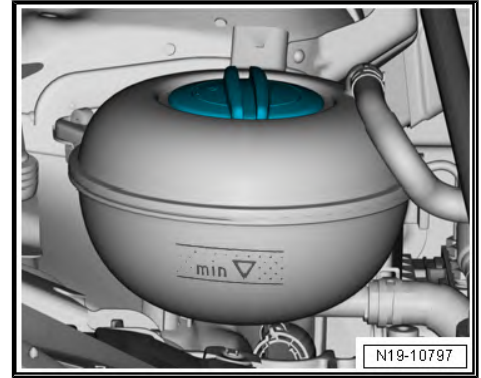
- Close valves -A- and -B- (turn lever transverse to direction of flow to do this).
- Connect hose -3- to compressed air.
- 6 ... 10 bar pressure
- Open valve -B-; turn lever in direction of flow to do this.
- The suction-jet pump reduces pressure in the cooling system to below atmospheric pressure. The needle on the gauge should move into the green zone.
- Also briefly open valve -A- (turn lever in direction of flow to do this) so that the hose on the coolant expansion tank of - VAS 6096- fills with coolant.
- Close valve -A- again.
- Leave valve -B- open for a further 2 minutes.
- The suction-jet pump will continue generating a vacuum in the cooling system. The needle on the gauge must remain in the green zone.
- Close valve -B-.
- The needle on the gauge must stay in the green zone. The vacuum in the cooling system is then sufficient for subsequent filling.



Note


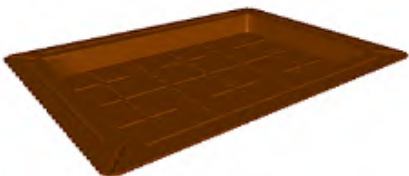
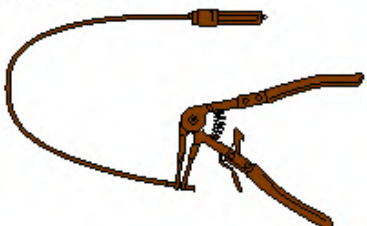
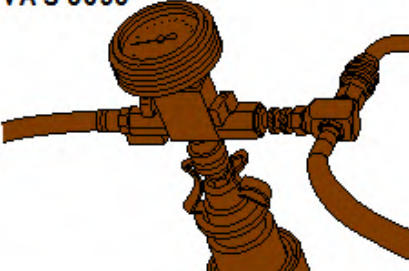

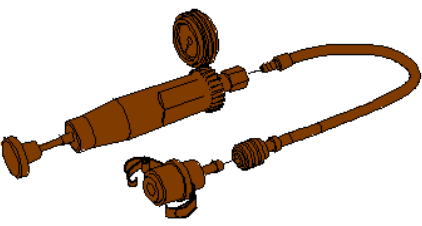
- ◆ *If the needle does not reach the green zone, repeat the process.*
- ◆ *If vacuum drops, cooling system must be checked for leaks.*
- Detach the compressed air hose.
- Open valve -A-.
- The vacuum in the cooling system causes the coolant to be drawn out of the coolant expansion tank of -VAS 6096- ; the cooling system is then filled.
- Remove cooling system charge unit - VAS 6096- from coolant expansion tank.

- Fill coolant up to “max.” mark.
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview – noise insulation .
- On vehicles with auxiliary heater, switch on auxiliary heater for about 30 seconds.
- Set temperature regulator to “HI”.
- Switch off air conditioner compressor. To do this, press **AC** button.
 - LED in the button must not light up.
- Start engine and run it for max. 2 min. at a speed of approx. 1500 rpm.
- Fill coolant up to the overflow hole of the coolant expansion tank while the engine is running.
- Tighten cap of coolant expansion tank until it engages.
- Run engine at idling speed until both large coolant hoses on radiator are heated up.
- Switch off engine and let it cool off.
- Check coolant level.
 - The coolant level must be between the “min. mark” and the “max. mark” when the engine is cold.
 - When the engine is at operating temperature, it is permissible that the coolant level is at the “max. mark” or above.
- Top up with coolant again if necessary.



1.3.2 Draining and adding coolant, Ibiza 2018, Arona

Special tools and workshop equipment required

<p>T10007 A</p> 	<p>VA S 6208</p> 
<p>VA S 6340</p> 	<p>VA S 6096</p> 
<p>V.A.G 1274/8</p> 	<p>V.A.G 1274 B</p> 

- ◆ Refractometer - T10007 A-
- ◆ Drip tray for workshop hoist - VAS 6208-
- ◆ Hose clip pliers - VAS 6340-
- ◆ Coolant system charge unit - VAS 6096-
- ◆ Adapter for cooling system tester - V.A.G 1274/8-
- ◆ Cooling system tester - V.A.G 1274 B-
- ◆ Safety glasses

◆ Safety gloves

Draining

CAUTION

If the engine is hot, the coolant system is exposed to high pressure. Danger of scalding by steam and hot coolant.

Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear protective goggles.
- Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

- Carefully open filler cap -arrow- on coolant expansion tank.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



Note

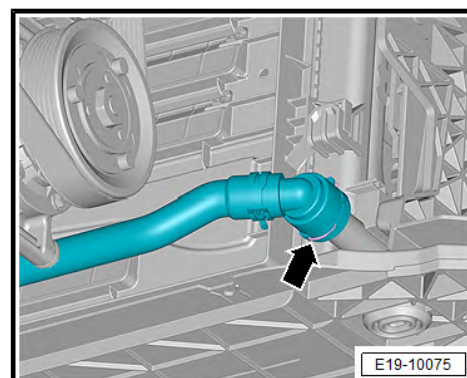
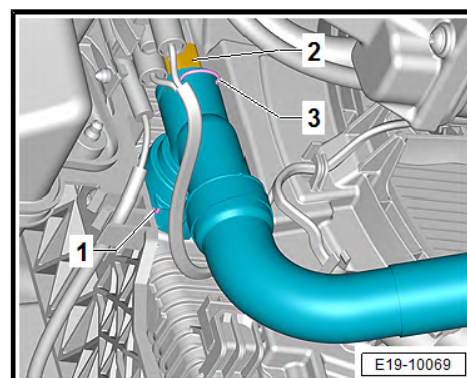
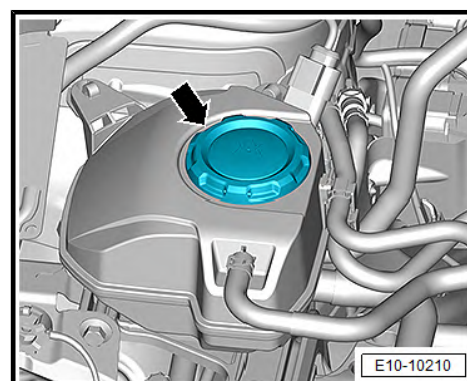
Collect drained coolant in a clean container for re-use or disposal.

- Place drip tray for workshop hoist - VAS 6208- beneath engine.

Vehicles with radiator, version 1:

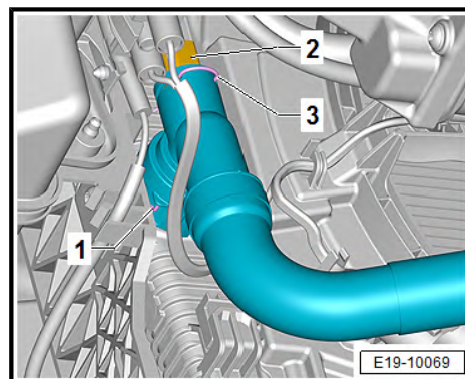
- Disconnect connector -2- on radiator outlet coolant temperature sender - G83- .
- Slightly lift retaining clip -1-, disconnect coolant hose from radiator (bottom left) and drain off coolant.

- Lift retaining clip -arrow- a little, disconnect coolant hose from water radiator (bottom right) for charge air cooling circuit and drain off remaining coolant.



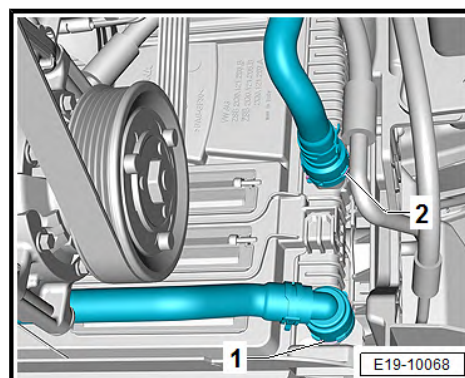
Vehicles with radiator, version 2:

- Disconnect connector -2- on radiator outlet coolant temperature sender - G83- .
- Slightly lift retaining clip -1-, disconnect coolant hose from radiator (bottom left) and drain off coolant.



- Slightly lift retaining clips -1- and -2-, disconnect coolant hoses from radiator (bottom right) and drain off remaining coolant.

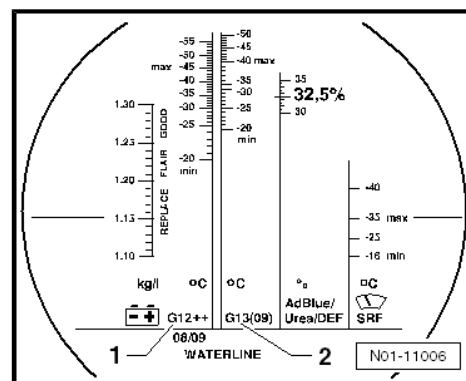
Continued for all vehicles:





Note

- ◆ *The water used for mixing has a major influence on the effectiveness of the coolant. Because the water quality differs from country to country and even from region to region, the quality of the water to be used in the cooling system has been specified by Volkswagen. Distilled water fulfils all requirements. Therefore, always use only distilled water when mixing coolant for topping up or renewing coolant.*
- ◆ *Use only coolant additives which conform with the ⇒ Electronic parts catalogue (ETKA) . Other coolant additives may reduce corrosion protection substantially. The resulting damage could lead to loss of coolant and subsequent severe damage to the motor.*
- ◆ *Mixed in the proper proportions, coolant inhibits frost and corrosion damage as well as scaling. It also raises the boiling point of coolant. For this reason, the cooling system must be filled all-year-round with coolant additives.*
- ◆ *Because of its high boiling point, the coolant improves engine reliability under heavy loads, particularly in countries with tropical climates.*
- ◆ *Use ONLY refractometer - T10007A- for determining current anti-freeze value.*
- ◆ *The frost protection must be effective down to at least -25 °C, and approx. -36 °C in cold countries. The effectiveness of the frost protection may only be increased if a higher level of frost protection is required due to the climate. It may, however, be increased only to a maximum of -48°C. Otherwise, the cooling effect will be impaired.*
- ◆ *Do not reduce the coolant concentration by adding water even in warmer seasons and in warmer countries. Frost protection must be guaranteed down to at least -25 °C.*
- ◆ *Read off anti-freeze figures for respective replenished coolant additives.*
- ◆ *The temperature read off the refractometer - T10007A- corresponds the »ice flocculation point«. Flakes of ice may start forming in the coolant at this temperature.*
- ◆ *Never reuse old coolant.*
- ◆ *Use only a water/coolant additive mixture as a slip agent for coolant hoses.*



Filling

Coolant mixture ratio

- Coolant (40 %) and distilled water (60 %) for frost protection to -25 °C
- Coolant (50 %) and distilled water (50 %) for frost protection to -36 °C
- Coolant: ⇒ Electronic parts catalogue (ETKA)

Procedure

- Reconnect coolant hoses with plug-in connectors
⇒ [page 308](#) .

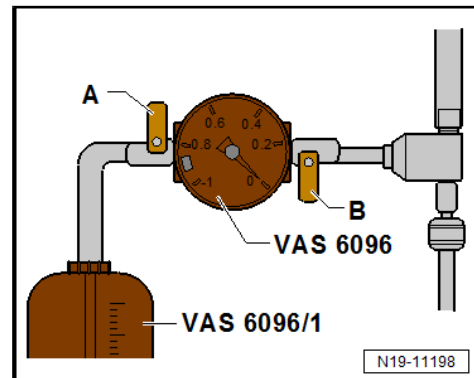
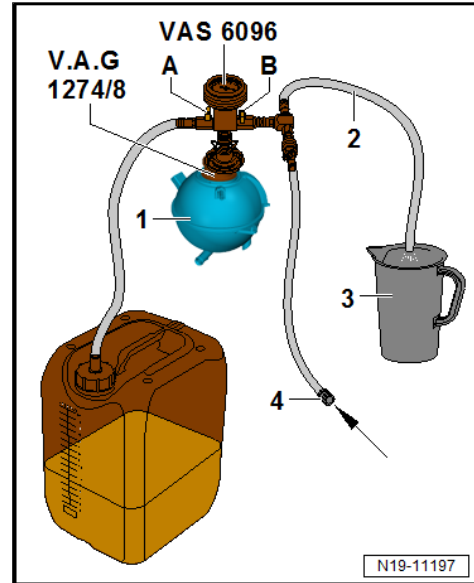
- Fill coolant expansion tank of -VAS 6096- with at least 10 litres of pre-mixed coolant in correct mixture ratio.
- Screw adapter for cooling system tester - V.A.G 1274/8- onto coolant expansion tank.
- Mount cooling system charge unit - VAS 6096- on adapter - V.A.G 1274/8- .
- Feed vent hose -2- into a small container -3-.



Note

Exhaust air takes a slight quantity of coolant along with it; this should be collected.

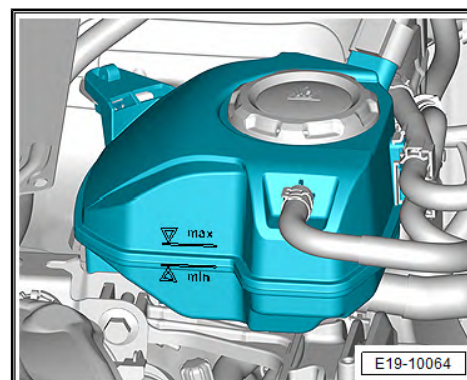
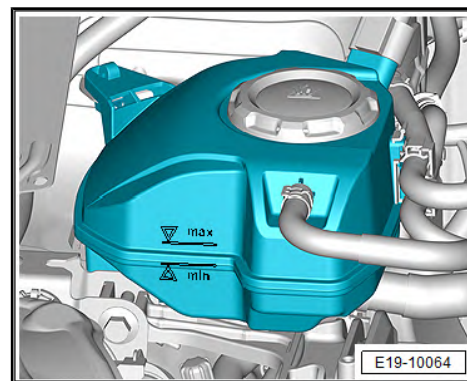
- Close valves -A- and -B- (turn lever transverse to direction of flow to do this).
- Connect hose -3- to compressed air.
- 6 ... 10 bar of working pressure.
- Open valve -B-; turn lever in direction of flow to do this.
- The suction-jet pump reduces pressure in the cooling system to below atmospheric pressure. The needle on the gauge should move into the green zone.
- Also briefly open valve -A- (turn lever in direction of flow to do this) so that the hose on the coolant expansion tank of - VAS 6096- fills with coolant.
- Close valve -A- again.
- Leave valve -B- open for a further 2 minutes.
- The suction-jet pump will continue generating a vacuum in the cooling system. The needle on the gauge must remain in the green zone.
- Close valve -B-.
- The needle on the gauge must stay in the green zone. The vacuum in the cooling system is then sufficient for subsequent filling.



Note

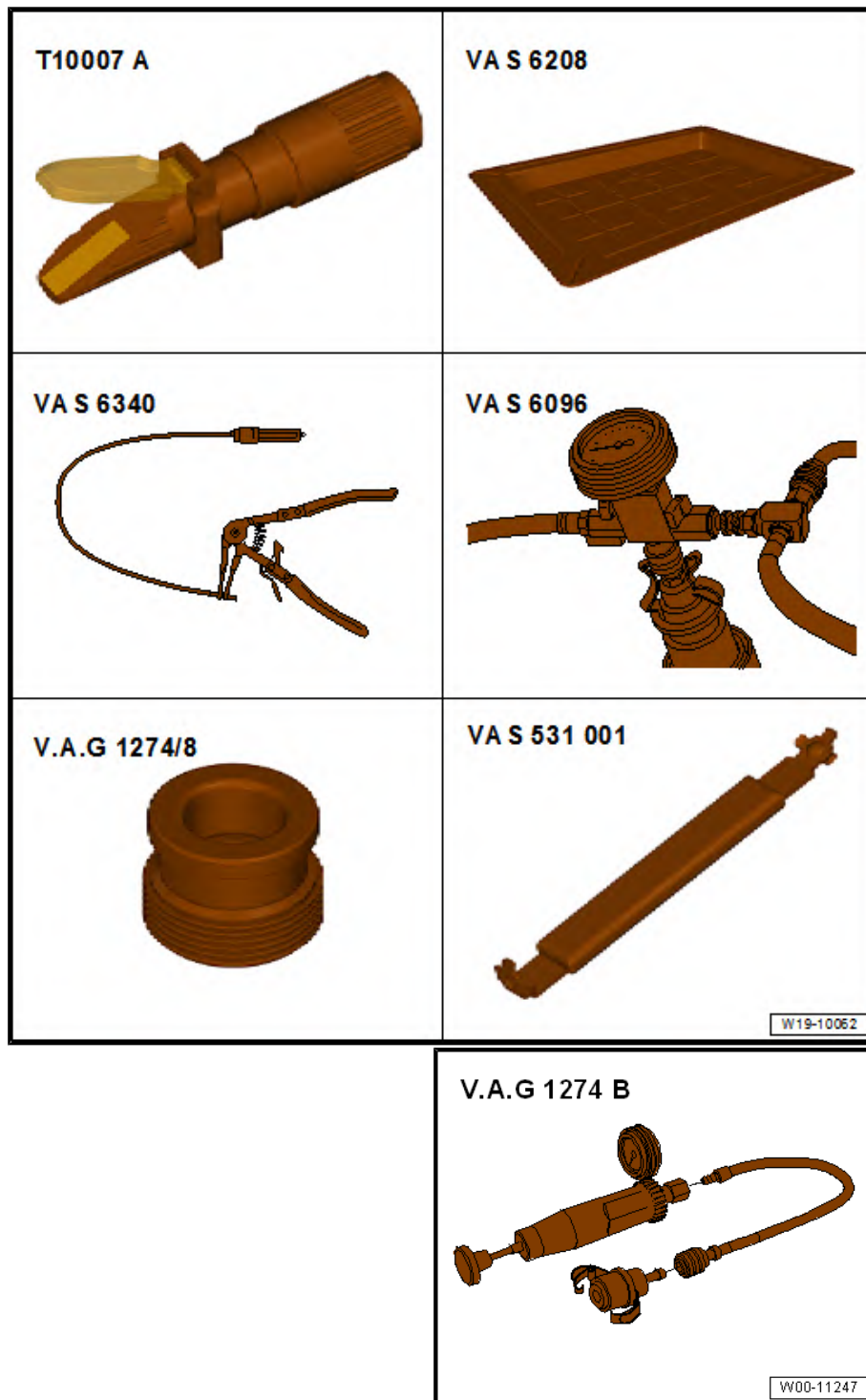
- ◆ *If the needle does not reach the green zone, repeat the process.*
- ◆ *If vacuum drops, cooling system must be checked for leaks.*
- Detach the compressed air hose.
- Open valve -A-.
- The vacuum in the cooling system causes the coolant to be drawn out of the coolant expansion tank of -VAS 6096- ; the cooling system is then filled.
- Remove cooling system charge unit - VAS 6096- from coolant expansion tank.

- Fill coolant up to “max.” mark.
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview – noise insulation .
- On vehicles with auxiliary heater, switch on auxiliary heater for about 30 seconds.
- Set temperature regulator to “HI”.
- Switch off air conditioner compressor. To do this, press **AC** button.
- LED in the button must not light up.
- Start engine and run it for max. 2 min. at a speed of approx. 1500 rpm.
- Fill coolant up to the overflow hole of the coolant expansion tank while the engine is running.
- Tighten cap of coolant expansion tank until it engages.
- Run engine at idling speed until both large coolant hoses on radiator are heated up.
- Switch off engine and let it cool off.
- Check coolant level.
- The coolant level must be between the “min. mark” and the “max. mark” when the engine is cold.
- When the engine is at operating temperature, it is permissible that the coolant level is at the “max. mark” or above.
- Top up with coolant again if necessary.



1.3.3 Draining and adding coolant, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required



- ◆ Adapter for cooling system tester - V.A.G 1274/8-
- ◆ Coolant system charge unit - VAS 6096-
- ◆ Drip tray for workshop hoist - VAS 6208-
- ◆ Hose clip pliers - VAS 6362-
- ◆ Refractometer - T10007 A-
- ◆ Release tool - VAS 531 001-
- ◆ Cooling system tester - V.A.G 1274 B-

◆ Safety glasses

◆ Safety gloves

Draining

CAUTION

If the engine is hot, the coolant system is exposed to high pressure. Danger of scalding by steam and hot coolant.

Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear protective goggles.
- Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

- Carefully open filler cap -arrow- on coolant expansion tank.



Note

Disregard item -2-.

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; Underbody protection – assembly overview .



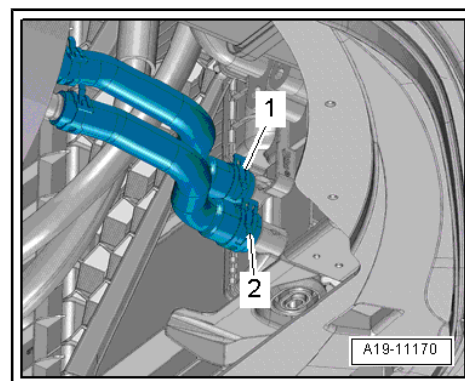
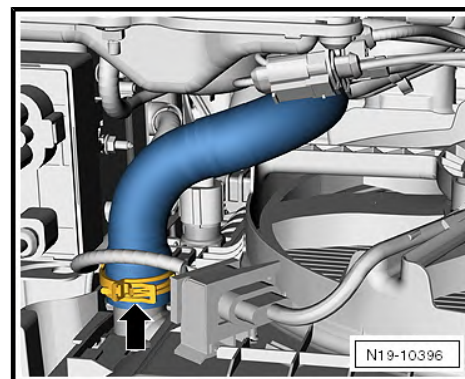
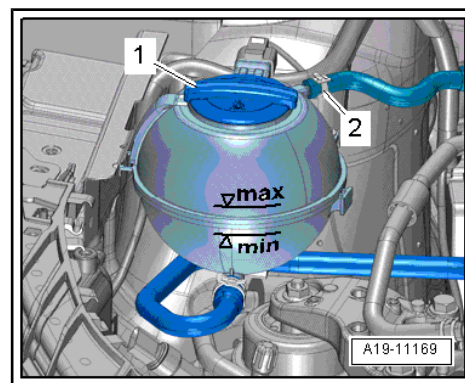
Note

Collect drained coolant in a clean container for re-use or disposal.

- Place drip tray for workshop hoist - VAS 6208- beneath engine.
- Remove lower left coolant hose from radiator. To do this, release hose clip -arrow- using hose clip pliers - VAS 6362- .

- Remove lower right coolant hoses from radiator. To do this, loosen hose clips -1 and 2-.

Filling



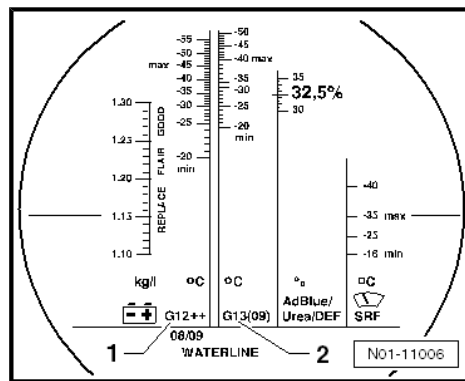


Note

- ◆ *The water used for mixing has a major influence on the effectiveness of the coolant. Because the water quality differs from country to country and even from region to region, the quality of the water to be used in the cooling system has been specified by Volkswagen. Distilled water fulfils all requirements. Therefore, always use only distilled water when mixing coolant for topping up or renewing coolant.*
- ◆ *Use only coolant additives which conform with the ⇒ Electronic parts catalogue (ETKA) . Other coolant additives may reduce corrosion protection substantially. The resulting damage could lead to loss of coolant and subsequent severe damage to the motor.*
- ◆ *Mixed in the proper proportions, coolant inhibits frost and corrosion damage as well as scaling. It also raises the boiling point of coolant. For this reason, the cooling system must be filled all-year-round with coolant additives.*
- ◆ *Because of its high boiling point, the coolant improves engine reliability under heavy loads, particularly in countries with tropical climates.*
- ◆ *Use ONLY refractometer - T10007A- for determining current anti-freeze value.*
- ◆ *The frost protection must be effective down to at least -25 °C, and approx. -36 °C in cold countries. The effectiveness of the frost protection may only be increased if a higher level of frost protection is required due to the climate. It may, however, be increased only to a maximum of -48°C. Otherwise, the cooling effect will be impaired.*
- ◆ *Do not reduce the coolant concentration by adding water even in warmer seasons and in warmer countries. Frost protection must be guaranteed down to at least -25 °C.*
- ◆ *Read off anti-freeze figures for respective replenished coolant additives.*
- ◆ *The temperature read off the refractometer - T10007A- corresponds the »ice flocculation point«. Flakes of ice may start forming in the coolant at this temperature.*
- ◆ *Never reuse old coolant.*
- ◆ *Use only a water/coolant additive mixture as a slip agent for coolant hoses.*

Coolant mixture ratio

- Coolant (40 %) and distilled water (60 %) for frost protection to -25 °C
- Coolant (50 %) and distilled water (50 %) for frost protection to -36 °C
- Coolant: ⇒ Electronic parts catalogue (ETKA)



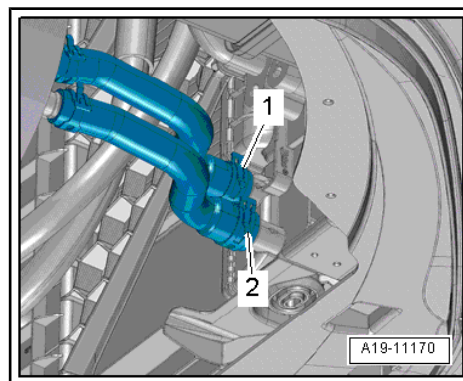
Procedure

- Connect coolant hoses to water radiator for charge air cooler using hose clips -1 and 2-.

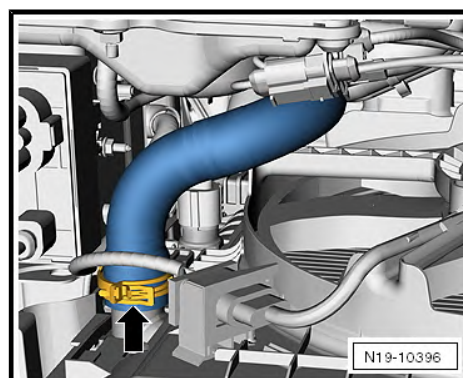


Note

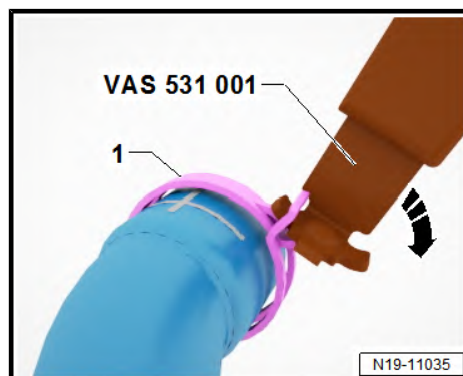
The design of the clip -arrow- is different from that of conventional clips and requires a special tool for the clip to be engaged.



- Push coolant hose with clip -arrow- onto radiator at bottom.



- Engage clip -1- in direction of -arrow- using release tool - VAS 531 001- .



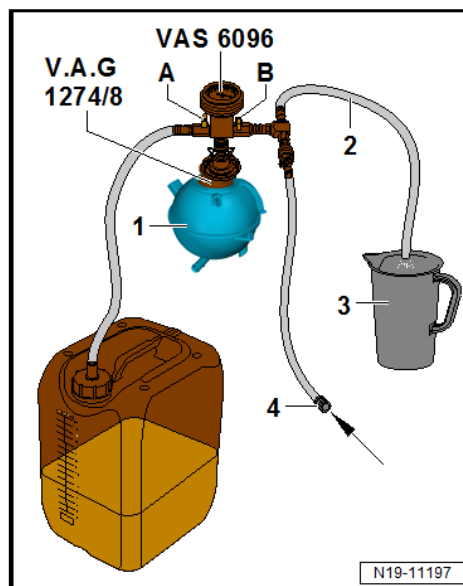
- Fill coolant reservoir of -VAS 6096- with at least 8 litres of pre-mixed coolant in correct mixture ratio:
- Screw adapter for cooling system tester - V.A.G 1274/8- onto coolant expansion tank.
- Mount cooling system charge unit - VAS 6096- on adapter - V.A.G 1274/8- .
- Feed vent hose -2- into a small container -3-.



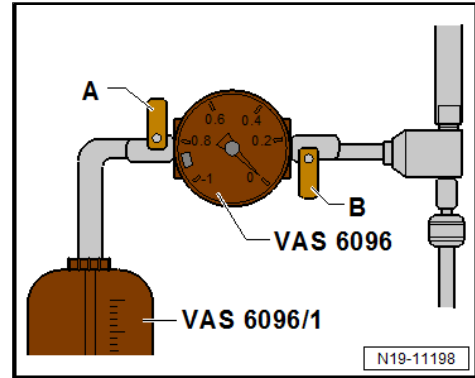
Note

Exhaust air takes a slight quantity of coolant along with it; this should be collected.

- Close both valves -A- and -B- and turn the lever so that it is at right angles to direction of flow.
- Connect hose -4- to compressed air supply.
- 6 ... 10 bar of working pressure.

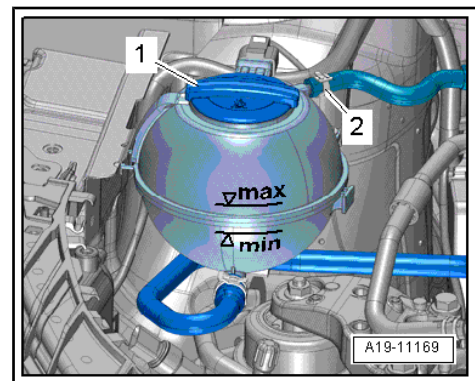


- Open valve -B-; turn lever in direction of flow to do this.
- The suction-jet pump reduces pressure in the cooling system to below atmospheric pressure. The needle on the gauge should move into the green zone.
- Also briefly open valve -A- (turn lever in direction of flow to do this) so that the hose on the coolant expansion tank of -VAS 6096- fills with coolant.
- Close valve -A- again.
- Leave valve -B- open for a further 2 minutes.
- The suction-jet pump will continue generating a vacuum in the cooling system. The needle on the gauge must remain in the green zone.
- Close valve -B-.
- The needle on the gauge must stay in the green zone. The vacuum in the cooling system is then sufficient for subsequent filling.

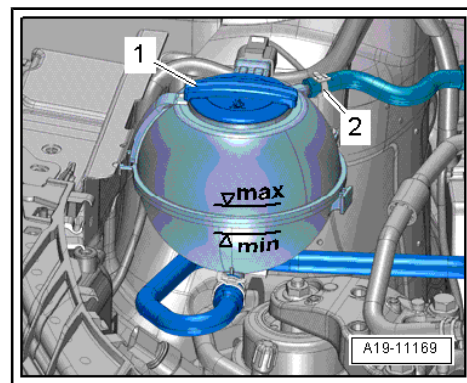


Note

- ◆ *If the needle does not reach the green zone, repeat the process.*
- ◆ *If vacuum drops, cooling system must be checked for leaks.*
- Detach the compressed air hose.
- Open valve -A-.
- The vacuum in the cooling system causes the coolant to be drawn out of the coolant expansion tank of -VAS 6096- ; the cooling system is then filled.
- Remove cooling system charge unit - VAS 6096- from coolant expansion tank.
- Fill coolant up to "max." mark.
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody cladding; Underbody cladding - Assembly overview .
- On vehicles with auxiliary heater, switch on auxiliary heater for about 30 seconds.
- Set temperature regulator to "HI".
- Switch off air conditioner compressor. To do this, press AC button.
- LED in the button must not light up.
- Start engine and run it for max. 2 min. at a speed of approx. 1500 rpm.
- Fill coolant up to the overflow hole of the coolant expansion tank while the engine is running.
- Tighten cap of coolant expansion tank until it engages.
- Run engine at idling speed until both large coolant hoses on radiator are heated up.
- Switch off engine and let it cool off.



- Check coolant level.
- The coolant level must be between the “min. mark” and the “max. mark” when the engine is cold.
- When the engine is at operating temperature, it is permissible that the coolant level is at the “max. mark” or above.
- Top up with coolant again if necessary.



2 Coolant pump, regulation of cooling system

⇒ [“2.1 Assembly overview - coolant pump, thermostat”, page 278](#)

⇒ [“2.2 Assembly overview - electric coolant pump”, page 280](#)

⇒ [“2.3 Assembly overview - coolant temperature sender”, page 282](#)

⇒ [“2.4 Removing and installing electric coolant pump”, page 283](#)

⇒ [“2.5 Removing and installing coolant pump”, page 286](#)

⇒ [“2.6 Removing and installing thermostat”, page 291](#)

⇒ [“2.7 Removing and installing toothed belt pulley for coolant pump”, page 294](#)

⇒ [“2.8 Removing and installing coolant temperature sender G62”, page 294](#)

⇒ [“2.9 Removing and installing radiator outlet coolant temperature sender G83”, page 297](#)

2.1 Assembly overview - coolant pump, thermostat

1 - Thermostat housing

- ☐ Removing and installing
⇒ [“2.5 Removing and installing coolant pump”, page 286](#)

2 - Thermostat

- ☐ For cylinder block coolant circuit
- ☐ Until >> 10.07.2016:
Start of opening at approximately 80 °C
- ☐ As of 11.07.2016 >>:
Start of opening at approximately 97 °C
- ☐ Removing and installing
⇒ [“2.6.2 Removing and installing thermostat for cylinder block coolant circuit”, page 293](#)

3 - Seal

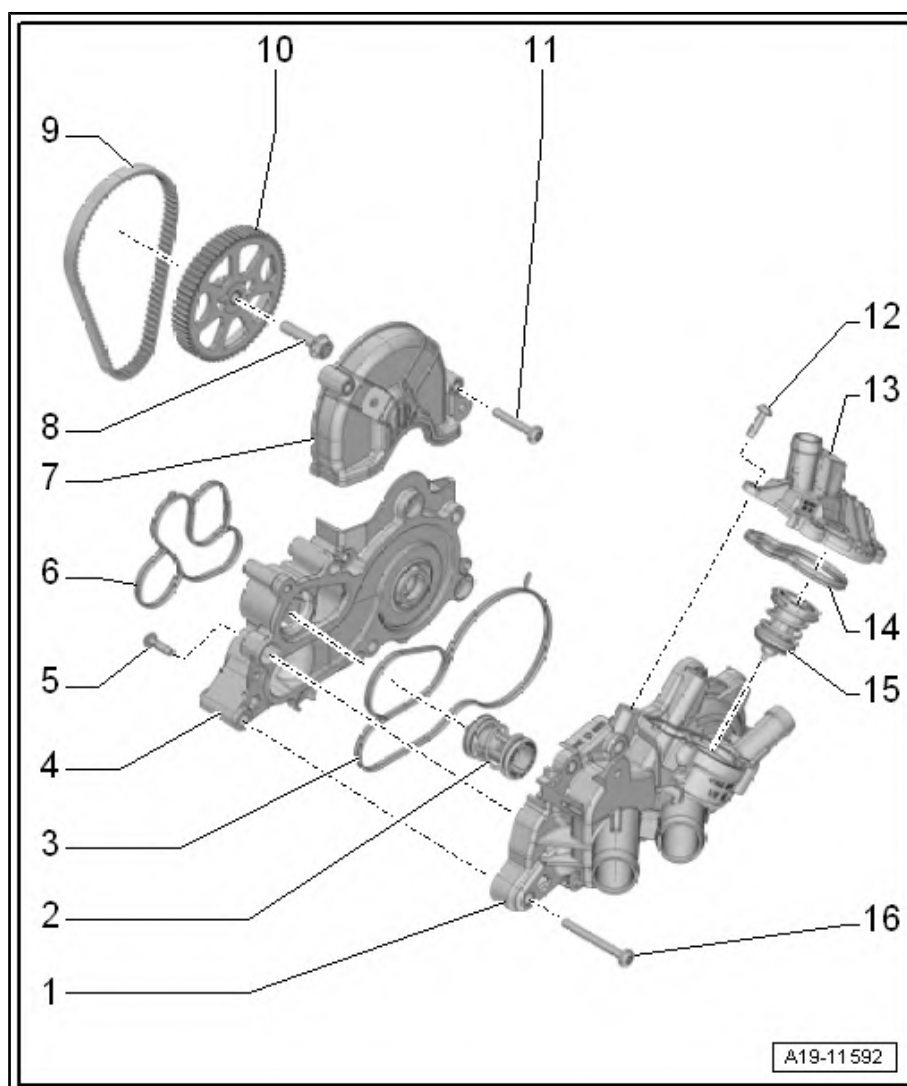
- ☐ Renew after removal

4 - Coolant pump

- ☐ Removing and installing
⇒ [“2.5 Removing and installing coolant pump”, page 286](#)
- ☐ Renew toothed belt as well when renewing coolant pump

5 - Bolt

- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it screws



into old thread Then
tighten bolt to torque.

- ☐ Specified torque and tightening sequence ⇒ [page 280](#)

6 - Seal

- ☐ Renew after removal

7 - Toothed belt guard

- ☐ For toothed belt for coolant pump

8 - Bolt

- ☐ Renew after removal
- ☐ 20 Nm +90°

9 - Toothed belt

- ☐ For coolant pump
- ☐ Renew after removal

10 - Coolant pump pulley

- ☐ For coolant pump
- ☐ Removing and installing
⇒ [“2.7 Removing and installing toothed belt pulley for coolant pump”, page 294](#)
- ☐ Fitting position ⇒ [page 294](#)
- ☐ Apply sealant when installing

11 - Bolt

- ☐ 8 Nm

12 - Bolt

- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it screws into old thread Then tighten bolt to torque.
- ☐ Specified torque and tightening sequence ⇒ [page 280](#)

13 - Slider

- ☐ For thermostat

14 - Seal

- ☐ Renew after removal

15 - Thermostat

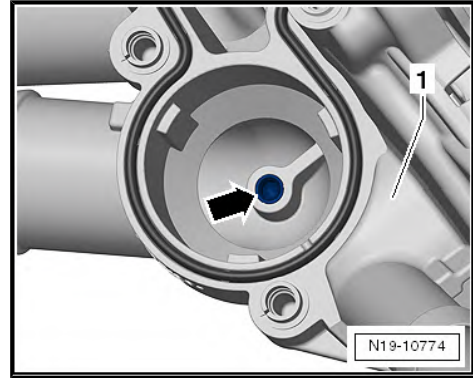
- ☐ For main coolant circuit (radiator)
- ☐ Until >> 10.07.2016: Start of opening at approximately 105 °C
- ☐ As of 11.07.2016 >>: Start of opening at approximately 87 °C
- ☐ Removing and installing
⇒ [“2.6.1 Removing and installing thermostat for main coolant circuit \(radiator\)”, page 291](#)
- ☐ Fitting position ⇒ [page 280](#)

16 - Bolt

- ☐ Specified torque and tightening sequence ⇒ [page 289](#)

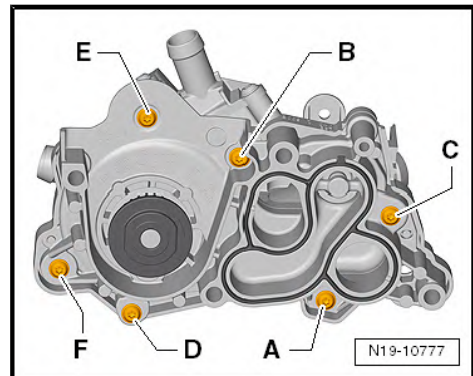
Installation position of thermostat for large cooling circuit

- Must be positioned with centring pin in guide -arrow- in thermostat housing.



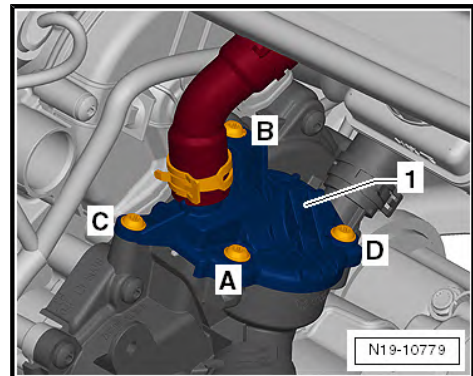
Thermostat housing to coolant pump - specified torque and sequence

- Tighten bolts in the sequence -A ... F- to 7 Nm.



Cover for thermostat to thermostat housing - specified torque

- Tighten bolts for cap -1- in sequence -A ... D- to 7 Nm.



2.2 Assembly overview - electric coolant pump

1 - Continued coolant circulation pump - V51-

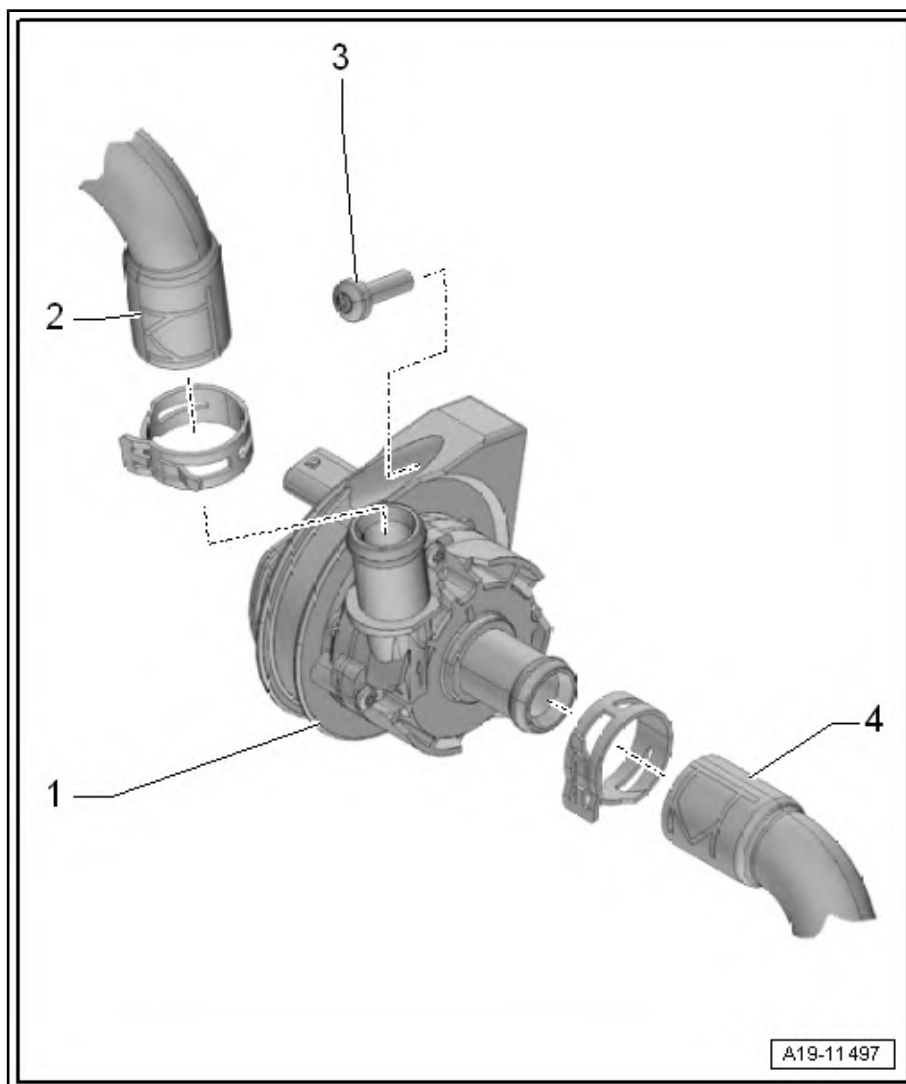
- ☐ with holder
- ☐ Removing and installing
⇒ ["2.4 Removing and installing electric coolant pump", page 283](#)

2 - Coolant hose

3 - Bolt

- ☐ 8 Nm

4 - Coolant hose



2.3 Assembly overview - coolant temperature sender

⇒ [“2.3.1 Assembly overview - coolant temperature sender, Ateca, Leon 2013, Ibiza 2018, Arona”, page 282](#)

⇒ [“2.3.2 Assembly overview - coolant temperature sender, Toledo 2013, Ibiza 2016”, page 283](#)

2.3.1 Assembly overview - coolant temperature sender, Ateca, Leon 2013, Ibiza 2018, Arona

1 - O-ring

- ☐ Renew after removal

2 - Radiator outlet coolant temperature sender - G83-

- ☐ Removing and installing
⇒ [“2.9 Removing and installing radiator outlet coolant temperature sender G83”, page 297](#)

3 - Support ring

4 - O-ring

- ☐ Renew after removal

5 - Coolant temperature sender - G62-

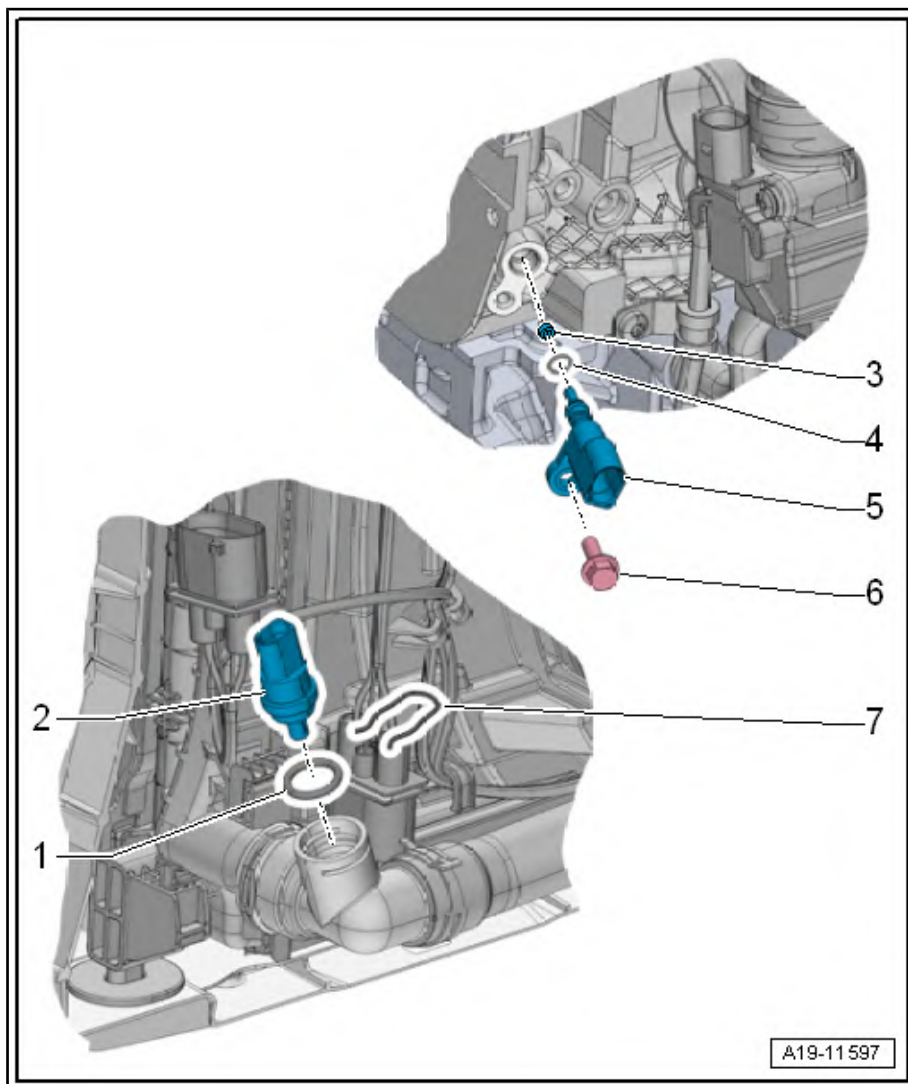
- ☐ Removing and installing
⇒ [“2.8 Removing and installing coolant temperature sender G62”, page 294](#)

6 - Bolt

- ☐ 8 Nm

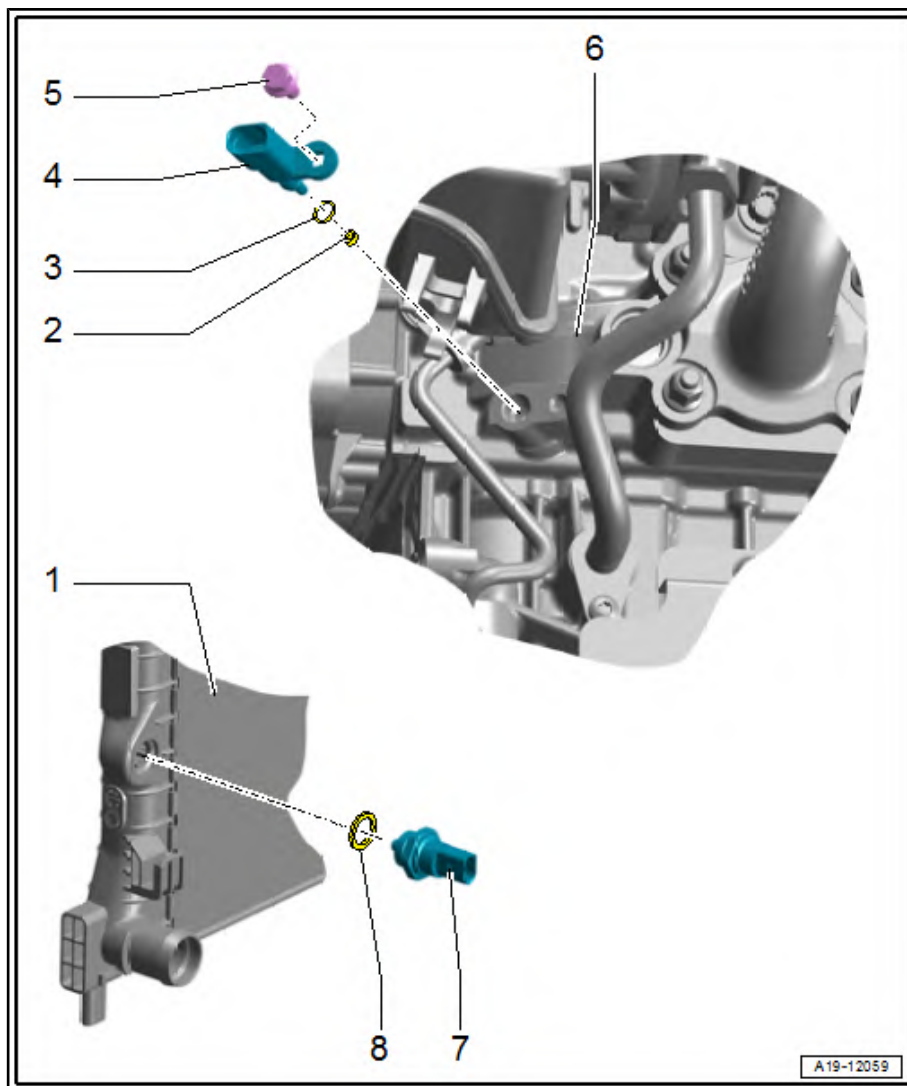
7 - Retaining clip

- ☐ Check for firm seating



2.3.2 Assembly overview - coolant temperature sender, Toledo 2013, Ibiza 2016

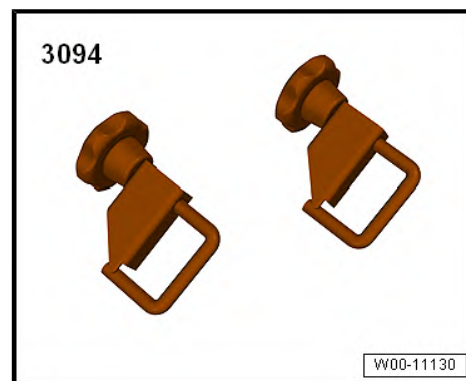
- 1 - Water cooler
- 2 - Support ring
- 3 - O-ring
 - ☐ Renew after removal
- 4 - Coolant temperature sender - G62-
 - ☐ Removing and installing
⇒ ["2.8 Removing and installing coolant temperature sender G62"](#),
page 294
- 5 - Bolt
 - ☐ 8 Nm
- 6 - Cylinder head
- 7 - Radiator outlet coolant temperature sender - G83-
 - ☐ Removing and installing
⇒ ["2.9.3 Coolant temperature sensor at radiator outlet G83 - removing and installing, Toledo 2013, Ibiza 2016"](#),
page 299
 - ☐ Specified torque
- 8 - Seal
 - ☐ Renew after removal
 - ☐ Installation is vehicle-specific
 - ☐ For allocation refer to ⇒
Electronic parts catalogue (ETKA) .



2.4 Removing and installing electric coolant pump

Special tools and workshop equipment required

- ◆ Hose clamps to 25 mm - 3094-



- ◆ Drip tray for workshop hoist - VAS 6208-



- ◆ Hose clip pliers - VAS 6362-



Removing

CAUTION

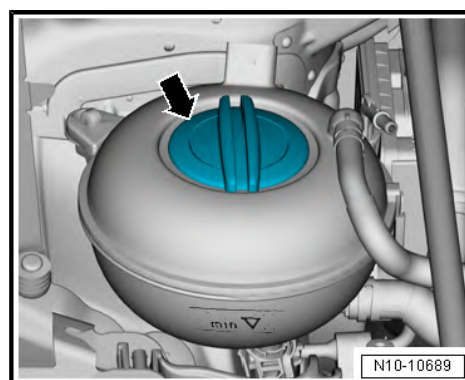
If the engine is hot, the coolant system is exposed to high pressure. Danger of scalding by steam and hot coolant.

Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear protective goggles.
- Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

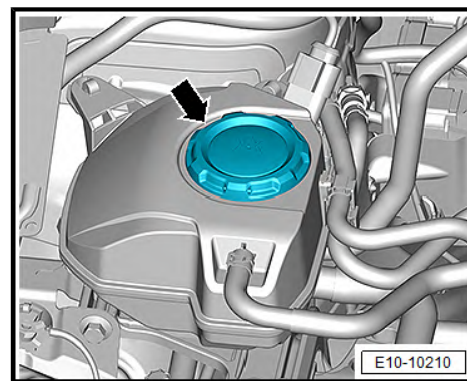
Ateca, Leon 2013

- Open filler cap -arrow- of coolant expansion tank.



Ibiza 2018, Arona

- Carefully open filler cap -arrow- on coolant expansion tank.



Toledo 2013, Ibiza 2016

- Open filler cap -1- on coolant expansion tank.



Note

Disregard item -2-.

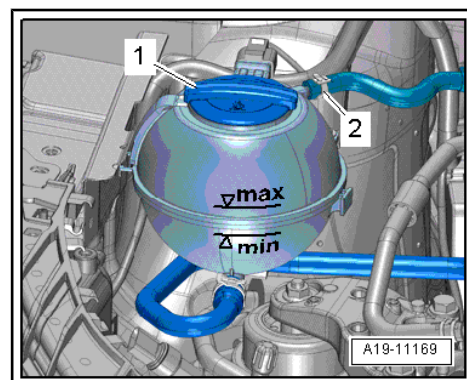
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

Toledo 2013, Ibiza 2016

Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; Underbody protection – assembly overview

Continued for all vehicles

- Place drip tray for workshop hoist - VAS 6208- underneath.



- Unplug electrical connector -1-.
- Clamp off coolant hoses on continued coolant circulation pump - 3094- using hose clamps up to Ø 25 mm - V51- .
- Loosen the hose clips -3-, remove the coolant hoses.
- Remove bolt -2- and detach continued coolant circulation pump - V51- .

Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Secure all hose connections with hose clips corresponding to the series production status ⇒ Electronic Parts Catalogue (ETKA) .*
- ◆ *Do not reuse the dirty coolant.*
- Check coolant level
⇒ ["1.3 Draining and adding coolant", page 260](#) .

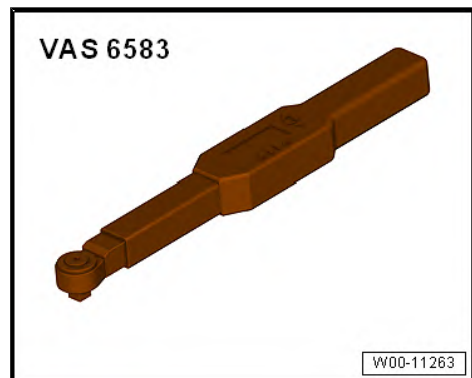
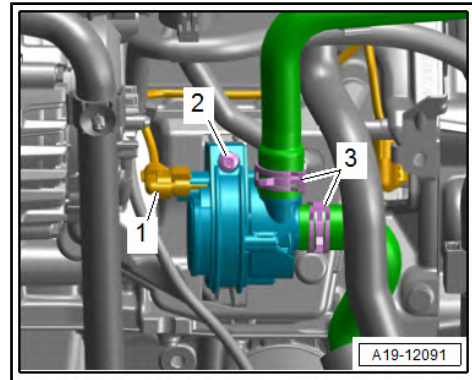
Specified torques

- ◆ ⇒ ["2.2 Assembly overview - electric coolant pump", page 280](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation
- ◆ Toledo 2013, Ibiza 2016 ⇒ General body works, exterior; Rep. gr. 50 ; Underbody protection; Assembly overview: underbody protection

2.5 Removing and installing coolant pump

Special tools and workshop equipment required

- ◆ Torque wrench - VAS 6583-



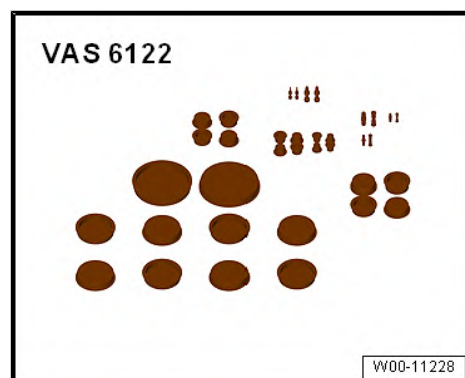
- ◆ Hose clip pliers - VAS 6362-



- ◆ Torx screw insert T 30 - T10405-

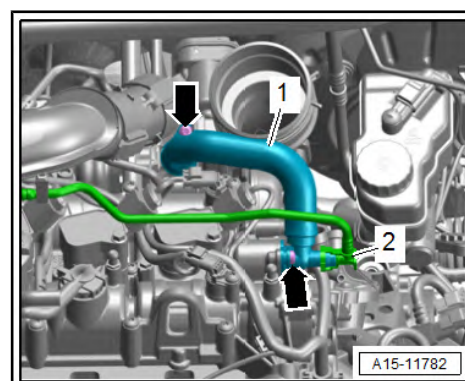


- ◆ Engine bung set - VAS 6122-

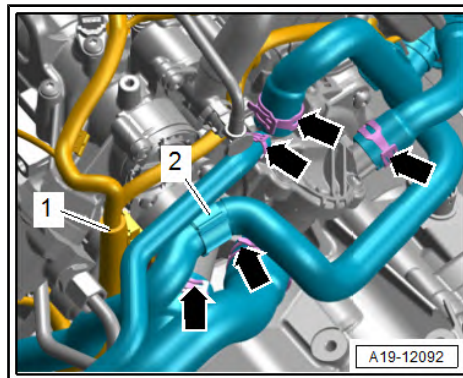


Removing

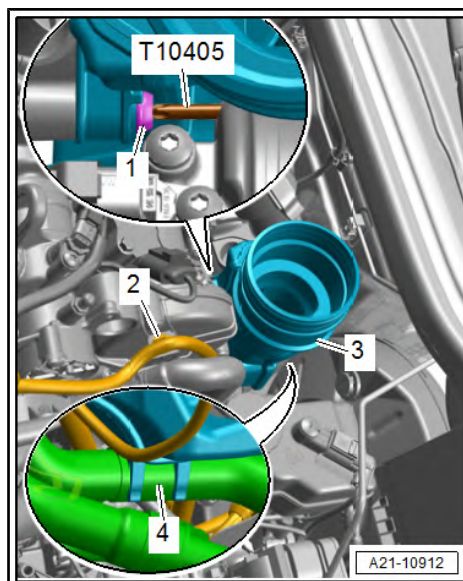
- Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .
- Seal open lines and unions with clean plugs from engine sealing plug set - VAS 6122- .
- Drain coolant
⇒ ["1.3 Draining and adding coolant", page 260](#) .
- Press release tabs on both sides, and disconnect hose -2- for activated charcoal filter.
- Unscrew bolts -arrows-, and detach crankcase breather hose -1-.



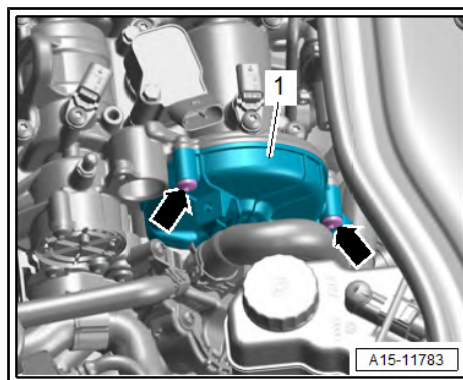
- Move clear electrical wiring harness -1- and coolant hose -2-.
- Release hose clips -arrows-, and remove coolant hoses.
- Move clear wiring harness -2- and coolant hose -4-, and push them aside.



- Unscrew bolt -1- using socket T30 - T10405- .
- Pull resonator -3- towards left off turbocharger, and carefully remove it upwards.



- Unscrew bolts -arrows-, and remove toothed belt guard -1- for coolant pump toothed belt.



- Loosen and unscrew bolts in the sequence -5- to -1-.
- Detach coolant pump with toothed belt.

Installing

Carry out the remaining installation in reverse sequence, noting the following:

- If coolant pump is renewed, remove thermostat housing from old coolant pump and install it to new one
⇒ [“2.6.1 Removing and installing thermostat for main coolant circuit \(radiator\)”, page 291](#) .



Note

- ◆ *Renew seal.*
- ◆ *If coolant pump is being renewed, renew toothed belt as well.*
- ◆ *Secure all hose connections with hose clips corresponding to the series production status ⇒ Electronic Parts Catalogue (ETKA) .*

- Ensure proper seating of gaskets -arrows-.
- Lubricate seal for coolant pump lightly with coolant.



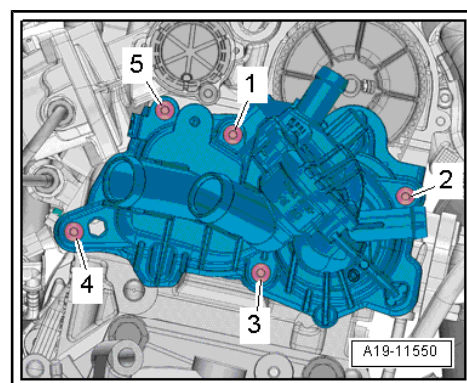
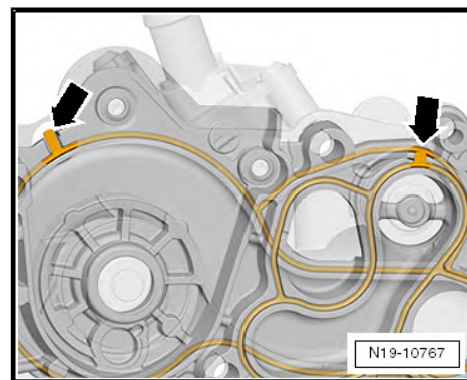
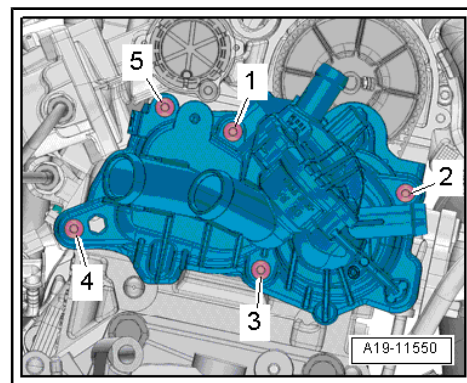
Note

- ◆ *Risk of premature wear of toothed belt or coolant pump.*
- ◆ *Always adhere to the sequence of work steps given below when installing the coolant pump.*
- ◆ *This ensures that the toothed belt is correctly tensioned.*
- ◆ *The following work steps must be carried out with the aid of a 2nd mechanic.*

- Used toothed belts must be renewed after each removal.
- Set No. 1 cylinder to TDC
⇒ [“4.7 Setting piston to TDC position”, page 155](#) .
- Fit toothed belt so that it is centred and move coolant pump into installation position.
- Mount coolant pump on cylinder head with securing bolts.
- Pre-tighten bolts in the specified sequence:

Stage	Bolts	Specified torque
1.	-1 ... 5-	Screw in by hand as far as stop
2.	-1 ... 5-	10 Nm

- Loosen all bolts again by one turn.

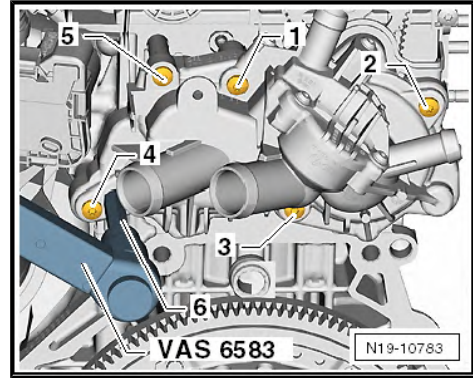


- Fit torque wrench -VAS 6583- with hexagon socket (10 mm) -item 6- to coolant pump.
- Using hexagon on coolant pump, preload coolant pump in clockwise direction to 30 Nm using 10 mm hexagon socket -6-, extension and torque wrench - VAS 6583- .
- For ease of use, fit torque wrench - VAS 6583- on vertically.



Note

- ◆ *Do not support torque wrench with your other hand.*
- ◆ *To ensure the poly V-belt is not over-tensioned, do not »push the torque wrench again« after the specified torque has been achieved.*
- ◆ *Have a second mechanic tighten securing bolts -2-, -1- and -5- to specified torque, while holding the torque wrench - VAS 6583- to the specified torque.*
- Hold coolant pump under load.
- While doing so, have a second mechanic retighten coolant pump securing bolts in anti-clockwise direction to 10 Nm, starting with bolts -2-, -1- and -5- («stage 3»).
- The required belt tension is reached by tightening securing bolts -2-, -1- and -5-.
- After securing bolts have been tightened initially, torque wrench - VAS 6583- can be removed.
- Then tighten securing bolts («stage 4»).



Stage	Bolts	Specified torque
3.	-2, 1, 5-	10 Nm
4.	-3, 4, 5, 1, 2-	12 Nm



Note

Do not reuse the dirty coolant.

- Add coolant ⇒ [“1.3 Draining and adding coolant”, page 260](#) .

Specified torques

- ◆ Securing bolts for crankcase breather hose
⇒ [“1.1 Assembly overview - turbocharger”, page 351](#)
- ◆ Securing bolts for coolant pump toothed belt guard
⇒ [“2.1 Assembly overview - coolant pump, thermostat”, page 278](#)
- ◆ Intake connecting pipe of turbocharger
⇒ [“1.1 Assembly overview - turbocharger”, page 351](#)
- ◆ Air filter housing
⇒ [“3.1 Assembly overview - air filter housing”, page 393](#) .

2.6 Removing and installing thermostat

⇒ [“2.6.1 Removing and installing thermostat for main coolant circuit \(radiator\)”, page 291](#)

⇒ [“2.6.2 Removing and installing thermostat for cylinder block coolant circuit”, page 293](#)

2.6.1 Removing and installing thermostat for main coolant circuit (radiator)

Special tools and workshop equipment required

◆ Hose clip pliers - VAS 6362-



◆ Wrench - T10508-



Removing

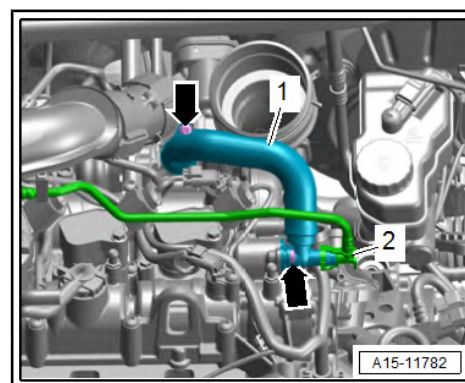
- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .
- Drain coolant
⇒ [“1.3 Draining and adding coolant”, page 260](#) .
- Press release tabs on both sides, and disconnect hose -2- for activated charcoal filter.



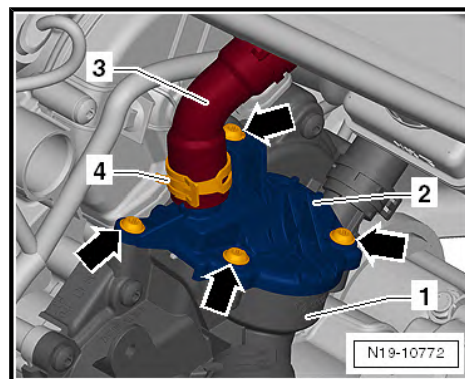
Note

Risk of chemical damage to the coolant pump gasket caused by oil entering between the coolant pump and the cylinder head.

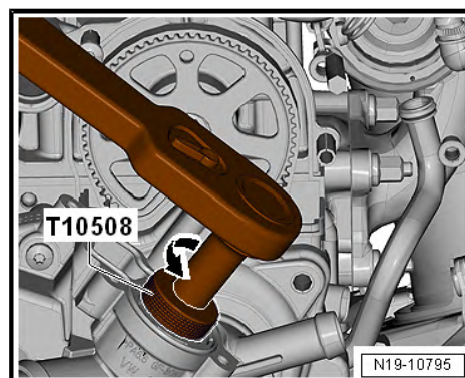
- Cover coolant pump with a cloth.
- Unscrew bolts -arrows-, and detach crankcase breather hose -1-.



- Remove coolant hose -3- from turbocharger connection.
- Release hose clip -4- and detach coolant hose -3-.
- Remove bolts -arrows- and detach cover -2- from thermostat housing -1-.



- Using special wrench - T10508- , turn thermostat in the direction of the arrow-, and remove it.



Installing

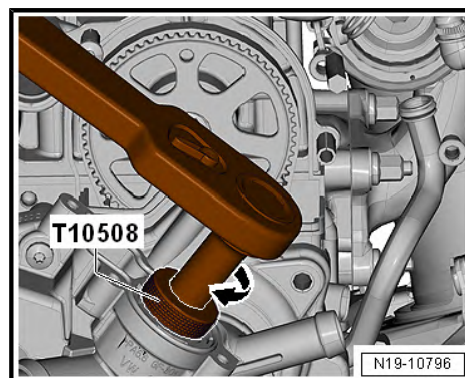
Install in reverse order of removal, observing the following:



Note

Renew seal.

- Moisten gasket with coolant.
- Installation position of thermostat ➔ [page 280](#) .
- Using special wrench - T10508- , fit thermostat, push it slightly downwards, and turn it in clockwise direction -arrow- to stop.



Note

Do not reuse the dirty coolant.

- Add coolant ➔ [“1.3 Draining and adding coolant”, page 260](#) .

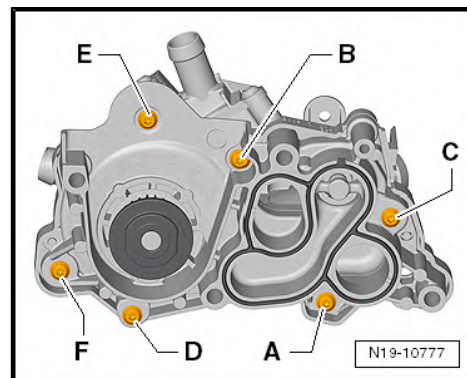
Specified torques

- ♦ ➔ [Fig. “Cover for thermostat to thermostat housing - specified torque”](#) , [page 280](#)
- ♦ Intake connecting pipe of turbocharger
➔ [“1.1 Assembly overview - turbocharger”, page 351](#)
- ♦ Air filter housing
➔ [“3.1 Assembly overview - air filter housing”, page 393](#) .

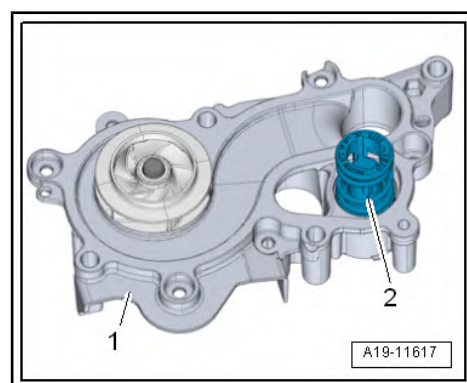
2.6.2 Removing and installing thermostat for cylinder block coolant circuit

Removing

- Remove coolant pump
⇒ [“2.5 Removing and installing coolant pump”, page 286](#) .
- Unscrew bolts in the sequence -F to A-.
- Detach coolant pump from thermostat housing.



- Detach thermostat -2- from coolant pump -1-.



Installing

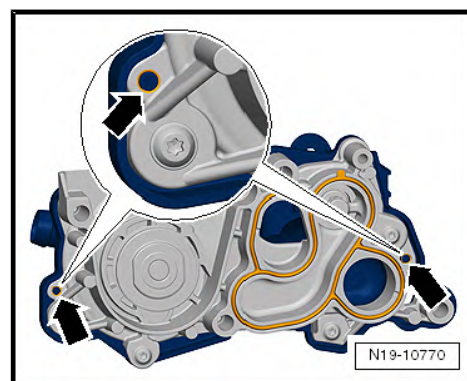
Install in reverse order of removal, observing the following:



Note

Renew seal.

- Moisten gasket with coolant.
- Fit thermostat housing onto coolant pump.
- Centring pins on thermostat must be fitted in guides -arrows- on coolant pump.
- Tighten bolts for thermostat housing ⇒ [page 280](#) .
- Install coolant pump
⇒ [“2.5 Removing and installing coolant pump”, page 286](#) .



Note

Do not reuse the dirty coolant.

- Add coolant ⇒ [“1.3 Draining and adding coolant”, page 260](#) .

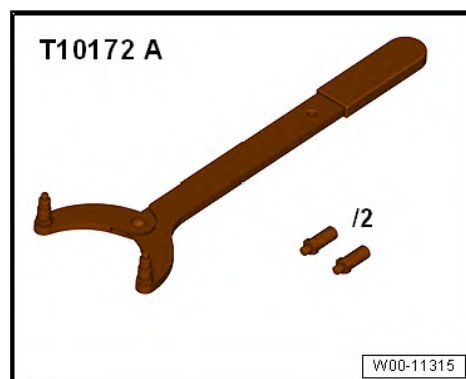
Specified torques

- ◆ ⇒ Fig. [“Thermostat housing to coolant pump - specified torque and sequence”](#) , page 280

2.7 Removing and installing toothed belt pulley for coolant pump

Special tools and workshop equipment required

- ◆ Counterhold - T10172 A- with adapter -T10172/2-



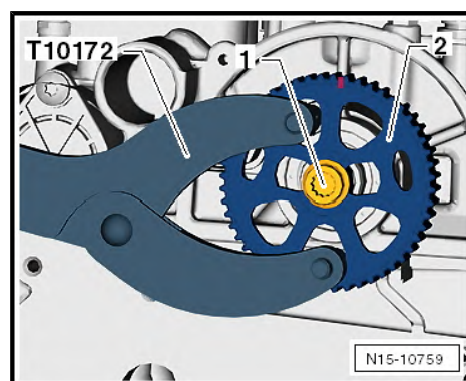
Removing

- Remove coolant pump
⇒ ["2.5 Removing and installing coolant pump", page 286](#) .
- Loosen bolt -1- using counterhold - T10172 A- with adapters -T10172/2- .
- Unscrew bolt and remove toothed belt pulley -2-.

Installing

Install in reverse order of removal, observing the following:

- Fit toothed belt pulley:

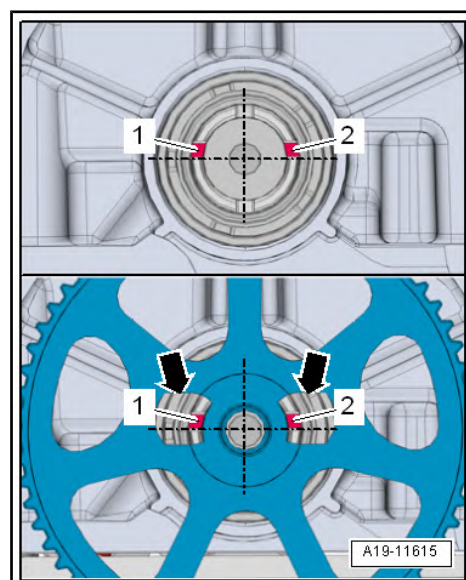


Position of camshaft recesses:

- The grooves -1- and -2- in the camshaft are arranged asymmetrically.
- Cut-outs -arrows- in toothed belt pulley are also arranged asymmetrically.
- Fit toothed belt pulley onto camshaft so that the asymmetrical notches of the camshaft are fully centred within the cut-outs of the toothed belt pulley.
- Install coolant pump
⇒ ["2.5 Removing and installing coolant pump", page 286](#)

Specified torques

- ◆ ⇒ ["2.1 Assembly overview - coolant pump, thermostat", page 278](#)



2.8 Removing and installing coolant temperature sender - G62-

Special tools and workshop equipment required

- ◆ Drip tray for workshop hoist - VAS 6208-



Removing

⚠ CAUTION

If the engine is hot, the coolant system is exposed to high pressure. Danger of scalding by steam and hot coolant.

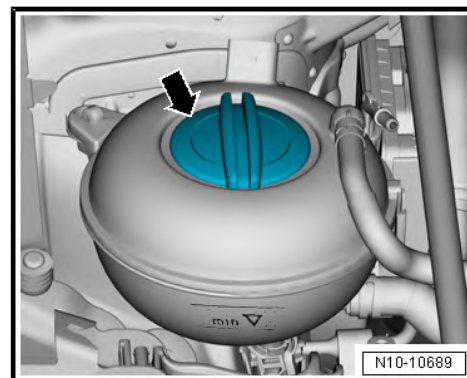
Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear protective goggles.
- Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

- Engine cold.

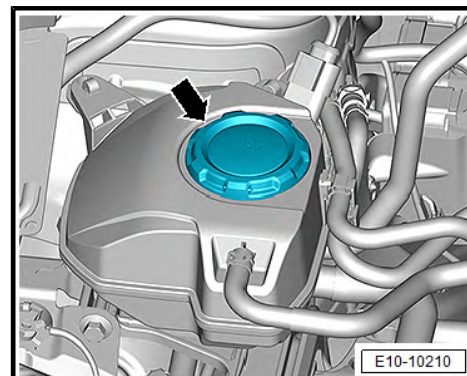
Ateca, Leon 2013

- Open filler cap -arrow- of coolant expansion tank.



Ibiza 2018, Arona

- Carefully open filler cap -arrow- on coolant expansion tank.



Toledo 2013, Ibiza 2016

- Open filler cap -1- on coolant expansion tank.



Note

Disregard item -2-.

Toledo 2013, Ibiza 2016

Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; Underbody protection – assembly overview

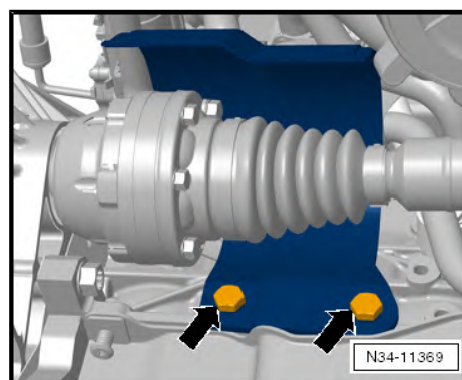
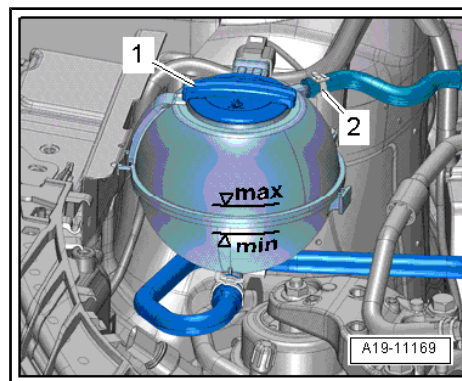
Continued for all vehicles

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- If available, unscrew bolts -arrows-, and remove heat shield for right drive shaft.



Note

Place a cloth underneath to catch any escaping coolant.

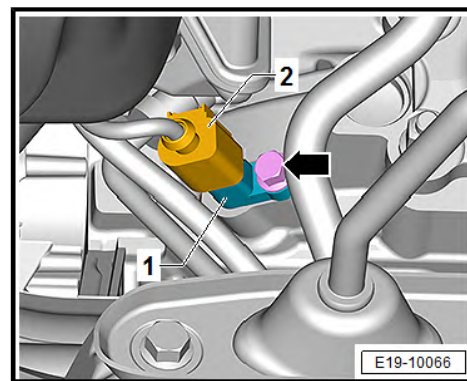


- Unplug electrical connector -2-.
- Place drip tray for workshop hoist - VAS 6208- underneath.
- Unscrew bolt -arrow-, and pull off coolant temperature sender - G62- -item 1-.



Note

- ◆ If O-ring -3- with support ring -4- remains lodged in cylinder head, lift out O-ring with support ring using a piece of wire.
- ◆ To avoid loss of coolant, insert new coolant temperature sender - G62- immediately into cylinder head.



Installing

Install in reverse order of removal, observing the following:



Note

Renew O-ring.

- Check coolant level ⇒ [page 260](#) .

Specified torques

- ◆ ⇒ [“2.3 Assembly overview - coolant temperature sender”, page 282](#)
- ◆ Drive shaft heat shield ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft

2.9 Removing and installing radiator outlet coolant temperature sender - G83-

⇒ [“2.9.1 Radiator outlet coolant temperature sender G83 - removing and installing, Ateca, Leon 2013”, page 297](#)

⇒ [“2.9.2 Removing and installing radiator outlet coolant temperature sender G83 , Ibiza 2018, Arona”, page 299](#)

⇒ [“2.9.3 Coolant temperature sensor at radiator outlet G83 - removing and installing, Toledo 2013, Ibiza 2016”, page 299](#)

2.9.1 Radiator outlet coolant temperature sender - G83- - removing and installing, Ateca, Leon 2013

Removing

- Engine cold.



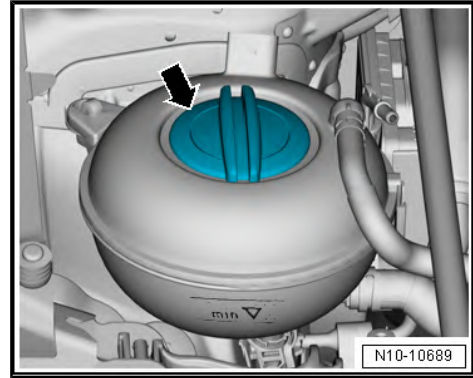
CAUTION

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and hot coolant.

Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear protective goggles.
- Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

- Briefly open cap of coolant expansion tank -arrow- in order to eliminate residual pressure in the cooling system, then tighten the cap again until it engages.
- Remove nose insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .



- Unplug electrical connector -2-.



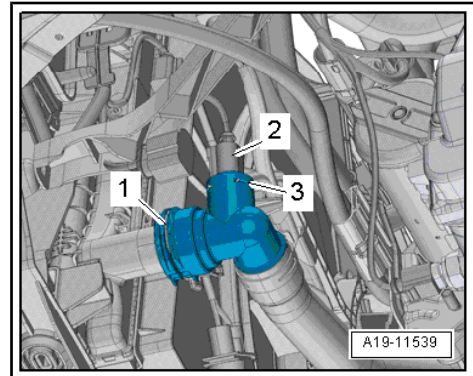
Note

Use a cloth to catch the escaping coolant.

- Pull off retaining clip -1- and pull radiator outlet coolant temperature sender - G83- out of connection -3-.

Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Renew O-ring.*
- ◆ *To avoid loss of coolant, screw in new radiator outlet coolant temperature sender - G83- immediately.*
- Install front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Check coolant level ⇒ [page 262](#) .

Specified torques

- ◆ ⇒ [“2.3.1 Assembly overview - coolant temperature sender, Ateca, Leon 2013, Ibiza 2018, Arona”, page 282](#)

2.9.2 Removing and installing radiator outlet coolant temperature sender - G83- , Ibiza 2018, Arona

Removing

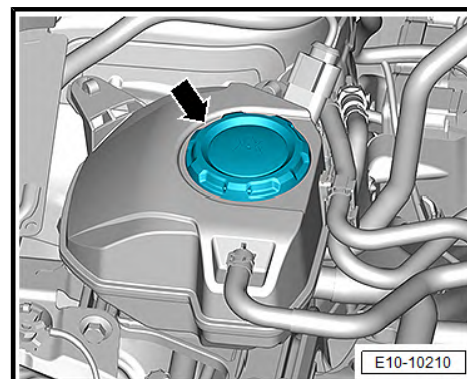
- Engine cold.

CAUTION

If the engine is hot, the coolant system is exposed to high pressure. Danger of scalding by steam and hot coolant.

Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear protective goggles.
- Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.



- Briefly open cap of coolant expansion tank -arrow- in order to eliminate residual pressure in the cooling system, then tighten the cap again until it engages.
- Place drip tray for workshop hoist - VAS 6208- underneath.
- Unplug electrical connector -2-.
- Pull out retaining clip -3-, remove radiator outlet coolant temperature sender - G83- .

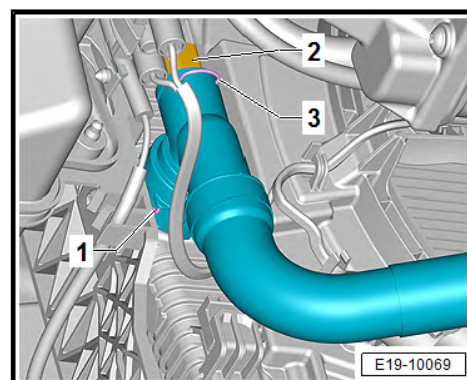
Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Renew O-ring.*
- ◆ *Insert new coolant temperature sender on the radiator outlet - G83- immediately into connection in order to avoid loss of coolant.*
- Check coolant level ➤ [page 271](#) .



Specified torques

- ◆ ➤ [“2.3.1 Assembly overview - coolant temperature sender, Ateca, Leon 2013, Ibiza 2018, Arona”, page 282](#)

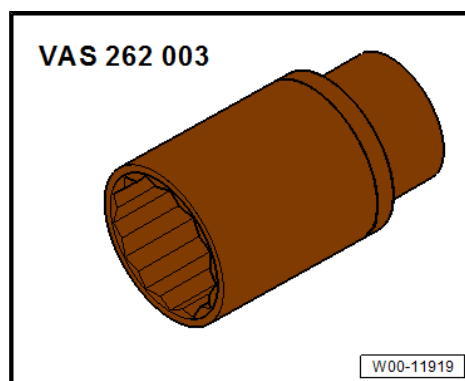
2.9.3 Coolant temperature sensor at radiator outlet - G83- - removing and installing, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required

- ◆ Drip tray for workshop hoist - VAS 6208-



- ◆ Socket AF 29 - VAS 262 003-



Removing

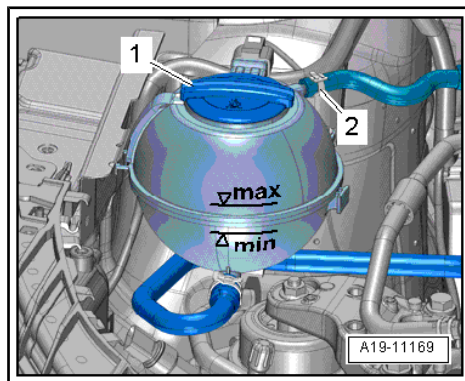
- Engine cold.
- In order to relieve residual pressure in cooling system, briefly open filler cap -1- of coolant expansion tank and then screw on tightly again until it latches into place.



Note

Disregard item -2-.

- Release and pull off connector -1- on coolant expansion tank.
- Unclip filler neck -2- for washer fluid reservoir.
- Release and detach coolant expansion tank on lock carrier -arrows-.
- Place drip tray for workshop hoist - VAS 6208- underneath.

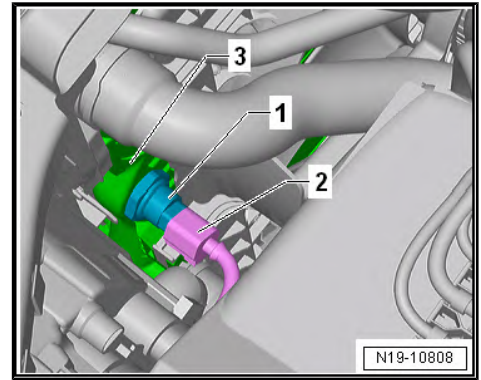


- Release and pull off connector -2- on radiator outlet coolant temperature sender - G83- -1-.
- Use a cloth to catch the escaping coolant.
- Unscrew radiator outlet coolant temperature sender - G83- using socket, 29 mm - VAS 262 003- .

Installing

Install in reverse order of removal, observing the following:

- Check coolant level
⇒ ["1.3.3 Draining and adding coolant, Toledo 2013, Ibiza 2016", page 271](#) .



Note

- ◆ *Renew O-ring.*
- ◆ *To avoid loss of coolant, screw in new radiator outlet coolant temperature sender - G83- immediately.*

Specified torques

- ◆ ⇒ ["4.1 Assembly overview - radiator/radiator fan", page 304](#)
- ◆ ⇒ ["2.3.2 Assembly overview - coolant temperature sender, Toledo 2013, Ibiza 2016", page 283](#)

3 Coolant pipes

⇒ [“3.1 Assembly overview - coolant pipes”, page 302](#)

⇒ [“3.2 Removing and installing coolant pipes”, page 302](#)

3.1 Assembly overview - coolant pipes



Note

The arrows on the coolant pipes and on the ends of coolant hoses must be aligned with each other.

1 - Coolant hose

2 - Coolant pipe

- ❑ Removing and installing
⇒ [“3.2 Removing and installing coolant pipes”, page 302](#)

3 - Bolt

- ❑ 8 Nm

4 - Coolant hose

5 - Coolant hoses

6 - Coolant line

- ❑ Clipped onto intake manifold (top)

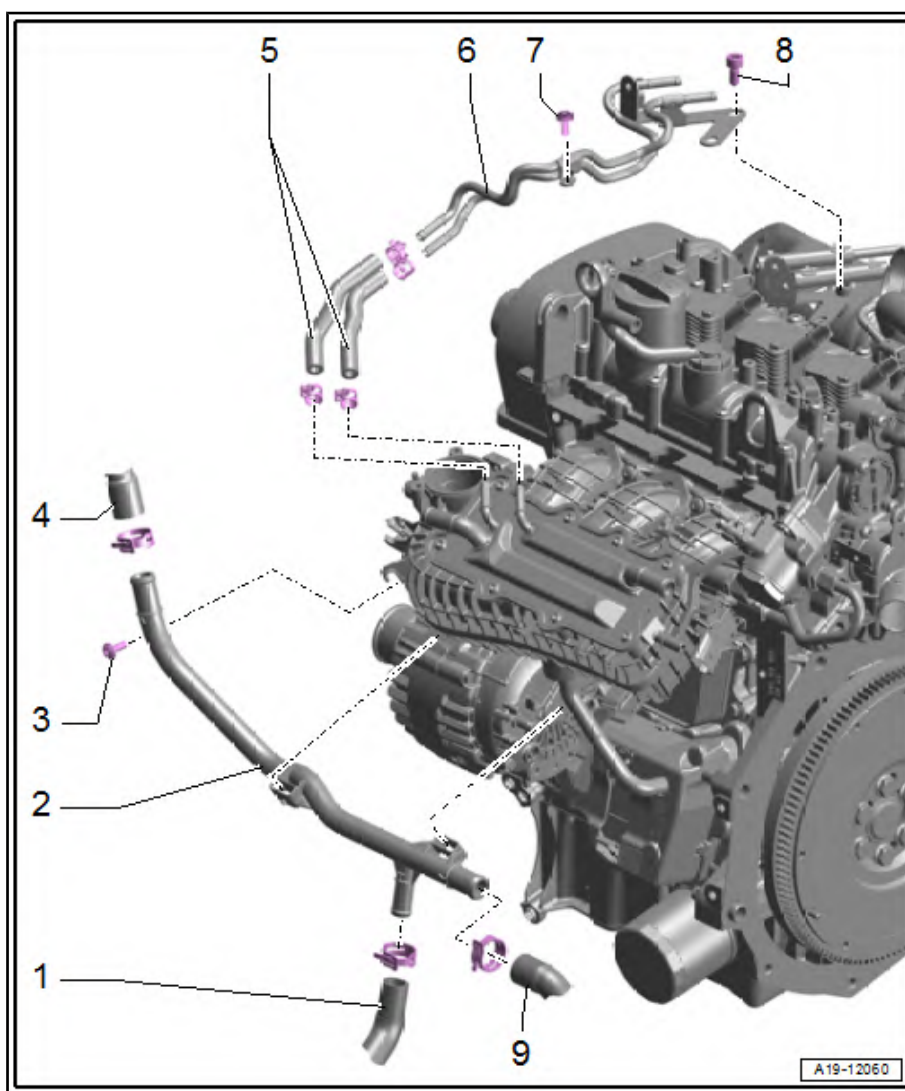
7 - Bolt

- ❑ 9 Nm

8 - Bolt

- ❑ Specified torque
⇒ [Item 6 \(page 351\)](#)

9 - Coolant hose



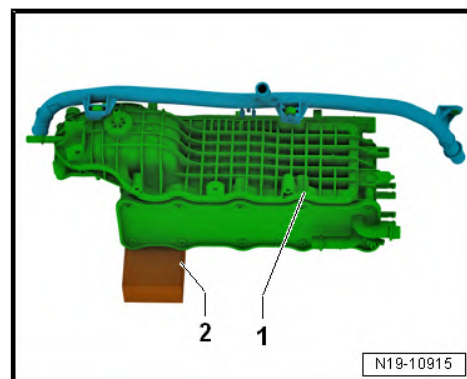
3.2 Removing and installing coolant pipes

Removing

- Remove intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 400](#)

i Note

- ◆ *Risk of damage to intake manifold and coolant pipe.*
- ◆ *This procedure requires extreme caution.*
- Lay intake manifold -1- on the workbench as shown.



- Place e.g. a block of wood -2- under the intake manifold as an underlay.
- Carefully release catches -arrows-, and pull coolant pipe -2- off intake manifold -1-.

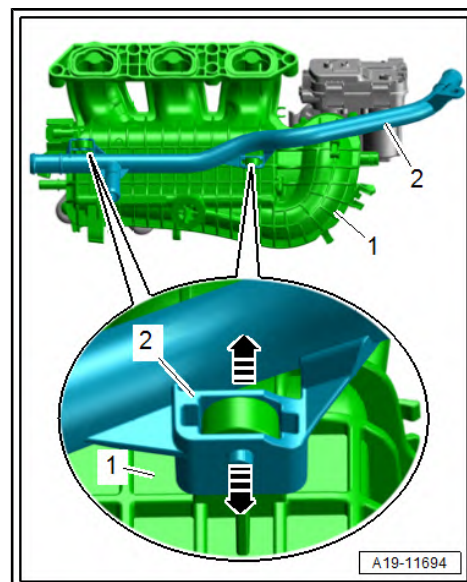
Installing

Carry out the remaining installation in reverse sequence, noting the following:

- Press coolant hose onto the intake manifold until it audibly engages.

i Note

- ◆ *Renew seals and O-rings.*
- ◆ *Secure all hose connections with hose clips corresponding to the series production status ⇒ Electronic Parts Catalogue (ETKA) .*



- Install intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 400](#) .
- Check coolant level
⇒ [“1.3 Draining and adding coolant”, page 260](#) .

Specified torques

- ◆ ⇒ [“4.1 Assembly overview - intake manifold”, page 399](#)

4 Radiator, radiator fan

⇒ ["4.1 Assembly overview - radiator/radiator fan", page 304](#)

⇒ ["4.2 Assembly overview - radiator cowl and radiator fan", page 312](#)

⇒ ["4.3 Removing and installing radiator", page 313](#)

⇒ ["4.4 Removing and installing water radiator for charge air cooling circuit", page 324](#)

⇒ ["4.5 Removing and installing radiator cowl", page 335](#)

⇒ ["4.6 Removing and installing radiator fan V7 ", page 341](#)

⇒ ["4.7 Removing and installing radiator blind", page 342](#)

⇒ ["4.8 Removing and installing radiator blind control motor V544 ", page 343](#)

⇒ ["4.9 Assembly overview - radiator blind", page 347](#)

4.1 Assembly overview - radiator/radiator fan

⇒ ["4.1.1 Assembly summary - radiator/radiator fan, Ateca, Leon 2013", page 304](#)

⇒ ["4.1.2 Assembly overview - Cooler/Radiator fan, model 1, Ibiza 2018, Arona", page 307](#)

⇒ ["4.1.3 Assembly overview - Cooler/Radiator fan, model 2, Ibiza 2018, Arona", page 309](#)

⇒ ["4.1.4 Assembly summary - radiator/radiator fan, Toledo 2013, Ibiza 2016", page 310](#)

4.1.1 Assembly summary - radiator/radiator fan, Ateca, Leon 2013

1 - Radiator for engine coolant

- ☐ Removing and installing
⇒ ["4.3.1 Removing and installing radiator, Ateca, Leon 2013", page 313](#)
- ☐ Renew coolant after replacing.

2 - Coolant hose

- ☐ Pull out retaining clip to remove
- ☐ Connect ⇒ [page 306](#)

3 - Retaining clip

4 - O-ring

- ☐ Renew after removal

5 - Radiator outlet coolant temperature sender - G83-

- ☐ Removing and installing
⇒ ["2.9.1 Radiator outlet coolant temperature sender G83 - removing and installing, Ateca, Leon 2013", page 297](#)

6 - O-ring

- ☐ Renew after removal

7 - Coolant hose

- ☐ Pull out retaining clip to remove ⇒ [page 306](#)
- ☐ Connect

8 - O-ring

- ☐ Renew after removal

9 - Coolant hose

- ☐ Pull out retaining clip to remove
- ☐ Connect ⇒ [page 306](#)

10 - Cowling

11 - Cowling

12 - Bonded rubber bush

- ☐ For radiator

13 - Radiator for charge air cooling circuit

- ☐ Removing and installing
⇒ ["4.4.1 Removing and installing supply gas recirculation cooler, Ateca, Leon 2013", page 324](#)

14 - Condenser

- ☐ Removing and installing ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit; Removing and installing condenser .

15 - Bonded rubber bush

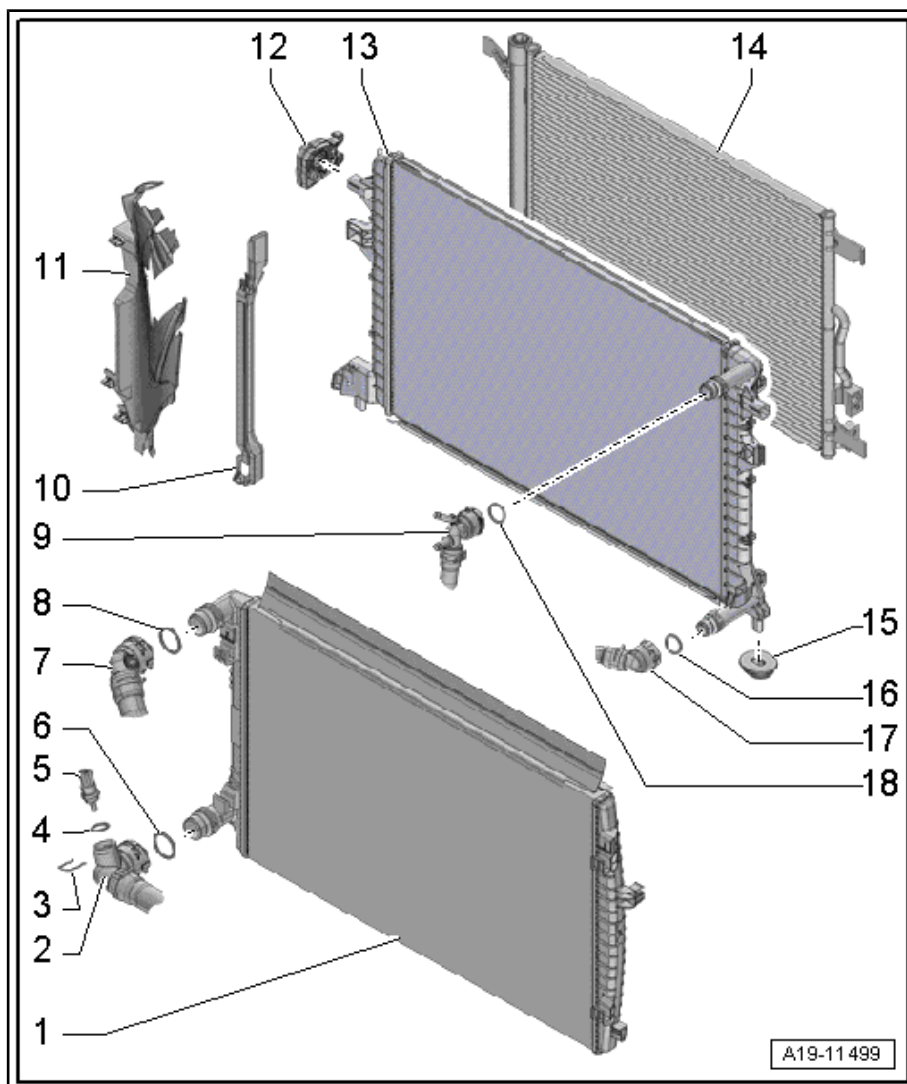
- ☐ For radiator

16 - O-ring

- ☐ Renew after removal

17 - Coolant hose

- ☐ Pull out retaining clip to remove
- ☐ Connect ⇒ [page 306](#)



18 - O-ring

- ☐ Renew after removal

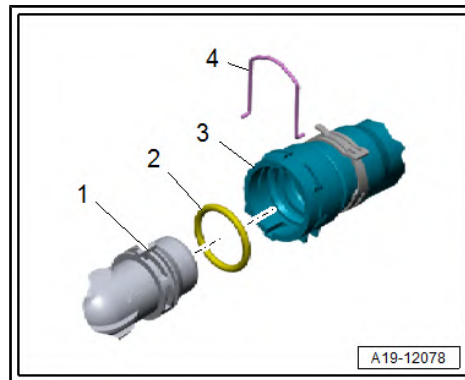
Connecting coolant hose with plug-in connectors**Note**

Renew retaining clip -4- if damaged.

Connecting coolant hose with plug-in connectors**Note**

Renew retaining clip -4- if damaged.

- Remove old O-ring -2- in coolant hose -3-.
- Moisten new O-ring with coolant and insert into coolant hose.
- Press coolant hose onto coolant pipe -1- until it engages with a click.
- Push coolant hose further on, and pull it back then to check if plug-in connector is engaged securely.



4.1.2 Assembly overview - Cooler/Radiator fan, model 1, Ibiza 2018, Arona

1 - Cowling

2 - Radiator mount support

- ☐ The radiator mounting will be reused when re-installing the radiator. It will then be bolted to the lock carrier. Bolts ⇒ Electronic Parts Catalogue (ETKA)

3 - Condenser

- ☐ Removing and installing ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit; Removing and installing condenser .

4 - Radiator for charge air cooling circuit

- ☐ Removing and installing ⇒ ["4.4.2 Removing and installing water radiator for charge air cooling circuit, Ibiza 2018, Arona", page 329](#)

5 - Coolant hose

- ☐ Pull out retaining clip to remove
- ☐ Connect ⇒ [page 308](#)

6 - O-ring

- ☐ Renew after removal

7 - Cowling

8 - Coolant hose

- ☐ Pull out retaining clip to remove
- ☐ Connect ⇒ [page 308](#)

9 - Bonded rubber bush

- ☐ For the charge-air cooler radiator

10 - Radiator for engine coolant

- ☐ Removing and installing ⇒ ["4.3.2 Removing and installing radiator, Model 1, Arona, Ibiza 2018", page 315](#)
- ☐ Renew coolant after replacing.

11 - Coolant hose

- ☐ Pull out retaining clip to remove
- ☐ Connect ⇒ [page 308](#)

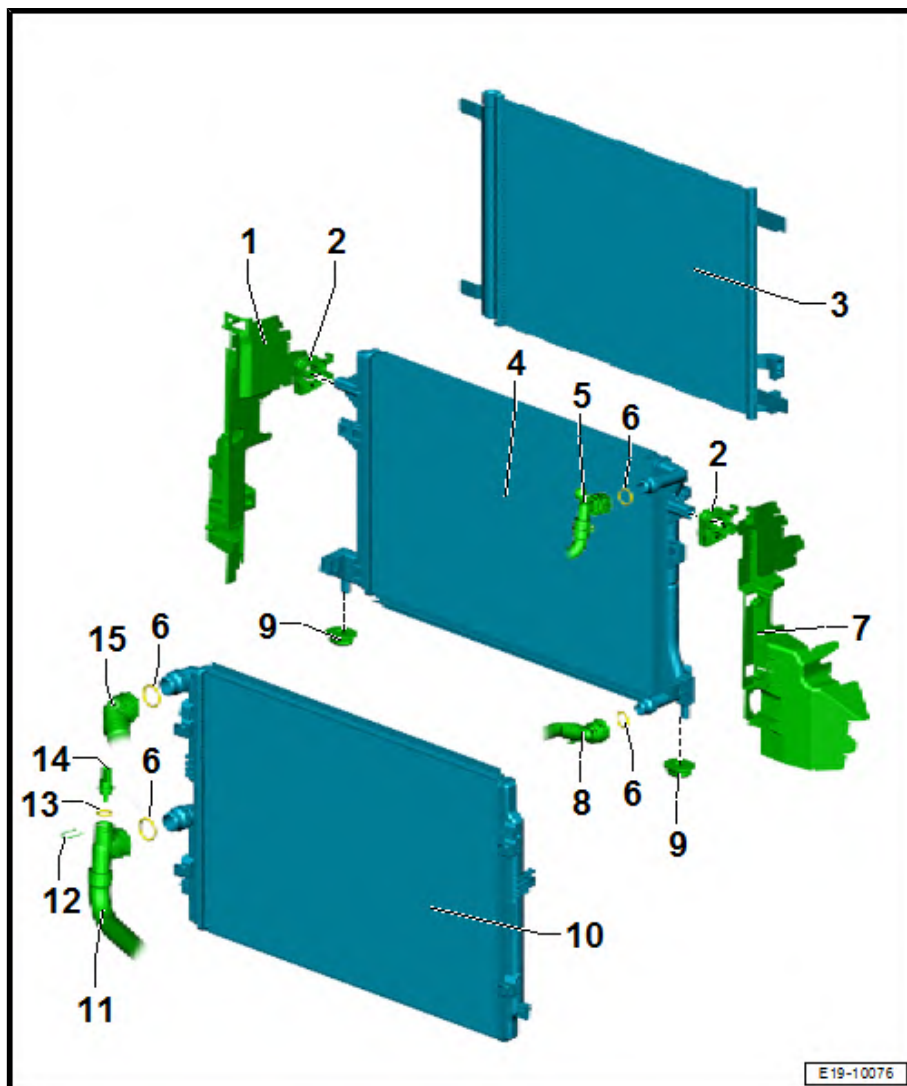
12 - Retaining clip

13 - O-ring

- ☐ Renew after removal

14 - Radiator outlet coolant temperature sender - G83-

- ☐ Removing and installing ⇒ ["2.9.2 Removing and installing radiator outlet coolant temperature sender G83 , Ibiza 2018, Arona", page 299](#)



15 - Coolant hose

- ☐ Pull out retaining clip to remove
- ☐ Connect ➔ [page 308](#)

Connecting coolant hose with plug-in connectors



Note

Renew retaining clip -4- if damaged.

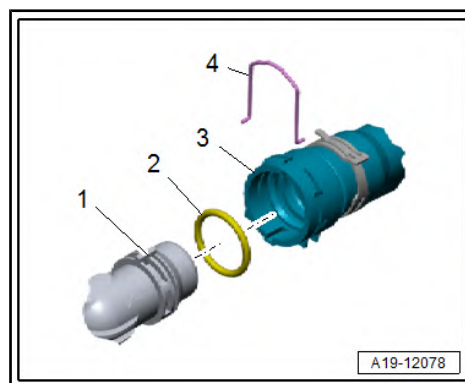
Connecting coolant hose with plug-in connectors



Note

Renew retaining clip -4- if damaged.

- Remove old O-ring -2- in coolant hose -3-.
- Moisten new O-ring with coolant and insert into coolant hose.
- Press coolant hose onto coolant pipe -1- until it engages with a click.
- Push coolant hose further on, and pull it back then to check if plug-in connector is engaged securely.



4.1.3 Assembly overview - Cooler/Radiator fan, model 2, Ibiza 2018, Arona

1 - Cowling

2 - Condenser

- ☐ Removing and installing
⇒ Heating, air conditioning; Rep. gr. 87 ;
Refrigerant circuit; Removing and installing
condenser .

3 - Cowling

4 - Radiator mount support

- ☐ For radiator

5 - Bonded rubber bush

- ☐ For radiator

6 - O-ring

- ☐ Renew after removal

7 - Coolant hose

- ☐ Pull out retaining clip to remove
- ☐ Connect ⇒ [page 310](#)

8 - Coolant hose

- ☐ Pull out retaining clip to remove
- ☐ Connect ⇒ [page 310](#)

9 - Radiator for engine coolant

- ☐ Removing and installing
⇒ [“4.3.2 Removing and installing radiator, Model 1, Arona, Ibiza 2018”, page 315](#)
- ☐ Renew coolant after replacing.

10 - Coolant hose

- ☐ Pull out retaining clip to remove
- ☐ Connect ⇒ [page 310](#)

11 - Retaining clip

12 - O-ring

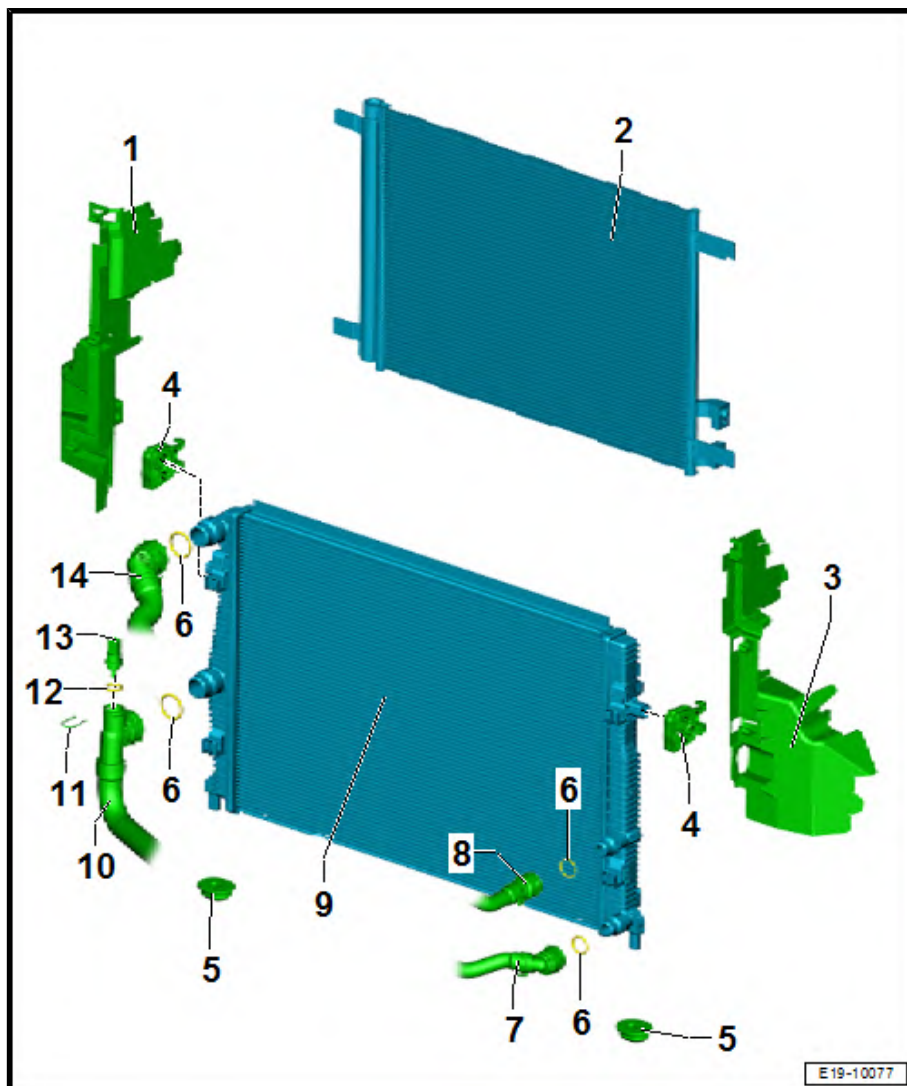
- ☐ Renew after removal

13 - Radiator outlet coolant temperature sender - G83-

- ☐ Removing and installing
⇒ [“2.9.2 Removing and installing radiator outlet coolant temperature sender G83 , Ibiza 2018, Arona”, page 299](#)

14 - Coolant hose

- ☐ Pull out retaining clip to remove
- ☐ Connect ⇒ [page 310](#)



Connecting coolant hose with plug-in connectors



Note

Renew retaining clip -4- if damaged.

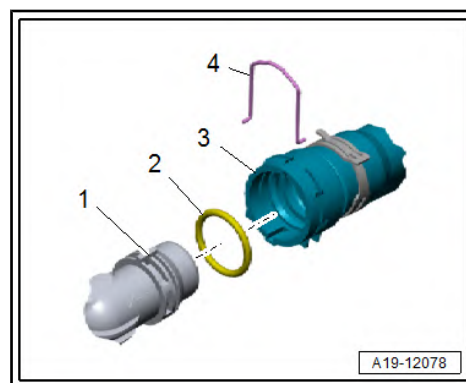
Connecting coolant hose with plug-in connectors



Note

Renew retaining clip -4- if damaged.

- Remove old O-ring -2- in coolant hose -3-.
- Moisten new O-ring with coolant and insert into coolant hose.
- Press coolant hose onto coolant pipe -1- until it engages with a click.
- Push coolant hose further on, and pull it back then to check if plug-in connector is engaged securely.



4.1.4 Assembly summary - radiator/radiator fan, Toledo 2013, Ibiza 2016

1 - Coolant hoses

- ☐ For coolant circuit of charge air cooler

2 - Air duct

3 - Water radiator for charge air cooler

- ☐ Radiator and water radiator for charge air cooling circuit are removed together
- ☐ Renew coolant after replacing.
- ☐ Removing and installing
⇒ ["4.3.4 Radiator - removing and installing, Toledo 2013, Ibiza 2016", page 321](#)

4 - Coolant pipe - bottom

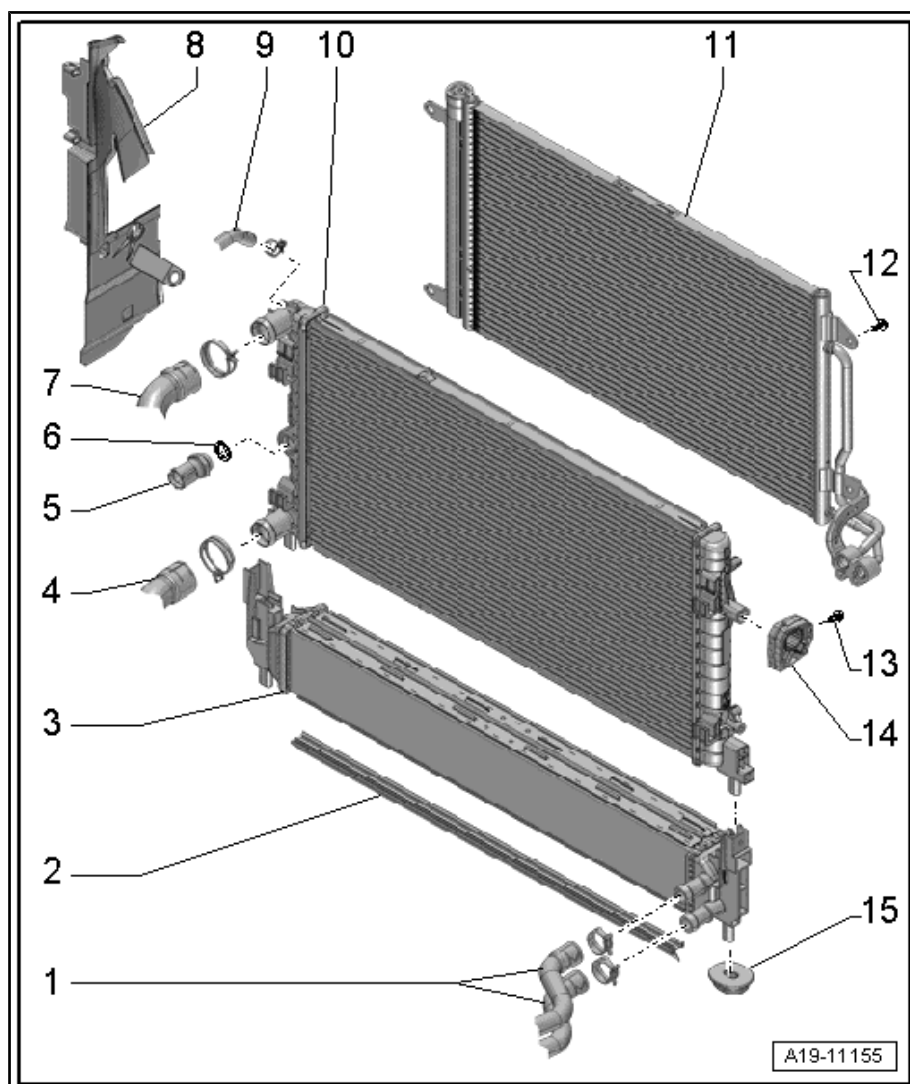
- ☐ Use release tool - VAS 531 001- to lock.
- ☐ Clamp moulded

5 - Radiator outlet coolant temperature sender - G83-

- ☐ Removing and installing
⇒ ["2.9.3 Coolant temperature sensor at radiator outlet G83 - removing and installing, Toledo 2013, Ibiza 2016", page 299](#)
- ☐ 35 Nm

6 - Seal

- ☐ Renew after removal



7 - Upper coolant hose

- ☐ Use release tool - VAS 531 001- to lock.
- ☐ Clamp moulded

8 - Air duct

9 - Coolant hose

- ☐ To coolant expansion tank
- ☐ Use release tool - VAS 531 001- to lock.
- ☐ Clamp moulded

10 - Radiator for engine coolant

- ☐ Removing and installing
⇒ ["4.3.4 Radiator - removing and installing, Toledo 2013, Ibiza 2016", page 321](#)
- ☐ Renew coolant after replacing.

11 - Condenser

- ☐ Removing and installing ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit; Removing and installing condenser .

12 - Bolt

- ☐ Specified torque ⇒ Heating, air conditioning system; Rep. gr. 87 ; Refrigerant circuit; Assembly overview - condenser

13 - Bolt

- ☐ 5 Nm

14 - Support

- ☐ Check fitting position

15 - Support

- ☐ For water radiator for charge air cooler

4.2 Assembly overview - radiator cowl and radiator fan

⇒ [“4.2.1 Assembly overview - radiator cowl and radiator fan, Toledo 2013, Ibiza 2016”, page 312](#)

⇒ [“4.2.2 Assembly overview - radiator cowl and radiator fan, Ateca, Leon 2013, Ibiza 2018, Arona”, page 313](#)

4.2.1 Assembly overview - radiator cowl and radiator fan, Toledo 2013, Ibiza 2016

Radiator cowl and radiator fans

1 - Pin

- ☐ For spreader clip

2 - Air duct ring

- ☐ For radiator fan(s)
- ☐ Depending on version

3 - Radiator fan - V7-

- ☐ With radiator fan control unit - J293- .
- ☐ Removing and installing
⇒ [“4.6 Removing and installing radiator fan V7”, page 341](#)

4 - Fan ring

- ☐ Removing and installing
⇒ [“4.5 Removing and installing radiator cowl”, page 335](#)

5 - Air flow flap

6 - Clip

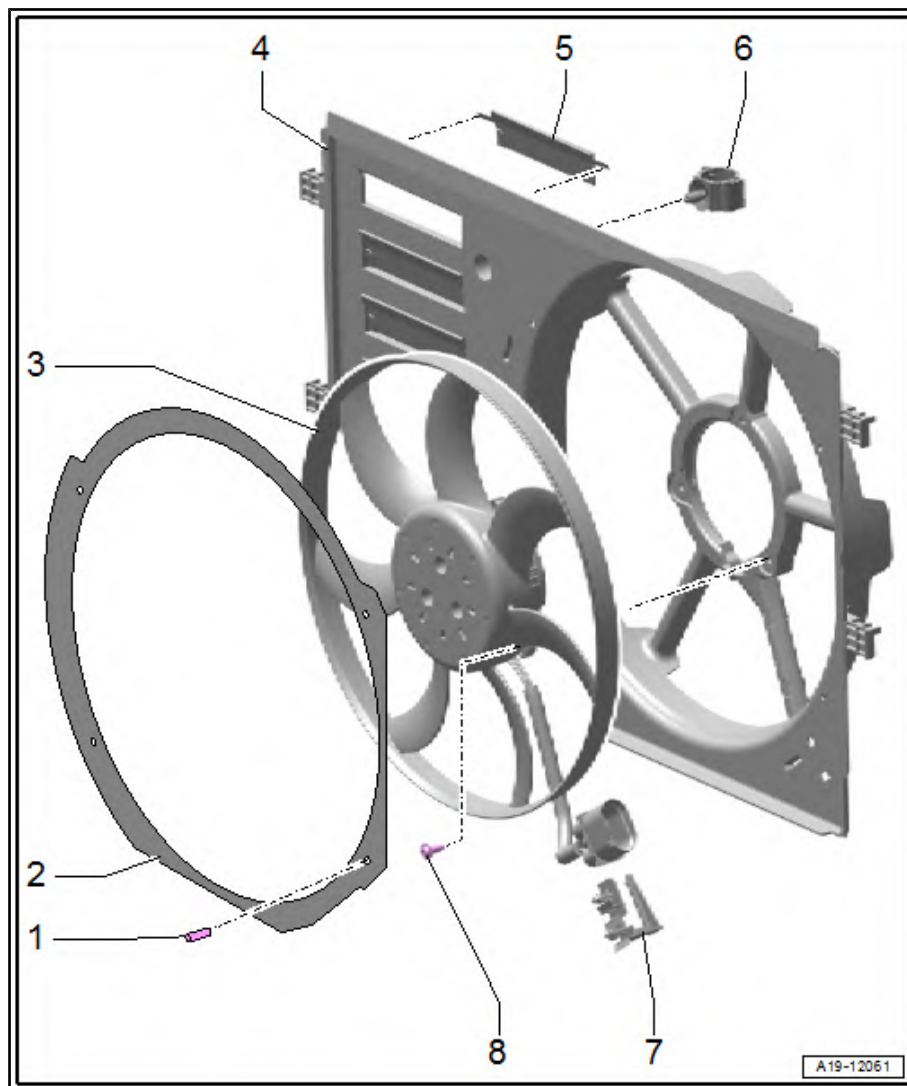
- ☐ For coolant hose

7 - Support

- ☐ For electrical connector.

8 - Bolt

- ☐ 1.5 Nm



4.2.2 Assembly overview - radiator cowl and radiator fan, Ateca, Leon 2013, Ibiza 2018, Arona

1 - Bolt

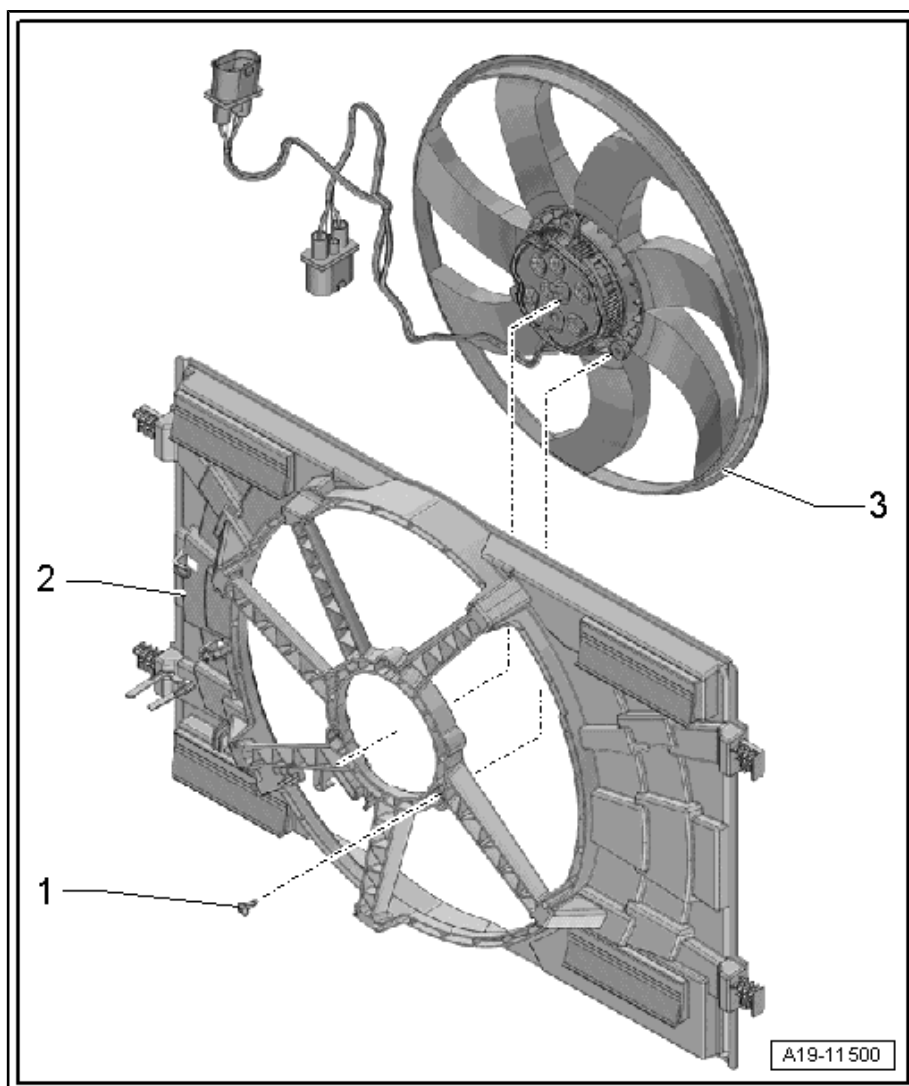
- 5 Nm

2 - Radiator cowl

- Removing and installing
⇒ [“4.5.1 Removing and positioning the radiator cowl, Ateca, Leon 2013”, page 335](#)

3 - Radiator fan - V7-

- Removing and installing
⇒ [“4.6.1 Radiator fan V7 removing and installing, Leon 2013, Ibiza 2018, Arona”, page 341](#)



4.3 Removing and installing radiator

⇒ [“4.3.1 Removing and installing radiator, Ateca, Leon 2013”, page 313](#)

⇒ [“4.3.2 Removing and installing radiator, Model 1, Arona, Ibiza 2018”, page 315](#)

⇒ [“4.3.3 Removing and installing radiator, Model 2, Arona, Ibiza 2018”, page 317](#)

⇒ [“4.3.4 Radiator - removing and installing, Toledo 2013, Ibiza 2016”, page 321](#)

4.3.1 Removing and installing radiator, Ateca, Leon 2013

Special tools and workshop equipment required

- ◆ Drip tray for workshop hoist - VAS 6208-

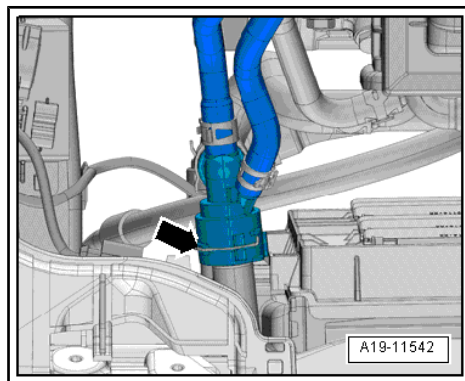
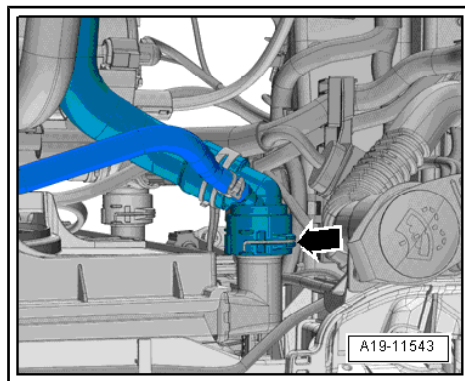


- ◆ Removal wedge - 3409-



Removing

- Drain coolant
⇒ ["1.3.1 Draining and adding coolant, Ateca, Leon 2013", page 260](#) .
- Lift the retaining clip -arrow-, separate the coolant hose at the top left from the radiator.
- Lift retaining clip slightly -arrow- and separate coolant hose (top right) from water radiator for charge air cooling circuit.
- Remove radiator cowl
⇒ ["4.5.1 Removing and positioning the radiator cowl, Ateca, Leon 2013", page 335](#) .



- Use the removal wedge to press both sides of locking tab -1- away from the engine compartment - 3409- and push the radiator -in the direction of the arrow-.
- Pull radiator out of mountings at bottom.
- Remove radiator from water radiator for charge air cooling circuit.
- Remove radiator (top section).

Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Observe the instructions if there are minor dents in the fins*
⇒ [“3.7 Fitting radiator and condensers”, page 12](#) .
- ◆ *Renew O-rings after removal.*
- Insert radiator into mounting at bottom. Engage radiators with one another. Ensure proper engagement by pulling.
- Install radiator cowl
⇒ [“4.5.1 Removing and positioning the radiator cowl, Ateca, Leon 2013”, page 335](#) .
- Connect coolant hose with plug-in connector ⇒ [page 306](#) .
- Add coolant ⇒ [page 262](#) .

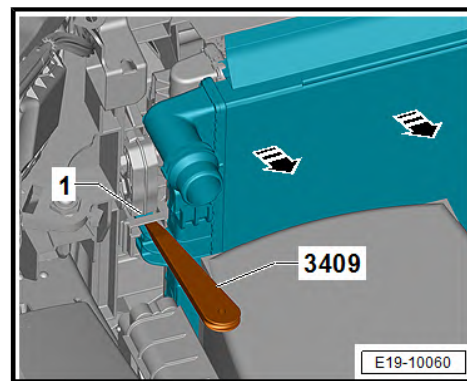
Specified torques

- ◆ ⇒ [“4.1.1 Assembly summary - radiator/radiator fan, Ateca, Leon 2013”, page 304](#)
- ◆ ⇒ [“3.1.1 Assembly overview - air filter housing, Ateca, Leon 2013”, page 393](#)

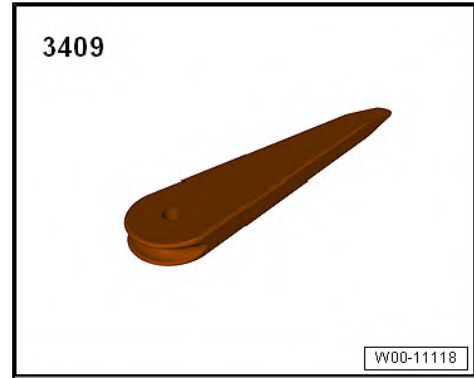
4.3.2 Removing and installing radiator, Model 1, Arona, Ibiza 2018

Special tools and workshop equipment required

- ◆ Drip tray for workshop hoist - VAS 6208-

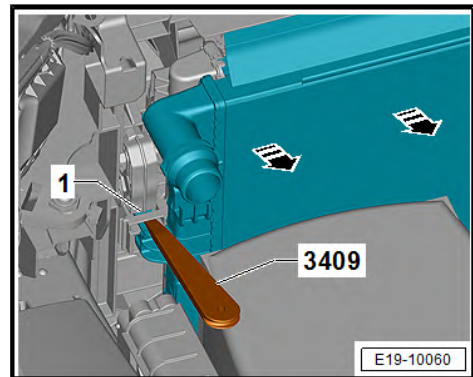
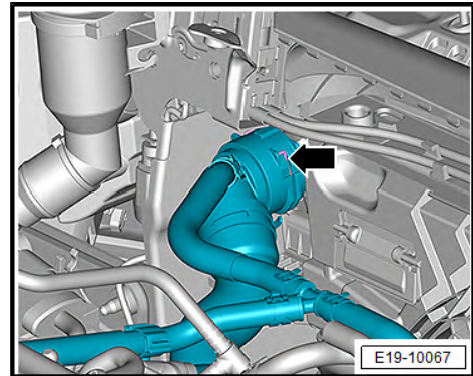


◆ Removal wedge - 3409-



Version 1

- Drain coolant
⇒ ["1.3.2 Draining and adding coolant, Ibiza 2018, Arona", page 265](#).
- Lift the retaining clip -arrow-, separate the coolant hose at the top left from the radiator.
- Remove radiator cowl
⇒ ["4.5.2 Removing and positioning the radiator cowl, Arona, Ibiza 2018", page 336](#).
- Use the removal wedge to press both sides of locking tab -1- - 3409- and push the radiator -in the direction of the arrow-.
- Pull radiator out of mountings at bottom.
- Remove radiator from water radiator for charge air cooling circuit.
- Remove radiator (top section).



Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Observe the instructions if there are minor dents in the fins*
⇒ ["3.7 Fitting radiator and condensers", page 12](#).
- ◆ *Renew O-rings after removal.*
- Insert radiator into mounting at bottom. Engage radiators with one another. Ensure proper engagement by pulling.
- Install radiator cowl
⇒ ["4.5.2 Removing and positioning the radiator cowl, Arona, Ibiza 2018", page 336](#).
- Connect coolant hose with plug-in connector ⇒ [page 308](#).
- Add coolant ⇒ [page 269](#).

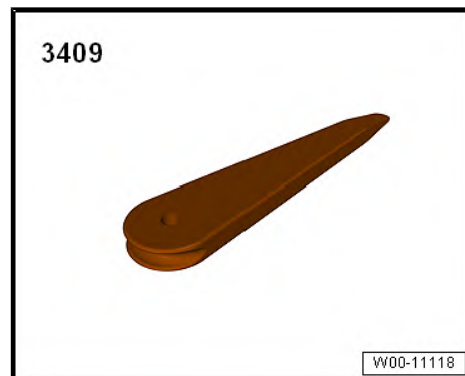
Specified torques

- ◆ ⇒ ["4.1 Assembly overview - radiator/radiator fan", page 304](#)
- ◆ ⇒ ["3.1.2 Assembly overview - air filter housing, Ibiza 2018, Arona", page 395](#)

4.3.3 Removing and installing radiator, Model 2, Arona, Ibiza 2018

Special tools and workshop equipment required

- ◆ Removal wedge - 3409-

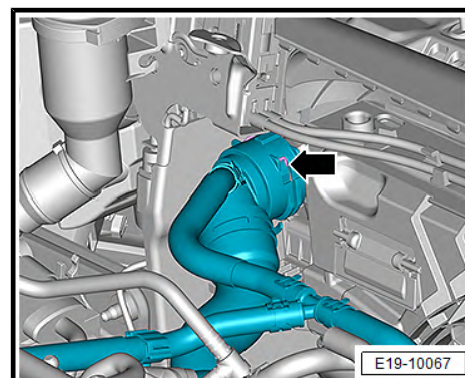


- ◆ Drip tray for workshop hoist - VAS 6208-



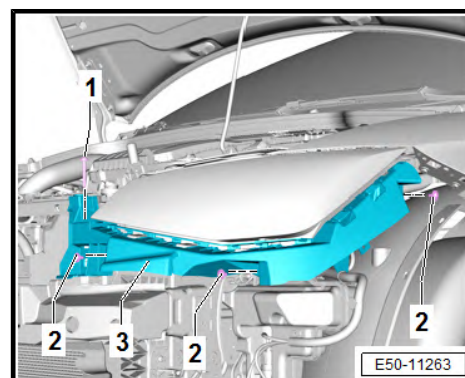
Removing

- Drain coolant
⇒ ["1.3.2 Draining and adding coolant, Ibiza 2018, Arona", page 265](#).
- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing front bumper cover .
- Lift the retaining clip -arrow-, remove the coolant hose at the top left from the radiator.
- Remove radiator cowl
⇒ ["4.5.2 Removing and positioning the radiator cowl, Arona, Ibiza 2018", page 336](#).



Ibiza with original radiator mount support

- Unscrew the screws -1- and -2- of the bottom headlight guide -3-.
- Remove headlight rail -3-.

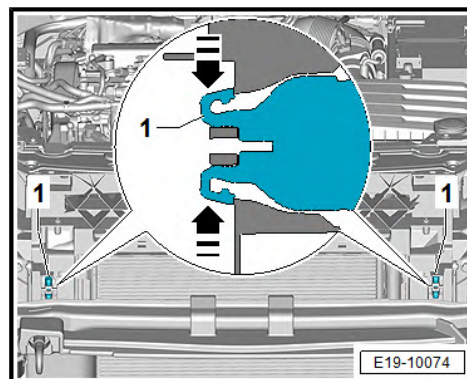


Continued for all vehicles

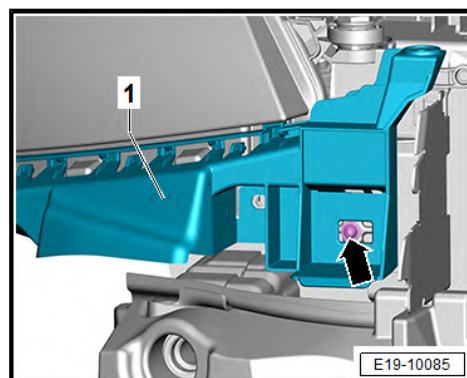
- Release catches -arrows- of radiator mounting -1- on left and right, or cut through using side cutters.

**Note**

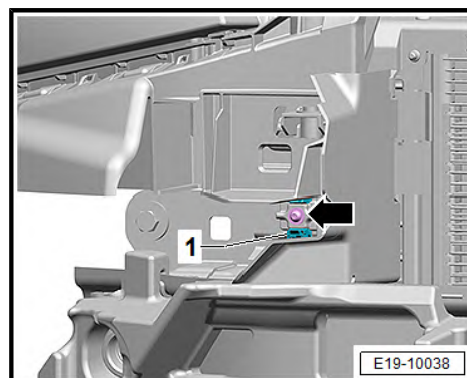
The radiator mounting will be reused when reinstalling the radiator. It will then be bolted to the lock carrier. Bolts ⇒ ETKA (Electronic parts catalogue) .

**Ibiza with coolant bearing support, screwed**

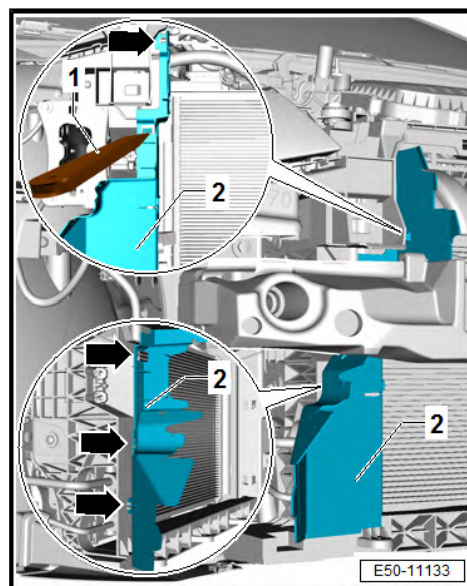
- Left and right, using the fixing of the bottom guide -1-, unscrew the bolt -arrow- from the cooler bracket.

**Arona with coolant bearing support, screwed**

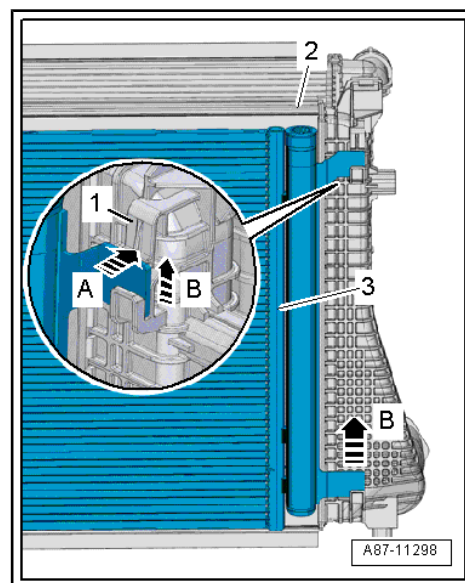
- Unscrew the screws -arrow- of the radiator mounting bracket -1- right and left.

**Vehicles with air conditioner compressor**

- Loosen the clips -arrows- using the removal wedge -3409- -1- and disconnect the air line -2-.



- Push upper edge of radiator slightly in direction of engine.
- Press catches -1- on both sides in direction of -arrow A- to release them.
- Pull condenser -3- upwards in direction of -arrow B- and detach from radiator.
- Tie up condenser to lock carrier.



Continued for all vehicles

- Pull the radiator -1- at the bottom out of the radiator mountings -arrows-.
- Remove coolant radiator -1- downwards.

Installing

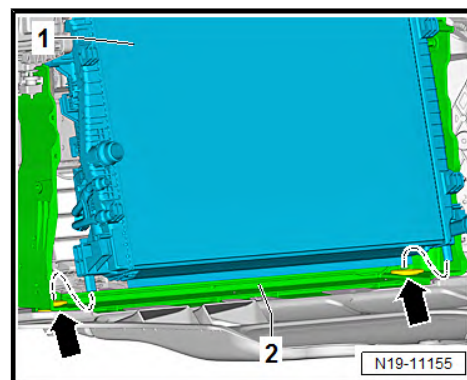
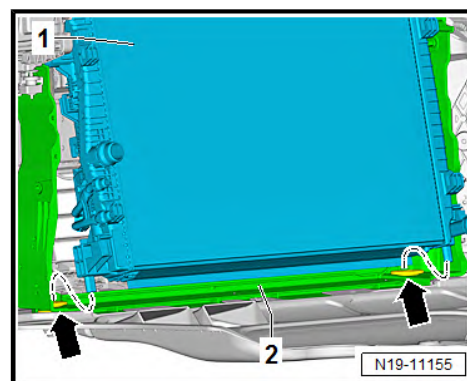
Install in reverse order of removal, observing the following:



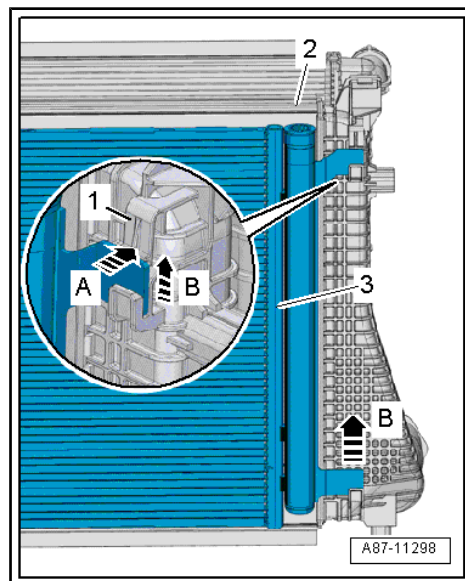
Note

- ◆ *If there are minor dents in the fins, refer to
⇒ [“3.7 Fitting radiator and condensers”, page 12](#).*
- ◆ *Renew O-rings.*

- Insert radiator -1- at bottom into the radiator mountings -arrows-.

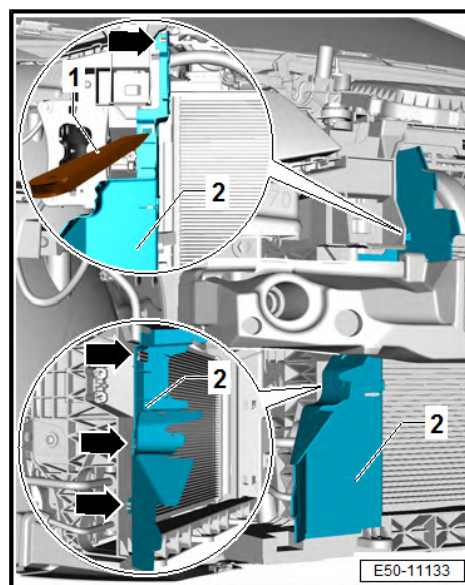


- Bring condenser -3- into installation position.



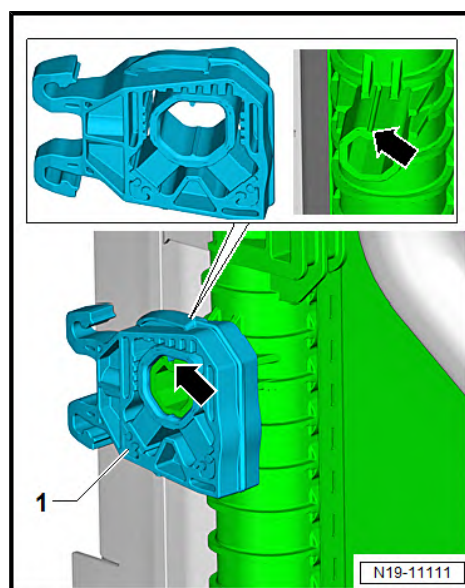
Vehicles with air conditioner compressor

- Install air duct -2-.

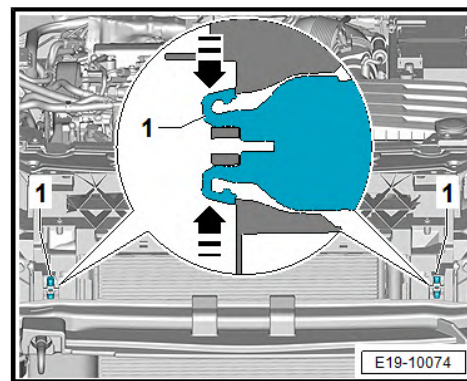


Installation position of radiator mounting

- Fit radiator mountings -1- on left and right onto radiator. When doing so, note the installation position -arrow-.

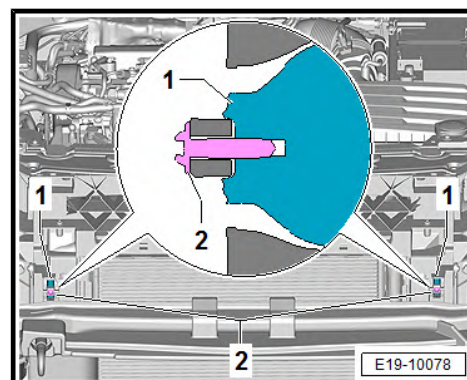


- Insert radiator into the lock carrier. Ensure proper seating of radiator mountings -1- in lock carrier.



Vehicles with radiator mounting carrier, bolted

- If fastener was cut off, bolt radiator mountings to lock carrier. Bolts -2- ➔ Electronic parts catalogue (ETKA) .
- Specified torque: 5 Nm
- Install the bottom headlight guides ➔ Electrical System; Rep. gr. 94 ; Headlights; Assembly overview - Headlights .
- Install front bumper cover ➔ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing front bumper .
- Install radiator cowl
➔ [“4.5.2 Removing and positioning the radiator cowl, Arona, Ibiza 2018”, page 336](#) .
- Connect coolant hose with plug-in connector ➔ [page 308](#) .
- Add coolant ➔ [page 269](#) .



Specified torques

- ◆ ➔ Electrical system; Rep. gr. 94 ; Headlight; exploded view: headlight
- ◆ ➔ [“4.1 Assembly overview - radiator/radiator fan”, page 304](#)
- ◆ ➔ [“3.1.2 Assembly overview - air filter housing, Ibiza 2018, Arona”, page 395](#)

4.3.4 Radiator - removing and installing, Toledo 2013, Ibiza 2016

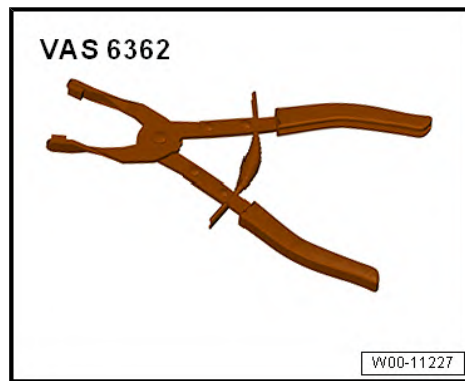


Note

The radiator and water radiator for charge air cooling circuit are removed together.

Special tools and workshop equipment required

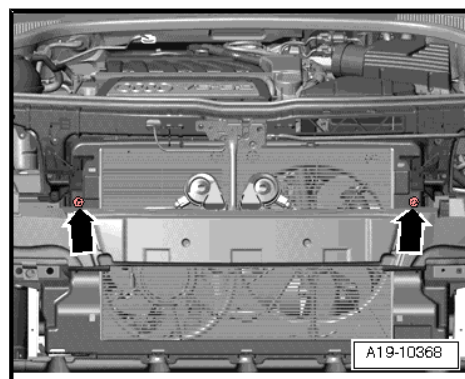
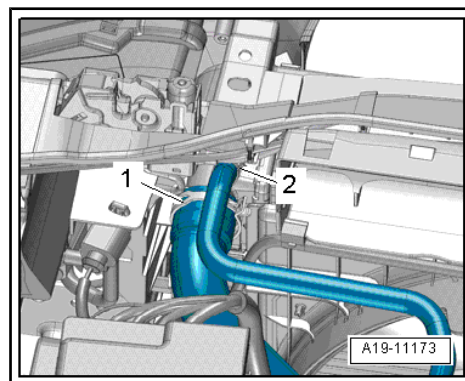
- ◆ Hose clip pliers - VAS 6362-



- ◆ Release tool - VAS 531 001- (not illustrated)

Removing

- Drain coolant
⇒ ["1.3.3 Draining and adding coolant, Toledo 2013, Ibiza 2016", page 271](#) .
- Remove bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper; Removing and installing front bumper cover (all variants) .
- Remove radiator cowl
⇒ ["4.5.3 Radiator cowl - removing and installing, Toledo 2013, Ibiza 2016", page 339](#) .
- Detach coolant hoses on top left of radiator. To do this, loosen hose clips -1 and 2- using hose clip pliers - VAS 6362- .
- Remove bolts -arrows-.
- Tilt top of radiator slightly backwards.
- Raise radiator, disengage from lower mounting points and push backwards.



Vehicles with air conditioner:

CAUTION

Risk of freezing injury caused by refrigerant.

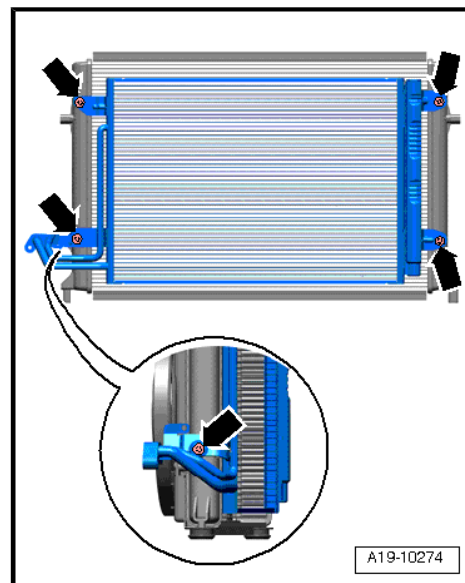
- Do not open refrigerant circuit of air conditioning system.

- Remove bolts -arrows-.

NOTICE

Risk of damage to refrigerant lines from rupture of inner foil.

- Never bend refrigerant lines to a radius of less than 100 mm ($r < 100$ mm).
- Place condenser in bonnet lock latch at front and secure with cable ties to prevent it from falling.



Continued for all vehicles:

- Release catches on water radiator for charge air cooler -1- -arrows A-.
- Pull water radiator for charge air cooler off radiator -2- -arrow B-, and detach it -arrow C-.
- Remove both radiators.

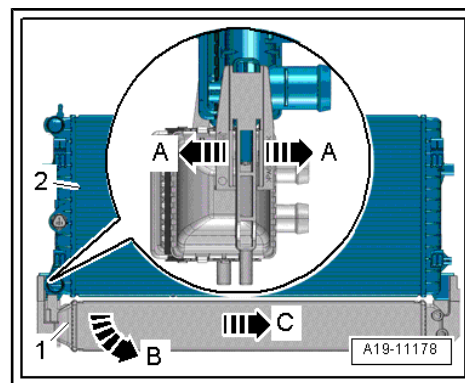
Installing

Install in reverse order of removal, observing the following:



Note

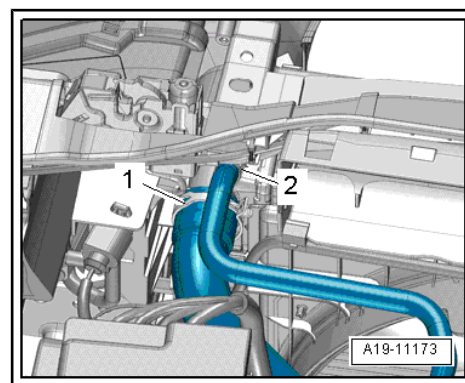
- ♦ If there are minor dents in the fins, refer to [⇒ "3.7 Fitting radiator and condensers", page 12](#).
- ♦ Renew O-rings.



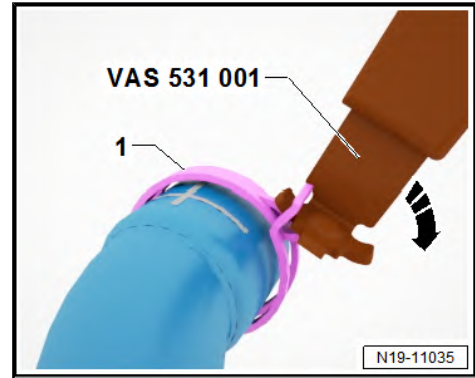
Note

The design of the clips -1 and 2- is different from that of conventional clips and requires a special tool for the clips to be engaged.

- Push coolant hoses with hose clips -1 and 2- onto radiator at top.



- Engage clips -1- in direction of -arrow- using release tool - VAS 531 001- .
- Vehicles with air conditioning system: Install condenser ⇒ Heating, air conditioning system; Rep. gr. 87 ; Refrigerant circuit; Removing and installing condenser .
- Install radiator cowl
⇒ ["4.5.3 Radiator cowl - removing and installing, Toledo 2013, Ibiza 2016", page 339](#) .
- Install bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper; Removing and installing front bumper cover (all variants) .



Note

Do not reuse the dirty coolant.

- Add coolant ⇒ [page 273](#) .

Specified torques

- ♦ ⇒ ["4.1.4 Assembly summary - radiator/radiator fan, Toledo 2013, Ibiza 2016", page 310](#)
- ♦ ⇒ ["3.1.3 Assembly overview - air filter housing, Toledo 2013, Ibiza 2016", page 396](#)

4.4 Removing and installing water radiator for charge air cooling circuit

⇒ ["4.4.1 Removing and installing supply gas recirculation cooler, Ateca, Leon 2013", page 324](#)

⇒ ["4.4.2 Removing and installing water radiator for charge air cooling circuit, Ibiza 2018, Arona", page 329](#)

4.4.1 Removing and installing supply gas recirculation cooler, Ateca, Leon 2013

Special tools and workshop equipment required

- ♦ Drip tray for workshop hoist - VAS 6208-



Removing

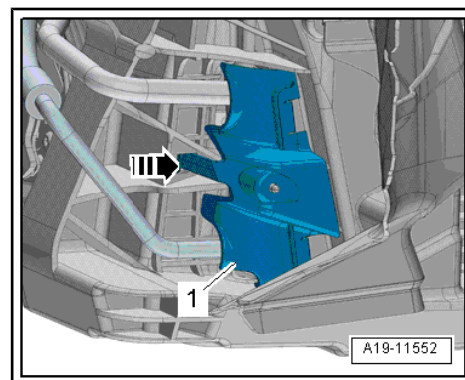
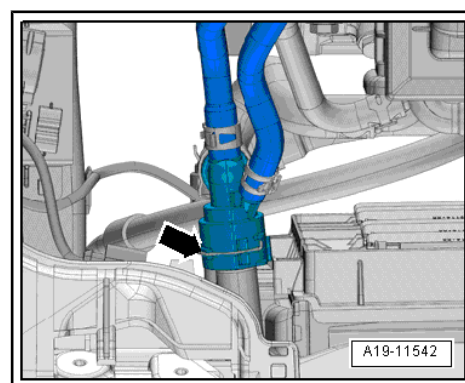
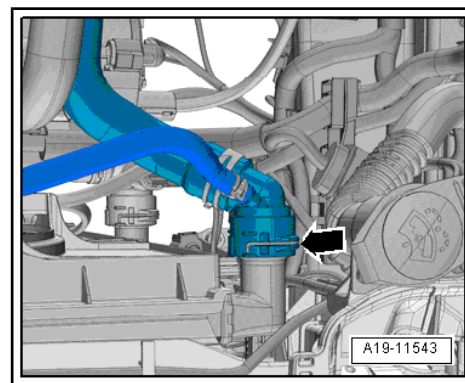
- Drain coolant.
- Remove bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing bumper cover

Leon 2013

- Remove the front headlights ⇒ Electrical System; Rep. gr. 94 ; Headlights; Removing and installing headlights

Continued for all vehicles

- Lift the retaining clip -arrow-, remove the coolant hose at the top left from the radiator.
- Lift retaining clip slightly -arrow- and separate coolant hose (top right) from water radiator for charge air cooling circuit.
- Remove radiator cowl
⇒ ["4.5.1 Removing and positioning the radiator cowl, Ateca, Leon 2013", page 335](#) .
- Release fastener -arrow- and remove cover -1- towards front.



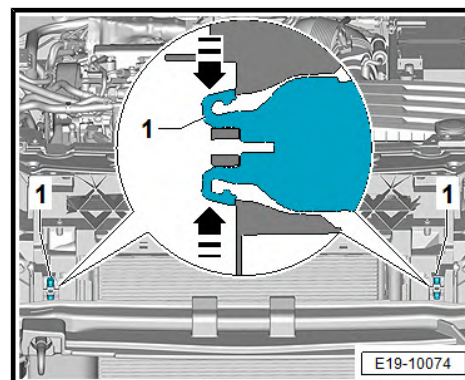
Vehicles with original radiator mounting carrier

- Release catches -arrows- of radiator mounting -1- on left and right, or cut through using side cutters.



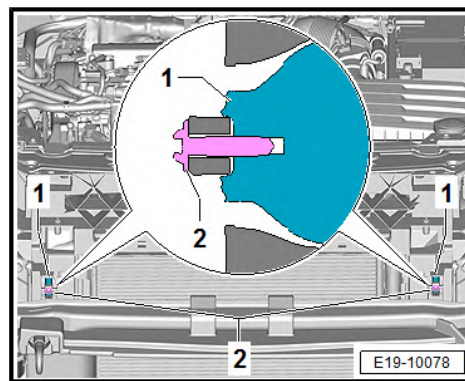
Note

The radiator mounting will be reused when reinstalling the radiator. It will then be bolted to the lock carrier. Bolts ⇒ ETKA (Electronic parts catalogue) .



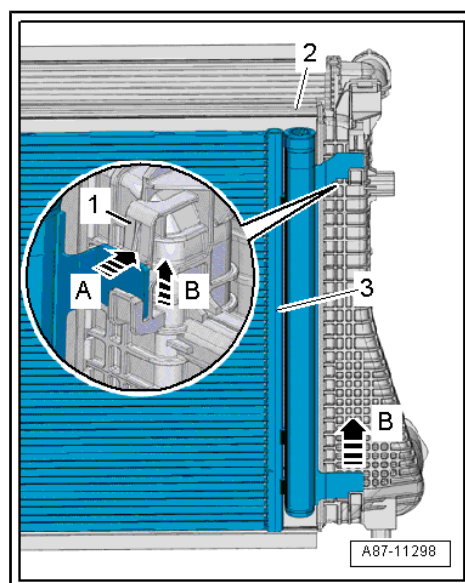
Vehicles with radiator mounting carrier, bolted

- Unscrew bolts -2- of radiator mounting carrier -1- on left and right.

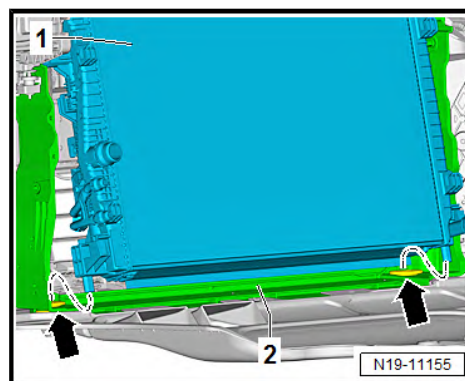


Continued for all vehicles

- Push upper edge of radiator slightly in direction of engine.
- Raise radiator, disengage from lower mounting points and push backwards.
- Press catches -1- on both sides in direction of -arrow A- to release them.
- Pull condenser -3- in -direction of arrow B-, and detach it from charge-air cooler -2-.
- Tie up condenser to lock carrier.



- Lift radiator module -1- at bottom out of radiator mountings -arrows-.
- Remove both radiators.



- If necessary, detach radiator from radiator for charge air cooling circuit.
- To do this, release catches -arrow-.

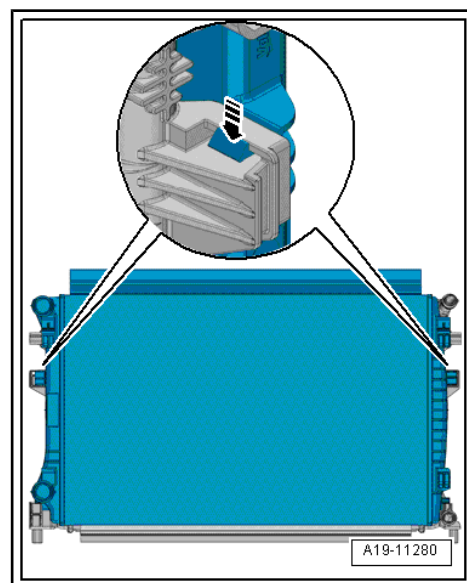
Installing

Install in reverse order of removal, observing the following:

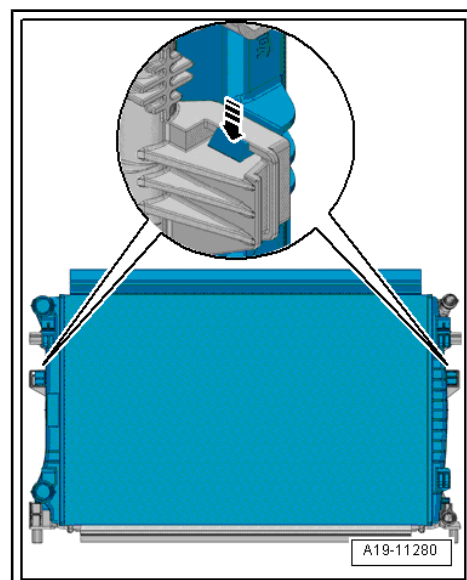


Note

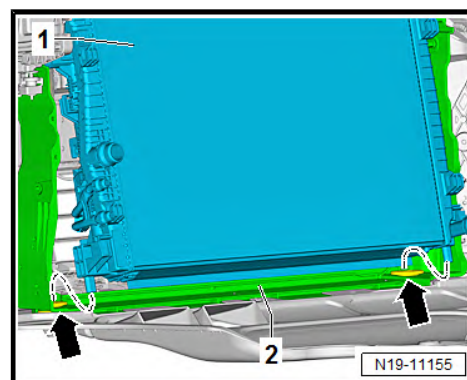
- ◆ *Observe the instructions if there are minor dents in the fins
⇒ "3.7 Fitting radiator and condensers", page 12 .*
- ◆ *Renew O-rings after removal.*



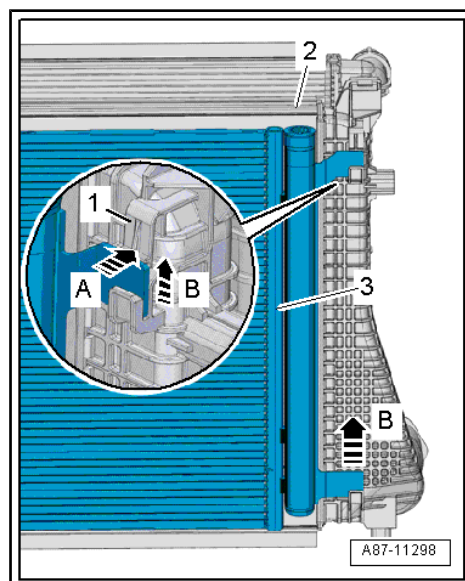
- Engage radiators with one another. Ensure proper engagement by pulling.



- Insert radiator for charge air cooling circuit -1- at bottom into radiator mountings -arrows-.

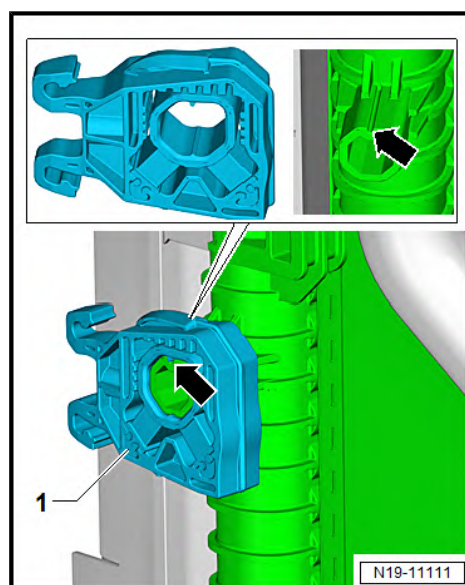


- Bring condenser -3- into installation position.

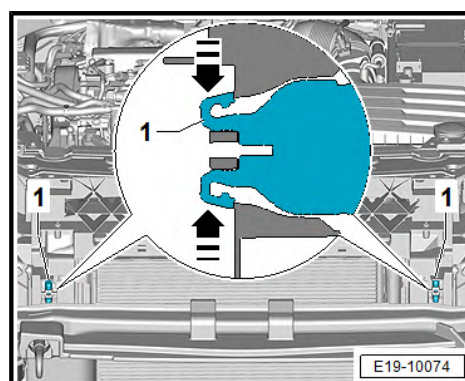


Installation position of radiator mounting

- Fit radiator mountings -1- on left and right onto radiator. When doing so, note the installation position -arrow-.



- Swing water radiator for charge air cooling circuit into lock carrier. Ensure proper seating of radiator mountings -1- in lock carrier.



Vehicles with radiator mounting carrier, bolted

- If fastener was cut off, bolt radiator mountings to lock carrier.
Bolts -2- ⇒ Electronic parts catalogue (ETKA) .

Bolts	Specified torque
-2-	5 Nm

Continued for all vehicles

- Install front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing front bumper .
- Install radiator cowl
⇒ [“4.5.1 Removing and positioning the radiator cowl, Ateca, Leon 2013”, page 335](#) .
- Connect coolant hose with plug-in connector ⇒ [page 306](#) .
- Add coolant ⇒ [page 262](#) .

Specified torques

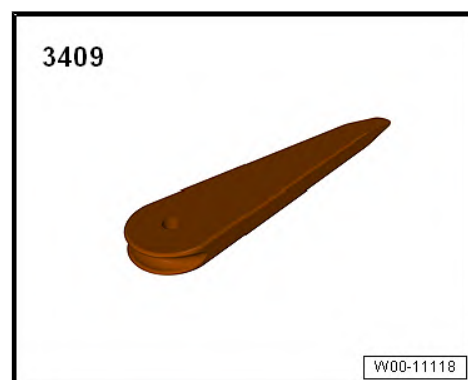
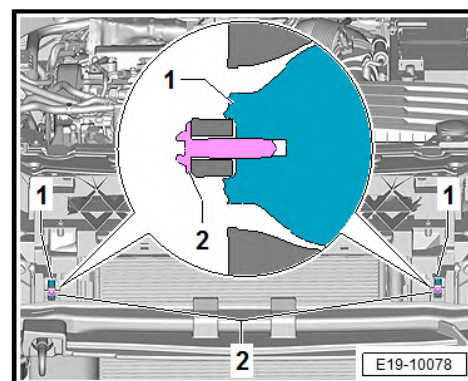
- ◆ ⇒ [“4.1.1 Assembly summary - radiator/radiator fan, Ateca, Leon 2013”, page 304](#)
- ◆ ⇒ [“3.1.1 Assembly overview - air filter housing, Ateca, Leon 2013”, page 393](#)

4.4.2 Removing and installing water radiator for charge air cooling circuit, Ibiza 2018, Arona

Special tools and workshop equipment required

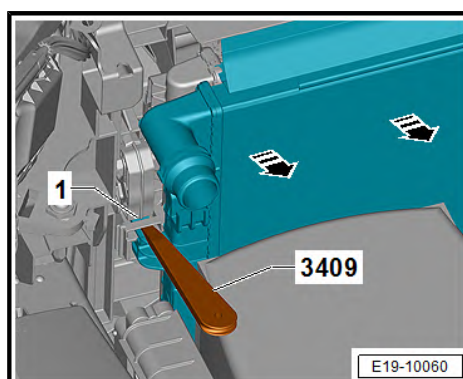
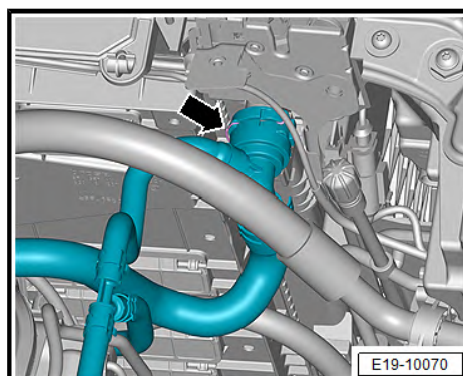
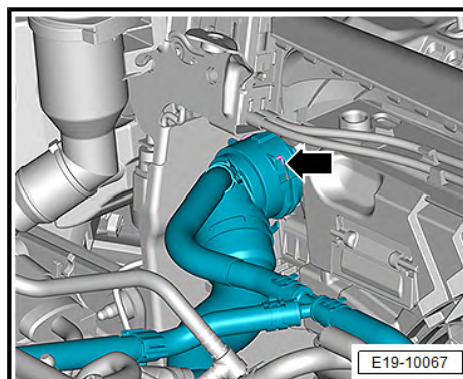
- ◆ Drip tray for workshop hoist - VAS 6208-

- ◆ Removal wedge - 3409-



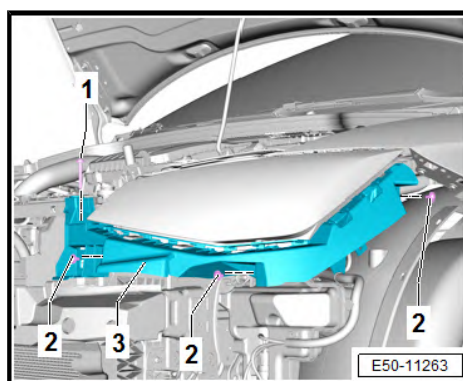
Removing

- Drain coolant
⇒ ["1.3.2 Draining and adding coolant, Ibiza 2018, Arona", page 265](#) .
- Lift the retaining clip -arrow-, separate the coolant hose at the top left from the radiator.
- Lift retaining clip -arrow- and disconnect coolant hose (top right) from water radiator for charge air cooling circuit.
- Remove radiator cowl.
- Use the removal wedges to press both sides of locking tab -1- - 3409- and push the radiator -in the direction of the arrow-.
- Remove water radiator upwards
⇒ ["4.5.2 Removing and positioning the radiator cowl, Arona, Ibiza 2018", page 336](#) .
- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing bumper cover .



Ibiza with original radiator mount support

- Unscrew the screws -1- and -2- of the bottom headlight guide -3-.
- Remove headlight rail -3-.



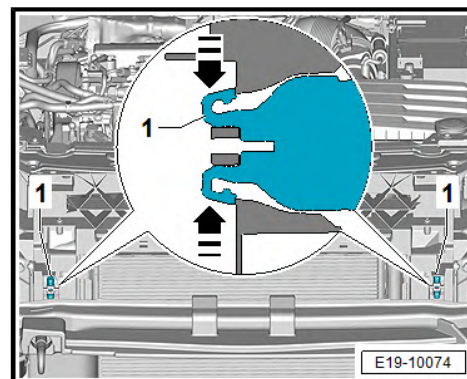
Continued for all vehicles

- Release catches -arrows- of radiator mounting -1- on left and right, or cut through using side cutters.



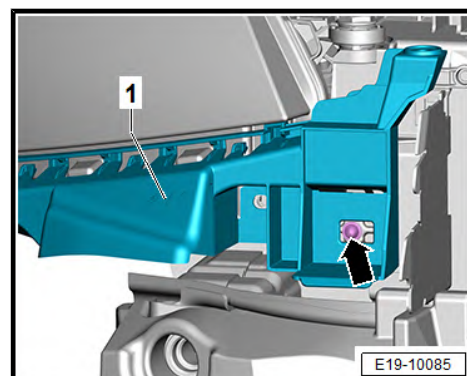
Note

The radiator mounting will be reused when reinstalling the radiator. It will then be bolted to the lock carrier. Bolts ⇒ ETKA (Electronic parts catalogue) .



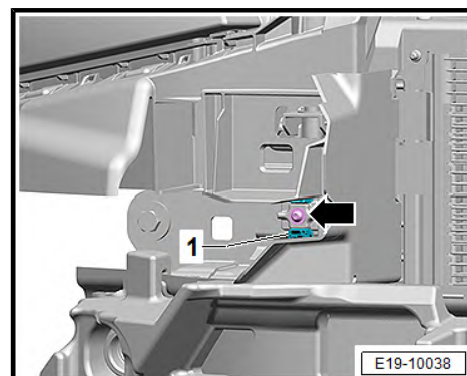
Ibiza with coolant bearing support, screwed

- Left and right, using the fixing of the bottom guide -1-, unscrew the bolt -arrow- from the cooler bracket.



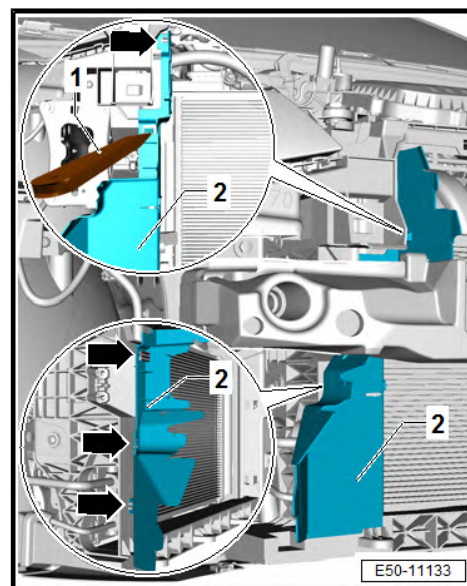
Arona with coolant bearing support, screwed

- Unscrew the screws -arrow- of the radiator mounting bracket -1- right and left.

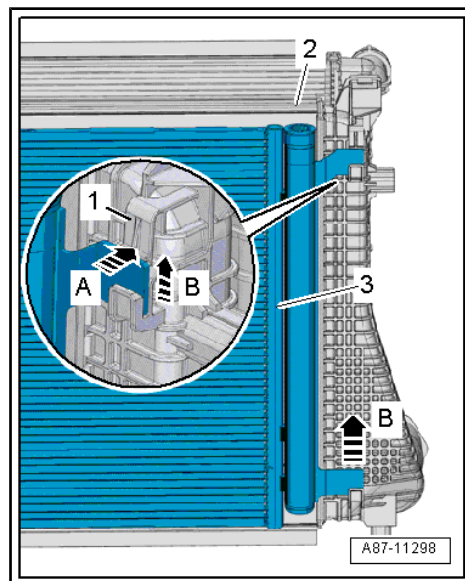


Vehicles with air conditioner compressor

- Loosen the clips -arrows- using the removal wedge - 3409- -1- and disconnect the air line -2-.

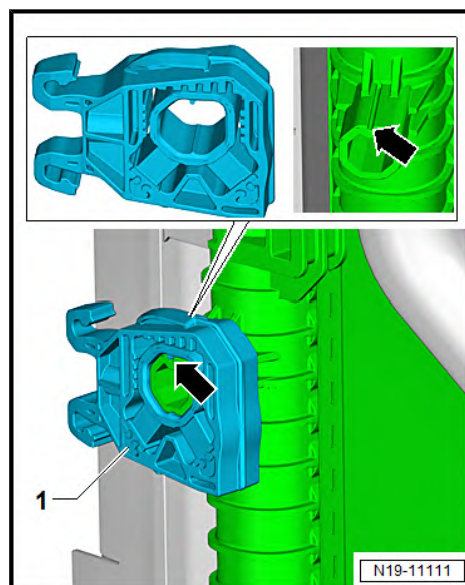


- Push upper edge of radiator slightly in direction of engine.
- Press catches -1- on both sides in direction of -arrow A- to release them.
- Pull condenser -3- in -direction of arrow B-, and detach it from charge-air cooler -2-.
- Tie up condenser to lock carrier.



Continued for all vehicles

- Dismantle and remove radiator mountings -1- right and left on the radiator.



- Pull water radiator for charge air cooling circuit -1- at bottom out of radiator mountings -arrows-.
- Remove water radiator for charge air cooling circuit downwards.

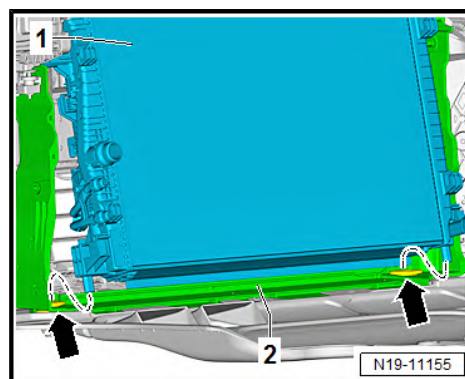
Installing

Install in reverse order of removal, observing the following:

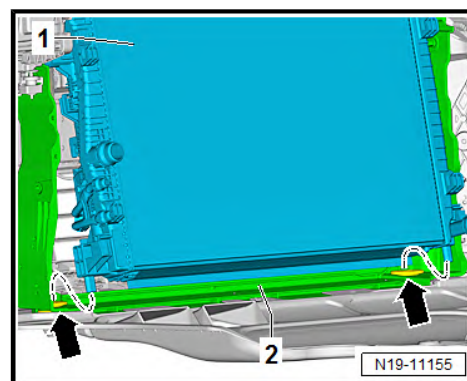


Note

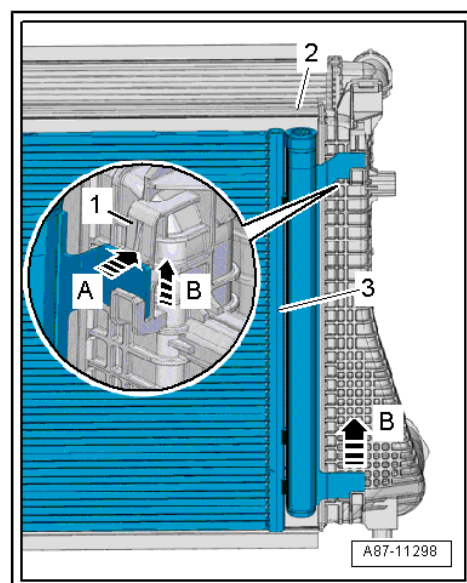
- ♦ *Observe the instructions if there are minor dents in the fins
⇒ ["3.7 Fitting radiator and condensers", page 12](#) .*
- ♦ *Renew O-rings after removal.*



- Insert water radiator for charge air cooling circuit -1- at bottom into radiator mountings -arrows-.

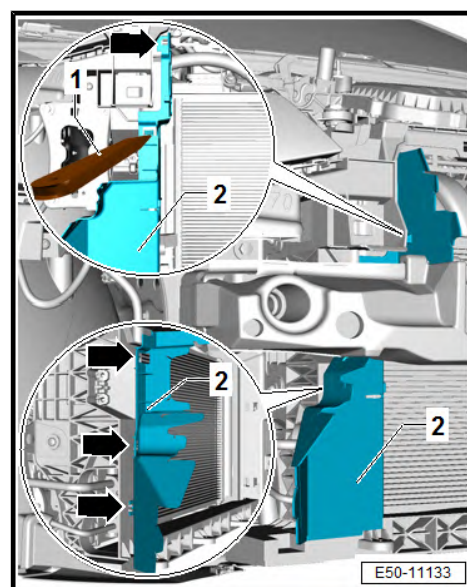


- Bring condenser -3- into installation position.



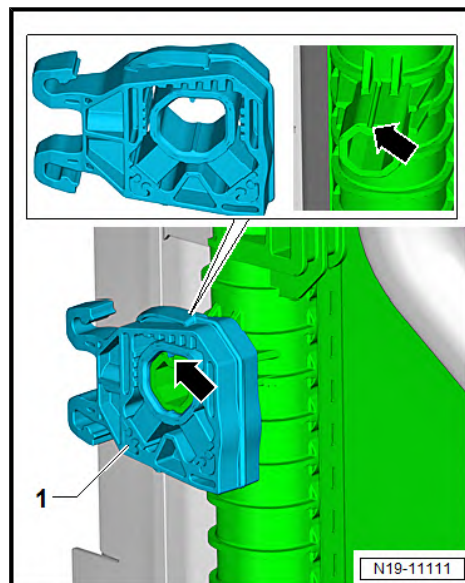
Vehicles with air conditioner compressor

- Install air duct -2-.

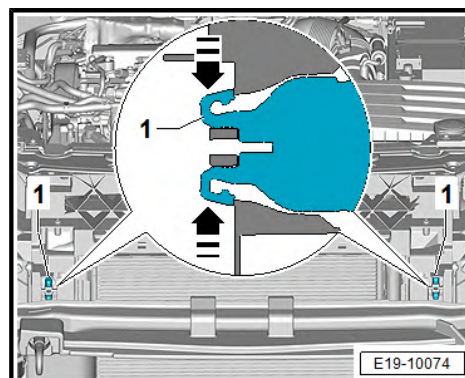


Installation position of radiator mounting

- Fit radiator mountings -1- on left and right onto radiator. When doing so, note the installation position -arrow-.



- Swing water radiator for charge air cooling circuit into lock carrier. Ensure proper seating of radiator mountings -1- in lock carrier.



Vehicles with radiator mounting carrier, bolted

- If fastener was cut off, bolt radiator mountings to lock carrier.
Bolts -2- ⇒ Electronic parts catalogue (ETKA) .

- Specified torque: 5 Nm

Continued for all vehicles

- Install coolant radiator. Engage radiators with one another.
Ensure proper engagement by pulling.
- Fit headlight rails ⇒ Electrical system; Rep. gr. 94 ; Lights, bulbs, switches - exterior; Removing and installing headlights, headlight rails .
- Install front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing front bumper .
- Install radiator cowl
⇒ [“4.5.2 Removing and positioning the radiator cowl, Arona, Ibiza 2018”, page 336](#) .
- Connect coolant hose with plug-in connector ⇒ [page 308](#) .
- Add coolant ⇒ [page 269](#) .

Specified torques

- ◆ ⇒ [“4.1 Assembly overview - radiator/radiator fan”, page 304](#)
- ◆ ⇒ [“3.1.2 Assembly overview - air filter housing, Ibiza 2018, Arona”, page 395](#)
- ◆ ⇒ Electrical system; Rep. gr. 94 ; Lights, bulbs, switches - exterior; Headlights; Assembly overview - headlights, headlight rails .
- ◆ ⇒ Electrical system; Rep. gr. 94 ; Headlight; exploded view: headlight .

4.5 Removing and installing radiator cowl

⇒ [“4.5.1 Removing and positioning the radiator cowl, Ateca, Leon 2013”, page 335](#)

⇒ [“4.5.2 Removing and positioning the radiator cowl, Arona, Ibiza 2018”, page 336](#)

⇒ [“4.5.3 Radiator cowl - removing and installing, Toledo 2013, Ibiza 2016”, page 339](#)

4.5.1 Removing and positioning the radiator cowl, Ateca, Leon 2013

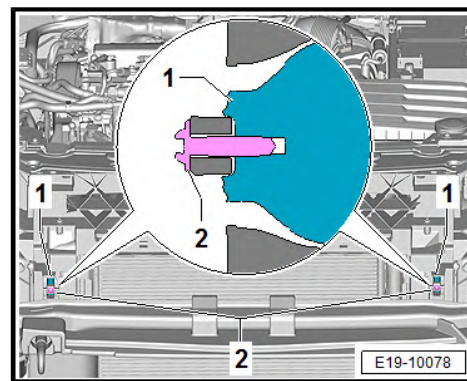
Removing



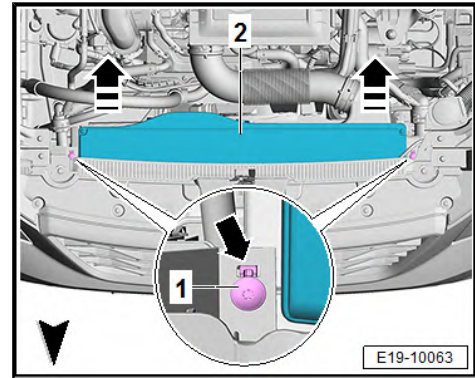
CAUTION

Risk of injury; the radiator fans can run at any time.

- Separate electrical connector.



- Release hose clip -1-, and pull air hose -2- off air filter housing.
- Unscrew bolts -3- on both sides.
- Release locking lugs -arrow-, unclip air hose -4- from the front end and remove on both sides in -direction of the arrow-.



- Separate electrical connector -3- on radiator fan.
- Simultaneously press locking tabs on left and right of radiator cowl -A- in direction of -arrow-.
- Pull radiator fan cowl upwards and remove from radiator -arrows-.
- Carefully remove radiator cowl downwards.

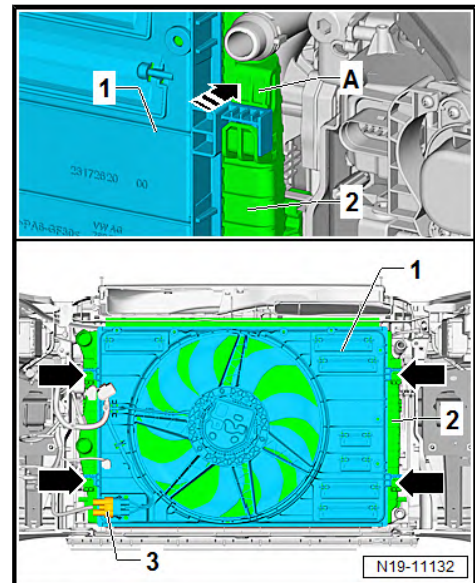
Installing

Install in reverse order of removal, observing the following:

- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Specified torques

- ♦ ⇒ ["3.1.1 Assembly overview - air filter housing, Ateca, Leon 2013", page 393](#)



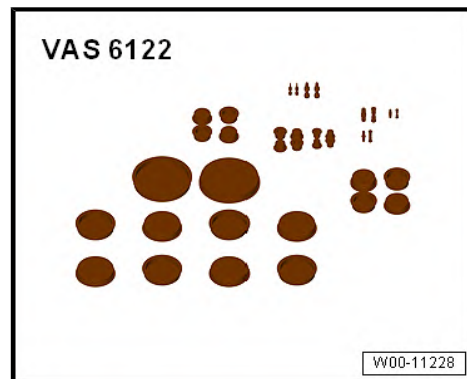
4.5.2 Removing and positioning the radiator cowl, Arona, Ibiza 2018

Special tools and workshop equipment required

- ♦ Drip tray for workshop hoist - VAS 6208-



◆ Engine bung set - VAS 6122-



Removing

Arona

- Remove front bumper cover ➔ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing front bumper cover .

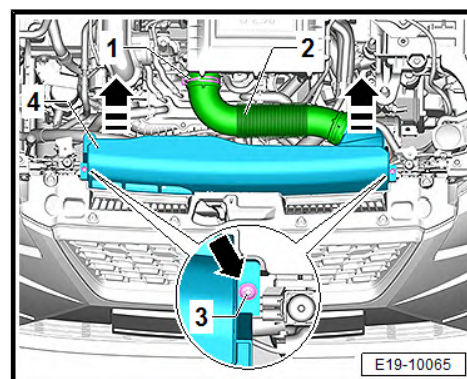
Continued for all vehicles

- Release hose clip -1-, and pull air hose -2- off air filter housing.
- Unscrew bolts -3- on both sides.
- Release locking lugs -arrow-, unclip air hose -4- from the front end and remove on both sides in -direction of the arrow-.

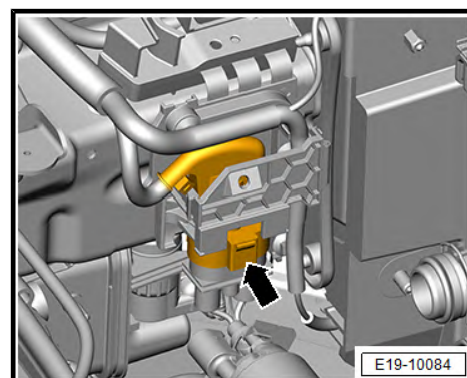
CAUTION

Risk of injury; the radiator fans can run at any time.

- Separate electrical connector.

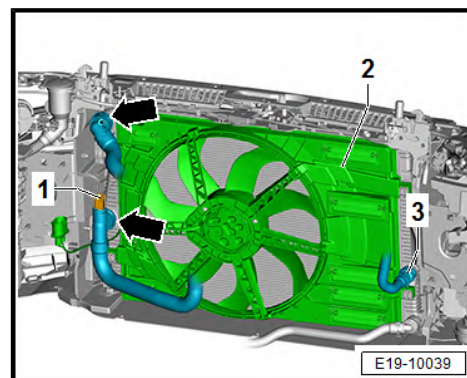


- Remove electrical connector -arrow- from radiator fan.



Vehicles with radiator, variant 2

- Place drip tray for workshop hoist - VAS 6208- beneath engine.
- Disconnect connector -1- on radiator outlet coolant temperature sender - G83- .
- Slightly lift retaining clip -3-, disconnect coolant hose from radiator (top right) and drain off coolant.
- Slightly lift retaining clips -arrows-, disconnect coolant hoses from radiator and drain off remaining coolant.
- Seal open lines and unions with clean plugs from engine sealing plug set - VAS 6122- .



Arona

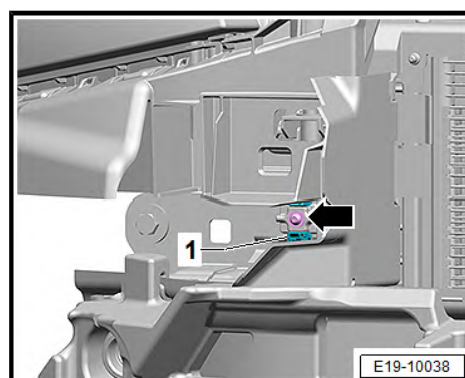
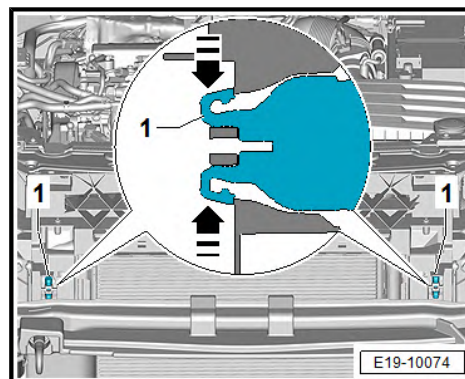
- Release catches -arrows- of radiator mounting -1- on left and right, or cut through using side cutters.



Note

The radiator mounting will be reused when reinstalling the radiator. It will then be bolted to the lock carrier. Bolts ⇒ ETKA (Electronic parts catalogue) .

- Vehicles with coolant bearing support, screwed.
- Unscrew the screws -arrow- of the radiator mounting bracket -1- right and left.
- Slide the radiator and radiator cowl assembly slightly in the direction of the engine.



Continued for all vehicles



Note

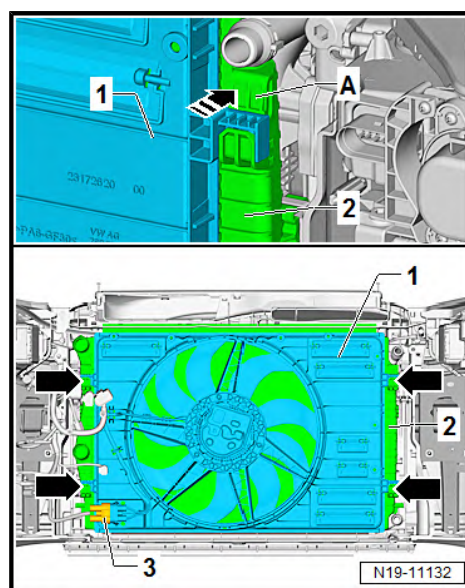
-Item 3- should be disregarded.

- Press in the locking tabs for radiator cowl -A- left and right in -direction of arrow-.
- Pull radiator fan cowl upwards and remove from radiator -arrows-.
- Carefully remove the fan cowl -1- upwards.



Note

If there are minor dents in the fins, refer to ⇒ "3.7 Fitting radiator and condensers", page 12 .



Installing

Install in reverse order of removal, observing the following:

- Insert the radiator cowl upwards.
- The fan frame must engage audibly on the right and left at the top.
- Check that it has engaged securely by pulling on it.

Arona

- Secure radiator mountings -1-, whose fasteners have been pinched off, to lock carrier. Bolts -2- ⇒ Electronic parts catalogue (ETKA) .
- Specified torque: 5 Nm
- Install front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing front bumper .

Continued for all vehicles

- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Vehicles with radiator, variant 2

- Connect coolant hoses ⇒ [page 310](#) .
- Add coolant ⇒ [page 269](#) .

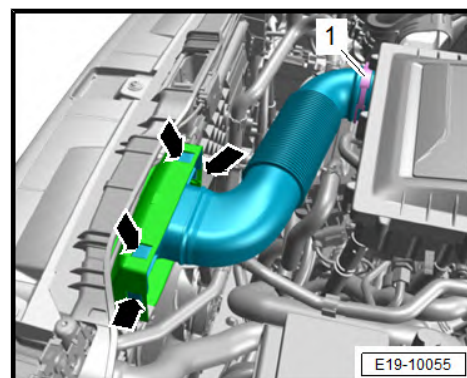
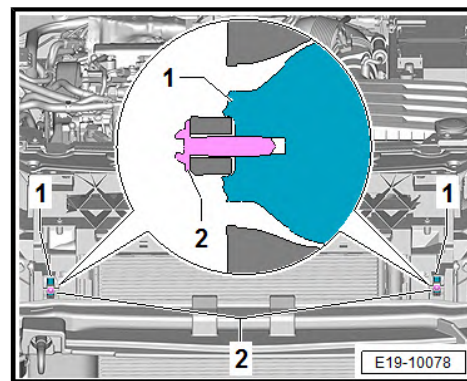
Specified torques

- ◆ ⇒ [“3.1.2 Assembly overview - air filter housing, Ibiza 2018, Arona”, page 395](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Assembly overview - bumper cover

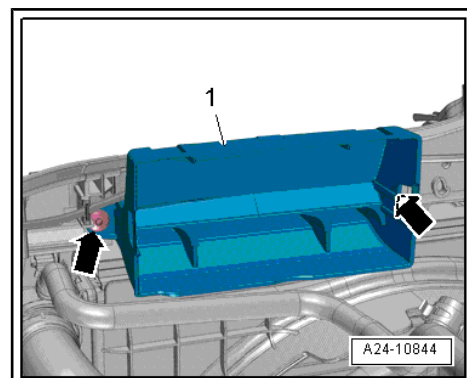
4.5.3 Radiator cowl - removing and installing, Toledo 2013, Ibiza 2016

Removing

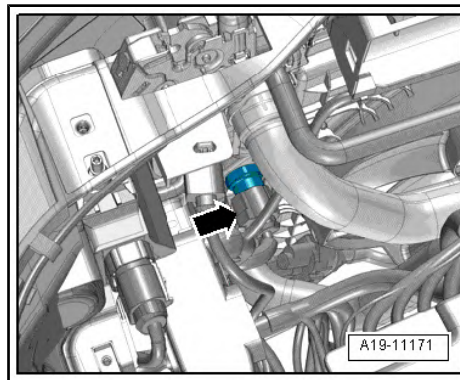
- Release fasteners -arrows- and remove air duct.
- Loosen retaining clip -1-.



- Unscrew bolts -arrows-, and remove air duct -1-.



- Disconnect connector -arrow- on radiator outlet coolant temperature sender - G83- .

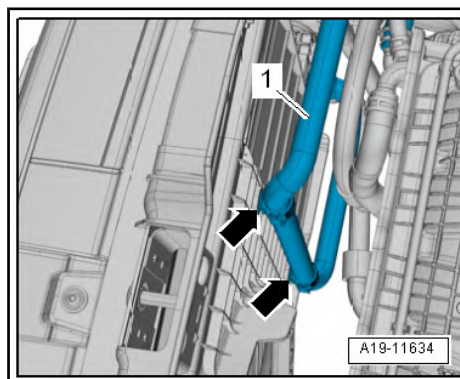


- Move clear coolant hose -1- on radiator cowl -arrows-.

⚠ CAUTION

Risk of injury; the radiator fans can run at any time.

- Separate electrical connector.



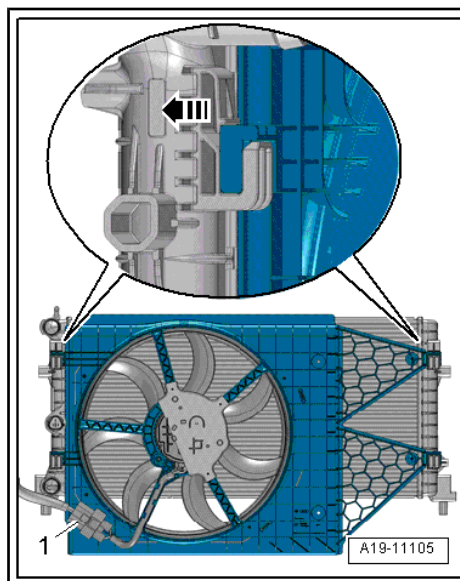
- Disconnect connector -1- for radiator fan at bottom of radiator cowl.
- Simultaneously press locking tabs on left and right of radiator cowl -arrow-, and lift radiator cowl off radiator.

Installing

Install in reverse order of removal, observing the following:

Specified torques

- ◆ ⇒ ["3.1.3 Assembly overview - air filter housing, Toledo 2013, Ibiza 2016", page 396](#)



4.6 Removing and installing radiator fan - V7-

⇒ ["4.6.1 Radiator fan V7 removing and installing, Leon 2013, Ibiza 2018, Arona", page 341](#)

⇒ ["4.6.2 Radiator fan V7 removing and installing, Toledo 2013, Ibiza 2016", page 341](#)

4.6.1 Radiator fan - V7- removing and installing, Leon 2013, Ibiza 2018, Arona

Removing

- Remove radiator cowl
⇒ ["4.5 Removing and installing radiator cowl", page 335](#) .
- Remove electrical line from the wire guide.
- Unscrew nuts -arrows-, and remove radiator fan - V7- .

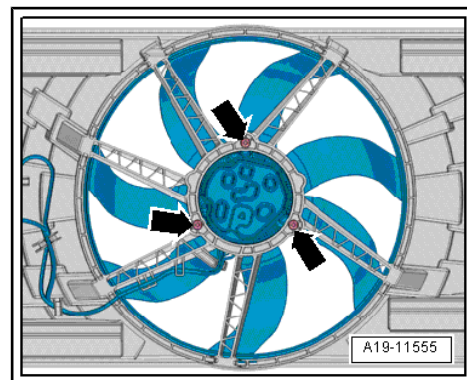
Installing

Install in reverse order of removal, observing the following:

- Install radiator cowl
⇒ ["4.5 Removing and installing radiator cowl", page 335](#) .

Specified torques

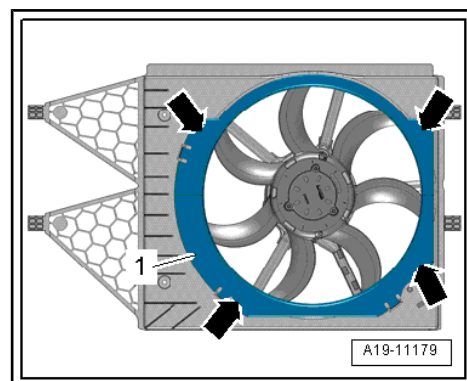
- ◆ ⇒ ["4.1 Assembly overview - radiator/radiator fan", page 304](#)



4.6.2 Radiator fan - V7- removing and installing, Toledo 2013, Ibiza 2016

Removing

- Remove radiator cowl
⇒ ["4.5.3 Radiator cowl - removing and installing, Toledo 2013, Ibiza 2016", page 339](#) .
- Push through clamping pins -arrows-, and remove fan ring -1-.



- Remove electric cable -1- from cable guide.
- Unscrew nuts -arrows-, and remove radiator fan - V7- .

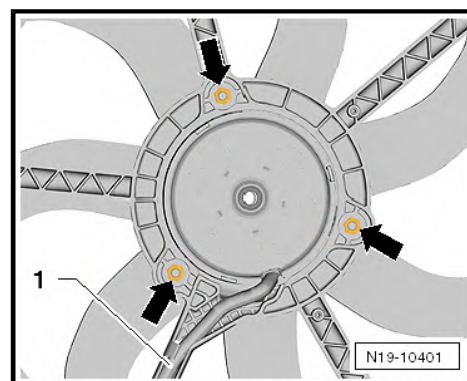
Installing

Install in reverse order of removal, observing the following:

- Install radiator cowl
⇒ ["4.5.3 Radiator cowl - removing and installing, Toledo 2013, Ibiza 2016", page 339](#) .

Specified torques

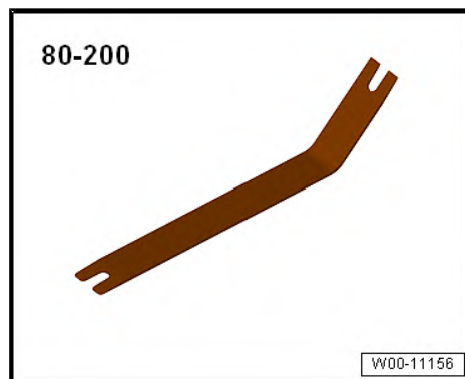
- ◆ ⇒ ["4.1.4 Assembly summary - radiator/radiator fan, Toledo 2013, Ibiza 2016", page 310](#)



4.7 Removing and installing radiator blind

Special tools and workshop equipment required

- ◆ Removal lever - 80 - 200-

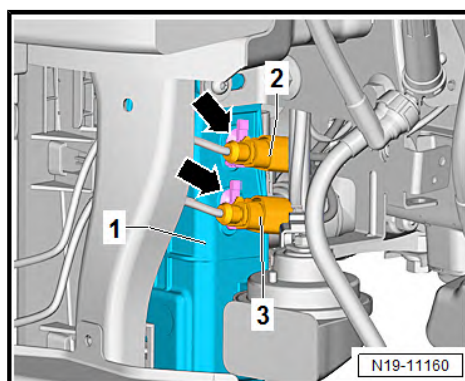


- ◆ Removal wedge - 3409-

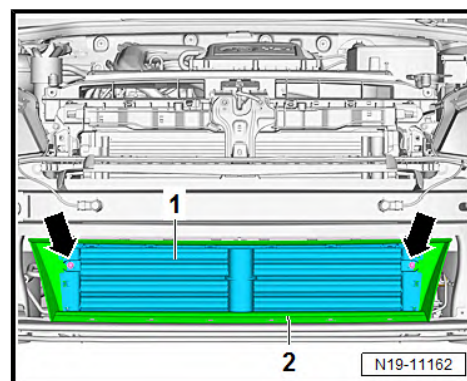


Removing

- Remove noise insulation ⇒ Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing front bumper cover .
- Release and pull off connectors -2- and -3-.
- Unclip bracket -arrows- from front end -1-.



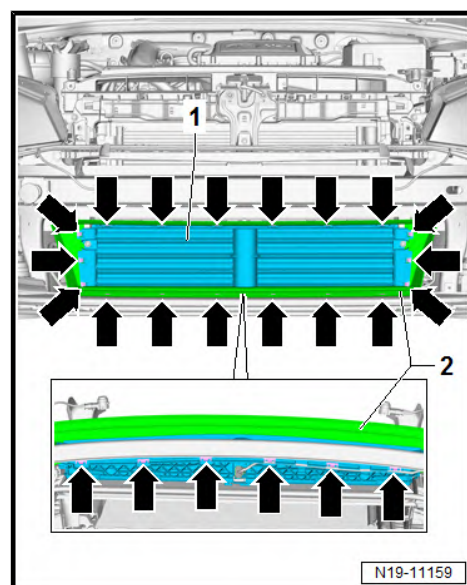
- Remove bolts -arrows-.
- Pull radiator blind -1- together with seal -2- towards front.
- Secure radiator blind -1- to prevent it from falling.



- Unclip seal -2- on retaining tabs -arrows-.
- Pull seal -2- off radiator blind -1-.
- Remove radiator blind -1- downwards.

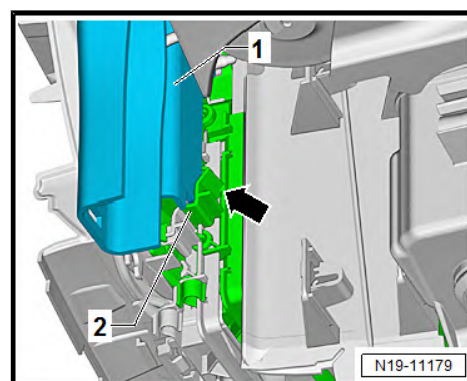
Installing

Installation is in the reverse sequence of removal. Observe the following:



- Make sure that the guides of radiator blind -2- are properly seated on bumper carrier -1- -arrow-.
- After replacing radiator blind, a basic setting must be performed.
- Use ⇒ Vehicle diagnostic tester.
- Clear event memory ⇒ Vehicle diagnostic tester.
- Switch on ignition, select and execute following menu options on ⇒ Vehicle diagnostic tester:

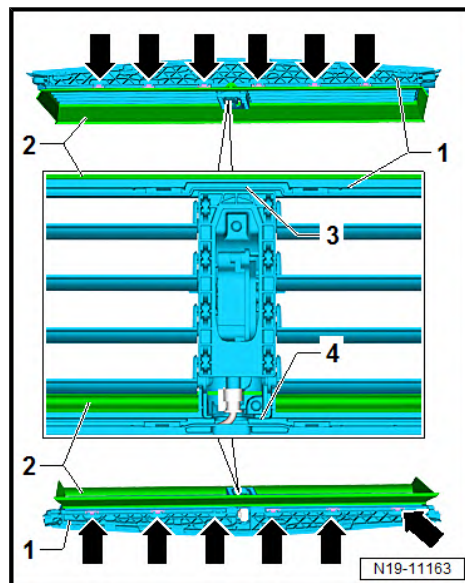
- ◆ 0001 - Radiator blind control motor adaption - V544



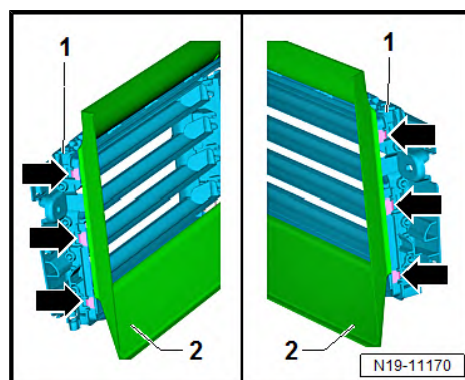
4.8 Removing and installing radiator blind control motor - V544-

- Remove radiator blind
⇒ [“4.7 Removing and installing radiator blind”, page 342](#) .

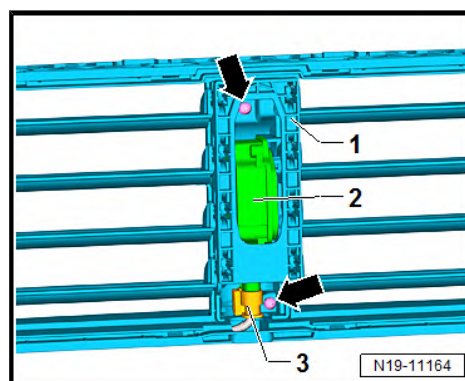
- Unclip seal -2- at top and bottom on retaining tabs -arrows-.
- Pull seal -2- off radiator blind -1-.



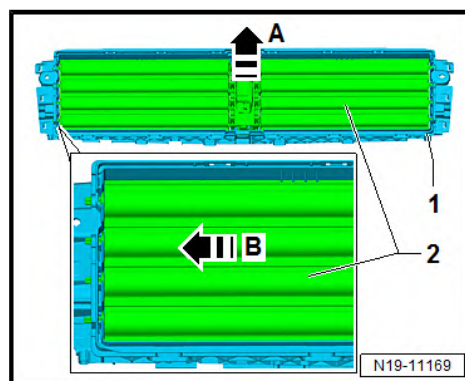
- Unclip seal -2- on left and right on retaining tabs -arrows-.
- Pull seal -2- off radiator blind -1-.



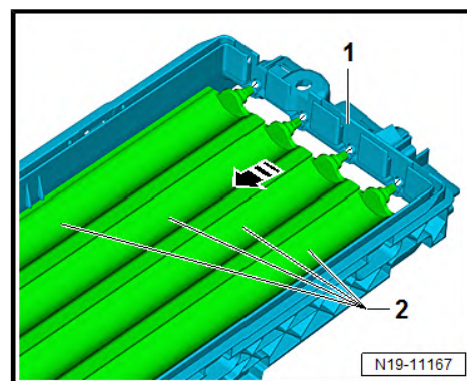
- Set flaps of radiator blind to open position as shown in illustration.
- To do this, move connecting piece -1-.
- Release electrical connector -3- and pull off.
- Remove bolts -arrows-.



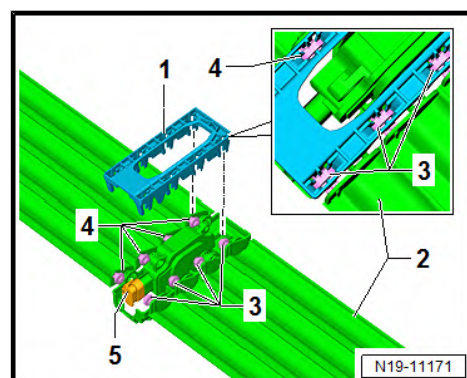
- Lift radiator blind control motor - V544- together with flaps upwards out of motor mounting => [Item 3 \(page 349\)](#) .
- Push radiator blind control motor - V544- with flaps -2- as far to the left as possible -arrow B-.



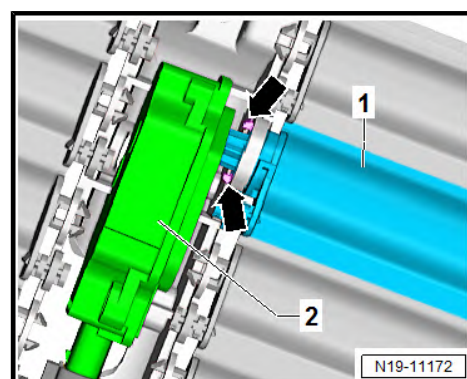
- Lever flaps -2- on right side out of frame -1-.



- Mark installation position of connecting piece -1-.
- Use connector contact -5- as a reference.
- Lever connecting piece -1- off guide rollers -3- and -4- of flaps -2-.



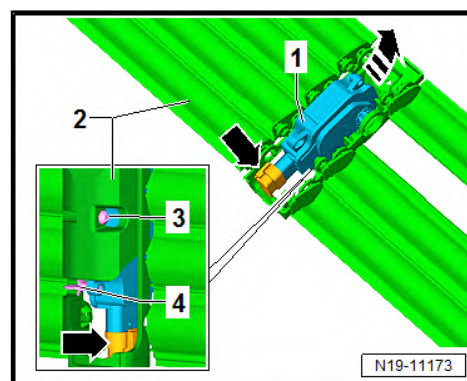
- Pull control flap -1- off radiator blind control motor - V544- -2-.
- To do this, release retaining clips -arrows-.



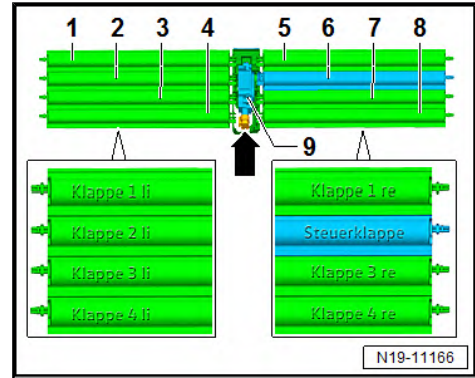
- If fitted, unscrew bolt -3-.
- Carefully swing radiator blind control motor - V544- upwards in -direction of arrow-.
- Pull radiator blind control motor - V544- off pin -4-.
- If necessary, release flaps on motor mounting, and remove them ➔ [Item 8 \(page 349\)](#) .

Installing

Installation is in the reverse sequence of removal. Observe the following:

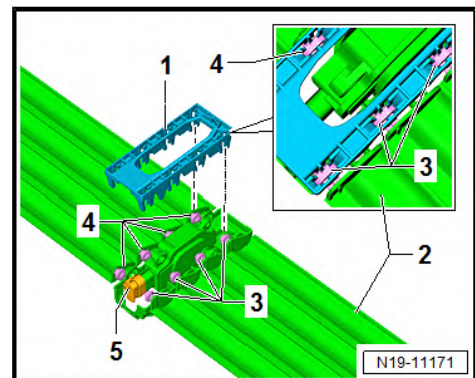


- Insert flaps -1- through -8- as shown in illustration, and engage them.
- Insert control flap -6-, and engage it.
- Note position of connector contact -arrow- when installing. The connector contact must face downwards.
- Note arrangement of flaps. The flaps are located on top of one another.
- The upper flaps rest on the flaps located below them.

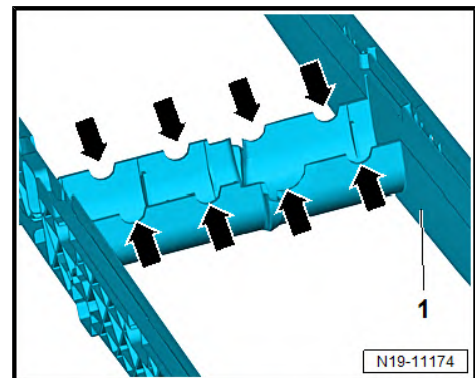


Number	Left flaps	Number	Flaps right side
1	Flap 1, left	5	Flap 1, right
2	Flap 2, left	6	Control flap
3	Flap 3, left	7	Flap 3, right
4	Flap 4, left	8	Flap 4, right

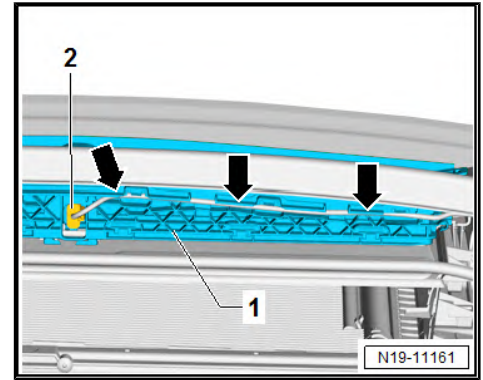
- Fit connecting piece -1- in correct installation position.
- Use the marking made beforehand or the connector contact -arrow- as a reference.
- Make sure that the connecting piece is properly seated on guide rollers.
- Insert flaps with radiator blind control motor - V544- into frame.
- Bolt on radiator blind control motor - V544- , and connect connector.



- Insert radiator blind control motor - V544- with flaps into frame -1-.
- Make sure that the flaps of radiator blind control motor - V544- are properly seated in mountings -arrows-.

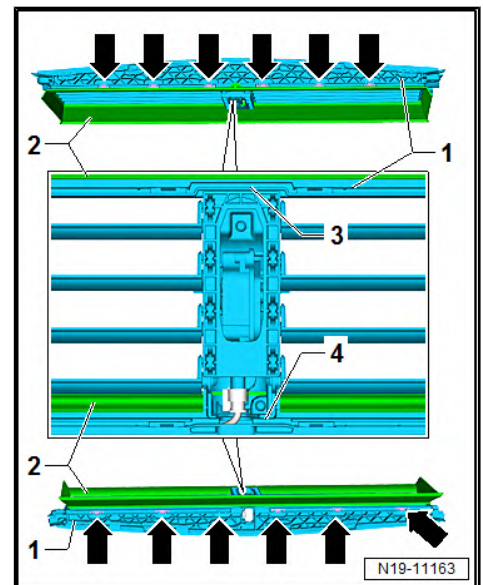


- Connect the electrical connector -2-.
- Clip in wiring harness -arrows-.



- Fit seal -2- to frame of radiator blind -1-.
- Make sure it is properly positioned on recesses -3- and -4-.
- Clip in seal -2-.
- After replacing radiator blind control motor - V544- , a basic setting must be performed.
- Use ⇒ Vehicle diagnostic tester.
- Clear event memory ⇒ Vehicle diagnostic tester.
- Switch on ignition, select and execute following menu options on ⇒ Vehicle diagnostic tester:

- ◆ 0001 - Radiator blind control motor adaption - V544



4.9 Assembly overview - radiator blind

⇒ ["4.9.1 Assembly overview - radiator blind", page 347](#)

⇒ ["4.9.2 Assembly overview - components of radiator blind", page 349](#)

4.9.1 Assembly overview - radiator blind

1 - Bumper carrier

- ☐ Assembly overview ➔
General body repairs,
exterior; Rep. gr. 50 ;
Lock carrier; Assembly
overview - lock carrier

2 - Rear seal

3 - Radiator blind control motor - V544-

- ☐ Removing and installing

4 - Locking lugs

- ☐ For seals

5 - Ambient temperature sensor - G17-

- ☐ Fitting location
➔ [Item 12 \(page 348\)](#)
- ☐ Clipped into front seal
- ☐ ➔ Current flow diagrams, Electrical fault finding and Fitting locations

6 - Radiator blind

- ☐ Removing and installing

7 - Connector contact

- ☐ For radiator blind control motor - V544-
- ☐ Secured to lock carrier.
- ☐ ➔ Current flow diagrams, Electrical fault finding and Fitting locations

8 - Support

- ☐ For securing connector contact to lock carrier ➔ [Item 7 \(page 348\)](#)

9 - Bolt

- ☐ 2 off
- ☐ 8 Nm

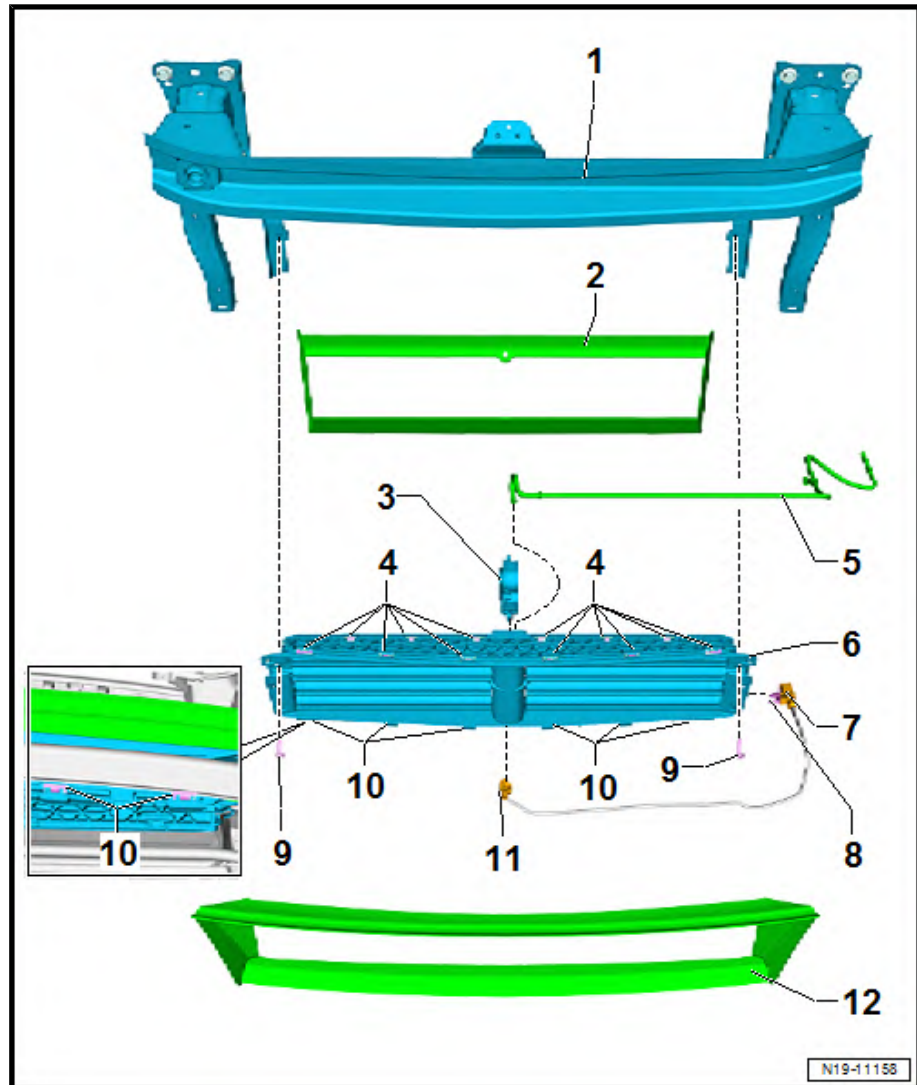
10 - Wiring harness

- ☐ For radiator blind control motor - V544-
- ☐ ➔ Current flow diagrams, Electrical fault finding and Fitting locations

11 - Locking lugs

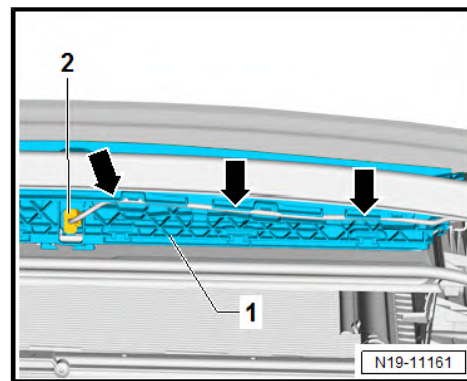
- ☐ For seals

12 - Front seal



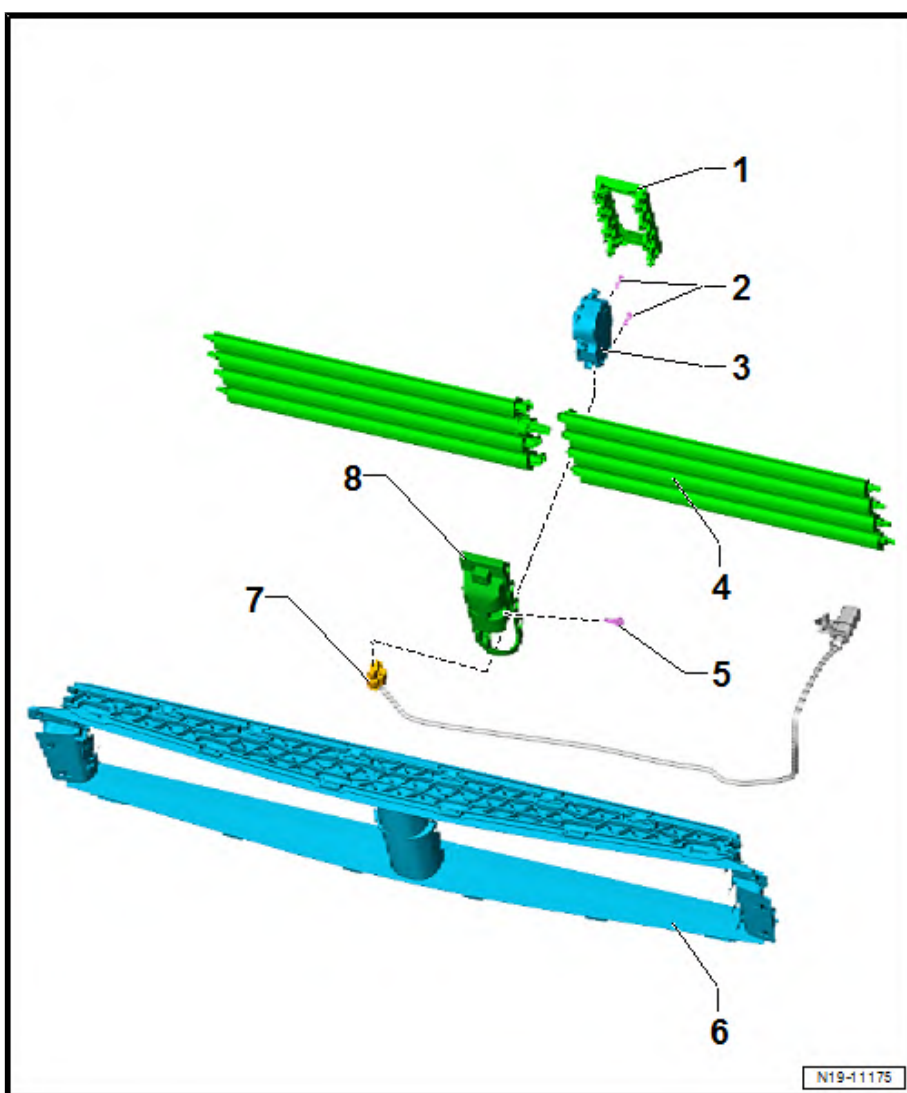
Routing cables/lines on radiator blind

- Wiring harness -2- for radiator blind control motor - V544- is clipped into frame of radiator blind -1- -arrows-.



4.9.2 Assembly overview - components of radiator blind

- 1 - Connecting link
- 2 - Bolt
 - ☐ 1.5 Nm
- 3 - Radiator blind control motor - V544-
 - ☐ Removing and installing
- 4 - Flaps
 - ☐ Note arrangement
⇒ [page 350](#)
- 5 - Bolt
 - ☐ 1.5 Nm
- 6 - Guide
- 7 - Wiring harness
- 8 - Engine mounting

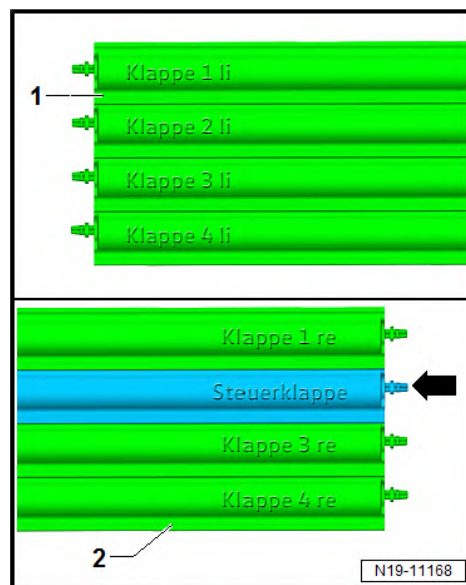


Arrangement of louvres

1 - Left flaps

2 - Flaps right side

Flecha - Control flap



21 – Turbocharging/supercharging

1 Turbocharger

⇒ [“1.1 Assembly overview - turbocharger”, page 351](#)

⇒ [“1.2 Removing and installing turbocharger”, page 353](#)

⇒ [“1.3 Removing and installing charge pressure positioner V465”, page 358](#)

⇒ [“1.4 Removing and installing connection for turbocharger”, page 360](#)

1.1 Assembly overview - turbocharger

⇒ [“1.1.1 Assembly overview - turbocharger, part 1”, page 351](#)

⇒ [“1.1.2 Assembly overview - turbocharger, part 2”, page 352](#)

1.1.1 Assembly overview - turbocharger, part 1

1 - Turbocharger union

- ☐ Removing and installing
⇒ [page 360](#)

2 - Bolt

- ☐ 8 Nm

3 - O-ring

- ☐ Renew after removal
- ☐ Before installing, lightly moisten O-ring with clean engine oil

4 - Seal

- ☐ Renew after removal

5 - Support

- ☐ for coolant lines

6 - Bolt

- ☐ 20 Nm

7 - Turbocharger

- ☐ Can only be renewed together with exhaust manifold
- ☐ Removing and installing
⇒ [“1.2 Removing and installing turbocharger”, page 353](#)

8 - Nut

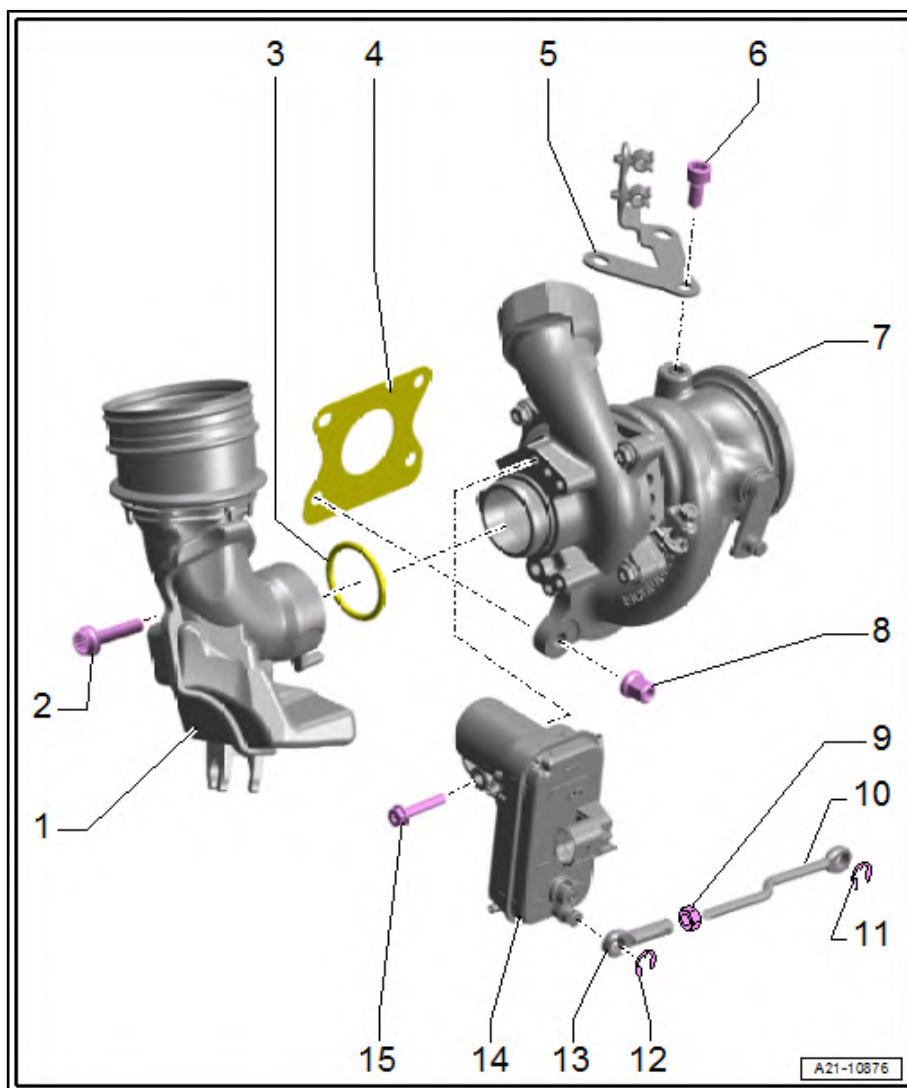
- ☐ Renew after removal
- ☐ 25 Nm

9 - Lock nut

- ☐ For charge pressure positioner - V465-
- ☐ 10 Nm

10 - Operating lever

- ☐ For charge pressure positioner - V465-



Volkswagen Technical Site: <http://vwts.ru> <http://vwts.info>

11 - Securing clip

12 - Securing clip

13 - Operating lever

- ☐ For charge pressure positioner - V465-

14 - Charge pressure positioner - V465-

- ☐ Removing and installing ➔ ["1.3 Removing and installing charge pressure positioner V465", page 358](#)

15 - Bolt

- ☐ 3 units ➔ Electronic Parts Catalogue (ETKA) .
- ☐ 8 Nm + 45°
- ☐ Renew after removal



Note

If one or more of the bolts are loose, always renew all 3 bolts

1.1.2 Assembly overview - turbocharger, part 2

1 - Turbocharger

- ☐ Removing and installing
➔ ["1.2 Removing and installing turbocharger", page 353](#)

2 - O-ring

- ☐ Renew after removal

3 - Bolt

- ☐ 9 Nm

4 - Bolt

- ☐ 20 Nm

5 - Oil supply line

6 - O-ring

- ☐ Renew after removal

7 - Bolt

- ☐ 9 Nm

8 - O-ring

- ☐ Renew after removal
- ☐ Before installing, lightly moisten O-ring with clean engine oil

9 - Bolt

- ☐ 8 Nm

10 - Hose

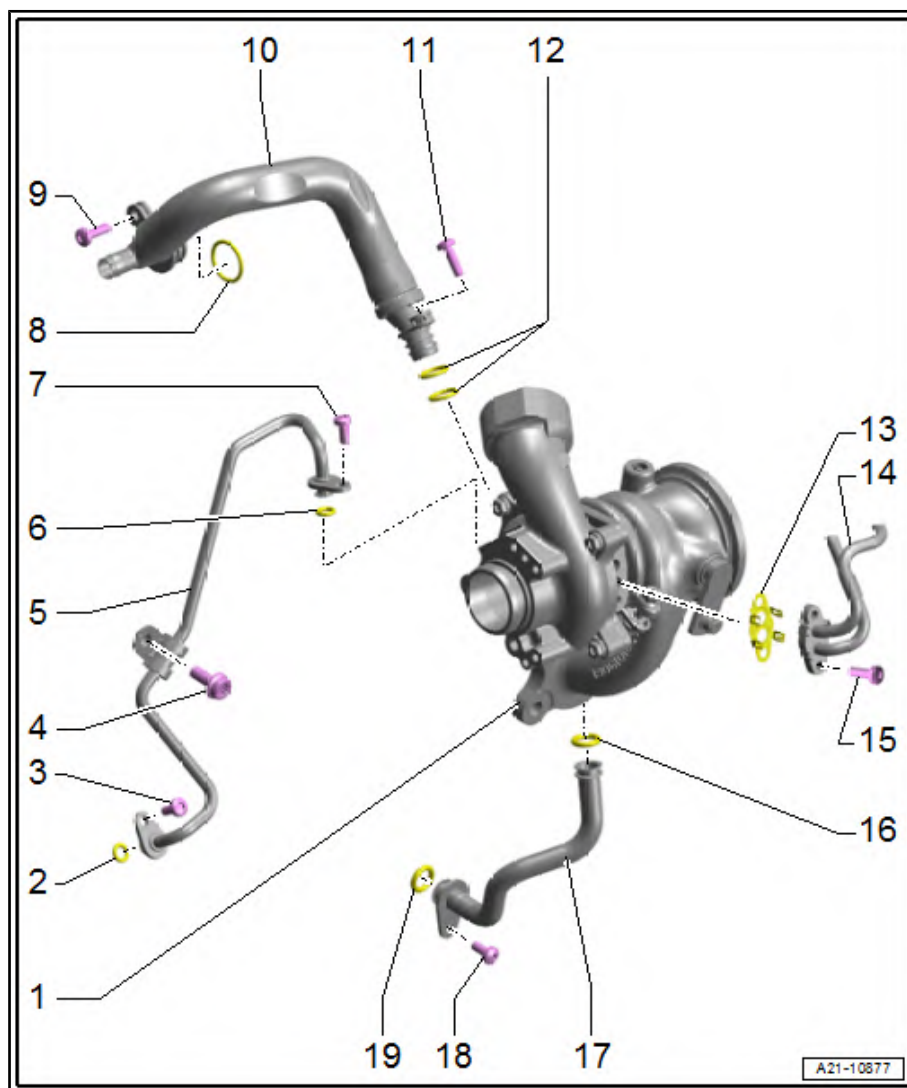
- ☐ For crankcase ventilation.

11 - Bolt

- ☐ 8 Nm

12 - O-ring

- ☐ Renew after removal



- ☐ Before installing, lightly moisten O-ring with clean engine oil

13 - Seal

- ☐ Renew after removal

14 - Coolant lines

- ☐ Supply and return

15 - Bolt

- ☐ 8 Nm

16 - O-ring

- ☐ Renew after removal

17 - Oil return line

18 - Bolt

- ☐ 9 Nm

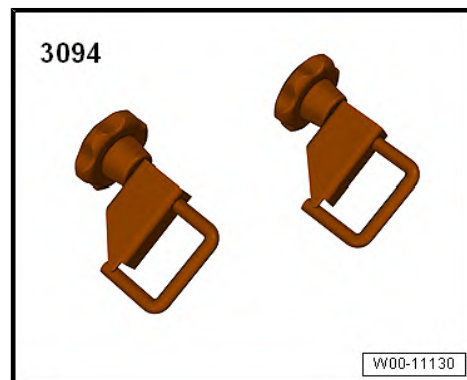
19 - O-ring

- ☐ Renew after removal

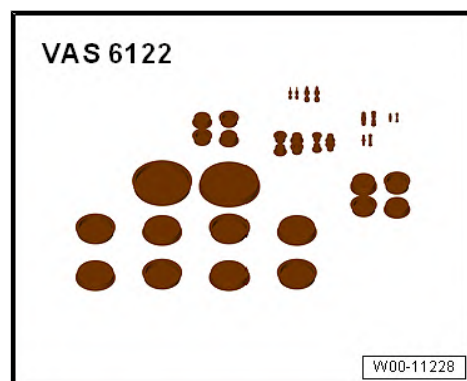
1.2 Removing and installing turbocharger

Special tools and workshop equipment required

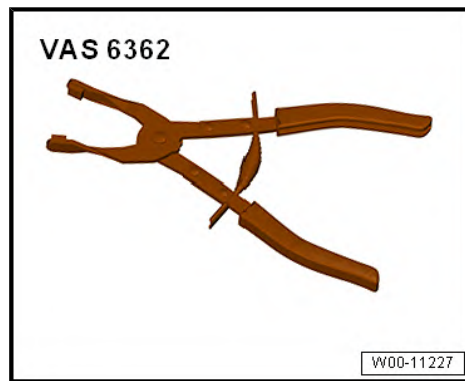
- ◆ Hose clamps to 25 mm - 3094-



- ◆ Engine bung set - VAS 6122-



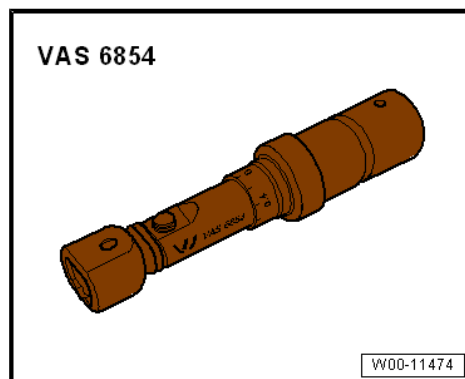
- ◆ Hose clip pliers - VAS 6362-



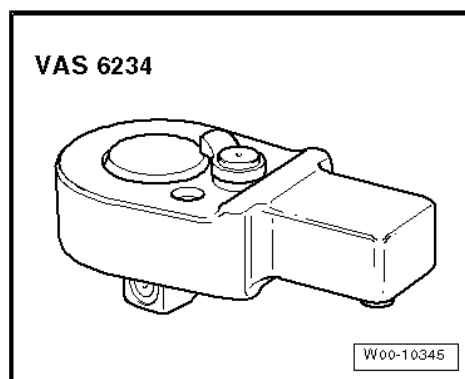
- ◆ Torx screw insert T 30 - T10405-



- ◆ Torque wrench - VAS 6854-



- ◆ Ratchet insert 1/4" - VAS 6234-



- ◆ Bit XZN 10 - T10501-



Removing

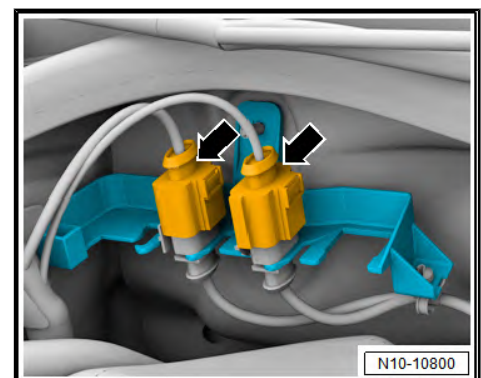


Note

- ◆ *Attach all heat-shielding sleeves in the same places when installing.*
- ◆ *If a mechanical fault is discovered on the turbocharger (e.g. a destroyed compressor impeller), it is not sufficient to just renew the turbocharger. To avoid subsequent damage, the following work must be carried out:*
- ◆ *Check air filter housing, air filter element and air inlet hoses for contamination.*
- ◆ *Check the whole charge air path and charge air cooler for foreign objects.*
- ◆ *If foreign objects are discovered in the charge air system, clean the charge air path and, if necessary, renew the charge air cooler.*
- Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .
- Remove air intake pipe
⇒ ["2.5 Removing and installing air pipe", page 368](#)
- Remove connection for turbocharger ⇒ [page 360](#) .

Toledo 2016, Ibiza 2016

- Disconnect connectors of lambda probe 1 after catalytic converter - GX7- and lambda probe 1 before catalytic converter - GX10- -arrows-.



Continued for all vehicles

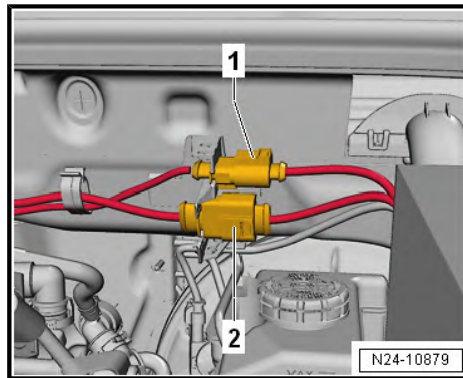
- Unplug corresponding connector.

- 1 - For Lambda probe 1 after catalytic converter - GX7- .
- 2 - For Lambda probe 1 before catalytic converter - GX10- .



Note

- ◆ Do not allow the decoupling element to kink by more than 10°. It could become damaged.
- ◆ Install decoupling element so that it is not under tension.
- ◆ Take care not to damage wire mesh on decoupling element.
- ◆ Do not remove protective packaging from replacement part until you are ready to fit the flexible joint

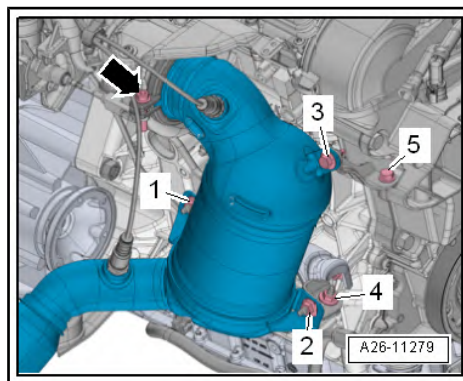


- Open screw-type clip -arrow- and position it on intake funnel of catalytic converter.
- Remove bolt -3-.
- Unscrew nuts -1- and -2- and tie up catalytic converter.

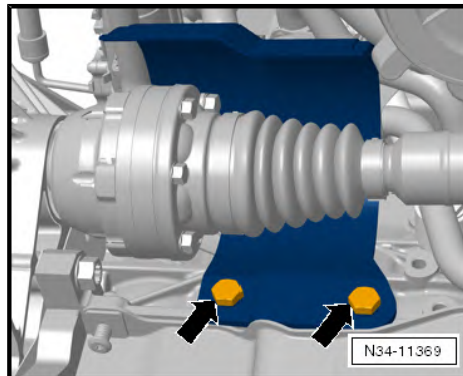


Note

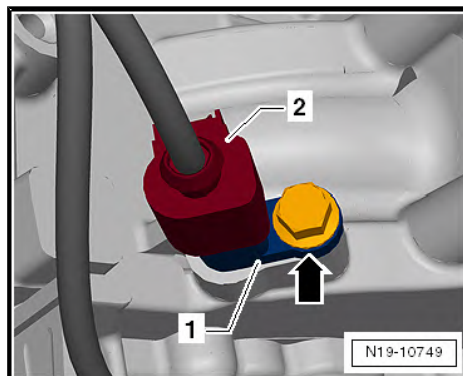
-Items 4 and 5- can be disregarded.



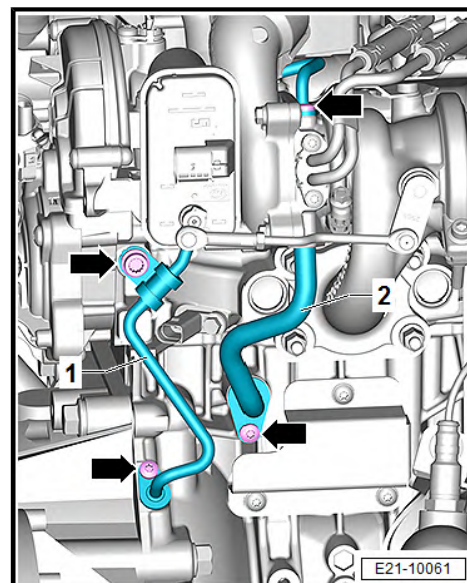
- Remove bolts -arrows-. Remove heat shield for right drive shaft.



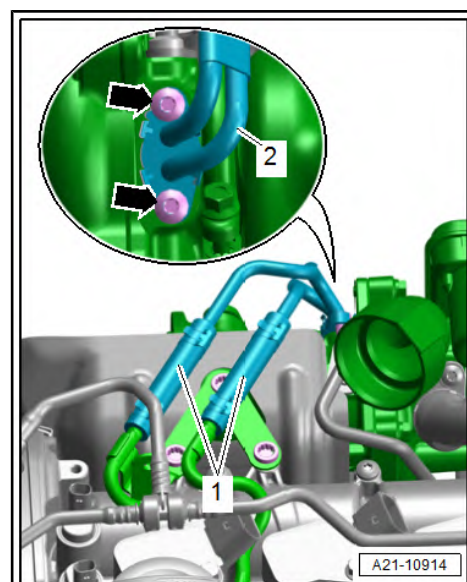
- Open heat-shield sleeve of the connector -2- of the thermostat - G62- and remove.
- Release electrical connector -2- and pull off.



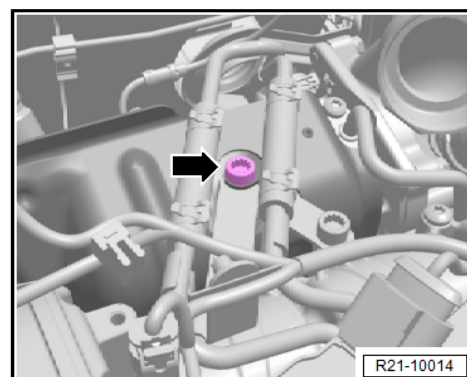
- Unscrew bolt -arrow- for the oil return line -2-.
- Pull out and remove oil return line of the exhaust gas turbocharger -2-.
- Remove bolts -arrows- of the oil return pipe -1-.
- Stretch out the oil return line -1- and removed.



- Clamp off coolant hoses -1- with hose clamps, up to Ø 25 mm - 3094- .
- Unscrew bolts -arrows-, and swivel coolant lines -2- to one side.



- Unscrew screw -arrow-.



- Unscrew nuts -arrows-, remove turbocharger -1-, and disconnect connector -2-.

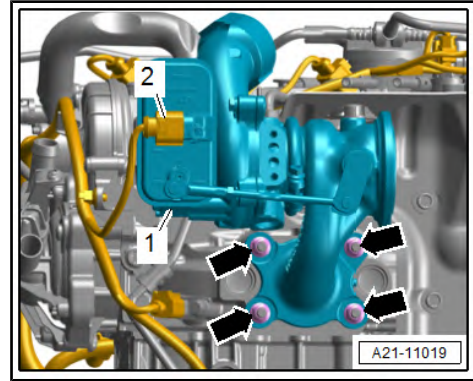
Installing

Install in reverse order of removal, observing the following:



Note

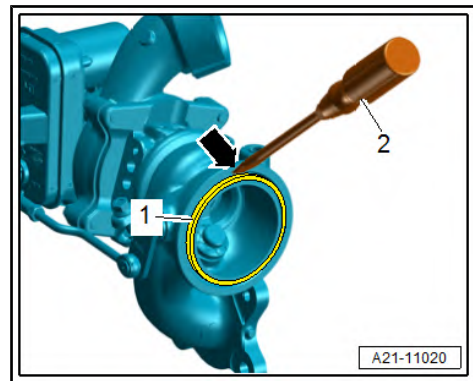
- ◆ *Renew seals, nuts and O-rings.*
- ◆ *Fill turbocharger with engine oil at connection for oil supply line.*
- ◆ *Secure all hose connections with hose clips corresponding to the series production status ⇒ Electronic Parts Catalogue (ETKA) .*
- ◆ *After installing turbocharger, run engine for about 1 minute at idling speed to ensure that oil is supplied to the turbocharger. Do not rev up immediately.*
- If a turbocharger already used is being reinstalled, insert screwdriver -2- into groove -arrow- on turbocharger, and lever out seal -1-.
- Electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



Note

Do not reuse the dirty coolant.

- Add coolant ⇒ [page 260](#) .



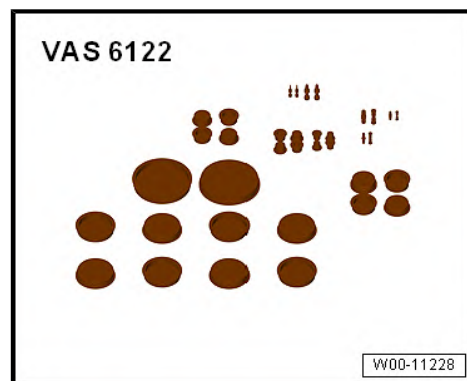
Specified torques

- ◆ Toothed belt guard
⇒ [“2.1 Assembly overview - coolant pump, thermostat”, page 278](#)
- ◆ Air filter housing
⇒ [“3.1 Assembly overview - air filter housing”, page 393](#) .
- ◆ ⇒ [“1.1 Assembly overview - turbocharger”, page 351](#)
- ◆ ⇒ [Fig. ““Installing catalytic converter - specified torque and tightening sequence””, page 456](#)
- ◆ Tightening sequence for catalytic converter
⇒ [Fig. ““Installing catalytic converter - specified torque and tightening sequence””, page 456](#)
- ◆ Tightening sequence for catalytic converter, Toledo 2013, Ibiza 2016
⇒ [Fig. ““Installing catalytic converter - specified torque and tightening sequence””, page 459](#)

1.3 Removing and installing charge pressure positioner - V465-

Special tools and workshop equipment required

◆ Engine bung set - VAS 6122-

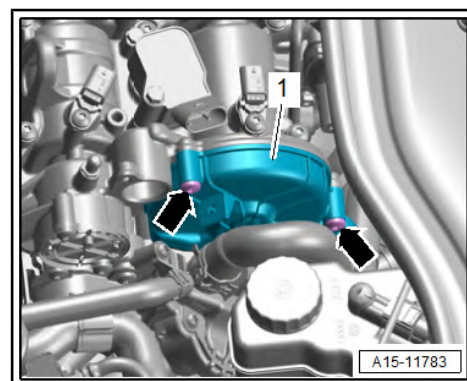


◆ Torx screw insert T 30 - T10405-



Removing

- Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .
- Remove connection for turbocharger ⇒ [page 360](#) .
- Unscrew bolts -arrows-, and remove toothed belt guard -1- for coolant pump toothed belt.



- Disconnect connector -2-, and remove charge pressure positioner - V465- -1-.
- Pull off securing clips -3-, and remove operating lever -4-.
- Remove bolts -arrows-.

Installing

Installation is carried out in the reverse order. When installing, note the following:



Note

Renew O-rings after removal.

- Connect ⇒ Vehicle diagnostic tester.
- Switch on ignition and select and run the following menu item at ⇒ Vehicle diagnostic tester:

◆ 0001 - Adaption charge pressure positioner V465

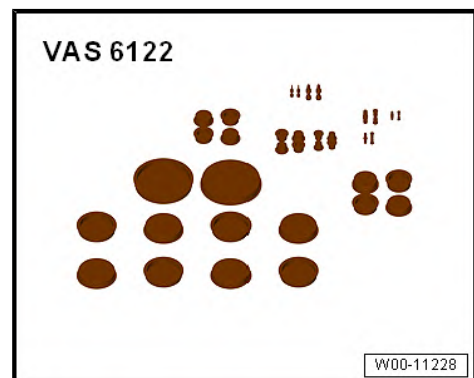
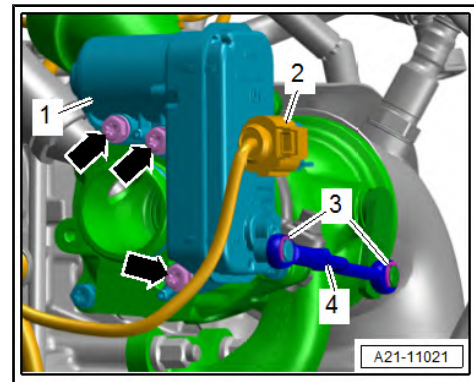
Specified torques

- ◆ ⇒ ["1.1 Assembly overview - turbocharger", page 351](#)
- ◆ ⇒ ["2.1 Assembly overview - coolant pump, thermostat", page 278](#)
- ◆ ⇒ ["3.1 Assembly overview - air filter housing", page 393](#)

1.4 Removing and installing connection for turbocharger

Special tools and workshop equipment required

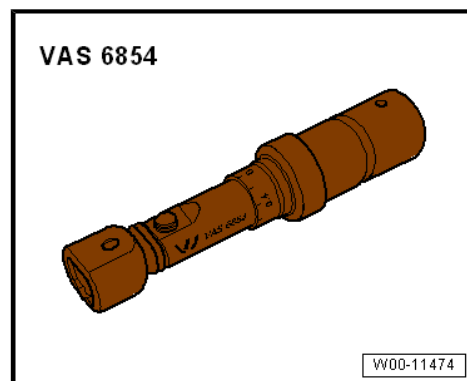
- ◆ Engine bung set - VAS 6122-



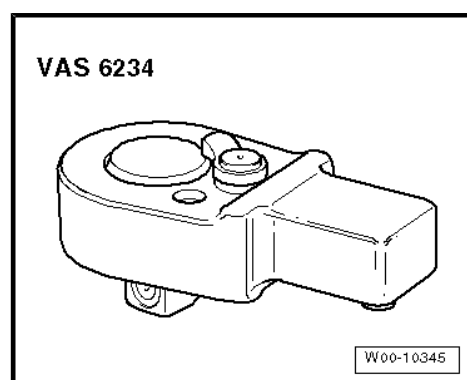
- ◆ Torx screw insert T 30 - T10405-



- ◆ Torque wrench - VAS 6854-



- ◆ Ratchet insert 1/4" - VAS 6234-



Removing

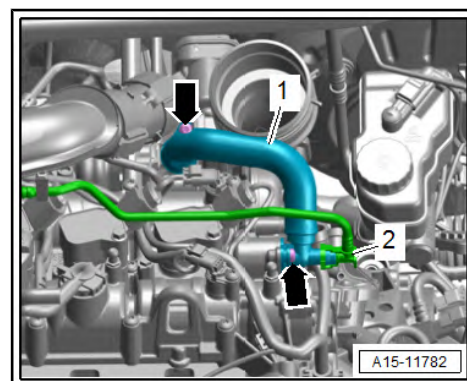
- Remove air filter housing ➤ [page 397](#) .
- Press release tabs on both sides, and disconnect hose -2- for activated charcoal filter.



Note

Risk of chemical damage to the coolant pump gasket caused by oil entering between the coolant pump and the cylinder head.

- Cover coolant pump with a cloth.
- Unscrew bolts -arrows-, and detach crankcase breather hose -1-.



- Pull off electrical connector -arrows- for charge pressure positioner - V465- .
- Loosen clear wiring harness from the retaining clips -5- and depending on the version the coolant hose -4- as well, and push them to one side.
- Unscrew screw -1- with the torque wrench - VAS 6854- , the ratchet 1/4" - VAS 6234- and the socket bit Torx T 30 - T10405-2-.
- Seal open lines and unions with clean plugs from engine sealing plug set - VAS 6122- .
- Pull union -3- towards left of turbocharger, and carefully remove it upwards.

Installing

Install in reverse order of removal, observing the following:

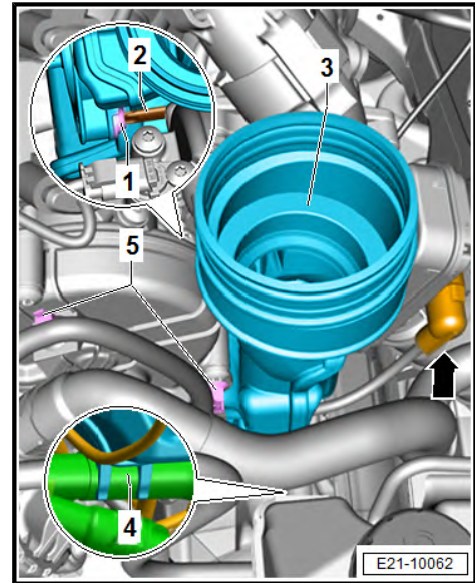


Note

Renew O-rings.

Specified torques

- ◆ ⇒ ["3.1 Assembly overview - air filter housing", page 393](#)
- ◆ ⇒ ["1.1 Assembly overview - turbocharger", page 351](#)



2 Charge air system

⇒ [“2.1 Assembly overview - charge air system”, page 363](#)

⇒ [“2.2 Removing and installing charge air cooler”, page 365](#)

⇒ [“2.3 Removing and installing charge pressure sender GX26 ”, page 366](#)

⇒ [“2.4 Checking charge air system for leaks”, page 367](#)

⇒ [“2.5 Removing and installing air pipe ”, page 368](#)

2.1 Assembly overview - charge air system



Note

Check all air hoses, air pipes and vacuum lines to make sure they are firmly seated and not leaking before carrying out tests or repairs.

1 - Seal

- ☐ Renew after removal

2 - Sealing lip

- ☐ Renew after removal
- ☐ Before installing, moisten lightly with clean engine oil.

3 - Intercooler

- ☐ Removing and installing
⇒ [“2.2 Removing and installing charge air cooler”, page 365](#)
- ☐ Change coolant after renewing
- ☐ Installation location of the coolant connections is different

4 - Bolt

- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it screws into old thread Then tighten bolt to torque.
- ☐ 15 Nm

5 - Coolant hose

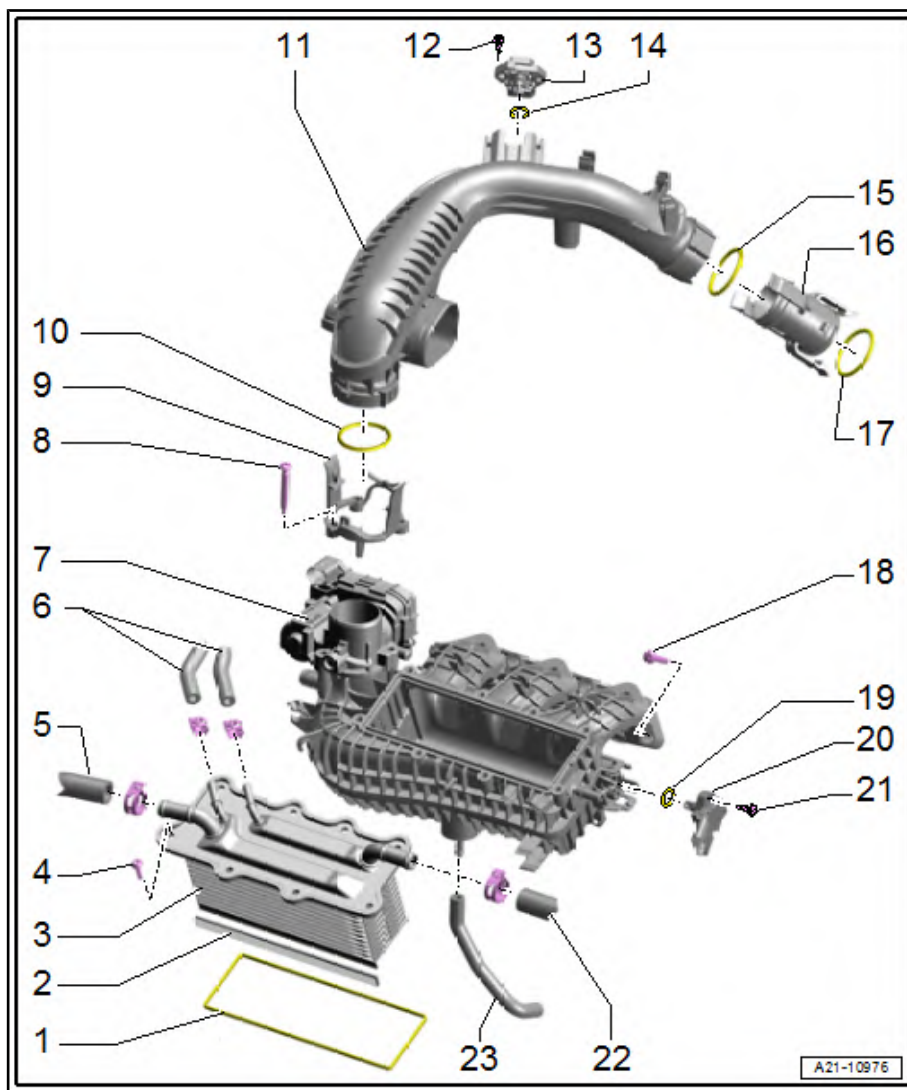
6 - Coolant hoses

7 - Intake manifold

Removing and installing
⇒ [“4.2 Removing and installing intake manifold”, page 400](#)

8 - Bolt

- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it screws into old thread Then tighten bolt to torque.
- ☐ 7 Nm



9 - Retaining clip

- ☐ For air pipe.

10 - O-ring

- ☐ Renew after removal
- ☐ Before installing, lightly moisten O-ring with clean engine oil

11 - Air intake pipe

- ☐ Removing and installing ⇒ ["2.5 Removing and installing air pipe ", page 368](#)

12 - Bolt

- ☐ Repair solution for retaining tab when broken off
- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it screws into old thread Then, tighten bolt to specified torque.
- ☐ 7 Nm

13 - Charge pressure sender - GX26-

- ☐ Consisting of:
 - Charge pressure sender - G31-
 - Charge air temperature sender - G1001-
- ☐ Removing and installing ⇒ ["2.3 Removing and installing charge pressure sender GX26 ", page 366](#)

14 - O-ring

- ☐ Renew after removal

15 - O-ring

- ☐ Renew after removal
- ☐ Before installing, lightly moisten O-ring with clean engine oil

16 - Union

17 - O-ring

- ☐ Renew after removal
- ☐ Before installing, lightly moisten O-ring with clean engine oil

18 - Bolt

- ☐ Specified torque and tightening sequence ⇒ [page 400](#)

19 - O-ring

- ☐ Renew after removal

20 - Intake manifold sender - GX9-

- ☐ Consisting of:
 - Intake manifold pressure sender - G71-
 - Intake manifold temperature sender - G72-
- ☐ Removing and installing ⇒ ["5.3 Removing and installing intake manifold sender GX9 ", page 408](#)

21 - Bolt

- ☐ Repair solution for retaining tab when broken off
- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it screws into old thread Then, tighten bolt to specified torque.
- ☐ 7 Nm

22 - Coolant hose

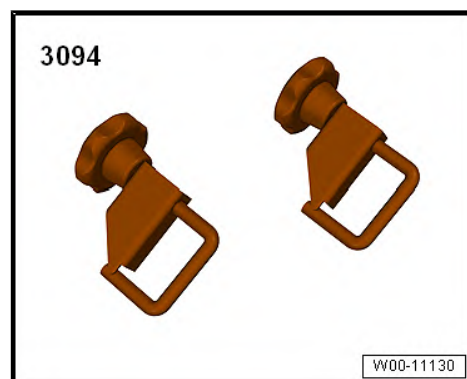
23 - Hose

- ☐ For crankcase ventilation.

2.2 Removing and installing charge air cooler

Special tools and workshop equipment required

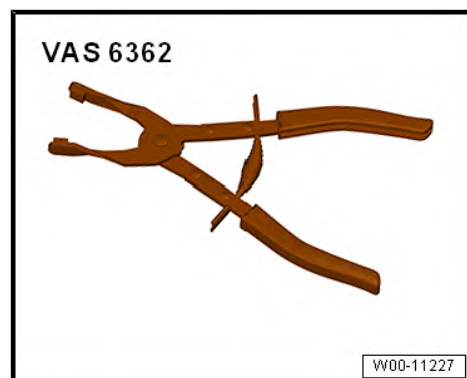
- ◆ Hose clamps to 25 mm - 3094-



- ◆ Drip tray for workshop hoist - VAS 6208-



- ◆ Hose clip pliers - VAS 6362-



Removing

- Remove air filter housing ➔ [page 397](#) .
- Remove air intake pipe ➔ [page 368](#) .



Note

Place a cloth underneath to catch any escaping coolant.

- Place drip tray for workshop hoist - VAS 6208- underneath.
- Clamp off coolant hoses on charge air cooler using hose clamps, up to 25 mm - 3094- .

- Release hose clips -1, 2- and disconnect coolant hoses.
- Remove bolts -arrows- and detach charge air cooler.

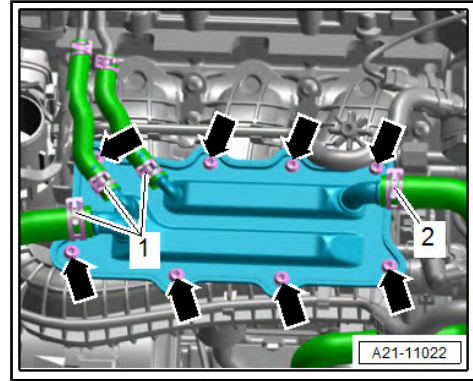
Installing

Install in reverse order of removal, observing the following:



Note

- ◆ If there are minor dents in the fins, refer to
⇒ [“3.7 Fitting radiator and condensers”, page 12](#) .
- ◆ Renew seal.
- ◆ Secure all hose connections with the hose clips corresponding to original equipment ⇒ *Electronic Parts Catalogue (ETKA)* .
- Check coolant level
⇒ [“1.3 Draining and adding coolant”, page 260](#) .



Note

Do not reuse the dirty coolant.

Specified torques

- ◆ ⇒ [“2.1 Assembly overview - charge air system”, page 363](#)
- ◆ ⇒ [“3.1 Assembly overview - air filter housing”, page 393](#)

2.3 Removing and installing charge pressure sender - GX26-

Charge pressure sender - GX26- consists of:

- ◆ Charge pressure sender - G31-
- ◆ Charge air temperature sender - G1001-

Removing

- Unplug electrical connector -1-.

Version -A-

- Release fasteners -arrows-, and remove charge pressure sender - GX26- .

Version -B-

- Unscrew bolts -2- and remove charge pressure sender - GX26- .

Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Renew O-ring.*
- ◆ *If fasteners on the air intake pipe have broken off, secure the charge pressure sender - GX26- using suitable bolts -2- as per ⇒ Electronic Parts Catalogue (ETKA)*

Specified torques

- ◆ ⇒ [Item 12 \(page 364\)](#)

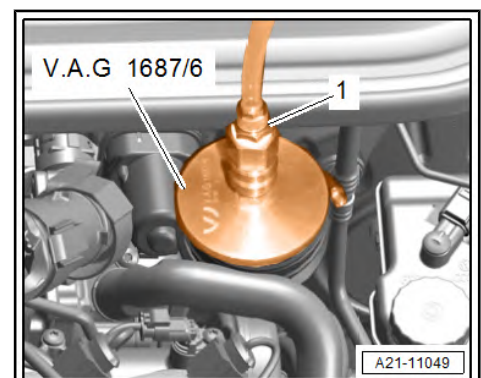
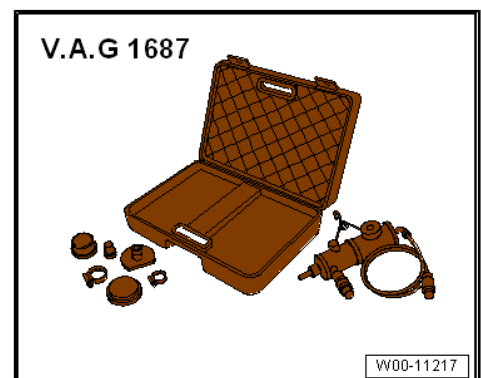
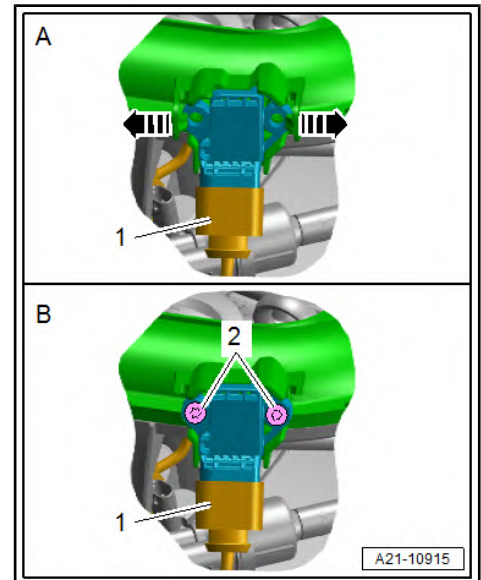
2.4 Checking charge air system for leaks

Special tools and workshop equipment required

- ◆ Charge air system tester - V.A.G 1687-

Procedure

- Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .
- Fit end seal - V.A.G 1687/6- to connection.
- Connect hose -1- of charge air system tester -V.A.G 1687- to end seal - V.A.G 1687/6- .



Prepare charge air system tester - V.A.G 1687- as follows:

- Completely unscrew pressure regulating valve -2-, close valves -3- and -4-.
- To turn pressure regulating valve -2-, rotary knob must be pulled upwards.
- Connect charge air system tester - V.A.G 1687- to compressed air -1- via commercial adapter.



Note

If there is water in inspection glass, drain it via water drain plug -6-.

- Open valve -3-.



Note

- ♦ *Risk of damage if pressure is set too high.*
- ♦ *The pressure must not exceed 0.5 bar!*
- Adjust pressure to 0.5 bar with pressure control valve -2-.
- Open valve -4- and wait until test circuit is full. If necessary, re-adjust pressure to 0.5 bar.
- Check charge air system for audible leaks or leaks that can be felt with the hand; apply commercially available leak detecting spray or use ultrasonic tester - V.A.G 1842 S- .



Note

- ♦ *A small amount of air escapes through the valves and enters the engine. Therefore a holding pressure test is not possible.*
- ♦ *How to use the ultrasonic tester -V.A.G 1842 S- → operating instructions*
- ♦ *Before removing the adapters, depressurise the test circuit by detaching the hose coupling.*

Installing

Installation is carried out in the reverse order. When installing, note the following:



Note

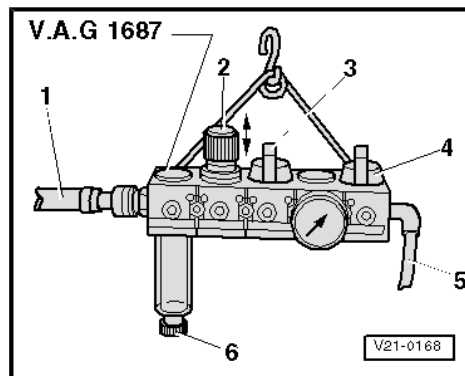
- ♦ *Renew seal and O-rings.*
- ♦ *Secure all hose connections with hose clips corresponding to the series production status → Electronic Parts Catalogue (ETKA) .*

Specified torques

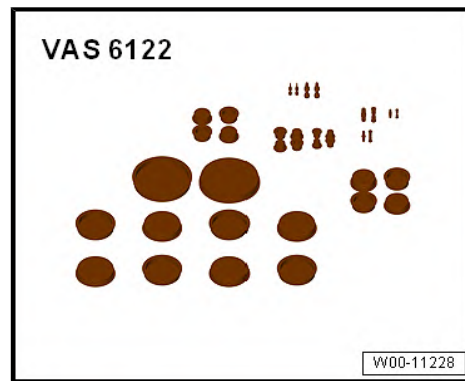
- ♦ ⇒ [“3.1 Assembly overview - air filter housing”, page 393](#)

2.5 Removing and installing air pipe

Special tools and workshop equipment required



◆ Engine bung set - VAS 6122-

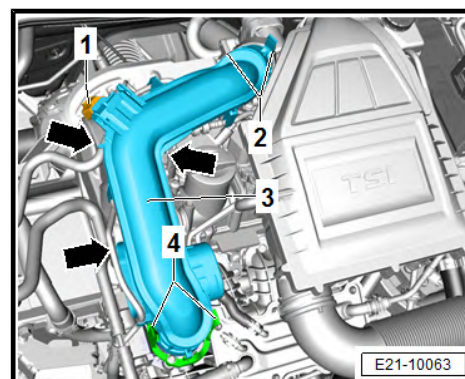


◆ Removal wedge - 3409-



Removing

- Unplug electrical connector -1- for charge pressure sender - GX26- and move wiring clear.
- Move clear hoses -arrows- at air intake pipe -3-.
- First unlock the latches -4- of the air tube on the throttle valve control unit - GX3- .
- Then unlock the latches -2- of the air duct pipe on the turbo compressor using the removal wedge - 3409- and remove the air duct pipe -3-.
- Seal all open connections using clean plugs from engine bung set - VAS 6122- .



Installing

Install in reverse order of removal, observing the following:

- Renew seals after removal.
- Before installing, lightly coat seals with clean engine oil.
- Renew any retaining tabs that have been damaged.
- If retaining tabs of charge pressure sender - GX26- have broken off, sensor can be secured using 2 bolts ⇒ Electronic Parts Catalogue .

Specified torques

- ◆ Securing bolts for sensor ⇒ [Item 12 \(page 364\)](#)
- ◆ Securing bolt for air filter housing
⇒ ["3.1 Assembly overview - air filter housing", page 393](#)

24 – Mixture preparation - injection

1 Injection system

⇒ [“1.1 Overview of fitting locations - injection system”, page 370](#)

1.1 Overview of fitting locations - injection system

⇒ [“1.1.1 Overview of fitting locations - engine compartment, Ateca, Leon 2013”, page 370](#)

⇒ [“1.1.2 Overview of fitting locations - engine compartment, Ibiza 2018, Arona”, page 373](#)

⇒ [“1.1.3 Overview of fitting locations - engine compartment, Toledo 2013, Ibiza 2016”, page 376](#)

⇒ [“1.1.4 Overview of fitting locations on engine \(from above\)”, page 379](#)

⇒ [“1.1.5 Overview of fitting locations - engine, inlet side”, page 381](#)

⇒ [“1.1.6 Overview of fitting locations - engine, exhaust side”, page 382](#)

1.1.1 Overview of fitting locations - engine compartment, Ateca, Leon 2013

Overview of fitting locations - engine compartment

1 - Charge pressure sender - GX26-

- ❑ Consisting of:

Charge pressure sender - G31-

Charge air temperature sender - G1001-

2 - Lambda probe 1 before catalytic converter - GX10-

- ❑ Consisting of:

Lambda probe - G39-

Lambda probe heater - Z19-

- ❑ Assembly overview
⇒ [“8.1.1 Assembly overview - lambda probe, Ateca, Leon 2013, Ibiza 2018, Arona”, page 429](#)

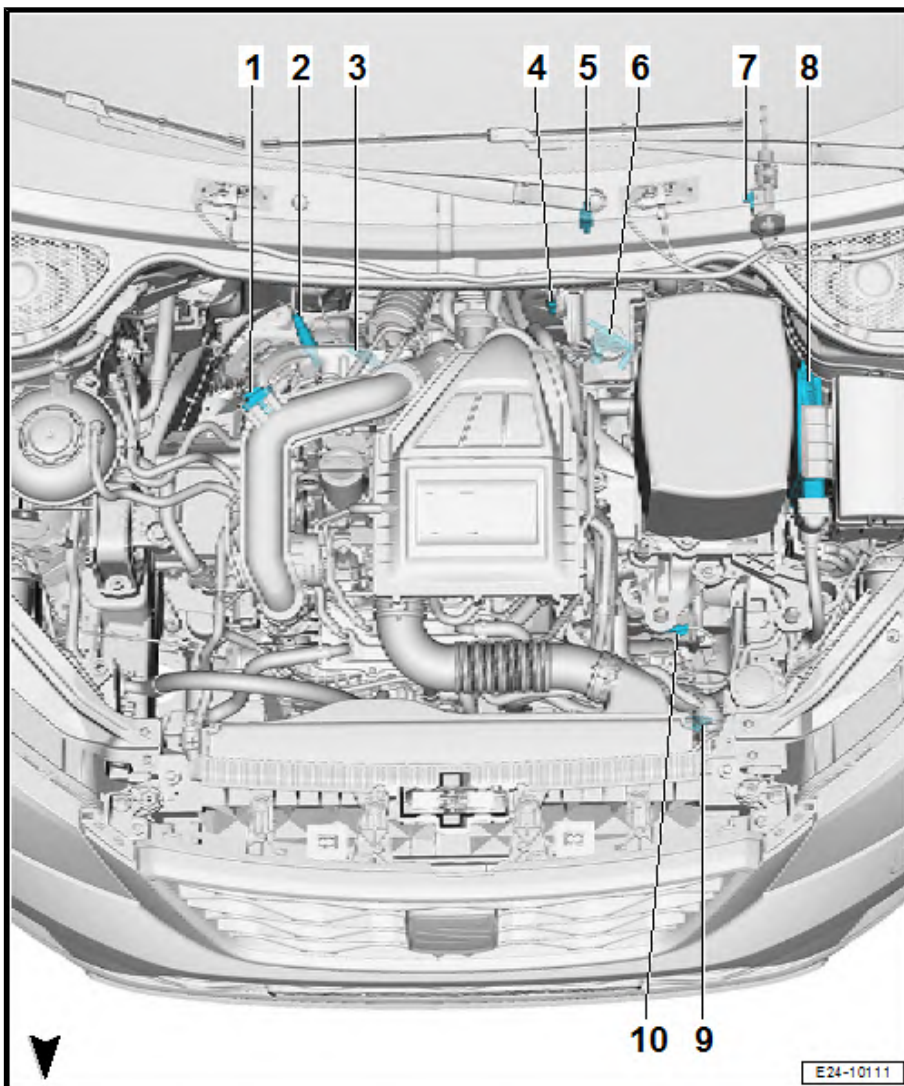
3 - Lambda probe 1 after catalytic converter - GX7-

- ❑ Consisting of:

Lambda probe after catalytic converter - G130-

Lambda probe heater 1 after catalytic converter - Z29-

- ❑ Assembly overview
⇒ [“8.1.1 Assembly overview - lambda probe, Ateca, Leon 2013, Ibiza 2018, Arona”, page 429](#)



4 - Brake light switch - F- / Brake pedal switch - F47-

- ❑ Fitting location ⇒ [page 372](#)

5 - Vacuum sender - G608-

- ❑ Fitting location ⇒ [page 373](#)

6 - Accelerator position sender - G79- with accelerator position sender 2 - G185-

- ❑ Fitting location ⇒ [page 372](#)

7 - Clutch position sender - G476-

- ❑ Fitting location ⇒ [page 372](#)

8 - Engine (motor) control unit - J623-

- ❑ Removing and installing ⇒ [“6 Engine \(motor\) control unit”, page 412](#)

9 - Radiator outlet coolant temperature sender - G83-

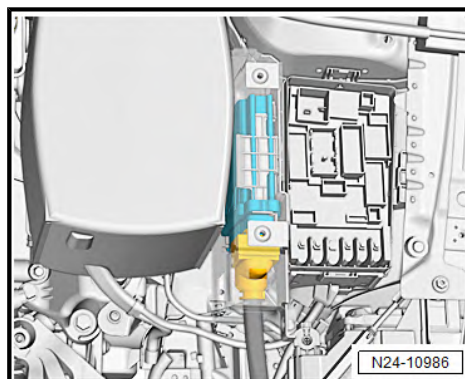
- ❑ Assembly overview
⇒ [“2.3.1 Assembly overview - coolant temperature sender, Ateca, Leon 2013, Ibiza 2018, Arona”, page 282](#)

10 - Gearbox neutral position sender - G701- / reversing light switch - F4-

- ❑ Fitting location ⇒ [page 373](#)

Fitting location of engine control unit - J623-

- ◆ Between battery and fuse carrier on left in engine compartment



Fitting location -A- of accelerator position sender - G79- and accelerator position sender 2 - G185-

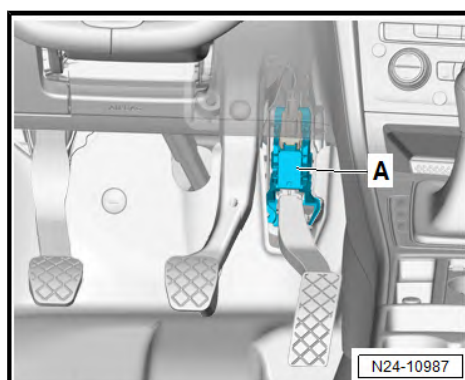
- ◆ In accelerator pedal module.



Note

The accelerator position sender - G79- and accelerator position sender 2 - G185- are integrated in the accelerator pedal module and cannot be renewed individually.

Removing and installing ⇒ Rep. gr. 20 ; Accelerator mechanism;
Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185-

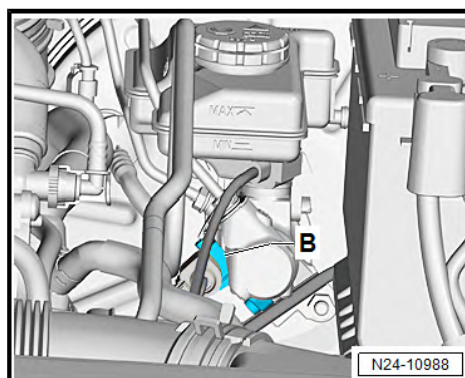


Fitting location brake light switch - F- and brake pedal switch - F47-

- ◆ On brake master cylinder

B - Brake light switch - F- / Brake pedal switch - F47-

Removing and installing ⇒ Brake system; Rep. gr. 45 ; Sensors;
Removing and installing brake light switch

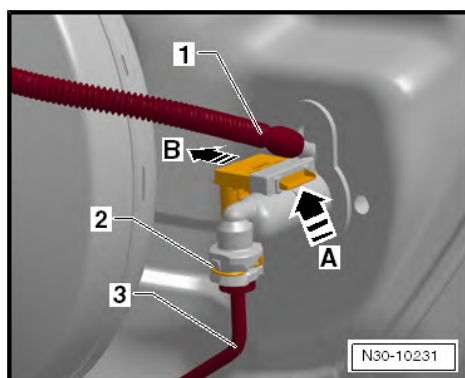


Fitting location of clutch position sender - G476-

- ◆ On clutch master cylinder, next to brake servo

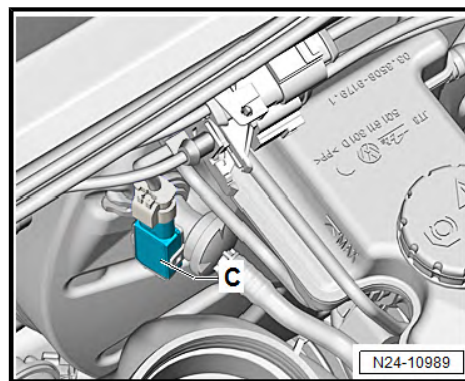
Removing and installing ⇒ Rep. gr. 30 ; Clutch mechanism; Removing and installing clutch position sender - G476-

- ◆ At plenum chamber partition panel -arrow-.



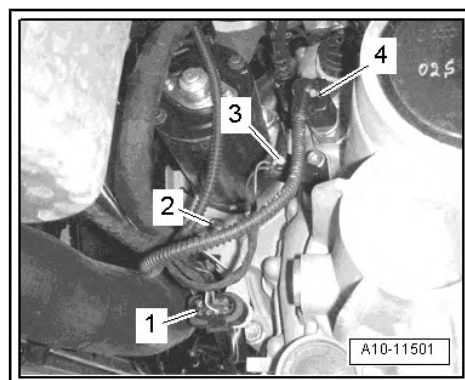
Fitting location of vacuum sender - G608- -C-

- ◆ On brake servo



Fitting location of gearbox neutral position sender - G701-

- ◆ At front left of manual gearbox
- 3 - Connector for gearbox neutral position sender - G701-
- 4 - Electrical connector for reversing light switch - F4-



1.1.2 Overview of fitting locations - engine compartment, Ibiza 2018, Arona

1 - Charge pressure sender - GX26-

- ❑ Consisting of:

Charge pressure sender - G31-

Charge air temperature sender - G1001-

2 - Lambda probe 1 before catalytic converter - GX10-

- ❑ Consisting of:

Lambda probe - G39-

Lambda probe heater - Z19-

- ❑ Assembly overview
⇒ ["8.1.1 Assembly overview - lambda probe, Ateca, Leon 2013, Ibiza 2018, Arona", page 429](#)

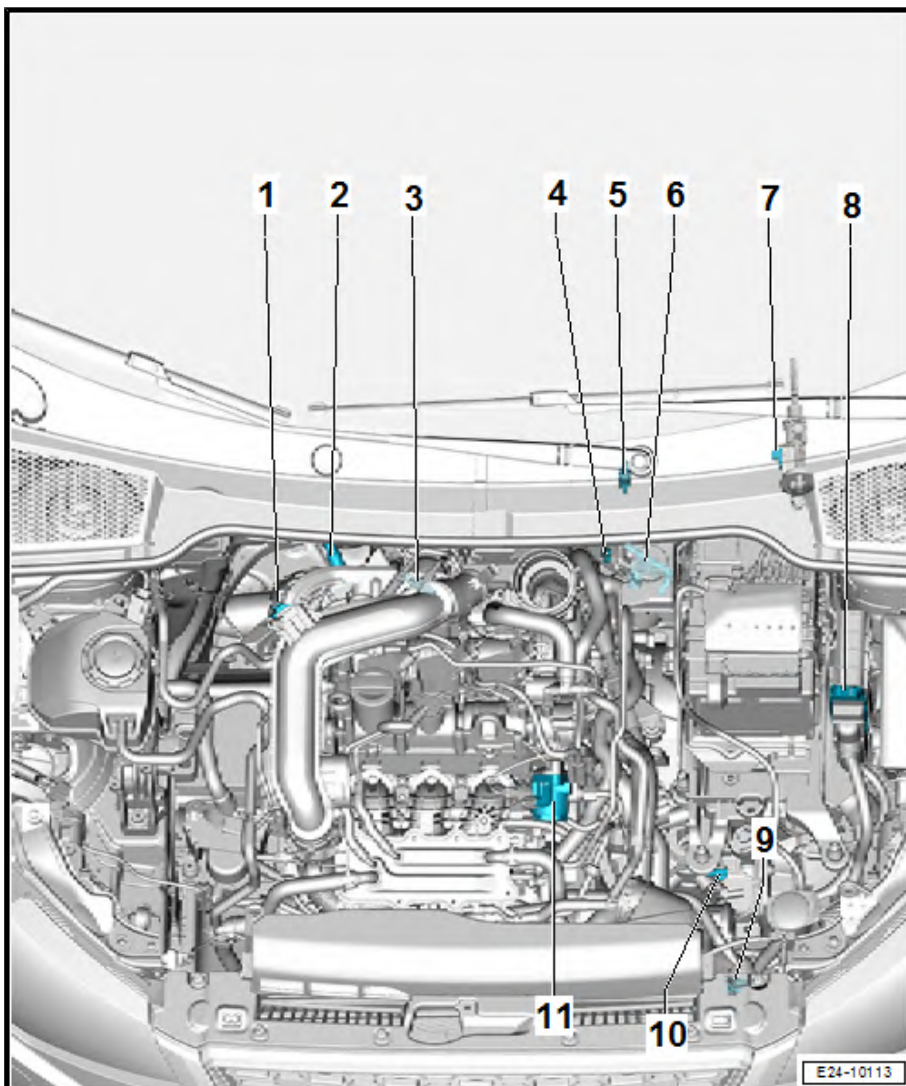
3 - Lambda probe 1 after catalytic converter - GX7-

- ❑ Consisting of:

Lambda probe after catalytic converter - G130-

Lambda probe heater 1 after catalytic converter - Z29-

- ❑ Assembly overview
⇒ ["8.1.1 Assembly overview - lambda probe, Ateca, Leon 2013, Ibiza 2018, Arona", page 429](#)



4 - Accelerator position sender - G79- with accelerator position sender 2 - G185-

- ❑ Fitting location ⇒ [page 375](#)

5 - Vacuum sender - G608-

- ❑ Fitting location ⇒ [page 376](#)

6 - Brake light switch - F- / Brake pedal switch - F47-

- ❑ Fitting location ⇒ [page 375](#)

7 - Clutch position sender - G476-

- ❑ Fitting location ⇒ [page 375](#)

8 - Engine (motor) control unit - J623-

- ❑ Fitting location ⇒ [page 375](#)
- ❑ Removing and installing ⇒ [page 412](#)

9 - Radiator outlet coolant temperature sender - G83-

- ❑ Assembly overview
⇒ ["2.3.1 Assembly overview - coolant temperature sender, Ateca, Leon 2013, Ibiza 2018, Arona", page 282](#)

10 - Gearbox neutral position sender - G701- / reversing light switch - F4-

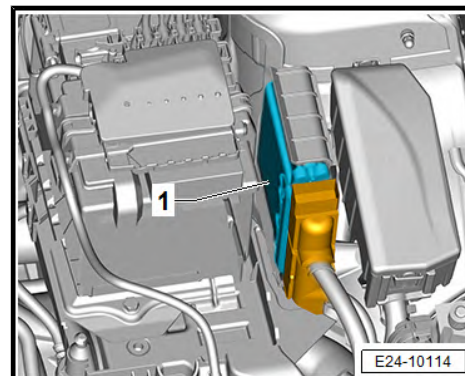
- ❑ Fitting location ⇒ [page 376](#)

11 - High-pressure pump

- ❑ Removing and installing ⇒ [page 426](#)

Fitting location of engine control unit - J623-

- ◆ Left of the engine compartment, between battery and electronics box.



Accelerator position sender - G79- and accelerator position sender 2 - G185-

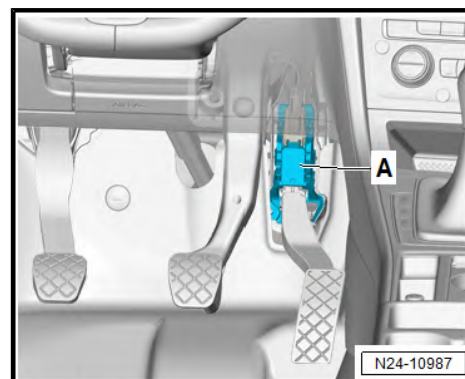
- ◆ In accelerator pedal module.



Note

The accelerator position sender - G79- and accelerator position sender 2 - G185- are integrated in the accelerator pedal module and cannot be renewed individually.

Removing and installing ⇒ Rep. gr. 20 ; Accelerator mechanism;
Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185-

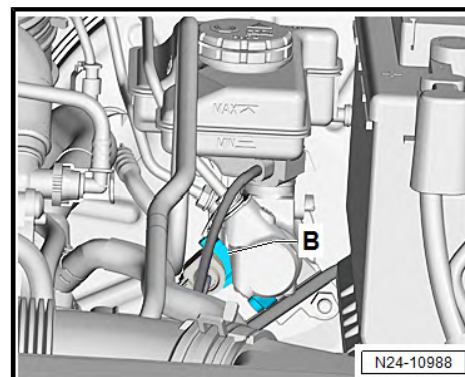


Fitting location brake light switch - F- and brake pedal switch - F47-

- ◆ On brake master cylinder

B - Brake light switch - F- / Brake pedal switch - F47-

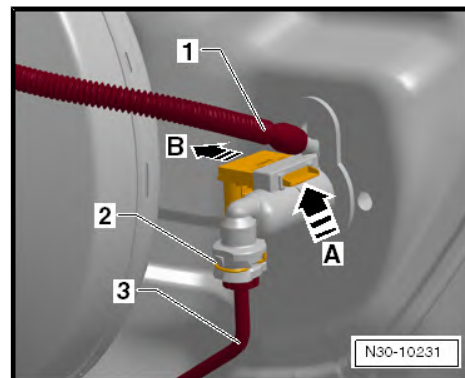
Removing and installing ⇒ Brake system; Rep. gr. 45 ; Sensors;
Removing and installing brake light switch



Fitting location of clutch position sender - G476-

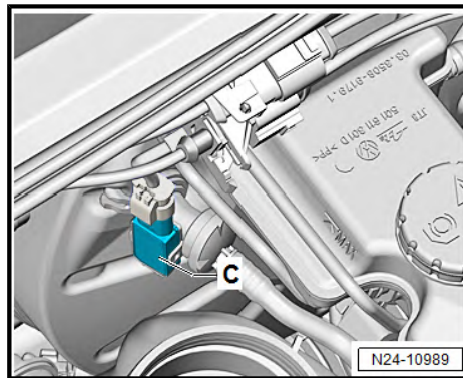
- ◆ On clutch master cylinder, next to brake servo

Removing and installing ⇒ Rep. gr. 30 ; Clutch mechanism; Removing and installing clutch position sender - G476-



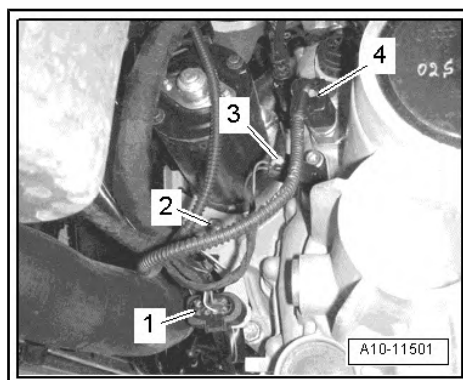
Fitting location of vacuum sender - G608- -C-

- ◆ On brake servo
- ◆ At plenum chamber partition panel -arrow-.



Fitting location of gearbox neutral position sender - G701-

- ◆ At front left of manual gearbox
- 3 - Connector for gearbox neutral position sender - G701-
- 4 - Electrical connector for reversing light switch - F4-



1.1.3 Overview of fitting locations - engine compartment, Toledo 2013, Ibiza 2016

1 - Charge pressure sender - GX26-

- ❑ Consisting of:

Charge pressure sender - G31-

Charge air temperature sender - G1001-

- ❑ Removing and installing
⇒ ["2.3 Removing and installing charge pressure sender GX26"](#),
[page 366](#)

2 - Lambda probe 1 before catalytic converter - GX10-

- ❑ Consisting of:

Lambda probe - G39-

Lambda probe heater - Z19-

- ❑ Assembly overview
⇒ ["8.1.2 Assembly overview - lambda probe, Toledo 2013, Ibiza 2016"](#),
[page 430](#)

3 - Lambda probe 1 after catalytic converter - GX7-

- ❑ Consisting of:

Lambda probe after catalytic converter - G130-

Lambda probe heater 1 after catalytic converter - Z29-

- ❑ Assembly overview
⇒ ["8.1.2 Assembly overview - lambda probe, Toledo 2013, Ibiza 2016"](#),
[page 430](#)

4 - Accelerator position sender - G79- with accelerator position sender 2 - G185-

- ❑ Fitting location ⇒ [page 378](#)

5 - Brake light switch - F- / Brake pedal switch - F47-

- ❑ Fitting location ⇒ [page 378](#)

6 - Engine (motor) control unit - J623-

- ❑ Removing and installing

7 - Clutch position sender - G476-

- ❑ Fitting location ⇒ [page 378](#)

8 - Gearbox neutral position sender - G701- / reversing light switch - F4-

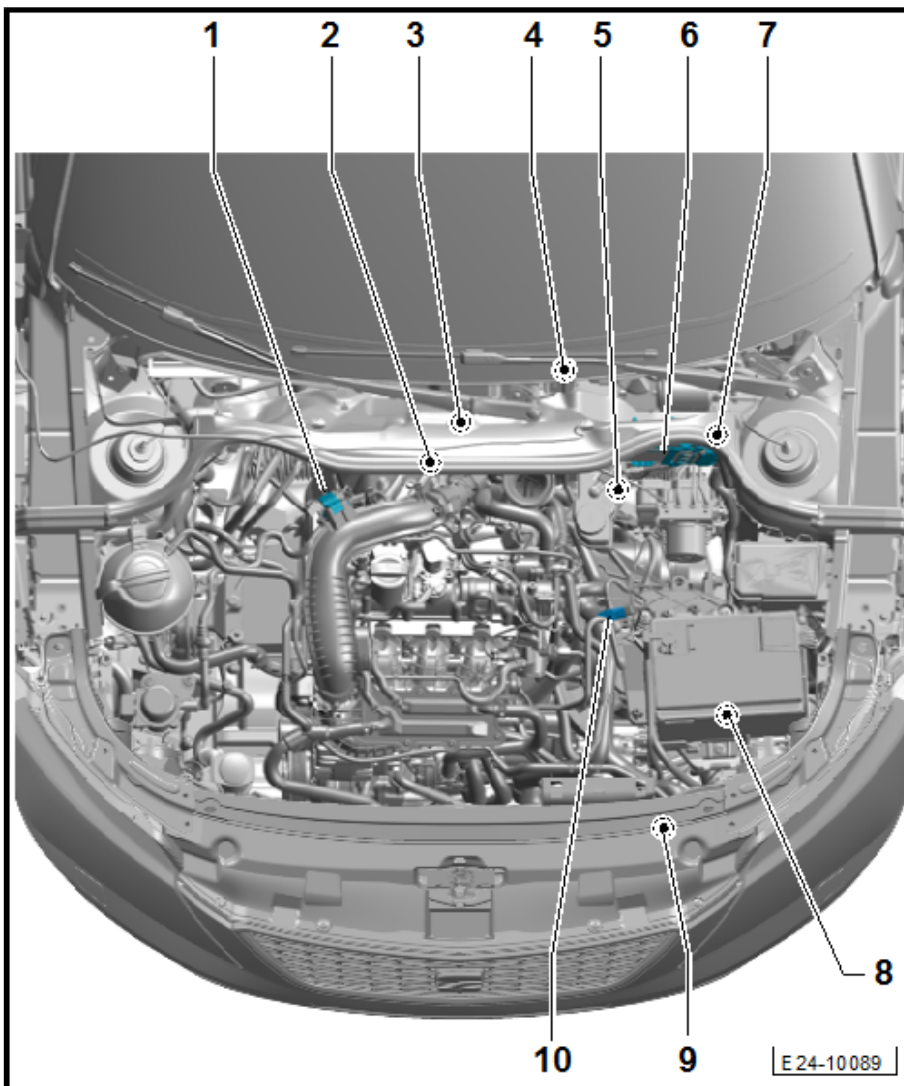
- ❑ Fitting location ⇒ [page 379](#)

9 - Radiator outlet coolant temperature sender - G83-

- ❑ Assembly overview
⇒ ["2.3.2 Assembly overview - coolant temperature sender, Toledo 2013, Ibiza 2016"](#),
[page 283](#)

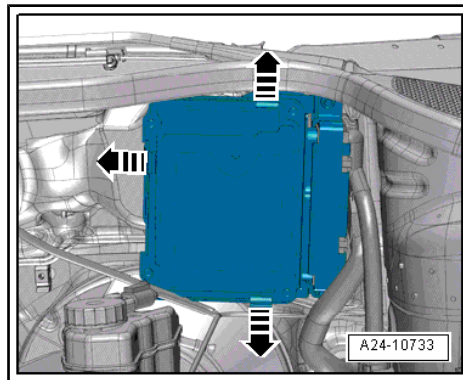
10 - Press sensor for brake servo - G294-

- ❑ Fitting location ⇒ [page 379](#)



Fitting location of engine control unit - J623-

- ◆ At plenum chamber bulkhead on left



Accelerator position sender - G79- and accelerator position sender 2 - G185-

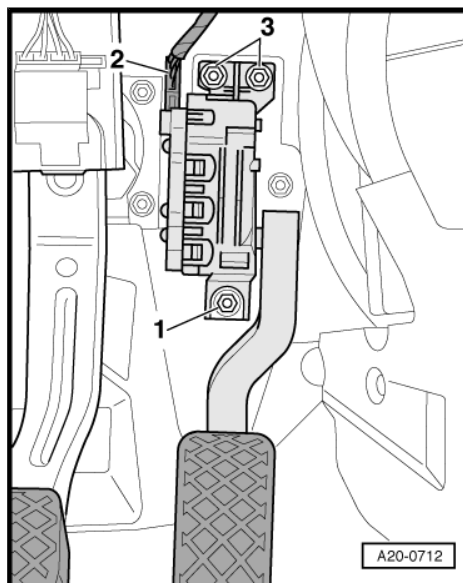
- ◆ In accelerator pedal module.
- 2 - Connector for accelerator pedal module



Note

The accelerator position sender - G79- and accelerator position sender 2 - G185- are integrated in the accelerator pedal module and cannot be renewed individually.

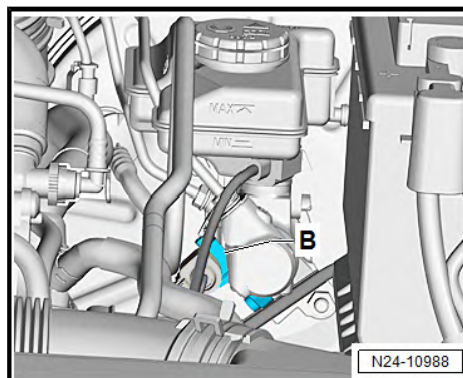
Removing and installing ⇒ Rep. gr. 20 ; Accelerator mechanism;
Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185-



Fitting location brake light switch - F- and brake pedal switch - F47-

- ◆ On brake master cylinder
- B - Brake light switch - F- / Brake pedal switch - F47-

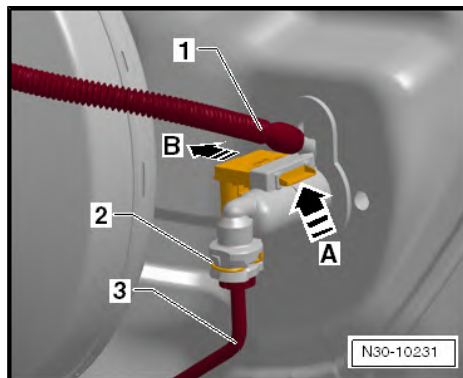
Removing and installing ⇒ Brake system; Rep. gr. 45 ; Sensors;
Removing and installing brake light switch



Fitting location of clutch position sender - G476-

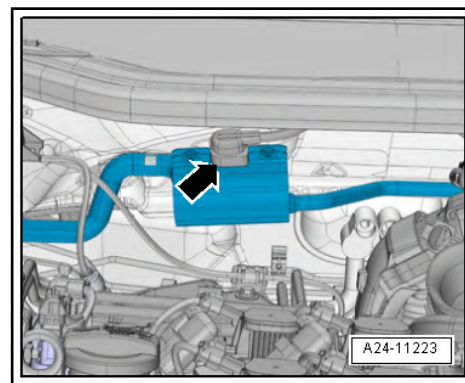
- ◆ On clutch master cylinder, next to brake servo

Removing and installing ⇒ Rep. gr. 30 ; Clutch mechanism; Removing and installing clutch position sender - G476-



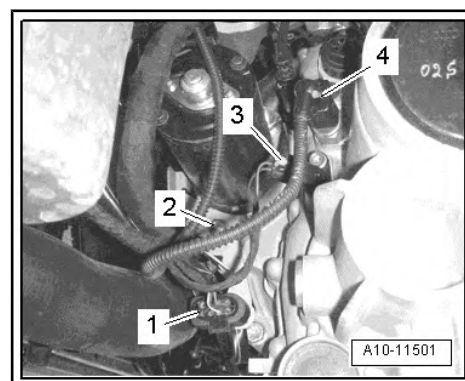
Fitting location of brake servo pressure sensor - G294-

- ◆ At plenum chamber partition panel -arrow-.



Fitting location of gearbox neutral position sender - G701-

- ◆ At front left of manual gearbox
- 3 - Connector for gearbox neutral position sender - G701-
- 4 - Electrical connector for reversing light switch - F4-



1.1.4 Overview of fitting locations on engine (from above)

1 - Inlet camshaft control valve 1 - N205-

- ❑ Assembly overview
⇒ [“3.1 Assembly overview - valve gear”, page 204](#)

2 - Exhaust camshaft control valve 1 - N318-

- ❑ Assembly overview
⇒ [“3.1 Assembly overview - valve gear”, page 204](#)

3 - Activated charcoal filter solenoid valve 1 - N80-

4 - Ignition coil 1 with output stage - N70-

- ❑ Assembly overview
⇒ [“1.1 Assembly overview - ignition system”, page 464](#)

5 - Ignition coil 2 with output stage - N127-

- ❑ Assembly overview
⇒ [“1.1 Assembly overview - ignition system”, page 464](#)

6 - Ignition coil 3 with output stage - N291-

- ❑ Assembly overview
⇒ [“1.1 Assembly overview - ignition system”, page 464](#)

7 - Hall sender 3 - G163-

- ❑ Assembly overview
⇒ [“1.1 Assembly overview - ignition system”, page 464](#)

8 - Hall sender - G40- (camshaft position sensor)

- ❑ Assembly overview ⇒ [“1.1 Assembly overview - ignition system”, page 464](#)

9 - Fuel metering valve - N290-

- ❑ Assembly overview ⇒ [“7.1 Assembly overview - high-pressure pump”, page 425](#)

10 - Injector, cylinder 3 - N32-

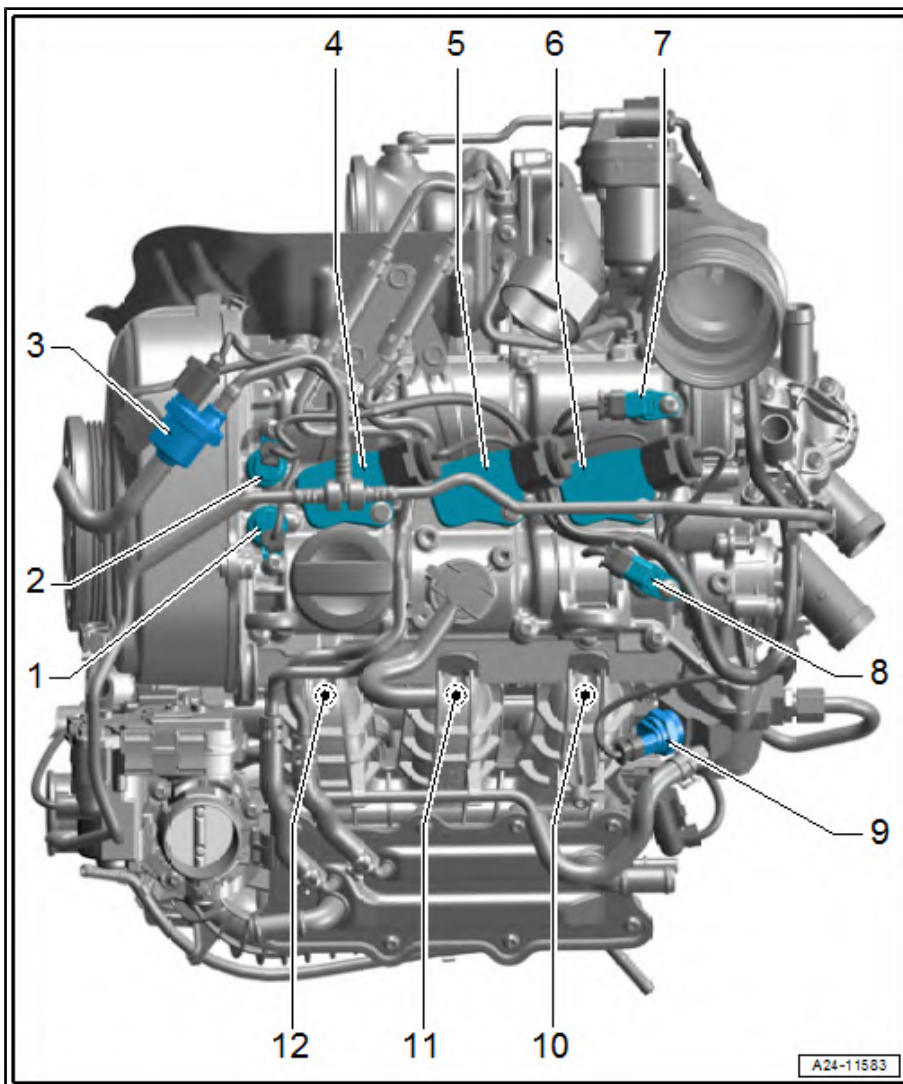
- ❑ Assembly overview ⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 383](#)

11 - Injector, cylinder 2 - N31-

- ❑ Assembly overview ⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 383](#)

12 - Injector, cylinder 1 - N30-

- ❑ Assembly overview ⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 383](#)



1.1.5 Overview of fitting locations - engine, inlet side

1 - Oil pressure sender - G10-

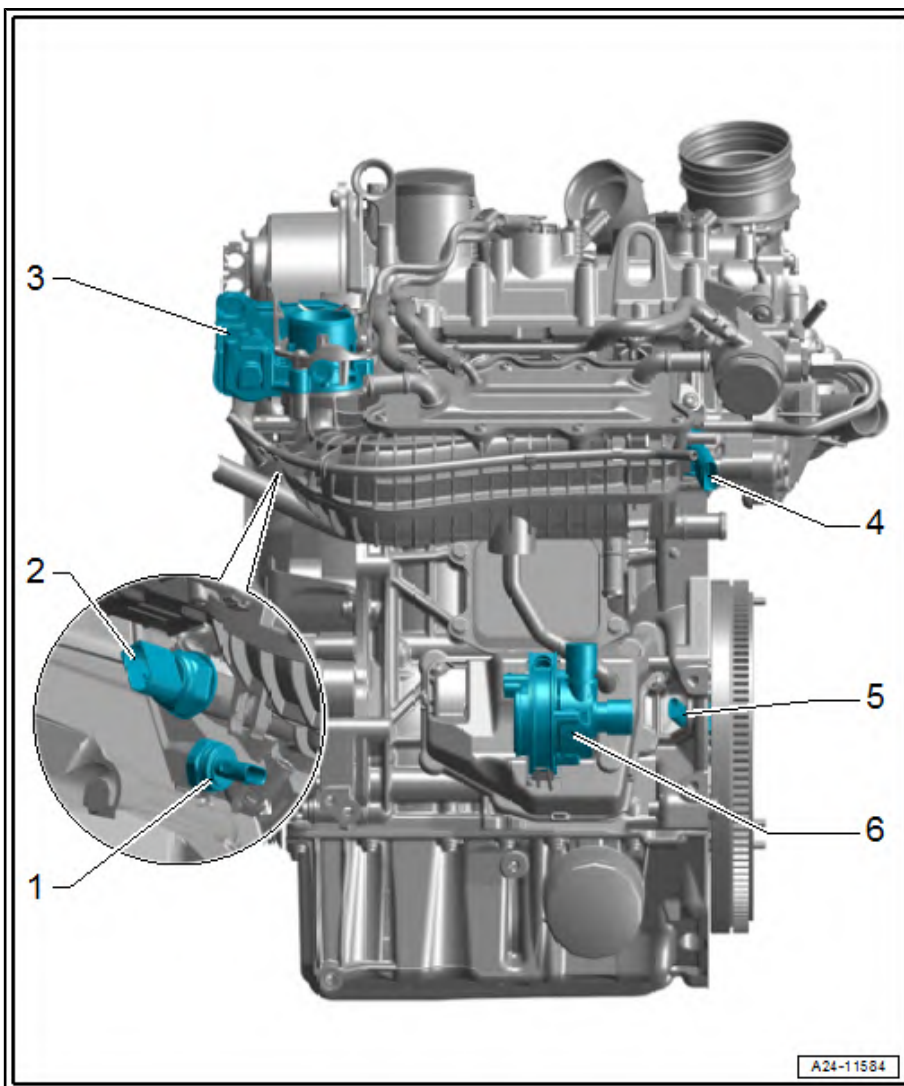
- ❑ Assembly overview
⇒ [“4.1 Assembly overview - oil filter, oil pressure switch”, page 251](#)

2 - Fuel pressure sender - G247-

- ❑ Assembly overview
⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 383](#)

3 - Throttle valve module - GX3-

- ❑ Consisting of:
Throttle valve module - J338-
Throttle valve drive (electric power control) - G186-
Angle sender for throttle valve drive - G187-
Throttle valve drive angle sender 2 (electric power control) - G188-
- ❑ Removing and installing
⇒ [“4.3 Removing and installing throttle valve module GX3”, page 402](#)
- ❑ Cleaning
⇒ [“4.4 Cleaning throttle valve module GX3”, page 403](#)
- ❑ Assembly overview
⇒ [“4.1 Assembly overview - intake manifold”, page 399](#)



4 - Intake manifold sender - GX9-

- ❑ Consisting of:
Intake manifold pressure sender - G71-
Intake manifold temperature sender - G72-
- ❑ Assembly overview ⇒ [“4.1 Assembly overview - intake manifold”, page 399](#)

5 - Engine speed sender - G28-

- ❑ Assembly overview ⇒ [“1.1 Assembly overview - ignition system”, page 464](#)

6 - Continued coolant circulation pump - V51-

- ❑ Assembly overview ⇒ [“2.2 Assembly overview - electric coolant pump”, page 280](#)

1.1.6 Overview of fitting locations - engine, exhaust side

1 - Oil level and oil temperature sender - G266-

- Assembly overview
⇒ [“1.1 Assembly overview - sump/oil pump”, page 233](#)

2 - Knock sensor 1 - G61-

- Assembly overview
⇒ [“1.1 Assembly overview - ignition system”, page 464](#)

3 - Coolant temperature sender - G62-

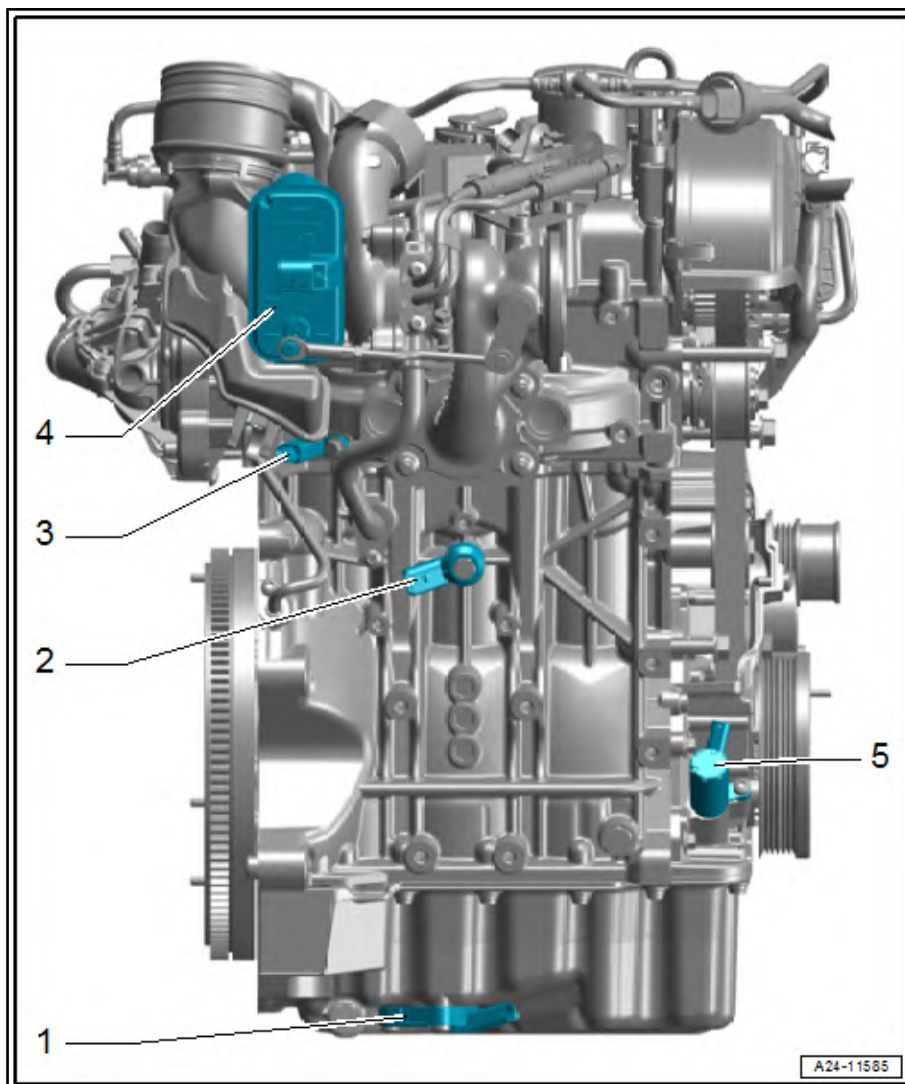
- Assembly overview
⇒ [“2.3 Assembly overview - coolant temperature sender”, page 282](#)

4 - Charge pressure positioner - V465-

- Assembly overview
⇒ [“1.1 Assembly overview - turbocharger”, page 351](#)

5 - Valve for oil pressure control - N428-

- Assembly overview
⇒ [page 251](#)



2 Injectors

⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 383](#)

⇒ [“2.2 Removing and installing fuel rail”, page 385](#)

⇒ [“2.3 Removing and installing injectors”, page 386](#)

⇒ [“2.4 Cleaning injectors”, page 391](#)

2.1 Assembly overview - fuel rail with injectors

⇒ [“2.1.1 Assembly overview - fuel rail with injectors, Version 1”, page 383](#)

⇒ [“2.1.2 Assembly overview - fuel rail with injectors, Version 2”, page 384](#)

2.1.1 Assembly overview - fuel rail with injectors, Version 1

1 - Fuel distributor

- ☐ Removing and installing
⇒ [“2.2 Removing and installing fuel rail”, page 385](#)

2 - Bolt

- ☐ Renew after removal
- ☐ Tighten alternately in stages; final torque 9 Nm
- ☐ 2 off
- ☐ M6x55

3 - Fuel pressure sender - G247-

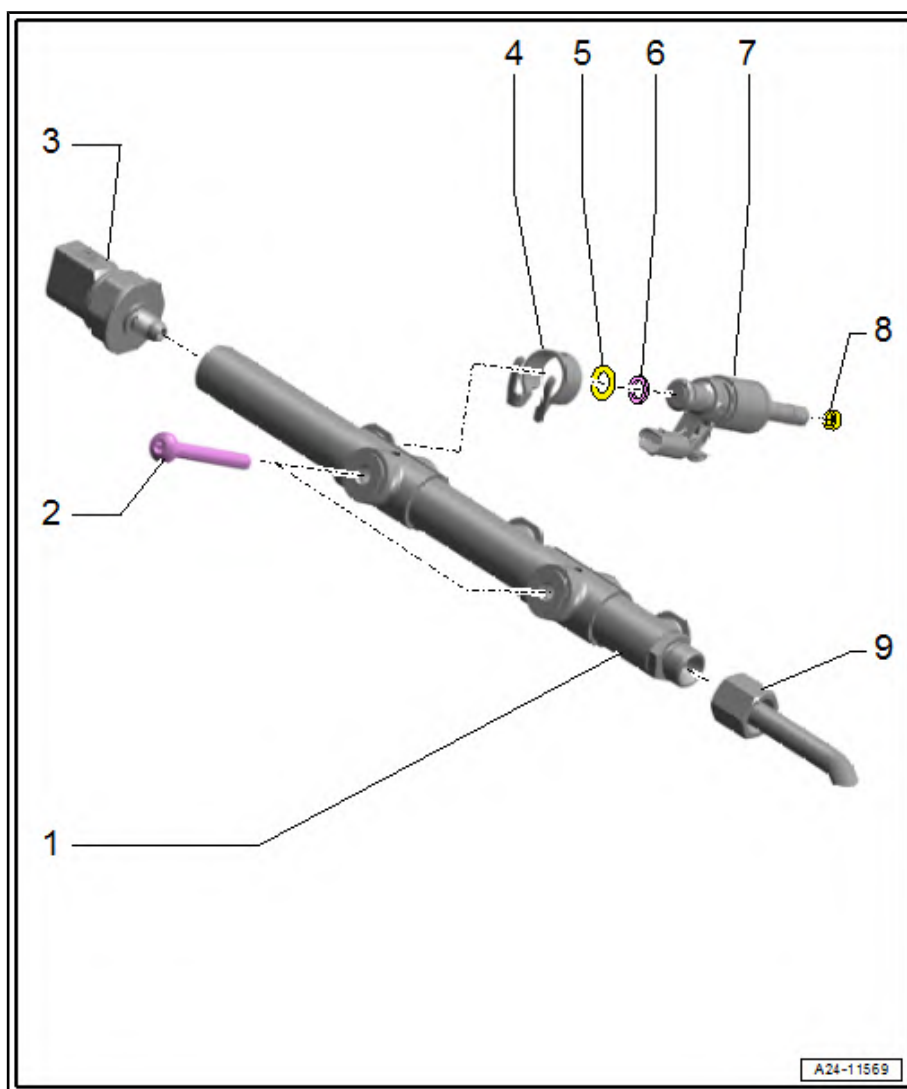
- ☐ Checking
⇒ [“5.2 Checking fuel pressure sender G247”, page 406](#)
- ☐ Removing and installing
⇒ [“5.1 Removing and installing fuel pressure sender G247”, page 405](#)
- ☐ Lubricate taper lightly with clean engine oil; do not lubricate thread
- ☐ 22 Nm

4 - Support ring

- ☐ Renew after removal
- ☐ Fuel rail exerts force which secures injector in cylinder head via this support ring
- ☐ Clipped to -item 7-

5 - O-ring

- ☐ Renew after removal
- ☐ Lubricate with clean engine oil.



6 - Spacer ring

- ☐ Renew if damaged

7 - Injector

- ☐ Removing and installing ⇒ [“2.3 Removing and installing injectors”, page 386](#)

8 - Combustion chamber seal

- ☐ Do not treat with grease or other lubricant.
- ☐ Renewing ⇒ [“2.3 Removing and installing injectors”, page 386](#)

9 - High-pressure pipe

- ☐ Renew after removal
- ☐ Unions must be free of damage
- ☐ Do not alter shape.
- ☐ Removing and installing ⇒ [“7.3 Removing and installing high-pressure pipe”, page 427](#)
- ☐ Lubricate thread of union nuts with clean engine oil
- ☐ 16 Nm + 45°

2.1.2 Assembly overview - fuel rail with injectors, Version 2

1 - Fuel distributor

- ☐ Removing and installing
⇒ [“2.2 Removing and installing fuel rail”, page 385](#)

2 - Bolt

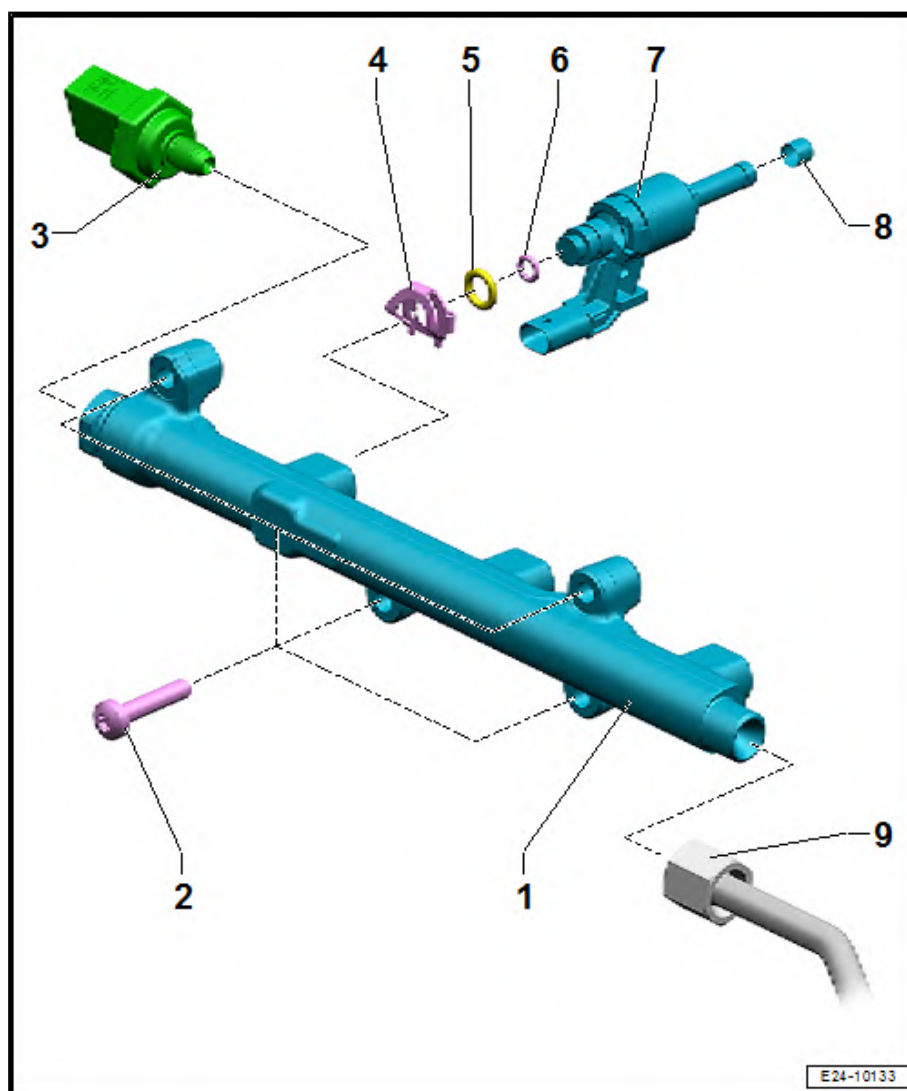
- ☐ Renew after removal
- ☐ Tighten alternately in stages; final torque 9 Nm
- ☐ 2 off
- ☐ M6x30

3 - Fuel pressure sender - G247-

- ☐ Checking
⇒ [“5.2 Checking fuel pressure sender G247”, page 406](#)
- ☐ Removing and installing
⇒ [“5.1 Removing and installing fuel pressure sender G247”, page 405](#)
- ☐ Lubricate taper lightly with clean engine oil; do not lubricate thread
- ☐ 22 Nm

4 - Support ring

- ☐ Renew after removal
- ☐ Fuel rail exerts force which secures injector in cylinder head via this support ring
- ☐ Clipped to -item 7-



E24-10133

5 - O-ring

- ☐ Renew after removal
- ☐ Lubricate with clean engine oil.

6 - Spacer ring

- ☐ Renew if damaged

7 - Injector

- ☐ Removing and installing ⇒ [“2.3 Removing and installing injectors”, page 386](#)

8 - Combustion chamber seal

- ☐ Do not treat with grease or other lubricant.
- ☐ Renewing ⇒ [“2.3 Removing and installing injectors”, page 386](#)

9 - High-pressure pipe

- ☐ Renew after removal
- ☐ Unions must be free of damage
- ☐ Do not alter shape.
- ☐ Removing and installing ⇒ [“7.3 Removing and installing high-pressure pipe”, page 427](#)
- ☐ Lubricate thread of union nuts with clean engine oil
- ☐ 16 Nm + 45°

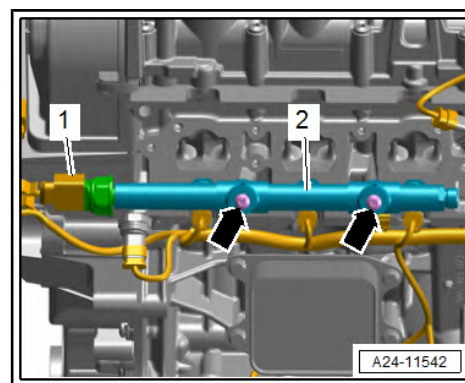
2.2 Removing and installing fuel rail

Removing

- Remove intake manifold ⇒ [page 400](#) .
- Remove high-pressure pipe ⇒ [page 427](#) .
- Seal lines so that no dirt can enter fuel system.

Vehicles with radiator, version 1

- Unplug electrical connector -1-.
- Unscrew bolts -arrows-, and carefully pull fuel rail -2- off injectors.



Vehicles with radiator, version 2

- Unplug electrical connector -1-.
- Unscrew bolts -arrows-, and carefully pull fuel rail -2- off injectors.

Installing

Install in reverse order of removal, observing the following:



Note

Renew O-ring ⇒ [Item 5 \(page 383\)](#) .

- Apply mountings on fuel rail onto injectors.
- Press fuel rail onto injectors as far as stop (first on right side, then on left side).
- Firmly press down fuel rail in area of bracket and screw in bolts by two full turns.
- Tighten bolts to specified torque.
- Install high-pressure pipe
⇒ [“7.3 Removing and installing high-pressure pipe”, page 427](#) .
- Install intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 400](#) .

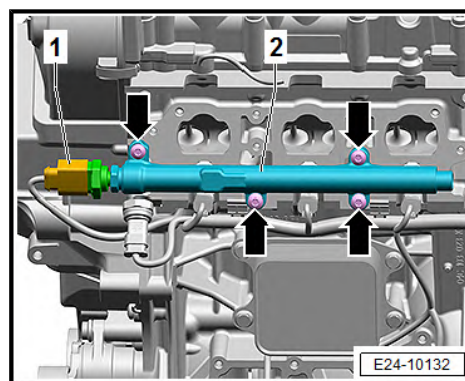
Specified torques

- ♦ ⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 383](#)

2.3 Removing and installing injectors

Special tools and workshop equipment required

- ♦ Tool set for FSI engines - T10133 C- with -T10133/16A- and -T10133/19-

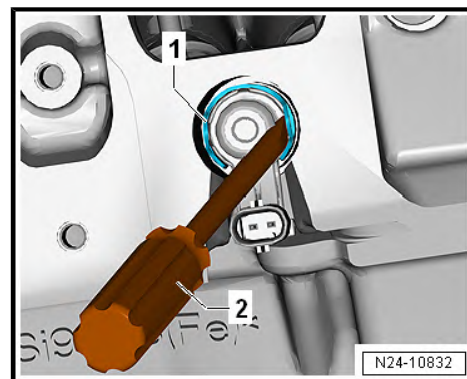


Note

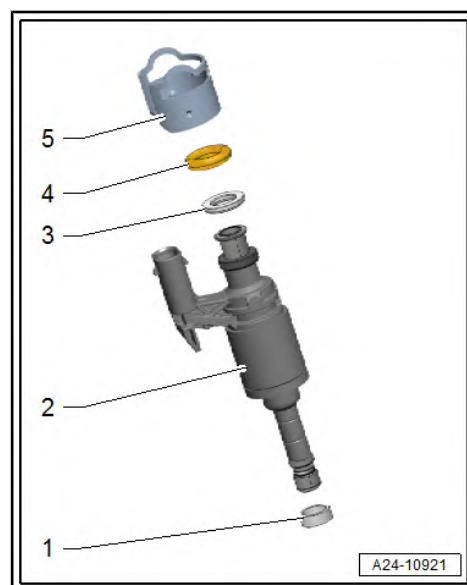
Injectors must only be removed when the engine is cold.

Removing

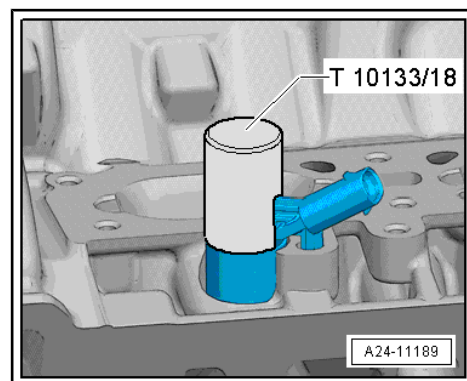
- Remove fuel rail
⇒ [“2.2 Removing and installing fuel rail”, page 385](#) .
- Unplug electrical connector from corresponding injector.
- Lever support ring -1- off injector using a screwdriver -2-.



- Remove O-ring -4- from injector -2-.



- Fit impact sleeve -T10133/18- over injector.

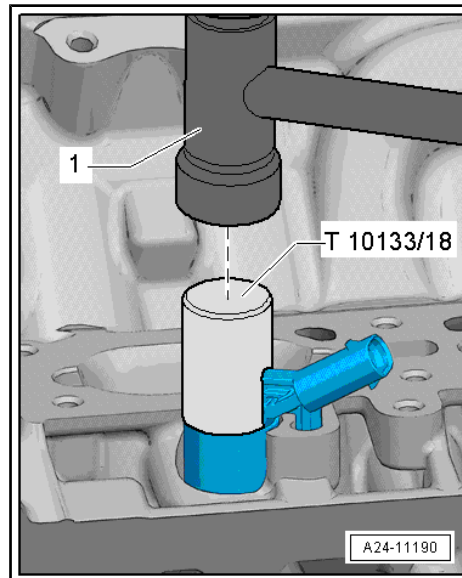


- Carefully loosen injector with light blows of a plastic hammer
-1- onto impact sleeve.



Note

- ◆ Use a torque wrench to pull out the injector.
- ◆ Set the torque wrench to 5 Nm.
- ◆ If the torque limit is exceeded, the injector may become damaged.

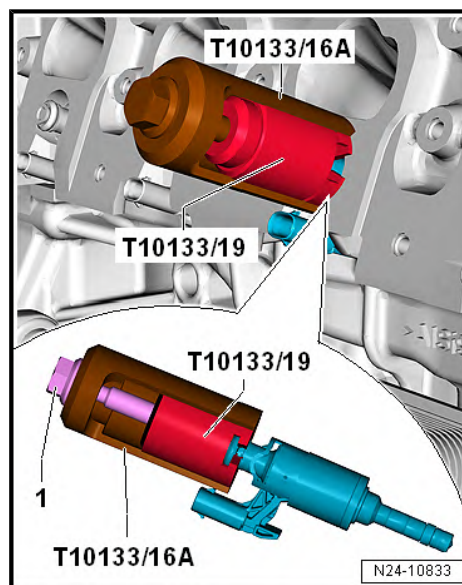


- Fit puller -T10133/19- to groove on injector.
- Fit removing tool -T10133/16A- to puller.
- Pull out injector by screwing in bolt -1- on puller.
- If the torque limit of »5 Nm« has been reached and the injector still can't be pulled out, remove the puller.
- Use the impact sleeve again to loosen the injector.
- Repeat the procedure on each injector.



Note

Always renew the combustion chamber seal prior to reinstalling the injector.



Dismantling injectors:

- Pull support ring -5- and spacer ring -3- off injector -2-.
- Carefully remove old combustion chamber seal -1-. To do so, cut the ring open using a knife, or spread it with a small screwdriver, and pull it off towards front.



Note

Take care not to damage the groove of injector. The injector must be renewed if the groove is damaged.

Installing

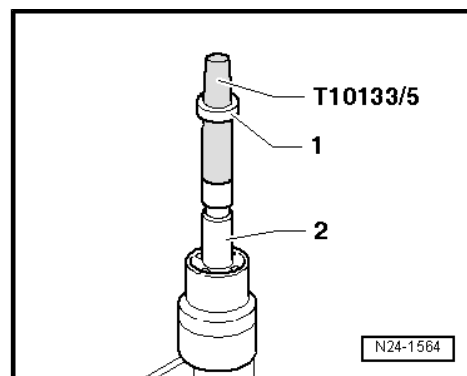
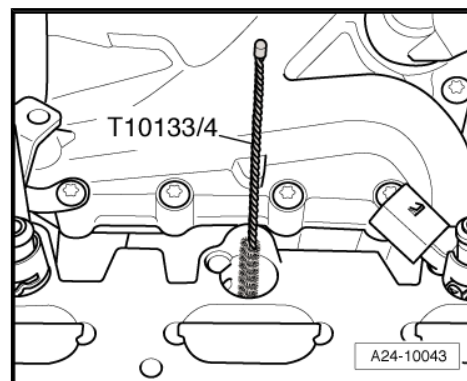
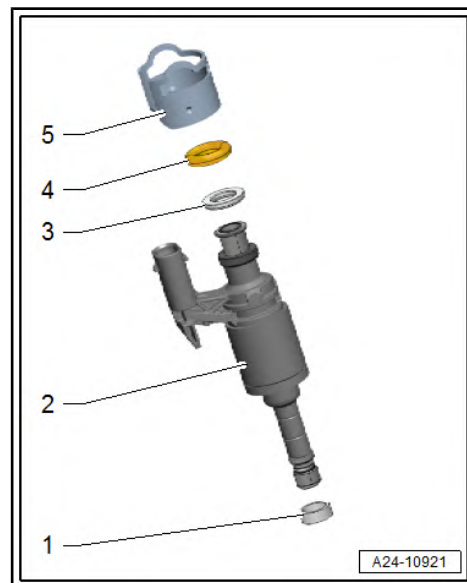


Note

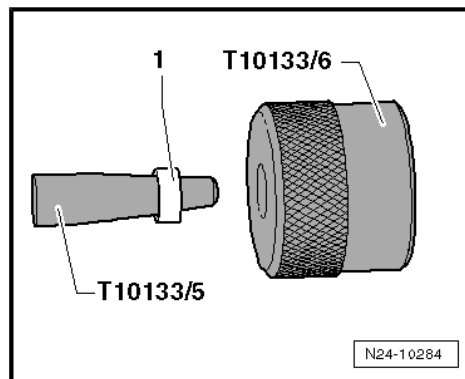
- ◆ Use the entire repair kit when installing.
- ◆ Renew support rings after each removal.
- ◆ Renew combustion chamber seal before reinstalling the injector.
- ◆ Lightly lubricate the new O-rings for injectors with clean engine oil.
- ◆ Renew spacer ring if damaged.

- Clean hole in cylinder head using nylon brush -T10133/4- .
- When reinstalling injector, remove any combustion residue from groove for combustion chamber seal and from injector shaft using a clean cloth.

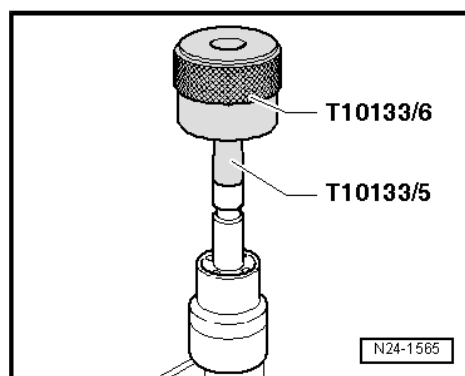
- Fit assembly cone -T10133/5- with a new combustion chamber ring seal -1- on injector -2-.



- Slide combustion chamber ring seal with assembly sleeve - T10133/6- onto assembly cone -T10133/5- as far as it will go.

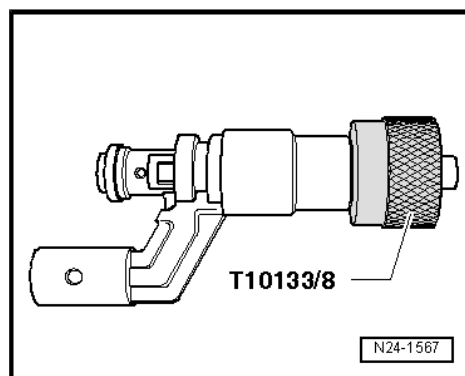
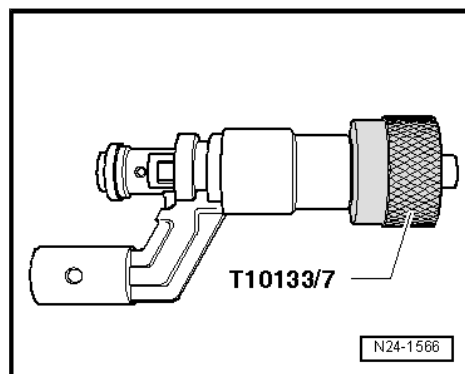


- Turn assembly sleeve -T10133/6- around and push combustion chamber seal into the respective groove.



Note

- ♦ *The combustion chamber seal is widened when it is pushed onto the injector. It must be compressed again after sliding on. This is done in two stages as described below.*
- ♦ *Push calibration sleeve -T10133/7- onto injector to stop and simultaneously turn it slightly (approx. 180°).*
- Twist calibration sleeve -T10133/7- in opposite direction and pull it off.
- Push calibration sleeve -T10133/8- onto injector to stop and simultaneously turn it slightly (approx. 180°).
- Twist calibration sleeve -T10133/8- in opposite direction and pull it off.

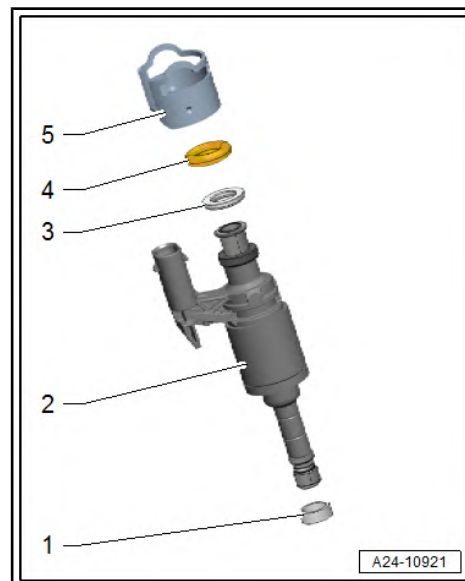


- Before installing injector -2- moisten new O-ring -4- with clean engine oil.

Note

The combustion chamber seal -1- must not be lubricated.

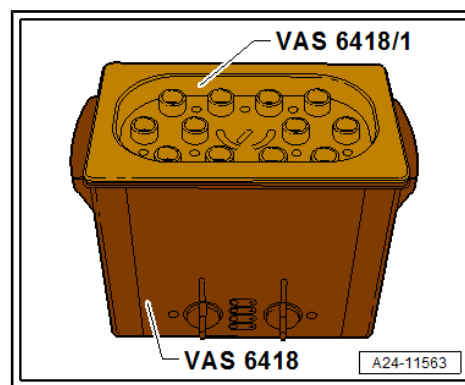
- Electrical connector of injector must engage in respective recess in cylinder head.
- The injector should enter smoothly. Where necessary, wait until the combustion chamber seal has contracted sufficiently.
- Push injector by hand as far as it will go into the hole of the cylinder head (which must be free of oil and grease). Ensure injectors are positioned correctly in cylinder head.
- Installing fuel rail
⇒ ["2.2 Removing and installing fuel rail", page 385](#) .
- Then replace the injection valves which have to be adapted again.
- Connect a ⇒ Vehicle diagnostic tester.
- Switch on ignition, select and execute following menu options on ⇒ Vehicle diagnostic tester:
- ◆ 0001 - Delete adaption values of the injection valves



2.4 Cleaning injectors

Special tools and workshop equipment required

- ◆ Ultrasonic cleaning device - VAS 6418-



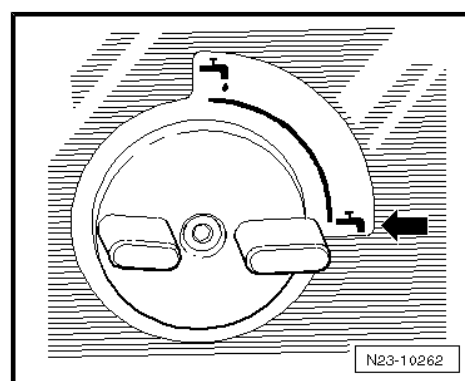
- ◆ Mounting plate for injection modules - VAS 6418/1-
- ◆ Cleaning agents: ⇒ Electronic parts catalogue

Cleaning

- Close drain tap -arrow- of ultrasonic cleaning unit - VAS 6418- at right-hand side of housing.
- Fill ultrasonic cleaning unit with 2120 ml of water which was allowed to stand for a while and with cleaning fluid - VAS 6418/2- .

Mixing ratio for cleaning fluid

- 2100 ml of water which was allowed to stand for a while and 20 ml of cleaning fluid - VAS 6418/2- .
- Remove injectors ⇒ [page 386](#) .



- Fit mounting plate for injection modules - VAS 6418/1- onto cleaning unit.



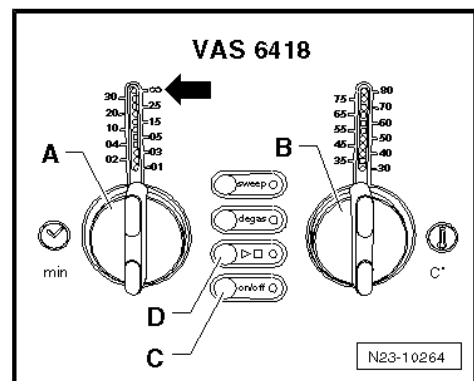
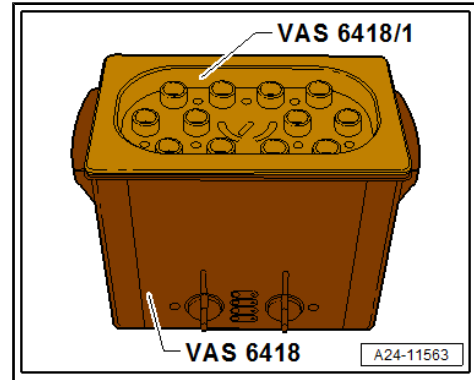
Note

- ◆ *Before starting ultrasonic cleaning unit - VAS 6418- , it is essential that the safety information described in the operating manual is observed.*
- ◆ *The ideal fluid level is reached when the cleaning agent is approx. 1 to 4 mm above the base of the support plate. The ultrasonic cleaner - VAS 6418- could become damaged if the fluid level is too low.*
- Insert injectors into guides of mounting plate for injection modules - VAS 6418/1- as far as stop.
- Switch on cleaning unit by pressing **[on/off]** button -C-.
- Use rotary knob -A- to set cleaning time to 30 minutes.
- Set rotary knob -B- to a temperature of 50°C.
- Press button **[▶]** -D- to start the cleaning process.



Note

- ◆ *Temperature-controlled cleaning is now activated. During the warm-up period, ultrasonic waves are activated to mix the cleaning fluid. Once the preselected temperature is reached, the ultrasonic waves are switched to continuous operation.*
- ◆ *The cleaning time must be at least 30 minutes and cleaning only starts at a temperature of at least 50°C.*
- Each time after cleaning injectors (combustion chamber), renew combustion chamber seal (Teflon ring seal)
⇒ ["2.3 Removing and installing injectors", page 386](#) .



3 Air filter

⇒ [“3.1 Assembly overview - air filter housing”, page 393](#)

⇒ [“3.2 Removing and installing air filter housing”, page 397](#)

3.1 Assembly overview - air filter housing

⇒ [“3.1.1 Assembly overview - air filter housing, Ateca, Leon 2013”, page 393](#)

⇒ [“3.1.2 Assembly overview - air filter housing, Ibiza 2018, Arona”, page 395](#)

⇒ [“3.1.3 Assembly overview - air filter housing, Toledo 2013, Ibiza 2016”, page 396](#)

3.1.1 Assembly overview - air filter housing, Ateca, Leon 2013

1 - Air duct (bottom section)

- ☐ On lock carrier

2 - Air duct

- ☐ On lock carrier

3 - Cover

- ☐ For air duct

4 - Bolt

- ☐ 1.5 Nm

5 - Clamp

- ☐ When installing, ensure correct seating of spring-type clip on chamfer of hose

6 - Bolt

- ☐ 5 Nm

7 - Bump stop

- ☐ check for damage and renew if necessary
- ☐ Make sure it is firmly seated after installation

8 - Air intake hose

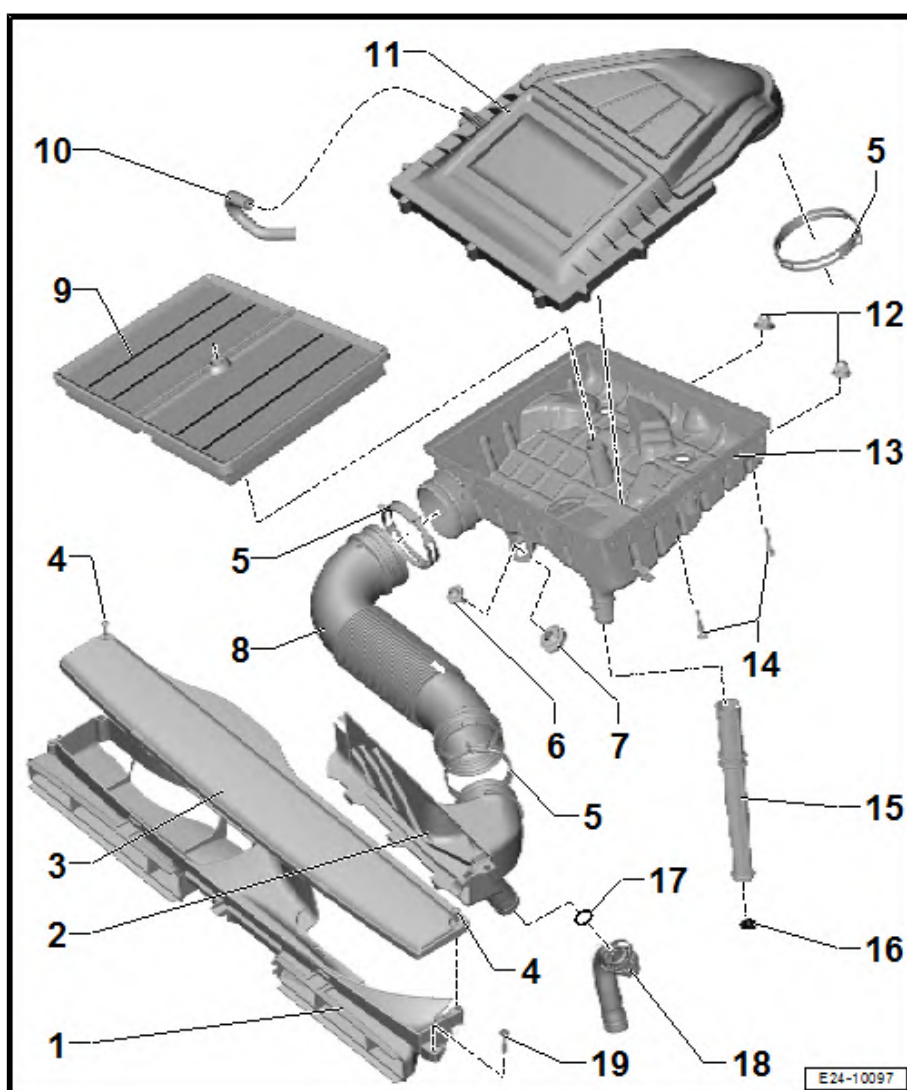
- ☐ With installation position

9 - Air filter element

- ☐ Use only genuine air filter elements ⇒ Electronic Parts Catalogue
- ☐ For change intervals refer to ⇒ Maintenance tables
- ☐ Removing and installing Ateca ⇒ Maintenance ; Booklet KH1
- ☐ Removing and installing Leon 2013 ⇒ Maintenance ; Booklet 501

10 - Hose

- ☐ For crankcase ventilation.



11 - Air filter upper part

- ☐ Remove dirt, leaves and salt residues

12 - Bump stop

- ☐ check for damage and renew if necessary
- ☐ Make sure it is firmly seated after installation

13 - Air filter lower part

- ☐ Remove dirt, leaves and salt residues

14 - Bolt

- ☐ 9 off
- ☐ 1.5 Nm

15 - Water drain hose

- ☐ Cleaning

16 - Filter**17 - O-ring**

- ☐ Renew if damaged

18 - Water drain hose

- ☐ With valve
- ☐ Cleaning

19 - Bolt

- ☐ 2 off
- ☐ 2 Nm

3.1.2 Assembly overview - air filter housing, Ibiza 2018, Arona

1 - Air filter element

- ☐ Use only genuine air filter elements ⇒ Electronic Parts Catalogue
- ☐ For change intervals refer to ⇒ Maintenance tables
- ☐ Removing and installing ⇒ Maintenance ; Booklet KJ1

2 - Hose

- ☐ For crankcase ventilation.

3 - Air filter upper part

- ☐ Remove dirt, leaves and salt residues

4 - Clamp

- ☐ When installing, ensure correct seating of spring-type clip on chamfer of hose

5 - Bump stop

- ☐ check for damage and renew if necessary
- ☐ Make sure it is firmly seated after installation

6 - Bolt

- ☐ 5 Nm

7 - Bump stop

- ☐ check for damage and renew if necessary
- ☐ Make sure it is firmly seated after installation

8 - Bolt

- ☐ 9 off
- ☐ 1.5 Nm

9 - Water drain hose

- ☐ Cleaning

10 - Filter

11 - Water drain hose

- ☐ Cleaning

12 - O-ring

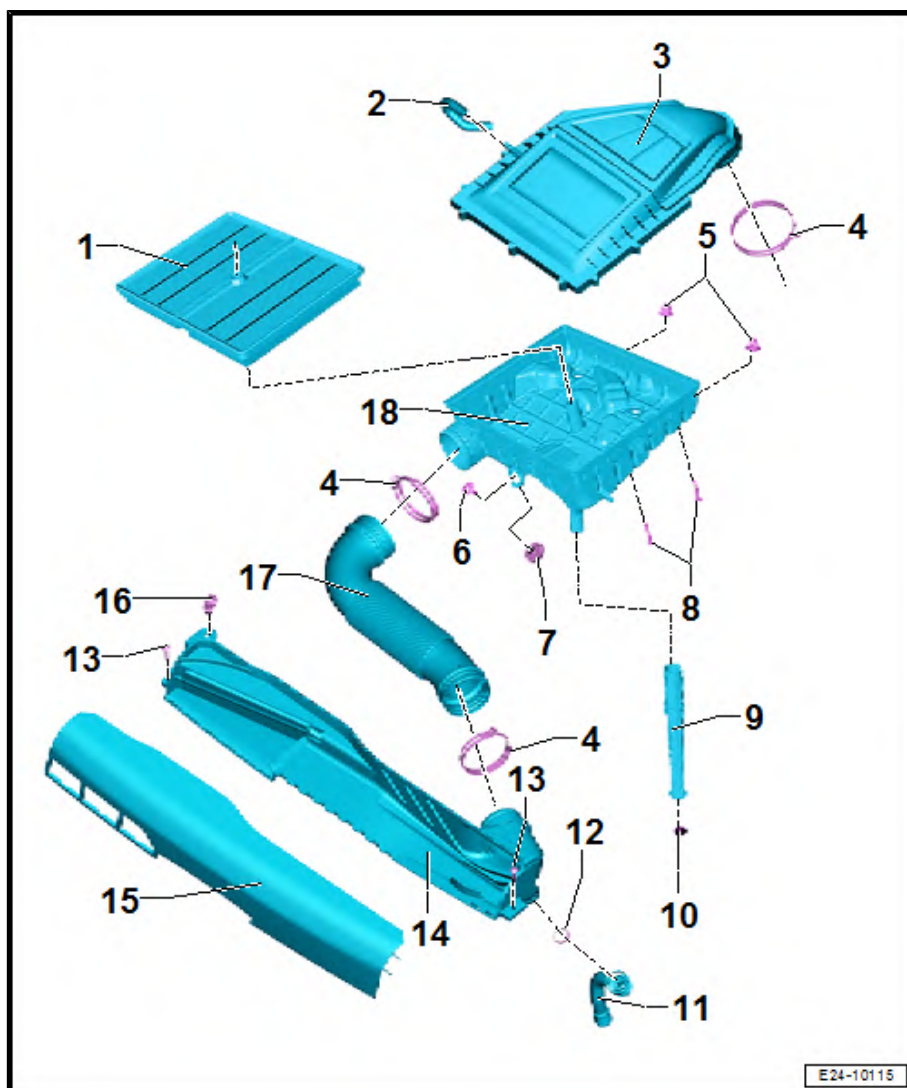
- ☐ Renew if damaged

13 - Bolt

- ☐ 2 off
- ☐ 2 Nm

14 - Air duct (bottom section)

- ☐ On lock carrier



E24-10115

15 - Cover

- ☐ For air duct

16 - Front bonnet rod

17 - Air intake hose

- ☐ With installation position

18 - Air filter lower part

- ☐ Remove dirt, leaves and salt residues

3.1.3 Assembly overview - air filter housing, Toledo 2013, Ibiza 2016

1 - Air filter element

- ☐ Use only genuine air filter elements ⇒ Electronic parts catalogue (ETKA) .
- ☐ For change intervals refer to ⇒ Maintenance tables
- ☐ Removing and installing Ibiza 2016 ⇒ Maintenance ; Booklet 603
- ☐ Removing and installing Toledo 2013 ⇒ Maintenance ; Booklet KG1

2 - Hose

- ☐ For crankcase ventilation.

3 - Air filter upper part

- ☐ Remove dirt, leaves and salt residues

4 - Clamp

- ☐ When installing, ensure correct seating of spring-type clip on chamfer of hose

5 - Bump stop

- ☐ check for damage and renew if necessary
- ☐ Make sure it is firmly seated after installation

6 - Air filter lower part

- ☐ Remove dirt, leaves and salt residues

7 - Bolt

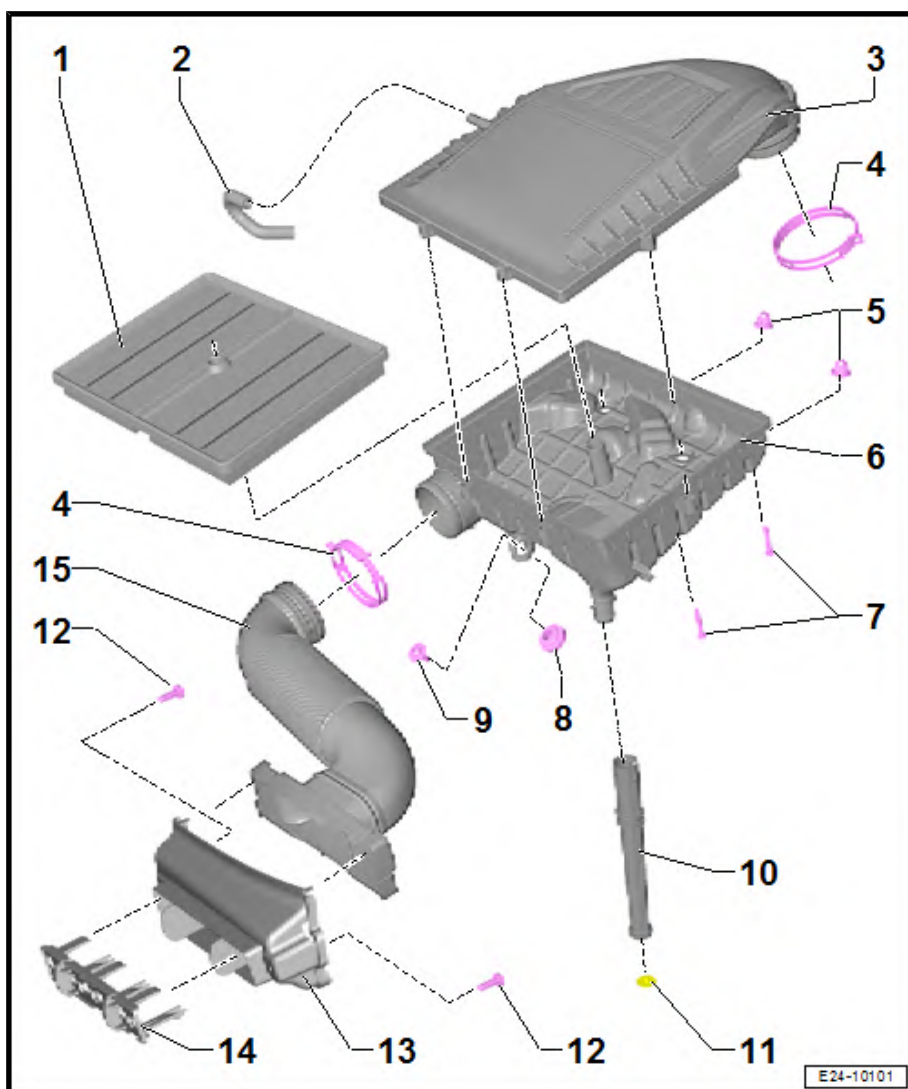
- ☐ 9 off
- ☐ 1.5 Nm

8 - Bump stop

- ☐ check for damage and renew if necessary
- ☐ Make sure it is firmly seated after installation

9 - Bolt

- ☐ 5 Nm



10 - Water drain hose

- ☐ Cleaning

11 - Filter

12 - Bolt

- ☐ 1.5 Nm

13 - Air duct

- ☐ On lock carrier

14 - Intake baffle plate

15 - Air intake hose

3.2 Removing and installing air filter housing

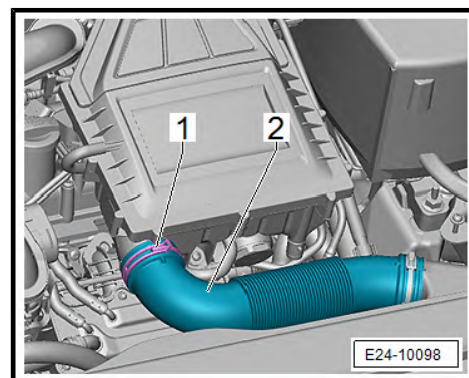
Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-

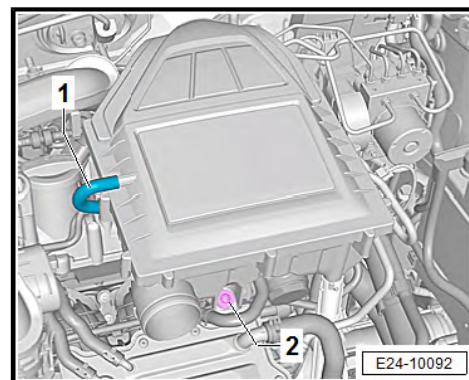


Removing

- Loosen clip -1-, and pull down hose -2-.



- Pull crankcase breather hose off -1-.
- Remove bolt -2-.



- Unclip vacuum line -1- from air filter housing.
- Loosen clamp -2- and remove intake hose for turbocharger.
- Remove air filter housing upwards.

Installing

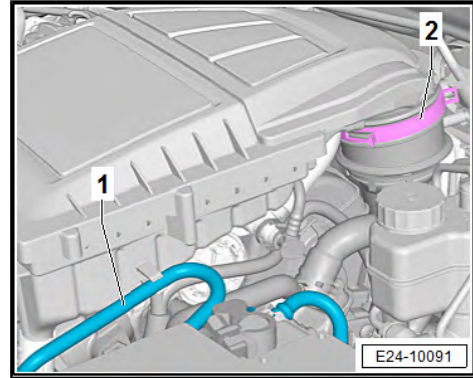


Note

- ◆ *If the air filter element is very dirty or wet, particles of dirt or water may reach the components and falsify the measured air mass value. This would lead to loss of power, since a smaller injection quantity is calculated.*
- ◆ *Make sure to use the genuine air filter element.*
- ◆ *Air filter housings must be clean.*
- ◆ *Hose unions and air intake pipes/hoses must be free of oil and grease when installing.*
- ◆ *Use silicone-free lubricant to install the air intake hoses.*
- ◆ *Secure all hose connections with hose clips corresponding to the series production status ⇒ Electronic Parts Catalogue (ETKA) .*
- ◆ *In order to avoid impermissible operation: When using compressed air to blow out the air filter housing, cover the critical air-carrying components such as air pipes, etc. with a clean cloth.*
- ◆ *Observe the regulations for disposal.*
- Remove salt residues, dirt and leaves from top and bottom part of air filter housing using a vacuum cleaner.
- Blow out water drain with compressed air.

Specified torques

- ◆ Securing bolt for air filter housing
⇒ ["3.1 Assembly overview - air filter housing", page 393](#)



4 Intake manifold

⇒ [“4.1 Assembly overview - intake manifold”, page 399](#)

⇒ [“4.2 Removing and installing intake manifold”, page 400](#)

⇒ [“4.3 Removing and installing throttle valve module GX3”, page 402](#)

⇒ [“4.4 Cleaning throttle valve module GX3”, page 403](#)

4.1 Assembly overview - intake manifold

1 - Coolant pipe

- ☐ Clipped onto intake manifold.

2 - Bolt

- ☐ 8 Nm

3 - Intake manifold

- ☐ Combined with charge air cooler
- ☐ Removing and installing
⇒ [“4.2 Removing and installing intake manifold”, page 400](#)

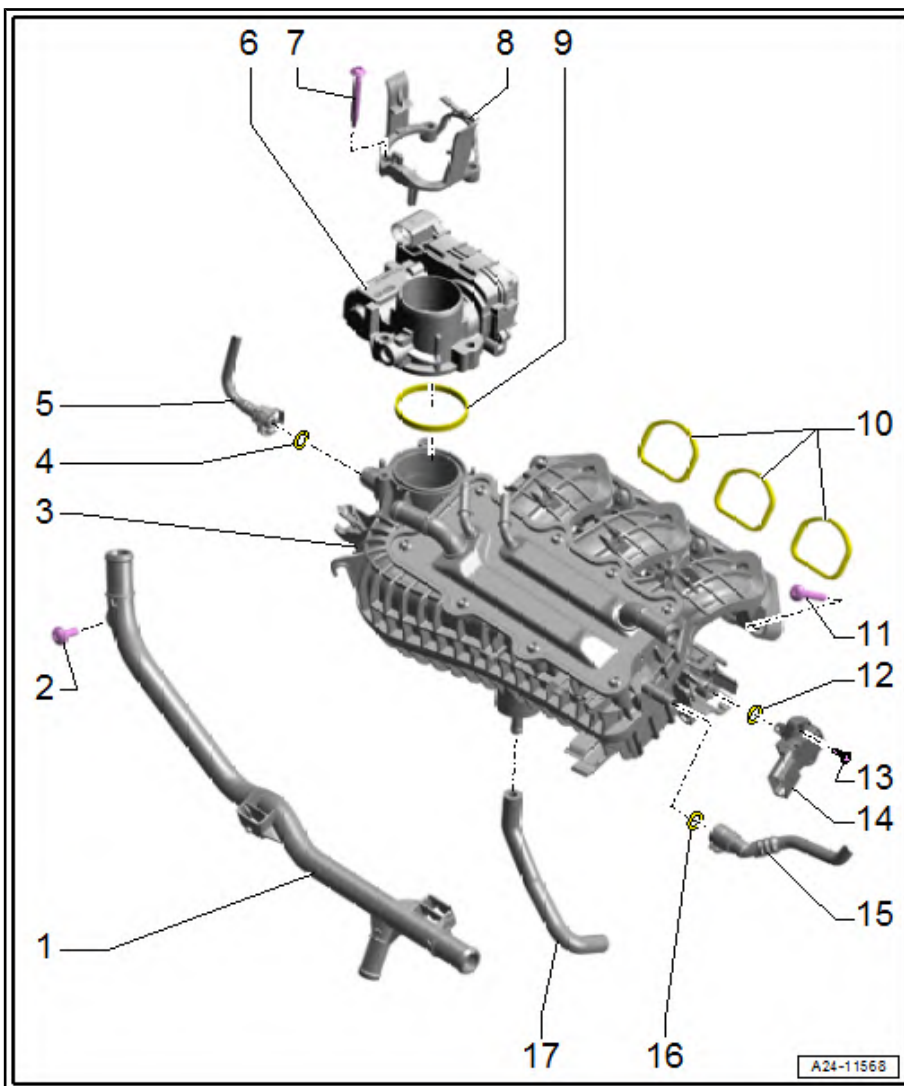
4 - O-ring

- ☐ If damaged, renew entire vacuum line
⇒ [Item 5 \(page 399\)](#)

5 - Vacuum line

6 - Throttle valve module - GX3-

- ☐ Removing and installing
⇒ [“4.3 Removing and installing throttle valve module GX3”, page 402](#)
- ☐ Cleaning
⇒ [“4.4 Cleaning throttle valve module GX3”, page 403](#)
- ☐ After throttle valve control module - GX3- has been replaced, it must be re-adapted to engine control unit - J623- . Use vehicle diagnostic tester for this.



7 - Bolt

- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it screws into old thread Then tighten bolt to torque.
- ☐ 7 Nm

8 - Retaining clip

- ☐ For air pipe.

9 - O-ring

- ☐ Renew after removal

10 - Seals

- ☐ Renew after removal

11 - Bolt

- ☐ Specified torque and tightening sequence ⇒ [page 400](#)

12 - O-ring

- ☐ Renew after removal

13 - Bolt

- ☐ Repair solution when retaining tabs have broken off
- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it screws into old thread Then tighten bolt to torque.
- ☐ 7 Nm

14 - Intake manifold sender - GX9-

- ☐ Removing and installing ⇒ ["5.3 Removing and installing intake manifold sender GX9 ", page 408](#)

15 - Vacuum line

16 - O-ring

- ☐ If damaged, renew entire vacuum line ⇒ [Item 15 \(page 400\)](#)

17 - Hose

- ☐ For crankcase ventilation.

Intake manifold - specified torque and tightening sequence

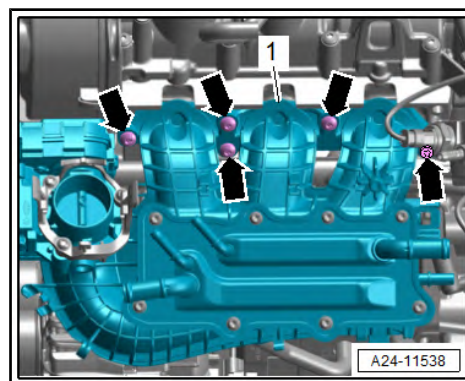
– Tighten bolts in stages as follows:

Stage	Bolts	Specified torque
1.	-Arrows-	Starting in centre, screw in bolts alternately by hand until they make contact
2.	-Arrows-	Starting in centre, screw in bolts alternately to 8 Nm



Note

-Items 1, 2- can be disregarded.



4.2 Removing and installing intake manifold

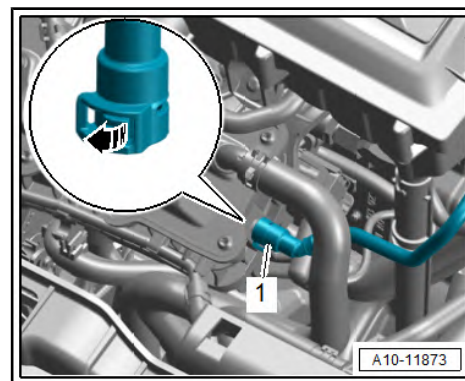
Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-



Removing

- Drain coolant
⇒ [“1.3 Draining and adding coolant”, page 260](#) .
- Press release buttons -arrow-, and pull off line -1-.
- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .
- Remove air intake pipe
⇒ [“2.5 Removing and installing air pipe”, page 368](#)

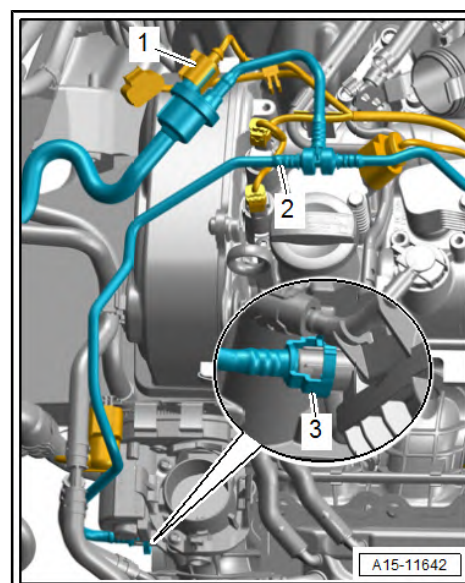


- Remove line -2- for activated charcoal filter system. To do this, press release button -3- on both sides.



Note

Disregard item -1-.

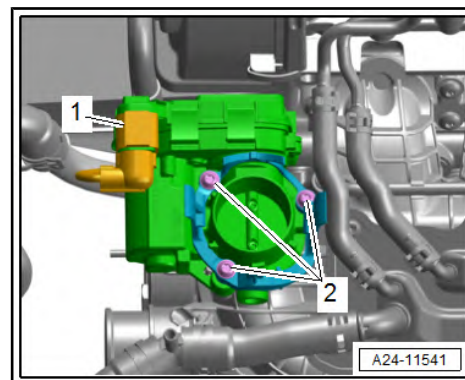


- Disconnect connector -1- for throttle valve module - GX3- .

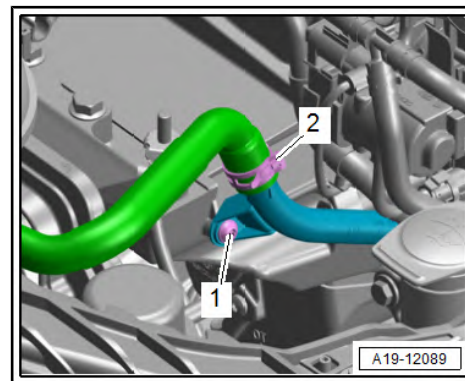


Note

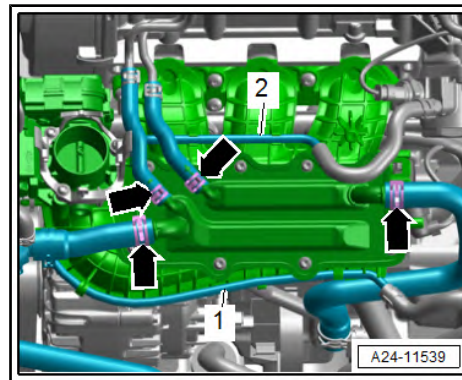
Disregard item -2-.



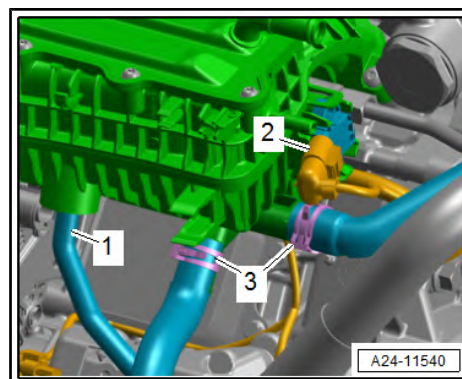
- Unscrew bolt -1-.
- Release hose clip -2- and remove coolant hose.



- Release hose clips -arrows-, and remove coolant hoses.
- Lay fuel line -2- and coolant line -1- at intake manifold to one side.



- Disconnect connector -2- for intake manifold sender - GX9- .
- Pull off crankcase breather hose -1-.
- Loosen the hose clips -3-, remove the coolant hoses.



- Remove bolts -arrows-.
- Remove intake manifold -1-.

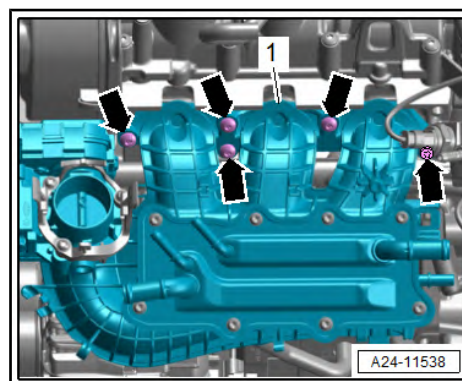
Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Renew seals and O-rings.*
- ◆ *Do not reuse the dirty coolant.*
- Add coolant ⇒ [“1.3 Draining and adding coolant”, page 260](#) .



Specified torques

- ◆ ⇒ [“3.1 Assembly overview - coolant pipes”, page 302](#)
- ◆ ⇒ [“3.1 Assembly overview - air filter housing”, page 393](#)
- ◆ ⇒ [“4.1 Assembly overview - intake manifold”, page 399](#)

4.3 Removing and installing throttle valve module - GX3-

Throttle valve module - GX3- consists of

- ◆ Throttle valve module - J338-
- ◆ Throttle valve drive (electric power control) - G186-
- ◆ Angle sender for throttle valve drive - G187-
- ◆ Throttle valve drive angle sender 2 (electric power control) - G188-

Removing

- Remove air intake pipe
⇒ [“2.5 Removing and installing air pipe”, page 368](#) .
- Disconnect connector -1- for throttle valve module - GX3- .
- Unscrew bolts -2- and remove throttle valve module - GX3- .

Installing

Install in reverse order of removal, observing the following:



Note

Renew O-rings after removal.

- After throttle valve control module - GX3- has been replaced, it must be re-adapted to engine control unit - J623- .
- Connect a ⇒ Vehicle diagnostic tester.
- Switch on ignition and select and run the following menu items at ⇒ Vehicle diagnostic tester:

◆ 0001 - Delete learnt values

◆ 0001 - Adaption of throttle valve module - J338

Specified torques

- ◆ ⇒ [“4.1 Assembly overview - intake manifold”, page 399](#)

4.4 Cleaning throttle valve module - GX3-



Note

- ◆ If a new engine control unit - J623- is installed, the throttle valve module must be adapted.
- ◆ Contamination and coking in end stop can result in incorrect adaptation values.
- ◆ When cleaning the throttle valve nozzle it must not be scratched.

Special tools and workshop equipment required

- ◆ Acetone (commercially available)
- ◆ Brush

Procedure

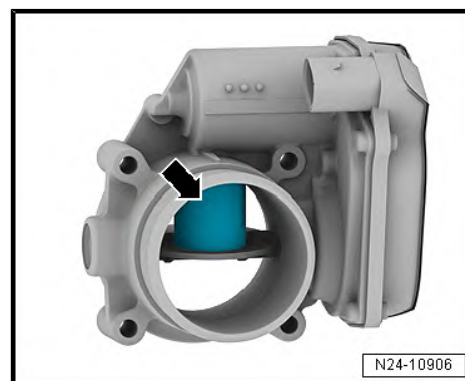
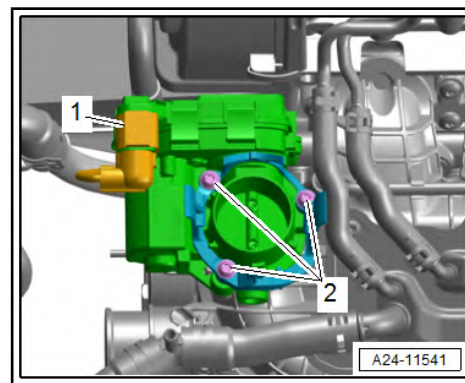
- Remove throttle valve module - GX3-
⇒ [“4.3 Removing and installing throttle valve module GX3”, page 402](#) .
- Open throttle valve by hand and lock in open position using a suitable object (e.g. wood or plastic wedge) -arrow-.



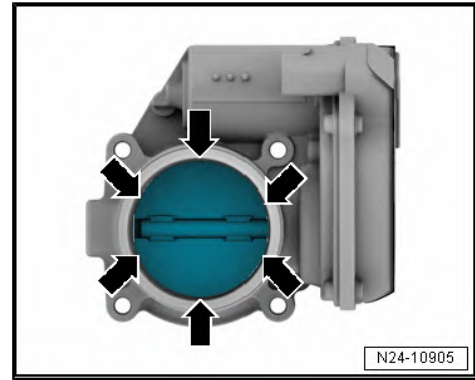
CAUTION

Risk of injury caused by acetone. Acetone is highly flammable and may cause eye and skin irritation.

- Wear protective goggles.
- Wear protective gloves.



- Thoroughly clean throttle valve connection, especially around closed throttle valve -arrows- using commercially available acetone to DIN 53247 and a brush.
- Wipe out throttle valve housing with a lint-free cloth.
- Allow acetone to dry off completely.
- Install throttle valve module - GX3-
⇒ ["4.3 Removing and installing throttle valve module GX3", page 402](#) .
- Delete learnt values, and adapt engine control unit - J623- to throttle valve module - GX3- .
- Switch on ignition and select and run the following menu items at ⇒ Vehicle diagnostic tester:
 - ◆ `0001 - Delete learnt values`
 - ◆ `0001 - Adaption of throttle valve module - J338`



5 Sensors

⇒ ["5.1 Removing and installing fuel pressure sender G247 ", page 405](#)

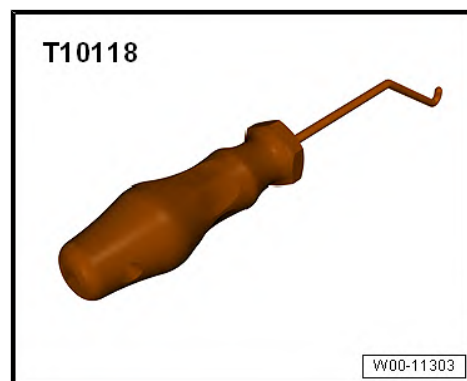
⇒ ["5.2 Checking fuel pressure sender G247 ", page 406](#)

⇒ ["5.3 Removing and installing intake manifold sender GX9 ", page 408](#)

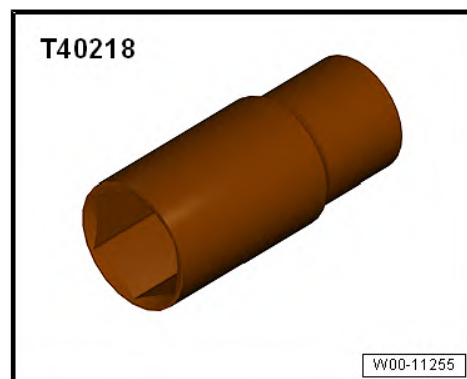
5.1 Removing and installing fuel pressure sender - G247-

Special tools and workshop equipment required

◆ Assembly tool - T10118-



◆ Socket 27 mm - T40218- or commercially available 27 mm hexagon socket insert



Removing

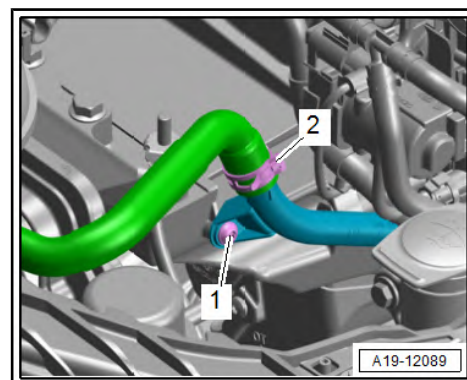
- Unscrew bolt -1- for coolant pipe at front.



Note

Disregard item -2-.

- Move clear fuel hose, and press it to one side.



- Unplug electrical connector -1-.



Note

Place a cloth underneath to catch escaping fuel.

- Unscrew fuel pressure sender - G247- -2- using socket 27 mm - T40218- .

Installing

Install in reverse order of removal, observing the following:



Note

Do not lubricate thread of fuel pressure sender.

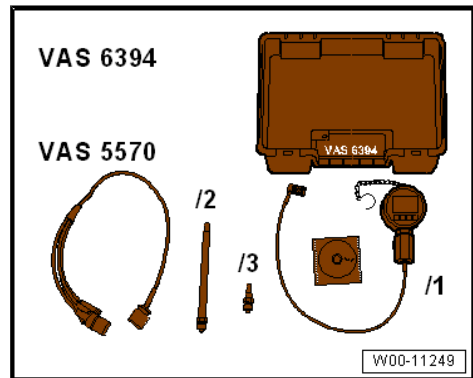
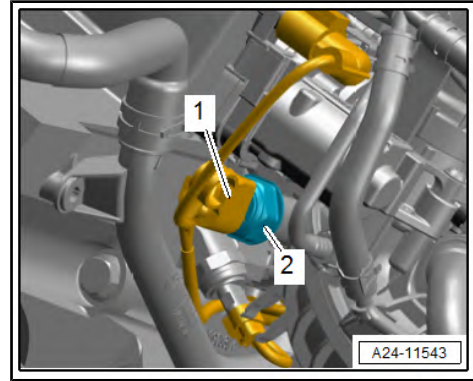
Specified torques

- ♦ ➔ [“2.1 Assembly overview - fuel rail with injectors”, page 383](#)
- ♦ ➔ [“3.1 Assembly overview - coolant pipes”, page 302](#)

5.2 Checking fuel pressure sender - G247-

Special tools and workshop equipment required

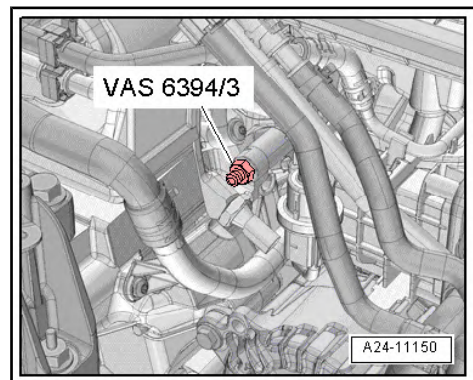
- ♦ Vehicle diagnosis and service information system
- ♦ Test instrument adapter/DSO (3-pin) - VAS 5570-



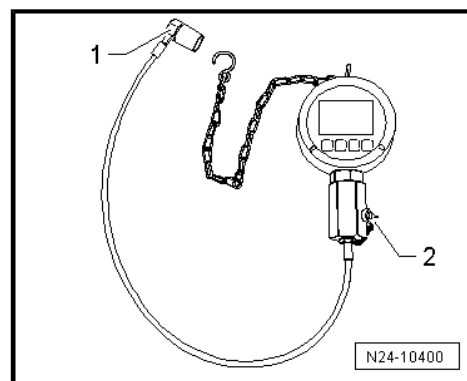
- ♦ Pressure sensor tester - VAS 6394-

Procedure

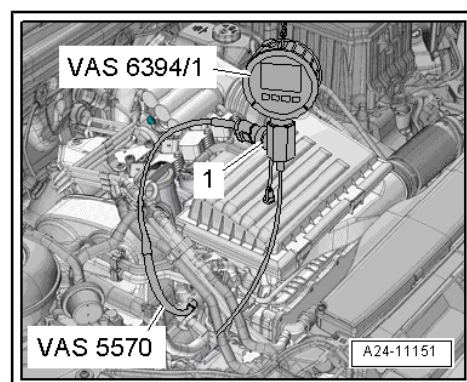
- Remove fuel pressure sender - G247-
➔ [“5.1 Removing and installing fuel pressure sender G247 ”, page 405](#) .
- Lubricate taper seal of adapter -VAS 6394/3- with clean engine oil and screw into fuel rail (22 Nm).



- Unscrew plug -2- and screw fuel pressure sender - G247- into tester -VAS 6394/1- .
- Connect pressure line -1- of tester to adapter - VAS 6394/3- .



- Connect vehicle and fuel pressure sender - G247- electrically using test instrument adapter/DSO (3-pin) - VAS 5570- .

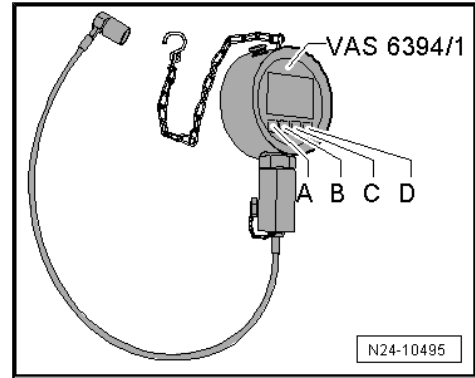


- Switch on tester -VAS 6394/1- by pressing button -A- once briefly.



Note

- ◆ When button -A- is pressed for 2 seconds, the illumination is switched on for 20 seconds.
- ◆ If tester -VAS 6394/1- does not indicate 0 bar, zero the tester ⇒ Operating instructions .
- Connect vehicle diagnostic tester ⇒ Maintenance ; Booklet KJ1 ; General; Connecting vehicle diagnostic tester .
- Run the engine at idling speed.
- In the self-diagnosis, select the following menu items.
 - ◆ Engine electronics
 - ◆ Measured values
 - ◆ Fuel pressure
- Compare pressure displayed on tester -VAS 6394/1- with actual value displayed on ⇒ Vehicle diagnostic tester.
 - A maximum pressure deviation of 5 bar is permissible
- If deviation is greater than 5 bar, renew fuel pressure sender - G247- .
- Repeat test with new fuel pressure sender - G247- , and compare both measured values again.
- If measured values are now the same, install new fuel pressure sender - G247- .
- If measured values are not the same again, check electrical connection between fuel pressure sender - G247- and engine control unit - J623- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



5.3 Removing and installing intake manifold sender - GX9-

Intake manifold sender - GX9- consists of:

- ◆ Intake manifold pressure sender - G71-
- ◆ Intake manifold temperature sender - G72-

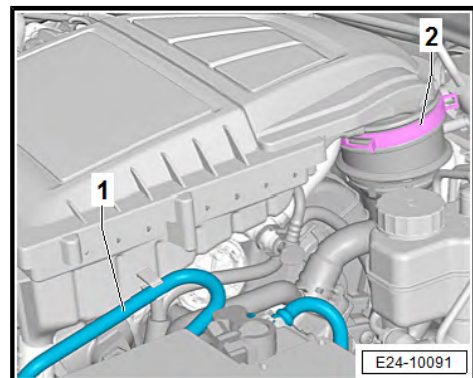
Removing

- Unclip vacuum line -1- from air filter housing.

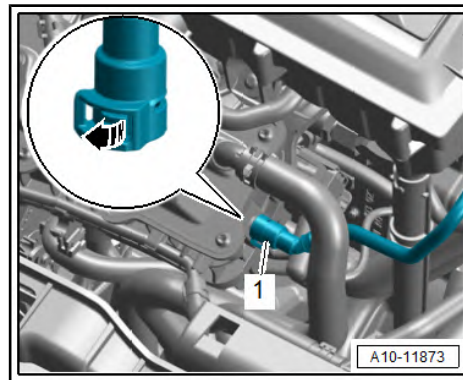


Note

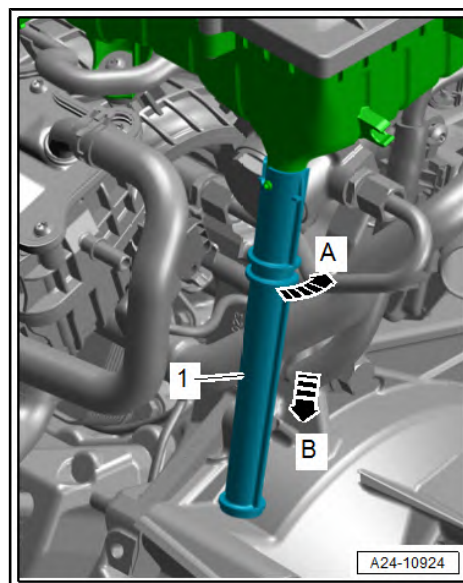
Disregard item -2-.



- Release catch -arrow- and disconnect vacuum hose -1-.



- If present, remove drain hose -1-; to do so, turn gently in -direction of arrow- -A- and remove down in -direction of arrow- -B-.



Version A

- Unplug electrical connector -1-.
- Release fasteners -arrows-, remove intake manifold sender - GX9- .

Version B

- Unplug electrical connector -1-.
- Unscrew bolts -2-, and remove intake manifold sender - GX9- .

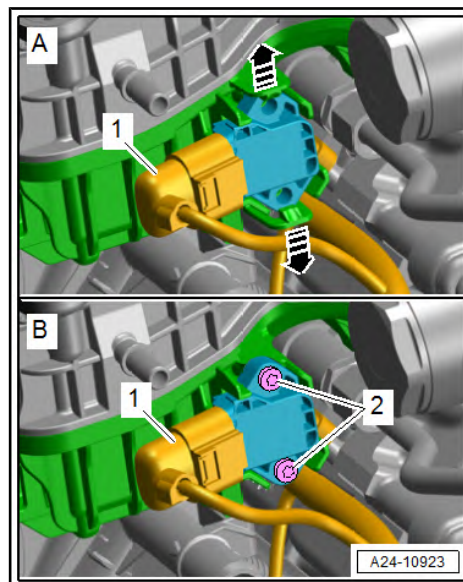
Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Renew O-ring.*
- ◆ *If fasteners on the intake manifold have broken off, secure the intake manifold sender - GX9- using suitable bolts -2- as per ⇒ Electronic Parts Catalogue (ETKA)*



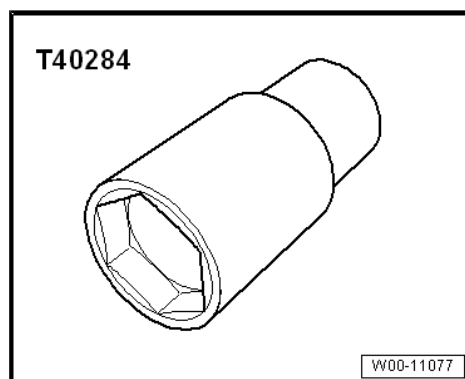
Specified torques

- ◆ ⇒ [“3.1 Assembly overview - air filter housing”, page 393](#)
- ◆ ⇒ [“4.1 Assembly overview - intake manifold”, page 399](#)

5.4 Removing and installing exhaust gas pressure sensor 1 - G450-

Special tools and workshop equipment required

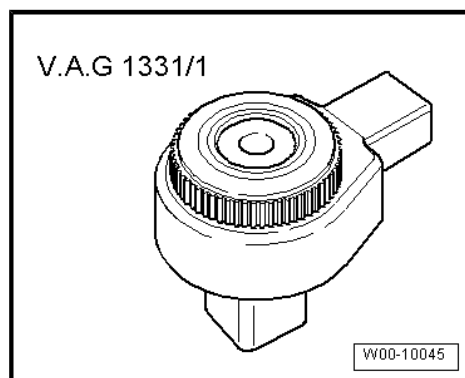
◆ Socket 24 mm - T40284-



◆ Torque wrench - V.A.G 1331-



◆ Ratchet wrench - V.A.G 1331/1-



Removing

- Remove air pipe
⇒ ["2.5 Removing and installing air pipe", page 368](#) .

- Pull off connector -1-.
- Use socket, 24 mm - T40284- to unscrew exhaust gas pressure sensor 1 - G450- -2-.

Installing

Install in reverse order of removal, observing the following:

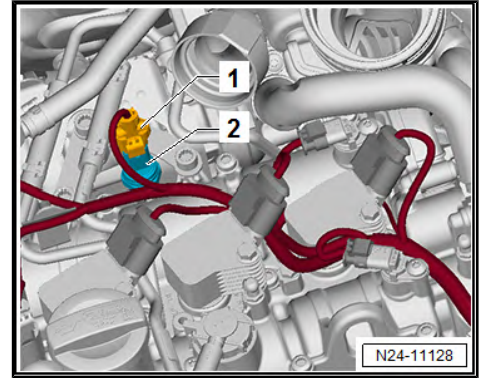


Note

- ◆ *Renew exhaust gas pressure sensor 1 - G450- after removal.*
 - ◆ *Before installing the exhaust gas pressure sensor 1 - G450- , check hole in camshaft housing for soiling.*
- Install air pipe
⇒ ["2.5 Removing and installing air pipe ", page 368](#) .

Specified torques:

- ◆ ⇒ ["1.2 Assembly overview - camshaft housing", page 160](#)



6 Engine (motor) control unit

⇒ [“6.1 Removing and installing engine control unit J623”, page 412](#)

⇒ [“6.2 Removing and installing engine control unit J623 with protective housing”, page 415](#)

⇒ [“6.3 Assembly overview - engine \(motor\) control unit”, page 422](#)

6.1 Removing and installing engine control unit - J623-

⇒ [“6.1.1 Removing and installing engine control unit J623, Ateca, Leon 2013”, page 412](#)

⇒ [“6.1.2 Removing and installing engine control unit J623, Ibiza 2018, Arona”, page 413](#)

⇒ [“6.1.3 Removing and installing engine control unit J623, Toledo 2013, Ibiza 2016”, page 414](#)

6.1.1 Removing and installing engine control unit - J623- , Ateca, Leon 2013

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester

Removing



Note

- ◆ *If the engine control unit - J623- needs to be renewed, connect ⇒ Vehicle diagnostic tester and perform “Guided functions, Renewing engine control unit”.*
 - ◆ *If renewed, the engine control unit - J623- must be adapted to the electronic immobilizer ⇒ Vehicle diagnostic tester “Guided functions”.*
- Switch off ignition and remove key from ignition lock.



Note

Contact between the positive battery terminal and the engine control unit will cause engine control unit damage. For this reason, the battery always needs to be disconnected prior to removing the engine control unit from its bracket ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

- Unlock latches -in the direction of the arrow- and remove from engine control unit - J623- .
- Release and pull off connectors for engine (motor) control unit - J623- .
- Remove engine control unit.

Installing

Installation is in the reverse sequence of removal. Observe the following:

- Connect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

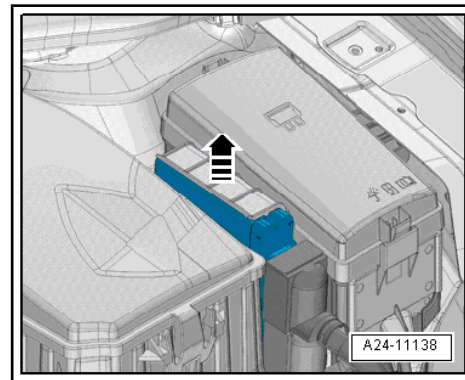
After having installed the new engine control unit, the following work must be carried out:

- Connect vehicle diagnostic tester .
- Switch on ignition and select the following menu options on vehicle diagnostic and service information system :

◆ 01 - Engine electronics

◆ Guided Functions

◆ 01 - Renew engine/motor control unit



6.1.2 Removing and installing engine control unit - J623- , Ibiza 2018, Arona

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester

Removing



Note

- ◆ If the engine control unit - J623- needs to be renewed, connect ⇒ Vehicle diagnostic tester and perform "Guided functions, Renewing engine control unit".
 - ◆ If renewed, the engine control unit - J623- must be adapted to the electronic immobilizer ⇒ Vehicle diagnostic tester "Guided functions".
- Switch off ignition and remove key from ignition lock.



Note

Contact between the positive battery terminal and the engine control unit will cause engine control unit damage. For this reason, the battery always needs to be disconnected prior to removing the engine control unit from its bracket ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

- Release catches in direction of -arrow- and remove engine control unit - J623- -1-.
- Release and pull off connectors -2- for engine control unit - J623- .
- Remove engine control unit -1-.

Installing

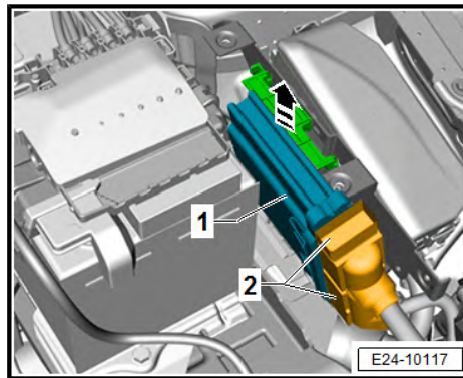
Install in reverse order of removal, observing the following:

- Connect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

After having installed the new engine control unit, the following work must be carried out:

- Connect vehicle diagnostic tester ⇒ Maintenance ; Booklet KJ1 ; General; Connecting vehicle diagnostic tester .
- Switch on ignition and select the following menu options on vehicle diagnostic tester :

◆ 01 - Renew engine/motor control unit



6.1.3 Removing and installing engine control unit - J623- , Toledo 2013, Ibiza 2016

Removing

- If engine control unit is renewed, select 0001 - Renew engine control unit function in ⇒ Vehicle diagnostic tester.
- Switch off ignition.



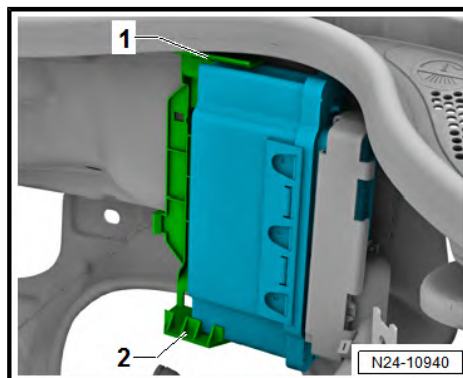
Note

- ◆ *If the engine (motor) control unit comes into contact with the positive battery terminal, permanent damage to the engine (motor) control unit will be the consequence.*
- ◆ *Therefore, disconnect the battery before removing the engine control unit ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .*
- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting battery .
- Release catches of holder -1- from engine control unit - J623- .
- Press down tab -2-, and remove engine control unit - J623- upwards.

Engine control unit with protective housing

- Disconnect engine control unit from protective housing
⇒ "6.2.3 Detach engine control unit J623 from safety housing, Toledo 2013, Ibiza 2016", page 421 .

All versions



- Using a screwdriver, lever out locking bar -1- of upper wiring harness in -direction of arrow-.
- Using a screwdriver, lever out locking bar -2- of lower wiring harness in -direction of arrow-.
- Pull connectors off engine control unit.
- Remove engine control unit.

Installing

Installation is in the reverse sequence of removal. Observe the following:

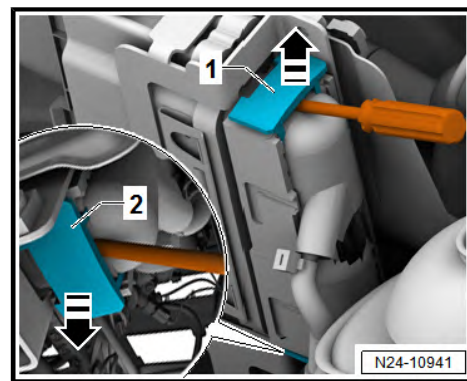
Engine control unit with protective housing

- Secure engine control unit in protective housing.
⇒ ["6.2.3 Detach engine control unit J623 from safety housing, Toledo 2013, Ibiza 2016", page 421](#)

After installing a new engine control unit, the following operations must be performed:

- Connect ⇒ Vehicle diagnostic tester.
- Switch on ignition, and select and carry out following menu options on ⇒ Vehicle diagnostic tester:

- ◆ `0001 - Renew engine (motor) control unit`
- ◆ `0001 - Adapt new engine control unit to immobiliser`



6.2 Removing and installing engine control unit - J623- with protective housing

⇒ ["6.2.1 Removing and installing the engine control unit J623 with anti-theft coding, Ateca, Leon 2013", page 415](#)

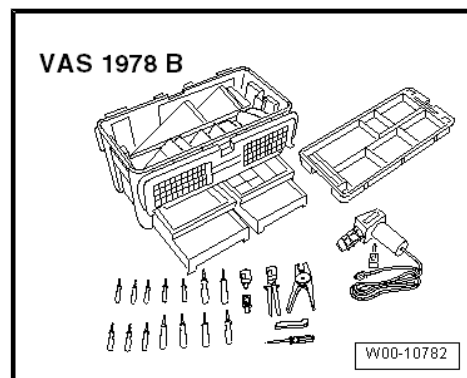
⇒ ["6.2.2 Removing and installing engine/motor control unit J623 with anti-theft coding, Ibiza 2018, Arona", page 418](#)

⇒ ["6.2.3 Detach engine control unit J623 from safety housing, Toledo 2013, Ibiza 2016", page 421](#)

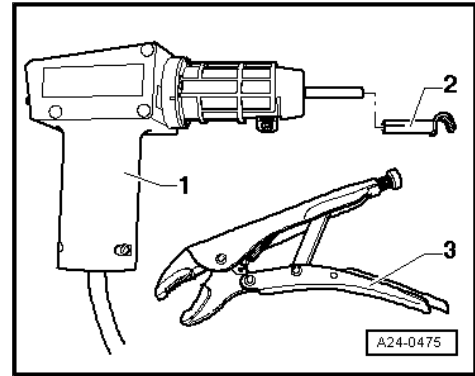
6.2.1 Removing and installing the engine control unit - J623- with anti-theft coding, Ateca, Leon 2013

Special tools and workshop equipment required

- ◆ Wiring harness repair kit - VAS 1978 B-



- ◆ Hot air blower - VAS 1978/14A- -item 1- with nozzle -2- from wiring harness repair set - VAS 1978 B-



- ◆ Small grinder (commercially available)
- ◆ Vehicle diagnostic tester

Removing



Note

- ◆ If the engine control unit - J623- needs to be renewed, connect ⇒ Vehicle diagnostic tester and perform "Guided functions, Renewing engine control unit".
- ◆ If renewed, the engine control unit - J623- must be adapted to the electronic immobilizer ⇒ Vehicle diagnostic tester "Guided functions".



Note

The protective housing is secured with shear-head bolts. The shear-head bolts cannot be removed without being damaged. Use e.g. the axial grinder - VAS 6682- or a commercially available angle grinder to remove the shear-head bolts. If the protective housing is damaged, it must be renewed.

- Switch off ignition and remove key from ignition lock.



Note

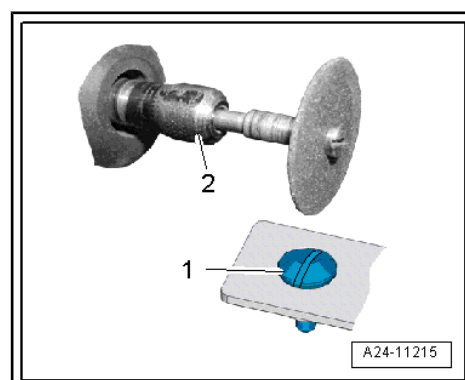
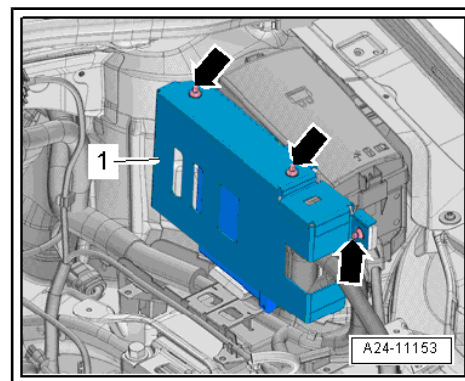
- ◆ If the engine (motor) control unit comes into contact with the positive battery terminal, permanent damage to the engine (motor) control unit will be the consequence.
- ◆ Therefore, disconnect the battery before removing the engine control unit ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

To remove protective housing -1-, unscrew shear bolts -arrows- as follows:

i Note

Cover the area around the engine control unit, and protect it from flying sparks.

- Make groove (for a screwdriver) in head of shear bolt -1- using a small grinder -2-.



i Note

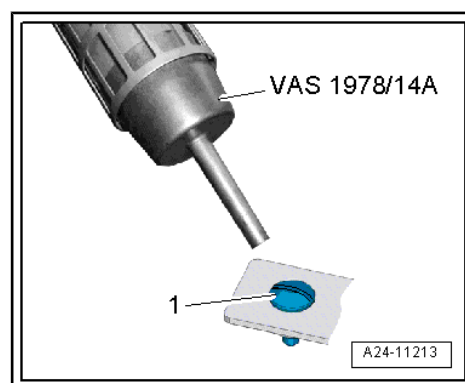
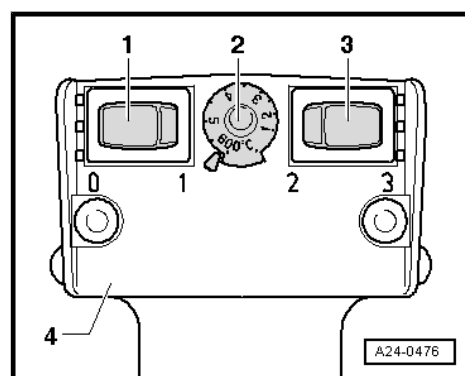
The threads of the shear bolts are secured with locking fluid. To unscrew these bolts, the threads must therefore be heated with the hot air blower.

- Set the hot air blower as shown in illustration. In other words, set potentiometer for temperature regulation -2- to maximum heating output and 2-stage switch for air volume -3- to position 3.

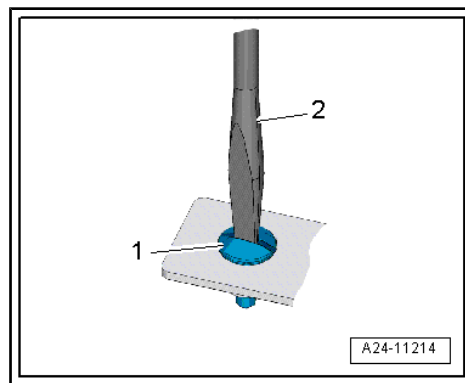
! NOTICE

Risk of damage to adjacent components caused by hot air blower. Risk of overheating.

- If necessary, cover adjacent components.
- Heat head of shear bolt -1- for approx. 20 to 30 seconds.



- Unscrew shear bolt -1- with screwdriver -2-.

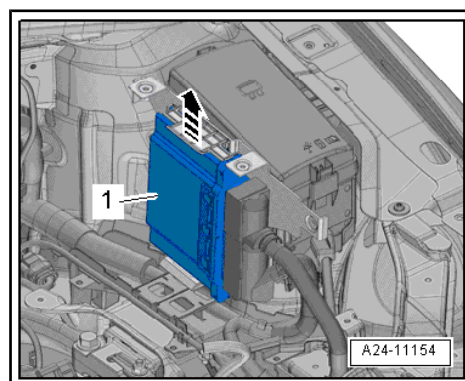


- Release catches in direction of -arrow- and remove engine control unit - J623- -1-.
- Release and pull off connectors for engine (motor) control unit - J623- .

Installing

Installation is in the reverse sequence of removal. Observe the following:

- It is essential that the engine control unit - J623- be provided with the protective housing again.
- Clean threaded holes for shear-head bolts from locking fluid residue. A thread chaser is suitable for cleaning.
- Use new bolts.



After having installed the new engine control unit, the following work must be carried out:

- Connect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Connect vehicle diagnostic tester .
- Switch on ignition and select the following menu options on vehicle diagnostic tester :

◆ 01 - Engine electronics

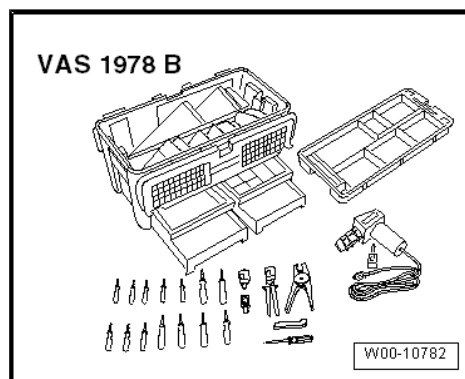
◆ Guided Functions

◆ 01 - Renew engine/motor control unit

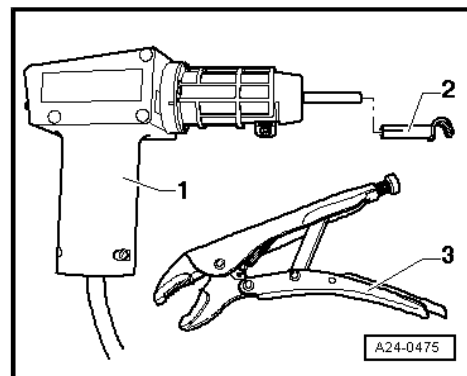
6.2.2 Removing and installing engine/motor control unit - J623- with anti-theft coding, Ibiza 2018, Arona

Special tools and workshop equipment required

- ◆ Wiring harness repair kit - VAS 1978 B-



- ◆ Hot air blower - VAS 1978/14A- -item 1- with nozzle -2- from wiring harness repair set - VAS 1978 B-



- ◆ Small grinder (commercially available)
- ◆ Vehicle diagnostic tester

Removing

- If engine control unit is renewed, select 0001 - Renew engine control unit function in ⇒ Vehicle diagnostic tester.
- Switch off ignition and remove key from ignition lock.



Note

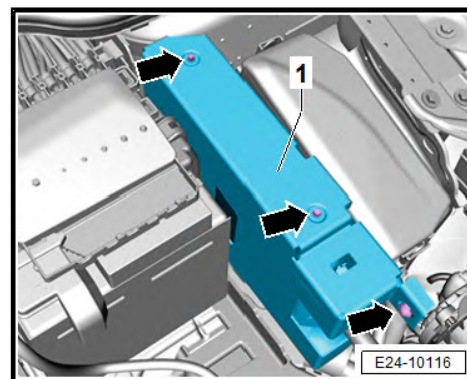
- ◆ *If the engine (motor) control unit comes into contact with the positive battery terminal, permanent damage to the engine (motor) control unit will be the consequence.*
- ◆ *To do so, disconnect the battery before the engine control unit is removed.*
- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting battery .

To remove protective housing -1-, unscrew shear bolts -arrows- as follows:

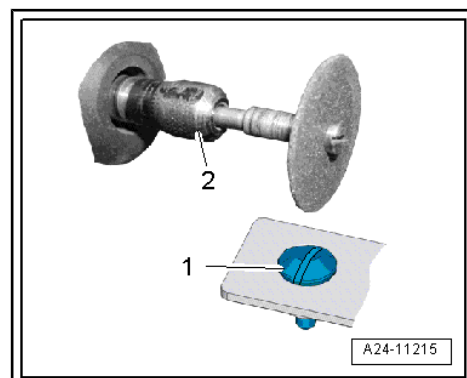


Note

Cover the area around the engine control unit, and protect it from flying sparks.



- Make groove (for a screwdriver) in head of shear bolt -1- using a small grinder -2-.





Note

The threads of the shear bolts are secured with locking fluid. To unscrew these bolts, the threads must therefore be heated with the hot air blower.

- Set the hot air blower as shown in illustration. In other words, set potentiometer for temperature regulation -2- to maximum heating output and 2-stage switch for air volume -3- to position 3.

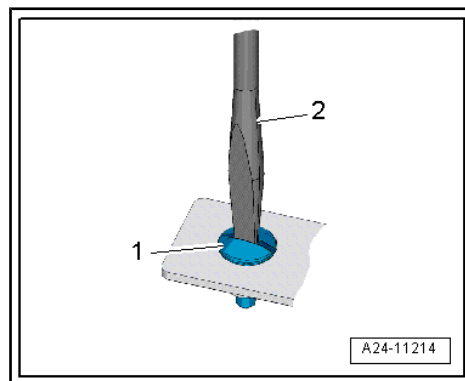
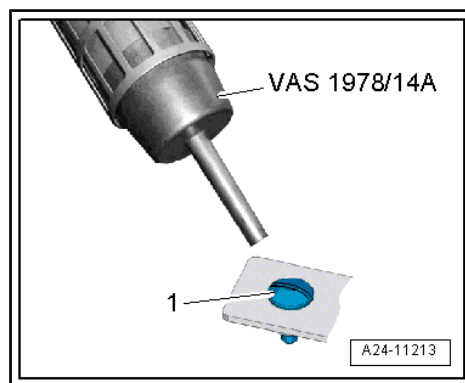
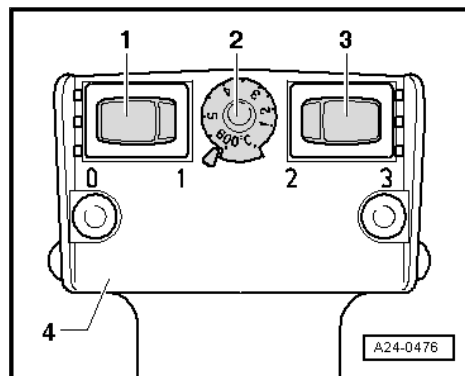


NOTICE

Risk of damage to adjacent components caused by hot air blower. Risk of overheating.

- If necessary, cover adjacent components.
- Heat head of shear bolt -1- for approx. 20 to 30 seconds.

- Unscrew shear bolt -1- with screwdriver -2-.



- Release catches in direction of -arrow- and remove engine control unit - J623- -1-.
- Release and pull off connectors -2- for engine control unit - J623- .
- Remove engine control unit -1-.

Installing

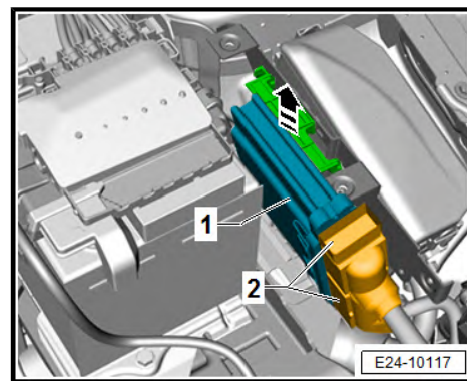
Install in reverse order of removal, observing the following:

- It is essential that the engine control unit - J623- be provided with the protective housing again.
- Clean threaded holes for shear-head bolts from locking fluid residue. A thread chaser is suitable for cleaning.
- Use new bolts.

After having installed the new engine control unit, the following work must be carried out:

- Connect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Connect vehicle diagnostic tester ⇒ Maintenance ; Booklet KJ1 ; General; Connecting vehicle diagnostic tester .
- Switch on ignition and select the following menu options on vehicle diagnostic and service information system :

◆ 01 - Renew engine/motor control unit



6.2.3 Detach engine control unit - J623- from safety housing, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required

- ◆ Angle grinder e.g. axial grinder - VAS 6682-



Note

The protective housing is secured with shear-head bolts. The shear-head bolts cannot be removed without being damaged. Use e.g. the axial grinder - VAS 6682- or a commercially available angle grinder to remove the shear-head bolts. If the protective housing is damaged, it must be renewed.

Removing

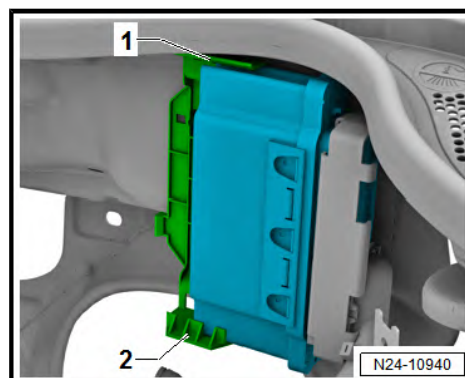
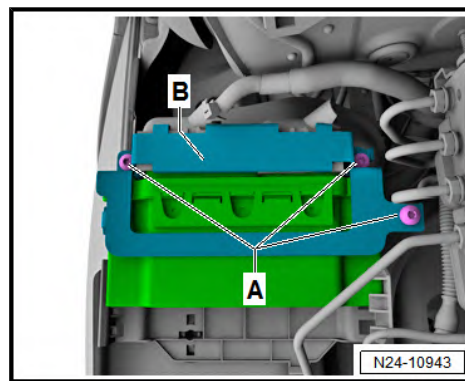
- Remove engine control unit from holder
⇒ [“6.1.3 Removing and installing engine control unit J623, Toledo 2013, Ibiza 2016”, page 414](#) .
- Move clear wiring harness, and push it to one side as far as possible.

- Remove bolts -A-. Remove retainer -B-.
- Remove engine control unit from protective housing.

Installing

Installation is in the reverse sequence of removal. Observe the following:

- Push engine control unit into protective housing as far as it will go.
- Fit locking element -B- onto protective housing, and secure it with new shear bolts -A- ⇒ Electronic Parts Catalogue (ET-KA) .
- First, insert engine control unit into tab -2- of holder.
- Push engine control unit into holder until upper tab -1- is engaged.



6.3 Assembly overview - engine (motor) control unit

⇒ [“6.3.1 Assembly overview - engine \(motor\) control unit, Ateca, Leon 2013, Ibiza 2018, Arona”, page 422](#)

⇒ [“6.3.2 Assembly overview - engine \(motor\) control unit, Toledo 2013, Ibiza 2016”, page 424](#)

6.3.1 Assembly overview - engine (motor) control unit, Ateca, Leon 2013, Ibiza 2018, Arona

1 - Support

2 - Nuts

- ☐ 2 off
- ☐ 8 Nm

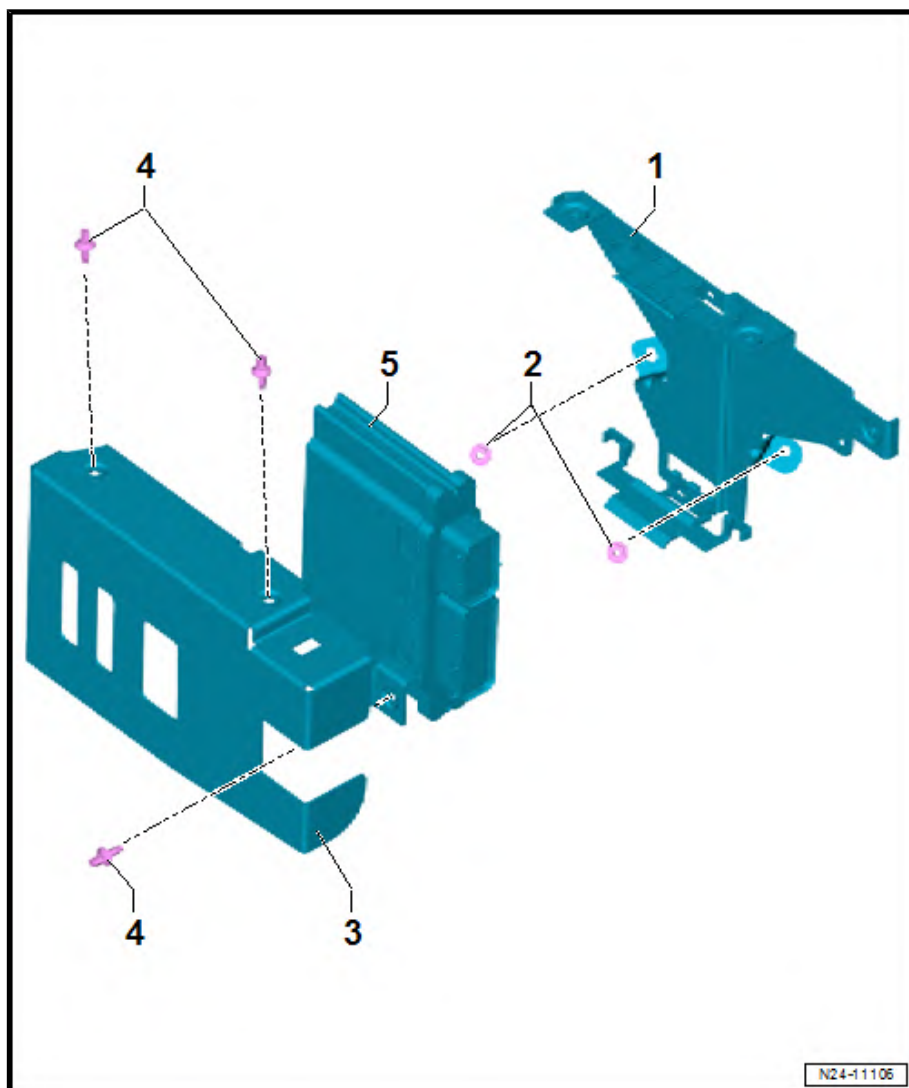
3 - Protective housing

4 - Shear bolts

- ☐ 3 off

5 - Engine (motor) control unit - J623-

- ☐ Removing and installing
⇒ ["6.2 Removing and installing engine control unit J623 with protective housing", page 415](#)



6.3.2 Assembly overview - engine (motor) control unit, Toledo 2013, Ibiza 2016

1 - Support

2 - Engine (motor) control unit - J623-

- ☐ Removing and installing
⇒ ["6.1.3 Removing and installing engine control unit J623, Toledo 2013, Ibiza 2016", page 414](#)

3 - Locking bar

- ☐ Removing and installing
⇒ ["6.2.3 Detach engine control unit J623 from safety housing, Toledo 2013, Ibiza 2016", page 421](#)

4 - Bolt

- ☐ Tighten shear-head screws evenly until head shears off.
- ☐ For securing bracket to engine control unit
- ☐ For allocation refer to ⇒ Electronic parts catalogue (ETKA)

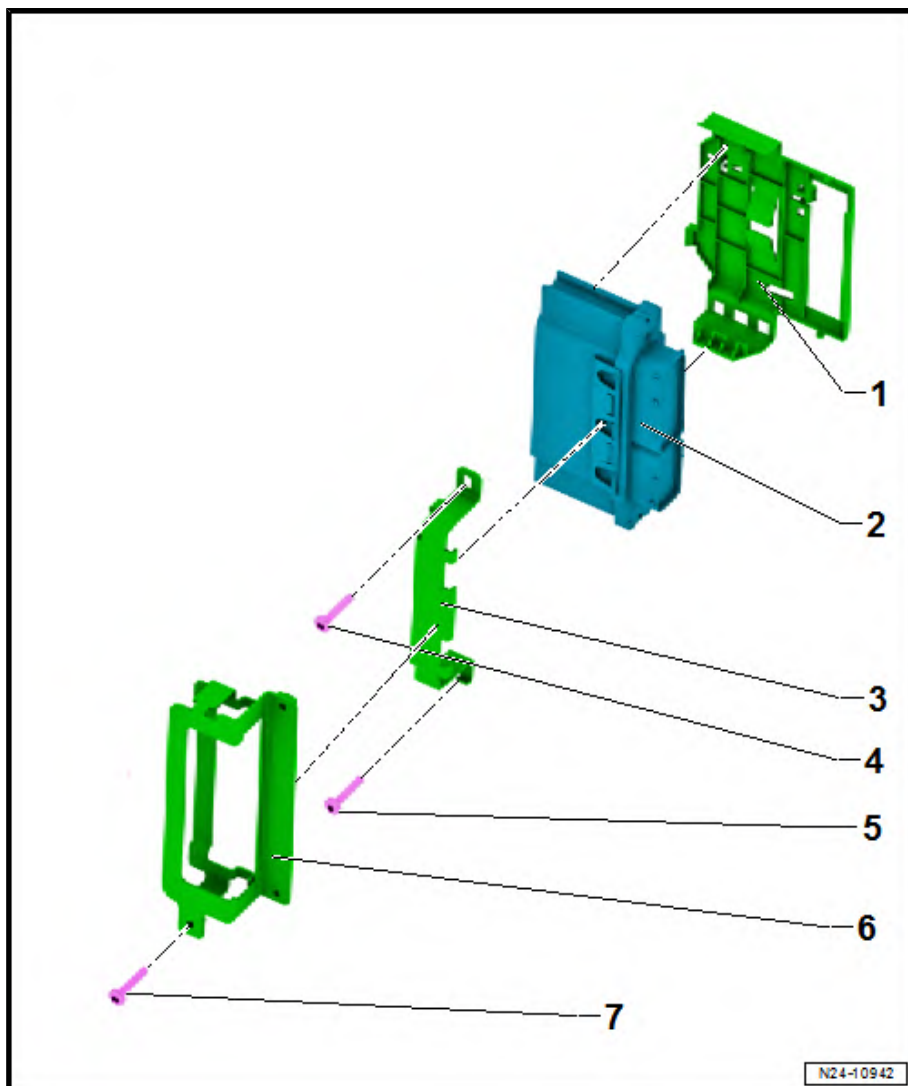
5 - Bolt

- ☐ Tighten shear-head screws evenly until head shears off.
- ☐ For allocation refer to ⇒ Electronic parts catalogue (ETKA)

6 - Protective housing

7 - Bolt

- ☐ Tighten shear-head screws evenly until head shears off.
- ☐ For securing bracket to engine control unit
- ☐ For allocation refer to ⇒ Electronic parts catalogue (ETKA)



7 High-pressure pump

⇒ "7.1 Assembly overview - high-pressure pump", page 425

⇒ "7.2 Removing and installing high-pressure pump", page 426

⇒ "7.3 Removing and installing high-pressure pipe", page 427

7.1 Assembly overview - high-pressure pump

1 - Roller tappet

- ☐ When installing lubricate lightly with clean engine oil

2 - O-ring

- ☐ Renew after removal
- ☐ When installing lubricate lightly with clean engine oil

3 - High-pressure pump

- ☐ With fuel pressure regulating valve - N276- .
- ☐ Do not dismantle.
- ☐ Removing and installing
⇒ page 426

4 - High-pressure pipe

- ☐ Removing and installing
⇒ page 427
- ☐ Renew after removal
- ☐ Check for damage before reinstalling.
- ☐ Do not alter shape.
- ☐ Unions must be free of damage
- ☐ Lubricate thread of union nuts with clean engine oil
- ☐ 16 Nm + 45°

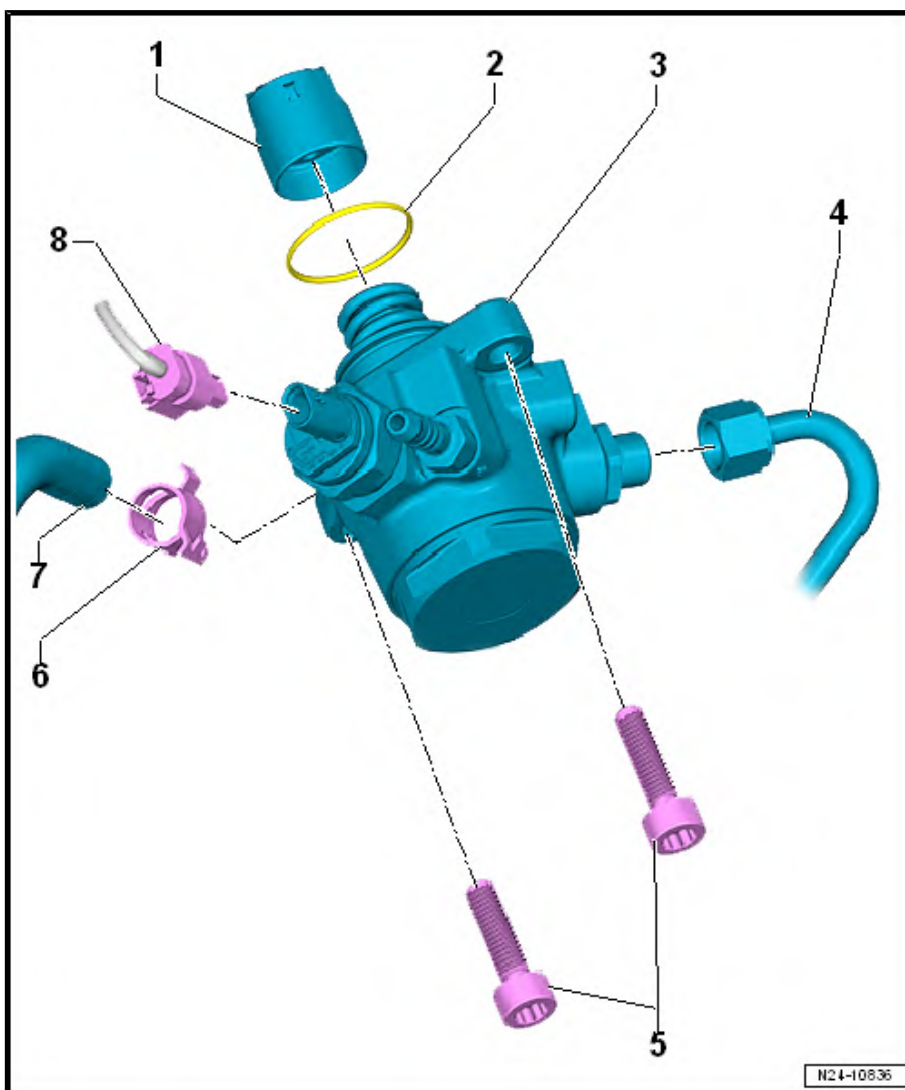
5 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence
⇒ page 426

6 - Hose clamp

7 - Return (leakage) line (fuel return line)

8 - Electrical connector



Volkswagen Technical Site: <http://vwts.ru> <http://vwts.info>

High-pressure pump - specified torque and tightening sequence



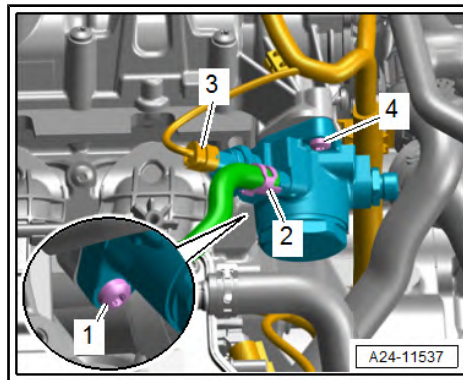
Note

If a further tightening angle is specified for certain bolts, these must be renewed.

Install high-pressure pump as follows to avoid deformation of the high-pressure pump flange:

- Tighten bolts in stages as follows:

Stage	Bolts	Specified torque/turning further angle
1.	-1, 4-	Screw in by hand as far as stop
2.	-1, 4-	Tighten one turn alternately until flange of high-pressure pump makes contact with camshaft housing
3.	-1, 4-	20 Nm
4.	-1, 4-	Turn 90° further



7.2 Removing and installing high-pressure pump

Removing

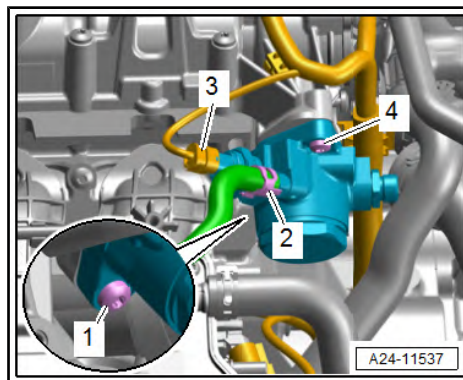
- Engine cold.
- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .
- Remove high-pressure pipe
⇒ [“7.3 Removing and installing high-pressure pipe”, page 427](#) .
- Disconnect connector -3-.



Note

Place a cloth underneath to catch escaping fuel.

- Release hose clip -2- and detach fuel supply hose.
- Unscrew bolts -1 and 4-, and remove high-pressure pump with roller tappet.



Installing

- Check roller tappet for damage and renew if necessary.
- Moisten roller tappet -1- with clean engine oil.
- Insert oiled roller tappet -1- into camshaft housing.
- Turn crankshaft in direction of engine rotation until roller tappet is at bottom dead centre.



Note

Renew O-ring.

- Insert new, lubricated O-ring -2- in groove of high-pressure pump -3-.



Note

If the high-pressure pump is tightened unevenly (i.e. canted), it may become damaged.

- Fit high-pressure pump, and initially and alternately hand-tighten bolts -1 and 4-.
- Tighten bolts -1 and 4- to final specified torque ➤ [page 426](#) .
- Push on fuel hose, and secure it with hose clip -2-.
- Push on connector -3-.
- Install high-pressure pipe
➤ [“7.3 Removing and installing high-pressure pipe”, page 427](#) .
- Install air filter housing
➤ [“3.2 Removing and installing air filter housing”, page 397](#) .
- Check fuel system for leaks.

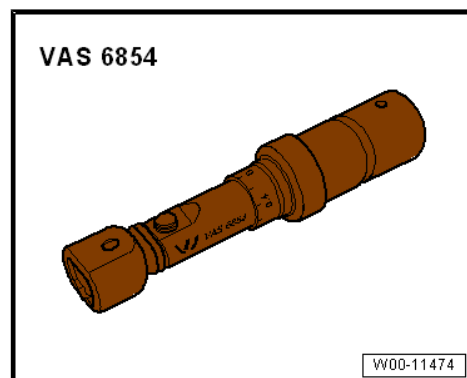
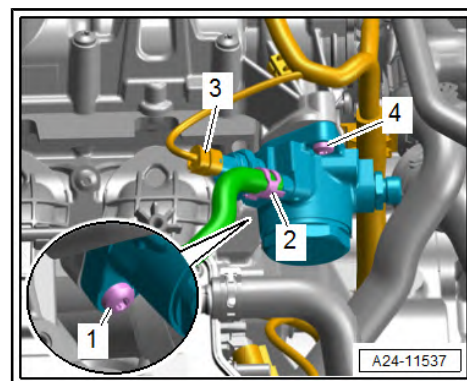
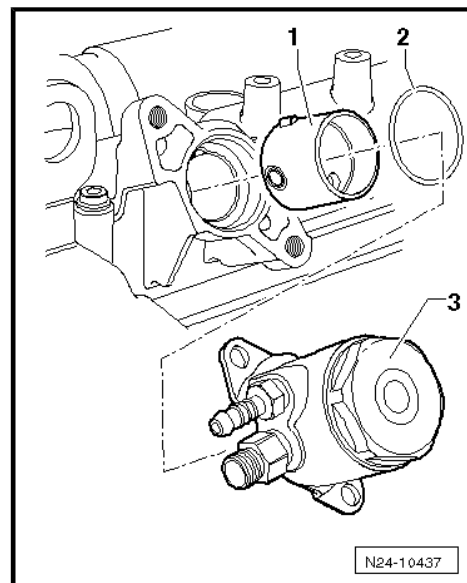
Specified torques

- ◆ ➤ [“2.1 Assembly overview - fuel rail with injectors”, page 383](#)
- ◆ ➤ [“7.1 Assembly overview - high-pressure pump”, page 425](#)
- ◆ ➤ [“3.1 Assembly overview - air filter housing”, page 393](#)

7.3 Removing and installing high-pressure pipe

Special tools and workshop equipment required

- ◆ Torque wrench - VAS 6854-



◆ Tool set - T10395A-



Removing

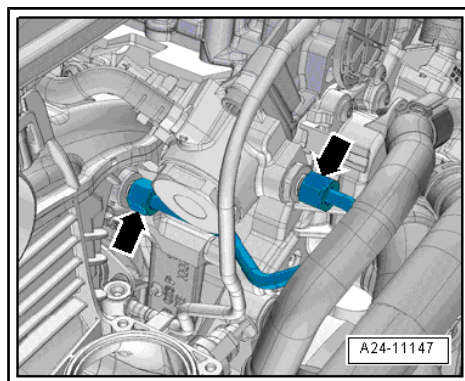
- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .

CAUTION

The fuel system is pressurised.

Danger of injury caused by fuel spray.

- Wear protective goggles.
- Wear protective gloves.
- To release pressure, wrap a clean cloth around the connection and carefully loosen the connection.



- Unscrew union nuts -arrows- and detach high-pressure pipe.

Installing

Install in reverse order of removal, observing the following:

- Lubricate thread of union nuts with clean engine oil.
- Hand-tighten union nuts for high-pressure pipe (make sure that pipe is not under stress).
- Tighten union nuts using torque wrench - VAS 6854- and tool attachment - T10395/3- .

Specified torques

- ◆ ⇒ [“7.1 Assembly overview - high-pressure pump”, page 425](#)
- ◆ ⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 383](#)

8 Lambda probe

⇒ [“8.1 Assembly overview - Lambda probe”, page 429](#)

⇒ [“8.2 Removing and installing lambda probe”, page 431](#)

8.1 Assembly overview - Lambda probe

⇒ [“8.1.1 Assembly overview - lambda probe, Ateca, Leon 2013, Ibiza 2018, Arona”, page 429](#)

⇒ [“8.1.2 Assembly overview - lambda probe, Toledo 2013, Ibiza 2016”, page 430](#)

8.1.1 Assembly overview - lambda probe, Ateca, Leon 2013, Ibiza 2018, Arona



Note

- ◆ *New lambda probes are coated with an assembly paste. This paste must not get into the slots on the Lambda probe body.*
- ◆ *In the case of a used Lambda probe, grease only the thread with high-temperature paste. This paste must not get into the slots on the Lambda probe body. High-temperature paste ⇒ Electronic parts catalogue (ETKA) .*
- ◆ *During installation, the electrical connecting cable of the Lambda probe must be secured at the same points. The electrical wiring must be prevented from touching the exhaust pipe.*

1 - Lambda probe 1 after catalytic converter - GX7-

- ❑ Consisting of:

Lambda probe after catalytic converter - G130-

Lambda probe heater 1 after catalytic converter - Z29-

- ❑ Removing and installing
⇒ ["8.2.1 Lambda probe-removing and installing, Leon 2013, Ibiza 2018, Arona", page 431](#)

- ❑ 55 Nm

2 - Electrical connector, brown

- ❑ For Lambda probe 1 before catalytic converter - GX10- .

3 - Electrical connector, black

- ❑ For Lambda probe 1 after catalytic converter - GX7- .

4 - Lambda probe 1 before catalytic converter - GX10-

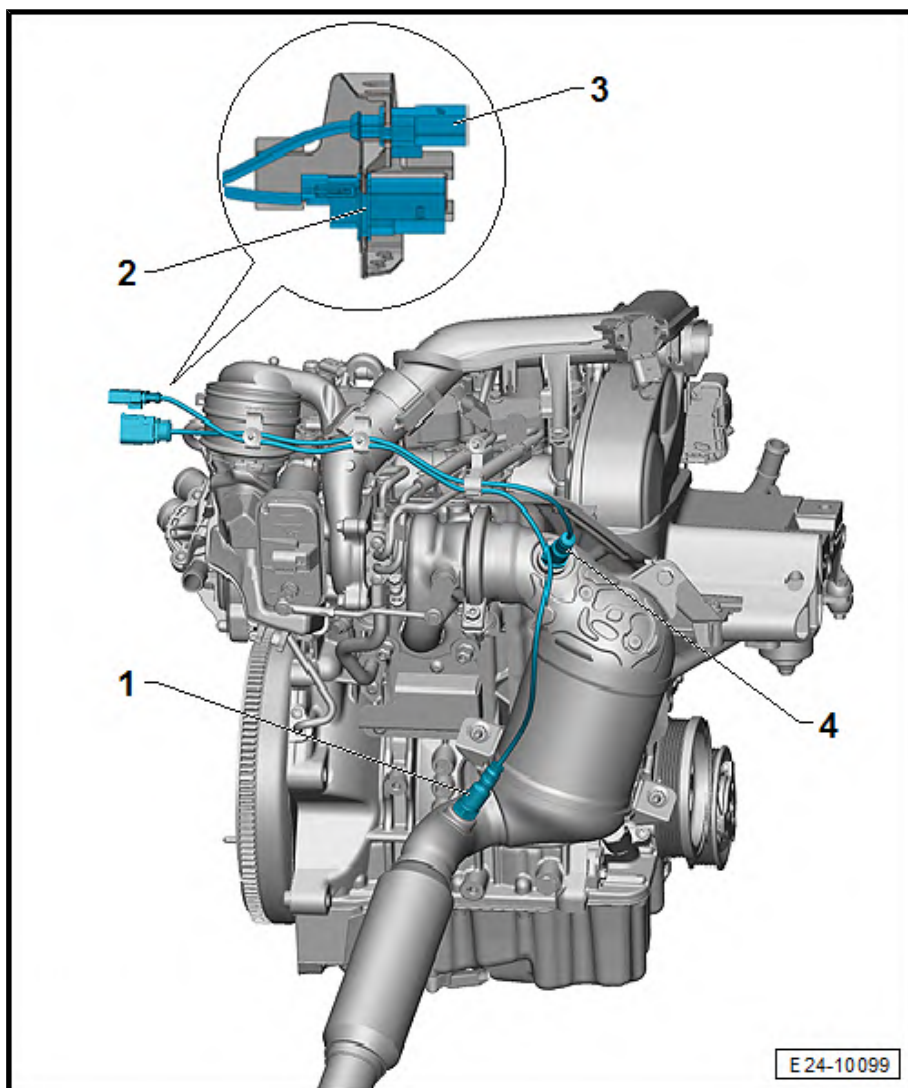
- ❑ Consisting of:

Lambda probe - G39-

Lambda probe heater - Z19-

- ❑ Removing and installing
⇒ ["8.2.1 Lambda probe-removing and installing, Leon 2013, Ibiza 2018, Arona", page 431](#)

- ❑ 55 Nm

**8.1.2 Assembly overview - lambda probe, Toledo 2013, Ibiza 2016****Note**

- ◆ *New lambda probes are coated with an assembly paste. This paste must not get into the slots on the Lambda probe body.*
- ◆ *In the case of a used Lambda probe, grease only the thread with high-temperature paste. This paste must not get into the slots on the Lambda probe body. High-temperature paste ⇒ Electronic parts catalogue (ETKA) .*
- ◆ *During installation, the electrical connecting cable of the Lambda probe must be secured at the same points. The electrical wiring must be prevented from touching the exhaust pipe.*

1 - Lambda probe 1 after catalytic converter - GX7-

- ❑ Consisting of:

Lambda probe after catalytic converter - G130-

Lambda probe heater 1 after catalytic converter - Z29-

- ❑ Removing and installing
⇒ ["8.2.2 Lambda probe - removing and installing, Toledo 2013, Ibiza 2016", page 433](#)

- ❑ 55 Nm

2 - Electrical connector

- ❑ For Lambda probe 1 before catalytic converter - GX10- .

3 - Electrical connector

- ❑ For Lambda probe 1 after catalytic converter - GX7- .

4 - Lambda probe 1 before catalytic converter - GX10-

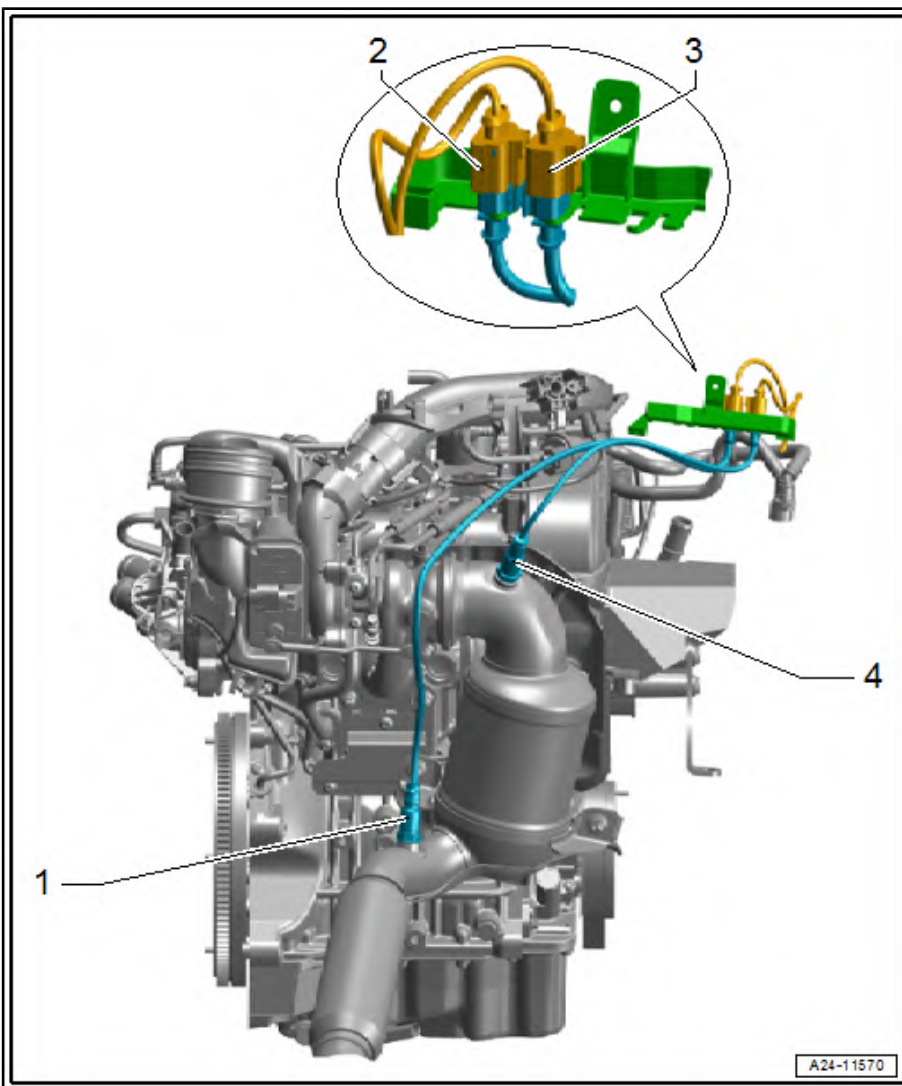
- ❑ Consisting of:

Lambda probe - G39-

Lambda probe heater - Z19-

- ❑ Removing and installing
⇒ ["8.2.2 Lambda probe - removing and installing, Toledo 2013, Ibiza 2016", page 433](#)

- ❑ 55 Nm



8.2 Removing and installing lambda probe

⇒ ["8.2.1 Lambda probe- removing and installing, Leon 2013, Ibiza 2018, Arona", page 431](#)

⇒ ["8.2.2 Lambda probe - removing and installing, Toledo 2013, Ibiza 2016", page 433](#)

8.2.1 Lambda probe- removing and installing, Leon 2013, Ibiza 2018, Arona

Lambda probe 1 before catalytic converter - GX10- consists of

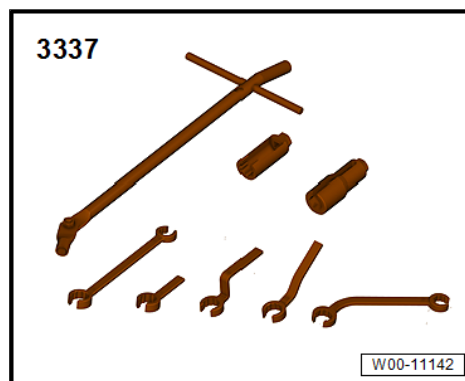
- ◆ Lambda probe - G39-
- ◆ Lambda probe heater - Z19-

Lambda probe 1 after catalytic converter - GX7- consisting of:

- ◆ Lambda probe after catalytic converter - G130-
- ◆ Lambda probe heater 1 after catalytic converter - Z29-

Special tools and workshop equipment required

◆ Lambda probe open ring spanner set - 3337-

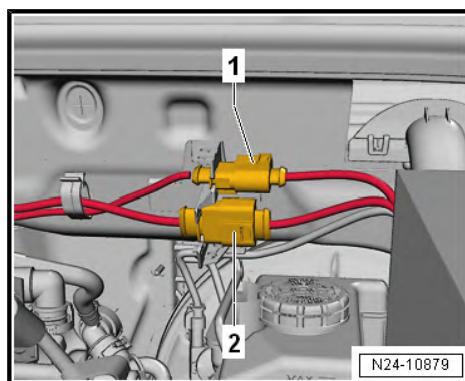


◆ Safety gloves

Removing

– Unplug corresponding connector.

- 1 - For Lambda probe 1 after catalytic converter - GX7- .
- 2 - For Lambda probe 1 before catalytic converter - GX10- .



- Unscrew corresponding Lambda probe using a tool from Lambda probe open ring spanner set - 3337/7- .

1 - Lambda probe 1 after catalytic converter - GX7-

2 - Lambda probe 1 before catalytic converter - GX10-

Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *New lambda probes are coated with an assembly paste. This paste must not get into the slots on the Lambda probe body.*
- ◆ *In the case of a used Lambda probe, grease only the thread with high-temperature paste. This paste must not get into the slots on the Lambda probe body. High-temperature paste ⇒ Electronic parts catalogue (ETKA) .*
- ◆ *During installation, the electrical connecting cable of the Lambda probe must be secured at the same points. The electrical wiring must be prevented from touching the exhaust pipe.*

- If lambda probe has been renewed, erase learnt values and adapt lambda probe to engine control unit using ⇒ vehicle diagnostic tester .

- Switch on ignition and select the following menu item at ⇒ Vehicle diagnostic tester:

- ◆ 01 - Engine electronics
- ◆ 0001 - Functions
- ◆ 0001 Basic setting
- ◆ 0001 - Delete adaptation values
- ◆ 0001 - Lambda probe adaption

Specified torque

- ◆ ⇒ ["8.1.1 Assembly overview - lambda probe, Ateca, Leon 2013, Ibiza 2018, Arona", page 429](#)

8.2.2 Lambda probe - removing and installing, Toledo 2013, Ibiza 2016

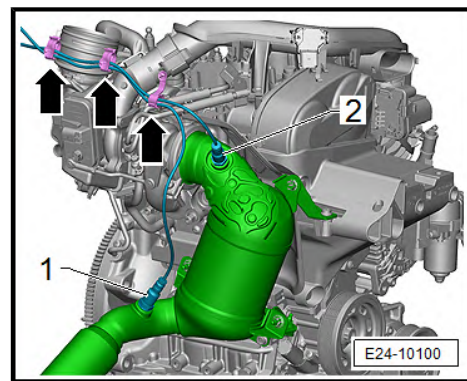
Lambda probe 1 before catalytic converter - GX10- consists of

- ◆ Lambda probe - G39-
- ◆ Lambda probe heater - Z19-

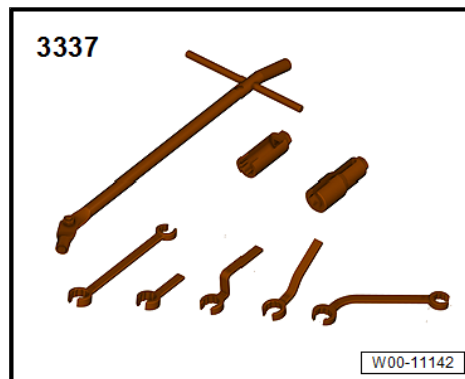
Lambda probe 1 after catalytic converter - GX7- consisting of:

- ◆ Lambda probe after catalytic converter - G130-
- ◆ Lambda probe heater 1 after catalytic converter - Z29-

Special tools and workshop equipment required



◆ Lambda probe open ring spanner set - 3337-



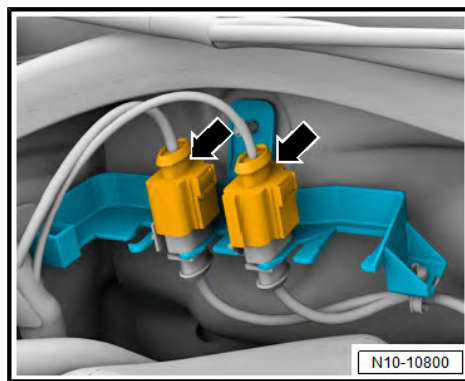
◆ Safety gloves

Removing

- Disconnect corresponding connector -arrow-:

Conector marrón - Lambda probe before catalytic converter - GX10-

Conector negro - Lambda probe after catalytic converter - GX7-



- Unscrew corresponding Lambda probe using a tool from Lambda probe open ring spanner set - 3337- .

1 - Lambda probe 1 after catalytic converter - GX7-

2 - Lambda probe 1 before catalytic converter - GX10-

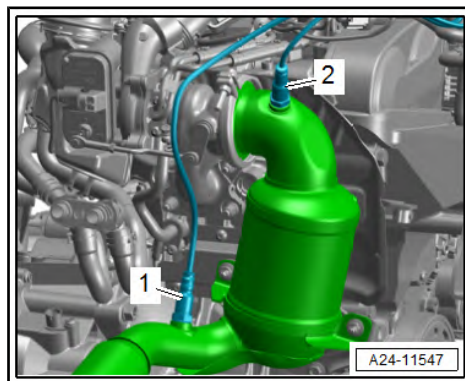
Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *New lambda probes are coated with an assembly paste. This paste must not get into the slots on the Lambda probe body.*
- ◆ *In the case of a used Lambda probe, grease only the thread with high-temperature paste. This paste must not get into the slots on the Lambda probe body. High-temperature paste ⇒ Electronic parts catalogue (ETKA) .*
- ◆ *During installation, the electrical connecting cable of the Lambda probe must be secured at the same points. The electrical wiring must be prevented from touching the exhaust pipe.*



Specified torque

- ◆ ⇒ ["8.1.2 Assembly overview - lambda probe, Toledo 2013, Ibiza 2016", page 430](#)

26 – Exhaust system

1 Exhaust pipes, silencers

⇒ [“1.1 Assembly overview - silencers”, page 435](#)

⇒ [“1.2 Disconnecting exhaust pipes/silencers”, page 440](#)

⇒ [“1.3 Removing and installing silencer”, page 444](#)

⇒ [“1.4 Aligning exhaust system free of stress”, page 452](#)

⇒ [“1.5 Checking exhaust system for leaks”, page 453](#)

⇒ [“1.6 Installation position of clamp”, page 453](#)

⇒ [“1.7 Align end exhaust pipes”, page 454](#)

1.1 Assembly overview - silencers

⇒ [“1.1.1 Assembly overview - silencer, Ateca, Leon 2013”, page 435](#)

⇒ [“1.1.2 Assembly overview - silencer, Ibiza 2018, Arona”, page 437](#)

⇒ [“1.1.3 Assembly overview - silencer, Toledo 2013, Ibiza 2016”, page 439](#)

1.1.1 Assembly overview - silencer, Ateca, Leon 2013

1 - Retainer

- ☐ Renew if damaged

2 - Bolts

- ☐ 23 Nm

3 - Mounting »A«

- ☐ Renew if damaged
- ☐ Only for rear silencer
- ☐ Aligning ➔ [page 437](#)

4 - Rear silencer

- ☐ Combined in one unit with front silencer as original equipment. Renew separately for repair purposes
- ☐ Removing and installing ➔ ["1.3.4 Removing and positioning back silencer, Ateca, Leon 2013", page 449](#)
- ☐ Disconnecting exhaust pipes/silencers ➔ ["1.2.1 Disconnecting exhaust pipes/silencers, Ateca, Leon 2013", page 440](#)
- ☐ Aligning exhaust system free of stress

5 - Clamp

- ☐ Fitting position ➔ [page 437](#)

6 - Securing nuts

- ☐ 30 Nm

7 - Retainer

- ☐ Renew if damaged

8 - Bolt

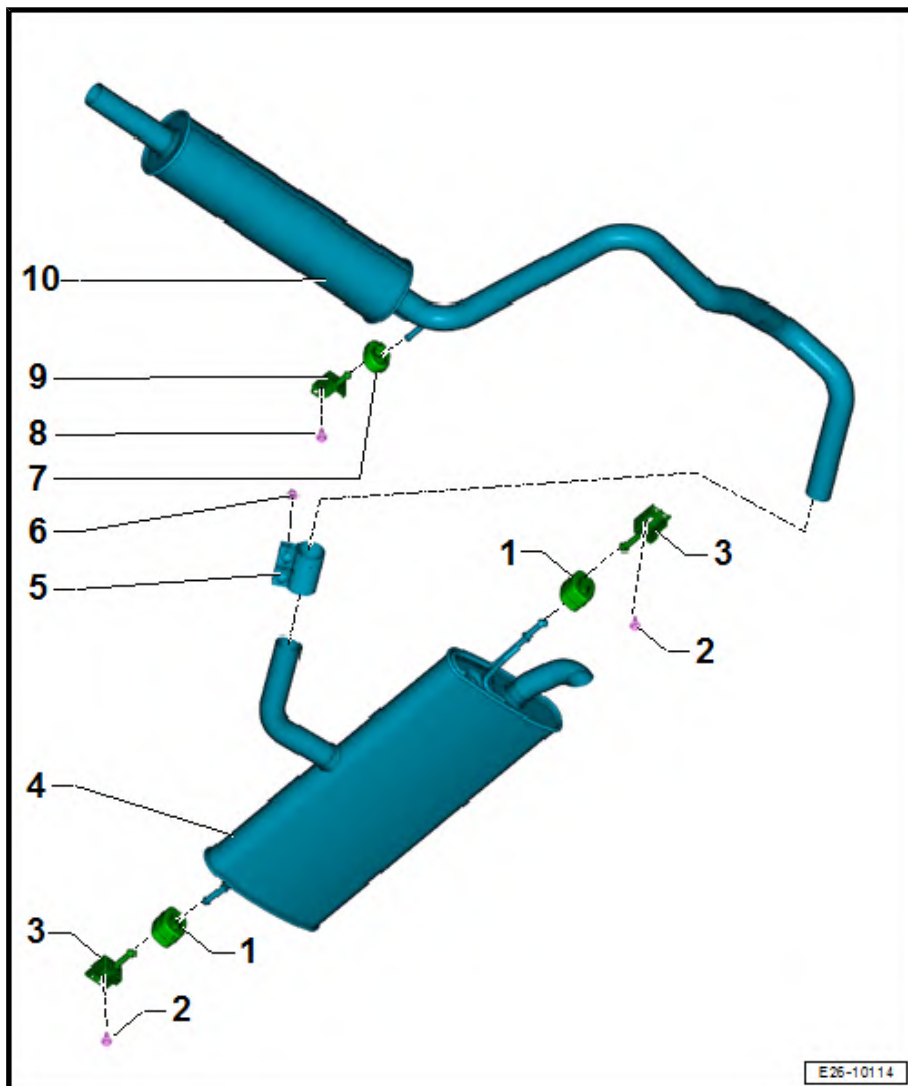
- ☐ 20 Nm +90°

9 - Mounting »B«

- ☐ Renew if damaged
- ☐ Only for front silencer
- ☐ Aligning ➔ [page 437](#)

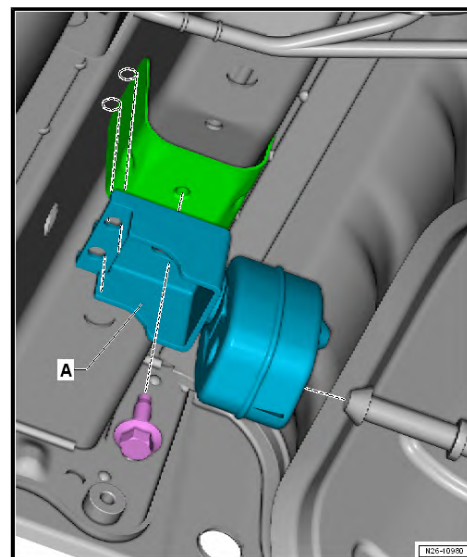
10 - Front silencer

- ☐ Combined in one unit with rear silencer as original equipment. Renew separately for repair purposes
- ☐ Removing and installing ➔ ["1.3.1 Removing and positioning front silencer, Ateca, Leon 2013", page 444](#)
- ☐ Disconnecting exhaust pipes/silencers ➔ ["1.2.1 Disconnecting exhaust pipes/silencers, Ateca, Leon 2013", page 440](#)
- ☐ Aligning exhaust system free of stress ➔ ["1.4 Aligning exhaust system free of stress", page 452](#)



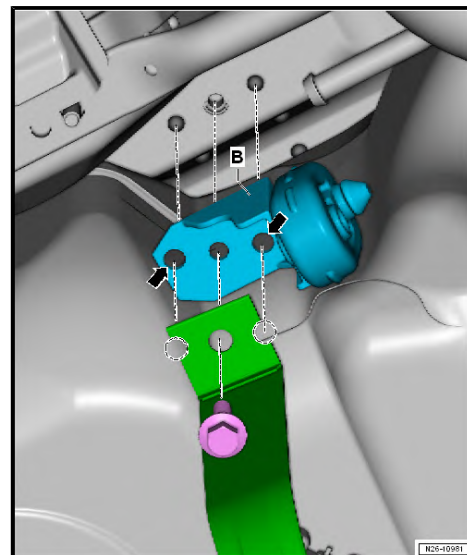
Aligning mounting »A«

- Pre-tighten bolt.
- Arrange hanger over the long hole bore
- Using blunt side of commercially available 8 mm drill bit, align holes of mounting -A- centrally and perpendicular to longitudinal member.
- Then tighten to specified torque.



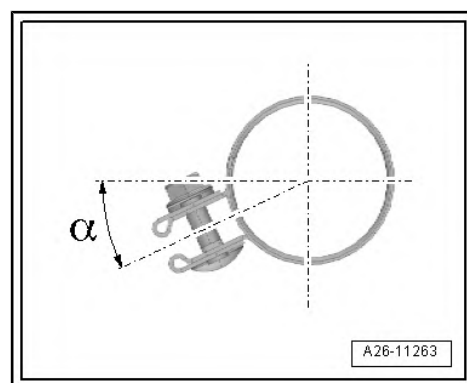
Aligning mounting »B«

- Pre-tighten bolt.
- Arrange hanger over the long hole bore
- Using blunt side of commercially available 8 mm drill bit, align holes -arrows- of mounting -B- centrally and parallel to longitudinal member.
- Then tighten to specified torque.



Installation position of rear clamp

- Fit clamp in position shown.
- Permissible installation angle α = approx. 20°.
- Bolted connection faces towards rear.
- Nuts upwards.



1.1.2 Assembly overview - silencer, Ibiza 2018, Arona

1 - Clamp

- ☐ Fitting position
⇒ ["1.6 Installation position of clamp", page 453](#)
- ☐ Position ⇒ [page 454](#)
- ☐ Specified torque
⇒ [page 454](#)

2 - Front silencer

- ☐ Removing and installing
⇒ ["1.3.2 Removing and installing front silencer, Ibiza 2018, Arona", page 446](#)

3 - Mounting

- ☐ Renew if damaged

4 - Support

5 - Securing bolt

- ☐ 20 Nm

6 - Separating point

- ☐ Separating
⇒ ["1.2.2 Separating exhaust pipes from silencers, Ibiza 2018, Arona", page 441](#)

7 - Rear silencer

- ☐ Removing and installing
⇒ ["1.3.5 Removing and installing back silencer, Ibiza 2018, Arona", page 450](#)

8 - Mounting

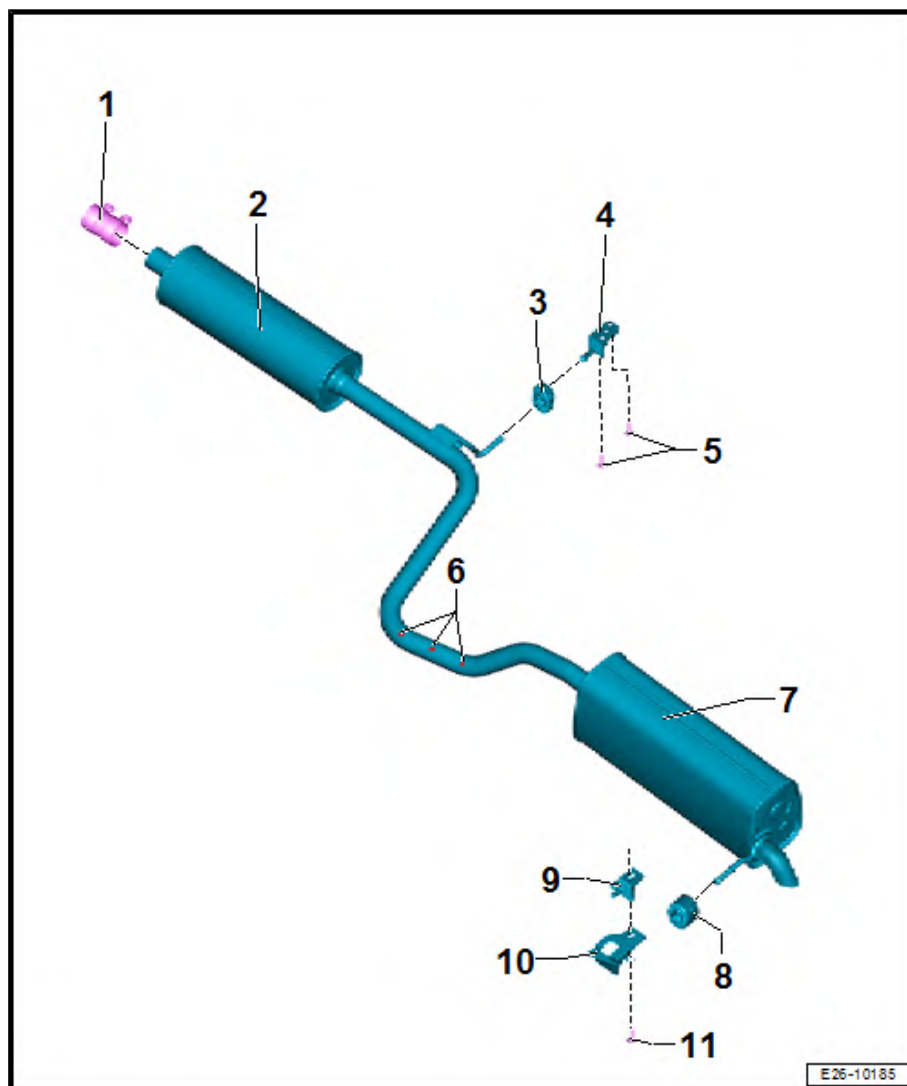
- ☐ Renew if damaged

9 - Support

10 - Support

11 - Securing bolt

- ☐ 20 Nm



1.1.3 Assembly overview - silencer, Toledo 2013, Ibiza 2016



Note

- ◆ After working on the exhaust system, ensure that the system is not under tension
- ◆ and that there is sufficient clearance to the bodywork.
- ◆ If necessary, loosen double clamp(s). Align silencer and exhaust pipe so that sufficient clearance is maintained to the bodywork and the support rings are evenly loaded.
- ◆ Renew self-locking nuts.
- ◆ Before installing, coat threads of lock nuts and stud bolts with high-temperature paste according to TL 521 12.

1 - Clamp

- ☐ Fitting position
⇒ ["1.6 Installation position of clamp", page 453](#)
- ☐ Position ⇒ [page 454](#)
- ☐ Specified torque
⇒ [page 454](#)

2 - Tunnel cross-piece

- ☐ Note installation position (mark before removal, if necessary).
- ☐ Removal and installation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; Heat shields – assembly overview

3 - Securing nuts

- ☐ 20 Nm

4 - Front silencer

- ☐ Removing and installing
⇒ ["1.3.3 Front silencer - removing and installing, Toledo 2013, Ibiza 2016", page 447](#)

5 - Support

6 - Bolts

- ☐ 23 Nm

7 - Mounting

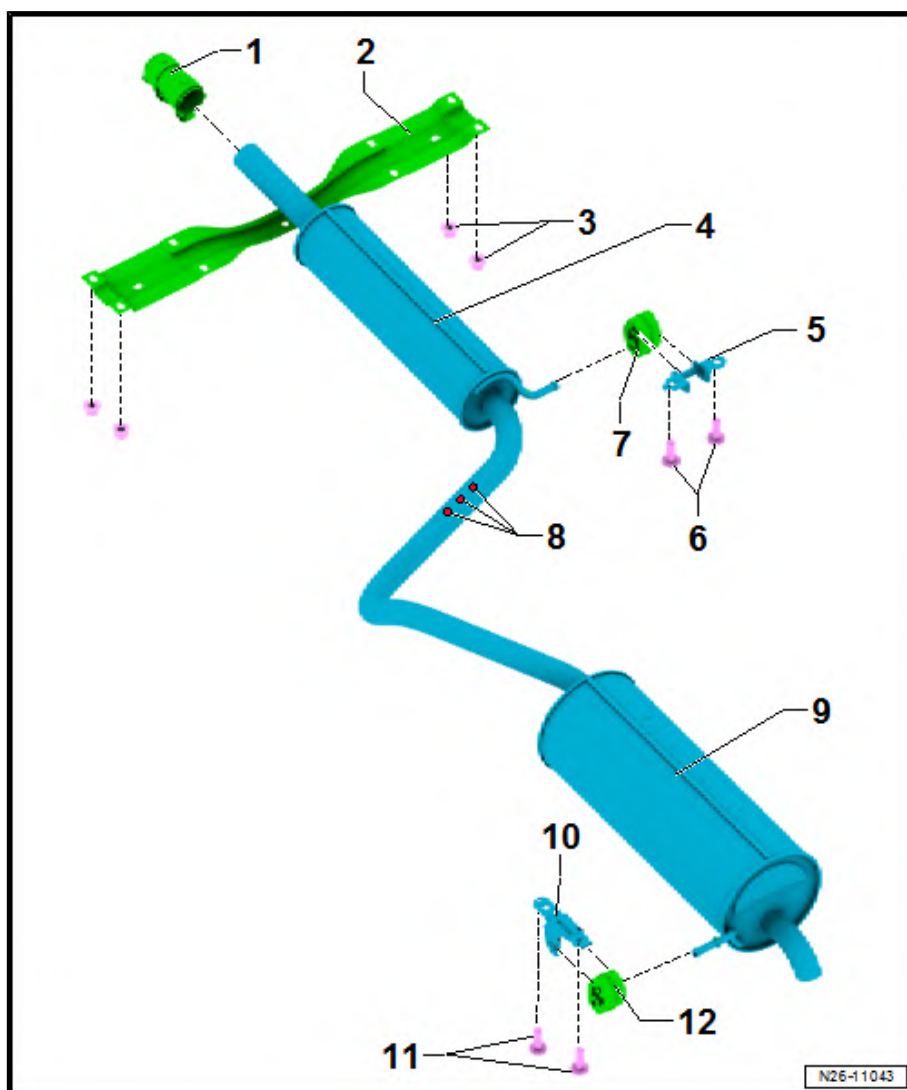
- ☐ Renew if damaged

8 - Separating point

- ☐ Separating ⇒ ["1.2.3 Separating exhaust pipes from silencers, Toledo 2013, Ibiza 2016", page 443](#)

9 - Rear silencer

- ☐ Removing and installing
⇒ ["1.3.6 Back silencer - removing and installing, Toledo 2013, Ibiza 2016", page 451](#)



10 - Support**11 - Securing bolts**

- ☐ 23 Nm

12 - Mounting

- ☐ Renew if damaged

1.2 Disconnecting exhaust pipes/silencers

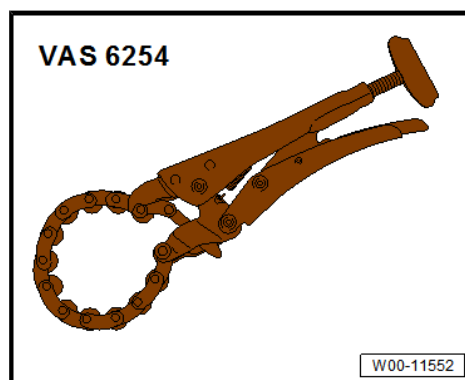
⇒ ["1.2.1 Disconnecting exhaust pipes/silencers, Ateca, Leon 2013", page 440](#)

⇒ ["1.2.2 Separating exhaust pipes from silencers, Ibiza 2018, Arona", page 441](#)

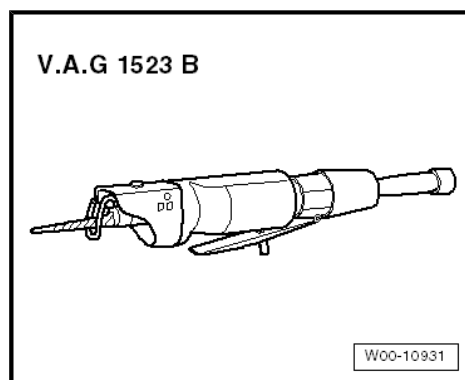
⇒ ["1.2.3 Separating exhaust pipes from silencers, Toledo 2013, Ibiza 2016", page 443](#)

1.2.1 Disconnecting exhaust pipes/silencers, Ateca, Leon 2013**Special tools and workshop equipment required**

- ◆ Chain-type pipe cutter - VAS 6254-



- ◆ Body saw - V.A.G 1523B-



- ◆ Torque wrench - V.A.G 1331-



CAUTION

Risk of injury caused by flying metal shavings.

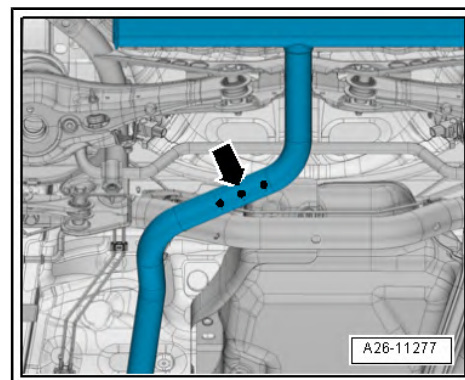
Risk of injury and irritation to eyes and skin.

- Wear protective goggles.
- Wear protective gloves.

- ◆ Separating points are provided in the exhaust system for the individual removal of exhaust system parts.
- ◆ The separating points are indicated with markings on the outside of the exhaust pipe.

Separating point on rear silencer

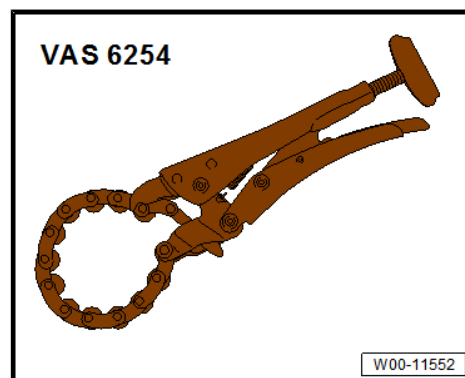
- Cut through exhaust pipe at centre separating point -upper arrow- at right angles, e.g. with pneumatic sabre saw - V.A.G 1523B- or chain pipe cutter - VAS 6254- .
- Cut through exhaust pipe at right angles at cutting point -arrows- using chain pipe cutter - VAS 6254- .
- Note installation position of clamp
⇒ Fig. "Installation position of rear clamp" , page 437



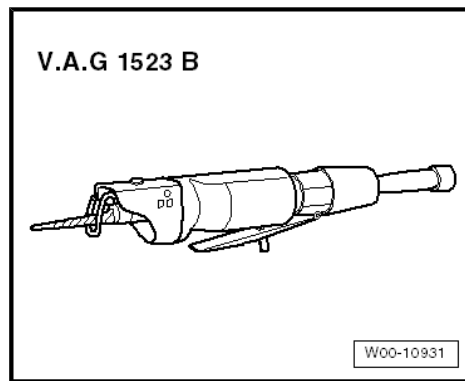
1.2.2 Separating exhaust pipes from silencers, Ibiza 2018, Arona

Special tools and workshop equipment required

- ◆ Chain-type pipe cutter - VAS 6254-



◆ Body saw - V.A.G 1523B-



◆ Torque wrench - V.A.G 1331-



CAUTION

Risk of injury caused by flying metal shavings.

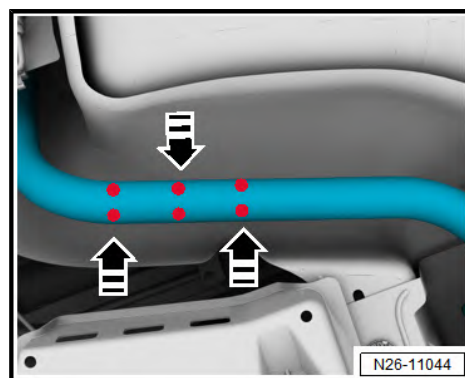
Risk of injury and irritation to eyes and skin.

- Wear protective goggles.
- Wear protective gloves.

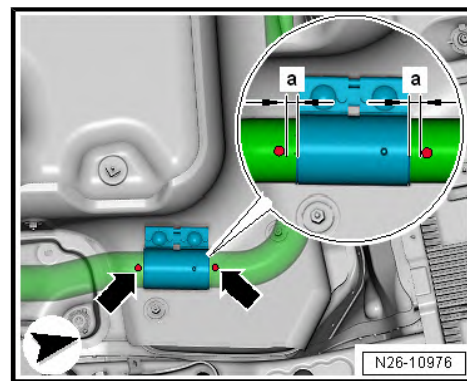
- ◆ Separating points are provided in the exhaust system for the individual removal of exhaust system parts.
- ◆ The separating points are indicated with markings on the outside of the exhaust pipe.

Separating point on rear silencer

- If fitted, remove underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - underbody trim panels .
- Cut through exhaust pipe at centre separating point
-upper arrow- at right angles, e.g. with pneumatic sabre saw - V.A.G 1523B- or chain pipe cutter - VAS 6254- .



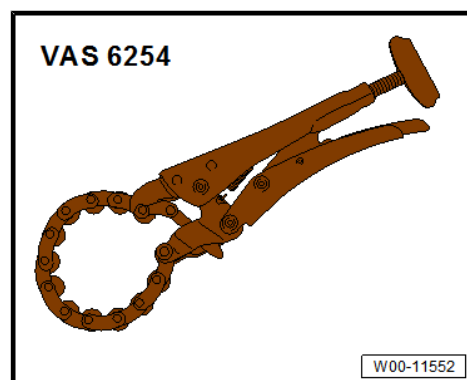
- Position repair double clamp centrally between outer markings -lower arrow-.
- Take installation position of clamp into account
⇒ ["1.6 Installation position of clamp", page 453](#).



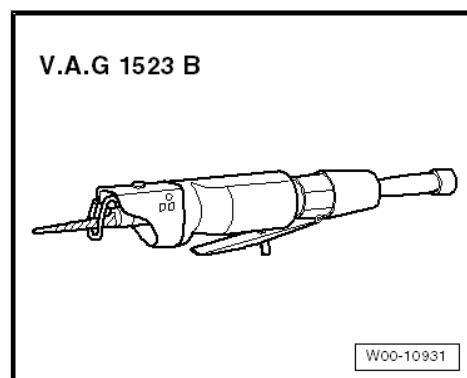
1.2.3 Separating exhaust pipes from silencers, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required

- ◆ Chain-type pipe cutter - VAS 6254-



- ◆ Body saw - V.A.G 1523B-



- ◆ Torque wrench - V.A.G 1331-



CAUTION

Risk of injury caused by flying metal shavings.

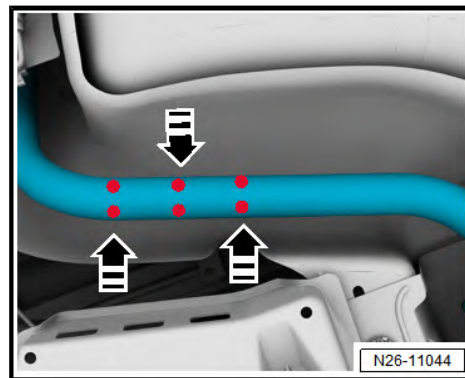
Risk of injury and irritation to eyes and skin.

- Wear protective goggles.
- Wear protective gloves.

- ◆ Separating points are provided in the exhaust system for the individual removal of exhaust system parts.
- ◆ The separating points are indicated with markings on the outside of the exhaust pipe.

Separating point on rear silencer

- Cut through exhaust pipe at centre separating point
-upper arrow- at right angles, e.g. with pneumatic sabre saw - V.A.G 1523B- or chain pipe cutter - VAS 6254- .
- Position repair double clamp centrally between outer markings
-lower arrow-.
- Take installation position of clamp into account
⇒ ["1.6 Installation position of clamp", page 453](#) .

**1.3 Removing and installing silencer**

⇒ ["1.3.1 Removing and positioning front silencer, Ateca, Leon 2013", page 444](#)

⇒ ["1.3.2 Removing and installing front silencer, Ibiza 2018, Arona", page 446](#)

⇒ ["1.3.3 Front silencer - removing and installing, Toledo 2013, Ibiza 2016", page 447](#)

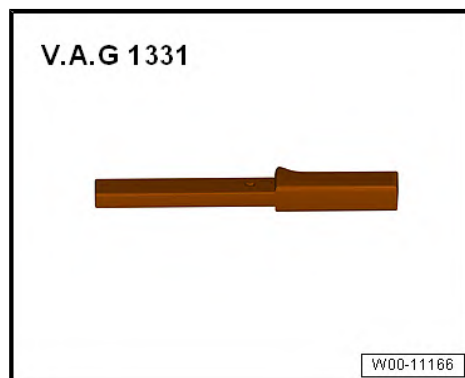
⇒ ["1.3.4 Removing and positioning back silencer, Ateca, Leon 2013", page 449](#)

⇒ ["1.3.5 Removing and installing back silencer, Ibiza 2018, Arona", page 450](#)

⇒ ["1.3.6 Back silencer - removing and installing, Toledo 2013, Ibiza 2016", page 451](#)

1.3.1 Removing and positioning front silencer, Ateca, Leon 2013**Special tools and workshop equipment required**

- ◆ Torque wrench - V.A.G 1331-



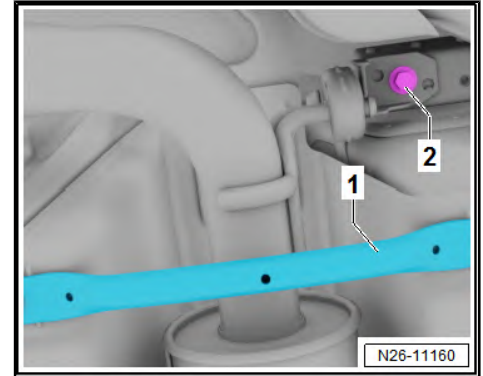
Removing

Separating point without clamp

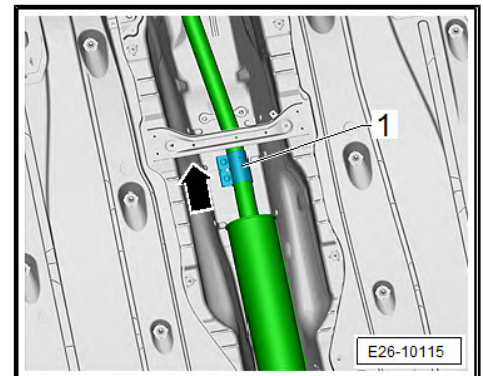
- Separate rear silencer from front silencer
⇒ [“1.2.1 Disconnecting exhaust pipes/silencers, Ateca, Leon 2013”, page 440](#) .
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Assembly overview - underbody trims .

Separating point with clamp

- Unscrew the nuts at the rear of the tunnel bridge -1- and remove the tunnel bridge ⇒ Body Repairs; Rep. gr. 66 ; Underbody panelling; removing and installing the tunnel bridge .



- Loosen clamp -1- between catalytic converter and front silencer, and push it in direction of travel -arrow-.

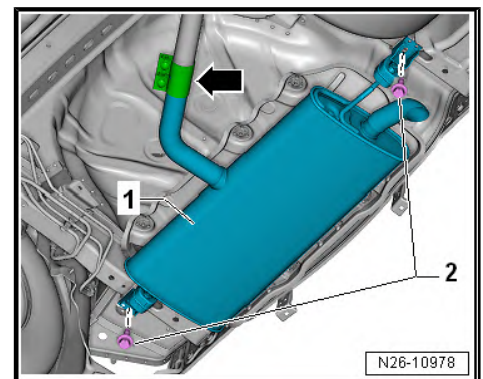


- Loosen clamp -arrow- between front and rear silencer -1- and push in the opposite direction.



Note

Disregard item -2-.



- Remove bolt -2- on mounting.
- Detach front silencer, and guide it out.

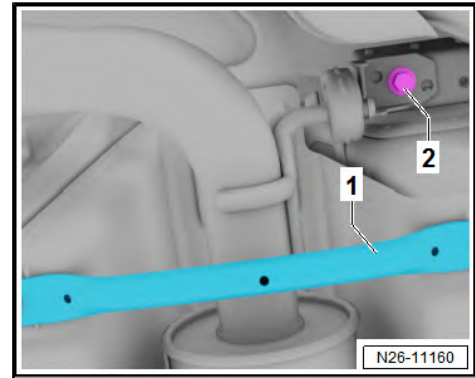
Installing

Install in reverse order of removal, observing the following:

- Align exhaust system free of stress
⇒ ["1.4 Aligning exhaust system free of stress", page 452](#) .
- Note installation position of clamps
⇒ [Fig. "Installation position of rear clamp", page 437](#) .

Specified torques

- ◆ Securing bolts for bracket
⇒ ["1.1.1 Assembly overview - silencer, Ateca, Leon 2013", page 435](#)
- ◆ Bolts for clamp ⇒ [Item 6 \(page 436\)](#)
- ◆ Nuts at the rear of the tunnel bridge ⇒ Body Repairs; Rep. gr. 66 ; Underbody panelling; removing and installing the tunnel bridge



1.3.2 Removing and installing front silencer, Ibiza 2018, Arona

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Removing

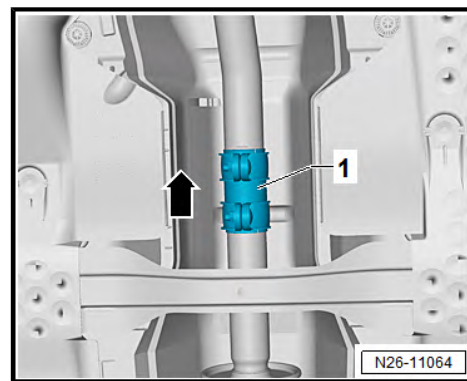
- If fitted, remove underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - underbody trim panels .

Separating point without clamp

- Separate front silencer from the rear silencer
⇒ ["1.2.2 Separating exhaust pipes from silencers, Ibiza 2018, Arona", page 441](#) .
- Separating point ⇒ [Item 6 \(page 438\)](#)

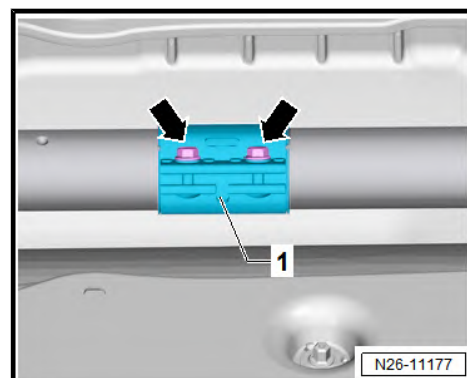
Continued for all vehicles

- Loosen clamp -1- between catalytic converter and front silencer, and push it in direction of travel -arrow-.



Separating point with clamp

- Loosen clamp -1- between front and rear silencer, and push it in opposite direction of travel.



Continued for all vehicles

- Remove bolt -2- on mounting.



Note

Disregard item -1-.

- Detach front silencer, and guide it out.

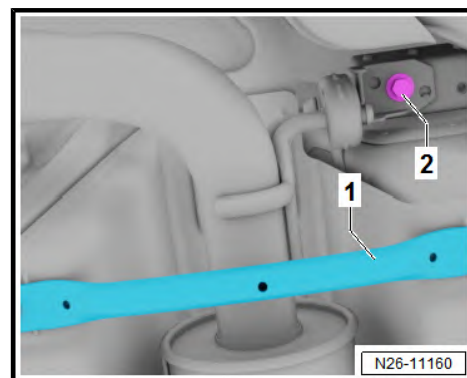
Installing

Install in reverse order of removal, observing the following:

- Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 452](#) .
- Note installation position of clamps
⇒ [“1.6 Installation position of clamp”, page 453](#) .

Specified torques

- ◆ ⇒ [“1.1.2 Assembly overview - silencer, Ibiza 2018, Arona”, page 437](#)
- ◆ ⇒ [“1.4 Aligning exhaust system free of stress”, page 452](#)
- ◆ ⇒ [“1.6 Installation position of clamp”, page 453](#)



1.3.3 Front silencer - removing and installing, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Removing

⚠ CAUTION

Risk of accident caused by high weight of silencers.

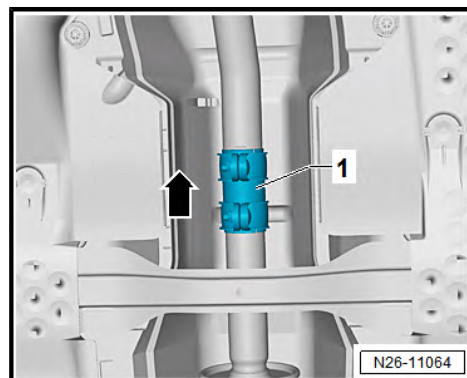
- Seek help from a second a mechanic for the following work.

Separating point without clamp

- Separate rear silencer from front silencer
⇒ [“1.2.3 Separating exhaust pipes from silencers, Toledo 2013, Ibiza 2016”, page 443](#) .

Separating point with clamp

- Loosen clamp -1- between catalytic converter and front silencer, and push it in direction of travel -arrow-.
- Loosen clamp between front and rear silencer, and push it in opposite direction of travel.



- Bend heat shield -1- in direction of -arrow-.
- Bracket -2- needs to be guided past heat shield -1-.
- Unscrew bolts -3- from bracket -2-. Guide bracket -2- past heat shield -1-.
- Detach front silencer, and guide it out.

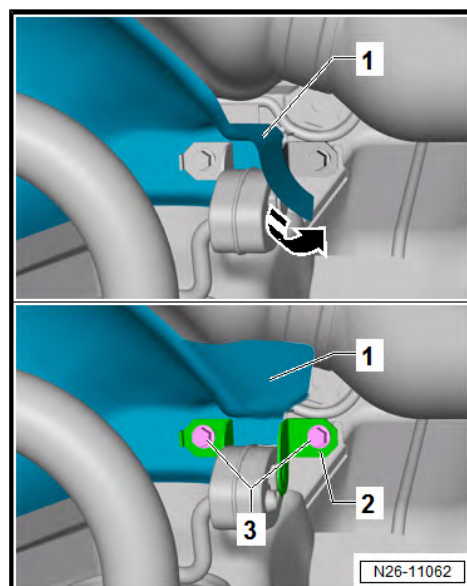
Installing

Install in reverse order of removal, observing the following:

- Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 452](#) .
- Note installation position of clamps
⇒ [“1.6 Installation position of clamp”, page 453](#) .

Specified torques

- Securing bolts for bracket
⇒ [“1.1.3 Assembly overview - silencer, Toledo 2013, Ibiza 2016”, page 439](#)
- Bolts for clamp ⇒ [page 454](#)



1.3.4 Removing and positioning back silencer, Ateca, Leon 2013

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Removing

CAUTION

- Risk of accident caused by high weight of silencers.
- Seek help from a second a mechanic for the following work.

Separating point without clamp

- Disconnect silencers
⇒ ["1.2.1 Disconnecting exhaust pipes/silencers, Ateca, Leon 2013", page 440](#).

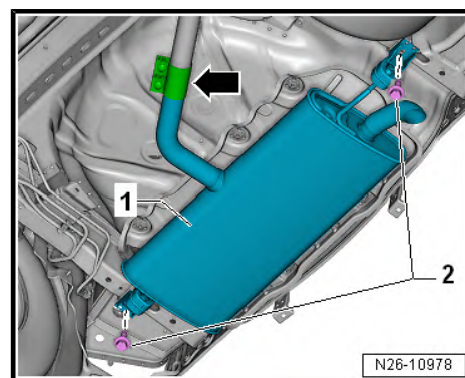
Separating point with clamp

- Loosen clamp -arrow-, and push it forwards.
- Remove bolt -2- on both sides.
- Remove rear silencer -1-.

Continued for all vehicles

- Then remove rear silencer.

Installing



Install in reverse order of removal, observing the following:

- Note installation position of clamp ⇒ [page 437](#)



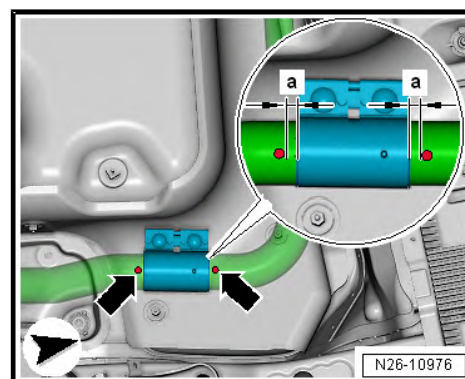
Note

Make sure to obtain the dimension -a = approx. 5 mm- between the marks -arrows-.

- Aligning exhaust system free of stress
⇒ ["1.4 Aligning exhaust system free of stress", page 452](#)

Specified torques

- ◆ Securing bolts for bracket
⇒ ["1.1.1 Assembly overview - silencer, Ateca, Leon 2013", page 435](#)
- ◆ Bolts for clamp ⇒ [Item 6 \(page 436\)](#)



1.3.5 Removing and installing back silencer, Ibiza 2018, Arona

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Removing

- If fitted, remove underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - underbody trim panels .

CAUTION

Risk of accident caused by high weight of silencers.

- Seek help from a second a mechanic for the following work.

Separating point without clamp

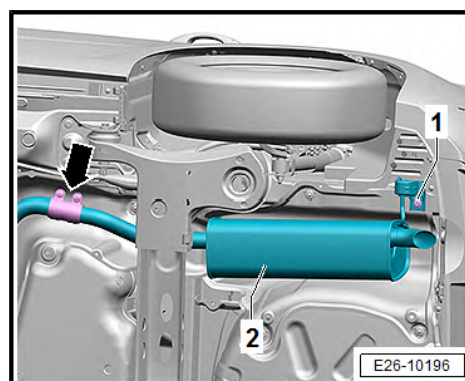
- Disconnect rear silencer from front silencer
⇒ ["1.2.2 Separating exhaust pipes from silencers, Ibiza 2018, Arona", page 441](#) .
- Separating point ⇒ [Item 6 \(page 438\)](#)

Separating point with clamp

- Loosen clamp -arrow-, and push it forwards.

Continued for all vehicles

- Unscrew bolt -1-.
- Remove rear silencer -2-.



Installing

Install in reverse order of removal, observing the following:

- Note installation position of clamp
⇒ ["1.6 Installation position of clamp", page 453](#)



Note

Make sure to obtain the dimension -a = approx. 5 mm- between the marks -arrows-.

- Align exhaust system free of stress
⇒ ["1.4 Aligning exhaust system free of stress", page 452](#) .

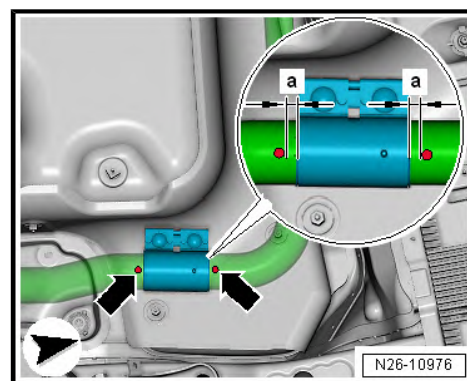
Specified torques

- ◆ ⇒ ["1.1.2 Assembly overview - silencer, Ibiza 2018, Arona", page 437](#)
- ◆ ⇒ ["1.4 Aligning exhaust system free of stress", page 452](#)
- ◆ ⇒ ["1.6 Installation position of clamp", page 453](#)

1.3.6 Back silencer - removing and installing, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



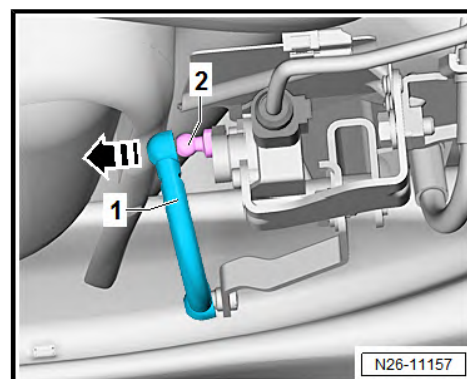
V.A.G 1331



W00-11166

Removing

- Lever the lever -1- off ball head -2- of rear left vehicle level sender - G76- in direction of -arrow-.



- Unscrew bolt -1-, and attach bracket -2- on one side.

CAUTION

Risk of accident caused by high weight of silencers.

- Seek help from a second a mechanic for the following work.

Separating point without clamp

- Disconnect silencers
⇒ [“1.2.3 Separating exhaust pipes from silencers, Toledo 2013, Ibiza 2016”, page 443](#) .

Separating point with clamp

- Unbolt bracket on rear silencer, and remove it.
- Loosen clamp -1-, and push it to one side towards front silencer -2-.

Continued for all vehicles

- Then remove rear silencer.

Installing

Install in reverse order of removal, observing the following:

- Note installation position of clamp
⇒ [“1.6 Installation position of clamp”, page 453](#)



Note

Make sure to obtain the dimension -a = approx. 5 mm- between the marks -arrows-.

- Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 452](#) .
- Tighten securing bolt -1- for bracket of rear left vehicle level sender - G76- to specified torque ⇒ [page 452](#) .

Specified torques

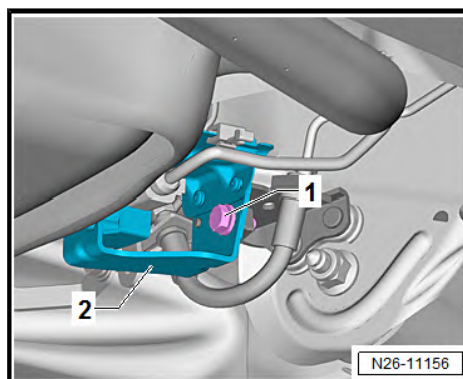
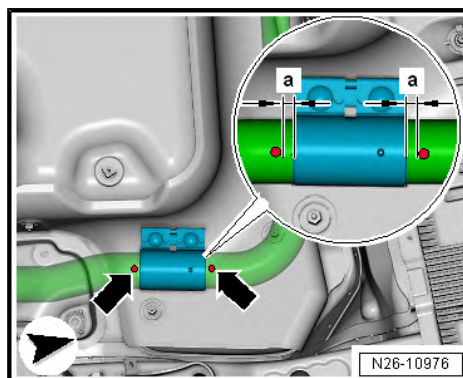
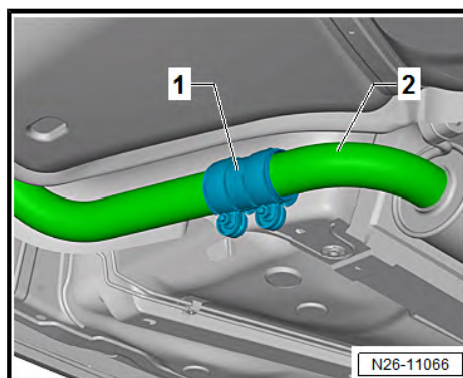
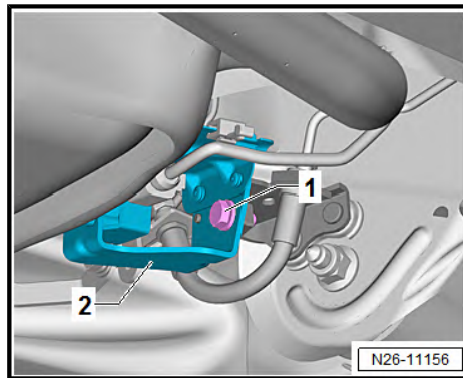
Component	Specified torque
Securing bolt for rear left vehicle level sender - G76-	20 Nm

- Securing bolts for bracket
⇒ [“1.1.3 Assembly overview - silencer, Toledo 2013, Ibiza 2016”, page 439](#)
- Bolts for clamp ⇒ [page 454](#)

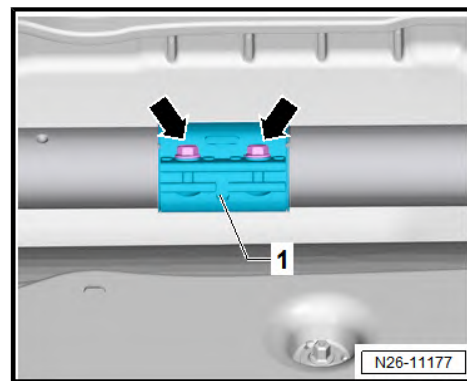
1.4 Aligning exhaust system free of stress

Procedure

- The exhaust system must be aligned when cold.



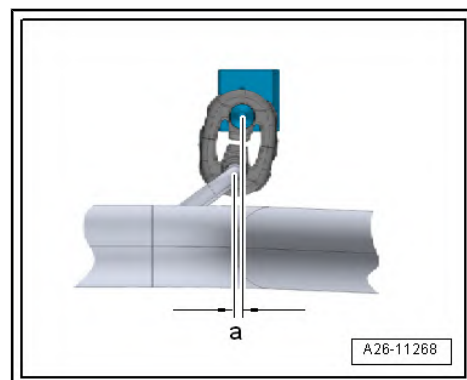
- Slacken nuts on front clamp -arrows-.



- Push exhaust system towards front until preloading at mounting for exhaust pipe -a- = 5 mm.
- Fit front clamp
⇒ [“1.6 Installation position of clamp”, page 453](#) .

Specified torques

- ◆ Clamp ⇒ [page 454](#)



1.5 Checking exhaust system for leaks

Procedure

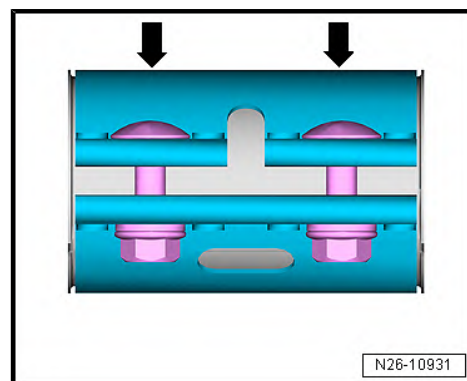
- Start engine, and run at idling speed.
- Seal exhaust pipes with cloths or plugs, for example, for the duration of the leakage test.
- Check (by listening) points of connection between exhaust manifold and the cylinder head, between turbocharger and front exhaust pipe etc. to make sure there are no leaks.
- Repair any leaks found.

1.6 Installation position of clamp



Note

Make sure to use clamps with continuous clip only.



Position of clamp

Make sure that installation dimension -a- is obtained.

a - Distance to marking: approx. 8.5 mm

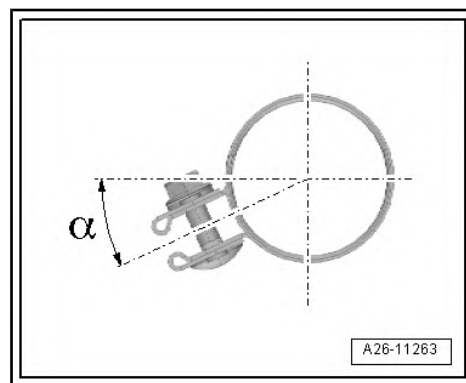
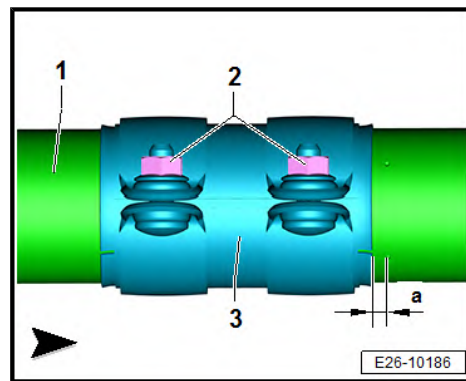
1 - Clamp

2 - Front exhaust pipe

3 - Securing nut

Installation position of the clamping sleeve

- Angle α (= approx. 20°) must not be exceeded.



Specified torques

Component	Specified torque
Clamp	30 Nm

1.7 Align end exhaust pipes

Procedure

- Unfasten rear silencer mounting to align tailpipes.
- Align rear silencer maintaining distance -a- and -b- between bumper cut-out and exhaust pipe.

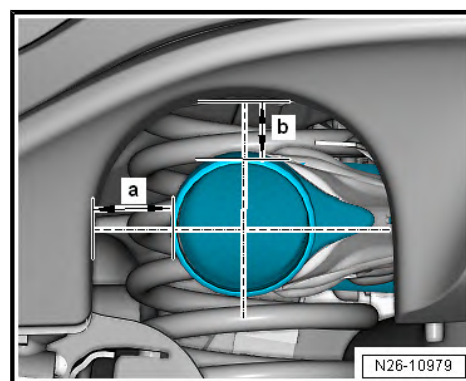
Adjustment dimensions

Dimension a: 25 mm

Dimension b: 30 mm

Specified torques

- ◆ Securing bolts for mountings
⇒ ["1.1 Assembly overview - silencers", page 435](#)
- ◆ Clamp ⇒ [page 454](#)



2 Exhaust gas cleaning

⇒ [“2.1 Assembly overview - emission control”, page 455](#)

⇒ [“2.2 Removing and installing catalytic converter”, page 459](#)

⇒ [“2.3 Removing and installing particulate filter”, page 463](#)

2.1 Assembly overview - emission control

⇒ [“2.1.1 Assembly overview - emission control, Ateca, Leon 2013, Ibiza 2018, Arona”, page 455](#)

⇒ [“2.1.2 Assembly overview - emission control, Toledo 2013, Ibiza 2016”, page 458](#)

2.1.1 Assembly overview - emission control, Ateca, Leon 2013, Ibiza 2018, Arona

1 - Support

2 - Bolt

- ❑ Specified torque and tightening sequence
⇒ [page 456](#)

3 - Nut

- ❑ Specified torque and tightening sequence
⇒ [page 456](#)

4 - Bolt

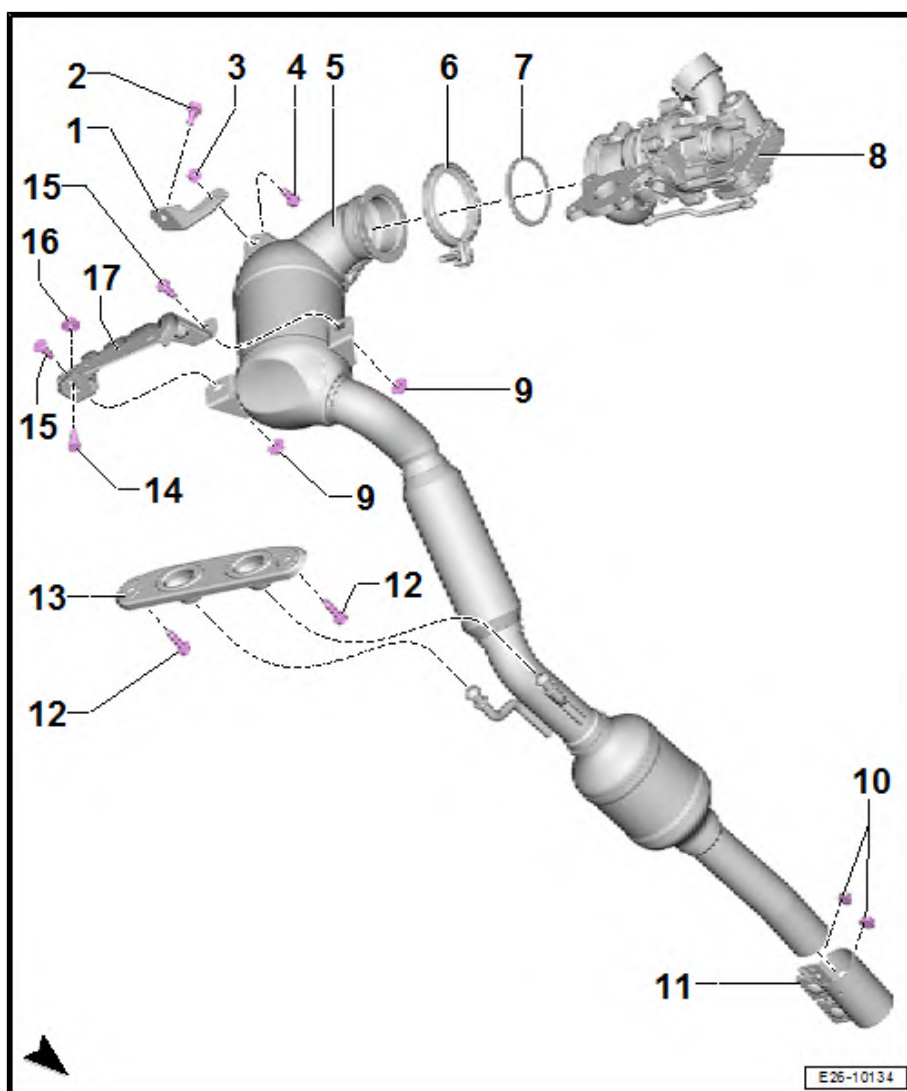
- ❑ Specified torque and tightening sequence
⇒ [page 456](#)

5 - Front exhaust pipe with catalytic converter

- ❑ Do not allow the decoupling element to kink by more than 10°. It could become damaged.
- ❑ Install decoupling element so that it is not under tension.
- ❑ Take care not to damage wire mesh on decoupling element.
- ❑ Protect catalytic converter from damage by knocks and impact
- ❑ Removing and installing
⇒ [“2.2.1 Catalytic converter - removing and installing, Leon 2013, Ibiza 2018, Arona”, page 459](#)
- ❑ Do not remove protective packaging from replacement part until you are ready to fit the flexible joint
- ❑ Aligning exhaust system free of stress ⇒ [“1.4 Aligning exhaust system free of stress”, page 452](#)

6 - Screw-type clip

- ❑ Renew after removal
- ❑ Specified torque and tightening sequence ⇒ [page 456](#)



7 - Seal

- ☐ Renew after removal

8 - Turbocharger

- ☐ Removing and installing ⇒ [“1.2 Removing and installing turbocharger”, page 353](#)
- ☐ Specified torque and tightening sequence ⇒ [“1.1 Assembly overview - turbocharger”, page 351](#)

9 - Nut

- ☐ Specified torque and tightening sequence ⇒ [page 456](#)

10 - Nut

- ☐ 25 Nm

11 - Front clamp

- ☐ Align exhaust system free of stress before tightening clamp
⇒ [“1.4 Aligning exhaust system free of stress”, page 452](#)
- ☐ Fitting position ⇒ [“1.6 Installation position of clamp”, page 453](#)
- ☐ Tighten threaded connections evenly.

12 - Bolt

- ☐ 20 Nm

13 - Mounting

- ☐ Renew if damaged

14 - Bolt

- ☐ Specified torque and tightening sequence ⇒ [page 456](#)

15 - Bolt

- ☐ Specified torque and tightening sequence ⇒ [page 456](#)

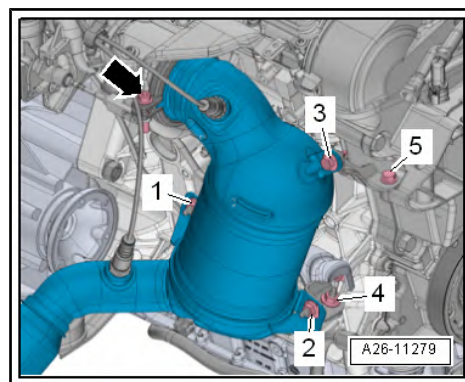
16 - Nut

- ☐ Specified torque and tightening sequence ⇒ [page 456](#)

17 - Support

Installing catalytic converter - specified torque and tightening sequence

1.	– Fit catalytic converter to turbocharger, attach screw-type clip -arrow- without tightening	
2.	– Loosely screw in bolts -3, 5- and bolts -1, 2, 4- by hand	• It should still be possible to move catalytic converter and bracket.
3.	– Tighten screw-type clip -arrow-.	15 Nm
4.	– Tighten bolts and nuts in the sequence -1 to 5-.	20 Nm



Bracket and heat shields

1 - Heat shield

- ☐ For engine
- ☐ Renew if damaged

2 - Bolts

- ☐ 4 off
- ☐ 20 Nm

3 - Support

4 - Bolts

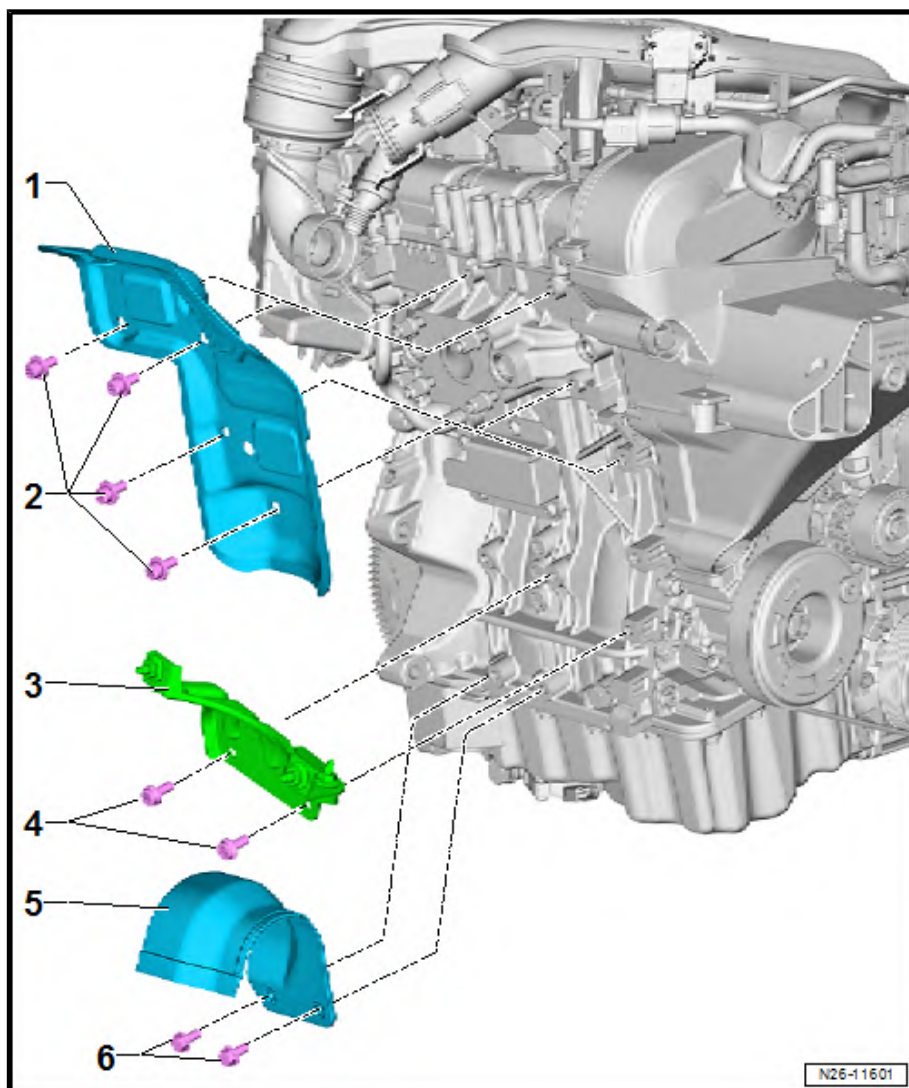
- ☐ 2 off
- ☐ 20 Nm

5 - Heat shield

- ☐ For drive shaft.
- ☐ Renew if damaged

6 - Bolts

- ☐ 2 off
- ☐ 25 Nm



2.1.2 Assembly overview - emission control, Toledo 2013, Ibiza 2016

1 - Retaining loop

- ☐ Renew if damaged

2 - Front exhaust pipe with catalytic converter

- ☐ Do not allow the decoupling element to kink by more than 10°. It could become damaged.
- ☐ Install decoupling element so that it is not under tension.
- ☐ Take care not to damage wire mesh on decoupling element.
- ☐ Protect catalytic converter from damage by knocks and impact
- ☐ Removing and installing
⇒ ["2.2.2 Catalytic converter - removing and installing, Toledo 2013, Ibiza 2016", page 461](#)
- ☐ Do not remove protective packaging from replacement part until you are ready to fit the flexible joint
- ☐ Aligning exhaust system free of stress
⇒ ["1.4 Aligning exhaust system free of stress", page 452](#)

3 - Support

- ☐ Renew if damaged

4 - Bolt

- ☐ 20 Nm

5 - Nut

- ☐ Specified torque and tightening sequence ⇒ [page 459](#)

6 - Support

7 - Screw-type clip

- ☐ Specified torque and tightening sequence ⇒ [page 459](#)

8 - Seal

- ☐ Renew after removal

9 - Turbocharger

10 - Nut

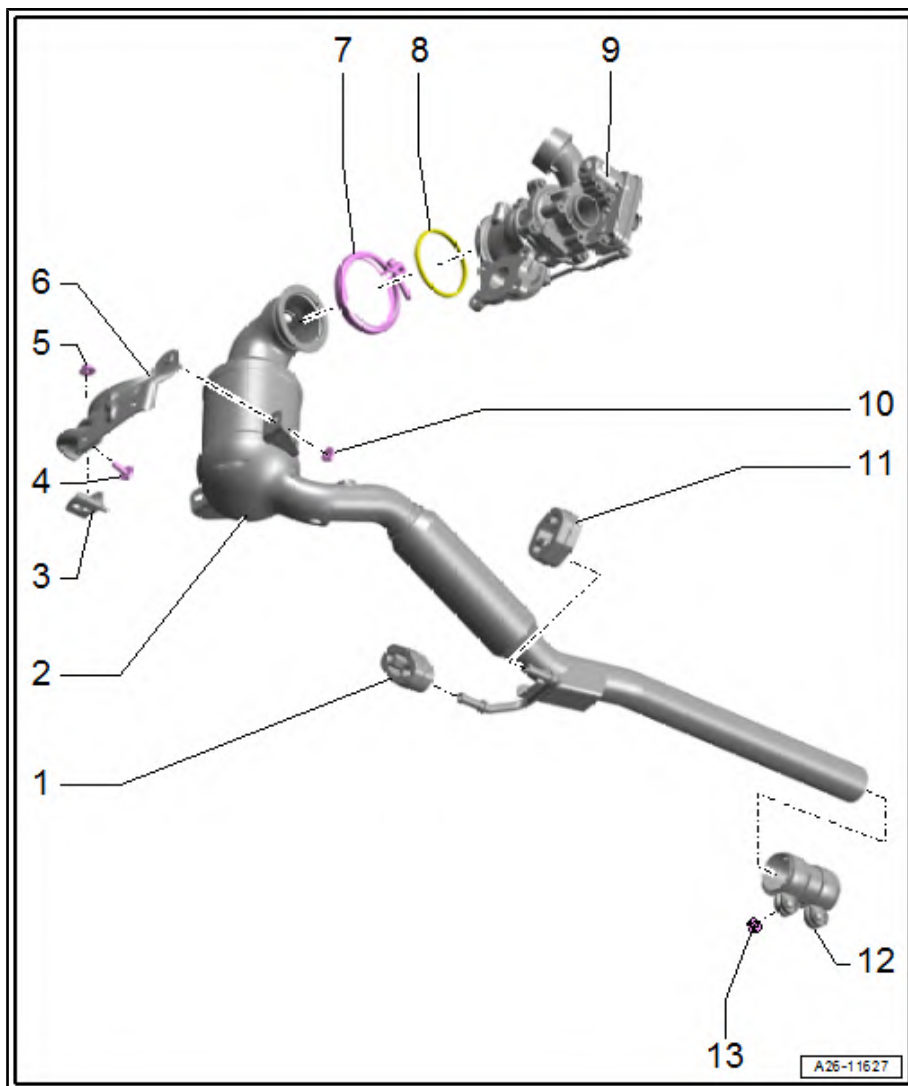
- ☐ Specified torque and tightening sequence ⇒ [page 459](#)

11 - Retaining loop

- ☐ Renew if damaged

12 - Clamp

- ☐ Align exhaust system free of stress before tightening clamp.
- ☐ Fitting position ⇒ ["1.4 Aligning exhaust system free of stress", page 452](#)



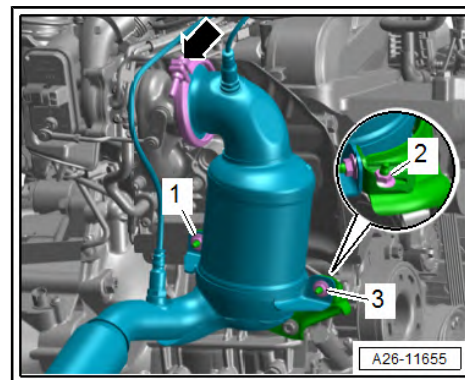
- ❑ Tighten threaded connections evenly ➔ [“1.6 Installation position of clamp”, page 453](#)

13 - Nut

- ❑ 23 Nm

Installing catalytic converter - specified torque and tightening sequence

1.	- Fit catalytic converter to turbocharger, attach screw-type clip -arrow- without tightening	
2.	- Screw in bolts -1, 2, 3- loosely by hand	• It should still be possible to move catalytic converter and bracket.
3.	- Tighten screw-type clip -arrow-.	15 Nm
4.	- Tighten bolts and nuts in the sequence -1 to 3-.	20 Nm



2.2 Removing and installing catalytic converter

➔ [“2.2.1 Catalytic converter - removing and installing, Leon 2013, Ibiza 2018, Arona”, page 459](#)

➔ [“2.2.2 Catalytic converter - removing and installing, Toledo 2013, Ibiza 2016”, page 461](#)

2.2.1 Catalytic converter - removing and installing, Leon 2013, Ibiza 2018, Arona

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ High-temperature paste ➔ Electronic parts catalogue (ETKA) .



Note

The catalytic converter is removed together with the front exhaust pipe.

Removing

- Disconnect connectors -1- and -2-, and unclip wiring harness from retainer.



Note

Attach cable ties in all the same places when installing.

Only when the catalytic converter is used

- Remove Lambda probes
⇒ ["8.2.1 Lambda probe- removing and installing, Leon 2013, Ibiza 2018, Arona", page 431](#) .

Continuation for removal

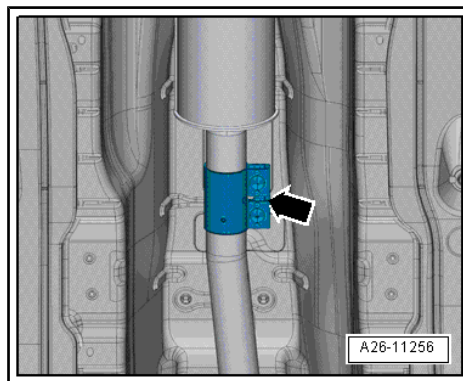
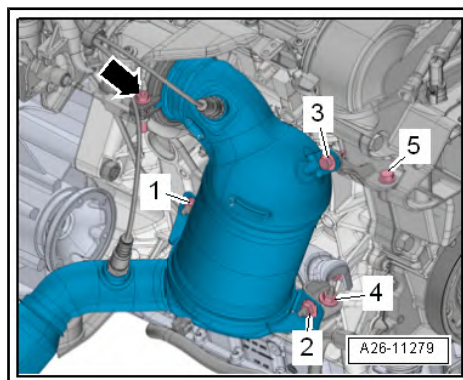
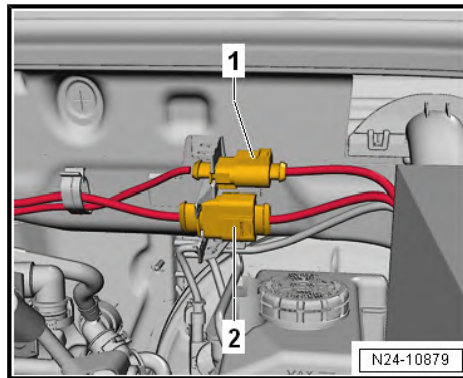
- Open screw-type clip -arrow- and position it on intake funnel of catalytic converter.
- Remove bolt -3-.
- Unscrew nuts -1- and -2-.



Note

-Items 4 and 5- can be disregarded.

- Remove nose insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- If fitted, remove underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - underbody trim panels .
- Remove drive shaft heat shield ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft heat shield .
- Loosen the clamp -arrow-, and push it forwards.



- Remove bolts -arrows-.



Note

- ◆ When removing the catalytic converter from its installation location, ensure that the Lambda probes and their connections are not damaged.
- ◆ The decoupling element of the main exhaust pipe must not be bent more than 10°, otherwise it will be damaged.

- Remove catalytic converter -1- through the tunnel opening by twisting 180° around its axis.

Installing

Install in reverse order of removal, observing the following:



Note

Renew seal and self-locking nuts.

- Insert the screwdriver -2- into the groove -arrow- of the turbocharger and remove the oil seal -1-.
- Insert new oil seal
- Renew screw-type clip between turbocharger and catalytic converter.
- Observe sequence for installation of catalytic converter
⇒ [Fig. “Installing catalytic converter - specified torque and tightening sequence”](#), page 456
- Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”](#), page 452 .

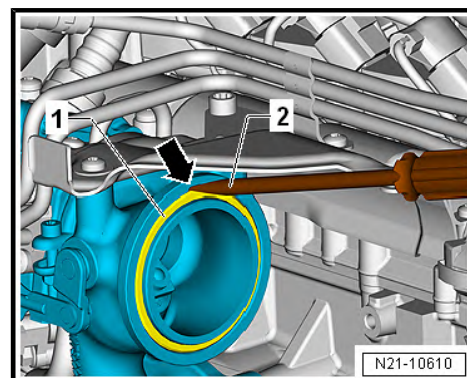
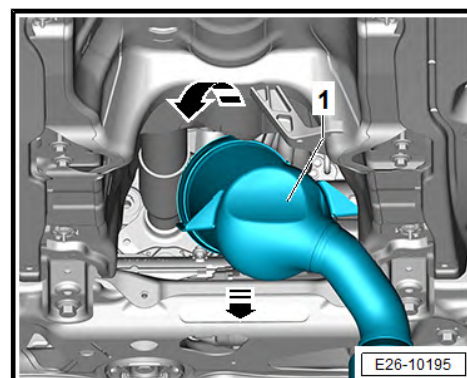
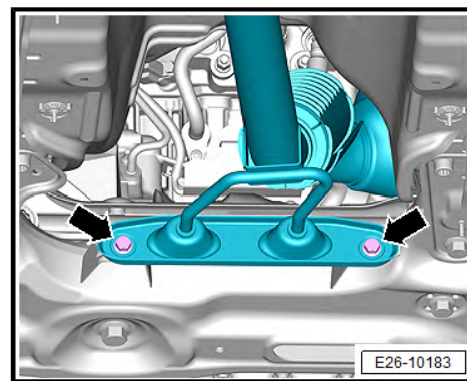
Specified torques

- ◆ ⇒ [“2.1.1 Assembly overview - emission control, Ateca, Leon 2013, Ibiza 2018, Arona”](#), page 455
- ◆ Specified torques and tightening sequence for catalytic converter
⇒ [Fig. “Installing catalytic converter - specified torque and tightening sequence”](#), page 456
- ◆ ⇒ [“8.1.1 Assembly overview - lambda probe, Ateca, Leon 2013, Ibiza 2018, Arona”](#), page 429
- ◆ ⇒ [“1.6 Installation position of clamp”](#), page 453
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .

2.2.2 Catalytic converter - removing and installing, Toledo 2013, Ibiza 2016

Special tools and workshop equipment required

- ◆ High-temperature paste ⇒ Electronic parts catalogue (ETKA) .



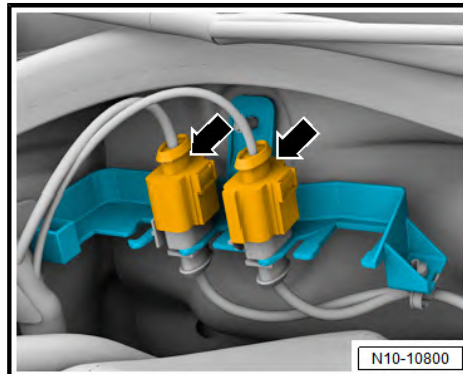
**Note**

The catalytic converter is removed together with the front exhaust pipe.

Removing**Note**

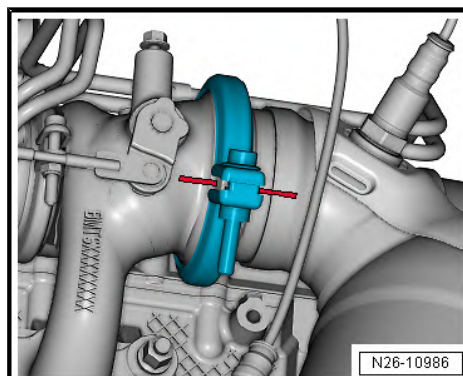
Attach cable ties in all the same places when installing.

- Disconnect respective connector -arrows-, and move clear electrical wiring.

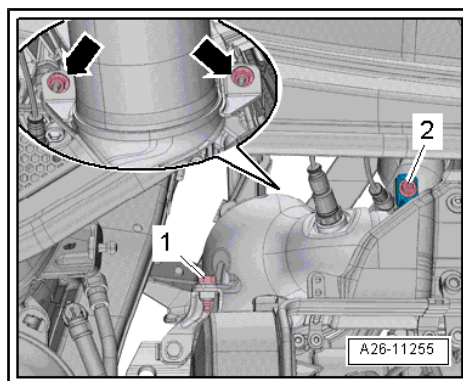
**Clamp position****Note**

- ◆ *Installation position of clamp may vary depending on vehicle model.*
- ◆ *Prior to loosening the connection between the catalytic converter and the turbocharger, mark position of the clamp ⇒ [page 462](#).*
- ◆ *The mark is to be made on the component opposite the component to be renewed.*
- ◆ *Make sure that the clamp is fitted at the same position on re-installation.*

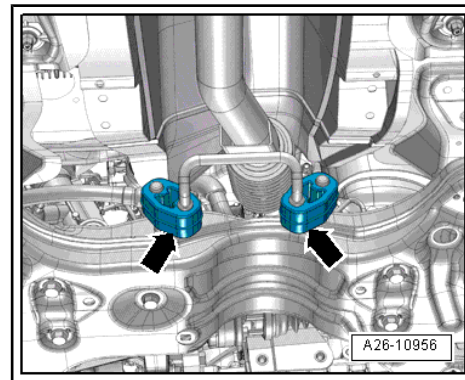
- Mark installation position of clamp.

**Continuation**

- Remove Lambda probes
⇒ ["8.2.2 Lambda probe - removing and installing, Toledo 2013, Ibiza 2016", page 433](#).
- Unscrew bolt -2-, and position it on intake funnel of catalytic converter.
- Remove bolt -1- and nuts -arrows-.



- Detach catalytic converter with front exhaust pipe from rubber mountings -arrows-.



- Loosen clamp -arrow-, and push it to rear.
- Detach catalytic converter with front exhaust pipe.

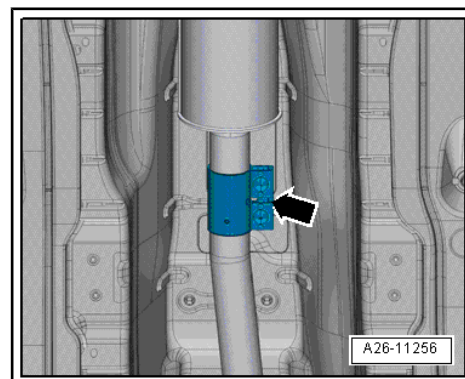
Installing

Install in reverse order of removal, observing the following:



Note

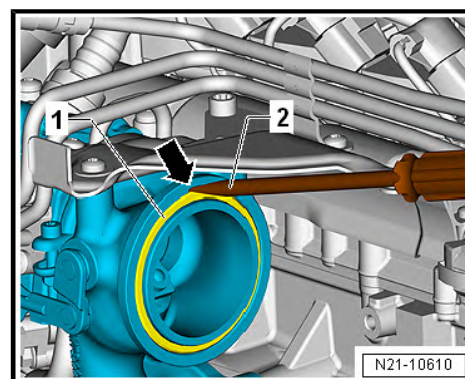
- ◆ *Renew seal and self-locking nuts.*
- ◆ *Lubricate exhaust manifold studs with high-temperature paste. For high-temperature paste refer to ⇒ [Electronic Parts Catalogue \(ETKA\)](#)*



- Insert screwdriver -2- into groove -arrow- on turbocharger, and lever out seal -1-.
- Aligning exhaust system free of stress
⇒ ["1.4 Aligning exhaust system free of stress", page 452](#)

Specified torques

- ◆ Specified torques and tightening sequence for catalytic converter
⇒ [Fig. ""Installing catalytic converter - specified torque and tightening sequence"" , page 459](#)
- ◆ ⇒ ["8.1.2 Assembly overview - lambda probe, Toledo 2013, Ibiza 2016", page 430](#)
- ◆ ⇒ ["1.6 Installation position of clamp", page 453](#)



2.3 Removing and installing particulate filter



Note

- ◆ *The removal and installation procedure for the particulate filter is the same as that for the catalytic converter. Therefore, only removal and installation of the catalytic converter is described
⇒ ["2.2 Removing and installing catalytic converter", page 459](#) .*
- ◆ *If the particulate filter was renewed, the ash load must be reset using ⇒ [Vehicle diagnostic tester](#).*

28 – Ignition system

1 Ignition system

⇒ [“1.1 Assembly overview - ignition system”, page 464](#)

⇒ [“1.2 Removing and installing ignition coils with output stage”, page 465](#)

⇒ [“1.3 Removing and installing knock sensor I G61”, page 467](#)

⇒ [“1.4 Removing and installing Hall sender”, page 469](#)

⇒ [“1.5 Removing and installing engine speed sender G28”, page 470](#)

1.1 Assembly overview - ignition system

1 - Spark plug

- ☐ Remove and install with spark plug socket and extension - 3122 B-
- ☐ Renewing:

◆ Ateca ⇒ Maintenance ; Booklet KH7

◆ Leon 2013 ⇒ Maintenance ; Booklet 501

◆ Ibiza 2018 ⇒ Maintenance ; Booklet KJ1

◆ Arona ⇒ Maintenance ; Booklet KJ1

◆ Ibiza 2016 ⇒ Maintenance ; Booklet 603

◆ Toledo 2013 ⇒ Maintenance ; Booklet KG1

- ☐ Change interval ⇒ Maintenance tables
- ☐ 22 Nm

2 - Ignition coil with output stage

◆ For cylinder 11/1: Ignition coil 1 with power output stage - N70-

◆ For cylinder 11/2: Ignition coil 2 with power output stage - N127-

◆ For cylinder 11/3: Ignition coil 3 with power output stage - N291-

- ☐ Removing and installing

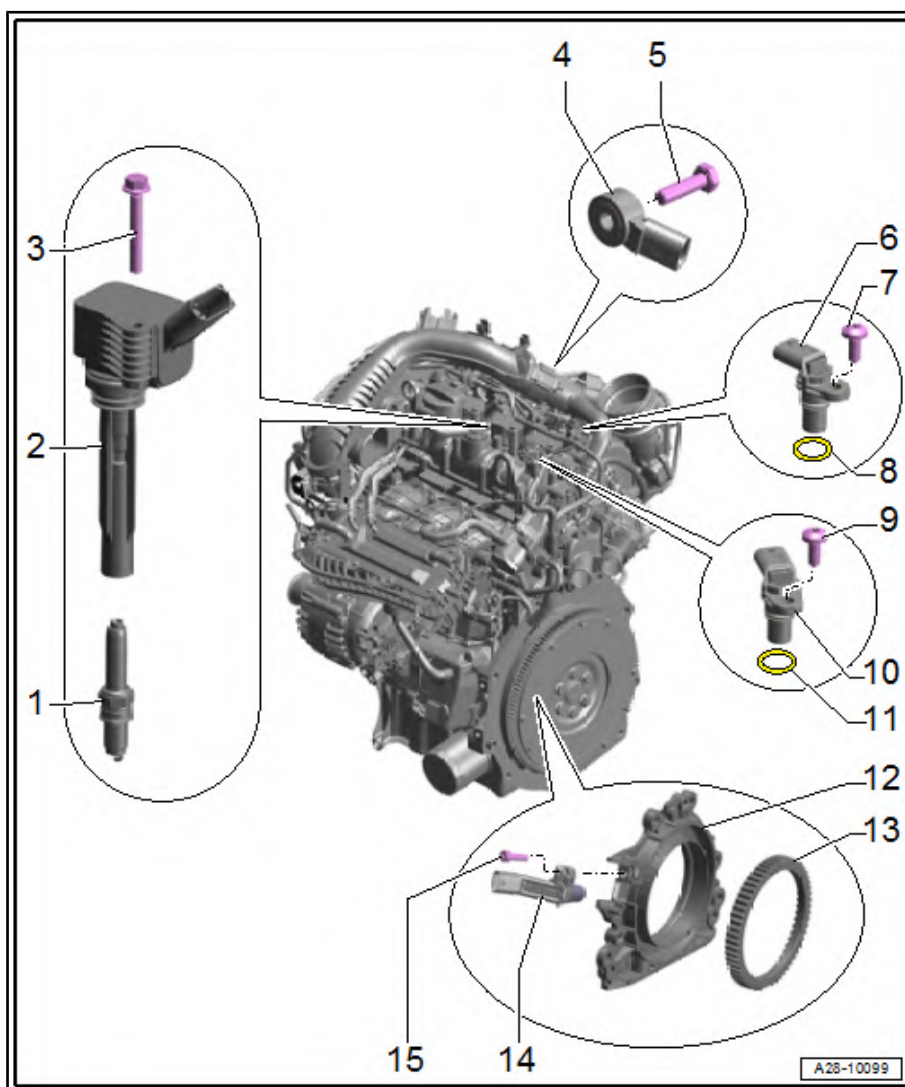
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 465](#)

3 - Bolt

- ☐ 8 Nm

4 - Knock sensor 1 - G61-

- ☐ Removing and installing ⇒ [“1.3 Removing and installing knock sensor I G61”, page 467](#)



5 - Bolt

- ☐ The specified torque influences the function of the knock sensor.
- ☐ 20 Nm

6 - Hall sender 3 - G163-

- ☐ Camshaft position sender, exhaust side
- ☐ Removing and installing ⇒ ["1.4 Removing and installing Hall sender", page 469](#)

7 - Bolt

- ☐ 8 Nm

8 - O-ring

- ☐ Renew if damaged

9 - Bolt

- ☐ 8 Nm

10 - Hall sender - G40-

- ☐ Camshaft position sender, inlet side
- ☐ Removing and installing ⇒ ["1.4 Removing and installing Hall sender", page 469](#)

11 - O-ring

- ☐ Renew if damaged

12 - Sealing flange, gearbox side

- ☐ Removing and installing ⇒ ["2.3 Removing and installing sealing flange on gearbox side", page 137](#)

13 - Sender wheel

- ☐ For engine speed sender - G28- .
- ☐ Removing and installing ⇒ ["2.3 Removing and installing sealing flange on gearbox side", page 137](#)

14 - Engine speed sender - G28-

- ☐ Removing and installing ⇒ [page 470](#)

15 - Bolt

- ☐ 4.5 Nm

1.2 Removing and installing ignition coils with output stage

Special tools and workshop equipment required

- ◆ Puller - T10530-



Removing

Only ignition coil for "cylinder 1":

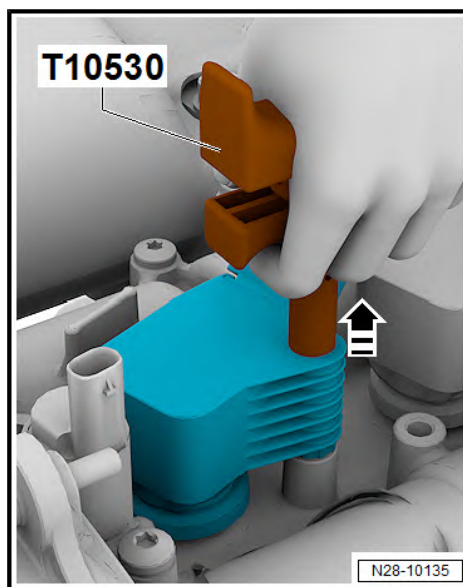
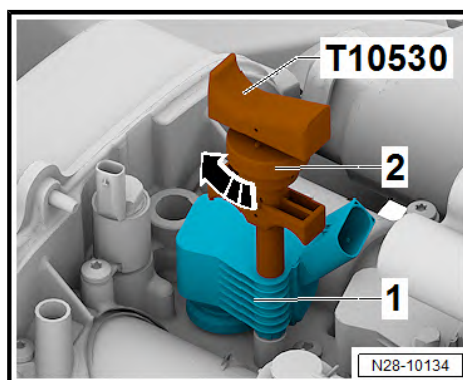
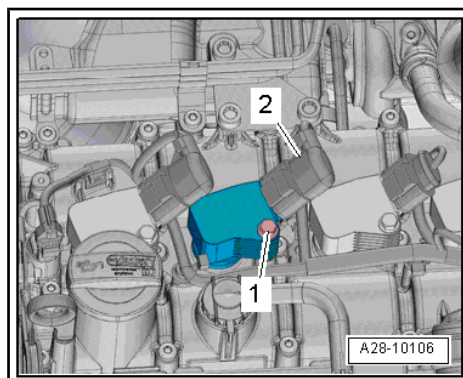
- Remove air intake pipe
⇒ ["2.5 Removing and installing air pipe", page 368](#) .

Only ignition coils for "cylinders 2, 3"

- Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 397](#) .

All ignition coils (continued):

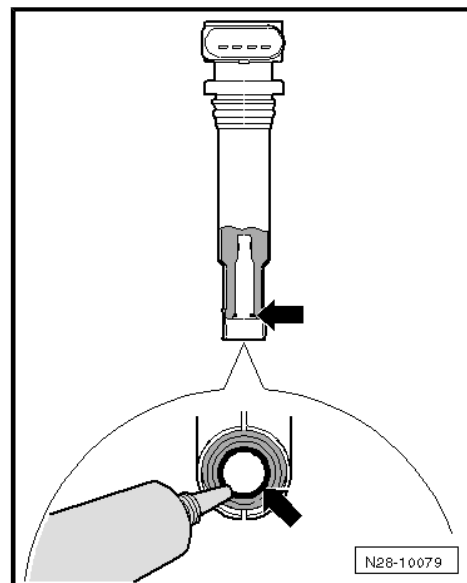
- Unplug electrical connector -2-.
- Unscrew bolt -1-.
- Push puller - T10530- as far as stop into hole in ignition coil -1-.
- Tighten knurled nut -2- in -direction of arrow-.
- Using puller - T10530- , pull ignition coil in -direction of arrow- out of camshaft housing.



Installing

Install in reverse order of removal, observing the following:

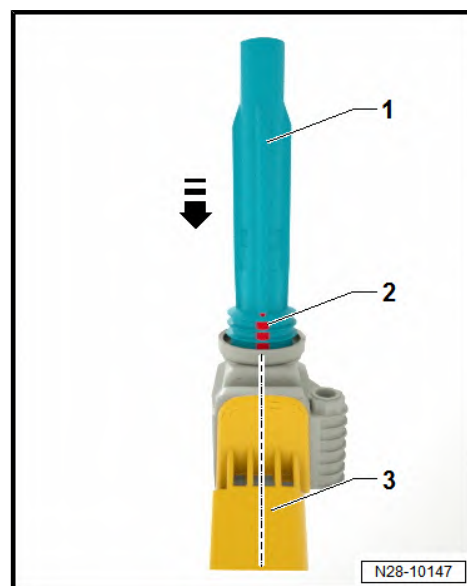
- Apply a thin bead of silicone around sealing hose -arrows- of ignition coil ➔ Electronic parts catalogue (ETKA) .



- Fit spark plug connector -1- by hand onto ignition coil as far as stop
- The vent drilling -2- must be centred relative to connector housing -3- while doing so.
- Fit all ignition coils loosely into spark plug holes.
- Align ignition coils with connectors and simultaneously push all connectors onto ignition coils.
- Press ignition coils evenly onto spark plugs by hand (do not use tools).

Specified torques

- ◆ ➔ [“1.1 Assembly overview - ignition system”, page 464](#)
- ◆ ➔ [“3.1 Assembly overview - air filter housing”, page 393](#)



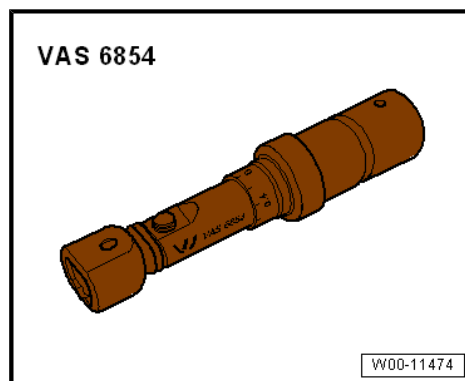
1.3 Removing and installing knock sensor I - G61-

Special tools and workshop equipment required

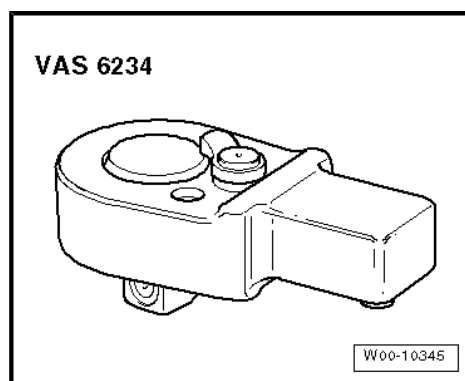
- ◆ Torque wrench - V.A.G 1331-



- ◆ Torque wrench - VAS 6854-

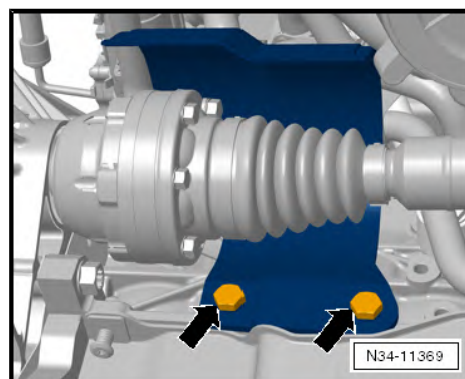


- ◆ Ratchet insert 1/4" - VAS 6234-

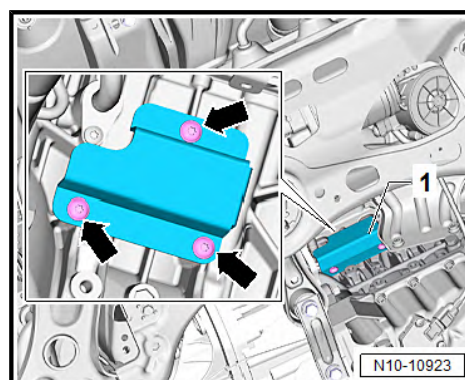


Removing

- If available, unscrew bolts -arrows-, and remove heat shield for right drive shaft.



- Unscrew bolts -arrows- and remove heat shield -1-.



- Remove heat-shield sleeve
- Unplug electrical connector -1-.
- Unscrew bolt -2- and remove knock sensor 1 - G61- .

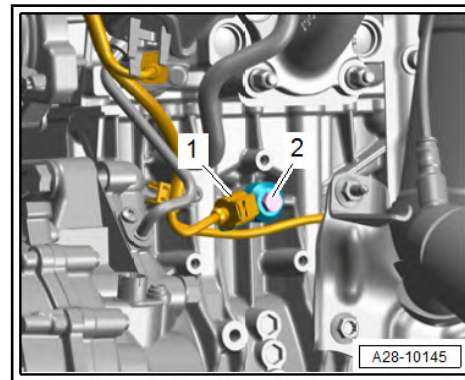
Installing

Install in reverse order of removal, observing the following:

Specified torques

- ◆ ⇒ [“1.1 Assembly overview - ignition system”, page 464](#)

Component	Specified torque
Screw heatshield for drive shaft	25 Nm
Securing bolts for heat shield of knock sensor 1 - G61-	12 Nm



1.4 Removing and installing Hall sender

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Removing

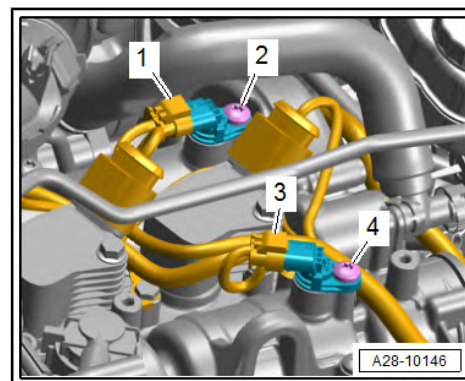
- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 397](#) .

Hall sender - G40- :

- Disconnect connector -3-.
- Unscrew bolt -4- and remove Hall sender - G40- .

Hall sender 3 - G163- :

- Unplug electrical connector -1-.
- Unscrew bolt -2- and remove Hall sender 3 - G163- .



Installing

Install in reverse order of removal, observing the following:



Note

Renew O-rings after removal.

Specified torques

- ◆ ⇒ [“1.1 Assembly overview - ignition system”, page 464](#)
- ◆ ⇒ [“3.1 Assembly overview - air filter housing”, page 393](#)

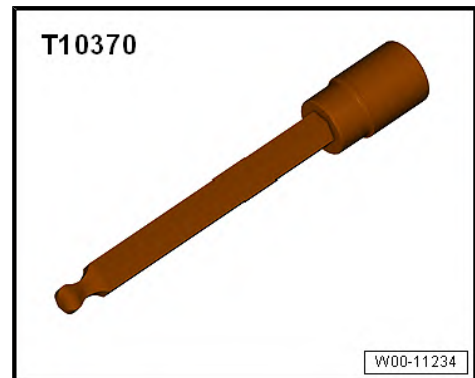
1.5 Removing and installing engine speed sender - G28-

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Socket AF 4 - T10370-



Removing

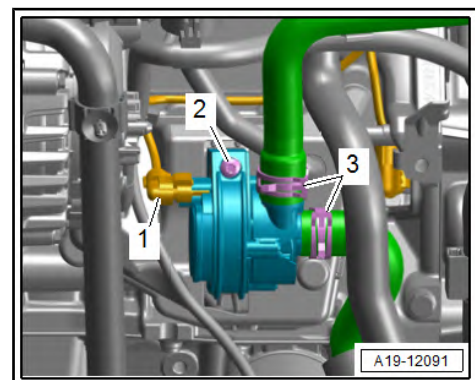
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

Toledo 2013, Ibiza 2016

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody protection; Underbody protection – assembly overview .

Continued for all vehicles

- Unplug electrical connector -1-.
- Remove bolt -2- and press continued coolant circulation pump - V51- to the side.



Note

-Item 3- should be disregarded.

- Release and pull off electrical connector -1-.
- Unscrew bolt -2- using 4 mm socket insert - T10370- . Remove engine speed sender - G28- .

Installing

Install in reverse order of removal, observing the following:

- Bring engine speed sender - G28- in installation position making sure that guide -3- engages in sealing flange -4-.
- Tighten bolt -2- and plug in electrical connector -1-.
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

Toledo 2013, Ibiza 2016

- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Underbody cladding; Underbody cladding - Assembly overview .

Specified torques

- ◆ ⇒ [“1.1 Assembly overview - ignition system”, page 464](#)
- ◆ ⇒ [“2.2 Assembly overview - electric coolant pump”, page 280](#)
- ◆ ⇒ [“2.2 Assembly overview - electric coolant pump”, page 280](#)

