



## Workshop Manual

Golf 2013 ➤, Golf 2017 ➤, Golf 2020 ➤,  
Golf Sportsvan 2015 ➤,  
Golf Variant 2014 ➤, Polo 2014 ➤,  
Polo 2018 ➤, Polo Lim RUS 2016 ➤,  
Polo Lim RUS 2020 ➤

4-cylinder injection engine (1.6 l engine, 4 V, EA 211)									
Engine ID	CWV A	CWV B							

Edition 11.2020



## List of Workshop Manual Repair Groups

### Repair Group

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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

(VRL014973; Edition 11.2020)

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⇒ [p1.5 recautions when working on exhaust system", page 2](#)

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#### 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 engine start**

If the vehicle's start/stop system is activated, the engine can start unexpectedly. A message in the dash panel insert indicates 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

### **Risk of injury caused by unsecured testing and measuring instruments**

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 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.

### **Risk of damage to components**

Connecting or disconnecting electric cables or washing the engine while it is running may damage components.

- Switch off the ignition before connecting or disconnecting electric cables.
- Switch off the ignition before washing the engine.

## 1.5 Safety precautions when working on exhaust system

### **Risk of poisoning due to chemical substances**

Exhaust gas temperature senders may contain chemical substances. There is a risk of poisoning or injuries to respiratory system.

- Never open an exhaust gas temperature sender by cutting, sawing or any other means.

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

The exhaust system could contain hot condensate and/or particles. There is a risk of injury to the eyes, skin and respiratory system, as well as poisoning.

- Always wear protective gloves and eye protection when cutting the exhaust system.
- When cutting, use an extraction system or otherwise ensure sufficient ventilation.



## 1.6 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.

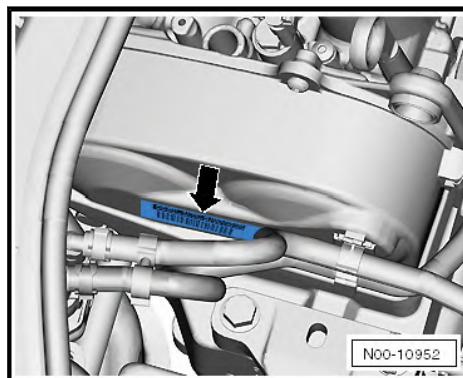


## 2 Identification

⇒ [n2.1 umber/engine data", page 4](#)

### 2.1 Engine number/engine data

The engine code and the engine number are located 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 9 characters (alphanumeric). The first part (3 code letters max.) represents the "engine code". The second part (six-characters) represents the "serial number". After 999,999 engines with the same code letters have been produced, the first of the six digits is replaced by a letter.

#### Vehicles with four digit engine codes

Four-place engine codes are being introduced, starting with letter "C". The first 3 places show the mechanical design of engine and are stamped on the engine as previously. 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 type plate, the vehicle data label and on the engine control unit.



#### Note

*Fitting locations of vehicle data sticker ⇒ Maintenance; Booklet ; Vehicle data sticker.*

Engine code		CWVA	CWVB
Manufactured		02.14 ➤	02.14 ➤
Exhaust emission standard		EU5	EU5
Displacement	cm <sup>3</sup>	1598	1598
Power	kW at rpm	81/5800	66/4250-6000
Torque	Nm at rpm	155/3800-4000	155/3800-4000
Bore	Ø mm	76.5	76.5
Stroke	mm	86.9	86.9
Compression ratio		10.5	10.5
Cylinders/valves per cylinder		4 / 4	4 / 4
RON	At least	95 unleaded <sup>1)</sup>	95 unleaded <sup>1)</sup>
Injection, ignition		Bosch ME 17	Bosch ME 17



Engine code	CWVA	CWVB
Firing order	1-3-4-2	1-3-4-2

<sup>1)</sup> In exceptional circumstances min. 91 RON, however with reduced performance.



## 3 Repair instructions

⇒ [f3.1 or cleanliness", page 6](#)

⇒ [i3.2 nformation", page 6](#)

⇒ [r3.3 epair notes", page 6](#)

⇒ [o3.4 bjects in engine", page 7](#)

⇒ [c3.5 orrosion", page 7](#)

⇒ [a3.6 nd attachment of lines", page 7](#)

⇒ [r3.7 adiator and condensers", page 7](#)

⇒ [v3.8 acuum system", page 7](#)

### 3.1 Rules for cleanliness

When working on the fuel supply/injection system, pay careful attention to the following "7 rules":

- ◆ Thoroughly clean all joints and surrounding areas before dismantling.
- ◆ 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 clean components only: do not remove replacement parts from packing until immediately before installing. Do not use parts that have been kept unpackaged (for example in toolboxes).
- ◆ If system is open, do not work with compressed air. Do not 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 has a self-diagnosis capability. Interrogate the event memory before performing repairs and before fault finding. Also check the vacuum hoses and connections (unmetered air).
- ◆ For trouble-free operation of electrical components, a voltage of at least 11.5 volts is necessary.
- ◆ Do not use sealants containing silicone. Particles of silicone drawn into the engine will not be burnt in the engine and damage the Lambda probe.
- ◆ Vehicles are fitted with a crash fuel shut-off circuit. The risk of a fire after a crash is diminished by the fuel pump relay switching off the fuel pump.
- ◆ The system also improves the starting characteristics of the engine. When the driver door is opened, the fuel pump is activated for 2 seconds in order to build up pressure in the fuel system, observe safety precautions ⇒ [page 1](#) .

### 3.3 General repair notes

- ◆ Clean tools and workbench etc. before working on injection system.





- ◆ If the high-pressure lines are not renewed, the existing high-pressure lines must be labelled before removal.
- ◆ High-pressure fuel lines must always be re-installed in their original positions (i.e. on the same cylinder).
- ◆ Align high-pressure lines so that they are not subjected to 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.
- ◆ All cable ties that are opened or cut through during removal must be fitted/renewed in the same position during installation.
- ◆ Fuel hoses in engine compartment must be secured only with spring-type clips. The use of crimp-type or screw-type clips is not permissible.

### 3.4 Foreign objects in engine

To prevent the ingress of foreign bodies during work on the engine, seal open channels of the intake and exhaust sections with suitable plugs, for example from the engine bung set -VAS 6122-.

### 3.5 Contact corrosion

Contact corrosion can occur if non-approved fasteners are used on the vehicle (bolts, nuts, washers etc.).

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.

### 3.6 Routing and attachment of lines

- ◆ In order to ensure that lines are all installed in their original position, the lines for the fuel, hydraulic and vacuum systems and for the activated charcoal filter system as well as electrical wires must be marked appropriately before they are removed. Make sketches or take photographs if necessary.
- ◆ Because of the lack of space in the engine compartment, make sure that there is sufficient clearance between lines and all moving or hot components. This is to avoid damage to lines.

### 3.7 Fitting radiator and condensers

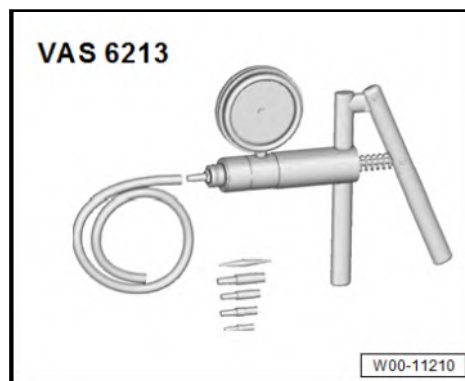
Even when installed correctly, radiator and condenser may show slight indentations on the fins. This does not mean that these components have been damaged. Minor indentations such as these are not a reason to renew either the radiator or condenser.

### 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

⇒ [e1.1 engine", page 9](#)

⇒ [e1.2 engine and gearbox", page 46](#)

⇒ [e1.3 engine on engine and gearbox support", page 50](#)

⇒ [e1.4 engine", page 52](#)

#### 1.1 Removing engine

⇒ [e1.1.1 engine, Golf 2013>, Golf SV 2015>, Golf Estate 2014>, Golf 2017>, Polo 2018>, Golf 2020>", page 9](#)

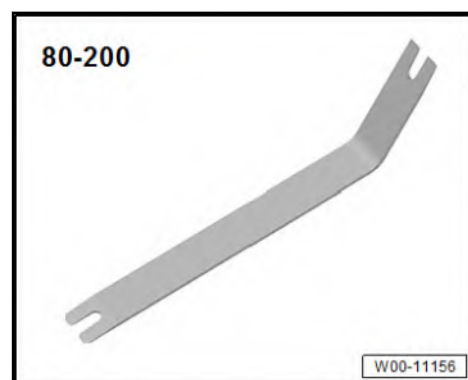
⇒ [e1.1.2 engine, Polo 2014>, Polo Saloon RUS 2016>", page 23](#)

⇒ [e1.1.3 engine, Polo Saloon RUS 2020", page 35](#)

##### 1.1.1 Removing engine, Golf 2013>, Golf SV 2015>, Golf Estate 2014>, Golf 2017>, Polo 2018>, Golf 2020>

Special tools and workshop equipment required

◆ Removal lever -80 - 200-



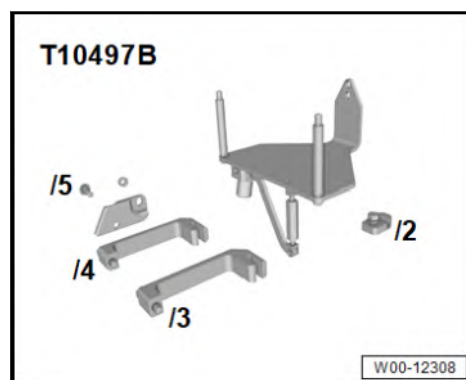
◆ Extension -2024 B/1- of lifting tackle -2024B-, not illustrated

◆ Engine and gearbox jack -V.A.G 1383 A-





◆ Engine support -T10497B-



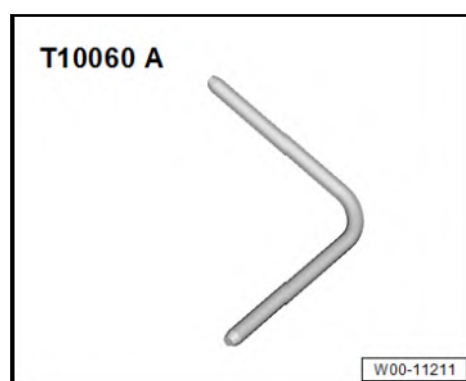
◆ Drip tray for workshop hoist -VAS 6208-



◆ Spring-type clip pliers -VAS 6362-

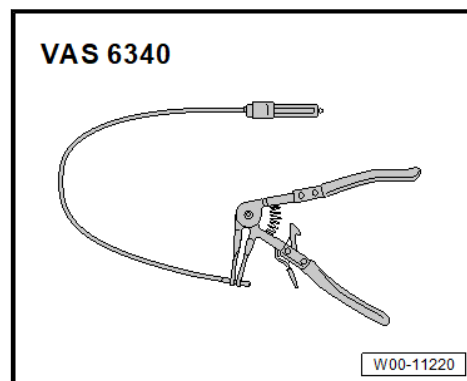


◆ Locking pin -T10060 A-





- ◆ Hose clamp pliers -VAS 6340-



- ◆ Commercially available stepladder
- ◆ Safety glasses
- ◆ Safety gloves

#### Procedure



#### Note

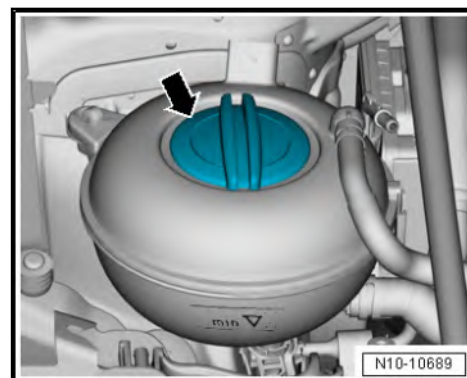
- ◆ *The engine is removed downwards together with the gear-box.*
- ◆ *Reinstall all cable ties in the same locations when installing.*
- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .



#### Note

*The coolant expansion tank may differ in design depending on the type and version of the vehicle.*

- Open filler cap -arrow- for coolant expansion tank.





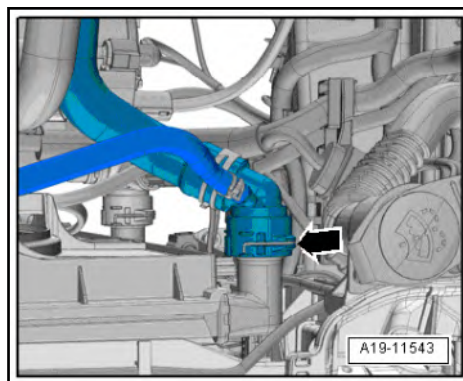
**⚠ CAUTION**

The cooling system could be under pressure. Danger of scalding by steam and hot coolant.

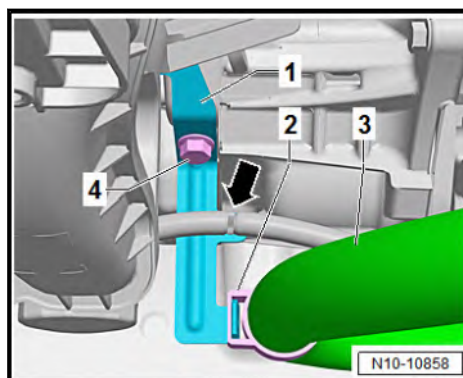
Skin and other parts of the body may be scalded.

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

- Remove front wheels ➔ Running gear, axles, steering; Rep. gr. 44; Wheels, tyres; Wheel change.
- Remove front wheel housing liners ➔ General body repairs, exterior; Rep. gr. 66; Wheel housing liner; Assembly overview - front wheel housing liner.
- Remove noise insulation ➔ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Remove underbody cladding at front. ➔ Rep. gr. 66; Underbody cladding; Removing and installing underbody cladding
- Drain coolant ➔ [page 287](#) .
- Remove air filter housing ➔ [page 366](#) .
- Lift retaining clip -arrow- and disconnect coolant hose (top left) from radiator.



- Remove radiator cowl ➔ [page 339](#) .
- Open retainer for coolant hose -2-.



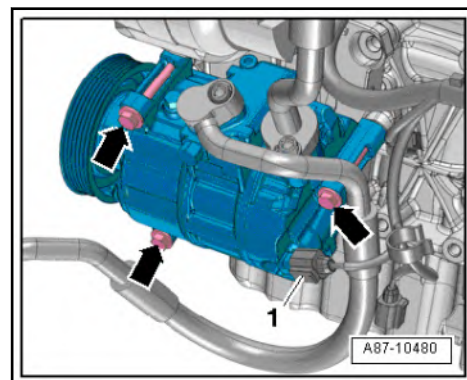
- Separate coolant hose -3- from bracket -1-.



#### Note

Ignore position -4-.

Vehicles with air conditioner compressor:



- Remove poly V-belt ➔ [page 118](#) .
- Release and pull off connector -1- on air conditioner compressor regulating valve -N280-.



#### CAUTION

Risk of freezing injury caused by refrigerant.

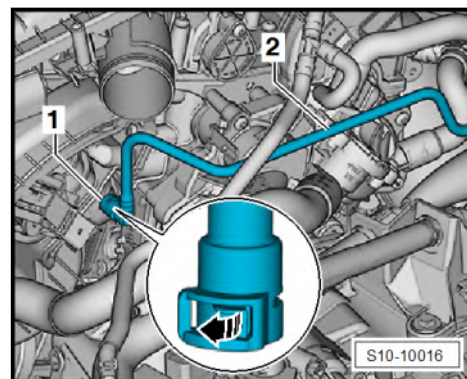
- Do not open refrigerant circuit of air conditioning system.



#### NOTICE

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

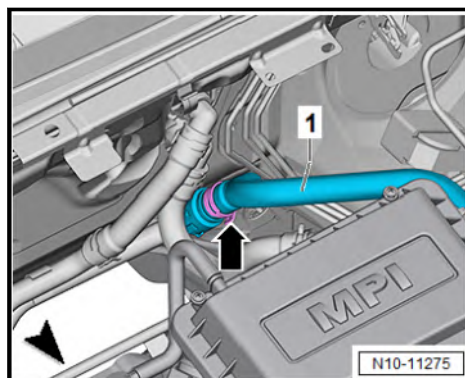
- Never bend refrigerant lines to a radius tighter than  $r < 100$  mm.
  - Unscrew bolts -arrows- for air conditioning compressor.
  - Remove air conditioner compressor with refrigerant lines connected, and tie it up towards outside.
- Continued for all vehicles:**
- Disconnect battery ➔ Electrical system; Rep. gr. 27; Battery; Disconnecting and reconnecting battery.
  - Remove battery and battery tray ➔ Electrical system; Rep. gr. 27; Battery; Removing and installing battery tray.
  - Release retaining tab -arrow-, and pull off hose connection -1- for vacuum hose -2-.





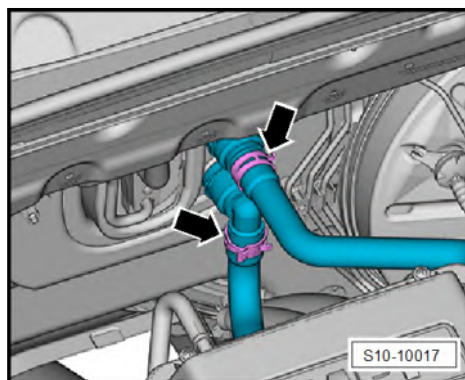


## Vehicles with auxiliary heater



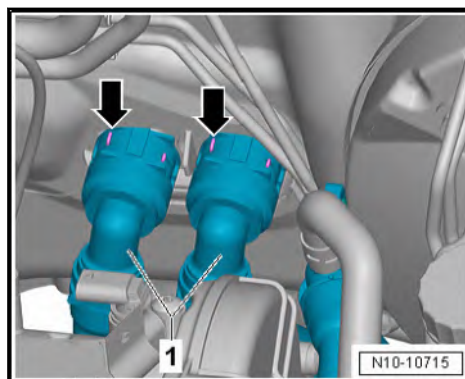
- Loosen hose clip -arrow-, and pull off coolant hose -1-.

## Version with hose clips



- Loosen hose clips -arrows-, and pull coolant hoses off heat exchanger for heater.

## Version with retaining clips

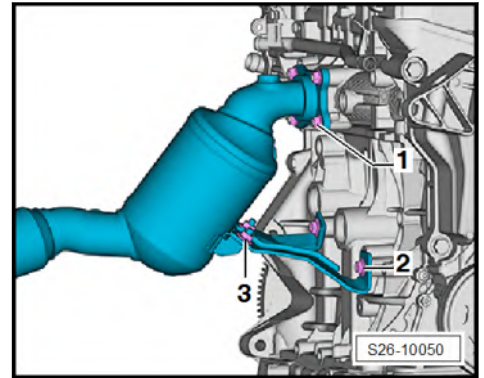


- Release retaining clips -arrows-.
- Pull coolant hoses -1- off heat exchanger for heater unit.

**Golf 2013>, Golf Estate 2014>, Golf SV 2015, Golf 2017>, Golf 2020>**

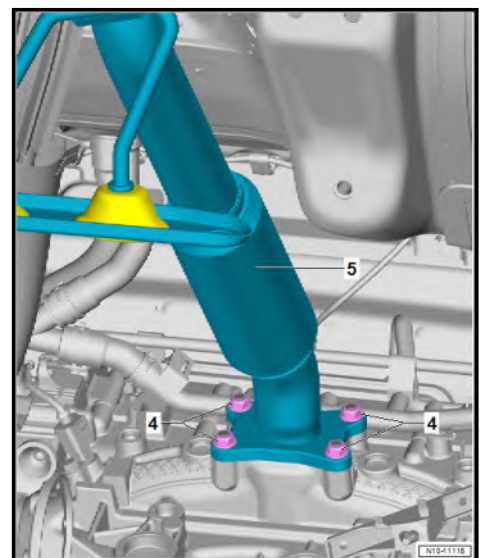
- Unclip lambda probe cable.
- Unscrew nuts -1- for securing front exhaust pipe to cylinder head.





- Unscrew bolts -2- and exhaust system bracket, and tie up exhaust system.

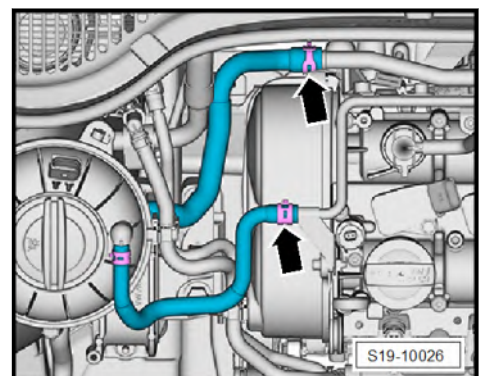
**Polo 2018>**



- Unscrew nuts -4-, and detach and tie up -5- flexible pipe.

**Continued for all vehicles**

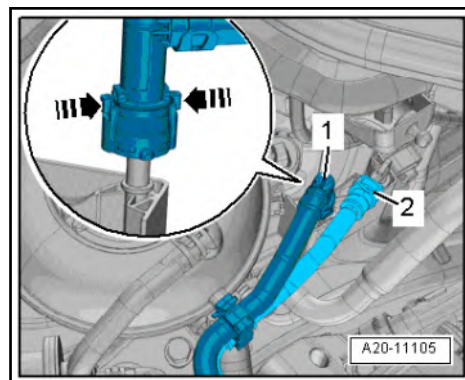
- Loosen hose clips -arrows-, and pull off coolant hoses.



*Place a cloth underneath to catch any escaping coolant.*



- Release and pull off fuel lines -1- and -2-. Disconnect plug-in connectors ⇒ Rep. gr. 20; Plug-in connectors; Disconnecting plug-in connectors.



**CAUTION**

The fuel system is pressurised.

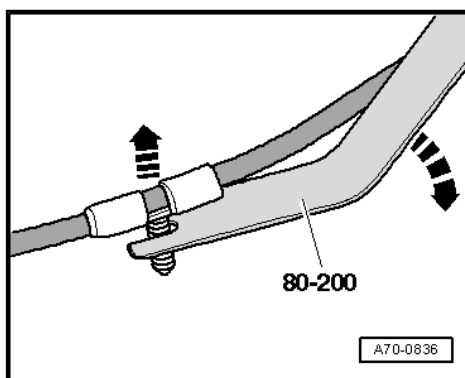
Danger of injury through fuel spray.

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

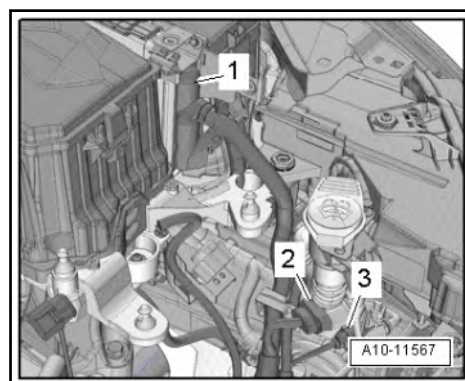


**Note**

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

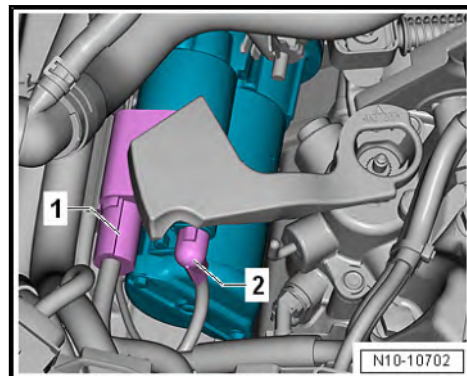


- Unplug upper electrical connector -1- at engine control unit -J623- ⇒ [c6 ontrol unit](#), [page 379](#) .





- Remove connectors -2- and -3- from retainer, release them, and pull them off.
- Move electrical lines free.
- Release and unplug electrical connector -2-.



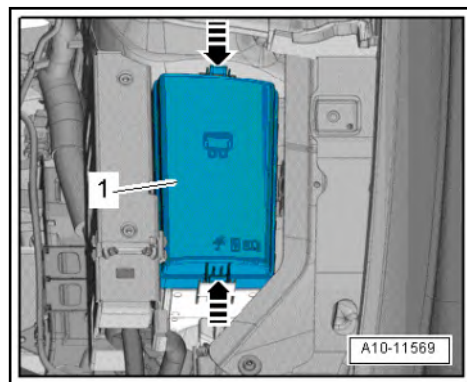
#### Note

*Cover for positive battery terminal -1- does not need to be detached.*

- Unbolt earth wire from body.

**Golf 2013>, Golf Estate 2014, Golf SV 2015, Golf 2017>, Golf 2020>**

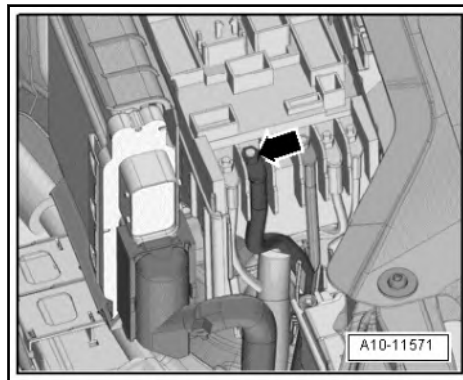
- Release catches -arrows- and detach cover -1- for electronics box in engine compartment.



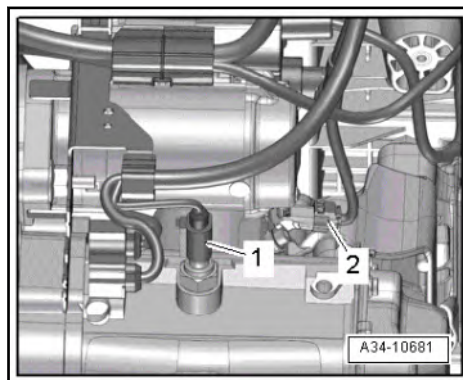
- Release catch using a screwdriver -arrow- and detach cover -1- for electronics box in engine compartment upwards.



- Remove nut -arrow-, detach electrical wiring and move clear.

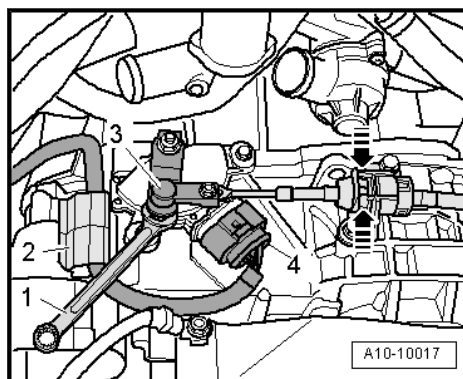


Continued for all vehicles with manual gearbox

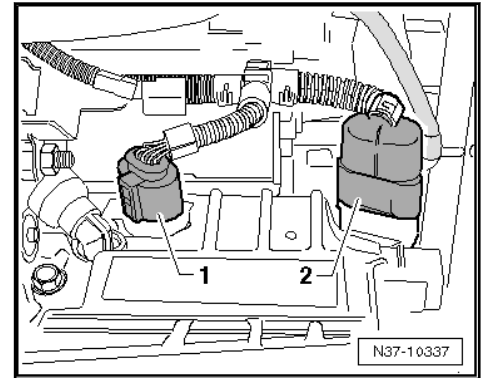


- Release and pull off connectors -1-.
- If fitted, release and pull off connector -2-.
- Remove gear selector cable from gearbox ⇒ Rep. gr. 34; Selector mechanism; Removing and installing selector mechanism.
- Remove clutch slave cylinder ⇒ Rep. gr. 30; Clutch mechanism; Removing and installing clutch slave cylinder.
- Do not remove clutch line from clutch slave cylinder while doing so.

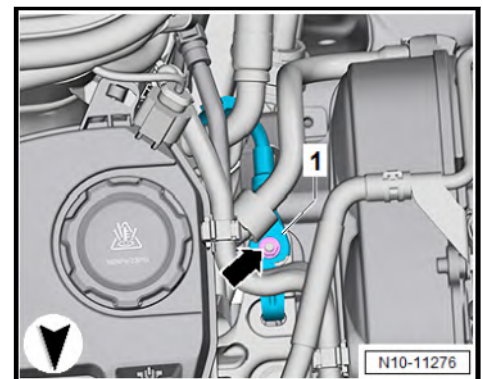
**Vehicles with automatic gearbox:**



- Remove selector lever cable from gearbox ⇒ Rep. gr. 37; Selector mechanism; Removing and installing selector lever cable.
- Release connector -4- and pull off.
- Move wiring harness on retainer -2- clear to one side.
- Release and pull off connectors -1- and -2-.

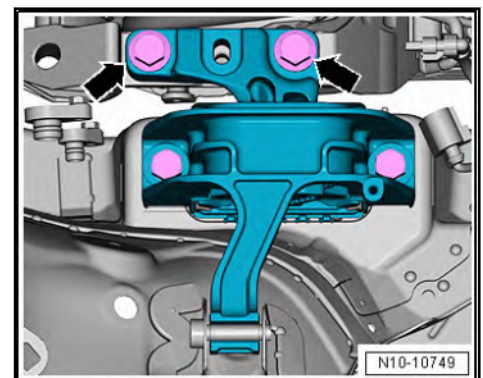


#### Golf 2020➤



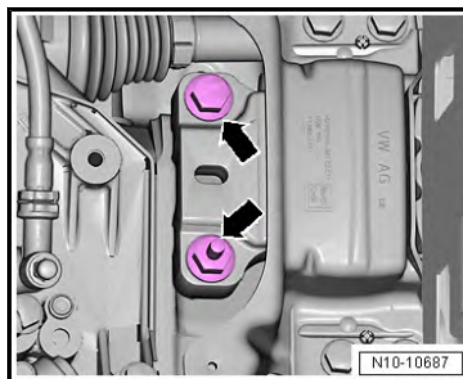
- Unscrew nut -arrow-.
- Detach earth wire -1-.

**Continued for all vehicles**

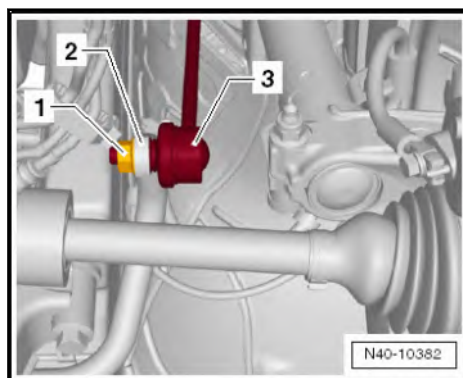


- Unscrew bolts -arrows- on engine mounting approx. 2 turns.
- Unscrew bolts -arrows- on gearbox mounting approx. 2 turns.

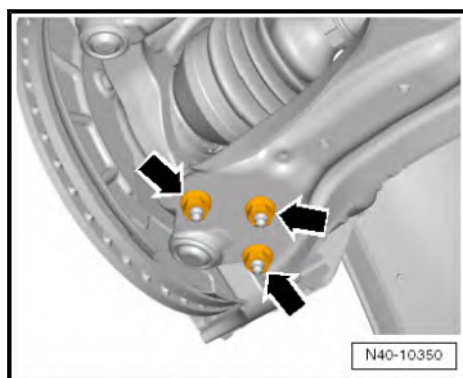




- Unscrew nuts -1- for coupling rod -3- on left and right from anti-roll bar -2-.



- Remove pendulum support ⇒ [page 95](#) .
- Unscrew nuts on both sides -arrows-.



- Pull suspension link out of swivel joint and turn wheel bearing housing outwards to relieve suspension link.

#### Vehicles with manual gearbox:

- Unbolt drive shafts on both sides from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40; Drive shaft; Assembly overview - drive shaft, and tie them up.



#### Note

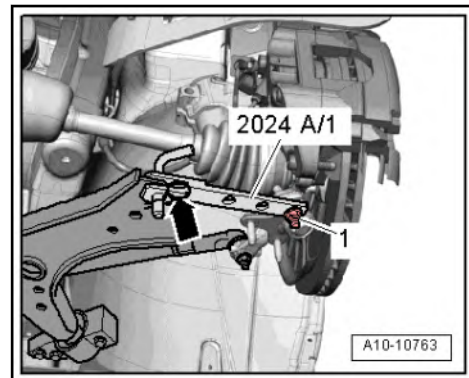
*Make sure not to damage the surface protection of the drive shaft.*



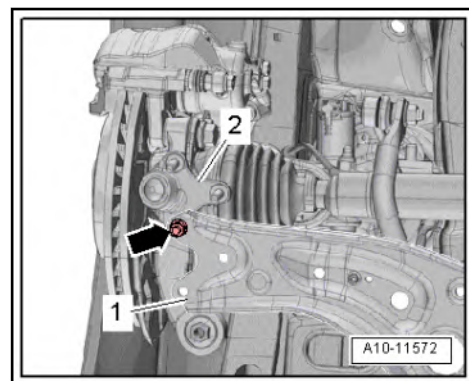
**Vehicles with automatic gearbox:**

- Remove drive shafts on left and right ⇒ Running gear, axles, steering; Rep. gr. 40; Drive shaft; Assembly overview - drive shaft, and tie them up.

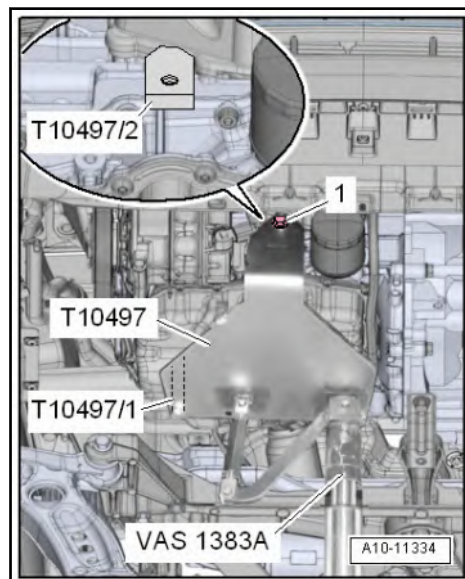
**Continued for all vehicles:**



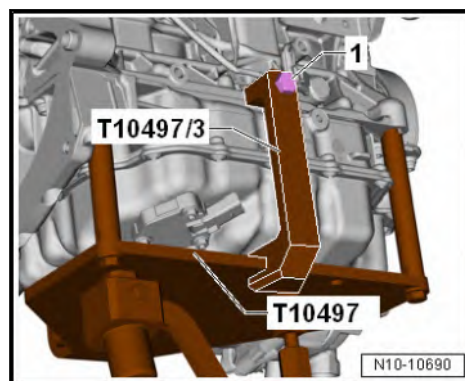
- Swivel front left suspension strut outwards and support with extension -2024 A /1-, as shown in illustration.
- Secure locking pin and swivel joint with locating pin -arrow- and nut -1-.
- Secure swivel joint -2- (right-side) to transverse link -1- with nut -arrow-, as shown in illustration.



- Apply clamping piece T10497B/2 at housing rib on cylinder block, as shown in illustration.
- Position engine support T10497B with pin T10497B/1 on cylinder block.



- Screw in bolt -1- through hole “B” in engine support T10497B and tighten it to 20 Nm.
- Fit adapter -T10497B/3- to engine support -T10497B- and tighten bolt -1- to 20 Nm.



- Insert engine and gearbox jack -V.A.G 1383 A- in engine support T10497B, and raise engine/gearbox assembly slightly.

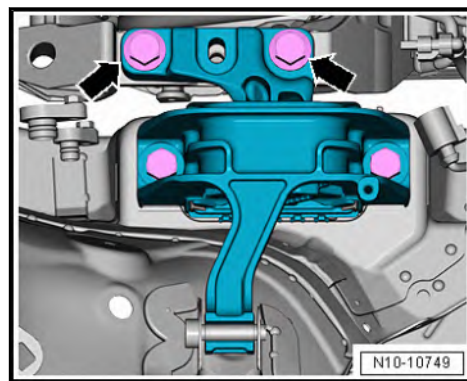


#### Note

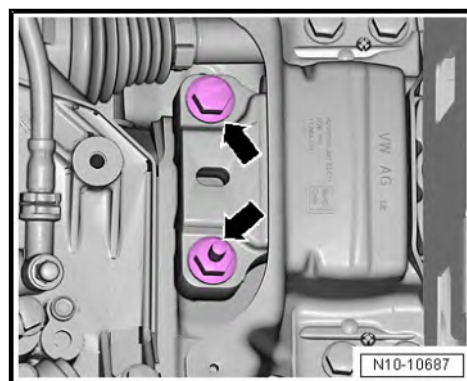
*To unscrew bolts for assembly mounting use commercially available stepladder.*

- Remove bolts -arrows- for engine mounting.





- Remove bolts -arrows- securing gearbox mounting.



- Remove pendulum support ➤ [page 95](#) .



#### Note

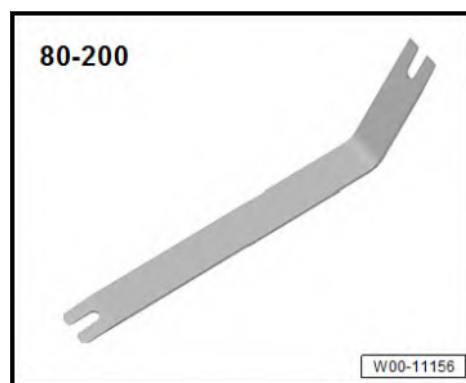
- ◆ *Risk of damage to the vacuum lines or electrical wiring as well as damage to the engine compartment.*
  - ◆ *Check that all vacuum lines and electrical wiring between engine, gearbox, subframe and body have been detached.*
  - ◆ *When lowering, carefully guide engine/gearbox assembly with assembly carrier out of engine compartment.*
- First lower engine/gearbox assembly slightly.
  - Then push gearbox end of engine/gearbox assembly forwards and only then lower further.

### 1.1.2 Removing engine, Polo 2014>, Polo Saloon RUS 2016>

Special tools and workshop equipment required



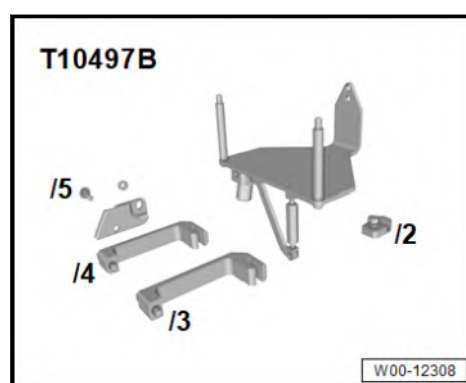
- ◆ Release lever -80 - 200-



- ◆ Extension -2024 B/1- of lifting tackle -2024B-, not illustrated
- ◆ Engine and gearbox jack -V.A.G 1383 A-



- ◆ Engine support -T10497B-



- ◆ Drip tray for workshop hoist -VAS 6208-





- ◆ Spring-type clip pliers -VAS 6362-



- ◆ Commercially available stepladder
- ◆ Safety glasses
- ◆ Safety gloves

#### Procedure



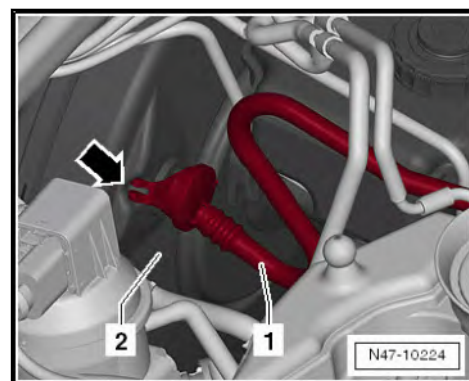
#### Note

- ◆ *The engine is removed downwards together with the gearbox.*
- ◆ *Reinstall all cable ties in the same locations when installing.*
- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .

#### Vehicles with automatic gearbox

- Remove gearbox control unit ⇒ Rep. gr. 39; Gearbox control system, Removing and installing gearbox control unit.
- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery tray.

#### Vehicles with manual gearbox



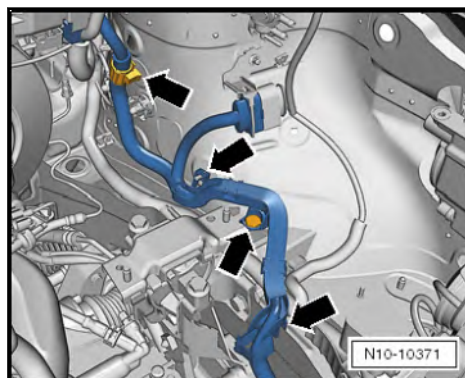
- Pull vacuum line -1- off brake servo -2-.
- If fitted, release and disconnect connector on vacuum sender on vacuum line.

#### Continued for all vehicles

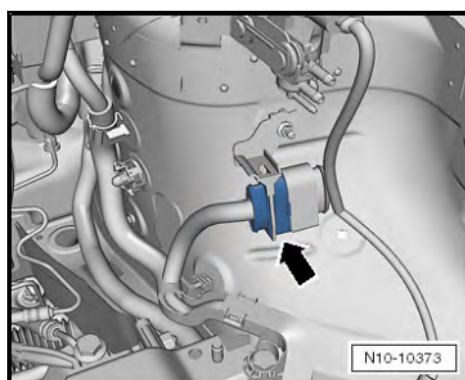
- Remove air filter ⇒ [page 366](#) .



- Carefully loosen wiring harness at its fastening points -arrows-.



- Release connector -arrow-, pull off and unclip from bracket.



- Release connector from engine control unit and pull off ⇒ [c6 ontrol unit”, page 379](#) .
- Place wiring harness on engine.
- Remove front wheels ⇒ Running gear, axles, steering; Rep. gr. 44; Wheels, tyres; Specified torque for wheel bolts.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50; Noise insulation.
- Remove left and right drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40; Drive shaft; Removing and installing drive shaft.
- Remove radiator cowl ⇒ [page 339](#) .
- Drain coolant ⇒ [page 287](#) .

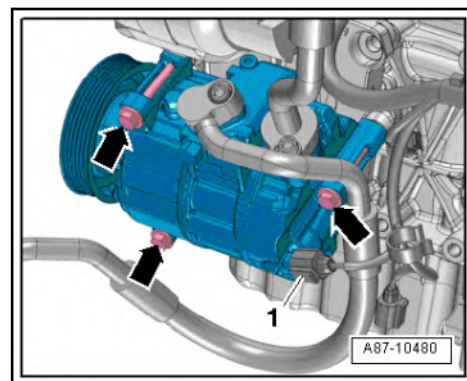


#### Note

*Do not reuse coolant which has been drained off.*



**Vehicles with air conditioner compressor:**



- Remove poly V-belt ⇒ [page 114](#) .
- Separate 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.

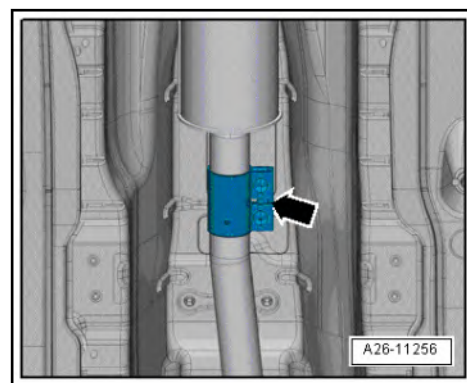
**ⓘ NOTICE**

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

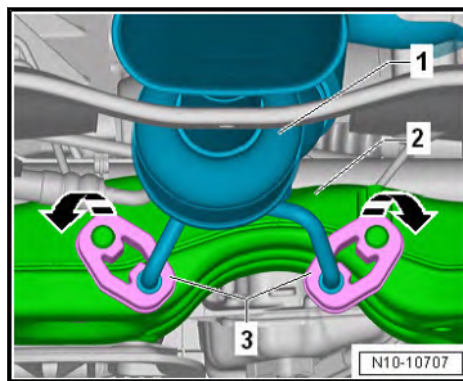
- Never bend refrigerant lines to a radius tighter than  $r < 100 \text{ mm}$ .
- Remove air conditioner compressor with refrigerant lines connected and tie it up on the right side.

**Continued for all vehicles**

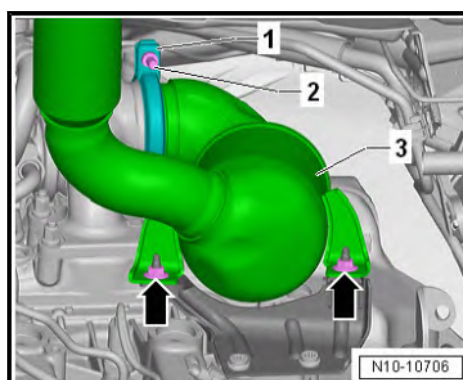
- Loosen clamp -arrow-, and push it to rear.



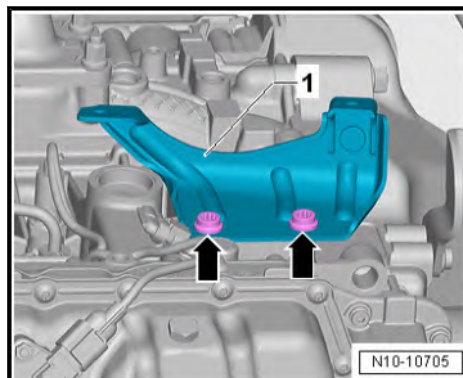
- Detach exhaust hangers -3- in -direction of arrow- from sub-frame -2-.



- Lower exhaust system -1- until it rests on subframe -2-.
- Unscrew bolt -2-.

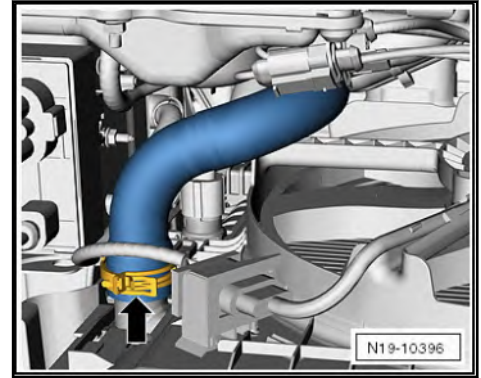


- Remove screw-type clip -1-.
- Unscrew nuts -arrows- and tie up catalytic converter -3-.
- Unscrew bolts -arrows- and remove bracket -1-.

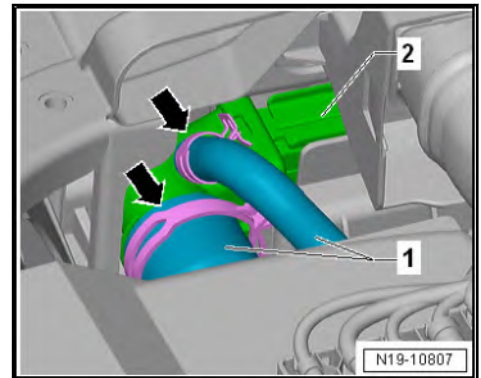


- Open spring-type clip -arrow- and pull off coolant hose downwards.

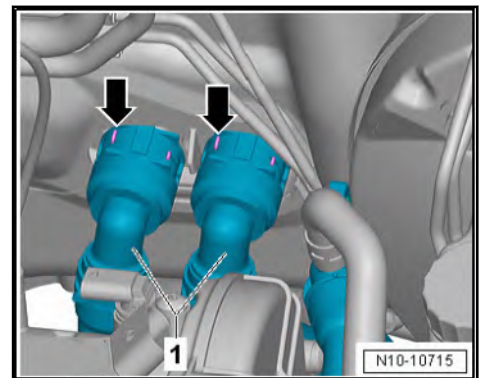




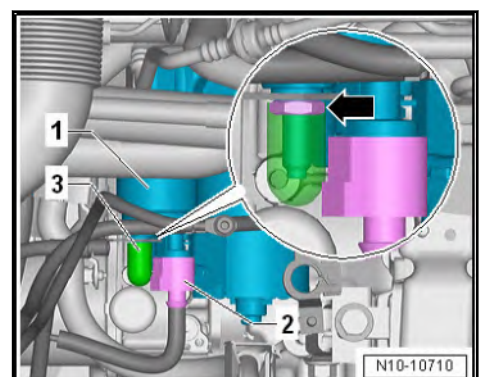
- Open spring-type clips -arrows-.



- Pull coolant hose -1- off radiator -2-.
- Release retaining clips -arrows-.

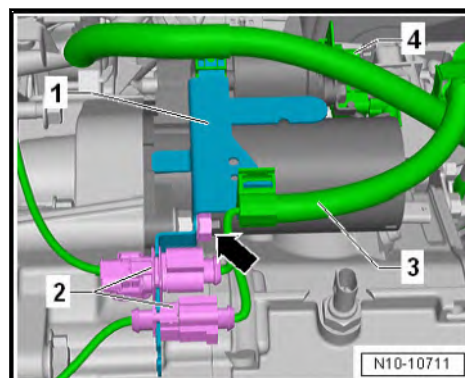


- Pull coolant hoses -1- off heat exchanger for heater unit.
- Release and pull off connector -2- on starter -1-.

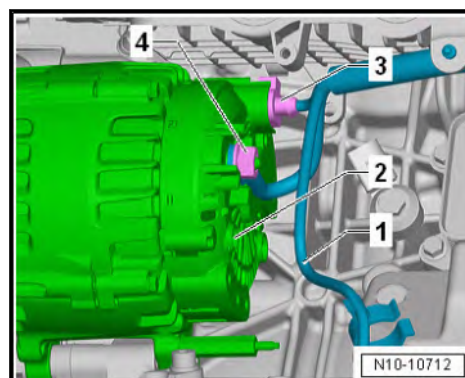




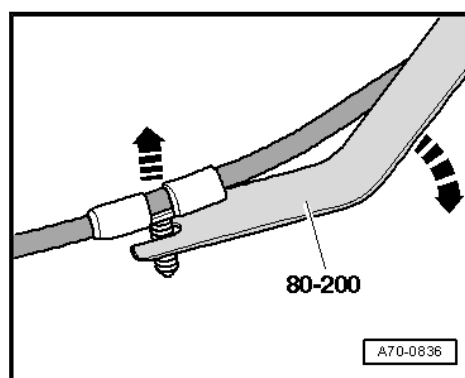
- Pull off protective cap -3-.
- Unscrew nut -arrow- and remove line from starter -1-.
- Release and pull off connectors -2-.



- Unclip connectors -2- from bracket -1-.
- Unclip wires -3- and -4- from bracket -1-.
- Unscrew nut -arrow-.
- Remove bracket -1- from gearbox.
- Release and pull off connector -3- on alternator -2-.

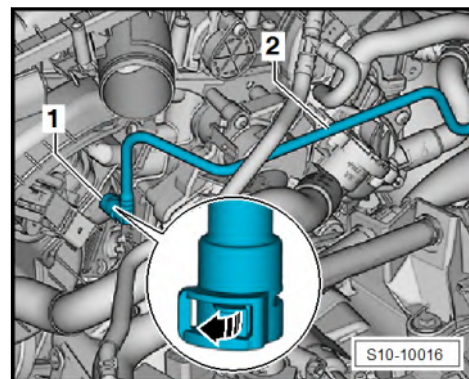


- Remove nuts -4-.
- Remove wire -1- from alternator -2-.
- Lay wiring harness -1- on coolant hose to one side.
- Lay lower wiring harness on intake manifold to one side.



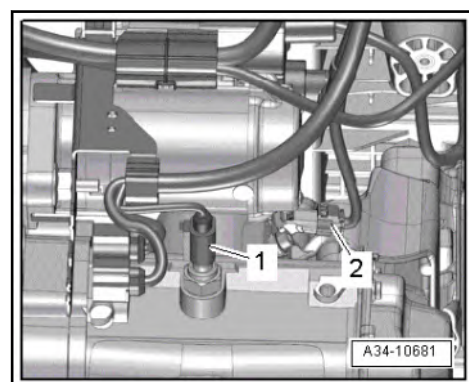
- Use removal lever -80 - 200- to do this.
- Release retaining tab -arrow-, and pull off hose connection -1- for vacuum hose -2-.





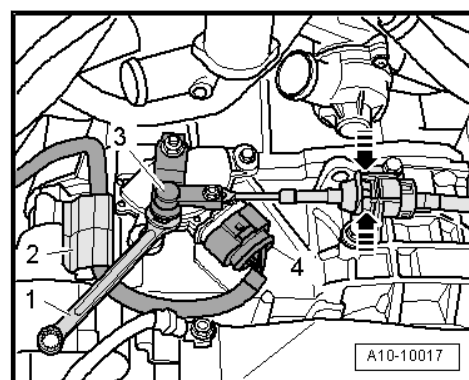
#### Vehicles with manual gearbox

- Release and pull off connector -1- on gearbox.

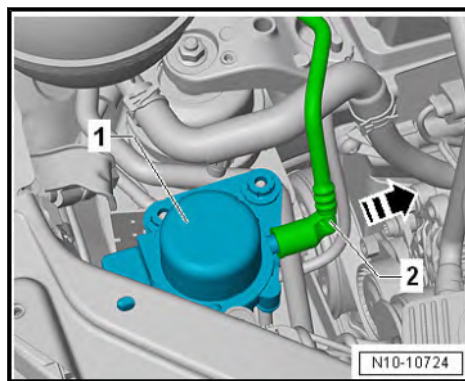


- If fitted, release and pull off connector -2-.
- Remove selector mechanism from gearbox ⇒ Rep. gr. 34; Selector mechanism; Removing and installing selector mechanism.
- Remove clutch slave cylinder ⇒ Rep. gr. 30; Clutch mechanism; Removing and installing clutch slave cylinder.

#### Vehicles with automatic gearbox

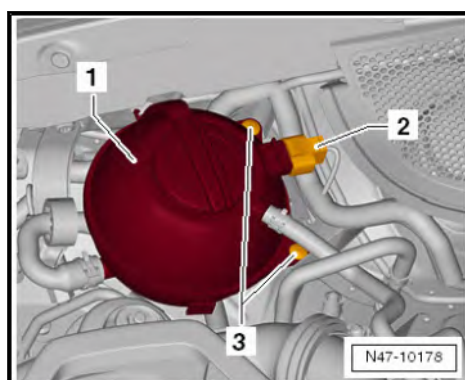


- Remove selector lever cable from gearbox ⇒ Rep. gr. 37; Selector mechanism; Removing and installing selector lever cable.
- Release connector -4- and pull off.
- Move wiring harness clear at bracket -2-.
- Pull vacuum line -2- in direction of -arrow- off vacuum pump for brakes -V192- -1-.

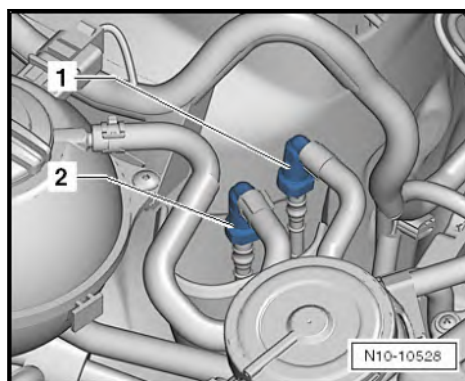


- Lay vacuum line -1- to one side.

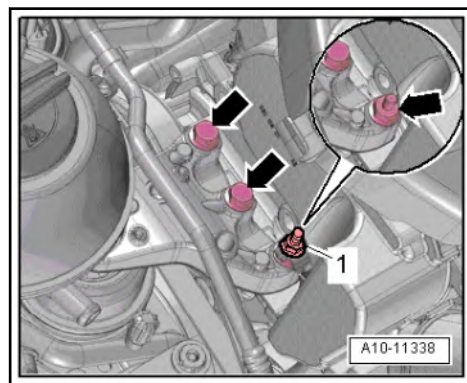
**Continued for all vehicles**



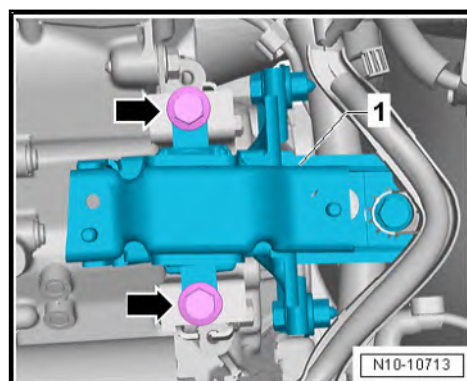
- Release connectors -2- and pull off.
- Unscrew securing bolts -3-.
- Place coolant expansion tank -1- on engine.
- Disconnect fuel supply line -1- and line to activated charcoal filter solenoid valve 1 -N80- -2-. Separate plug-in connectors  
⇒ Rep. gr. 20; Plug-in connectors.



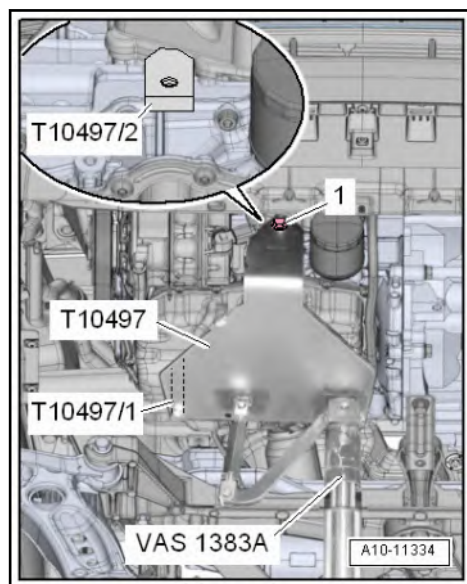
- Unscrew earth wire -1-.



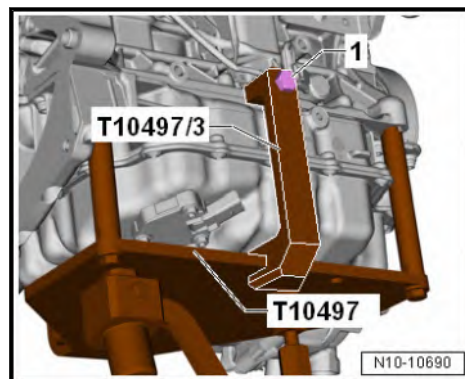
- Unscrew bolts -arrows- on engine mounting approx. 2 turns.
- Unscrew securing bolts -arrows- on gearbox mounting by approx. 2 turns.



- Remove pendulum support ➤ [page 95](#) .
- Apply clamping piece T10497B/2 at housing rib on cylinder block, as shown in illustration.
- Position engine support T10497B with pin T10497B/1 on cylinder block.



- Screw in bolt -1- through hole "B" in engine support T10497B and tighten it to 20 Nm.
- Fit adapter -T10497B/3- to engine support -T10497B- and tighten bolt -1- to 20 Nm.



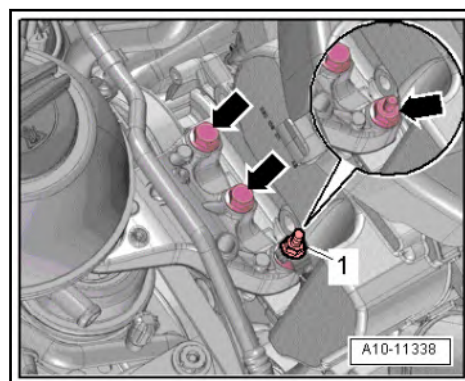
- Insert engine and gearbox jack -V.A.G 1383 A- in engine support T10497B, and raise engine/gearbox assembly slightly.



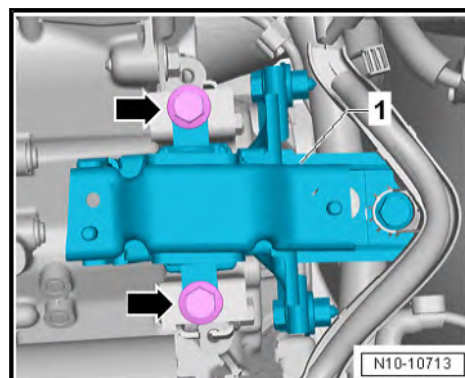
#### Note

*To unscrew bolts for assembly mounting use commercially available stepladder.*

- Remove bolts -arrows- for engine mounting.



- Unscrew securing bolts -arrows- from gearbox mounting.





#### Note

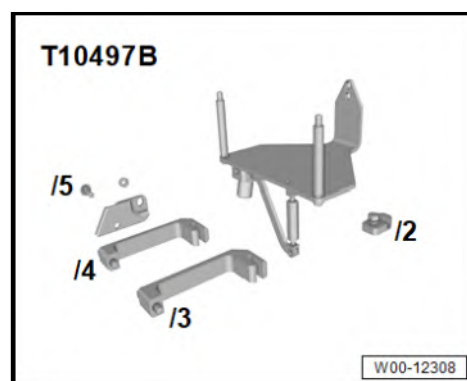
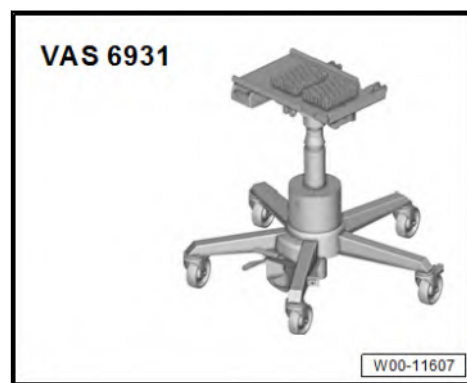
- ◆ *Risk of damage to the vacuum lines or electrical wiring as well as damage to the engine compartment.*
- ◆ *Check that all vacuum lines and electrical wiring between engine, gearbox, subframe and body have been detached.*
- ◆ *When lowering, carefully guide engine/gearbox assembly with assembly carrier out of engine compartment.*
- First lower engine/gearbox assembly slightly.
- Then push gearbox end of engine/gearbox assembly forwards and only then lower further.

### 1.1.3 Removing engine, Polo Saloon RUS 2020

#### Special tools and workshop equipment required

- ◆ Extension -2024 B/1- of lifting tackle -2024B-, not illustrated
- ◆ Engine and gearbox jack -V.A.G 1383 A- or engine and gearbox jack -VAS 6931-

- ◆ Engine support -T10497B-







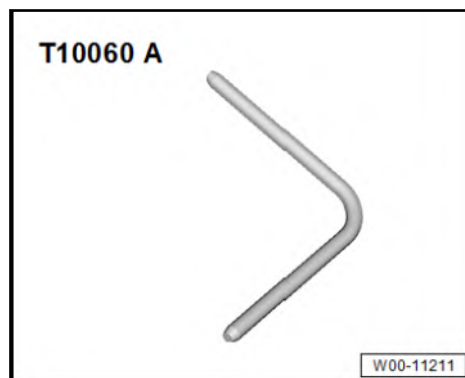
- ◆ Drip tray, e.g. -VAS 6208-



- ◆ Spring-type clip pliers -VAS 6362-



- ◆ Locking pin -T10060A-



- ◆ Commercially available stepladder
- ◆ Safety glasses
- ◆ Safety gloves
- ◆ Protective mat -VAS 531 003-, not illustrated

#### Procedure



#### Note

- ◆ *The engine is removed downwards together with the gear-box.*
- ◆ *All cable ties that are opened or cut through when the engine is removed must be renewed/replaced in the same position when the engine is installed.*
- ◆ *Leave ignition key in ignition lock to prevent steering lock from engaging.*



- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .
- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery.
- Remove air filter housing ⇒ [page 366](#) .

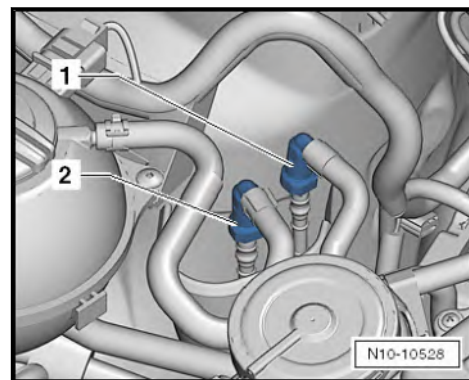
**⚠ CAUTION**

The fuel system is pressurised.

Danger of injury through fuel spray.

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

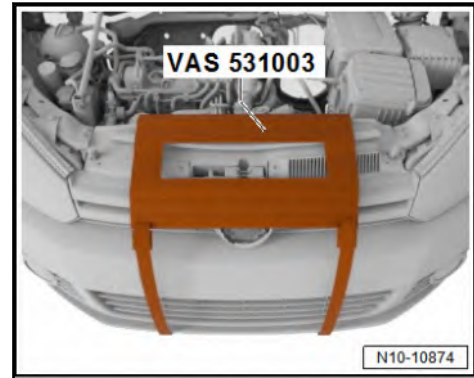
- Pull off fuel supply line -1- and breather line -2- ⇒ Rep. gr. 20; Plug-in connectors; Disconnecting plug-in connectors.



**i Note**

*Any open lines, pipes, hoses and connections must be sealed immediately with a suitable cap or plug.*

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Drain coolant ⇒ [page 287](#) .
- Remove radiator cowl ⇒ [page 339](#) .
- Cover radiator using protective mat -VAS 531 003-.



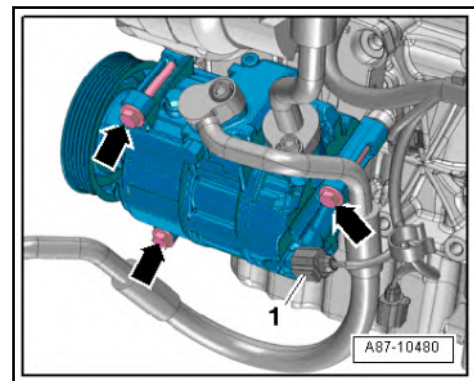
For vehicles with air conditioning system

**CAUTION**

Risk of freezing injury caused by refrigerant.

- Do not open refrigerant circuit of air conditioning system.

- Remove poly V-belt ⇒ [page 114](#) .
- Separate connector -1- on air conditioning compressor regulating valve -N280-.



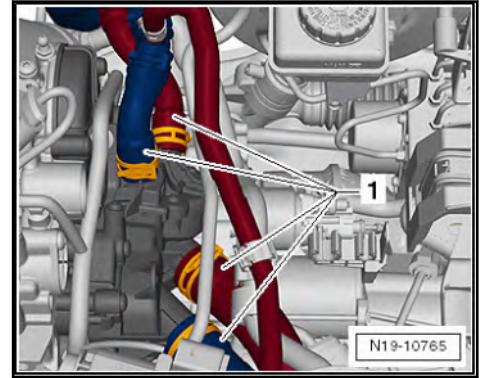
- Unscrew bolts -arrows- for air conditioning compressor.

**NOTICE**

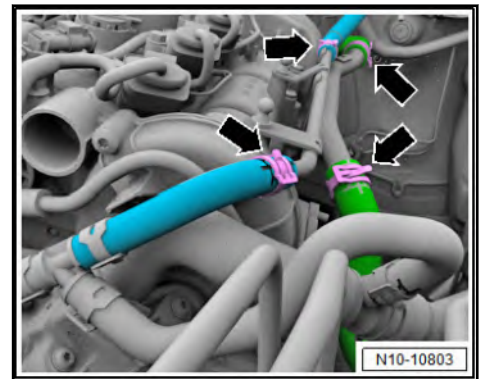
Risk of damage to refrigerant lines from rupture of inner foil.

- Never bend refrigerant lines to a radius tighter than  $r < 100$  mm.
- Remove air conditioner compressor with refrigerant lines connected and tie it up on the right side.
- Remove both front wheels ⇒ Running gear, axles, steering; Rep. gr. 44; Wheels, tyres.
- Pull off all coolant hoses -1- from thermostat housing.

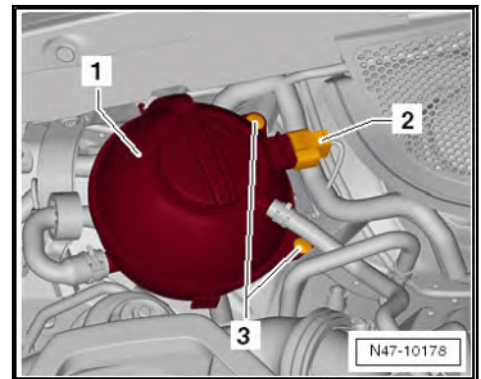




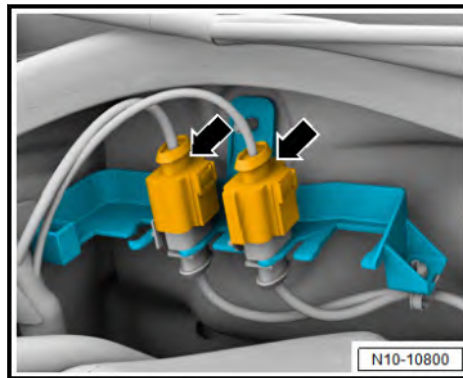
- Open clamps for coolant hoses on engine -arrows-, pull off hoses and lay aside.



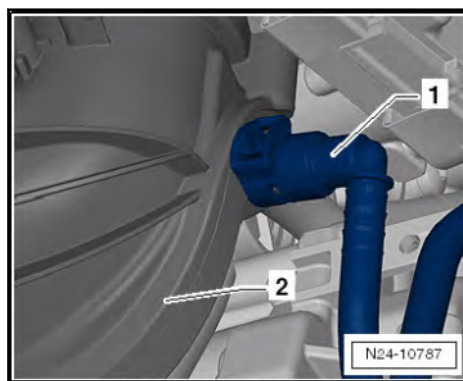
- Pull off connector -2- from expansion tank.



- Unscrew securing bolts -3-.
- Place coolant expansion tank -1- on engine.
- Disconnect both connectors -arrows- of lambda probe 1 after catalytic converter -GX7- and lambda probe 1 before catalytic converter -GX10-.



- Open fastener of vacuum line -1- and pull off vacuum line on intake manifold -2-.

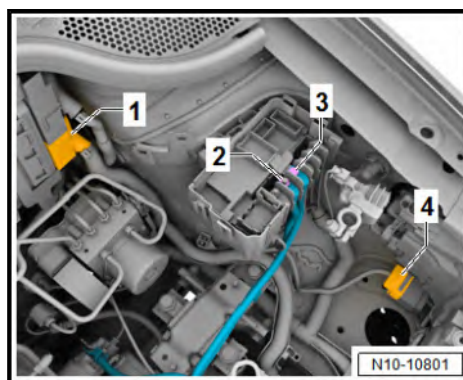


- Lay vacuum line to one side.
- Release cable tie.
- Remove engine control unit -J623- ➔ [page 379](#) .

#### For vehicles with automatic gearbox

- Remove automatic gearbox control unit -J217- with bracket  
⇒ Rep. gr. 39; Gearbox control unit; Removing and installing gearbox control unit.

#### Continued for all vehicles



- Release and pull off lower connector -1- on engine control unit -J623-.
- Disconnect electrical connector -4-.
- Unscrew nuts of threaded connection -2- and -3- on fuse box and disconnect wires.



### Vehicles with manual gearbox

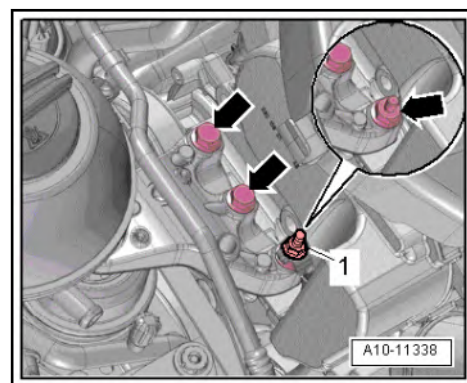
- Remove selector mechanism from gearbox ⇒ Rep. gr. 34; Selector mechanism; Removing and installing selector mechanism.
- Remove clutch slave cylinder ⇒ Rep. gr. 30; Clutch mechanism; Removing and installing clutch slave cylinder.

### Vehicles with automatic gearbox

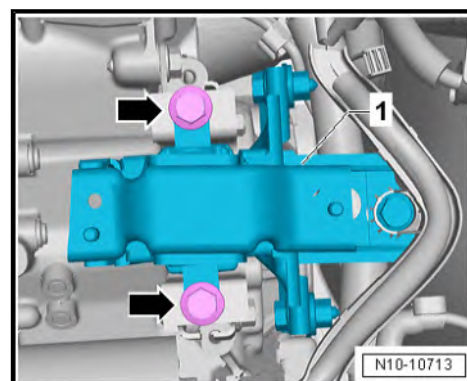
- Remove selector lever cable from gearbox, pull off mechatronic unit connector, and remove all retainers from gearbox ⇒ Rep. gr. 37; Selector mechanism; Removing and installing selector mechanism.

### Continued for all vehicles

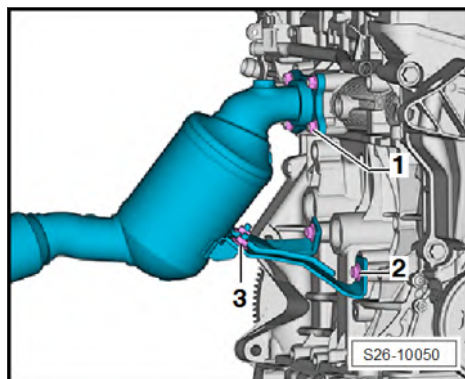
- Remove starter ⇒ Electrical system; Rep. gr. 27; Starter; Removing and installing starter.
- Release and disconnect electrical connectors on gearbox.
- Free off wiring harness from securing points and attach to engine.
- Unscrew and remove nut -1- of earth wire from centre hex stud and unscrew centre hex stud about two turns.



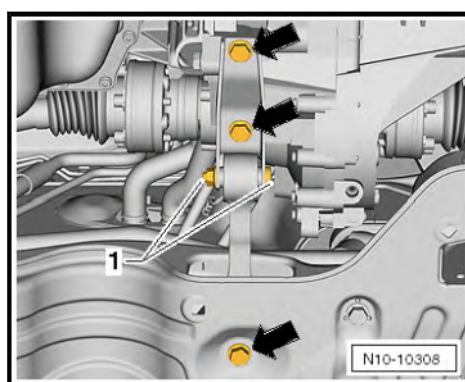
- Unscrew bolts -arrows- on engine mounting approx. 2 turns.
- Unscrew bolts -arrows- on gearbox mounting approx. 2 turns.



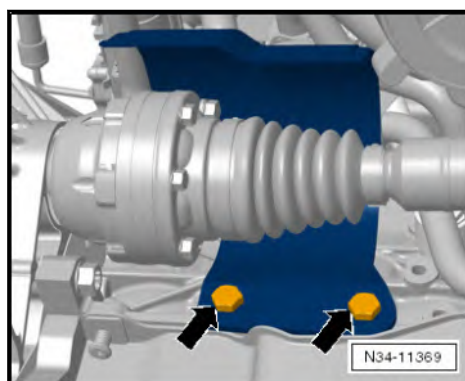
- Unscrew nuts -3- and bolts -2- and remove bracket for front exhaust pipe.



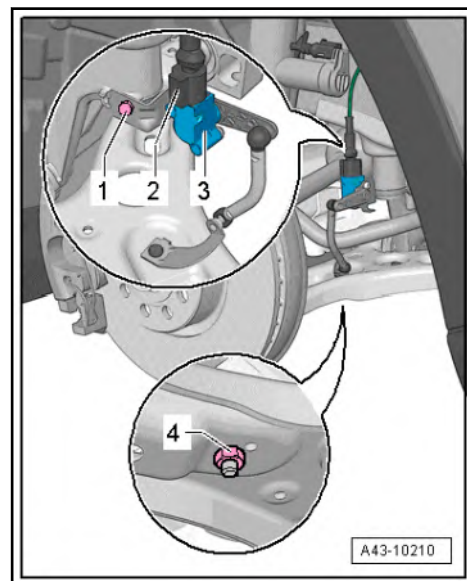
- Unscrew nuts -1- and pull off front exhaust pipe from studs.
- Raise and tie front exhaust pipe on body.
- Unscrew bolts -arrows- and remove pendulum support.



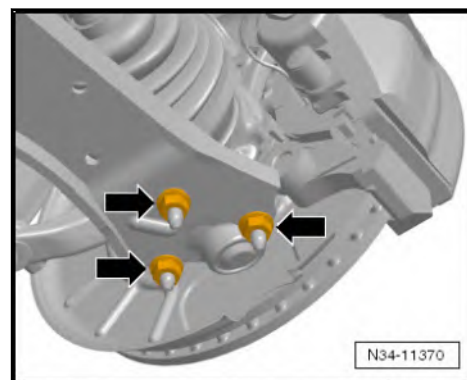
- Unscrew bolts -arrows- and, if fitted, remove heat shield for right drive shaft.



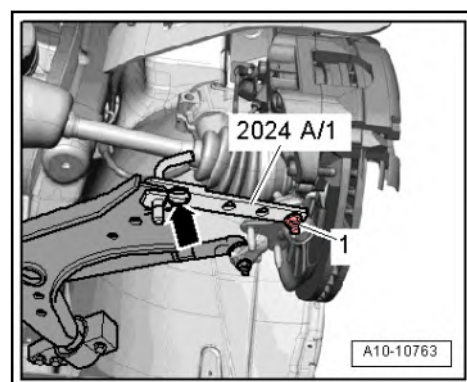
- If fitted, unscrew nut -4- and bolt -1-, and lay front left vehicle level sender -G78- -3- aside.



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



- Detach swivel joint from transverse link on left and right.
- Remove left and right drive shaft from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40; Drive shaft; Removing and installing drive shaft and attach to body.
- Swivel front left suspension strut outwards and support with extension -2024A/1-, as shown in illustration.



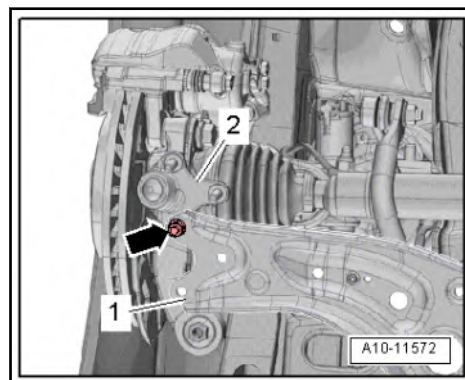
#### Note

*Make sure not to damage the surface protection of the drive shaft.*

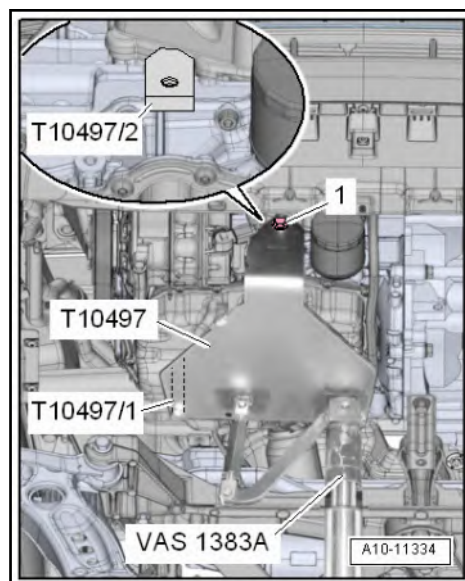




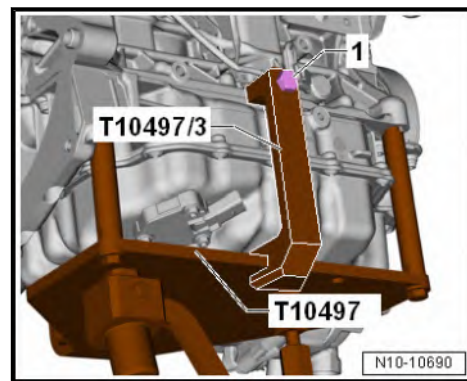
- Secure locking pin and swivel joint with locating pin -arrow- and nut -1-.
- Secure swivel joint -2- (right-side) to transverse link -1- with nut -arrow-, as shown in illustration.



- Bring lock carrier into service position ⇒ General body repairs, exterior; Rep. gr. 50; Lock carrier - bringing lock carrier into service position and moving it back.
- Mount adapter T10497B/2 on housing rib of cylinder block as shown in illustration.



- Position engine bracket -T10497B- with pin T10497B/1 on cylinder block.
- Screw clamping piece T10497B/2 with bolt -1- on engine bracket -T10497B- and tighten to 20 Nm.
- Fit adapter -T10497B/3- to engine support -T10497B- and tighten bolt -1- to 20 Nm.



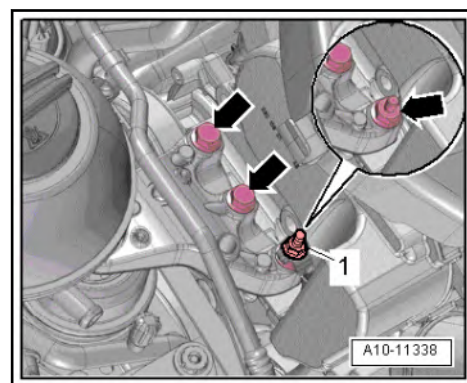
- Insert engine bracket -T10497B- on engine and gearbox jack -V.A.G 1383A- and raise engine/gearbox assembly slightly.



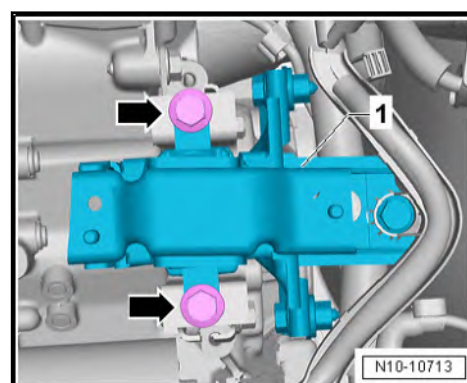
#### Note

*Use commercially available stepladder to unscrew bolts for assembly mounting.*

- Remove bolts -arrows- for engine mounting.



- Unscrew bolts -arrows- from gearbox mounting.



#### NOTICE

**Danger of damage to vacuum lines or electrical wiring and to 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.



- Lower engine/gearbox assembly slightly.
- Push gearbox end of engine/gearbox assembly forwards and lower carefully and slowly.

## 1.2 Separating engine and gearbox

⇒ [e1.2.1 engine and gearbox, vehicles with manual gearbox](#),  
[page 46](#)

⇒ [e1.2.2 engine and gearbox, vehicles with automatic gearbox](#),  
[page 47](#)

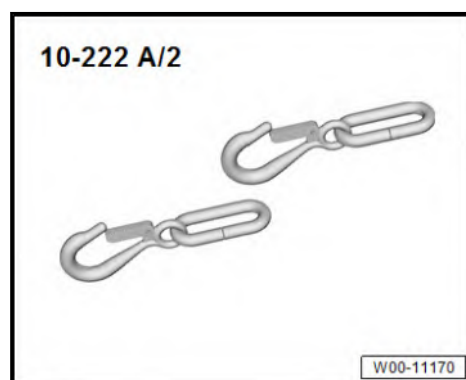
### 1.2.1 Separating engine and gearbox, vehicles with manual gearbox

Special tools and workshop equipment required

- ◆ Shackle -10 - 222 A /12-



- ◆ Hook -10 - 222 A /2-



- ◆ Workshop hoist -VAS 6100-



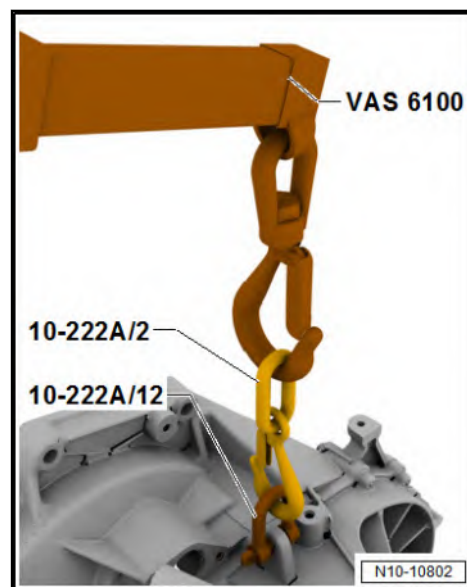
#### Procedure

- Engine/gearbox assembly removed and attached to engine bracket -T10497B-.

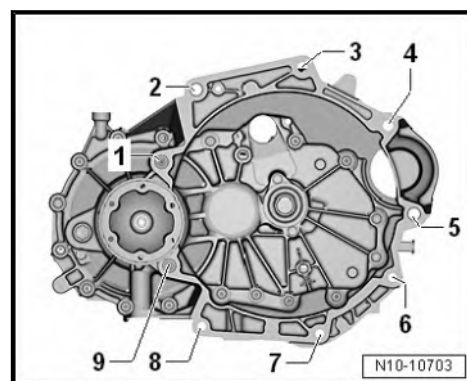




- Remove starter ⇒ Electrical system; Rep. gr. 27; Starter; Removing and installing starter.
- Bolt shackle -10 - 222 A /12- to gearbox.



- Attach hook -10 - 222 A /2- to workshop hoist -VAS 6100-.
- Attach hook -10 - 222 A /2- to shackle -10 - 222 A /12-.
- Remove bolts -1, 2, 3, 6, 7, 8, 9- securing gearbox to engine.



- Pull gearbox off engine.

## 1.2.2 Separating engine and gearbox, vehicles with automatic gearbox

Special tools and workshop equipment required

- ◆ Shackle -10 - 222 A /12-





◆ Hook -10 - 222 A /2-

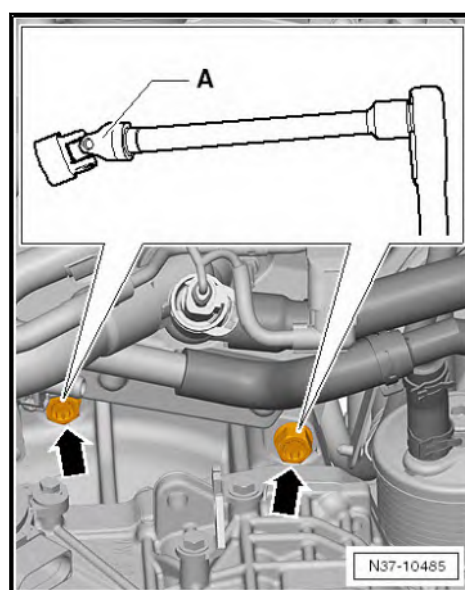


◆ Workshop hoist -VAS 6100-

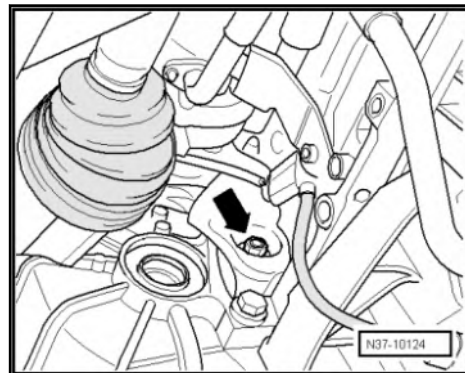


◆ Hose clamps -3094- and -3093-

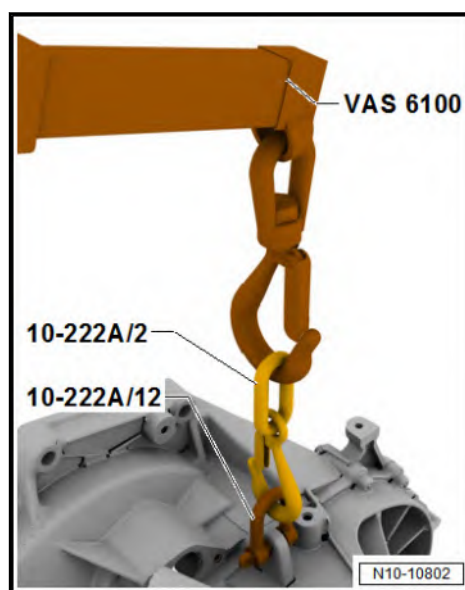
- Engine/gearbox assembly removed and attached to engine bracket -T10497B-.
- Remove starter ⇒ Electrical system; Rep. gr. 27; Starter; Removing and installing starter.
- Open clamps for coolant hoses on gear oil cooler, and pull off coolant hoses.
- Unscrew upper bolts -arrows- securing gearbox to engine using e.g. 12-point hexagon flex head socket -A-.



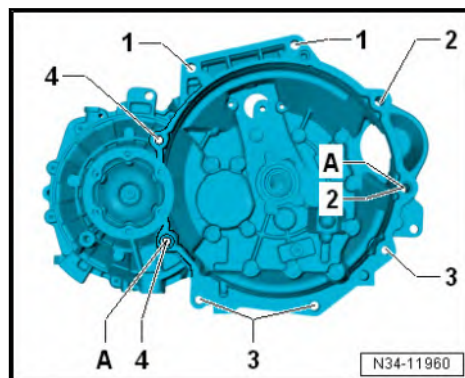
- Using insert -V/175-, remove the 3 torque converter nuts through opening -arrow- in gearbox.



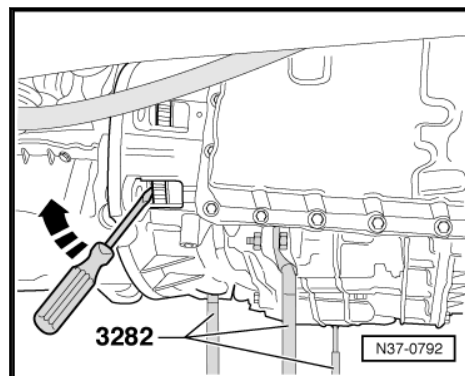
- To do this, turn engine in direction of engine rotation using wrench -T03003-.
- Bolt shackle -10 - 222 A /12- to gearbox.



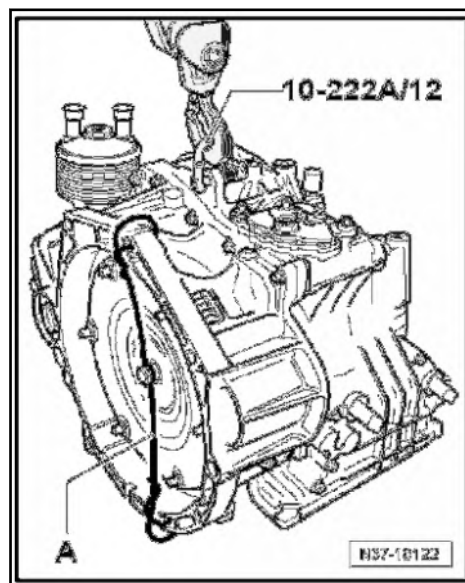
- Attach hook -10 - 222 A /2- to workshop hoist -VAS 6100-.
- Attach hook -10 - 222 A /2- to shackle -10 - 222 A /12-.
- Remove remaining engine/gearbox connecting bolts ⇒ Rep. gr. 37; Removing and installing gearbox; Specified torques for gearbox.



- Press gearbox off engine while simultaneously pressing torque converter out of drive plate of engine.



- Secure the torque converter against falling out.



### 1.3 Securing engine on engine and gear-box support

Special tools and workshop equipment required

- ◆ Engine and gearbox support -VAS 6095-



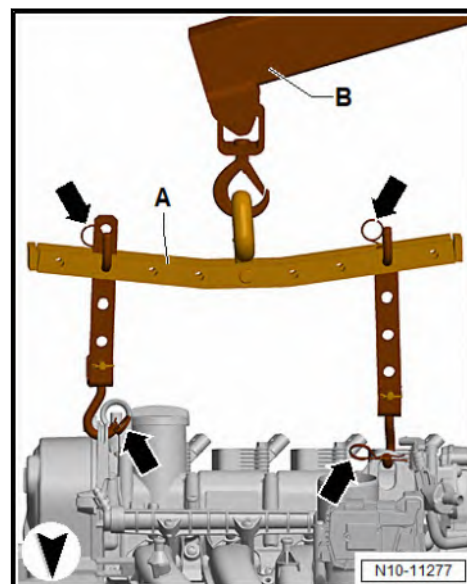


◆ Workshop hoist -VAS 6100-



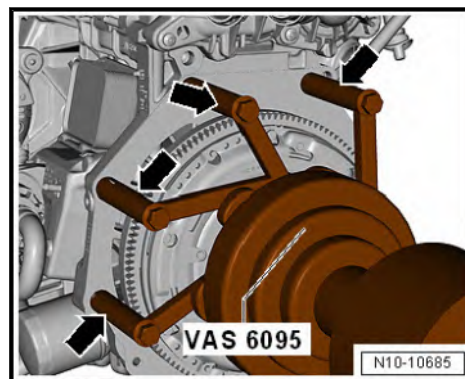
**Procedure**

- Gearbox detached from engine ⇒ [page 46](#) .
- Secure lifting tackle -2024B- -A- on engine, and attach it to workshop hoist -VAS 6100- -B- as shown in illustration.



**Note**

- ◆ *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 T10497B using workshop hoist -VAS 6100-.
- Secure engine to engine and gearbox bracket -VAS 6095- using pins -arrows- as shown in illustration.



## 1.4 Installing engine

⇒ [e1.4.1 engine, Golf 2013>, Golf SV 2015>, Golf Estate 2014>, Golf 2017>, Polo 2018>, Golf 2020>](#), page 52

⇒ [e1.4.2 engine, Polo 2014>, Polo Saloon RUS 2016>](#), page 55

⇒ [e1.4.3 engine, Polo Saloon RUS 2020>](#), page 58

### 1.4.1 Installing engine, Golf 2013>, Golf SV 2015>, Golf Estate 2014>, Golf 2017>, Polo 2018>, Golf 2020>

#### Procedure

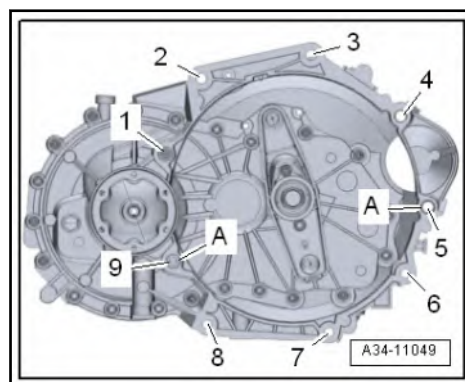
- Secure engine to engine support -T10497B- ⇒ [page 21](#) .



#### Note

- ◆ *Renew bolts that are tightened with turning further angle.*
- ◆ *Renew self-locking nuts and bolts, and seals, O-rings and gaskets.*
- ◆ *Secure all hose connections with hose clips corresponding to the series equipment ⇒ Electronic Parts Catalogue.*
- ◆ *Reinstall all cable ties in the same locations when installing.*

#### Installing gearbox to engine, vehicles with manual gearbox



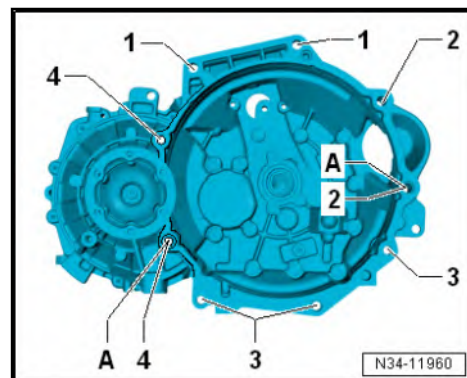
- Install intermediate plate ⇒ [page 137](#) .
- If there are no dowel sleeves -A- in cylinder block for centring engine and gearbox, insert new ones ⇒ [Item 5 \(page 136\)](#) .





- Bolt gearbox to engine at positions -1, 2, 3, 6, 7, 8, 9- ⇒ Rep. gr. 34; Removing and installing gearbox; Installing gearbox.
- Install gearbox support ⇒ Rep. gr. 34; Assembly mountings; Assembly overview - assembly mountings.
- Install starter ⇒ Electrical system; Rep. gr. 27; Starter; Assembly overview - starter.

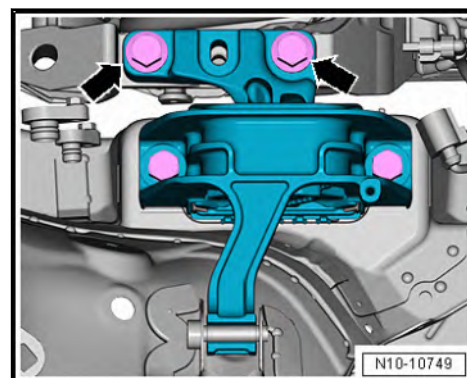
#### Installing gearbox to engine, vehicles with automatic gearbox



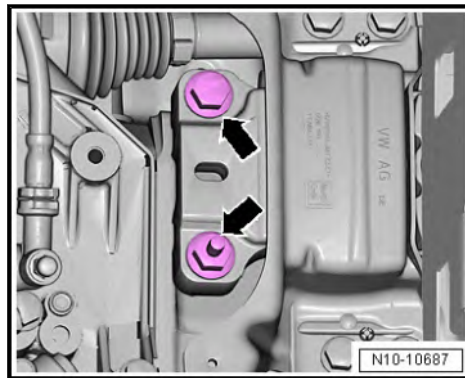
- Install intermediate plate ⇒ [page 137](#) .
- If there are no dowel sleeves -A- in the cylinder block for centring the engine and gearbox, insert new dowel sleeves.
- Bolt gearbox to engine at positions -1- to -4- ⇒ Rep. gr. 37; Removing and installing gearbox; Installing gearbox.
- Install starter ⇒ Electrical system; Rep. gr. 27; Starter; Removing and installing starter.

#### Installing engine/gearbox assembly:

- Support engine/gearbox assembly on engine support - T10497B- ⇒ [page 21](#) .
- Insert engine/gearbox assembly into body using engine support -T10497B- and engine and gearbox jack -V.A.G 1383 A-.
- First screw bolts -arrows- for engine mountings into stop by hand.



- First screw bolts -arrows- for gearbox mountings into stop by hand.



#### Note

- ◆ *The bolts are tightened to final torque only after adjusting the assembly mountings ⇒ [page 101](#) .*
- ◆ *Route lines of any kind and cables so that original routing is restored.*
- ◆ *Ensure that there is sufficient clearance to all moving or hot components.*

- Detach engine support T10497B from engine.

#### Vehicles with manual gearbox

- Install clutch slave cylinder ⇒ Rep. gr. 30; Clutch mechanism; Removing and installing clutch slave cylinder.
- Install cables with cable support bracket ⇒ Rep. gr. 34; Selector mechanism; Assembly overview - selector cables.

#### Vehicles with dual clutch gearbox

- Install selector lever cable, fit connector of mechatronic and install all retainers on gearbox:⇒ Rep. gr. 34; Removing and installing gearbox

#### Vehicles with automatic gearbox:

- Attach selector lever cable to gearbox ⇒ Rep. gr. 37; Selector mechanism; Removing and installing selector lever cable.
- Connect all connectors to gearbox.

#### Continued for all vehicles

- Install catalytic converter ⇒ [page 420](#) .
- Install drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40; Drive shaft; Assembly overview - drive shaft.
- Install transverse link, swivel joint and coupling rod ⇒ Running gear, axles, steering; Rep. gr. 40; Lower transverse link, swivel joint; Assembly overview - lower transverse link, swivel joint.
- If present, install vehicle level sender ⇒ Electrical system; Rep. gr. 94; Automatic headlight range control; Assembly overview - automatic headlight range control.
- Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87; Air conditioner compressor; Removing and installing air conditioner compressor.
- Install poly V-belt ⇒ [page 114](#) .
- Install all wires ⇒ Electrical system; Rep. gr. 97; Relay carriers, fuse carriers, electronics boxes; Overview of fitting lo-





cations - relay carriers, fuse carriers, electronics boxes and  
⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

- Install engine control unit -J623- ⇒ [page 379](#) .
- Connect coolant hoses with plug-in connector ⇒ [page 322](#) .
- Install pendulum support ⇒ [page 95](#) .
- Install front wheel housing liners ⇒ General body repairs, exterior; Rep. gr. 66; Wheel housing liner; Assembly overview - front wheel housing liner.
- Install front wheels ⇒ Running gear, axles, steering; Rep. gr. 44; Wheels, tyres; Changing wheel.
- Adjust assembly mountings ⇒ [page 101](#) .
- Install battery and battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery tray.
- Install air filter housing ⇒ [page 366](#) .
- Add coolant ⇒ [page 291](#) .



#### Note

*Do not reuse coolant which has been drained off.*

#### Specified torques

Retainer for coolant hose on engine	20 Nm
-------------------------------------	-------

- ◆ ⇒ [o2.1 verview – assembly mountings”, page 62](#)
- ◆ ⇒ [o3.1 verview - air filter housing”, page 364](#)
- ◆ ⇒ [o4.1 verview – radiator/radiator fan”, page 320](#)
- ◆ ⇒ [o4.2 verview – radiator cowl and radiator fan”, page 324](#)
- ◆ ⇒ [o1.1 verview - poly V-belt drive”, page 107](#)
- ◆ ⇒ Rep. gr. 34; Removing and installing gearbox; Specified torques for gearbox
- ◆ ⇒ Electrical system; Rep. gr. 27; Starter; Assembly overview - starter
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66; Wheel housing liner; Assembly overview- front wheel housing liner
- ◆ ⇒ Electrical system; Rep. gr. 27; Battery; Assembly overview - battery
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40; Subframe; Assembly overview - subframe

### 1.4.2 Installing engine, Polo 2014>, Polo Saloon RUS 2016>

Install in reverse order of removal. During this procedure, observe the following:

- Attach engine/gearbox assembly to engine support - T10497B-.



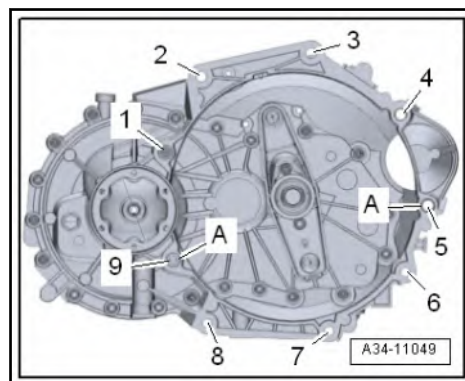
## Note

- ◆ *Renew bolts that are tightened with turning further angle.*
- ◆ *Renew self-locking nuts and bolts, and seals, O-rings and gaskets.*
- ◆ *Secure all hose connections with hose clips corresponding to the series equipment ⇒ Electronic Parts Catalogue.*
- ◆ *Reinstall all cable ties in the same locations when installing.*

### When the gearbox has been separated from the engine:

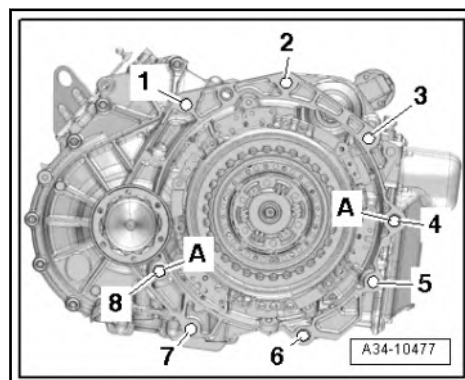
- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .

### Installing gearbox to engine, vehicles with manual gearbox



- Install intermediate plate ⇒ [page 137](#) .
- If there are no dowel sleeves -A- in cylinder block for centring engine and gearbox, insert new ones ⇒ [Item 5 \(page 136\)](#) .
- Bolt gearbox to engine at positions -1, 2, 3, 6, 7, 8, 9- ⇒ Rep. gr. 34; Removing and installing gearbox; Installing gearbox.

### Installing gearbox to engine, vehicles with automatic gearbox



- Install intermediate plate ⇒ [page 137](#) .
- If there are no dowel sleeves -A- in the cylinder block for centring the engine and gearbox, insert new dowel sleeves.
- Bolt gearbox to engine at positions -1, 2, 3, 6, 7, 8- ⇒ Rep. gr. 37; Removing and installing gearbox; Installing gearbox.



- Install starter ⇒ Electrical system; Rep. gr. 27; Starter; Removing and installing starter.

#### **Installing engine/gearbox assembly in vehicle:**

- Take up engine/gearbox assembly with engine support T10497B.
- Guide engine/gearbox assembly into body.
- Install engine mounting ⇒ [page 85](#) .
- Install gearbox mounting ⇒ [page 90](#) .
- Detach engine support T10497B from engine.
- Install pendulum support ⇒ [page 95](#) .

#### **Vehicles with manual gearbox**

- Install clutch slave cylinder ⇒ Rep. gr. 30; Clutch mechanism; Removing and installing clutch slave cylinder.
- Install cables with cable support bracket ⇒ Rep. gr. 34; Selector mechanism; Assembly overview - selector cables.

#### **Continued for all vehicles**

- Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87; Air conditioner compressor; Removing and installing air conditioner compressor.
- Install poly V-belt ⇒ [page 114](#) .
- Connect wires to engine control unit -J623- ⇒ [page 379](#) .
- Connect wires to alternator ⇒ Electrical system; Rep. gr. 27; Alternator; Assembly overview - alternator.
- Ensure proper 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.
- Install catalytic converter ⇒ [page 420](#) .
- Install drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40; Drive shaft; Removing and installing drive shaft.
- Install coolant expansion tank ⇒ [page 320](#) .
- Install radiator cowl ⇒ [page 339](#) .
- Install air filter housing ⇒ [page 366](#) .

#### **Vehicles with automatic gearbox**

- Install gearbox control unit ⇒ Rep. gr. 39; Gearbox control system; Removing and installing gearbox control unit.

#### **Continued for all vehicles**

- Install battery and battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery tray.
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50; Noise insulation.
- Install front wheels ⇒ Running gear, axles, steering; Rep. gr. 44; Wheels, tyres; Specified torque for wheel bolts.
- Add coolant ⇒ [page 291](#) .



## Specified torques



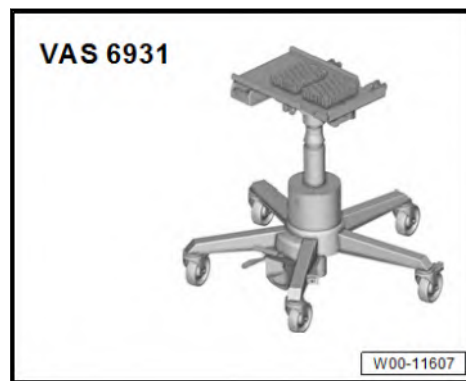
### Note

- ◆ *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.*
- ◆ [⇒ o2.1 verview – assembly mountings”, page 62](#)
- ◆ Securing gearbox on engine ⇒ Rep. gr. 34; Removing and installing gearbox; Specified torques for gearbox.

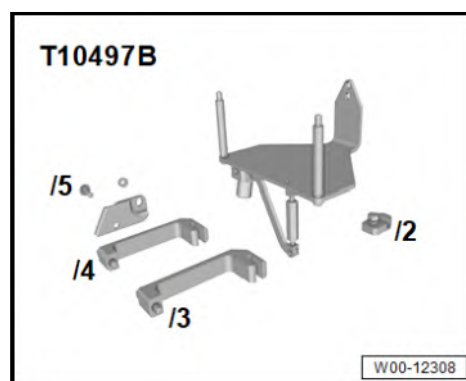
## 1.4.3 Installing engine, Polo Saloon RUS 2020>

### Special tools and workshop equipment required

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



- ◆ Engine support -T10497B-





- ◆ Drip tray for workshop hoist -VAS 6208-



- ◆ Spring-type clip pliers -VAS 6362-



- ◆ Commercially available stepladder

Install in reverse order of removal, observing the following:

- Install intermediate plate ⇒ [page 137](#) .

#### For vehicles with manual gearbox

- Clean splines of input shaft and, if clutch plate has already been in use, clean splines of hub. Remove any corrosion and very lightly lubricate splines of input shaft with grease -G 000 100-.
- Then move clutch plate back and forth on input shaft until hub moves easily on shaft. Always remove excess grease.
- Check clutch plate centring ⇒ Rep. gr. 30; Clutch; Removing and installing clutch.
- Check clutch release bearing for wear. Renew clutch release bearing in event of wear ⇒ Rep. gr. 30; Clutch release bearing; Assembly overview - clutch release bearing.

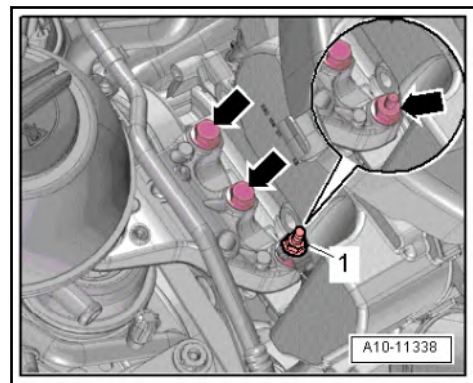
#### Continued for all vehicles

- Installing gearbox:
  - ◆ Manual gearbox ⇒ Rep. gr. 34; Removing and installing gearbox.
  - ◆ Automatic gearbox ⇒ Rep. gr. 37; Removing and installing gearbox.
- Install gearbox support.
- Take up weight of engine/gearbox assembly on engine bracket T10497B.
- Using engine support -T10497B-, place engine/gearbox assembly on engine and gearbox jack -V.A.G 1383A-.

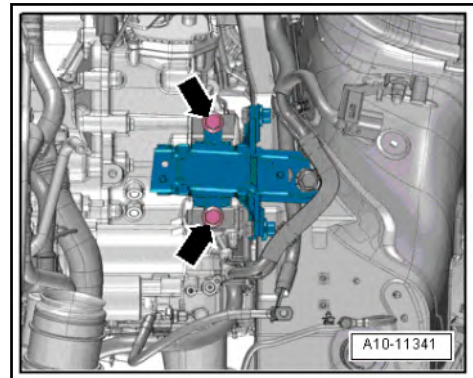


#### Note

- ◆ *Renew bolts that are tightened with specified further tightening angle.*
- ◆ *Renew self-locking nuts and bolts, and seals, O-rings and gaskets.*
- ◆ *Secure all hose connections with hose clips of the same standard as that used on the production line ⇒ Electronic parts catalogue.*
- ◆ *Attach cable ties in all the same places when installing.*
- 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.



- Detach engine support T10497B from engine.

#### For vehicles with manual gearbox

- Install clutch slave cylinder ⇒ Rep. gr. 30; Clutch mechanism; Removing and installing clutch slave cylinder.
- Install cables with cable support bracket ⇒ Rep. gr. 34; Selector mechanism; Removing and installing selector mechanism.

#### For vehicles with automatic gearbox

- Install selector lever cable, fit mechatronic unit connector, and install all retainers on gearbox ⇒ Rep. gr. 37; Selector mechanism; Removing and installing selector mechanism.



- Install automatic gearbox control unit -J217- with bracket  
⇒ Rep. gr. 39; Gearbox control unit; Removing and installing gearbox control unit.

#### Continued for all vehicles

- Install starter ⇒ Electrical system; Rep. gr. 27; Starter; Removing and installing starter.
- Install pendulum support ⇒ [page 95](#) .
- Install front exhaust pipe ⇒ [page 420](#) .
- Install right and left drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40; Drive shaft; Removing and installing drive shaft.
- Screw on nuts securing swivel joint to wheel bearing housing on left and right ⇒ Running gear, axles, steering; Rep. gr. 40; Lower suspension link, swivel joint; Removing and installing lower suspension link.

#### For vehicles with air conditioning system

- Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87; Air conditioner compressor; Removing and installing air conditioner compressor.
- Install poly V-belt ⇒ [page 114](#) .

#### Continued for all vehicles

- Add coolant ⇒ [page 287](#) .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview – noise insulation.
- Install engine control unit -J623- ⇒ [page 379](#) .
- Mount front wheels ⇒ Running gear, axles, steering; Rep. gr. 44; Wheels, tyres.
- Install battery and perform necessary measures for reconnection of battery ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery.
- Install air filter housing ⇒ [page 366](#) .
- Filling and bleeding cooling system ⇒ [page 287](#) .
- Read all event memories and then delete any event memory entries that were generated by removing and installing engine ⇒ Vehicle diagnostic tester.

#### 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.*
- ◆ [⇒ o2.1 verview – assembly mountings”, page 62](#)
- ◆ Securing gearbox on engine ⇒ Rep. gr. 34; Removing and installing gearbox; Specified torques for gearbox.





## 2 Assembly mountings

⇒ [o2.1 verview – assembly mountings", page 62](#)

⇒ [e2.2 ngine in installation position", page 74](#)

⇒ [a2.3 nd installing engine mounting", page 85](#)

⇒ [a2.4 nd installing gearbox mounting", page 90](#)

⇒ [a2.5 nd installing pendulum support", page 95](#)

⇒ [a2.6 djustment of assembly mountings", page 99](#)

⇒ [a2.7 ssembly mountings", page 101](#)

### 2.1 Assembly overview – assembly mountings

⇒ [o2.1.1 verview – assembly mountings, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Polo 2018>, Golf 2017>, Golf 2020>", page 62](#)

⇒ [o2.1.2 verview - assembly mountings, Polo 2014>, Polo Saloon RUS 2016>, manual gearbox", page 64](#)

⇒ [o2.1.3 verview - assembly mountings, Polo 2014>, Polo Saloon RUS 2016>, automatic gearbox", page 67](#)

⇒ [o2.1.4 verview - assembly mountings, Polo Saloon RUS 2020>", page 70](#)

#### 2.1.1 Assembly overview – assembly mountings, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Polo 2018>, Golf 2017>, Golf 2020>





#### 1 - Bolt

- ☐ Renew after removal
- ☐ Tightening sequence ⇒ [page 64](#)

#### 2 - Engine support

- ☐ Specified torque and tightening sequence ⇒ [page 64](#)

#### 3 - Engine mounting

- ☐ With support arm
- ☐ Removing and installing ⇒ [page 85](#)

#### 4 - Bolt

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

#### 5 - Bolt

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

#### 6 - Bolt

- ☐ 8 Nm

#### 7 - Bracket

#### 8 - Bolt

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

#### 9 - Pendulum support

- ☐ Removing and installing ⇒ [page 95](#)

#### 10 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ⇒ [page 64](#)

#### 11 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ⇒ [page 64](#)

#### 12 - Bolts

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ⇒ [page 64](#)

#### 13 - Bolt

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

#### 14 - Bolt

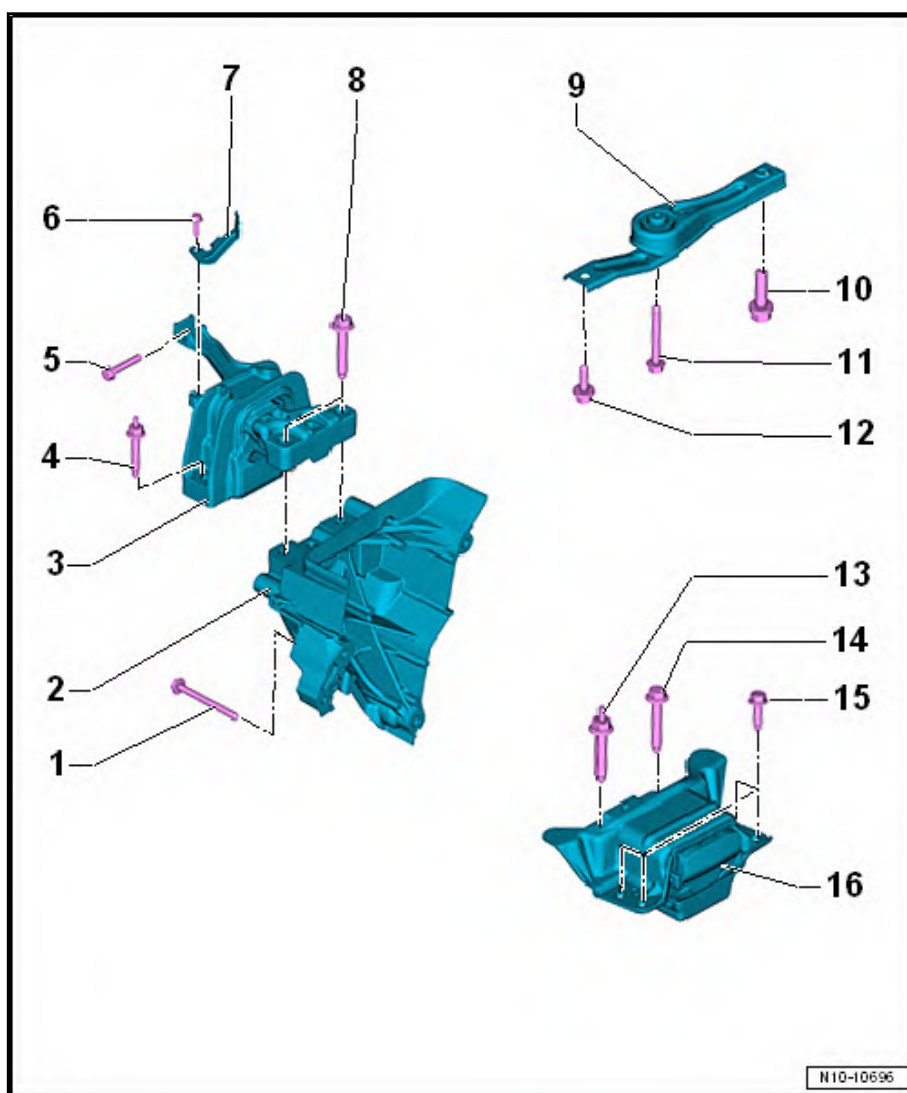
- ☐ Renew after removal
- ☐ 60 Nm +90°

#### 15 - Bolt

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

#### 16 - Gearbox mounting

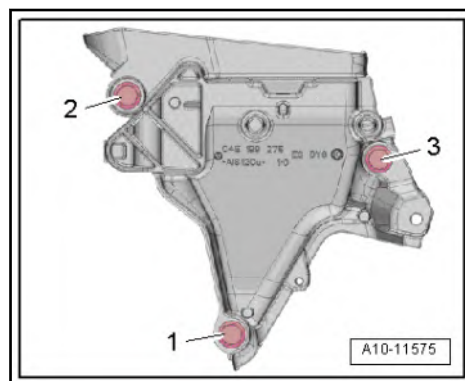
- ☐ With support arm





- ❑ Removing and installing ➤ [page 90](#)

## Engine support - specified torque and installation sequence



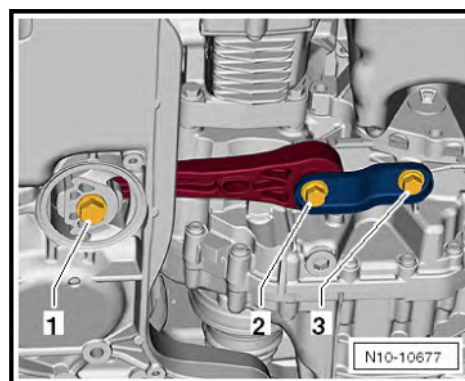
### Note

*Renew bolts that are tightened with turning further angle.*

- Tighten bolts in stages in the sequence shown.

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

## Installing pendulum support



### Note

*Replace bolts that are tightened with specified tightening angle.*

- Tighten bolts in stages in the sequence shown.

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

## 2.1.2 Assembly overview - assembly mountings, Polo 2014>, Polo Saloon RUS 2016>, manual gearbox



## 1 - Engine support

- ☐ Removing and installing ⇒ [page 125](#)
- ☐ Specified torque and tightening sequence ⇒ [page 66](#)

## 2 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ⇒ [page 66](#)

## 3 - Engine mounting

- ☐ Removing and installing ⇒ [page 85](#)
- ☐ Aligning engine mounting ⇒ [page 66](#)

## 4 - Bolt

- ☐ Renew after removal
- ☐ 20 Nm +90°
- ☐ Qty. 4

## 5 - Nut

## 6 - Centre hex stud

- ☐ With mounting for earth wire.
- ☐ Renew after removal
- ☐ 30 Nm +90°

## 7 - Bolt

- ☐ Qty. 2
- ☐ Renew after removal
- ☐ 30 Nm +90°

## 8 - Bolt

- ☐ Renew after removal
- ☐ 40 Nm +90°
- ☐ Tightening sequence ⇒ [page 67](#)

## 9 - Gearbox mounting

- ☐ Removing and installing ⇒ [page 90](#)
- ☐ Tightening sequence - gearbox mounting ⇒ [page 67](#) .

## 10 - Bolt

- ☐ Renew after removal
- ☐ 50 Nm +90°
- ☐ Tightening sequence - gearbox mounting ⇒ [page 67](#) .

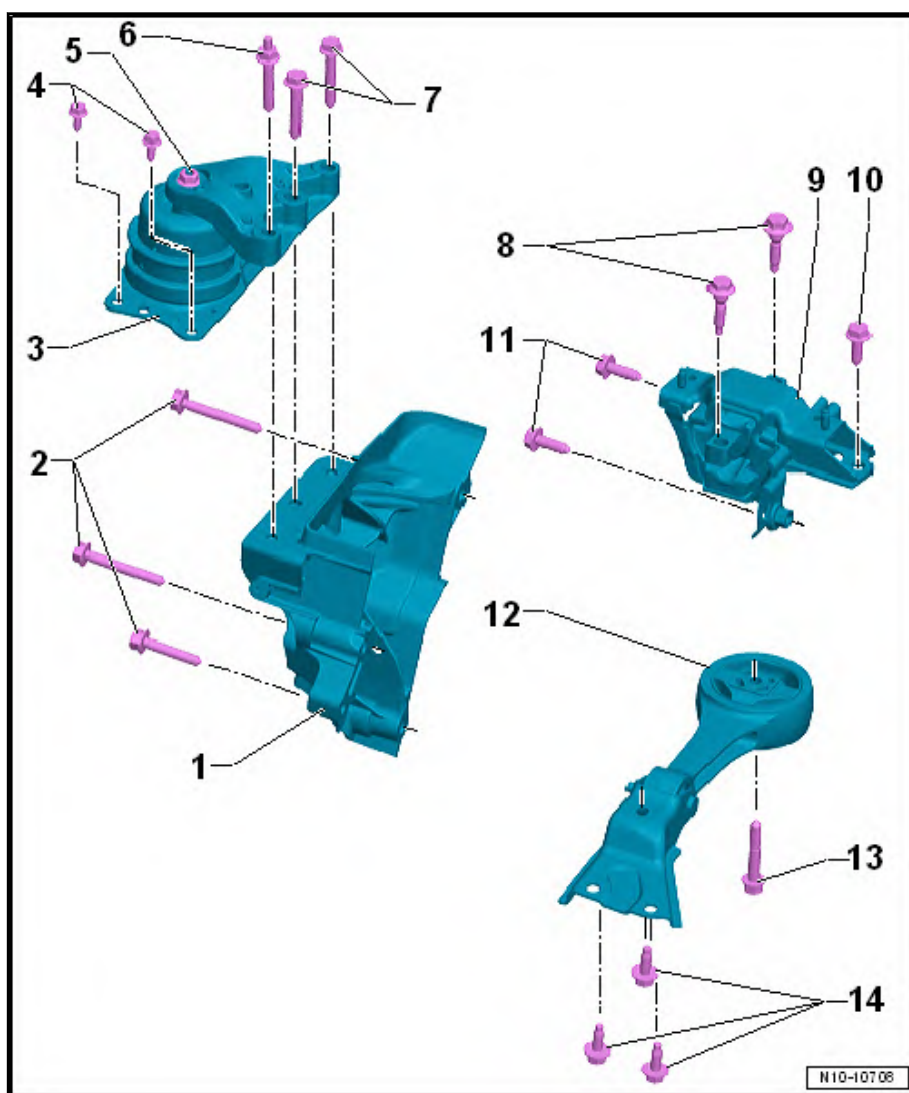
## 11 - Bolt

- ☐ Renew after removal
- ☐ 50 Nm +90°
- ☐ Qty. 2
- ☐ Tightening sequence - gearbox mounting ⇒ [page 67](#) .

## 12 - Pendulum support

- ☐ Removing and installing ⇒ [page 95](#)

## 13 - Bolt



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



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

#### 14 - Bolt

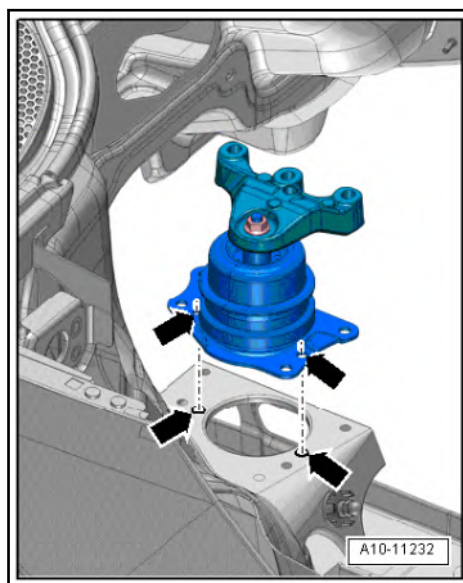
- ☐ Renew after removal
- ☐ 30 Nm +90°
- ☐ Qty. 3

#### 15 - Bolt

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

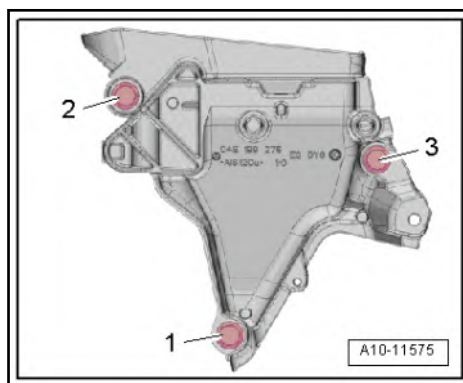
### Aligning engine mountings

- Fit engine mounting on longitudinal member.



- The positioning holes -arrows- must be in line; check with appropriate drill if necessary.

### Engine support - specified torque and tightening sequence

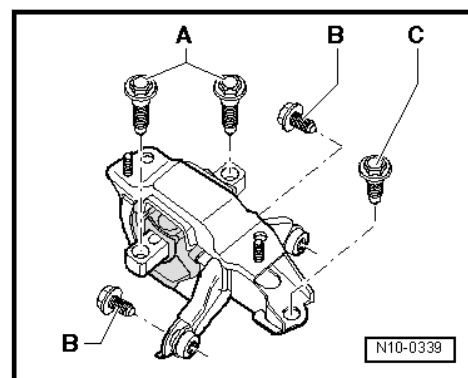


- Tighten bolts in stages in the sequence shown.

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



## Tightening sequence - gearbox mounting



Item	Procedure	Specified torque
B and C	Start bolts before tightening them	hand-tight
B	Tighten bolts	50 Nm +90°
C	Tighten bolt	50 Nm +90°
A	Start bolts before tightening them	hand-tight
A	Bolts	40 Nm +90°

### 2.1.3 Assembly overview - assembly mountings, Polo 2014>, Polo Saloon RUS 2016>, automatic gearbox



### 1 - Engine support

- ☐ Removing and installing ⇒ [page 125](#)
- ☐ Specified torque and tightening sequence ⇒ [page 69](#)

### 2 - Bolt

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

### 3 - Engine mounting

- ☐ Removing and installing ⇒ [page 85](#)
- ☐ Aligning engine mounting ⇒ [page 69](#)

### 4 - Bolt

- ☐ Renew after removal
- ☐ 20 Nm +90°
- ☐ Qty. 4

### 5 - Nut

### 6 - Centre hex stud

- ☐ With mounting for earth wire.
- ☐ Renew after removal
- ☐ 30 Nm +90°

### 7 - Bolt

- ☐ Qty. 2
- ☐ Renew after removal
- ☐ 30 Nm +90°

### 8 - Bolt

- ☐ Renew after removal
- ☐ 40 Nm +90°
- ☐ Tightening sequence - gearbox mounting ⇒ [page 70](#) .

### 9 - Gearbox mounting

- ☐ Removing and installing ⇒ [page 90](#)
- ☐ Tightening sequence - gearbox mounting ⇒ [page 70](#) .

### 10 - Bolt

- ☐ Renew after removal
- ☐ 50 Nm +90°
- ☐ Tightening sequence - gearbox mounting ⇒ [page 70](#) .

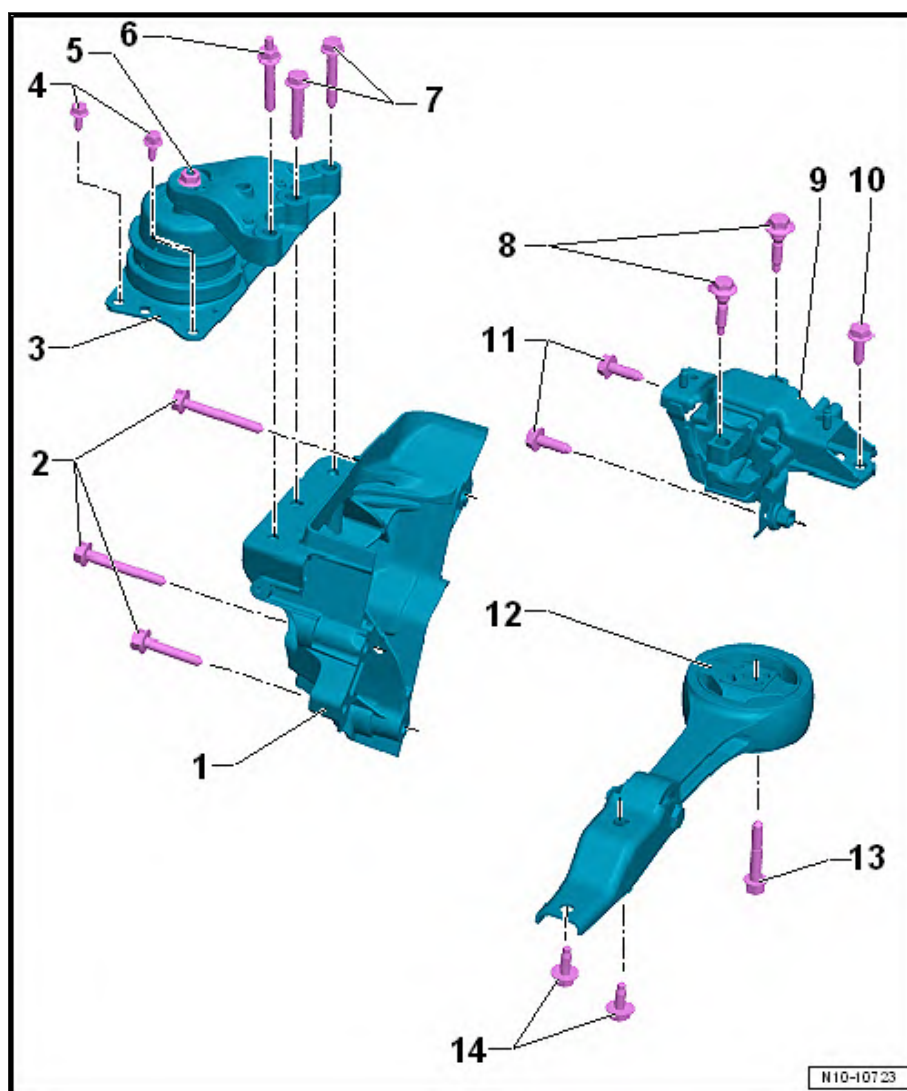
### 11 - Bolt

- ☐ Renew after removal
- ☐ 50 Nm +90°
- ☐ Qty. 2
- ☐ Tightening sequence - gearbox mounting ⇒ [page 70](#) .

### 12 - Pendulum support

- ☐ Removing and installing ⇒ [page 95](#)

### 13 - Bolt







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

#### 14 - Bolt

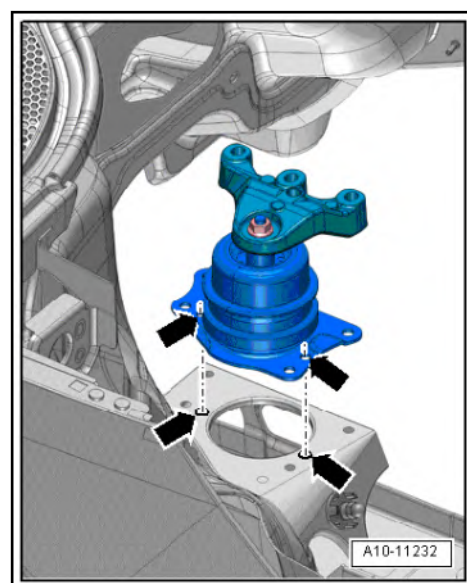
- ☐ Renew after removal
- ☐ 30 Nm +90°
- ☐ Qty. 2

#### 15 - Bolt

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

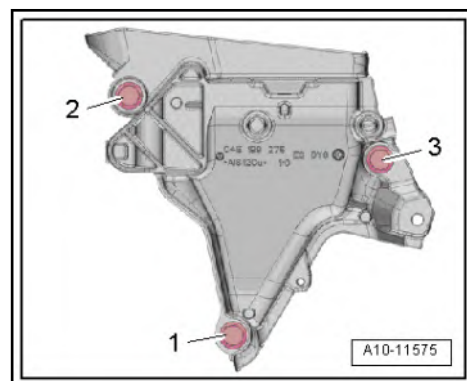
### Aligning engine mountings

- Fit engine mounting on longitudinal member.



- The positioning holes -arrows- must be in line; check with appropriate drill if necessary.

### Engine support - specified torque and tightening sequence



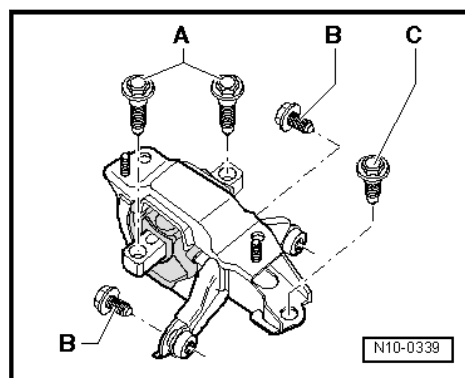
- Tighten bolts in stages in the sequence shown.

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





## Tightening sequence - gearbox mounting



Item	Procedure	Specified torque
B and C	Start bolts before tightening them	hand-tight
B	Tighten bolts	50 Nm +90°
C	Tighten bolt	50 Nm +90°
A	Start bolts before tightening them	hand-tight
A	Bolts	40 Nm +90°

### 2.1.4 Assembly overview - assembly mountings, Polo Saloon RUS 2020>



## 1 - Engine support

- ☐ Removing and installing ➤ [page 125](#)
- ☐ Specified torque and tightening sequence ➤ [page 72](#)

## 2 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ➤ [page 72](#)

## 3 - Engine mounting

- ☐ Removing and installing ➤ [page 85](#)

## 4 - Bolt

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

## 5 - Nut

- ☐ Securing nut must not be loosened

## 6 - Centre hex stud

- ☐ With mounting for earth wire; specified torque for earth wire ➤ [page 72](#)
- ☐ Renew after removal
- ☐ 30 Nm + 90°

## 7 - Bolt

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

## 8 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ➤ [page 73](#)

## 9 - Gearbox mounting

- ☐ Removing and installing ➤ [page 90](#)
- ☐ Tightening sequence ➤ [page 73](#)

## 10 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ➤ [page 73](#)

## 11 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ➤ [page 73](#)

## 12 - Pendulum support

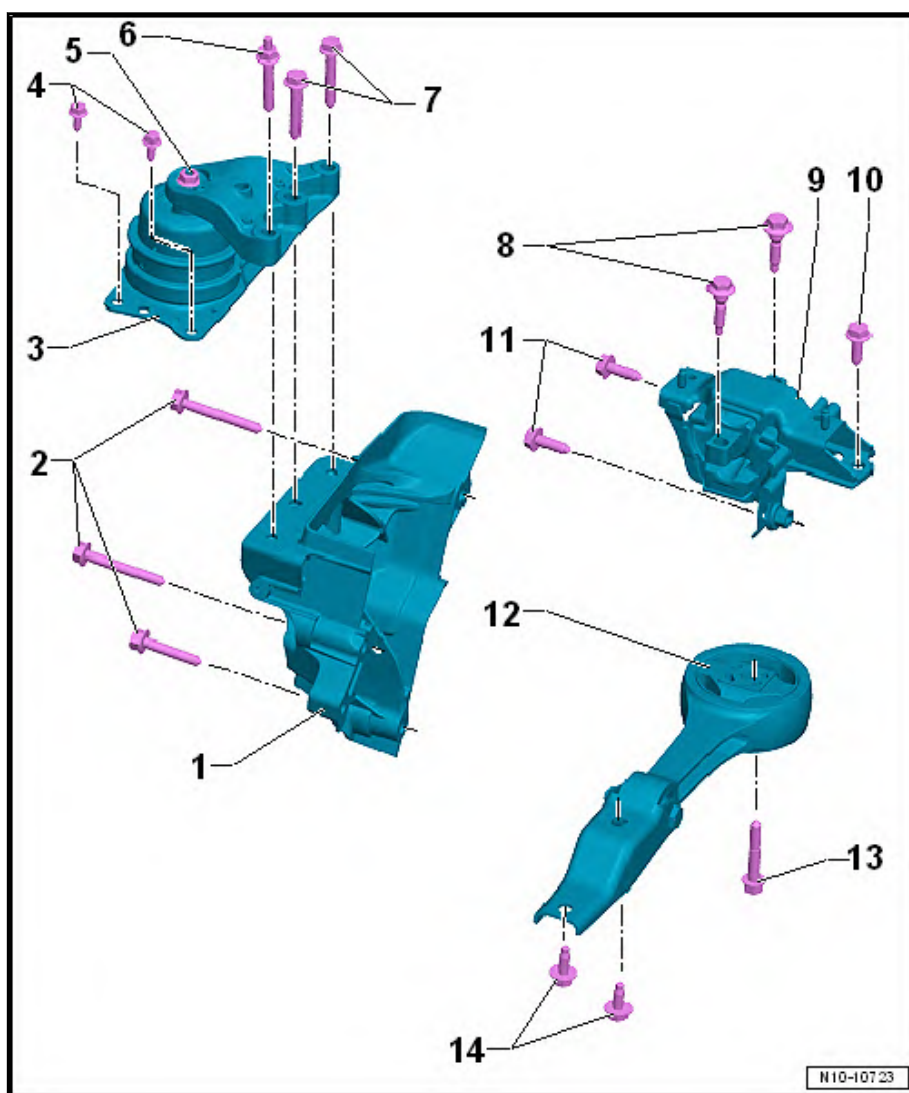
- ☐ Removing and installing ➤ [page 74](#)

## 13 - Bolt

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

## 14 - Bolt

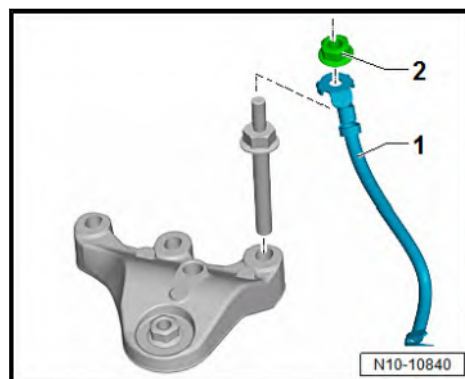
- ☐ Renew after removal





□ 30 Nm + 90°

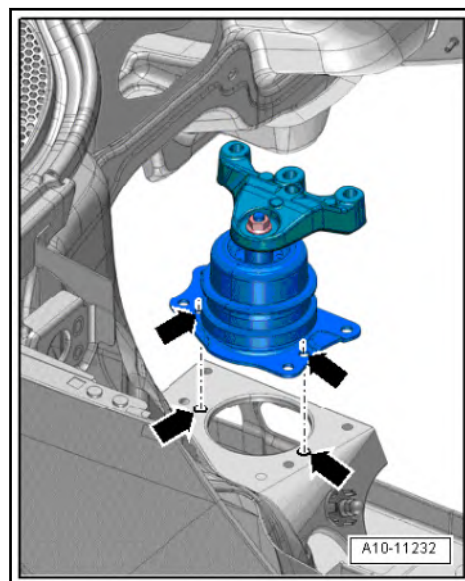
### Earth wire on engine mounting



### Specified torques

Component	Specified torque
Nut -2-	20 Nm

### Aligning engine mountings



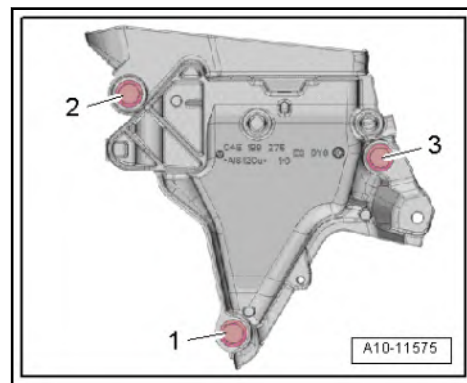
- Place engine mounting on longitudinal member.



#### Note

*Locating positions -arrows- must be in same plane. Check with a suitable drill bit if necessary.*

### Engine support - specified torque and installation sequence



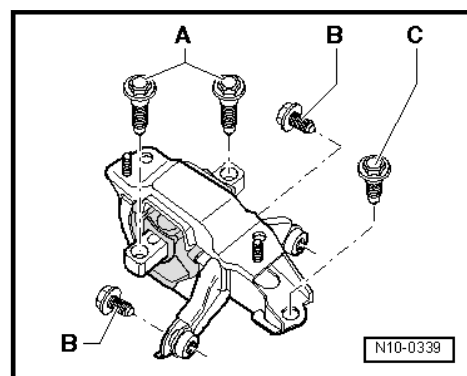
**! NOTICE**

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- to -3-	7 Nm
2.	-1- to -3-	40 Nm
3.	-1- to -3-	Turn 90° further

Gearbox mounting - specified torque and tightening sequence



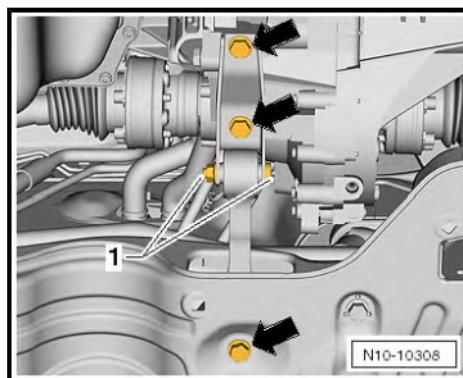
**! NOTICE**

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

Item	Procedure	Specified torque/turning further angle
B and C	Start bolts	hand-tight
B	Tighten bolts	50 Nm + 90°
C	Tighten bolt	50 Nm + 90°
A	Start bolts	hand-tight
A	Tighten bolts	Specified torque ⇒ Rep. gr. 34; Assembly mountings; Assembly overview - assembly mountings



## Removing and installing pendulum support



- Unscrew bolts -arrows-.



### Note

*Bolt -1- must not be loosened.*

- Pull pendulum support out of subframe.

Install in reverse order of removal.

## 2.2 Supporting engine in installation position

⇒ [e2.2.1 engine in installation position, Golf 2013>, Golf Estate>, Golf SV>, Golf 2017>, Polo 2018>, Golf 2020>](#), page 74

⇒ [e2.2.2 engine in installation position, Polo 2014>, Polo Saloon RUS 2016>](#), page 80

⇒ [e2.2.3 engine in installation position, Polo Saloon RUS 2020>](#), page 83

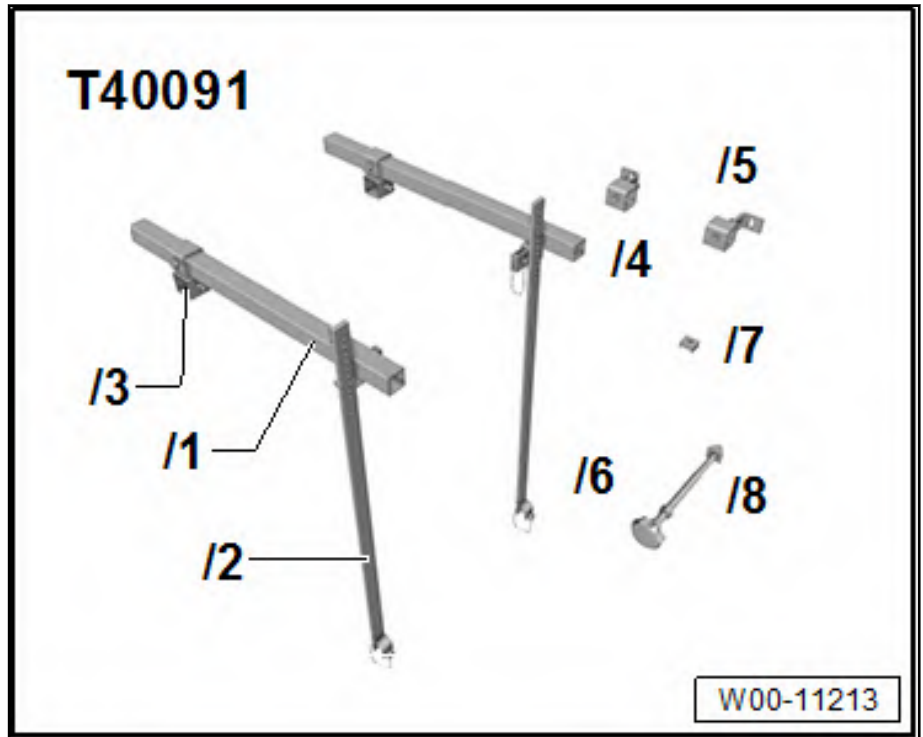
### 2.2.1 Supporting engine in installation position, Golf 2013>, Golf Estate>, Golf SV>, Golf 2017>, Polo 2018>, Golf 2020>

#### Special tools and workshop equipment required

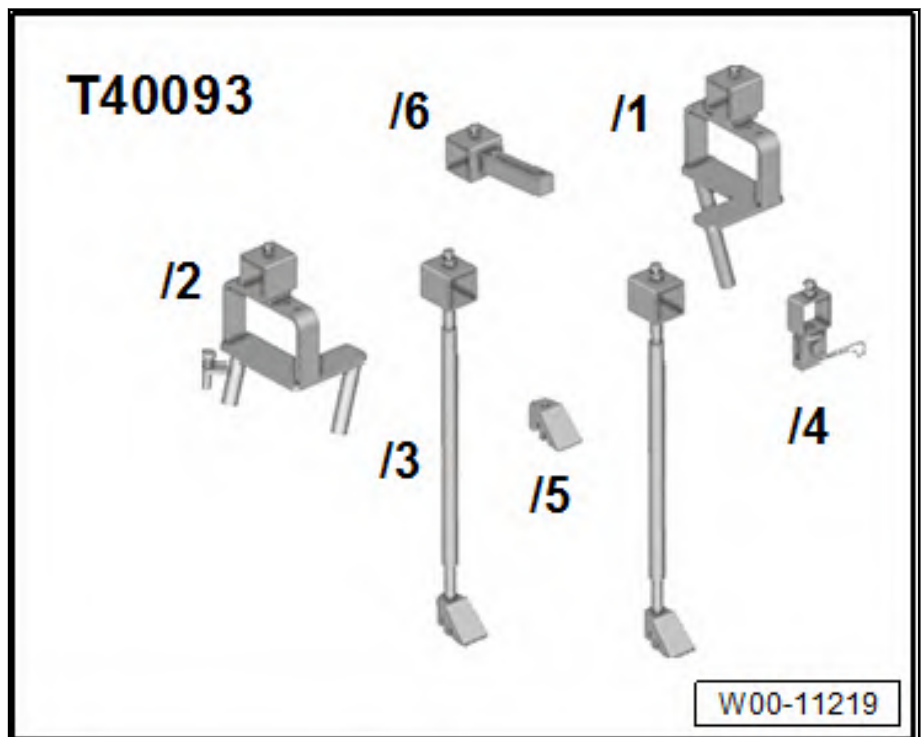
- ◆ Support bracket -10 - 222 A-



- ◆ Shackle -10 - 222 A /12-
- ◆ Adapter -10 - 222 A /18-
- ◆ Adapter -10 - 222 A /29-



- ◆ Adapter -T40091/1-
- ◆ Adapter -T40091/3-



- ◆ Adapter -T40093/3-
- ◆ Adapter -T40093/3-6-



## Procedure

- Remove air filter housing. ⇒ [page 366](#)

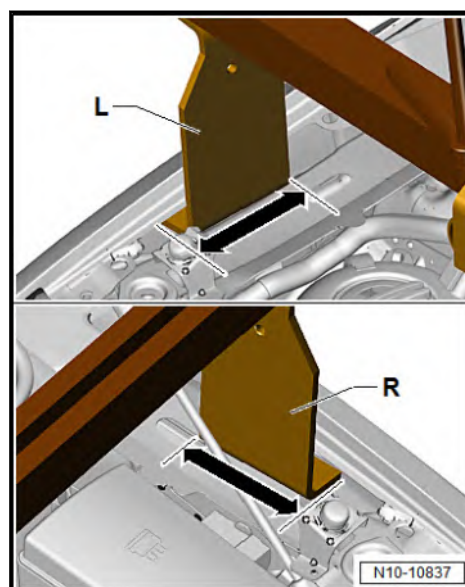
**Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Golf 2020>**

- Remove filler pipe for washer fluid reservoir of windscreen washer system ⇒ Electrical system; Rep. gr. 92; Windscreen washer system; Removing and installing washer fluid reservoir.

## Continued for all vehicles

- On both sides of vehicle, insert adapters -10 - 222 A /29- between wing mounting flange and sheet metal for mounting wing underneath it.

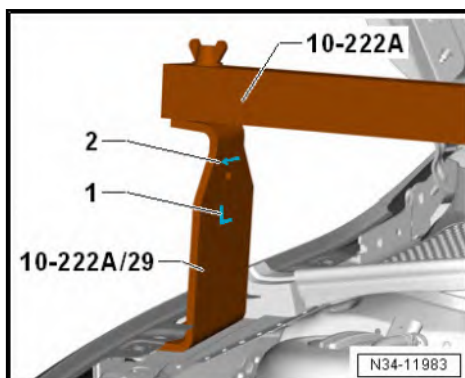
**Adapter -10 - 222 A /29- -L- is to be inserted on right side of vehicle:**



- Adapter -arrow- is engaged in recess of wing.

**Adapter -10 - 222 A /29- -R- is to be inserted on left side of vehicle:**

- Adapter -arrow- is engaged in recess of wing.
- Arrow -2- on adapter -10 - 222 A /29- always points in direction of travel.



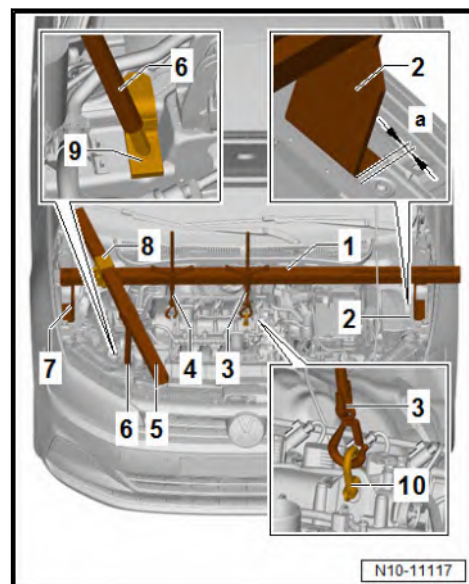
- Fit adapter -10 - 222 A /29- onto the load-bearing part of the upper wheel housing longitudinal member.





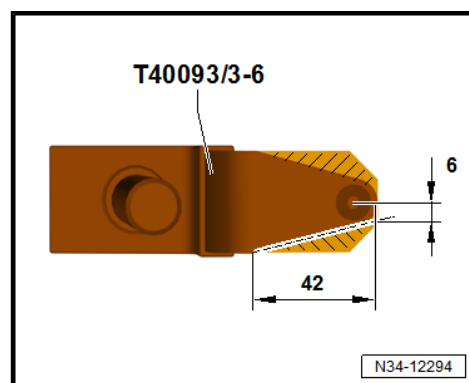
## Polo 2018>

- Push connecting piece -T40091/3- -8- onto support bracket -10-222 A- -1-.
- Insert -T40091/1- - 5- into connecting piece -T40091/3- -8-.
- Slide 2 spindles -10 - 222 A /32--3 - and -4- onto support bracket -10-222 A- -1-.
- Secure shackle -10-222 A /12--10- to camshaft housing.



- Bolt support bracket -10-222 A- -1- to adapters -10 - 222 A /29- -2- and -7-.
- Release air conditioning line from securing element on right longitudinal member.
- Place adapter -T40093/3- -6- on right longitudinal member.
- Install adapter -T40093/3-6- -A- as follows.

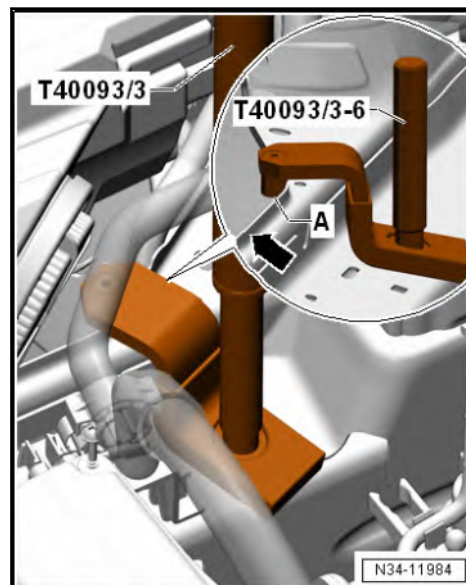
**Check adapters -T40093/3-6- and modify as necessary**



- 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-.



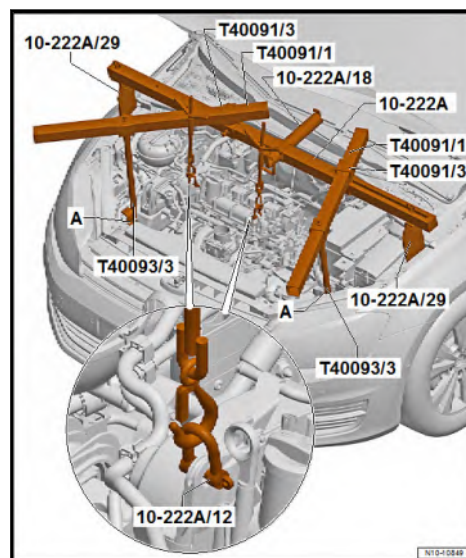
**Adapter -A- corresponds to adapter -T40093/3-6- and is fitted as follows:**



- To prevent damage to longitudinal members, mask off front area of adapters -T40093/3-6A- with textile-reinforced adhesive tape ⇒ Electronic parts catalogue.
- Each of the adapters -T40093/3-6- locks with pin -A- behind the web of the longitudinal member -arrow-.
- Bolt on spindles -T40093 /3-.
- Connect spindles -T40093 /3- via square tubes -T40091/1- to engine support bracket -10-222 A-, and fasten the connection (⇒ previous illustration).
- Attach spindle -10 - 222 A /32- to shackle -10-222 A /12-.
- Position support bracket according to dimension -a- = 1 cm.

**Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Golf 2020>**

- Push adapter -10 - 222 A /18- and two connecting pieces -T40091/3- onto support bracket -10-222 A-.

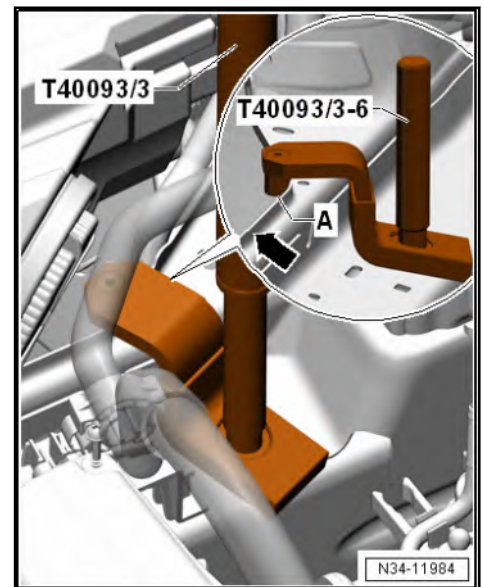


- Insert -T40091/1- into connecting pieces -T40091/3-.



- Slide spindle -10 - 222 A /11- onto -T40091/1-.
- Fit spindle -10 - 222 A /11- on adapter -10 - 222 A /18- as shown in illustration.
- Secure support bracket -10-222 A- to adapters -10 - 222 A / 29-.
- Install shackle -10 - 222 A /12- to engine as shown in illustration.
- Attach spindle -10 - 222 A /11- to shackle -10 - 222 A /12-.
- Install adapter -T40093/3-6- -A- as follows.

**Adapter -A- corresponds to adapter -T40093/3-6- and is fitted as follows:**



- If present, pull off wires in front area of flange on both longitudinal members -arrow-. Do not disconnect pipe/hose system.
- Place adapters -T40093/3-6- onto both longitudinal members (the figure shows the right longitudinal member).
- 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.
- Each of the adapters -T40093/3-6- locks with pin -A- behind the web of the longitudinal member -arrow-.
- Bolt on spindles -T40093 /3-.
- Connect spindles -T40093 /3- via square tubes -T40091/1- to engine support bracket -10-222 A-, and fasten the connection (⇒ previous illustration).
- Then, attach spindles in lifting eyes of engine. If necessary, use the shackles -10 - 222 A /12- for this.

#### **All versions**

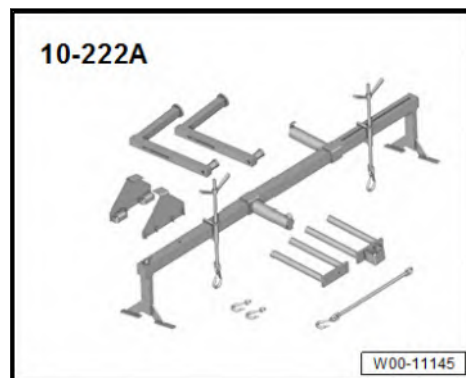
- Take up weight of engine/gearbox assembly and support bracket on spindles.



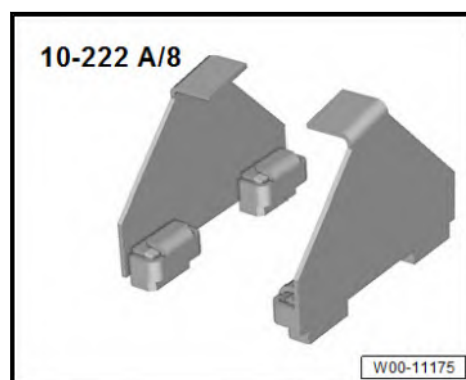
## 2.2.2 Supporting engine in installation position, Polo 2014>, Polo Saloon RUS 2016>

### Special tools and workshop equipment required

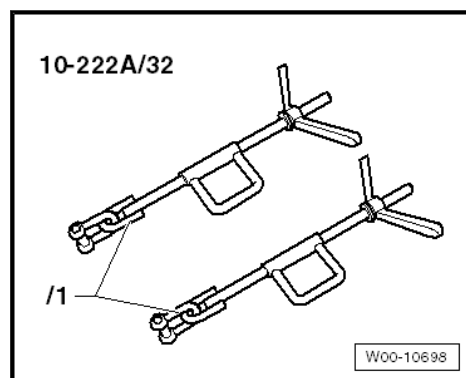
- ◆ Support bracket -10 - 222 A-



- ◆ Adapter -10 - 222 A /8-



- ◆ Adapter -10 - 222 A /32-

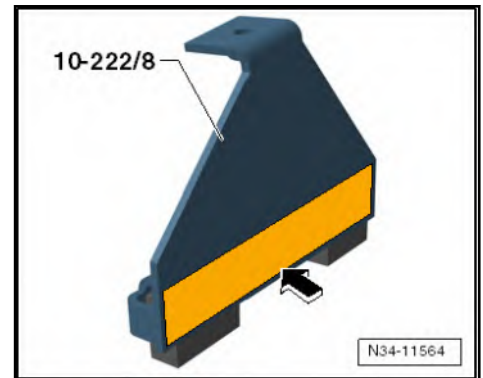


- ◆ Tensioning strap -T10038-



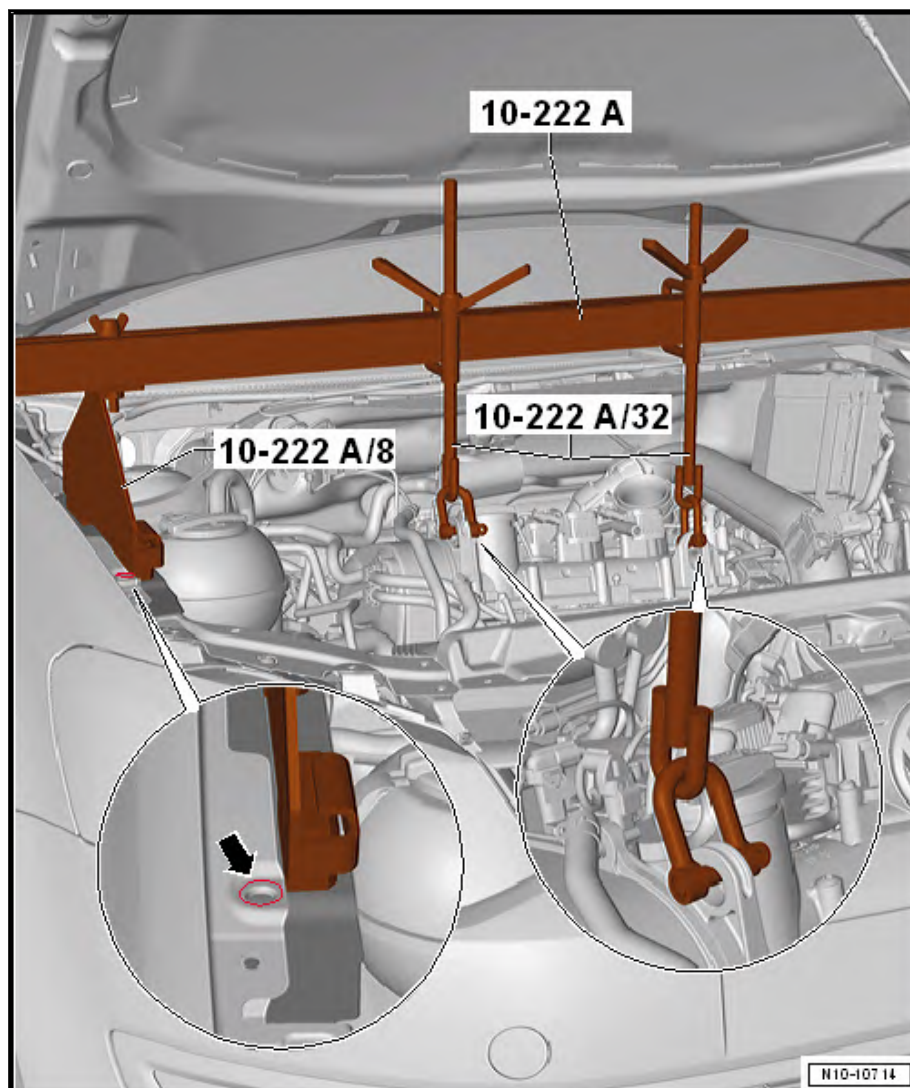


To prevent damage to edges of wings, mask off lower areas of both adapters -10 - 222 A /8- with duct tape -arrow- → Electronic parts catalogue.



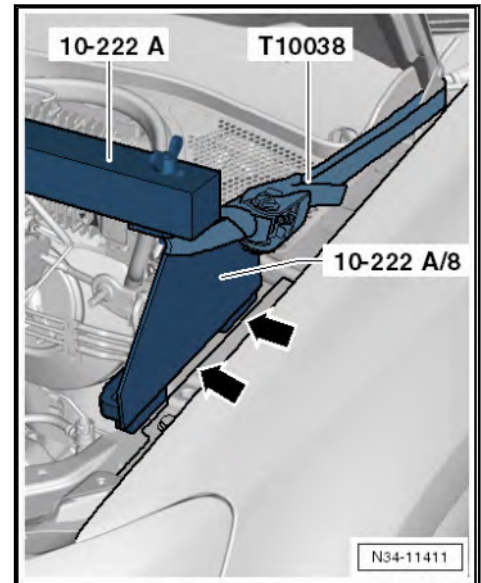
### Procedure

- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .
- Remove air filter housing ⇒ [page 366](#) .
- Remove battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery tray.



- Remove seals from upper edge of wing.
- Slide adapter -10 - 222 A /32- onto engine 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 engine support bracket -10 - 222 A- using tensioning straps -T10038- on both sides of bonnet hinges.



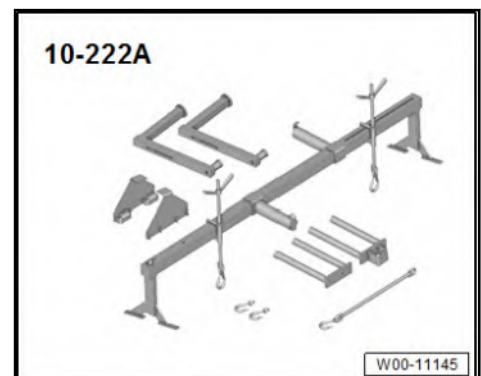


- Tighten spindle slightly to take up weight of engine/gearbox assembly; do not lift.

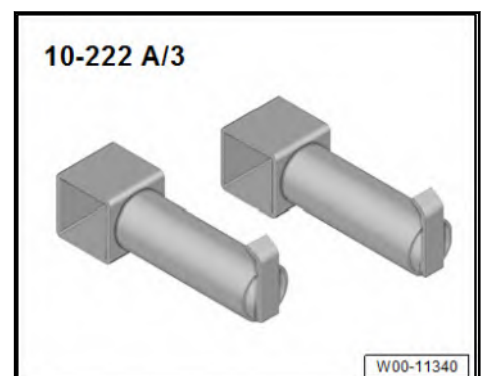
### 2.2.3 Supporting engine in installation position, Polo Saloon RUS 2020>

Special tools and workshop equipment required

- ◆ Support bracket -10 - 222 A-



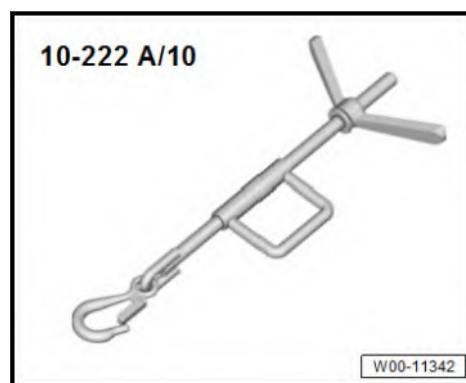
- ◆ Adapter -10-222A/3-







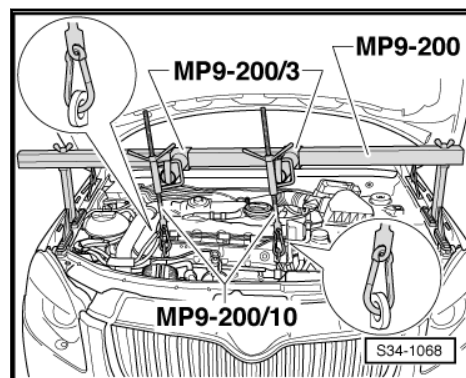
◆ Hook -10-222A/10-



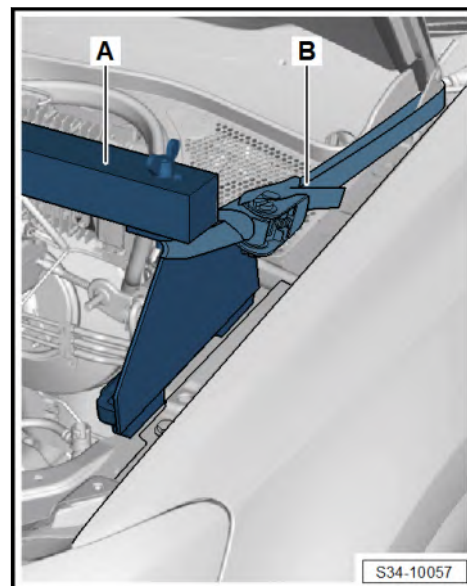
◆ Tensioning strap -T10038-



- Remove air filter housing ⇒ [page 366](#) .
- Position support bracket -10 - 222 A- with adapters -10-222A/3- and hook -10-222A/10- on vehicle.



- Secure support bracket -10 - 222 A- on both sides at lid hinges using tensioning strap -T10038-.



- Tighten hooks -10-222A/10- slightly to take up weight of engine/gearbox assembly; do not lift.

## 2.3 Removing and installing engine mounting

⇒ [a2.3.1 nd installing engine mounting, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo 2018>, Golf 2020>](#), page 85

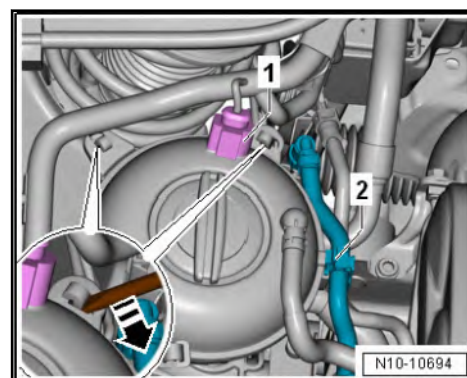
⇒ [a2.3.2 nd installing engine mounting, Polo 2014>, Polo Saloon RUS 2016>](#), page 86

⇒ [a2.3.3 nd installing engine mounting, Polo Saloon RUS 2020>](#), page 89

### 2.3.1 Removing and installing engine mounting, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo 2018>, Golf 2020>

#### Removing

- Disconnect electrical connector -1-.
- Move clear hose -2- from activated charcoal filter.

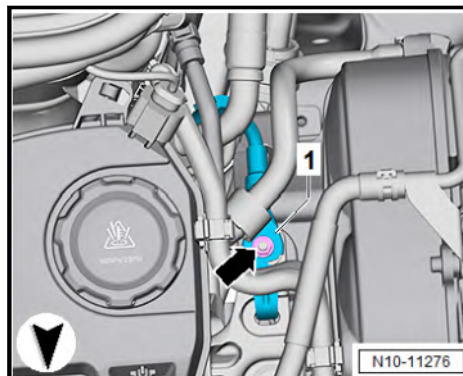


- Using a screwdriver, release fasteners -arrow- and move coolant expansion tank to one side.
- Support engine in its installation position ⇒ [page 74](#) .



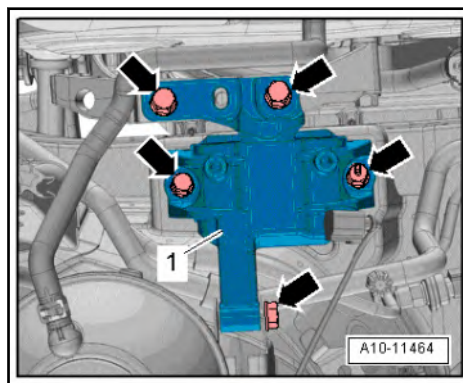
- Tighten spindles slightly to take up weight of engine/gearbox assembly; do not lift.

#### Golf 2020



- Unscrew nut -1-.
- Detach earth wire -2-.

#### Continued for all vehicles



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

#### Installing

Install in reverse order of removal, observing the following:

- Checking adjustment of assembly mountings ⇒ [page 99](#) .

#### Specified torques

- ♦ ⇒ [o2.1 verview – assembly mountings](#)”, [page 62](#)

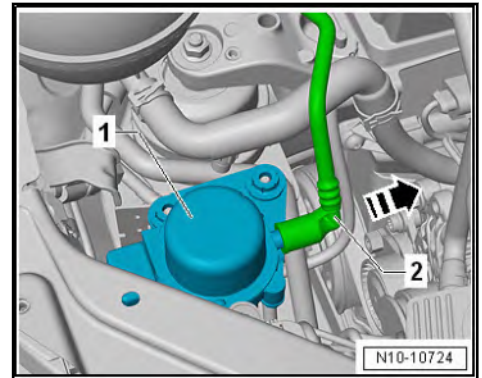
### 2.3.2 Removing and installing engine mounting, Polo 2014>, Polo Saloon RUS 2016>

#### Removing

- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .
- Remove air filter housing ⇒ [page 366](#) .

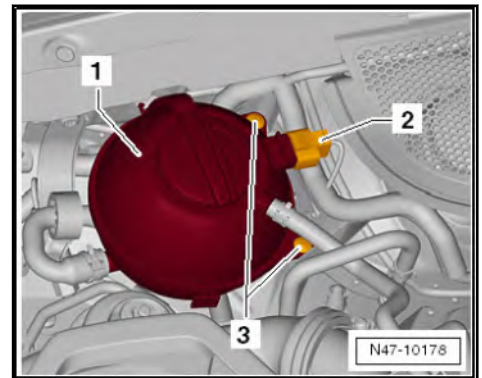


## Vehicles with automatic gearbox

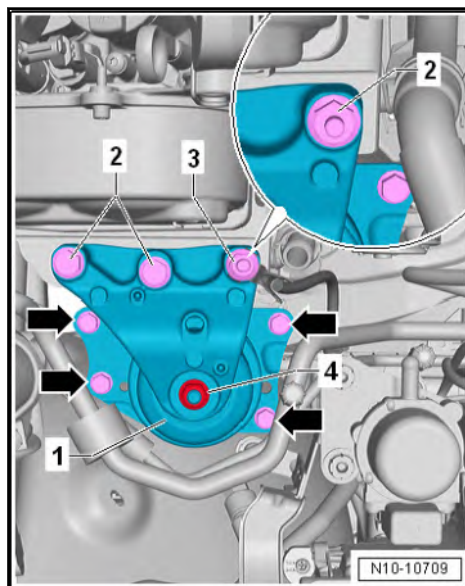


- Pull vacuum line -2- in direction of -arrow- off vacuum pump for brakes -V192- -1-.
- Lay vacuum line -1- to one side.

## Continued for all vehicles



- Release connectors -2- and pull off.
- Unscrew securing bolts -3-.
- Place coolant expansion tank -1- on engine.
- Support engine in installation position ➔ [page 74](#) .
- Tighten spindle slightly to take up weight of engine/gearbox assembly; do not lift.
- Unscrew nut -3-.



- Remove earth wire.



#### Note

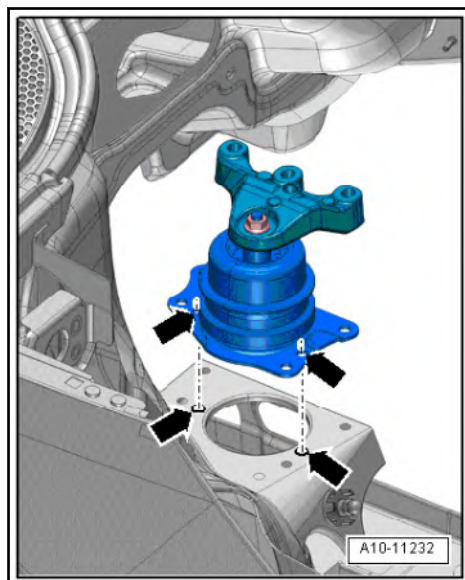
*Nut -4- must not be loosened.*

- Unscrew bolts -2- between engine mounting and engine.
- Unscrew bolts -arrows- and remove engine mounting.

#### Installing

Install in reverse order of removal. During this procedure, observe the following:

- Place assembly mounting on longitudinal member.



- The positioning holes -arrows- must be in line; check with appropriate drill if necessary.
- Remove support bracket -10 - 222 A- from engine.





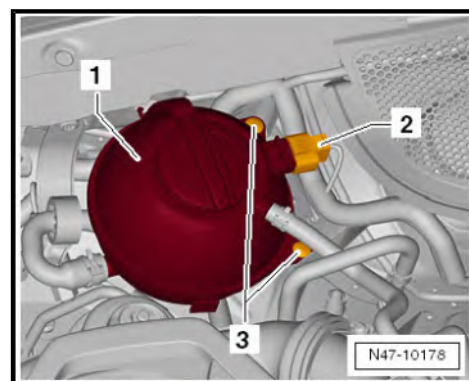
## Specified torques

- ◆ ➔ [o2.1 verview – assembly mountings”, page 62](#)
- ◆ ➔ [o3.1 verview - air filter housing”, page 364](#)

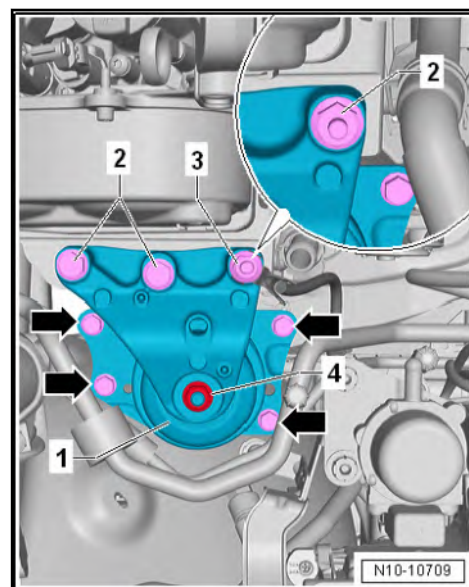
### 2.3.3 Removing and installing engine mounting, Polo Saloon RUS 2020>

#### Removing

- Heed the safety precautions ➔ [page 1](#) .
- Observe rules for cleanliness ➔ [page 6](#) .
- Note repair instructions ➔ [page 6](#) .
- Remove air filter housing ➔ [page 366](#) .
- Release and separate connector -2-.



- Unscrew securing bolts -3-.
- Place coolant expansion tank -1- on engine.
- Support engine in its installation position ➔ [page 74](#) .
- Unscrew nut -3-.



- Remove earth wire.



#### Note

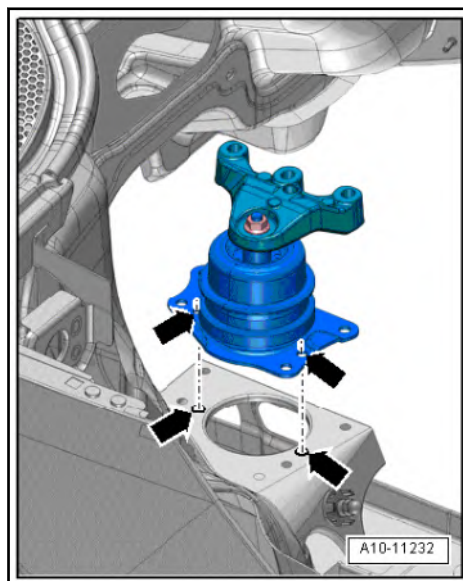
*Nut -4- must not be loosened.*

- Unscrew bolts -2- between engine mounting and engine.
- Unscrew bolts -arrows- and remove engine mounting.

#### Installing

Install in reverse order of removal. During this procedure, observe the following:

- Place assembly mounting on longitudinal member.



#### Note

*Positioning holes -arrows- must align. Check with a suitable drill bit if necessary.*

- Do not remove support bracket -10 - 222 A- until bolts securing gearbox mounting have been tightened to specified torque.

#### Specified torques

- ♦ ⇒ [a2.1 verview – assembly mountings”, page 62](#)
- ♦ ⇒ [a3.1 verview - air filter housing”, page 364](#)

## 2.4 Removing and installing gearbox mounting

⇒ [a2.4.1 nd installing gearbox mounting, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo 2018>, Golf 2020>”, page 90](#)

⇒ [a2.4.2 nd installing gearbox mounting, Polo 2014>, Polo Saloon RUS 2016>”, page 92](#)

⇒ [a2.4.3 nd installing gearbox mounting, Polo Saloon RUS 2020>”, page 94](#)

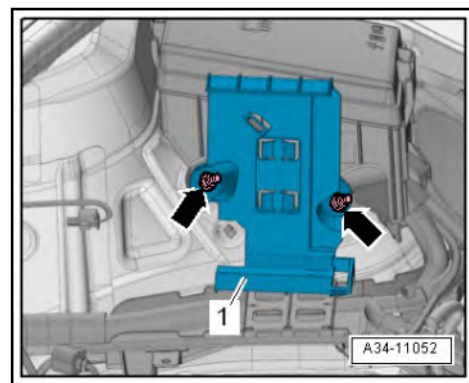
### 2.4.1 Removing and installing gearbox mounting, Golf 2013>, Golf Es-





**tate 2014>, Golf SV 2015>,  
Golf 2017>, Polo 2018>, Golf 2020>**

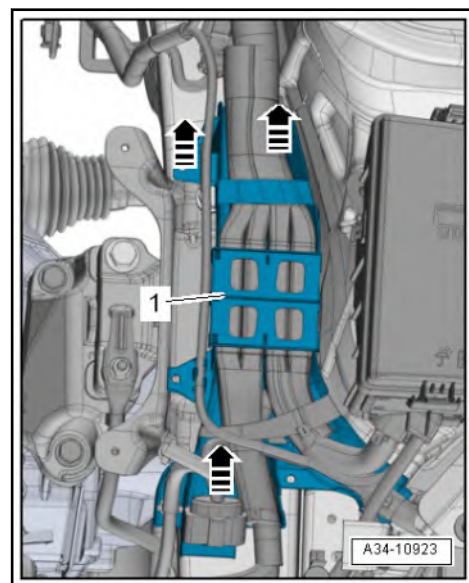
- Remove battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery tray.
- Remove engine control unit ⇒ [page 379](#) .
- Unscrew nuts -arrows-, and remove bracket -1-.



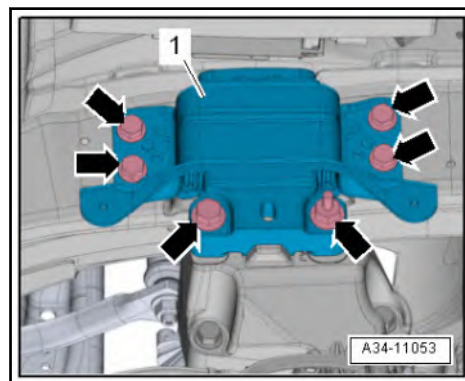
**Note**

*Different types of brackets are fitted depending on version.*

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



- Support engine in its installation position ⇒ [page 74](#) .
- Tighten spindle to take up weight of engine/gearbox assembly; do not lift.
- Unscrew bolts -arrows-.



- Lower engine/gearbox assembly slightly.
- Remove gearbox mounting -1-.

### Installing

Install in reverse order of removal. During this procedure, observe the following:



### Note

- ♦ *Risk of damage to threads in gearbox support by starting bolts at an angle.*
- ♦ *Gearbox support and support arm of gearbox mounting must be perfectly parallel to each other before screwing in bolts -arrows 1-. If necessary, lift gearbox at rear using trolley jack.*
- ♦ *Do not remove support bracket -10 - 222 A- until the bolts securing the assembly mounting have been tightened to specified torque.*
- ♦ *Replace bolts that are tightened with specified tightening angle.*
- Lift gearbox with spindle of support bracket until gearbox support makes contact with support arm of gearbox mounting.
- Checking adjustment of assembly mountings ⇒ [page 99](#) .

### Specified torques

- ♦ ⇒ [o2.1 verview – assembly mountings”, page 62](#)
- ♦ ⇒ Electrical system; Rep. gr. 27; Battery; Assembly overview - battery

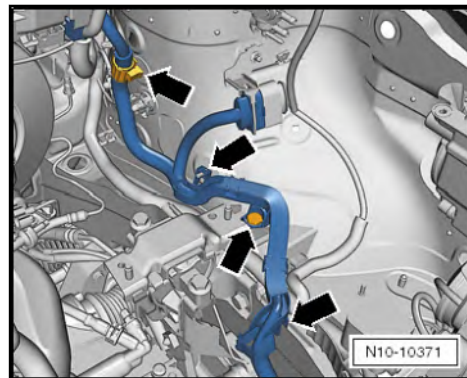
## 2.4.2 Removing and installing gearbox mounting, Polo 2014>, Polo Saloon RUS 2016>

### Removing

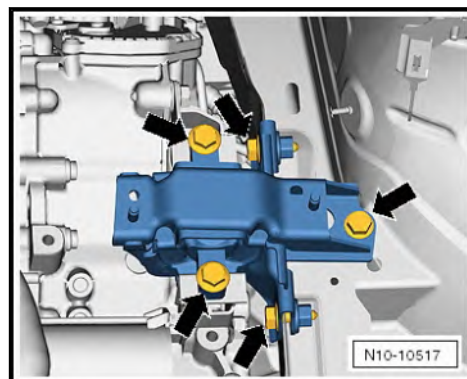
- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .
- Remove air filter housing ⇒ [page 366](#) .
- Remove battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery tray.



- Support engine in its installation position ➔ [page 74](#) .
- Tighten spindle slightly to take up weight of engine/gearbox assembly; do not lift.
- Carefully loosen wiring harness at its fastening points -arrows-.



- Unscrew securing bolts -arrows- from gearbox mounting.



## Installing

Install in reverse order of removal. During this procedure, observe the following:



### Note

- ◆ *Risk of damage to threads in gearbox support by starting bolts at an angle.*
- ◆ *Do not remove support bracket -10 - 222 A- until the bolts securing the assembly mounting have been tightened to specified torque.*
- ◆ *Replace bolts that are tightened with specified tightening angle.*

- Remove support bracket -10 - 222 A- from engine.

## Specified torques

- ◆ ➔ [o2.1 verview – assembly mountings”, page 62](#)
- ◆ Tightening sequence for gearbox mounting ➔ [page 67](#) .
- ◆ ➔ [o3.1 verview - air filter housing”, page 364](#)
- ◆ ➔ Electrical system; Rep. gr. 27; Battery; Assembly overview - battery



## 2.4.3 Removing and installing gearbox mounting, Polo Saloon RUS 2020>

### Removing

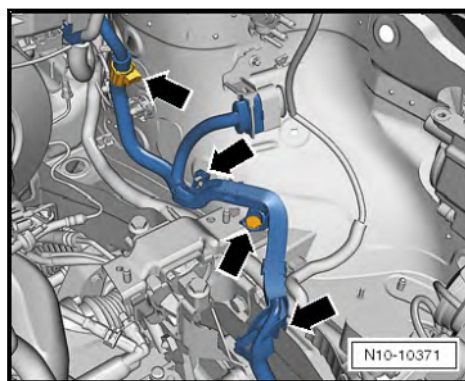
- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .
- Remove air filter housing ⇒ [page 366](#) .

### For vehicles with automatic gearbox

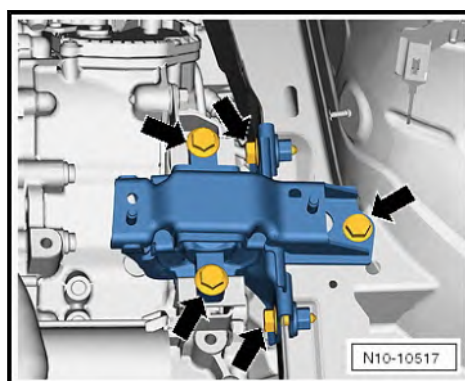
- Remove automatic gearbox control unit -J217- with bracket  
⇒ Rep. gr. 39; Gearbox control unit; Removing and installing gearbox control unit.

### Continued for all vehicles

- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery.
- Support engine in its installation position ⇒ [page 74](#) .
- Carefully loosen wiring harness at its fastening points -arrows-.



- Unscrew securing bolts -arrows- from gearbox mounting.



### Installing

Install in reverse order of removal, observing the following:



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



#### Note

- ◆ *Do not remove support bracket -10 - 222 A- until the bolts securing the assembly mounting have been tightened to specified torque.*
- ◆ *Renew bolts that are tightened with turning further angle.*
- Remove support bracket -10 - 222 A- from engine.

#### Specified torques

- ◆ [⇒ o2.1 verview – assembly mountings”, page 62](#)
- ◆ Tightening sequence for gearbox mounting [⇒ page 67](#) .
- ◆ [⇒ o3.1 verview - air filter housing”, page 364](#)
- ◆ ⇒ Electrical system; Rep. gr. 27; Battery; Assembly overview - battery

## 2.5 Removing and installing pendulum support

[⇒ a2.5.1 nd installing pendulum support, Golf 2013>, Golf Es-tate 2014>, Golf SV 2015>, Golf 2017>, Polo 2018>, Golf 2020>”, page 95](#)

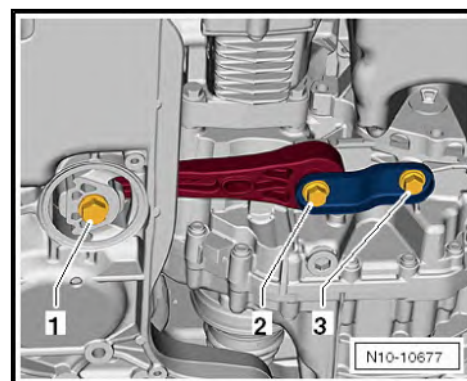
[⇒ a2.5.2 nd installing pendulum support, manual gearbox, Polo 2014>, Polo Saloon RUS 2016>”, page 96](#)

[⇒ a2.5.3 nd installing pendulum support, automatic gearbox, Polo 2014>, Polo Saloon RUS 2016>”, page 97](#)

[⇒ a2.5.4 nd installing pendulum support, Polo Saloon RUS 2020>”, page 98](#)

### 2.5.1 Removing and installing pendulum support, Golf 2013>, Golf Es-tate 2014>, Golf SV 2015>, Golf 2017>, Polo 2018>, Golf 2020>

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Unscrew bolts -1- to -3-, and remove pendulum support.



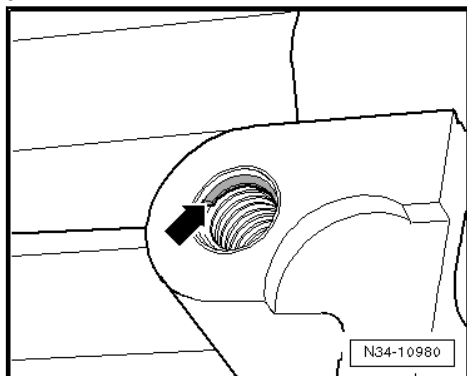
#### Installing

Install in reverse order of removal, observing the following:



#### Note

*There are threaded inserts, e.g. "Heli-Coil" in the bolting holes for the pendulum support.*



*This can be identified via the shoulder in the first thread pitch -arrow-.*

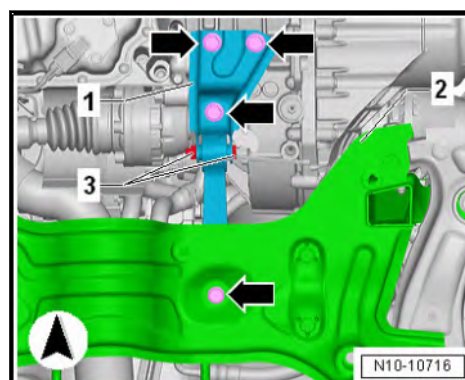
#### Specified torques

♦ ⇒ Fig. "Installing pendulum support", page 64

### 2.5.2 Removing and installing pendulum support, manual gearbox, Polo 2014>, Polo Saloon RUS 2016>

#### Removing

- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50; Noise insulation.
- Unscrew bolts -arrows- for pendulum support -1-.



#### Note

*Bolt -3- must not be loosened.*

- Pull pendulum support -1- out of assembly carrier -2-.





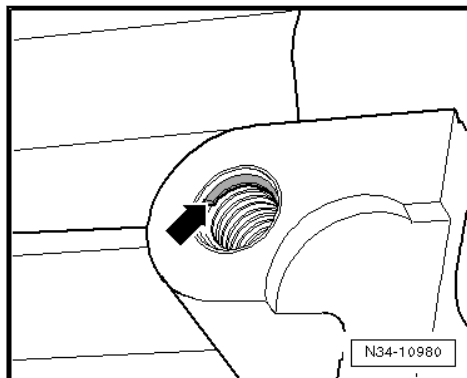
## Installing

Install in reverse order of removal. During this procedure, observe the following:



### Note

*There are threaded inserts, e.g. "Heli-Coil" in the bolting holes for the pendulum support.*



*Identification: shoulder along beginning of thread -arrow-.*

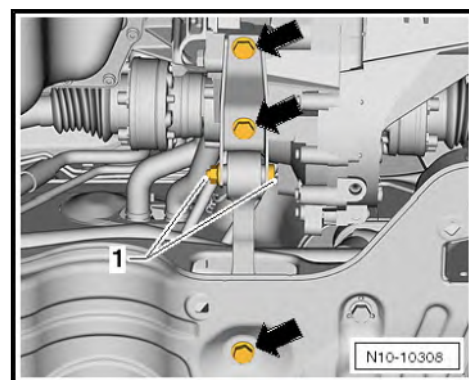
## Specified torques

◆ ⇒ [o2.1 verview – assembly mountings](#)”, page 62

### 2.5.3 Removing and installing pendulum support, automatic gearbox, Polo 2014>, Polo Saloon RUS 2016>

#### Removing

- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50; Noise insulation.
- Unscrew bolts -arrows- for pendulum support.



### Note

*Bolt -1- must not be loosened.*





- Pull pendulum support -1- out of assembly carrier -2-.

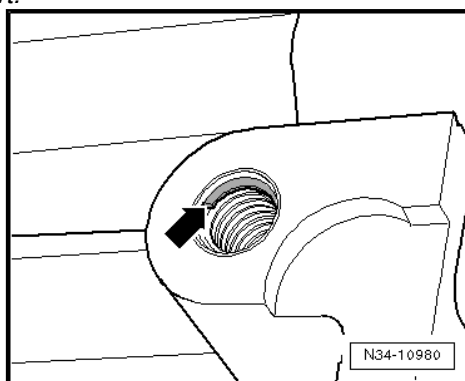
### Installing

Install in reverse order of removal. During this procedure, observe the following:



#### Note

*There are threaded inserts, e.g. "Heli-Coil" in the bolting holes for the pendulum support.*



*Identification: shoulder along beginning of thread -arrow-.*

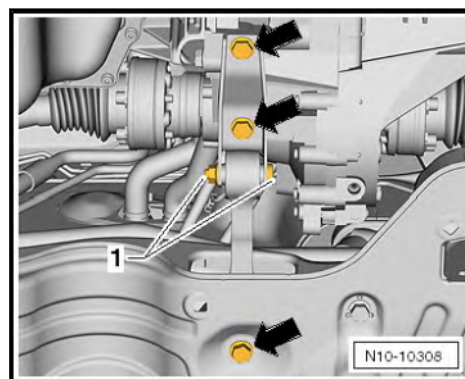
### Specified torques

- ♦ ⇒ [o2.1 verview – assembly mountings](#), page 62

## 2.5.4 Removing and installing pendulum support, Polo Saloon RUS 2020>

### Removing

- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50; Noise insulation.
- Unscrew bolts -arrows- for pendulum support.



#### Note

*Bolt -1- must not be loosened.*



- Pull pendulum support -1- out of assembly carrier -2-.

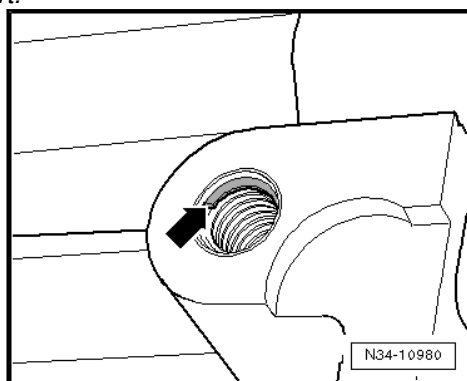
### Installing

Install in reverse order of removal. During this procedure, observe the following:



#### Note

There are threaded inserts, e.g. "Heli-Coil" in the bolting holes for the pendulum support.



Identification: shoulder along beginning of thread -arrow-.

### Specified torques

- ♦ ⇒ [o2.1 verview – assembly mountings](#), page 62

## 2.6 Checking adjustment of assembly mountings

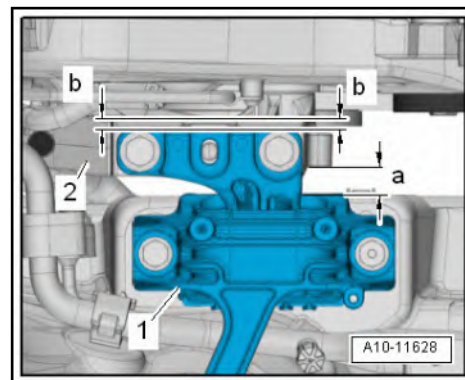
⇒ [a2.6.1 djustment of assembly mountings, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo 2018>, Golf 2020>](#), page 99

⇒ [a2.6.2 djustment of assembly mountings, Polo 2014>, Polo Saloon RUS 2016>, Polo Saloon RUS 2020>](#), page 100

### 2.6.1 Checking adjustment of assembly mountings, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo 2018>, Golf 2020>

#### Procedure

The following specifications must be obtained:





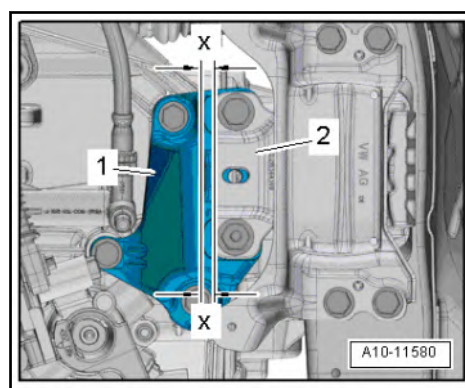
- There must be a distance -a- of 10 mm between engine support -2- and engine mounting -1-.
- Side surface of engine support -2- must be located parallel to support arm of engine mounting -1-.
- Dimension -b- must be identical on both sides.



#### Note

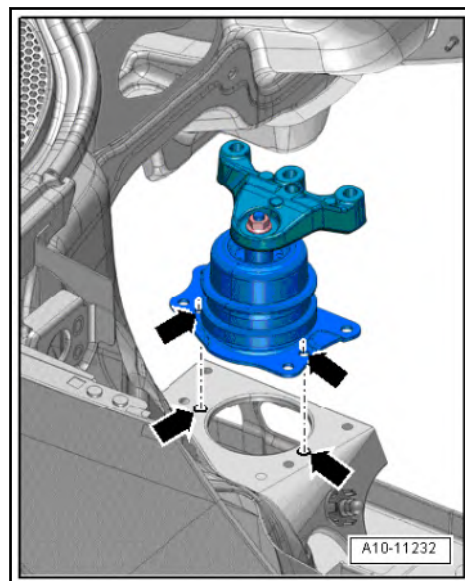
*Distance -a- (10 mm) can also be checked with a metal rod of suitable size, or similar.*

- If the dimension is too small or too high, adjust assembly mountings ➔ [page 101](#) .
- On the gearbox side, ensure that the edges of the support arm -2- and gearbox support -1- are parallel.



## 2.6.2 Checking adjustment of assembly mountings, Polo 2014>, Polo Saloon RUS 2016>, Polo Saloon RUS 2020>

### Procedure



- Fit engine mounting on longitudinal member.



**! NOTICE**

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



**Note**

*Positioning holes -arrows- must align. Check with a suitable drill bit if necessary.*

**Specified torques**

◆ ⇒ [o2.1 verview – assembly mountings](#)”, page 62

## 2.7 Adjusting assembly mountings

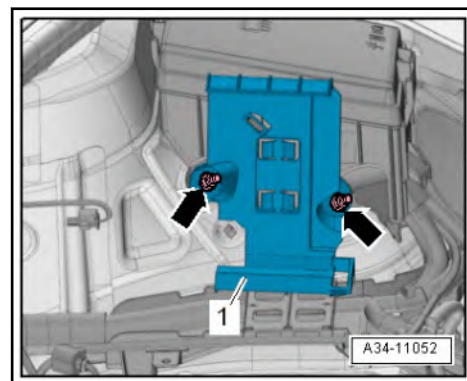
⇒ [a2.7.1 ssembly mountings, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo 2018>, Golf 2020>](#)”, page 101

⇒ [a2.7.2 ssembly mountings, Polo Saloon RUS 2020>](#)”, page 104

### 2.7.1 Adjusting assembly mountings, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo 2018>, Golf 2020>

**Procedure**

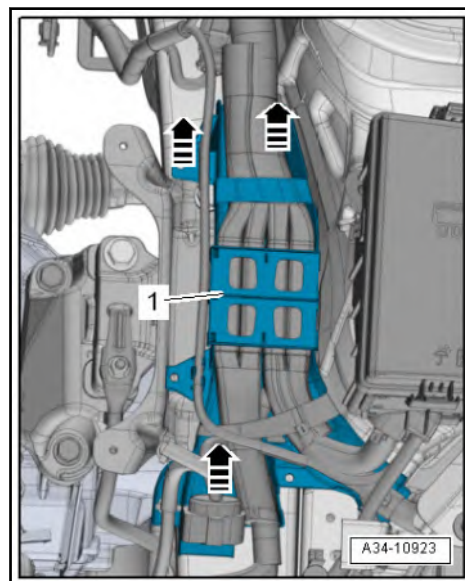
- Remove battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery tray.
- Remove air filter housing ⇒ [page 366](#) .
- Remove engine control unit ⇒ [page 379](#) .
- Unscrew nuts -arrows-, and remove bracket -1-.



**Note**

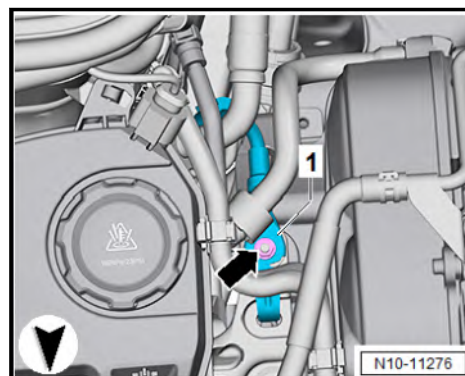
*Different types of brackets are fitted depending on version.*

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



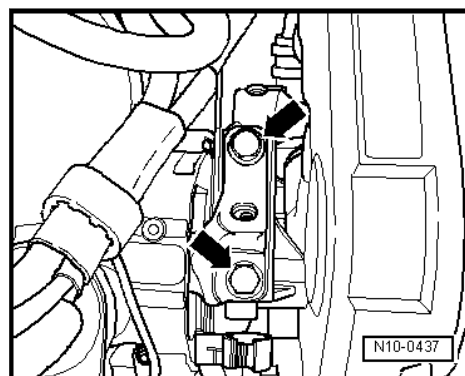
- Support engine in its installation position ⇒ [page 74](#) .
- Tighten spindles slightly to take up weight of engine/gearbox assembly; do not lift.

#### Golf 2020



- Unscrew nut -arrow-.
- Detach earth wire -1-.

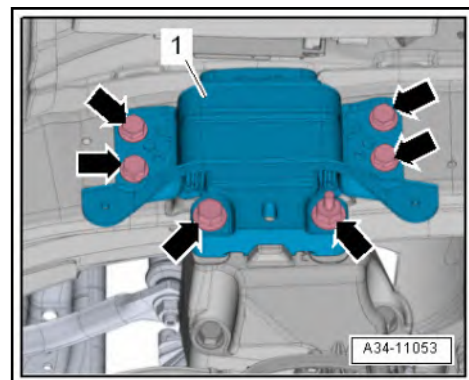
#### Continued for all vehicles



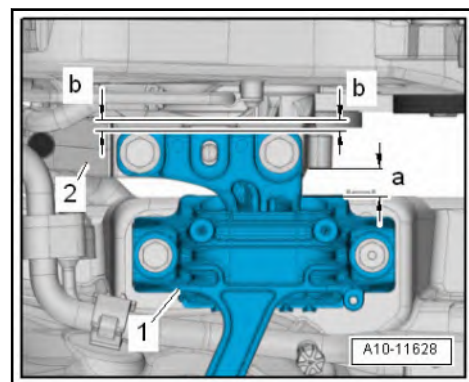
- Unscrew engine mounting bolts -arrows- one after the other and renew them (if not already renewed when installing engine).
- First screw bolts in loosely.



- Unscrew bolts -arrows- for gearbox mounting -1- one after the other and renew them (if not already renewed when installing engine).



- First screw bolts in loosely.
- Using assembly lever, adjust engine/gearbox assembly so that specifications listed below are attained:



There must be a distance -a- of 10 mm between engine support -2- and engine mounting -1-.

Side surface of engine support -2- must be located parallel to support arm of engine mounting -1-.

Dimension -b- must be identical on both sides.

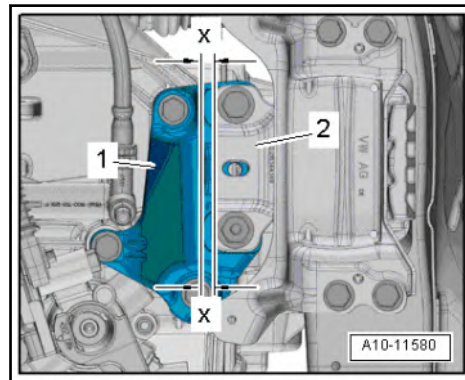


#### Note

*Distance -a- = 10 mm can also be checked with a metal rod of suitable size, or similar.*

- Tighten bolts for engine mounting.
- 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.

Install in reverse order of removal.

#### Specified torques

- ♦ ⇒ [o2.1 verview – assembly mountings”, page 62](#)
- ♦ ⇒ Electrical system; Rep. gr. 27; Battery; Assembly overview - battery
- ♦ ⇒ [o3.1 verview - air filter housing”, page 364](#)
- ♦ ⇒ [o2.1 verview – assembly mountings”, page 62](#)

## 2.7.2 Adjusting assembly mountings, Polo Saloon RUS 2020>

### Procedure

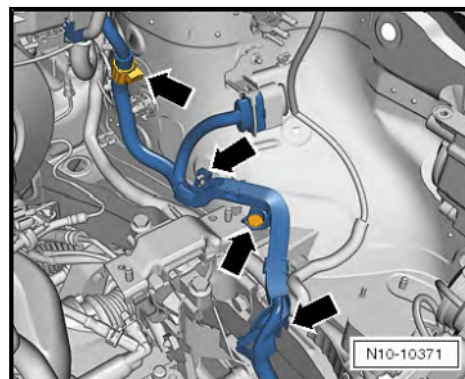
- Remove air filter housing ⇒ [page 366](#) .

### Vehicles with automatic gearbox

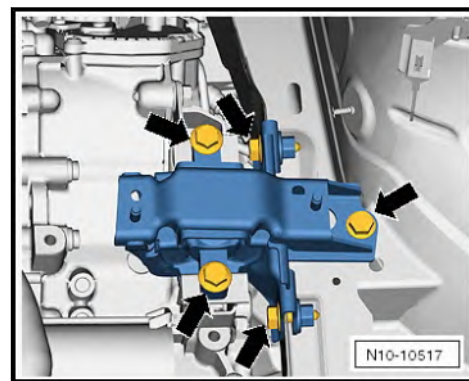
- Remove automatic gearbox control unit -J217- with bracket ⇒ Rep. gr. 39; Gearbox control unit; Removing and installing gearbox control unit.

### Continued for all vehicles

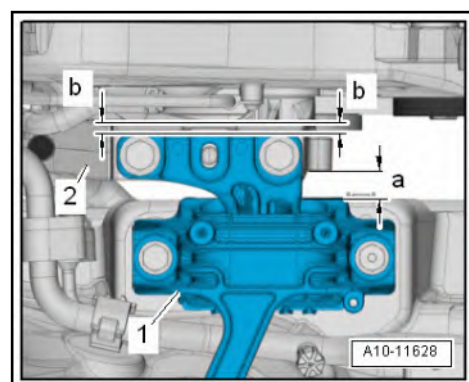
- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery tray.
- Carefully unclip electrical wiring -arrows-.



- Support engine in its installation position ⇒ [page 74](#) .
- Unscrew bolts -arrows- for gearbox mounting -1- one after the other and renew them (if not already renewed when installing engine).



- First screw bolts in loosely.
- Using assembly lever, adjust engine/gearbox assembly so that specifications listed below are attained:



There must be a distance -a- of 10 mm between engine support -2- and engine mounting -1-.

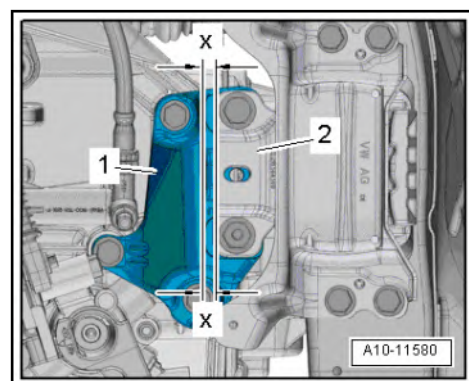
Side surface of engine support -2- must be located parallel to support arm of engine mounting -1-.

Dimension -b- must be identical on both sides.

**i Note**

*Distance -a- = 10 mm can also be checked with a metal rod of suitable size, or similar.*

- Tighten bolts for engine mounting.
- 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.

Install in reverse order of removal.

#### **Specified torques**

- ◆ ⇒ [o2.1 verview – assembly mountings”, page 62](#)
- ◆ ⇒ Electrical system; Rep. gr. 27; Battery; Assembly overview  
- battery
- ◆ ⇒ [o3.1 verview - air filter housing”, page 364](#)
- ◆ ⇒ [o2.1 verview – assembly mountings”, page 62](#)



## 13 – Crankshaft group

### 1 Cylinder block (pulley end)

⇒ [o1.1 verview - poly V-belt drive", page 107](#)

⇒ [a1.2 nd installing poly-V belt", page 114](#)

⇒ [a1.3 nd installing tensioner for poly V-belt", page 122](#)

⇒ [a1.4 nd installing vibration damper", page 123](#)

⇒ [a1.5 nd installing engine support", page 125](#)

⇒ [c1.6 rankshaft oil seal - belt pulley end", page 132](#)

#### 1.1 Assembly overview - poly V-belt drive

⇒ [o1.1.1 verview - poly V-belt drive, vehicles without air conditioner compressor, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo Saloon RUS 2020>, Golf 2020>", page 107](#)

⇒ [o1.1.2 verview - poly V-belt drive, vehicles without air conditioner compressor, Polo 2014, Polo Saloon RUS 2016>, Polo 2018>", page 109](#)

⇒ [o1.1.3 verview – poly V-belt drive, vehicles with air conditioner compressor, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Golf 2020>", page 111](#)

⇒ [o1.1.4 verview - poly V-belt drive, vehicles with air conditioner compressor, Polo 2014>, Polo Saloon RUS 2016>, Polo 2018>, Polo Saloon RUS 2020>", page 113](#)

#### 1.1.1 Assembly overview - poly V-belt drive, vehicles without air conditioner compressor, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo Saloon RUS 2020>, Golf 2020>



#### 1 - Bolt

- ☐ Renew after removal
- ☐ Use counter-hold tool - T10475- to loosen and tighten
- ☐ 150 Nm +180°

#### 2 - Vibration damper

- ☐ Removing and installing ⇒ [page 123](#)

#### 3 - Poly V-belt

- ☐ Check for wear
- ☐ Before removing, mark direction of rotation with chalk or felt-tipped pen
- ☐ Do not kink
- ☐ The length of the poly V-belt must be determined according to the ⇒ Electronic Parts Catalogue depending on the version of overrunning alternator pulley.
- ☐ Poly V-belt routing ⇒ [page 116](#)
- ☐ Removing and installing ⇒ [page 114](#)
- ☐ When installing, make sure it is properly seated on pulleys.

#### 4 - Bolt

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

#### 5 - Tensioning device for poly V-belt

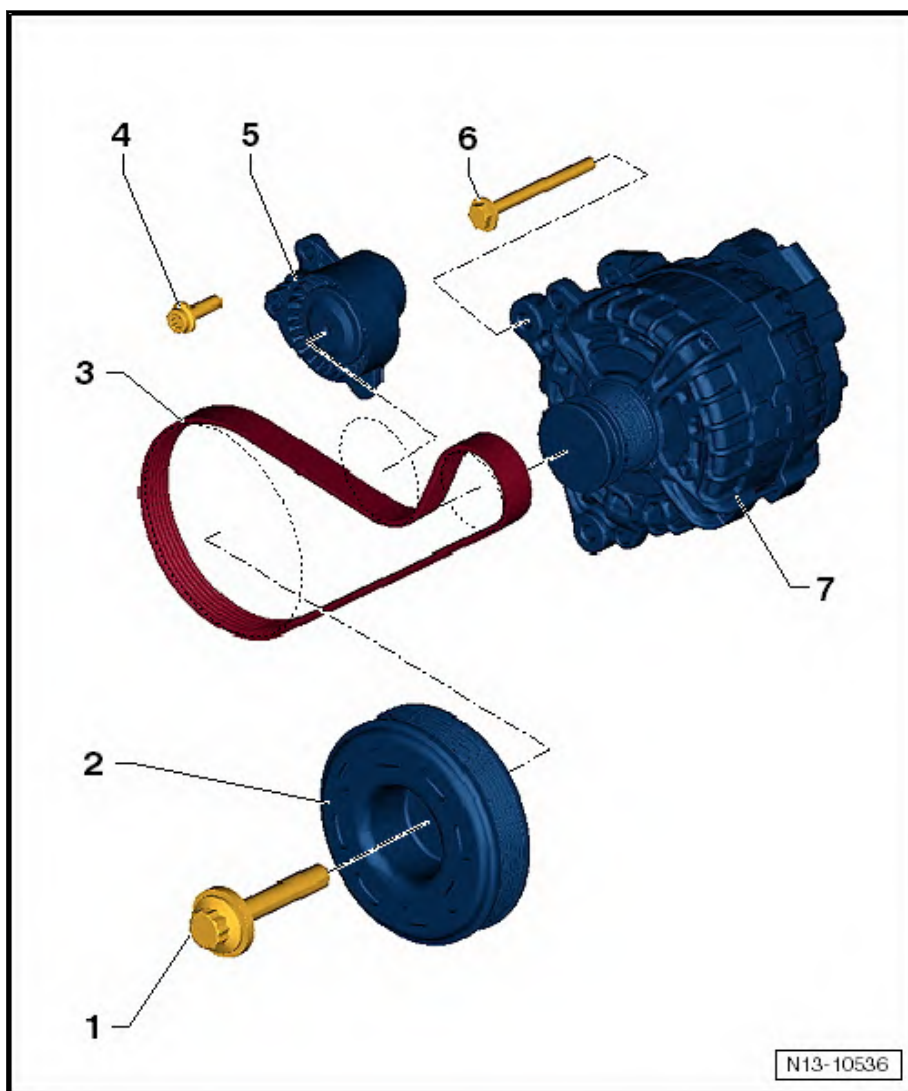
- ☐ Pivot with socket to slacken poly V-belt
- ☐ Lock with locking pin -T10060 A-.
- ☐ Removing and installing ⇒ [page 122](#)

#### 6 - Bolt

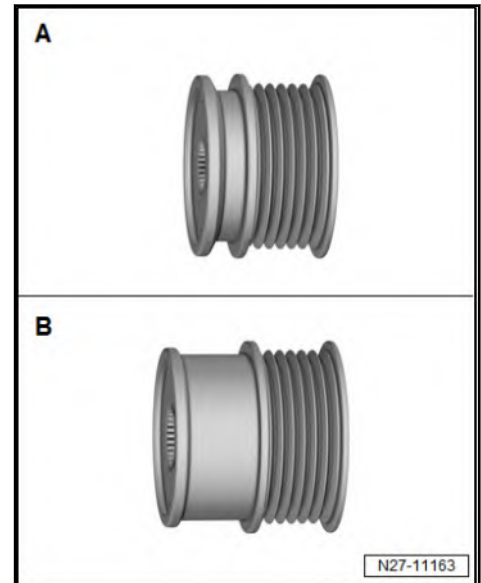
- ☐ Specified torque ⇒ Electrical system; Rep. gr. 27; Alternator; Assembly overview - alternator

#### 7 - Alternator

- ☐ Removing and installing ⇒ Electrical system; Rep. gr. 27; Alternator; Removing and installing alternator
- ☐ With freewheel
- ☐ Various versions of the overrunning alternator pulley, -A- or -B-, may be fitted depending on the type and version of alternator ⇒ [page 108](#).



#### Allocation of overrunning alternator pulley



The length of the poly V-belt must be determined according to the ⇒ Electronic Parts Catalogue depending on the version of overrunning alternator pulley.

### 1.1.2 Assembly overview - poly V-belt drive, vehicles without air conditioner compressor, Polo 2014, Polo Saloon RUS 2016>, Polo 2018>





#### 1 - Bolt

- ☐ Renew after removal
- ☐ Use counter-hold tool - T10475- to loosen and tighten
- ☐ 150 Nm +180°

#### 2 - Vibration damper

- ☐ Removing and installing ⇒ [page 123](#)

#### 3 - Poly V-belt

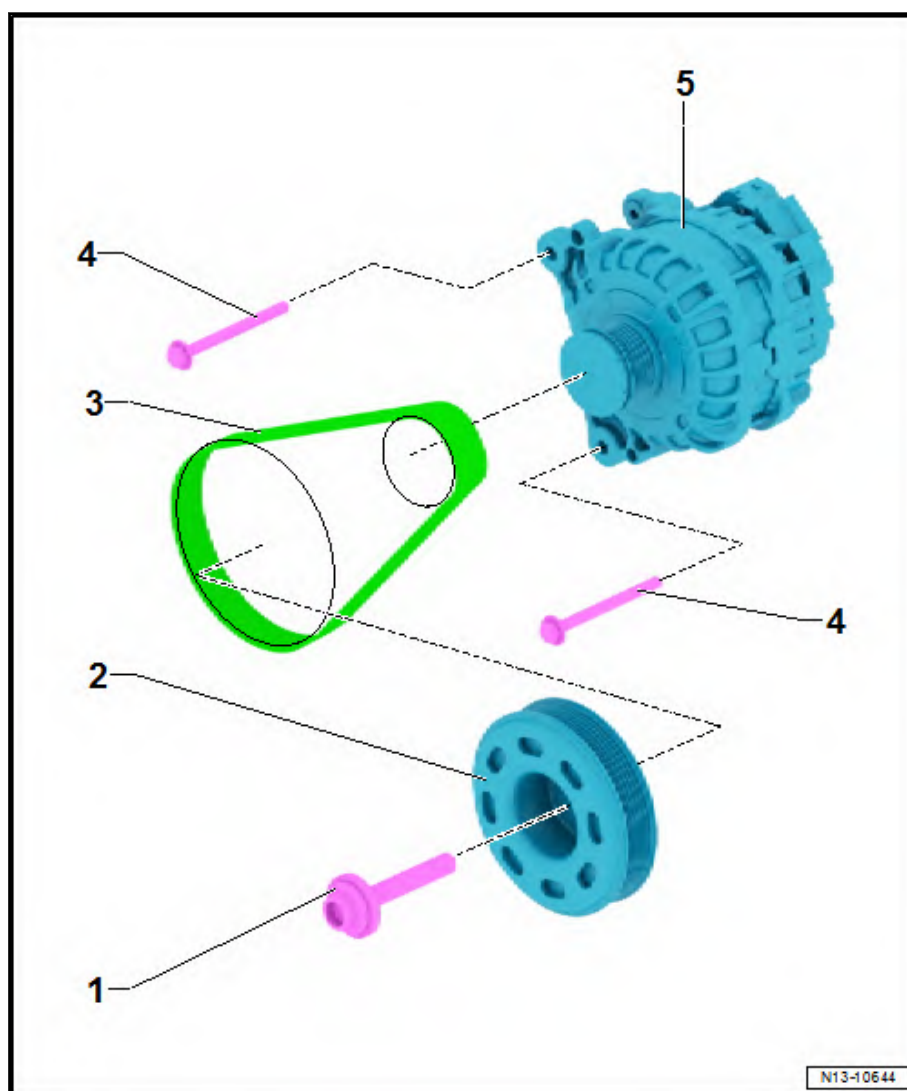
- ☐ Check for wear
- ☐ Do not kink
- ☐ The length of the poly V-belt must be determined according to the ⇒ Electronic Parts Catalogue depending on the version of overrunning alternator pulley.
- ☐ Removing and installing ⇒ [page 114](#)
- ☐ When installing, make sure it is properly seated on pulleys.

#### 4 - Bolt

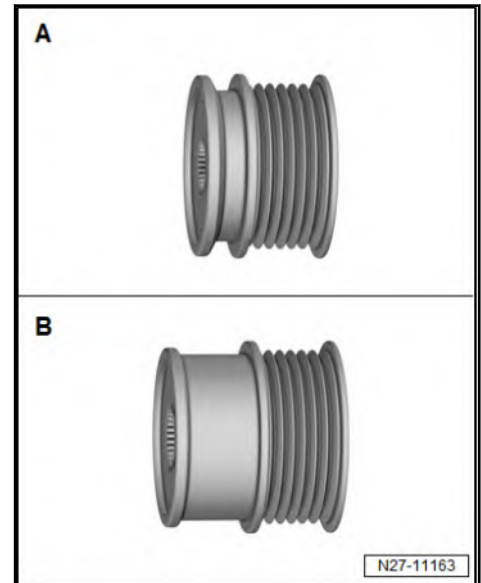
- ☐ Specified torque  
⇒ Electrical system;  
Rep. gr. 27; Alternator;  
Assembly overview - alternator

#### 5 - Alternator

- ☐ Removing and installing ⇒ Electrical system; Rep. gr. 27; Alternator; Removing and installing alternator
- ☐ With freewheel
- ☐ Various versions of the overrunning alternator pulley, -A- or -B-, may be fitted depending on the type and version of alternator ⇒ [page 110](#) .



#### Allocation of overrunning alternator pulley



The length of the poly V-belt must be determined according to the ⇒ Electronic Parts Catalogue depending on the version of overrunning alternator pulley.

### 1.1.3 Assembly overview – poly V-belt drive, vehicles with air conditioner compressor, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Golf 2020>



## 1 - Poly V-belt

- ☐ Check for wear
- ☐ Before removing, mark direction of rotation with chalk or felt-tipped pen
- ☐ Do not kink
- ☐ The length of the poly V-belt must be determined according to the ⇒ Electronic Parts Catalogue depending on the version of overrunning alternator pulley.
- ☐ Poly V-belt routing ⇒ [page 119](#)
- ☐ Removing and installing ⇒ [page 114](#)
- ☐ When installing, make sure it is properly seated on pulleys.

## 2 - Bolt

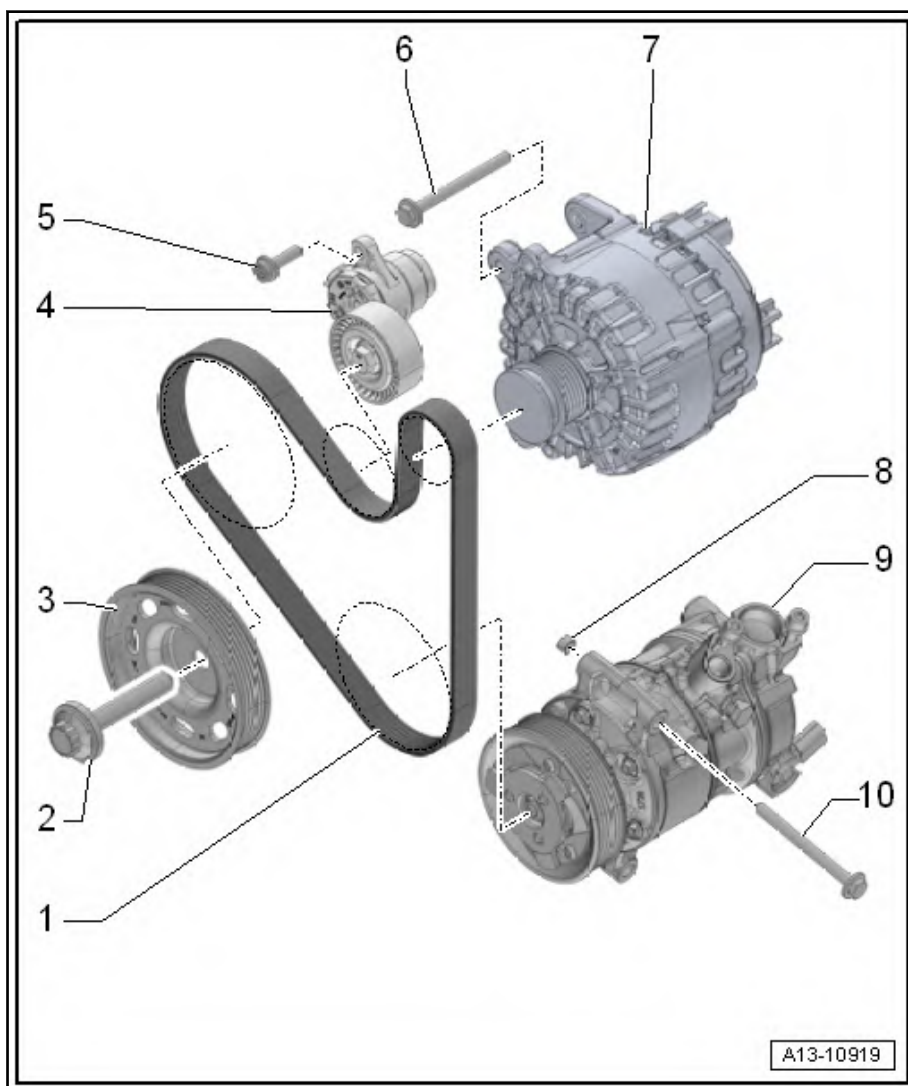
- ☐ Specified torque ⇒ [Item 1 \(page 108\)](#).

## 3 - Vibration damper

- ☐ Removing and installing ⇒ [page 123](#)

## 4 - Tensioning device for poly V-belt

- ☐ Pivot with socket to slacken poly V-belt
- ☐ Lock with locking pin - T10060 A-.
- ☐ Removing and installing ⇒ [page 122](#)



## 5 - Bolt

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

## 6 - Bolt

- ☐ Specified torque ⇒ Electrical system; Rep. gr. 27; Alternator; Assembly overview - alternator

## 7 - Alternator

- ☐ Removing and installing ⇒ Electrical system; Rep. gr. 27; Alternator; Removing and installing alternator
- ☐ With freewheel
- ☐ Various versions of the overrunning alternator pulley, -A- or -B-, may be fitted depending on the type and version of alternator ⇒ [page 113](#).

## 8 - Dowel sleeve

- ☐ For air conditioner compressor

## 9 - Air conditioner compressor

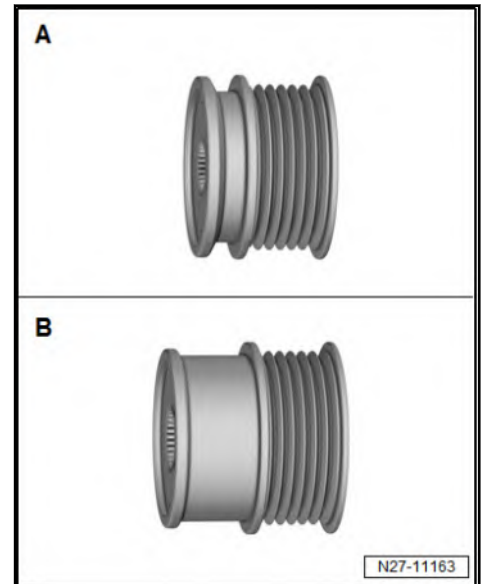
- ☐ Do not unscrew or disconnect refrigerant lines
- ☐ Removing and installing ⇒ Heating, air conditioning system; Rep. gr. 87; Air conditioner compressor; Removing and installing air conditioner compressor from and to bracket

## 10 - Bolt



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

#### Allocation of overrunning alternator pulley



The length of the poly V-belt must be determined according to the ⇒ Electronic Parts Catalogue depending on the version of overrunning alternator pulley.

#### 1.1.4 Assembly overview - poly V-belt drive, vehicles with air conditioner compressor, Polo 2014>, Polo Saloon RUS 2016>, Polo 2018>, Polo Saloon RUS 2020>



### 1 - Bolt

- ☐ Renew
- ☐ 150 Nm +180° further

### 2 - Vibration damper

- ☐ For crankshaft
- ☐ Keep straight when installing
- ☐ To remove and install, use counterhold tool - T10475-.

### 3 - Bolt

- ☐ Renew
- ☐ 20 Nm +90° further

### 4 - Cap

### 5 - Bolt

- ☐ 30 Nm

### 6 - Tensioning element

### 7 - Bolt

- ☐ 23 Nm

### 8 - Alternator

### 9 - Guide bush

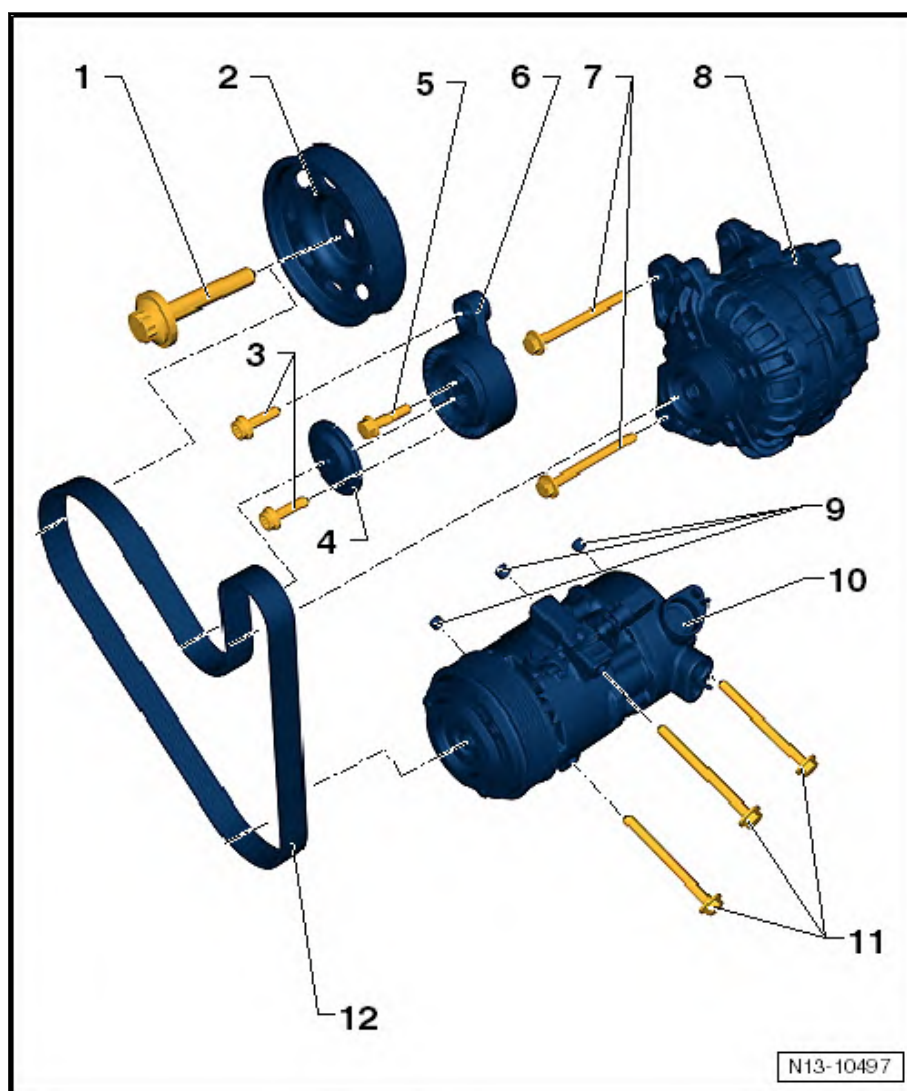
### 10 - Air conditioner compressor

### 11 - Bolt

- ☐ 23 Nm

### 12 - Poly V-belt

- ☐ Mark direction of rotation before removing
- ☐ Removing and installing poly V-belt ➔ [page 114](#)



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

## 1.2 Removing and installing poly-V belt

➔ [a1.2.1 nd installing poly-V belt, vehicles without air conditioner compressor, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo Saloon RUS 2020>, Golf 2020>](#), page 114

➔ [a1.2.2 nd installing poly V-belt, vehicles without air conditioner compressor, Polo 2014> Polo Saloon RUS 2016>, Polo 2018>, Polo Saloon RUS 2020>](#), page 117

➔ [a1.2.3 nd installing poly-V belt, vehicles with air conditioner compressor, Golf 2013>, Golf Estate 2014>, Golf SV 2015, Golf 2017>, Golf 2020>](#), page 118

➔ [a1.2.4 nd installing poly V-belt, vehicles with air conditioner compressor, Polo 2014> Polo Saloon RUS 2016>, Polo 2018>, Polo Saloon RUS 2020>](#), page 120

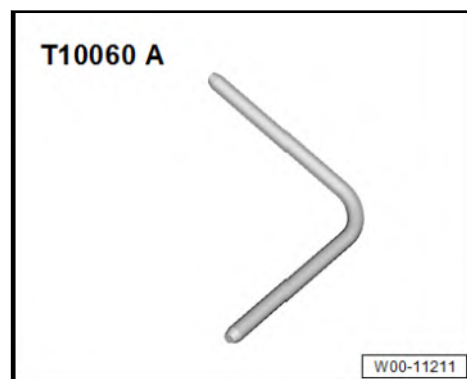
### 1.2.1 Removing and installing poly-V belt, vehicles without air conditioner compressor, Golf 2013>, Golf Estate



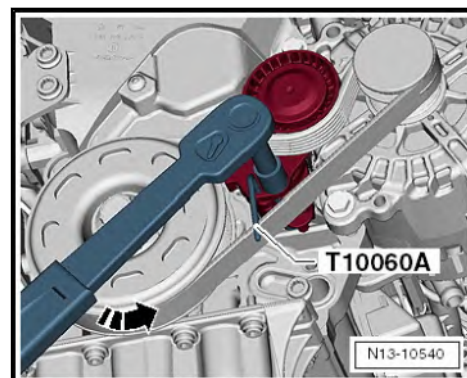
## 2014>, Golf SV 2015>, Golf 2017>, Polo Saloon RUS 2020>, Golf 2020>

Special tools and workshop equipment required

- ◆ Locking pin -T10060 A-



### Removing



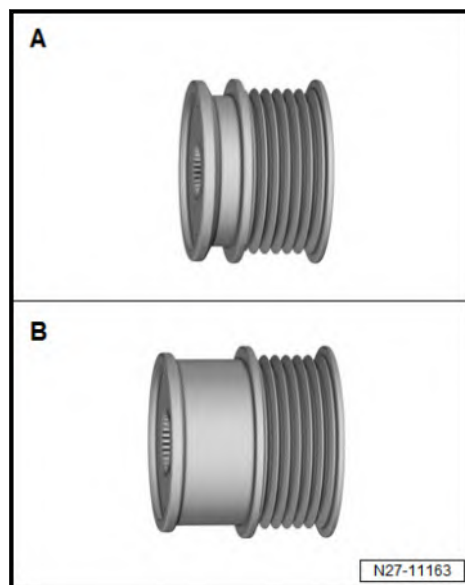
- Before removing, mark direction of rotation of poly V-belt with chalk or felt-tipped pen for re-installation.
- To slacken poly V-belt, turn tensioning device in anti-clockwise direction -arrow-.
- Lock tensioning device in place with locking pin -T10060 A-.
- Remove poly V-belt.

### Installing

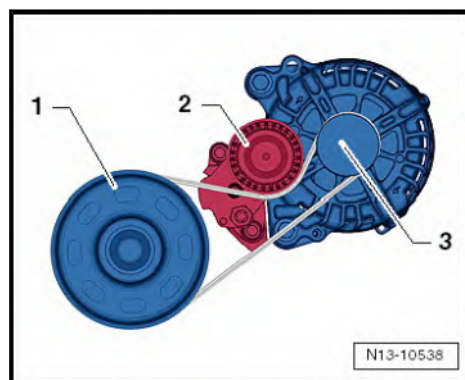
Install in reverse order of removal. During this procedure, observe the following:

Various versions of the overrunning alternator pulley, -A- or -B-, may be fitted depending on the type and version of alternator.

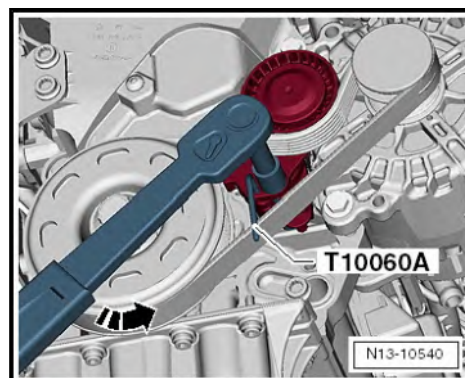




The length of the poly V-belt must be determined according to the ⇒ Electronic Parts Catalogue depending on the version of overrunning alternator pulley.



- Fit poly V-belt as shown in illustration.
- 1 - Vibration damper
- 2 - Tensioning device for poly V-belt
- 3 - Alternator
- Turn tensioning device in -direction of arrow-, and pull out locking pin -T10060 A-.



- Release tensioner.
- Check that poly V-belt is properly seated.



- Start engine and check that poly V-belt runs properly.

### 1.2.2 Removing and installing poly V-belt, vehicles without air conditioner compressor, Polo 2014> Polo Saloon RUS 2016>, Polo 2018>, Polo Saloon RUS 2020>

#### Special tools and workshop equipment required

- ◆ Poly V-belt repair kit with assembly tools ⇒ Parts Catalogue



#### Note

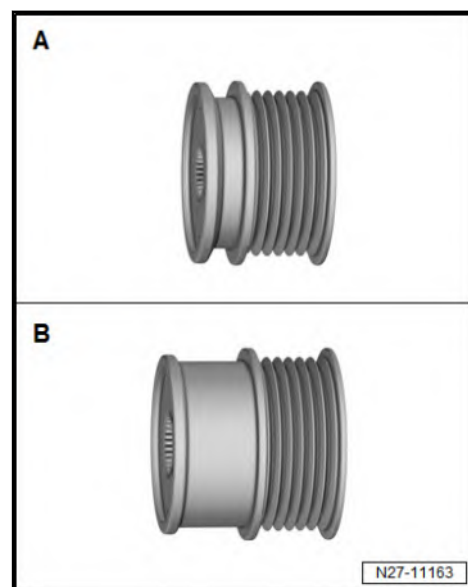
*If the assembly tool -T10367/2- is not included, it must be ordered separately via the ⇒ Electronic parts catalogue.*

#### Removing

- Cut through poly V-belt.

#### Installing

Various versions of the overrunning alternator pulley, -A- or -B-, may be fitted depending on the type and version of alternator.

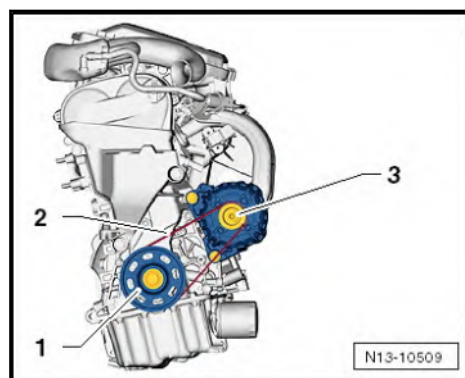


The length of the poly V-belt must be determined according to the ⇒ Electronic Parts Catalogue depending on the version of overrunning alternator pulley.

Proceed as described in the instructions provided with the repair kit.



## Poly V-belt routing



1 - Vibration damper/crankshaft

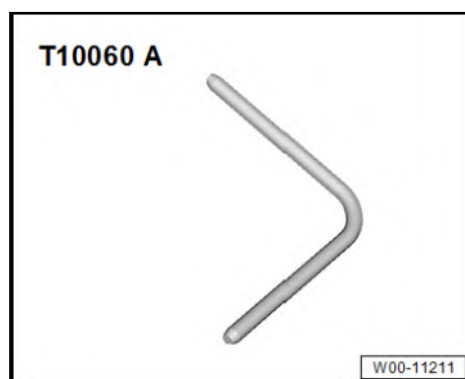
2 - Poly V-belt

3 - Alternator pulley

### 1.2.3 Removing and installing poly-V belt, vehicles with air conditioner compressor, Golf 2013>, Golf Estate 2014>, Golf SV 2015, Golf 2017>, Golf 2020>

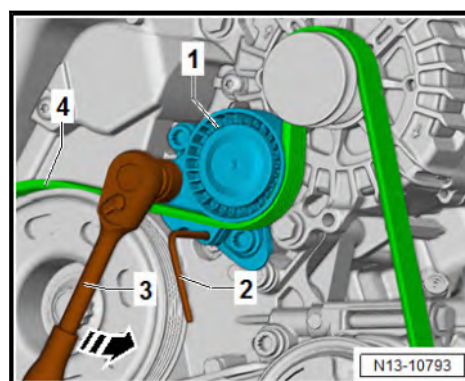
#### Special tools and workshop equipment required

- ◆ Locking pin -T10060 A-



#### Removing

- Before removing, mark direction of rotation of poly V-belt with chalk or felt-tipped pen for re-installation.
- Fit tool -3- onto hexagon of tensioner -1-.



- To slacken poly V-belt push tool -3- in -direction of arrow-.
- Lock tensioning device using locking pin -T10060 A- -2-.

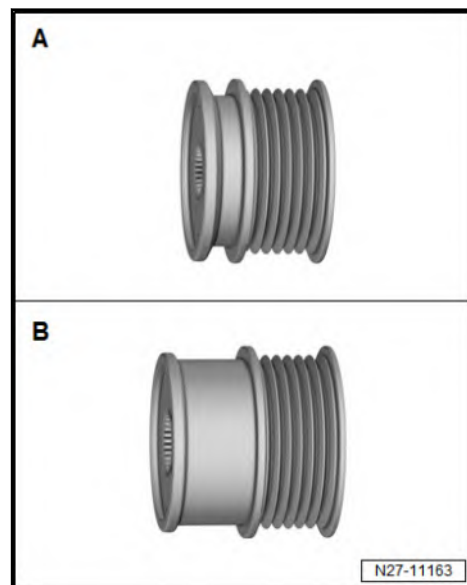


- Remove poly V-belt.

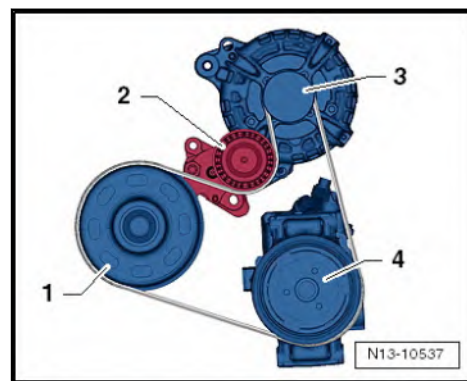
### Installing

Install in reverse order of removal, observing the following:

Various versions of the overrunning alternator pulley, -A- or -B-, may be fitted depending on the type and version of alternator.

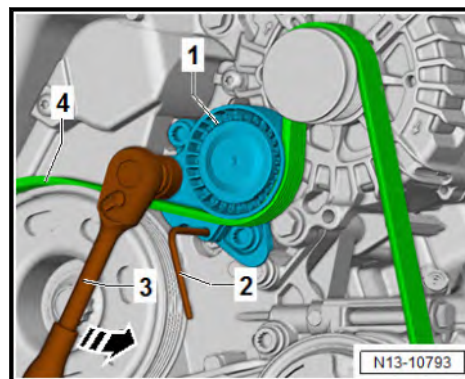


The length of the poly V-belt must be determined according to the → Electronic Parts Catalogue depending on the version of overrunning alternator pulley.



Install in reverse order of removal, observing the following:

- Fit poly V-belt as shown in illustration.
- 1 - Vibration damper
  - 2 - Tensioning device for poly V-belt
  - 3 - Alternator
  - 4 - Air conditioner compressor
- Turn tensioner anti-clockwise -direction of arrow- and remove locking pin -T10060 A- -2-.

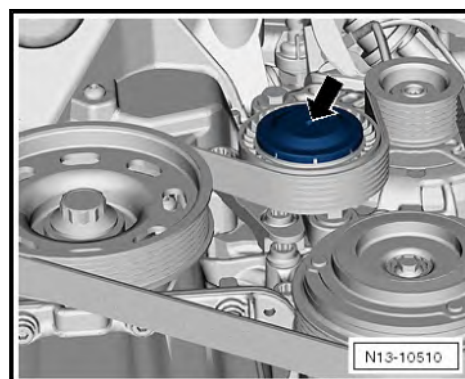


- Release tensioner.
- Check that poly V-belt is properly seated.
- Start engine and check that poly V-belt runs properly.

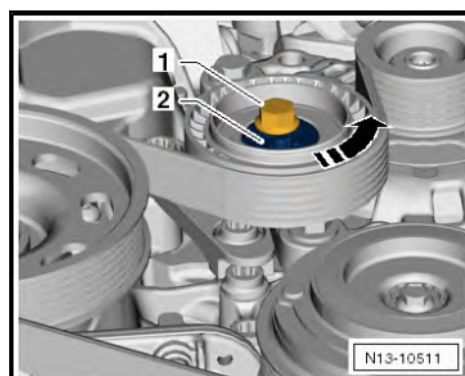
#### 1.2.4 Removing and installing poly V-belt, vehicles with air conditioner compressor, Polo 2014> Polo Saloon RUS 2016>, Polo 2018>, Polo Saloon RUS 2020>

##### Removing

- Before removing, mark direction of rotation of poly V-belt with chalk or felt-tipped pen for re-installation.
- Lever off belt tensioner cap -arrow- using a screwdriver.



- Loosen securing bolt -1-.
- Turn belt tensioner -2- in -direction of arrow- past TDC using a socket.





- Remove poly V-belt.

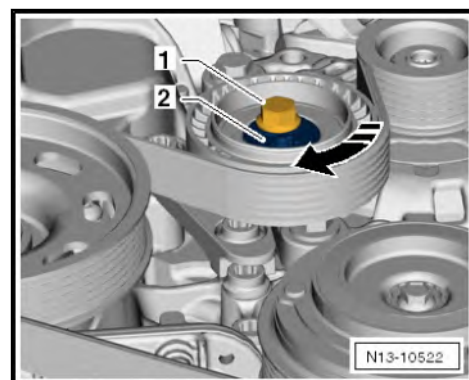
### Installing



#### Note

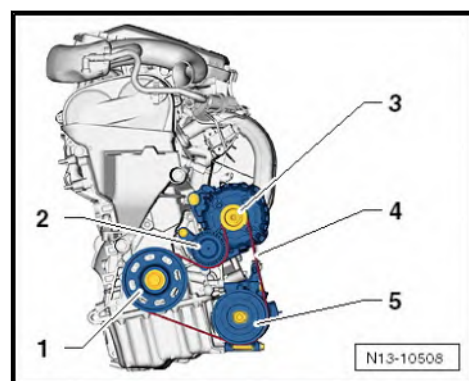
*When installing the poly V-belt, ensure that the belt is properly seated in the vibration damper and the pulleys.*

- Fit poly V-belt over vibration damper pulley and pulleys of alternator and air conditioner compressor.
- Push belt onto belt tensioner.
- Turn belt tensioner -2- in -direction of arrow- past TDC using a socket.



- Tighten securing bolt -1-.

### Poly V-belt routing



- 1 - Vibration damper/curlyshaft
- 2 - Tensioning pulley
- 3 - Alternator pulley
- 4 - Poly V-belt
- 5 - Air conditioner compressor pulley

### Specified torques

- ◆ [⇒ 01.1.4 verview - poly V-belt drive, vehicles with air conditioner compressor, Polo 2014>, Polo Saloon RUS 2016>, Polo 2018>, Polo Saloon RUS 2020>”, page 113](#)





## 1.3 Removing and installing tensioner for poly V-belt

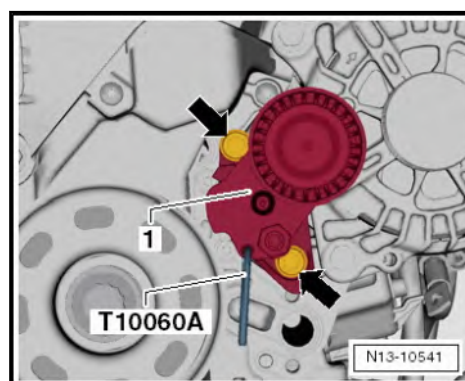
⇒ [a1.3.1 nd installing tensioner for poly V-belt, vehicles without air conditioner compressor](#), page 122

⇒ [a1.3.2 nd installing tensioner for poly V-belt, vehicles with air conditioner compressor](#), page 122

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

#### Removing

- Remove poly V-belt from tensioner ⇒ [page 114](#) .
- Remove bolts -arrows- and detach poly V-belt tensioner -1-.



#### Installing

Install in reverse order of removal. During this procedure, observe the following:

- Install poly V-belt ⇒ [page 114](#) .

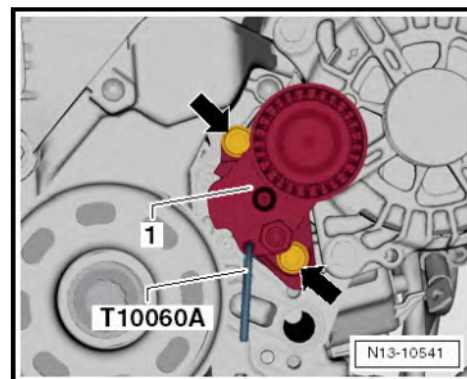
#### Specified torques

- ♦ ⇒ [o1.1.1 verview - poly V-belt drive, vehicles without air conditioner compressor, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo Saloon RUS 2020>, Golf 2020>](#), page 107

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

#### Removing

- Remove poly V-belt from tensioner ⇒ [page 118](#) .
- Remove bolts -arrows- and detach poly V-belt tensioner -1-.



### Installing

Install in reverse order of removal, observing the following:

- Install poly V-belt ➔ [page 118](#) .

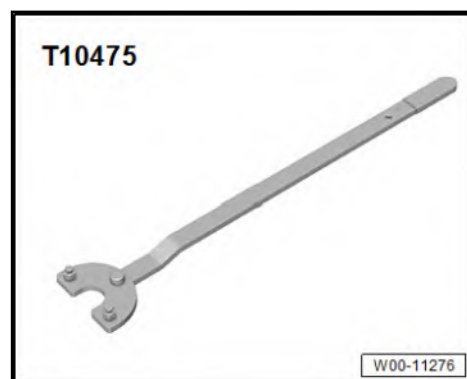
### Specified torques

- ◆ ➔ [o1.1.3 overview – poly V-belt drive, vehicles with air conditioner compressor, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Golf 2020>](#), page 111

## 1.4 Removing and installing vibration damper

### Special tools and workshop equipment required

- ◆ Counter-hold tool -T10475-



### Preparing counterhold tool -T10475-

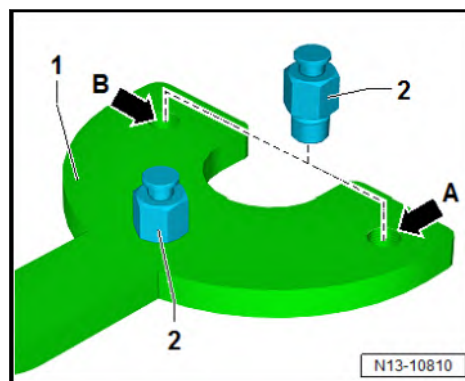


#### Note

- ◆ *Different types of vibration damper can be installed.*
- ◆ *For this reason, the counterhold tool -T10475- must be adapted to the holes of the respective vibration damper.*

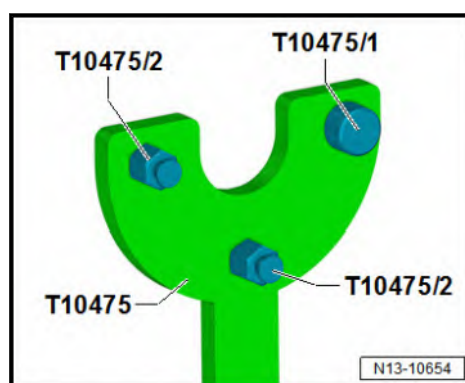
### Version 1

- Convert counterhold tool -T10475- -1- with inserts - T10475/2- -2-.



## Version 2

- Convert counterhold tool -T10475- with inserts -T10475/1- and -T10475/2- as shown in illustration.



- To do this, use hole -A- or -B- of counterhold tool -T10475--1- depending on type of vibration damper.

## Removing

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Remove poly V-belt ⇒ [page 114](#) .
- Set crankshaft to »TDC« of cylinder no. 1. ⇒ [page 203](#)
- Loosen bolt -arrow- for vibration damper using counterhold -T10475-.
- Unscrew bolt -arrow- and remove vibration damper.



### Note

*To avoid disturbing valve timing, do not turn the crankshaft when the vibration damper has been removed.*

## Installing

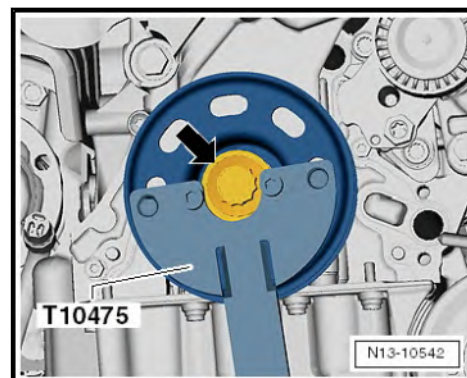


### Note

- ♦ *Renew bolts that are tightened with turning further angle.*
- ♦ *All contact surfaces between bolt, vibration damper and crankshaft toothed belt pulley must be free of oil and grease.*
- Attach vibration damper.



- Screw bolt -arrow- with oiled threads in to stop finger-tight.



- Tighten bolt -arrow- for vibration damper using counterhold -T10475-.

Further installation is carried out in reverse order of removal, observing the following:

- Install poly V-belt ⇒ [page 114](#) .

#### Specified torques

- ◆ ⇒ [o1.1 verview - poly V-belt drive", page 107](#)

## 1.5 Removing and installing engine support

⇒ [a1.5.1 nd installing engine support, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>", page 125](#)

⇒ [a1.5.2 nd installing engine support, Polo Saloon RUS 2020>", page 128](#)

### 1.5.1 Removing and installing engine support, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>

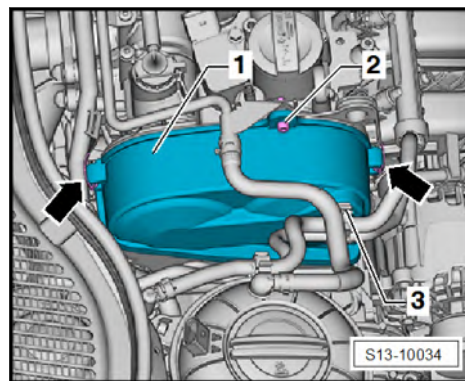
#### Removing

Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Golf 2020>

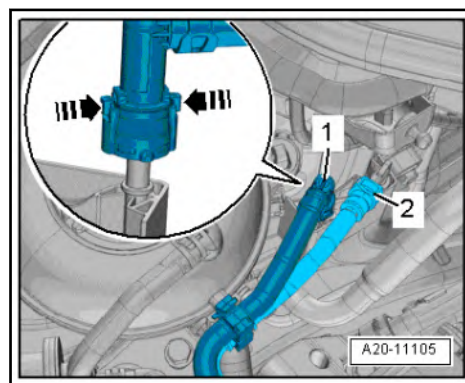
- Disconnect battery ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and reconnecting battery.
- Remove battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery tray.
- Drain coolant ⇒ [page 287](#) .

#### Continued for all vehicles

- Remove air filter housing ⇒ [page 366](#) .
- Remove tensioner for poly V-belt. ⇒ [page 122](#)
- Detach hoses from retainer -3-.



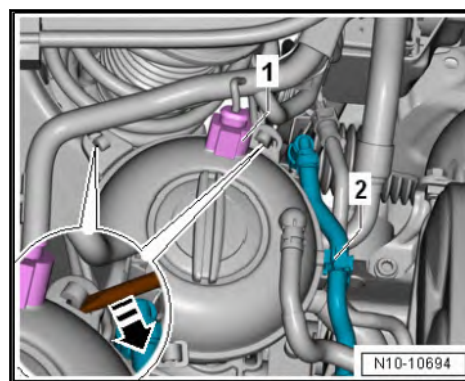
- Unscrew bolt -2-.
- Release clips -arrows- and remove upper toothed belt guard -1-.
- Disconnect fuel line -1-. Disconnect plug-in connectors  
⇒ Rep. gr. 20; Plug-in connectors; Disconnecting plug-in connectors.



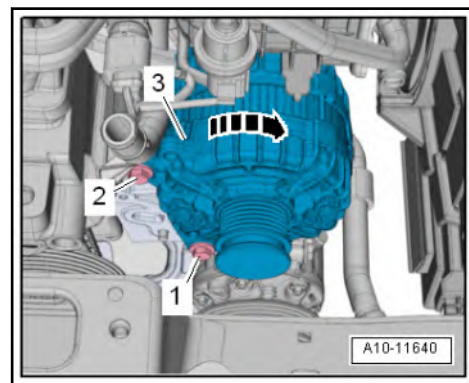
#### Note

*Any open lines, pipes, hoses and connections must be sealed immediately with a suitable cap or plug.*

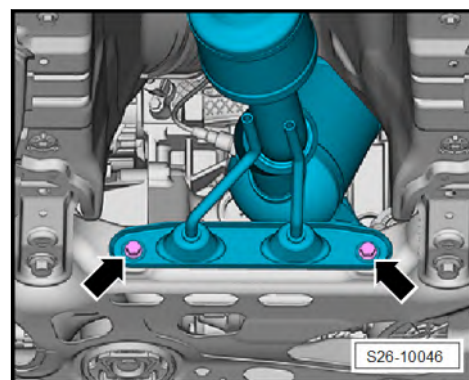
- Release hoses from retainer -2-, and lay them to one side.



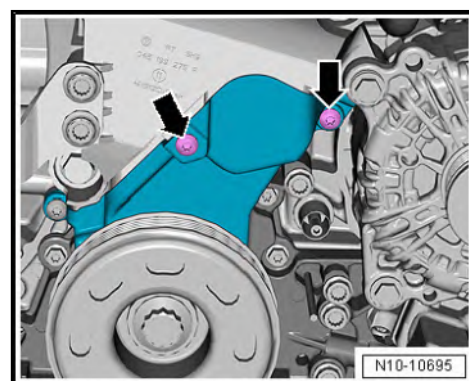
- Pull off connector -1-.
- Using a screwdriver, release catches -arrow-, and lay coolant expansion tank to one side.
- Open retaining clips on pipes of air conditioning system.
- Loosen bolt -1-, but do not unscrew it completely.



- Unscrew bolt -2-.
- Swivel alternator -3- in -direction of arrow- towards front.
- Unscrew bolts -arrows- from bracket for front exhaust pipe.

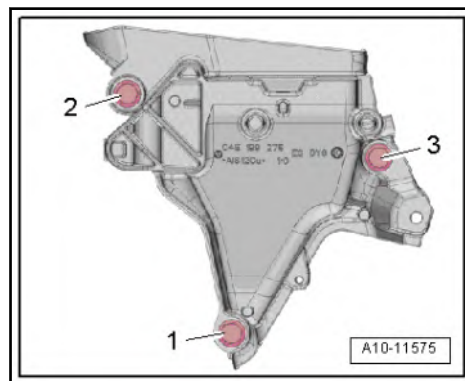


- Remove pendulum support ⇒ [page 95](#) .
- Support engine in its installation position ⇒ [page 74](#) .
- Tighten spindles slightly to take up weight of engine/gearbox assembly; do not lift.
- Removing engine mounting ⇒ [page 85](#) .
- Unscrew bolts -arrows-.

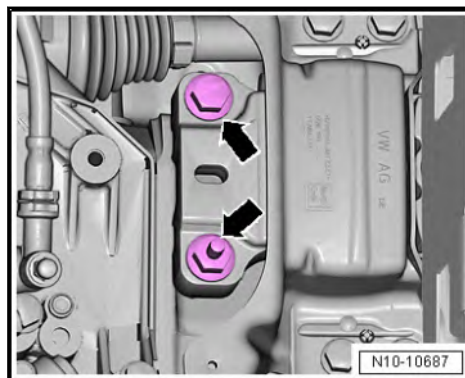


- Unscrew bolts -1, 2, 3-.





- Unscrew bolts -arrows-.



- Push engine/gearbox assembly slightly towards left, and detach engine support.

### Installing

Install in reverse order of removal, observing the following:

- Checking adjustment of assembly mountings ⇒ [page 99](#) .

### Specified torques

- ◆ ⇒ [o2.1 verview – assembly mountings”, page 62](#)
- ◆ ⇒ [o1.1 verview - poly V-belt drive”, page 107](#)
- ◆ ⇒ [o2.1 verview - toothed belt cover”, page 184](#)
- ◆ ⇒ [o3.1 verview - coolant pipes”, page 317](#)
- ◆ ⇒ [o3.1 verview - air filter housing”, page 364](#)
- ◆ ⇒ [o2.1 verview – emission control”, page 416](#)
- ◆ ⇒ Electrical system; Rep. gr. 27; Alternator; Exploded view - alternator
- ◆ ⇒ Electrical system; Rep. gr. 27; Battery; Assembly overview - battery

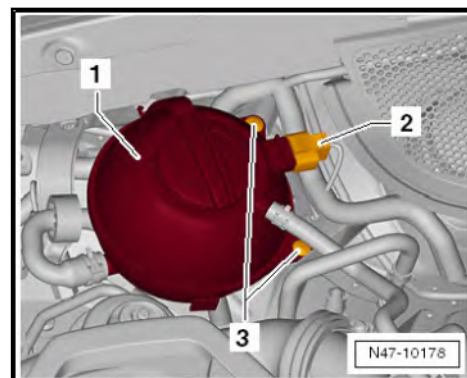
## 1.5.2 Removing and installing engine support, Polo Saloon RUS 2020>

### Removing

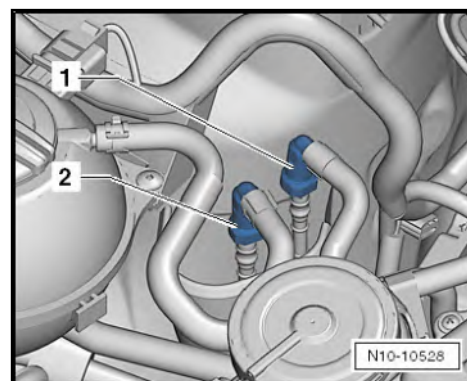
- Remove air filter housing ⇒ [page 366](#) .
- Remove battery ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery.
- Remove battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery.



- Pull off connector -2-.



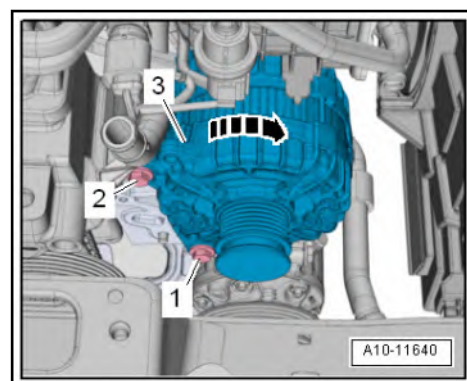
- Unscrew bolts -3-.
- Place coolant expansion tank -1- to one side.
- Disconnect plug-in connectors of fuel supply line -1- and line from activated charcoal filter solenoid valve 1 -N80- -item 2- ➔ Rep. gr. 20; Plug-in connectors; Disconnecting plug-in connectors.



#### Note

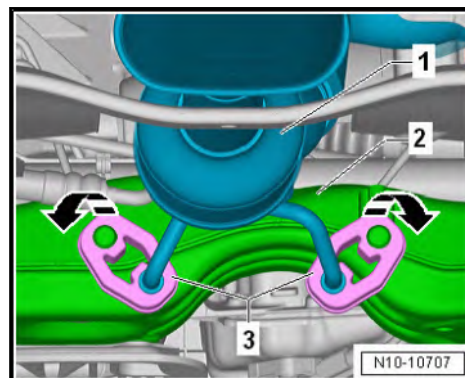
*Any open lines, pipes, hoses and connections must be sealed immediately with a suitable cap or plug.*

- Remove upper part of toothed belt guard ➔ [page 186](#) .
- Open retaining clips on pipes of air conditioning system.
- Remove poly V-belt tensioning roller ➔ [page 122](#) .
- Loosen bolt -1-, but do not unscrew it completely.

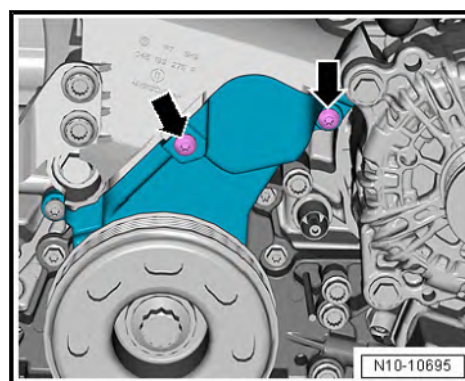




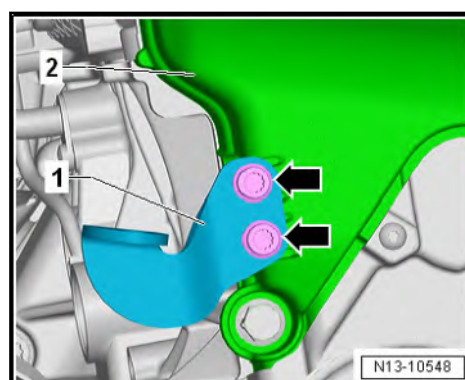
- Unscrew bolt -2-.
- Swivel alternator -3- in -direction of arrow- towards front.
- Detach mountings -3- of catalytic converter -1- from sub-frame -2- in direction of -arrow-.



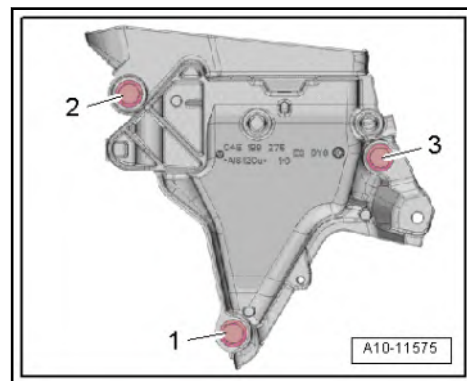
- Support engine in its installation position ⇒ [page 74](#) .
- Removing engine mounting ⇒ [page 85](#) .
- Unscrew bolts -arrows-.



- Unscrew bolts -arrows-.



- Remove bracket -1- from engine support -2-.
- Unscrew bolts -1-; -2- and -3-.

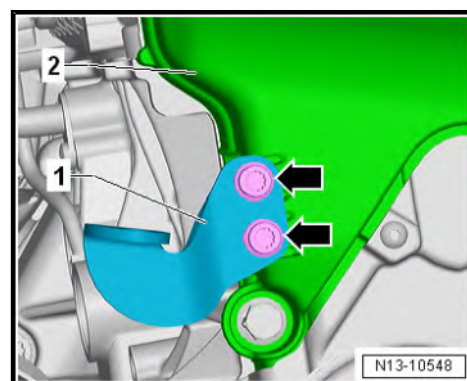


- Push engine/gearbox assembly slightly towards left, and detach engine support.

### Installing

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

- Mount bracket -1- on engine support -2-.



- Tighten bolts -arrows-.

### Specified torques



#### Note

*Renew bolts and nuts that are to be tightened with turning further angle, and renew components specified for replacement after removal.*

- ◆ [⇒ o2.1 verview – assembly mountings”, page 62](#)
- ◆ [⇒ o1.1 verview - poly V-belt drive”, page 107](#)
- ◆ Securing bolts for alternator ⇒ Electrical system; Rep. gr. 27; Alternator; Removing and installing alternator
- ◆ [⇒ o2.1 verview - toothed belt cover”, page 184 .](#)
- ◆ Battery tray ⇒ Electrical system; Rep. gr. 27; Battery; Removing and installing battery.
- ◆ [⇒ o4.1 verview – radiator/radiator fan”, page 320](#)

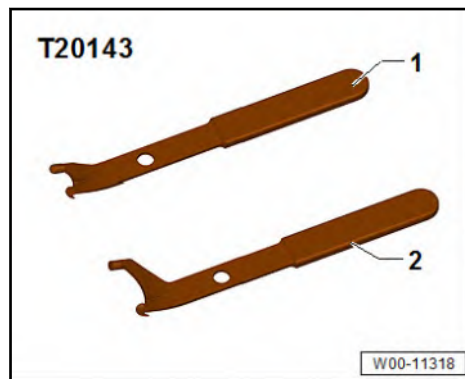
Component	Specified torque
Bracket to engine support	20 Nm



## 1.6 Renewing crankshaft oil seal - belt pulley end

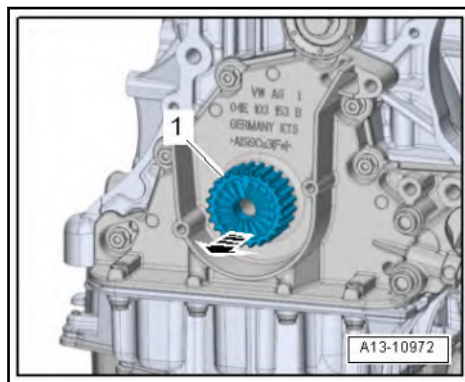
### Special tools and workshop equipment required

- ◆ Assembly device -T10485A-, not illustrated
- ◆ Extractor hook -T20143-



### Procedure

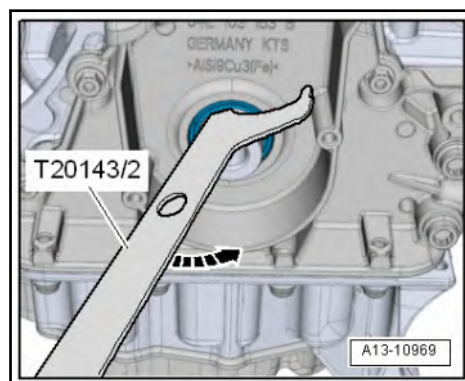
- Remove toothed belt ➔ [page 187](#) .
- Detach crankshaft pulley -1- -arrow-.



### Note

*To avoid disturbing valve timing, do not turn crankshaft out of "TDC" position when vibration damper is removed.*

- Pry out seal using extractor hook -T20143/2- -arrow-.



- Clean contact surface and sealing surface.

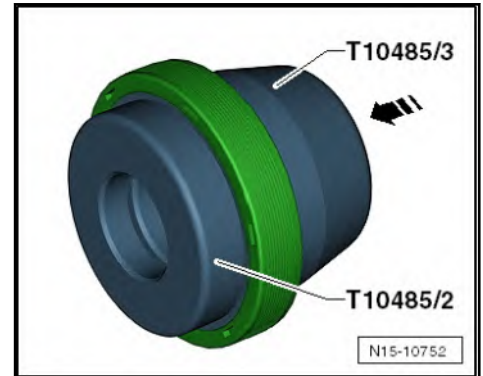




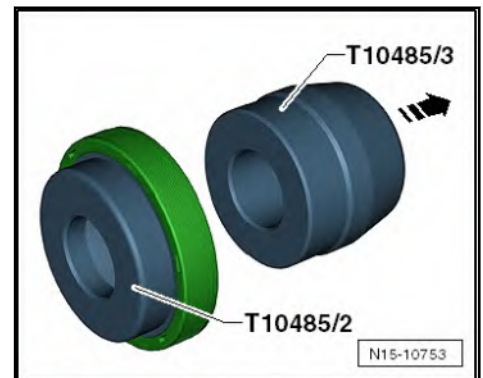
#### Note

*Do not lubricate new seal.*

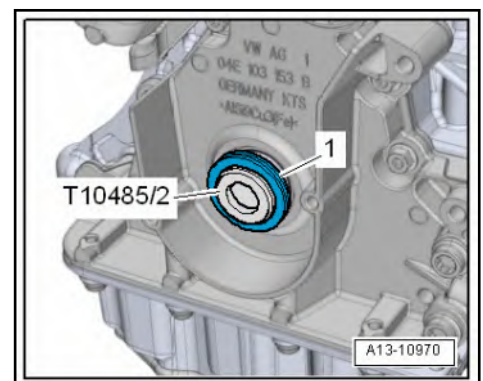
- Fit new seal in -direction of arrow- onto assembly sleeve -T10485A/2-.



- Pull off assembly sleeve -T10485A/3- in -direction of arrow-.

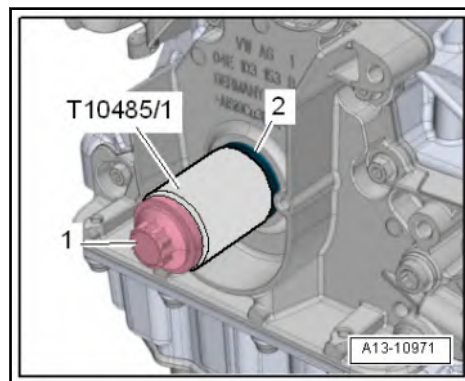


- Installation position: closed end of seal faces fitting sleeve.
- Fit assembly sleeve -T10485A/2- with oil seal -1- on crankshaft.

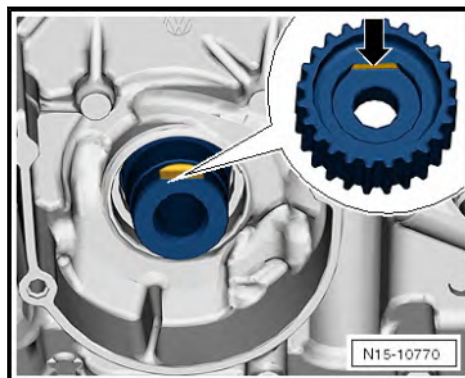


- Use fitting sleeve -T10485A/1- and bolt -1- for poly V-belt pulley to pull in oil seal -2- onto stop.





- Fit crankshaft sprocket onto crankshaft.



- The contact surface between vibration damper and crankshaft toothed belt pulley 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 toothed belt ➔ [page 190](#) .



## 2 Cylinder block, gearbox end

⇒ [o2.1 verview - cylinder block, gearbox end", page 135](#)

⇒ [a2.2 nd installing flywheel", page 139](#)

⇒ [a2.3 nd installing drive plate", page 140](#)

⇒ [a2.4 nd installing sealing flange on gearbox side", page 143](#)

### 2.1 Assembly overview - cylinder block, gearbox end

⇒ [o2.1.1 verview - cylinder block, gearbox end, vehicles with manual gearbox", page 135](#)

⇒ [o2.1.2 verview - cylinder block, gearbox end, vehicles with automatic gearbox", page 137](#)

#### 2.1.1 Assembly overview - cylinder block, gearbox end, vehicles with manual gearbox



#### Note

*For assembly work, secure engine to engine and gearbox support ⇒ [page 50](#) .*



**1 - Bolt**

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

**2 - Flywheel**

- ☐ Removing and installing ⇒ [page 139](#)
- ☐ Can only be fitted in one position

**3 - Engine speed sender - G28-**

- ☐ Removing and installing ⇒ [page 430](#)

**4 - Bolt**

- ☐ Specified torque ⇒ [page 424](#)

**5 - Dowel pin**

- ☐ Qty. 2

**6 - Adapter**

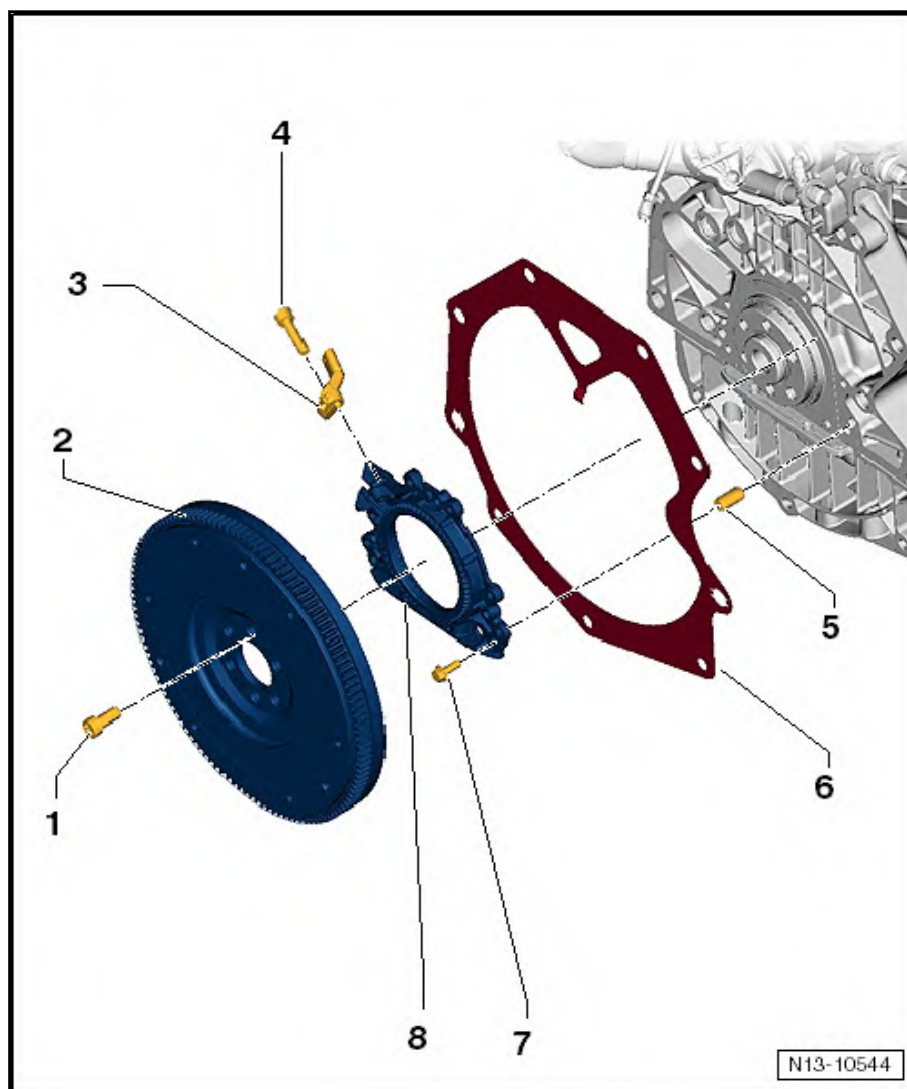
- ☐ Do not damage or bend when assembling.
- ☐ Installing ⇒ [page 137](#)

**7 - Bolt**

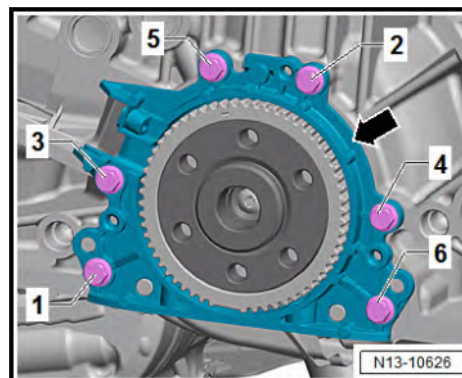
- ☐ Specified torque and tightening sequence ⇒ [page 136](#)

**8 - Sealing flange with sender wheel and oil seal**

- ☐ Renew sealing flange complete with oil seal and sender wheel only.
- ☐ Removing and installing ⇒ [page 143](#)



**Sealing flange on gearbox side - specified torque and tightening sequence**



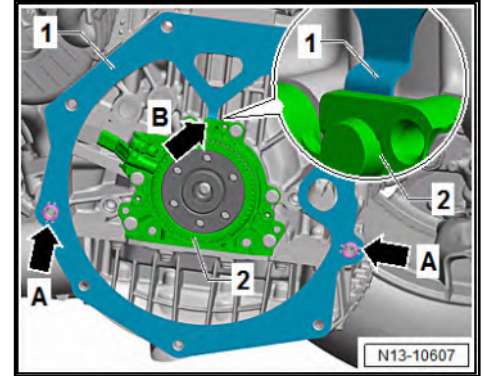
– Tighten bolts in 2 stages as follows.

Stage	Tightening sequence	Specified torque
1.	-1- to -6-	Screw in by hand as far as stop



Stage	Tightening sequence	Specified torque
2.	-1- to -6-	Tighten to 10 Nm

Install intermediate plate.



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

### 2.1.2 Assembly overview - cylinder block, gearbox end, vehicles with automatic gearbox



### 1 - Dual mass flywheel/drive plate

- ☐ Removing and installing drive plate ⇒ [page 140](#)
- ☐ Can only be installed in one position (holes are offset).

### 2 - Dowel sleeve

### 3 - Sealing flange, gearbox side

- ☐ With seal
- ☐ Renew only as complete unit
- ☐ Removing and installing ⇒ [page 143](#)
- ☐ Do not oil or grease oil seal sealing lip.
- ☐ Before installing, remove oil residue from crankshaft journal using a clean cloth.
- ☐ Do not remove guide sleeve until sealing flange has been slid onto crankshaft journal.

### 4 - Cylinder block

### 5 - Bolt

- ☐ Specified torque and tightening sequence ⇒ [page 138](#)

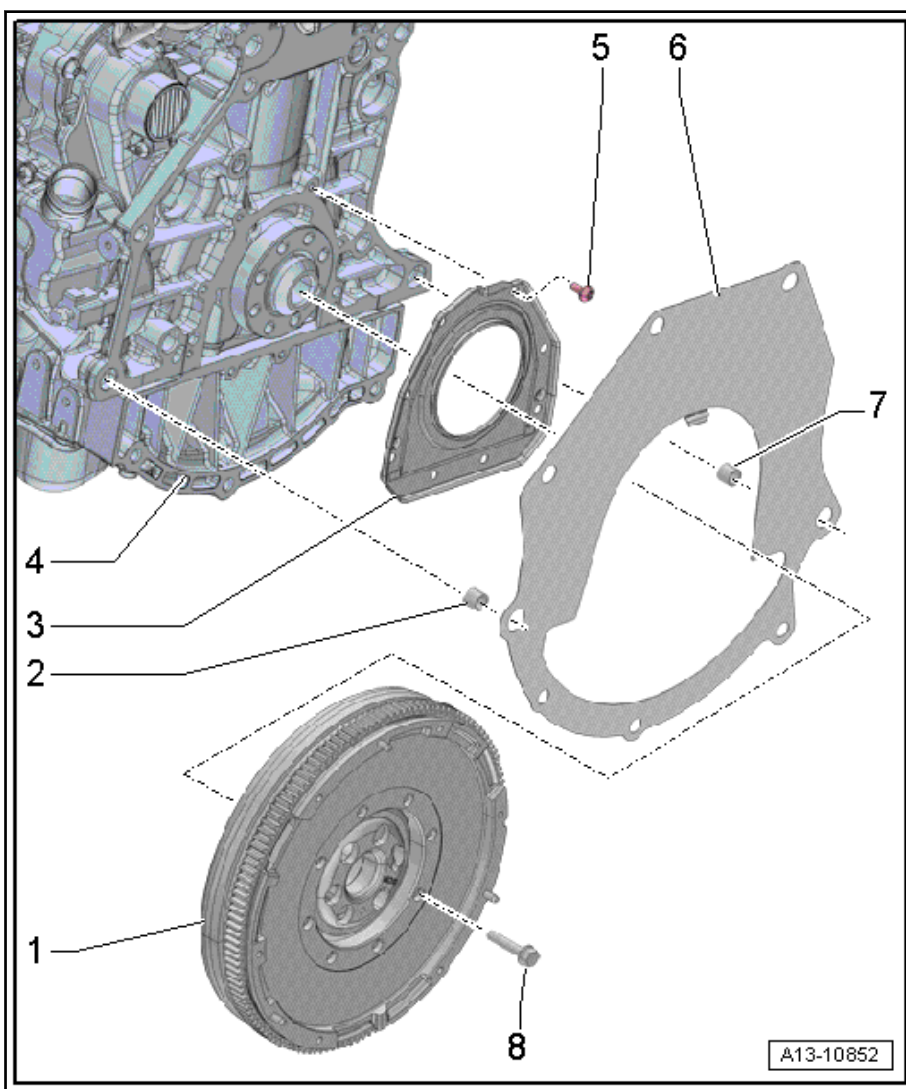
### 6 - Adapter

- ☐ Illustration does not show version installed in vehicle.
- ☐ Must seat on dowel sleeves.
- ☐ Do not damage or bend when assembling.
- ☐ Is fitted onto sealing flange ⇒ [page 139](#)

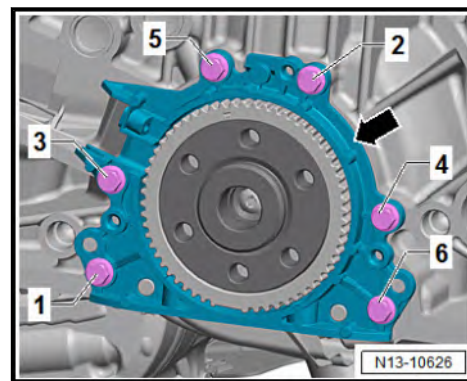
### 7 - Dowel sleeve

### 8 - Bolt

- ☐ For dual-mass flywheel/drive plate
- ☐ Renew after removal
- ☐ 60 Nm +90°



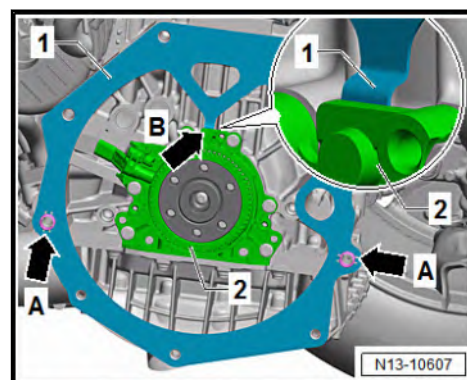
**Sealing flange on gearbox side - specified torque and tightening sequence**



- Tighten bolts in 2 stages as follows.

Stage	Tightening sequence	Specified torque
1.	-1- to -6-	Screw in by hand as far as stop
2.	-1- to -6-	Tighten to 10 Nm

Install intermediate plate.

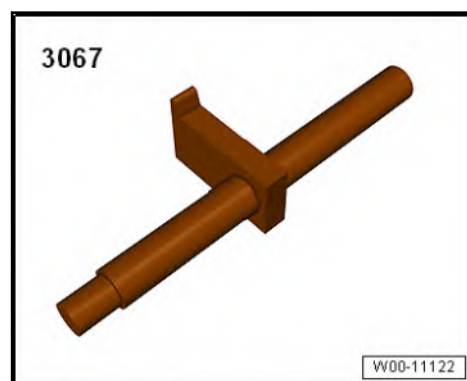


- Attach intermediate plate -1- to sealing flange -2- -arrow B-.
- Slide intermediate plate onto dowel sleeves -arrows A-.

## 2.2 Removing and installing flywheel

Special tools and workshop equipment required

- ◆ Counter-hold tool -3067-



### Removing

- Gearbox removed ⇒ Rep. gr. 34; Removing and installing gearbox.

Installation position of tool:

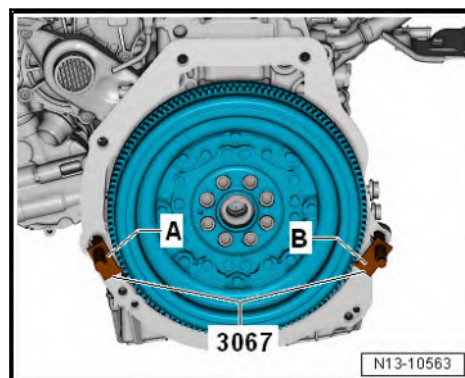




A - To tighten

B - To loosen

- Insert counterhold -3067- in hole on cylinder block -B-.



- Loosen and remove flywheel bolts.

### Installing

Install in reverse order of removal, observing the following:



### Note

- ♦ *Renew bolts that are tightened with turning further angle.*
- ♦ *Flywheel with sender wheel can only be fitted in one position.*

- Insert counterhold -3067- in hole in cylinder block -item A-.

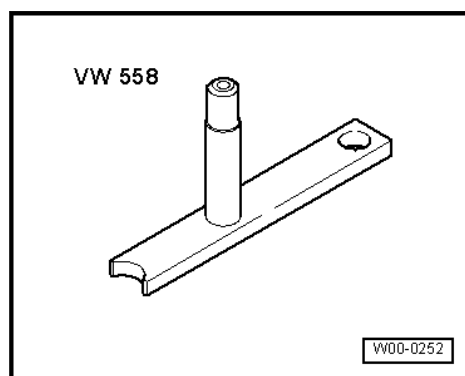
### Specified torques

- ♦ [⇒ o2.1.1 verview - cylinder block, gearbox end, vehicles with manual gearbox", page 135](#)
- ♦ ⇒ Rep. gr. 34; Removing and installing gearbox; Specified torques for gearbox

## 2.3 Removing and installing drive plate

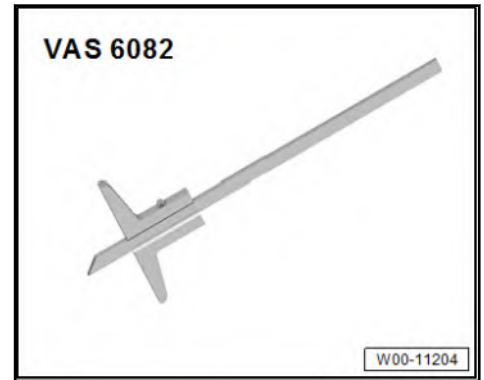
### Special tools and workshop equipment required

- ♦ Counter-hold tool -VW 558-





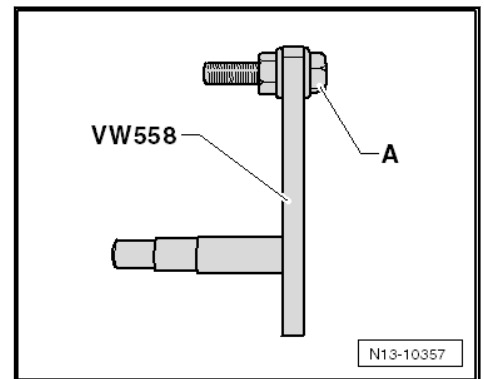
◆ Depth gauge -VAS 6082-



◆ Hexagon bolt M8×40 and hexagon nut M8

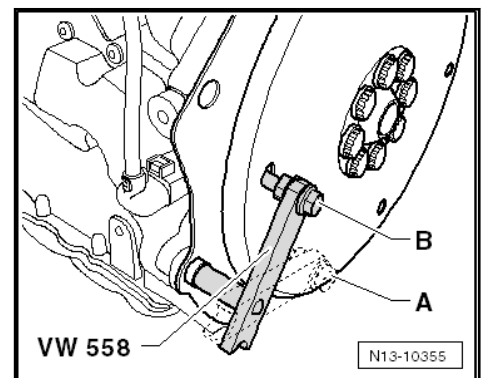
- Removing gearbox ⇒ Rep. gr. 37; Removing and installing gearbox.

**Preparing counter hold tool -VW 558-**



- Tighten hexagon bolt M8×40 -A- with hexagon nut on clutch counter-hold tool -VW 558-.

**Loosening and tightening drive plate:**



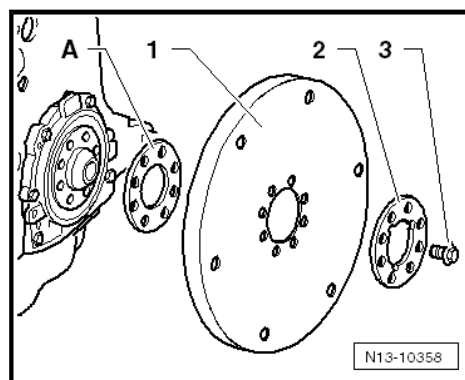
- Insert counter hold -VW 558- in cylinder block and drive plate as shown.

Stellung A - To loosen

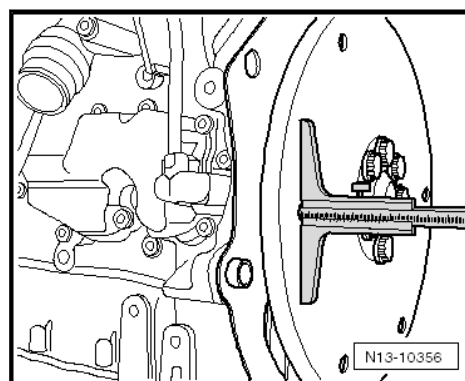
Stellung B - To tighten



### Installing drive plate:



- Fit drive plate without washer -A- first.
- Fit used securing bolts -3- and tighten to 30 Nm.
- Check dimension between drive plate and cylinder block at three points and calculate average.



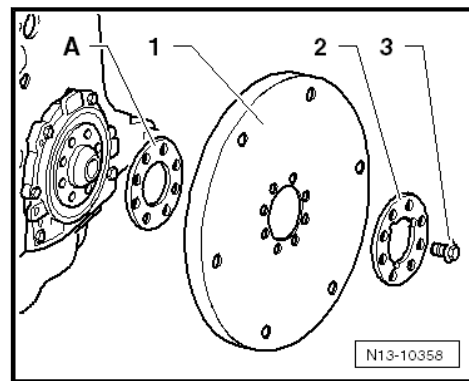
### Note

*Measure through hole in drive plate to milled surface of cylinder block. When measuring to intermediate plate, the plate thickness must be taken into account.*

- Specification measured without intermediate plate: 19.5 to 21.1 mm
- Specification measured with intermediate plate: 18.8 to 20.4 mm

If the specification is not reached, replace all securing bolts and tighten.

If specification is not attained:



- Remove drive plate again and fit shim -A-. Tighten bolts -3- again to 30 Nm.
- Repeat measurement. If the specification is not reached, replace all securing bolts and tighten.

#### Specified torques

- ◆ [⇒ o2.1.2 verview - cylinder block, gearbox end, vehicles with automatic gearbox", page 137](#)

## 2.4 Removing and installing sealing flange on gearbox side

#### Special tools and workshop equipment required

- ◆ Ring spanner insert -V.A.G 1332/11-

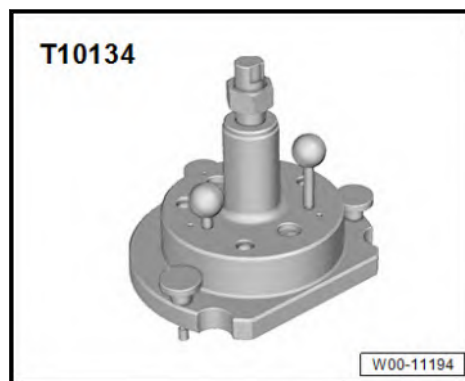


- ◆ Depth gauge -VAS 6082-





- ◆ Assembly tool -T10134-



- ◆ Locating bolt -T10340-



- ◆ Bolt M6x35 (3x)
- ◆ Spark plug socket, e.g. -3122 B-
- ◆ Hexagon key

#### Procedure



#### Note

*For reasons of clarity, illustration shows work procedure with engine removed.*

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Removing gearbox ⇒ Rep. gr. 34; Removing and installing gearbox.

#### Vehicles with manual gearbox:

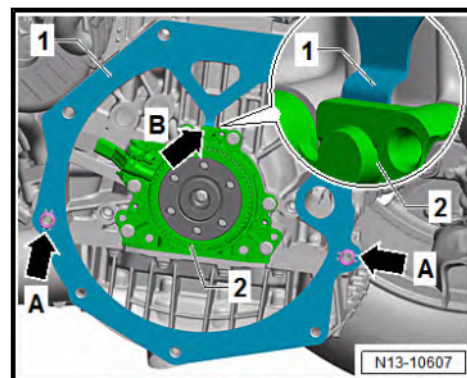
- Remove clutch ⇒ Rep. gr. 30; Removing and installing clutch.
- Remove flywheel ⇒ [page 139](#) .

#### Vehicles with automatic gearbox:

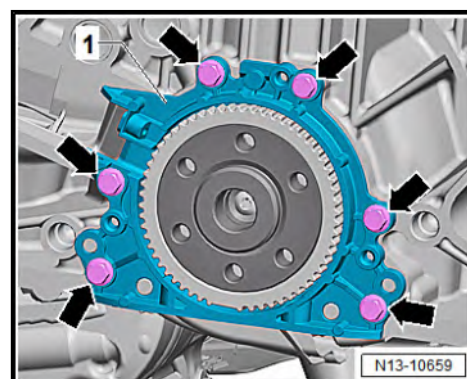
- Remove drive plate ⇒ [page 140](#) .



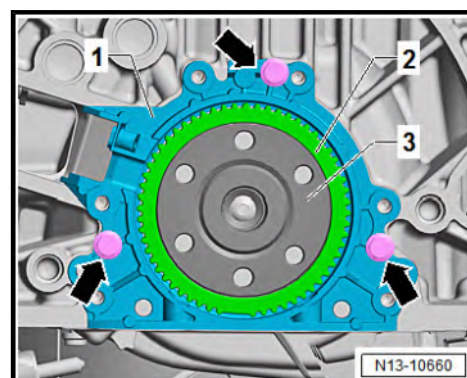
Continued for all vehicles:



- 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.
- Set piston of cylinder no. 1 to "TDC" position ⇒ [page 167](#) .
- Remove sump (bottom section) ⇒ [page 259](#) .
- Remove top section of sump ⇒ [page 267](#) .
- Remove engine speed sender -G28- ⇒ [page 430](#) .
- Unscrew bolts -arrows- for sealing flange -1-.



- To press off, screw 3 bolts M6 x 35 into sealing flange -1- -arrows-.







#### Note

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

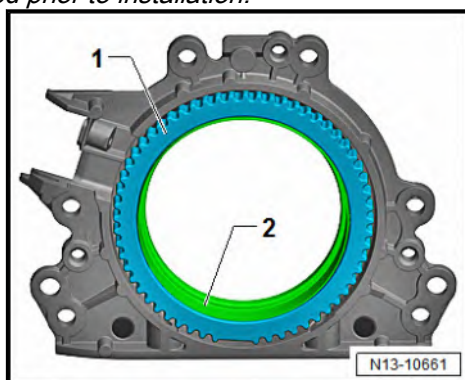
- Screw bolts alternately into sealing flange not more than  $\frac{1}{2}$  turn at a time.
- Remove sealing flange -1- together with sender wheel -2-.

#### Pressing in sealing flange with sender wheel



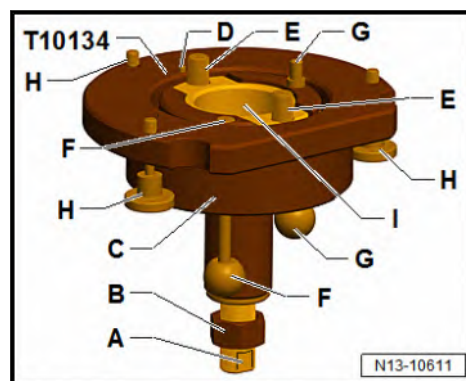
#### Note

*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 after removal from packaging.
- ◆ The sender wheel -1- is held in its installation position on the locating pin of the assembly tool -T10134- ➤ [page 147](#).
- ◆ Sealing flange and oil seal form one unit and must 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 147](#).

#### Set-up of assembly tool -T10134-:

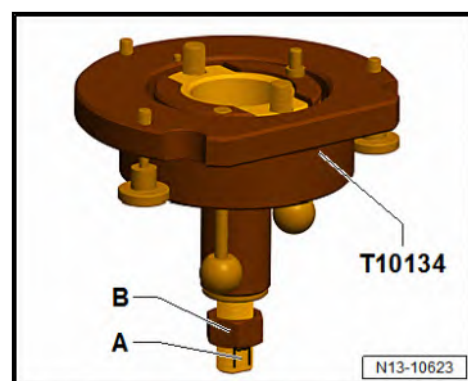


- A - Clamping surface
- B - Nut
- C - Assembly housing

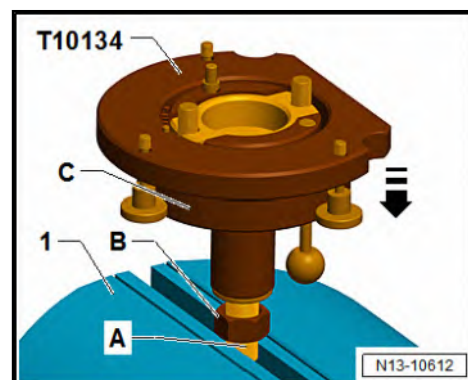


- D - Locating pin
- E - Hexagon socket head bolt (qty. 2)
- F - Guide pin for petrol engines (red knob)
- G - Guide pin for diesel engines (black knob)
- H - Knurled screws (qty. 3)
- I - Core

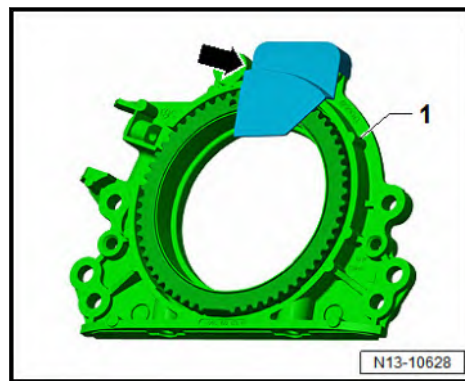
**Fitting sealing flange with sender wheel on assembly tool - T10134-:**



- Screw on nut -B- until just before it touches the clamping surface -A- of the threaded spindle.
- Clamp assembly device -T10134- at clamping surface -A- of threaded spindle in a vice -1-.



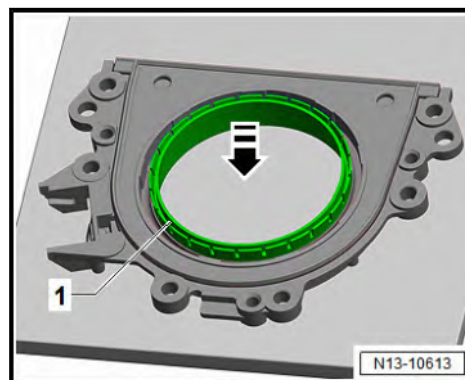
- Push assembly housing -C- downwards until it rests against nut -B-.
- Inner part of assembly tool and assembly housing must be at same height.
- If fitted, remove securing clip -arrow- from new sealing flange.



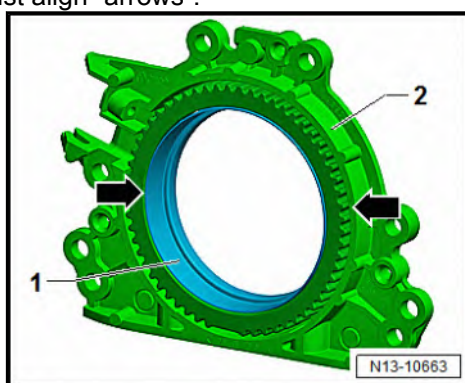
#### Note

*Do not take the sender wheel and support ring out of the sealing flange.*

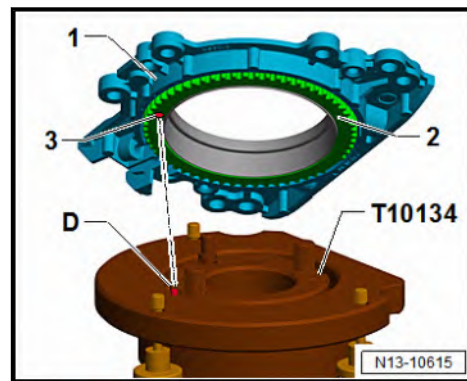
- Place sealing flange -1- with front side facing downwards on a clean level surface.



- Push sealing lip support ring -2- downwards in -direction of arrow- until it rests against flat surface.
- Upper edge of sealing lip support ring -1- and front edge of sealing flange -2- must align -arrows-.

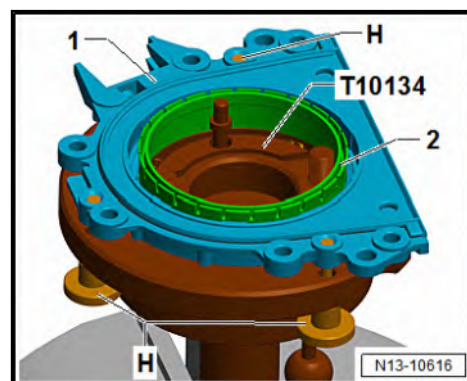


- Place sealing flange -1- with front side facing downwards on to assembly tool -T10134- so that locating pin -D- is seated in hole -3- in sender wheel hole -2-.



#### Note

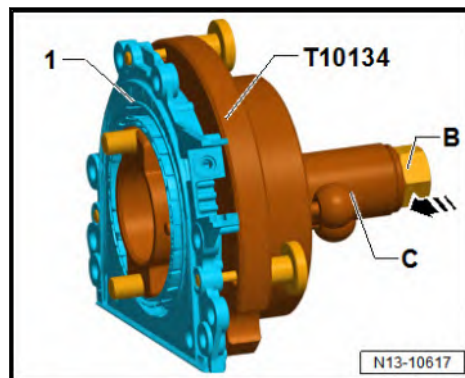
- ◆ The sealing flange can be supplied in different versions.
- ◆ On some versions, the »TDC position hole« -3- is not in the requisite TDC position -D-.
- If the position -3- is not correct in relation to the locating pin -D-, carefully rotate the sender wheel -2- with support ring.
- The sealing flange must rest flat against the assembly tool.
- Screw knurled screws -H- into sealing flange -1-.



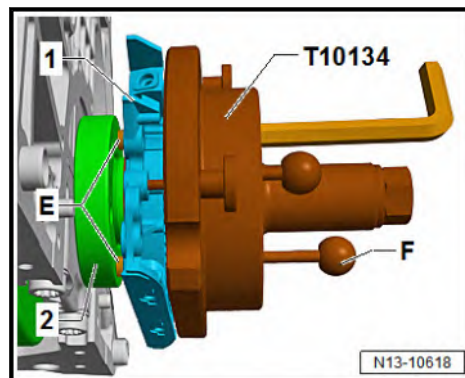
- Press sealing flange -1- and sealing lip support ring -2- against surface of assembly tool -T10134- whilst tightening knurled screws.
- This prevents the locating pin from slipping out of the sender wheel hole.
- When installing sealing flange, ensure that sender wheel remains fixed in assembly tool.



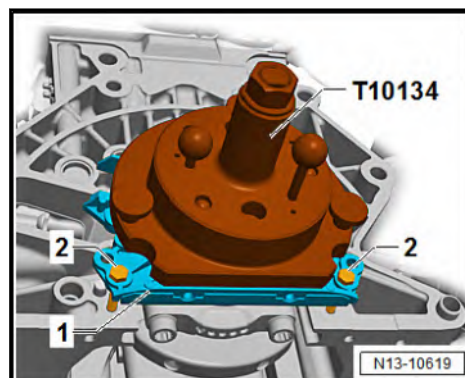
**Mounting assembly tool -T10134- with sealing flange -1- on crankshaft flange:**



- The crankshaft flange must be free of grease and oil.
- Engine is at "TDC" position ⇒ [page 167](#) .
- Screw on nut -B- until it reaches end of threaded spindle.
- Press threaded spindle of assembly tool -T10134- in -direction of arrow-, until nut -B- rests against assembly housing -C-.
- Align flat side of assembly housing to sealing surface of cylinder block on sump side.
- Attach assembly tool -T10134- together with sealing flange -1- to crankshaft flange -2-.

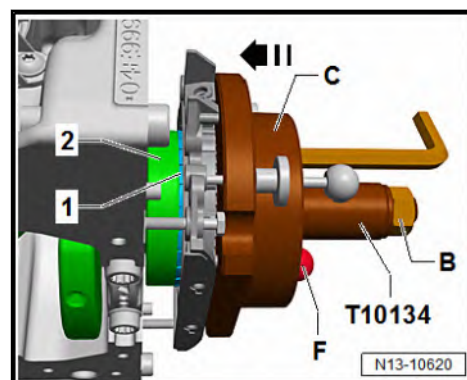


- To do this, screw hexagon socket head bolts -E- into crankshaft flange (approx. 5 full turns) using a hexagon key.
- Push guide pin for petrol engines (red knob) -F- into crankshaft flange.
- To guide sealing flange -1-, screw two M6×35 mm bolts -2- into cylinder block.





### 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.

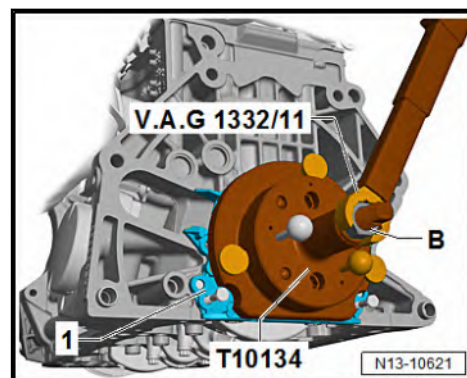


#### Note

*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- by hand onto threaded spindle until it rests against assembly housing -C-.

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

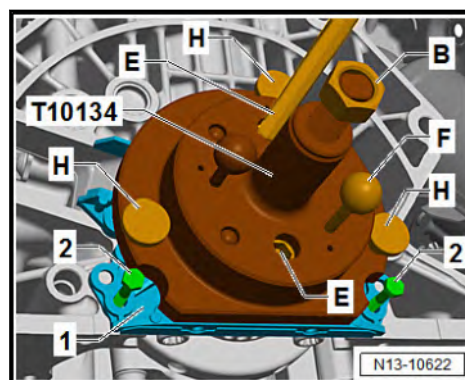


- Tighten nut -B- of assembly tool -T10134- to 35 Nm.
- After nut has been tightened to 35 Nm, a small air gap must still be present between cylinder block -2- and sealing flange -1-.

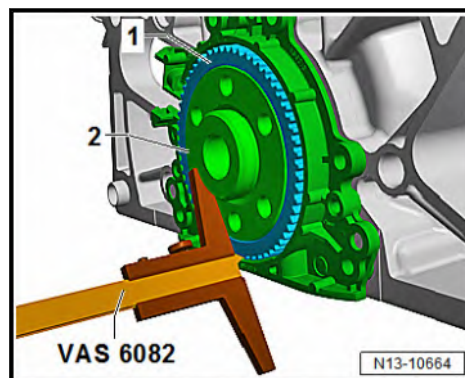




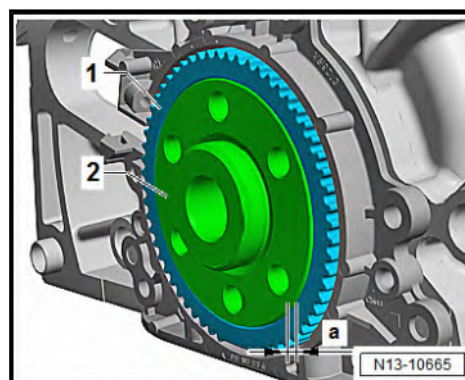
### Checking sender wheel installation position on crankshaft:



- 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 between crankshaft flange -2- and sender wheel -1-.
- Measure distance -a- between crankshaft flange -2- and sender wheel -1-.

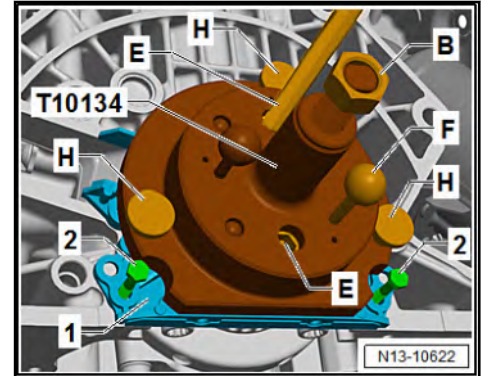


- Specification: dimension -a- = 0.5 mm

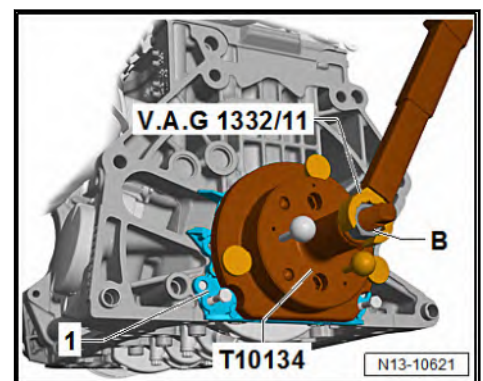


- If measured value is too low, press sender wheel further in ➤ [page 153](#) .
- If specification is achieved, proceed with subsequent work steps ➤ [page 153](#) .

#### Re-pressing sender wheel:



- Secure assembly tool -T10134- on crankshaft flange -2-.
- Make sure that 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 two M6x35 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 152](#) .
- If measured value is too low, tighten nut of assembly tool -T10134- to 45 Nm.
- Check sender wheel installation position on the crankshaft again ➤ [page 152](#) .

#### Installing

- Tighten bolts for sealing flange (vehicles with manual gearbox) ➤ [page 136](#) .



- Tighten bolts for sealing flange (vehicles with automatic gearbox) ⇒ [page 138](#) .
- Install upper part of sump ⇒ [page 267](#) .
- Install bottom section of sump ⇒ [page 259](#) .
- Install intermediate plate (vehicles with manual gearbox) ⇒ [page 137](#) .
- Install intermediate plate (vehicles with automatic gearbox) ⇒ [page 139](#) .
- Install flywheel (vehicles with manual gearbox) ⇒ [page 139](#) .
- Install drive plate (vehicles with automatic gearbox) ⇒ [page 140](#) .

#### Specified torques

- ◆ ⇒ [Fig. “Sealing flange on gearbox side - specified torque and tightening sequence”](#), page 136
- ◆ ⇒ [o2.1 verview - cylinder block, gearbox end](#), page 135
- ◆ ⇒ [o1.1 verview - ignition system](#), page 424
- ◆ ⇒ [o1.1 verview - sump/oil pump](#), page 256
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation
- ◆ ⇒ Rep. gr. 34; Removing and installing gearbox; Specified torques for gearbox



## 3 Crankshaft

⇒ [a3.1 xial clearance of crankshaft", page 155](#)

### 3.1 Measuring axial clearance of crankshaft

#### NOTICE

Do not loosen bolts of crankshaft bearing caps.

Bearing seats in cylinder block could deform.

- Never remove crankshaft.
- If the bolts of the crankshaft bearing caps were loosened, renew the cylinder block complete with crankshaft.

#### Note

*Measuring the main bearing clearance is not possible with normal workshop equipment.*

#### Special tools and workshop equipment required

- ◆ Universal dial gauge holder -VW 387-

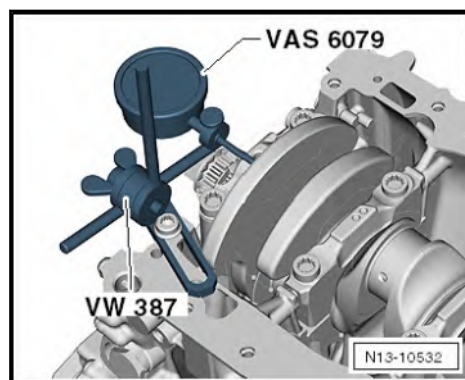


- ◆ Dial gauge -VAS 6079-





## Procedure



- Screw dial gauge -VAS 6079- with universal dial gauge holder -VW 387- onto cylinder block and set against crank web with projection of approx. 2 mm.
- Press crankshaft against dial gauge by hand and set gauge to “0”.
- Push crankshaft away from dial gauge and read off value.
- Axial clearance: 0.066 to 0.233 mm



## 4 Pistons and conrods

⇒ [o4.1 verview - pistons and conrods", page 157](#)

⇒ [a4.2 nd installing pistons", page 161](#)

⇒ [p4.3 istons and cylinder bores", page 162](#)

⇒ [r4.5 adial clearance of conrods", page 165](#)

⇒ [n4.4 ew conrod", page 164](#)

⇒ [a4.6 nd installing oil spray jets", page 166](#)

⇒ [p4.7 iston to TDC position", page 167](#)

### 4.1 Assembly overview - pistons and conrods



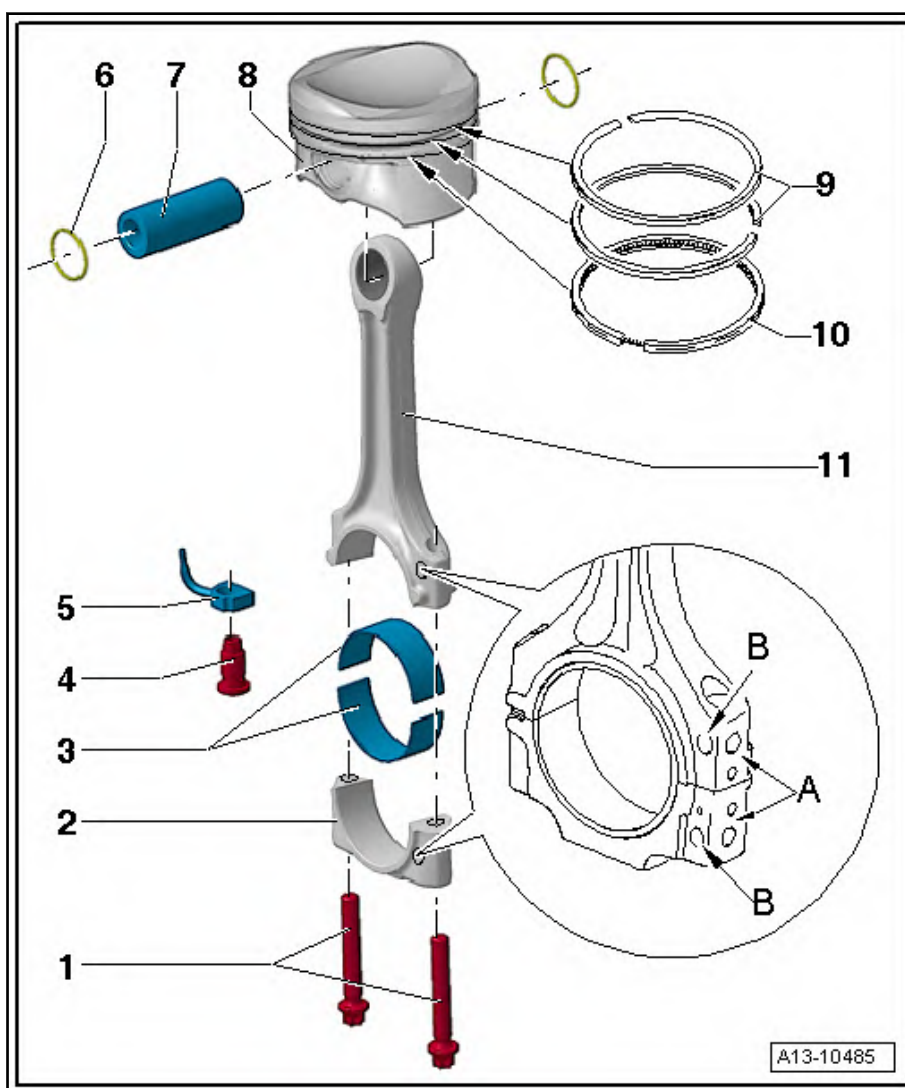


### 1 - Bolt

- ☐ Renew after removal
- ☐ Oil threads and contact surface
- ☐ 30 Nm +90° further

### 2 - Conrod bearing cap

- ☐ The conrod bearing cap only fits in one position and only on the appropriate conrod due to the breaking procedure (cracking) separating the cap from the conrod.
- ☐ Mark allocation to cylinder and conrod in colour -A-
- ☐ Installation position: orientation nubs -B- on conrod bearing cap must face in the same direction for all caps



### Note

*Upon assembly in the factory, the nubs -B- are oriented towards gearbox. The orientation of the conrods may be changed during repair work, but only if the orientation of all conrods is changed. The orientation nubs -A- on conrod bearing cap must face in the same direction for all caps.*

### 3 - Bearing bushes

- ☐ Fitting position ⇒ [page 160](#)
- ☐ Renew worn bearing shells
- ☐ Ensure firm seating

### 4 - Pressure relief valve

- ☐ 27 Nm
- ☐ Removing and installing ⇒ [page 166](#)

### 5 - Oil spray jet

- ☐ For piston cooling
- ☐ Removing and installing ⇒ [page 166](#)



## 6 - Retaining ring

- ☐ Qty. 2
- ☐ Renew after removal

## 7 - Piston pin

- ☐ Removing and installing ⇒ [page 161](#)

## 8 - Piston

- ☐ Mark installation position and cylinder number ⇒ [page 159](#) .
- ☐ Removing and installing ⇒ [page 161](#)
- ☐ Checking piston and cylinder bore ⇒ [page 162](#)

## 9 - Piston rings

- ☐ Compression rings
- ☐ Measuring ring gap ⇒ [page 163](#)
- ☐ Measuring ring-to-groove clearance ⇒ [page 163](#)
- ☐ Use commercially available piston ring pliers to remove and install.
- ☐ Installation position: marking "TOP" or side with lettering towards piston crown
- ☐ Offset gaps by 120°

## 10 - Piston rings

- ☐ Oil scraper rings
- ☐ Carefully remove and install 3-part oil scraper rings by hand.
- ☐ Measuring ring gap ⇒ [page 163](#)
- ☐ Ring-to-groove clearance not measurable.

## 11 - Connecting rod

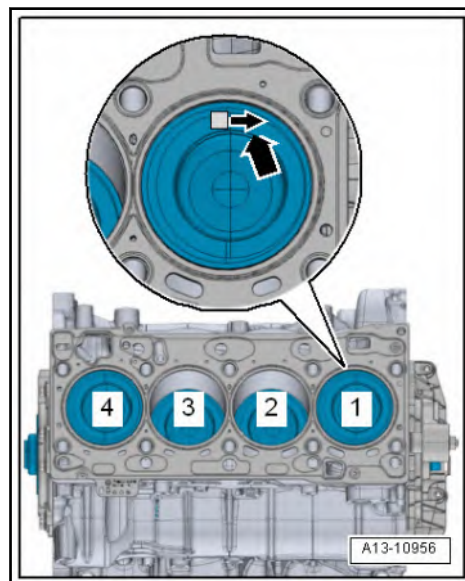
- ☐ With industrially cracked conrod bearing cap
- ☐ Renew as set only.
- ☐ Mark allocation to cylinder and conrod bearing cap in colour -A-
- ☐ Separating new conrod ⇒ [page 164](#) .
- ☐ Installation position: orientation nubs -B- on conrod bearing cap must face in the same direction for all caps



### Note

*Upon assembly in the factory, the nubs -A- are oriented towards gearbox. The orientation of the conrods may be changed during repair work, but only if the orientation of all conrods is changed. The orientation nubs -A- on conrod bearing cap must face in the same direction for all caps.*

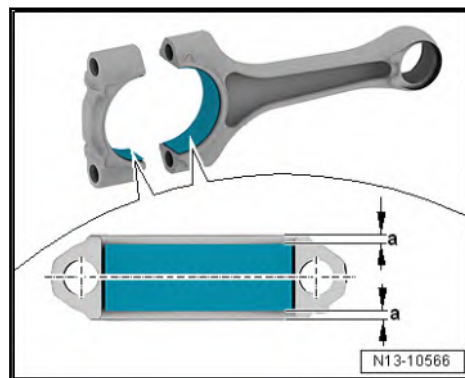
## Installation position and allocation of piston to cylinder



#### Note

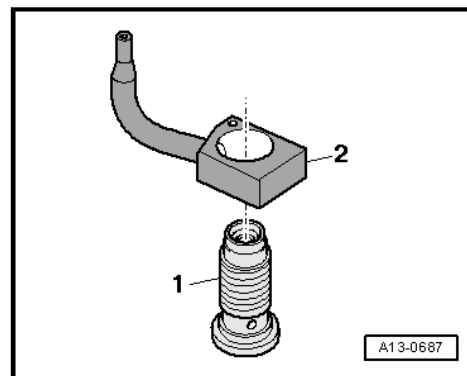
- ◆ If worn pistons are to be reinstalled, mark their allocation to the cylinder on the piston crown.
  - ◆ Use paint for this.
  - ◆ Do not use indentation, scratches, notches, or similar to mark piston crown.
- Arrow on piston crown points to pulley end -arrow-.

#### Bearing shells - installation position



- Ensure that crankshaft bearing shell is correctly positioned in conrod and conrod bearing cap.
- Dimension -a- must be the same as dimension -a-.

#### Oil spray jet and pressure relief valve



- 1 - Bolt with pressure relief valve, 27 Nm
- 2 - Oil spray jet (for cooling of pistons)
- Installation position: align leading edge of oil spray jet arrow with machined surface of cylinder block.



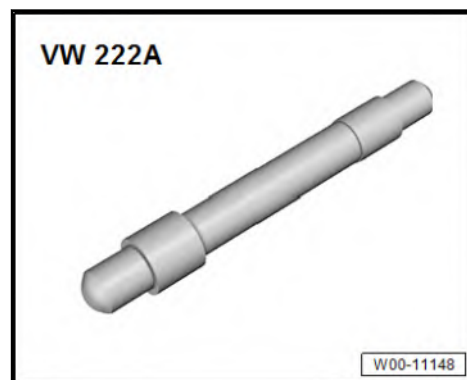
#### Note

- ◆ Do not bend oil spray jets.
- ◆ Check clearance of oil jets after reinstallation of pistons.
- ◆ Bent oil spray jets must be renewed.

## 4.2 Removing and installing pistons

### Special tools and workshop equipment required

- ◆ Drift -VW 222 A-



- ◆ Piston ring clamp, commercially available

### Removing

- Removing cylinder head. [⇒ page 174](#)
- Remove top section of sump [⇒ page 267](#) .
- Mark piston installation position and corresponding cylinder number.
- Mark installation position and matching of cylinder and conrod bearing cap to conrod [⇒ Item 11 \(page 159\)](#) .
- 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

*Renew bolts that are tightened with turning further angle.*

- Oil running surfaces of bearing shells.
- Install piston with commercially available piston ring clamp, noting installation position ⇒ [page 159](#) .
- Install conrod bearing cap, noting installation position ⇒ [Item 11 \(page 159\)](#) .
- Install cylinder head ⇒ [page 174](#) .
- Install upper part of sump ⇒ [page 267](#) .

#### Specified torques

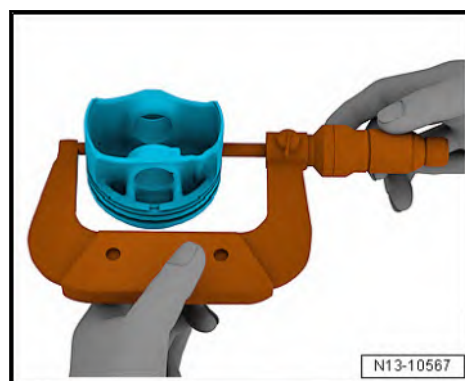
- ♦ ⇒ [o4.1 verview - pistons and conrods", page 157](#)
- ♦ ⇒ [o1.1 verview - cylinder head", page 170](#)
- ♦ ⇒ [o1.1 verview - sump/oil pump", page 256](#)

### 4.3 Checking pistons and cylinder bores

#### Special tools and workshop equipment required

- ♦ External micrometre 75 - 100 mm -VAS 6071-

#### Checking piston



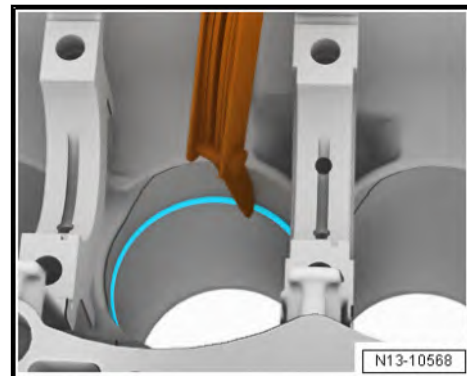
- Using an external micrometre, measure approx. 10 mm from lower edge, offset 90° from piston pin axis.
- Maximum deviation from nominal dimension: 0.04 mm.

Piston diameter, mm	
Specification without solid film lubricant	76.455 + 0.009 - 0.009



Piston diameter, mm	
Specification with solid film lubricant	$76.485 + 0.017$ $- 0.017$

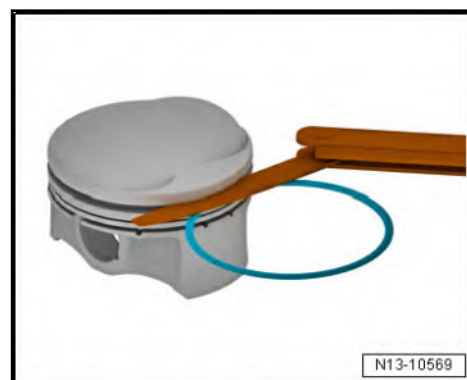
#### Measuring piston ring gap



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

Piston ring	New mm	Wear limit mm
1st compression ring	$0.20 + 0.15$	1.0
2nd compression ring	$0.40 + 0.20$	1.0
Oil scraper rings, 3 parts	$0.20 + 0.50$	No wear limit details available

#### Measuring ring-to-groove clearance

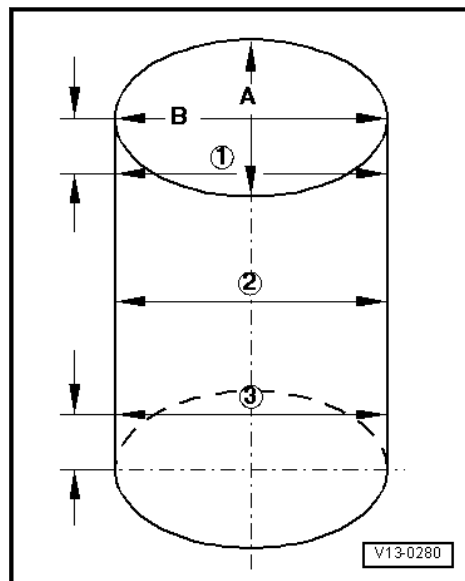


- Clean annular groove of piston before check.

Piston ring	New mm	Wear limit mm
1st compression ring	0.04 to 0.08	0.15
2nd compression ring	0.03 to 0.07	0.15
Oil scraper rings (3 parts)	Cannot be measured	

#### Measuring cylinder bore





#### Note

*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: 0.08 mm.

Cylinder bore diameter, mm	
Specification	$76.5 + 0.015$ $+ 0.005$



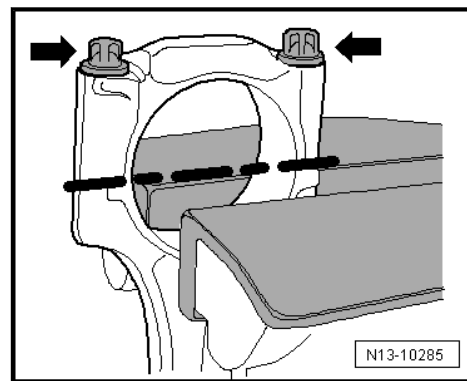
#### Note

*Do not measure cylinder bores when cylinder block is mounted on engine and gearbox support -VAS 6095-, as measurements may be incorrect.*

## 4.4 Separating new conrod

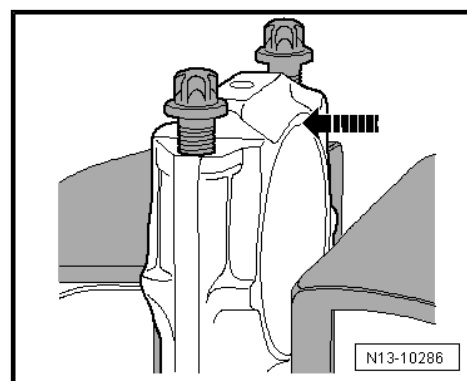
On a new conrod, it is possible that the breaking point has not fully separated. Proceed as follows if the conrod bearing cap cannot be removed by hand:

- Mark cylinder to which conrod belongs ➔ [Item 11 \(page 159\)](#).
- Lightly clamp conrod in vice using protective aluminium jaws, as shown in figure.



#### Note

- ◆ *Only clamp the conrod lightly in order to avoid damaging it.*
- ◆ *Conrod is clamped below the dashed line.*
- Unscrew both bolts -arrows- 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 Plastigage corresponding to the width of the bearing on the journal or into the bearing shells.
- Fit conrod bearing cap and tighten to 30 Nm (without turning further angle).
- Do not 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

- ♦ Allen key, long reach 5 mm -T10545-

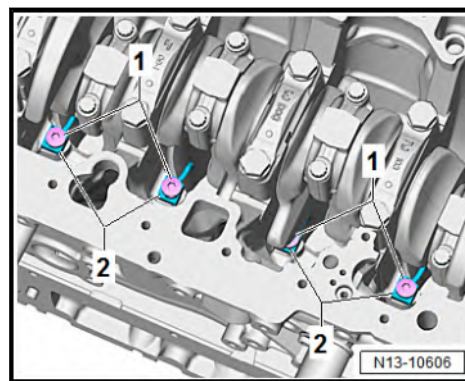
### Removing

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Remove top section of sump ⇒ [page 267](#) .



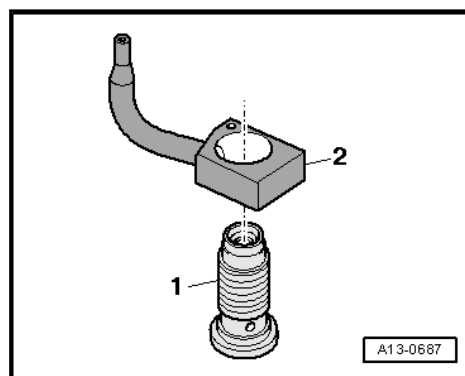
### Note

- ♦ *The crank web of the respective cylinder must be positioned so that the socket -T10545- can be inserted vertically in the pressure relief valve.*
- ♦ *Furthermore, the corners of the socket -T10545- and of the pressure relief valve must engage well.*
- Turn crankshaft via vibration damper securing bolt in direction of engine rotation until the respective bolt is accessible.
- Unscrew pressure relief valve -1-.



- Remove oil spray jets -2-.

### Installing



- 1 - Pressure relief valve - 27 Nm
- 2 - Oil spray jet
- Installation position: align leading edge of oil spray jet arrow with machined surface of cylinder block.



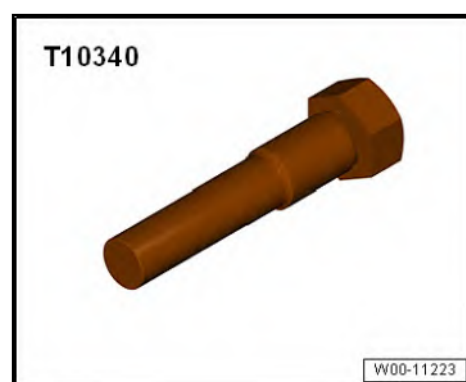
#### Note

- ◆ *Do not bend oil spray jets.*
- ◆ *Check clearance of oil jets after reinstallation of pistons.*
- ◆ *Bent oil spray jets must be renewed.*
- Install upper part of sump ⇒ [page 267](#) .
- Install noise insulation ⇒ General body repairs, exterior;  
Rep. gr. 66; Noise insulation; Assembly overview – noise  
insulation.

## 4.7 Setting piston to TDC position

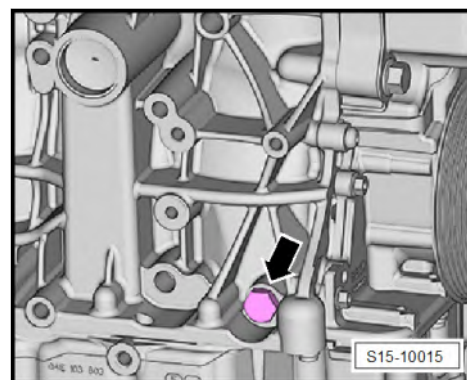
### Special tools and workshop equipment required

- ◆ Locating bolt -T10340-

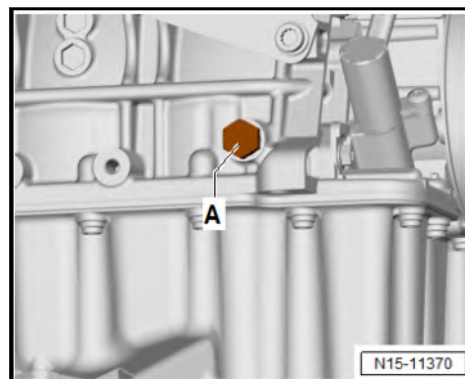


### Procedure

- Remove noise insulation ⇒ General body repairs, exterior;  
Rep. gr. 66; Noise insulation; Assembly overview - noise  
insulation.
- Place a cloth underneath to catch any engine oil which may  
drain out.
- 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.*

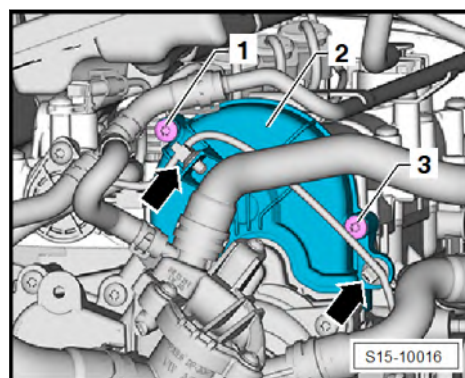
- Unscrew locking pin -T10340- -A-.
- Turn crankshaft 90° in direction of rotation of engine.
- Screw locking pin -T10340- -A- into cylinder block as far as stop and tighten to 30 Nm.
- Rotate crankshaft in normal direction of rotation as far as stop. The locking pin -T10340- -A- now rests against the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



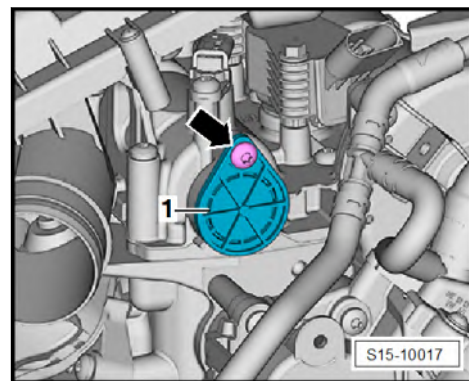
#### Note

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

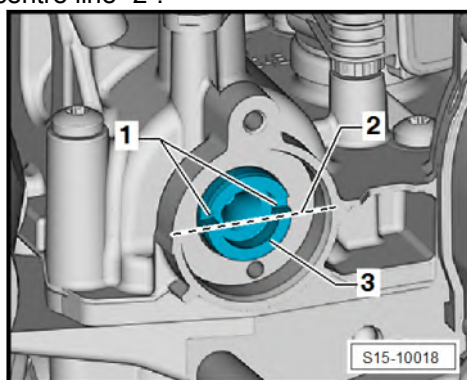
- Remove air filter housing ➔ [page 366](#) .
- Unclip wiring harness -arrows- and place to one side.



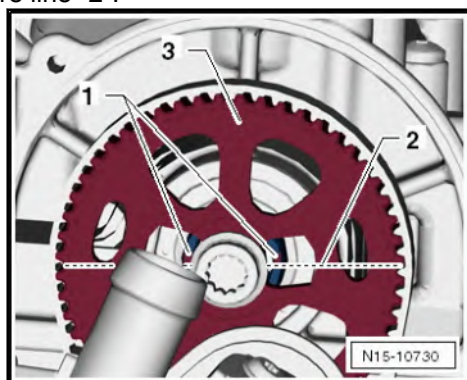
- Unscrew bolts -1- and -3-.
- Remove toothed belt cover -2-.
- Cover coolant pump with a cloth.
- Unscrew bolt -arrow-, and remove cap -1-.



- Grooves -1- of inlet 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.
- If the grooves of the camshafts are not in the specified position, turn the crankshaft 360° further in the direction of engine rotation and check the positions again.

#### Specified torques

- ◆ ⇒ [o1.2 view - camshaft housing](#), page 172
- ◆ ⇒ [o2.1 view - coolant pump, thermostat](#), page 300
- ◆ ⇒ [o3.1 view - air filter housing](#), page 364





## 15 – Cylinder head, valve gear

### 1 Cylinder head

⇒ [o1.1 verview - cylinder head", page 170](#)

⇒ [o1.2 verview - camshaft housing", page 172](#)

⇒ [a1.3 nd installing cylinder head", page 174](#)

⇒ [a1.4 nd installing camshaft housing", page 178](#)

⇒ [c1.5 ompression", page 181](#)

#### 1.1 Assembly overview - cylinder head



# 1 - Cylinder head gasket

- ☐ Observe installation position: Part number to cylinder head

- ☐ Renewing ⇒ [page 174](#)

# 2 - Dowel sleeve

- ☐ Qty. 2

# 3 - Cylinder head

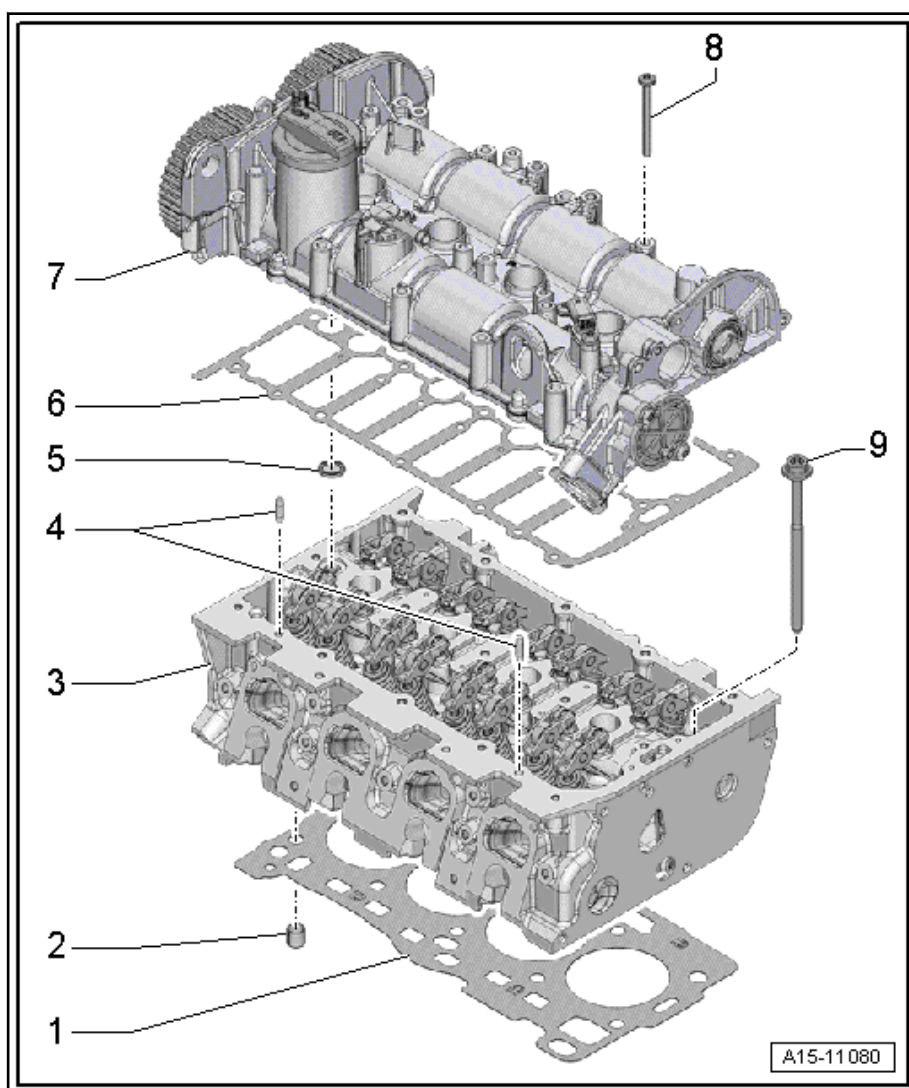
- ☐ Removing and installing ⇒ [page 174](#)

- ☐ Check for distortion ⇒ [page 172](#) .

# 4 - Dowel pins

# 5 - Seal

- ☐ With oil strainer
- ☐ Inserted into cylinder head



## Note

- ◆ The oil strainer is fitted only if the cylinder head has the appropriate recess.

- ◆ Cylinder heads without recess do not require an oil strainer.

# 6 - Seal

- ☐ Renew after removal

# 7 - Camshaft case

- ☐ Removing and installing ⇒ [page 178](#)

# 8 - Bolt

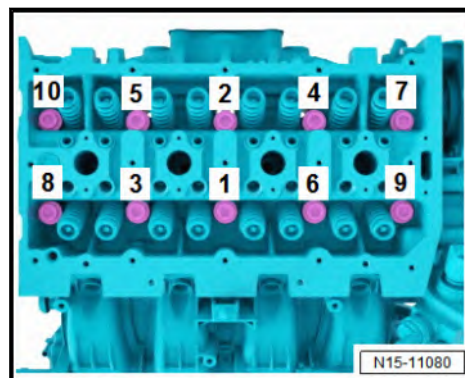
- ☐ Specified torque and tightening sequence ⇒ [page 174](#)

# 9 - Bolt

- ☐ Renew after removal
- ☐ Sequence when loosening ⇒ [page 176](#) .
- ☐ Specified torque and tightening sequence ⇒ [page 172](#)



## Cylinder head - specified torque and sequence



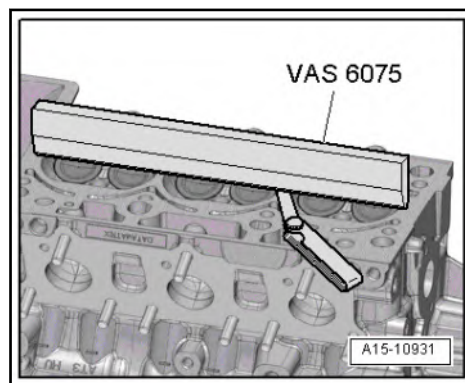
### Note

*Renew bolts that are tightened with turning further angle.*

- Tighten bolts in stages in the sequence shown.

Stage	Bolts	Specified torque/turning further angle
1.	-1 to 10-	40 Nm
2.	-1 to 10-	Turn 90° further
3.	-1 to 10-	Turn 90° further
4.	-1 to 10-	Turn 90° further

## 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 - Bolt

- ☐ Specified torque and tightening sequence ⇒ [page 174](#)

#### 2 - Inlet camshaft control valve 1 -N205-

- ☐ Removing and installing ⇒ [page 243](#)

#### 3 - Bolt

- ☐ 8 Nm

#### 4 - Camshaft case

- ☐ Removing and installing ⇒ [page 178](#)

#### 5 - Hall sender -G40-

- ☐ Removing and installing ⇒ [page 430](#)

#### 6 - Bolt

- ☐ 8 Nm

#### 7 - Seal

- ☐ For exhaust camshaft, gearbox end
- ☐ Removing and installing ⇒ [page 237](#)

#### 8 - Crankshaft

- ☐ For coolant pump
- ☐ Removing and installing ⇒ [page 308](#)

#### 9 - Bolt

- ☐ Specified torque ⇒ [Item 8 \(page 301\)](#)

#### 10 - Bolt

- ☐ 8 Nm

#### 11 - Cap

#### 12 - O-ring

- ☐ Renew after removal

#### 13 - Seal

- ☐ Renew after removal

#### 14 - Dowel pin

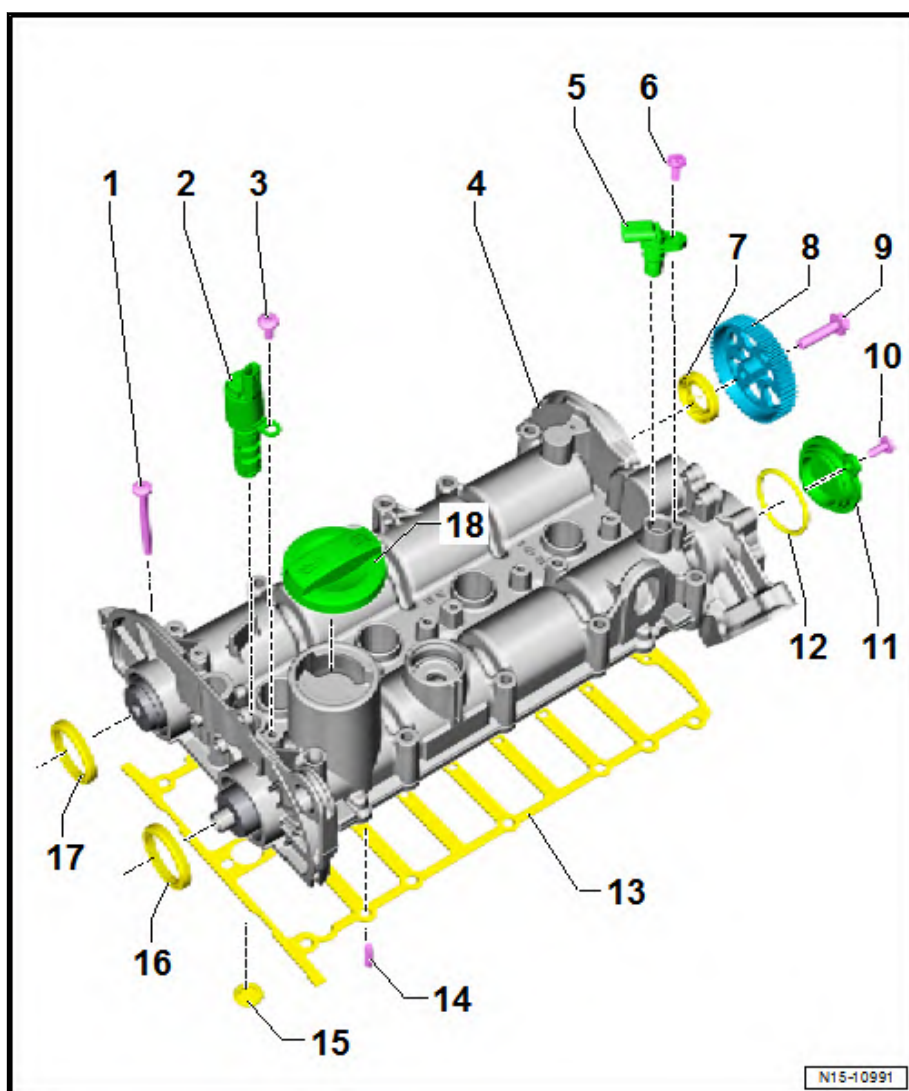
#### 15 - Seal

- ☐ With oil strainer
- ☐ Inserted into cylinder head



#### Note

- ◆ The oil strainer is fitted only if the cylinder head has the appropriate recess.
- ◆ Cylinder heads without recess do not require an oil strainer.





## 16 - Seal

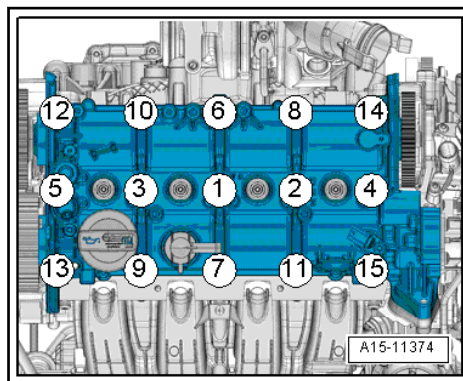
- ☐ For inlet camshaft
- ☐ Removing and installing ⇒ [page 237](#)

## 17 - Seal

- ☐ For exhaust camshaft
- ☐ Removing and installing ⇒ [page 237](#)

## 18 - Cap

### Camshaft housing - specified torque and tightening sequence



#### Note

*Renew bolts that are tightened with turning further angle.*

- Tighten bolts in stages in the sequence shown.

Stage	Bolts	Specified torque/turning further angle
1.	-1 to 15-	10 Nm
2.	-1 to 15-	Turn 180° further

## 1.3 Removing and installing cylinder head

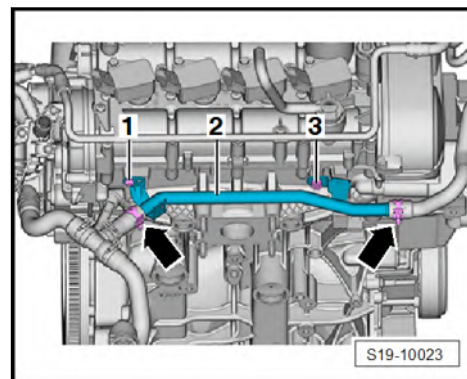
### Removing



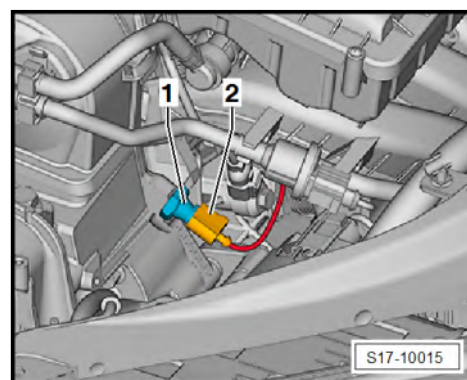
#### Note

*Attach all heat-shielding sleeves in the same places when installing.*

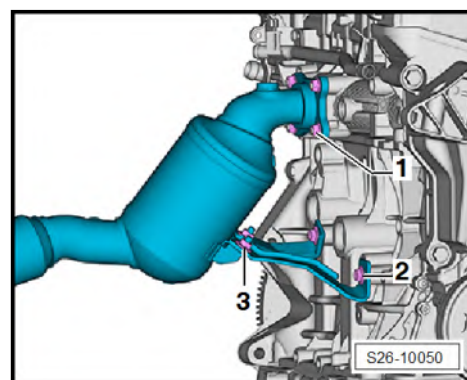
- Remove intake manifold ⇒ [page 373](#) .
- Remove camshaft housing ⇒ [page 178](#) .
- Remove gasket for camshaft housing ⇒ [page 172](#) .
- Unscrew securing bolts -1- and -3-.



- Remove coolant pipe -2-, and place it to one side.
- Release and pull off connector -2- on oil pressure switch -F1- -1-.

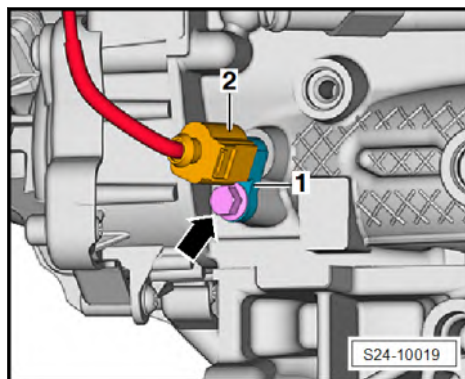


- If fitted, remove heat shield for right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40; Drive shaft; Removing and installing drive shaft heat shield.
- Unscrew nuts -1- for securing front exhaust pipe to cylinder head.

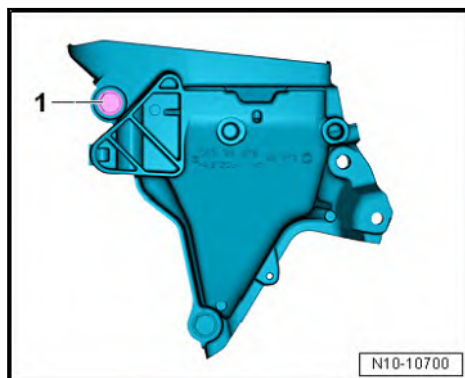


- Unscrew bolts -2- for exhaust pipe supports.
- Remove exhaust pipe from cylinder head, and tie it up.
- Release and pull off connector -2- for coolant temperature sender -G62- -1-.

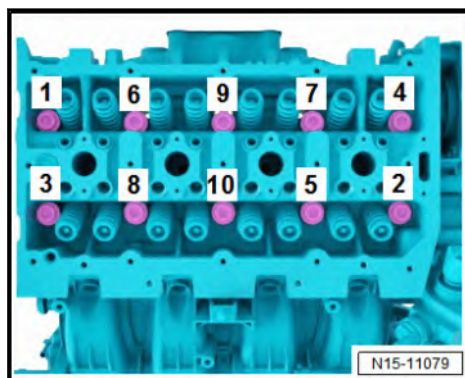




- Unscrew bolt -1- from engine support.



- Detach retaining clips for wiring harness from cylinder head.
- Loosen cylinder head bolts in the sequence -1 to 10-, and unscrew them.



- Remove cylinder head, and set it down on a soft surface (foam plastic).

#### Installing

- Carefully remove sealant residue from cylinder head and cylinder block.



#### Note

- ◆ *Ensure that no long scores or scratches are made on the surfaces.*
- ◆ *No oil or coolant must be allowed to remain in the blind holes for the cylinder head bolts in the cylinder block.*
- Carefully remove remains of emery and abrasives.



#### Note

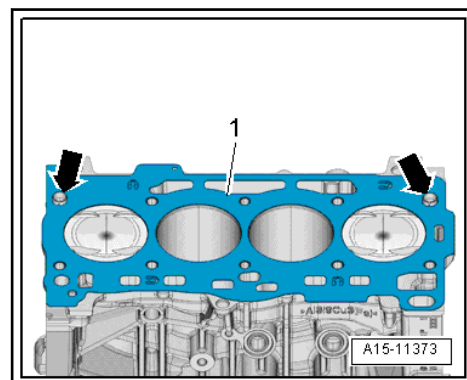
- ◆ Do not remove new cylinder head gasket from packaging until it is ready to be fitted.
- ◆ Handle the cylinder head gasket very carefully to prevent damage to the silicone coating or the indented area of the gasket.



#### Note

- ◆ Renew bolts that are tightened with turning further angle.
- ◆ Renew self-locking nuts as well as gaskets, seals and O-rings.
- ◆ When installing a replacement cylinder head, the contact surfaces between hydraulic compensation elements, roller rocker fingers and cams must be oiled before installing the camshaft housing.
- ◆ Secure all hose connections with hose clips corresponding to the series equipment ⇒ *Electronic Parts Catalogue*.
- ◆ Do not reuse coolant which has been drained off.

- Fit cylinder head gasket -1-.



- ◆ Note centring pins in cylinder block -arrows-.
- ◆ Check installation position of cylinder head gasket. Characteristic: the part number should be legible from the inlet side.
- If crankshaft has been turned in the meantime:
- ◆ Set piston of no. 1 cylinder to TDC position.
- ◆ Turn crankshaft back slightly.
- Fit cylinder head.
- Insert cylinder head bolts, and tighten them by hand.
- Tighten bolts for cylinder head ⇒ [page 172](#) .



#### Note

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



Further installation is carried out in reverse order of removal, observing the following:

- Install camshaft housing ⇒ [page 178](#) .
- Install intake manifold ⇒ [page 373](#) .
- Change engine oil. ⇒ Maintenance; Booklet
- Add coolant ⇒ [page 287](#) .

#### Specified torques

- ♦ ⇒ [Fig. “Engine support - specified torque and installation sequence”](#), page 64
- ♦ ⇒ [o1.1 overview - cylinder head](#), page 170
- ♦ ⇒ [o4.1 overview - intake manifold](#), page 369
- ♦ ⇒ [o2.1 overview - emission control](#), page 416
- ♦ ⇒ Running gear, axles, steering; Rep. gr. 40; Drive shaft; Assembly overview - drive shaft

## 1.4 Removing and installing camshaft housing

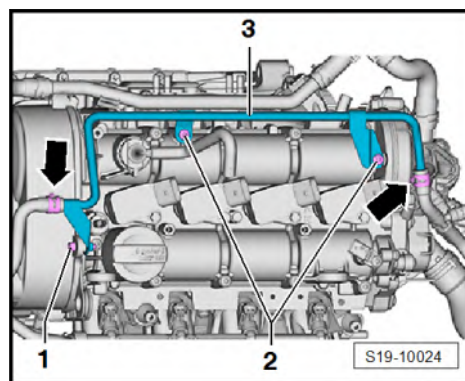


#### Note

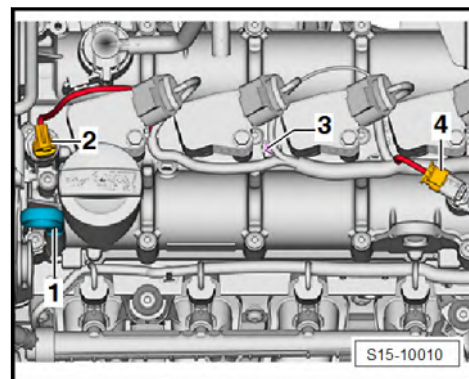
- ♦ *The camshafts must not be removed individually.*
- ♦ *In the event of repair, the camshaft housing must be renewed completely.*

#### Removing

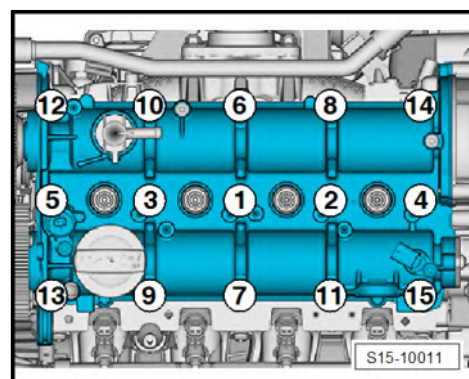
- Remove air filter housing ⇒ [page 366](#) .
- Remove coolant pump ⇒ [page 304](#) .
- Unscrew securing bolts -1- and -2-.



- Remove coolant pipe -3-, and place it to one side.
- Remove ignition coils ⇒ [page 426](#) .
- Remove toothed belt from camshafts ⇒ [page 218](#) .
- Release and disconnect connectors -2- and -4-.



- Remove bolt -3-, move wiring harness clear and place to left side.
- Pull out oil dipstick -1-.
- Loosen bolts for camshaft housing in the sequence -15 to 1- and unscrew.



- Carefully detach camshaft housing from adhesive bond and remove it.
- 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.

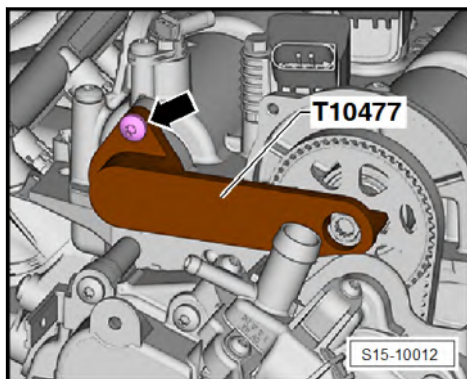
### Installing

Install in reverse order of removal. During this procedure, observe the following:

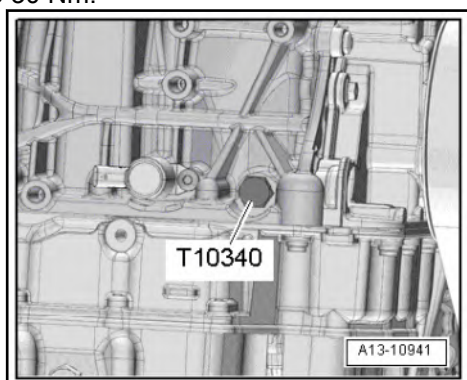


#### Note

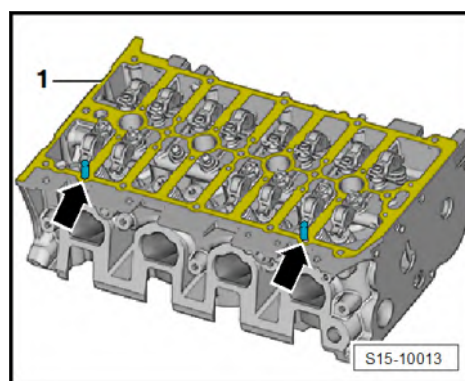
- ◆ *Renew bolts that are tightened with turning further angle.*
- ◆ *Renew gasket and seal with oil strainer.*
- Check “TDC” position of camshaft and crankshaft:
  - Camshaft clamp -T10477- installed to camshaft housing with bolt -arrow-.



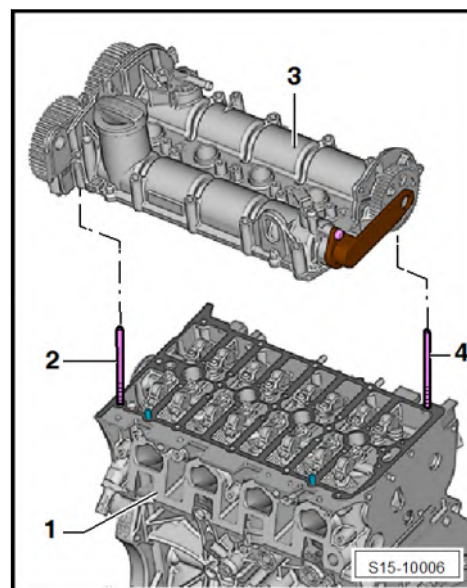
- Crankshaft is in "TDC" position ➤ [page 203](#) .
- Locking pin -T10340- screwed into cylinder block as far as stop and tightened to 30 Nm.



- Check, if all roller rocker fingers are seated properly on valve stem end and if their clipped into the respective compensation element.
- Fit gasket onto dowel pins -arrows- of cylinder head -1-.



- Screw 2 studs -2- and -4- (e.g. -T10288/4-) into cylinder head.



- Carefully fit camshaft housing -3- onto studs in cylinder head.



#### Note

*Ensure that camshaft housing is not tilted.*

- Tighten bolts for camshaft housing ⇒ [page 174](#) .
- Install toothed belt ⇒ [page 220](#) .
- Check valve timing, and adjust it if necessary. ⇒ [page 203](#)
- Install ignition coils ⇒ [page 426](#) .
- Install coolant pump ⇒ [page 304](#) .
- Install wires ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Turn the engine carefully at least 2 rotations to ensure that none of the valves make contact when the starter is operated.

#### Specified torques

- ◆ ⇒ [o1.2 verview - camshaft housing", page 172](#)
- ◆ ⇒ [o3.1 verview - air filter housing", page 364](#)
- ◆ ⇒ [o1.1 verview - ignition system", page 424](#)
- ◆ ⇒ [o2.1 verview - coolant pump, thermostat", page 300](#)
- ◆ ⇒ [o2.2 verview - toothed belt", page 184](#)
- ◆ ⇒ [o1.1 verview - cylinder head", page 170](#)

## 1.5 Checking compression

Special tools and workshop equipment required





- ◆ Spark plug socket -3122 B-

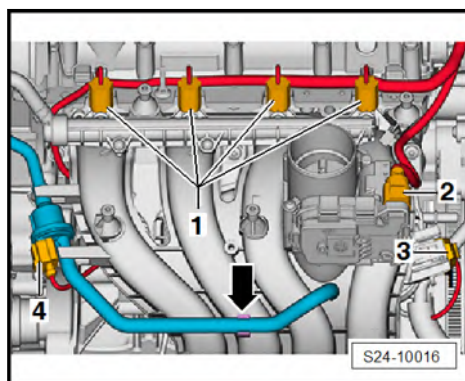


- ◆ Compression tester -V.A.G 1763-

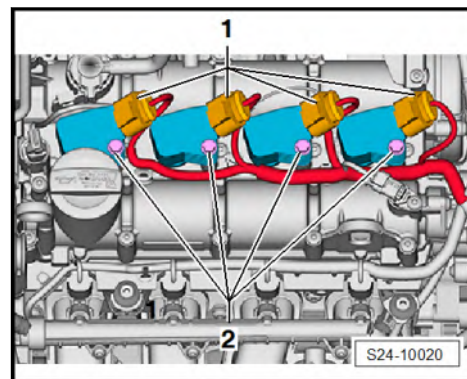


#### Procedure

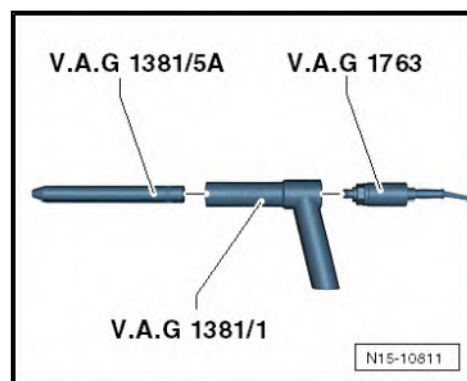
- Engine oil temperature at least 30°C.
- Battery voltage at least 12.5 V.
- Remove air filter housing ➔ [page 366](#) .
- Release and pull off connector for injectors -1-.



- Release and pull off connectors -1- for ignition coils with output stages.



- Unscrew bolts -2-.
- Pull out ignition coils with output stages ⇒ [page 426](#) .
- Unscrew spark plugs using spark plug socket, e.g. -3122 B-.
- Check compression pressure using compression tester - V.A.G 1763-; refer to ⇒ Operating instructions.



- Have a second mechanic press down accelerator completely and simultaneously operate starter until pressure no longer increases on tester display.
- Repeat procedure on each cylinder.

Compression pressures	
New engine	1.0 to 1.5 MPa (10.0 to 15.0 bar)
Wear limit	0.7 MPa (7.0 bar)
Maximum difference between cylinders	0.3 MPa (3.0 bar)

### Installing

Assembly is carried out in reverse sequence; note the following:

- Install spark plugs.
- Install ignition coils with output stages ⇒ [page 426](#) .
- Entries will have been made in the event memory of the engine control unit because connectors were separated and the engine was started ⇒ Vehicle diagnostic tester.

### Specified torques

- ◆ ⇒ [o1.1 overview - ignition system](#), [page 424](#)
- ◆ ⇒ [o3.1 overview - air filter housing](#), [page 364](#)



## 2 Toothed belt drive

⇒ [o2.1 verview - toothed belt cover", page 184](#)

⇒ [o2.2 verview - toothed belt", page 184](#)

⇒ [a2.3 nd installing toothed belt guard", page 186](#)

⇒ [a2.4 nd installing toothed belt", page 187](#)

⇒ [a2.5 nd installing valve timing tool", page 194](#)

⇒ [v2.6 alve timing", page 203](#)

⇒ [v2.7 alve timing", page 207](#)

⇒ [t2.8 oothed belt from camshaft", page 218](#)

### 2.1 Assembly overview - toothed belt cover

#### 1 - Lower toothed belt guard

- ❑ Removing and installing ⇒ [page 187](#)

#### 2 - Bolt

- ❑ 8 Nm

#### 3 - Engine support

- ❑ Specified torque and tightening sequence ⇒ [page 62](#)

#### 4 - Bolt

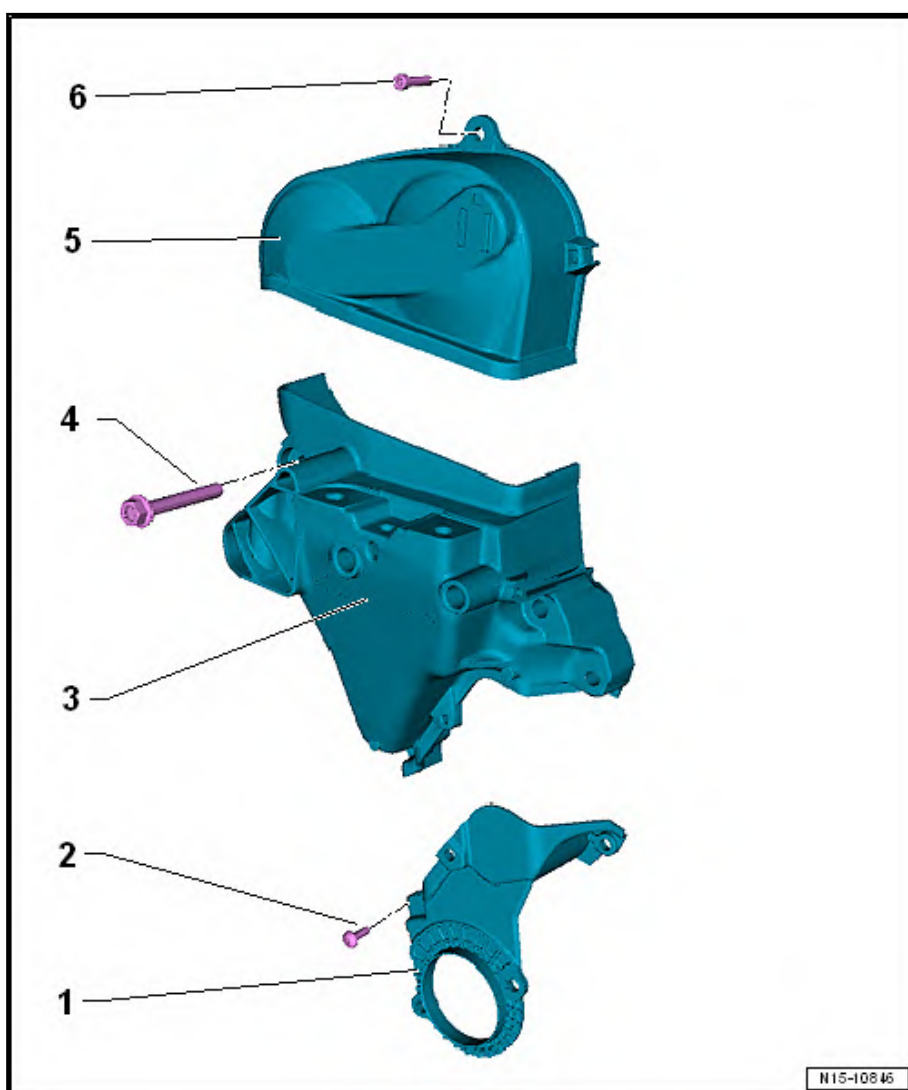
- ❑ Specified torque and tightening sequence ⇒ [page 62](#)

#### 5 - Upper toothed belt guard

- ❑ Removing and installing ⇒ [page 186](#)

#### 6 - Bolt

- ❑ 8 Nm



### 2.2 Assembly overview - toothed belt



#### 1 - Toothed belt

- ☐ Before removing, mark direction of rotation with chalk or felt-tipped marker pen.
- ☐ Check for wear
- ☐ Removing and installing ⇒ [page 187](#)

#### 2 - Bolt

- ☐ 25 Nm

#### 3 - Tensioning pulley

- ☐ Removal and installation involve removing engine support ⇒ [page 125](#).

#### 4 - Bolt

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

#### 5 - Exhaust camshaft toothed belt pulley

- ☐ Removing and installing ⇒ [page 231](#)

#### 6 - Inlet camshaft toothed belt pulley

- ☐ With camshaft adjuster
- ☐ Removing and installing camshaft adjuster ⇒ [page 226](#)

#### 7 - Guide bush

#### 8 - Bolt

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

#### 9 - O-ring

- ☐ Check for damage, renew if necessary; see ⇒ Electronic parts catalogue.

#### 10 - Plug

- ☐ 20 Nm

#### 11 - O-ring

- ☐ Captive, supplied with "item 13".
- ☐ Renew after removal

#### 12 - Spacer sleeve

- ☐ Supplied with item "13".

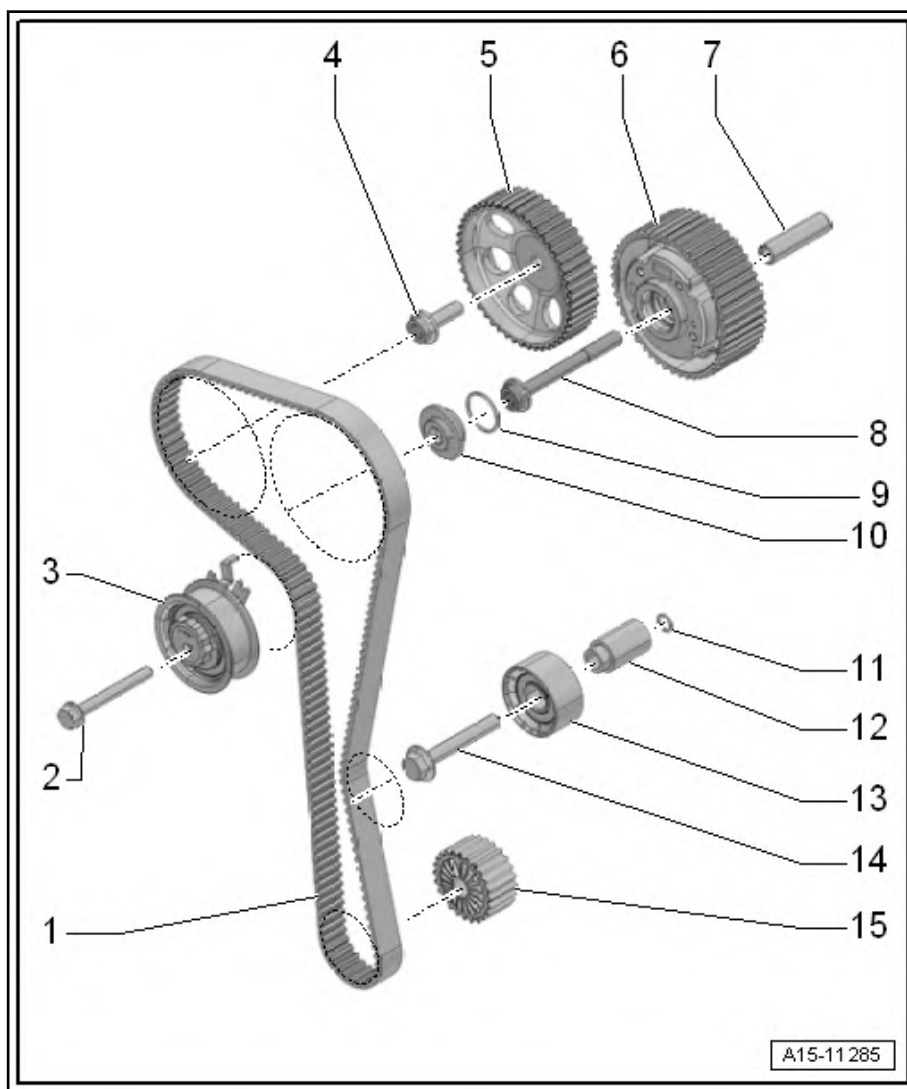
#### 13 - Idler roller

#### 14 - Bolt

- ☐ 40 Nm

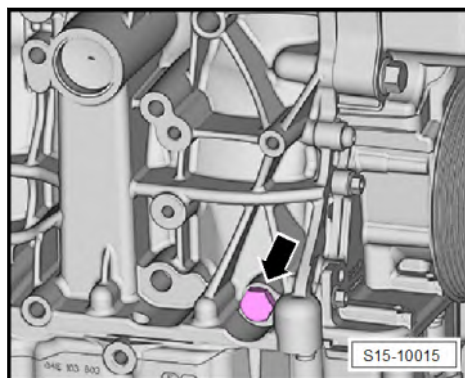
#### 15 - Crankshaft pulley

- ☐ Contact surface between toothed belt pulley and crankshaft must be free from oil
- ☐ Can only be fitted in one position
- ☐ Specified torque ⇒ [page 107](#)





## Plug for "TDC" drilling in cylinder block - specified torque



### Note

- ◆ Plug with integrated seal -arrow-
- ◆ Renew if damaged
- Tighten bolt -arrow- to 30 Nm.

## 2.3 Removing and installing toothed belt guard

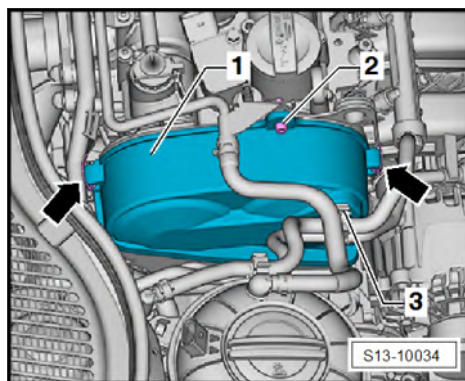
⇒ [a2.3.1 nd installing upper toothed belt guard", page 186](#)

⇒ [a2.3.2 nd installing lower toothed belt guard", page 187](#)

### 2.3.1 Removing and installing upper toothed belt guard

#### Removing

- Detach hoses from retainer -3-.



- Unscrew bolt -2-.
- Release clips -arrows-, and remove upper toothed belt guard -1-.

#### Installing

Further assembly is carried out in the reverse order of removal.

#### Specified torques

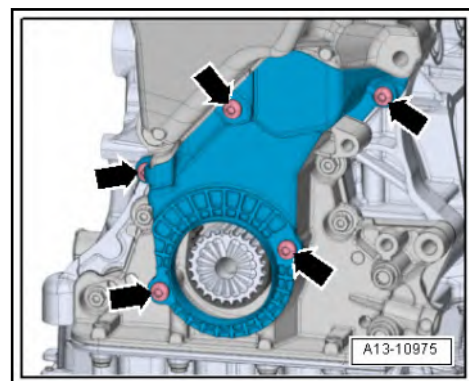
- ◆ ⇒ [o2.1 verview - toothed belt cover", page 184](#)



## 2.3.2 Removing and installing lower toothed belt guard

### Removing:

- Remove poly V-belt pulley from crankshaft ⇒ [page 123](#) .
- Unscrew bolts -arrows-.



- Remove lower part of toothed belt guard.

### Installing:

Install in reverse order of removal. Observe the following:

- Install vibration damper ⇒ [page 123](#) .

### Specified torques:

- ◆ ⇒ [o2.1 verview - toothed belt cover", page 184](#)
- ◆ ⇒ [o1.1 verview - poly V-belt drive", page 107](#)

## 2.4 Removing and installing toothed belt

### Special tools and workshop equipment required

- ◆ Torque wrench -VAS 6583A-, not illustrated
- ◆ Counterhold -T10172A- with adapter -T10172A/1- and -T10172A/2-



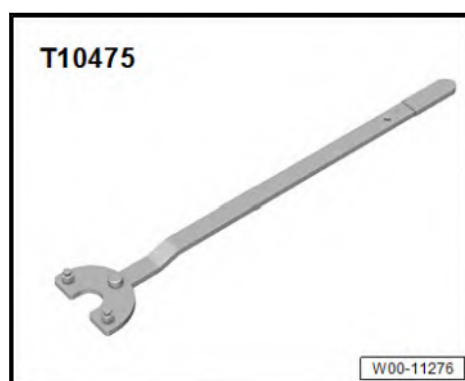




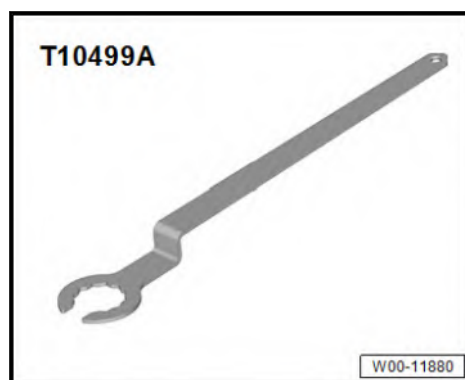
◆ Locating bolt -T10340-



◆ Counter-hold tool -T10475-



◆ Special wrench, 30 mm -T10499A-



◆ Insert tool -T10500-





◆ Assembly tool -T10487-



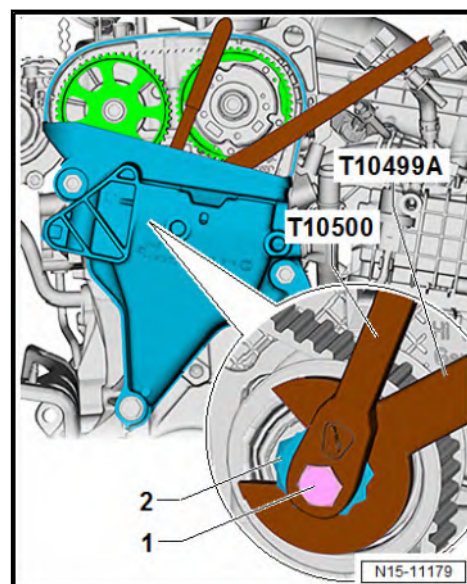
### Removing

- Set piston in cylinder no. 1 to TDC position. ➔ [page 167](#)
- Remove lower toothed belt guard ➔ [page 187](#).
- Loosen plug and securing bolt for camshaft adjuster on inlet side ➔ [page 226](#).



### Note

- ◆ *If a used toothed belt runs in the opposite direction when it is refitted, it may break.*
- ◆ *Before removing, mark direction of rotation of toothed belt with chalk or felt-tipped pen for re-installation.*
- Loosen bolt -1- with tool insert -T10500-.



- Release tension on tensioning roller at eccentric -2- using wrench -T10499A-.



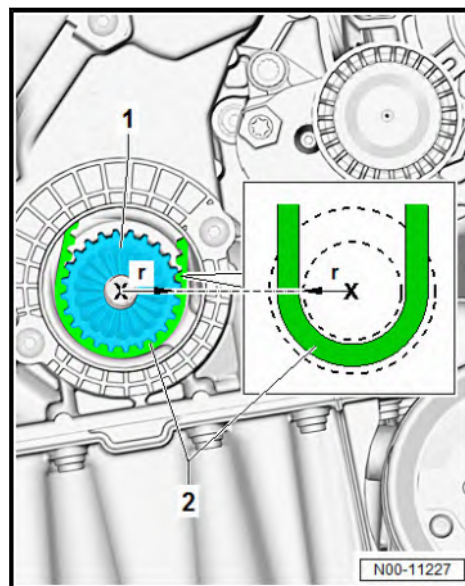
### NOTICE

**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  $r = 25 \text{ mm}$ .



## Bend radius of toothed belt



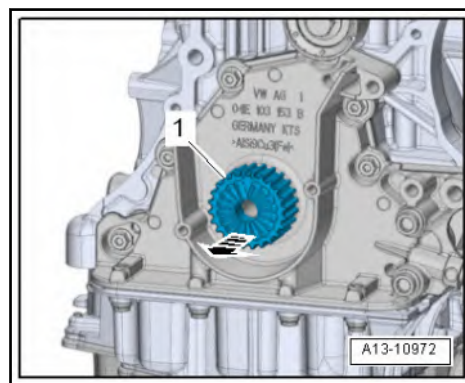
- The bend radius -r- on the toothed belt -2- should therefore never be below 25 mm (approx. half the diameter of gear -1- on crankshaft).



### Note

*The contact points between the toothed belt and components - such as camshaft pulleys, tensioning roller and idler pulley - must be kept free of oil.*

- Remove toothed belt.
- Remove crankshaft pulley -1- in -direction of arrow- from crankshaft.



## Installing



### Note

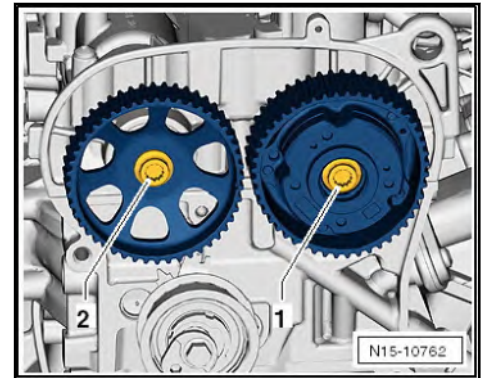
- ♦ *Renew bolts that are tightened with turning further angle.*
- ♦ *Renew the damaged O-ring of the plug at the toothed belt pulley of the inlet camshaft.*
- Check “TDC” position of camshaft and crankshaft ➔ [page 167](#).



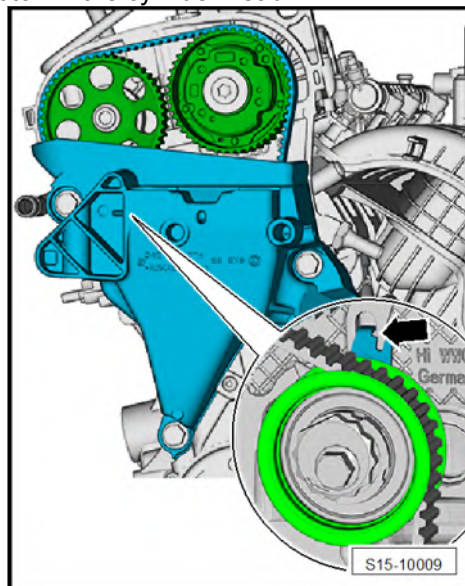
#### Note

*Before installing the camshaft adjusters, ensure that the guide sleeves are inserted in the camshafts.*

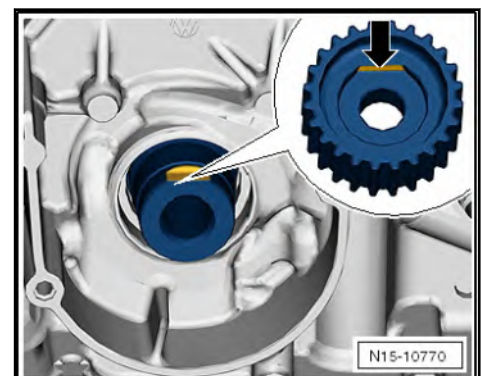
- Renew bolts -1- and -2- for camshaft pulleys and screw them in loosely.



- It should just be possible to turn the adjusters on the camshafts but no rocking is permissible.
- The sheet-metal tab -arrow- of the tensioning roller must engage in the cast notch in the cylinder head.



- Fit crankshaft sprocket onto crankshaft.



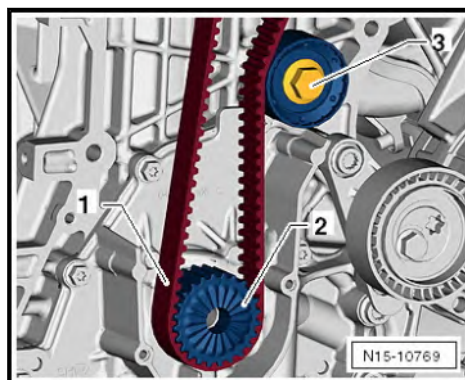


- The contact surface crankshaft pulley and crankshaft must be free of oil and grease.
- The contact surface -arrow- of the crankshaft pulley must be positioned on the machined surface of the crankshaft journal.

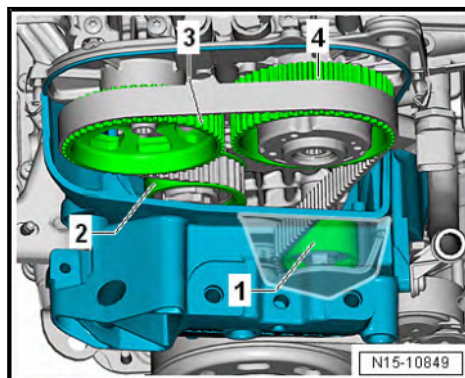
**Fit toothed belt in prescribed sequence:**

Note the arrow for the correct direction of rotation when installing the old toothed belt.

- Fit toothed belt -1- onto crankshaft pulley -2-.

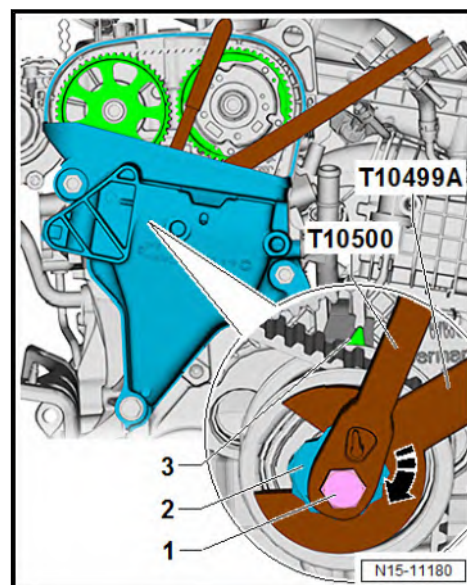


- Pull toothed belt upwards, and fit it on idler pulley -1-, tensioning roller -2- and camshaft pulleys -3- and -4-.



- Using special wrench -T10499A-, rotate eccentric -2- of tensioning roller in -direction of arrow- until adjustment pointer -3- is located approx. 10 mm to the right from adjustment window.





- Turn eccentric adjuster back until adjustment indicator is positioned exactly in adjustment window.



#### Note

- ◆ *Torque wrench -VAS 6583A- must be used for tightening.*
- ◆ *Use torque wrench only together with insert tool -T10500-.*
- ◆ *When setting the specified torque on the torque wrench -VAS 6583-, note that the length indicated on insert tool -T10500- must be entered in the torque wrench.*
- Hold eccentric in that position and tighten bolt -1- to 25 Nm. To do this, use insert tool -T10500- with torque wrench -VAS 6583A-.



#### Note

*Turning the engine further or running the engine may lead to slight differences in the position of the adjustment indicator -3- in relation to the adjustment window. This does not affect the toothed belt tension.*

- Tighten securing bolt for inlet camshaft adjuster to specified initial torque. ➔ [page 229](#)
- Tighten securing bolt for toothed belt pulley to specified initial torque. ➔ [page 234](#)

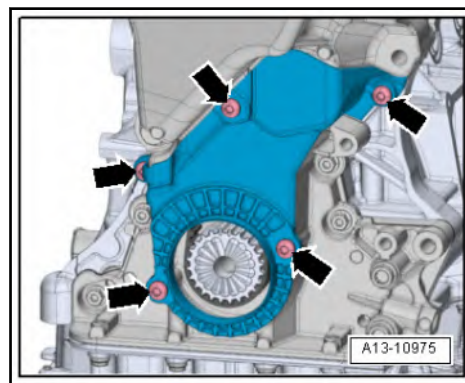


#### Note

*The securing bolts must not be tightened to the final specified torque (turning further angle) until the valve timings have been checked and are OK.*

- Install lower toothed belt guard -arrows-.





- Install vibration damper ⇒ [page 123](#) .
- Adjust valve timing ⇒ [page 207](#) .

Continue installation in reverse order of removal. During this procedure, observe the following:

- Add coolant ⇒ [page 287](#) .

### Specified torques

- Bolt for crankshaft pulleys ⇒ [o1.1 verview - poly V-belt drive", page 107](#)
- Bolt for toothed belt guard ⇒ [o2.1 verview - toothed belt cover", page 184](#)
- Rollers and toothed belt pulleys ⇒ [o2.2 verview - toothed belt", page 184](#)
- Bolt for ignition coil with output stage ⇒ [o1.1 verview - ignition system", page 424](#)
- Plug for hole in cylinder block ⇒ [page 186](#)
- Plug on camshaft housing ⇒ [o1.2 verview - camshaft housing", page 172](#)
- Bolts for cover of thermostat ⇒ [o2.1 verview - coolant pump, thermostat", page 300](#)
- Noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation

## 2.5 Preassembling and installing valve timing tool

⇒ [v2.5.1 alve timing tool", page 194](#)

⇒ [t2.5.2 est toolVAS 611 007", page 198](#)

⇒ [i2.5.3 n test toolVAS 611 007 electronically and performing basic setting", page 200](#)

### 2.5.1 Preassembling valve timing tool

Special tools and workshop equipment required



- ◆ Tester for checking elongation of chain links -VAS 611 007-



- ◆ Adapter set -VAS 611 007/18- (not shown)

Test tool -VAS 611 007-:

A - Angle sensor -VAS 611 007/1-

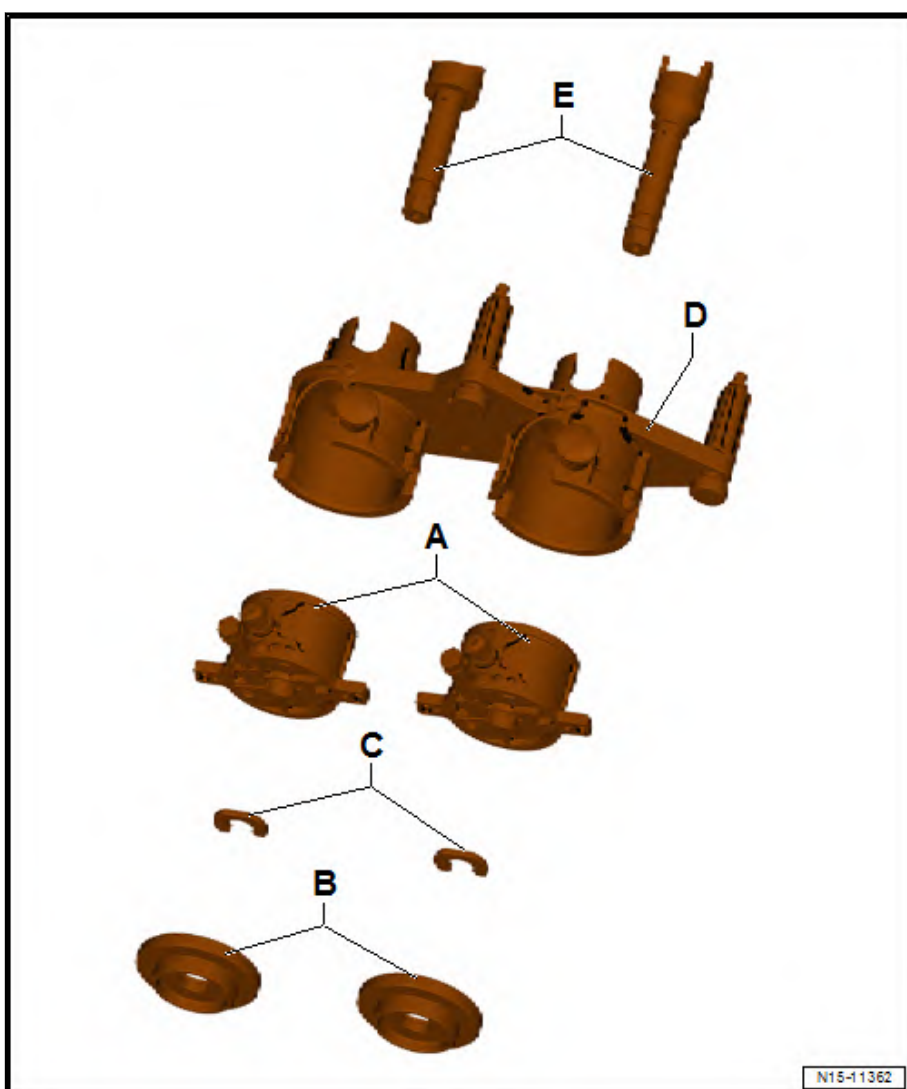
B - Lock ring -VAS 611 007/2-

C - Clamping ring -VAS 611 007/3-

D - Adapter for camshaft housing -VAS 611 007/11- for 1.0 and 1.6 l MPI engines

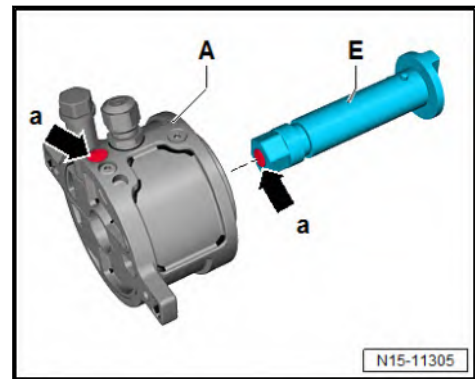
E - Adapter for angle sensor -VAS 611 007/12- and adapter for angle sensor -VAS 611 007/13-

- ☐ Adapter for angle sensor -VAS 611 007/12- blue, for inlet camshaft
- ☐ Adapter for angle sensor -VAS 611 007/13- red, for exhaust camshaft





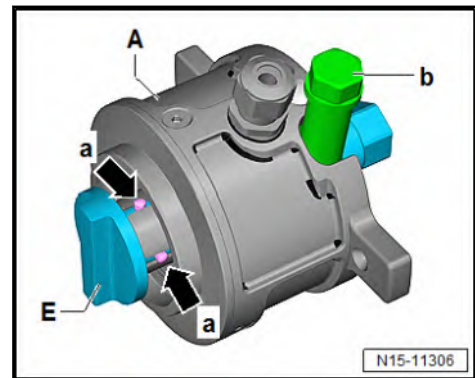
### Preassembling test tool -VAS 611 007-:



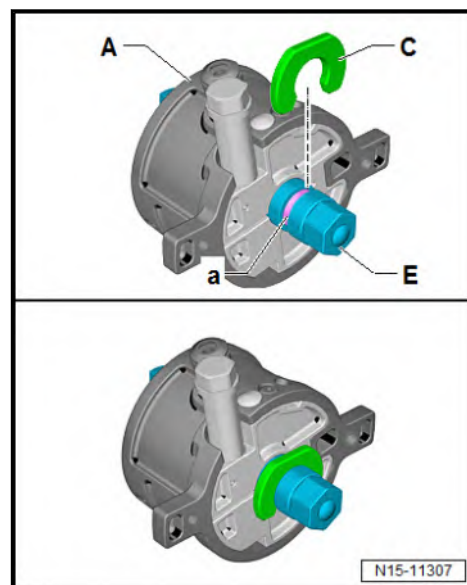
#### Note

*The shape of the adapter for angle sensor -E- may differ depending on the engine.*

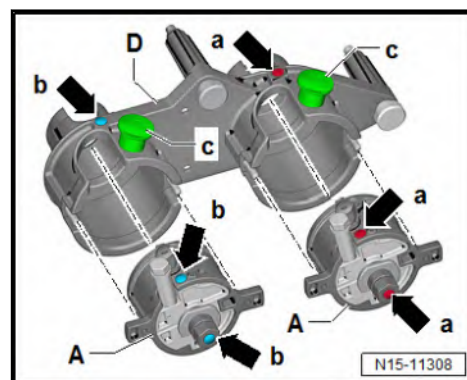
- Before inserting adapter for angle sensor -VAS 611 007/12- and adapter for angle sensor -VAS 611 007/13- -E- in angle sensors -VAS 611 007/1- -A-, verify correct allocation in accordance with colour coding -a-.
- Insert adapter for angle sensor -VAS 611 007/912- and adapter for angle sensor -VAS 611 007/13- -E- in angle sensors -VAS 611 007/1- -A-.
- Note position of dowel pins -a- when installing.



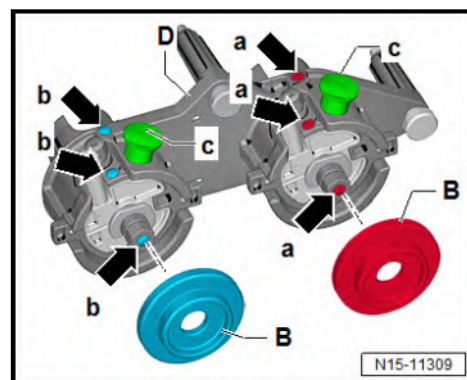
- The adapters for angle sensor -VAS 611 007/12- and -VAS 611 007/13- -E- can only be fitted in one position.
- Make sure that brake -b- is released. Do not apply force.
- Insert adapters for angle sensor -VAS 611 007/12- and -VAS 611 007/13- -E- to stop into angle sensor -VAS 611 007/1- -A-.
- Fit clamping ring -VAS 611 007/3- -C- in groove -a- of adapter for angle sensor -VAS 611 007/12- and -VAS 611 007/13- -E-, and clip it in until it can be heard to engage.



- Insert angle sensor -VAS 611 007/1- -A- with the red colour coding on the side marked in red -arrows a- of adapter for camshaft housing -VAS 611 007/11- -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 the procedure with the angle sensor -VAS 611 007/1- -A- with blue colour coding -arrows b-.
- Screw in securing rings -VAS 611 007/2- -B- approx. 2 turns.



- Note colour coding -arrows a- and -arrows b- when doing this.



- Make sure that the shafts are free to move. It must be possible to turn adapter for angle sensor -VAS 611 007/12- and -VAS 611 007/13- -E-.

## 2.5.2 Installing test tool -VAS 611 007-

### Special tools and workshop equipment required

- ♦ Tester for checking elongation of chain links -VAS 611 007-



### Procedure

- Preassemble test tool -VAS 611 007- ➔ [page 196](#) .
- Teach in test tool -VAS 611 007- electronically, and perform basic setting ➔ [page 200](#) .
- Turn the two adapter for angle sensor -VAS 611 007/12- and -VAS 611 007/13- in such a way that the display shows approx. »0°«.

### Polo 2014, LHD vehicles, Polo Saloon RUS 2016:

- Remove brake master cylinder ➔ Brake system; Rep. gr. 47; Brake servo/brake master cylinder; Removing and installing brake master cylinder.

### Continued for all vehicles:

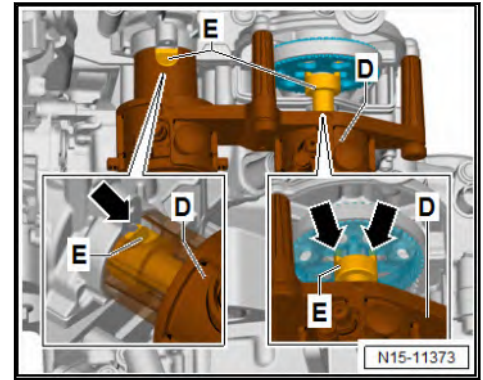
- Perform the preliminary work for checking the valve timing ➔ [v2.6 alve timing](#), [page 203](#) .
- Make sure that the piston in cylinder no. 1 is at "TDC" position for repair work on toothed belt drive ➔ [page 167](#) .
- Make sure that brakes on angle sensor -VAS 611 007/1- are released on both sides ➔ [page 196](#) .



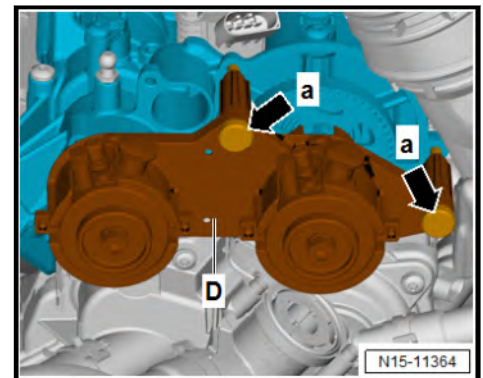
### Note

*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 611 007/11- -D- to camshaft housing, and slide it on.

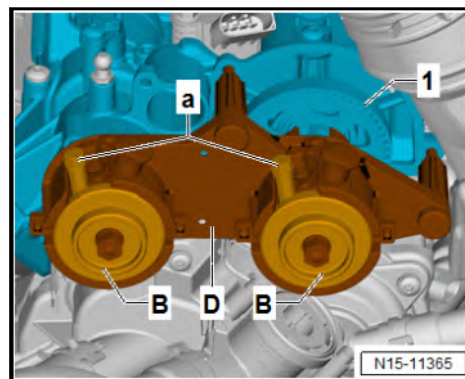


- Tighten knurled screws -arrows a- alternately by hand.
- Make sure that adapter for camshaft housing -VAS 611 007/11- -D- is properly seated.

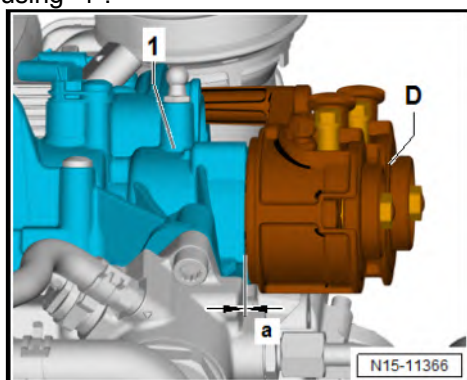
### **i** Note

- ◆ *If camshaft housing adapter -VAS 611 007/8- -D- touches the housing of the coolant pump, the basic setting of the coolant pump is incorrect.*
- ◆ *In this case, correct adjustment or testing of the valve timing is not possible.*
- ◆ *The coolant pump must be removed and readjusted ➔ [page 304](#).*
- 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 196](#).
- Tighten locking ring -VAS 611 007/2- -B- on both sides evenly by hand. When doing this, ensure that camshaft housing adapter -VAS 611 007/11- -D- always lies flat against camshaft housing -1-.



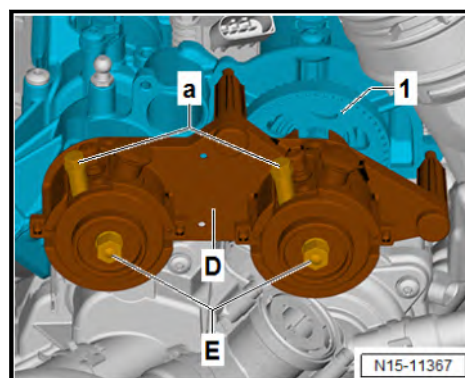


- Camshaft housing adapter -VAS 611 007/11- -D- should not lift off of camshaft housing -1-.



#### Note

- ◆ The correct preload is achieved when the camshaft housing adapter -VAS 611 007/11- lies flat against the camshaft housing.
  - ◆ If the locking ring -VAS 611 007/2- is tightened too much, the camshaft housing adapter -VAS 611 007/11- will lift off of the camshaft housing. This will falsify the result of the measurement.
- Make sure that brakes -a- are released on both sides.



### 2.5.3 Teaching in test tool -VAS 611 007- electronically and performing basic setting

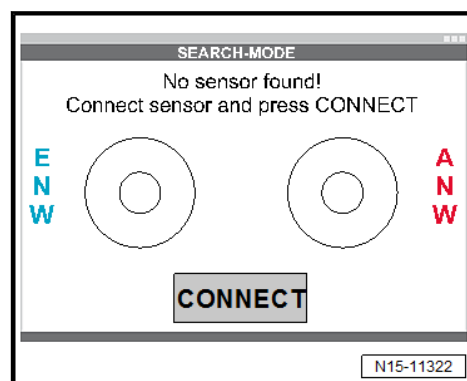
Special tools and workshop equipment required



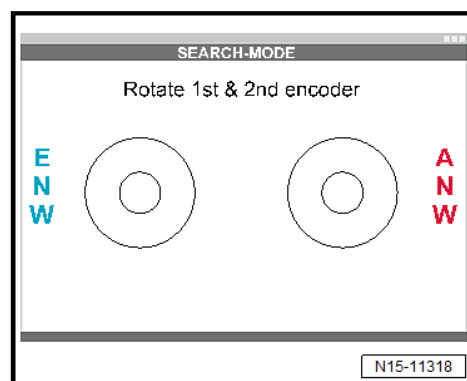
◆ Tester for checking elongation of chain links -VAS 611 007-



- 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 the angle sensors are not connected, the message shown in the illustration is displayed.



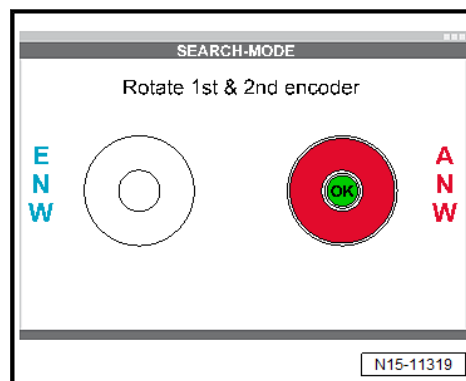
- Connect test tool -VAS 611 007-, and press **CONNECT**.
- If the test tool -VAS 611 007- is connected, the display is as shown in the illustration.



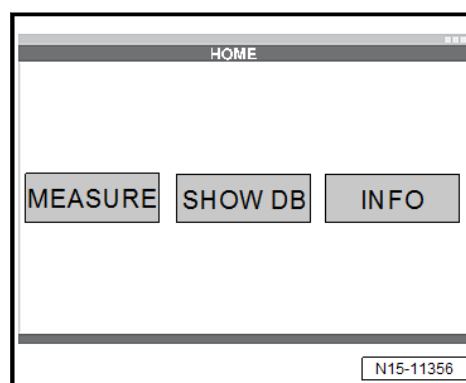
ANW - Exhaust camshaft, red

ENW - Inlet camshaft, blue

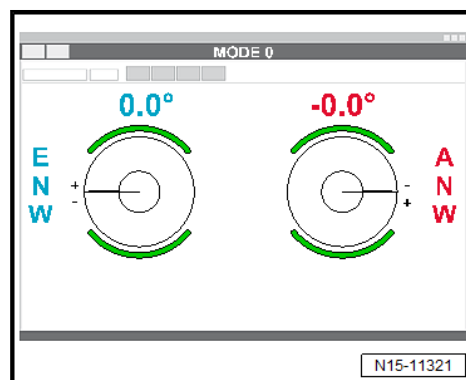
- Turn adapter for angle sensor -VAS 611 007/13- -E- of exhaust camshaft.



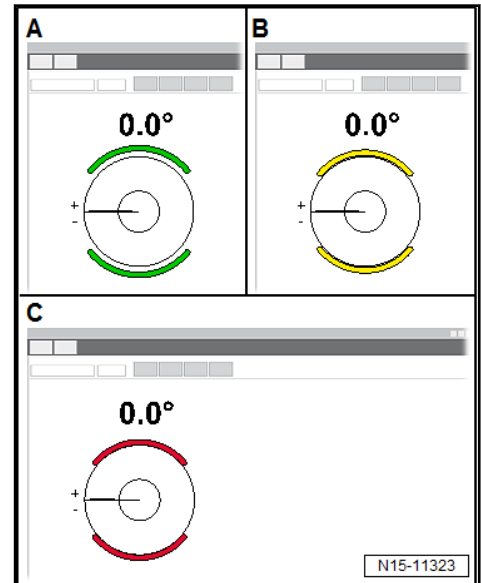
- If »OK« is displayed, the exhaust camshaft has been taught-in.
- Turn adapter for angle sensor -VAS 611 007/12- -E- of inlet camshaft.
- If the display is as shown in the illustration, the exhaust camshaft has been taught-in.



- Select function **MEASURE**.
- When the angle display appears, the valve timing can be checked or adjusted ⇒ [page 203](#) .



- Make sure that the brake indicator on the display is »green«.



- Display must not be »yellow« or »red«.
- A - »Green«, brake is released
- B - »Yellow«, brake is applied
- C - »Red«, brake has been tightened to final torque

## 2.6 Checking valve timing

### Special tools and workshop equipment required

- ◆ Tester for checking elongation of chain links -VAS 611 007-

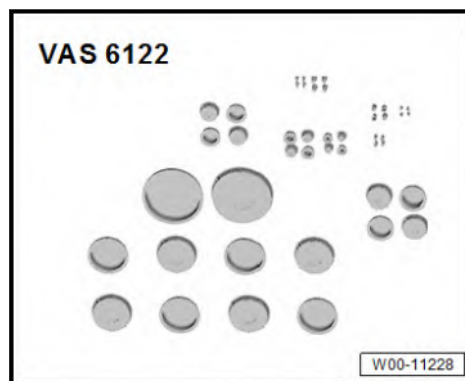


- ◆ Adapter set -VAS 611 007/18- (not shown)
- ◆ Locating bolt -T10340-



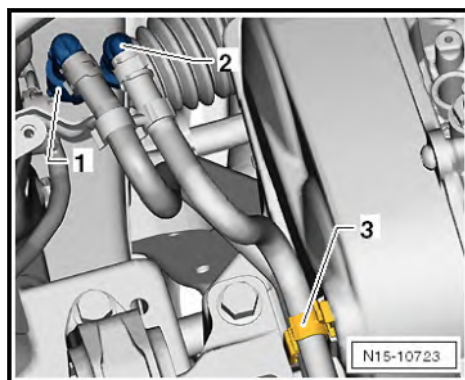


♦ Engine bung set -VAS 6122-

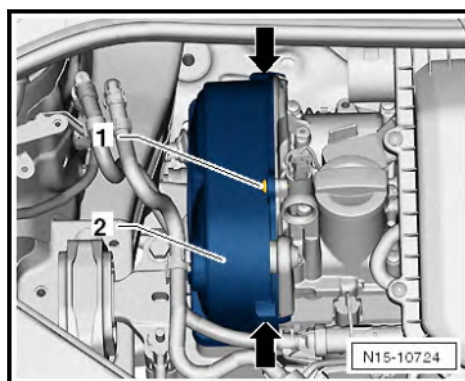


**Preliminary work for the procedure:**

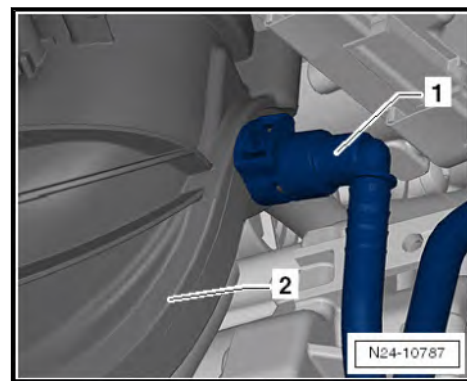
- Remove air filter housing ➔ [page 366](#) .
- Release and pull off fuel supply line -1- and breather line -2- ➔ Rep. gr. 20; Plug-in connectors; Disconnecting plug-in connectors.



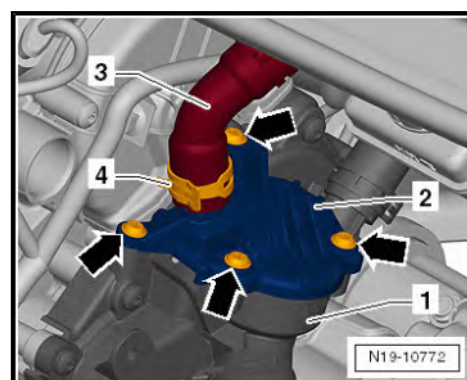
- Open line guide -3- and remove hoses.
- Seal lines so that fuel system is not contaminated by dirt.
- Detach clips -arrows-.



- Unscrew securing bolt -1-, and detach cover -2-.
- Remove vacuum line -1- from intake manifold -2-.

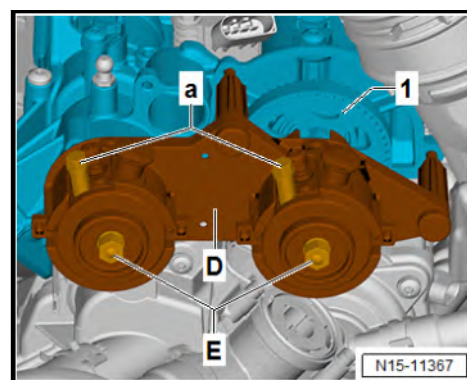


- Lay vacuum line to one side.
- Loosen clamp -4- and disconnect hose -3-.



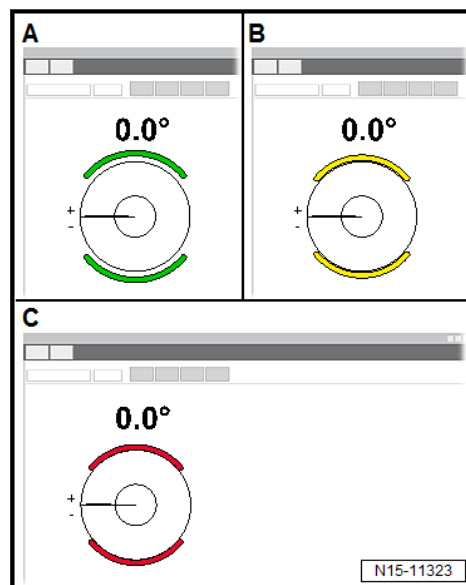
- Unscrew bolts -arrows-.
- Detach cover -2-.
- Set piston in cylinder no. 1 to “TDC” position for repair work on toothed belt drive ➔ [page 167](#) .
- Preassemble test tool -VAS 611 007- ➔ [page 194](#) .
- Install test tool -VAS 611 007- ➔ [page 198](#) .

#### Checking valve timing:

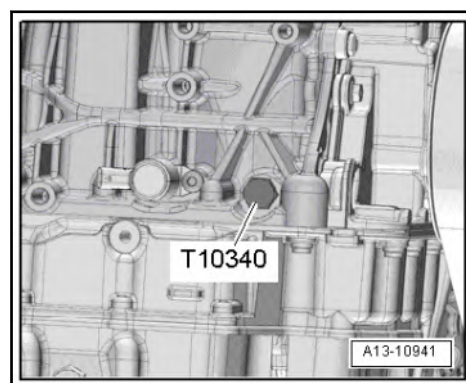


- Make sure that brakes -a- on test tool -VAS 611 007- are released on both sides.
- Make sure that the brake indicator on the display is »green« -A-.

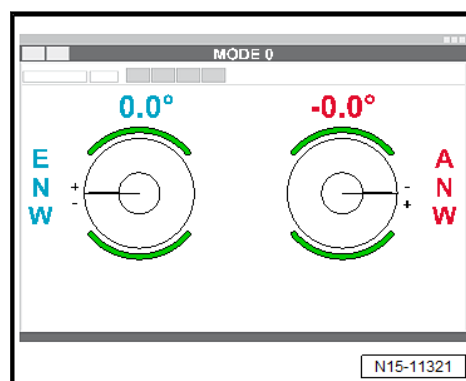




- Display must not be »yellow« or »red«.
- Unscrew locking pin -T10340-.



- Turn crankshaft 2 turns in direction of rotation of engine.
- Screw in locking pin -T10340-.
- Set piston for cylinder no. 1 to »TDC« position ➤ [page 167](#) .
- Read valve timing angles on display, and compare values with specifications.



Specified angle in °	Inlet camshaft	Exhaust camshaft
	-0.2°±1.5°	0.7°±1.5°



#### Note

- ◆ *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 the valve timing is not OK, adjust valve timing ⇒ [page 207](#).

Assemble in reverse order of dismantling. The following should be observed:

- Add coolant ⇒ [page 287](#).
- Install air filter housing ⇒ [page 366](#).



#### Note

*Renew bolts that are tightened with turning further angle.*

- Renew O-rings, seals and gaskets after each removal.

#### Specified torques

- ◆ ⇒ [o2.2 verview - toothed belt", page 184](#)
- ◆ ⇒ [Fig. "“Plug for TDC drilling in cylinder block - specified torque”", page 186](#)
- ◆ ⇒ [o1.2 verview - camshaft housing", page 172](#)
- ◆ ⇒ [o2.1 verview - coolant pump, thermostat", page 300](#)
- ◆ ⇒ Brake system; Rep. gr. 45; Control unit and hydraulic unit; Assembly overview - control unit and hydraulic unit
- ◆ ⇒ Brake system; Rep. gr. 47; Brake servo/brake master cylinder, Assembly overview - brake servo/brake master cylinder

## 2.7 Adjusting valve timing

### Special tools and workshop equipment required

- ◆ Tester for checking elongation of chain links -VAS 611 007-



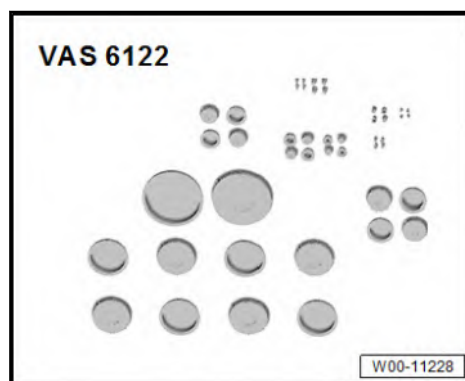
- ◆ Adapter set -VAS 611 007/18- (not shown)



◆ Locating bolt -T10340-



◆ Engine bung set -VAS 6122-



### Procedure

- Toothed belt installed.
- Check valve timing ⇒ [page 203](#) .
- Do not relieve tension from toothed belt, and do not remove toothed belt from camshafts when adjusting valve timing. Only loosen camshaft adjuster.
- Loosen camshaft adjuster on inlet side ⇒ [page 227](#) .
- Loosen toothed belt sprocket on exhaust side ⇒ [page 232](#) .

### NOTICE

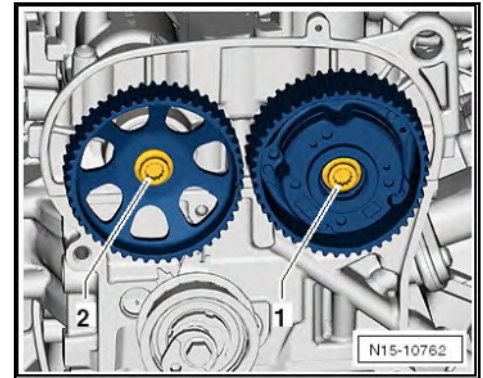
**Risk of damage to engine caused by incorrect valve timing.**

- Do not turn crankshaft out of TDC position.



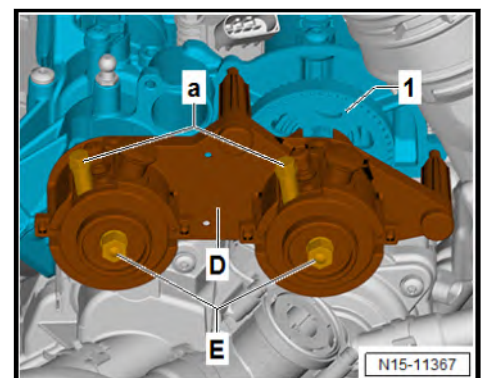
### Note

- ◆ *The contact points between the toothed belt and components - such as camshaft pulleys, tensioning roller and idler pulley - must be kept 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.*
- Place a cloth under the camshaft adjusters and over tensioning roller to catch the engine oil which runs out.
- Make sure that the piston of cylinder no. 1 is at “TDC” position for repair work on toothed belt drive ⇒ [page 167](#) .
- Renew bolts -1- and -2- and screw in loosely ⇒ [page 226](#) .

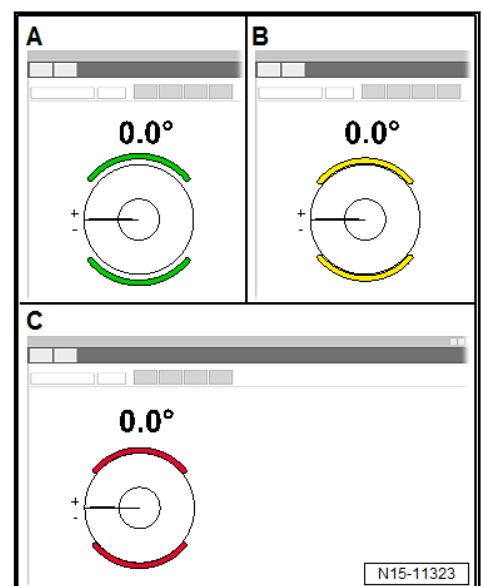


- It must still be possible to turn camshaft adjusters on camshafts.

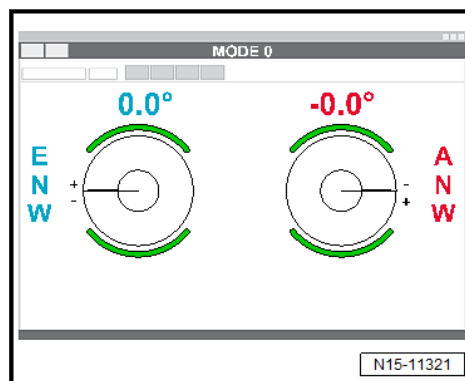
**Setting camshafts to »0°«:**



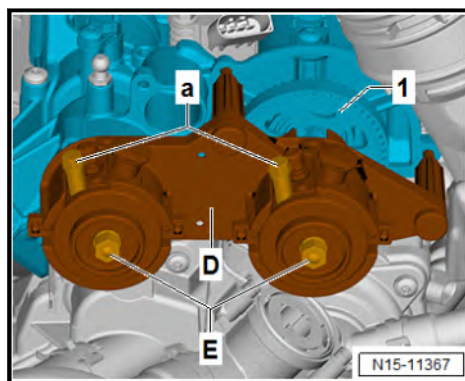
- Make sure that bolts -a- for brakes on test tool -VAS 611 007- are released on both sides.
- Make sure that the brake indicator on the display is »green« -A-.



- Display must not be »yellow« or »red«.
- Set both camshafts to »0.0°«.



- To do this, turn camshafts with adapter for angle sensor -VAS 611 007/12- and -VAS 611 007/13- -E-.

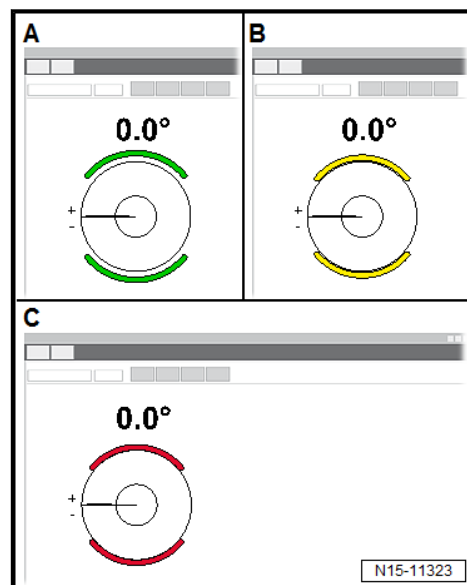


- Hold camshafts in »0.0°« position using adapters for angle sensor -VAS 611 007/12- and -VAS 611 007/13- -E- and a hexagon key.

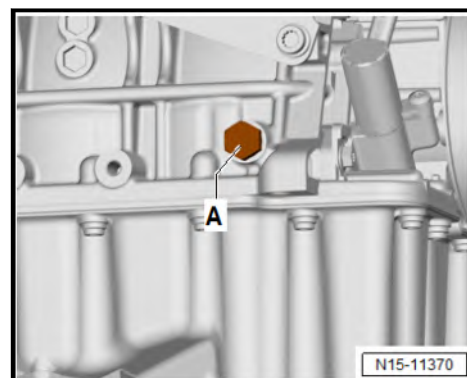


#### Note

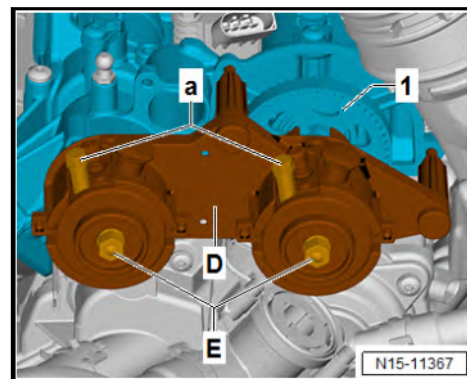
- ◆ *The camshafts tend to turn.*
- ◆ *Use a hexagon key to hold the camshafts in »0.0°« position.*
- ◆ *Always remove the hexagon key after the camshafts have been tightened.*
- Tighten brakes after adjustment has been completed.
- Tighten bolts -a- for brakes on test tool -VAS 611 007- to 11 Nm on both sides.
- Make sure that the brake indicator on the display is »red« -C-.



- Display must not be »yellow« or »green«.
- Unscrew locking pin -T10340- -A-.

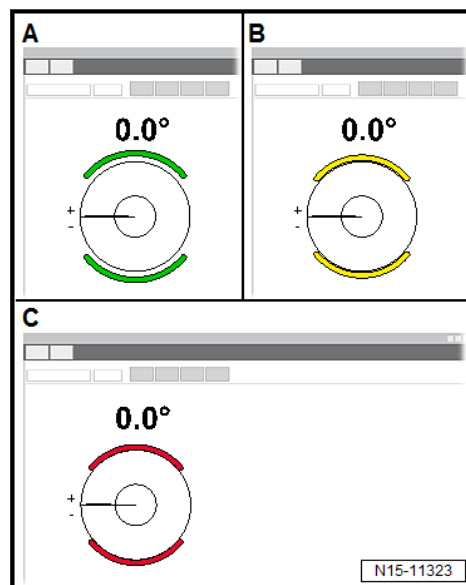


- Tighten camshaft adjuster on inlet camshaft to specified initial torque ⇒ [page 229](#) .
- Tighten toothed belt sprocket of exhaust camshaft to specified initial torque ⇒ [page 229](#) .
- Make sure that brakes -a- on test tool -VAS 611 007- are released on both sides.

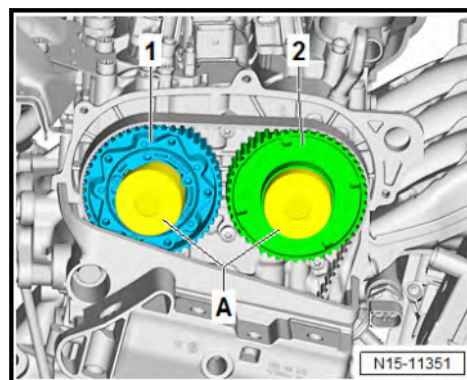


- Make sure that the brake indicator on the display is »green« -A-.





- Display must not be »yellow« or »red«.
- Seal camshaft adjusters -2-, as shown, using suitable plugs -A- from engine bung set -VAS 6122-.

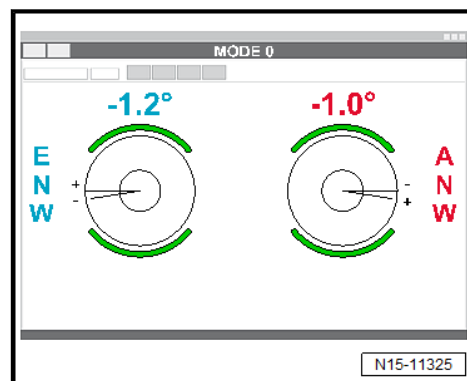


- Fit a piece of paper into plugs to catch the engine oil.
- Insert plugs into camshaft adjusters with the open side facing towards front, as shown in illustration.
- Turn crankshaft 2 turns in direction of rotation of engine.

#### Determining correction angle:

- Screw in locking pin -T10340-.
- Set piston for cylinder no. 1 to »TDC« position ➔ [page 167](#) .
- Read valve timing on display and write down values.

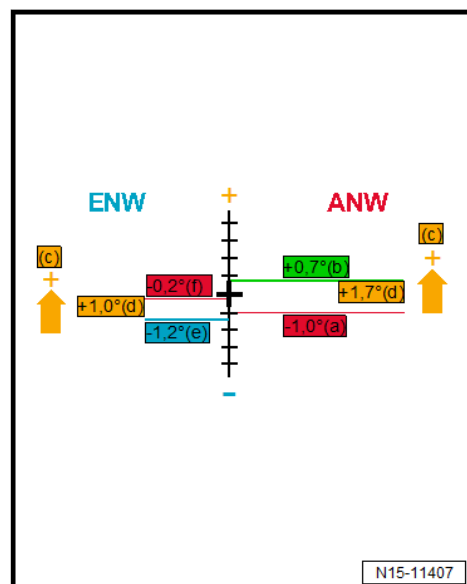
#### 1. measurement example: value reading on display



#### 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.
- ◆ The difference between the actual value (read after 2 full revolutions of the engine) and the specification is calculated.
- ◆ The result is the correction angle to be set, with the corresponding algebraic sign/direction of rotation.

#### Example



Index	Explanation
e	Inlet camshaft - actual value (after 2 full revolutions of the engine)
f	Inlet camshaft - specification (+/- tolerance)
c	Direction of correction (+/-)



Index	Explanation
d	Correction value - correction angle
a	Exhaust camshaft - actual value (after 2 full revolutions of the engine)
b	Exhaust camshaft - specification (+/- tolerance)

Angle in °	Inlet camshaft	Exhaust camshaft
Specified value	$-0.2^{\circ} \pm 1.5^{\circ}$	$0.7^{\circ} \pm 1.5^{\circ}$

- Set determined correction angle for camshafts.

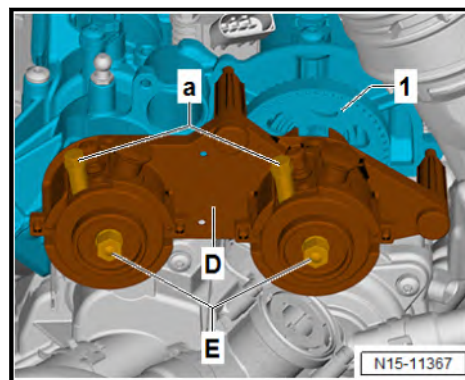
#### Setting valve timing with correction angle:

- Place a cloth underneath camshaft adjuster to catch any engine oil which runs out.
- Remove plugs taken from engine bung set -VAS 6122- from camshaft adjuster.
- 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 inlet side ➔ [page 227](#) .
- Loosen toothed belt sprocket on exhaust side ➔ [page 232](#) .

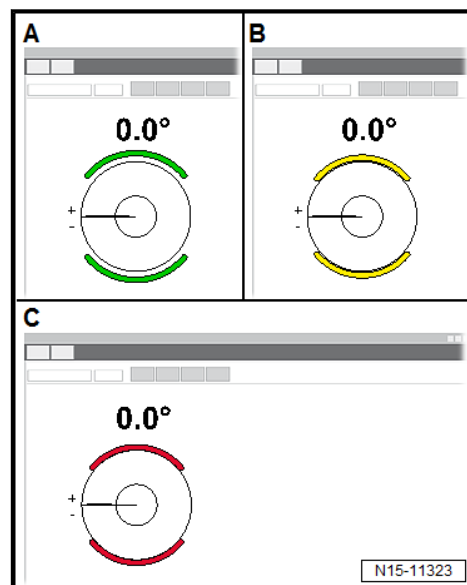
#### NOTICE

##### Risk of damage to engine caused by incorrect valve timing.

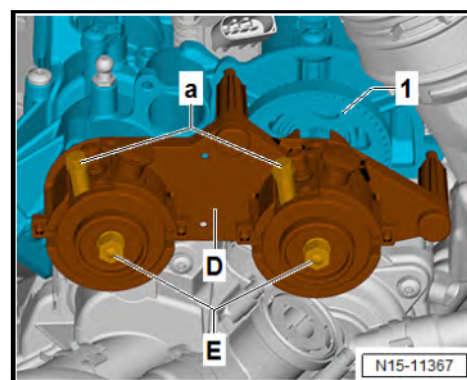
- Do not turn crankshaft out of TDC position.
- Make sure that the piston in cylinder no. 1 is at “TDC” position for repair work on toothed belt drive ➔ [page 167](#) .



- Make sure that bolts -a- for brakes on test tool -VAS 611 007- are released on both sides.
- Make sure that the brake indicator on the display is »green« -A-.

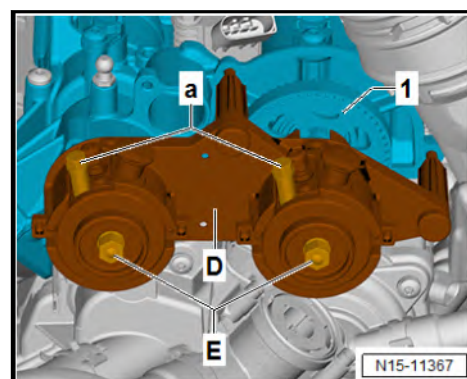


- Display must not be »yellow« or »red«.
- Set the two camshafts to the determined correction angle ➤ [page 212](#) .

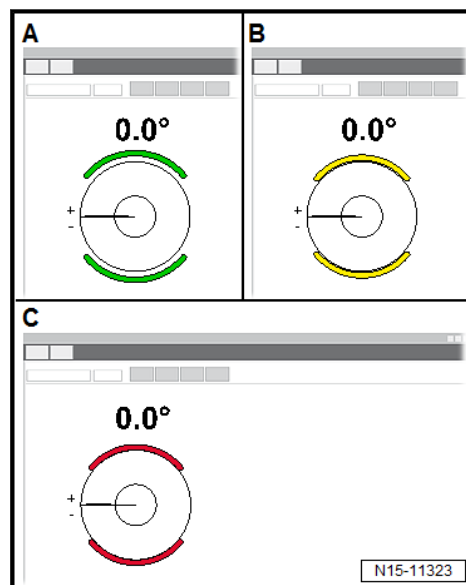


- To do this, turn camshafts with adapter for angle sensor -VAS 611 007/12- and -VAS 611 007/13- -E-.

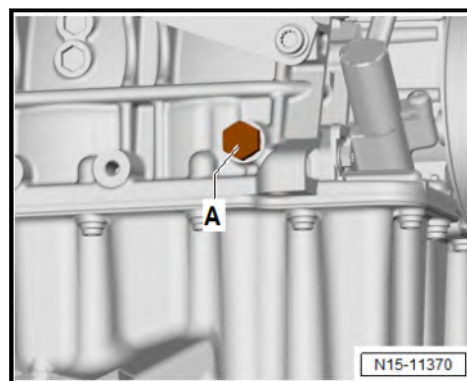
**If the valve timing has been set:**



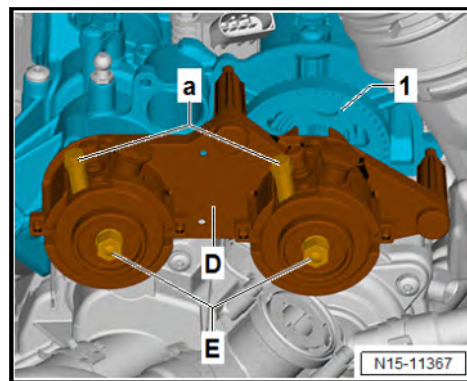
- Tighten bolts -a- for brakes on test tool -VAS 611 007- to 11 Nm on both sides.
- Make sure that the brake indicator on the display is »red« -C-.



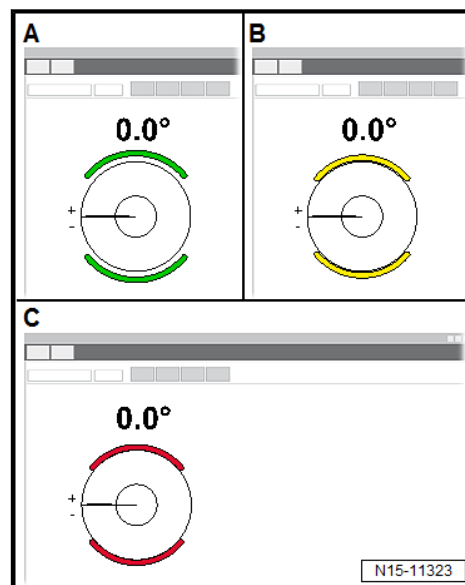
- Display must not be »yellow« or »green«.
- Unscrew locking pin -T10340- -A-.



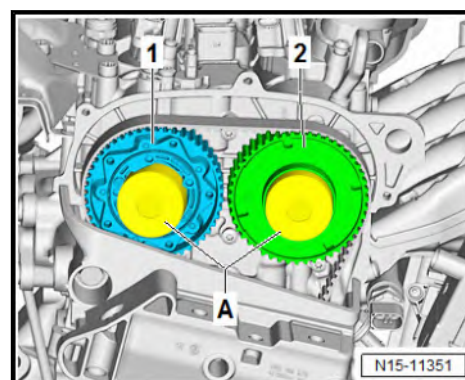
- Tighten camshaft adjuster on inlet camshaft to specified initial torque ➔ [page 229](#) .
- Tighten toothed belt sprocket of exhaust camshaft to specified initial torque ➔ [page 229](#) .
- Release brakes -a- on test tool -VAS 611 007- on both sides.



- Make sure that the brake indicator on the display is »green« -A-.



- Display must not be »yellow« or »red«.
- Seal camshaft adjusters -2- again, as shown, using suitable plugs -A- from engine bung set -VAS 6122-.



- Fit a new piece of paper into plugs -A- to catch the engine oil.
- Turn crankshaft 2 turns in direction of rotation of engine.
- Screw in locking pin -T10340-.
- Set piston for cylinder no. 1 to »TDC« position ➤ [page 167](#) .
- Check valve timing ➤ [page 203](#) .

**! 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
$-0.2^{\circ} \pm 1.5^{\circ}$	$0.7^{\circ} \pm 1.5^{\circ}$

- If the valve timing is not OK, adjust valve timing again ➤ [page 207](#) .





Assembly is carried out in reverse sequence; note the following:

- Unscrew locking pin -T10340-.
- Make sure that brakes on test tool -VAS 611 007- are released on both sides.
- Tighten camshaft adjuster on inlet camshaft to specified final torque ⇒ [page 230](#) .
- Tighten toothed belt sprocket of exhaust camshaft to specified final torque ⇒ [page 230](#) .

#### Specified torques

- ♦ ⇒ [o2.2 verview - toothed belt", page 184](#)
- ♦ ⇒ [Fig. "“Plug for TDC drilling in cylinder block - specified torque”", page 186](#)
- ♦ ⇒ [o3.1 verview - valve gear", page 224](#)
- ♦ ⇒ [o3.1 verview - crankcase breather system", page 275](#)
- ♦ ⇒ [o2.1 verview - coolant pump, thermostat", page 300](#)

## 2.8 Removing toothed belt from camshaft

#### Special tools and workshop equipment required

- ♦ Torque wrench -VAS 6583A-, not illustrated
- ♦ Counterhold -T10172A- with adapter -T10172A/1- and -T10172A/2-

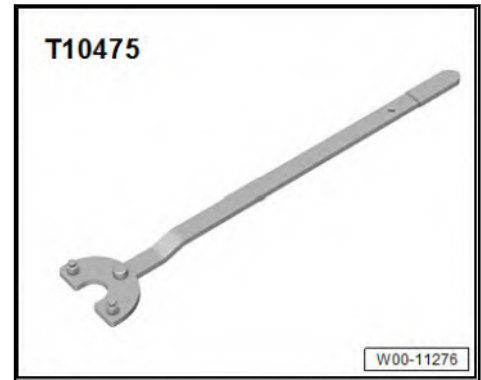


- ♦ Locating bolt -T10340-

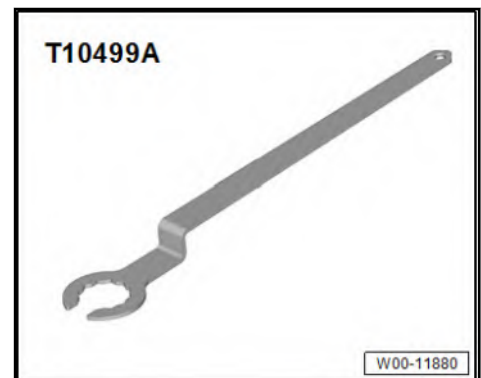




◆ Counter-hold tool -T10475-



◆ Special wrench, 30 mm -T10499A-



◆ Insert tool -T10500-



◆ Assembly tool -T10487-

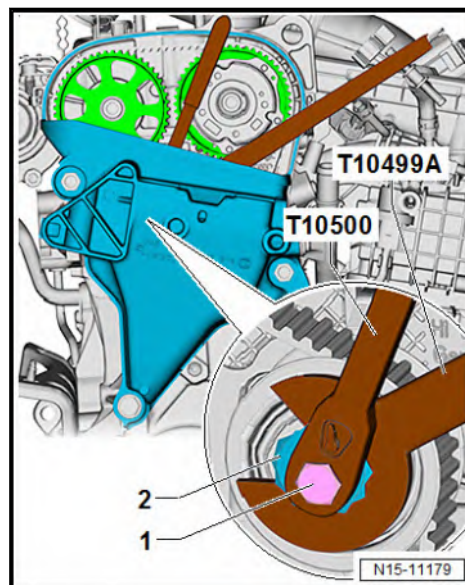


### Procedure

- Set piston in cylinder no. 1 to TDC position. ⇒ [page 167](#)
- Remove upper part of toothed belt guard ⇒ [page 186](#).
- Loosen securing bolt for camshaft adjuster on inlet side ⇒ [page 226](#).



- Loosen securing bolt of toothed belt pulley on exhaust side  
⇒ [page 232](#) .
- Loosen bolt -1- with tool insert -T10500-.



- Release tension on tensioning roller at eccentric -2- using wrench -T10499-.
- Remove toothed belt from camshaft pulleys.

#### Installing

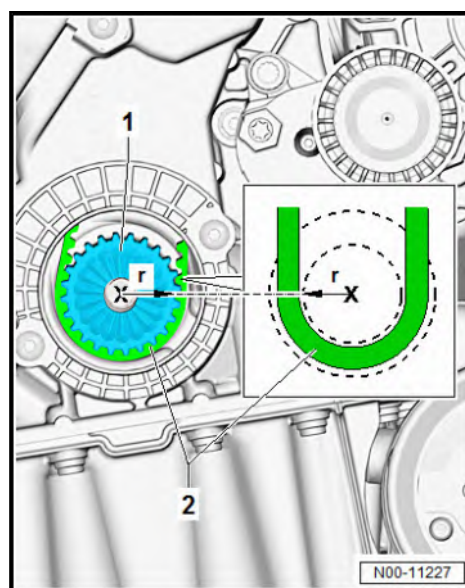


#### NOTICE

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  $r = 25 \text{ mm}$ .

#### Bend radius

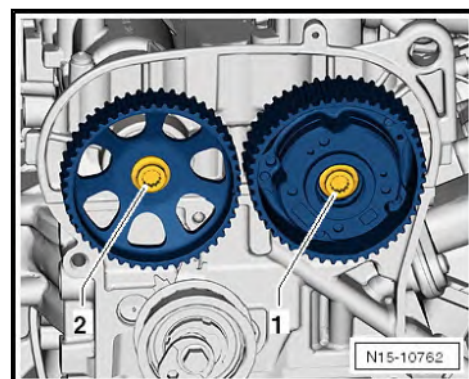


- The bend radius -r- on the toothed belt -2- should therefore never be below 25 mm (approx. half the diameter of gear -1- on crankshaft).

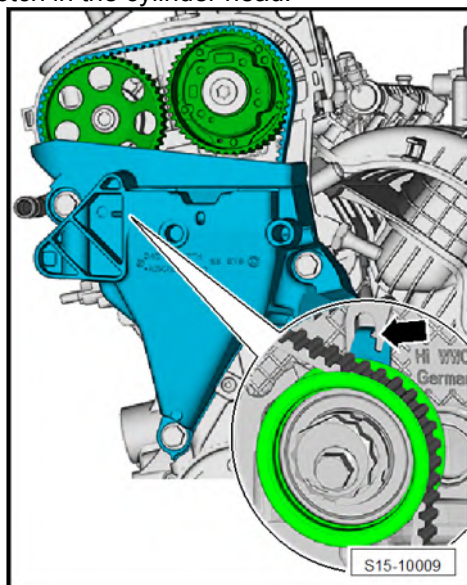


#### Note

- ◆ *Renew bolts that are tightened with turning further angle.*
- ◆ *Renew the damaged O-ring of the plug at the toothed belt pulley of the inlet camshaft.*
- Crankshaft is in "TDC" position ⇒ [page 167](#)
- Fit new bolts -1, 2- for camshaft pulleys, but do not tighten.

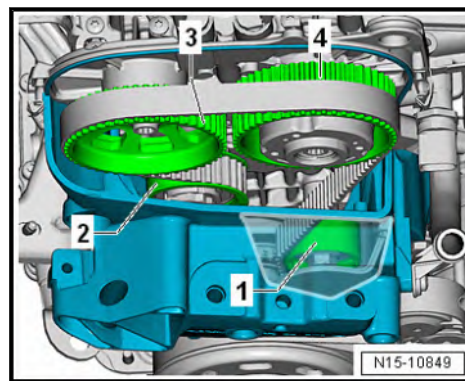


- It should just be possible to turn the adjusters on the camshafts but no rocking is permissible.
- The sheet-metal tab -arrow- of the tensioning roller must engage in the cast notch in the cylinder head.

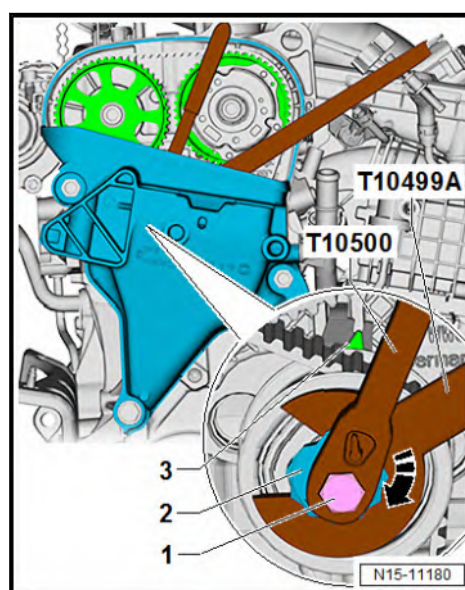


#### Fit toothed belt in prescribed sequence:

- Pull toothed belt upwards, and fit it on idler pulley -1-, tensioning roller -2- and camshaft pulleys -3- and -4-.



- Turn eccentric -2- of belt tensioner in -direction of arrow- using special wrench, 30mm -T10499A- until adjustment pointer -3- is located approx. 10 mm to the right from adjustment window.



- Turn eccentric adjuster back until adjustment indicator is positioned exactly in adjustment window.



#### Note

- ◆ *Torque wrench -VAS 6583A- must be used for tightening.*
- ◆ *Use torque wrench only together with insert tool -T10500-.*
- ◆ *When setting the specified torque on the torque wrench -VAS 6583A-, the length indicated on insert tool -T10500- must be entered in the torque wrench.*
- Hold eccentric in that position and tighten bolt -1- to 25 Nm. To do this, use insert tool -T10500- with torque wrench -VAS 6583A-.
- Hold eccentric in this position, and tighten bolt -1- to reduced specified torque of 12 Nm. To do this, use insert tool -T10500- with torque wrench -V.A.G 1410-.



#### Note

*Turning the engine further or running the engine may lead to slight differences in the position of the adjustment indicator -3- in relation to the adjustment window. This does not affect the toothed belt tension.*

- Adjust valve timing ⇒ [page 207](#) .



#### Note

*After completing work, make sure to remove the locking pin -T10340-.*

Continue installation in reverse order of removal.

#### Specified torques

- ◆ Bolt for toothed belt guard ⇒ [o2.1 verview - toothed belt cover", page 184](#)
- ◆ Rollers and toothed belt pulleys ⇒ [o2.2 verview - toothed belt", page 184](#)
- ◆ Plug for hole in cylinder block ⇒ [page 186](#)
- ◆ Thermostat ⇒ [o2.1 verview - coolant pump, thermostat", page 300](#)
- ◆ ⇒ [o1.1 verview - poly V-belt drive", page 107](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation





### **3 Valve gear**

⇒ [o3.1 verview - valve gear", page 224](#)

⇒ [a3.2 nd installing camshaft adjuster", page 226](#)

⇒ [a3.3 nd installing toothed belt pulley", page 231](#)

⇒ [a3.4 xial play of camshaft", page 236](#)

⇒ [a3.5 nd installing camshaft oil seal", page 237](#)

⇒ [a3.6 nd installing camshaft control valve 1N205", page 243](#)

⇒ [a3.7 nd installing valve stem seals", page 244](#)

#### **3.1 Assembly overview - valve gear**

⇒ [o3.1.1 verview - valves", page 224](#)

##### **3.1.1 Assembly overview - valves**



### 1 - Inlet valve

- ☐ Do not rework. Only lapping in is permitted.
- ☐ Valve dimensions  $\Rightarrow$  [page 255](#)
- ☐ Checking valve guides  $\Rightarrow$  [page 254](#)

### 2 - Outlet valve

- ☐ Do not rework. Only lapping in is permitted.
- ☐ Valve dimensions  $\Rightarrow$  [page 255](#)
- ☐ Checking valve guides  $\Rightarrow$  [page 254](#)

### 3 - Cylinder head

### 4 - Valve stem seal

- ☐ Renewing  $\Rightarrow$  [page 244](#)

### 5 - Valve springs

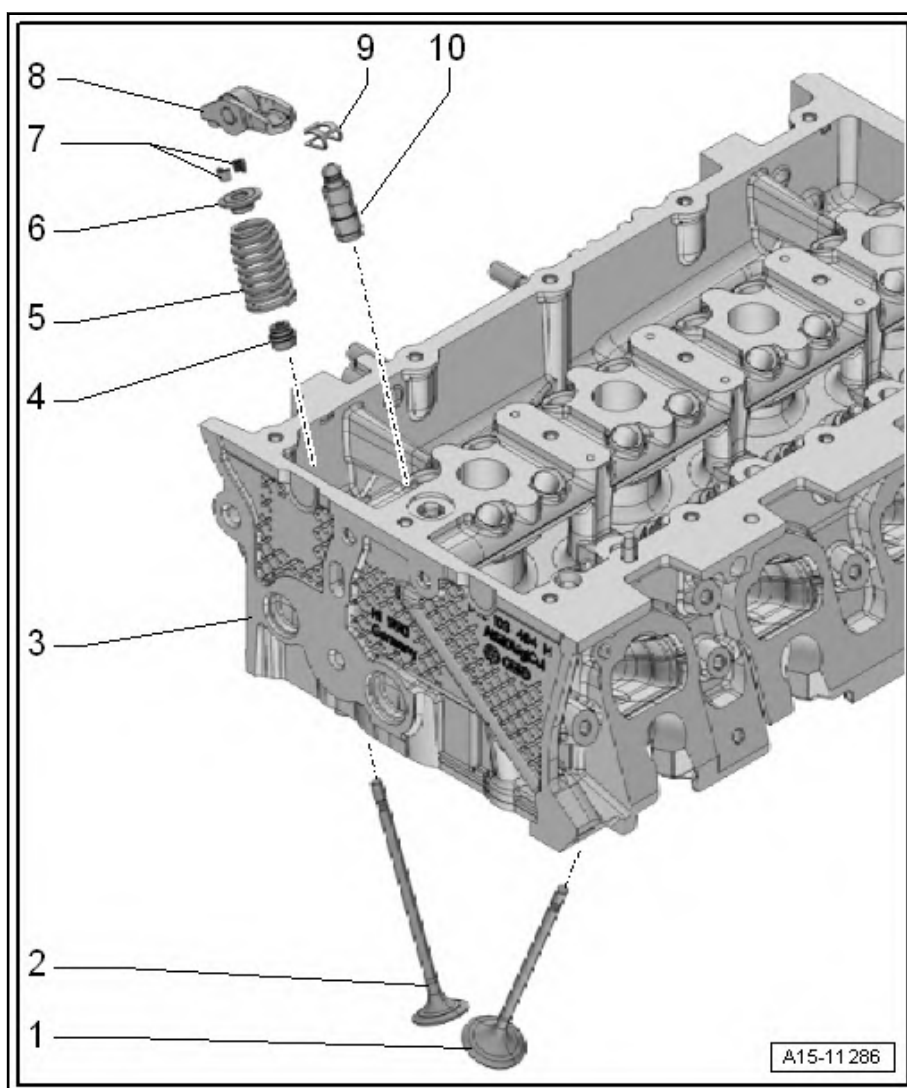
- ☐ Fitting position  $\Rightarrow$  [page 225](#)

### 6 - Valve spring plate

### 7 - Valve cotters

### 8 - Roller rocker fingers

- ☐ Removing and installing  $\Rightarrow$  [page 178](#)
- ☐ Mark installation position for re-installation.
- ☐ Check roller bearing for ease of movement.
- ☐ Lubricate contact surfaces before installing.



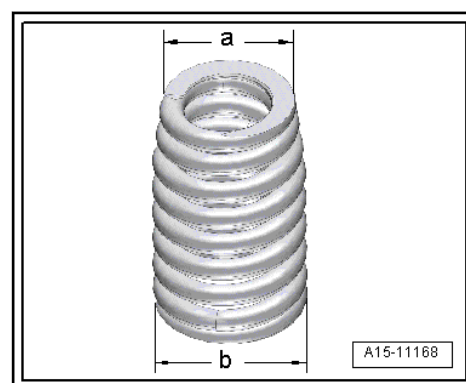
### 9 - Retaining clip

- ☐ For hydraulic compensation element.

### 10 - Hydraulic compensation element

- ☐ Do not interchange
- ☐ Oil contact surface

### Installation position of valve spring





- 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 Removing and installing camshaft adjuster

### Removing

#### Special tools and workshop equipment required

- ◆ Torque wrench -VAS 6583A-, not illustrated
- ◆ Counter-hold tool -T10554/1-

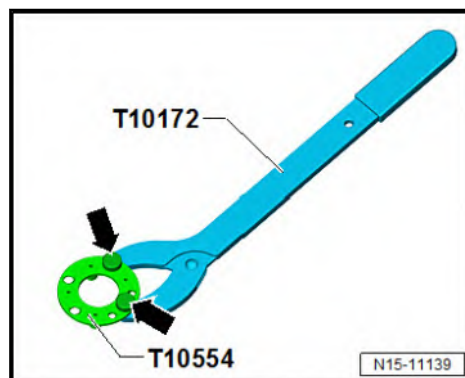


- ◆ Knurled screws -T10554/2- (not illustrated)
- ◆ Counter-hold tool -T10172A-



### Preparing tool

- Bolt on counter-hold tool -T10172- and counter-hold tool -T10554/1- using knurled screws -T10554/2- -arrows-.





## Procedure

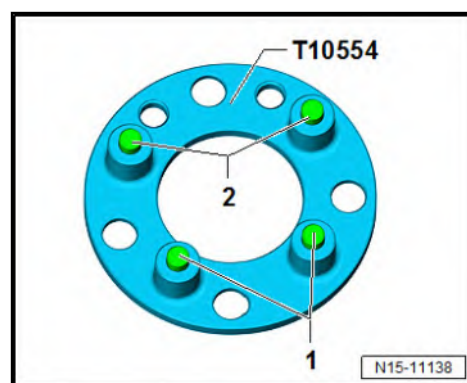
### Removing



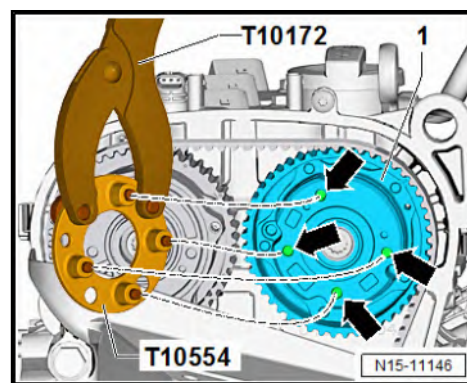
#### Note

- ◆ *Place a cloth under the camshaft adjuster and tensioning roller to catch the engine oil which runs out.*
  - ◆ *The contact points between the toothed belt and components - such as camshaft pulleys, tensioning roller and idler pulley - must be kept free of oil.*
- Remove toothed belt from camshafts ⇒ [page 218](#) .

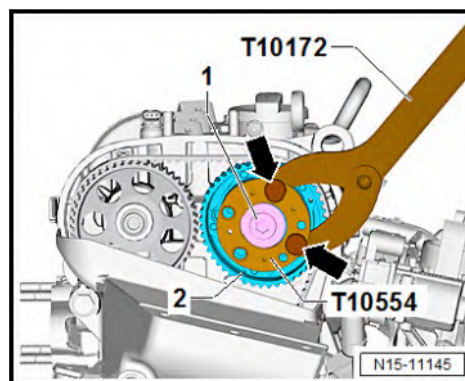
#### Fitting counter-hold tool -T10554-



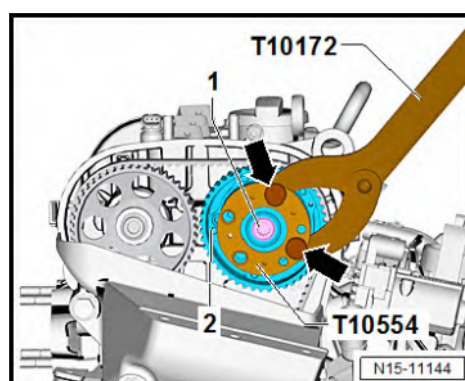
- The contours of pins -1- and -2- of counter-hold tool - T10554/1- are not distributed evenly on the bolt circle.
  - They correspond to the contour of the bolt circle in the camshaft adjuster.
- Fit counter-hold tool -T10554- with counter-hold tool - T10172- to camshaft pulley -1- as shown in illustration.



- The pins must be inserted properly into holes -arrows-.
- Fit counter-hold tool -T10554- so that it rests flat against camshaft adjuster -1-.
- Hold inlet camshaft in position using counter-hold tool - T10554- and counter-hold tool -T10172-.
- Loosen plug -1-, and unscrew it.



- Fit counter-hold tool -T10554- with counter-hold tool -T10172- again, to loosen securing bolt -1- of camshaft adjuster.



- Loosen bolt -1- of camshaft adjuster -2-.
- Loosen securing bolt of toothed belt pulley on exhaust side  
⇒ [page 231](#) .
- Detach toothed belt from camshafts.
- Unscrew securing bolt -1- of camshaft adjuster, and remove camshaft adjuster -2-.

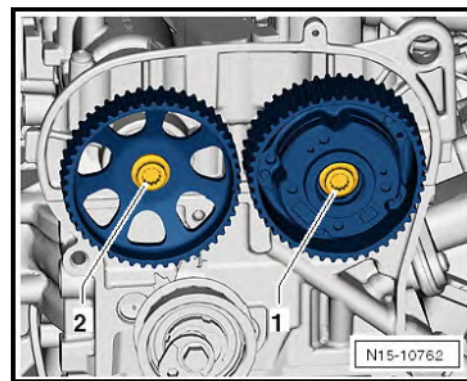
#### Installing

- Camshafts are located in “TDC” position.
- Camshaft pulleys are properly aligned.
- Crankshaft is in “TDC position”.



#### Note

- ◆ *Before installing the camshaft adjuster, ensure that the guide sleeve is inserted in the camshaft.*
- ◆ *Renew bolts that are tightened with turning further angle.*
- ◆ *Check O-ring of plug for damage, renew if necessary; see ⇒ [Electronic parts catalogue](#).*
- Renew bolt -1- for camshaft adjuster on inlet side, and screw it in to stop by hand.



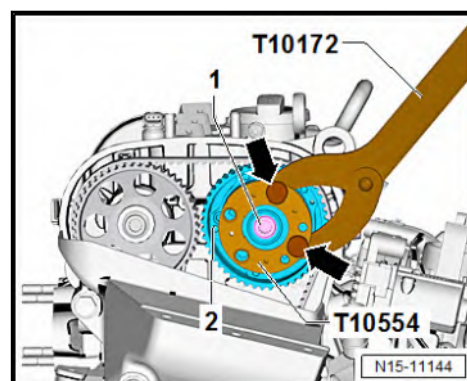
- Renew bolt -2- for toothed belt pulley on exhaust side, and screw it in to stop by hand.
- It should just be possible to turn camshaft pulleys on camshafts but no rocking is permissible.
- Fit toothed belt onto camshafts ➤ [page 221](#) .

### Pre-tightening



#### Note

- ◆ *If the camshafts are turned when pre-tightening with the crankshaft fixed in place using the locking pin -T10340-, the valve timing will be changed.*
- ◆ *If the crankshaft is not locked in place, the deviations that occur when counter holding will be transferred to the crankshaft via the toothed belt.*
- ◆ *The valve timing will not be affected in this case.*
- Before pre-tightening, unscrew locking pin -T10340-.
- Hold inlet camshaft in position using counter-hold tool -T10554- and counter-hold tool -T10172-.
- Pre-tighten bolt -1- to specified pre-tightening torque in two stages.



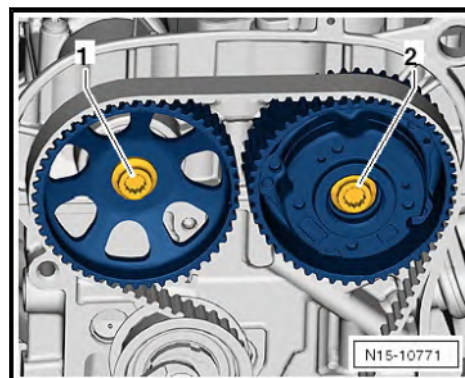
Stage	Securing bolt for camshaft adjuster	Specified torque
1.	-1-	18 Nm
2.	-1-	50 Nm

- Hold inlet camshaft in position using counter-hold tool -T10172- and adapter -T10172/1-.





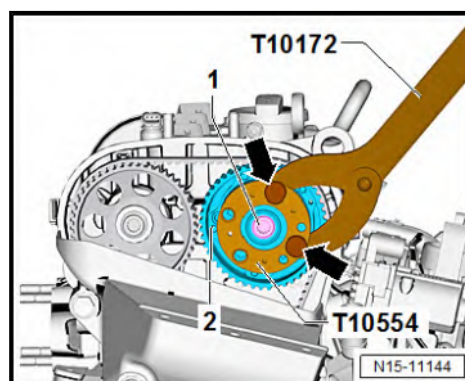
- Pre-tighten bolt -1- to specified pre-tightening torque in two stages.



Stage	Securing bolt for toothed belt pulley	Specified torque
1.	-1-	18 Nm
2.	-1-	50 Nm

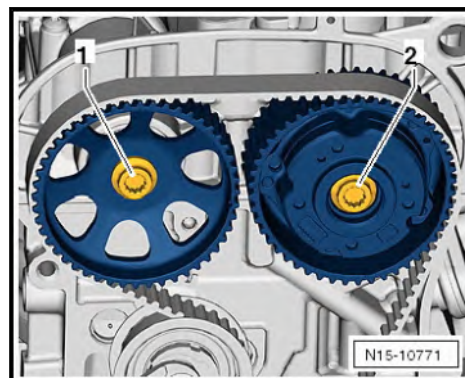
#### Tightening to final specified torque

- Screw locking pin -T10340- back in.
- Tighten bolt -1- for camshaft adjuster to final torque.



Stage	Securing bolt for camshaft adjuster	Angle to turn bolts
1.	-1-	135°

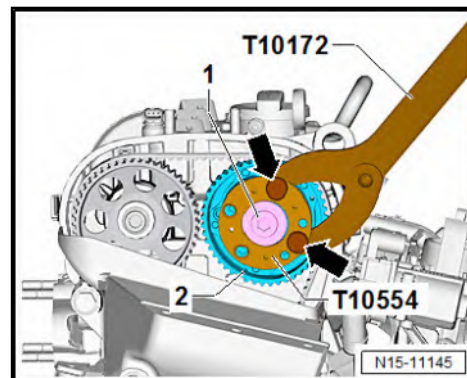
- Tighten securing bolt for toothed belt pulley on exhaust side to final specified torque.





Stage	Securing bolt for toothed belt pulley	Angle to turn bolts
1.	-1-	90°

- Screw in plug -1-, and tighten it to specified torque.



- Hold inlet camshaft in position using counter-hold tool - T10172A- and counter-hold tool -T10554-.

Stage	Plug for camshaft adjuster	Specified torque
1.	-1-	20 Nm

### Installing

Assembly is carried out in reverse sequence; note the following:



### Note

*Make sure to remove the camshaft locking pin before cranking the engine.*

### Specified torques

- ◆ ⇒ [o2.1 verview - toothed belt cover", page 184](#)
- ◆ ⇒ [o2.2 verview - toothed belt", page 184](#)
- ◆ ⇒ [o1.2 verview - camshaft housing", page 172](#)
- ◆ ⇒ [o3.1 verview - crankcase breather system", page 275](#)
- ◆ ⇒ [o2.1 verview – assembly mountings", page 62](#)
- ◆ ⇒ [a2.6 djustment of assembly mountings", page 99](#)
- ◆ ⇒ [o1.1 verview - poly V-belt drive", page 107](#)
- ◆ ⇒ Electrical system; Rep. gr. 27; Alternator; Exploded view - alternator
- ◆ ⇒ [o3.1 verview - coolant pipes", page 317](#)
- ◆ ⇒ [o2.1 verview - coolant pump, thermostat", page 300](#)

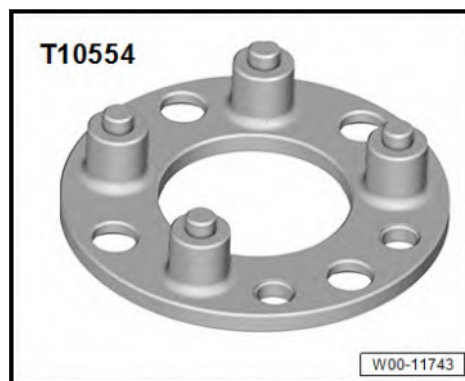
## 3.3 Removing and installing toothed belt pulley

### Special tools and workshop equipment required

- ◆ Torque wrench -VAS 6583A-, not illustrated



- ◆ Counter-hold tool -T10554/1-

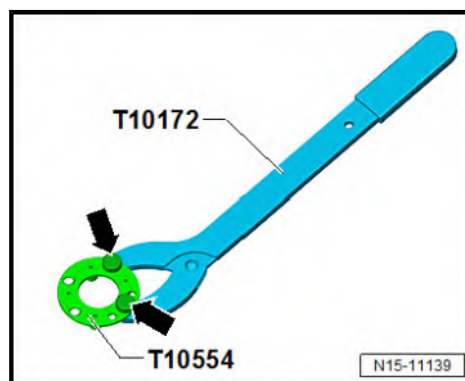


- ◆ Knurled screws -T10554/2- (not illustrated)
- ◆ Counter-hold tool -T10172A-



### Preparing tool

- Bolt on counter-hold tool -T10172- and counter-hold tool -T10554/1- using knurled screws -T10554/2- -arrows-.



### Procedure

#### Removing

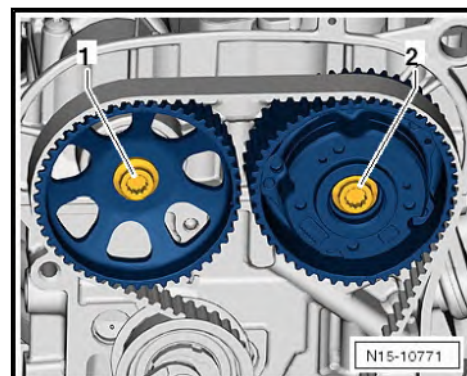


#### Note

- ◆ Place a cloth under the camshaft adjuster and tensioning roller to catch the engine oil which runs out.
- ◆ The contact points between the toothed belt and components - such as camshaft pulleys, tensioning roller and idler pulley - must be kept free of oil.
- Remove toothed belt from camshafts ➔ [page 218](#) .
- Loosen bolt for camshaft adjuster on inlet side ➔ [page 226](#) .



- Hold inlet camshaft in position using counter-hold tool - T10172- and adapter -T10172/1-.
- Loosen bolt -1-.



- Detach toothed belt from camshafts.
- Unscrew securing bolt -1- of toothed belt pulley, and remove toothed belt pulley.

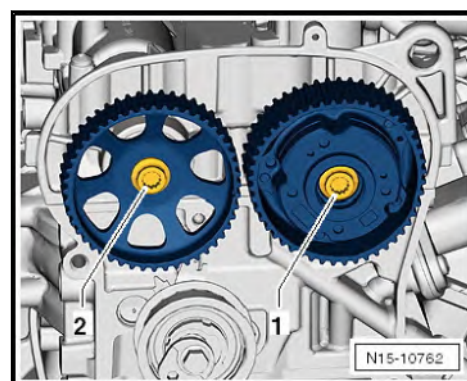
### Installing

- Camshafts are located in "TDC" position.
- The camshaft pulleys are properly aligned with each other.
- Crankshaft is in "TDC position".



### Note

- ◆ *Before installing the camshaft adjuster, ensure that the guide sleeve is inserted in the camshaft.*
- ◆ *Renew bolts that are tightened with turning further angle.*
- ◆ *Check O-ring of plug for damage, renew if necessary; see ⇒ Electronic parts catalogue.*
- Renew bolt -1- for camshaft adjuster on inlet side, and screw it in to stop by hand.

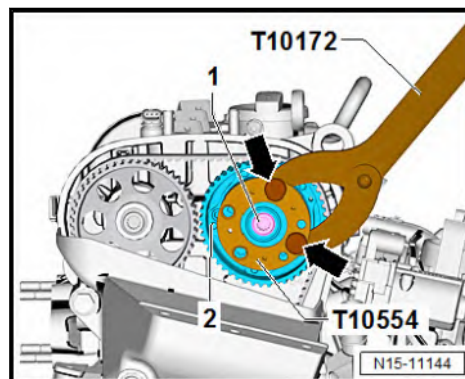


- Renew bolt -2- for toothed belt pulley on exhaust side, and screw it in to stop by hand.
- It should just be possible to turn camshaft pulleys on camshafts but no rocking is permissible.
- Adjust valve timing ⇒ [page 207](#) .



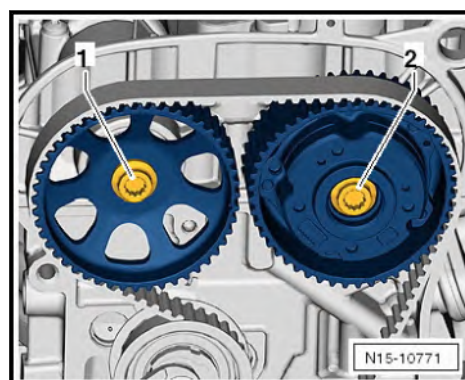
### Pre-tightening

- Hold inlet camshaft in position using counter-hold tool - T10554- and counter-hold tool -T10172-.
- Pre-tighten bolt -1- to specified pre-tightening torque in two stages.



Stage	Securing bolt for camshaft adjuster	Specified torque
1.	-1-	18 Nm
2.	-1-	50 Nm

- Hold inlet camshaft in position using counter-hold tool - T10172- and adapter -T10172/1-.
- Pre-tighten bolt -1- to specified pre-tightening torque in two stages.

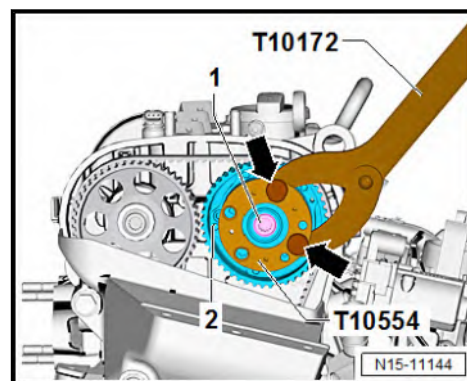


Stage	Securing bolt for toothed belt pulley	Specified torque
1.	-1-	18 Nm
2.	-1-	50 Nm

### Tightening to final specified torque

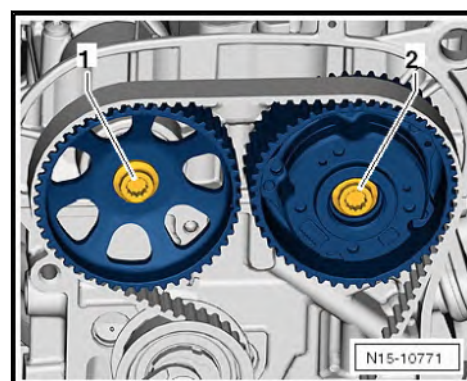
- Tighten bolt -1- for camshaft adjuster to final torque.





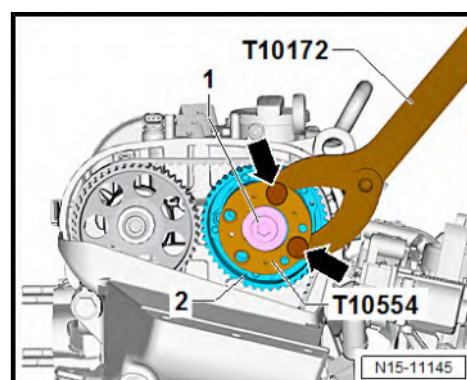
Stage	Securing bolt for camshaft adjuster	Angle to turn bolts
1.	-1-	135°

- Tighten securing bolt for toothed belt pulley on exhaust side to final specified torque.



Stage	Securing bolt for toothed belt pulley	Angle to turn bolts
1.	-1-	90°

- Screw in plug -1-, and tighten it to specified torque.



- Hold inlet camshaft in position using counter-hold tool - T10172A- and counter-hold tool -T10554-.

Stage	Plug for camshaft adjuster	Specified torque
1.	-1-	20 Nm

### Installing

Further assembly is performed in the reverse order of removal.





## Note

*Make sure to remove the camshaft locking pin before cranking the engine.*

### Specified torques:

- ⇒ [o2.1 verview - toothed belt cover", page 184](#)
- ⇒ [o2.2 verview - toothed belt", page 184](#)
- ⇒ [o3.1 verview - crankcase breather system", page 275](#)

## 3.4 Measuring axial play of camshaft

### Special tools and workshop equipment required

- ◆ Universal dial gauge holder -VW 387-

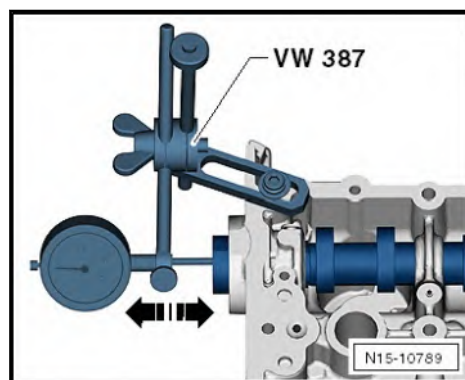


- ◆ Dial gauge -VAS 6079-



### Procedure

#### Checking camshaft axial clearance



- Remove camshaft housing ⇒ [page 178](#) .



- Secure dial gauge -VAS 6079- with universal dial gauge bracket -VW 387- to camshaft housing as shown in illustration.
- Press camshaft against dial gauge by hand.
- Set dial gauge to “0”.
- Press camshaft away from dial gauge and read off value:

Axial clearance:

- Wear limit: 0.25 mm.

### 3.5 Removing and installing camshaft oil seal

⇒ [a3.5.1 nd installing camshaft oil seal, inlet camshaft, pulley end”, page 237](#)

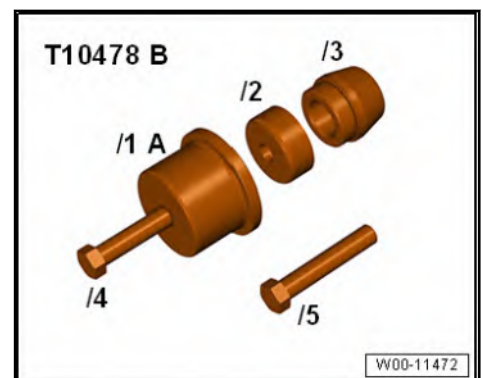
⇒ [a3.5.2 nd installing camshaft oil seal, exhaust camshaft, pulley end”, page 239](#)

⇒ [a3.5.3 nd installing camshaft oil seal, exhaust camshaft, gear-box end”, page 241](#)

#### 3.5.1 Removing and installing camshaft oil seal, inlet camshaft, pulley end

Special tools and workshop equipment required

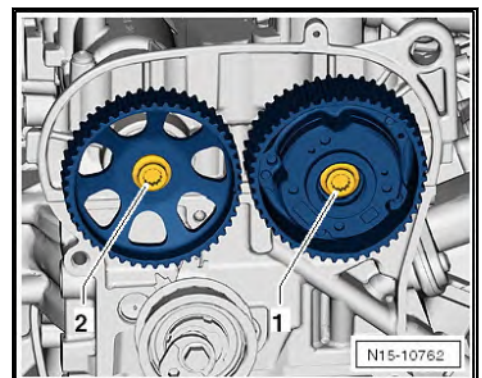
- ◆ Assembly tool -T10478 B-



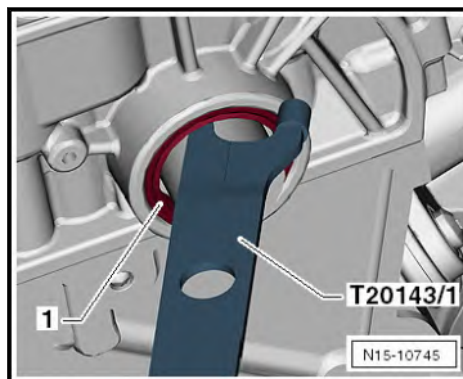
- ◆ Puller hook -T20143/1-, not illustrated

#### Removing

- Remove toothed belt from camshafts ⇒ [page 218](#) .
- Unscrew bolt -1- and remove camshaft toothed belt pulley.



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



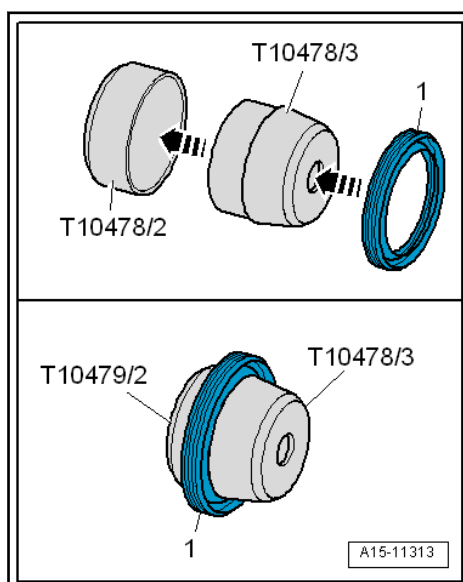
## Installing



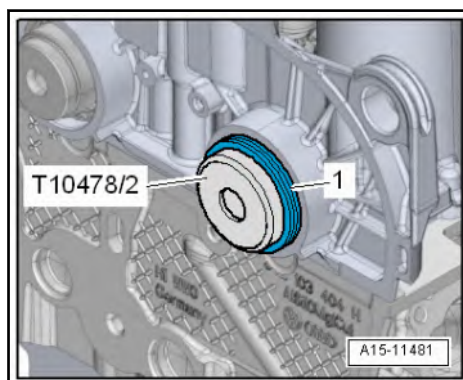
### Note

*Do not lubricate new seal.*

- Fit seal -1- over fitting sleeve -T10478/3- onto guide sleeve -T10478/2-.

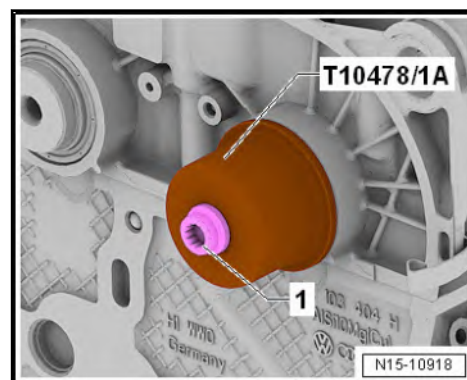


- Installation position: closed end of seal faces fitting sleeve.
- Separate fitting sleeve and guide sleeve.
- Fit guide sleeve -T10478/2- with oil seal -1- onto camshaft.





- Draw in seal to stop using thrust piece -T10478/1A- and bolt -1- for camshaft pulley.

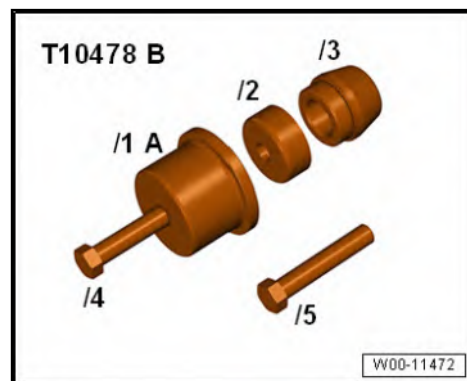


- Install toothed belt ➔ [page 220](#) .

### 3.5.2 Removing and installing camshaft oil seal, exhaust camshaft, pulley end

Special tools and workshop equipment required

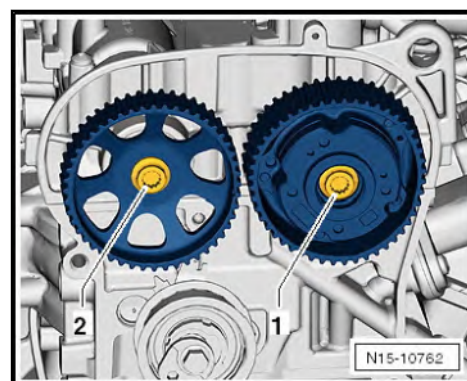
- ◆ Assembly tool -T10478 B-



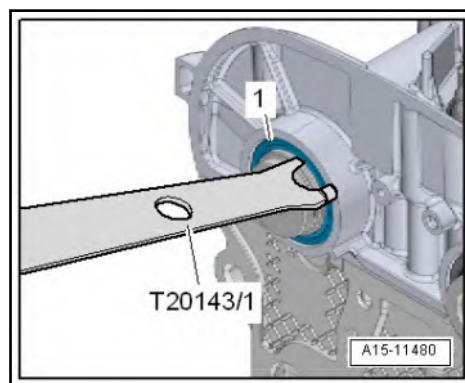
- ◆ Puller hook -T20143/1-, not illustrated

#### Removing

- Remove toothed belt from camshafts ➔ [page 218](#) .
- Unscrew bolt -2- and remove camshaft toothed belt pulley.



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



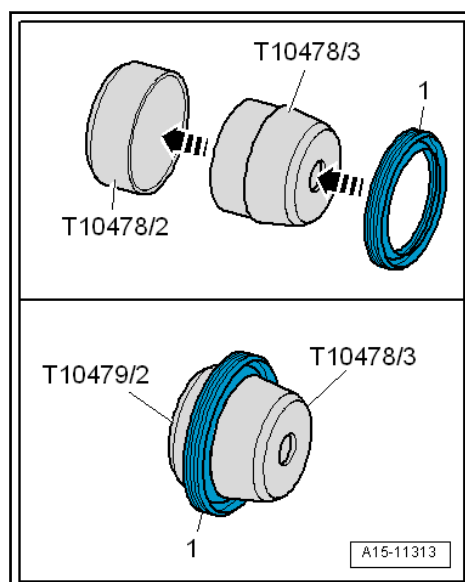
## Installing



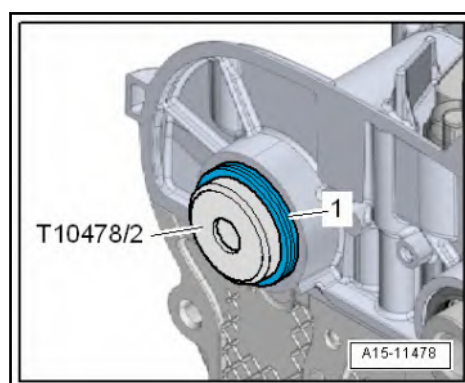
### Note

*Do not lubricate new seal.*

- Fit seal -1- over fitting sleeve -T10478/3- onto guide sleeve -T10478/2-.

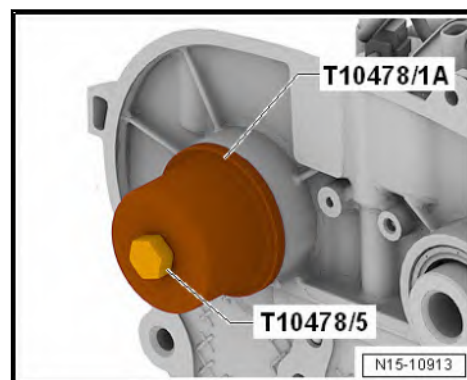


- Installation position: closed end of seal faces fitting sleeve.
- Separate fitting sleeve and guide sleeve.
- Fit guide sleeve -T10478/2- with oil seal -1- to camshaft.





- Pull in thrust piece -T10478/1A- with bolt -T10478/5- as far as stop.



- Install toothed belt ➔ [page 220](#) .

### 3.5.3 Removing and installing camshaft oil seal, exhaust camshaft, gearbox end

Special tools and workshop equipment required

- ◆ Assembly tool -T10479B-



- ◆ Puller hook -T20143/1-, not illustrated

#### Removing

- Remove toothed belt pulley for coolant pump ➔ [page 308](#) .

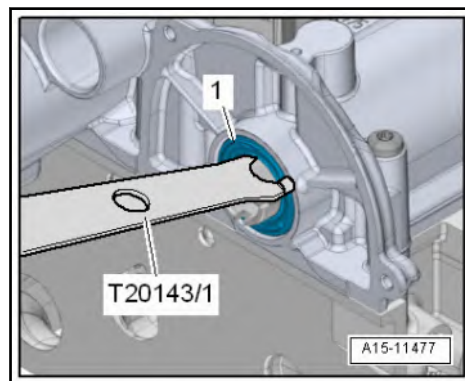


#### Note

*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.
- Carefully fit extractor hook -T20143/1- between camshaft and seal -1-.

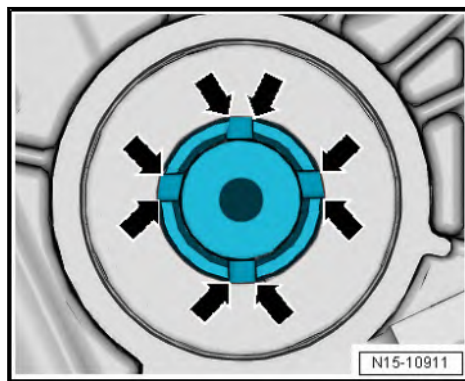




- Lever out seal.

### Installing

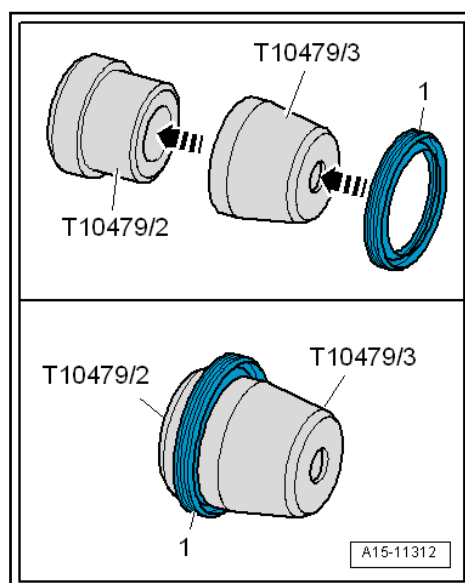
- Remove any burrs in the outer area of the grooves in the exhaust camshaft -arrows- using fine sandpaper (220–1000 P).



### Note

*Do not lubricate new seal.*

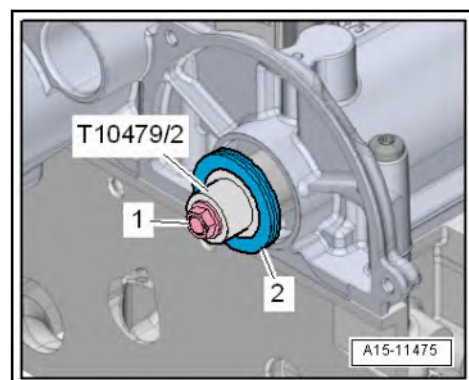
- Fit seal -1- over fitting sleeve -T10479/3- onto guide sleeve -T10479/2-.



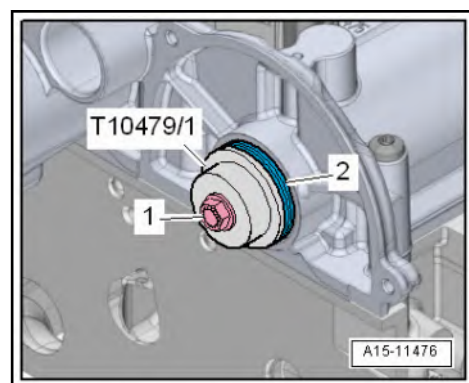
- Installation position: closed end of seal faces fitting sleeve.



- Separate fitting sleeve and guide sleeve.
- Fit guide sleeve -T10479/2- with oil seal -2- centrally to camshaft.



- Secure guide sleeve onto camshaft using bolt -1- for coolant pump drive sprocket.
- Push seal onto camshaft and unbolt guide sleeve.
- Draw in seal -2- to stop using thrust piece -T10479/1- and bolt -1- for toothed belt pulley for coolant pump.

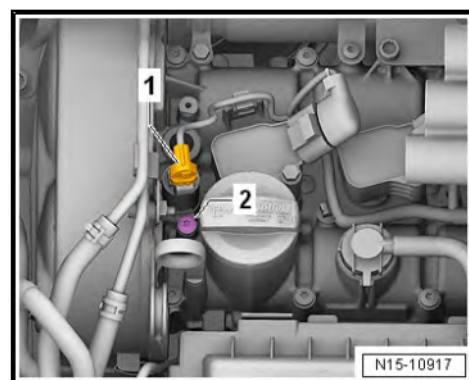


- Install toothed belt pulley for coolant pump ➤ [page 308](#) .

### 3.6 Removing and installing camshaft control valve 1 -N205-

#### Removing

- Release connectors -1- and pull off.



- Unscrew bolt -2-, and remove camshaft control valve 1 - N205-.



## Installing

Install in the reverse order of removal. When doing this, note the following:



### Note

*Renew O-ring.*

## Specified torque

♦ [⇒ o1.2 verview - camshaft housing", page 172](#)

## 3.7 Removing and installing valve stem seals

[⇒ a3.7.1 nd installing valve stem seals \(cylinder head installed\)", page 244](#)

[⇒ a3.7.2 nd installing valve stem seals \(cylinder head removed\)", page 249](#)

### 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/32-32-.



♦ Hose adapter -VAS 5161A/35- (not shown)



- ◆ Valve stem seal fitting tool -3365-



- ◆ Valve stem pliers -VAS 6770-



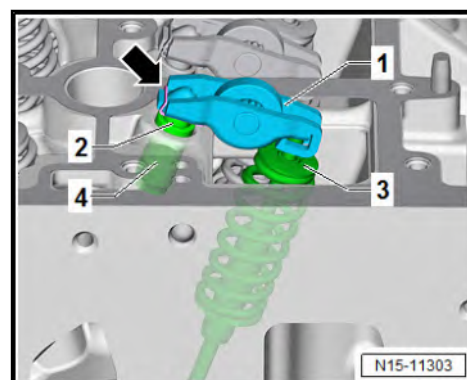
## Procedure

### Golf SV

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50; Bulkhead; Assembly overview - plenum chamber cover.
- Remove plenum chamber bulkhead ⇒ General body repairs, exterior; Rep. gr. 50; Bulkhead; Assembly overview - bulkhead.
- If fitted, remove heat shield for right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40; Drive shaft; Removing and installing drive shaft heat shield.

### Continued for all vehicles

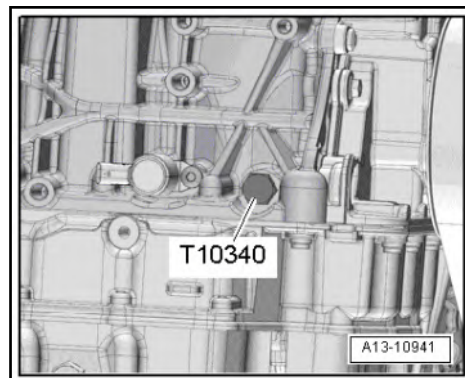
- Remove camshaft housing ⇒ [page 178](#) .
- Mark allocation of roller rocker fingers -1-, hydraulic compensation element -4- and valves -3- for reinstallation.



- Remove roller rocker fingers together with compensation elements and place them on a clean surface.



- Unscrew spark plugs with spark plug socket -3122 B-.
- Unscrew locking pin -T10340-.

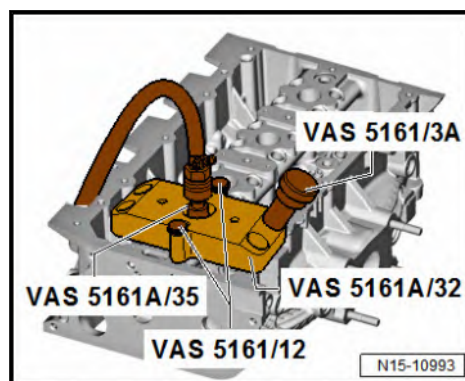


- Set piston of respective cylinder to "bottom dead centre".

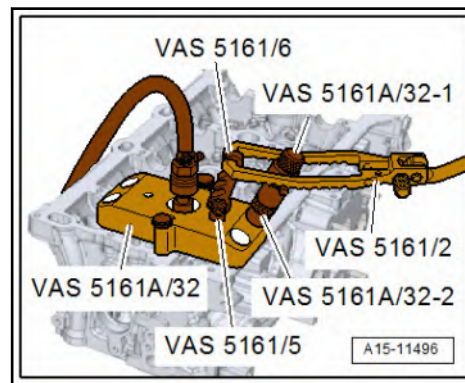


#### Note

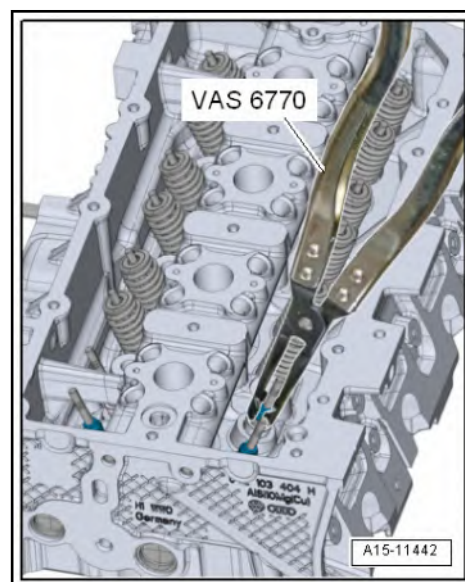
- ♦ *The pistons of cylinders no. 1 and no. 4 are at »TDC« position after the camshaft housing has been removed.*
  - ♦ *The pistons of cylinders no. 2 and no. 3 are at »bottom dead centre« position after the camshaft housing has been removed.*
  - ♦ *Crank engine via crankshaft half a turn in direction 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.*
- Fit guide plate -VAS 5161A/32-1- onto cylinder head and secure with knurled screws -VAS 5161/12-.



- Screw hose adapter -VAS 5161A/35- into respective spark plug thread hand-tight.
- 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/32-2- onto assembly cartridge and insert cartridge into guide plate -VAS 5161A/32-3-.
- Attach pressure fork -VAS 5161/2- to toothed piece at a suitable angle 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-.

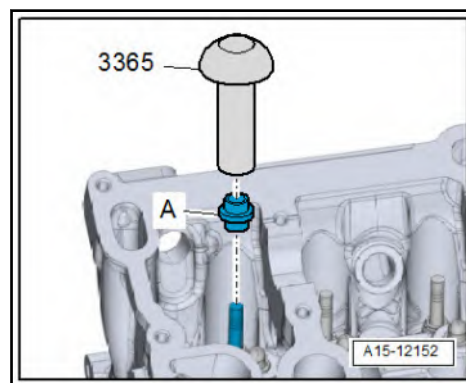


#### Note

*Risk of damage when installing valve stem seals.*

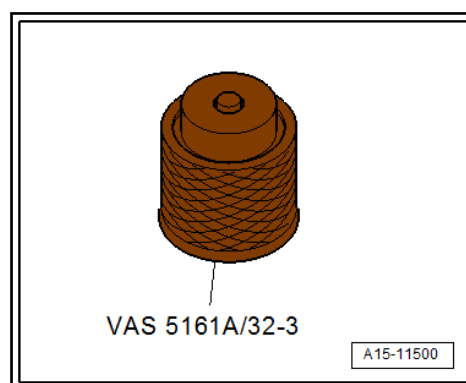
- Lightly oil sealing lip of valve stem seal -A-.



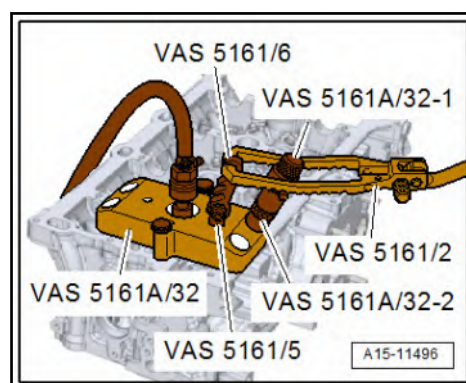


- Carefully press valve stem oil seal -A- onto valve guide using valve stem seal fitting tool -3365-.

**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 faces upwards.
- Release the spring washer. The spring force pushes the washer back upwards and holds the valve cotters in place.
- Press assembly cartridge -VAS 5161A/32-1- onto insertion device from above and pick up valve cotters.
- 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/32-1- onto cylinder head again.



- Insert assembly cartridge -VAS 5161A/32-2- with sleeve -VAS 5161A/32-3- into guide plate.



- Press pressure fork downwards and pull knurled screw upwards, turning it clockwise and anticlockwise. This inserts the valve cotters.
- Reduce pressure on pressure fork whilst pulling on knurled screw.
- Repeat procedure on each valve.

### Installing

Assemble in reverse order of dismantling. During this procedure, observe the following:

#### Golf SV

- Install plenum chamber bulkhead. ⇒ General body repairs, exterior; Rep. gr. 50; Plenum chamber bulkhead; Assembly overview - plenum chamber cover
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50; Plenum chamber bulkhead; Assembly overview - plenum chamber cover

#### Continued for all vehicles

- Install spark plugs ⇒ Maintenance; Booklet .
- Install camshaft housing ⇒ [page 178](#) .

#### Specified torques

- ◆ ⇒ [01.2 overview - camshaft housing", page 172](#)
- ◆ ⇒ [01.1 overview - ignition system", page 424](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 50; Plenum chamber bulkhead; Assembly overview - plenum chamber cover
- ◆ ⇒ General body repairs, exterior; Rep. gr. 50; Plenum chamber bulkhead; Assembly overview - plenum chamber bulkhead
- ◆ ⇒ 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

- ◆ Removal and installation device for valve cotters -VAS 5161A- with guide plate -VAS 5161A/32-32-.

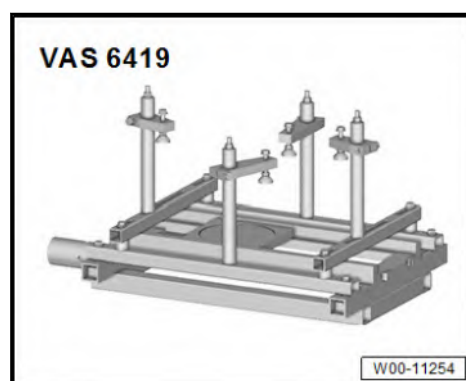




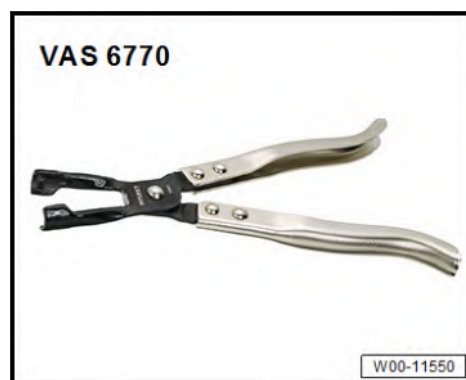
- ◆ Engine and gearbox support -VAS 6095-



- ◆ Cylinder head tensioning device -VAS 6419-



- ◆ Valve stem pliers -VAS 6770-

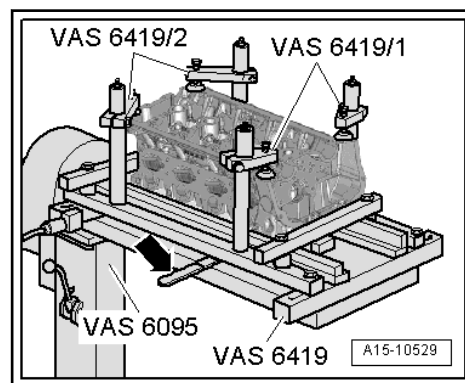


- ◆ Valve stem seal fitting tool -3365-

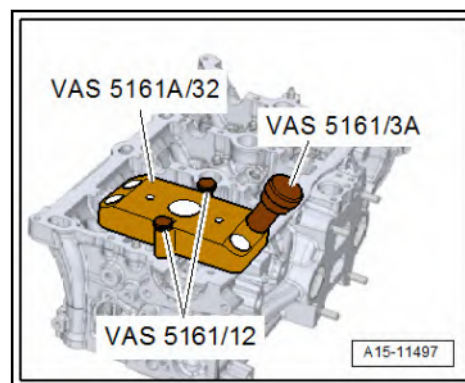


## Procedure

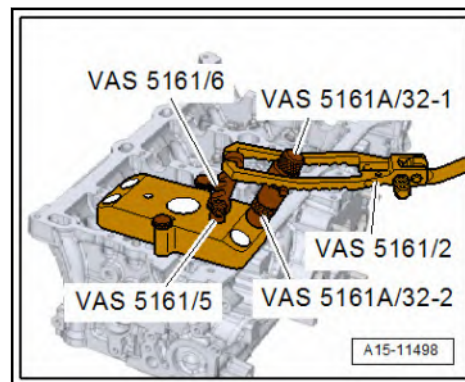
- Remove cylinder head ➔ [page 174](#) .



- Insert cylinder head tensioning 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 tensioning device to compressed air.
- Use lever -arrow- to slide air cushion under combustion chamber from which valve stem seals are to be removed.
- Allow compressed air to flow into air cushion until it lies against valve disc.
- Fit guide plate -VAS 5161A/32-1- onto cylinder head and secure with knurled screws -VAS 5161/12-.

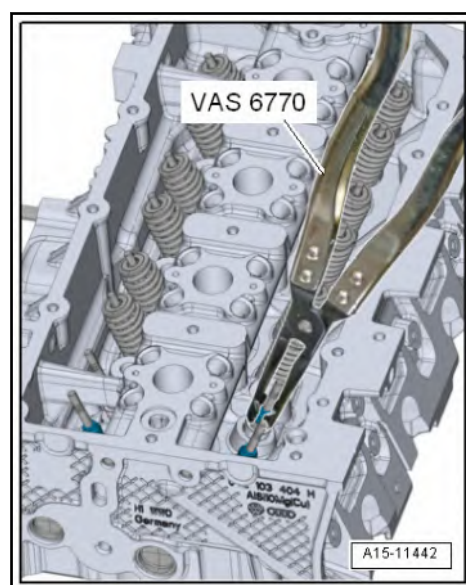


- Insert punch -VAS 5161/3A- into guide plate.
- Use a plastic hammer to knock loose the firmly seated valve cotters.
- Screw toothed piece -VAS 5161/6- with hooking fork -VAS 5161/5- into guide plate.





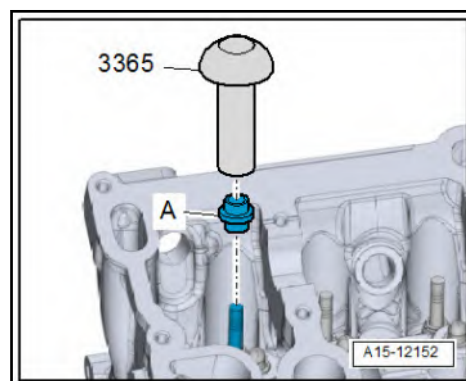
- Slide sleeve -VAS 5161A/32-2- onto assembly cartridge and insert cartridge into guide plate -VAS 5161A/32-3-.
- Attach pressure fork -VAS 5161/2- to toothed piece and press assembly cartridge down.
- At the same time, turn knurled screw of assembly cartridge clockwise until tips engage in valve cotters.
- 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

*Risk of damage when installing valve stem seals.*

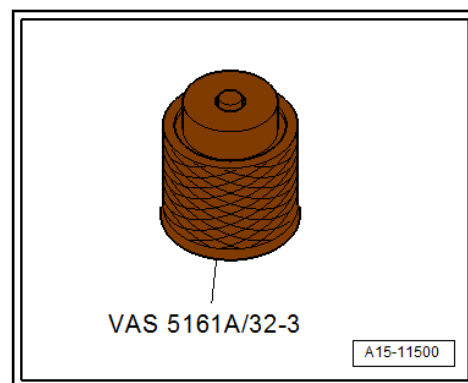
- Lightly oil sealing lip of valve stem seal -A-.



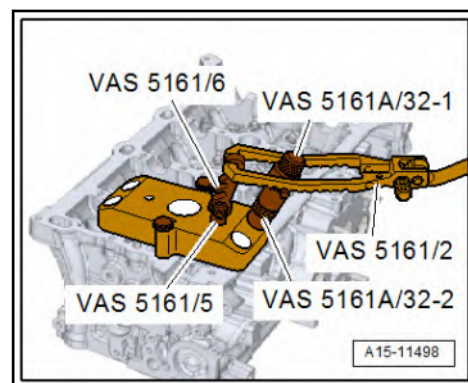
- Carefully press valve stem oil seal -A- onto valve guide using valve stem seal fitting tool -3365-.



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 faces upwards.
- Release the spring washer. The spring force pushes the washer back upwards and holds the valve cotters in place.
- Press assembly cartridge -VAS 5161A/32-1- onto insertion device from above, and pick up valve cotters.
- 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/32-1- onto cylinder head again.



- Insert assembly cartridge -VAS 5161A/32-2- with sleeve - VAS 5161A/32-3- into guide plate.
- Press pressure fork downwards and pull knurled screw upwards, turning it clockwise and anticlockwise. This inserts the valve cotters.
- Reduce pressure on pressure fork whilst pulling on knurled screw.
- Repeat procedure on each valve.
- Install cylinder head ➔ [page 174](#) .





## 4 Inlet and exhaust valves

⇒ [v4.1 alve guides", page 254](#)

⇒ [v4.2 alves", page 255](#)

⇒ [d4.3 imensions", page 255](#)

### 4.1 Checking valve guides

Special tools and workshop equipment required

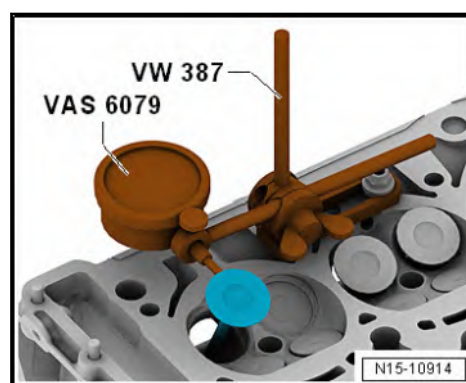
◆ Universal dial gauge bracket -VW 387-



◆ Dial gauge -VAS 6079-



### Test sequence



- Insert valve in guide. Valve stem end must be flush with 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 wear limit is still exceeded.

**i** Note

*Valve guides cannot be exchanged.*

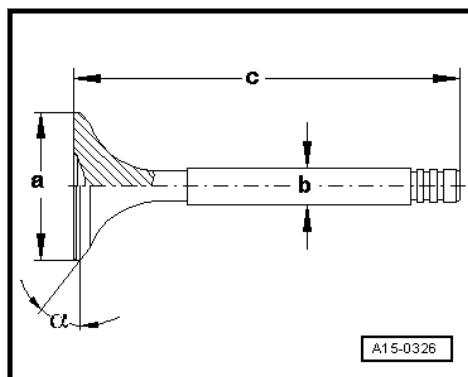
## 4.2 Checking valves

- Check for scoring on valve stems and valve seat surfaces.
- Exchange valve if significant scoring can be seen.

## 4.3 Valve dimensions

**i** Note

*Never rework the inlet and exhaust valves. Only lapping-in is permitted.*



Dimension		Inlet valve	Outlet valve
Ø a	mm	29.5	27.0
Ø b	mm	4.973	4.963
c	mm	110.25	110.09
α	°	45	30



## 17 – Lubrication

### 1 Sump, oil pump

⇒ [o1.1 verview - sump/oil pump", page 256](#)

⇒ [a1.2 nd installing lower part of sump", page 259](#)

⇒ [a1.3 nd installing oil pump", page 265](#)

⇒ [a1.4 nd installing upper part of sump", page 267](#)

⇒ [o1.5 il:", page 272](#)

#### 1.1 Assembly overview - sump/oil pump



##### Note

- ◆ *Metal shavings or a large quantity of small metal particles found during engine repair could indicate that the crankshaft bearings or conrod bearings are damaged. To avoid any subsequent damage, the following work must be carried out following the repair: Carefully clean oil channels and renew oil spray jets, engine oil cooler and oil filter.*
- ◆ *Oil spray jet and pressure relief valve ⇒ [page 166](#) .*



### 1 - Oil dipstick

- ☐ Oil capacities ⇒ Maintenance; Booklet ; Engine oil: capacities and specifications

### 2 - O-ring

- ☐ Renew after removal
- ☐ Lubricate before installing.

### 3 - Bleeder valve

- ☐ Observe installation position

### 4 - Cap

### 5 - Oil separator

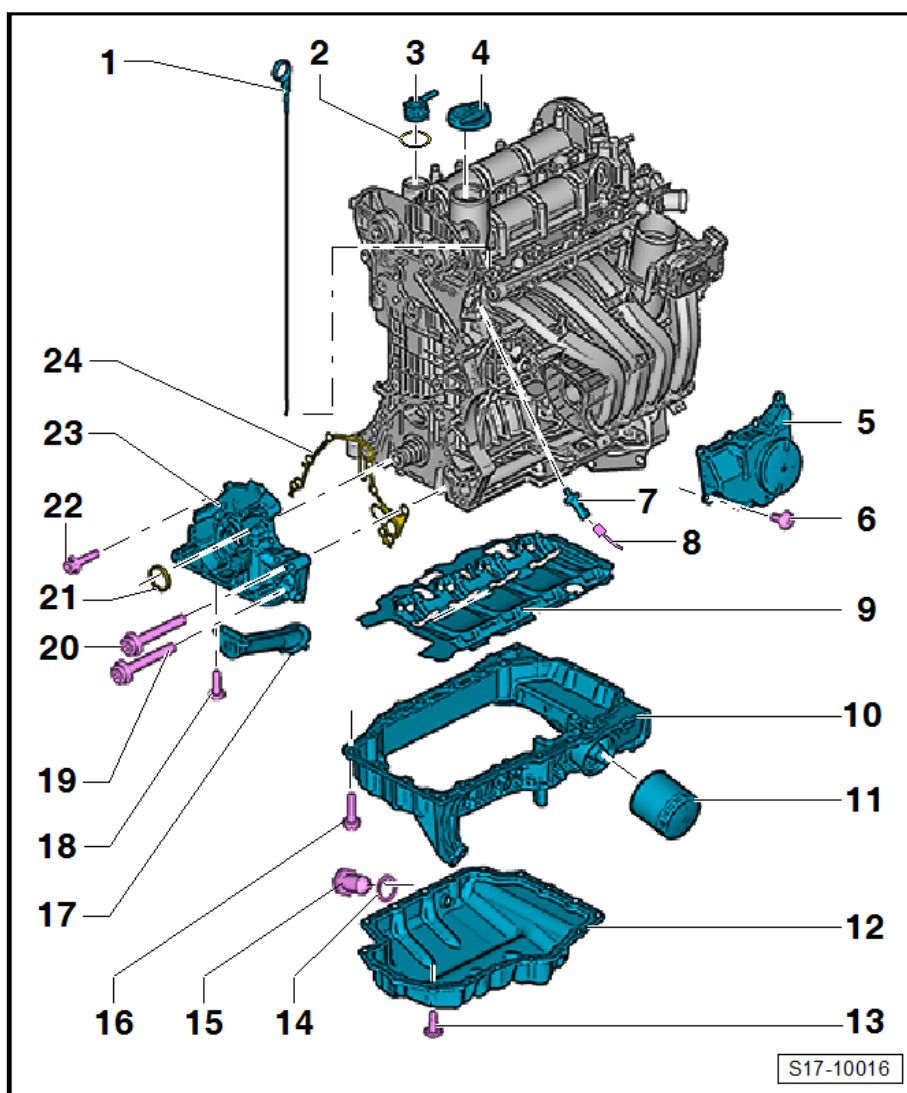
- ☐ Removing and installing ⇒ [page 276](#)
- ☐ Renew if damaged

### 6 - Bolt

- ☐ Specified torques and tightening sequence ⇒ [page 276](#)

### 7 - Oil pressure switch -F1-

- ☐ 0.03 to 0.06 MPa (0.3 to 0.6 bar)
- ☐ Checking oil pressure switch ⇒ [page 281](#) .
- ☐ 20 Nm
- ☐ Renew O-ring after each removal



### Note

- ◆ The oil pressure switch is fitted with a captive seal.
- ◆ The seal is not designed for repeated use.

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

### 8 - Connector

### 9 - Baffle plate

### 10 - Upper part of sump

- ☐ Removing and installing ⇒ [page 267](#)

### 11 - Oil filter

- ☐ Moisten seal with oil before installing
- ☐ If outer circumference of oil filter is damaged, renew oil filter
- ☐ 20 Nm
- ☐ If the connecting union for oil filter in sump became loose ⇒ [page 282](#)

### 12 - Lower part of sump

- ☐ Removing and installing ⇒ [page 259](#)

### 13 - Bolt



- ☐ Specified torques and tightening sequence ⇒ [page 258](#)

#### 14 - Seal

- ☐ Renew after removal

#### 15 - Oil drain plug

- ☐ 30 Nm

#### 16 - Bolt

- ☐ Renew after removal
- ☐ Specified torques and tightening sequence ⇒ [page 259](#)

#### 17 - Intake manifold

#### 18 - Bolt

- ☐ 8 Nm

#### 19 - Bolt

- ☐ Renew after removal
- ☐ Specified torques ⇒ [page 266](#)

#### 20 - Bolt

- ☐ For tensioning device.
- ☐ Specified torques ⇒ [page 107](#)

#### 21 - Seal

- ☐ Renewing ⇒ [page 132](#)
- ☐ For oil pump drive.

#### 22 - Bolt

- ☐ Renew after removal
- ☐ Specified torques ⇒ [page 266](#)

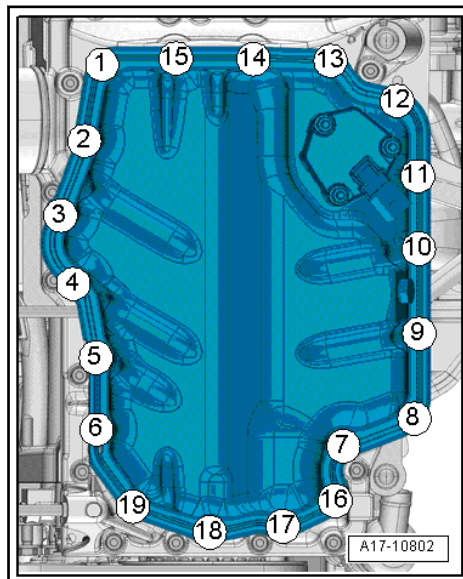
#### 23 - Oil pump

- ☐ Removing and installing ⇒ [page 265](#)
- ☐ Specified torque and tightening sequence ⇒ [page 266](#)

#### 24 - Seal

- ☐ Renew after removal
- ☐ Note guide pins for proper positioning

#### Lower part of sump - specified torque and tightening sequence

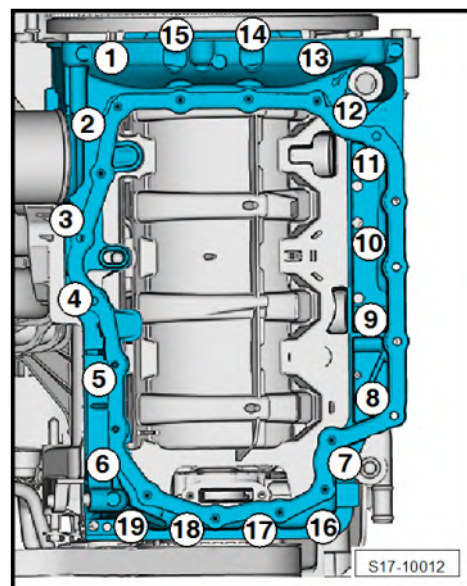




- Tighten bolts in stages in the sequence shown.

Stage	Bolts	Specified torque
1.	-1- to -19-	Screw in by hand as far as stop
2.	-1- to -19-	12 Nm

Upper part of sump - specified torque and tightening sequence



Note

*Renew bolts that are tightened with turning further angle.*

- Tighten bolts in stages in the sequence shown.

Stage	Bolts	Specified torque/turning further angle
1.	-1- to -19-	Screw in by hand as far as stop
1.	-1- to -19-	8 Nm
2.	-1- to -19-	Turn 90° further

## 1.2 Removing and installing lower part of sump

Special tools and workshop equipment required

- ◆ Allen key, long reach 5 mm -T10058-



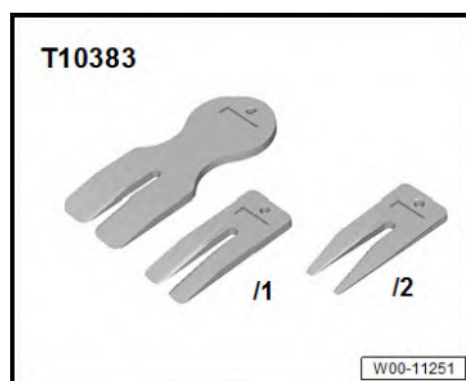




- ◆ Drip tray -VAS 6208-



- ◆ Wedge -T10383/2-



- ◆ Cutting tool -T10561-



- ◆ Applicator gun -VAS 6966-

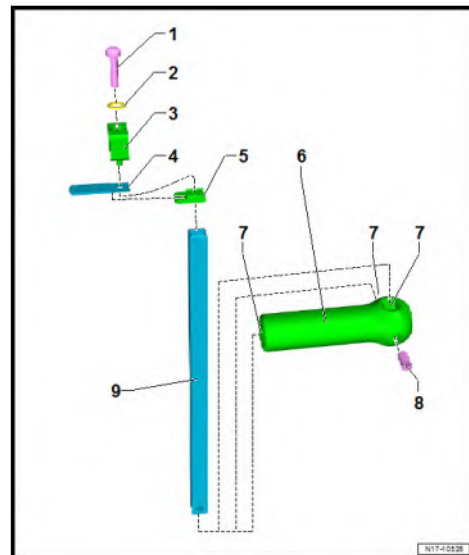


- ◆ Protective mat -VAS 531003-
- ◆ Scraper
- ◆ Hand drill with plastic brush attachment
- ◆ Sealant remover



- ◆ Cleaner and degreaser
- ◆ Safety goggles and protective gloves
- ◆ Silicone sealant → Electronic Parts Catalogue

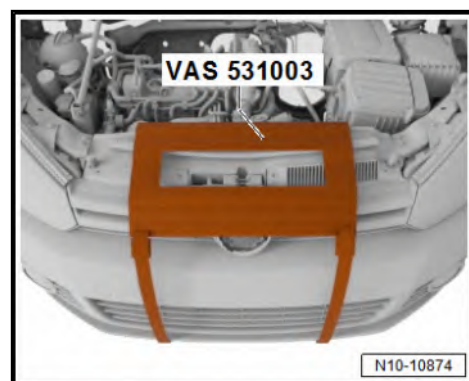
#### Cutting tool -T10561-



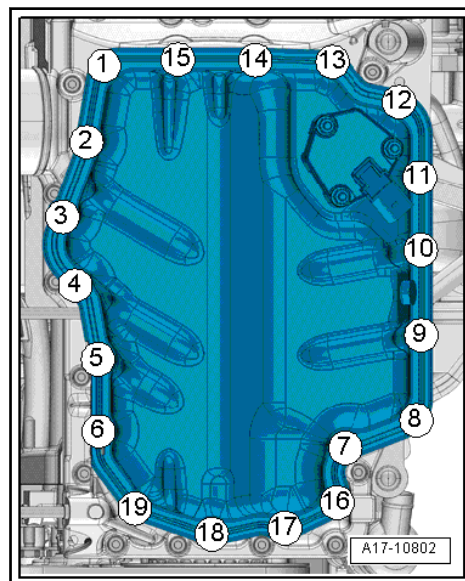
- 1 - Bolt
- 2 - Washer
- 3 - Bracket
- 4 - Knife
- 5 - Guide
- 6 - Handle
- 7 - Inserts for support (rod) for conversion of handle
- 8 - Bolt
- 9 - Support

#### Removing

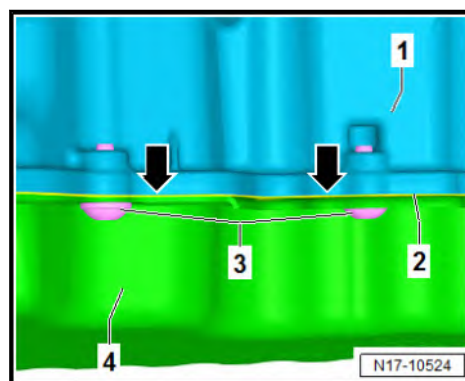
- Drain engine oil.
- Remove front right wheel housing liners ⇒ General body repairs, exterior; Rep. gr. 66; Wheel housing liner; Assembly overview - front wheel housing liner.
- After radiator cowl has been removed, fit protective mat -VAS 531003- to vehicle as shown in illustration.



- Loosen and unscrew bolts in the sequence -19 ... 1-.



- Loosen 2 bolts on oil sump, but do not unscrew completely.
- Cut through seal between oil sump -4- and engine -1-.



- Use cutting tool -T10561- to do this.

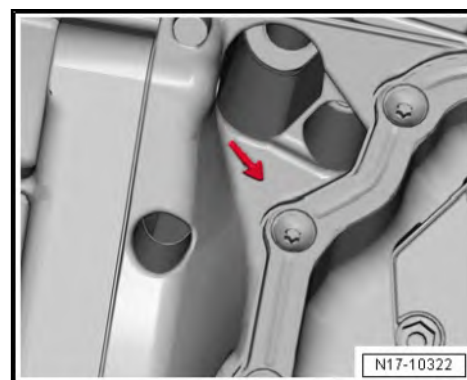


#### Note

- ◆ *The sump is sealed with liquid sealant -2- → Electronic parts catalogue.*
- ◆ *When hardened, the sealant has a high adhesive strength.*
- Separation is made centrally between bolts -3-.
- Position cutting tool -T10561- on seal -arrows- without it tilting.
- Drive in cutting tool -T10561- -3- using a hammer as far as it will go -arrow-.



- Do not tilt cutting tool -T10561- when doing this.
- Do not cutting tool -T10561- sideways.
- Do not lever with cutting tool -T10561-.
- Perform procedure at other points as described until sump is detached.
- Use wedge -T10383/2- to further loosen detached positions.
- Using a plastic hammer carefully drive in wedge.
- Drive in wedge -T10383/2- only to same depth as sealing surface.
- Carefully detach sump (bottom section) from adhesive bond.
- Fit wedge -T10383/2- at another position and detach the bonded joint in the same way.
- Carefully detach lower part of sump from adhesive bond using a commercially available scraper.
- Carefully separate at position indicated by -arrow-.



- To do this, carefully lever bottom section of sump off crank-case using a suitable screwdriver or assembly lever.

#### Installing



#### Note

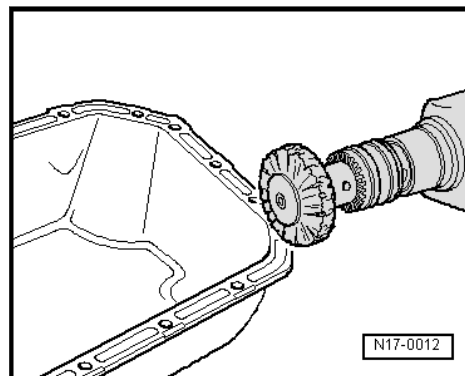
- ◆ *Danger of soiling lubrication system.*
- ◆ *Cover open parts of engine.*
- Spray sealing surface with sealant remover and leave to act.
- Remove sealant residues from sump upper part with a flat scraper.



**CAUTION**

Risk of eye injury caused by sealant residue.

- Wear protective goggles.
- Remove sealant residue from sump (bottom section) using a rotating plastic brush, for example.

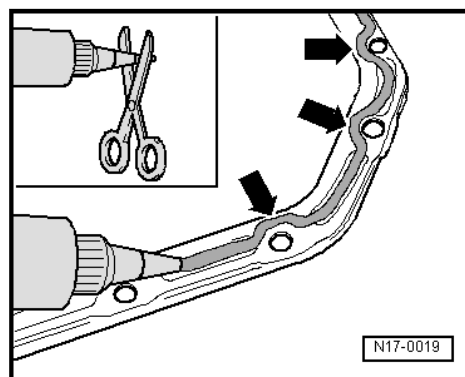


- Remove any oil and grease from sealing surfaces.



**Note**

- ◆ Observe use-by date of sealant.
- ◆ The sump must be installed within 5 minutes after applying sealant.
- ◆ The sump can be positioned more easily and with greater security if two M6 studs are screwed into the upper part of sump.
- Cut off nozzle on tube at front marking (Ø of nozzle approx. 3 mm).



**Note**

- ◆ Risk of blocking lubrication system with excess sealant.
- ◆ Do not apply sealant bead thicker than specified.
- Apply sealant in a bead -arrow- to clean sealing surface of bottom section of sump using applicator gun -VAS 6966-.

Sealant bead must be:

- ◆ 2...3 mm thick.



- ◆ Run bead along inner side of bolt holes -arrows-.
- Fit bottom section of sump, and tighten bolts ⇒ [page 258](#) .



#### Note

*After installing bottom section of sump, wait about 30 minutes for sealant to dry. Only then fill with engine oil.*

- Replenish engine oil and check oil level.

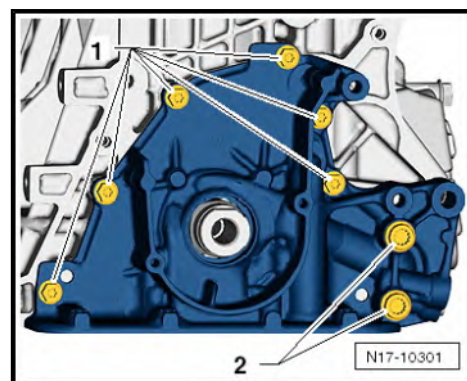
#### Specified torques

- ◆ ⇒ Fig. ““Lower part of sump - specified torque and tightening sequence””, [page 258](#)

## 1.3 Removing and installing oil pump

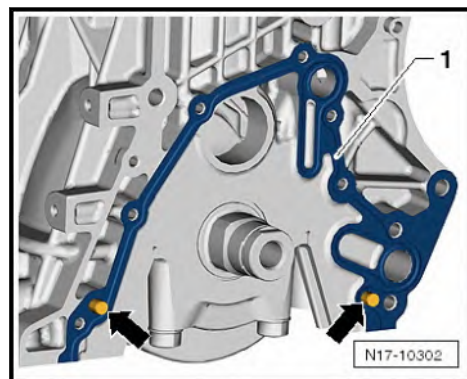
### Removing

- Disconnect battery ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and reconnecting battery.
- Remove toothed belt ⇒ [page 187](#) .
- Remove sump (bottom section) ⇒ [page 259](#) .
- Remove suction pipe of oil pump ⇒ [Item 17 \(page 258\)](#) .
- Remove top section of sump ⇒ [page 267](#) .
- Remove baffle plate ⇒ [Item 9 \(page 257\)](#) .
- Remove tensioner for poly V-belt ⇒ [page 122](#) .
- Remove alternator ⇒ Electrical system; Rep. gr. 27; Alternator; Removing and installing alternator.
- Remove crankshaft oil seal on belt pulley end ⇒ [page 132](#) .
- Unscrew oil pump securing bolts -1- and -2-.

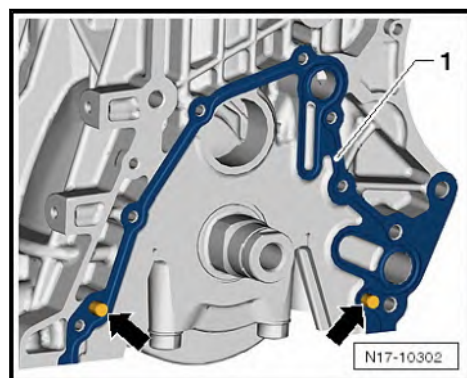


- Pull oil pump in a straight line off dowel pins on cylinder block.
- Remove gasket -1- from dowel pins -arrows-.

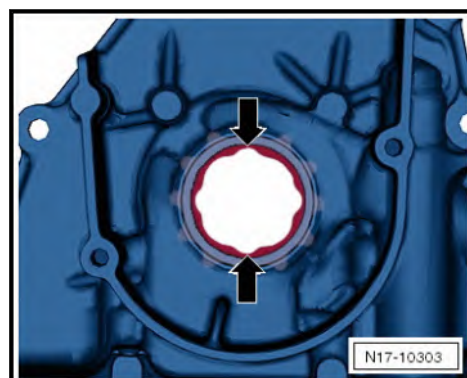




## Installing

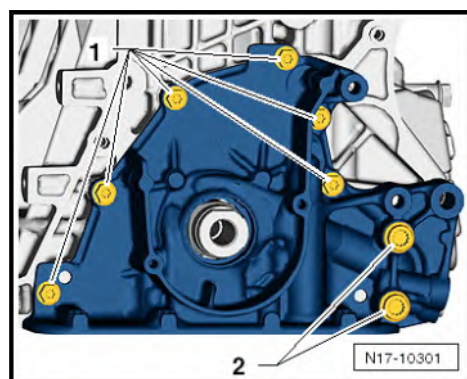


- Fit new gasket -1- onto dowel pins -arrows-.
- Rotate oil pump gear to a position where 2 opposing notches -arrows- are aligned as shown in illustration.



- Fit oil pump onto dowel pins.

## Specified torques





- Tighten new securing bolts -1- and -2- in the specified sequence:

Stage	Bolts	Specified torque/turning further angle
1.	-1-	5 Nm
2.	-2-	10 Nm
3.	-1-	8 Nm
4.	-2-	20 Nm
5.	-1- and -2-	Turn 90° further

- Install new crankshaft oil seal on belt pulley end ⇒ [page 132](#) .
- Install upper part of sump ⇒ [page 267](#) .
- Install toothed belt ⇒ [page 190](#) .

#### Specified torques

- ◆ ⇒ [o1.1 verview - sump/oil pump", page 256](#)
- ◆ ⇒ [o2.2 verview - toothed belt", page 184](#)
- ◆ ⇒ [o1.1 verview - poly V-belt drive", page 107](#)
- ◆ ⇒ Electrical system; Rep. gr. 27; Alternator; Exploded view - alternator
- ◆ ⇒ Electrical system; Rep. gr. 27; Battery; Assembly overview - battery

## 1.4 Removing and installing upper part of sump

#### Special tools and workshop equipment required

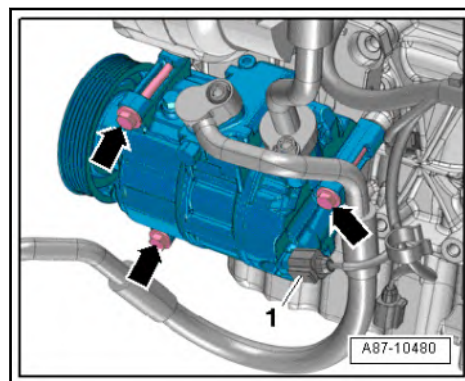
- ◆ Allen key, long reach 5 mm -T10058-



- ◆ Hand drill with plastic brush
- ◆ Safety glasses
- ◆ Sealant ⇒ Electronic Parts Catalogue



**Vehicles with air conditioner compressor:**



- Remove poly V-belt ➔ [page 118](#) .
- Separate 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.

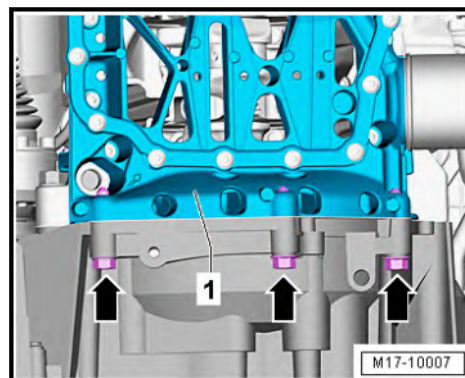
**ⓘ NOTICE**

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

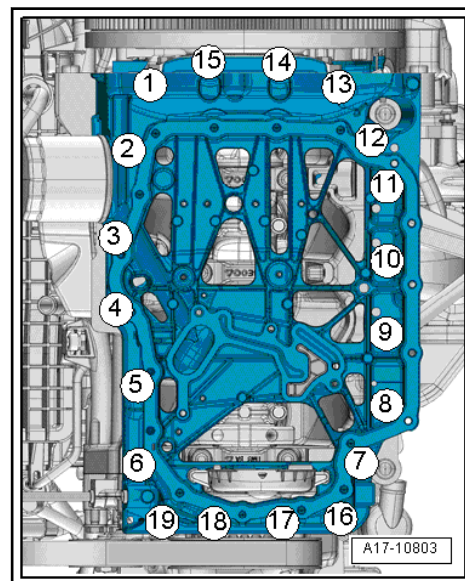
- Never bend refrigerant lines to a radius tighter than  $r < 100$  mm.
- Unscrew bolts -arrows- for air conditioning compressor.
- Remove air conditioner compressor with refrigerant lines connected and tie it up on the right side.

**Continued for all vehicles:**

- Remove sump (bottom section) ➔ [page 259](#) .
- Unscrew securing bolts -arrows- for gearbox to upper section of sump -1-.



- Loosen and unscrew bolts in the sequence -19 to 1-.



- Carefully detach upper part of sump from adhesive bond.
- Remove baffle plate.

#### Installing



#### Note

- ◆ *Renew bolts that are tightened with turning further angle.*
- ◆ *Renew gaskets, oil seals and self-locking nuts.*



#### Note

- ◆ *Risk of soiling lubrication system.*
- ◆ *Cover open parts of engine.*
- Remove sealant residues from cylinder block with a flat scraper.



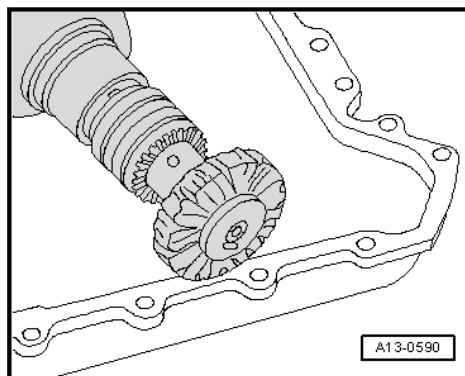
#### CAUTION

Risk of eye injury from dust and plastic parts being flung into the air.

Eye irritation and injury possible.

- Wear protective goggles.

- Remove sealant residue from upper part of sump, e.g. with rotating plastic brush.

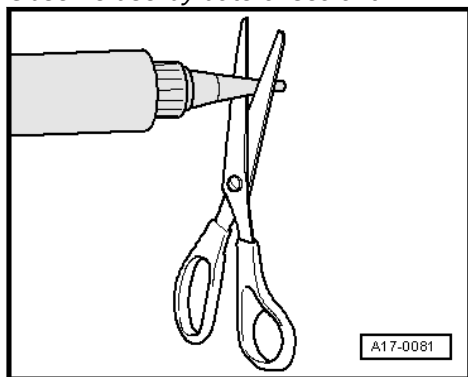


- Check oil galleries in upper part of sump and cylinder block for soiling.
- Remove any oil and grease from sealing surfaces.



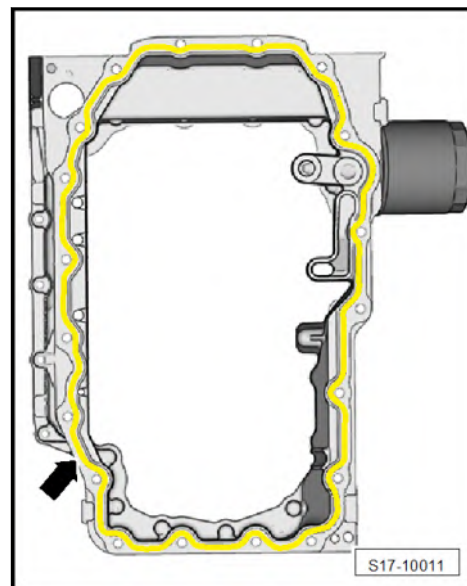
**Note**

*Observe use-by date of sealant.*



**Note**

- ♦ *Risk of blocking lubrication system with excess sealant.*
- ♦ *Do not apply sealant bead thicker than specified.*
- Cut off nozzle on tube at front marking (Ø of nozzle approx. 2 mm).



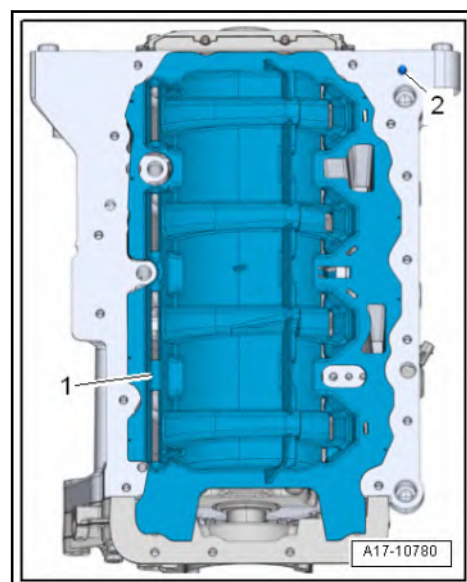
- Apply sealant in a bead -arrow- to clean sealing surface of bottom section of sump using applicator gun -VAS 6966-.
- Thickness of sealant bead: 2 to 3 mm.



**Note**

*Upper part of oil sump must be installed within 5 minutes after sealant has been applied.*

- Check that dowel pin -2- is securely seated in cylinder block.



- Attach baffle plate -1- to cylinder block.
- Position top section of sump and tighten bolts ⇒ [page 259](#) .

Further installation is carried out in reverse order of removal, observing the following:

- Install bottom section of sump ⇒ [page 259](#) .
- Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87; Air conditioner compressor; Removing and installing air conditioner compressor from and to bracket.





- Replenish engine oil, and check oil level ⇒ Maintenance; Booklet .

### Specified torques

- ♦ ⇒ [o1.1 verview - sump/oil pump", page 256](#)
- ♦ ⇒ Rep. gr. 34; Removing and installing gearbox; Specified torques for gearbox
- ♦ ⇒ Heating, air conditioning; Rep. gr. 87; Air conditioner compressor

## 1.5 Engine oil:



### Note

- ♦ *Risk of damage to catalytic converter.*
- ♦ *Oil level must not be above "max." mark.*

Capacities and specifications ⇒ Maintenance; Booklet ; Engine oil: Capacities and specifications.

Check engine oil level ⇒ Maintenance; Booklet ; Engine oil level: Checking.



## 2 Engine oil cooler

⇒ [o2.1 verview - engine oil cooler](#)", page 273

⇒ [a2.2 nd installing engine oil cooler](#)", page 273

### 2.1 Assembly overview - engine oil cooler

#### 1 - Engine oil cooler

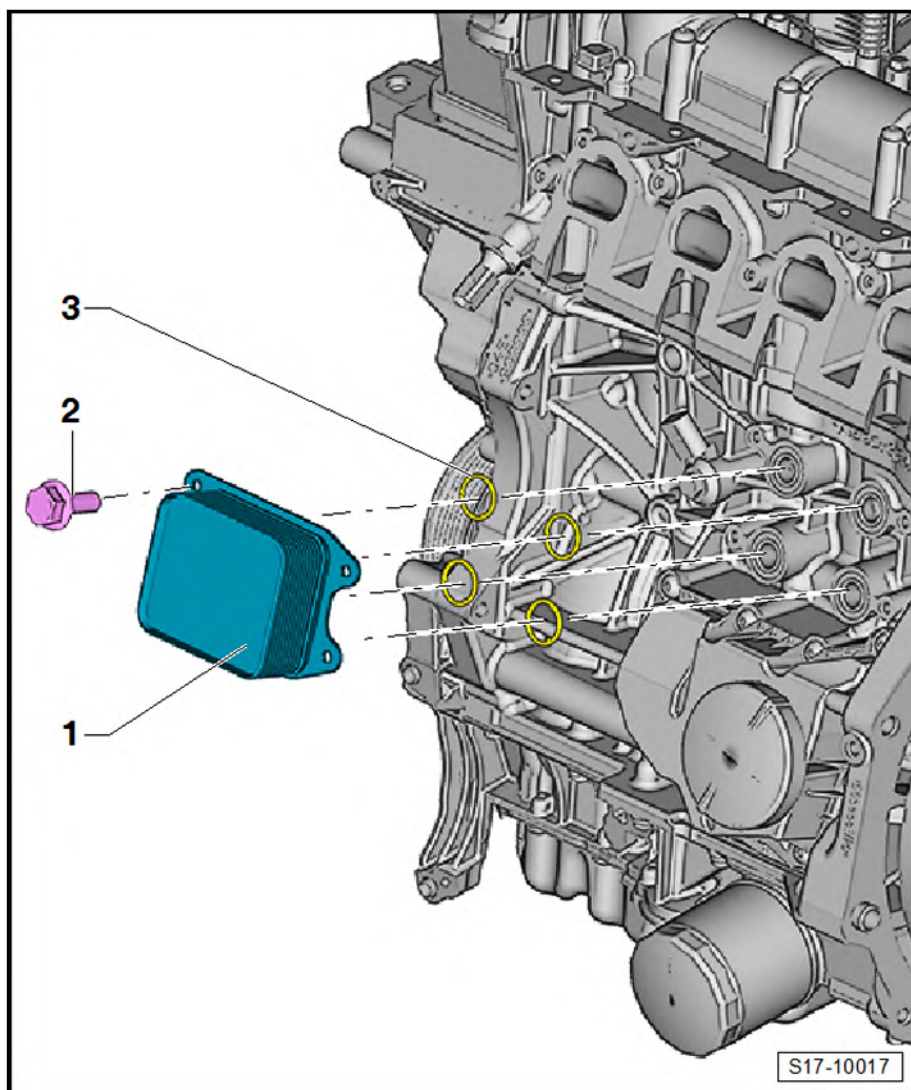
- ☐ Removing and installing ⇒ [page 273](#)
- ☐ Renew coolant after replacing.

#### 2 - Bolt

- ☐ Renew after removal
- ☐ Qty. 4
- ☐ 8 Nm +90°

#### 3 - Oil seals

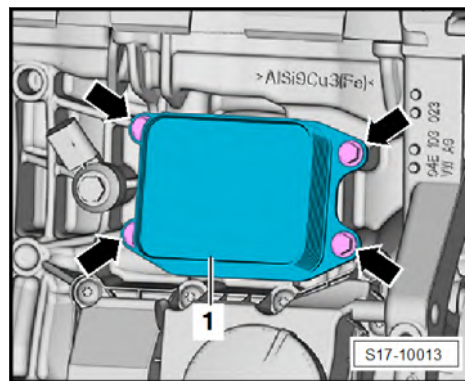
- ☐ Renew after removal



### 2.2 Removing and installing engine oil cooler

#### Removing

- Drain coolant ⇒ [page 287](#) .
- Remove intake manifold ⇒ [page 373](#) .
- Unscrew bolts -arrows- and detach engine oil cooler -1-.



### Installing

- Insert new O-rings.

Install in reverse order of removal, observing the following:

- Install intake manifold ⇒ [page 373](#) .
- Add coolant ⇒ [page 296](#) .

### Specified torques

- ♦ ⇒ [o2.1 verview - engine oil cooler", page 273](#)
- ♦ ⇒ [o4.1 verview – intake manifold", page 369](#)



### 3 Crankcase ventilation

⇒ [o3.1 verview - crankcase breather system", page 275](#)

⇒ [a3.2 nd installing oil separator", page 276](#)

#### 3.1 Assembly overview - crankcase breather system

##### 1 - Bolt

- ☐ Renew after removal
- ☐ 9 Nm

##### 2 - Oil separator

- ☐ Removing and installing ⇒ [page 276](#)
- ☐ Renew if damaged

##### 3 - O-ring

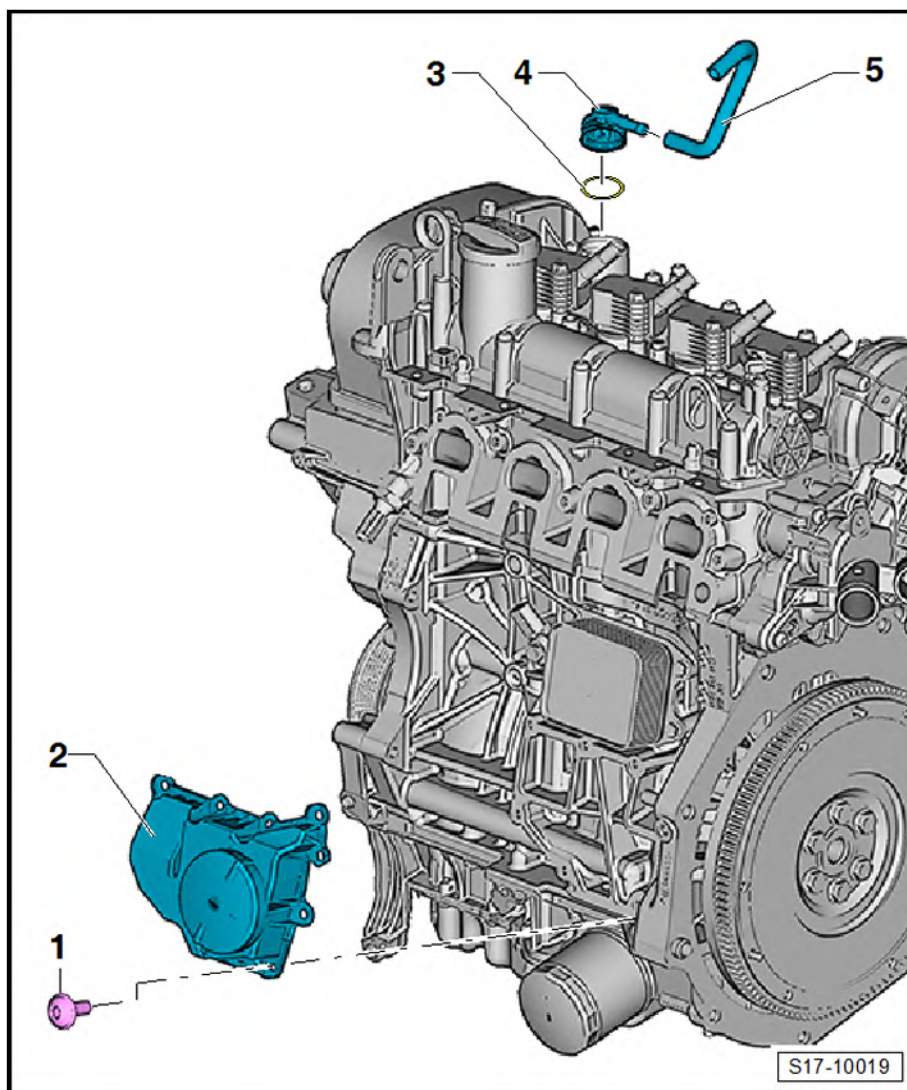
- ☐ Renew after removal
- ☐ Lubricate before installing.

##### 4 - Union

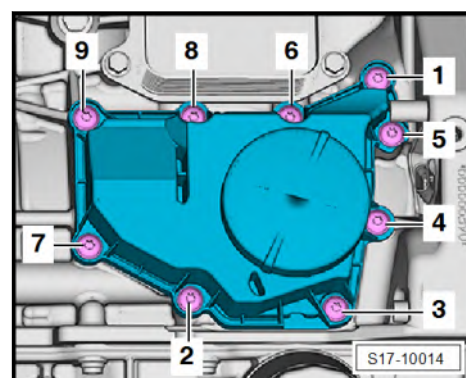
- ☐ Observe installation position

##### 5 - Hose

- ☐ For crankcase ventilation.



#### Oil separator - specified torque and sequence





- Tighten bolts in the sequence -1- to -9- to 9 Nm.

## 3.2 Removing and installing oil separator

### Special tools and workshop equipment required

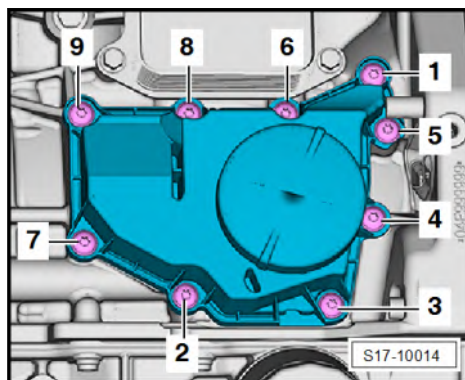
- ◆ Applicator gun -VAS 6966-



- ◆ Scraper
- ◆ Commercially available studs, M6x20 mm, qty. 2
- ◆ Sealant remover
- ◆ Cleaner and degreaser
- ◆ Safety goggles and protective gloves
- ◆ Silicone sealant ⇒ Electronic Parts Catalogue

### Removing

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Remove intake manifold ⇒ [page 373](#) .
- Loosen and unscrew bolts in the sequence -9- to -1-.



- Carefully release oil separator from bonded joint.

### Installing

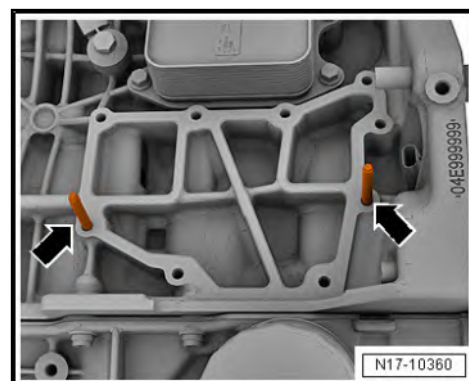
Install in the reverse order of removal. When doing this, note the following:



**CAUTION**

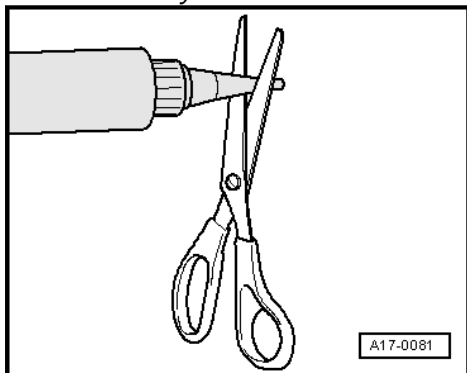
**Risk of injury from sealant and grease removers. Sealant and grease removers are highly flammable and may cause eye and skin irritation.**

- Wear protective goggles.
  - Wear protective gloves.
- 
- Remove sealant residue on cylinder block and sump using a chemical sealant remover or a flat scraper.
  - Degrease sealing surfaces.
  - Screw 2 M6x20 mm studs a few turns into holes -arrows-.



**i** Note

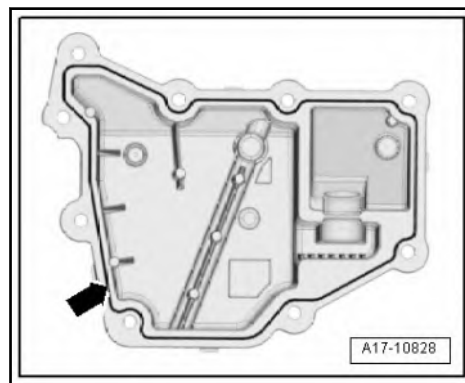
*Observe use-by-date of sealant.*



**i** Note

- ◆ Risk of soiling the lubrication system.
  - ◆ Cover any opened engine components.
- 
- Cut off nozzle on tube at front marking (Ø of nozzle approx. 1.5 mm).





#### Note

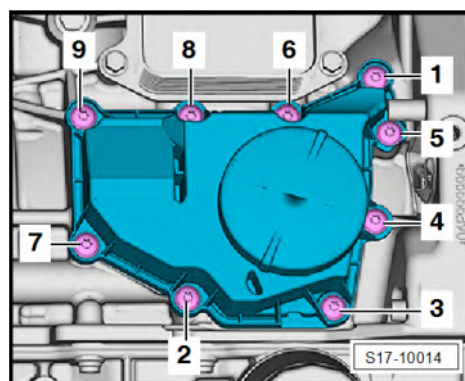
- ◆ Risk of blocking lubrication system with excess sealant.
- ◆ Do not apply sealant bead thicker than specified.
- Apply bead of sealant -arrow- onto clean sealing surface of oil separator using applicator gun -VAS 6966- as illustrated.
- Width of sealant bead: 1.5 mm.



#### Note

*The oil separator must be installed within 5 minutes after sealant has been applied.*

- Fit oil separator, and tighten bolts.



- Tighten bolts in the sequence -1- to -9-.

Perform further installation in reverse order, paying attention to the following:

#### Specified torque

- ◆ ⇒ [o3.1 verview - crankcase breather system", page 275](#)
- ◆ ⇒ [o4.1 verview – intake manifold", page 369](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation



## 4 Oil filter, oil pressure switch

⇒ [o4.1 verview - oil filter/oil pressure switch", page 279](#)

⇒ [a4.2 nd installing oil pressure switchF1", page 279](#)

⇒ [o4.3 il pressure", page 281](#)

⇒ [a4.4 nd installing oil filter housing", page 282](#)

### 4.1 Assembly overview - oil filter/oil pressure switch

#### 1 - Oil filter

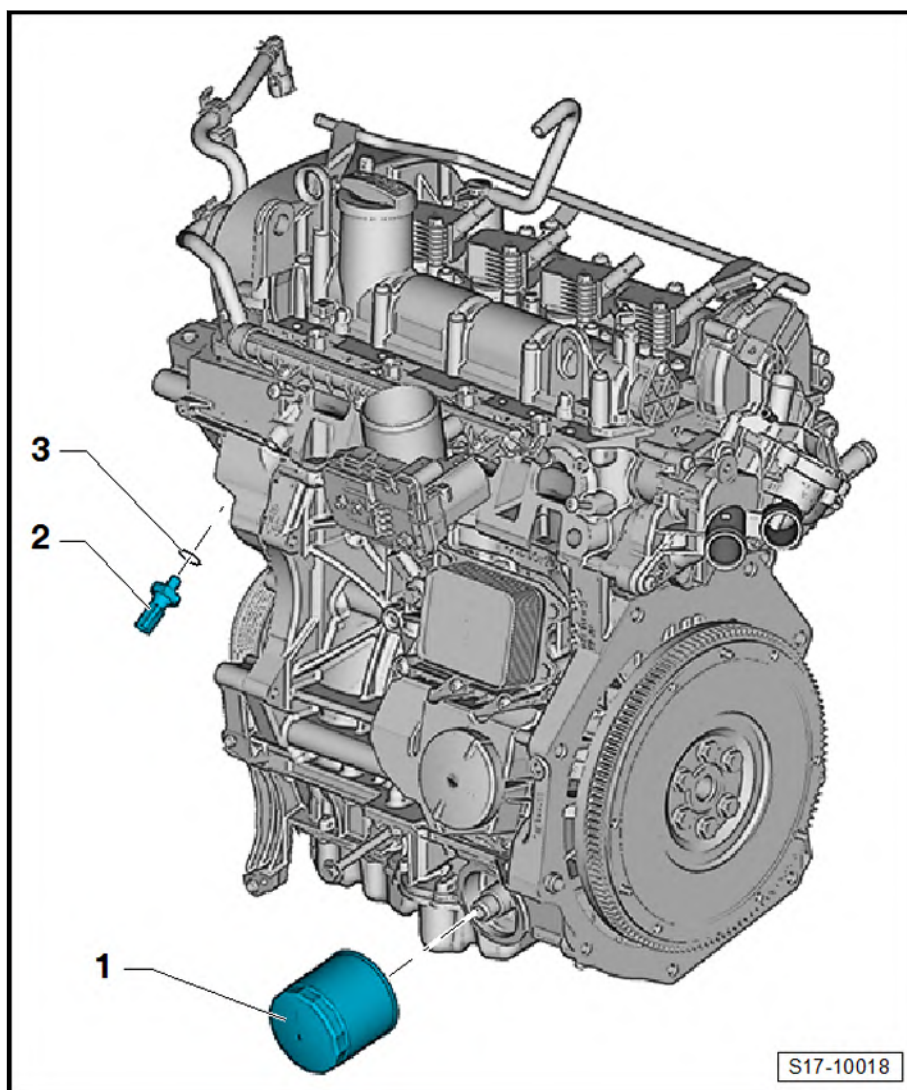
- ☐ Removing and installing ⇒ [page 282](#)
- ☐ Before installing, lightly coat seal with clean engine oil.
- ☐ Observe notes ⇒ [page 256](#)
- ☐ 20 Nm
- ☐ If the connecting union for oil filter in sump became loose ⇒ [page 282](#)

#### 2 - Oil pressure switch -F1-

- ☐ Switch pressure 0.03 to 0.06 MPa (0.3 to 0.6 bar)
- ☐ Checking oil pressure switch ⇒ [page 281](#) .
- ☐ Removing and installing ⇒ [page 279](#)
- ☐ 20 Nm

#### 3 - Seal

- ☐ Renew after removal

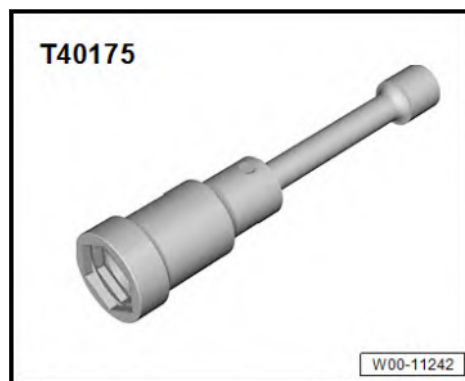


### 4.2 Removing and installing oil pressure switch -F1-

Special tools and workshop equipment required

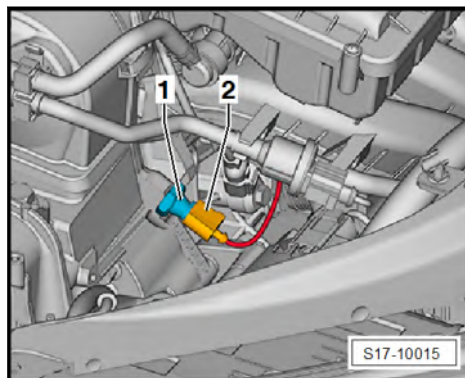


- ◆ T-bar and socket, 24 mm -T40175-



### Removing

- Depending on version
- Remove skid plate ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Release connectors -2- and pull off.



### Note

*The alternator must be covered with a cloth in order to avoid damage due to spilled engine oil.*

- Unscrew oil pressure switch -F1- -1-.

### Installing

Install in the reverse order of removal. When doing this, note the following:



### Note

- ◆ *Renew seal.*
- ◆ *Insert the new oil pressure switch -F1- immediately into the bore so that no larger amounts of oil can escape.*
- Check oil level ⇒ Maintenance; Booklet .

### Specified torques

- ◆ ⇒ [o4.1 verview - oil filter/oil pressure switch", page 279](#)



## 4.3 Checking oil pressure

### Special tools and workshop equipment required

- ◆ Oil pressure tester -V.A.G 1342-



- ◆ Auxiliary measuring set -V.A.G 1594D-, not illustrated
- ◆ Hand-held multimeter -V.A.G 1526E-, not illustrated
- Oil level OK. Checking ⇒ Maintenance; Booklet .
- Engine oil temperature at least 80°C (radiator fan must have run once)

### Checking oil pressure

- Remove oil pressure switch -F1- ➔ [page 279](#) .
- Screw oil pressure tester -V.A.G 1342- into bore for oil pressure switch in cylinder head.



- Screw oil pressure switch -F1- into bore in oil pressure tester -V.A.G 1342-.
- Start engine.
- Oil pressure at idling speed: at least 0.1 MPa (1 bar)
- Minimum oil pressure at 3000 rpm: 0.25 MPa (2.5 bar)
- Minimum oil pressure at 4500 rpm: 0.3 MPa (3 bar)



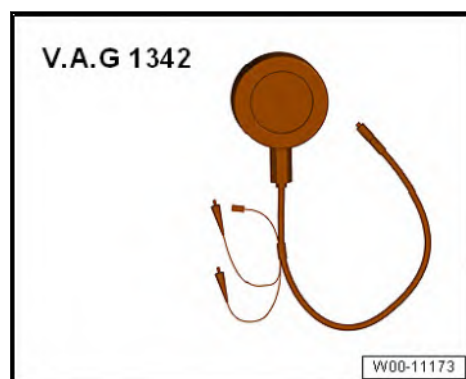
### Note

- ◆ *Mechanical damage, e.g. due to worn bearings or camshaft adjusters, could be the cause for oil pressure being too low.*
- ◆ *The oil pressure must not exceed 0.5 MPa (5 bar). Otherwise the fault is in the pump control circuit.*



### Checking oil pressure switch -F1-

- Switch off engine.
- Connect brown wire of tester to earth (-).



- Connect hand-held multimeter -V.A.G 1526E- using cables from auxiliary test set -V.A.G 1594D- to battery positive (+) and oil pressure switch -F1-.

- LED must not light up.

If the LED lights up:

- Replace oil pressure switch -F1-

If LED does not light up:

- Start engine, and increase engine speed.
- At an oil pressure of 0.03 to 0.06 MPa (0.3 to 0.6 bar) the LED must light up; otherwise renew oil pressure switch ➔ [page 279](#) .
- Install oil pressure switch -F1- ➔ [page 279](#) .

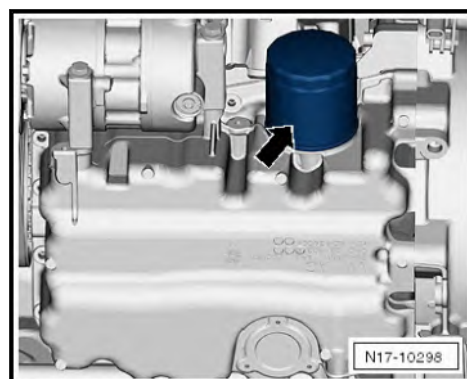
## 4.4 Removing and installing oil filter housing

### Special tools and workshop equipment required

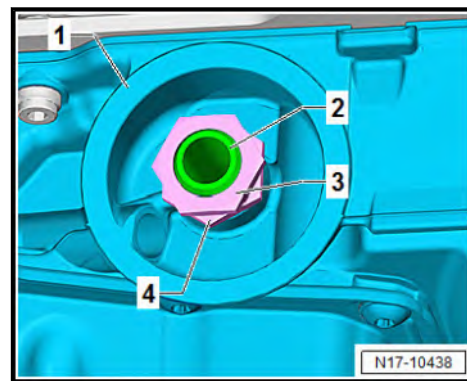
- ◆ Oil filter tool -3417-

### Removing

- Remove noise insulation ➔ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Drain engine oil ➔ Maintenance; Booklet .
- Remove oil filter -arrow- using oil filter tool -3417-.



### 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 nuts -068 115 723-, qty. 2 ⇒ Electronic Parts Catalogue
- Screw nuts -3- and -4- onto connecting union -2-, and counterlock them.
- Tighten connecting union -2- using nut -3-.
- Loosen the two nuts and remove them, taking care not to loosen the connecting union.

#### Specified torque

Connecting union	Specified torque
-2-	50 Nm

#### Installing

Install in the reverse order of removal. When doing this, note the following:

- Moisten seal of oil filter with engine oil.
- Tighten oil filter to specified torque of 20 Nm using oil filter tool -3417-.
- Fill engine oil.





## 19 – Cooling

### 1 Cooling system/coolant

⇒ [d1.1 iagram - coolant hoses", page 284](#)

⇒ [a1.2 nd adding coolant", page 287](#)

⇒ [c1.3 ooling system for leaks", page 296](#)

#### 1.1 Connection diagram - coolant hoses

⇒ [d1.1.1 iagram - coolant hoses", page 284](#)

⇒ [d1.1.2 iagram - coolant hoses", page 286](#)

##### 1.1.1 Connection diagram - coolant hoses



#### Note

- ◆ *Brown = coolant circuit for heater*
- ◆ *Green = coolant circuit for ATF (only for vehicles with automatic gearbox)*
- ◆ *The arrows point in the direction of coolant flow.*
- ◆ *The arrows on the coolant pipes and on the ends of the coolant hoses must be aligned with each other.*



#### 1 - Radiator for engine coolant

- ☐ Renew coolant after replacing
- ☐ Assembly overview
- ☐ Removing and installing

#### 2 - Cylinder head and cylinder block

- ☐ Renew coolant after replacing

#### 3 - Coolant expansion tank

#### 4 - Cap

- ☐ For coolant expansion tank
- ☐ The coolant expansion tank may have a different shape depending on the model year.
- ☐ Check pressure relief valve ➔ [page 299](#)

#### 5 - Radiator outlet coolant - G62-

- ☐ Assembly overview
- ☐ Removing and installing

#### 6 - Heat exchanger for heater

- ☐ Renew coolant after replacing

#### 7 - Coolant pump

- ☐ With thermostat housing
- ☐ Assembly overview
- ☐ Removing and installing

#### 8 - ATF cooler

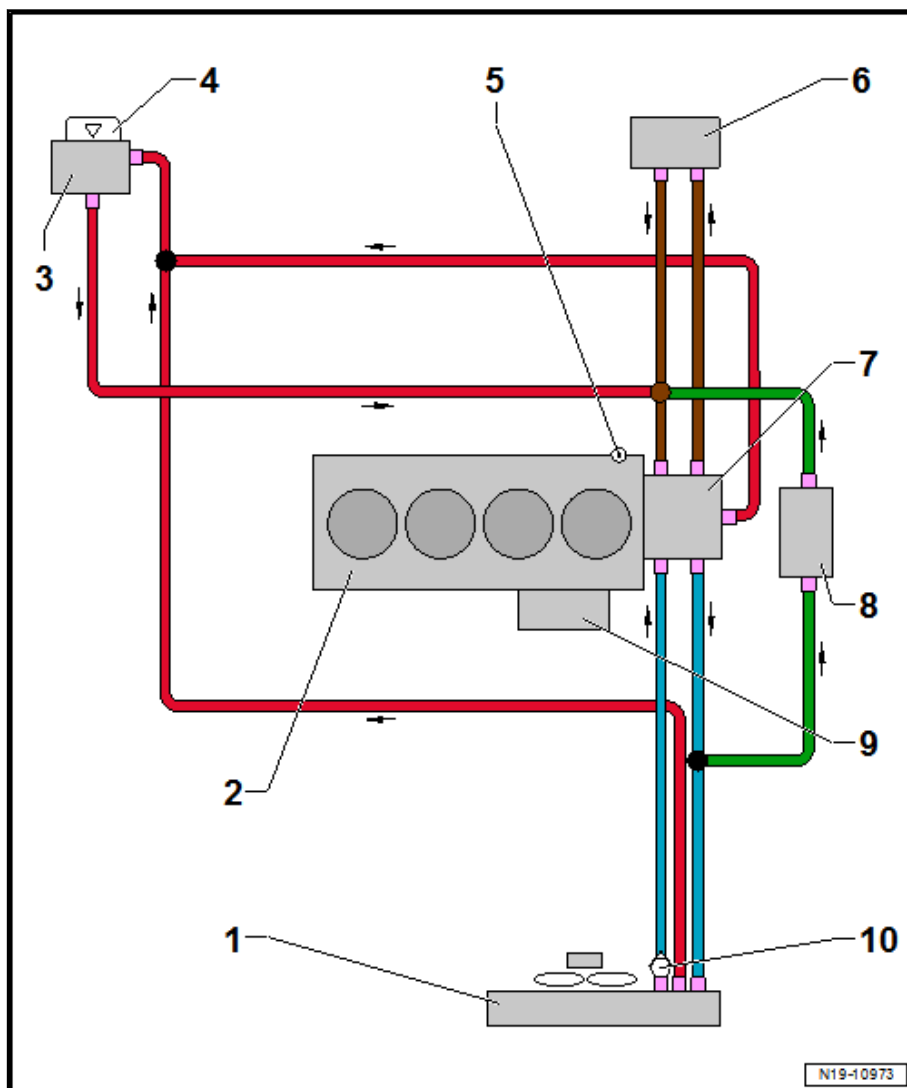
- ☐ Only models with automatic gearbox

#### 9 - Engine oil cooler

- ☐ Assembly overview
- ☐ Removing and installing

#### 10 - Radiator outlet coolant temperature sender -G83-

- ☐ Not fitted in every equipment variant
- ☐ Assembly overview
- ☐ Removing and installing





## 1.1.2 Connection diagram - coolant hoses



### Note

- ◆ *Brown = coolant circuit for heater*
- ◆ *Green = coolant circuit for ATF (only for vehicles with automatic gearbox)*
- ◆ *The arrows point in the direction of coolant flow.*
- ◆ *The arrows on the coolant pipes and on the ends of the coolant hoses must be aligned with each other.*



## 1 - Coolant expansion tank

### 2 - Cap

- ☐ For coolant expansion tank
- ☐ Check pressure relief valve ⇒ [page 299](#)

### 3 - Radiator outlet coolant - G62-

- ☐ Assembly overview ⇒ [page 303](#)
- ☐ Removing and installing ⇒ [page 313](#)

### 4 - Heat exchanger for heater

- ☐ Renew coolant after replacing

### 5 - ATF cooler

- ☐ Only models with automatic gearbox

### 6 - Thermostat

### 7 - Radiator for engine coolant

- ☐ Renew coolant after replacing
- ☐ Assembly overview ⇒ [page 323](#)
- ☐ Removing and installing ⇒ [page 330](#)

### 8 - Radiator outlet coolant temperature sender -G83-

- ☐ Assembly overview ⇒ [page 303](#)
- ☐ Removing and installing ⇒ [page 315](#)

### 9 - Coolant pump

- ☐ With thermostat housing
- ☐ Assembly overview ⇒ [page 300](#)
- ☐ Removing and installing ⇒ [page 304](#)

### 10 - Engine oil cooler

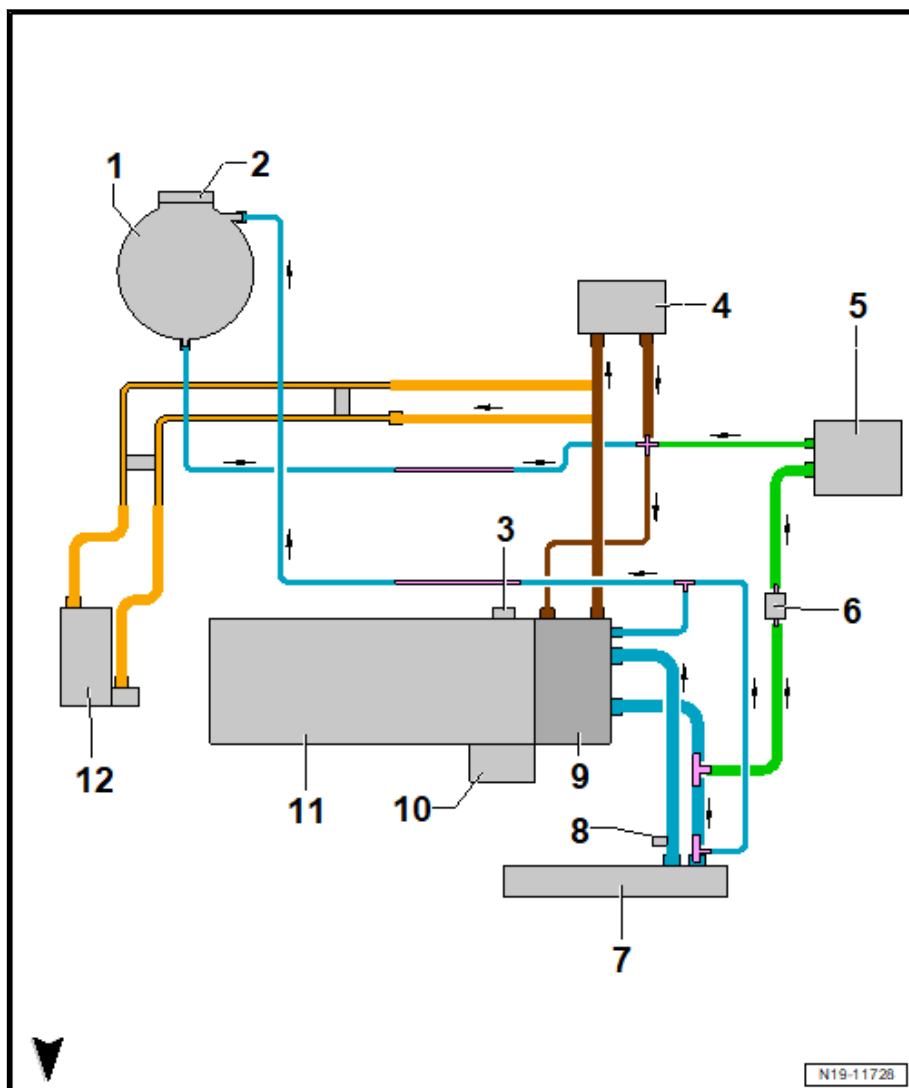
- ☐ Assembly overview ⇒ [page 273](#)
- ☐ Removing and installing ⇒ [page 273](#)

### 11 - Cylinder head and cylinder block

- ☐ Renew coolant after replacing

### 12 - Auxiliary heater

- ☐ Assembly overview ⇒ Auxiliary heater, supplementary heater; Rep. gr. 82; Auxiliary/supplementary heater; Overview of fitting locations – auxiliary/supplementary heater
- ☐ Removing and installing ⇒ Auxiliary heater, supplementary heater; Rep. gr. 82; Auxiliary heater, supplementary heater; Removing and installing auxiliary heater



## 1.2 Draining and adding coolant

### Special tools and workshop equipment required

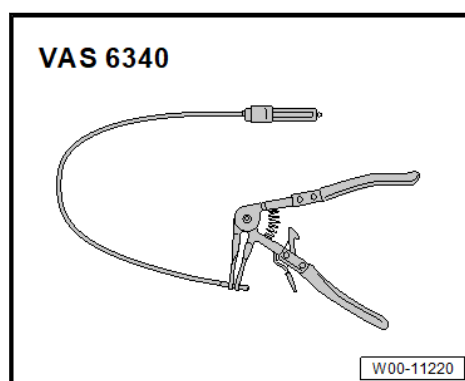
- ◆ Refractometer -T10007B-, not illustrated



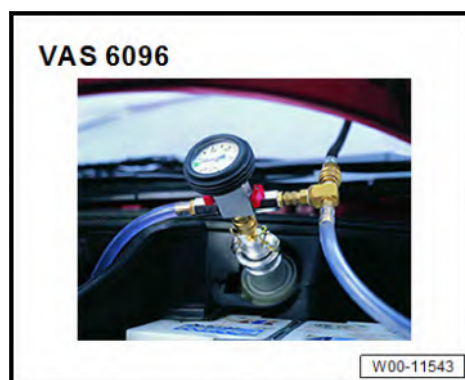
- ◆ Drip tray for workshop hoist -VAS 6208-



- ◆ Hose clamp pliers -VAS 6340-



- ◆ Cooling system charge unit -VAS 6096-



- ◆ Adapter for cooling system tester -V.A.G 1274/8-



- ◆ Safety glasses
- ◆ Safety gloves



◆ Cooling system tester -V.A.G 1274 B-



Draining

**CAUTION**

The cooling system could be under pressure. Danger of scalding by steam and hot coolant.

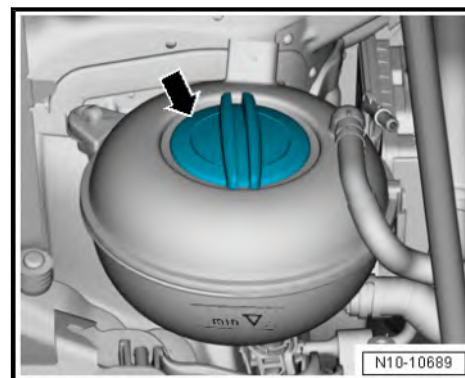
Skin and other parts of the body may be scalded.

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

**Note**

*The coolant expansion tank and cap may have a different shape depending on the model year.*

- Open filler cap -arrow- for coolant expansion tank.

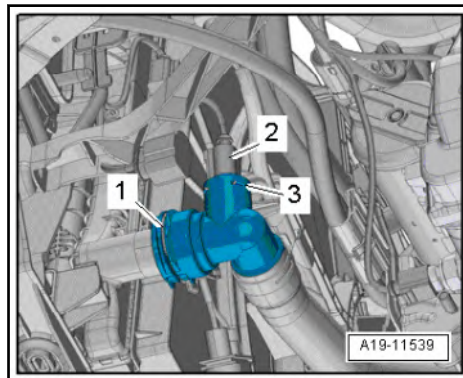


- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Place drip tray for workshop hoist -VAS 6208- underneath.

**Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>**

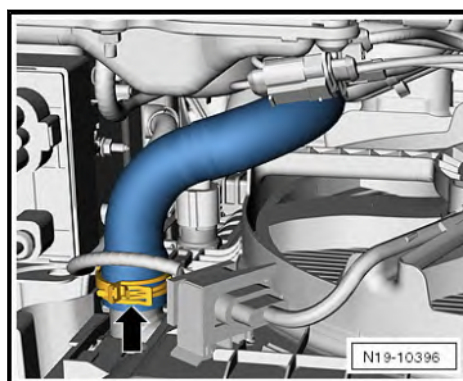
- Disconnect connector -2- from radiator outlet coolant temperature sender -G83- -3-.





- Pull out retaining clip -1-, and remove lower left coolant hose from radiator.

**Polo Saloon RUS 2020>**



- Loosen hose clip -arrow-.
- Pull coolant hose off radiator.

**Continued for all vehicles**

- Drain coolant.

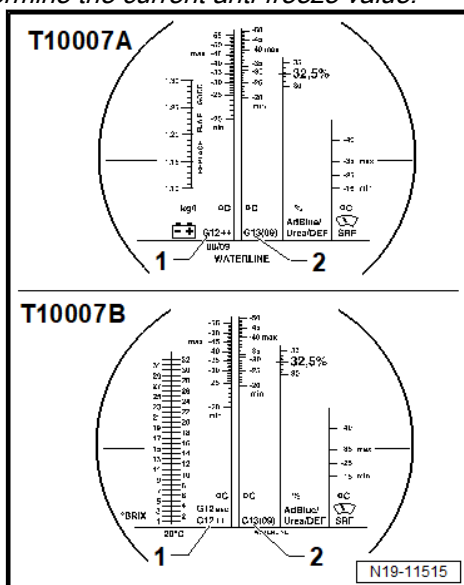


## Filling



## 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, only ever use 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 engine.
- ♦ Mixed in the proper proportions, coolant inhibits frost and corrosion damage as well as scaling. Such additives also raise the boiling point of the 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.
- ♦ The refractometer -T10007A- or refractometer -T10007B- must be used to determine the current anti-freeze value.



- ♦ Scale -1- of the refractometer is calibrated for the coolant additives G12++ and G12evo.
- ♦ Scale -2- of the refractometer is calibrated for the coolant additive G13.
- ♦ If it is not possible to ensure that the same type of coolant additive is filled: always determine anti-freeze protection using the scale for G13.
- ♦ Frost protection must be guaranteed down to  $-25^{\circ}\text{C}$  as a minimum and, in countries with arctic conditions, down to approx.  $-36^{\circ}\text{C}$ . Increasing the frost protection is permissible only if climatic conditions require stronger frost protection. It may, however, be increased only to a maximum of  $-48^{\circ}\text{C}$ . 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.*
- ◆ *The temperature reading on the refractometer corresponds to the »ice flocculation point«. Flakes of ice may start forming in the coolant below 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 <sup>1)</sup>	Distilled water <sup>1)</sup>
-25°C	40%	3.2 l	4.8 l
-36°C	50%	4.0 l	4.0 l

<sup>1)</sup> The quantity of coolant can vary depending on the vehicle equipment.

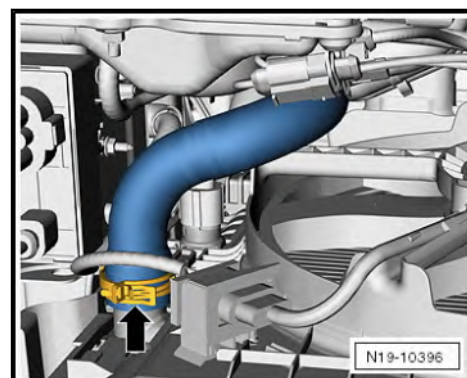
- Coolant: ⇒ Electronic Parts Catalogue.

#### Procedure

**Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020**

- Connect coolant hose with plug-in connector to radiator (bottom left) ⇒ [page 321](#).

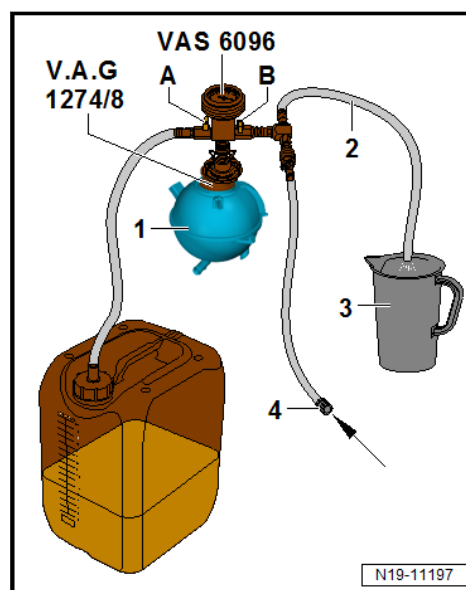
**Polo Saloon RUS 2020>**



- Connect coolant hose and secure with hose clamp -arrow-.



Continued for all vehicles



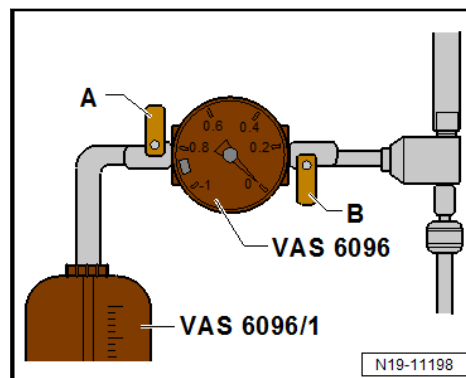
- Fill reservoir of -VAS 6096- with at least 10 litres of pre-mixed coolant in correct mixture ratio:
- Screw adapter for cooling system tester -V.A.G 1274/8- onto coolant expansion tank.
- Place cooling system charge unit -VAS 6096- on adapter -V.A.G 1274/8-.
- Feed vent hose -1- into a small container -2-.



**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.
- Pressure: 6 to 10 bar.
- 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.

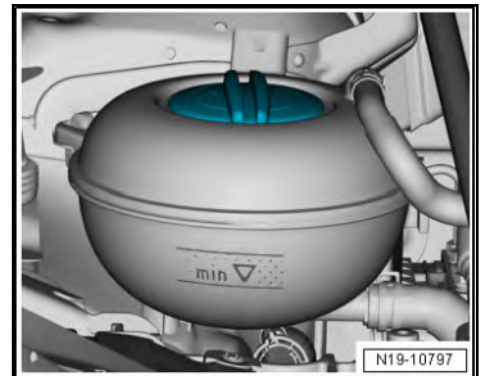


- In addition, briefly open valve -A- (turn lever in direction of flow to do this) so that hose on reservoir of -VAS 6096- fills with coolant.
- Close valve -A- again.
- Leave valve -B- open for a further 2 minutes.
- The suction-jet pump will continue generating a vacuum in the cooling system.
- The 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 low pressure in the cooling system is then sufficient for subsequent filling.



#### Note

- ♦ *If the needle does not reach the green zone, repeat the process.*
- ♦ *If the vacuum drops, the cooling system must be checked for leaks.*
- Pull off compressed air hose.
- Open valve -A-.
- The partial vacuum in cooling system causes coolant to be extracted from -VAS 6096- reservoir and coolant system to be filled.
- Remove cooling system charge unit -VAS 6096- from coolant expansion tank.
- Fill coolant up to max. mark.

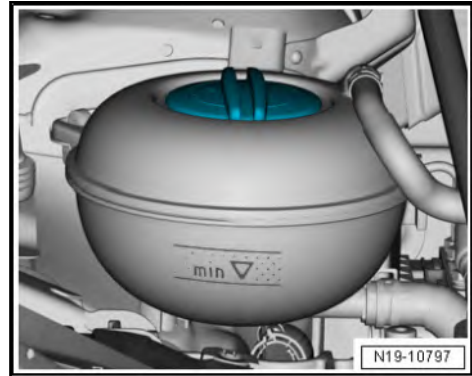


- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview – noise insulation.
- On vehicles with auxiliary heater, switch on auxiliary heater for about 30 seconds.
- Set temperature regulator to “HI”.
- Switch off air conditioner compressor.
- LED in the button must not light up.
- Tighten cap of coolant expansion tank until it engages.
- Start engine and run alternately at approx. 1500 rpm to maximum of 2800 rpm until radiator fan starts operating.





- Switch off engine and let it cool off.
- Check coolant level.



- Screw adapter for cooling system tester -V.A.G 1274/8- again onto expansion tank.
- Use cooling system tester -V.A.G 1274 B- to apply a pressure of 1 bar to the cooling system.
- Use tester to relieve pressure and remove cooling system tester -V.A.G 1274 B-.
- With the engine running, fill coolant up to approx. 5 mm above max. mark.
- When the engine is cold, the coolant level must be between the min. and the max. marks.
- The coolant level can be at or above the max. mark when the engine is at operating temperature.

### 1.3 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-



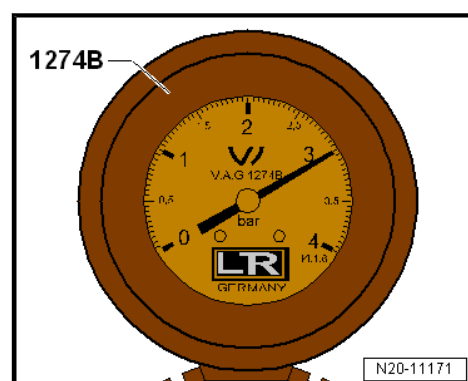
Note

*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.

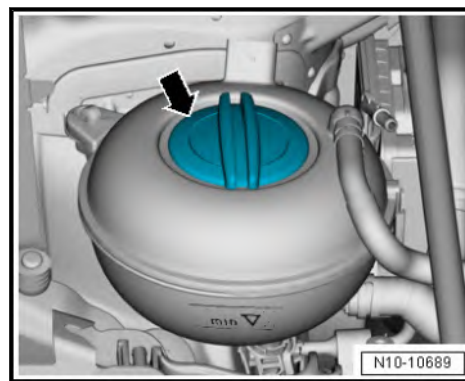
**If no pressure builds up or if the pressure drops again:**

The cooling system tester -V.A.G 1274 B- is leaking and should not be used.

- Engine at operating temperature.

**Procedure**

- Open filler cap -arrow- for coolant expansion tank.



#### Note

*The coolant expansion tank and cap may have a different shape depending on the model year.*

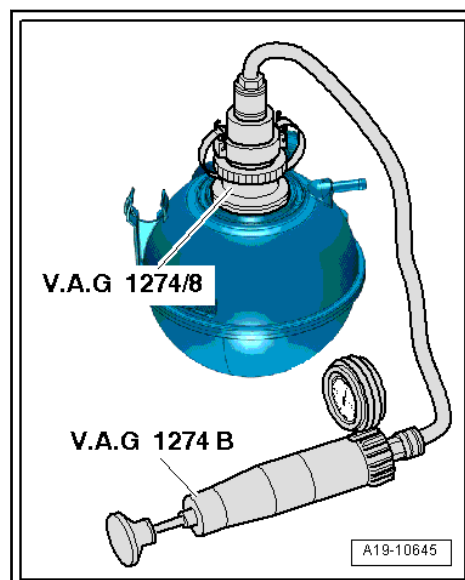
- Engine at operating temperature.

#### CAUTION

The cooling system could be under 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 suitable cloth and opening it carefully.
- 
- Fit cooling system tester -V.A.G 1274 B- with adapter - V.A.G 1274/8- to coolant expansion tank.



- Using hand pump of cooling system tester -V.A.G 1274 B-, build up a pressure of approx. 1.0 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

- ◆ A pressure drop of 0.2 bar within 10 minutes is caused by the coolant cooling down.
- ◆ The colder the engine, the lower the pressure loss.
- ◆ If necessary, repeat the check while the engine is cold.

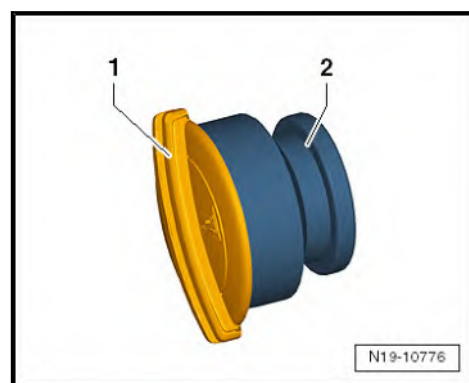
**Check pressure relief valve in cap.**



#### Note

*The cap may have a different shape depending on the model year.*

- Screw cap -1- into adapter for cooling system tester -V.A.G 1274/9- -2-.



- Connect adapter for cooling system tester -V.A.G 1274/9- to cooling system tester -V.A.G 1274 B- using connecting hose supplied.
- Build up pressure using hand pump of cooling system tester.

#### Blue cap

- ◆ The pressure relief valve must open at a pressure of 1.4 bar.

#### Black cap

- ◆ The pressure relief valve must open at a pressure of 1.6 to 1.8 bar.

If the pressure relief valve opens prematurely:

- Renew cap.



## 2 Coolant pump, regulation of cooling system

⇒ [o2.1 verview - coolant pump, thermostat", page 300](#)

⇒ [o2.2 verview - coolant temperature sender", page 303](#)

⇒ [a2.3 nd installing coolant pump", page 304](#)

⇒ [a2.4 nd installing toothed belt pulley for coolant pump", page 308](#)

⇒ [a2.5 nd installing thermostat", page 309](#)

⇒ [a2.6 nd installing coolant temperature senderG62", page 313](#)

⇒ [a2.7 nd installing radiator outlet coolant temperature senderG83", page 315](#)

### 2.1 Assembly overview - coolant pump, thermostat



### 1 - Thermostat housing

- ☐ Removing and installing ⇒ [page 312](#)
- ☐ Observe tightening sequence when tightening to coolant pump ⇒ [page 304](#).

### 2 - Thermostat

- ☐ For cylinder block coolant circuit
- ☐ Starts to open at approx. 87°C
- ☐ Different versions  
⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 312](#)

### 3 - Seal

- ☐ Renew after removal
- ☐ Ensure proper seating of seal
- ☐ Lightly coat with coolant before installing.

### 4 - Coolant pump

- ☐ Removing and installing ⇒ [page 304](#)
- ☐ Renew toothed belt after removing coolant pump

### 5 - Bolt

- ☐ 8 Nm
- ☐ Tightening sequence ⇒ [page 302](#)

### 6 - Seal

- ☐ Renew after removal
- ☐ Ensure proper seating of seal
- ☐ Lightly coat with coolant before installing.

### 7 - Toothed belt guard

- ☐ For toothed belt for coolant pump

### 8 - Bolt

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

### 9 - Toothed belt

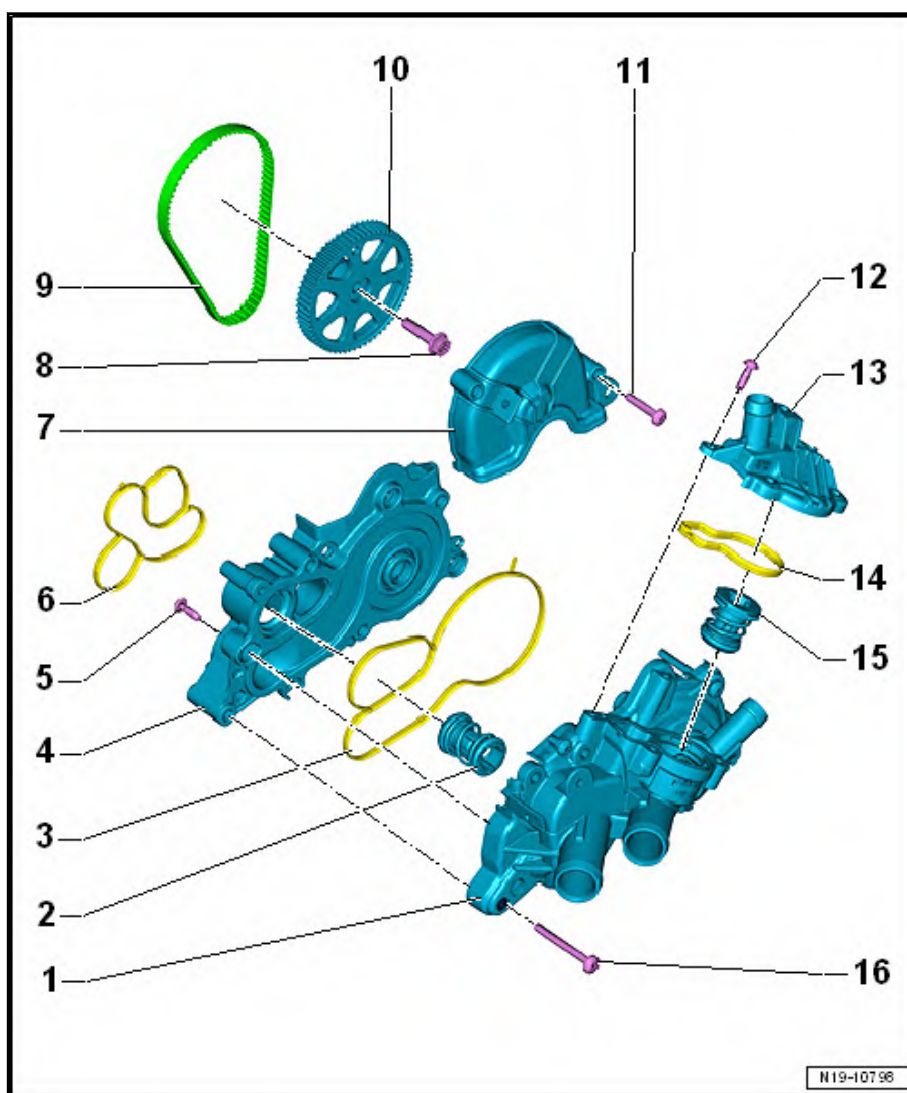
- ☐ Renew toothed belt after removing coolant pump
- ☐ For coolant pump drive
- ☐ Removing and installing ⇒ [page 304](#)

### 10 - Crankshaft

- ☐ For coolant pump drive
- ☐ Removing and installing ⇒ [page 308](#)

### 11 - Bolt

- ☐ 8 Nm







## 12 - Bolt

- ❑ Specified torque and tightening sequence ➤ [page 302](#)

## 13 - Cap

- ❑ For thermostat

## 14 - Seal

- ❑ Renew after removal
- ❑ Lightly coat with coolant before installing.

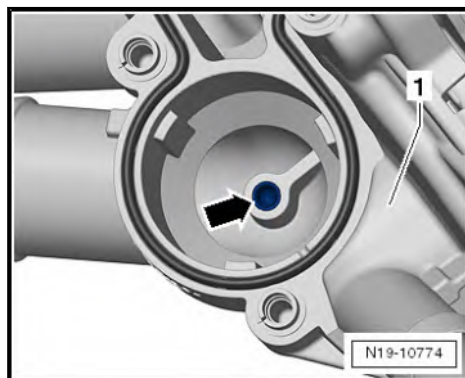
## 15 - Thermostat

- ❑ For cylinder head coolant circuit
- ❑ Starts to open at approx. 80°C
- ❑ Removing and installing ➤ [page 309](#)
- ❑ Fitting position ➤ [page 302](#)

## 16 - Bolt

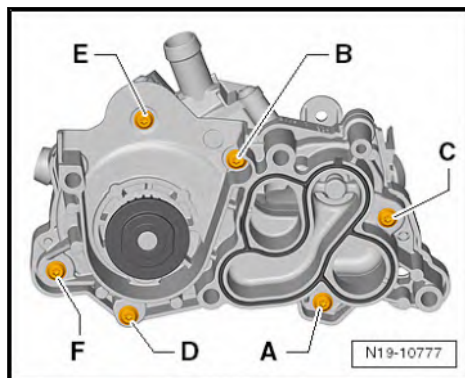
- ❑ Specified torque and tightening sequence ➤ [page 306](#)

Installation position of thermostat for cylinder block coolant circuit



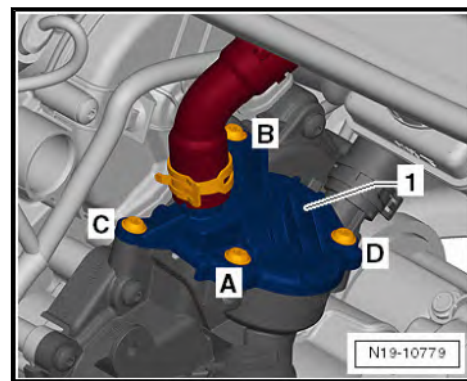
- Must be positioned with centring pin in guide -arrow- in thermostat housing.

Thermostat housing to coolant pump - specified torque and sequence



- Tighten bolts in the sequence -A ... F- to 8 Nm.

Cover for thermostat to thermostat housing - specified torque



#### Note

*Start thread cutting screws by hand so that they are screwed into the existing thread. Then, tighten bolt to specified torque.*

- Tighten bolts for cover -1- in sequence -A- to -D- to 8 Nm.

## 2.2 Assembly overview - coolant temperature sender

### 1 - Bolt

- 8 Nm

### 2 - Support ring

### 3 - O-ring

- Renew after removal

### 4 - Radiator outlet coolant - G62-

- Removing and installing ⇒ [page 313](#)

### 5 - O-ring

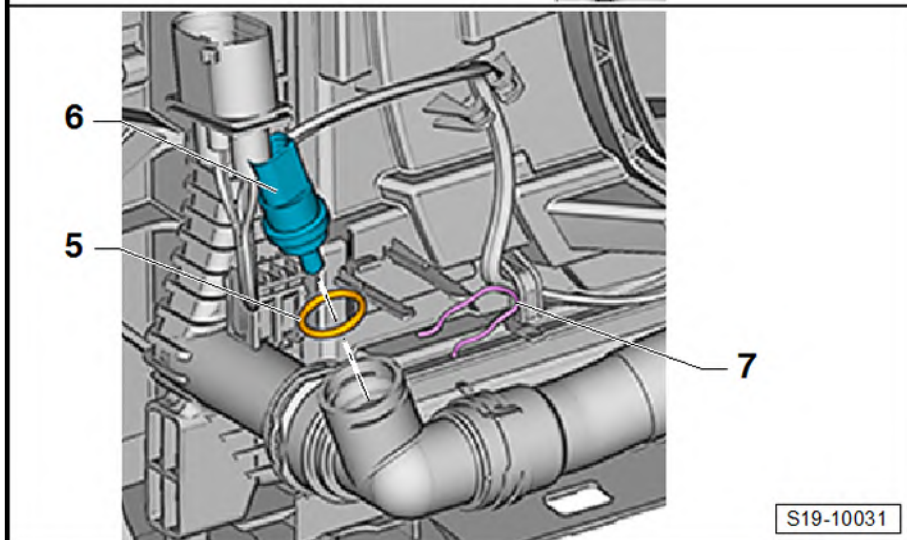
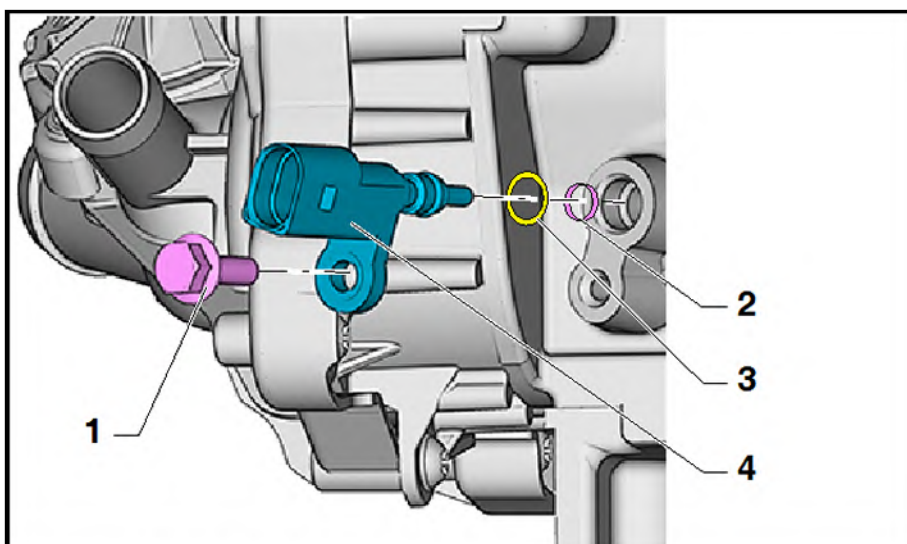
- Renew after removal

### 6 - Radiator outlet coolant temperature sender -G83-

- Not fitted in every equipment variant
- Removing and installing ⇒ [page 315](#)

### 7 - Retaining clip

- Check for firm seating



S19-10031



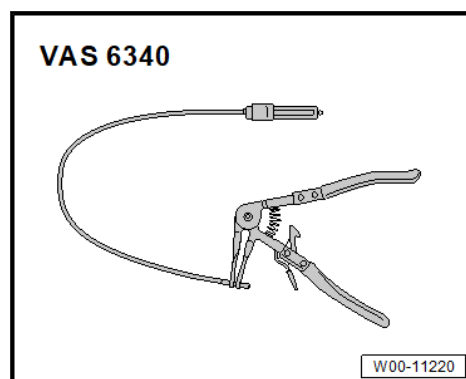
## 2.3 Removing and installing coolant pump

### Special tools and workshop equipment required

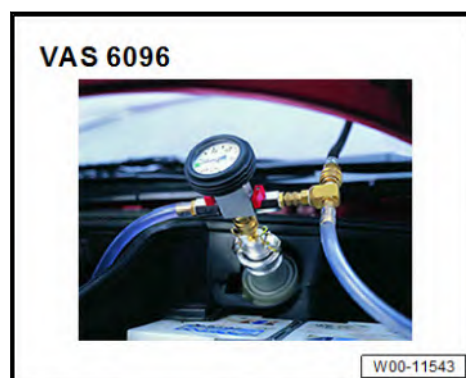
- ◆ Refractometer -T10007B-, not illustrated
- ◆ Drip tray for workshop hoist -VAS 6208-



- ◆ Hose clamp pliers -VAS 6340-



- ◆ Cooling system charge unit -VAS 6096-



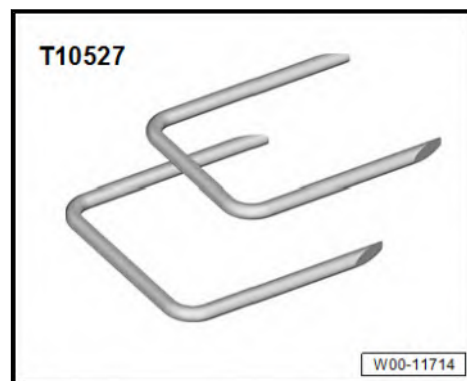
- ◆ Adapter for cooling system tester -V.A.G 1274/8-



- ◆ Torque wrench -VAS 6583A-, not illustrated



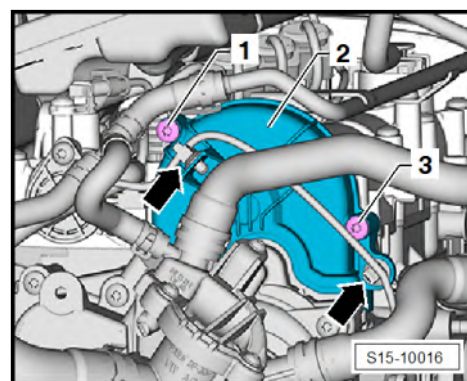
- ◆ Release tool -T10527-



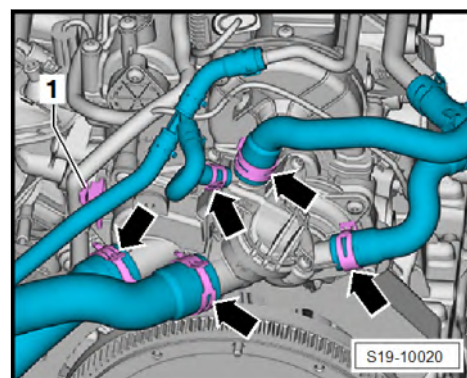
- ◆ Release tool -T10527/1-, not illustrated

### Removing

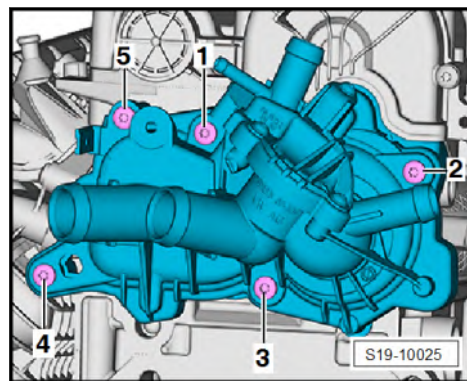
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Drain coolant ⇒ [page 287](#) .
- Lay wiring harness to one side -arrows-.



- Unscrew bolts -1, 3-, and remove toothed belt guard -2- for toothed belt for coolant pump.
- Release hose clips -arrows-, and remove coolant hoses.



- Loosen and unscrew bolts in the sequence -5- to -1-.



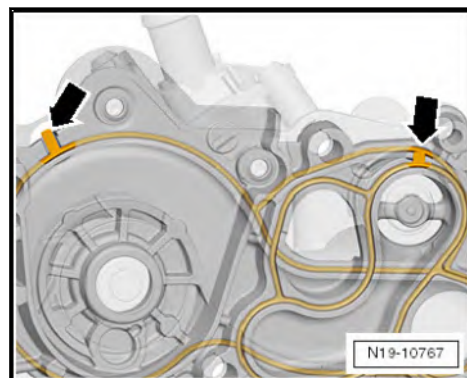
- Detach coolant pump with toothed belt.

### Installing



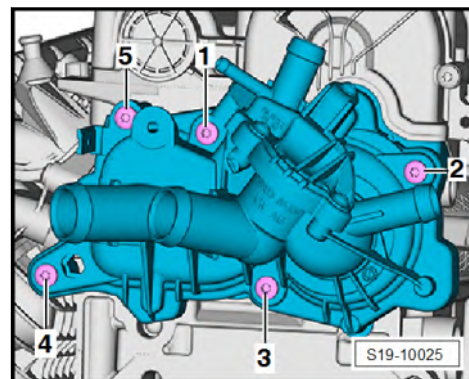
#### Note

- ◆ *Renew gaskets -arrows-.*
  - ◆ *Renew toothed belt after removing coolant pump.*
  - ◆ *Secure hose connections with hose clips of the same standard as that used on the production line ⇒ Electronic parts catalogue.*
- Ensure proper seating of gaskets -arrows-.



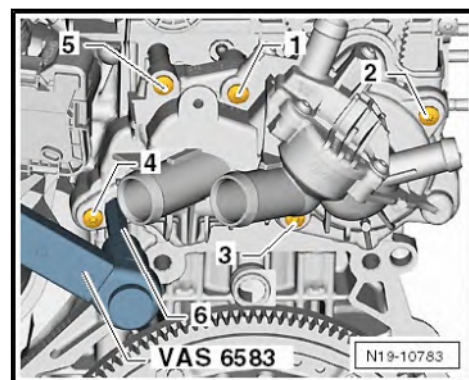
- Lubricate seal for coolant pump lightly with coolant.
  - Always adhere to the sequence of work steps given below when installing the coolant pump.
  - This ensures that the toothed belt is correctly tensioned.
  - The following work steps must be carried out with the aid of a 2nd mechanic.
  - Always renew toothed belts in conjunction with removal of coolant pump.
- Set No. 1 cylinder to TDC ⇒ [page 167](#) .
  - Fit toothed belt centrally onto camshaft pulley and coolant pump toothed belt pulley.
  - Mount coolant pump on cylinder head with securing bolts.
  - Pre-tighten bolts in the specified sequence:





Stage	Bolts	Specified torque
1.	-1- to -5-	Screw in by hand as far as stop
2.	-1- to -5-	10 Nm

- Loosen all bolts again by one turn.
- Fit torque wrench, e.g. -VAS 6583A-, with 10 mm hexagon key socket -item 6- to hex socket on coolant pump.



- Using torque wrench, e. g. -VAS 6583A-, preload coolant pump clockwise to 30 Nm.



#### 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.*
- Pre-load coolant pump.
- While doing so, have a second mechanic tighten coolant pump securing bolts in clockwise direction from right to left.
- Starting with bolts -2-, -1- and -5- (»3rd stage«), pretighten to 10 Nm.
- Then tighten securing bolts (»4th stage«).

Stage	Bolts	Specified torque
3.	-2, 1, 5-	10 Nm
4.	-3, 4, 5, 1, 2-	12 Nm

Perform further installation in reverse order, paying attention to the following:





- Add coolant ➔ [page 296](#) .

#### Specified torques

Component	Specified torque
Thermostat housing to coolant pump	7 Nm
Coolant pump	12 Nm
Toothed belt guard	8 Nm
Bolts for coolant pipe	➔ <a href="#">o3.1 overview - coolant pipes</a> , <a href="#">page 317</a>

#### Specified torques

- ◆ Tightening sequence for coolant pump ➔ [page 306](#)
- ◆ ➔ [o2.1 overview - coolant pump, thermostat](#), [page 300](#)
- ◆ ➔ Electrical system; Rep. gr. 27; Battery; Assembly overview - battery

## 2.4 Removing and installing toothed belt pulley for coolant pump

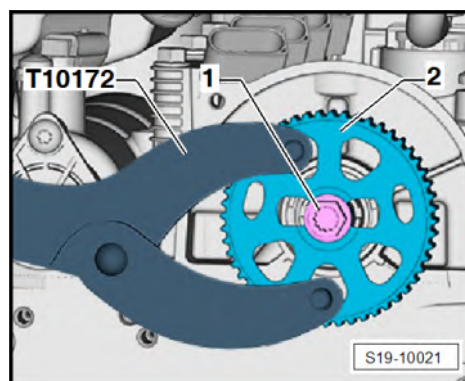
#### Special tools and workshop equipment required

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



#### Removing

- Remove coolant pump ➔ [page 304](#) .
- Loosen bolt -1- using counterhold -T10172A- with adapters -T10172/2-.



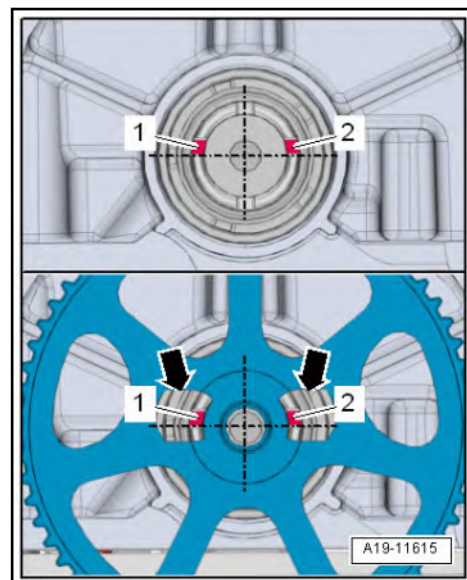
- Unscrew bolt, and remove toothed belt pulley of coolant pump drive -2-.



## Installing

Install in the reverse order of removal. When doing this, note the following:

- Fit toothed belt pulley of the coolant pump drive onto camshaft.



- The asymmetrical grooves -1- and -2- in the camshaft must be exactly centred in the recesses -arrows- in the toothed belt pulley.
- The grooves -1- and -2- in the camshaft are arranged asymmetrically.
- The recesses -arrows- in the toothed belt pulley of the coolant pump drive are also arranged asymmetrically.
- Install coolant pump ➔ [page 304](#) .

## Specified torque

- ◆ ➔ [o2.1 verview - coolant pump, thermostat", page 300](#)

## 2.5 Removing and installing thermostat

➔ [a2.5.1 nd installing thermostat for main coolant circuit \(radiator\)", page 309](#)

➔ [a2.5.2 nd installing thermostat for cylinder block coolant circuit", page 312](#)

### 2.5.1 Removing and installing thermostat for main coolant circuit (radiator)

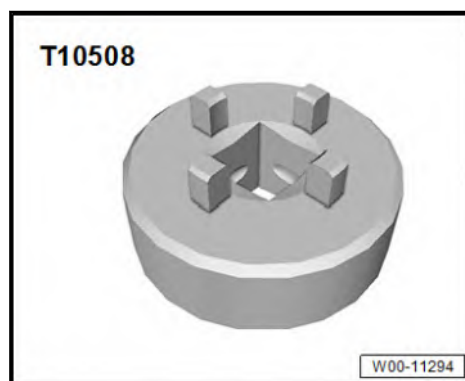
Special tools and workshop equipment required



- ◆ Spring-type clip pliers -VAS 6362-



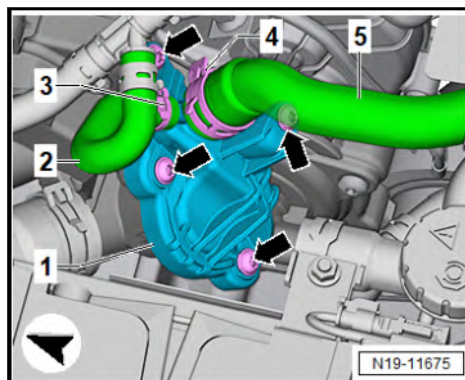
- ◆ Special wrench -T10508-



## Removing

- Drain coolant ⇒ [page 287](#) .

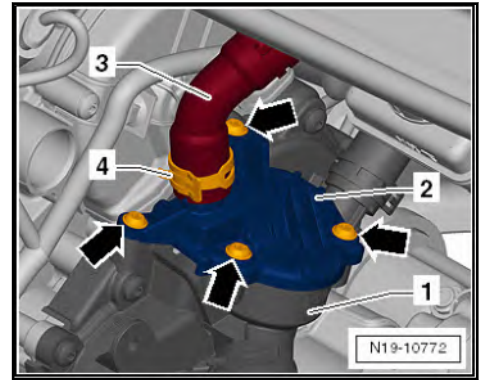
Golf 2020>



- Release hose clips -3- and -4-.
- Pull off coolant hoses -2- and -5-.
- Unscrew bolts -arrows-.
- Remove cover -1- from thermostat housing.

Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Polo Saloon RUS 2020>

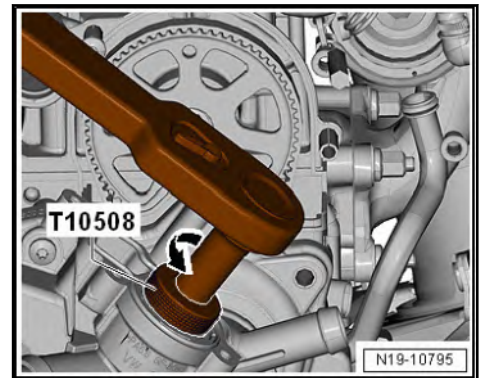
- Release hose clip -4- and detach coolant hose -3-.



- Remove bolts -arrows- and detach cover -2- from thermostat housing.

#### Continued for all vehicles

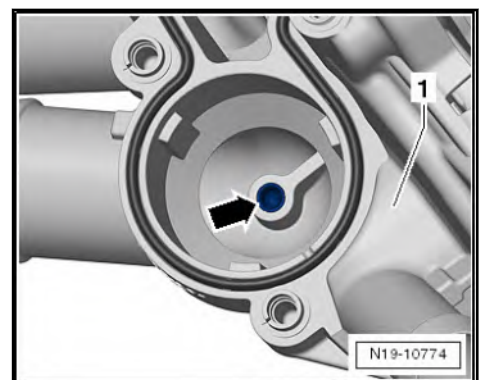
- Remove thermostat using special wrench -T10508-.



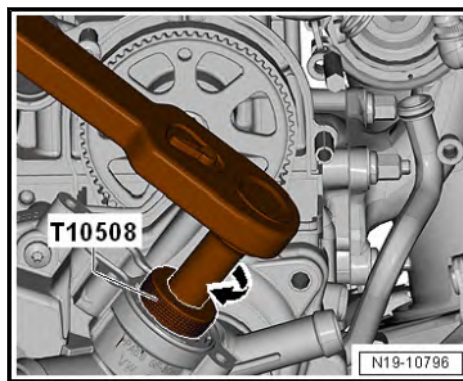
- Slightly push down special wrench -T10508- and turn it in -direction of arrow- while doing so.

#### Installing

- Insert thermostat ensuring that the centring pin of thermostat is seated in guide -arrow-.



- Install thermostat using special wrench -T10508-.



- Slightly push down special wrench -T10508- and turn it to stop in -direction of arrow- while doing so.

Install in reverse order of removal, observing the following:



#### Note

*Renew seals.*

- Moisten gasket with coolant.
- Add coolant ➔ [page 291](#) .

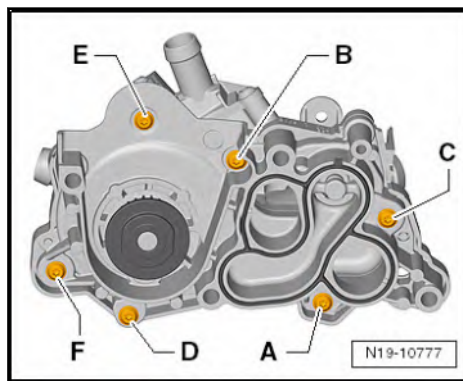
#### Specified torques

- ♦ ➔ Fig. “Cover for thermostat to thermostat housing - specified torque”, [page 302](#)

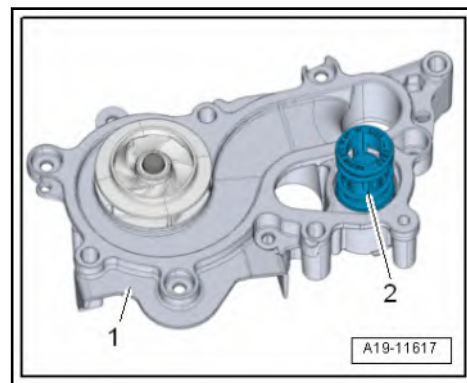
## 2.5.2 Removing and installing thermostat for cylinder block coolant circuit

### Removing

- Remove coolant pump ➔ [page 304](#) .
- Unscrew bolts in the sequence -F to A-.



- Detach coolant pump from thermostat housing.
- Detach thermostat -2- from coolant pump -1-.



### Installing

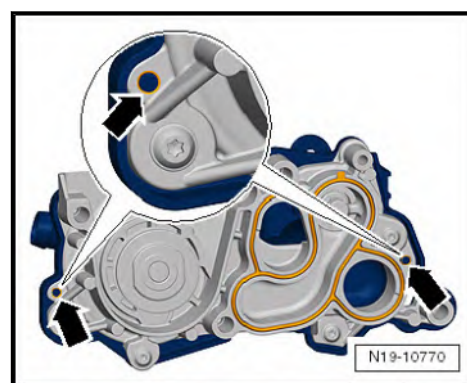
Install in reverse order of removal, observing the following:



#### Note

*Renew seals.*

- 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 302](#) .
- Install coolant pump ➔ [page 304](#) .
- Add coolant ➔ [page 291](#) .

### Specified torques

- ◆ ➔ Fig. “Thermostat housing to coolant pump - specified torque and sequence”, page 302

## 2.6 Removing and installing coolant temperature sender -G62-

### Removing

- Engine cold.



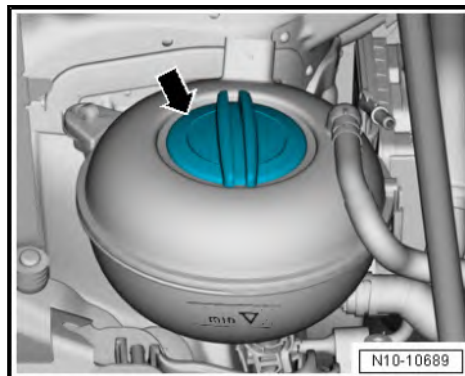
#### Note

*The coolant expansion tank may vary in design depending on the type and version of the vehicle.*





- Briefly open cap -arrow- of coolant expansion tank to reduce residual pressure in cooling system, and then tighten cap again until it engages.



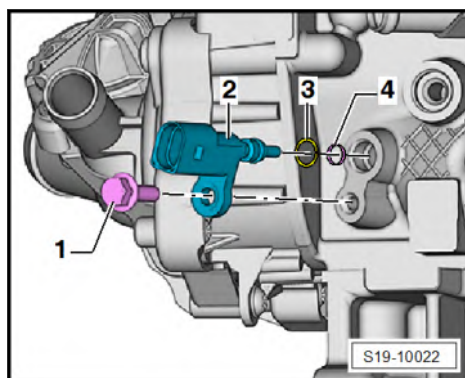
- Separate electrical connector:



#### Note

*Place a cloth underneath to catch escaping coolant.*

- Unscrew bolt -1- and pull off coolant temperature sender -G62- -item 2-.



#### 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.*
- ◆ *Insert new coolant temperature sender -G62- immediately into cylinder head in order to avoid loss of coolant.*

#### Installing

Install in reverse order of removal, observing the following:



#### Note

*Renew O-ring.*

- Check coolant level ➔ [page 296](#) .

#### Specified torques

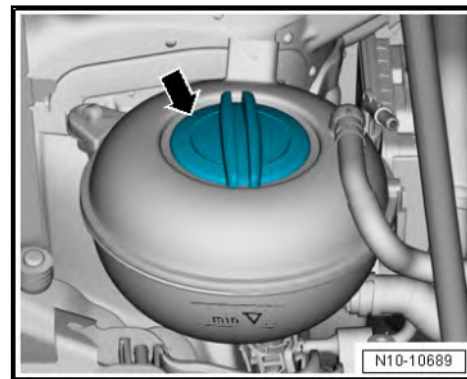
- ◆ ➔ [o2.2 verview - coolant temperature sender", page 303](#)



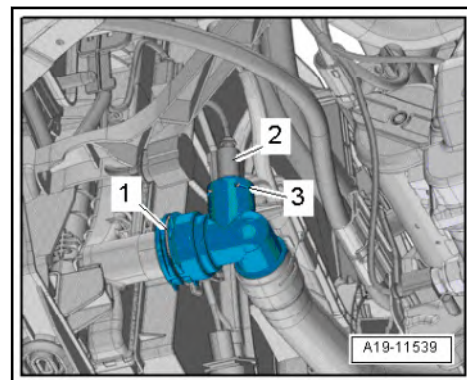
## 2.7 Removing and installing radiator outlet coolant temperature sender -G83-

### Removing

- Engine cold.
- Briefly open cap -arrow- of coolant expansion tank to reduce residual pressure in cooling system, and then tighten cap again until it engages.



- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Disconnect electrical connector -2-.



### Note

*Place a cloth underneath to catch 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.*
- ◆ *Insert new coolant temperature sender -G62- immediately into connection in order to avoid loss of coolant.*



- Install front noise insulation ⇒ General body repairs, exterior;  
Rep. gr. 66; Noise insulation; Assembly overview - noise  
insulation.
- Check coolant level ⇒ [page 296](#) .



### 3 Coolant pipes

⇒ [o3.1 verview - coolant pipes", page 317](#)

⇒ [a3.2 nd installing coolant pipes", page 317](#)

#### 3.1 Assembly overview - coolant pipes

1 - Coolant hose

2 - Bolt

□ 8 Nm

3 - Coolant pipe

4 - Coolant hose

5 - Bolt

□ 8 Nm

6 - Coolant hose

7 - Coolant pipe

□ Carefully lever it out of catches using a screwdriver when removing.

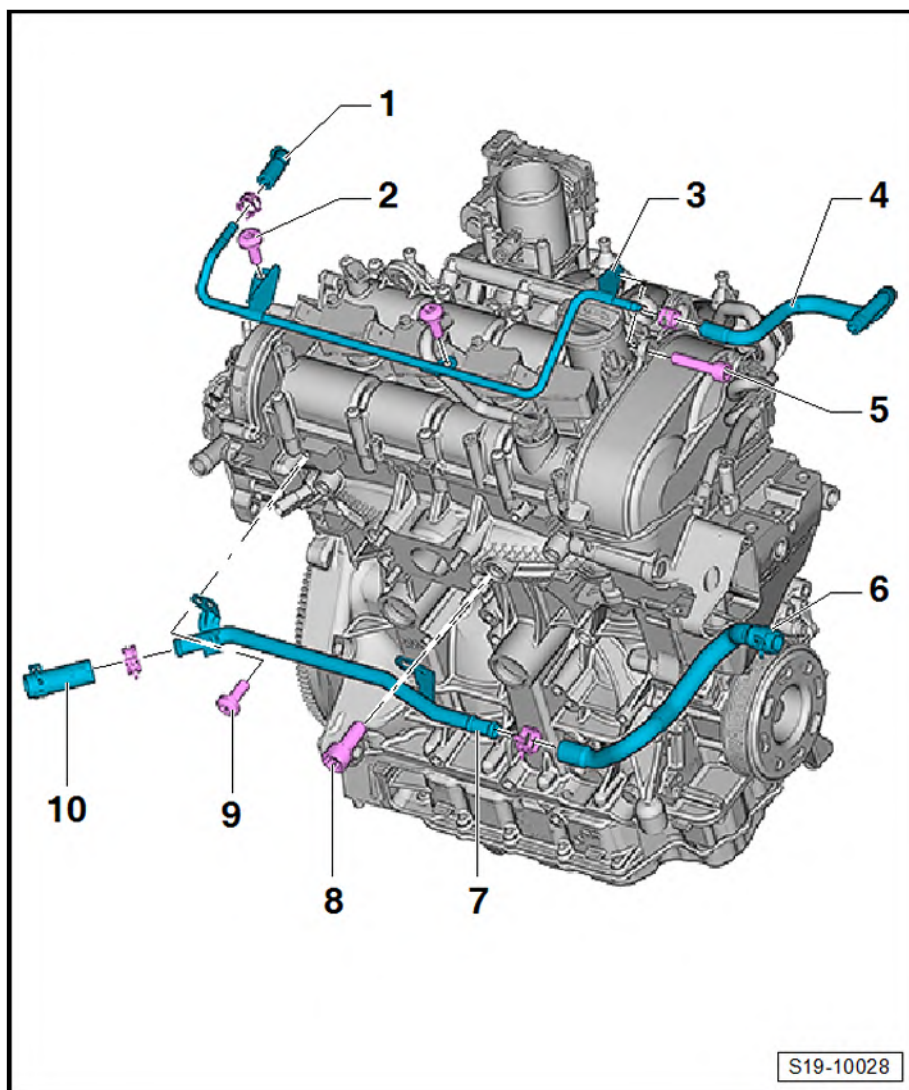
8 - Bolt

□ 20 Nm

9 - Bolt

□ 8 Nm

10 - Coolant hose



Note

*The arrow markings on the coolant pipes and on the ends of the coolant hoses must align.*

#### 3.2 Removing and installing coolant pipes

Special tools and workshop equipment required



- ◆ Hose clamps to 25 mm -3094-



- ◆ Spring-type clip pliers -VAS 6362-



## Removing

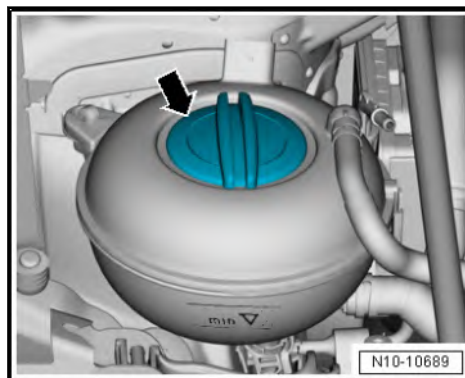
### CAUTION

The cooling system could be under pressure. Danger of scalding by steam and hot coolant.

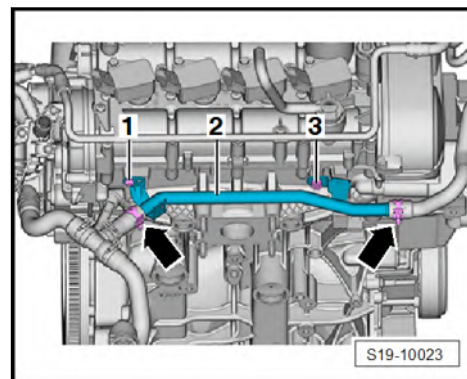
Skin and other parts of the body may be scalded.

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

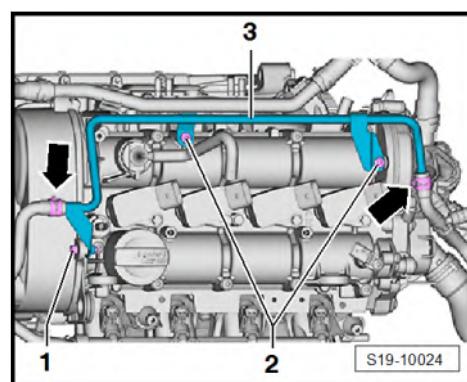
- Open filler cap -arrow- for coolant expansion tank.



- Clamp off coolant hoses using hose clamps up to 25 mm -3094-.
- Release hose clips -arrows-, and remove coolant hoses.



- Unscrew securing bolts -1- and -3-.
- Remove coolant pipe -2-.
- Unscrew securing bolts -1- and -2-.



- Remove coolant pipe -3-.

### Installing

Install in the reverse order of removal. When doing this, note the following:



#### Note

*Secure all hose connections with hose clips of the same standard as that used on the production line ⇒ Electronic parts catalogue.*

- Check coolant level ⇒ [page 296](#) .

### Specified torques

- ◆ ⇒ [o3.1 verview - coolant pipes](#)”, [page 317](#)





## 4 Radiator, radiator fan

⇒ [o4.1 verview – radiator/radiator fan", page 320](#)

⇒ [o4.2 verview – radiator cowl and radiator fan", page 324](#)

⇒ [a4.3 nd installing radiator", page 326](#)

⇒ [a4.4 nd installing radiator cowl", page 339](#)

⇒ [a4.5 nd installing radiator fanV7", page 342](#)

### 4.1 Assembly overview – radiator/radiator fan

⇒ [o4.1.1 verview – radiator/radiator fan, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>", page 320](#)

⇒ [o4.1.2 verview - radiator/radiator fan, Polo Saloon RUS 2020>", page 322](#)

⇒ [o4.1.3 verview – radiator/radiator fan, Golf 2020>", page 323](#)

#### 4.1.1 Assembly overview – radiator/radiator fan, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>



#### Note

*The arrows on the coolant pipes and on the ends of the coolant hoses must align with each other.*



#### 1 - Bolt

- ☐ 5 Nm
- ☐ Qty. 2

#### 2 - Upper radiator mounting

- ☐ For radiator
- ☐ If the securing tabs break off, it is not necessary to renew the upper radiator mounting. The securing tabs can be replaced by a specific bolt ⇒ Electronic parts catalogue.

#### 3 - Radiator/cooler

- ☐ Removing and installing ⇒ [page 326](#)
- ☐ Renew coolant after replacing

#### 4 - Coolant hose

- ☐ Connect ⇒ [page 322](#)

#### 5 - Radiator cowl with radiator fan -V7-

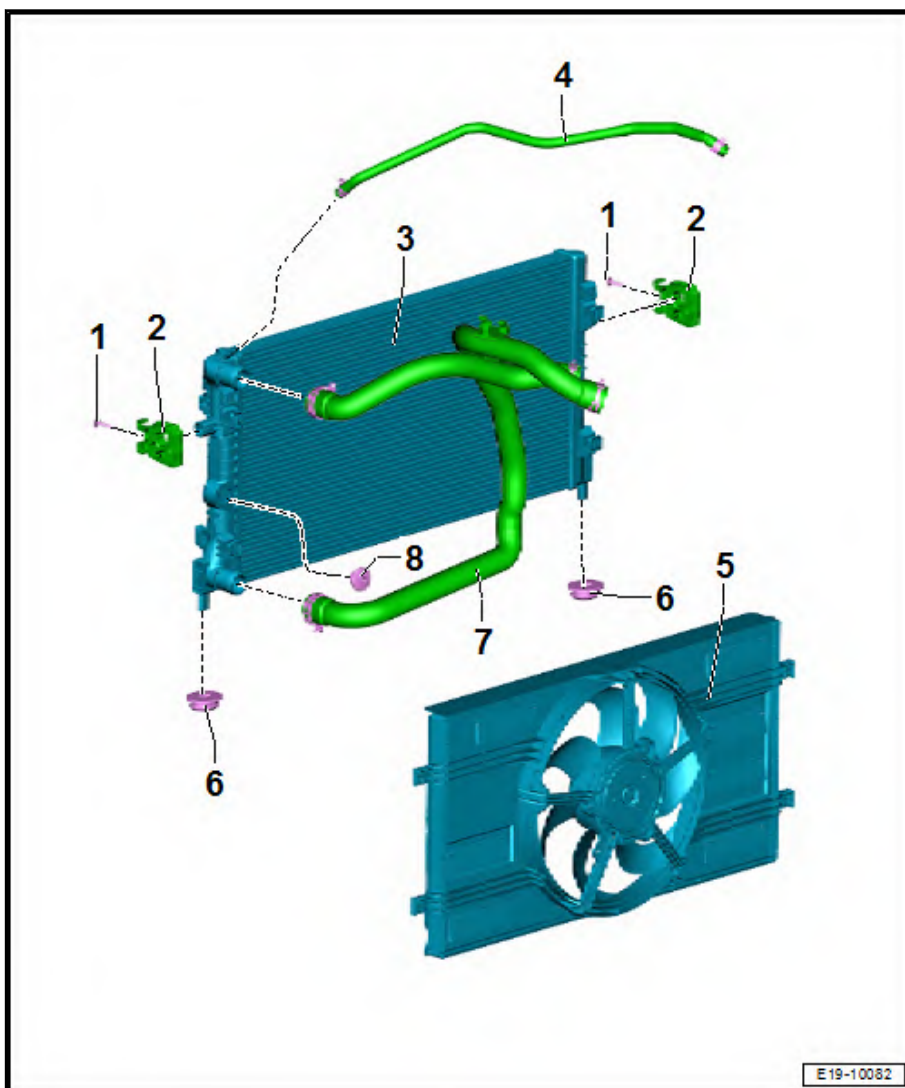
- ☐ Assembly overview ⇒ [page 324](#)
- ☐ Removing and installing ⇒ [page 339](#)
- ☐ With radiator fan control unit -J293-

#### 6 - Lower radiator mounting

- ☐ For radiator

#### 7 - Coolant hose

- ☐ Connect ⇒ [page 322](#)



#### Versions with plug-in connector:

- ☐ Pull out retaining clip to remove

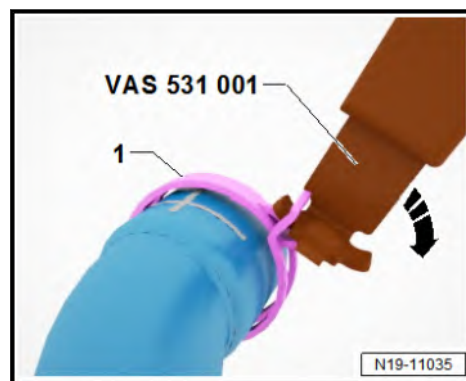
#### Versions with spring-type clip:

- ☐ Locking bonded spring-type clips ⇒ [page 321](#)

#### 8 - Plug

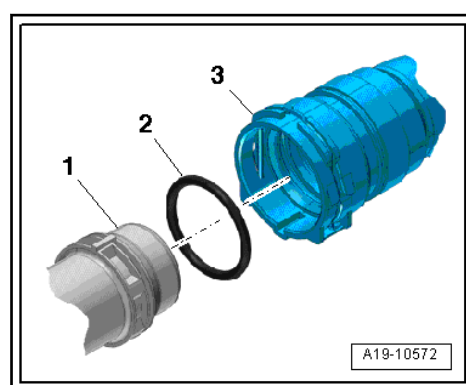
- ☐ Renew if damaged
- ☐ 10 Nm

#### Locking bonded spring-type clips



- Engage clip -1- in direction of -arrow- using release tool -VAS 531 001-.

#### Connecting coolant hose with plug-in connector



- Check old O-ring -2- in coolant hose -3- for damage, and renew if necessary; see ⇒ Electronic parts catalogue.
- Push coolant hose into connection -1- until it audibly engages.
- Press again on coolant hose and check plug-in connector is engaged correctly by pulling hose back.

#### 4.1.2 Assembly overview - radiator/radiator fan, Polo Saloon RUS 2020>



#### 1 - Lower radiator mounting

#### 2 - Radiator fan thermal switch -F18-

- ☐ Only vehicles without air conditioning system
- ☐ Not installed on vehicles with air conditioning system and replaced with a plug
- ☐ Specified torque radiator fan thermal switch -F18- 35 Nm
- ☐ Specified torque of plug 10 Nm

#### 3 - Upper radiator mounting

- ☐ If the securing tabs break off, it is not necessary to renew the upper radiator mounting. The securing tabs can be replaced by a specific bolt ⇒ Electronic parts catalogue.

#### 4 - Bolt

- ☐ 5 Nm

#### 5 - Radiator/cooler

- ☐ Removing and installing ⇒ [page 326](#)

#### 6 - Coolant hose

#### 7 - Expansion tank

- ☐ Checking cooling system for leaks ⇒ [page 296](#).

#### 8 - Cap

- ☐ Checking pressure relief valve in filler cap ⇒ [page 296](#).

#### 9 - Bolt

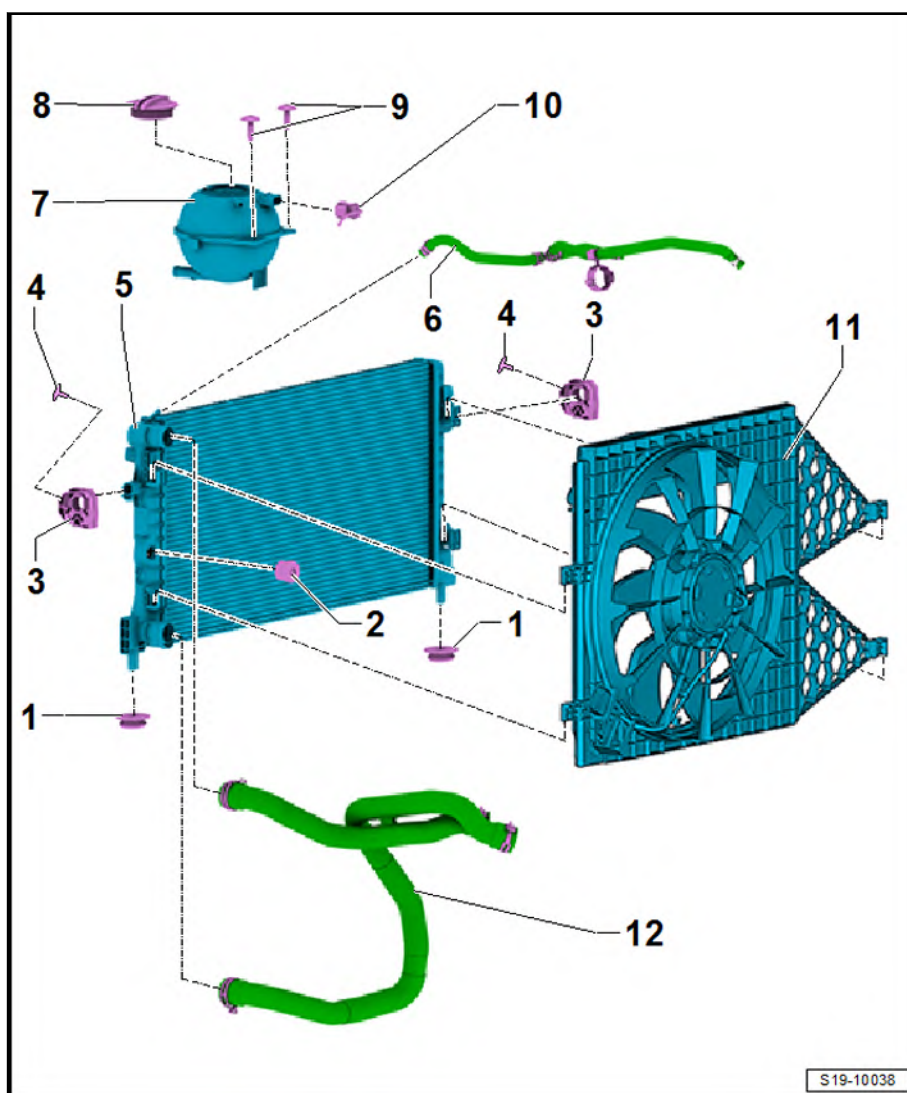
- ☐ 2 Nm

#### 10 - Connector

#### 11 - Radiator cowl with radiator fan -V7-

- ☐ Removing and installing ⇒ [page 339](#)

#### 12 - Coolant hose



### 4.1.3 Assembly overview – radiator/radiator fan, Golf 2020➤



1 - Upper coolant hose with plug-in connector

2 - Retaining clip

□ Qty. 2

3 - Lower coolant hose with plug-in connector and coolant temperature sender

4 - Bolt

□ Qty. 2

□ 5 Nm

5 - Upper radiator mounting

□ If the securing tabs break off, it is not necessary to renew the upper radiator mounting. The securing tabs can be replaced by a specific bolt ⇒ Electronic parts catalogue.

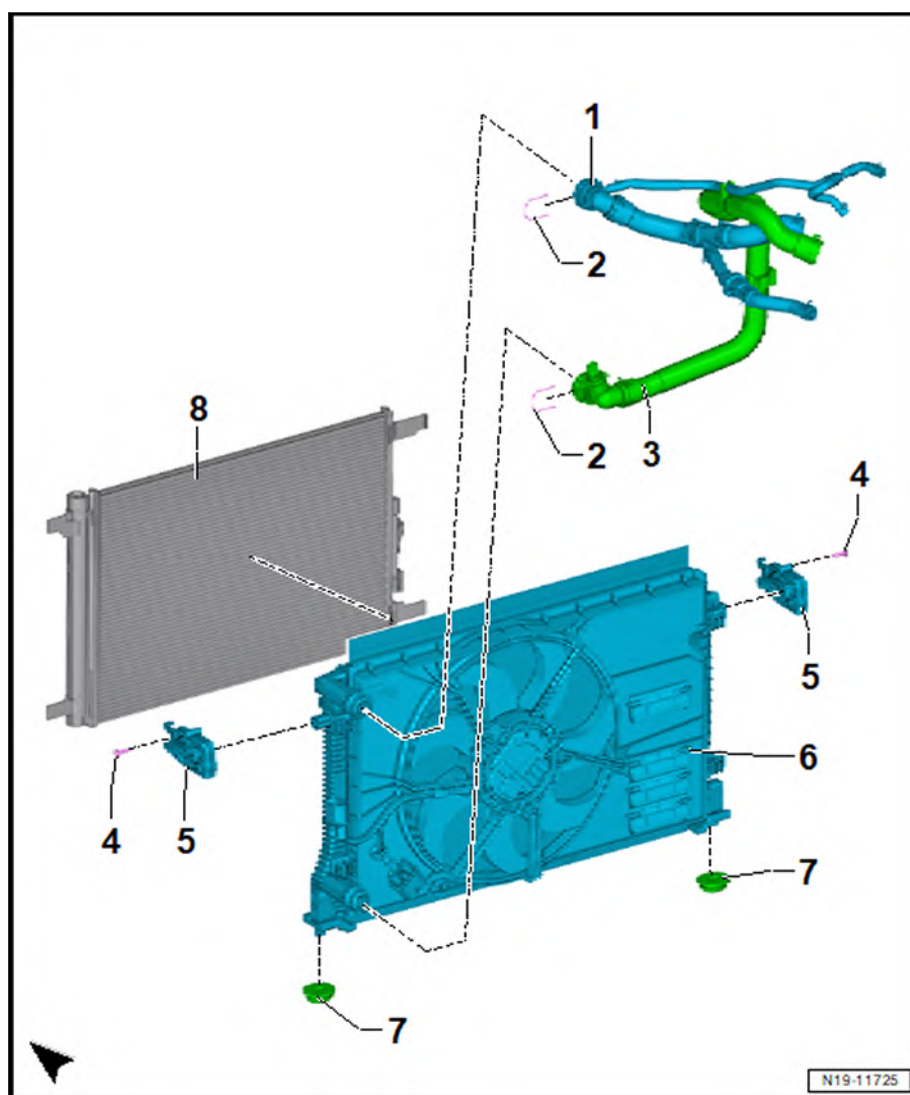
6 - Radiator cowl with radiator fan -V7-

□ Removing and installing ⇒ [page 339](#)

7 - Lower radiator mounting

8 - Radiator/cooler

□ Removing and installing ⇒ [page 326](#)



## 4.2 Assembly overview – radiator cowl and radiator fan

⇒ [o4.2.1 verview – radiator cowl and radiator fan, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>](#), page 324

⇒ [o4.2.2 verview - radiator cowl and radiator fan, Polo Saloon RUS 2020>](#), page 325

### 4.2.1 Assembly overview – radiator cowl and radiator fan, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>





**1 - Bolt**

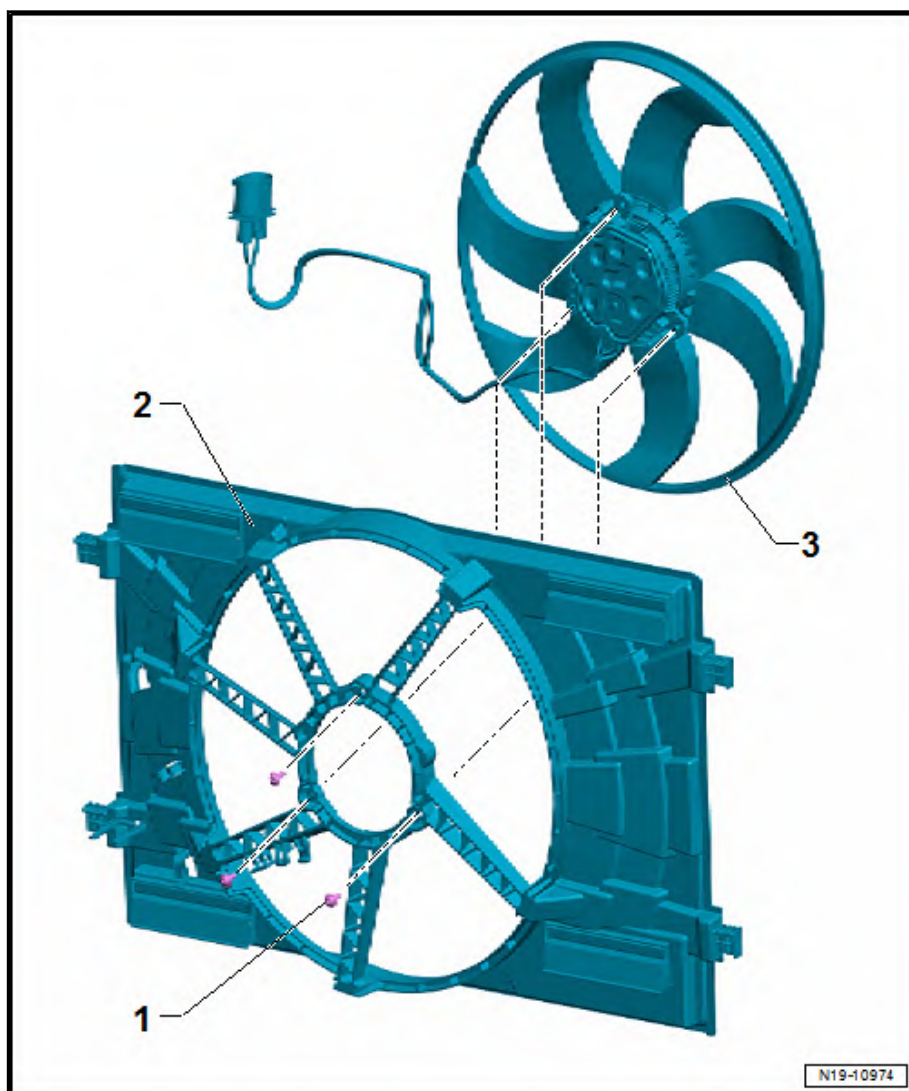
- 5 Nm

**2 - Radiator cowl**

- Removing and installing ➤ [page 339](#)

**3 - Radiator fan -V7-**

- Removing and installing ➤ [page 342](#)



**4.2.2 Assembly overview - radiator cowl and radiator fan, Polo Saloon RUS 2020>**





**1 - Ring**

- ☐ Air channelling

**2 - Radiator fan -V7-**

- ☐ Removing and installing ⇒ [page 342](#)

**3 - Radiator cowl**

- ☐ Removing and installing ⇒ [page 339](#)

**4 - Nut**

- ☐ 8 Nm

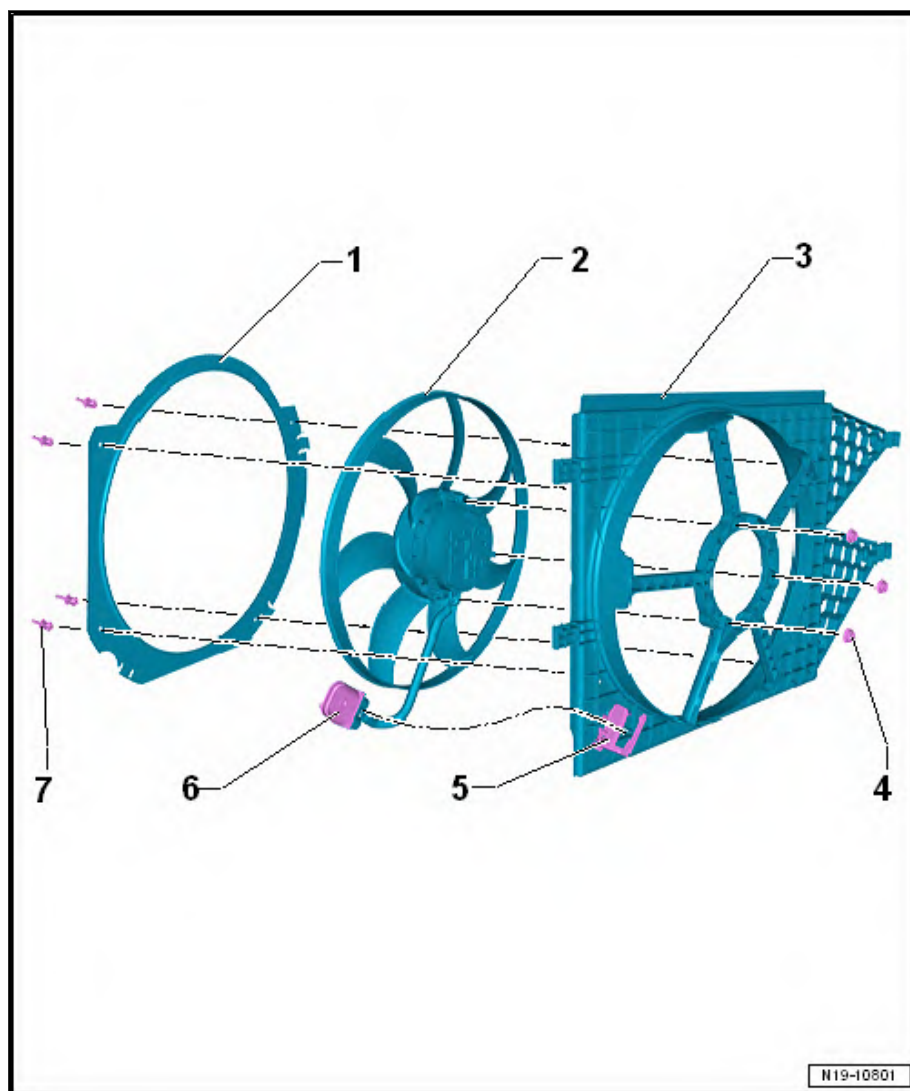
**5 - Bracket**

- ☐ Electrical connector

**6 - Connector**

**7 - Spreader rivets**

- ☐ For securing ring



## 4.3 Removing and installing radiator

⇒ [a4.3.1 nd installing radiator, Polo 2014>, Polo Saloon RUS 2016>](#), [page 326](#)

⇒ [a4.3.2 nd installing radiator, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Polo 2018>, Golf 2020>](#), [page 330](#)

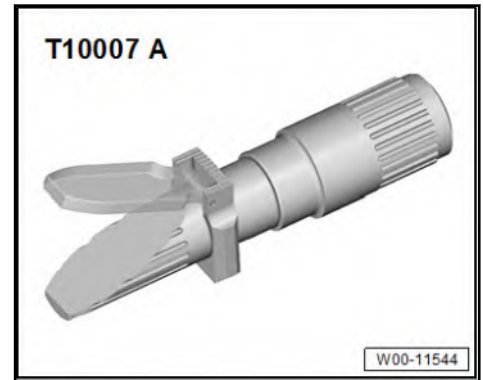
⇒ [a4.3.3 nd installing radiator, Polo Saloon RUS 2020>](#), [page 337](#)

### 4.3.1 Removing and installing radiator, Polo 2014>, Polo Saloon RUS 2016>

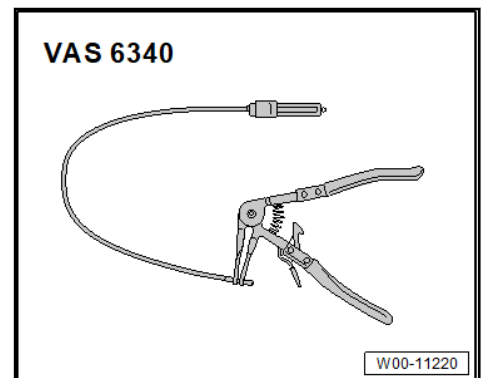
Special tools and workshop equipment required



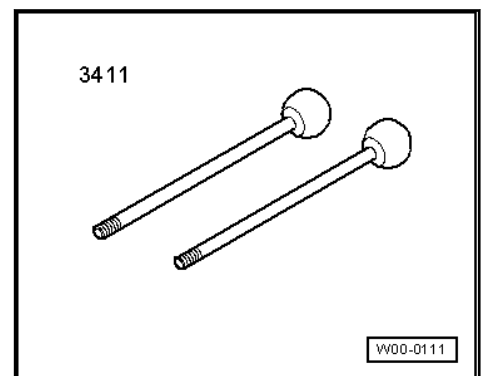
◆ Refractometer -T10007 A-



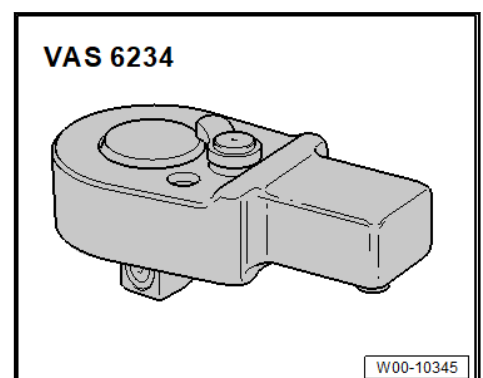
◆ Hose clamp pliers -VAS 6340-



◆ Guide pins -3411-



◆ Ratchet insert 1/4 inch -VAS 6234-



### Removing

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Drain coolant from radiator ⇒ [page 287](#) .



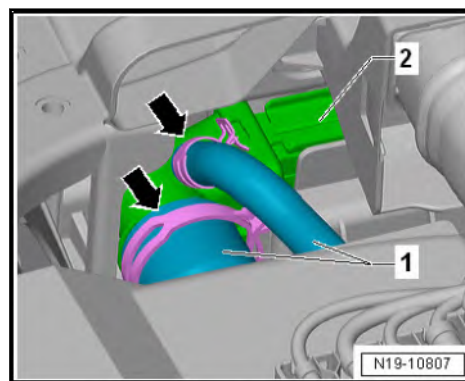
- Remove radiator cowl ⇒ [page 339](#) .

#### Vehicles with air conditioner:

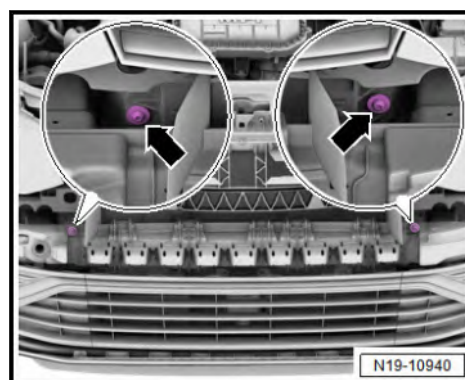
- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63; Front bumper; Removing and installing bumper cover.

#### Continued for all vehicles:

- Open spring-type clips -arrows-.



- Pull upper coolant hose -1- off radiator -2-.
- Unscrew securing bolts -arrows-.



- Lift radiator out of lower mountings and press it slightly towards rear.

#### Vehicles with air conditioning system



#### NOTICE

Risk of damage to coolant pipes caused by deformation.

- Never attempt to reshape the coolant pipe.

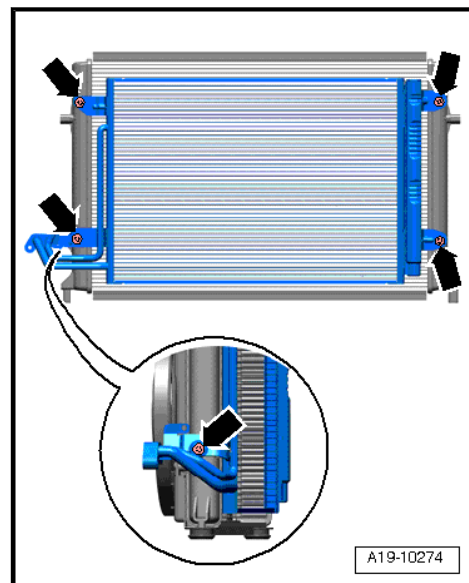


#### CAUTION

Risk of freezing injury caused by refrigerant.

- Do not open refrigerant circuit of air conditioning system.

- Unscrew bolts -arrows-.



- Place condenser in lock carrier at front and secure it in place to prevent it from falling down.

#### Continued for all vehicles

- Removing radiator.

#### Installing

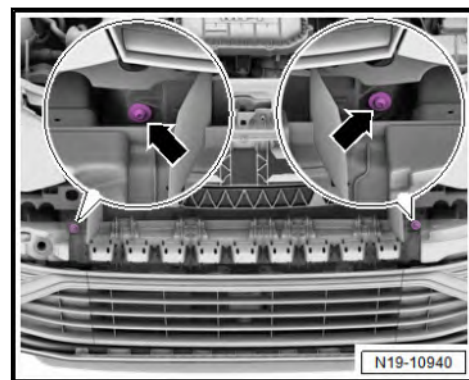
Install in reverse order of removal. During this procedure, observe the following:



#### Note

*If there are minor dents in the fins, refer to ➔ [page 7](#).*

- Tighten securing bolts -arrows- using torque wrench (5 to 13 Nm) -VAS 6854- and ratchet insert 1/4 inch -VAS 6234-.



- Install front bumper cover ➔ General body repairs, exterior; Rep. gr. 63; Front bumper; Removing and installing bumper cover.
- Install radiator cowl ➔ [page 339](#).
- Add coolant ➔ [page 287](#).



## Note

*Do not reuse coolant which has been drained off.*

## Specified torques

- ♦ [⇒ o4.1 verview – radiator/radiator fan”, page 320](#)

### 4.3.2 Removing and installing radiator, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Po- lo 2018>, Golf 2020>

#### Special tools and workshop equipment required

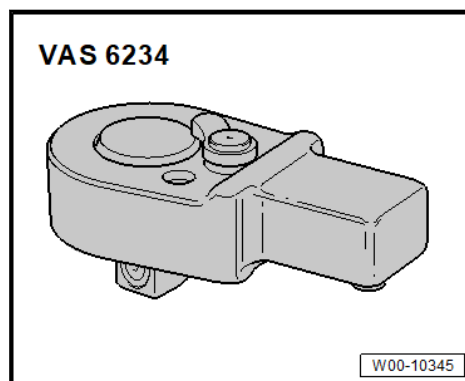
- ♦ Drip tray for workshop hoist -VAS 6208-



- ♦ Spring-type clip pliers -VAS 6362-

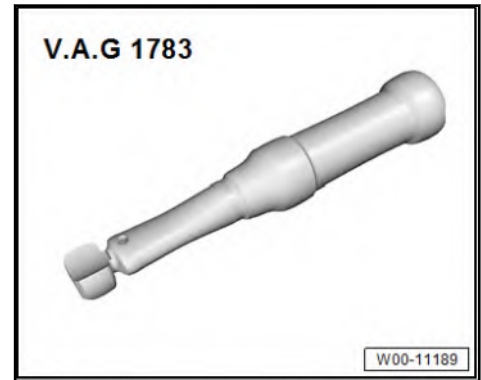


- ♦ Ratchet insert 1/4 inch -VAS 6234-





- ◆ Torque wrench 2-10 Nm -VAG 1783-

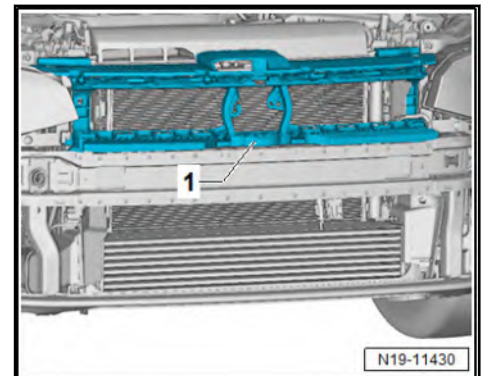


- ◆ Lever -3409-



### Removing

- Drain coolant ⇒ [page 287](#) .
- Remove assembly frame -1- ⇒ General body repairs, exterior; Rep. gr. 50; Lock carrier; Removing and installing lock carrier.

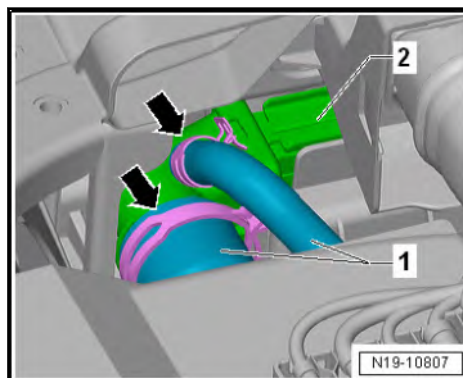


- Remove radiator cowl ⇒ [page 339](#)



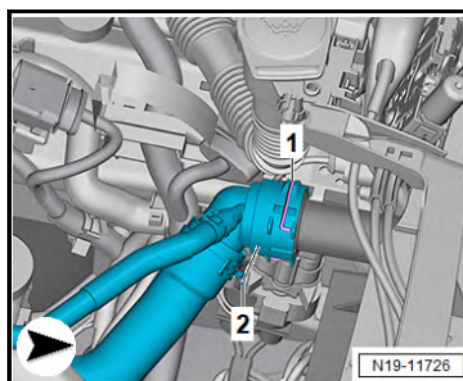


Golf 2013>, Golf Estate 2014>, Golf SV 2015, Golf 2017>, Polo 2018>



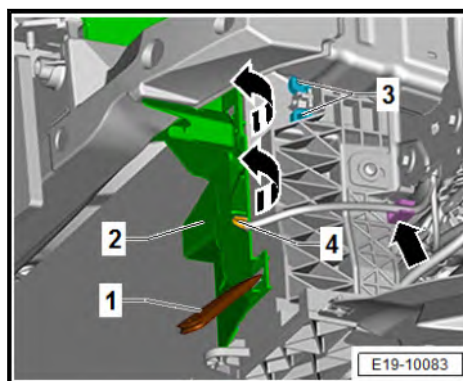
- Open spring-type clips -arrows-.
- Pull off coolant hoses -1- from top left of radiator -2-.

Golf 2020>



- Release retaining clip -1-, and pull off coolant hose -2-.

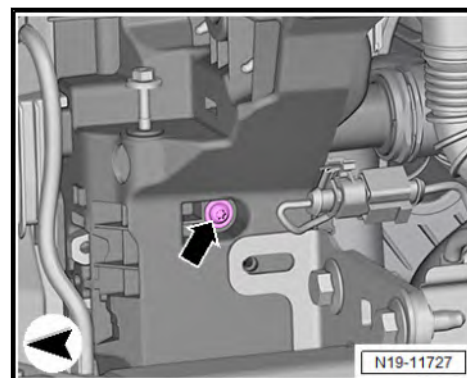
Continued for all vehicles



- Separate electrical connector -4- and remove from its retain-er -arrow-.
- Press in locking tab on both sides using removal wedge -3409- -1-.
- Move cowling -2- slightly in direction of -arrow- to gain access to radiator mounting -3-.

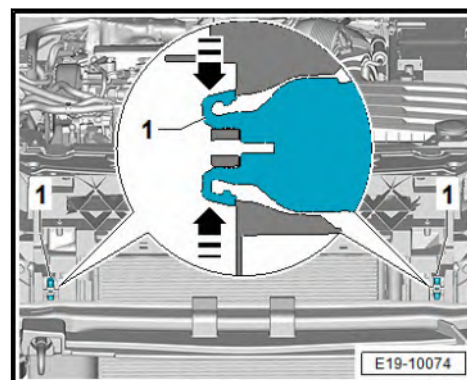


## Golf 2020➤



- Unscrew bolt -arrow- from upper radiator mounting.

### Vehicles with original radiator mounting carrier



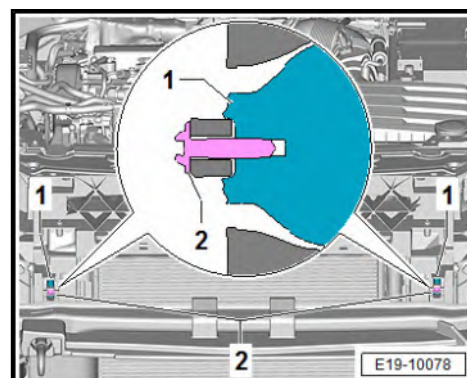
- Release catches -arrows- of radiator mounting -1- on left and right, or cut through using side cutters.



### Note

*The radiator mounting carrier will be reused for reinstallation. It will then be bolted to the lock carrier. For bolts, refer to ⇒ Electronic parts catalogue.*

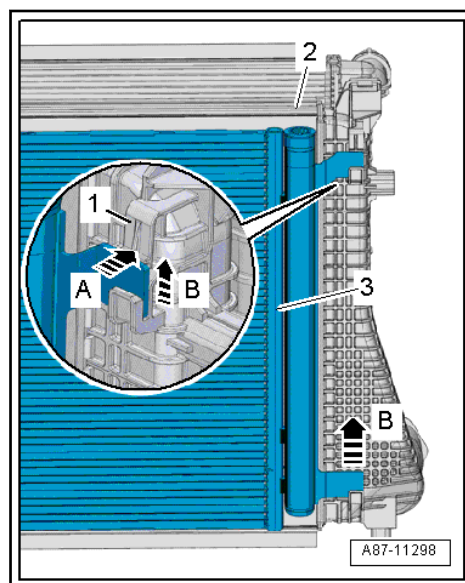
### Vehicles with radiator mounting carrier, bolted



- Unscrew bolts -2- of radiator mounting carrier -1- on left and right.

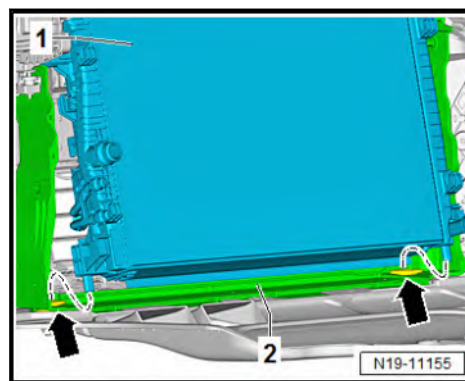


## Vehicles with air conditioning system



- 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- upwards in direction of -arrow B- and detach from radiator.
- Tie up condenser on lock carrier.

### Continued for all vehicles



- Lift radiator -1- at bottom out of radiator mountings -arrows-.
- Remove radiator -1- upwards.

### Installing

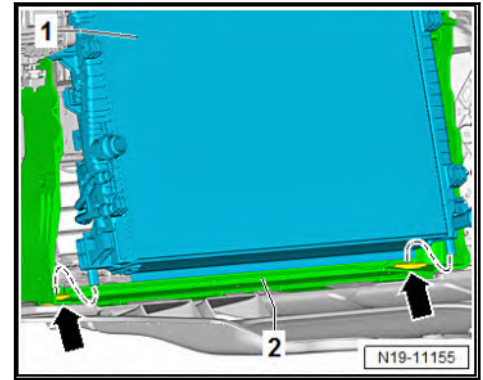
Assembly is carried out in reverse sequence; note the following:



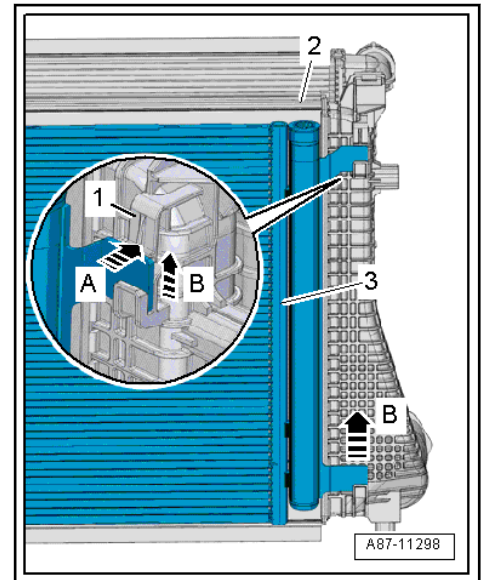
#### Note

*If there are minor dents in the fins, refer to [⇒ page 7](#).*

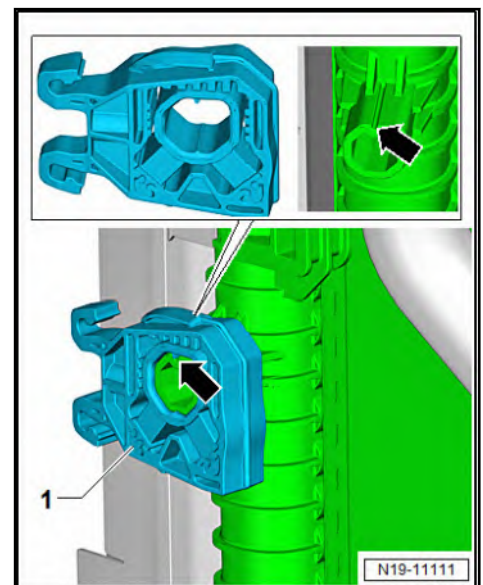
- Insert radiator -1- at bottom into radiator mountings -arrows-.



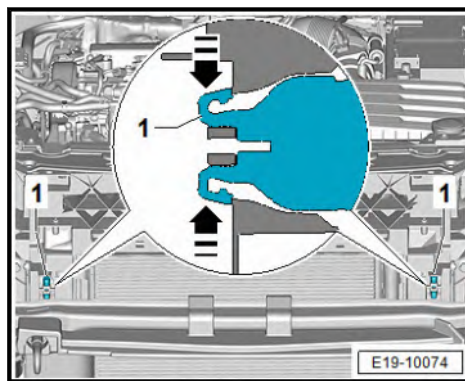
- Bring condenser -3- into installation position.



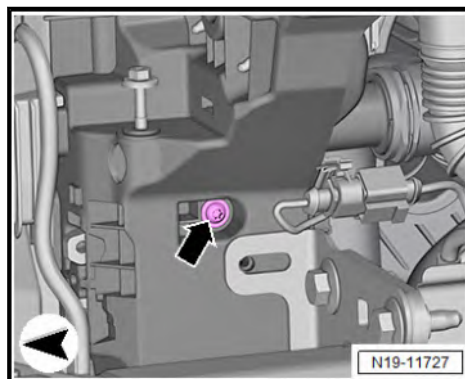
#### Installation position of radiator mounting



- Fit radiator mountings -1- on left and right onto radiator. When doing so, note the installation position -arrow-.
- Insert radiator into lock carrier. Ensure proper seating of radiator mountings -1- in lock carrier.

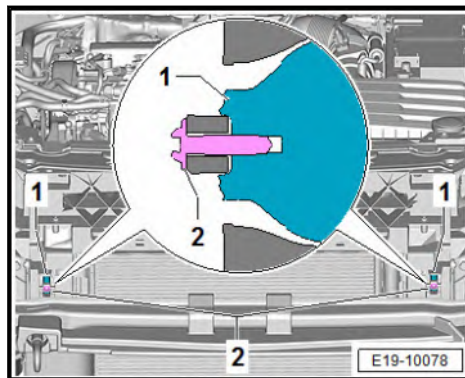


Golf 2020➤



- Unscrew bolt -arrow- from upper radiator mounting.

**Vehicles with radiator mounting carrier, bolted**



- If fastener was cut off, bolt radiator mountings to lock carrier.  
Bolts -2- ⇒ Electronic parts catalogue.
- Specified torque: 5 Nm

**Continued for all vehicles**

- Install assembly frame ⇒ General body repairs, exterior;  
Rep. gr. 50; Lock carrier; Removing and installing lock carrier.
- Install front bumper cover ⇒ General body repairs, exterior;  
Rep. gr. 63; Front bumper; Removing and installing bumper cover.
- Install radiator cowl ⇒ [page 339](#) .
- Add coolant ⇒ [page 291](#) .





#### Specified torques

- ◆ ⇒ [04.1 overview – radiator/radiator fan”, page 320](#)

### 4.3.3 Removing and installing radiator, Polo Saloon RUS 2020>

#### Special tools and workshop equipment required

- ◆ Drip tray for workshop hoist -VAS 6208-



- ◆ Release tool -VAS 531 001-



#### CAUTION

**Danger of injury; the radiator fans can run at any time.**

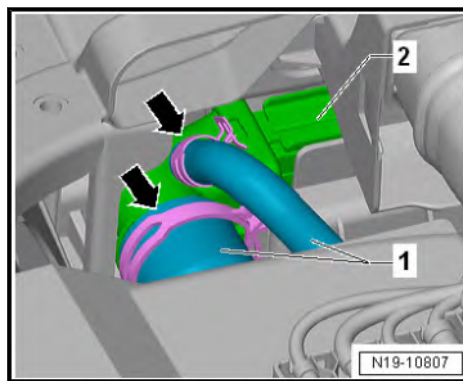
- Disconnect electrical connectors:

- Disconnect electrical connectors of fan before starting work in area of radiator cowl.

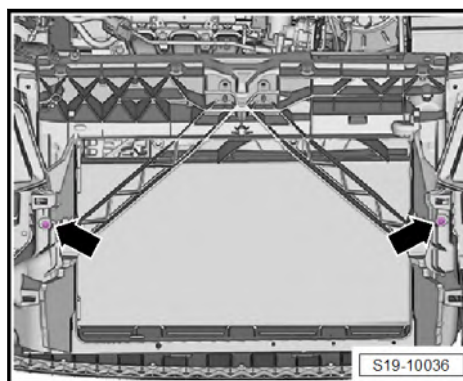
#### Removing

- Remove radiator cowl ⇒ [page 339](#) .
- Drain coolant ⇒ [page 287](#) .
- Remove front bumper ⇒ General body repairs, exterior; Rep. gr. 63; Front bumper; Removing and installing bumper cover.
- Pull off coolant hoses -1- at top of radiator -2- after opening clamps -arrows-.





- Remove securing bolts -arrows-.



- Lift radiator out of lower mountings and push backwards slightly.

For vehicles with air conditioning system

**NOTICE**

Risk of damage to coolant pipes caused by deformation.

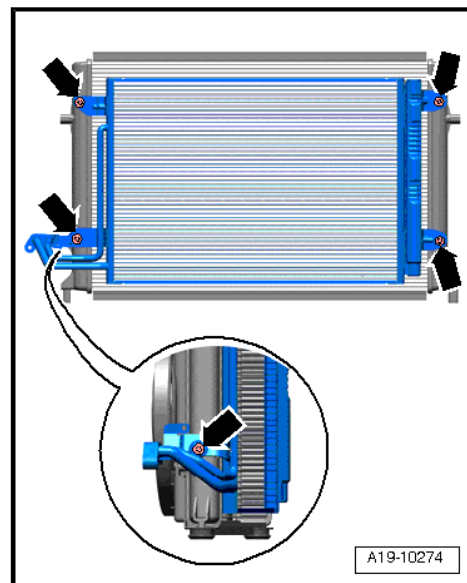
- Never attempt to reshape the coolant pipe.

**CAUTION**

Risk of freezing injury caused by refrigerant.

- Do not open refrigerant circuit of air conditioning system.

- Unscrew securing bolts for condenser -arrows-.



- Insert condenser forwards in lock carrier and secure to prevent it from falling down.

#### Continued for all vehicles

- Removing radiator.

#### Installing

Install in reverse order of removal, observing the following:



#### Note

*If there are minor dents in the fins, refer to ➤ [page 7](#) .*

- Install front bumper ➤ General body repairs, exterior; Rep. gr. 63; Front bumper; Removing and installing bumper cover.
- Install radiator cowl ➤ [page 339](#) .
- Add coolant ➤ [page 287](#) .



#### Note

*Do not reuse coolant which has been drained off.*

#### Specified torques

- ◆ ➤ [o4.1 verview – radiator/radiator fan](#) , [page 320](#)

### 4.4 Removing and installing radiator cowl

➤ [a4.4.1 nd installing radiator, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>](#) , [page 339](#)

➤ [a4.4.2 nd installing radiator cowl, Polo Saloon RUS 2020>](#) , [page 341](#)

#### 4.4.1 Removing and installing radiator, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014> ,



## Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>

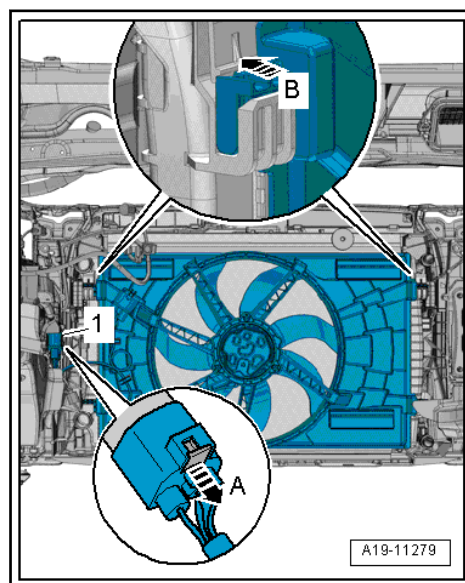
### CAUTION

Danger of injury; the radiator fans can run at any time.

- Disconnect electrical connectors:

### Removing

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Release and pull off connector -1- on radiator fan.



- To do this, push securing mechanism towards rear -arrow A-, and press down release mechanism.
- Press locking tabs on left and right of radiator fan cowl -arrow B-.
- Pull radiator cowl upwards, and remove it from mountings on radiator.
- Turn radiator cowl slightly, and remove it towards bottom.

### Installing

Install in reverse order of removal. During this procedure, observe the following:

- Install wires ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

### Specified torques

- ♦ ⇒ [o3.1 verview - air filter housing", page 364](#)
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation



## 4.4.2 Removing and installing radiator cowl, Polo Saloon RUS 2020>



### Note

*The procedure for removal and installation of the radiator cowl with two radiator fans is the same as that for a radiator cowl with one radiator fan.*



### CAUTION

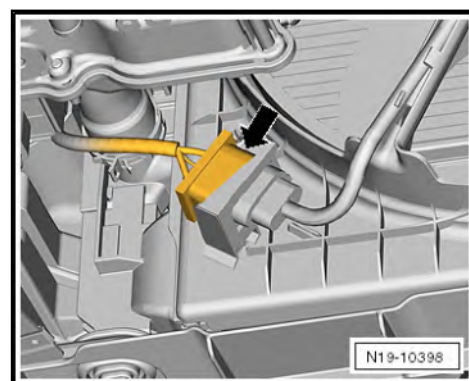
**Danger of injury; the radiator fans can run at any time.**

– Disconnect electrical connectors:

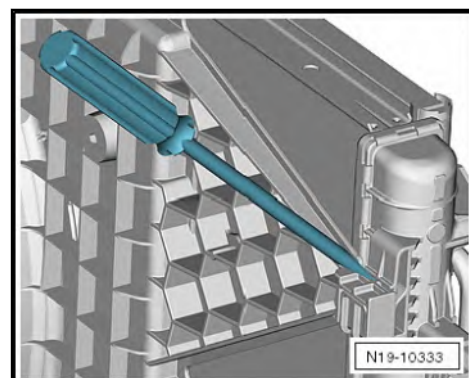
- Disconnect electrical connectors of fan before starting work in area of radiator cowl.

### Removing

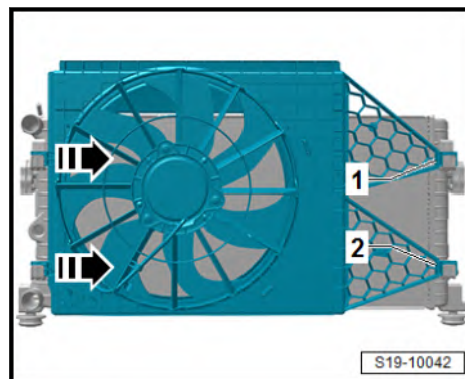
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Disconnect electrical connector -arrow-.



- Using a suitable tool, release locking lugs for radiator cowl on left and right.



- Press out mountings for radiator cowl -1- and -2-.



- Press out radiator cowl in direction of -arrow-.
- Remove radiator cowl by taking it upwards out of the vehicle.

#### Installing

Install in reverse order of removal.

### 4.5 Removing and installing radiator fan - V7-

⇒ [a4.5.1 nd installing radiator fanV7, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>”, page 342](#)

⇒ [a4.5.2 nd installing radiator fanV7, Polo Saloon RUS 2020>”, page 343](#)

#### 4.5.1 Removing and installing radiator fan -V7-, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>

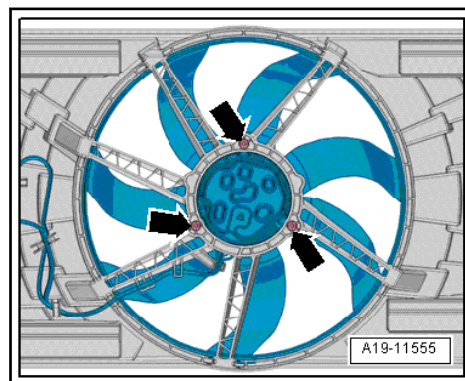
#### Removing



#### Note

*Reinstall all cable ties in the same locations when installing.*

- Remove radiator cowl ⇒ [page 339](#) .
- Separate electrical connector:



- Unscrew bolts -arrows- and remove radiator fan -V7-.



## Installing

Install in reverse order of removal, observing the following:

- Install radiator cowl ⇒ [page 339](#) .

## Specified torques

- ◆ ⇒ [o4.2 verview – radiator cowl and radiator fan”, page 324](#)

### 4.5.2 Removing and installing radiator fan - V7-, Polo Saloon RUS 2020>

#### CAUTION

Danger of injury; the radiator fans can run at any time.

- Disconnect electrical connectors:

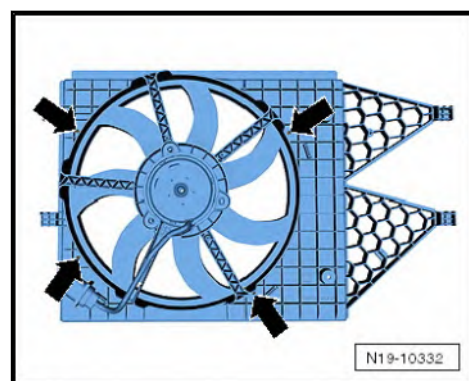
## Removing



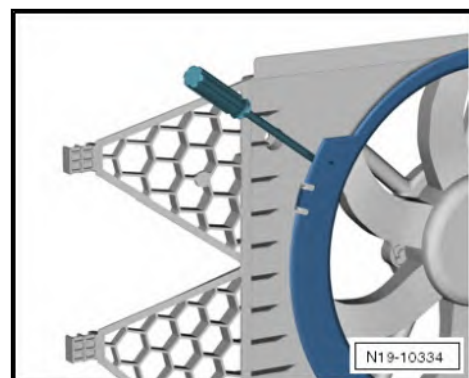
#### Note

*Attach cable ties in all the same places when installing.*

- Remove radiator cowl ⇒ [page 339](#) .
- Release wiring harness for fan from radiator cowl.
- Push back pins for spreader rivets -arrows-, and detach spreader rivets.

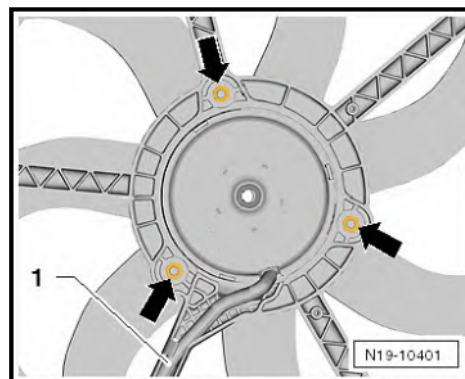


- Carefully lift fan ring using a suitable tool on back of radiator cowl.



- Remove electric cable -1- from cable guide.



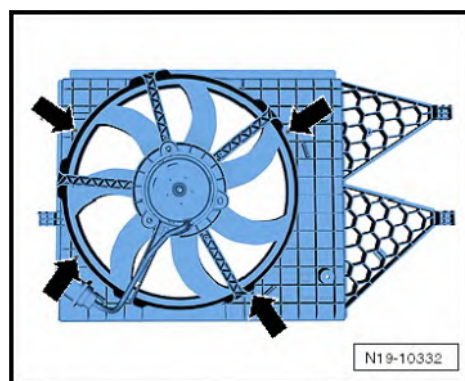


- Unscrew nuts -arrows-.
- Remove radiator fan -V7-.

### Installing

Install in reverse order of removal, observing the following:

- Ensure proper seating of spreader rivets -arrows-.



- Install radiator cowl ➤ [page 339](#) .

### Specified torques

- ♦ ➤ [o4.2 verview – radiator cowl and radiator fan”, page 324](#)



## 24 – Mixture preparation - injection

### 1 Injection system

⇒ [o1.1 fitting locations - injection system", page 345](#)

⇒ [o1.2 overview - fuel system", page 351](#)

#### 1.1 Overview of fitting locations - injection system

Overview of fitting locations - engine from above, Golf, Golf  
Estate, Golf SV, Polo 2018



#### 1 - Inlet camshaft control valve 1 -N205-

- ☐ Assembly overview ⇒ [page 172](#)
- ☐ Removing and installing ⇒ [page 243](#)

#### 2 - Ignition coils with output stages

- ◆ Ignition coil 1 with output stage -N70-
- ◆ Ignition coil 2 with output stage -N127-
- ◆ Ignition coil 3 with output stage -N291-
- ◆ Ignition coil 4 with output stage -N292-
  - ☐ Assembly overview ⇒ [page 424](#)
  - ☐ Removing and installing ⇒ [page 426](#)

#### 3 - Lambda probe 1 before catalytic converter -GX10-

- ☐ Lambda probe -G39- and Lambda probe heater -Z19-
- ☐ Assembly overview ⇒ [page 391](#)
- ☐ Removing and installing ⇒ [page 392](#)

#### 4 - Lambda probe 1 after catalytic converter -GX7-

- ☐ Lambda probe after catalytic converter -G130- and Lambda probe heater 1 after catalytic converter -Z29-
- ☐ Assembly overview ⇒ [page 391](#)
- ☐ Removing and installing ⇒ [page 392](#)

#### 5 - Hall sender -G40-

- ☐ Camshaft position sensor
- ☐ Assembly overview ⇒ [page 424](#)
- ☐ Removing and installing ⇒ [page 430](#)

#### 6 - Engine control unit -J623-

- ☐ Removing and installing ⇒ [page 379](#)

#### 7 - Radiator outlet coolant temperature sender -G83-

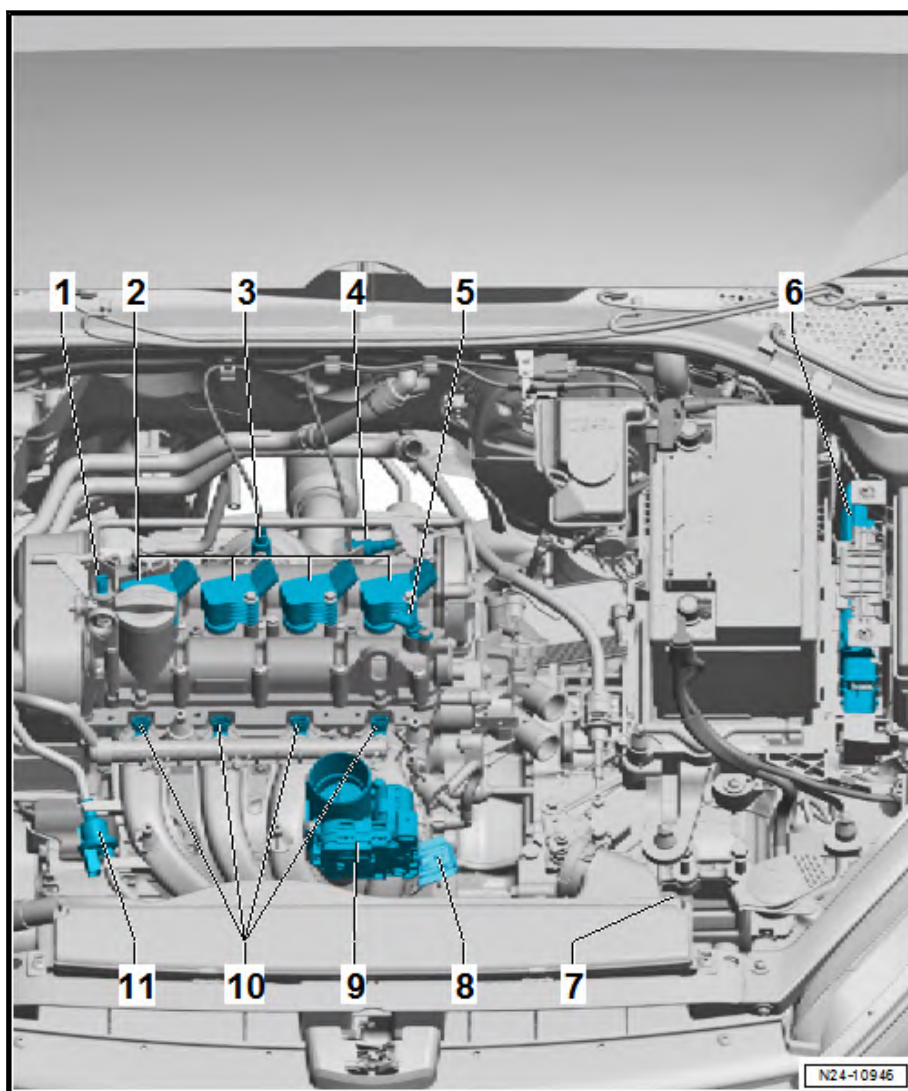
- ☐ Assembly overview ⇒ [page 303](#)
- ☐ Removing and installing ⇒ [page 315](#)

#### 8 - Intake manifold sender -GX9-

- ☐ Consists of intake air temperature sender -G299- and intake manifold pressure sender -G71-
- ☐ Assembly overview ⇒ [page 378](#)
- ☐ ⇒ [page 378](#)

#### 9 - Throttle valve module -GX3-

- ☐ with throttle valve drive -G186-, angle sensor 1 for throttle valve drive -G187- and angle sensor 2 for throttle valve drive -G188-





- ☐ Assembly overview ➔ [page 369](#)
- ☐ Removing and installing ➔ [page 376](#)
- ☐ Cleaning ➔ [page 376](#) .

#### 10 - Injectors

- ◆ Injector, cylinder 1 -N30-
- ◆ Injector, cylinder 2 -N31-
- ◆ Injector, cylinder 3 -N32-
- ◆ Injector, cylinder 4 -N33-
  - ☐ Assembly overview ➔ [page 354](#)
  - ☐ Removing and installing ➔ [page 357](#)
  - ☐ Checking injectors ➔ [page 358](#) .
  - ☐ Cleaning injectors ➔ [page 362](#)

#### 11 - Activated charcoal filter solenoid valve 1 -N80-

- ☐ ➔ Rep. gr. 20; Activated charcoal filter system; Checking fuel tank breather

Overview of fitting locations - engine from above Polo 2014,  
Polo Saloon RUS 2016, Polo Saloon RUS 2020



#### 1 - Inlet camshaft control valve 1 -N205-

- ☐ Assembly overview ➤ [page 172](#)
- ☐ Removing and installing ➤ [page 243](#)

#### 2 - Ignition coils with output stages

- ◆ Ignition coil 1 with output stage -N70-
- ◆ Ignition coil 2 with output stage -N127-
- ◆ Ignition coil 3 with output stage -N291-
- ◆ Ignition coil 4 with output stage -N292-
  - ☐ Assembly overview ➤ [page 424](#)
  - ☐ Removing and installing ➤ [page 426](#)

#### 3 - Lambda probe 1 before catalytic converter -GX10-

- ☐ Lambda probe -G39- and Lambda probe heater -Z19-
- ☐ Assembly overview ➤ [page 391](#)
- ☐ Removing and installing ➤ [page 392](#)

#### 4 - Lambda probe 1 after catalytic converter -GX7-

- ☐ Lambda probe after catalytic converter -G130- and Lambda probe heater 1 after catalytic converter -Z29-
  - ☐ Assembly overview ➤ [page 391](#)
  - ☐ Removing and installing ➤ [page 392](#)

#### 5 - Hall sender -G40-

- ☐ Camshaft position sensor
- ☐ Assembly overview ➤ [page 424](#)
- ☐ Removing and installing ➤ [page 430](#)

#### 6 - Engine control unit -J623-

- ☐ Removing and installing ➤ [page 379](#)

#### 7 - Radiator outlet coolant temperature sender -G83-

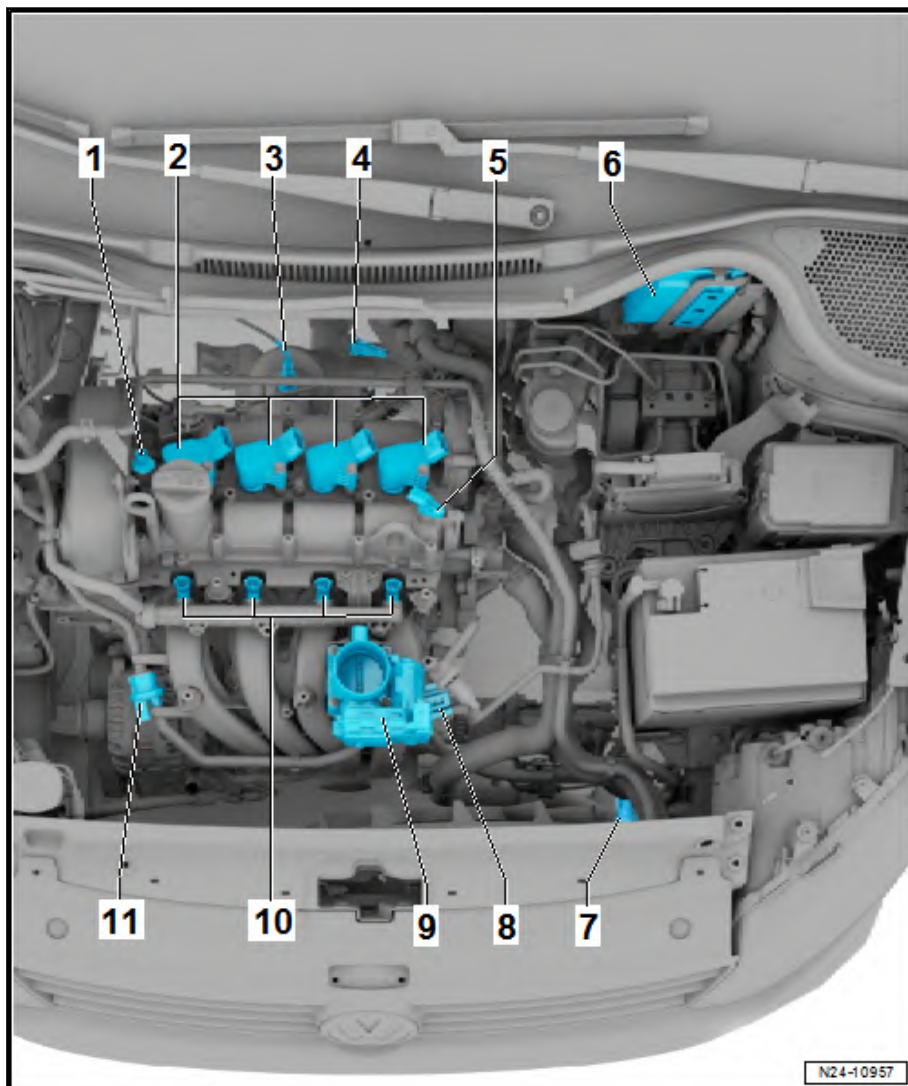
- ☐ Not fitted in every equipment variant
- ☐ Assembly overview ➤ [page 303](#)
- ☐ Removing and installing ➤ [page 315](#)

#### 8 - Intake manifold sender -GX9-

- ☐ Consists of intake air temperature sender -G299- and intake manifold pressure sender -G71-
- ☐ Assembly overview ➤ [page 378](#)
- ☐ ➤ [page 378](#)

#### 9 - Throttle valve module -GX3-

- ☐ with throttle valve drive -G186-, angle sensor 1 for throttle valve drive -G187- and angle sensor 2 for throttle valve drive -G188-





- ☐ Assembly overview ➤ [page 369](#)
- ☐ Removing and installing ➤ [page 376](#)
- ☐ Cleaning ➤ [page 376](#) .

#### 10 - Injectors

- ◆ Injector, cylinder 1 -N30-
- ◆ Injector, cylinder 2 -N31-
- ◆ Injector, cylinder 3 -N32-
- ◆ Injector, cylinder 4 -N33-
  - ☐ Assembly overview ➤ [page 354](#)
  - ☐ Removing and installing ➤ [page 357](#)
  - ☐ Checking injectors ➤ [page 358](#) .
  - ☐ Cleaning injectors ➤ [page 362](#)

#### 11 - Activated charcoal filter solenoid valve 1 -N80-

Overview of fitting locations - intake side





#### 1 - Knock sensor 1 -G61-

- ☐ Assembly overview ➤ [page 424](#)
- ☐ Removing and installing ➤ [page 428](#)

#### 2 - Oil pressure switch -F1-

- ☐ Assembly overview ➤ [page 279](#)
- ☐ Removing and installing ➤ [page 279](#)

#### 3 - Activated charcoal filter solenoid valve 1 -N80-

- ☐ ➤ Rep. gr. 20; Activated charcoal filter system; Checking fuel tank breather

#### 4 - Injectors

- ◆ Injector, cylinder 1 -N30-
- ◆ Injector, cylinder 2 -N31-
- ◆ Injector, cylinder 3 -N32-
- ◆ Injector, cylinder 4 -N33-
  - ☐ Assembly overview ➤ [page 354](#)
  - ☐ Removing and installing ➤ [page 357](#)
  - ☐ Checking injectors ➤ [page 358](#)
  - ☐ Cleaning injectors ➤ [page 362](#)

#### 5 - Hall sender -G40-

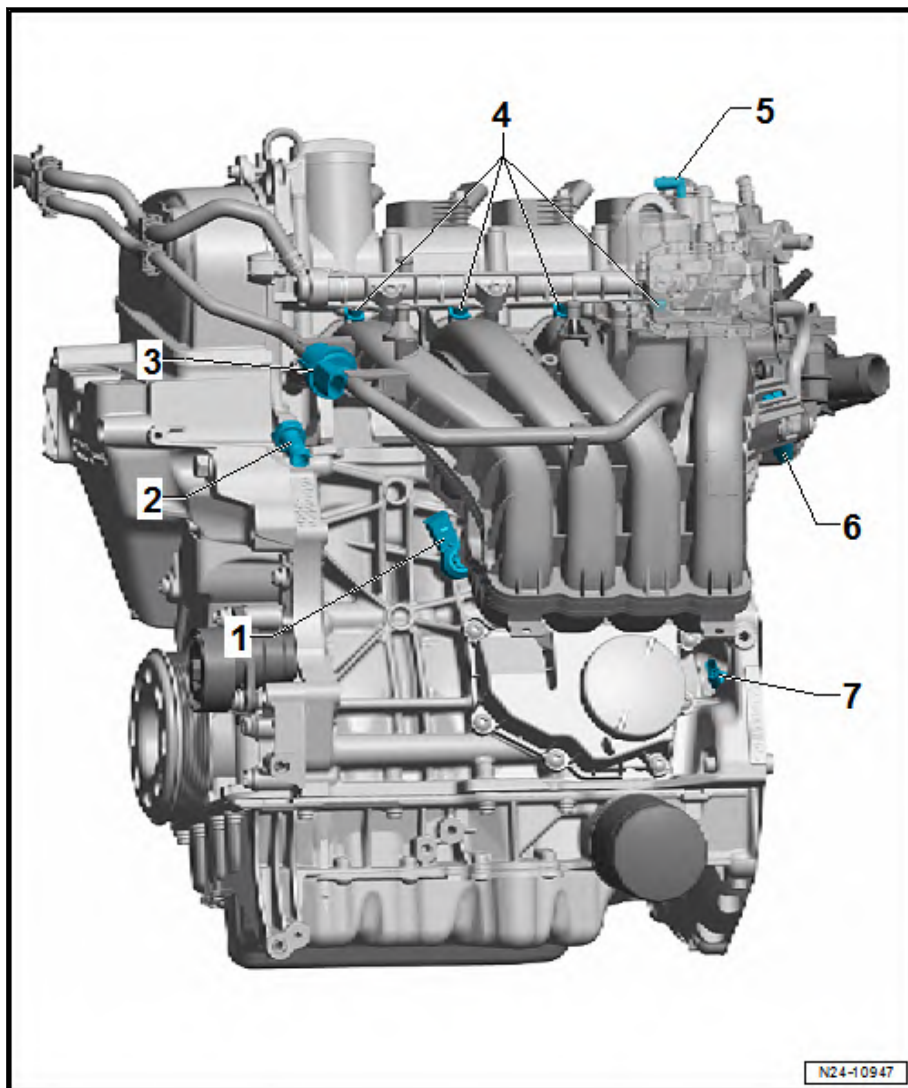
- ☐ Assembly overview ➤ [page 424](#)
- ☐ Removing and installing ➤ [page 430](#)

#### 6 - Intake manifold sender -GX9-

- ☐ Consists of intake manifold pressure sender -G71- and intake air temperature sender -G42-
- ☐ Assembly overview ➤ [page 369](#)
- ☐ Removing and installing ➤ [page 378](#)

#### 7 - Engine speed sender -G28-

- ☐ Assembly overview ➤ [page 424](#)
- ☐ Removing and installing ➤ [page 430](#)



Overview of fitting locations - exhaust side



#### 1 - Lambda probe 1 after catalytic converter -GX7-

- ❑ Consists of Lambda probe after catalytic converter -G130- and Lambda probe heater 1 after catalytic converter -Z29-
- ❑ Removing and installing ⇒ [page 392](#)

#### 2 - Radiator outlet coolant - G62-

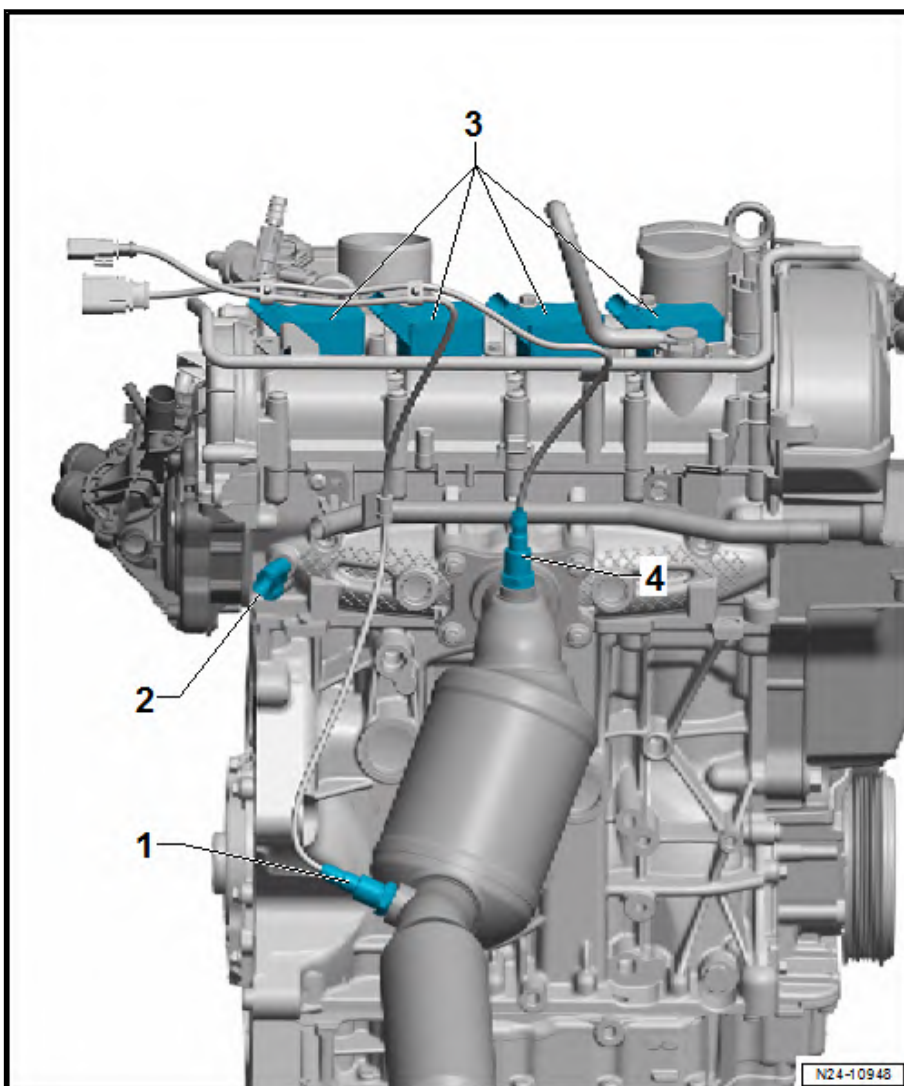
- ❑ Assembly overview - ⇒ [page 303](#)
- ❑ Removing and installing ⇒ [page 313](#)

#### 3 - Ignition coils with output stages

- ◆ Ignition coil 1 with output stage -N70-
- ◆ Ignition coil 2 with output stage -N127-
- ◆ Ignition coil 3 with output stage -N291-
- ◆ Ignition coil 4 with output stage -N292-
- ❑ Assembly overview ⇒ [page 424](#)
- ❑ Removing and installing ⇒ [page 426](#)

#### 4 - Lambda probe 1 before catalytic converter -GX10-

- ❑ Consists of Lambda probe -G39- and Lambda probe heater -Z19-
- ❑ Removing and installing ⇒ [page 392](#)



## 1.2 Assembly overview - fuel system



## 1 - Air filter

- ☐ Assembly overview ➤ [page 364](#)
- ☐ Removing and installing ➤ [page 366](#)

## 2 - Radiator outlet coolant - G62-

- ☐ Assembly overview - ➤ [page 303](#)
- ☐ Removing and installing ➤ [page 313](#)

## 3 - Lambda probe 1 after catalytic converter -GX7-

- ☐ Consists of Lambda probe after catalytic converter -G130- and Lambda probe heater 1 after catalytic converter -Z29-
- ☐ Removing and installing ➤ [page 392](#)

## 4 - Engine control unit -J623-

- ☐ Removing and installing ➤ [page 379](#)

## 5 - Intake manifold

- ☐ Assembly overview ➤ [page 369](#)
- ☐ Removing and installing ➤ [page 373](#)

## 6 - Intake manifold sender - GX9-

- ☐ Consists of intake manifold pressure sender -G71- and intake air temperature sender -G42-
- ☐ Assembly overview ➤ [page 369](#)
- ☐ Removing and installing ➤ [page 378](#)

## 7 - Throttle valve module -GX3-

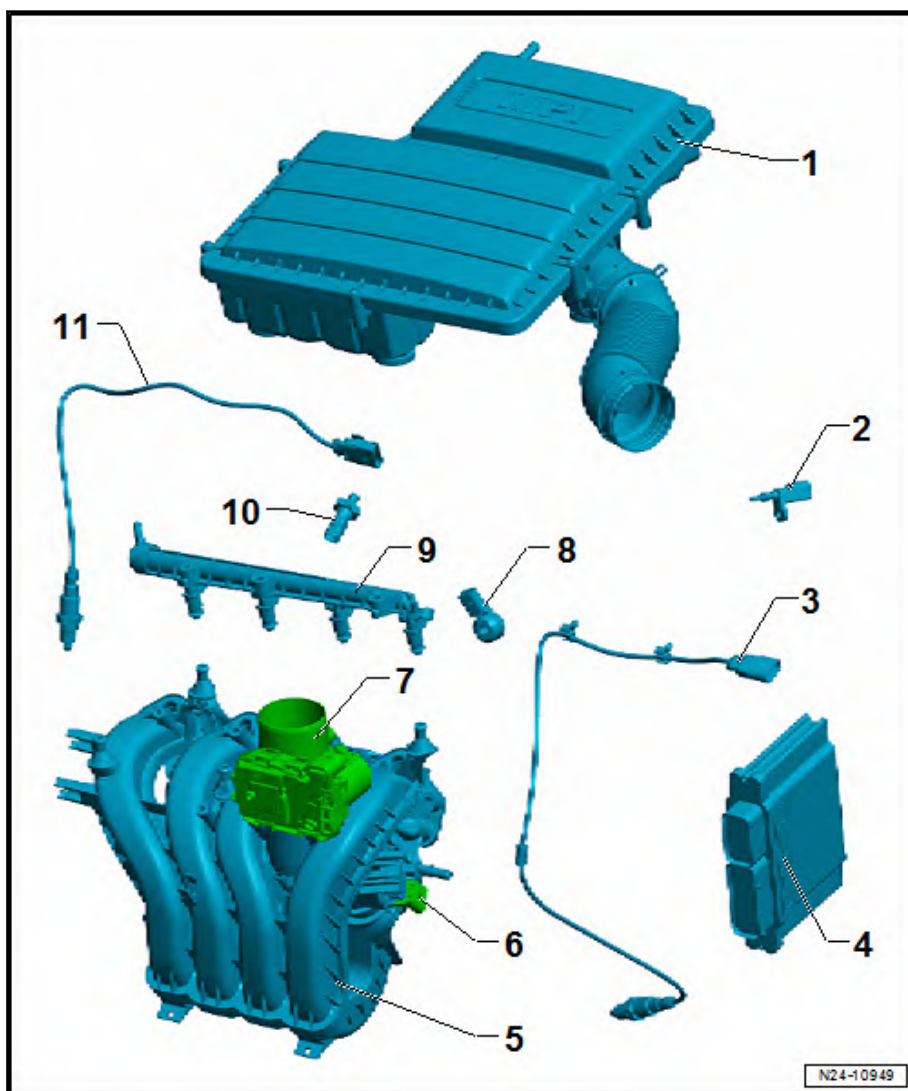
- ☐ Assembly overview ➤ [page 369](#)
- ☐ Removing and installing ➤ [page 376](#)
- ☐ Cleaning ➤ [page 376](#) .

## 8 - Knock sensor 1 -G61-

- ☐ Assembly overview ➤ [page 424](#)
- ☐ Removing and installing ➤ [page 428](#)

## 9 - Fuel rail with injectors

- ◆ Injector, cylinder 1 -N30-
- ◆ Injector, cylinder 2 -N31-
- ◆ Injector, cylinder 3 -N32-
- ◆ Injector, cylinder 4 -N33-
- ☐ Assembly overview ➤ [page 354](#)
- ☐ Removing and installing fuel rail ➤ [page 354](#) .
- ☐ Removing and installing injectors ➤ [page 357](#) .





- ☐ Checking injectors ⇒ [page 358](#) .
- ☐ Cleaning injectors ⇒ [page 362](#)

#### **10 - Oil pressure switch -F1-**

- ☐ Assembly overview ⇒ [page 279](#)
- ☐ Removing and installing ⇒ [page 279](#)

#### **11 - Lambda probe 1 before catalytic converter -GX10-**

- ☐ Consists of Lambda probe -G39- and Lambda probe heater -Z19-
- ☐ Removing and installing ⇒ [page 392](#)



## 2 Injectors

⇒ [o2.1 verview - fuel rail with injectors", page 354](#)

⇒ [a2.2 nd installing fuel rail", page 354](#)

⇒ [a2.3 nd installing injectors", page 357](#)

⇒ [i2.4 njectors", page 358](#)

⇒ [i2.5 njectors", page 362](#)

### 2.1 Assembly overview - fuel rail with injectors

#### 1 - Supply line

- ☐ From fuel delivery unit
- ☐ Black with white marks.
- ☐ Secure with spring-type clips
- ☐ Ensure firm seating

#### 2 - Fuel rail with injectors

- ☐ Removing and installing ⇒ [page 354](#)
- ☐ Checking injectors for leaks and quantity injected ⇒ [page 358](#)

#### 3 - Bolt

- ☐ 7 Nm

#### 4 - Injector

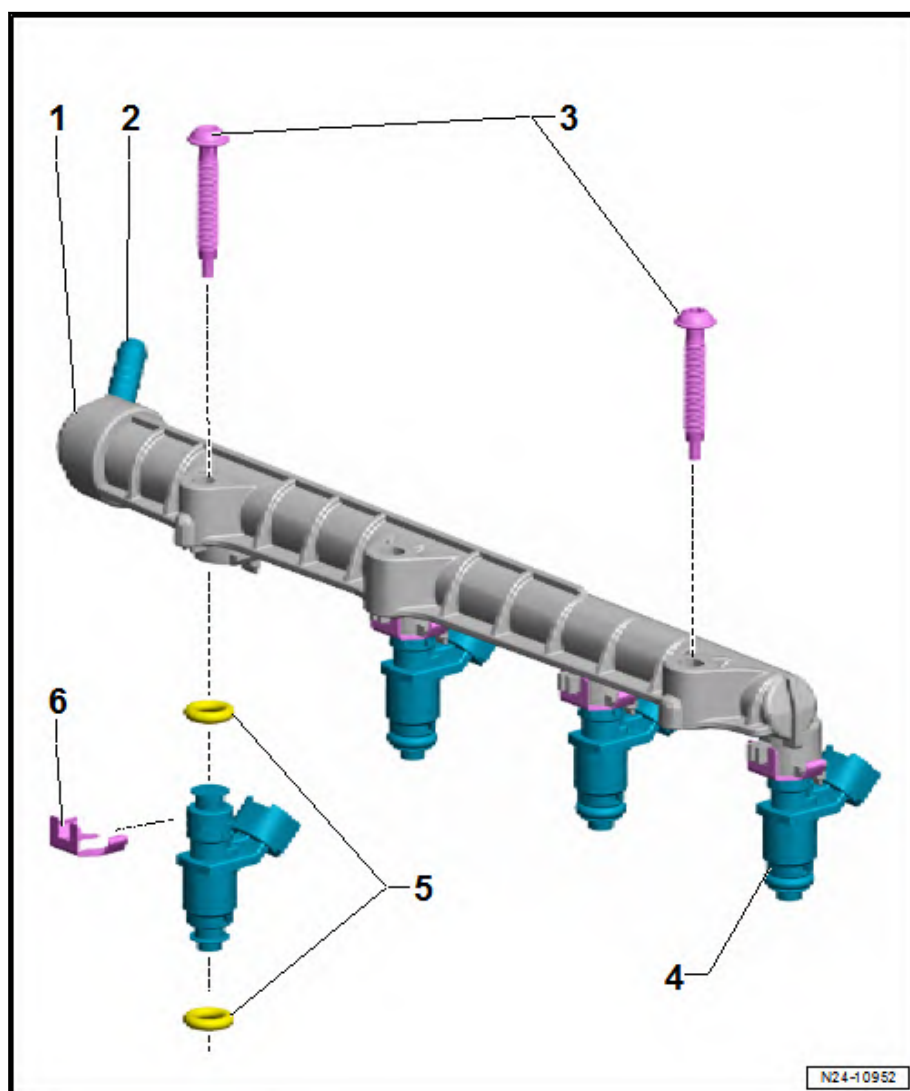
- ☐ Injector, cylinder 1 - N30-
- ☐ Injector, cylinder 2 - N31-
- ☐ Injector, cylinder 3 - N32-
- ☐ Injector, cylinder 4 - N33-
- ☐ Removing and installing ⇒ [page 357](#)
- ☐ Checking injectors for leaks and quantity injected ⇒ [page 358](#)

#### 5 - O-ring

- ☐ Renew after removal
- ☐ Before installing, moisten lightly with clean engine oil.

#### 6 - Retaining clip

- ☐ Ensure correct seating on injector and fuel rail



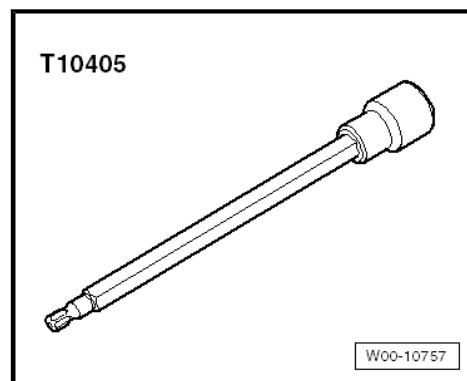
### 2.2 Removing and installing fuel rail

Special tools and workshop equipment required



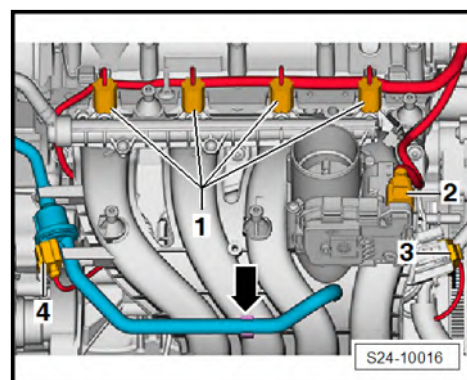


◆ Socket Torx T 30 -T10405-

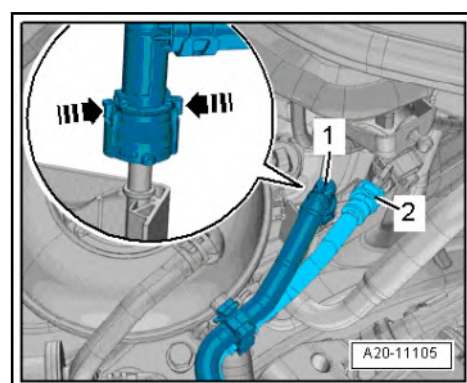


**Removing**

- Heed the safety precautions ➤ [page 1](#) .
- Observe rules for cleanliness ➤ [page 6](#) .
- Note repair instructions ➤ [page 6](#) .
- Remove air filter housing ➤ [page 366](#) .
- Release and pull off connector for injectors -1-.



Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>



- Release fuel supply line -1- and pull it off. Disconnect plug-in connectors ➤ Rep. gr. 20; Plug-in connectors; Disconnecting plug-in connectors.





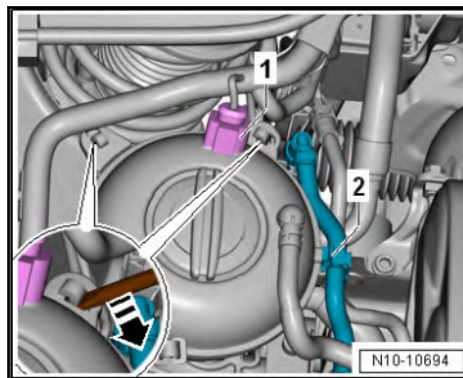
**CAUTION**

The fuel system is pressurised.

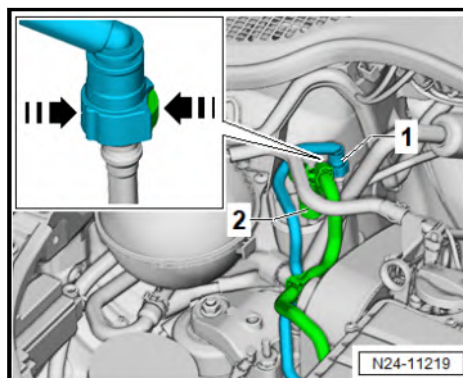
Danger of injury through fuel spray.

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

- Open clamp for fuel supply line on coolant expansion tank -2-, and remove fuel supply line.

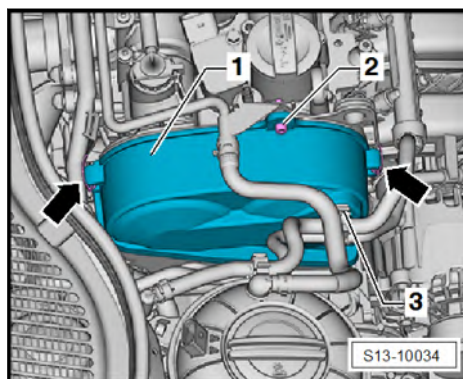


Polo Saloon RUS 2020>



- Disconnect hose coupling for fuel supply line -1- ⇒ Rep. gr. 20; Plug-in connectors; Disconnecting plug-in connectors.

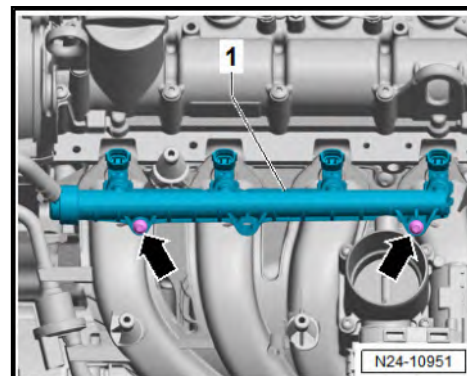
Continued for all vehicles



- Open clamp for fuel supply line -3- on upper toothed belt guard -1-, and remove fuel supply line.



- Seal line so that fuel system is not contaminated by dirt.
- Unscrew bolts -arrows- from intake manifold.



- Pull fuel rail -1- together with injectors out of the intake manifold.

### Installing

Install in the reverse order of removal. When doing this, note the following:

- Renew oil seals.
- Before installing, lightly coat seals with clean engine oil.
- Ensure proper seating of seals.
- Firmly press down fuel rail in area of fastener, and screw in bolts by two full turns.
- Tighten bolts evenly and diagonally.

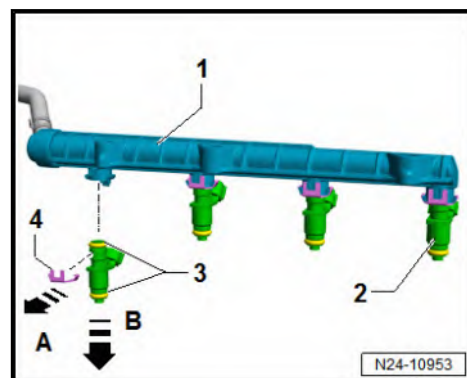
### Specified torques

- ♦ [⇒ o2.1 verview - fuel rail with injectors", page 354](#)

## 2.3 Removing and installing injectors

### Removing

- Removing fuel rail [⇒ page 354](#) .
- Carefully remove retaining clip -4- of injector to be removed in -direction of arrow A-.



- Pull off injector on fuel rail -1- in -direction of arrow B-.

### Installing

Install in reverse order of removal. During this procedure, observe the following:

- Renew seals -3-.



- Before installing, lightly coat seals with clean engine oil.
- Ensure proper seating of seals.
- Ensure proper seating of injectors -2- in fuel rail -1-.
- Ensure proper seating and installation position of retaining clips -4-.
- Installing fuel rail ⇒ [page 354](#) .

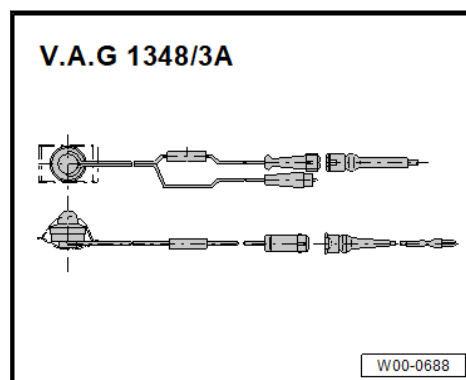
#### Specified torques

- ♦ ⇒ [o2.1 verview - fuel rail with injectors", page 354](#)

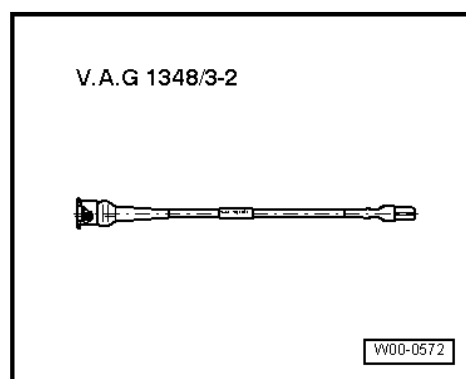
## 2.4 Checking injectors

#### Special tools and workshop equipment required

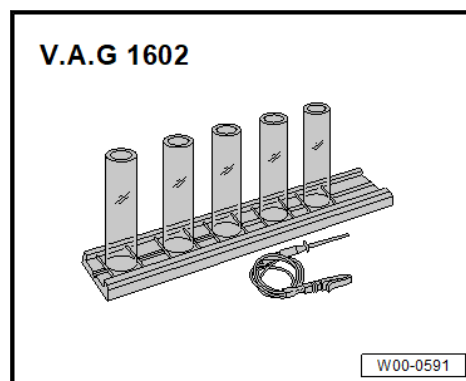
- ♦ Remote control for V.A.G 1348 -V.A.G 1348/3A-



- ♦ Adapter line -V.A.G 1348/3-2-

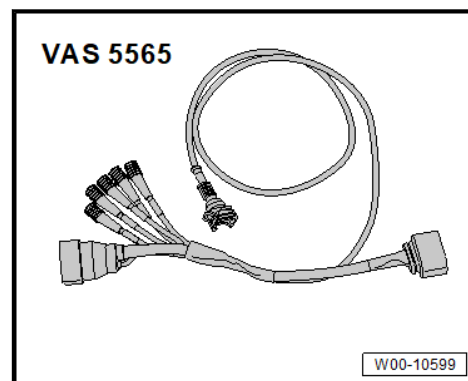


- ♦ Auxiliary measuring set -V.A.G 1594D-, not illustrated
- ♦ Injection rate tester -V.A.G 1602-





◆ Adapter -VAS 5565-



**Test conditions**

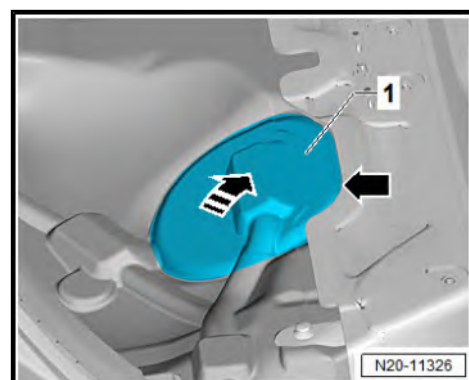
- Do not disconnect fuel hoses.
- Injectors are not being removed from fuel rail.
- Fuel pressure OK ⇒ Rep. gr. 20; Fuel pump; Checking fuel system pressurisation pump G6 .
- Engine and fuel temperature: approx. 20°C.
- Battery voltage must be at least 11.5 V. If necessary, connect battery charger ⇒ Electrical system; Rep. gr. 27; Battery; Charging battery.

**Test sequence**

- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .
- Remove fuel rail together with injectors ⇒ [page 354](#) .
- Remove four measuring glasses from injection rate tester -V.A.G 1602-.
- Switch off ignition and all electrical consumers, and withdraw ignition key.

**Golf SV:**

- Remove right rear seat ⇒ General body repairs, interior; Rep. gr. 72; Rear seats; Removing and installing bench seat/individual seats.
- Partially detach cover -1- in floor covering at parting line -arrow-.



- Do not detach cover completely from floor covering in order to ensure it is reinstalled in the correct installation position.
- Detach it just enough that the cover can be folded upwards.

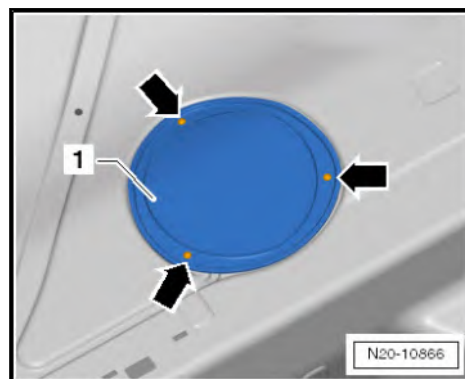


- Fold up cover in -direction of arrow-.

#### Golf and Golf Estate:

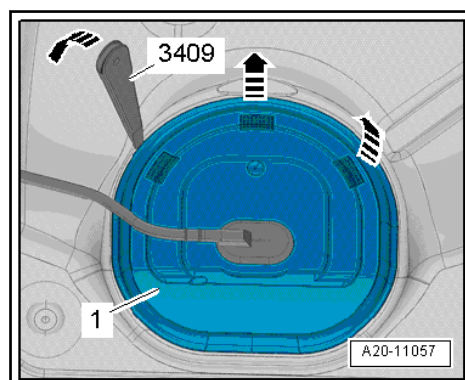
- Remove rear bench seat ⇒ General body repairs, interior;  
Rep. gr. 72; Rear seats; Removing and installing bench  
seat / individual seats.

#### Polo Saloon RUS 2020➤

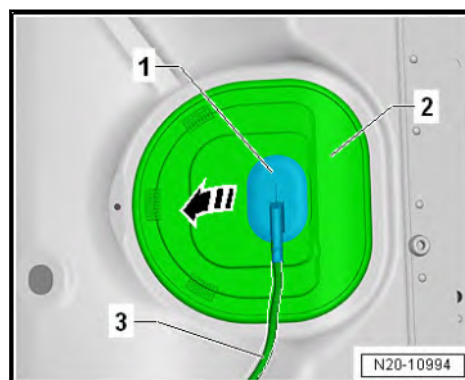


- Unscrew bolts -arrows-.
- Detach cover -1-.

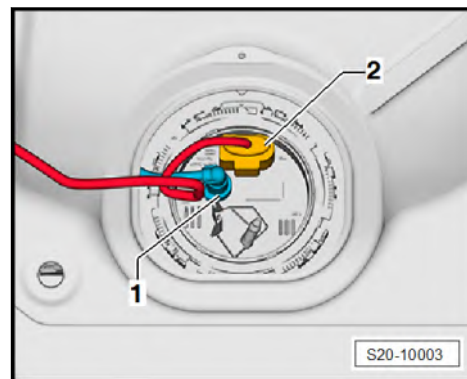
#### Continued for all vehicles:



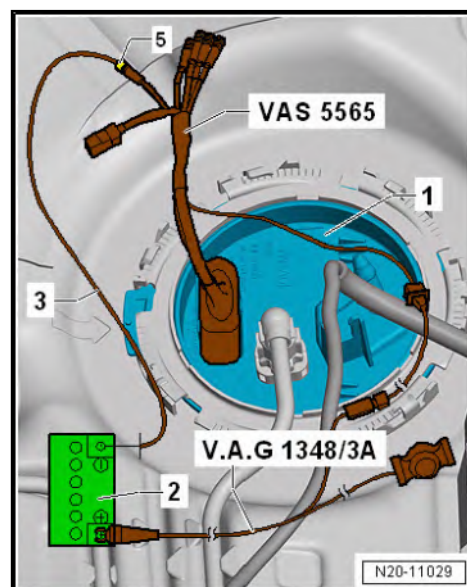
- Unclip cover -1- for flange at retaining tabs -arrows-, using  
removal wedge -3409-.
- Unclip sealing grommet -1- downwards from cover -2-.



- Push cover -2- back along wiring harness -3-.
- Release and pull off connector -2- on flange of fuel delivery  
unit.



- Connect adapter -VAS 5565- to fuel delivery unit -1-.



- Connect remote control -V.A.G 1348/3A- to adapter -VAS 5565- and to battery positive terminal in engine compartment.
- Connect connection -5- (yellow) from adapter -VAS 5565- to negative battery terminal clamp using auxiliary cable -3- from auxiliary measuring set -V.A.G 1594D-.



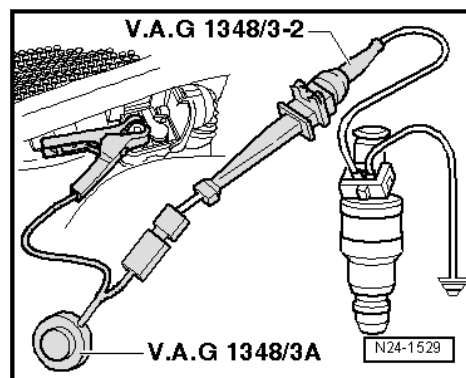
#### Note

*This step serves only to have the fuel pump running when the engine is stopped.*

#### Checking quantity injected

- Connect a contact of injector to be checked to engine earth using auxiliary cables from auxiliary measuring set -V.A.G 1594C-.





- Connect second injector contact with adapter cable -V.A.G 1348/3-2- to remote control for V.A.G 1348 -V.A.G 1348/3A-.
- Connect crocodile clip to positive battery pole in engine compartment.
- Place a measuring glass of injection rate tester -V.A.G 1602- under injector to be checked.
- Activate fuel delivery unit.
- Operate remote control for V.A.G. 1348 -V.A.G 1348/3A- for 30 seconds to activate the injector to be checked.
- Switch off fuel pump.
- Repeat check on other injectors.
- After all injectors have been activated, place measuring glasses on a level surface and compare the fuel quantity injected.

The specification is 84...99 ml per injector.

If the measured values of one or more injectors are above or below the prescribed specifications:

- Renew defective injector ⇒ [page 357](#) .

### Leakage test

- Place measuring glasses of injection rate tester -V.A.G 1602- under injectors.
- Activate fuel delivery unit.

No more than 2 drops/min. must escape from each injector.

- Switch off fuel pump.

**If the fuel loss is greater:**

- Renew defective injector ⇒ [page 357](#) .

### Installing

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

- Renew O-rings on all injectors, and slightly moisten them with clean engine oil.
- Fit fuel rail with secured injectors onto intake manifold and tighten evenly ⇒ [page 354](#) .

## 2.5 Cleaning injectors

### Special tools and workshop equipment required

- ♦ Ultrasonic cleaning unit -VAS 6418-

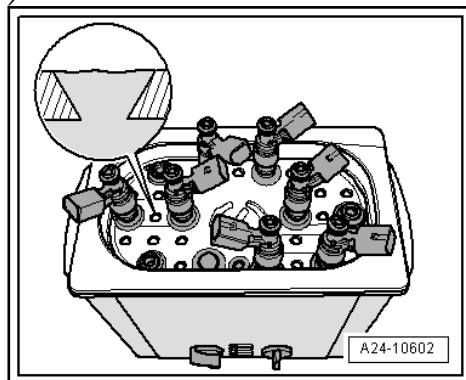


- ◆ Mounting plate for injection modules -VAS 6418/1-
- ◆ Cleaning fluid ⇒ Electronic Parts Catalogue



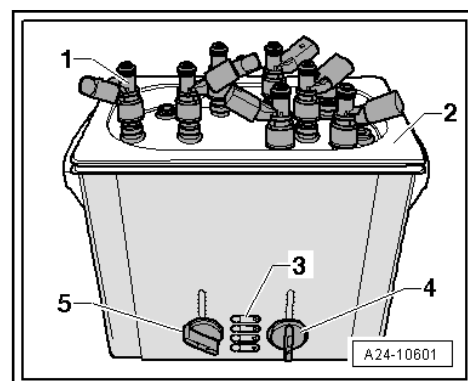
#### Note

*The ultrasonic unit must be filled with cleaning agent to upper edge of holes (see detail).*



*Observe ultrasonic unit safety regulations and operating instructions.*

#### Cleaning



- Remove injectors ⇒ [page 357](#) .
- Insert injectors -1- all the way into mounting plate for injection modules -VAS 6418/1- -item 2-.
- Immerse injectors together with mounting plate for injection modules -VAS 6418/1- into cleaning fluid -VAS 6418/2-.
- Set rotary knob -4- to a temperature of 50°C.
- Set a cleaning time of 30 minutes with the rotating knob -5-.
- Switch on ultrasonic cleaning unit with button -3-.



#### Note

*The time set starts to elapse as soon as a cleaning temperature of 50°C has been attained.*

- After cleaning, renew combustion chamber ring seal for each injector ⇒ [page 357](#) .



### **3      Air filter**

⇒ [o3.1 verview - air filter housing", page 364](#)

⇒ [a3.2 nd installing air filter housing", page 366](#)

#### **3.1      Assembly overview - air filter housing**



**1 - Air duct (bottom section)**

- ☐ On lock carrier

**2 - Bolt**

- ☐ 2 Nm

**3 - Rubber mounting**

- ☐ Ensure it is properly seated

**4 - Air filter lower part**

- ☐ Remove any mechanical soiling
- ☐ Depending on vehicle, with additional vacuum connection

**5 - Air filter element**

- ☐ Use only genuine air filter elements ⇒ Electronic Parts Catalogue
- ☐ For change intervals refer to ⇒ Maintenance tables
- ☐ Removing and installing ⇒ Maintenance; Booklet 819

**6 - Air filter upper part**

**7 - Bolt**

- ☐ 2 Nm

**8 - Hose**

- ☐ For crankcase ventilation.

**9 - Air intake hose**

- ☐ Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Golf 2020>

**10 - Hose clamp**

- ☐ Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Golf 2020>

**11 - Bolt**

- ☐ Polo 2018>, Polo Saloon RUS 2020>
- ☐ 2 Nm

**12 - Intake connecting pipe**

- ☐ Polo 2018>, Polo Saloon RUS 2020>

**13 - Seal**

- ☐ Ensure it is properly seated

**14 - Bolt**

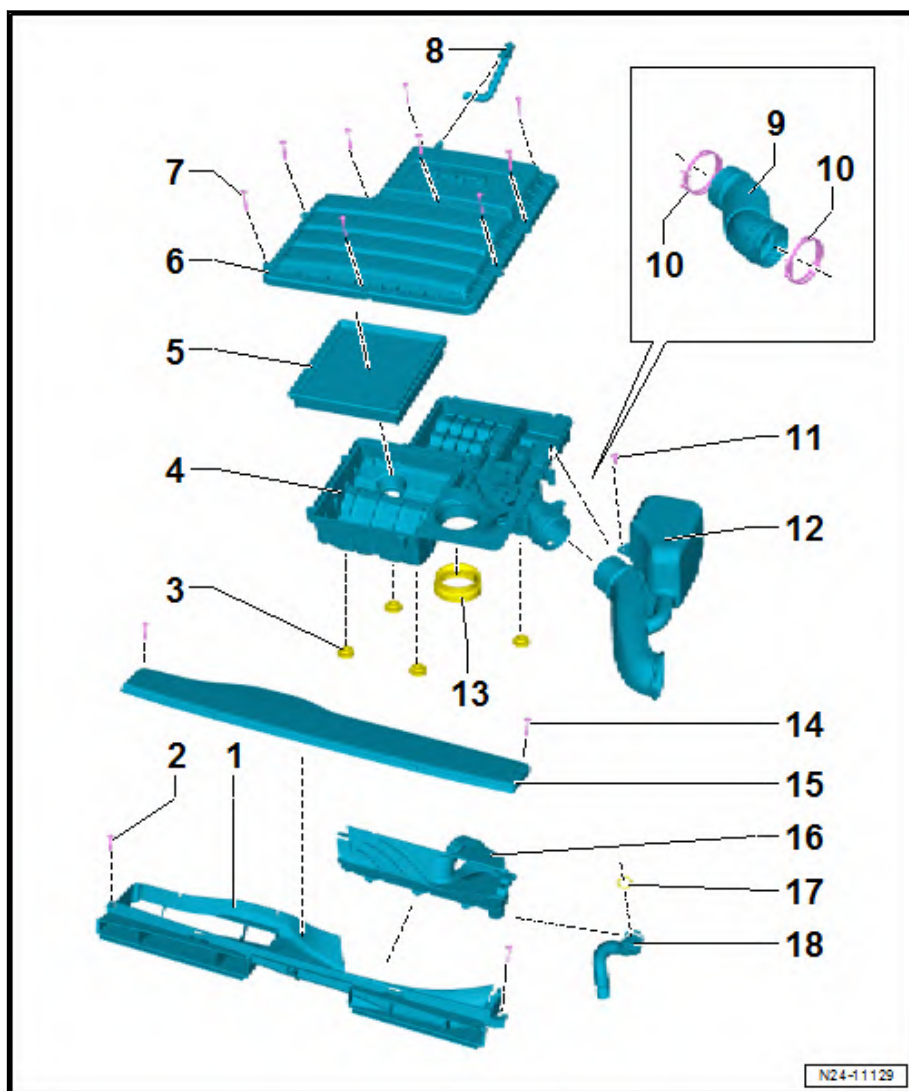
- ☐ Qty. 2 (Golf 2013>, Golf Estate 2014>, Golf SV 2015, Golf 2017>, Golf 2020>)
- ☐ Qty. 4 (Polo 2018>)
- ☐ 2 Nm

**15 - Cover**

- ☐ For air duct

**16 - Air duct (top section)**

- ☐ On lock carrier





## 17 - O-ring

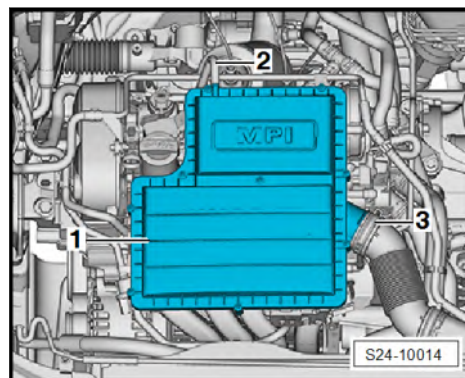
- ☐ Renew if damaged

## 18 - Water drain hose

- ☐ Cleaning

## 3.2 Removing and installing air filter housing

### Removing air filter housing



- Pull off hose -2-.

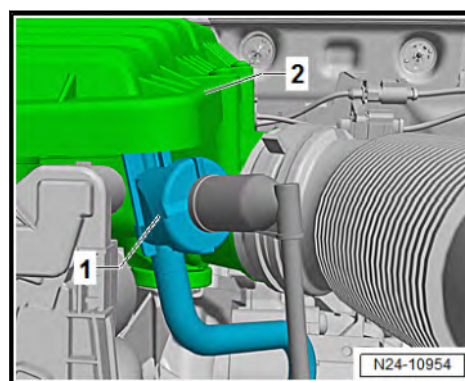
Golf 2013>, Golf Estate 2014>, Golf SV 2015, Golf 2017>,  
Golf 2020>

- Release hose clip -3-, and remove air hose.

Polo 2018>, Polo Saloon RUS 2020>

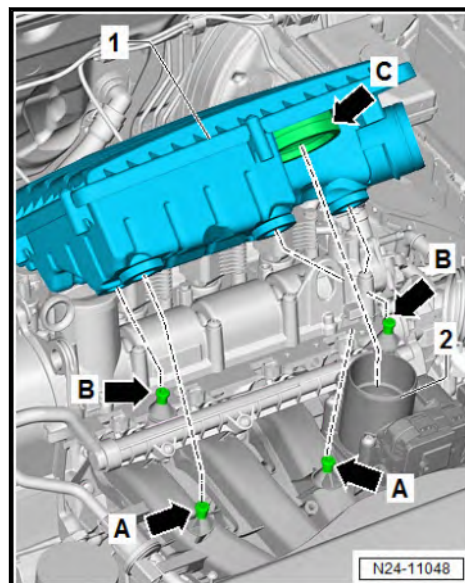
- Unscrew bolt for intake manifold ⇒ [Item 11 \(page 365\)](#) .

Continued for all vehicles



- If fitted, pull vacuum line -1- off air filter -2-.

Sequence of work steps when removing the air filter housing



#### Note

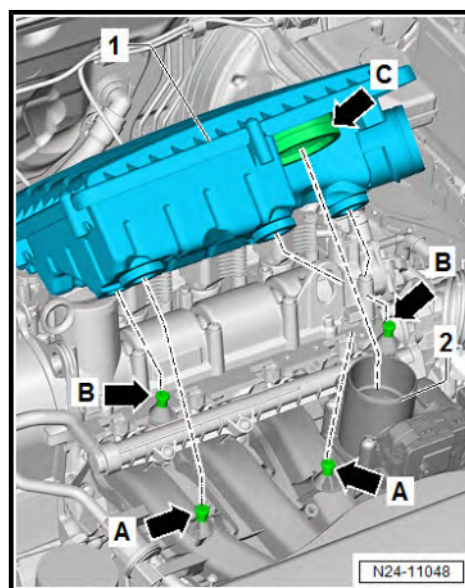
*When removing the air filter housing, make sure to perform the necessary work steps in the sequence specified below. Otherwise, the ball heads on the intake manifold -arrow A- may break off.*

- First, pull air filter housing -1- off ball heads -arrows B-.
- Then, pull air filter housing -1- off ball heads -arrows A-.
- While doing this, guide out air duct -arrow C- of throttle valve module connection -2-.

#### Installing

Install in reverse order of removal. During this procedure, observe the following:

#### Sequence of work steps when installing the air filter housing







#### Note

*When installing the air filter housing, make sure to perform the necessary work steps in the sequence specified below. Otherwise, the ball heads on the intake manifold -arrow A- may break off.*

- First, fit air filter housing -1- onto ball heads -arrows A-.
- While doing this, guide air duct -arrow C- onto connection of throttle valve module -2-.
- Then, fit air filter housing -1- onto ball heads -arrows B-.
- Make sure that the air filter housing is seated properly and evenly on all ball heads.
- Press air filter housing -1- as far as stop onto ball heads -arrows A-.
- Then, press air filter housing -1- as far as stop onto ball heads -arrows B-.



#### 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.*
- ◆ *A clean air filter housing is essential.*
- ◆ *Hose unions and air intake pipes/hoses must be free of oil and grease when installing.*
- ◆ *Use a silicone-free lubricant to install the air hoses.*
- ◆ *Secure all hose connections with hose clips of the same standard as that used on the production line ⇒ Electronic parts catalogue.*
- ◆ *When using compressed air to blow out the air filter housing, cover the critical air-carrying components, such as air pipes, with a clean cloth. This is to avoid any functional impairments.*
- ◆ *Observe disposal regulations.*
- Extract mechanical soiling from upper and lower part of air filter housing.
- Blow out water drain with compressed air.

#### Specified torques

- ◆ ⇒ [o3.1 verview - air filter housing", page 364](#)



## 4 Intake manifold

⇒ [o4.1 verview – intake manifold”, page 369](#)

⇒ [a4.2 nd installing intake manifold”, page 373](#)

⇒ [a4.3 nd installing throttle valve moduleGX3”, page 376](#)

⇒ [t4.4 hrottle valve moduleGX3”, page 376](#)

### 4.1 Assembly overview – intake manifold

⇒ [o4.1.1 verview – intake manifold, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>”, page 369](#)

⇒ [o4.1.2 verview - intake manifold, Polo Saloon RUS 2020>”, page 371](#)

#### 4.1.1 Assembly overview – intake manifold, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>



## 1 - Throttle valve module - GX3-

- ☐ Throttle valve module - GX3- consists of
- ◆ Throttle valve drive for electronic power control - G186-
- ◆ Throttle valve drive angle sender 1 for electronic power control -G187-
- ◆ Throttle valve drive angle sender 2 for electronic power control -G188-
- ☐ Cleaning ⇒ [page 376](#) .
- ☐ Removing and installing ⇒ [page 376](#)
- ☐ If renewed, clear programmed values and adapt engine control unit -J623- ⇒ Vehicle diagnostic tester

## 2 - Bolt

- ☐ 7 Nm
- ☐ Qty. 4

## 3 - Bolt

- ☐ 7 Nm

## 4 - Fuel rail with injectors

- ☐ Assembly overview ⇒ [page 354](#)
- ☐ Removing and installing ⇒ [page 354](#)

## 5 - Seal

- ☐ Renew after removal

## 6 - Intake manifold

- ☐ Removing and installing ⇒ [page 373](#)

## 7 - Seal

- ☐ Renew after removal

## 8 - Seal

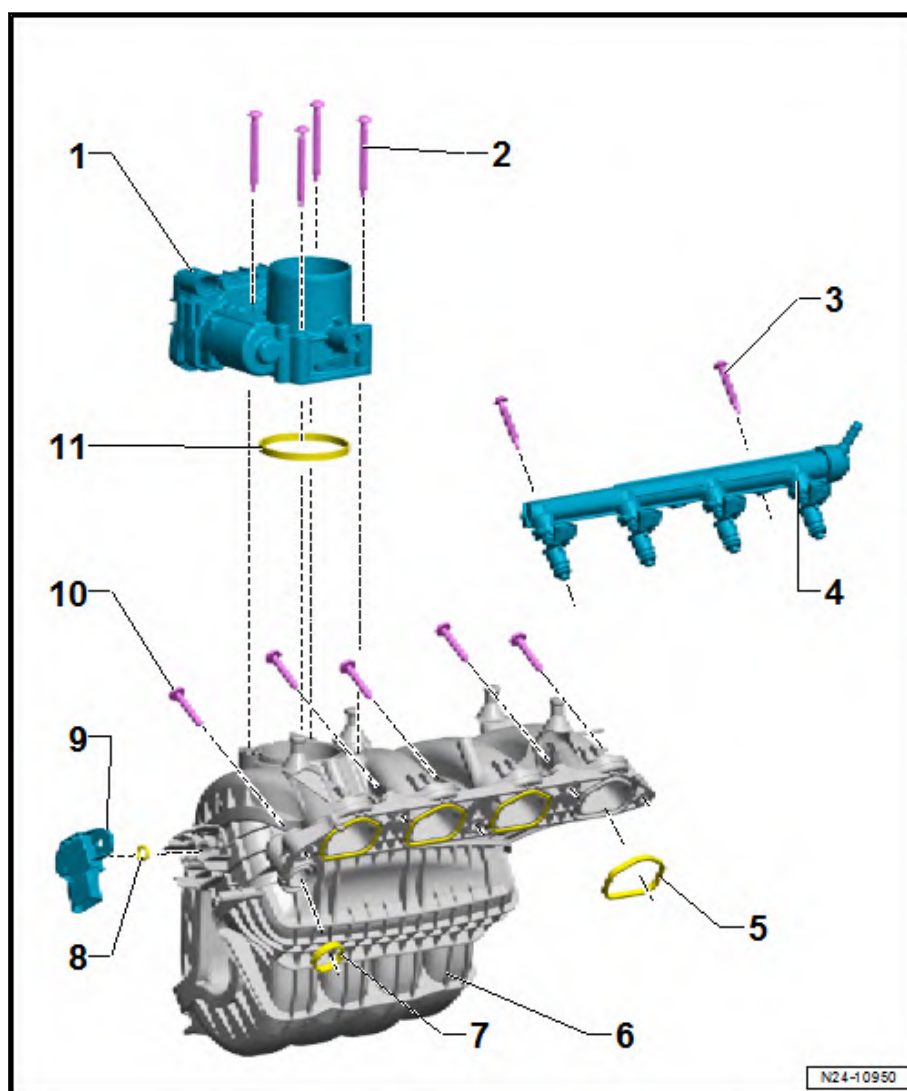
- ☐ Renew after removal

## 9 - Intake manifold sender -GX9-

- ☐ Intake manifold sender -GX9- consists of:
- ◆ Intake manifold pressure sender -G71-
- ◆ Intake air temperature sender -G42-
- ☐ Removing and installing ⇒ [page 378](#)
- ☐ Repair solution for missing locking tab ⇒ [page 378](#)

## 10 - Bolt

- ◆ Starting in centre, screw in bolt alternately towards outside as far as stop
- ◆ Starting in centre, tighten bolt alternately towards outside to specified torque
- ☐ 10 Nm





## 11 - Seal

- ☐ Renew after removal

### 4.1.2 Assembly overview - intake manifold, Polo Saloon RUS 2020>



## 1 - Throttle valve module - GX3-

- ☐ Throttle valve module - GX3- consists of
- ◆ Throttle valve module - J338-
- ◆ Throttle valve drive for electronic power control - G186-
- ◆ Throttle valve drive angle sender 1 for electronic power control - G187-
- ◆ Throttle valve drive angle sender 2 for electronic power control - G188-
  - ☐ Cleaning ⇒ [page 376](#) .
  - ☐ Removing and installing ⇒ [page 376](#)
  - ☐ If renewed, clear programmed values and adapt engine control unit -J623- ⇒ Vehicle diagnostic tester

## 2 - Bolt

- ☐ 7 Nm
- ☐ Qty. 4

## 3 - Bolt

- ☐ 7 Nm

## 4 - Fuel rail with injectors

- ☐ Assembly overview ⇒ [page 354](#)
- ☐ Removing and installing ⇒ [page 354](#)

## 5 - Bolt

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

## 6 - Throttle valve housing

## 7 - Seal

- ☐ Renew after removal

## 8 - Intake manifold

- ☐ Removing and installing ⇒ [page 373](#)

## 9 - Seal

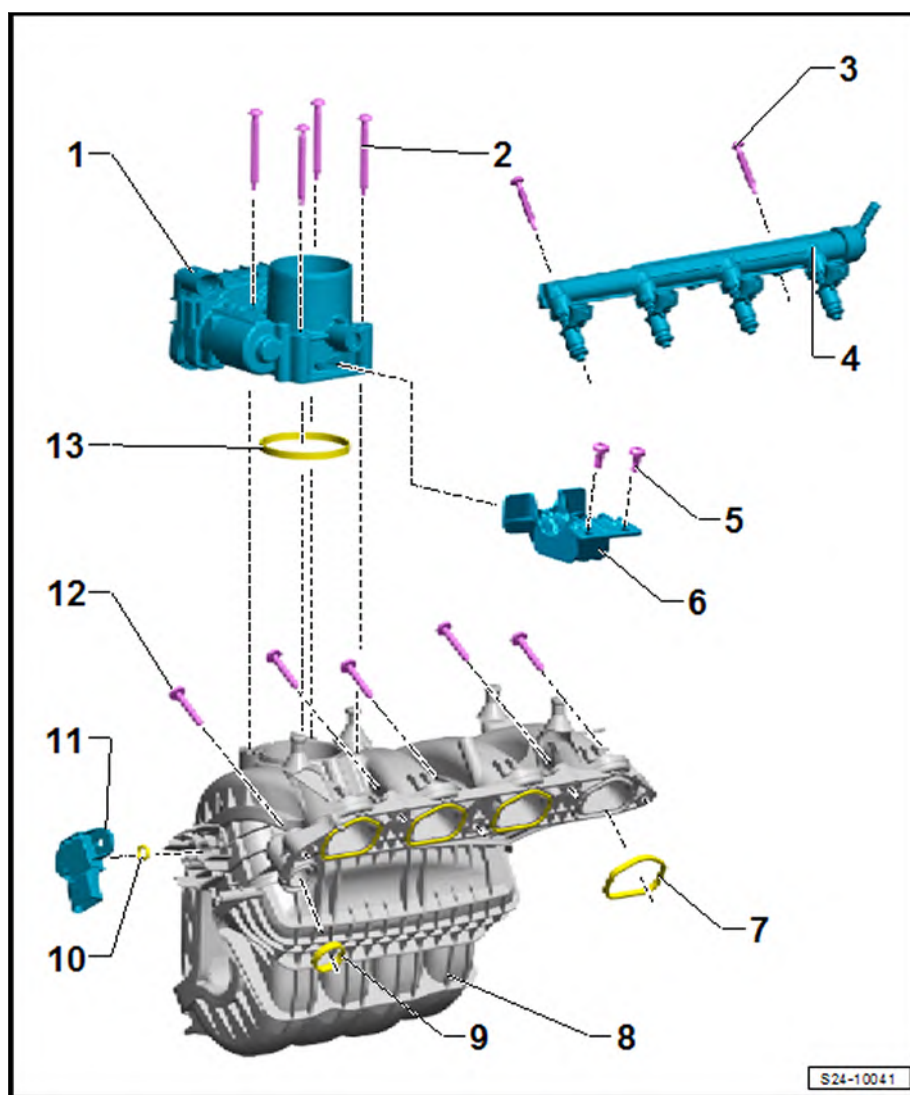
- ☐ Renew after removal

## 10 - Seal

- ☐ Renew after removal

## 11 - Intake manifold sender -GX9-

- ☐ Intake manifold sender -GX9- consists of:
- ◆ Intake manifold pressure sender -G71-
- ◆ Intake air temperature sender -G42-
  - ☐ Removing and installing ⇒ [page 378](#)





- ❑ Repair solution for missing locking tab ➔ [page 378](#)

## 12 - Bolt

- ◆ Starting in centre, screw in bolt alternately towards outside as far as stop
- ◆ Starting in centre, tighten bolt alternately towards outside to specified torque
  - ❑ 10 Nm

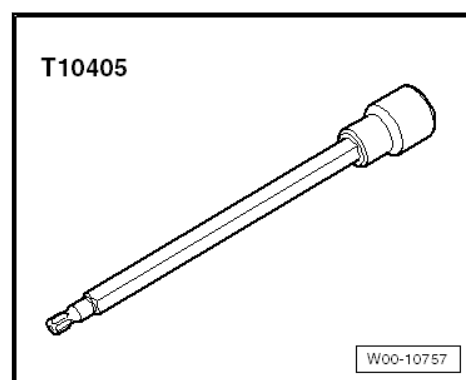
## 13 - Seal

- ❑ Renew after removal

## 4.2 Removing and installing intake manifold

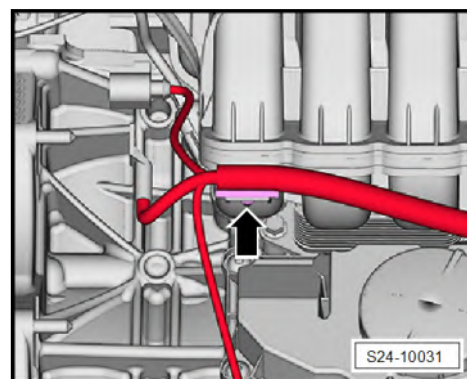
### Special tools and workshop equipment required

- ◆ Socket Torx T 30 -T10405-



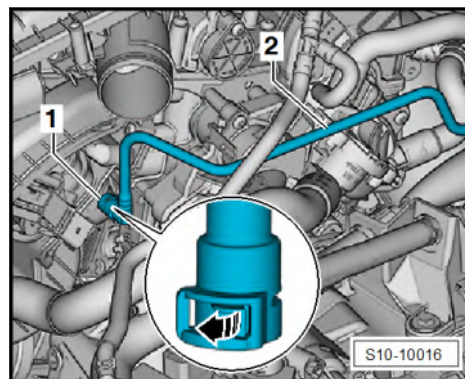
### Removing

- Heed the safety precautions ➔ [page 1](#) .
- Observe rules for cleanliness ➔ [page 6](#) .
- Note repair instructions ➔ [page 6](#) .
- Remove noise insulation ➔ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Detach wiring harness from bottom of intake manifold -arrow-.

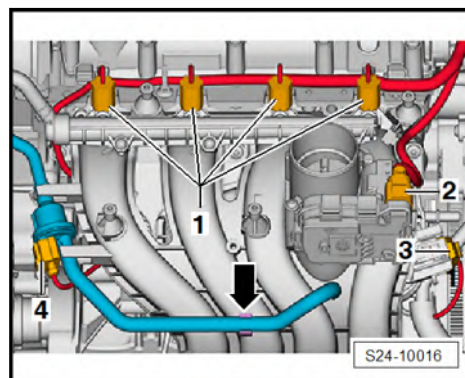


- Remove air filter housing ➔ [page 366](#) .
- Release securing mechanism of plug-in connector -arrow-, and pull vacuum line -2- off intake manifold -1-.





- Release and pull off connector for injectors -1-.

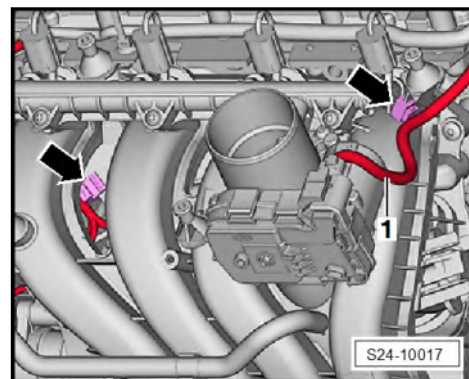


- Release and pull off connector -2- for throttle valve module -J338-.
- Release and pull off connector -3- for intake manifold sender -GX9-.
- Release and pull off connector -4- of activated charcoal filter solenoid valve 1 -N80-.
- Unclip breather line from retainer -arrow-.
- Unclip activated charcoal filter solenoid valve 1 -N80- from intake manifold.
- Carefully pull breather line to intake manifold off activated charcoal filter solenoid valve 1 -N80-.
- Remove fuel rail together with injectors and lay to side ➡ [page 354](#) .



#### Note

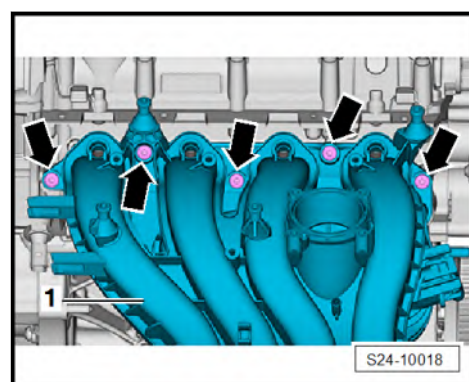
- ◆ *The fuel line does not need to be disconnected.*
- ◆ *Do not remove injectors from fuel rail.*
- Pull wiring harness -1- off intake manifold -arrows-.



#### Polo Saloon RUS 2020>

- Remove throttle valve housing ⇒ [Item 6 \(page 372\)](#) .

Continued for all vehicles



- Unscrew bolts -arrows-.
- Remove intake manifold -1-.

If intake manifold is to be renewed, remove throttle valve module -J338- ⇒ [page 376](#) .

#### Installing

Install in reverse order of removal. During this procedure, observe the following:

- Ensure proper seating of seals.



#### Note

*Renew seals and O-rings.*

- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview – noise insulation.
- Install air filter housing ⇒ [page 366](#) .

#### Specified torques

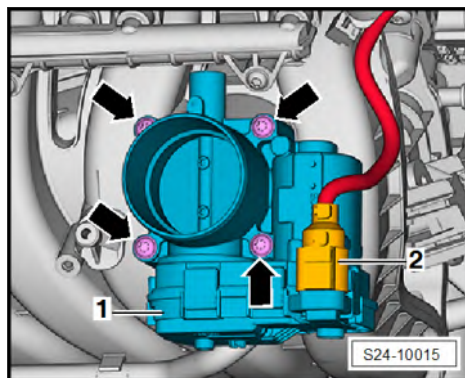
- ◆ ⇒ [o4.1 overview – intake manifold”, page 369](#) .
- ◆ ⇒ [o2.1 overview - fuel rail with injectors”, page 354](#)
- ◆ ⇒ [o3.1 overview - air filter housing”, page 364](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation



## 4.3 Removing and installing throttle valve module -GX3-

### Removing

- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .
- Remove air filter housing ⇒ [page 366](#) .
- Release connectors -2- and pull off.



- Unscrew bolts -arrows-, and remove throttle valve module -GX3- -1-.

### Installing

Install in reverse order of removal. During this procedure, observe the following:

- After throttle valve module -GX3- has been renewed, it must be readapted to engine control unit -J623- ⇒ Vehicle diagnostic tester.

◆ [Guided Engine Functions](#)

◆ [Adaption of throttle valve module - J338](#)

### Specified torques

- ◆ ⇒ [o4.1 verview – intake manifold”, page 369](#)
- ◆ ⇒ [o3.1 verview - air filter housing”, page 364](#)

## 4.4 Cleaning throttle valve module -GX3-



### Note

- ◆ *If a new engine control unit -J623- is installed the throttle valve module must be adjusted.*
- ◆ *Contamination and coking in end stop can result in incorrect adaptation values.*
- ◆ *When cleaning the throttle valve housing, take care not to scratch it.*

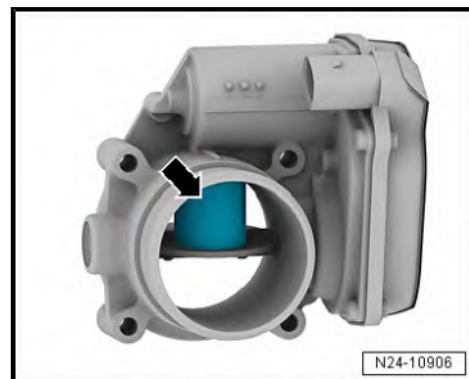
### Special tools and workshop equipment required

- ◆ Acetone (commercially available)
- ◆ Brush



## Procedure

- Heed the safety precautions ➔ [page 1](#) .
- Observe rules for cleanliness ➔ [page 6](#) .
- Note repair instructions ➔ [page 6](#) .
- Remove throttle valve module -GX3- ➔ [page 376](#) .
- Open throttle valve by hand and lock it in open position with a wedge (plastic or wood) -arrow-.



## CAUTION

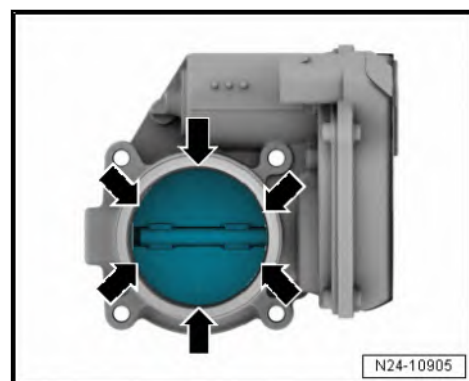
**Risk of injury caused by acetone. Acetone is highly flammable and may cause eye and skin irritation.**

- Wear protective goggles.
- Wear protective gloves.

## Note

*Do not use compressed air to clean throttle valve.*

- Clean throttle valve housing thoroughly, especially around the points -arrows- where the throttle valve closes, using commercially available acetone and a small brush.



- Wipe the inside of the throttle valve housing with a lint-free cloth.
- Allow acetone to dry off completely.
- Install throttle valve module -GX3- ➔ [page 376](#) .
- Delete learnt values, and adapt engine control unit -J623- to throttle valve module -GX3- ➔ Vehicle diagnostic tester.



## 5 Senders and sensors

⇒ [a5.1 nd installing intake manifold senderGX9", page 378](#)

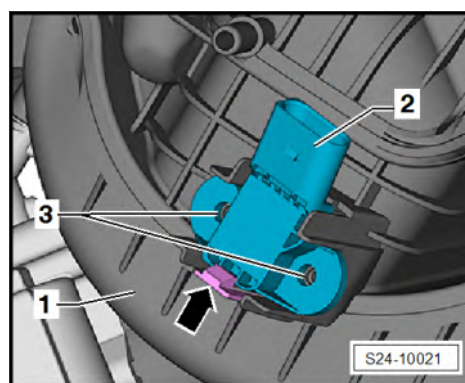
### 5.1 Removing and installing intake manifold sender -GX9-

Intake manifold sender -GX9- consists of:

- ◆ Intake air temperature sender
- ◆ Intake manifold pressure sender -G71-

#### Removing

- Remove air filter housing ⇒ [page 366](#) .
- Release and pull off connector on intake manifold sender -GX9- -2-.



- Remove intake manifold sender -GX9- -2-. To do this, release retaining tab -arrow-.



#### Note

*The intake manifold sender -GX9- -2- may then also be bolted to the intake manifold -1-. In this case unscrew the bolts from holes -3-.*

#### Installing

Install in reverse order of removal, observing the following:



#### Note

- ◆ *Renew O-ring.*
- ◆ *If the retaining tabs broke off during removal, the sender can be secured using two securing bolts as per ⇒ [Electronic Parts Catalogue ⇒ page 378](#) .*
- Install air filter housing ⇒ [a3.2 nd installing air filter housing", page 366](#) .

#### Specified torques

Component	Specified torque
Intake manifold sender -GX9-	3 Nm



## 6 Engine control unit

⇒ [a6.1 nd installing engine control unitJ623", page 379](#)

### 6.1 Removing and installing engine control unit -J623-

⇒ [a6.1.1 nd installing engine control unitJ623, engine control unit with metal locking plate, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>; Polo 2018>, Golf 2020>", page 379](#)

⇒ [a6.1.2 nd installing engine control unitJ623, engine control unit with protective housing, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf >2017, Polo 2018>", page 382](#)

⇒ [a6.1.3 nd installing engine control unitJ623, engine control unit with protective housing, Polo 2014>, Polo Saloon RUS 2016>", page 385](#)

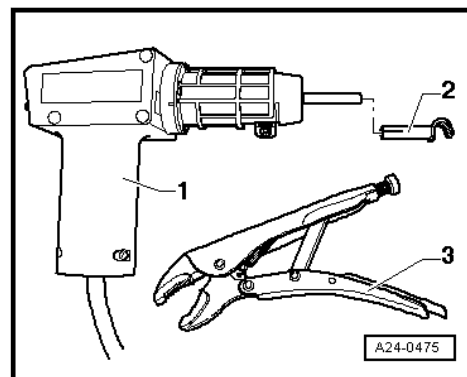
⇒ [a6.1.4 nd installing engine control unitJ623, without protective housing, Polo 2014> Polo Saloon RUS 2016>", page 388](#)

⇒ [a6.1.5 nd installing engine control unitJ623 without protective housing, Polo Saloon RUS 2020>", page 389](#)

#### 6.1.1 Removing and installing engine control unit -J623-, engine control unit with metal locking plate, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>; Polo 2018>, Golf 2020>

##### Special tools and workshop equipment required

- ◆ Hot air blower -VAS 1978/14A- -1- with nozzle attachment -2- from wiring harness repair set -VAS 1978 B-



- ◆ Wiring harness repair set -VAS 1978 B-



- ◆ Small grinder (commercially available)
- ◆ Vehicle diagnostic tester





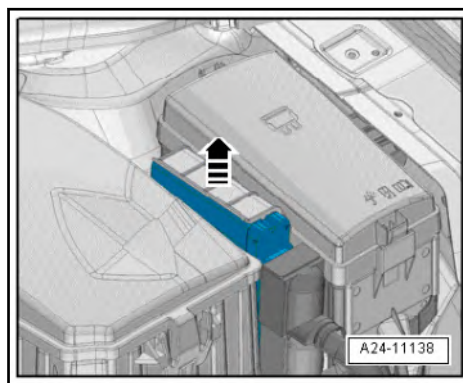
## Removing

- If engine control unit is renewed, select test sequence/function Replace engine control unit on “vehicle diagnostic tester” in “Guided functions” mode.
- Switch off ignition and remove key from ignition lock.

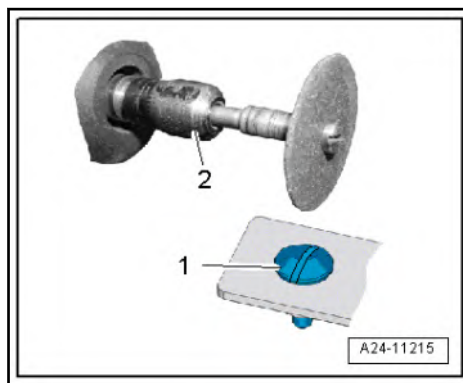


### Note

- ◆ *If the engine control unit comes into contact with the positive battery terminal, permanent damage to the engine control unit will be the consequence.*
- ◆ *Therefore, make sure to disconnect the battery before removing the engine control unit.*
- Disconnect battery ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and connecting battery.
- Release retaining clip -arrow- and take out engine control unit -J623-.



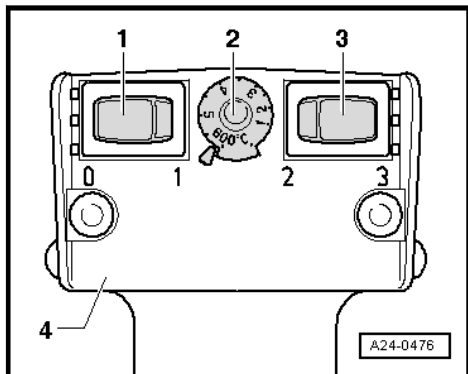
- Make groove (for a screwdriver) in head of shear bolt -1- using a small grinder -2-.





## 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 hot air blower as shown in illustration.*



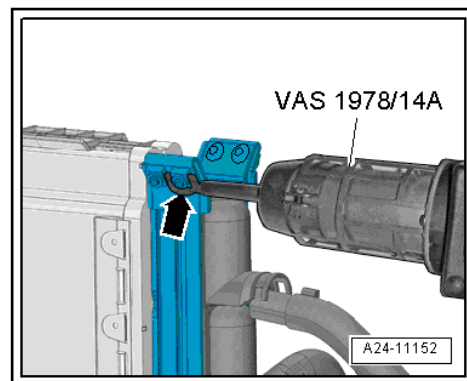
- In other words, set potentiometer for temperature regulation -2- to maximum heating output and 2-stage switch for air volume -3- to position 3.



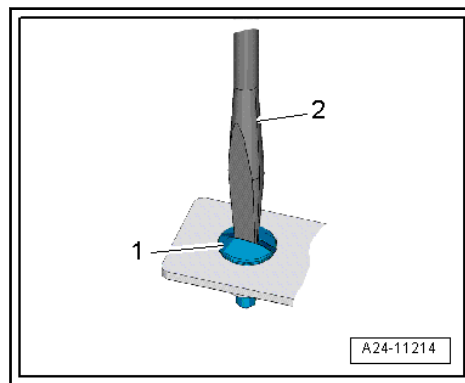
## NOTICE

**Risk of damage to adjacent components caused by hot air blower. Risk of overheating.**

- If necessary, cover adjacent components.
- Hold hot air blower -VAS 1978/14A- with nozzle attachment -arrow- to thread of shear bolt.



- Heat shear bolts for approx. 20 to 30 seconds.
- Unscrew shear bolt -1- with screwdriver -2-.



- Detach metal locking plate from connectors for engine control unit -J623-.
- Release and pull off connectors.

### Installing

Install in reverse order of removal. During this procedure, observe the following:

- The metal locking plate must always be re-fitted on the engine control unit -J623-.
- Clean the threaded holes for the shear-head bolts of locking compound residues. A thread chaser is suitable for cleaning.
- Use new shear-head bolts.

**After a new engine (motor) control unit has been installed, the following work procedure must be carried out:**

- Connect battery ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and connecting battery.
- Connect the vehicle diagnostic tester.
- Switch on ignition and select the following menu options on vehicle diagnostic tester:

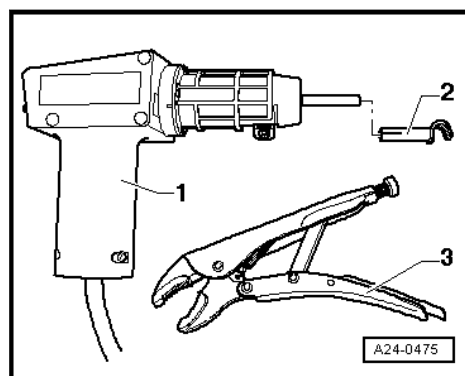
◆ **Guided Engine Functions**

◆ **Renewing engine control unit**

## 6.1.2 Removing and installing engine control unit -J623-, engine control unit with protective housing, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf >2017, Polo 2018>

### Special tools and workshop equipment required

- ◆ Hot air blower -VAS 1978/14A- -item 1- with nozzle -2- from wiring harness repair set -VAS 1978 B-





- ◆ Wiring harness repair set -VAS 1978 B-



- ◆ Small grinder (commercially available)
- ◆ Vehicle diagnostic tester

### Removing

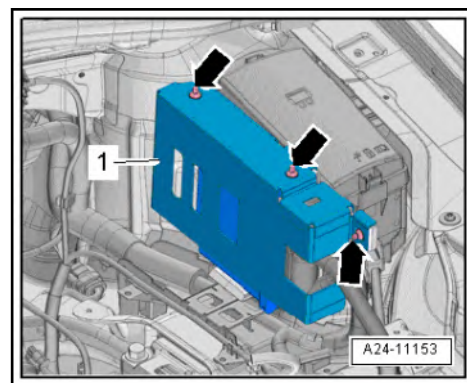
- If engine control unit is renewed, select test sequence/function Replace engine control unit on “vehicle diagnostic tester” in “Guided functions” mode.
- Switch off ignition and remove key from ignition lock.



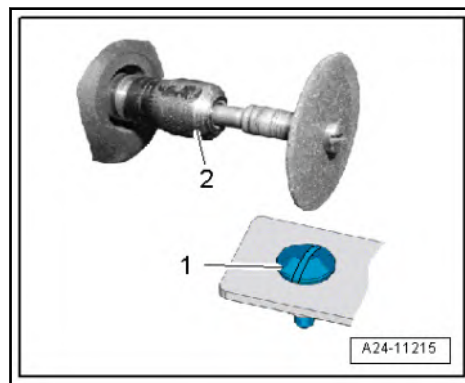
### Note

- ◆ *If the engine control unit comes into contact with the positive battery terminal, permanent damage to the engine control unit will be the consequence.*
- ◆ *Therefore, make sure to disconnect the battery before removing the engine control unit.*
- Disconnect battery ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and connecting battery.

To remove protective housing -1-, unscrew shear bolts -arrows- as follows:

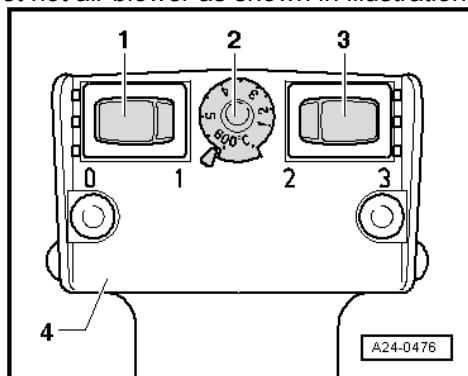


- Make groove (for a screwdriver) in head of shear bolt -1- using a small grinder -2-.



#### 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 hot air blower as shown in illustration.



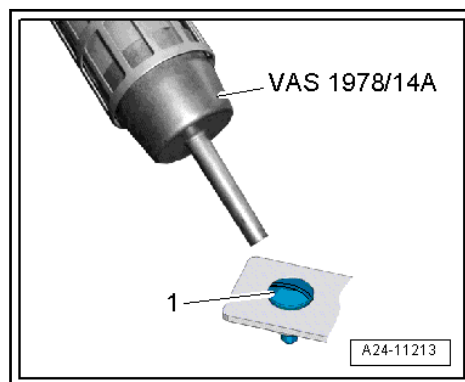
- In other words, set potentiometer for temperature regulation -2- to maximum heating output and 2-stage switch for air volume -3- to position 3.



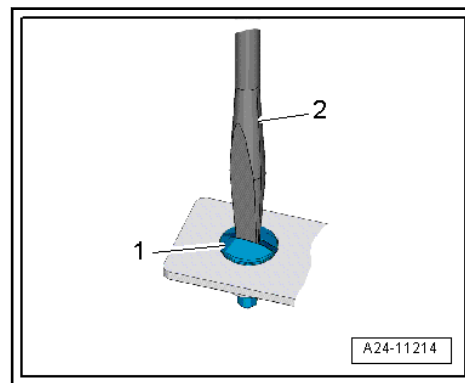
#### NOTICE

Risk of damage to adjacent components caused by hot air blower. Risk of overheating.

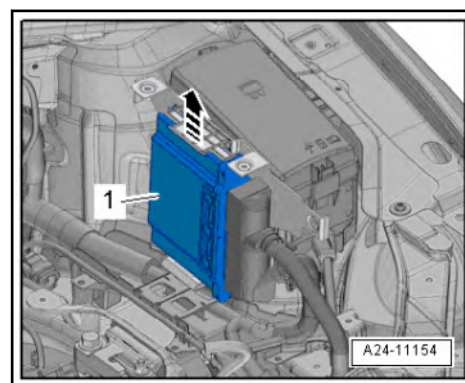
- If necessary, cover adjacent components.
- Heat head of shear bolt -1- for approx. 20 to 30 seconds.



- Unscrew shear bolt -1- with screwdriver -2-.



- Release fastener -arrow- and detach engine control unit -1-.



- Release and pull off connectors for engine (motor) control unit -J623-.

### Installing

Install in reverse order of removal, observing the following:

- It is essential that the engine (motor) control unit -J623- be provided with the protective housing again.
- Clean the threaded holes for the shear-head bolts of locking compound residues. A thread chaser is suitable for cleaning.
- Use new shear-head bolts.

**After a new engine (motor) control unit has been installed, the following work procedure must be carried out:**

- Connect battery ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and connecting battery.
- Connect the vehicle diagnostic tester.
- Switch on ignition and select the following menu options on vehicle diagnostic tester:

◆ Guided Engine Functions

◆ Renewing engine control unit

### 6.1.3 Removing and installing engine control unit -J623-, engine control unit with protective housing, Polo 2014>, Polo Saloon RUS 2016>

**If engine control unit is to be renewed:**

- Connect the vehicle diagnostic tester.
- Select operating mode Guided functions.





- Carry out guided function Renew control unit.

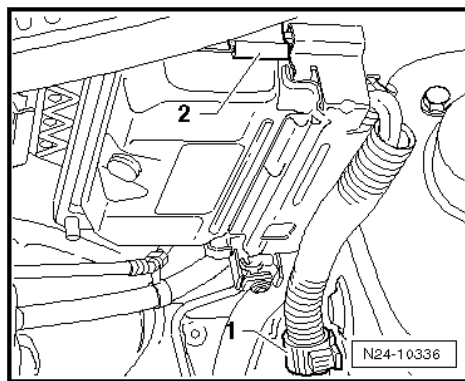
### Removing

- Switch off ignition.

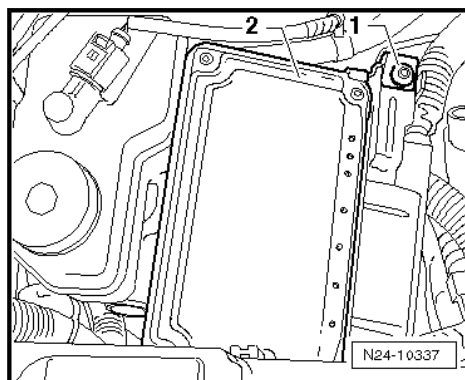


### Note

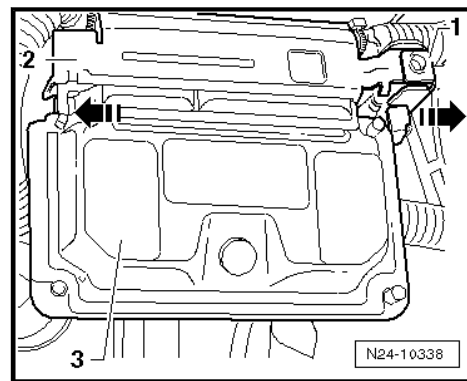
- ♦ *If the engine control unit comes into contact with the positive battery terminal, permanent damage to the engine control unit will be the consequence.*
- ♦ *Therefore, make sure to disconnect the battery before removing the engine control unit.*
- Open line guide -1- and raise catch -2-.



- Remove engine control unit from its bracket.
- Unscrew shear-head bolt -1- using a pair of pliers.



- Turn engine control unit -2- around and also unscrew second shear-head bolt using a pair of pliers.
- Pull bracket -1- and protective housing -2- off engine control unit -3- in -direction of arrow-.

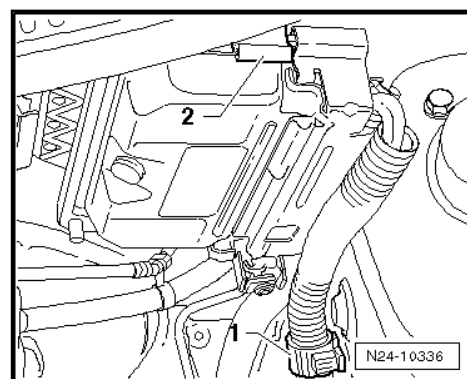


- Release connector from engine control unit and pull off.

### Installing

Install in reverse order of removal. During this procedure, observe the following:

- Attach and lock connectors.
- Push protective housing over engine control unit.
- Install protective housing bracket with new shear bolts.
- Clean the threaded holes for the shear-head bolts of locking compound residues. A thread chaser is suitable for cleaning.
- Tighten shear-head bolts evenly until bolt head breaks off.
- Insert engine control unit into mounting bracket on plenum chamber bulkhead until it audibly engages in catch -1-.



- Press line into line guide -1- and close.
- Connect the vehicle diagnostic tester.
- Read event memory, and delete any stored faults.
- Carry out road test.
- Read event memory again.

### If engine control has been renewed:

Connect battery ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and connecting battery.

- Connect the vehicle diagnostic tester.
- Select operating mode Guided functions.
- Carry out guided function Renew engine control unit.



## 6.1.4 Removing and installing engine control unit -J623-, without protective housing, Polo 2014> Polo Saloon RUS 2016>

If engine control unit is to be renewed:

- Connect the vehicle diagnostic tester.
- Select operating mode Guided functions.
- Carry out guided function Renew engine control unit.

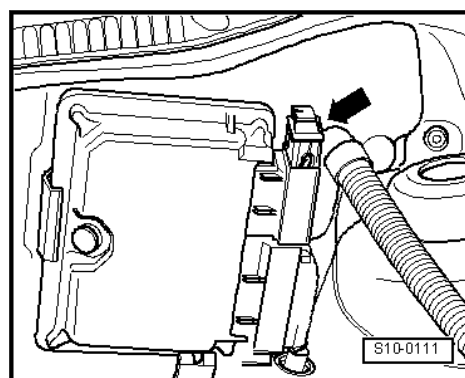
### Removing

- Switch off ignition.

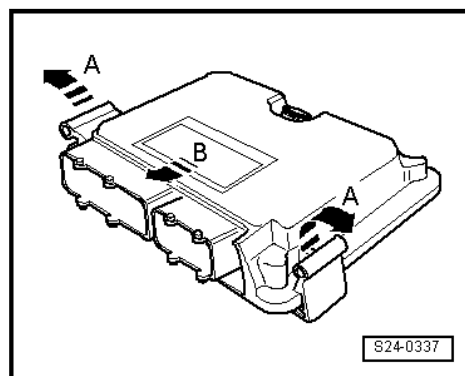


#### Note

- ♦ *If the engine control unit comes into contact with the positive battery terminal, permanent damage to the engine control unit will be the consequence.*
- ♦ *Therefore, make sure to disconnect the battery before removing the engine control unit.*
- Release -arrow- connectors from engine control unit and pull off.



- Press clips -arrows A- outwards and pull engine control unit out to side -B-.



### Installing

- Insert new engine control unit and press it to left.
- Connect connectors and lock.
- Connect the vehicle diagnostic tester.
- Read event memory, and delete any stored faults.



- Carry out road test.
- Read event memory again.

**If engine control has been renewed:**

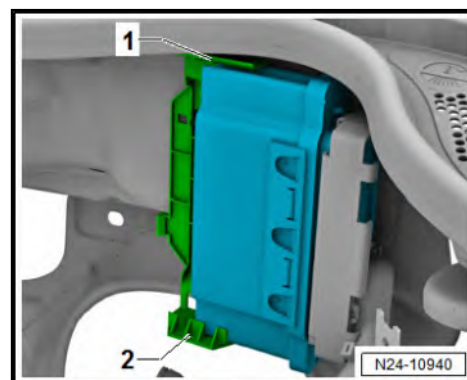
Connect battery ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and connecting battery.

- Connect the vehicle diagnostic tester.
- Select operating mode Guided functions.
- Carry out guided function Renew engine control unit.

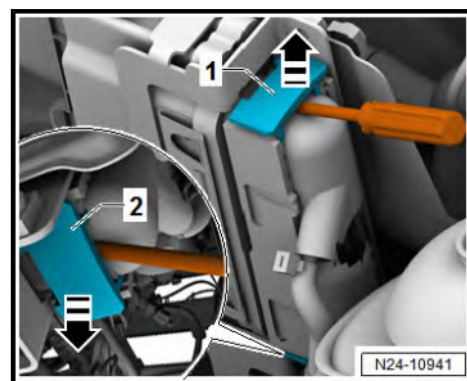
### 6.1.5 Removing and installing engine control unit -J623- without protective housing, Polo Saloon RUS 2020>

#### Removing

- If engine control unit is renewed, select test sequence/function "Replace engine control unit" on ⇒ Vehicle diagnostic tester in "Guided Functions" mode.
- Switch off ignition.
- Release catch of holder -1- on engine control unit -J623-.



- Remove engine control unit -J623- upwards from fastener -2-.
- Using a screwdriver, lever off catch -1- for connector of upper wiring harness in direction of -arrow-.



- Using a screwdriver, lever off catch -2- for connector of lower wiring harness in direction of -arrow-.
- Release connector from engine control unit -J623- and pull off.



## Installing

Install in reverse order of removal, observing the following:

### If engine control has been renewed:

- Connect battery ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and connecting battery.
- Connect ⇒ Vehicle diagnostic tester.
- Select operating mode `Guided functions`.
- Carry out guided function `Renew engine control unit`.



## 7 Lambda probe

⇒ [o7.1 verview - Lambda probe", page 391](#)

⇒ [a7.2 nd installing Lambda probe", page 392](#)

### 7.1 Assembly overview - Lambda probe



#### 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](#).*
- ◆ *During installation, it is essential that wiring of lambda probe is reattached in same positions. The wire must be prevented from touching the exhaust pipe.*
- ◆ *The way the electrical wires are routed may differ from the illustration.*

#### 1 - Lambda probe 1 after catalytic converter - GX7-

- ☐ Not fitted on Polo 2018> with emissions class EU3
- ☐ Lambda probe 1 after catalytic converter - GX7- consists of
- ◆ Lambda probe after catalytic converter -G130-
- ◆ Lambda probe 1 heater after catalytic converter - Z29-

- ☐ Removing and installing ⇒ [page 392](#)
- ☐ 55 Nm

#### 2 - Connector

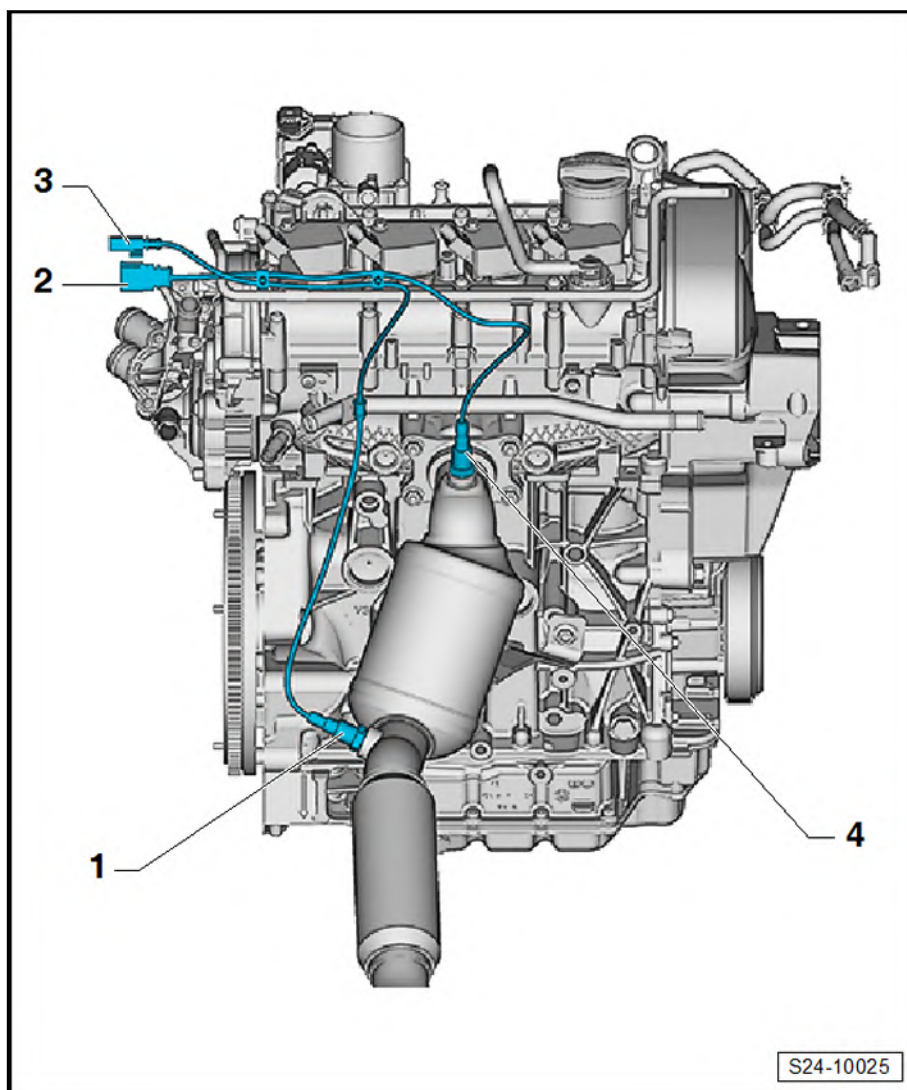
- ☐ For Lambda probe 1 before catalytic converter - GX10-.

#### 3 - Connector

- ☐ For Lambda probe 1 after catalytic converter - GX7-.

#### 4 - Lambda probe 1 before catalytic converter - GX10-

- ☐ Lambda probe 1 before catalytic converter - GX10- consists of
- ◆ Lambda probe -G39-
- ◆ Lambda probe heater - Z19-
- ☐ Removing and installing ⇒ [page 392](#)
- ☐ 55 Nm



S24-10025





## 7.2 Removing and installing Lambda probe

⇒ a7.2.1 nd installing lambda probe 1 before catalytic converterGX10/lambda probe 1 after catalytic converterGX7", page 392

### 7.2.1 Removing and installing lambda probe 1 before catalytic converter -GX10-/ lambda probe 1 after catalytic converter -GX7-

Special tools and workshop equipment required

- ◆ Lambda probe open ring spanner set -3337-

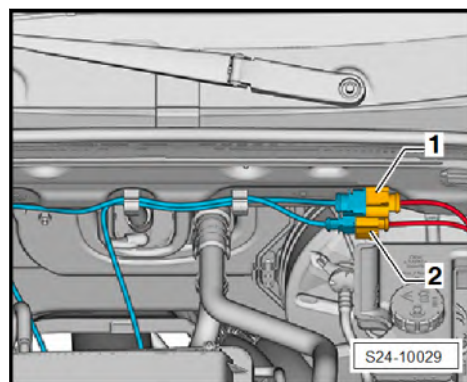


#### Note

- ◆ *Lambda probe 1 after catalytic converter - GX7- -1-*
- ◆ *Not fitted on Polo 2018> with emissions class EU3.*

#### Removing

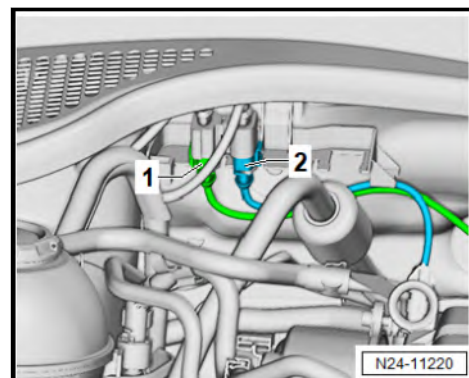
Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014>, Polo 2014>, Polo 2018>, Polo Saloon RUS 2016>, Golf 2020>



- Unplug corresponding electrical connector:
- 1 - For Lambda probe 1 after catalytic converter - GX7-.
- 2 - For Lambda probe 1 before catalytic converter - GX10-.



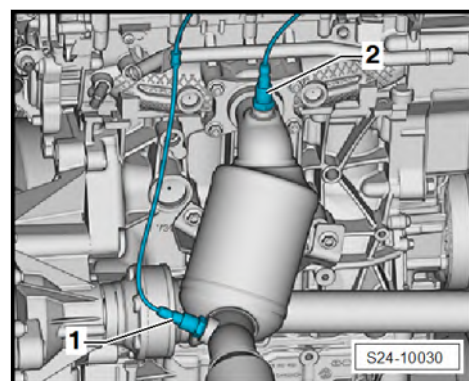
## Polo Saloon RUS 2020➤



- Unplug corresponding electrical connector:
  - 1 - For Lambda probe 1 after catalytic converter - GX7-.
  - 2 - For Lambda probe 1 before catalytic converter - GX10-.

### Continued for all vehicles

- Unscrew corresponding Lambda probe using a spanner from Lambda probe open ring spanner set -3337-.



- 1 - Lambda probe after catalytic converter -G130-
- 2 - Lambda probe -G39-

### Installing

Install in the reverse order of removal. When doing this, note 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.*
  - ◆ *During installation, it is essential that wiring of lambda probe is reattached in same positions. The wire must be prevented from touching the exhaust pipe.*
- If a lambda probe has been renewed, erase learnt values and adapt lambda probe to engine control unit.



- Switch on ignition, connect ⇒ Vehicle diagnostic tester and select the following one after the other:

- ◆ Guided Engine Functions
- ◆ Erase learnt values
- ◆ Lambda probe adaption

#### **Specified torques**

- ◆ ⇒ [o7.1 overview - Lambda probe", page 391](#)



## 26 – Exhaust system

### 1 Exhaust pipes and silencers

⇒ [o1.1 verview – silencers”, page 395](#)

⇒ [e1.2 xhaust pipes from silencers”, page 405](#)

⇒ [a1.3 nd installing silencer”, page 407](#)

⇒ [e1.4 xhaust system free of stress”, page 414](#)

⇒ [e1.5 xhaust system for leaks”, page 415](#)

#### 1.1 Assembly overview – silencers

⇒ [o1.1.1 verview – silencers, Golf 2013>, Golf SV 2015>, Golf 2017>, Golf 2020>”, page 395](#)

⇒ [o1.1.2 verview - silencers, Golf Estate 2014>”, page 398](#)

⇒ [o1.1.3 verview - silencers, Polo 2014>, Polo Saloon RUS 2016>, Polo 2018>”, page 401](#)

⇒ [o1.1.4 verview - silencers, Polo Saloon RUS 2020>”, page 403](#)

##### 1.1.1 Assembly overview – silencers, Golf 2013>, Golf SV 2015>, Golf 2017>, Golf 2020>



**1 - Retaining loop**

- ☐ Renew if damaged

**2 - Bolt**

- ☐ 20 Nm

**3 - Mounting »A«**

- ☐ Renew if damaged
- ☐ Only for rear silencer
- ☐ Aligning ➤ [page 396](#)

**4 - Rear silencer**

- ☐ Combined in one unit with front silencer as original equipment. Can be renewed individually for repair purposes.
- ☐ Removing and installing ➤ [page 407](#)
- ☐ Separating exhaust pipes from silencers ➤ [page 405](#)
- ☐ Aligning exhaust system free of tension ➤ [page 414](#).

**5 - Rear clamp**

- ☐ Align exhaust system free of tension before tightening ➤ [page 414](#).
- ☐ Fitting position ➤ [page 401](#)
- ☐ Tighten threaded connections evenly.

**6 - Nut**

- ☐ 30 Nm

**7 - Retaining loop**

- ☐ Renew if damaged

**8 - Bolt**

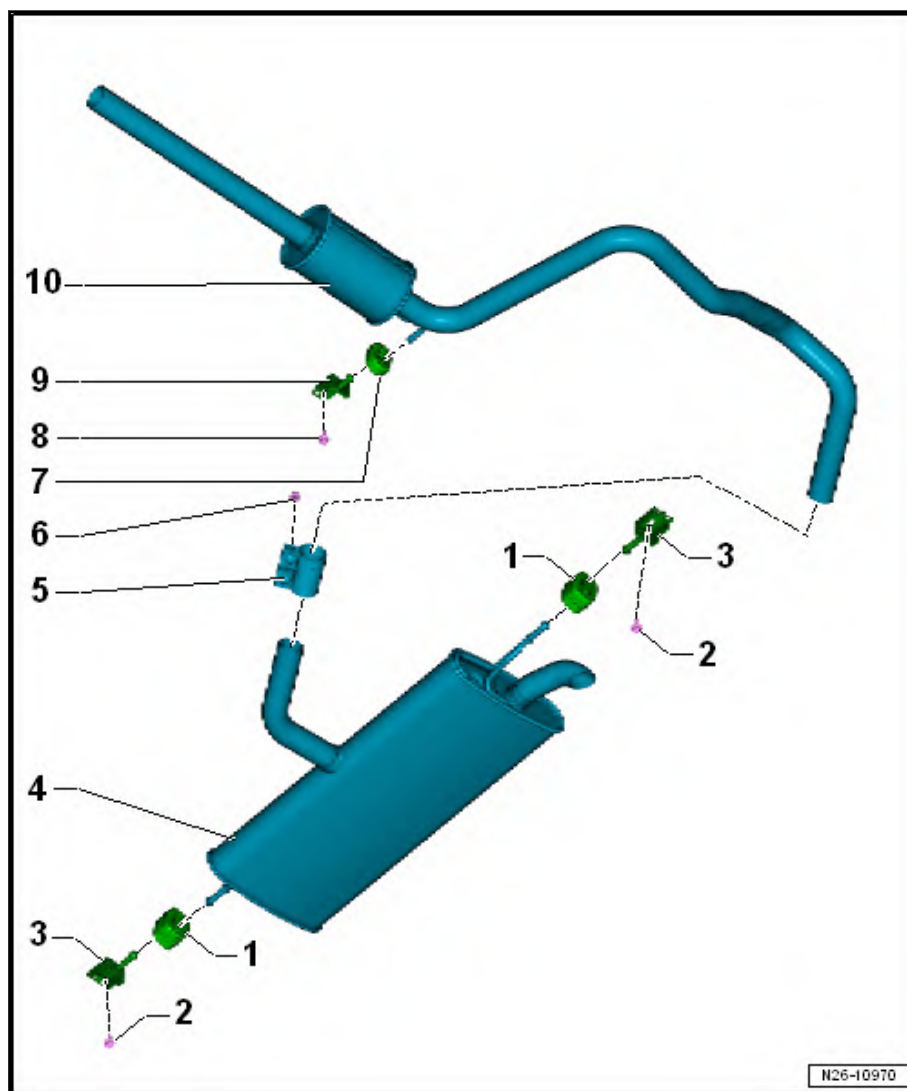
- ☐ 20 Nm +90°

**9 - Mounting »B«**

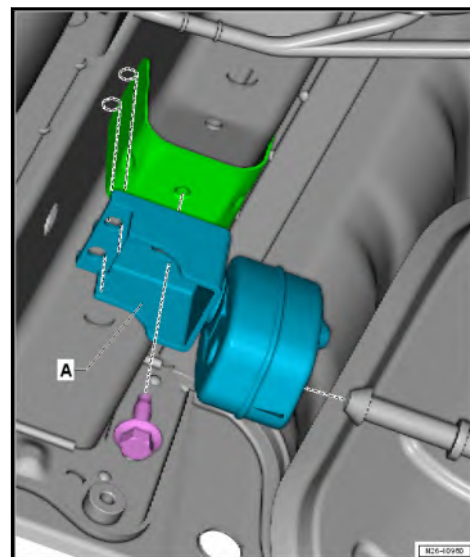
- ☐ Renew if damaged
- ☐ Only for front silencer
- ☐ Aligning ➤ [page 397](#)

**10 - Front silencer**

- ☐ Combined in one unit with rear silencer as original equipment. Can be renewed individually for repair purposes.
- ☐ Removing and installing ➤ [page 407](#)
- ☐ Separating exhaust pipes from silencers ➤ [page 405](#)
- ☐ Aligning exhaust system free of tension ➤ [page 414](#).

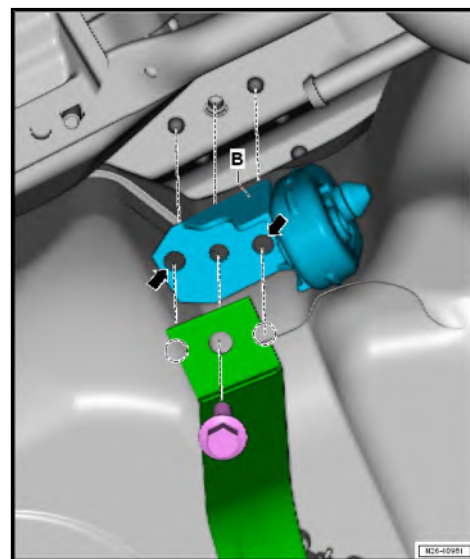


**Aligning mounting »A«**



- Pre-tighten bolt.
- Align mounting at elongated hole as necessary.
- 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.

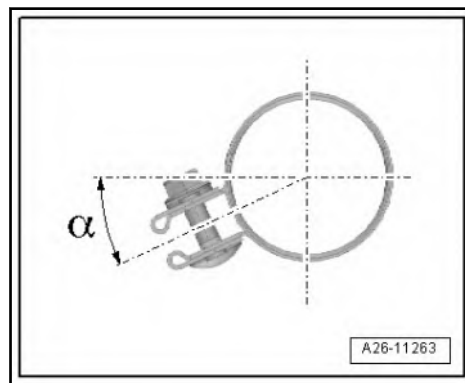
#### Aligning mounting »B«



- Pre-tighten bolt.
- Align mounting at elongated hole as necessary.
- Using blunt end 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  $\alpha$  = approx. 20°.
- Bolt connections face to rear.
- Nuts upwards.

### 1.1.2 Assembly overview - silencers, Golf Estate 2014>



## 1 - Front silencer

- ☐ Combined in one unit with rear silencer as original equipment. Can be renewed individually for repair purposes.
- ☐ Removing and installing ⇒ [page 407](#)
- ☐ Separating exhaust pipes from silencers ⇒ [page 405](#)
- ☐ Aligning exhaust system free of tension ⇒ [page 414](#).

## 2 - Retaining loop

- ☐ Renew if damaged

## 3 - Mounting »A«

- ☐ Renew if damaged
- ☐ Aligning ⇒ [page 400](#)

## 4 - Bolt

- ☐ M8 x 25
- ☐ 20 Nm

## 5 - Nut

- ☐ 30 Nm

## 6 - Rear clamp

- ☐ Align exhaust system free of tension before tightening ⇒ [page 414](#).
- ☐ Fitting position ⇒ [page 401](#)
- ☐ Tighten threaded connections evenly.

## 7 - Mounting »B«

- ☐ Renew if damaged
- ☐ Aligning ⇒ [page 400](#)

## 8 - Bolt

- ☐ M8 x 25
- ☐ 20 Nm

## 9 - Rear silencer

- ☐ Combined in one unit with front silencer as original equipment. Can be renewed individually for repair purposes.
- ☐ Removing and installing ⇒ [page 407](#)
- ☐ Separating exhaust pipes from silencers ⇒ [page 405](#)
- ☐ Aligning exhaust system free of tension ⇒ [page 414](#).

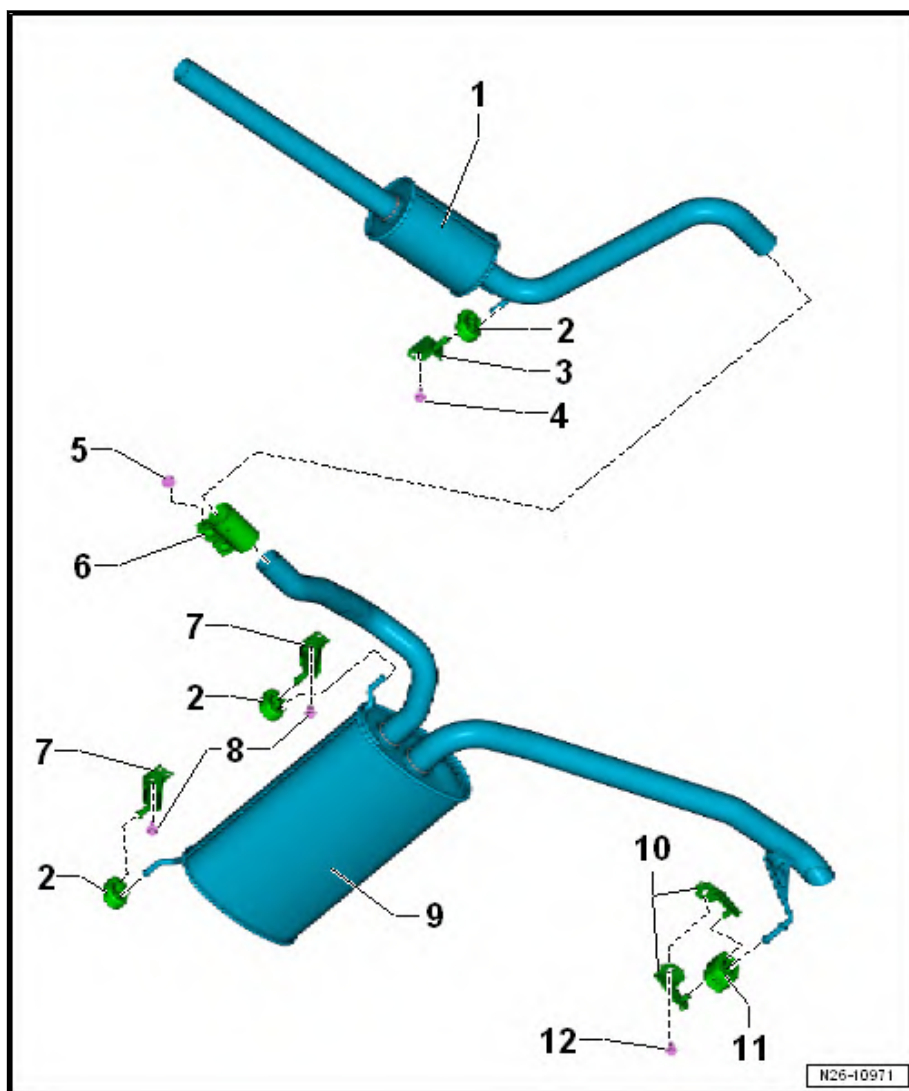
## 10 - Mounting »C«

- ☐ Renew if damaged
- ☐ Aligning ⇒ [page 400](#)

## 11 - Retaining loop

- ☐ Renew if damaged

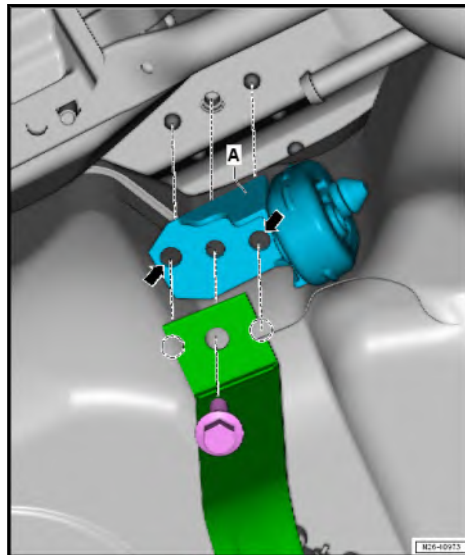
## 12 - Bolt





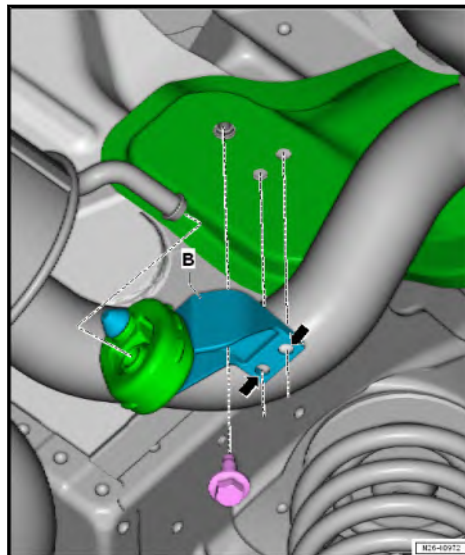
- ❑ M8 x 25
- ❑ 20 Nm

#### Aligning mounting »A«



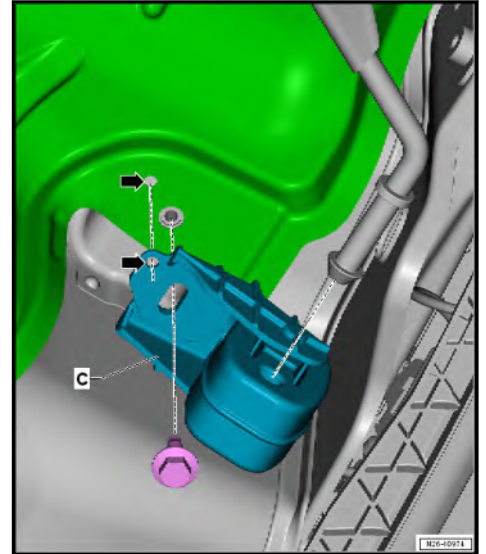
- Pre-tighten bolt.
- Align mounting at elongated hole as necessary.
- Using blunt end of commercially available 8 mm drill bit, align holes -arrows- of mounting -A- centrally and parallel to longitudinal member.
- Then tighten to specified torque.

#### Aligning mounting »B«



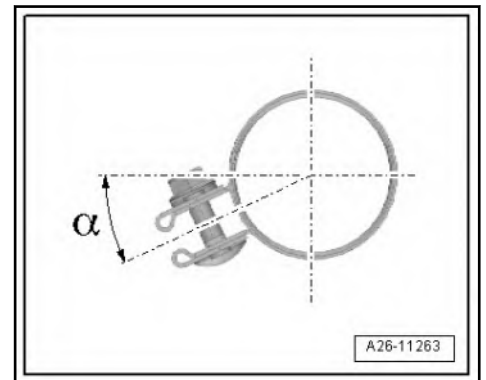
- Pre-tighten bolt.
- Align mounting at elongated hole as necessary.
- Align holes -arrows- of mounting -B- centrally using blunt side of commercially available 8 mm drill bit.
- Then tighten to specified torque.

#### Mounting »C«



- Pre-tighten bolt.
- Align mounting at elongated hole as necessary.
- Align holes -arrows- of mounting -C- centrally using blunt end of commercially available 8 mm drill bit.
- Then tighten to specified torque.

#### Installation position of rear clamp



- Fit clamp in position shown.
- Permissible installation angle - $\alpha$ - = approx. 20°.
- Bolt connections face to rear.
- Nuts upwards.

#### 1.1.3 Assembly overview - silencers, Polo 2014>, Polo Saloon RUS 2016>, Polo 2018>



#### 1 - Mounting

- ☐ Renew if damaged

#### 2 - Bolt

- ☐ 20 Nm
- ☐ Qty. 2

#### 3 - Rear silencer

- ☐ In initial equipment, component with centre silencer. Can be renewed individually for repair purposes.
- ☐ Removing and installing ⇒ [page 407](#)
- ☐ Separating exhaust pipes from silencers ⇒ [page 405](#)
- ☐ Aligning exhaust system free of tension ⇒ [page 414](#).

#### 4 - Mounting

- ☐ Renew if damaged

#### 5 - Centre silencer

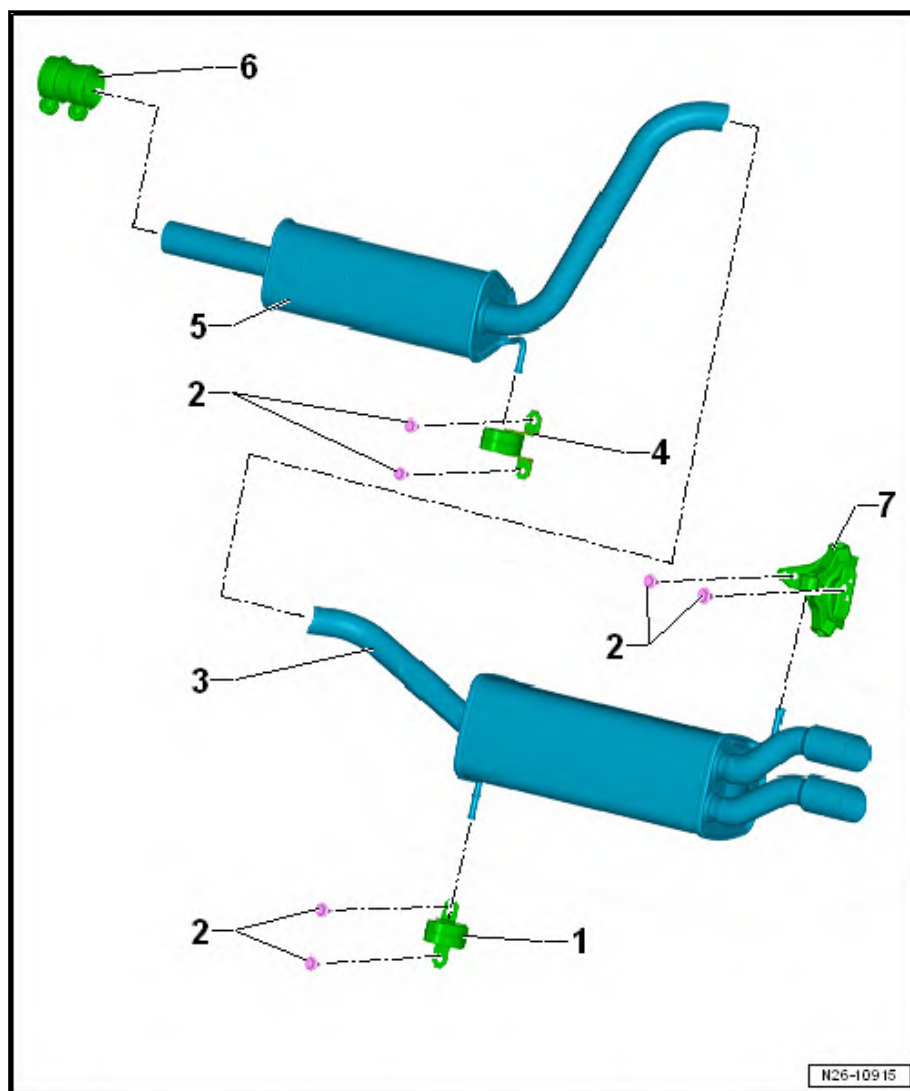
- ☐ Combined in one unit with rear silencer as original equipment. Can be renewed individually for repair purposes.
- ☐ Removing and installing ⇒ [page 407](#)
- ☐ Separating exhaust pipes from silencers ⇒ [page 405](#)
- ☐ Aligning exhaust system free of tension ⇒ [page 414](#).

#### 6 - Clamping sleeve

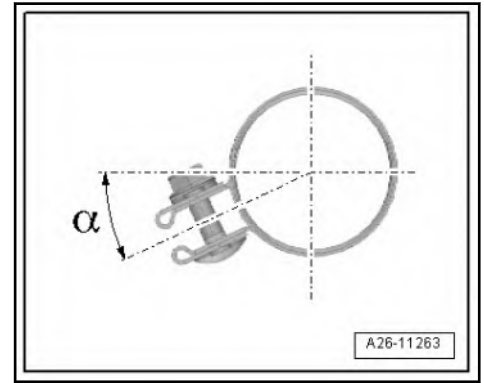
- ☐ Align exhaust system free of tension before tightening ⇒ [page 414](#).
- ☐ Fitting position ⇒ [page 402](#)
- ☐ Tighten threaded connections evenly.
- ☐ 23 Nm

#### 7 - Mounting

- ☐ Renew if damaged



Installation position of rear clamp



- Fit clamp in position shown.
- Angle - $\alpha$ - = approx. 20°.
- Bolt connections face to rear.
- Nuts upwards.

#### 1.1.4 Assembly overview - silencers, Polo Saloon RUS 2020➤





### 1 - Clamping sleeve

- ☐ Align exhaust system free of tension before tightening ➤ [page 414](#) .
- ☐ Fitting position ➤ [page 404](#)
- ☐ Tighten threaded connections evenly.
- ☐ 23 Nm

### 2 - Centre silencer

- ☐ Combined in one unit with rear silencer as original equipment. Can be renewed individually for repair purposes.
- ☐ Removing and installing ➤ [page 407](#)
- ☐ Separating exhaust pipes from silencers ➤ [page 405](#)
- ☐ Aligning exhaust system free of tension ➤ [page 414](#) .

### 3 - Mounting

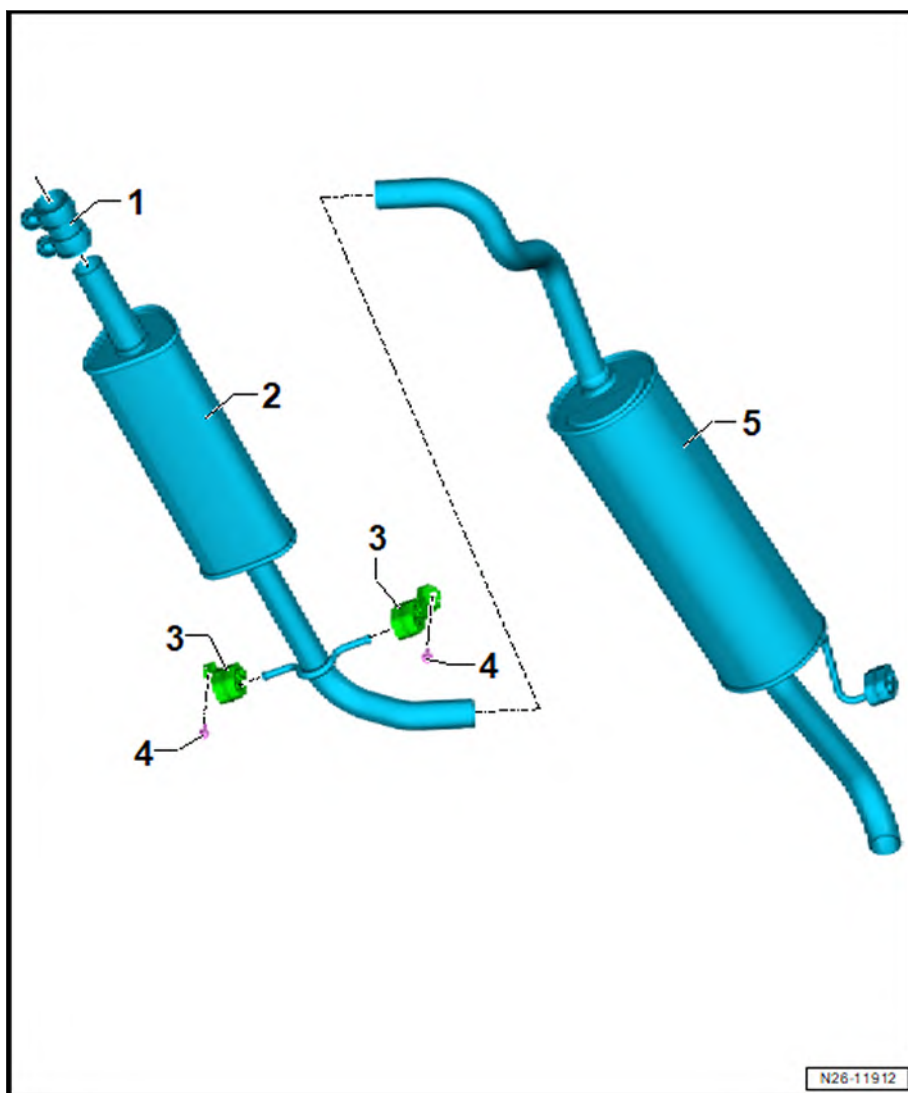
- ☐ Renew if damaged

### 4 - Bolt

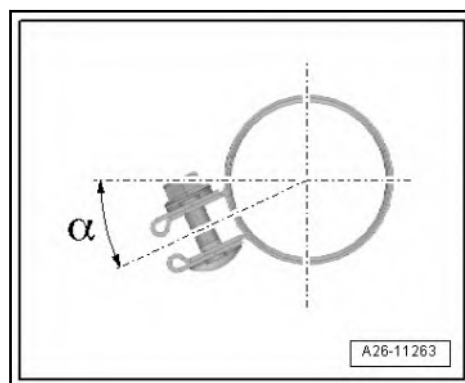
- ☐ 20 Nm
- ☐ Qty. 2

### 5 - Rear silencer

- ☐ In initial equipment, component with centre silencer. Can be renewed individually for repair purposes.
- ☐ Removing and installing ➤ [page 407](#)
- ☐ Separating exhaust pipes from silencers ➤ [page 405](#)
- ☐ Aligning exhaust system free of tension ➤ [page 414](#) .



### Installation position of rear clamp



- Fit clamp in position shown.
- Angle - $\alpha$ - = approx. 20°.



- Bolt connections face to rear.
- Nuts upwards.

## 1.2 Separating exhaust pipes from silencers

⇒ e1.2.1 xhaust pipes from silencers, Polo 2014>, Polo Saloon RUS 2016>, Golf 2013>, Golf SV 2015>, Golf 2017, Polo Saloon RUS 2020>, Golf 2020>”, page 405

⇒ e1.2.2 xhaust pipes from silencers, Golf Estate 2014, Polo 2018>”, page 406

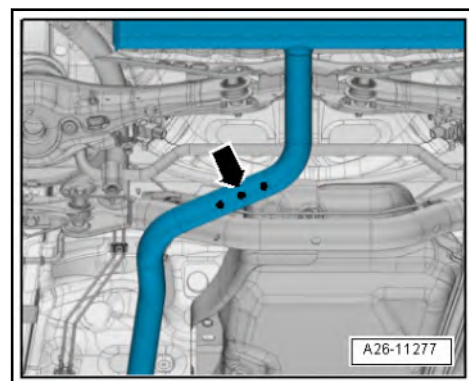
### 1.2.1 Separating exhaust pipes from silencers, Polo 2014>, Polo Saloon RUS 2016>, Golf 2013>, Golf SV 2015>, Golf 2017, Polo Saloon RUS 2020>, Golf 2020>

Special tools and workshop equipment required

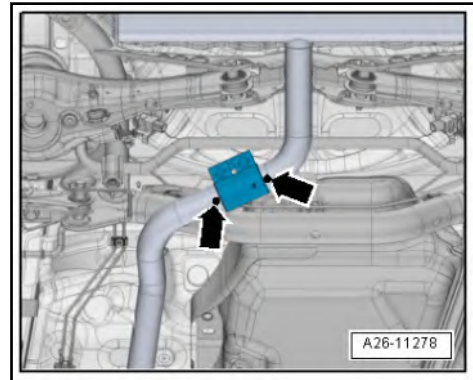
- ◆ Chain pipe cutter -VAS 6254-



#### Procedure



- ◆ The connecting pipe can be cut through at the cutting location in order to renew the centre and rear silencers separately.
- ◆ Cutting location is marked by an indentation on the circumference of exhaust pipe.
- Cut through exhaust pipe at right angles at separating point -arrow- using chain pipe cutter -VAS 6254-.
- Position clamp centrally at side marks -arrows- when installing.



- Fit rear clamp ⇒ [page 401](#) .
- Align exhaust system free of stress ⇒ [page 414](#) .

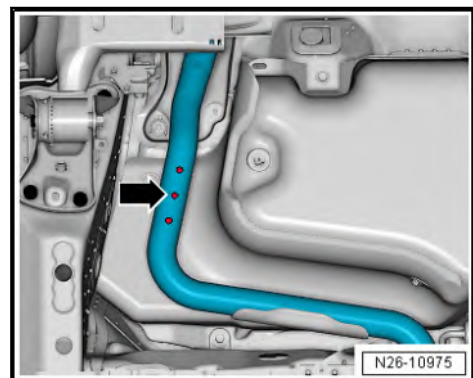
### 1.2.2 Separating exhaust pipes from silencers, Golf Estate 2014, Polo 2018>

Special tools and workshop equipment required

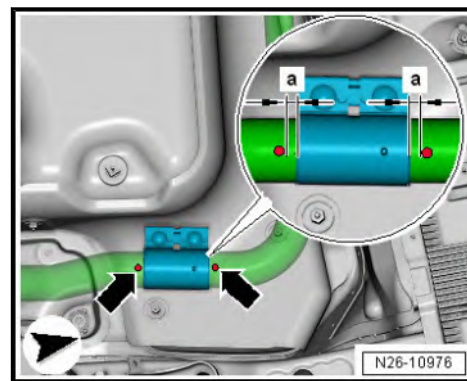
- ◆ Chain pipe cutter -VAS 6254-



#### Procedure



- ◆ The connecting pipe can be cut through at the cutting location in order to renew the centre and rear silencers separately.
- ◆ Cutting location is marked by an indentation on the circumference of exhaust pipe.
- Cut through exhaust pipe at right angles at separating point -arrow- using chain pipe cutter -VAS 6254-.
- When installing, position clamp centrally (-dimension a-) between side marks -arrows-.



- Fit rear clamp ⇒ [page 401](#) .
- Align exhaust system free of stress ⇒ [page 414](#) .

## 1.3 Removing and installing silencer

⇒ [a1.3.1 nd installing front silencer, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Golf 2020>](#), page 407

⇒ [a1.3.2 nd installing rear silencer, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf 2020>](#), page 408

⇒ [a1.3.3 nd installing rear silencer, Golf Estate 2014](#)", page 410

⇒ [a1.3.4 nd installing silencers, Polo 2014>, Polo Saloon 2016>, Polo 2018>](#)", page 411

⇒ [a1.3.5 nd installing silencer, Polo Saloon RUS 2020>](#)", page 412

### 1.3.1 Removing and installing front silencer, Golf 2013>, Golf Estate 2014>, Golf SV 2015>, Golf 2017>, Golf 2020>

#### Removing

- Remove rear tunnel cross member ⇒ General body repairs, exterior; Rep. gr. 66; Underbody cladding; Assembly overview - underbody cladding.



#### Note

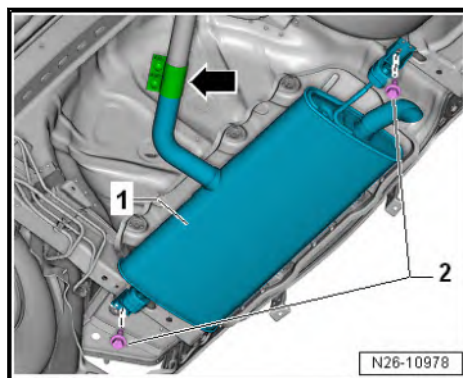
- ◆ *The illustration is provided for better clarity.*
- ◆ *Installation locations may vary depending on version.*

#### Separating point without clamp

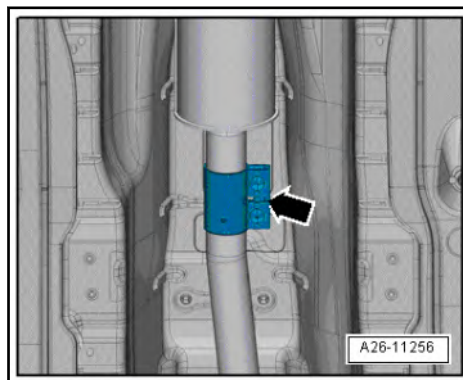
- Separate silencers ⇒ [page 405](#)



## Separating point with clamp



- Loosen clamp -arrow-, and push it towards rear.
- Detach rubber mounting of front silencer ⇒ [Item 7 \(page 396\)](#) .
- Loosen clamp -arrow-, and push it forwards.



- Remove front silencer.

## Installing

Install in reverse order of removal. During this procedure, observe the following:

- Align exhaust system free of stress ⇒ [page 414](#) .

## Specified torques

- ⇒ [o1.1 verview – silencers”, page 395](#)
- ⇒ [o2.1 verview – emission control”, page 416](#)
- ⇒ General body repairs, exterior; Rep. gr. 66; Underbody cladding; Assembly overview - underbody cladding

## 1.3.2 Removing and installing rear silencer, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf 2020>

### Removing

- If fitted, remove rear left underbody trim ⇒ General body repairs, exterior; Rep. gr. 66; Underbody trim; Assembly overview - underbody panels.



**CAUTION**

Risk of accident caused by high weight of silencers.

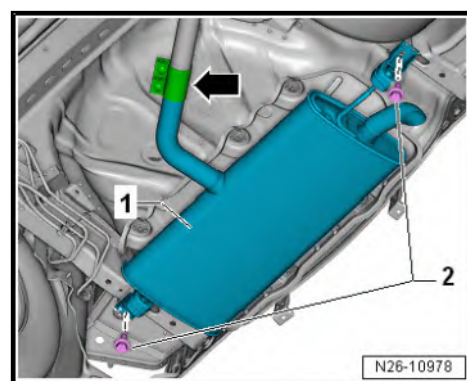
- Seek help from a second mechanic for the following work.

**Separating point without clamp**

- Separate silencers ➔ [page 405](#)

**Separating point with clamp**

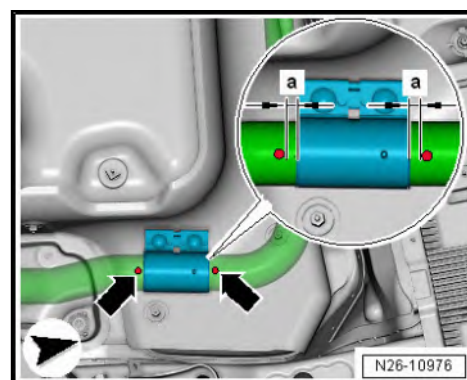
- Loosen clamp -arrow-, and push it forwards.
- Remove bolt -2- on both sides.



- Remove rear silencer -1-.

**Installing**

Install in reverse order of removal, observing the following:



**Note**

*Make sure to obtain the same distance -dimension a- to the marks -arrows-.*

- Align exhaust system free of stress ➔ [page 414](#) .

**Specified torques**

- ➔ [o1.1 overview – silencers”, page 395](#)
- ➔ [o2.1 overview – emission control”, page 416](#)
- ➔ General body repairs, exterior; Rep. gr. 66; Underbody cladding; Assembly overview - underbody cladding





### 1.3.3 Removing and installing rear silencer, Golf Estate 2014

#### Removing

- If fitted, remove rear left underbody trim ⇒ General body repairs, exterior; Rep. gr. 66; Underbody trim; Assembly overview - underbody panels.

#### CAUTION

Risk of accident caused by high weight of silencers.

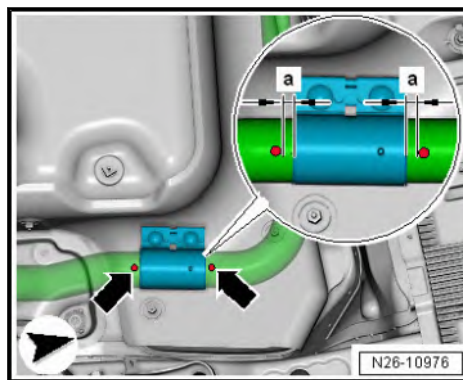
- Seek help from a second a mechanic for the following work.

#### Separating point without clamp

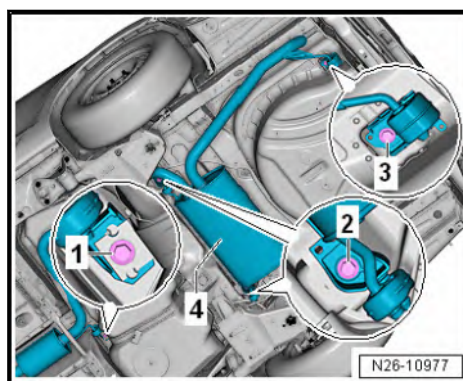
- Separate silencers ⇒ [page 405](#)

#### Separating point with clamp

- Loosen clamp -arrows-, and push it forwards.



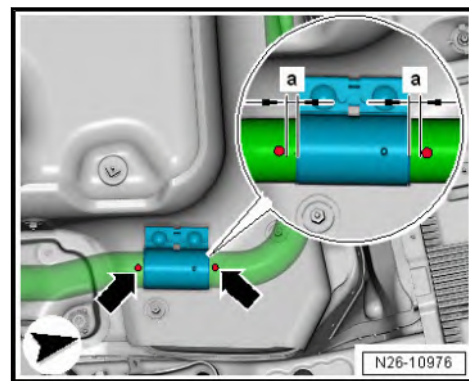
- Unscrew bolts -1- and -2-.



- Unscrew bolt -3-, and remove rear silencer -4-.

#### Installing

Install in reverse order of removal, observing the following:



#### Note

*Make sure to obtain the same distance -dimension a- to the marks -arrows-.*

- Align exhaust system free of stress ➔ [page 414](#) .

#### Specified torques

- ➔ [o1.1 overview – silencers”, page 395](#)
- ➔ [o2.1 overview – emission control”, page 416](#)
- ➔ General body repairs, exterior; Rep. gr. 66; Underbody cladding; Assembly overview - underbody cladding

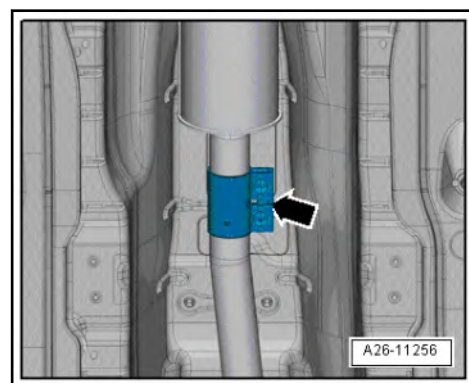
### 1.3.4 Removing and installing silencers, Polo 2014>, Polo Saloon 2016>, Polo 2018>

#### Removing

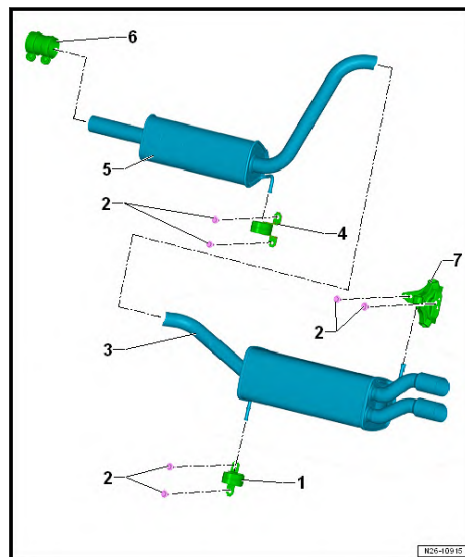
- Separate exhaust system ➔ [page 405](#) .

#### Centre silencer

- Loosen clamp -arrow-, and push it to rear.

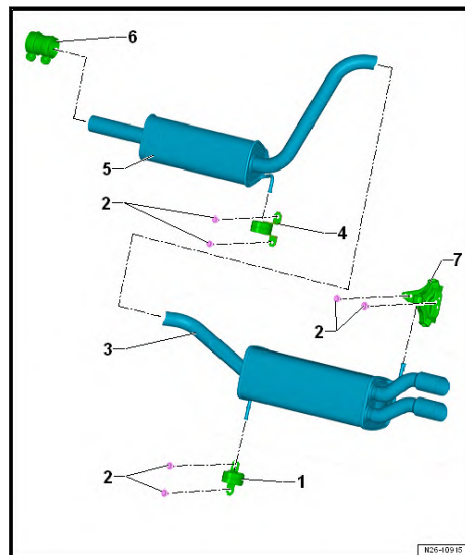


- Unscrew bolts -2- to remove bracket -4-.



- Remove middle silencer -5-.

#### Rear silencer



- Remove brackets -1- and -2-.
- To do this, unscrew bolts -2-.
- Guide out rear silencer -3- between rear axle and body.

#### Installing

Install in reverse order of removal. During this procedure, observe the following:

- Align exhaust system free of stress ⇒ [page 414](#) .

#### Specified torques

- ♦ ⇒ [o1.1 verview – silencers”, page 395](#)
- ♦ ⇒ [o2.1 verview – emission control”, page 416](#)

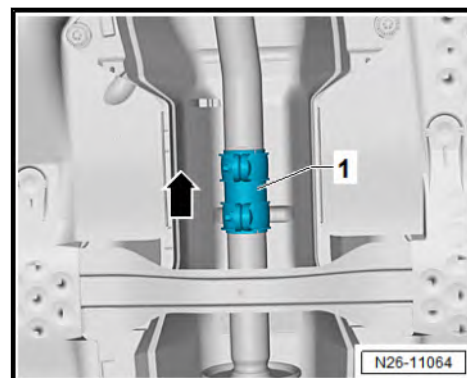
### 1.3.5 Removing and installing silencer, Polo Saloon RUS 2020>

#### Removing

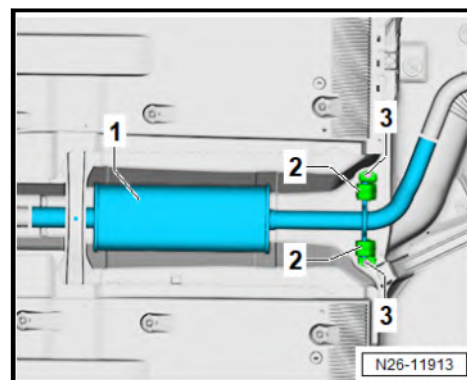
- Separate exhaust system ⇒ [page 405](#) .



## Centre silencer

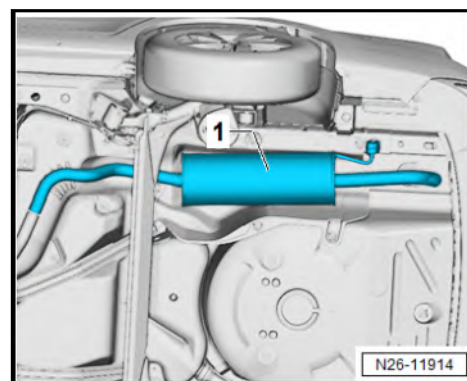


- Release clamping sleeve -1- and push forwards -arrow-.
- Unscrew bolts -3-.



- Remove bracket -2-.
- Remove centre silencer -1-.

## Rear silencer



- Guide out rear silencer -1- between rear axle and body.

## Installing

Install in reverse order of removal, observing the following:

- Align exhaust system free of stress ➔ [page 414](#) .

## Specified torques

- ◆ ➔ [o1.1 verview – silencers](#)”, [page 395](#)
- ◆ ➔ [o2.1 verview – emission control](#)”, [page 416](#)



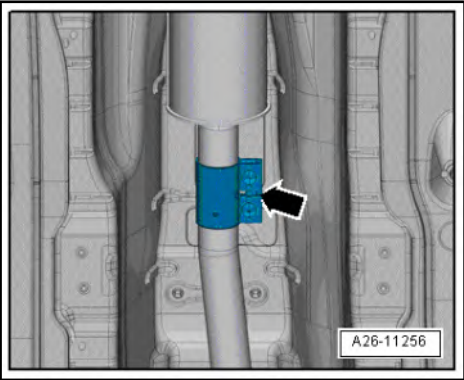
## 1.4 Aligning exhaust system free of stress

⇒ [e1.4.1 xhaust system free of stress", page 414](#)

⇒ [e1.4.2 nd exhaust pipes", page 414](#)

### 1.4.1 Aligning exhaust system free of stress

#### Procedure

- The exhaust system must be aligned when cold.
  - Loosen bolt connections for front clamp -arrow-.
- 
- Push exhaust system towards front of vehicle until preloading at mounting for exhaust pipe -a- = 5 mm.

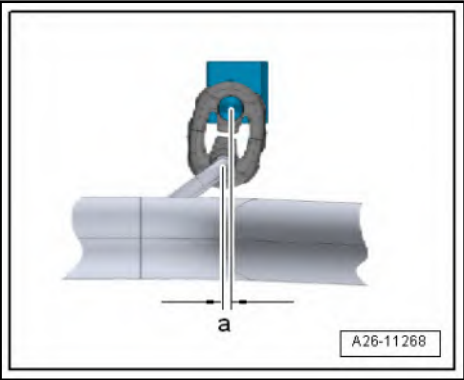
- Fit front clamp ⇒ [page 417](#) .

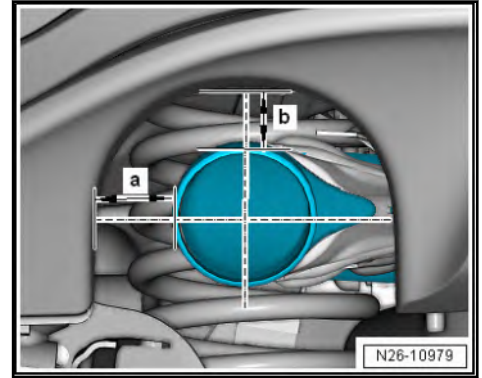
#### Specified torques

- ♦ ⇒ [o2.1 verview – emission control", page 416](#)

### 1.4.2 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 dimension

Dimension a: 35 mm

Dimension b: 25 mm

#### Specified torques

- ◆ Securing bolts for mountings ⇒ [o1.1 verview – silencers](#), [page 395](#)

## 1.5 Checking exhaust system for leaks

#### Procedure

- Start engine and run it at idling speed.
- Seal end 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 cylinder head as well as cutting points to make sure there are no leaks.
- Repair any leaks found.





## 2 Emission control

⇒ [o2.1 verview – emission control", page 416](#)

⇒ [a2.2 nd installing catalytic converter", page 420](#)

### 2.1 Assembly overview – emission control

⇒ [o2.1.1 verview – emission control, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014, Golf 2020>", page 416](#)

⇒ [o2.1.2 verview - emission control, Polo 2014>, Polo Saloon RUS 2016>, Polo 2018>, Polo Saloon RUS 2020>", page 418](#)

#### 2.1.1 Assembly overview – emission control, Golf 2013>, Golf 2017>, Golf SV 2015>, Golf Estate 2014, Golf 2020>

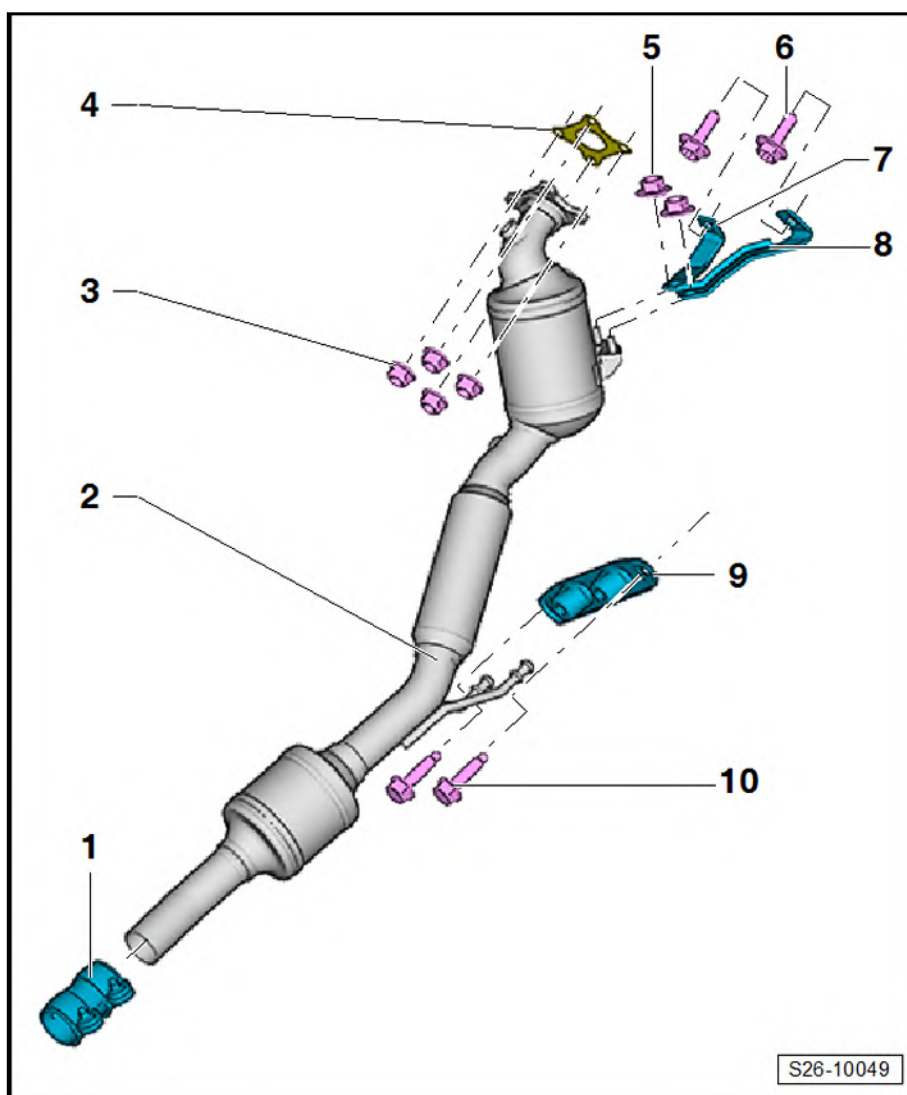


### 1 - Clamping sleeve

- ☐ Align exhaust system free of tension before tightening ➤ [page 414](#).
- ☐ Installation position and specified torque ➤ [page 417](#)
- ☐ Tighten bolted connections evenly.

### 2 - Front exhaust pipe with catalytic converter

- ☐ Do not bend flexible joint more than 10°. Otherwise, it can be damaged.
- ☐ Install flexible joint 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 ➤ [page 420](#)
- ☐ Do not remove protective packaging from replacement part until you are ready to fit the flexible joint
- ☐ Aligning exhaust system free of tension ➤ [page 414](#).



### 3 - Nuts

- ☐ Specified torque and tightening sequence ➤ [page 418](#)

### 4 - Seal

- ☐ Renew after removal

### 5 - Nuts

- ☐ Specified torque and tightening sequence ➤ [page 418](#)

### 6 - Bolt

- ☐ Specified torque and tightening sequence ➤ [page 418](#)

### 7 - Bracket

- ☐ Renew if damaged

### 8 - Bracket

- ☐ Renew if damaged

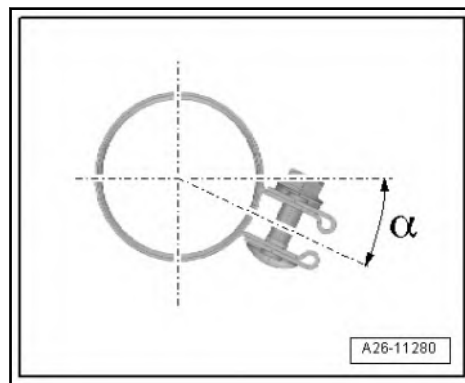
### 9 - Bracket

- ☐ Renew if damaged

### 10 - Bolt

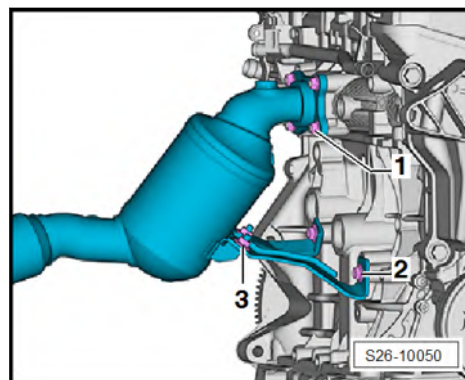
- ☐ 20 Nm

### Installation position of front clamp



- Fit clamp in position shown.
- Angle  $\alpha$  = approx.  $20^\circ$ .
- Bolted connection facing towards right.
- Nuts upwards.

#### Installing front exhaust pipe - specified torque and tightening sequence



1.	Fit front exhaust pipe onto studs on cylinder head and at the same time into brackets	
2.	Screw in nuts -1-, nuts -3- and bolts -2- loosely by hand	<ul style="list-style-type: none"><li>• It should still be possible to move front exhaust pipe and bracket</li></ul>
3.	Tighten nuts -1-	20 Nm
4.	Tighten nuts -3-	20 Nm
5.	Tighten bolts -2- for securing brackets to cylinder head.	20 Nm

#### 2.1.2 Assembly overview - emission control, Polo 2014>, Polo Saloon RUS 2016>, Polo 2018>, Polo Saloon RUS 2020>

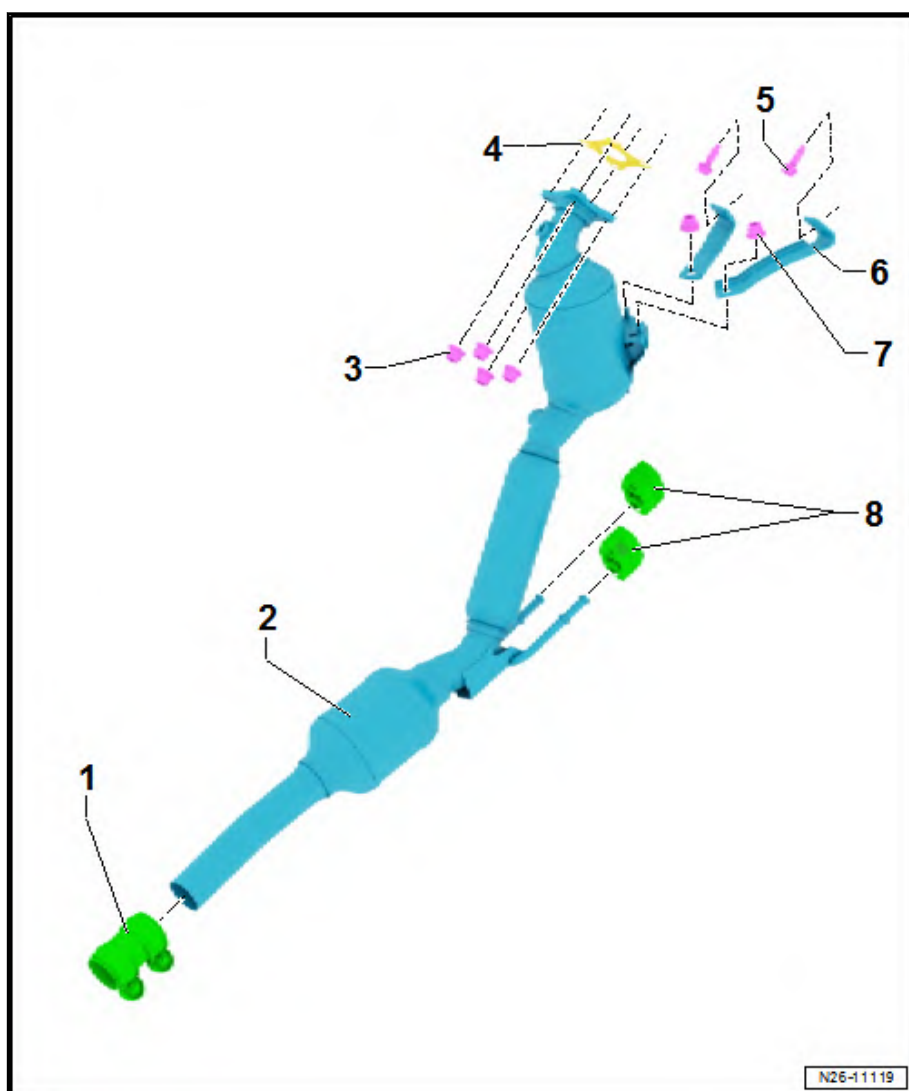


### 1 - Clamping sleeve

- ☐ Align exhaust system free of tension before tightening ➤ [page 414](#).
- ☐ Installation position and specified torque ➤ [page 419](#)
- ☐ Tighten bolted connections evenly.

### 2 - Front exhaust pipe with catalytic converter

- ☐ Do not bend flexible joint more than 10°. Otherwise, it can be damaged.
- ☐ Install flexible joint 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 ➤ [page 420](#)
- ☐ Do not remove protective packaging from replacement part until you are ready to fit the flexible joint
- ☐ Aligning exhaust system free of tension ➤ [page 414](#).



### 3 - Nuts

- ☐ Specified torque and tightening sequence ➤ [page 420](#)

### 4 - Seal

- ☐ Renew after removal

### 5 - Bolt

- ☐ Not fitted on Polo 2018> with emissions class EU3
- ☐ Specified torque and tightening sequence ➤ [page 418](#)

### 6 - Bracket

- ☐ Not fitted on Polo 2018> with emissions class EU3
- ☐ Renew if damaged

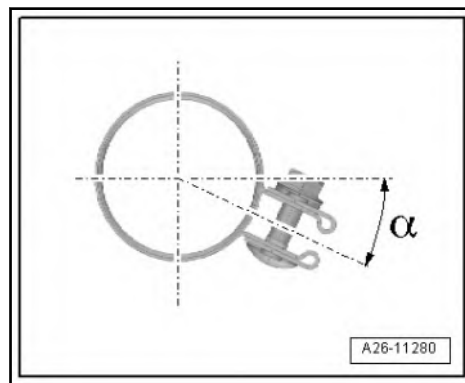
### 7 - Nuts

- ☐ Not fitted on Polo 2018> with emissions class EU3
- ☐ Specified torque and tightening sequence ➤ [page 418](#)

### 8 - Retaining rubbers

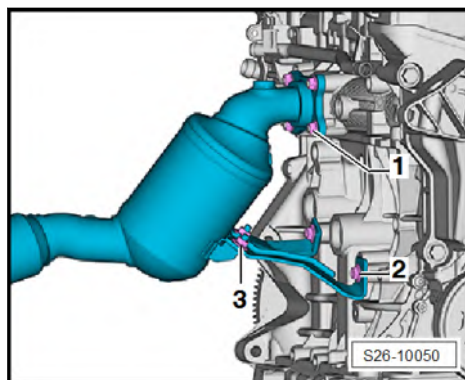
- ☐ Renew if damaged

### Installation position of front clamp



- Fit clamp in position shown.
- Angle  $\alpha$  = approx. 20°.
- Bolted connection facing towards right.
- Nuts upwards.

#### Installing front exhaust pipe - specified torque and tightening sequence



1.	Fit front exhaust pipe onto studs on cylinder head and at the same time into brackets	
2.	Screw in nuts -1-, nuts -3- and bolts -2- loosely by hand	<ul style="list-style-type: none"><li>• It should still be possible to move front exhaust pipe and bracket</li></ul>
3.	Tighten nuts -1-	20 Nm
4.	Tighten nuts -3-	20 Nm
5.	Tighten bolts -2- for securing brackets to cylinder head.	20 Nm

## 2.2 Removing and installing catalytic converter



#### Note

*The catalytic converter is removed together with the front exhaust pipe.*

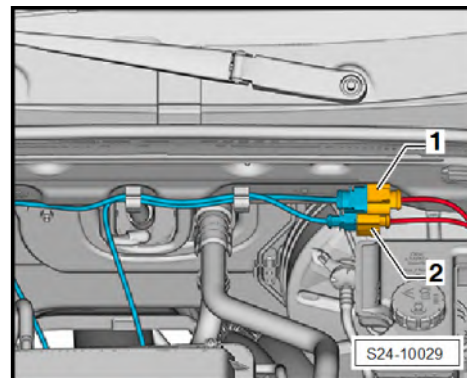
#### Special tools and workshop equipment required

- ♦ High-temperature paste ⇒ Electronic parts catalogue.



## Removing

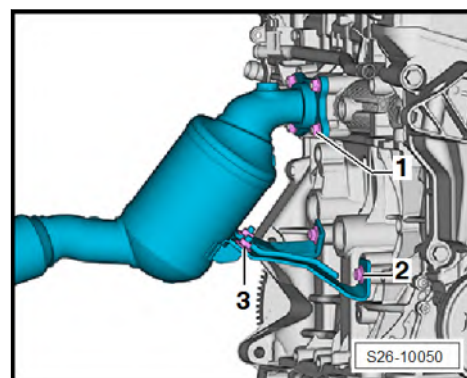
- Release and pull off electrical connectors -1- and -2-.



### Note

*The electrical wires may be routed differently.*

- Remove connectors from retainers.
- Unclip wires from retainers, and lay them to one side.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.
- Remove tunnel cross-piece ⇒ General body repairs, exterior; Rep. gr. 66; Underbody trim; Assembly overview - underbody trim panels.
- Unclip lambda probe cable.
- Unscrew nuts -1- for securing front exhaust pipe to cylinder head.



### Note

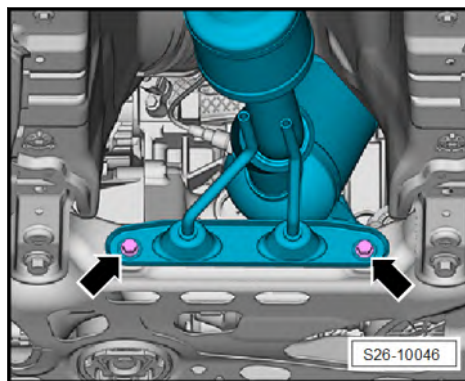
*The items -2- and -3- should be disregarded for the Polo 2018>.*

- Unscrew nuts -3- for securing front exhaust pipe to brackets.
- Unscrew bolts -2- for securing brackets to cylinder head.
- Pull front exhaust pipe off studs on cylinder head.

### Continuation for Golf, Golf SV and Golf Estate:

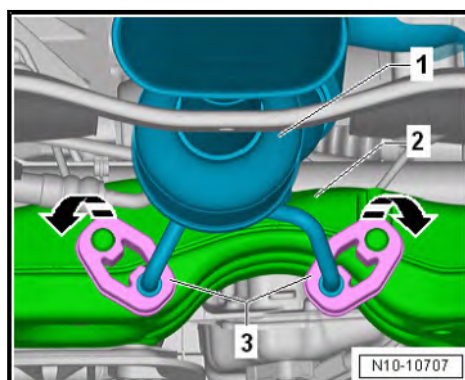
- Unscrew bolts -arrows-.





**Continuation for Polo:**

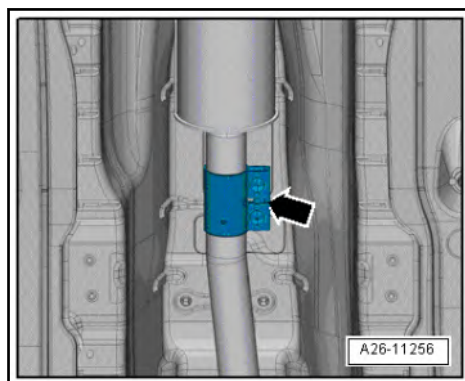
- Detach exhaust hangers -3- in -direction of arrow- from subframe -2-.



- Lower exhaust system -1- until it rests on subframe -2-.

**Continued for all:**

- Loosen clamp -arrow-, and push it to rear.



**Note**

- ◆ *Do not bend the flexible joint in the front exhaust pipe by more than 10° because it might otherwise be damaged.*
- ◆ *Do not bend flexible joint by pulling.*
- ◆ *Do not damage wire mesh of flexible joint.*
- Remove front exhaust pipe towards rear.



## Installing

Install in reverse order of removal. During this procedure, observe the following:



### Note

- ◆ *Renew seals/gaskets and self-locking nuts.*
- ◆ *Coat studs and bolts of front exhaust pipe with high-temperature paste ⇒ Electronic parts catalogue.*
- Align exhaust system free of stress ⇒ [page 414](#) .

## Specified torques

- ◆ ⇒ [o2.1 verview – emission control", page 416](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66; Underbody cladding; Assembly overview - underbody cladding
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation



## 28 – Ignition system

### 1 Ignition system

⇒ [o1.1 verview - ignition system", page 424](#)

⇒ [a1.2 nd installing ignition coils with output stage", page 426](#)

⇒ [a1.3 nd installing knock sensor 1G61", page 428](#)

⇒ [a1.4 nd installing Hall sender", page 430](#)

⇒ [a1.5 nd installing engine speed senderG28", page 430](#)

#### 1.1 Assembly overview - ignition system



### 1 - Bolt

- ☐ Specified torque influences the function of the knock sensor.
- ☐ 20 Nm

### 2 - Knock sensor 1 -G61-

- ☐ Removing and installing ⇒ [page 428](#)

### 3 - Spark plug

- ☐ Remove and install using spark plug socket, e.g. -3122 B-
- ☐ Change interval ⇒ Maintenance; Booklet
- ☐ Note part number ⇒ Electronic parts catalogue
- ☐ 22 Nm

### 4 - Ignition coil with output stage

- ◆ Ignition coil 1 with output stage -N70-
- ◆ Ignition coil 2 with output stage -N127-
- ◆ Ignition coil 3 with output stage -N291-
- ◆ Ignition coil 4 with output stage -N292-
- ☐ Removing and installing ⇒ [page 426](#)

### 5 - Bolt

- ☐ 8 Nm

### 6 - Bolt

- ☐ 8 Nm

### 7 - Hall sender -G40-

- ☐ Removing and installing ⇒ [page 430](#)

### 8 - O-ring

- ☐ Renew after removal

### 9 - Bolt

- ☐ 5 Nm

### 10 - Engine speed sender -G28-

- ☐ Removing and installing ⇒ [page 430](#)

### 11 - Sealing flange on gearbox end

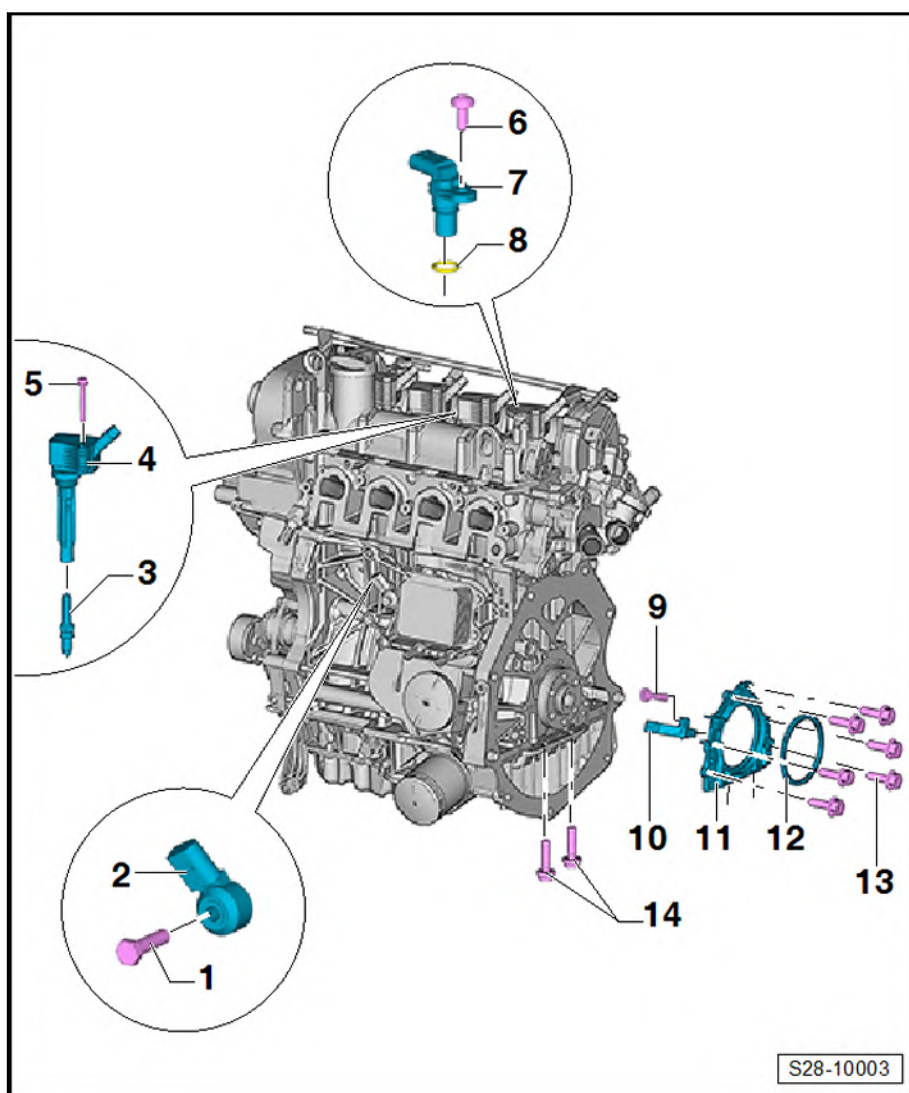
- ☐ Removing and installing ⇒ [page 143](#)

### 12 - Sender wheel

- ☐ For engine speed sender -G28-
- ☐ Cannot be removed separately, only together with sealing flange -item 11-

### 13 - Bolt

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





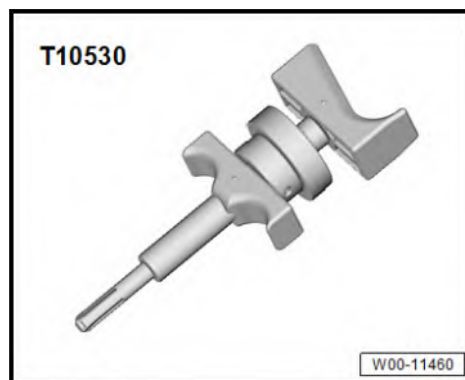
#### 14 - Bolt

- ☐ Renew after removal
- ☐ Specified torque and tightening sequence ➔ [page 259](#)

## 1.2 Removing and installing ignition coils with output stage

### Special tools and workshop equipment required

- ◆ Puller -T10530-

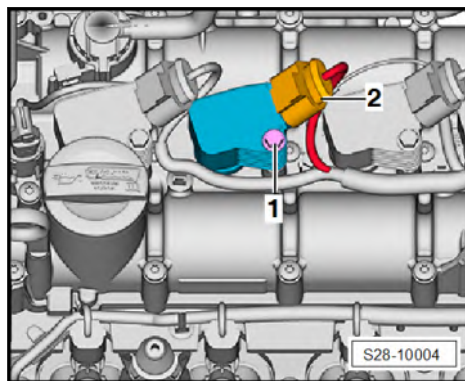


#### Note

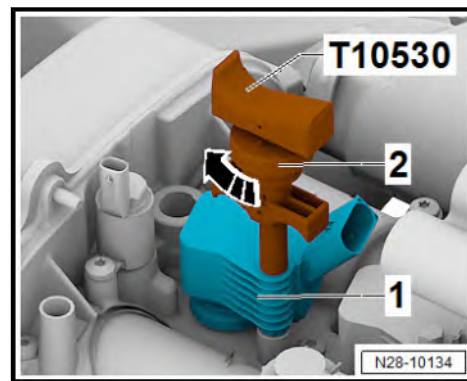
- ◆ *The ignition coils are easier to remove when the engine is warm.*
- ◆ *The grease used upon assembly in the factory makes it easier to remove ignition coils or the spark plug connectors when the engine is warm.*
- ◆ *When installing used ignition coils with output stage, the ignition coils must be lubricated with silicone paste ➔ Electronic parts catalogue.*
- ◆ *Ignition coils with output stage and spark plug connectors are available individually for repairs ➔ Electronic parts catalogue.*

### Removing

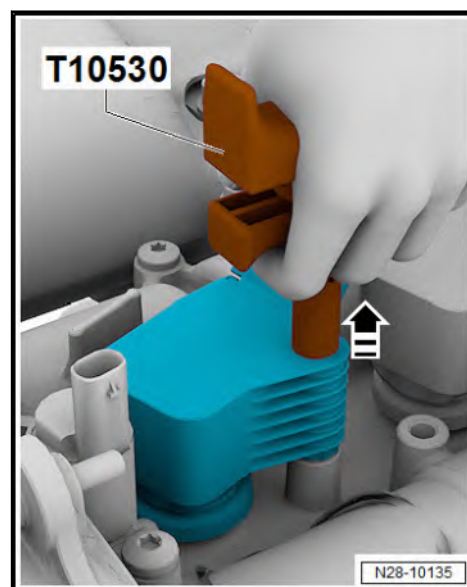
- Remove air filter housing ➔ [page 366](#) .
- Disconnect connector -2-.



- Unscrew bolt -1-.
- Push puller -T10530- into hole in ignition coil -1- to stop.



- Tighten nut -2- in -direction of arrow- so that puller -T10530- is securely seated in hole of ignition coil.
- Using puller -T10530-, pull ignition coil in -direction of arrow- out of camshaft housing.



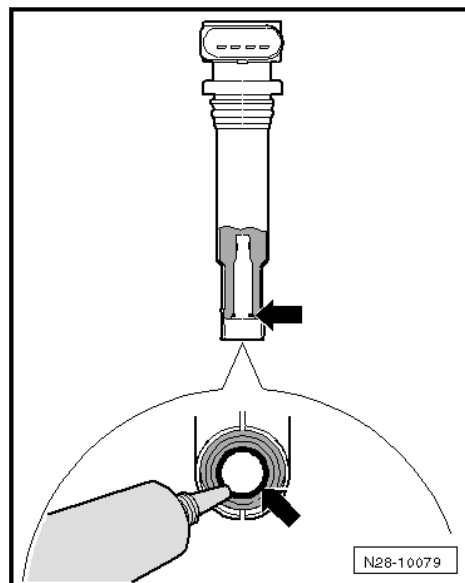
- Loosen nut of puller -T10530-, and remove puller from hole in ignition coil.
- Using puller -T10530-, pull remaining ignition coils one after the other out of camshaft housing.

### Installing

Install in the reverse order of removal. When doing this, note the following:

- Apply a thin coat of silicone paste around sealing hose of ignition coil ⇒ Electronic parts catalogue.





- Insert ignition coils loosely into spark plug recess.
- Align ignition coils so that securing bolt can be screwed in.
- Press ignition coils evenly onto spark plugs by hand (do not use tools).

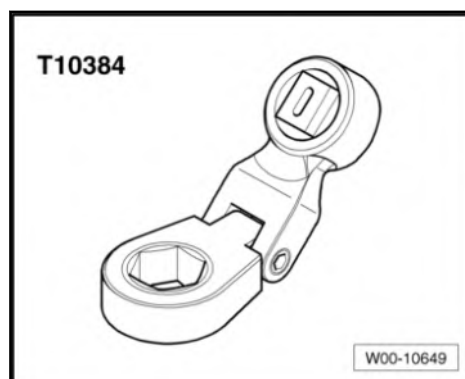
#### Specified torques

- ◆ ⇒ [o1.1 verview - ignition system", page 424](#)
- ◆ ⇒ [o3.1 verview - air filter housing", page 364](#)

### 1.3 Removing and installing knock sensor 1 -G61-

#### Special tools and workshop equipment required

- ◆ Ring ratchet spanner, 13 mm AF -T10384-

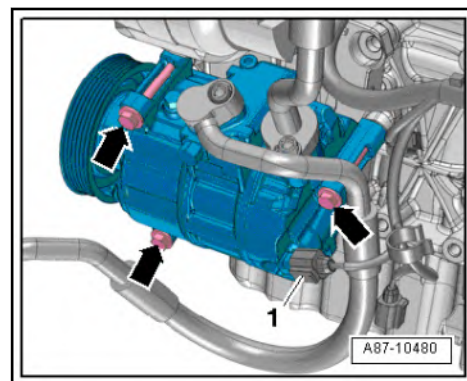


#### Removing

- Heed the safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 6](#) .
- Note repair instructions ⇒ [page 6](#) .
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview - noise insulation.



# Vehicles with air conditioner compressor:



- Remove poly V-belt ➔ [page 118](#) .
- Release and pull off connector -1- on air conditioner compressor regulating valve -N280-.

## CAUTION

Risk of freezing injury caused by refrigerant.

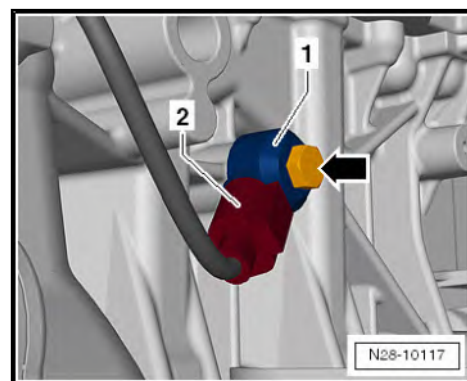
- Do not open refrigerant circuit of air conditioning system.

## NOTICE

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

- Never bend refrigerant lines to a radius tighter than  $r < 100 \text{ mm}$ .
- Unscrew bolts -arrows- for air conditioning compressor.
- Remove air conditioner compressor with refrigerant lines connected, and tie it up towards outside.

Continued for all vehicles:



- Release connector -2- and pull off.
- Unscrew bolt -arrow- and remove knock sensor 1 -G61- -1- from engine.

## Installing

Install in reverse order of removal. During this procedure, observe the following:

## Specified torques

- ♦ ➔ [o1.1 verview - ignition system", page 424](#)



- ♦ ⇒ Heating, air conditioning; Rep. gr. 87; Air conditioner compressor; Removing and installing air conditioner compressor

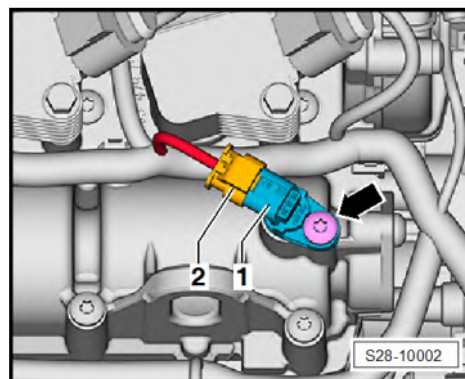
- ♦ ⇒ [o1.1 verview - poly V-belt drive", page 107](#)

## 1.4 Removing and installing Hall sender

Hall sender -G40-

### Removing

- Remove air filter housing ⇒ [page 366](#) .
- Release connector -2- and pull off.



- Unscrew bolt -arrow-.
- Remove Hall sender -G40- -1-.

### Installing

- Install in reverse order of removal.

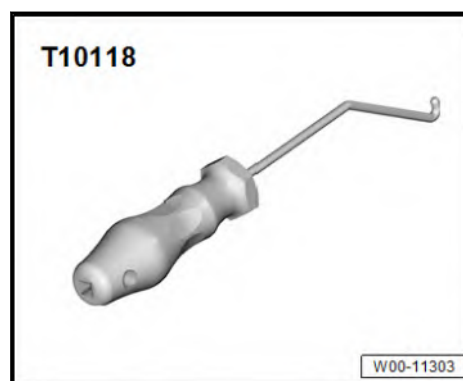
### Specified torques

- ♦ ⇒ [o1.1 verview - ignition system", page 424](#)
- ♦ ⇒ [o3.1 verview - air filter housing", page 364](#)

## 1.5 Removing and installing engine speed sender -G28-

Special tools and workshop equipment required

- ♦ Assembly tool -T10118-



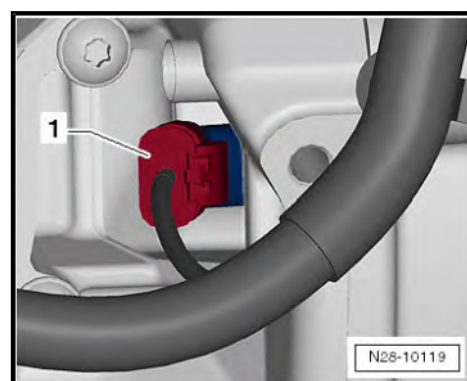


- ◆ Socket, 4 mm -T10370-

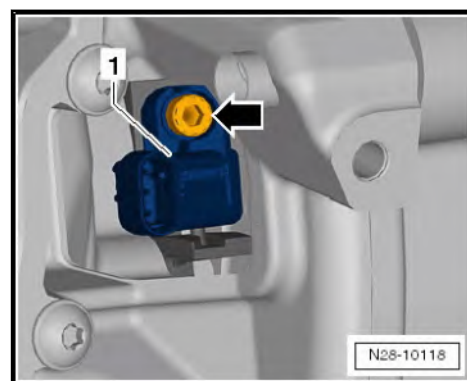


### Removing

- Release connector -1- and pull off. To do this, use spring-type clip pliers -T10118-.



- Unscrew bolt -arrow- using socket -T10370-.



- Pull out engine speed sender -G28- -1-.

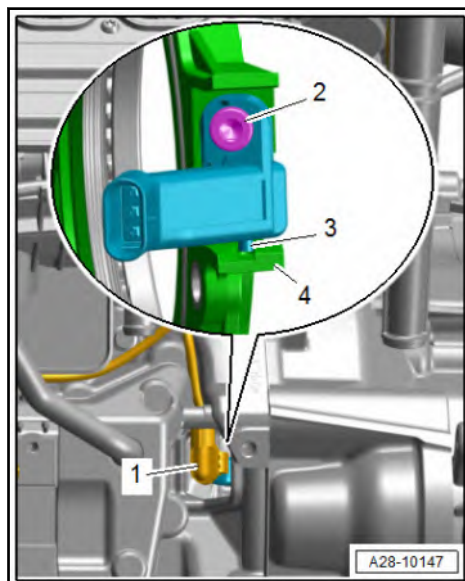
### Installing



#### Note

- ◆ *Carefully insert the engine speed sender -G28- into the hole.*
- ◆ *This will prevent the engine speed sender -G28- from falling between engine and gearbox.*

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 connect connector -1-.

#### Specified torques

- ♦ ⇒ [o1.1 overview - ignition system", page 424](#)