

Workshop Manual Rapid NH 2014 ➤ Superb III 2015 ➤

1,4/92; 110 kW TSI Motor

Engine ID	CZC A	CZD A	CZE A						
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Edition 10.2016

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List of Workshop Manual Repair Groups

Repair Group

- 00 - Technical data
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- 17 - Lubrication
- 19 - Cooling
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- 24 - Mixture preparation - injection
- 26 - Exhaust system
- 28 - Ignition system

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

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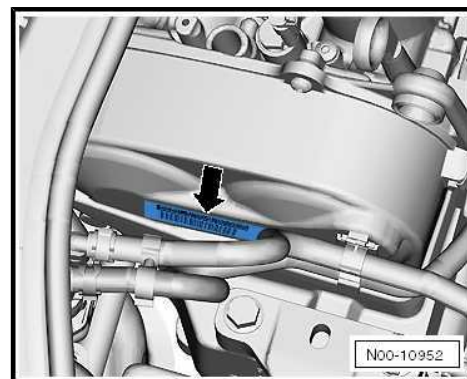
1 Identification

(SRL000984; Edition 10.2016)

⇒ **“1.1 Engine number, engine data”, page 1**

1.1 Engine number, engine data

“The engine identification characters” and the “serial number” are located on the sticker -arrow- at the top timing belt guard.



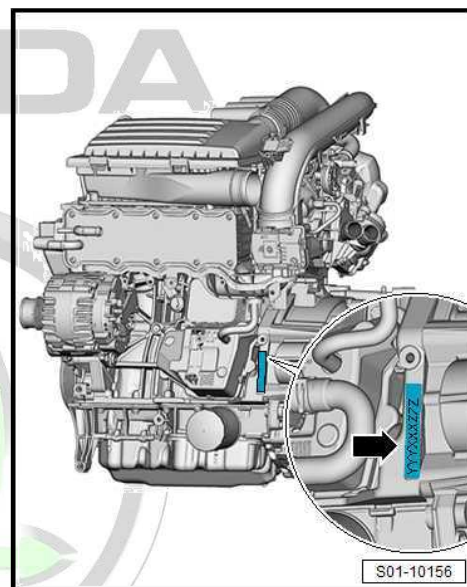
The “engine identification characters” and “serial number” are located on the cylinder block -arrow-.

The “engine identification characters” are also indicated on the vehicle data sticker.

- ◆ Starting with the letter “C”, new four digit engine codes have been introduced.
- ◆ The first 3 digits of the engine identification characters refer to the displacement and the mechanical construction of the engine. They are type-punched on the cylinder block including the serial number.
- ◆ The 4th digit refers to the output and torque of the engine and depends upon the engine - J623- control unit.

Fitting locations for vehicle data stickers:

- ◆ ⇒ Maintenance ; Booklet Superb III
- ◆ ⇒ Maintenance ; Booklet Kodiaq



Engine identification characters	CZCA	CZDA	CZEA
Superb III production	06.2015 ▶	10.2015 ▶	03.2015 ▶
Kodiaq production	01.2017 ▶	10.2016 ▶	01.2017 ▶
Emission standards	EU6	EU6	EU6
Displacement cm ³	1395	1395	1395
Power output kW at rpm	92/5000-6000	110/5000-6000	110/5000-6000
Torque Nm at rpm	200/1400-4000	250/1500-3500	250/1500-3500
Bore Ø mm	74,5	74,5	74,5
Stroke mm	80,0	80,0	80,0
Compression ratio	10,5	10,5	10,5
Cylinder / valves per cylinder	4/4	4/4	4/4
Fuel - RON min.	95 unleaded	95 unleaded	95 unleaded

Engine identification characters	CZCA	CZDA	CZEA
Ignition system/fuel injection	Motronic ME 17	Motronic ME 17	Motronic ME 17
Firing order	1-3-4-2	1-3-4-2	1-3-4-2
Exhaust gas recirculation	no	no	no
Balancing shaft module	no	no	no
Intake manifold change-over	no	no	no
Camshaft control valve, inlet / exhaust	yes / no	yes / yes	yes / yes
Exhaust gas turbocharger	yes	yes	yes

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2 Safety instructions

⇒ "2.1 Safety precautions when working on fuel supply system", page 3

⇒ "2.2 Safety precautions when working on vehicles with a start/stop system", page 3

⇒ "2.3 Safety precautions during road tests in which testing and measuring equipment is used", page 4

⇒ "2.4 Safety precautions when working on cooling system", page 4

⇒ "2.5 Safety precautions when working on ignition system", page 4

⇒ "2.6 General safety instructions", page 4

2.1 Safety precautions when working on fuel supply system

Fuel under very high pressure creates a risk of injury.

- Wear protective gloves.
- Wear safety goggles.
- Decrease fuel pressure to residual pressure
⇒ "1.2 Reduce fuel pressure", page 292.

Place a clean cloth around the connection point and loosen the connection point carefully before opening the fuel system.

Leaking fuel creates a fire hazard.

Fuel pump is activated by switching on ignition and via driver door contact switch. Therefore, if the battery power hasn't been disconnected, for safety reasons the plug of the fuel delivery unit must be disconnected, or the fuel pump fuse must be removed before opening the fuel system.

- Take out fuse for fuel pump control unit - J538- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Risk of damage to the electronic components when disconnecting the battery.

Only disconnect the battery when the ignition is switched off ⇒ Electrical system; Rep. gr. 27 - Battery; Disconnecting and connecting battery .

2.2 Safety precautions when working on vehicles with a start/stop system

Risk of injury as a result of automatic engine start in vehicles with start/stop system.

In vehicles with an activated start-stop system (indicated by a message in the dash panel insert), the engine can start automatically if necessary.

- Ensure that the start-stop system is deactivated when carrying out work on the vehicle (switch ignition off, if required switch ignition on again).

2.3 Safety precautions during road tests in which testing and measuring equipment is used

Risk of accident due to deflection

Using testers and measuring instruments during driving operation creates a risk of deflection.

There is a risk of injury due to insufficient securing of testers and measuring instruments.

Increased risk of injury from unsecured testers and measuring instruments must be prevented.

Measuring instruments can turn into dangerous projectiles on air-bag activation.

Testers and measuring instruments must always be secured on the rear seat using a seat belt and operated by a 2nd person from there.

2.4 Safety precautions when working on cooling system

Risk of injury due to hot steams.

- Wear protective gloves.
- Wear safety goggles.

Relieve any possible pressure prior to the repair.

When the engine is warm, the cooling system is under overpres-
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Hot steam may escape when the compensation bottle is opened.

- Cover the cap of the coolant expansion tank with a cloth and open carefully.

2.5 Safety precautions when working on ignition system

Risk of injury due to high voltage.

- Do not touch the ignition system with the engine running or at start speed.

Risk of damage to injection and ignition system

- Ignition must be switched off before disconnecting and re-connecting the cables of the fuel injection and the ignition system as well as of the test equipment.

Switch off ignition before an engine wash.

2.6 General safety instructions

The safety measures for the pressure reduction in the high pressure system must be observed

⇒ ["1.2 Reduce fuel pressure", page 292](#) .

Place a clean cleaning cloth around the connection point before detaching hose connections. Reduce pressure by carefully removing the hose.

- Do not touch or remove ignition leads with the engine running or at start speed.

Ignition must be switched off before disconnecting and re-connecting the cables of the fuel injection and the ignition system as well as of the test equipment.

If the engine must be operated at start speed without it starting, as for example, when checking the compression pressure, remove the fuse for the voltage supply of the injection valves and the ignition coils from the fuse holder ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

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3 Repair instructions

⇒ [“3.1 Cleanliness rules”, page 6](#)

⇒ [“3.2 Foreign bodies in the engine”, page 6](#)

⇒ [“3.3 Contact corrosion”, page 6](#)

⇒ [“3.4 Cable routing and securing”, page 6](#)

⇒ [“3.5 Assembly of radiators and condensers”, page 7](#)

⇒ [“3.6 General repair instructions”, page 7](#)

3.1 Cleanliness rules

Carefully observe the following “rules” for cleanliness when working on the fuel supply/injection system:

- ◆ Thoroughly clean the connection points and their surroundings before releasing.
- ◆ Place removed parts on a clean surface and cover. Use lint-free cloths.
- ◆ Carefully cover or close opened components if the repair is not completed immediately.
- ◆ Only install clean parts: Only unpack replacement parts immediately prior to fitting. Do not use any parts which have been stored unwrapped (e.g. in tool boxes etc.).
- ◆ When the system is open: Do not work with compressed air. Do not move vehicle.
- ◆ Ensure that no fuel runs onto the fuel hoses. If happens, clean the hoses immediately.
- ◆ Protect electrical plug connections from dirt and moisture and only connect them when dry.

3.2 Foreign bodies in the engine

To prevent penetration of foreign bodies, open channels of the inlet connection and exhaust tract must be sealed with suitable plugs during assembly works on the engine, e.g. from the screw plug set for engine , e.g. -VAS 6122- .

3.3 Contact corrosion

The use of unsuitable connection elements causes contact corrosion (screws, nuts, washers, ...).

This is why only connection elements with a special surface coatings are fitted.

Therefore, the rubber or plastic parts and the adhesives are made from electrically non-conductive materials.

If there is a question mark about the suitability of parts, generally use new parts ⇒ Electronic Catalogue of Original Parts “ETKA” .

3.4 Cable routing and securing

Lay lines of all kinds in such a way that the original line guide is re-established.

- ◆ Fuel feed lines
- ◆ Hydraulic lines
- ◆ Brake fluid lines
- ◆ Coolant lines

- ◆ Vacuum lines
- ◆ Activated charcoal filter system lines
- ◆ Electrical lines

To rule out mix ups and ensure the original fitting position, mark the lines before disassembly.

Make photos or sketches where necessary.

To avoid damage to lines, ensure sufficient clearance from all moving or hot components.

Insulation or heat shield matts must be installed again in their original position.

Secure all hose connections with hose clamps, assignment⇒ Electronic Catalogue of Original Parts .

When installing fit the coolant hoses free of stress, without them touching any other components (pay attention to the marking on the coolant connection and hose).

3.5 Assembly of radiators and condensers

The radiator, condenser and charge air cooler may have minor indentations on the fins, even if assembly is correct. This is not a case of damage. Radiator, condensers or charge air cooler must not be replaced because of these indentations.

3.6 General repair instructions

⇒ [“3.6.1 Additional instructions when undertaking assembly work on the air-conditioning system”, page 7](#)

⇒ [“3.6.2 General instructions for charge air system”, page 8](#)

⇒ [“3.6.3 General notes on the ignition system”, page 8](#)

⇒ [“3.6.4 General notes on the injection system”, page 9](#)

3.6.1 Additional instructions when undertaking assembly work on the air-conditioning system

CAUTION

Risk of frost due to refrigerant.

Do not open the refrigerant circuit of the air conditioning system.

In order to avoid damage to the condenser as well as to the refrigerant lines and hoses, ensure that the lines and hoses are not over-tensioned, kinked or bent.

Steps which should be taken in order to remove and install the engine without opening the refrigerant circuit

- Remove the holding clamp(s) of the coolant lines.
- Removing AC compressor ⇒ Heating, Air Conditioning; Rep. gr. 87 ; AC compressor; installing and removing AC compressor .
- Mount the AC compressor in such a way that the refrigerant lines/hoses are not under tension.

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3.6.2 General instructions for charge air system

When undertaking all installation work, particularly in the engine compartment because of its cramped construction, please observe the following:

- ◆ Lay lines of all kinds (for example, for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.
- ◆ Ensure that there is adequate free access to all moving or hot components.

In case a mechanical damage to the exhaust gas turbocharger is found, for example, damage to the compressor wheel, it is not sufficient to only replace the turbocharger. In order to avoid consequential damage, perform the following tasks:

- ◆ Clean all oil lines.
- ◆ Change engine oil and oil filter.
- ◆ Inspect the air filter housing, the air filter element and the intake hoses for contaminations.
- ◆ Inspect the whole charge-air routing and the charge air cooler for foreign bodies.
- ◆ The charge-air system must be tight.
- ◆ Replace self-locking nuts.
- ◆ Hose connections and hoses for the charge air system must be free of oil and grease before being installed.
- ◆ Only install approved clamps for securing the hose connections → ETKA - Electronic Catalogue of Original Parts .
- ◆ Spring-type clip pliers are recommended for installation of spring-type clips.
- ◆ Before connecting the oil feed line, fill the exhaust turbocharger via the connection fitting with engine oil.
- ◆ To ensure the oil supply to the exhaust gas turbocharger, leave the engine running for about 1 minute after installing the exhaust gas turbocharger.

3.6.3 General notes on the ignition system

- ◆ Switch off the ignition before disconnecting and connecting the battery, as this may damage the engine control unit.
- ◆ The engine control unit and further components are equipped with self-diagnosis; inspect → Vehicle diagnostic tester.
- ◆ A minimum voltage of 11.5 V is required for perfect functioning of the electrical components.
- ◆ Certain inspections may cause the control unit to detect and store a fault. It is therefore necessary to interrogate the event memory after having completed all inspections and repairs, and if necessary delete → Vehicle diagnostic tester.

Safety measures

⇒ **“2.5 Safety precautions when working on ignition system” , page 4** .

Setting data, spark plugs:

- ◆ ⇒ Maintenance ; Booklet Superb III
- ◆ ⇒ Maintenance ; Booklet Kodiaq

3.6.4 General notes on the injection system

- ◆ The engine control unit is equipped with a self-diagnosis system. Before repairs and also for fault finding, first of all interrogate the event memory. Also check the vacuum hoses and connections (unmetered air).
- ◆ Fuel hoses in the engine compartment must only be secured with spring clips ⇒ ETKA - Electronic catalogue of original parts . The use of clamp-type or screw-type clips is not allowed.
- ◆ A minimum voltage of 11.5 V is required for perfect functioning of the electrical components.
- ◆ Do not use sealants containing silicone. Traces of silicone elements drawn in by the engine are not burnt in the engine and damage the lambda probe.
- ◆ Certain inspections may cause the control unit to detect and store a fault. It is therefore necessary to interrogate the event memory after having completed all inspections and repairs, and if necessary delete ⇒ Vehicle diagnostic tester.

Safety precautions when working on the injection system

⇒ ["2.6 General safety instructions", page 4](#) .



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1 Removing and installing engine

⇒ [“1.1 Removing engine”, page 10](#)

⇒ [“1.2 Separate engine and gearbox”, page 19](#)

⇒ [“1.3 Attach engine attached to engine and gearbox mount”, page 20](#)

⇒ [“1.4 Installing engine”, page 21](#)

1.1 Removing engine

Special tools and workshop equipment required

- ◆ Removal tool for inner lining of the door panel - MP8-602/1-
- ◆ Extension - 2024 A /1- of lifting device - MP9-201 (2024A)-
- ◆ Engine and gearbox jack , e.g. -V.A.G 1383A- or -VAS 6931-
- ◆ Engine mount - T10497A-
- ◆ Hose strap pliers , e.g. -VAS 6362-
- ◆ Locking pin - T10060A-
- ◆ Double ladder , e. g. -VAS 5085-
- ◆ Protective goggles and gloves
- ◆ Radiator protection mat - VAS 531003-



Note

- ◆ *The engine is removed downwards together with the gearbox.*
- ◆ *All cable straps that have been loosened or cut open when the engine was removed must be attached again in the same location when the engine is installed again.*
- ◆ *Leave the ignition key in the ignition lock so that the steering lock does not click into place.*
- Remove the front wheels ⇒ Chassis, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Remove the front left and right wheelhouse liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheelhouse liner; removing and installing front wheelhouse liner .
- Remove air filter housing

⇒ [“3.2 Removing and installing air filter housing”, page 302](#)

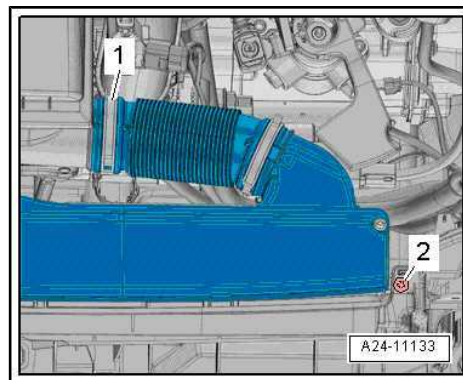


WARNING

Fuel under very high pressure creates a risk of injury.

- Reduce the fuel pressure in the high pressure system
⇒ [“1.2 Reduce fuel pressure”, page 292](#) .

- Drain coolant
⇒ [“1.3 Draining and filling up coolant”, page 225](#) .
- Release screw left and right arrow -2-.
- Unclip and remove the air guide on the lock carrier.
- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Removing fan shroud
⇒ [“4.4 Removing and installing radiator cowling with radiator fan”, page 257](#) .



- Cover radiator with radiator protection mat - VAS 531003- .

Vehicles with air conditioning

- Remove the ribbed V-belt
⇒ [“1.3.2 Removing and installing V-ribbed belt - Vehicles with air conditioning”, page 42](#) .

CAUTION

Risk of frost due to refrigerant.

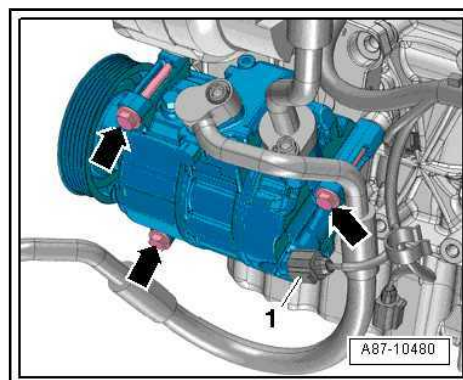
Do not open the refrigerant circuit of the air conditioning system.

- Disconnect plug connection -1- on the control valve for the air conditioning system compressor - N280- .
- Release screws -arrows- for AC compressor.

NOTICE

Risk of damaging AC compressor, refrigerant lines and hoses.

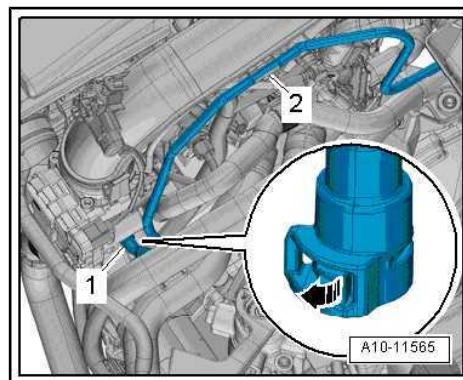
- ◆ Do not over-tension, buckle or bend refrigerant lines and hoses.
- Remove AC compressor with connected refrigerant hoses and strap up to the right side.



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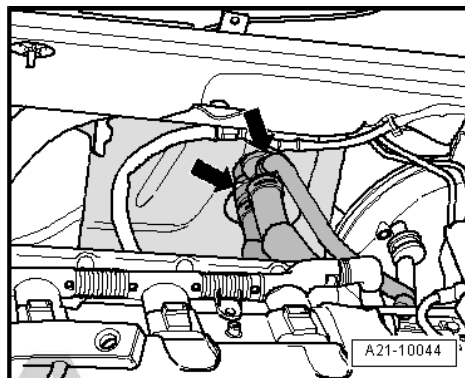
Continued for all vehicles

- Unlock catch -arrow- and remove vacuum hose -1-.
- Expose vacuum hose on the air guide pipe -2-.



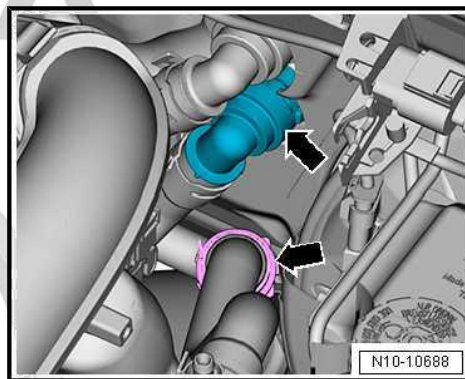
Vehicles without auxiliary heating

- Raise holding clamps -arrows- and remove coolant hoses from heat exchanger for heating.



Vehicles with auxiliary heating

- Loosen holding clamp and holding clamps and pull off both coolant hoses -arrows-.



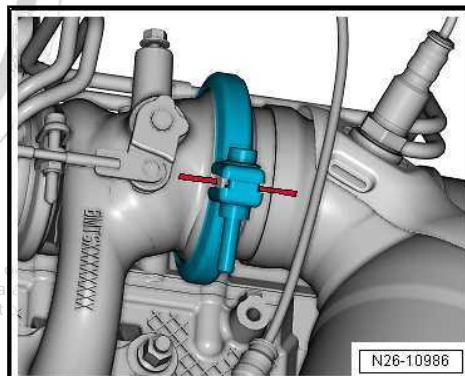
Continued for all vehicles

- Mark the position of the clamp.



Note

- ◆ Before loosening the separation point between catalytic converter and turbocharger, mark the position of the clamp.
- ◆ Put the clamp back into position when assembling!

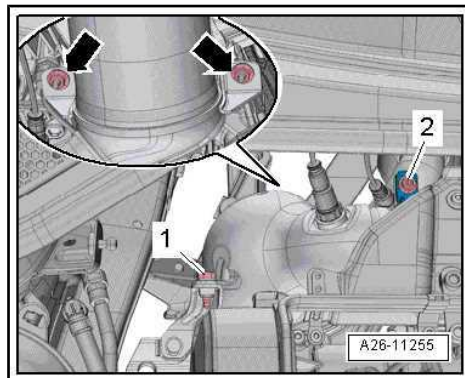


- Unscrew screw -2- and remove screw clamp.
- Remove screw -1-, remove nuts -arrows- and strap up catalytic converter to the bodyshell so as not to damage the decoupling element.



Note

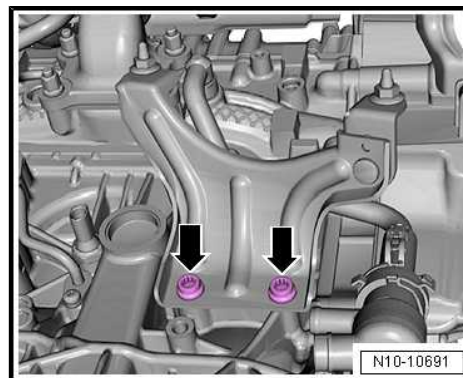
do not twist decoupling element in the exhaust pipe more than 10° - risk of damage



- Release screws -arrows- and remove holder.



Place a cloth below to absorb leaking coolant.



- Loosen hose clamp -1- and remove coolant hose.

CAUTION

Risk of injury from fuel under pressure.

- ◆ To relieve the fuel pressure, place a clean cloth around the connection point and loosen the connection point carefully before opening the fuel system.

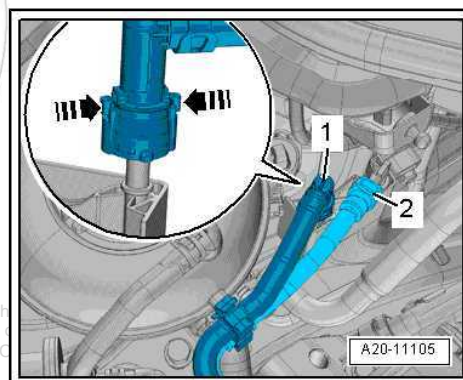
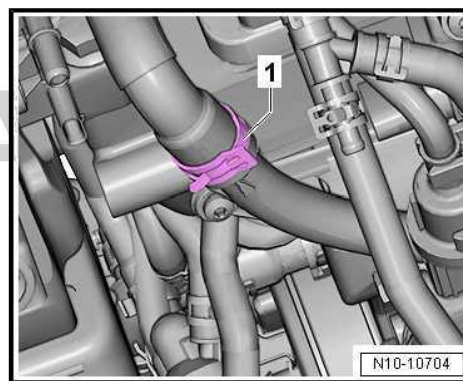
NOTICE

Risk of malfunctions caused by soiling.

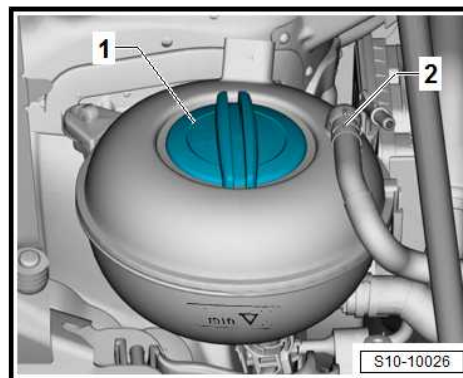
Observe safety measures and rules for cleanliness

⇒ [“3.1 Cleanliness rules”, page 6](#).

- Separate fuel feed line -1- and the line to activated charcoal filter -2-.

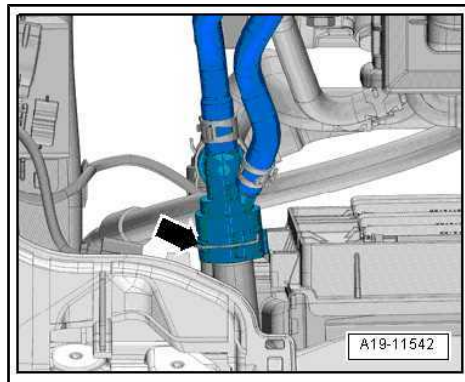


- Loosen hose clamp -2- and remove coolant hose.



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- Raise holding clamp -arrow- and disconnect coolant hose right above radiator for charge air circuit.

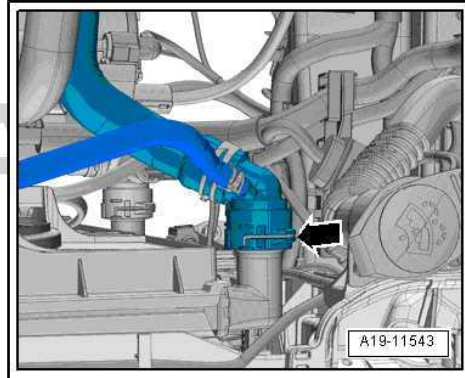


- Raise holding clamp -arrow- and remove top left coolant hose from radiator.

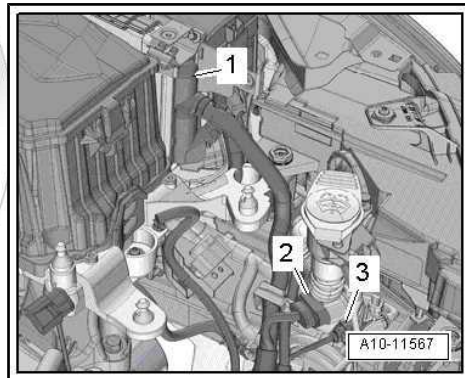


Note

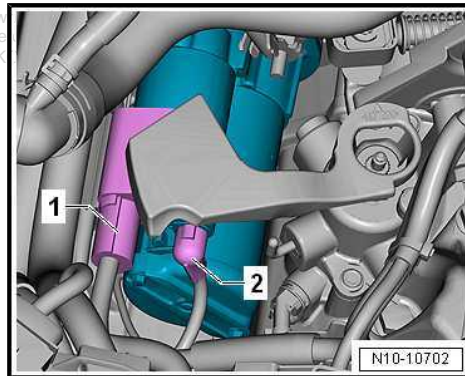
For the following clip unclipping procedure use the removal tool for inner door trim panel - MP8-602/1- .



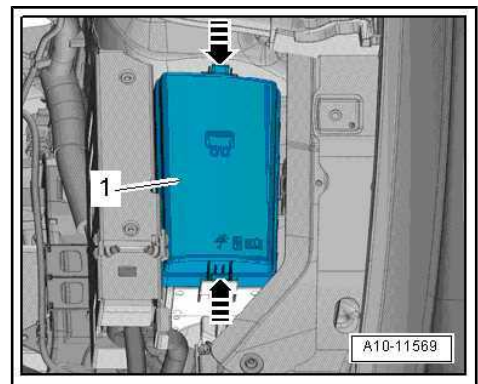
- Unplug connector -1- on the engine control unit - J623- ⇒ ["6 Engine control unit", page 315](#) .
- Take electrical plug connections -2- and -3- out of the holder and disconnect.
- Expose electric cables.



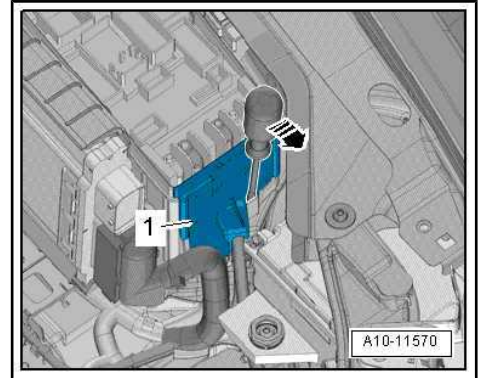
- Separate electrical plug connection -2-.
- Press back B+-pole protection -1- and unscrew B+-cable from the starter magnet switch.
- Unscrew the earth cable on the body.



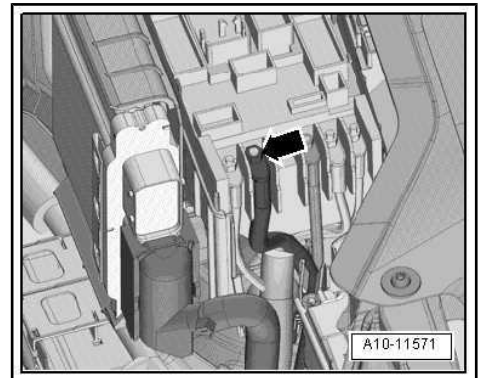
- Unlock catches -arrows-, remove cover -1- for E-box in the engine compartment.



- Unlock catch with a screwdriver -arrow- and pull cover -1- for E-box in the engine compartment upwards.



- Unscrew nut -arrow-, remove and expose electric cable.



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Vehicles fitted with a manual gearbox

- Disconnect plug connections -1- and -2-.
- Remove gearshift mechanism from the gearbox ⇒ Rep. gr. 34 ; Gearshift mechanism; removing and installing shift mechanism .
- Disconnect breather from slave cylinder ⇒ Rep. gr. 30 ; Clutch mechanism; Removing and installing the breather .

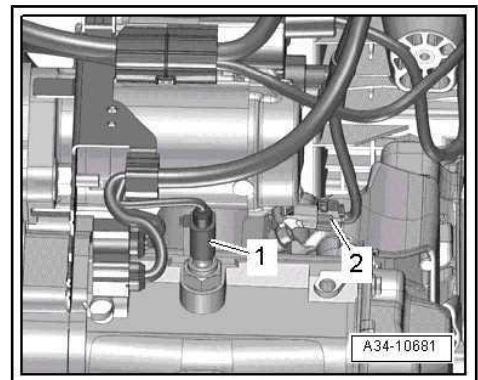
Vehicles with automatic gearbox

- Remove selector lever linkage from gearbox, disconnect mechatronics connector and remove all holders from the gearbox ⇒ Rep. gr. 37 ; Shift mechanism; installing and removing shift mechanism .

- Disconnect plugs from mechatronics ⇒ Rep. gr. 34 ; Removing and installing the gearbox; remove gearbox

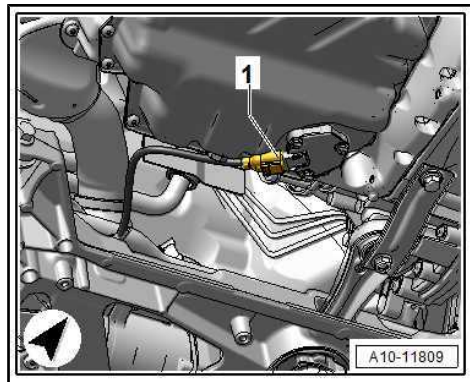
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- Expose electric cable.

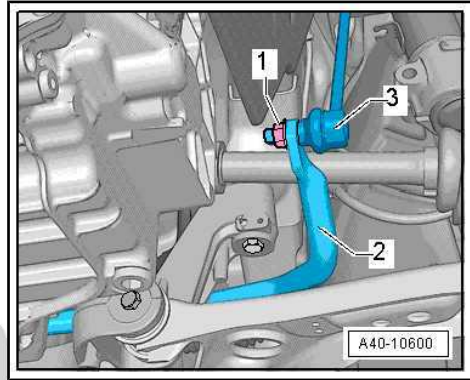


Continued for all vehicles

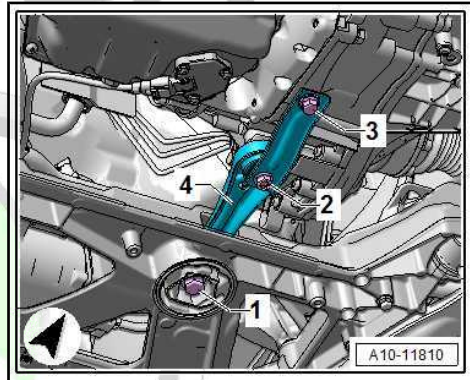
- Disconnect plug -1- at the oil level and oil temperature sender - G266- .



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



- Undo screws -1-, -2-, -3- and remove the pendulum support -4-.



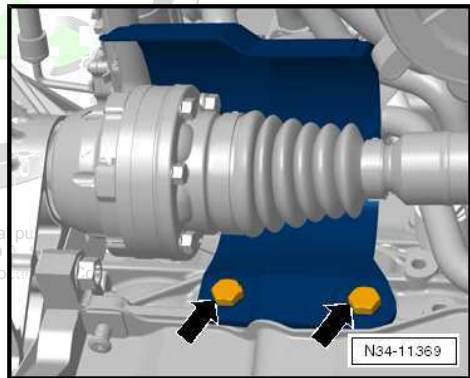
- Release screws -arrows- and remove heat shield for right car-dan shaft.

For vehicles with four-wheel drive

- Remove angle gearbox ⇒ Gearbox; Rep. gr. 34 ; Angle gearbox; Remove angle gearbox .

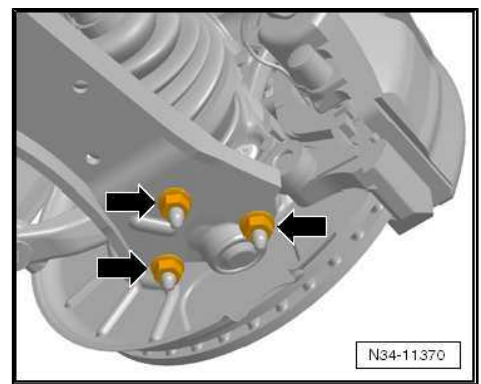
For Superb III vehicles with automatic gearbox

- Remove assembly carrier ⇒ Running gear, axles, steering; Rep. gr. 40 ; Assembly carrier; Removing and installing assembly carrier with steering gear .



For Superb III vehicles with manual gearbox and for Kodiaq vehicles

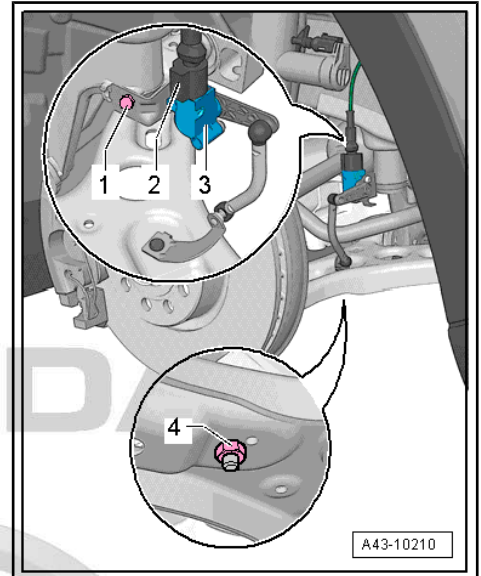
- Unscrew nuts -arrows- on left and right for swivel hub.



- If present, unscrew nuts -4- and screw -1- from the front left vehicle level sensor - G78- -3- and place to one side.
- Unhook swivel hub from track control arm on left and right for swivel hub.
- Unscrew left and right cardan shaft from gearbox ⇒ Chassis, axles, steering; Rep. gr. 40 ; Cardan shaft; removing and installing cardan shaft and tie up.

Note

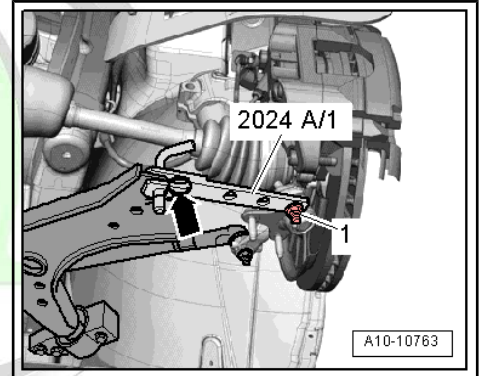
Ensure that the surface protection of the cardan shaft is not damaged.



- Swivel suspension strut left towards the outside and support with extension -2024 A /1- , as shown in the illustration.

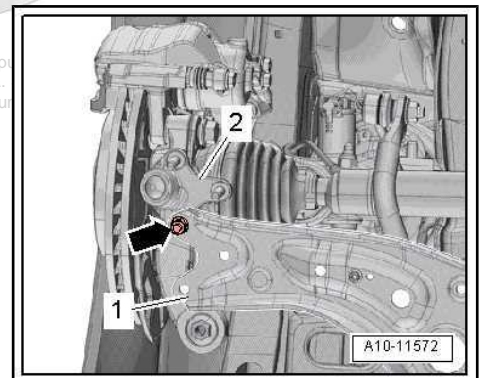
CAUTION

There is a risk of accident from loose parts of the support.



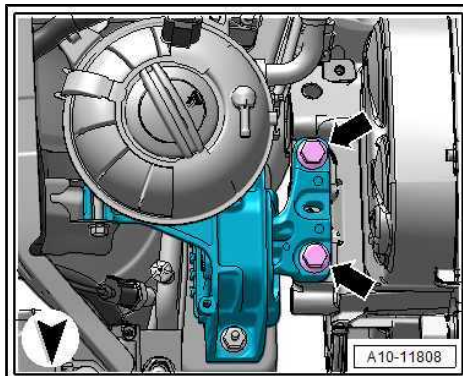
- Secure rig pin with plug-in lock and swivel hub-arrow- and nut-1-.

- Screw swivel hub -2- right at the track control arm -1- tight using the nut -arrow-, as shown in the illustration.



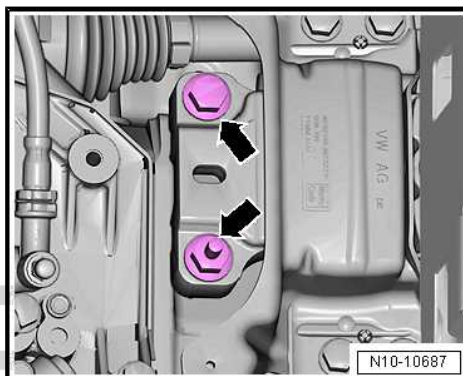
Continued for all vehicles

- Screw out screws -arrows- on engine mount by approximately 2 turns.



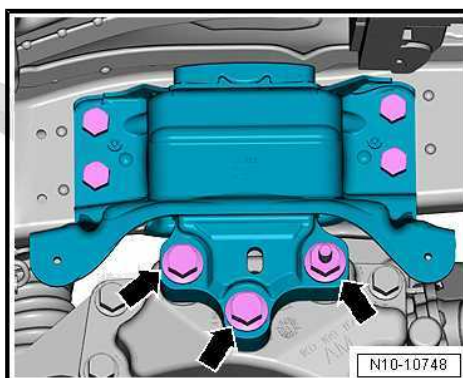
Gearbox mount with 2 screws

- Screw out screws -arrows- on gearbox mount by approximately 2 turns.



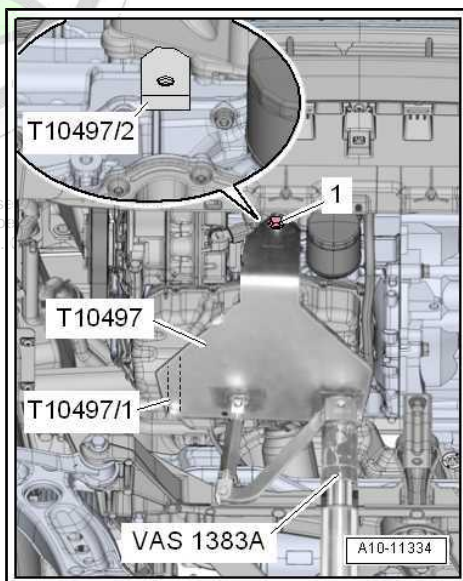
Gearbox mount with 3 screws

- Screw out screws -arrows- on gearbox mount by approximately 2 turns.



Continued for all vehicles

- Position clamping piece T10497A/2 on the housing fin of the cylinder block, as shown in the illustration.
- Position engine mount - T10497A- with bolts T10497A/1 at the cylinder block.
- Screw clamping piece T10497A/2 with screw -1- onto the engine mount T10497A and tighten it to 20 Nm.



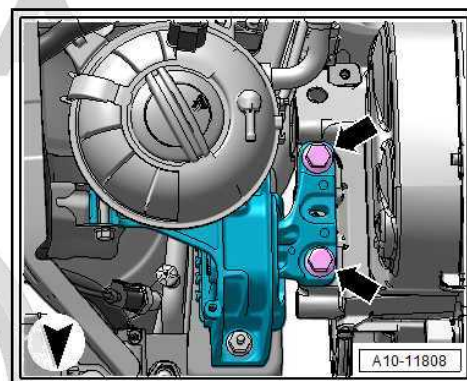
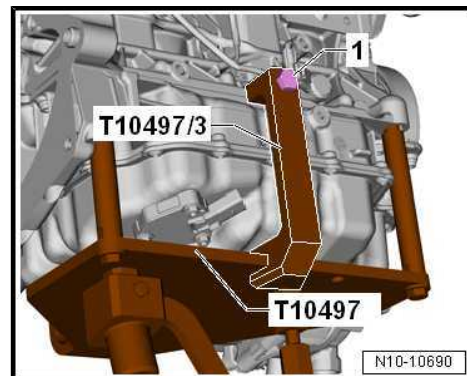
- Fit the adapter - T10497A/3- to the engine mount - T10497A- and tighten screw -1- to 20 Nm.
- Insert engine mount - T10497A- onto the engine and gearbox jack - V.A.G 1383A- or -VAS 6931- and lift the engine/gearbox assembly a little.



Note

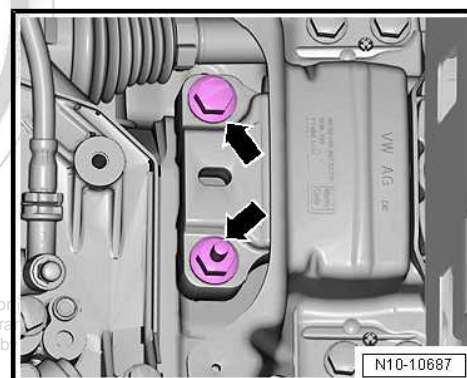
To remove the screws for the assembly mountings, use a commercially available double ladder, e. g. -VAS 5085-.

- Screw out engine mount screws -arrows- fully.



Gearbox mount with 2 screws

- Screw out gearbox mount screws -arrows- fully.



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Gearbox mount with 3 screws

- Screw out gearbox mount screws -arrows- fully.

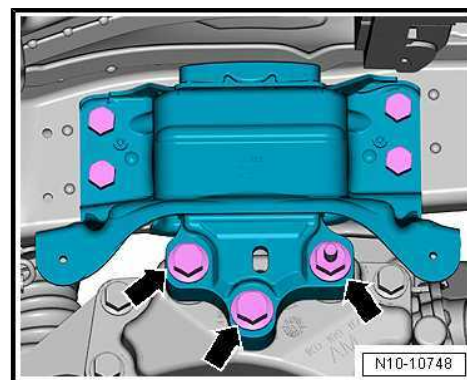
Continued for all vehicles



NOTICE

Risk of damaging vacuum lines or electric cables and the engine compartment.

- Check that all vacuum lines and electric cables between engine, gearbox, assembly mountings and body have been loosened.
- Drain engine/gearbox unit a little.
- Push the gearbox side of the engine/gearbox unit forwards and drain it slowly and carefully.



1.2 Separate engine and gearbox

Special tools and workshop equipment required

- ◆ Additional hook - MP9-200/10 (10-222A/2)-

- ◆ Workshop crane , e.g. -VAS 6100-
- ◆ Lifting eye - 10-222A/12-

Work procedure

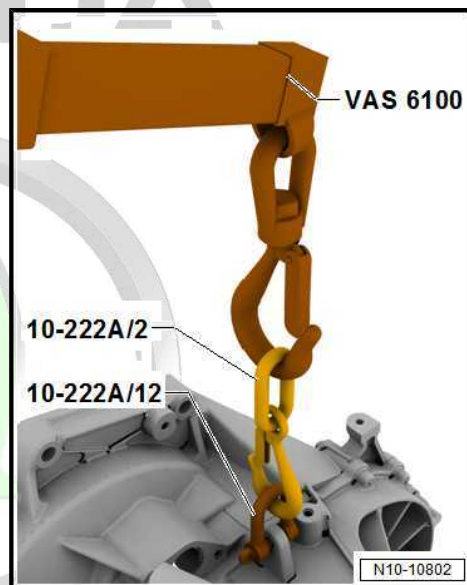
- Engine/gearbox unit removed and attached to engine mount - T10497A- .
- Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter .
- Install shackle - 10-222A/12- on gearbox.
- Hook additional hook - MP9-200/10 (10-222A/2)- with shackle - 10-222A/12- onto the workshop crane - VAS 6100- .



Note

Pre-load the workshop crane - VAS 6100- slightly, but do not raise the gearbox.

- Unscrew engine/gearbox connecting screws ⇒ Rep. gr. 34 ; Removing and installing gearbox .
- Remove gearbox from engine.



1.3 Attach engine attached to engine and gearbox mount

Special tools and workshop equipment required

- ◆ Supporting device - MP9-201 (2024A)-
- ◆ Engine and gearbox support - VAS 6095-
- ◆ Workshop crane , e.g. -VAS 6100-

Work procedure

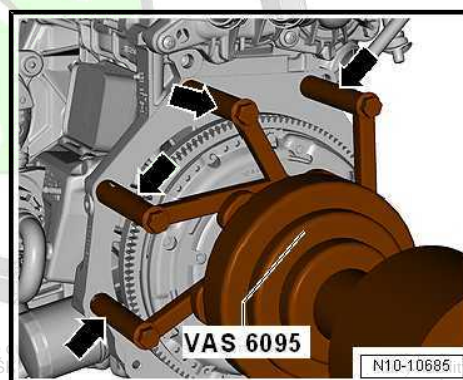
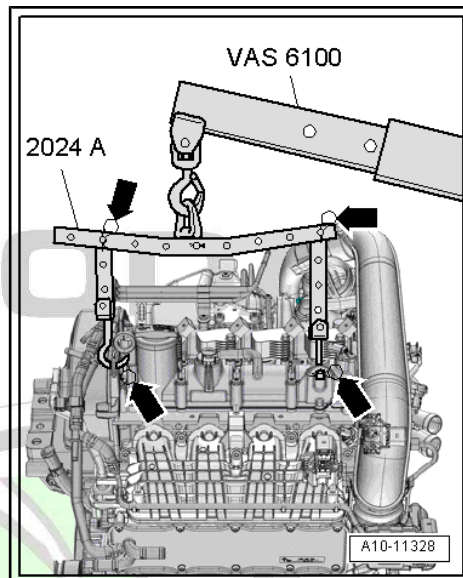
- Gearbox disconnected from engine
⇒ [“1.2 Separate engine and gearbox”, page 19](#) .

- Suspend lifting device - MP9-201 (2024A)- from the engine and workshop crane - VAS 6100- as shown in the illustration.
- For coordination with the unit centre of gravity position the perforated rails must be placed as shown in the illustration.

CAUTION

There is a risk of accident from loose parts of the lifting device.

- The suspension hooks and rig pin on the lifting must be secured using plug-in locks -arrows-.
- Lift engine with installed engine mount T10497A off the engine/gearbox jack - V.A.G 1383 A- with workshop crane - VAS 6100- .
- Remove engine mount T10497A .
- Secure engine with bolts -arrows- at engine and gearbox mount - VAS 6095- as shown in the illustration.



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1.4 Installing engine

Special tools and workshop equipment required

- ◆ Extension - 2024 A /1- of lifting device - MP9-201 (2024A)-
- ◆ Engine and gearbox jack , e.g. -V.A.G 1383A- or -VAS 6931-
- ◆ Engine mount - T10497A-
- ◆ Hose strap pliers , e.g. -VAS 6362-
- ◆ Locking pin - T10060A-
- ◆ Double ladder , e. g. -VAS 5085-
- ◆ Protective goggles and gloves
- ◆ Grease - G 000 100-

For vehicles with manual gearbox

- Clean the serration of the drive shaft and if the clutch disc has been used clean the hub serration, remove any corrosion present and only apply a very thin layer of grease - G 000 100- to the serration of the drive shaft.
- Subsequently move the clutch disc up and down on the drive shaft until the hub fits smoothly on the shaft. Always remove excess grease.
- Check centring of driven plate assembly ⇒ Rep. gr. 30 ; Clutch; removing and installing clutch .

- Check the clutch release bearing for wear. Replace release bearing when worn ⇒ Rep. gr. 30 ; Clutch control; Summary of components- Clutch release mechanism .

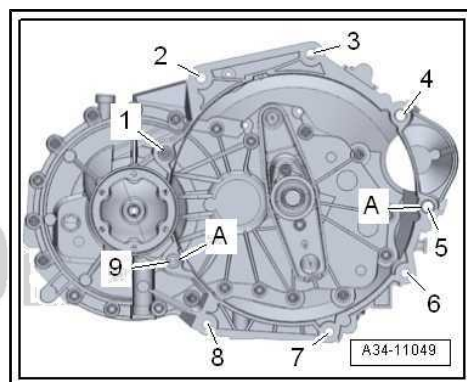
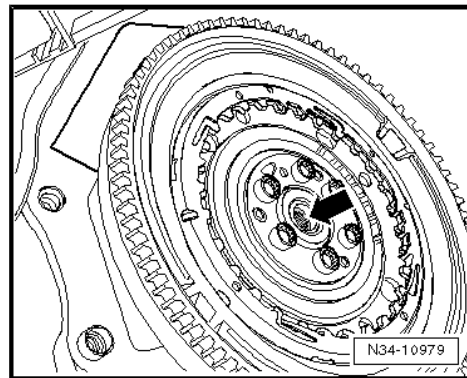
For vehicles with automatic gearbox

- Replace the needle bearing in the crankshaft
⇒ [“3.2 Replace the needle bearing in the crankshaft”, page 63](#) .

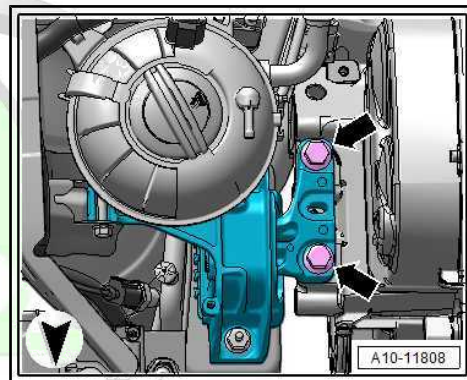
Continued for all vehicles

Installation is performed in the reverse order, pay attention to the following points:

- Screws which have been tightened firmly to a torquing angle must be replaced.
- Replace self-locking nuts, gasket rings, gaskets and O-rings.
- Secure all hose connection ends with spring-type clips that comply with the series design ⇒ ETKA - Electronic Catalogue of Original Parts .
- Fit all cable straps on again in the same place when installing.
- Installing intermediate plate
⇒ [Fig. “Installing intermediate plate””, page 53](#) .
- If there are no dowel sleeves in the cylinder block for centering the engine and gearbox, insert dowel sleeves -A-.
- Screw gearbox securely onto engine at positions -1-, -2-, -3-, -6-, -7-, -8- and -9-.
- Install gearbox support bracket.
- Attach engine/gearbox unit to engine mount - T10497A- .
- Insert engine/gearbox unit into the body.



- Initially insert screws -arrows- for engine mount by hand as far as the stop.



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or gearbox mount by hand as

-

Gearbox mount with 3 screws

- Initially insert screws -arrows- for gearbox mount by hand as far as the stop.

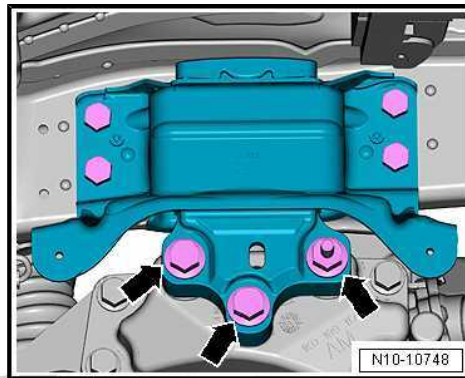
Continued for all vehicles



Note

The screws must not be permanently tightened until the assembly bracket is adjusted

⇒ [“2.1 Assembly overview - assembly mountings”, page 26](#) .



- Remove engine mount - T10497A- from engine.

Vehicles fitted with a manual gearbox

- Connect breather to slave cylinder ⇒ Rep. gr. 30 ; Clutch mechanism; Removing and installing the breather .
- Install linkages with cable support ⇒ Rep. gr. 34 ; Shift mechanism; installing and removing shift mechanism .

Vehicles with automatic gearbox

- Install assembly carrier ⇒ Running gear, axles, steering; Rep. gr. 40 ; Assembly carrier; Removing and installing assembly carrier with steering box .
- Install selector lever linkage, install mechatronics connector and install holders to the gearbox ⇒ Rep. gr. 37 ; Shift mechanism; installing and removing shift mechanism .

For vehicles with four-wheel drive

- Install angle gearbox ⇒ Gearbox; Rep. gr. 34 ; Angle gearbox; Remove angle gearbox .

Continued for all vehicles

- Install exhaust pipe with catalytic converter
⇒ [“2.2 Removing and installing catalytic converter”, page 354](#) .
- Install pendulum support
⇒ [“2.1 Assembly overview - assembly mountings”, page 26](#) .
- Install drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Install track control arm, steering joint and coupling rod ⇒ Chassis, Axles, steering; Rep. gr. 40 ; Bottom track control arm, steering joint; Removing and installing the bottom track control arm .
- Install AC compressor ⇒ Heating, Air Conditioning; Rep. gr. 87 ; AC compressor; Removing and installing AC compressor .
- Install the V-ribbed belt
⇒ [“1.3 Removing and installing V-ribbed belt”, page 41](#) .
- Connect plug for engine control unit - J623-
⇒ [“6 Engine control unit”, page 315](#) .
- Connect coolant hoses with quick coupling
⇒ [Fig. “Connect coolant hose with quick coupling””, page 253](#) .
- Install the front left and right wheelhouse liner⇒ Exterior body work; Rep. gr. 66 ; Wheelhouse liner; Removing and installing the front wheelhouse liner .

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- Install the front wheels ⇒ Chassis, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Adjust the assembly bracket
⇒ [“2.1 Assembly overview - assembly mountings”, page 26](#) .
- Install battery tray and battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Install air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 302](#) .
- Top up and bleed cooling system
⇒ [“1.3 Draining and filling up coolant”, page 225](#) .
- Interrogate all event memories and delete all event entries which are caused by removing and installing the engine ⇒ Vehicle diagnostic tester.
- After deleting the event memory of the engine control unit the readiness code must be re-generated.

! NOTICE

Risk of damaging control units as a result of overvoltage.

- ◆ Do not use charger for jump starting!

Tightening torques



Note

- ◆ *Tightening torques apply only for lightly greased, oiled, phosphatized or blackened nuts and screws.*
- ◆ *Other lubricants such as engine and gearbox oil are allowed, but no lubricants containing graphite.*
- ◆ *Do not use degreased parts.*

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Component		Specified torque
Screws/nuts	M6	9 Nm
	M7	15 Nm
	M8	20 Nm
	M10	40 Nm
	M12	65 Nm
deviations:		
Connecting screws on engine to gearbox ⇒ Rep. gr. 34 ; Installing and removing gearbox; tightening torques for gearbox		
<ul style="list-style-type: none"> ◆ Screws for assembly bracket ⇒ “2.1 Assembly overview - assembly mountings”, page 26 ◆ Cardan shaft guard ⇒ Chassis, axles, steering; Rep. gr. 40 ; Cardan shaft; Removing and installing cardan shaft. 		

2 Assembly bracket

⇒ [“2.1 Assembly overview - assembly mountings”, page 26](#)

⇒ [“2.2 Removing and installing engine mount”, page 28](#)

⇒ [“2.3 Removing and installing gearbox mount”, page 28](#)

⇒ [“2.4 Removing and installing pendulum support”, page 30](#)

⇒ [“2.5 Support the engine in its installed position”, page 31](#)

⇒ [“2.6 Adjusting the unit mounting”, page 33](#)

⇒ [“2.7 Check assembly bracket setting”, page 35](#)

2.1 Assembly overview - assembly mountings

1 - Screw

- ☐ Replace after disassembly
- ☐ order of tightening
⇒ [Fig. “Engine support bracket - tightening torque and tightening order”, page 27](#)
- ☐ 45 Nm + 90°

2 - Engine support bracket

- ☐ Tightening torque and tightening order
⇒ [Fig. “Engine support bracket - tightening torque and tightening order”, page 27](#)
- ☐ removing and installing
⇒ [“1.6 Removing and installing engine support”, page 45](#)

3 - Engine mounting

- ☐ with supporting arm
- ☐ removing and installing
⇒ [“2.2 Removing and installing engine mount”, page 28](#)

4 - Screw

- ☐ Replace after disassembly
- ☐ 40 Nm + 90°

5 - Screw

- ☐ Replace after disassembly
- ☐ 20 Nm + 90°

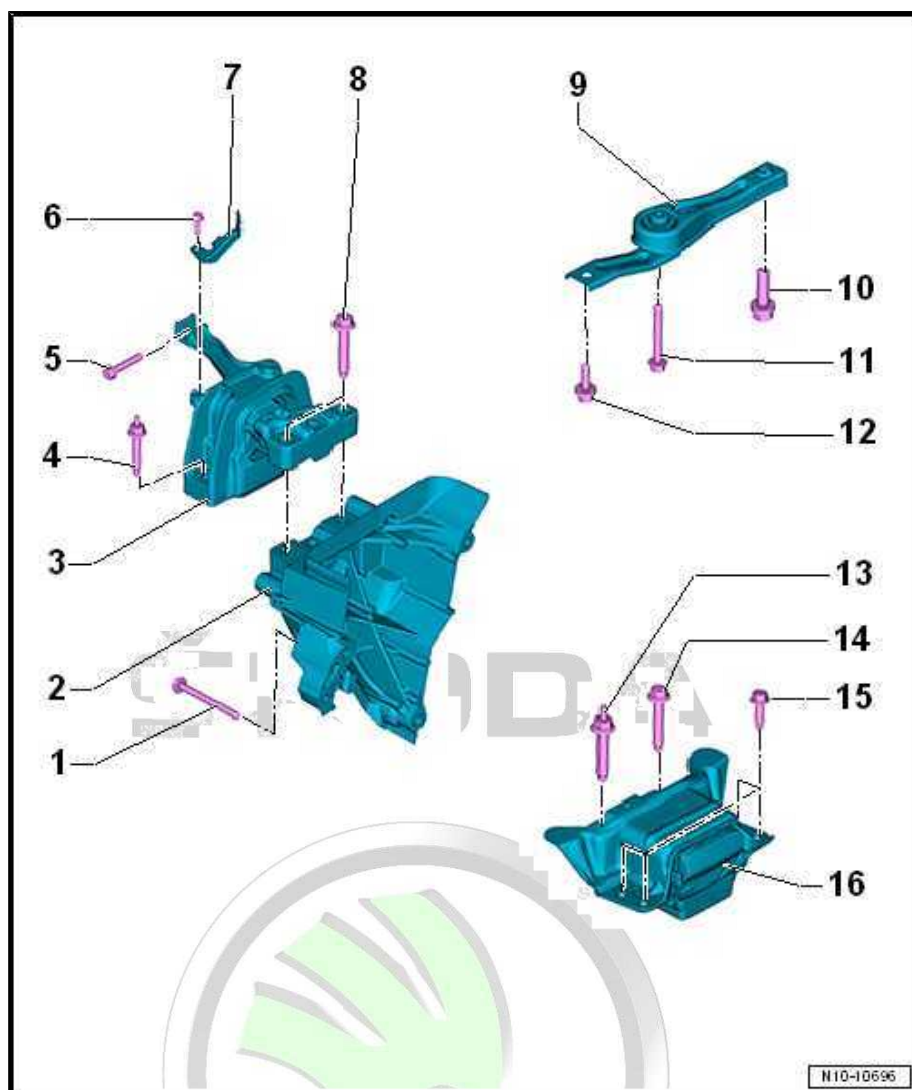
6 - Screw

- ☐ 8 Nm

7 - Support

8 - Screw

- ☐ Replace after disassembly
- ☐ 60 Nm + 90°



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9 - Pendulum support

- ☐ removing and installing ⇒ [“2.4 Removing and installing pendulum support”, page 30](#)

10 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque and tightening order
⇒ Fig. [““Pendulum support - tightening torque and tightening order””, page 27](#)

11 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque and tightening order
⇒ Fig. [““Pendulum support - tightening torque and tightening order””, page 27](#)

12 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque and tightening order
⇒ Fig. [““Pendulum support - tightening torque and tightening order””, page 27](#)

13 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque ⇒ Rep. gr. 34 ; Assembly mountings; Summary of components - assembly mountings

14 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque ⇒ Rep. gr. 34 ; Assembly mountings; Summary of components - assembly mountings

15 - Screw

- ☐ Replace after disassembly
- ☐ 50 Nm + 90°

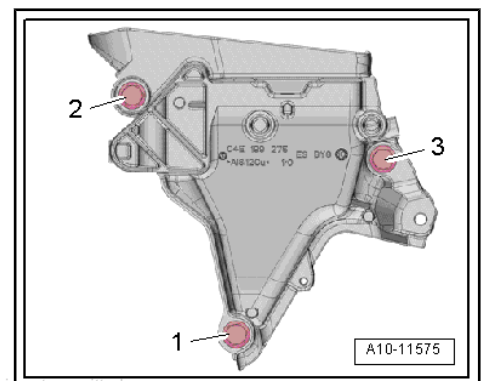
16 - Gearbox mount

- ☐ with supporting arm
- ☐ removing and installing ⇒ [“2.3 Removing and installing gearbox mount”, page 28](#)

Engine support bracket - tightening torque and tightening order

- Tighten screws gradually in the given sequence:

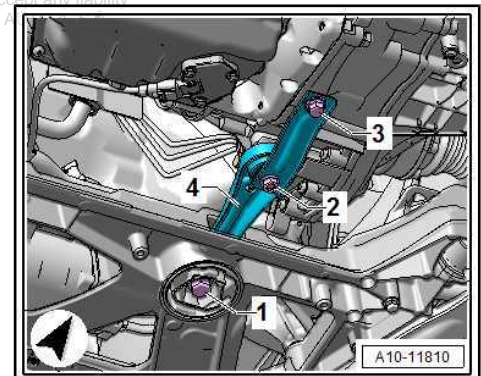
Stage	Screws	Tightening torque/torquing angle
1.	-1...3-	7 Nm
2.	-1...3-	40 Nm
3.	-1...3-	Turn 90° further



Pendulum support - tightening torque and tightening order

- Tighten screws gradually in the given sequence:

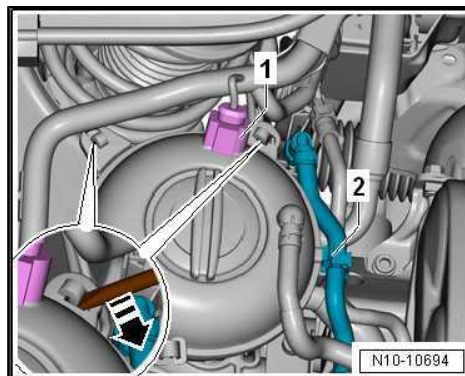
Stage	Screws	Tightening torque/torquing angle
1.	-2-, -3-	50 Nm
2.	-1-	130 Nm
3.	-1...3-	Turn 90° further



2.2 Removing and installing engine mount

Removing

- Separate electrical plug connection -1-.
- Unclip holder -2- with hoses from the expansion tank and place to one side.
- Unlock catches using a screwdriver -arrow- and lay coolant expansion tank to the side.
- Suspend engine into the installation position
⇒ [“2.5 Support the engine in its installed position”, page 31](#).



- Release screws -arrows- and remove engine mount -1-.

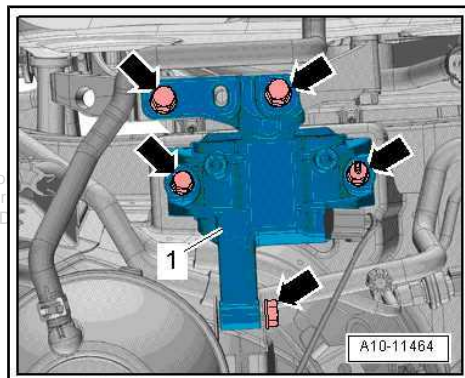
Install

Installation is performed in the reverse order, pay attention to the following points:

- Check assembly bracket setting
⇒ [“2.7 Check assembly bracket setting”, page 35](#).

Tightening torques

- ◆ Assembly bracket
⇒ [“2.1 Assembly overview - assembly mountings”, page 26](#).



2.3 Removing and installing gearbox mount

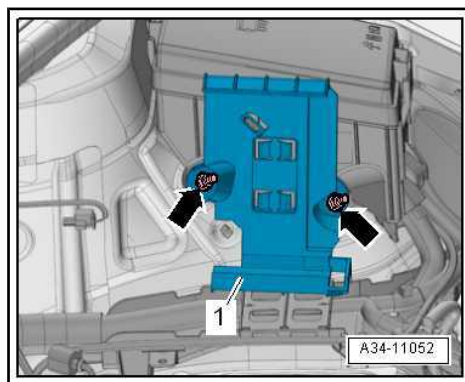
Removing

- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Remove engine control unit
⇒ [“6 Engine control unit”, page 315](#).
- Unscrew screws -arrows- and remove holder -1-.

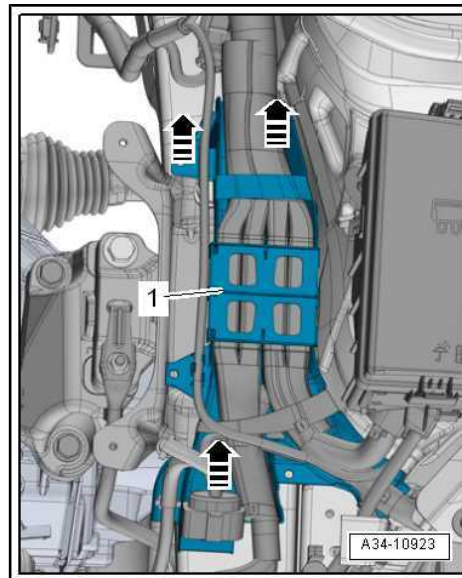


Note

Holders are installed differently according to build version.



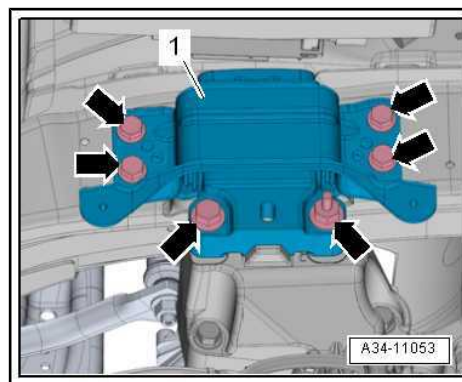
- Unscrew screw -1-, unclip upwards -arrows- and push slightly to the side.
- Suspend engine into the installation position
 ⇒ "2.5 Support the engine in its installed position", page 31 .



Gearbox mount with 2 screws

- Release screws -arrows- and remove gearbox mount -1-.

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Gearbox mount with 3 screws

- Unscrew screws -2- and then screws -1-.
- Remove gearbox mount -1-.

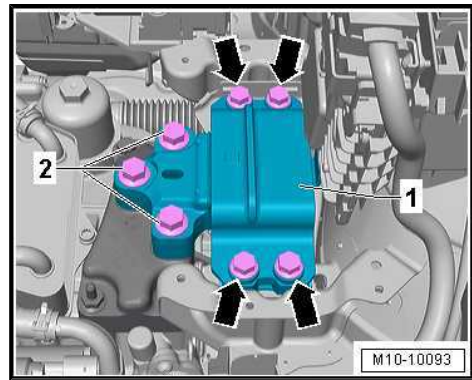
Install

Installation is performed in the reverse order, pay attention to the following points:



NOTICE

There is a risk of damaging the thread in the gearbox support bracket by positioning the bolts obliquely.



- ♦ Before screwing in the screws -arrows- the gearbox support bracket and supporting arm of the gearbox mount must be absolutely parallel to each other. If necessary, push up gearbox at the rear using a hydraulic trolley jack.
- ♦ Do not remove supporting device - T30099- until the bolts securing the gearbox mount have been tightened to specified torque.
- Lift gearbox with the support bracket spindle until the gearbox support bracket is touching the supporting arm of the gearbox mount.
- Check assembly bracket setting
⇒ [“2.7 Check assembly bracket setting”, page 35](#) .
- Remove supporting device - T30099- .

Tightening torques

- ♦ Assembly bracket
⇒ [“2.1 Assembly overview - assembly mountings”, page 26](#) .

2.4 Removing and installing pendulum support

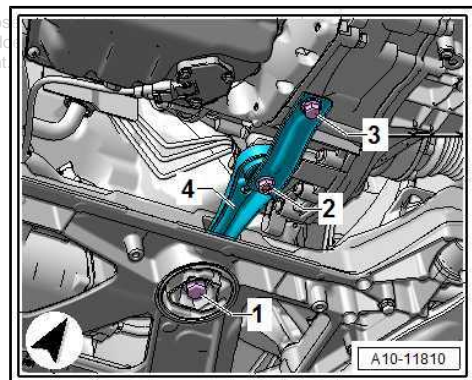
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Undo screws -1-, -2-, -3- and remove the pendulum support.

Install

Installation is performed in the reverse order, pay attention to the following points:

Tightening torques

- ♦ Pendulum support
⇒ [“2.1 Assembly overview - assembly mountings”, page 26](#)



2.5 Support the engine in its installed position

⇒ [“2.5.1 Support the engine in installation position, Superb III”, page 31](#)

⇒ [“2.5.2 Support the engine in its installed position, Kodiaq”, page 32](#)

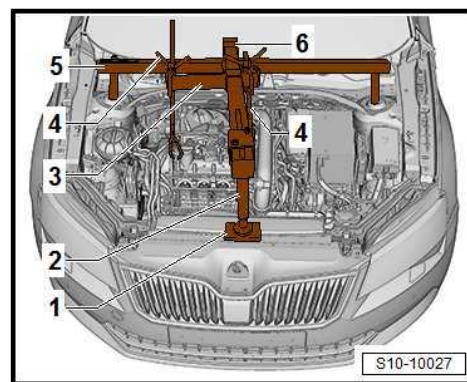
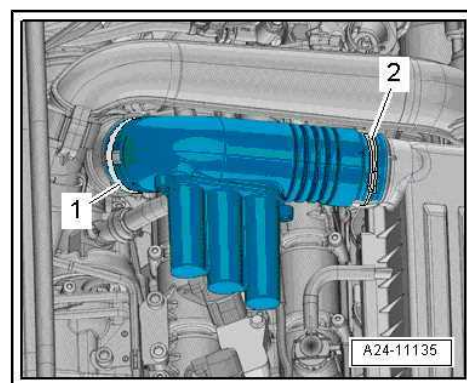
2.5.1 Support the engine in installation position, Superb III

Special tools and workshop equipment required

- ◆ Surface - T30119-
 - ◆ Support - 10-222A/31-3-
 - ◆ Adapter - MP9-200/18 (10-222A/18)-
 - ◆ Hook for MP9-200 and T30099 - MP9-200/10 (10-222A/10)-
 - ◆ Supporting device - T30099-
 - ◆ Adapter - T40091/3-
 - Loosen hose clamps -1-, -2- and remove air guide pipes.
 - Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 302](#) .
 - Remove the plenum panel cover ⇒ External body repairs; Rep. gr. 50 ; Bulkhead; Assembly overview - plenum panel cover .
 - Remove caps of screwed connections for front suspension strut domes.
 - Install adapter -3- with hook for MP9-200 and T30099 -4- and support -2-.
 - Place support bracket -5- with support -2- and base -1- on the screwed connections of the front suspension strut domes.
- 1 - Surface - T30119-
- 2 - Support - 10-222A/31-3-
- 3 - Adapter - MP9-200/18 (10-222A/18)-
- 4 - Hook for MP9-200 and T30099 - MP9-200/10 (10-222A/10)-
- 5 - Supporting device - T30099-
- 6 - Adapter - T40091/3-
- Attach snap hook to the engine suspension eyes.
- Slightly pre-tension the engine/gearbox unit via hooks MP9-200 and T30099 - MP9-200/10- , but do not raise.

Tightening torques

- ◆ Battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery
- ◆ Windscreen wiper arms ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Removing and installing windscreen wiper arms .



2.5.2 Support the engine in its installed position, Kodiaq

Special tools and workshop equipment required

- ◆ Supporting device - MP9-200 (10 - 222 A)-
- ◆ Adapter - 10 - 222 A /29-
- ◆ Adapter - MP9-200/18 (10-222A/18)-
- ◆ Hook for MP9-200 and T30099 - MP9-200/10 (10-222A/10)-
- ◆ Adapter - T40091/3-
- ◆ Carrier part - T40091/1-
- ◆ Spindle - T40093 /3-
- ◆ Adapter - T40093/3-6-
- Loosen hose clamps -1-, -2- and remove air guide pipes.
- Remove air filter housing
⇒ **"3.2 Removing and installing air filter housing", page 302** .
- To fit the supporting device , the cross member of the front wall must be detached on the right side of the vehicle.

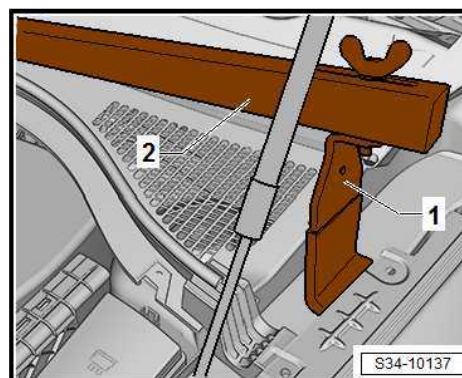
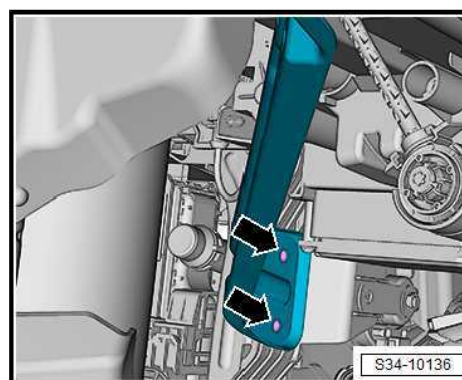
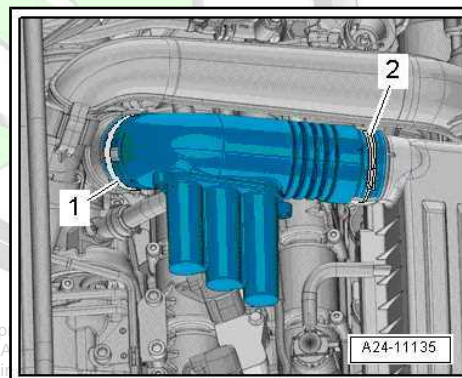
Detaching the cross member creates a space to fit the spindle - T40093 /3- with adapter - T40093/3-6- for the supporting device .

- Remove the front right wheelhouse liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheelhouse liner; Removing and installing the front wheelhouse liner .

- Unscrew screws -arrows- and detach the cross member from the front wall.

- Fit the adapter - 10 - 222 A /29- -1- under the wing plate on both sides of the vehicle, as shown.
- Adapter with symbol "L" is installed on the "right" side of the vehicle.
- Adapter with symbol "R" is installed on the "left" side of the vehicle.
- The arrow shows the direction of travel on each side.

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- Fit supporting device - MP9-200 (10 - 222 A)- together with the other elements, as shown.

A - Adapter - MP9-200/18 (10-222A/18)-

B - Adapter - T40093/3-6-

C - Carrier part - T40091/1-

D - Spindle - T40093 /3-

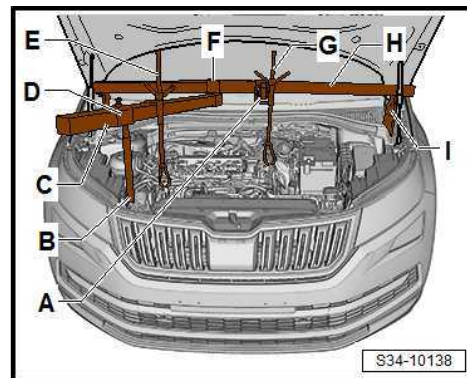
E - Hook for MP9-200 and T30099 - MP9-200/10 (10-222A/10)-

F - Adapter - T40091/3-

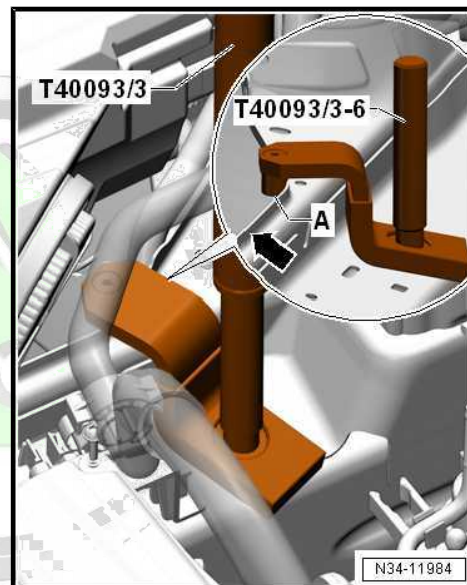
G - Hook for MP9-200 and T30099 - MP9-200/10-

H - Supporting device - MP9-200 (10 - 222 A)-

I - Adapter - 10 - 222 A /29-

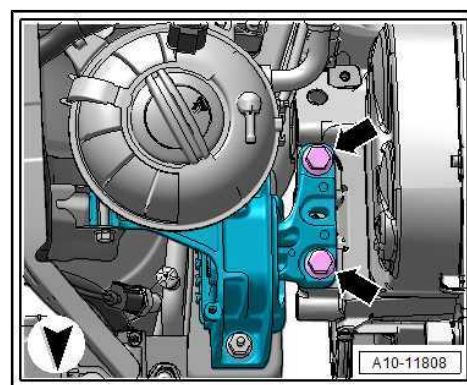


- Position the adapter - T40093/3-6- on the frame side rail as shown.
- The adapter - T40093/3-6- must be secured by the bolt -A- to the flange of the frame side rail -arrow-.
- Connect adapter - T40093/3-6- to the spindle - T40093 /3- and pre-tension assembled supporting device .
- Slightly pre-tension the engine/gearbox unit via hooks MP9-200 and T30099 - MP9-200/10- , but do not raise.



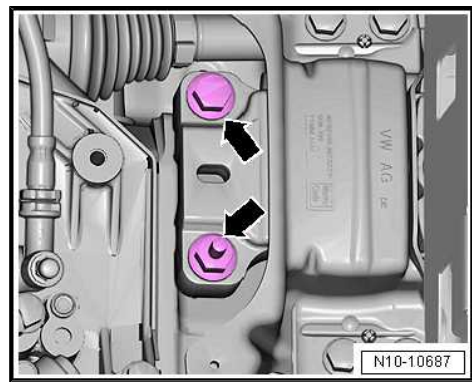
2.6 Adjusting the unit mounting

- Suspend engine into the installation position
⇒ [“2.5 Support the engine in its installed position”, page 31](#) .
- Unscrew screws -arrows- for engine mount one after another and replace (if not already done during engine installation).
- Firstly, loosely insert the screws.
- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .



Gearbox mount with 2 screws

- Unscrew screws -arrows- for gearbox mount one after another and replace (if not already done during engine installation).

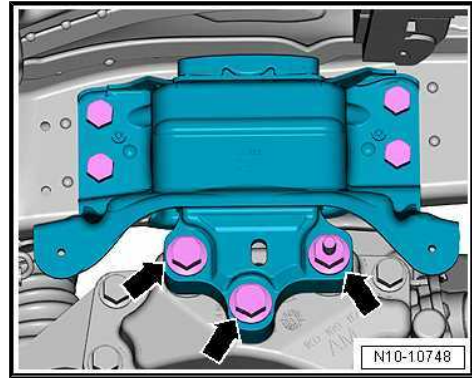


Gearbox mount with 3 screws

- Unscrew screws -arrows- for gearbox mount one after another and replace (if not already done during engine installation).

Continued for all vehicles

- Firstly, loosely insert the screws.



- Move engine/gearbox unit with an assembly lever until the following dimensions are set:

A distance of $-a- = 10 \text{ mm}$ must be present between engine support -2- and engine mount -1-.

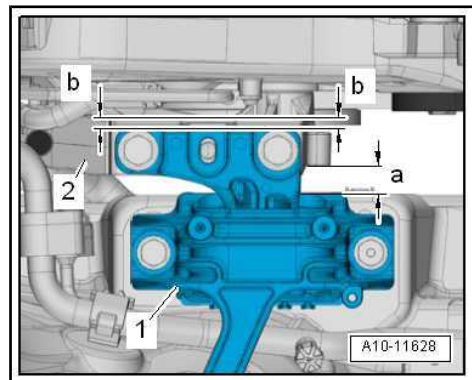
The cast edge on the engine support -2- must be parallel with the engine mount supporting arm -1-.

Dimension $-b- = -b-$.



Note

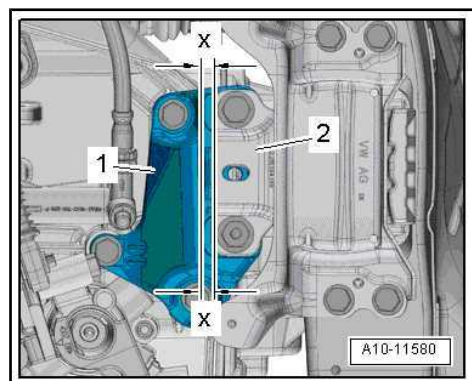
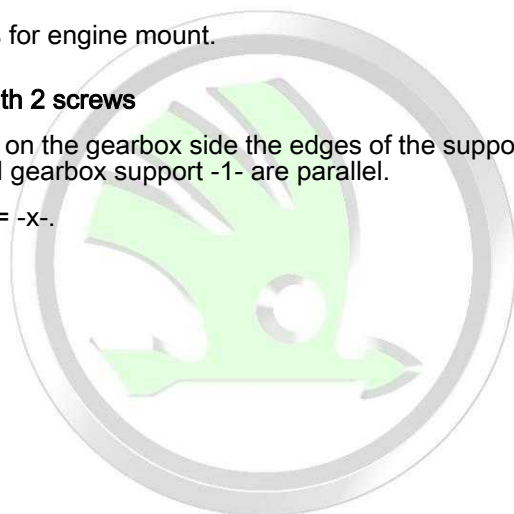
The distance $-a- = 10 \text{ mm}$ can be checked, for example with suitable round bars.



- Tighten screws for engine mount.

Gearbox mount with 2 screws

- Make sure that on the gearbox side the edges of the supporting arm -2- and gearbox support -1- are parallel.
- Dimension $-x- = -x-$.



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Gearbox mount with 3 screws

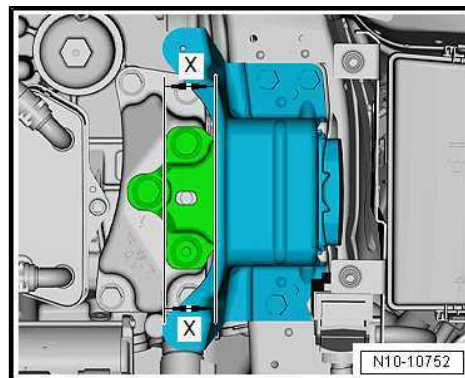
- Make sure that on the gearbox side the edges of the supporting arm and gearbox support are parallel.
- Dimension -x- = -x-.

Continued for all vehicles

- Tighten gearbox mount screws.

Tightening torques

- ◆ Assembly bracket
⇒ [“2.1 Assembly overview - assembly mountings”, page 26](#).
- ◆ Battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery



2.7 Check assembly bracket setting

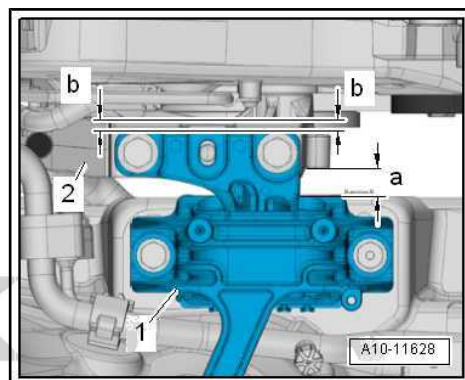
The following dimensions must be reached:

- A distance of -a- = 10 mm must be present between engine support -2- and engine mount -1-.
- The cast edge on the engine support -2- must be parallel with the engine mount supporting arm -1-.
- Dimension -b- = -b-.

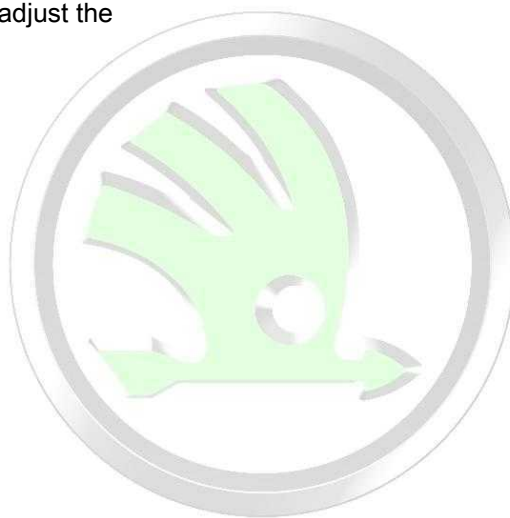


Note

The distance -a- = 10 mm can be checked, for example with suitable round bars.



- If the measured distance is too great or too small, adjust the assembly bracket
⇒ [“2.6 Adjusting the unit mounting”, page 33](#).



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1 Cylinder block (pulley end)

- ⇒ [“1.1 Assembly overview - ribbed V-belt drive”, page 36](#)
- ⇒ [“1.2 Summary of components - sealing flange on the belt pulley side”, page 40](#)
- ⇒ [“1.3 Removing and installing V-ribbed belt”, page 41](#)
- ⇒ [“1.4 Removing and installing tensioner pulley for ribbed V-belt”, page 43](#)
- ⇒ [“1.5 Installing and removing the vibration damper”, page 43](#)
- ⇒ [“1.6 Removing and installing engine support”, page 45](#)
- ⇒ [“1.7 Replacing crankshaft sealing ring - belt pulley end”, page 48](#)
- ⇒ [“1.8 Removing and installing the sealing flange on the belt pulley side”, page 50](#)

1.1 Assembly overview - ribbed V-belt drive

- ⇒ [“1.1.1 Summary of components - Vehicles without air conditioning”, page 36](#)
- ⇒ [“1.1.2 Summary of components - Vehicles with air conditioning”, page 38](#)

1.1.1 Summary of components - Vehicles without air conditioning



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1 - Screw

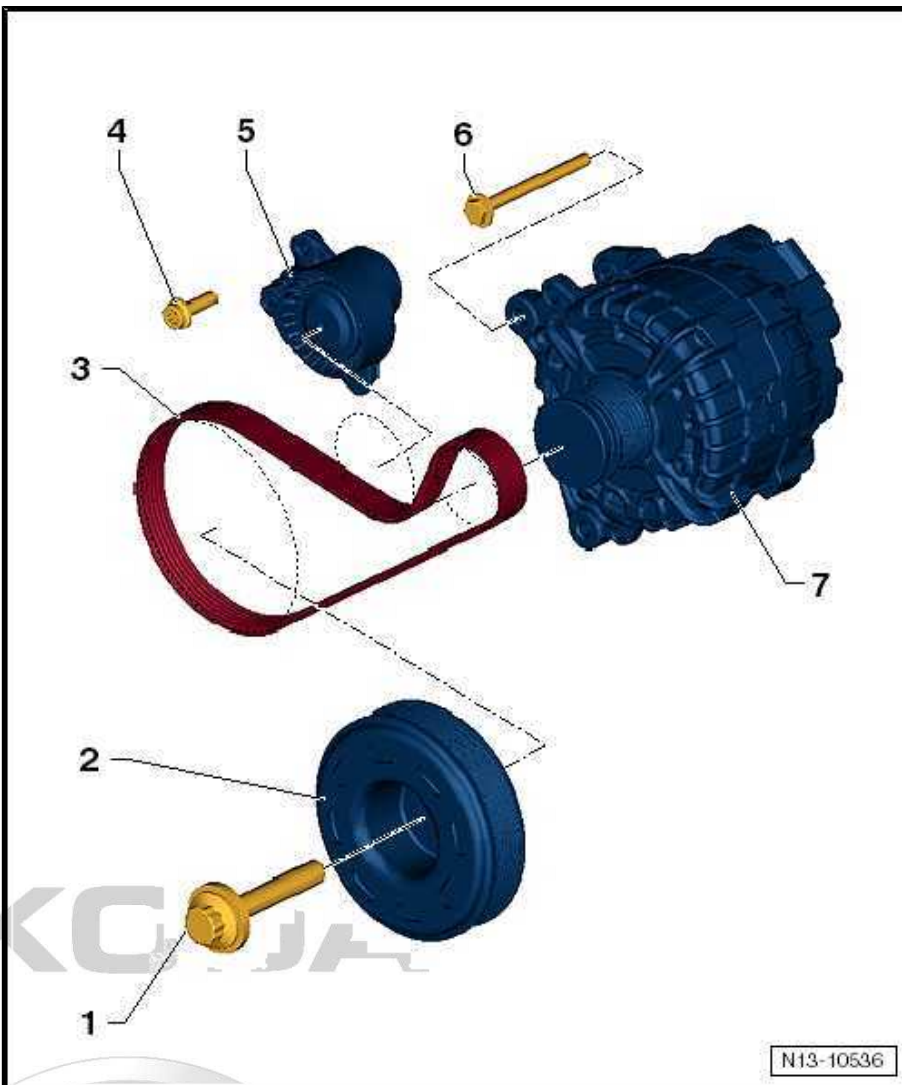
- ☐ Replace after disassembly
- ☐ to release and tighten use counterholder - T10475-
- ☐ 150 Nm + 180°

2 - Vibration damper

- ☐ with vibration damper
- ☐ removing and installing
⇒ ["1.5 Installing and removing the vibration damper", page 43](#)

3 - V-ribbed belt

- ☐ check for wear
- ☐ mark the direction of rotation with chalk or a felt-tip pen before removing
- ☐ do not kink
- ☐ depending on the model of the belt pulley for alternator, the correct length of the V-ribbed belt must be assigned ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ Routing of the ribbed V-belt ⇒ [page 41](#)
- ☐ removing and installing
⇒ ["1.3 Removing and installing V-ribbed belt", page 41](#)
- ☐ pay attention to the correct position on the belt pulley when installing it.



4 - Screw

- ☐ Replace after disassembly
- ☐ 20 Nm + 90°

5 - Swivel tensioning pulley for poly V-belt

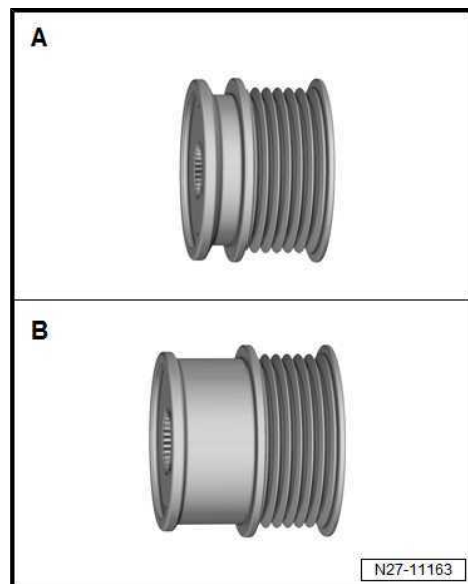
- ☐ swivel with socket to slacken the V-ribbed belt
- ☐ lock with locking pin - T10060 A-
- ☐ removing and installing ⇒ ["1.4 Removing and installing tensioner pulley for ribbed V-belt", page 43](#)

6 - Screw

- ☐ 23 Nm

7 - Generator

- ☐ Removing and installing ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .
- ☐ Depending on the model of the alternator, different separation ribbed V-belt pulleys can be fitted with freewheel -A- and -B- ⇒ [Fig. "Model of the V-ribbed belt pulley with freewheel" , page 38](#)
- ☐ depending on the model of the belt pulley for alternator, the correct length of the ribbed V-belt must be assigned ⇒ ETKA - Electronic Catalogue of Original Parts



1.1.2 Summary of components - Vehicles with air conditioning

1 - V-ribbed belt

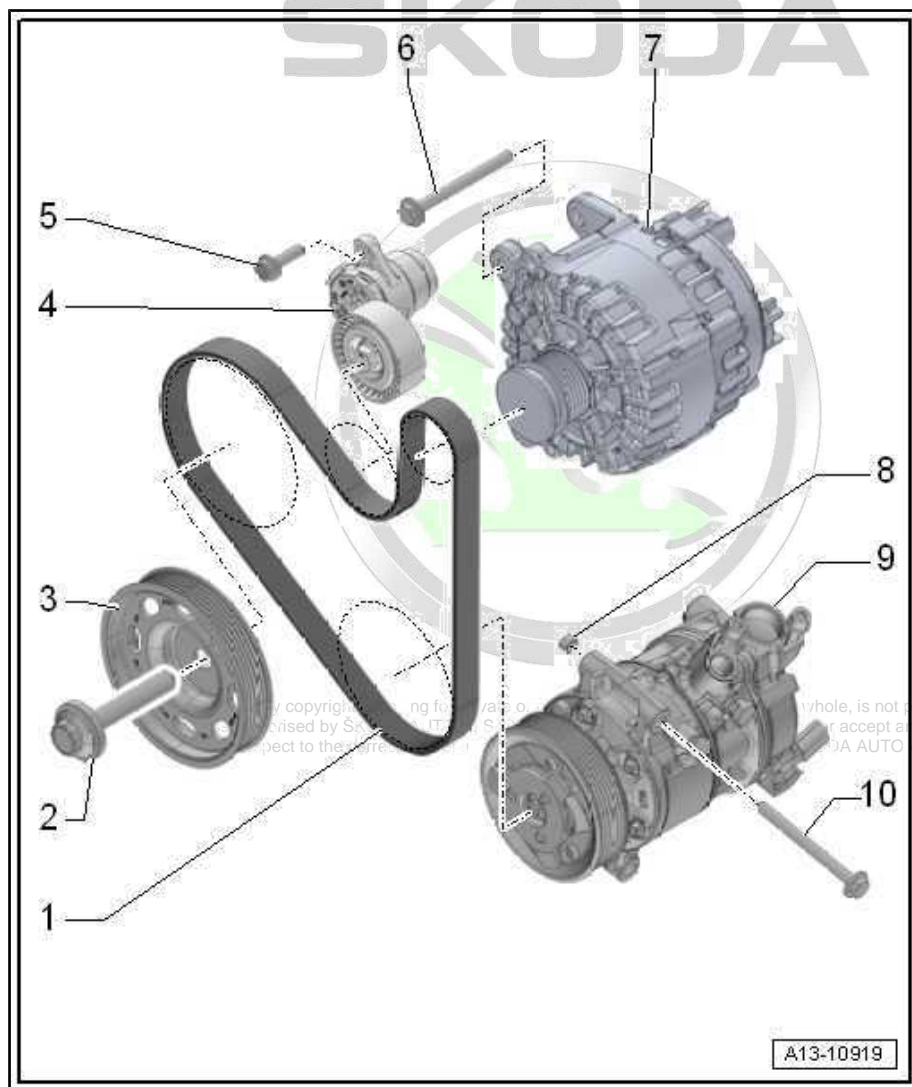
- ☐ check for wear
- ☐ mark the direction of rotation with chalk or a felt-tip pen before removing
- ☐ do not kink
- ☐ depending on the model of the belt pulley for alternator, the correct length of the V-ribbed belt must be assigned ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ Routing of the ribbed V-belt ⇒ [page 42](#)
- ☐ removing and installing ⇒ ["1.3.1 Removing and installing V-ribbed belt - Vehicles without air conditioning", page 41](#)
- ☐ pay attention to the correct position on the belt pulley when installing it.

2 - Screw

- ☐ Replace after disassembly
- ☐ to release and tighten use counterholder - T10475-
- ☐ 150 Nm + 180°

3 - Vibration damper

- ☐ with vibration damper
- ☐ removing and installing ⇒ ["1.5 Installing and removing the vibration damper", page 43](#)



4 - Swivel tensioning pulley for poly V-belt

- ☐ swivel with socket to slacken the V-ribbed belt
- ☐ lock with locking pin - T10060 A-
- ☐ removing and installing ⇒ [“1.4 Removing and installing tensioner pulley for ribbed V-belt”, page 43](#)

5 - Screw

- ☐ 20 Nm + 90°

6 - Screw

- ☐ 23 Nm

7 - Generator

- ☐ Removing and installing ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .
- ☐ Depending on the model of the alternator, different separation ribbed V-belt pulleys can be fitted with freewheel -A- and -B- ⇒ Fig. [“Model of the V-ribbed belt pulley with freewheel”](#) , page 39
- ☐ depending on the model of the belt pulley for alternator, the correct length of the V-ribbed belt must be assigned ⇒ ETKA - Electronic Catalogue of Original Parts

8 - Fitting sleeve

- ☐ for the AC compressor

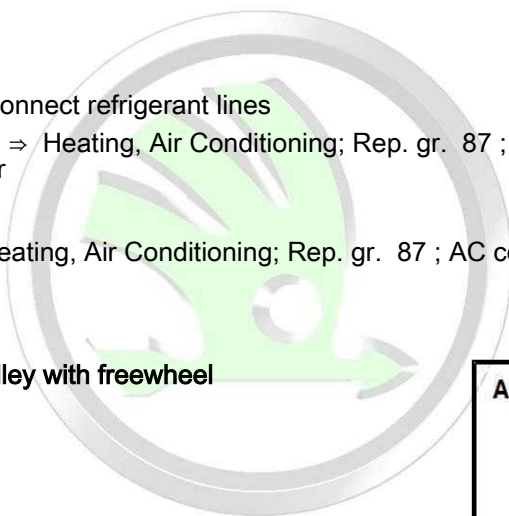
9 - AC compressor

- ☐ Do not unscrew or disconnect refrigerant lines
- ☐ installing and removing ⇒ Heating, Air Conditioning; Rep. gr. 87 ; AC compressor; installing and removing AC compressor

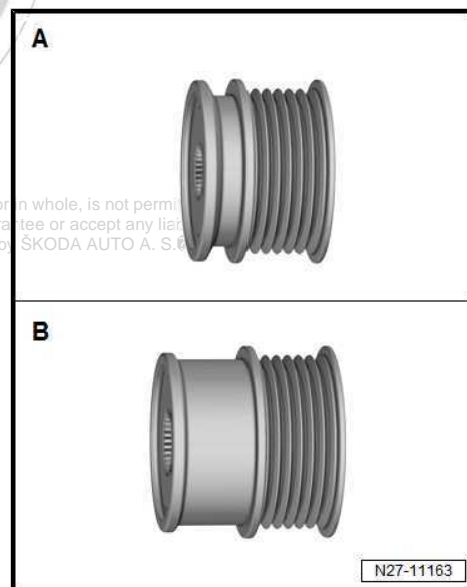
10 - Screw

- ☐ Tightening torque ⇒ Heating, Air Conditioning; Rep. gr. 87 ; AC compressor; installing and removing AC compressor

Model of the V-ribbed belt pulley with freewheel



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1.2 Summary of components - sealing flange on the belt pulley side

1 - Screw

- ☐ Replace after disassembly
- ☐ to release and tighten use counterholder - T10475-
- ☐ Tightening torque
⇒ [“1.1 Assembly overview - ribbed V-belt drive”, page 36](#)

2 - Vibration damper

- ☐ with vibration damper
- ☐ removing and installing
⇒ [“1.5 Installing and removing the vibration damper”, page 43](#)

3 - Sealing ring

- ☐ for crankshaft on the belt pulley side
- ☐ replace after removal
⇒ [“1.7 Replacing crankshaft sealing ring - belt pulley end”, page 48](#)
- ☐ do not oil

4 - Sealing flange on the belt pulley side

- ☐ must be positioned on dowel pins
- ☐ removing and installing
⇒ [“1.8 Removing and installing the sealing flange on the belt pulley side”, page 50](#)

5 - Screw

- ☐ Different diameters⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ Replace after disassembly
- ☐ Tightening torque and tightening order
⇒ [Fig. “Sealing flange on the belt pulley side - tightening torque and tightening order”, page 41](#)

6 - Gasket

- ☐ Replace after disassembly

7 - Cylinder block

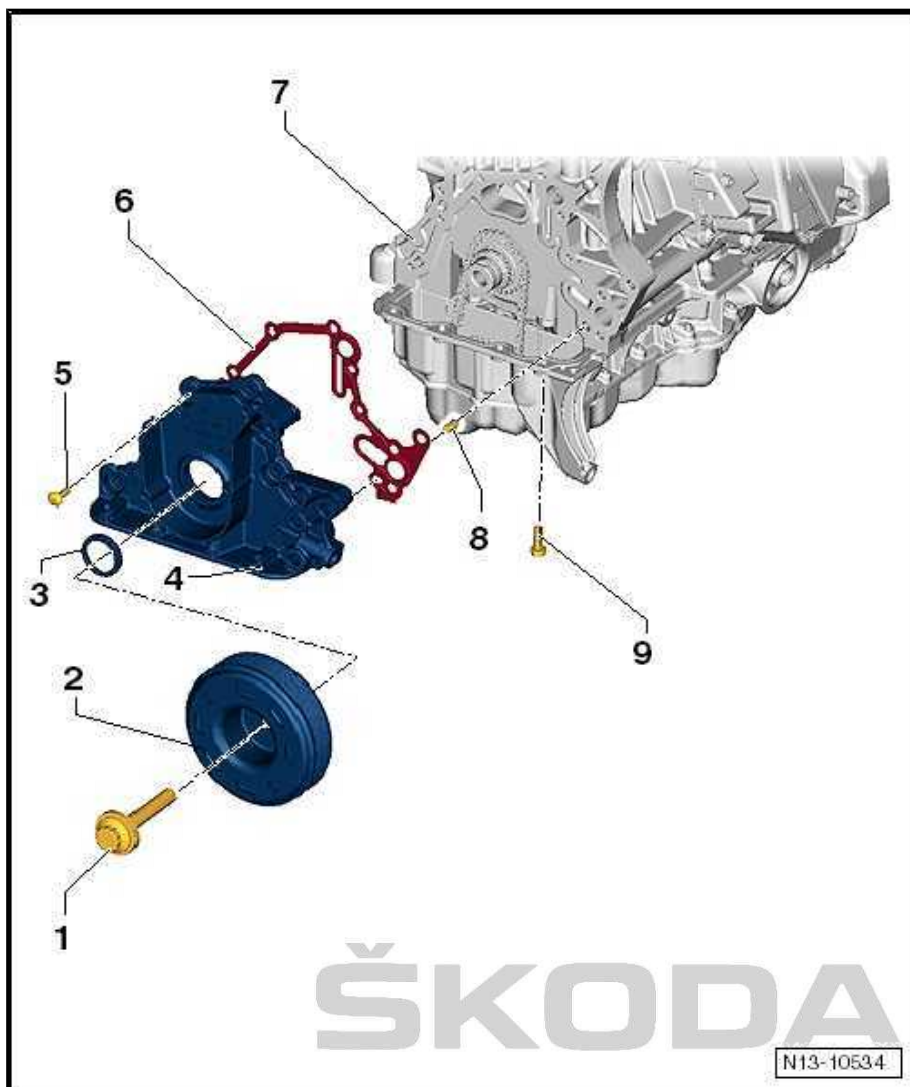
- ☐ After replacing, fill with fresh coolant ⇒ [“1.3 Draining and filling up coolant”, page 225](#)

8 - Fit pin

- ☐ 2 pieces

9 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque and tightening order ⇒ [“1.1 Assembly overview - sump/oil pump”, page 195](#)

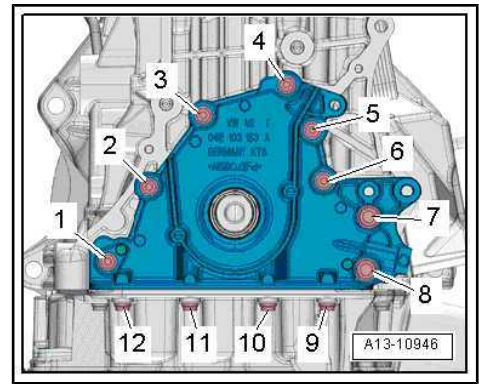


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Sealing flange on the belt pulley side - tightening torque and tightening order

- Tighten screws gradually:

Stage	Screws	Tightening torque/torquing angle
1.	-1...12-	by hand as far as the stop
2.	-1...12-	crosswise to 8 Nm
3.	-7-, -8-	20 Nm
4.	-1...12-	Turn 90° further



1.3 Removing and installing V-ribbed belt

⇒ "1.3.1 Removing and installing V-ribbed belt - Vehicles without air conditioning", page 41

⇒ "1.3.2 Removing and installing V-ribbed belt - Vehicles with air conditioning", page 42

1.3.1 Removing and installing V-ribbed belt - Vehicles without air conditioning

Special tools and workshop equipment required

- ◆ Locking pin - T10060 A-

Removing

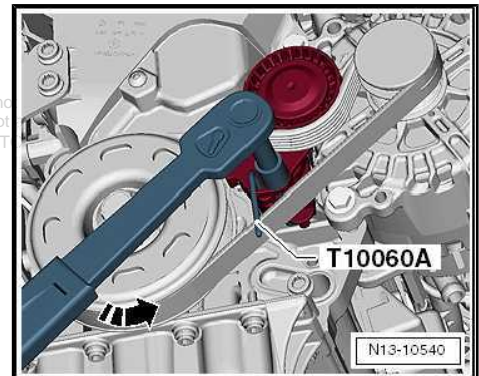
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Swing the tensioning pulley in -direction of arrow- to detension the V-ribbed belt.
- Lock tensioning pulley with locking pin - T10060 A-



Note

There is a risk of destruction through reversing the rotation direction of an already used V-ribbed belt.

- Mark the direction of rotation with chalk or a felt-tip pen on the V-ribbed belt for re-installation before removing the V-ribbed belt.
- Remove the ribbed V-belt.

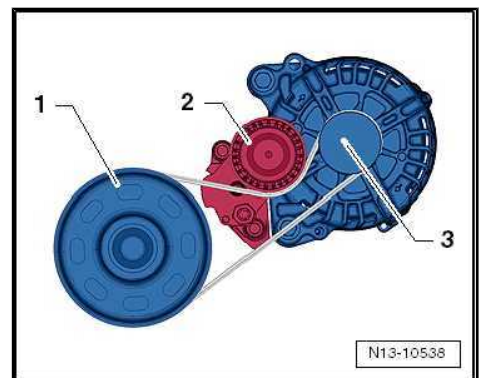


Install

Installation is performed in the reverse order, pay attention to the following points:

- Lay the V-ribbed belt as shown in the illustration.

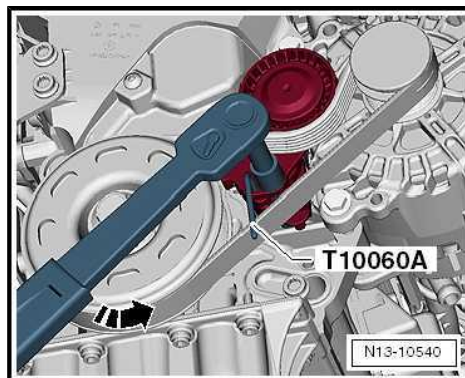
- 1 - Ribbed V-belt pulley
- 2 - Swivel tensioning pulley for poly V-belt
- 3 - Generator



- Turn the tensioning pulley in -direction of arrow- and pull out the locking pin - T10060A- .
- Release tension on tensioning pulley.
- Check that the poly V-belt is positioned correctly.
- Start end and check that the V-ribbed belt is running correctly.

Tightening torques

- ◆ Noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation.



1.3.2 Removing and installing V-ribbed belt - Vehicles with air conditioning

Special tools and workshop equipment required

- ◆ Locking pin - T10060 A-

Removing

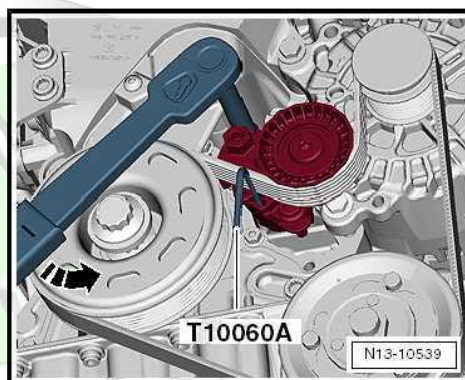
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Swing the tensioning pulley in -direction of arrow- to detension the V-ribbed belt.
- Lock tensioning pulley with locking pin - T10060 A- .



Note

There is a risk of destruction through reversing the rotation direction of an already used V-ribbed belt.

- Mark the direction of rotation with chalk or a felt-tip pen on the V-ribbed belt for re-installation before removing the V-ribbed belt.
- Remove the ribbed V-belt.

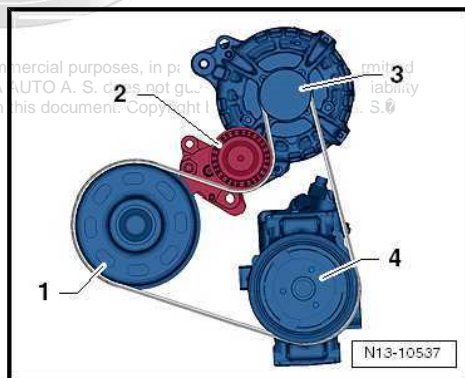


Install

Installation is performed in the reverse order, pay attention to the following points:

- Lay the V-ribbed belt as shown in the illustration:

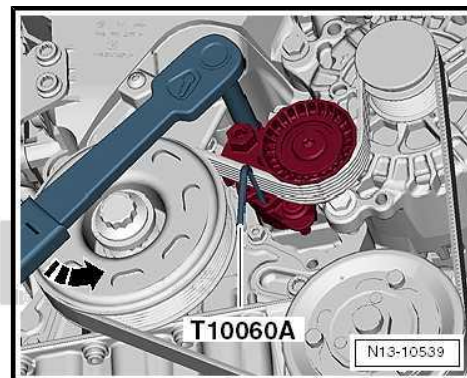
- 1 - Ribbed V-belt pulley
- 2 - Swivel tensioning pulley for poly V-belt
- 3 - Generator
- 4 - AC compressor



- Turn the tensioning pulley in -direction of arrow- and pull out the locking pin - T10060A- .
- Release tension on tensioning pulley.
- Check that the poly V-belt is positioned correctly.
- Start end and check that the V-ribbed belt is running correctly.

Tightening torques

- ◆ Noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation.



1.4 Removing and installing tensioner pulley for ribbed V-belt

Removing

- Remove the V-ribbed belt from the tensioning device ⇒ [“1.3 Removing and installing V-ribbed belt”, page 41](#) .
- Unscrew screws -arrows- and pull off tensioning pulley -1- for V-ribbed belt.

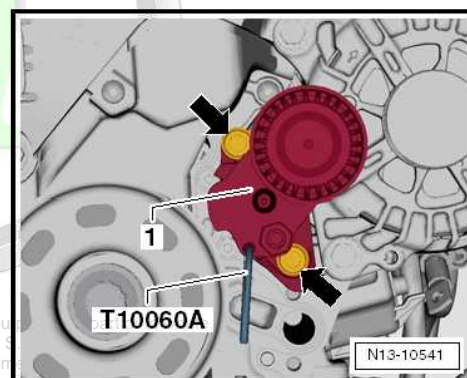
Install

Installation is performed in the reverse order, pay attention to the following points:

- Install the V-ribbed belt ⇒ [“1.3 Removing and installing V-ribbed belt”, page 41](#) .

Tightening torques

- ◆ Tensioning pulley ⇒ [“1.1 Assembly overview - ribbed V-belt drive”, page 36](#) .



1.5 Installing and removing the vibration damper

Special tools and workshop equipment required

- ◆ Counterholder - T10475-

Removing

- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Remove V-ribbed belt ⇒ [“1.3 Removing and installing V-ribbed belt”, page 41](#) .

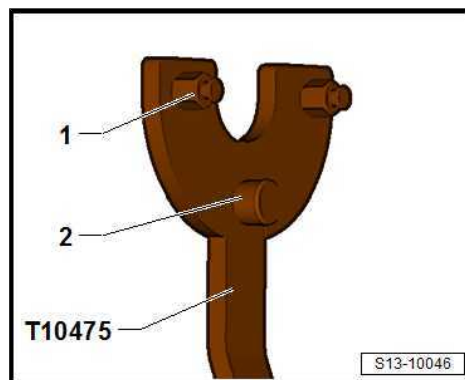


Note

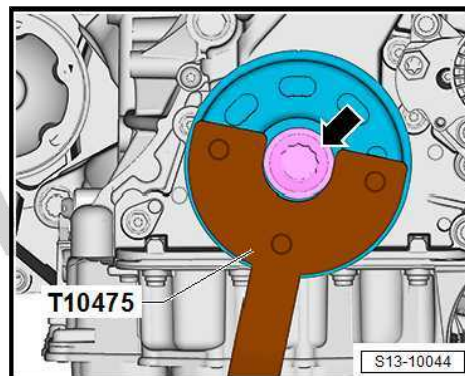
- ◆ *Two versions of the vibration dampers may be available, which differ in terms of the position of the holes for the vibration damper's catch.*
- ◆ *If the counterholder - T10475- cannot be position on the vibration damper, the counterholder must be adjusted.*

Adjust counterholder - T10475-

- Unscrew the support pin - T10475/1- -2- from the counterholder - T10475- .
- Unscrew the vibration damper holding pin -1- from the counterholder - T10475- and screw into the hole for the support pin - T10475/1- -2-.



Position the counterholder - T10475- on the vibration damper – version 1



Position the adjusted counterholder - T10475- on the vibration damper – version 2

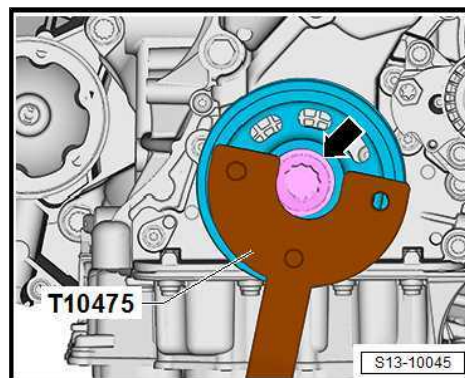
Continue removal

- Loosen screw -arrow- for vibration damper; to do so, use counterholder - T10475- .
- Unscrew screw and remove vibration damper.



Risk of destruction of the engine.

- ◆ So as not to adjust the timing the crankshaft must not be turned while the vibration damper is removed.



Install



Note

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All contact surfaces between screws, vibration damper and crankshaft pulley must be free of oil and grease.

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

- Install the V-ribbed belt
⇒ [“1.3 Removing and installing V-ribbed belt”, page 41](#) .

Tightening torques

- ◆ Screw for vibration damper
⇒ [“1.1 Assembly overview - ribbed V-belt drive”, page 36](#) .

1.6 Removing and installing engine support

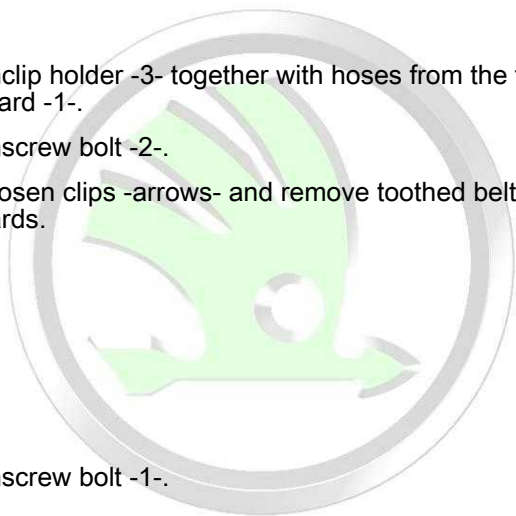
Removing

- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Loosen hose clamps -1- and -2- and remove air guide pipe.
- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 302](#) .
- Remove tensioning pulley for V-ribbed belt
⇒ [“1.4 Removing and installing tensioner pulley for ribbed V-belt”, page 43](#) .

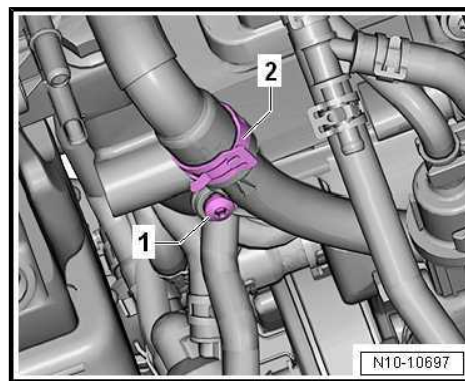
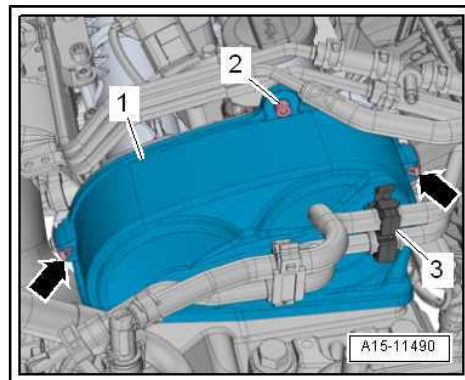
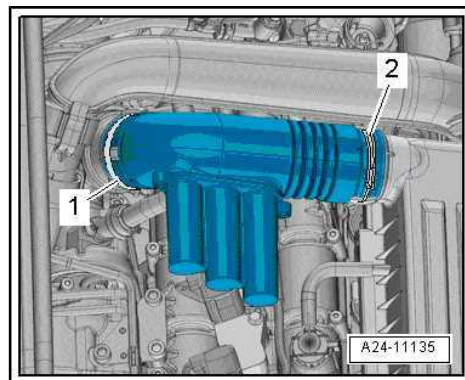
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- Unclip holder -3- together with hoses from the toothed belt guard -1-.
- Unscrew bolt -2-.
- Loosen clips -arrows- and remove toothed belt guard -1- upwards.

- Unscrew bolt -1-.



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- Unscrew screws -1- and remove the catalytic converter holder -2-.

⚠ CAUTION

Risk of injury caused by fuel which is under high pressure.

Lay a clean cloth around the connection point and carefully slacken the connection point in order to relieve the pressure in the fuel system.

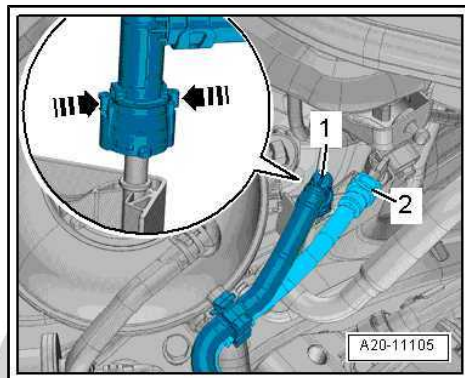
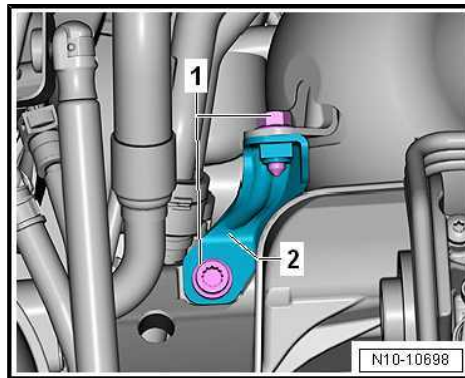
ⓘ NOTICE

Risk of malfunctions caused by soiling.

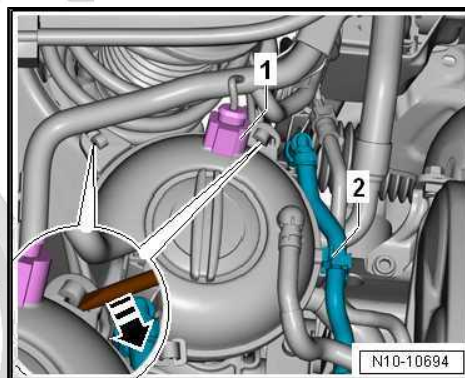
Observe safety measures and rules for cleanliness

⇒ [“3.1 Cleanliness rules”, page 6](#) .

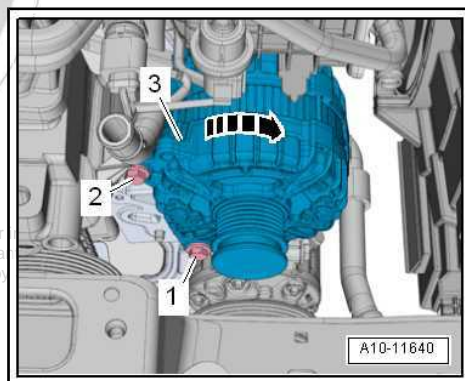
- Separate fuel feed line -1- and the line to activated charcoal filter -2-.



- Disconnect plug connection -1-.
- Unclip holder -2- with hoses from the expansion tank and place to one side.
- Unlock catches using a screwdriver -arrow- and lay coolant expansion tank to the side.
- Open holding clamps on the air conditioning system pipes.

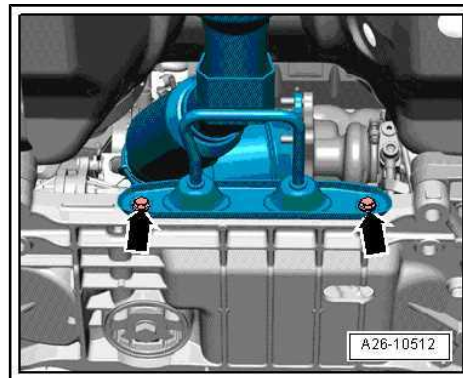


- Loosen screw -1- but do not unscrew it.
- Unscrew bolt -2-.
- Swivel generator -3- forward in -direction of the arrow-.

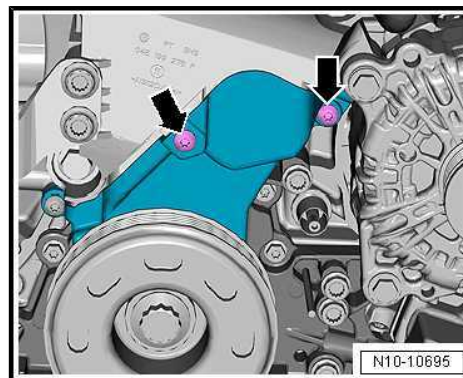


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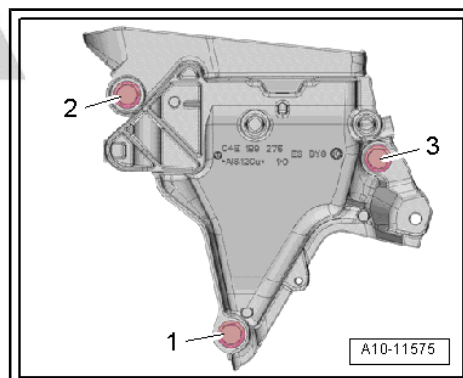
- Release screws -arrows-.
- Remove pendulum support
⇒ [“2.4 Removing and installing pendulum support”, page 30](#).
- Suspend engine into the installation position
⇒ [“2.5 Support the engine in its installed position”, page 31](#).
- Remove engine mounts
⇒ [“2.2 Removing and installing engine mount”, page 28](#).



- Release screws -arrows-.

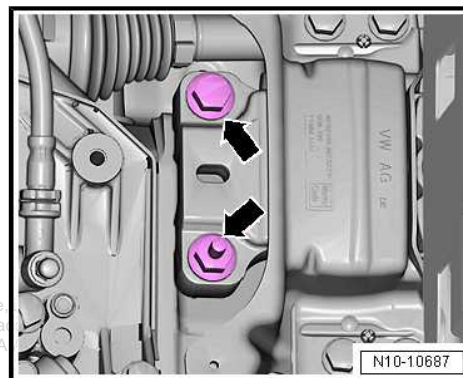


- Unscrew screws -1-, -2-, -3-.



Gearbox mount with 2 screws

- Release screws -arrows-.



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Gearbox mount with 3 screws

- Release screws -arrows-.

Continued for all vehicles

- Push the engine/gearbox assembly slightly to the left and front.
- Remove engine support bracket.

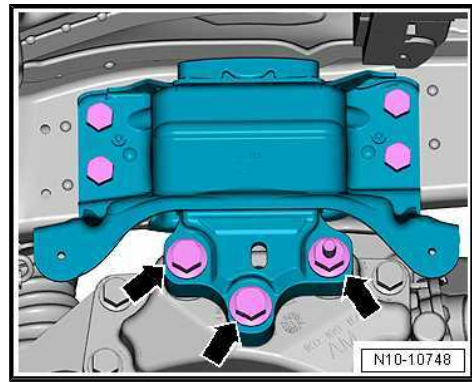
Install

Installation is performed in the reverse order, pay attention to the following points:

- Check assembly bracket setting
⇒ [“2.7 Check assembly bracket setting”, page 35](#) .

Tightening torques

- ♦ Assembly bracket
⇒ [“2.1 Assembly overview - assembly mountings”, page 26](#) .
- ♦ Tensioning pulley for V-ribbed belt
⇒ [“1.1 Assembly overview - ribbed V-belt drive”, page 36](#) .
- ♦ Engine support bracket
⇒ [“2.1 Summary of components - toothed belt guard”, page 91](#) .
- ♦ Toothed belt guard
⇒ [“2.1 Summary of components - toothed belt guard”, page 91](#) .
- ♦ Fixing screws for generator ⇒ Electrical system; Rep. gr. 27 ; Generator; Removing and installing generator.
- ♦ Coolant pipes
⇒ [“3.1 Summary of components - coolant pipe”, page 248](#) .
- ♦ Removing and installing parts of the exhaust system
⇒ [“2.1 Summary of components - exhaust gas cleaning”, page 348](#) .



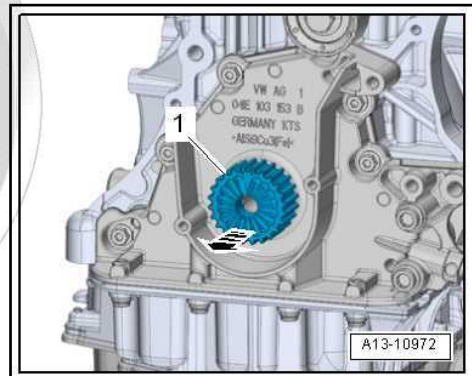
1.7 Replacing crankshaft sealing ring - belt pulley end

Special tools and workshop equipment required

- ♦ Assembly device - T10485-
- ♦ Extractor - T20143-

Work procedure

- Remove toothed belt
⇒ [“2.3 Removing and installing toothed belt”, page 95](#) .
- Remove crankshaft toothed belt pulley -1- -arrow-.



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- Lift out sealing ring using the extractor hook -T20143/2- -arrow-.
- Clean the contact and sealing surfaces.



Note

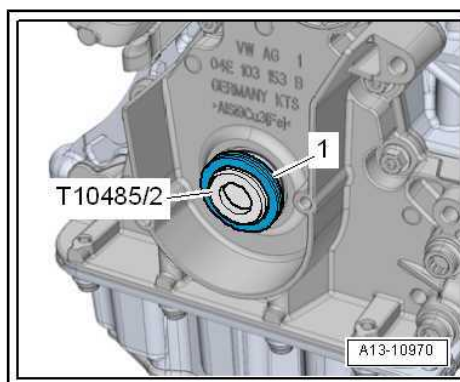
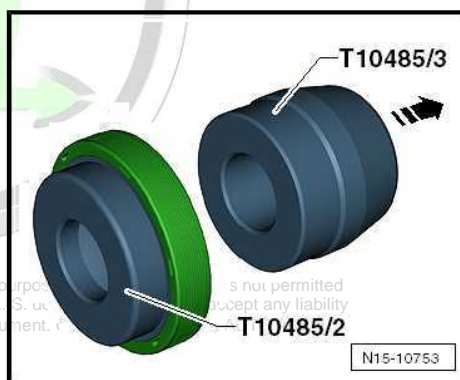
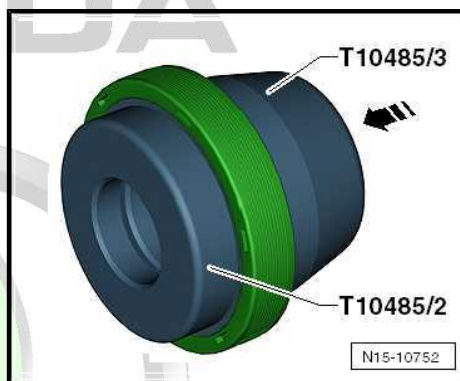
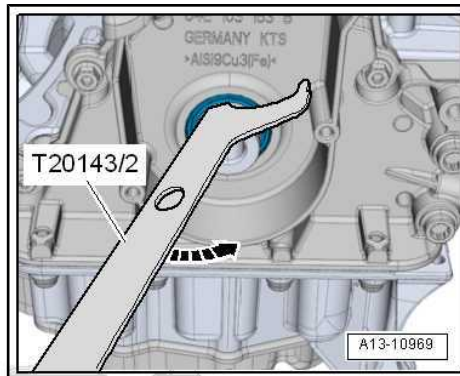
Do not oil new sealing ring.

- Push new sealing ring in -direction of the arrow- over the assembly sleeve - T10485/3- onto the assembly sleeve - T10485/2- .

- Fitting position: Closed side of sealing ring points to the receiver tube.

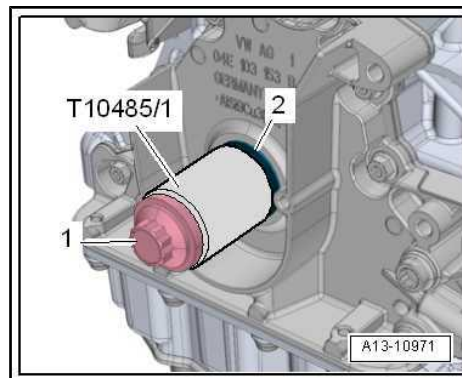
- Pull off assembly sleeve - T10485/3- in -direction of arrow-.

- Fit guide bushing -T10485/2- with seal -1- onto crankshaft journal.

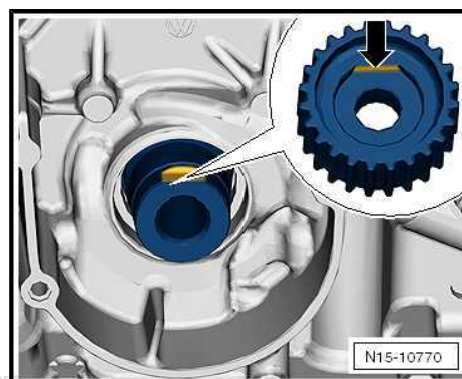


- Pull sealing ring -2- in to the stop using the thrust piece - T10485/1- and the belt pulley screw -1-.

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- Fit crankshaft toothed belt pulley onto the crankshaft.
- The contact surface between the V-ribbed belt pulley crankshaft and crankshaft toothed belt sprocket must be free of oil and grease.
- Milled surface -arrow- on the crankshaft toothed belt must be positioned on the crankshaft stub.
- install (set the timing) ⇒ [page 104](#) .



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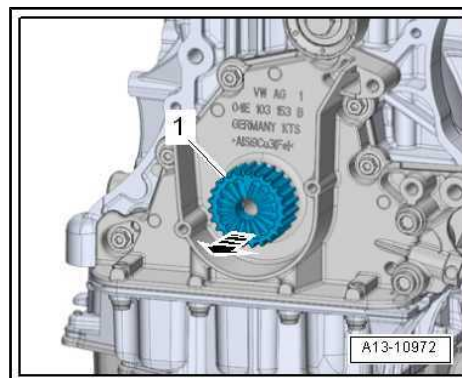
1.8 Removing and installing the sealing flange on the belt pulley side

Special tools and workshop equipment required

- ♦ Cleaning and degreasing agent , e.g. -D 009 401 04-

Removing

- Remove toothed belt
⇒ [“2.3 Removing and installing toothed belt”, page 95](#) .
- Remove crankshaft toothed belt pulley -1- -arrow-.
- Remove sump top part
⇒ [“1.4 Removing and installing oil sump top part”, page 202](#) .



- Unscrew the screws -1- to -8- and carefully loosen the sealing flange from the bonding.
- Drive out the gasket ring from the removed sealing flange.

Install

Installation is performed in the reverse order, pay attention to the following points:

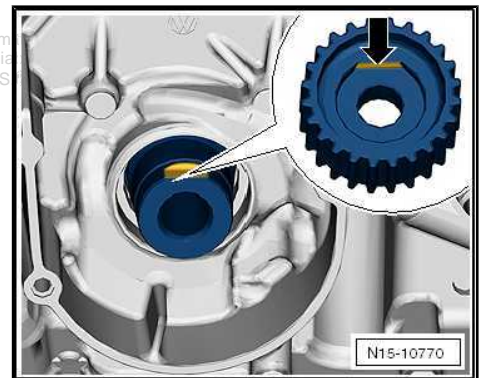
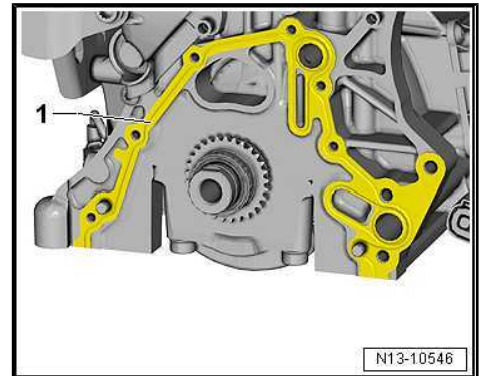
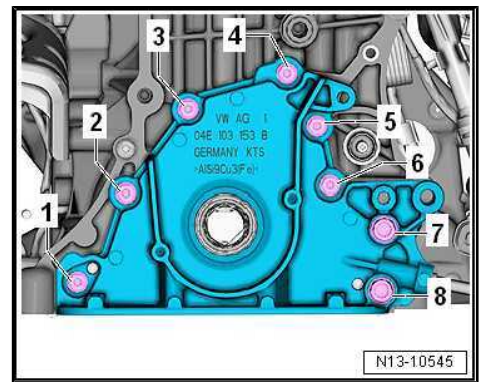
! NOTICE

Risk of contamination of the lubrication system by sealant residues.

- Remove sealant residues from the cylinder block.
- Clean oil and grease from sealing surfaces.
- Push gasket -1- onto the dowel pins on the cylinder block.
- Carefully push sealing flange onto the dowel pins on the cylinder block.
- Tighten sealing flange screws
⇒ [Fig. “Sealing flange on the belt pulley side - tightening torque and tightening order”](#), page 41 .
- Install the gasket ring for the crankshaft -belt pulley side
⇒ [“1.7 Replacing crankshaft sealing ring - belt pulley end”](#), page 48 .
- Fit crankshaft toothed belt pulley onto the crankshaft.
- The contact surface between the V-ribbed belt pulley and the crankshaft toothed belt pulley must be free of oil and grease.
- Milled surface -arrow- on the crankshaft toothed belt must be positioned on the crankshaft stub.
- Install sump top part
⇒ [“1.4 Removing and installing oil sump top part”](#), page 202 .
- install (set the timing)
⇒ [“2.3 Removing and installing toothed belt”](#), page 95 .

Tightening torques

- ◆ Sealing flange on the belt pulley side
⇒ [Fig. “Sealing flange on the belt pulley side - tightening torque and tightening order”](#), page 41 .
- ◆ Sump top part
⇒ [“1.1 Assembly overview - sump/oil pump”](#), page 195 .



2 Cylinder block on gearbox side

⇒ [“2.1 Summary of components - cylinder block on gearbox side”, page 52](#)

⇒ [“2.2 Removing and installing flywheel”, page 53](#)

⇒ [“2.3 Removing and installing sealing flange on gearbox side”, page 54](#)

2.1 Summary of components - cylinder block on gearbox side



Note

For assembly work, secure the engine to the engine and gearbox support -VAS 6095-
⇒ [“1.3 Attach engine attached to engine and gearbox mount”, page 20](#).

1 - Screw

- ☐ Replace after disassembly
- ☐ 60 Nm + 90°

2 - Flywheel

- ☐ removing and installing
⇒ [“2.2 Removing and installing flywheel”, page 53](#)
- ☐ can be installed only in one position

3 - Engine speed sender - G28-

- ☐ removing and installing
⇒ [“1.5 Removing and installing engine speed sender G28”, page 365](#)

4 - Screw

- ☐ Tightening torque
⇒ [“1.1 Assembly overview - ignition system”, page 360](#)

5 - Fit pin

- ☐ 2 pieces

6 - Intermediate plate

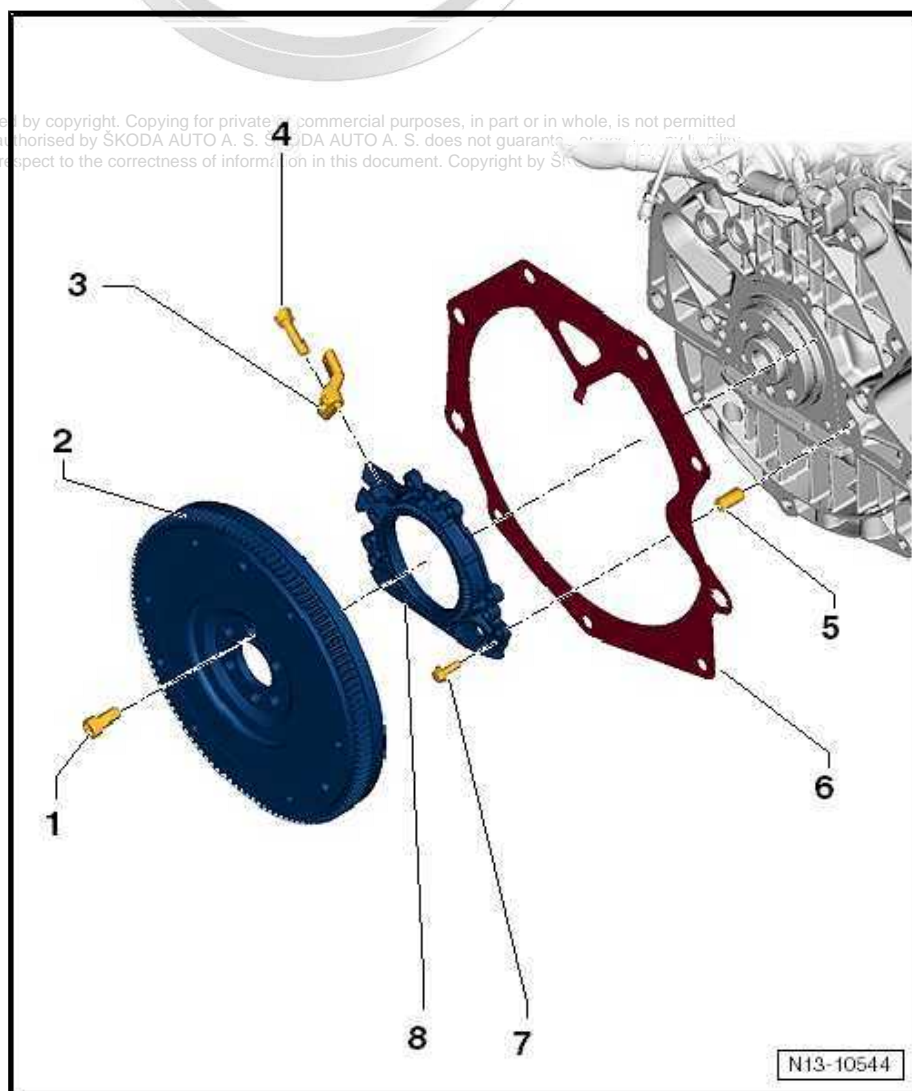
- ☐ do not damage/bend during assembly work
- ☐ installing
⇒ [Fig. “Installing intermediate plate”, page 53](#)

7 - Screw

- ☐ Tightening torque and tightening order
⇒ [Fig. “Sealing flange on the gearbox side - tightening torque and tightening order”, page 53](#)

8 - Sealing flange with sender wheel and oil seal

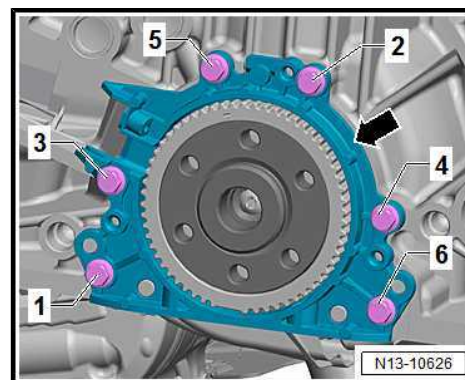
- ☐ Replace sealing flange complete with oil seal and sender wheel only
- ☐ removing and installing ⇒ [“2.3 Removing and installing sealing flange on gearbox side”, page 54](#)



Sealing flange on the gearbox side - tightening torque and tightening order

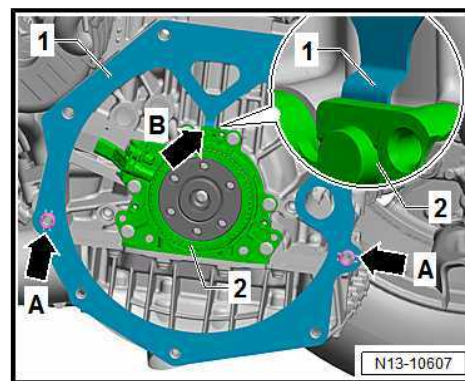
- Tighten screws in steps as follows:

Stage	Screws	Specified torque
1.	-1 ... 6-	by hand as far as the stop
2.	-1 ... 6-	tighten crosswise in steps up to 10 Nm



Installing intermediate plate

- Mount intermediate plate -1- on sealing flange arrow -B- and push onto the dowel sleeves arrows -A-.



2.2 Removing and installing flywheel

Special tools and workshop equipment required

- ◆ Counterholder - MP1-223 (3067)-

Removing

- Gearbox removed.
- Remove clutch in vehicles with manual gearbox ⇒ Rep. gr. 30 ; Clutch; removing and installing clutch .
- Fitting position of the tool:

A - for tightening

B - for slackening

- Insert the counterholder - 3067- into the hole on the cylinder block -B-.
- Loosen and remove all flywheel bolts.

Install

Installation is performed in the reverse order, pay attention to the following points:



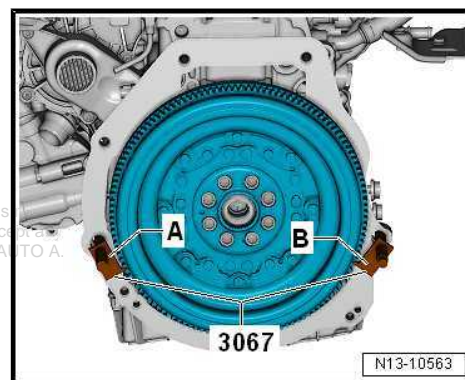
Note

Assembly of flywheel with rotor is only possible in one position.

- Insert the counterholder - 3067- into the hole on the cylinder block -A-.

Tightening torques

- ◆ Flywheel to crankshaft
⇒ [“2.1 Summary of components - cylinder block on gearbox side”, page 52](#) .



2.3 Removing and installing sealing flange on gearbox side

Special tools and workshop equipment required

- ◆ Depth gauge - VAS 6082-
- ◆ Assembly device - T10134-
- ◆ Locating screw - T10340-
- ◆ 3x screw M6x35.

Work procedure

- Gearbox is removed ⇒ Rep. gr. 34 ; Installing and removing gearbox; remove gearbox ⇒ Rep. gr. 34 or ⇒ Rep. gr. 34 ; installing and removing gearbox; removing gearbox .



Note

- ◆ *For reasons of clarity, the work was performed with the engine removed.*
- ◆ *The procedure is identical whether the engine is installed or removed.*
- Remove the flywheel
⇒ [“2.2 Removing and installing flywheel”, page 53](#) .
- Remove intermediate plate -1- from the dowel sleeves arrows -A-.
- Move intermediate plate -1- upwards.
- At the same time, pull the retaining lug arrow -B- of the intermediate plate -1- out of the recess behind the sealing flange.

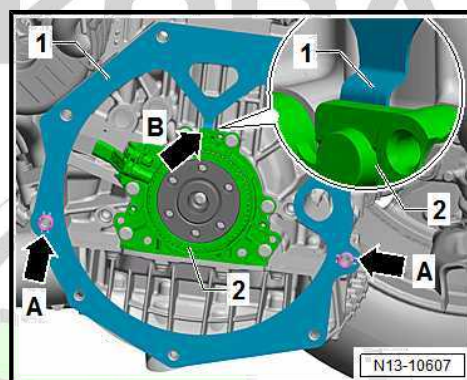
Position crankshaft to “TDC”:

CAUTION

Risk of engine damage.

You must adjust the “TDC” position, as described!

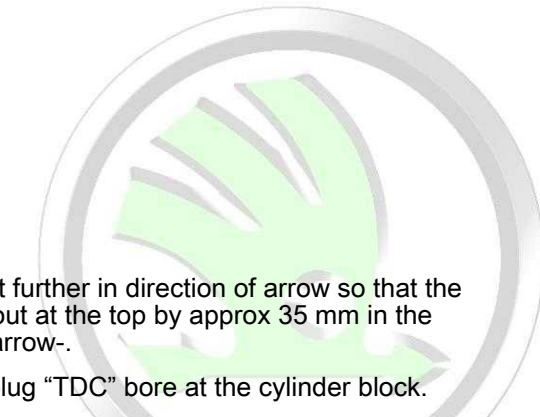
- ◆ Locating screw - T10340- can collide with crankshaft in two positions.
- Remove ignition coil with power output stage 1
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#) .
- Remove ignition plug cylinder 1 with spark plug socket wrench , e. g. -3122 B- .



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Set the correct position of the crankshaft for screwing in the locating screw:

- Carefully insert a screwdriver into the opening of the ignition plug, minimum length of shaft 250 mm, in -direction of arrow- so that it touches the piston head.
- Rotate the crankshaft in direction of rotation of engine on “TDC” for cylinder 1.



- Turn engine shaft further in direction of arrow so that the screwdriver just out at the top by approx 35 mm in the -direction of the arrow-.
- Unscrew screw plug “TDC” bore at the cylinder block.

! NOTICE

Risk of damage to the engine if the locating screw - T10340- is screwed in at the wrong position.

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If the locating screw - T10340- cannot be screwed in up to the stop, the crankshaft is not in the correct position.

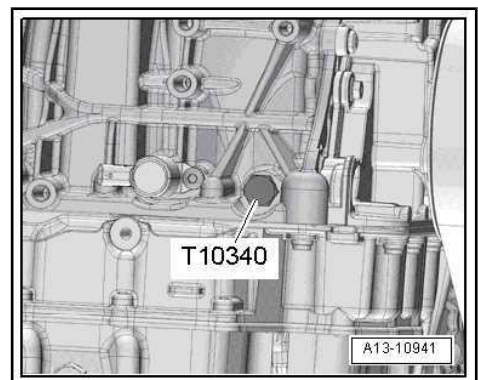
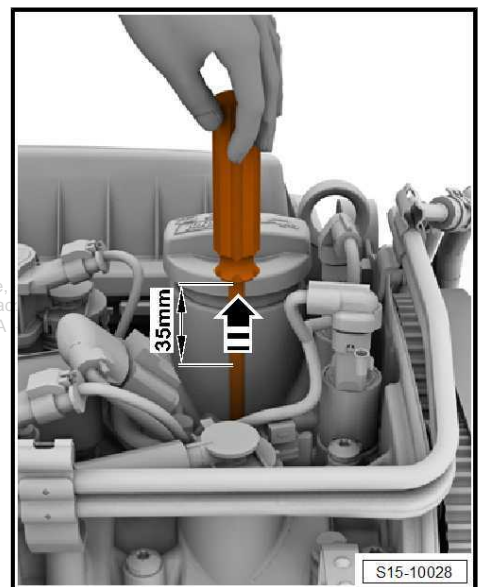
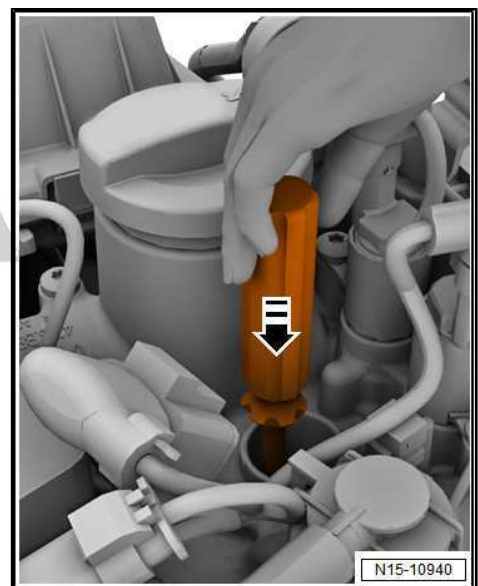
In this case, proceed as follows:

- Unscrew locking pin.
- Set the correct position of the crankshaft for screwing in the locating screw ⇒ [page 55](#) .
- Screw the locating screw - T10340- up to the stop into the cylinder block and tighten to 30 Nm.
- Turn crankshaft up to the stop in direction of rotation of engine.
- The crankshaft cheek is now resting on the locating screw .

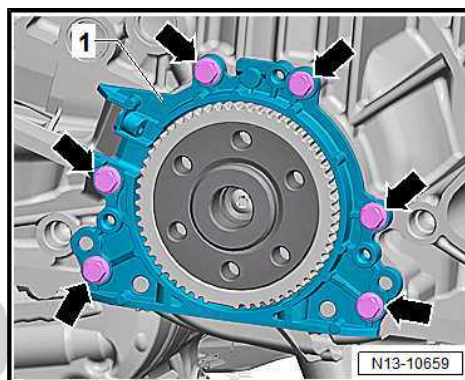
i Note

The crankshaft is only locked in direction of rotation of engine using the locating screw - T10340- .

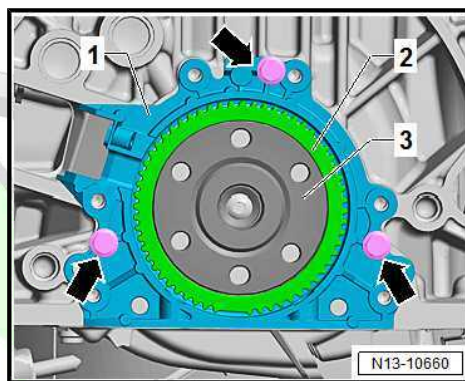
- Remove sump top part
⇒ [“1.4 Removing and installing oil sump top part”, page 202](#) .
- Remove engine speed transmitter - G28-
⇒ [“1.5 Removing and installing engine speed sender G28 ”, page 365](#) .



- Unscrew locating screws on the sealing flange -arrows-.
- Sealing flange and rotor are pressed together with 3 M6x35 mm screws from the crankshaft.



- Alternating, screw in three screws -arrows- (max. 1/2 turn (180°) per screw) into the threaded holes of the sealing flange -1- and remove the sealing flange together with the rotor -2- from the crankshaft -3-.

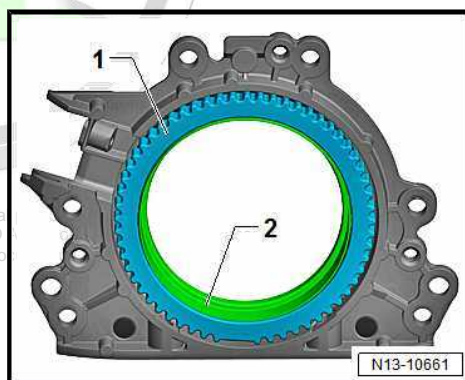


Sealing flange with rotor



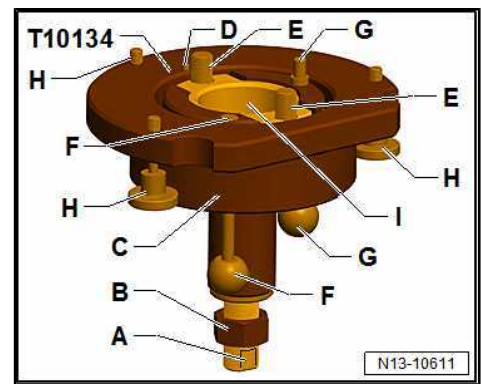
Note

- ◆ The sealing flange with PTFE gasket ring is provided with sealing lip supporting ring -2-. This support ring serves as a fitting sleeve and must not be removed prior to installation.
- ◆ Do not separate or turn the sealing flange and rotor -1- after removing them from the spare part package.
- ◆ The rotor is given its fitting location by fixing the assembly tool - T10134- to the positioning pin.
- ◆ Sealing flange and oil seal form one unit and must only be replaced together with the sender wheel.
- ◆ The rotor has an elastomer layer on its sealing surface for the crankshaft. This layer must not be brought into contact with dirt or grease.
- ◆ The assembly tool - T10134- is given its fitting location to the crankshaft by means of a guide bolt, which is guided into the threaded bore of the crankshaft.



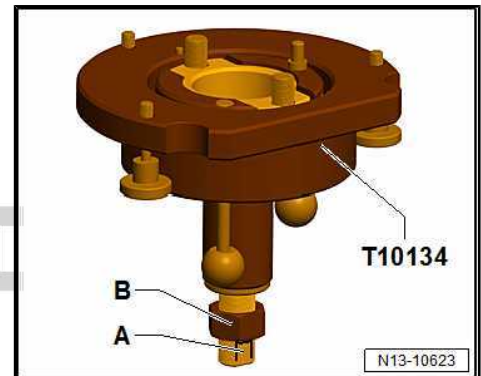
Assembly tool - T10134-

- A - Clamping surface
- B - Hexagon nut
- C - Assembly housing
- D - Locating pin
- E - Allan screws (2 pieces)
- F - Guide bolts for petrol engines
- G - Guide bolts for diesel engines
- H - Knurled screws (3 pieces)
- I - Inner part

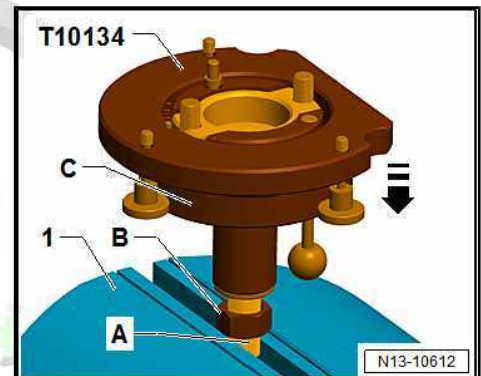


A - Attach sealing flange with rotor to the assembly tool - T10134-

- Screw on nut -B- until just before it touches the clamping surface -A- of the threaded spindle.



- Grip assembly tool - T10134- at clamping surface -A- of the threaded spindle in a vice.
- Press assembly housing -C- downwards until it lies on hexagon nut -B-.
- Screw nut onto threaded spindle until inner part of assembly tool and assembly housing are at same height.

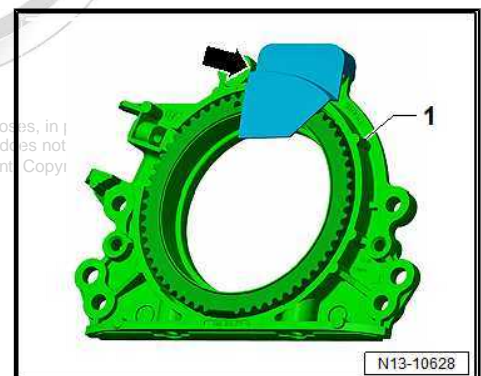


- Remove the securing clip -arrow- from the new sealing flange.

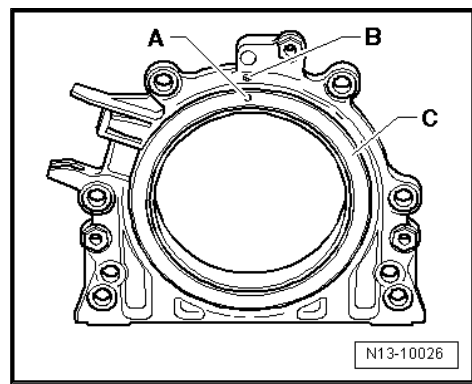


Note

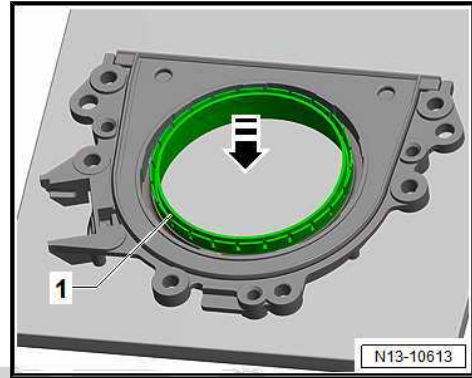
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unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not
Do not remove or turn the rotor from the sealing flange. ation in this document. Copy



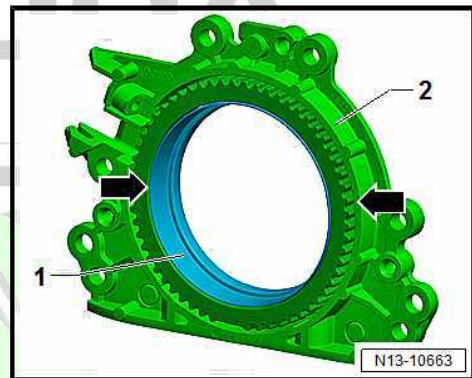
- Locating hole -A- on sender wheel -C- must align with marking -B- on sealing flange.



- Place sealing flange with front side facing down on a clean level surface.
- Press down sealing lips supporting ring -1- in -direction of the arrow-, until it rests on the level surface.



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

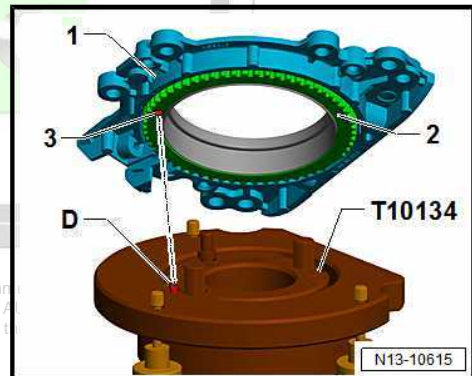


- Lay the sealing flange -1- with the front side onto the assembly tool - T10134- in such a way that the positioning pin -D- engages into the hole -3- of the sender wheel -2-.



Note

Sealing flange must lie straight on the assembly tool.



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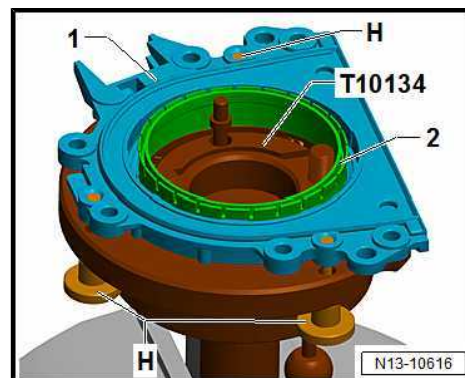
- Press on the sealing flange -1- and sealing lip supporting ring -2- by tightening the 3 knurled screws -H- onto the surface of the assembly tool - T10134- .



Note

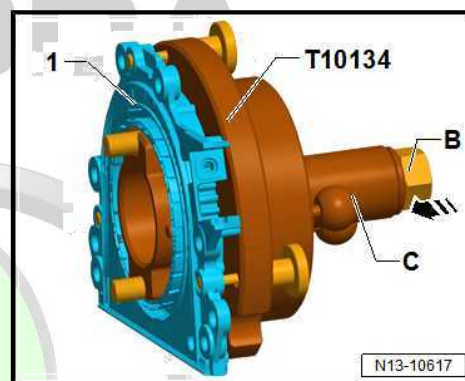
This prevents locating pin from slipping out of sender wheel hole.

- When installing the sealing flange, ensure that the sender wheel remains fixed in the assembly device.



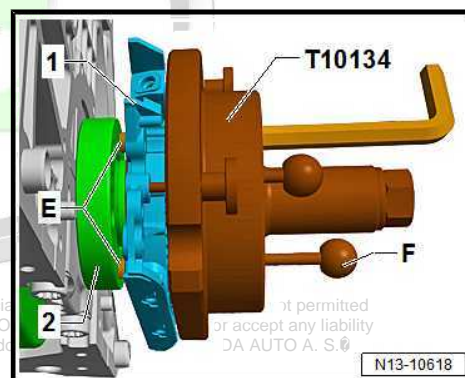
B - secure assembly tool - T10134- with sealing flange onto the crankshaft flange and cylinder block

- Crankshaft flange free from oil and grease.
- The engine is at "TDC".
- Screw nut -B- on until it reaches end of threaded spindle.
- Press the threaded spindle on the assembly tool - T10134- in -direction of arrow- until the nuts -B- rest against the assembly cup -C-.
- Align flat side of assembly housing to the cylinder block sealing surface on the oil sump side.
- Secure the assembly tool - T10134- and the sealing flange -1- with Allan screws -E- to the crankshaft flange.

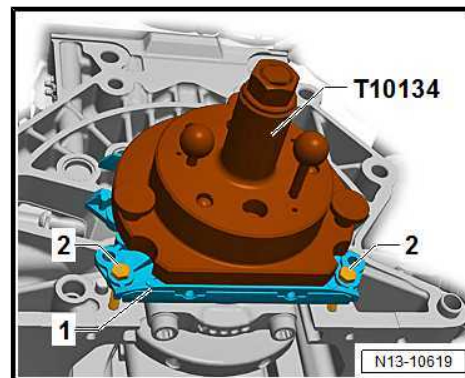


Note

Screw in Allan screws -E- into the crankshaft flange by approx. five thread turns.



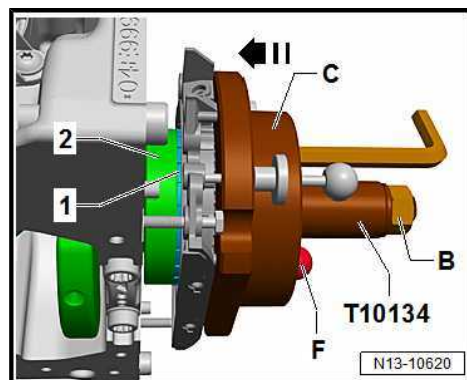
- Screw in two M6x35 mm screws -2- by about 3 turns for sealing flange guide -1- into the cylinder block.



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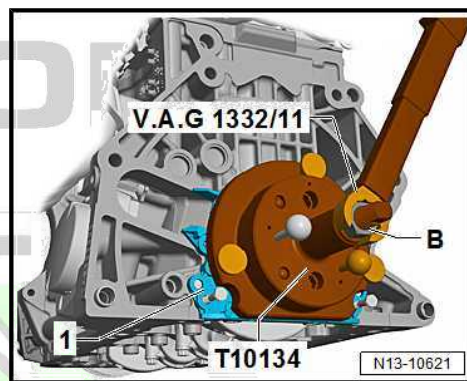
Screw C - attach assembly tool - T10134- onto crankshaft flange

- Push the assembly cup -C- by hand in the -direction of the arrow- until the sealing lip supporting ring -1- rests on the crankshaft flange -2-.
- Push guide pin for petrol engines (red knob) -F- into hole in crankshaft. This ensures that the sender wheel reaches its final installation position.
- Tighten the two hexagon socket head bolts hand-tight.
- Screw nut -B- onto threaded spindle by hand until it lies against assembly housing -C-.



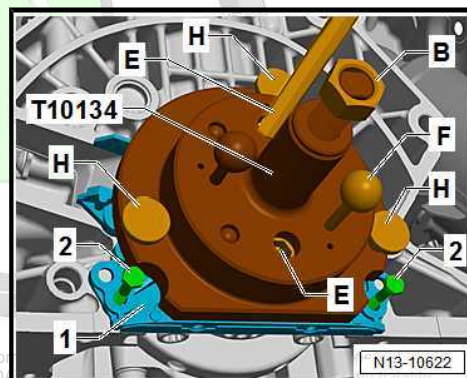
Press D - press rotor with assembly tool - T10134- onto crankshaft flange

- Tighten nuts -B- on the assembly tool - T10134- with torque wrench to 35 Nm.
- After tightening the nut to 35 mm there must still be a narrow air gap between the cylinder block and the sealing flange.

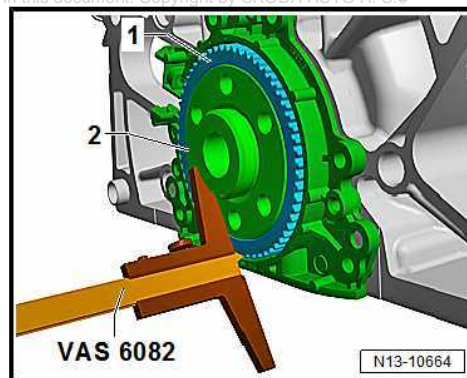


E - Inspect the installation position of the rotor on the crankshaft

- Screw nut -B- on until it reaches end of threaded spindle.
- Unscrew bolts-2- from the intake manifold.
- Unscrew the knurled screws -H- from the sealing flange.
- Unscrew the Allan screws -E- from the crankshaft flange.
- Remove assembly tool - T10134- .
- Remove sealing lip support ring.



- Place caliper gauge on crankshaft flange.



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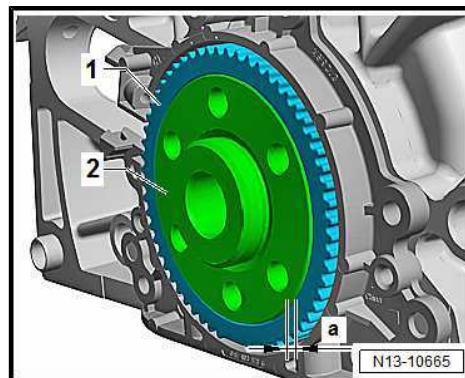
- Measure distance -a- between crankshaft flange -2- and sensor rotor -1-.
- Specified value: Dimension -a- = 0.5 mm

If dimension »a« is too small:

- Press down rotor ⇒ [page 61](#) .

If dimension »a« is achieved:

- Complete the remaining installation ⇒ [page 62](#) .

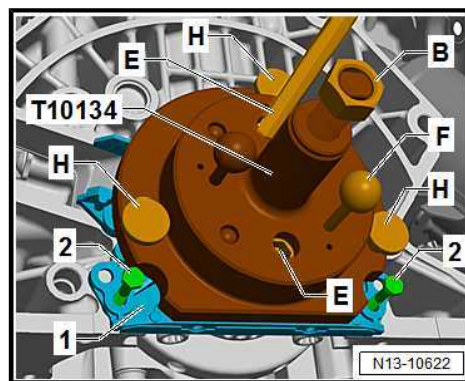


F - Pressing down the rotor

- Secure assembly tool - T10134- to crankshaft flange with hexagon socket head bolts -E-.

Make sure the positioning pin of the assembly device - T10134- engages in the bore of the sender wheel.

- Tighten the two hexagon socket head bolts -E- hand-tight.
- Screw the knurled screws -H- into the flange -1-.
- Screw nut -B- onto threaded spindle by hand until it lies against the assembly housing.



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- Tighten nut -B- of the assembly tool - T10134- to 40 Nm.
- Again inspect the fitting position of the rotor on the crankshaft
⇒ [page 60](#) .

If the dimension »a« is too small again:

- Tighten nut -B- of the assembly tool - T10134- to 45 Nm.
- Again inspect the fitting position of the rotor on the crankshaft
⇒ [page 60](#) .

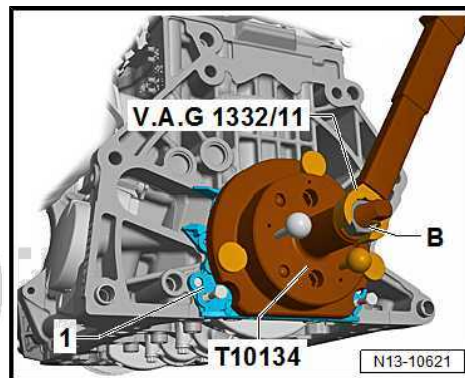
Installing

- Tighten screws for sealing flange crosswise.
- Install oil sump bottom part
⇒ [“1.3 Removing and installing oil sump bottom part”, page 199](#) .
- Installing intermediate plate
⇒ [Fig. “Installing intermediate plate” , page 53](#) .
- Install flywheel
⇒ [“2.2 Removing and installing flywheel”, page 53](#) .

NOTICE

Risk of engine damage if the locating screw - T10340- would not be removed.

To finish off the work, check to see whether the locating screw - T10340- has been removed.



Tightening torques

- ♦ Sealing flange on the gearbox side
⇒ [Fig. “Sealing flange on the gearbox side - tightening torque and tightening order” , page 53](#) .
- ♦ Engine speed sender - G28-
⇒ [“1.1 Assembly overview - ignition system”, page 360](#) .
- ♦ Ignition coil with power output stage
⇒ [“1.1 Assembly overview - ignition system”, page 360](#) .
- ♦ Spark plug
⇒ [“1.1 Assembly overview - ignition system”, page 360](#) .
- ♦ Flywheel to crankshaft
⇒ [“2.1 Summary of components - cylinder block on gearbox side”, page 52](#) .

Component	Specified torque
Screw plug for bore in the cylinder block	30 Nm
Locating screw - T10340-	30 Nm

3 Crankshaft

⇒ “3.1 Crankshaft dimensions”, page 63

⇒ “3.2 Replace the needle bearing in the crankshaft”, page 63

⇒ “3.3 Measuring axial play of crankshaft”, page 64

3.1 Crankshaft dimensions



NOTICE

There is a risk of bearing seat deformation.

Newer loosen the screws of the main bearing cover.

- ◆ The crankshaft must not be removed. Merely releasing the screws of the crankshaft bearing cover will result in deformations of the bearing seats of the cylinder block.
- ◆ If the bearing cap bolts are loosened, the cylinder block must be renewed complete with the crankshaft.
- ◆ Measuring the main bearing clearance is not possible with normal workshop equipment.

Grinding dimension	Ø conrod journal mm	
Basic dimension	48,00	-0,022 -0,042

3.2 Replace the needle bearing in the crankshaft

Only for vehicles with automatic gearbox

Special tools and workshop equipment required

- ◆ Centering mandrel -T30029 (3176)-
- ◆ Interior extractor -Kukko 21/2-
- ◆ Countersupport -Kukko 22/1-

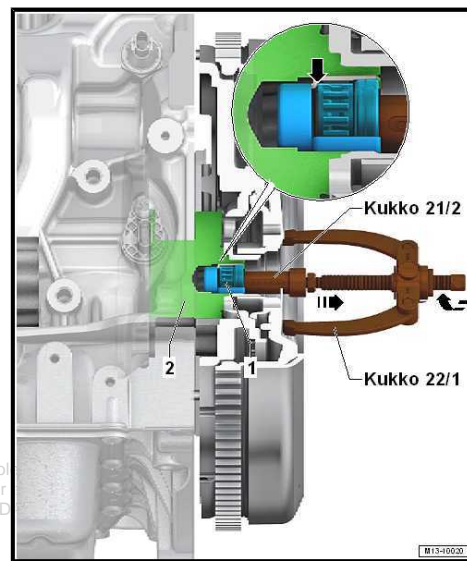
Removing

- Remove needle bearing with internal extractor -Kukko 21/2- and countersupport -Kukko 22/1- .

Install

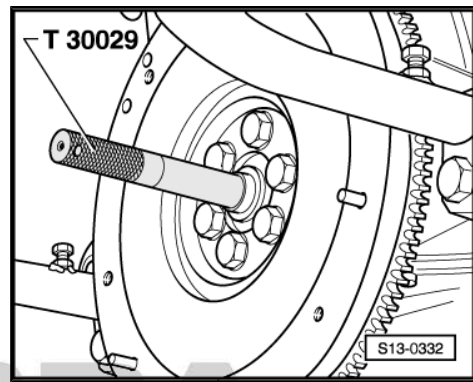
Fitting position of the needle bearing:

- ◆ The marked side of the needle bearing should be visible when in its installed condition.
- Clean the bearing in the crankshaft.



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- Drive in needle bearing with centring mandrel -T30029 (3176)- flush with the crankshaft face.



3.3 Measuring axial play of crankshaft

NOTICE

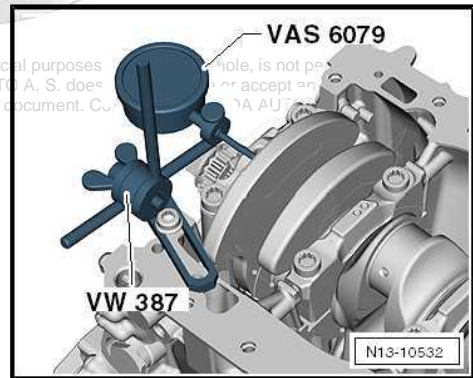
There is a risk of bearing seat deformation.

Never loosen the screws of the main bearing cover.

- ◆ The crankshaft must not be removed. Merely releasing the screws of the crankshaft bearing cover will result in deformations of the bearing seats of the cylinder block.
- ◆ If the bearing cap bolts are loosened, the cylinder block must be renewed complete with the crankshaft.
- ◆ Measuring the main bearing clearance is not possible with normal workshop equipment.

Special tools and workshop equipment required

- ◆ Universal dial gauge holder - MP3-447 (VW 387)-
- ◆ Dial gauge , e.g. -VAS 6079-
- Secure dial gauge e.g. -VAS 6079- with the universal dial gauge bracket - MP3-447 (VW 387)- to the cylinder block, as shown in the illustration.
- Place dial gauge against the crankshaft cheek.
- Press crankshaft against the dial gauge and set dial gauge to "0".
- Press the crankshaft off the dial gauge and read the measured value.
- Axial clearance: 0.066...0.233 mm.



4 Pistons and conrods

⇒ [“4.1 Assembly overview - piston and conrod”, page 65](#)

⇒ [“4.2 Removing and installing the piston”, page 67](#)

⇒ [“4.3 Checking piston and cylinder bore”, page 68](#)

⇒ [“4.4 Removing and installing oil injection nozzles”, page 69](#)

4.1 Assembly overview - piston and conrod

1 - Screw

- ☐ Replace after disassembly
- ☐ Oil threads and contact surface
- ☐ 30 Nm + 90°

2 - Conrod bearing cap

- ☐ as a result of the conrods separated in the cracking process, the conrod bearing cap fits only in one position and only to the relevant conrod
- ☐ Mark assignment to the cylinder and to the conrod in colour -B-
- ☐ Fitting position: Peg -A- on the conrod bearing cap points to the belt pulley side

3 - Bearing shells

- ☐ Fitting position
⇒ [Fig. “Bearing shell installation position”](#), page 66
- ☐ replace used bearing shells
- ☐ check for firm seating

4 - Conrod

- ☐ with cracked conrod bearing cap
- ☐ Replace as set only.
- ☐ Mark assignment to the cylinder and to the conrod bearing cap in colour -B-
- ☐ separate new connecting rod ⇒ [Fig. “Separating new conrod bearing cap”](#), page 67
- ☐ Fitting position: Peg -A- on the conrod bearing cap points to the belt pulley side

5 - Circlip

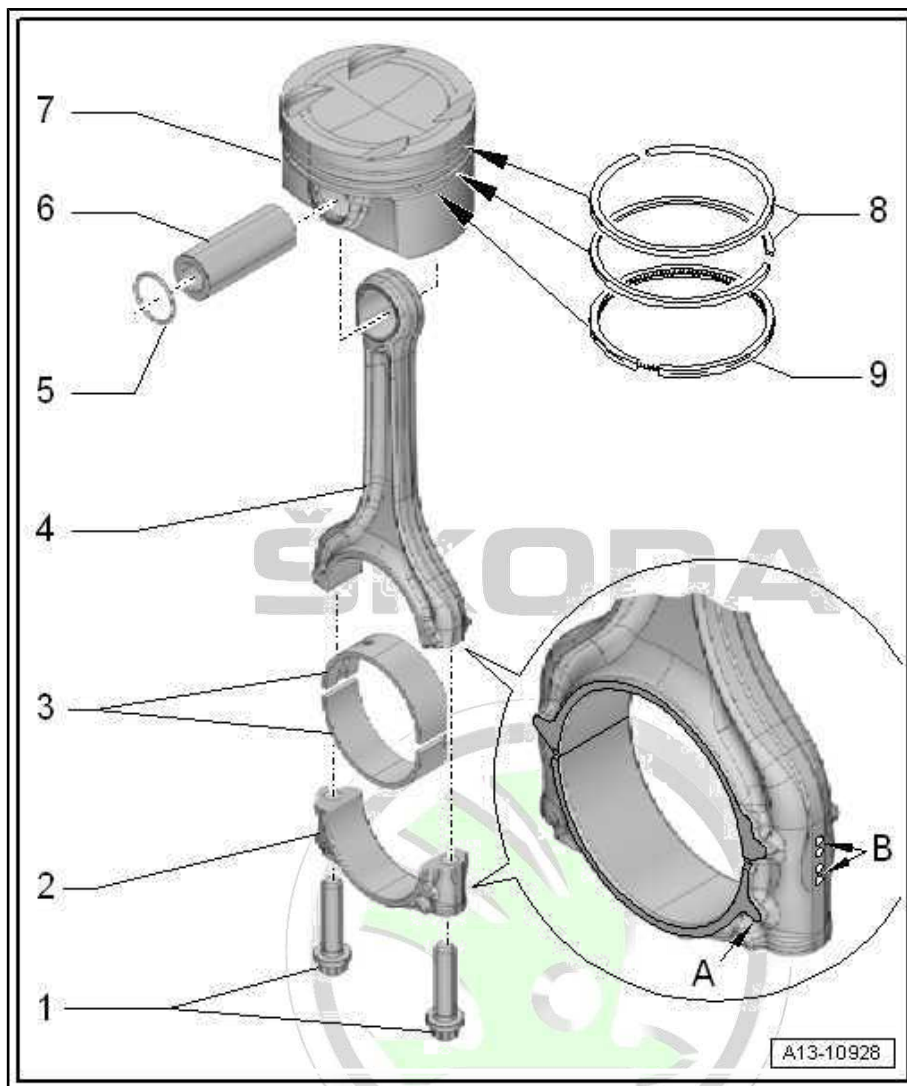
- ☐ 2 pieces
- ☐ Replace after disassembly

6 - Piston pin

- ☐ removing and installing ⇒ [“4.2 Removing and installing the piston”, page 67](#)

7 - Piston

- ☐ with combustion chamber



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- ☐ Mark the installation position and the assignment to cylinder
⇒ Fig. “Fitting position of piston and assignment of piston to cylinder”, page 66
- ☐ removing and installing ⇒ “4.2 Removing and installing the piston”, page 67
- ☐ Check piston and cylinder bore ⇒ “4.3 Checking piston and cylinder bore”, page 68

8 - Piston rings

- ☐ Compression rings
- ☐ Measure end gap ⇒ Fig. “Measure piston ring end gap”, page 68
- ☐ Measure vertical gap ⇒ Fig. “Measure piston ring vertical gap”, page 69
- ☐ use commercially available piston ring pliers for removing and installing
- ☐ Fitting position: Identification “TOP” or labelled side for piston crown
- ☐ Offset gaps by 120°

9 - Piston ring

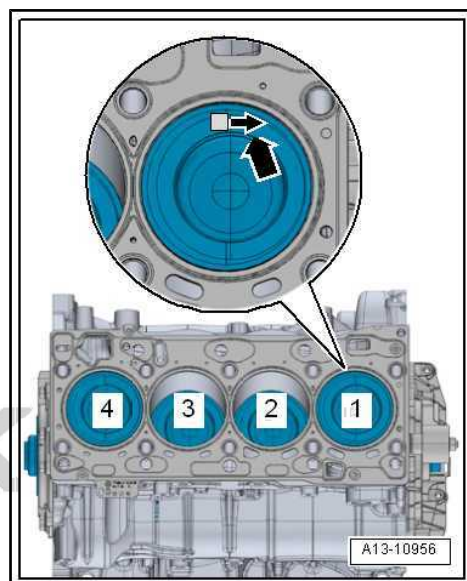
- ☐ Oil scraper ring
- ☐ Measure end gap ⇒ Fig. “Measure piston ring end gap”, page 68
- ☐ Measure vertical gap ⇒ Fig. “Measure piston ring vertical gap”, page 69
- ☐ use piston ring pliers for removing and installing
- ☐ Fitting position: Identification “TOP” or labelled side for piston crown
- ☐ Offset joint 120° to bottom compression ring

Fitting position of piston and assignment of piston to cylinder



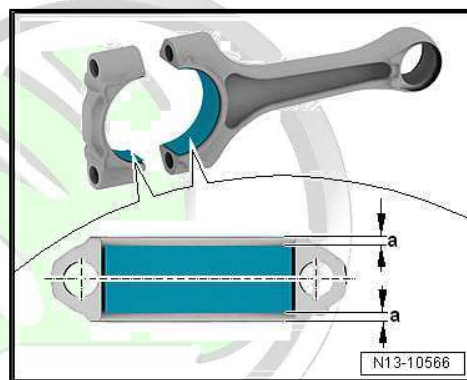
Risk of damaging the piston crown.

- ◆ For re-installation, mark the assignment in colour on the piston crown of cylinders that have already been used. Do not mark piston crown not using centre punch, scratch, nick or similar.
- Arrow on the piston crown to the belt pulley side -arrow-.



Bearing shell installation position

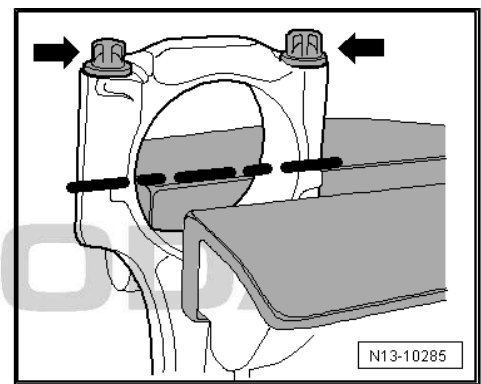
- Insert bearing shells centrally in the conrod and conrod bearing cap.
- Dimension -a- = 2.5 mm.



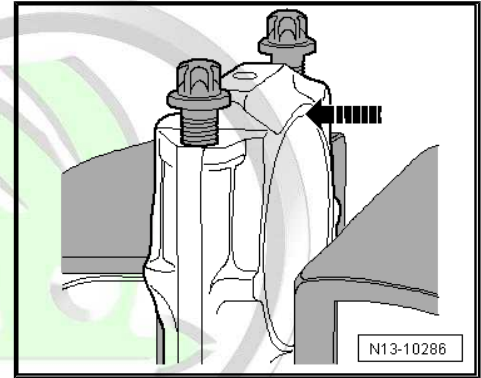
Separating new conrod bearing cap

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

- To prevent damage, tension the conrod only slightly in a vice with protective jaws as shown.
- Tension the conrod below the dotted line.
- Unscrew screws -arrows- by approx. 5 turns.



- Knock against the conrod bearing cap carefully with a plastic hammer -arrow- in order to loosen it.



4.2 Removing and installing the piston

Special tools and workshop equipment required

- ◆ Drift - VW 222 A-
- ◆ Commercially available piston ring tensioning strap

Removing

- Engine attached to engine and gearbox mount - VAS 6095-
⇒ ["1.3 Attach engine attached to engine and gearbox mount", page 20](#) .
- Remove cylinder head
⇒ ["1.3 Removing and installing the cylinder head", page 79](#) .
- Remove oil sump top part
⇒ ["1.4 Removing and installing oil sump top part", page 202](#)
and remove baffle.
- Mark installation position and assignment of the piston to the cylinder.
- Mark the installation position and assignment of the conrod to the cylinder and to the conrod bearing cap -Pos. 4-
⇒ ["4.1 Assembly overview - piston and conrod", page 65](#) .
- Remove conrod bearing cap and pull out piston with conrod upwards.



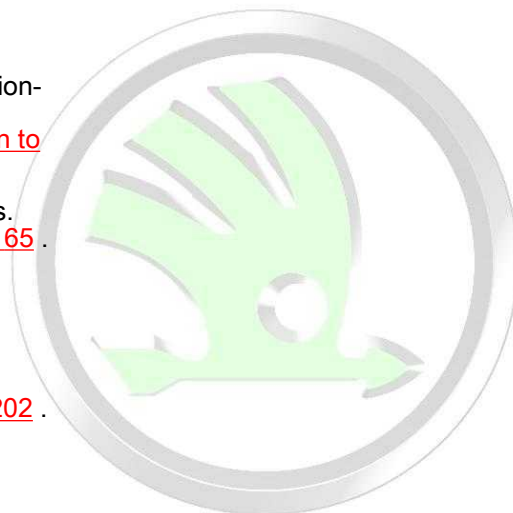
In case of tightness of the piston pin, heat piston to approximately 60 °C.

- Remove securing rings from the piston pin eye.
- Drive off piston pin with a drift - VW 222 A- .

Install

Installation is performed in the reverse order, pay attention to the following points:

- Oil the contact surfaces of the bearing shells.
- Install piston with commercially available piston ring tensioning strap, check installation position
⇒ [Fig. “Fitting position of piston and assignment of piston to cylinder”](#), [page 66](#) .
- Install conrod bearing cap, check installation position Pos. -2- ⇒ [“4.1 Assembly overview - piston and conrod”](#), [page 65](#) .
- Install cylinder head
⇒ [“1.3 Removing and installing the cylinder head”](#), [page 79](#) .
- Install sump top part
⇒ [“1.4 Removing and installing oil sump top part”](#), [page 202](#) .



Tightening torques

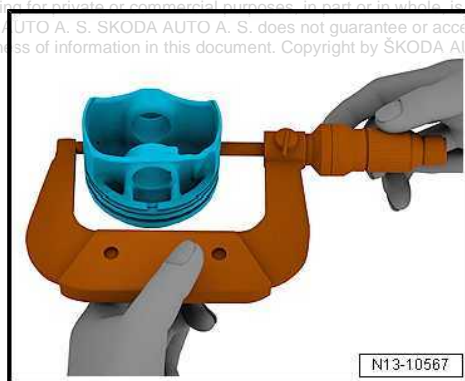
- ♦ Conrod bearing cap
⇒ [“4.1 Assembly overview - piston and conrod”](#), [page 65](#) .

4.3 Checking piston and cylinder bore

Checking piston

- Using an external micrometer, measure pistons approx. 10 mm from the lower edge of skirt, at 90° to the piston pin axis.
- Maximum deviation from nominal dimension: 0.04 mm.

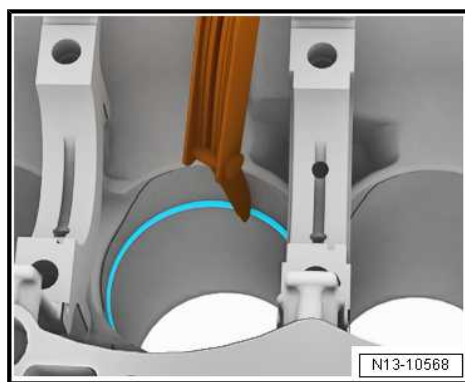
Piston Ø mm	
Nominal dimension	74,42 ¹⁾
<ul style="list-style-type: none">• ¹⁾ dimensions without coating• Manufacturer of the piston Federal Mogul (thickness 0.018 mm per side)• Manufacturer of the piston Mahle (thickness 0.015 mm per side)	



Measure piston ring end gap

- Insert ring at right angles from above down into lower cylinder bore, about 15 mm away from edge of cylinder.
- Push a commercially available feeler gauge into the piston ring opening to check the end gap.

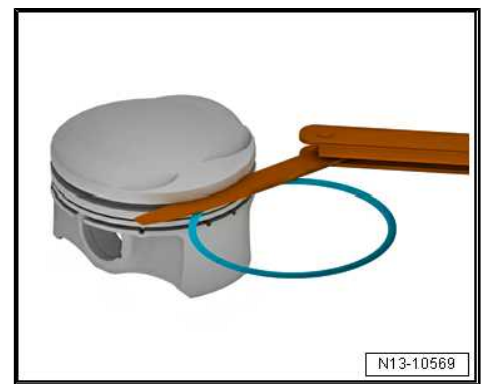
Piston ring	New mm	Wear limit mm
Sealing ring	0,20 + 0,15	1,0
2-part oil scraper ring	0,20 + 0,20	3,0
3-part oil scraper ring	0,50 + 0,20	3,0



Measure piston ring vertical gap

- Clean before inspecting the annular groove of the piston.

Piston ring	New mm	Wear limit mm
1. Compressor ring (manufacturer of piston rings is Federal Mogul)	0,05 ... 0,09	0,15
1. Compressor ring (manufacturer of piston rings is Mahle)	0,035 ... 0,085	0,15
2. Sealing ring	0,030 ... 0,070	0,15
3-part oil scraper rings	Not measurable	
2-part oil scraper rings	0,04 ... 0,08	



Measure cylinder bore



There is risk of damaging the cylinder bore surface.

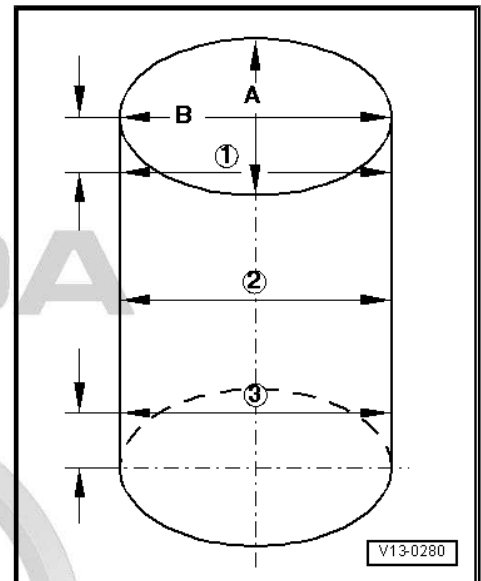
- ◆ Do not use normal workshop equipment to work on cylinder bore (boring, honing, grinding).
- Using the internal precision instrument - VAS 6078- , measure crosswise at 3 points in the transverse direction -A- and longitudinal direction -B-.
- Maximum deviation from nominal dimension: 0.08 mm

Cylinder bore Ø mm	
Nominal dimension	74,5 + 0,015 ¹⁾ +0,005



Note

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



4.4 Removing and installing oil injection nozzles

Special tools and workshop equipment required

- ◆ Torx insert T40 - T10545-

Removing

- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Remove oil sump top part
⇒ [“1.4 Removing and installing oil sump top part”, page 202](#)
and remove baffle.

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Note

- ◆ *The crankshaft must be turned so that the Torx insert T40 - T10545- can be inserted into the applicable pressure relief valve.*
- ◆ *The teeth of Torx insert T40 - T10545- and the pressure relief valve must engage correctly.*
- Turn the crankshaft using the locating screw of the vibration damper in direction of rotation of engine until the pressure relief valve is accessible.
- Unscrew and remove the pressure relief valves -1- with Torx insert T40 - T10545- .
- Remove oil spray nozzles -2-.

Install

NOTICE

Risk of damaging the oil injection nozzles.

Do not bend oil injection nozzles.

- ◆ Replace the oil injection nozzles if they are bent.
- ◆ Check clearance of pistons from oil injection nozzles after re-installing the piston and nozzles.

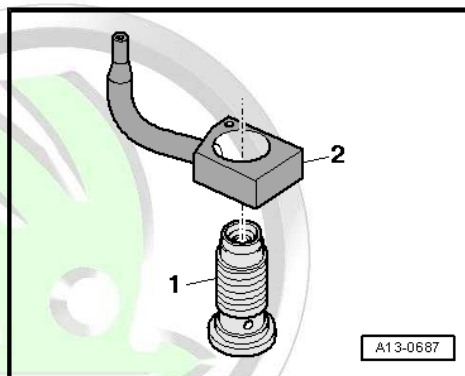
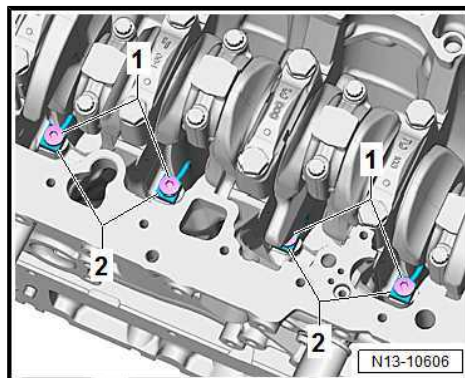
Installation is performed in the reverse order, pay attention to the following points:

Oil spray nozzle and pressure relief valve

- Fitting position: Align the guide edge of the oil injection nozzle to the area of the cylinder block being worked on.
- 1 - Pressure relief valve
- 2 - Oil spray nozzle (for cooling piston)
- Fit baffle plate and install sump top part
⇒ [“1.4 Removing and installing oil sump top part”, page 202](#) .

Tightening torques

Component	Specified torque
Pressure relief valve	27 Nm



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1 Cylinder head

⇒ [“1.1 Summary of components - cylinder head”, page 71](#)

⇒ [“1.2 Summary of components - camshaft housing”, page 73](#)

⇒ [“1.3 Removing and installing the cylinder head”, page 79](#)

⇒ [“1.4 Removing and installing camshaft housing”, page 84](#)

⇒ [“1.5 Testing the compression”, page 88](#)

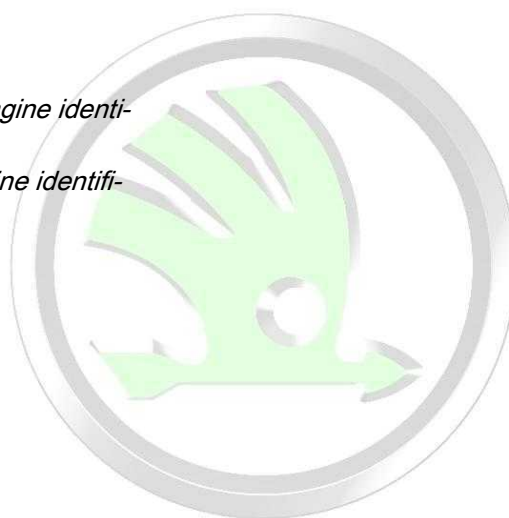
⇒ [“1.6 Testing the combustion chamber for tightness”, page 89](#)

1.1 Summary of components - cylinder head



Note

- ◆ *Summary of components of cylinder head with engine identification characters CZCA is shown.*
- ◆ *Positions of the components are identical for engine identification characters CZDA and CZEa.*



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1 - Cylinder head gasket

- ☐ Replace.
⇒ [“1.3 Removing and installing the cylinder head”, page 79](#).
- ☐ check fitting position:
Cylinder head part number

2 - Fitting sleeve

- ☐ 2 pieces

3 - Cylinder head

- ☐ removing and installing
⇒ [“1.3 Removing and installing the cylinder head”, page 79](#)
- ☐ check for distortion
⇒ [Fig. “Inspecting the cylinder head for distortion”, page 73](#)
- ☐ After replacing, fill with fresh coolant
⇒ [“1.3 Draining and filling up coolant”, page 225](#)

4 - Dowel pins

5 - Gasket

- ☐ No longer used and is integrated into camshaft control valve 1 - N205- and exhaust camshaft control valve 1 - N318-.

6 - Gasket

- ☐ Replace after disassembly

7 - Camshaft housing

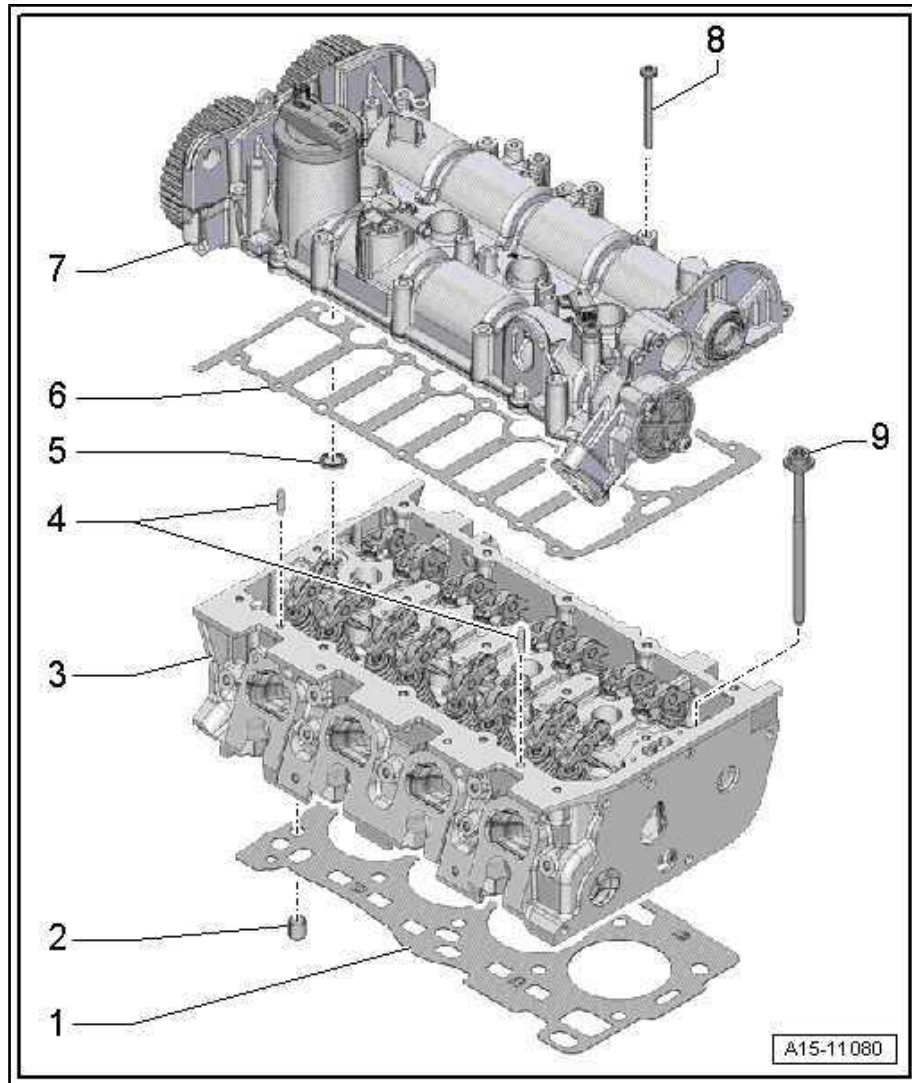
- ☐ The camshafts cannot be removed individually
- ☐ removing and installing ⇒ [“1.4 Removing and installing camshaft housing”, page 84](#)

8 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque and tightening order
⇒ [Fig. “Camshaft housing - tightening torque and tightening order”, page 75](#)

9 - Screw

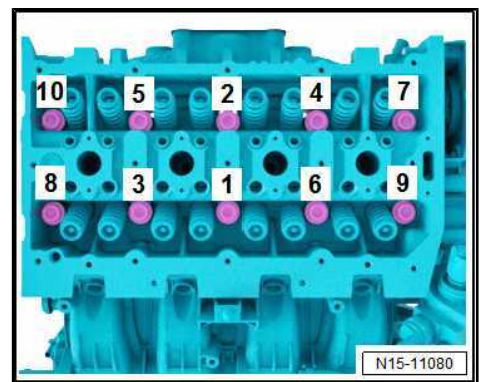
- ☐ Replace after disassembly
- ☐ Loosening order ⇒ [page 83](#)
- ☐ Tightening torque and tightening order
⇒ [Fig. “Cylinder head - tightening torque and tightening order”, page 73](#)



Cylinder head - tightening torque and tightening order

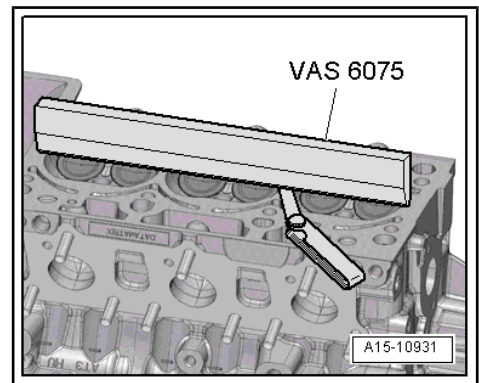
- Tighten screws in steps in the given sequence:

Stage	Screws	Tightening torque/torquing angle
1.	-1 ... 10-	40 Nm
2.	-1 ... 10-	Turn 90° further
3.	-1 ... 10-	Turn 90° further
4.	-1 ... 10-	Turn 90° further



Inspecting the cylinder head for distortion

- Inspect cylinder head at several points for distortion using a 500 mm knife-edge straightedge - VAS 6075- and feeler gauge.
- Maximum permitted distortion: 0.05 mm.



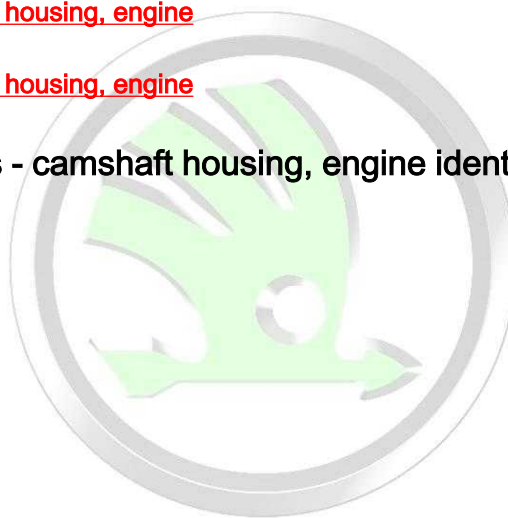
1.2 Summary of components - camshaft housing

⇒ [“1.2.1 Summary of components - camshaft housing, engine identification characters CZCA”, page 73](#)

⇒ [“1.2.2 Summary of components - camshaft housing, engine identification characters CZDA”, page 76](#)

⇒ [“1.2.3 Summary of components - camshaft housing, engine identification characters CZEZ”, page 78](#)

1.2.1 Summary of components - camshaft housing, engine identification characters CZCA



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1 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque and tightening order
⇒ [Fig. “Camshaft housing - tightening torque and tightening order”](#), page 75

2 - Inlet camshaft control valve

1 - N205-

- ☐ removing and installing
⇒ [“3.6 Removing and installing N205 the camshaft adjustment valve 1”](#), page 188

3 - Screw

- ☐ 8 Nm

4 - Camshaft housing

- ☐ The camshafts cannot be removed individually
- ☐ removing and installing
⇒ [“1.4 Removing and installing camshaft housing”](#), page 84

5 - Hall sender - G40-

- ☐ removing and installing
⇒ [“1.4.1 Removing and installing Hall sender G40”](#), page 364

6 - Screw

- ☐ 8 Nm

7 - Sealing ring

- ☐ for exhaust camshaft on the gearbox side
- ☐ removing and installing
⇒ [“3.3.3 Removing and installing exhaust camshaft on gearbox side, engine identification characters CZCA, CZDA”](#), page 179

8 - Toothed belt pulley

- ☐ For coolant pump
- ☐ removing and installing
⇒ [“2.7 Removing and installing toothed belt pulley for coolant pump”](#), page 242

9 - Screw

- ☐ Replace after disassembly
- ☐ 20 Nm + 90°

10 - Screw

- ☐ 8 Nm

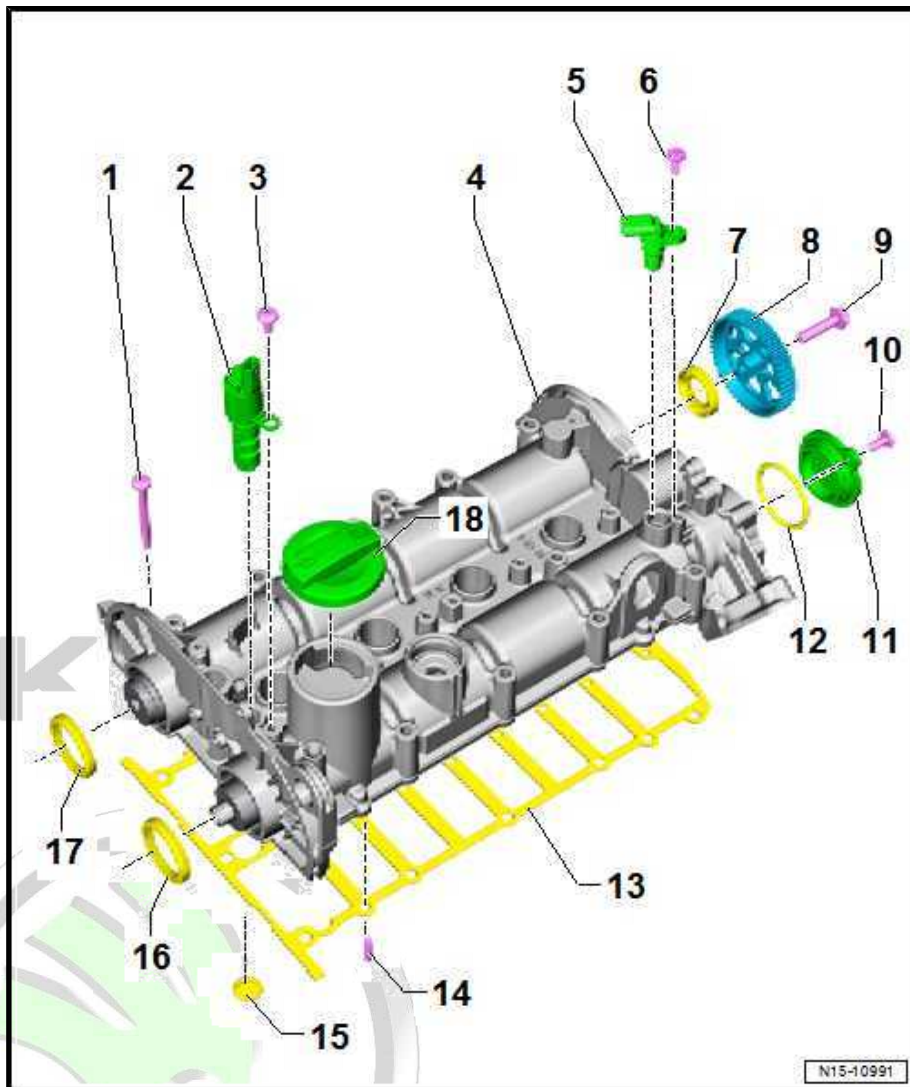
11 - Screw cap

12 - O-ring

- ☐ Replace after disassembly

13 - Gasket

- ☐ Replace after disassembly
- ☐ Different versions ⇒ ETKA - Electronic Catalogue of Original Parts



14 - Fit pin

15 - Gasket

- ☐ No longer present and is integrated into valve 1 for camshaft control - N205- item -2-

16 - Sealing ring

- ☐ For inlet camshaft.
- ☐ replace after removal
⇒ [“3.3.1 Removing and installing the inlet camshaft on the belt pulley side”, page 176](#)

17 - Sealing ring

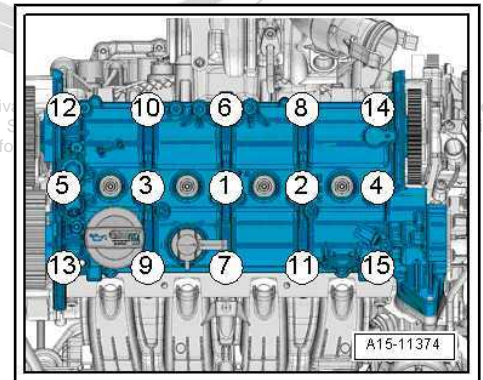
- ☐ for exhaust camshaft on the belt pulley side
- ☐ replace after removal
⇒ [“3.3.2 Removing and installing the exhaust camshaft on the belt pulley side”, page 177](#)
- ☐

18 - Screw cap

Camshaft housing - tightening torque and tightening order

- Tighten screws gradually in the given sequence:

Stage	Screws	Tightening torque/torqueing angle
1.	-1...15-	10 Nm
2.	-1...15-	Turn 180° further



1.2.2 Summary of components - camshaft housing, engine identification characters CZDA

1 - Camshaft control valve 1 in the exhaust - N318-

- ☐ removing and installing
⇒ [“3.7 Removing and installing camshaft control valve 1 in the exhaust N318”, page 188](#)

2 - Screw

- ☐ 8 Nm

3 - Inlet camshaft control valve 1 - N205-

- ☐ removing and installing
⇒ [“3.6 Removing and installing N205 the camshaft adjustment valve 1”, page 188](#)

4 - Camshaft housing

- ☐ The camshafts cannot be removed individually
- ☐ removing and installing
⇒ [“1.4 Removing and installing camshaft housing”, page 84](#)

5 - Hall sender 3 - G300-

- ☐ removing and installing
⇒ [“1.4.2 Removing and installing hall sender 3 G300”, page 364](#)

6 - Screw

- ☐ 8 Nm

7 - Hall transmitter - G40-

- ☐ removing and installing
⇒ [“1.4.1 Removing and installing Hall sender G40”, page 364](#)

8 - Sealing ring

- ☐ for exhaust camshaft on the gearbox side
- ☐ removing and installing
⇒ [“3.3.3 Removing and installing exhaust camshaft on gearbox side, engine identification characters CZCA, CZDA”, page 179](#)

9 - Toothed belt pulley

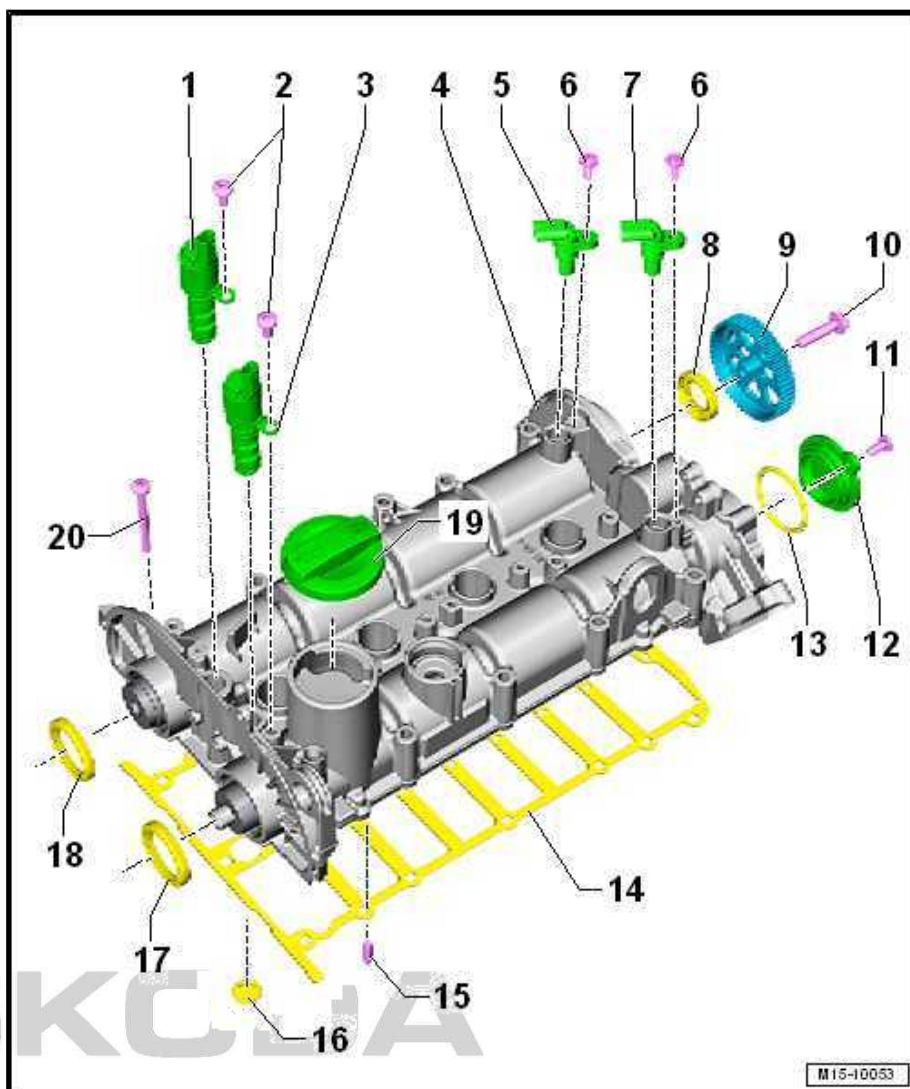
- ☐ For coolant pump
- ☐ removing and installing
⇒ [“2.7 Removing and installing toothed belt pulley for coolant pump”, page 242](#)

10 - Screw

- ☐ Replace after disassembly
- ☐ 20 Nm + 90°

11 - Screw

- ☐ 8 Nm



12 - Screw cap

13 - O-ring

- ☐ Replace after disassembly

14 - Gasket

- ☐ Replace after disassembly
- ☐ Different versions ⇒ ETKA - Electronic Catalogue of Original Parts

15 - Fit pin

16 - Gasket

- ☐ No longer used and is integrated into camshaft control valve 1 - N205- Pos. -3- and exhaust camshaft control valve 1 - N318- Pos. -1-.

17 - Sealing ring

- ☐ For inlet camshaft.
- ☐ replace after removal
⇒ [“3.3.1 Removing and installing the inlet camshaft on the belt pulley side”, page 176](#)

18 - Sealing ring

- ☐ for exhaust camshaft on the belt pulley side
- ☐ replace after removal
⇒ [“3.3.2 Removing and installing the exhaust camshaft on the belt pulley side”, page 177](#)
- ☐

19 - Screw cap

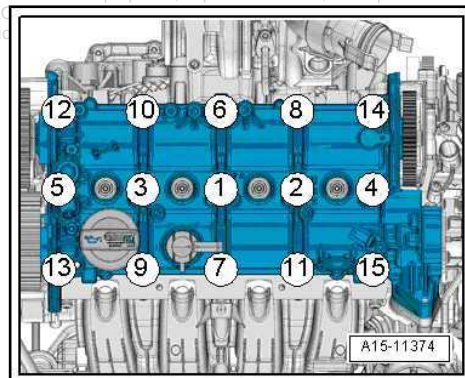
20 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque and tightening order ⇒ [page 77](#)

Camshaft housing - tightening torque and tightening order

– Tighten screws gradually in the given sequence:

Stage	Screws	Tightening torque/torqueing angle
1.	-1...15-	10 Nm
2.	-1...15-	Turn 180° further



1.2.3 Summary of components - camshaft housing, engine identification characters CZEA

1 - Screw

- ☐ 8 Nm

2 - Exhaust cam adjuster for cylinder 2 - N587-

- ☐ removing and installing
⇒ [“3.5.3 Removing and installing exhaust cam for cylinder 2 N587”](#), page 185

3 - Exhaust cam adjuster for cylinder 3 - N595-

- ☐ removing and installing
⇒ [“3.5.4 Removing and installing exhaust cam for cylinder 3 N595”](#), page 186

4 - Inlet cam adjuster for cylinder 3 - N591-

- ☐ removing and installing
⇒ [“3.5.2 Removing and installing inlet cam for cylinder 3 N591”](#), page 184

5 - Inlet cam adjuster for cylinder 2 - N583-

- ☐ removing and installing
⇒ [“3.5.1 Removing and installing inlet cam for cylinder 2 N583”](#), page 183

6 - Screw

- ☐ 8 Nm

7 - Hall sender 3 - G300-

- ☐ removing and installing
⇒ [“1.4.2 Removing and installing hall sender 3 G300”](#), page 364

8 - Hall transmitter - G40-

- ☐ removing and installing ⇒ [“1.4.1 Removing and installing Hall sender G40”](#), page 364

9 - O-ring

- ☐ Replace after disassembly

10 - Sealing ring

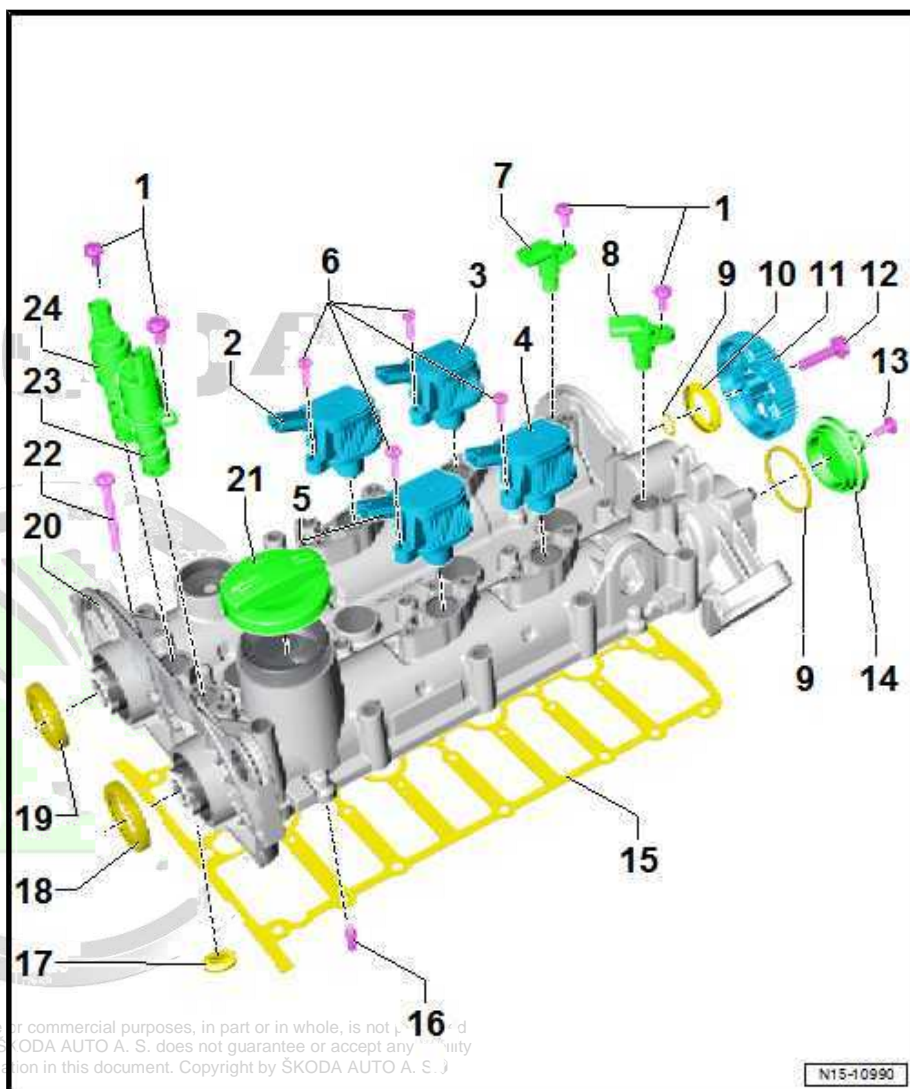
- ☐ for exhaust camshaft on the gearbox side
- ☐ removing and installing
⇒ [“3.3.3 Removing and installing exhaust camshaft on gearbox side, engine identification characters CZCA, CZDA”](#), page 179

11 - Toothed belt pulley

- ☐ For coolant pump
- ☐ removing and installing
⇒ [“2.7 Removing and installing toothed belt pulley for coolant pump”](#), page 242

12 - Screw

- ☐ Replace after disassembly
- ☐ 20 Nm + 90°



13 - Screw

- ☐ 8 Nm

14 - Screw cap

15 - Gasket

- ☐ Replace after disassembly

16 - Fit pin

17 - Gasket

- ☐ No longer used and is integrated into camshaft control valve 1 - N205- Pos. -23- and exhaust camshaft control valve 1 - N318- Pos. -24-.

18 - Sealing ring

- ☐ For inlet camshaft.
- ☐ replace after removal
⇒ [“3.3.1 Removing and installing the inlet camshaft on the belt pulley side”, page 176](#)

19 - Sealing ring

- ☐ For exhaust camshaft.
- ☐ replace after removal
⇒ [“3.3.2 Removing and installing the exhaust camshaft on the belt pulley side”, page 177](#)

20 - Camshaft housing

- ☐ The camshafts cannot be removed individually
- ☐ removing and installing ⇒ [“1.4 Removing and installing camshaft housing”, page 84](#)

21 - Screw cap

22 - Screw

- ☐ Tightening torque and tightening order
⇒ [Fig. “Camshaft housing - tightening torque and tightening order””, page 79](#)

23 - Inlet camshaft control valve 1 - N205-

- ☐ removing and installing
⇒ [“3.6 Removing and installing N205 the camshaft adjustment valve 1”, page 188](#)

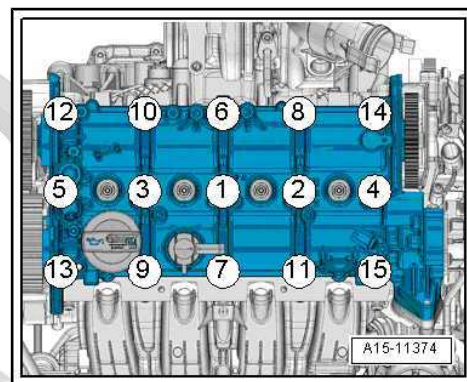
24 - Camshaft control valve 1 in the exhaust - N318-

- ☐ removing and installing
⇒ [“3.7 Removing and installing camshaft control valve 1 in the exhaust N318”, page 188](#)

Camshaft housing - tightening torque and tightening order

– Tighten screws gradually in the given sequence:

Stage	Screws	Tightening torque/torquing angle
1.	-1...15-	10 Nm
2.	-1...15-	Turn 180° further



1.3 Removing and installing the cylinder head

Special tools and workshop equipment required

- ◆ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-

- ◆ Protective goggles and gloves

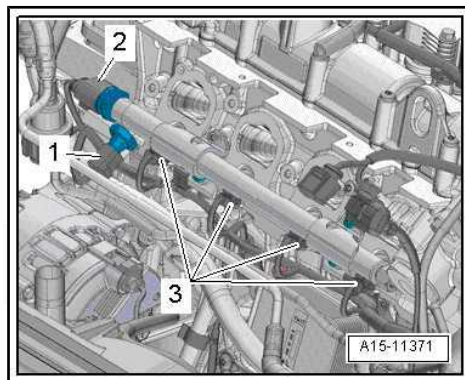
Removing



Note

All heat protection sleeves should be fastened again in the same place when installing.

- Remove camshaft housing
⇒ [“1.4 Removing and installing camshaft housing”, page 84](#).
- Removing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 305](#).
- Disconnect the plug connections:
 - 1 - On the oil pressure switch for reduced oil pressure - F378-
 - 2 - On the fuel pressure sender - G247-
 - 3 - On injectors -N30- to -N33-

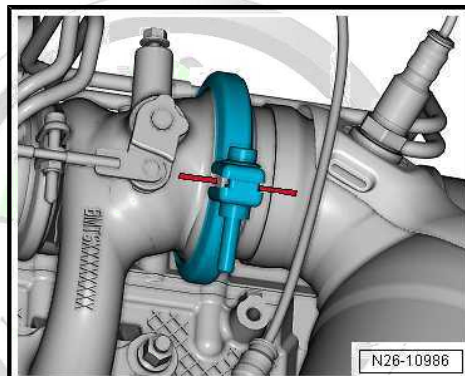


- Mark the position of the clamp.



Note

- ◆ *Before loosening the separation point between catalytic converter and turbocharger, mark the position of the clamp.*
- ◆ *Put the clamp back into position when assembling!*

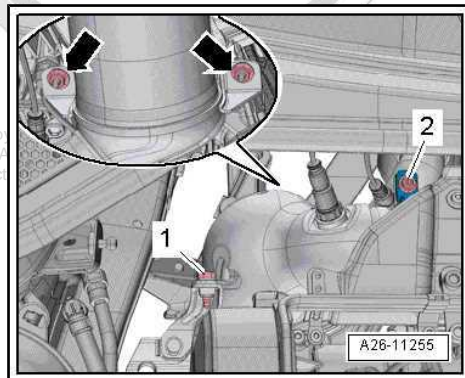


- Unscrew screw -2- and remove screw clamp.
- Remove screw -1-, remove nuts -arrows- and strap up catalytic converter to the bodyshell so as not to damage the decoupling element.



Note

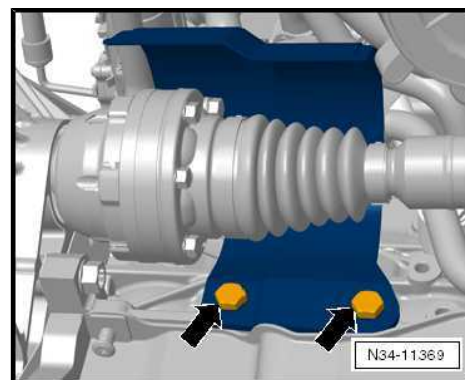
do not twist decoupling element in the exhaust pipe more than 10° - risk of damage



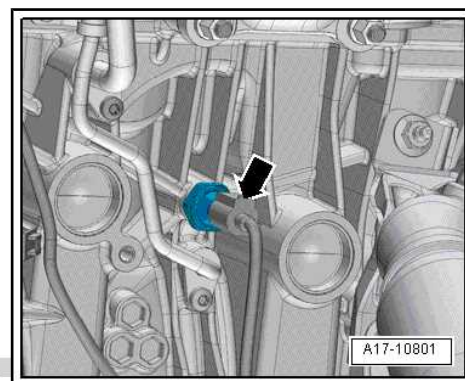
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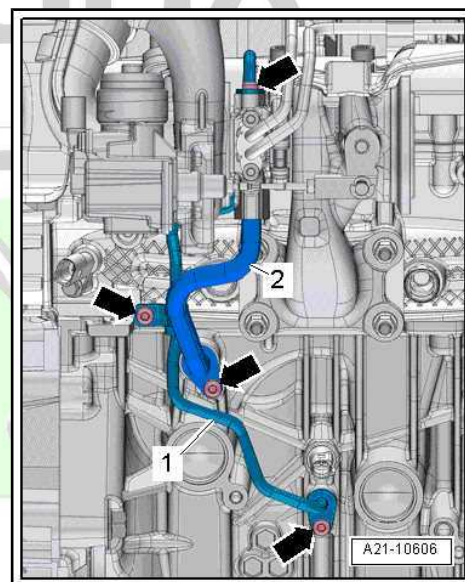
- Release screws -1- and remove heat shield for right cardan shaft, if present.



- Remove heat protection sleeve for oil pressure switch - F1- .
- Disconnect electrical plug connection -arrow- at the oil pressure switch - F1- .

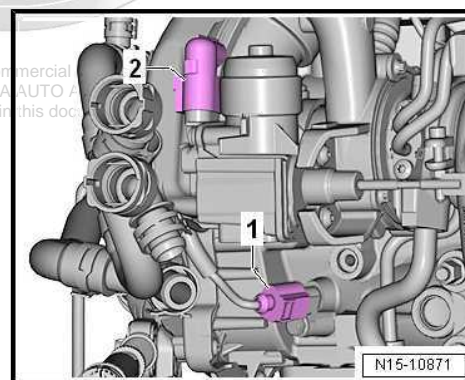


- Screw out the screws -arrows-, remove oil feed line -1- and oil return pipe -2-.

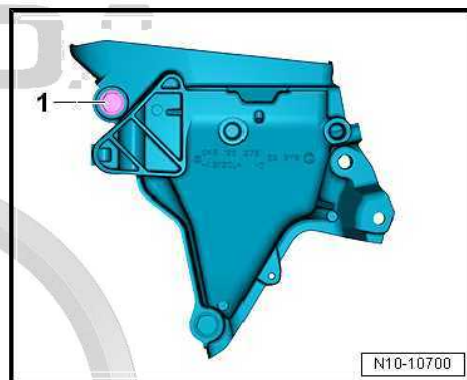


- Disconnect the plug connections:

- 1 - Coolant temperature sender - G62-
- 2 - For charge pressure regulator - V465-



- Unscrew screw -1- at the engine support.



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- Loosen and unscrew the screws for the cylinder head in the sequence -1...10-.
- Remove cylinder head and place it on a clean base (foam).

Install



NOTICE

Risk of damaging sealing surfaces.

- Carefully remove residual sealant from the cylinder head and cylinder block.
- Make sure this does not cause any extended scoring or scratching.



NOTICE

Risk of damaging the cylinder block.

- ◆ There must be no oil or coolant in the blind holes for the cylinder head bolts in the cylinder block.



NOTICE

Risk of damage to the cylinder head gasket.

- ◆ Remove the new cylinder head gasket from its wrapping immediately before fitting.
- ◆ To prevent the silicon layer and the area of the bead from being damaged, handle the gasket with the utmost care.



Note

- ◆ *Replace self-locking nuts, gasket rings, gaskets and O-rings.*
- ◆ *If a replacement cylinder head must be installed, the contact surfaces between hydraulic balancing elements, roller rocker fingers and camshaft slideways must be oiled before the camshaft housing is installed.*
- ◆ *Secure all hose connections with hose clamps which comply with the series design ⇒ Electronic Catalogue of Original Parts“ETKA.”.*
- ◆ *When the cylinder head or the cylinder head gasket is replaced, the engine oil must be replaced.*
- Stuff clean cloth into the cylinders to avoid any dirt getting in between cylinder wall and piston.

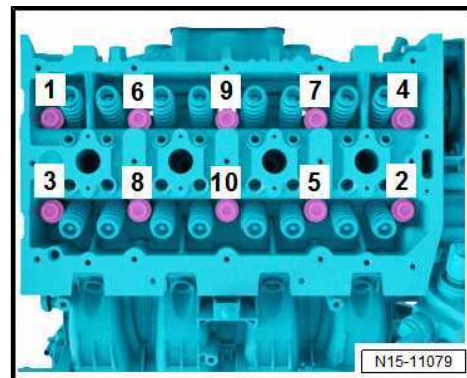


CAUTION

Risk of injury to eyes and skin.

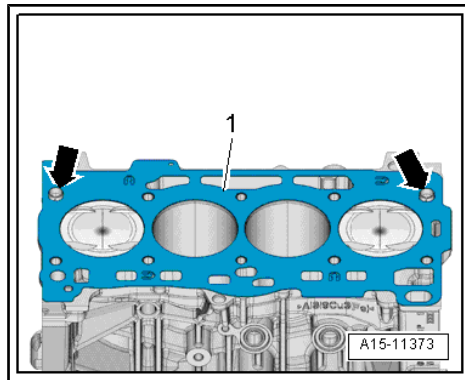
Wear safety gloves and safety goggles.

- Carefully remove old sealant residue from the cylinder head and cylinder block using a chemical sealant remover.
- Make sure that, when cleaning the cylinder head and cylinder block, no foreign bodies can get into the cylinder or into the oil and coolant galleries.



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- Fit on cylinder head gasket -1-.
- ♦ Pay attention to dowel sleeves in cylinder block -arrows-.
- ♦ Check installation position of the cylinder head gasket, identification: Part number must be legible from the inlet side.
- If the crankshaft has rotated in the meantime: Position piston of cylinder 1 at TDC. Turn the crank shaft back again slightly.
- Insert the cylinder head.
- Insert cylinder head bolts and tighten hand-tight.
- Tighten cylinder head bolts
⇒ [Fig. “Cylinder head - tightening torque and tightening order”](#), [page 73](#) .



Note

Tightening up the cylinder head bolts after doing repair work is not necessary.

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

- Install camshaft housing
⇒ [“1.4 Removing and installing camshaft housing”](#), [page 84](#) .
- Installing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”](#), [page 305](#) .
- Change engine oil:
♦ ⇒ Maintenance ; Booklet Superb III
♦ ⇒ Maintenance ; Booklet Kodiaq
- Replace coolant
⇒ [“1.3 Draining and filling up coolant”](#), [page 225](#) .

Tightening torques

- ♦ Engine support bracket
⇒ [Fig. “Engine support bracket - tightening torque and tightening order”](#), [page 27](#) .
- ♦ Cylinder head
⇒ [“1.1 Summary of components - cylinder head”](#), [page 71](#) .
- ♦ Oil line for exhaust gas turbocharger
⇒ [“1.1 Summary of components - exhaust gas turbocharger”](#), [page 268](#) .
- ♦ Install high catalytic converter
⇒ [“2.1 Summary of components - exhaust gas cleaning”](#), [page 348](#) .
- ♦ Heat shield for cardan shaft ⇒ Chassis, axles, steering; Rep. gr. 40 ; Cardan shaft; installing and removing heat shield for cardan shaft .

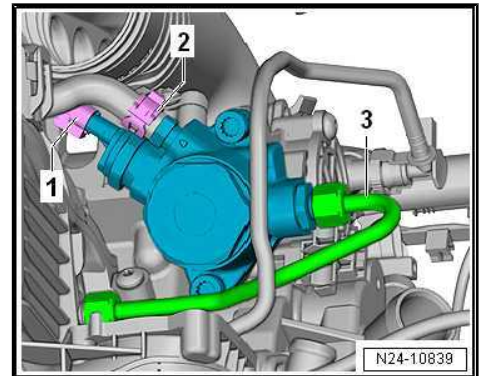
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1.4 Removing and installing camshaft housing

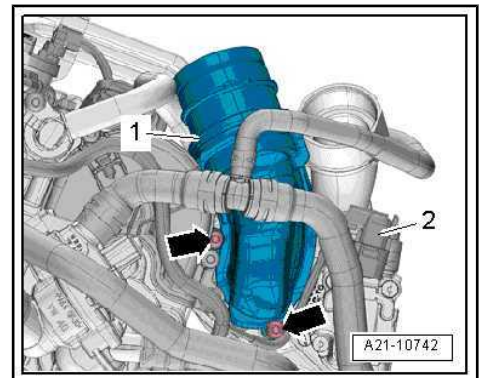
Removing

- Remove coolant pump
⇒ [“2.5 Removing and installing coolant pump”](#), [page 235](#) .

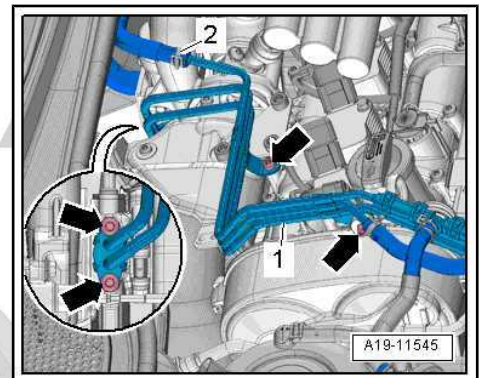
- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 302](#) .
- Removing ignition coils
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#) .
- Remove the toothed belt from the camshafts
⇒ [“2.5 Remove the toothed belt from the camshaft”, page 140](#) .
- Remove high pressure pipe -3-
⇒ [“7.3 Removing and installing high pressure pipe”, page 321](#) .
- Separate electrical plug connection -1-.
- Loosen hose clamp -2- and disconnect hose.
- Separate electrical plug connection -2-.



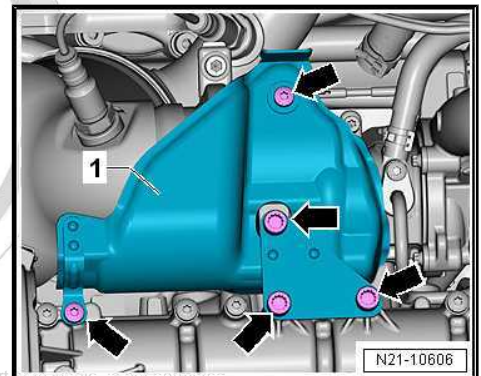
- Release screws -arrows- and remove connection piece -1-.



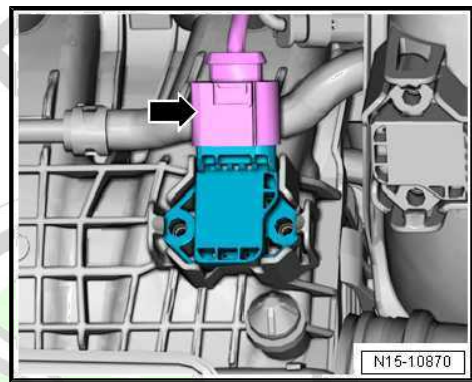
- Loosen hose clamp -2- and remove coolant hose.
- Unscrew -arrows- screws and swivel coolant lines -1- to the right side.



- Release screws -arrows- and remove mount with heat shield -1-.



- Remove connector -arrow- from manifold pressure sender - GX9- .



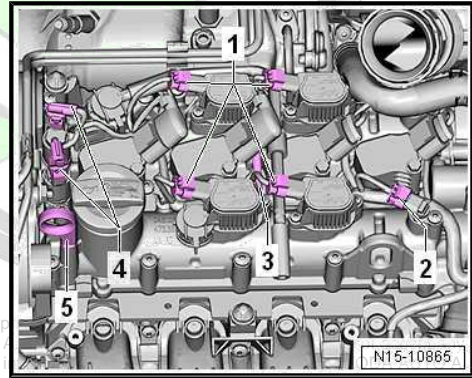
- Disconnect the plug connections:

1 - for cam adjuster - N583- / -N587- / -N591- / -N595- (only for engine identification characters CZEa)

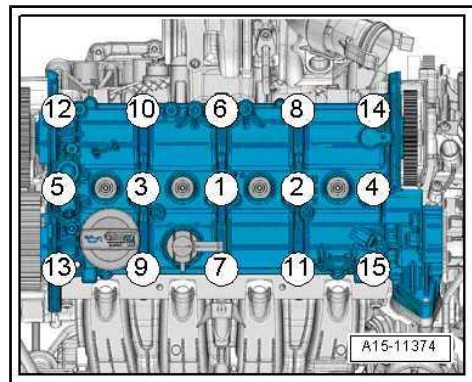
2 - for Hall sender - G40- and Hall sender 3 - G300- (only for engine identification characters CZEa, CZDA)

4 - for camshaft control valve 1 - N205- and camshaft control valve 1 in the exhaust - N318- (only for engine identification characters CZDA, CZEa).

- Unscrew screw -3- and expose the wiring loom and lay it to the left-hand side.
- Pull out oil dipstick -5-.



- Loosen and unscrew screws for camshaft housing in the sequence -15- to -1-.
- Carefully unscrew the camshaft housing and remove from the bonding.
- When installing again, mark the assignment of the roller rocker finger and the balancing elements.
- Remove the roller rocker finger together with the balancing elements and lay aside on a clean surface.



Install



Note

Replace gasket.

- “Check TDC” position of camshaft and crankshaft:



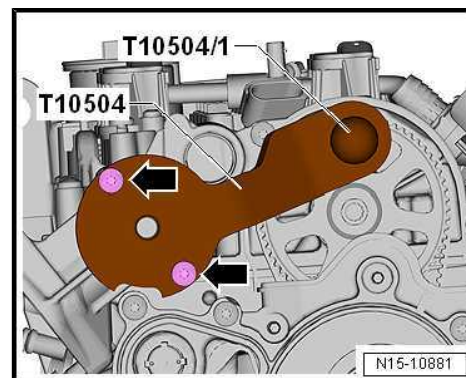
NOTICE

Risk of damaging the valve gear.

- ◆ When turning, the camshafts must not be moved axially.

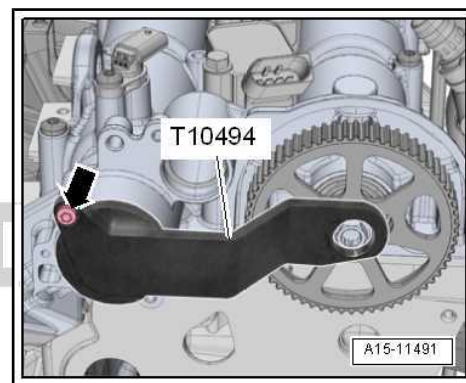
Engine identification characters CZEA

- Camshaft clamp - T10504- attached to camshaft housing.



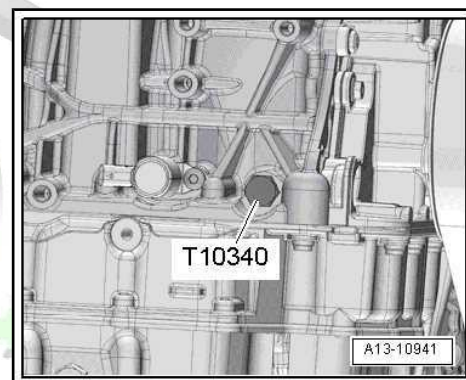
Engine identification characters CZCA, CZDA

- Camshaft clamp - T10494- attached to camshaft housing.

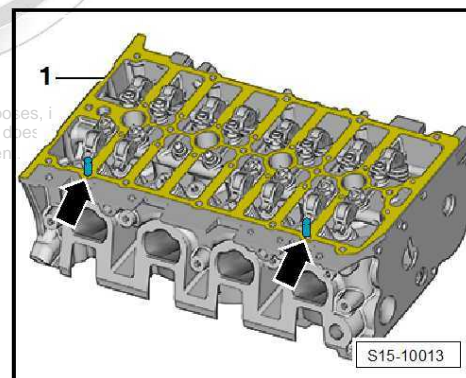


Continued for all engine identification character

- Fixing screw - T10340- turned up to the stop in the cylinder block and tightened to 30 Nm.
- Crankshaft in engine direction of rotation applied to the locating screw - T10340- = "TDC" position.
- Check that all roller rocker fingers are lying flat correctly on the end of the valve stem and are clipped into the respective balancing element.



- Fit gasket onto dowel pins -arrows-.



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- Screw in threaded bolts -2- and -4-, e.g. -T10288/4- , into the cylinder head.
- Carefully place camshaft housing -3- vertically from above on to the threaded bolts in the cylinder head.



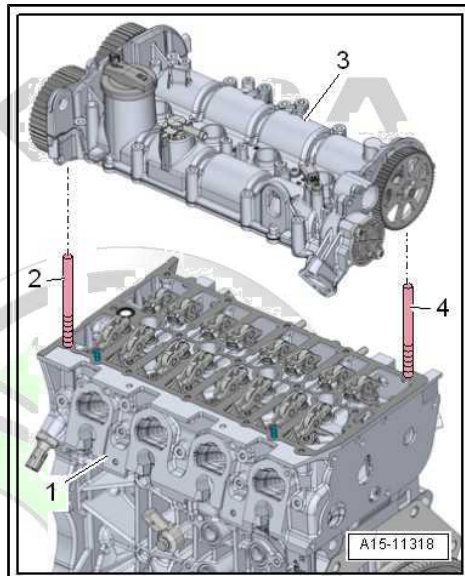
Note

Make sure that the camshaft housing does not tilt.

- Tighten camshaft housing screws.

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

- Install high pressure pipe
⇒ [“7.3 Removing and installing high pressure pipe”, page 321](#) .
- install (set the timing)
⇒ [“2.5 Remove the toothed belt from the camshaft”, page 140](#) .
- Install ignition coils
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#) .
- Install coolant pump
⇒ [“2.5 Removing and installing coolant pump”, page 235](#) .
- Electrical connections and proper routing ⇒ [Current flow diagrams, Electrical fault finding and Fitting locations](#).



NOTICE

Risk of damaging valves and piston crowns after work on the valve gear.

To ensure that no valve is set during starting, turn the engine carefully by at least 2 turns.

Tightening torques

- ♦ Camshaft housing
⇒ [“1.2 Summary of components - camshaft housing”, page 73](#) .
- ♦ Exhaust gas turbocharger
⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#) .

1.5 Testing the compression

Special tools and workshop equipment required

- ♦ Spark plug wrench , e.g. -3122 B-
- ♦ Compression tester - V.A.G 1763-
- Engine oil temperature at least 30 °C.
- Battery voltage at least 12.5 V.
- Remove fuse for fuel pump control unit from the fuse holder.
Fuse assignment ⇒ [Current flow diagrams, Electrical fault finding and Fitting locations](#)



Note

Removing fuse interrupts the voltage supply of the fuel pump control unit.

- Start engine and allow to run until it has cut out.
- Switch off ignition.
- Pull out ignition coils at power output stage
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#) .
- Unscrew spark plugs with spark plug wrench , e. g. -3122 B- .
- Check the compression pressure using the compression tester - V.A.G 1763- ; handling, ⇒ Operating Manual .
- 2nd mechanic depresses the accelerator pedal fully and at the same time actuates the starter until the tester shows no further pressure rise.
- Repeat the work procedure for each cylinder.

Compression readings	
New part	1,0 ... 1.5 MPa (10.0...15.0 bar)
Wear limit	0.7 MPa (7.0 bar)
Maximum difference between cylinders	0.3 MPa (3.0 bar)

Install

Installation is performed in the reverse order, pay attention to the following points:

- Install spark plugs.
- Install ignition coils at power output stage
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#) .

Because the electrical plug connections were disconnected and the engine started, faults are stored in the event memory of the engine control unit.

- Clear event memory and re-generate the readiness code ⇒ Vehicle diagnostic tester.

Tightening torques

- ◆ Ignition coil with power output stage
⇒ [“1.1 Assembly overview - ignition system”, page 360](#) .
- ◆ Spark plugs
⇒ [“1.1 Assembly overview - ignition system”, page 360](#) .

1.6 Testing the combustion chamber for tightness

Special tools and workshop equipment required

- ◆ Spark plug wrench , e.g. -3122 B-
- ◆ Adapter - T40012- or -VAS 5161A/35-
- Remove ignition coils with power output stage
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#) .

- Unscrew the spark plugs with spark plug wrench - 3122 B- .
- Carefully insert a screwdriver into the opening of the ignition plug of the appropriate cylinder, minimum length of shaft 250 mm, in -direction of arrow- so that it touches the piston head.
- Turn the crankshaft until the piston is at "TDC".
- Screw the pressure hose MP 1-210 into the spark plug thread.
- Connect pressure hose to compressed air supply.
- With the assistance of a second mechanic, lock the screw on the crankshaft at "TDC" position in order to avoid displacement of the piston after pressure build-up.
- ♦ Vehicles without air conditioning system Pos. -1-
⇒ ["1.1.1 Summary of components - Vehicles without air conditioning", page 36](#) .
- ♦ Vehicles with air conditioning system Pos. -2-
⇒ ["1.1.2 Summary of components - Vehicles with air conditioning", page 38](#) .



Note

Perform a pressure build-up in the "TDC" position when the induction and outlet valves are closed.

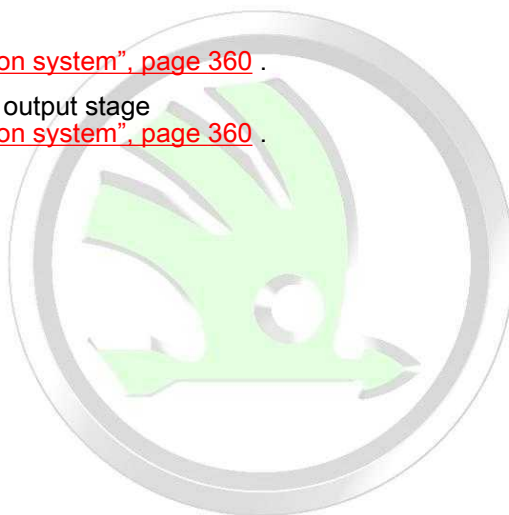
- Build up a pressure of 0.3 MPa (3 bar) in the combustion chamber.
- Repeat the test for the remaining cylinder.
- Determine how the pressure escapes:
 - 1 - Via the inlet valve(s) - the pressure enters the throttle valve.
 - 2 - Via the outlet valve(s) - the pressure enters the exhaust system.
 - 3 - Via the piston rings - the pressure enters the cylinder block.

Tightening torques

- ♦ Spark plugs
⇒ ["1.1 Assembly overview - ignition system", page 360](#) .
- ♦ Screw for ignition coil with power output stage
⇒ ["1.1 Assembly overview - ignition system", page 360](#) .



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2 Toothed belt drive

⇒ [“2.1 Summary of components - toothed belt guard”, page 91](#)

⇒ [“2.2 Summary of components - toothed belt”, page 92](#)

⇒ [“2.3 Removing and installing toothed belt”, page 95](#)

⇒ [“2.4 Test timing”, page 129](#)

⇒ [“2.5 Remove the toothed belt from the camshaft”, page 140](#)

2.1 Summary of components - toothed belt guard

1 - Bottom toothed belt guard

2 - Screw

- 8 Nm

3 - Engine support bracket

- Tightening torque and tightening order
⇒ [Fig. “Engine support bracket - tightening torque and tightening order”, page 27](#)
- removing and installing
⇒ [“1.6 Removing and installing engine support”, page 45](#)

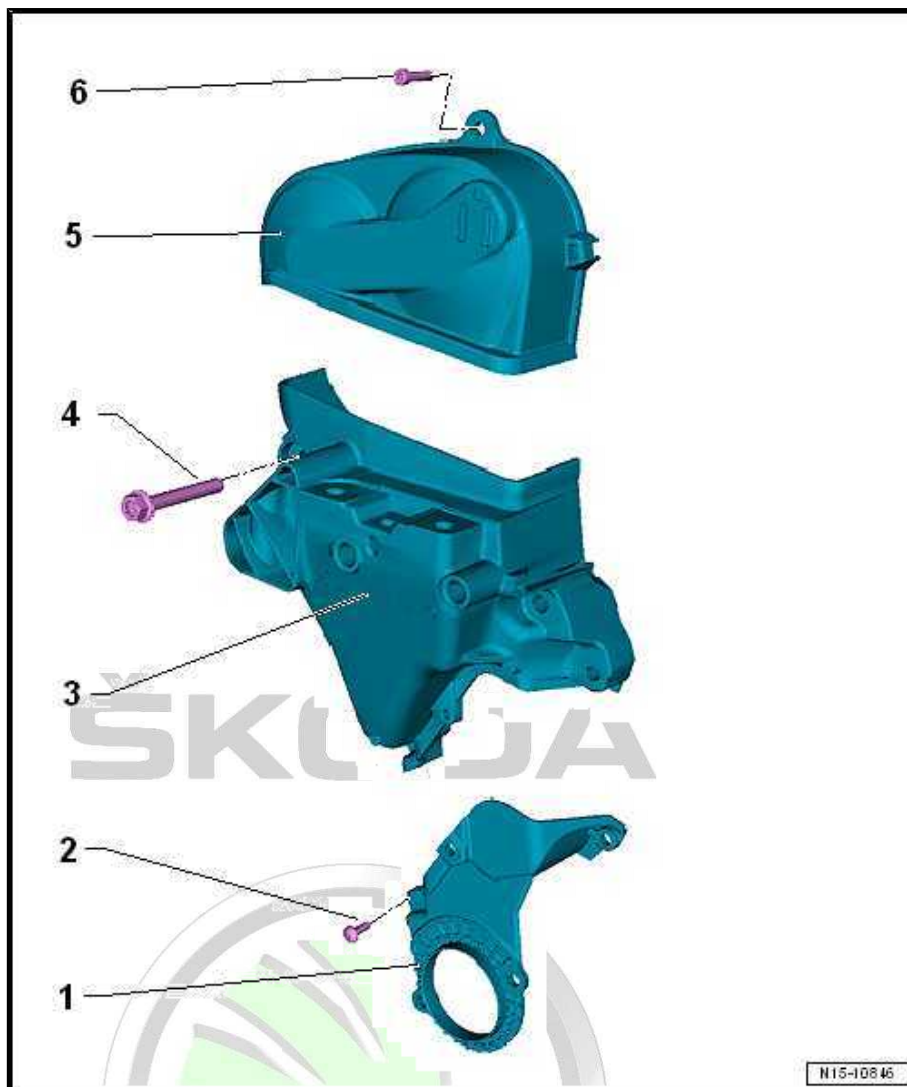
4 - Screw

- Tightening torque and tightening order
⇒ [Fig. “Engine support bracket - tightening torque and tightening order”, page 27](#)

5 - Top toothed belt guard

6 - Screw

- 8 Nm



2.2 Summary of components - toothed belt

⇒ [“2.2.1 Summary of components - engine identification characters CZCA”, page 92](#)

⇒ [“2.2.2 Summary of components - engine identification characters CZDA, CZEa”, page 94](#)

2.2.1 Summary of components - engine identification characters CZCA

1 - Toothed belt

- ☐ mark the direction of rotation with chalk or a felt-tip pen before removing
- ☐ check for wear
- ☐ Bending radius of the toothed belt
⇒ [Fig. “Bending radius of the toothed belt”, page 93](#).
- ☐ removing and installing (setting the timing)
⇒ [“2.3.1 Removing and installing toothed belt - engine identification characters CZCA, CZDA”, page 95](#)

2 - Screw

- ☐ 25 Nm

3 - Tensioning roller

- ☐ for removing and installing, remove engine support
⇒ [“1.6 Removing and installing engine support”, page 45](#)

4 - Screw

- ☐ Replace after disassembly
- ☐ 50 Nm + 90°

5 - Toothed belt pulley, exhaust camshaft

- ☐ removing and installing
⇒ [“2.5 Remove the toothed belt from the camshaft”, page 140](#)

6 - Toothed belt pulley, inlet camshaft

- ☐ With camshaft control
- ☐ Removing and installing camshaft control ⇒ [“3.4 Removing and installing camshaft control”, page 182](#)

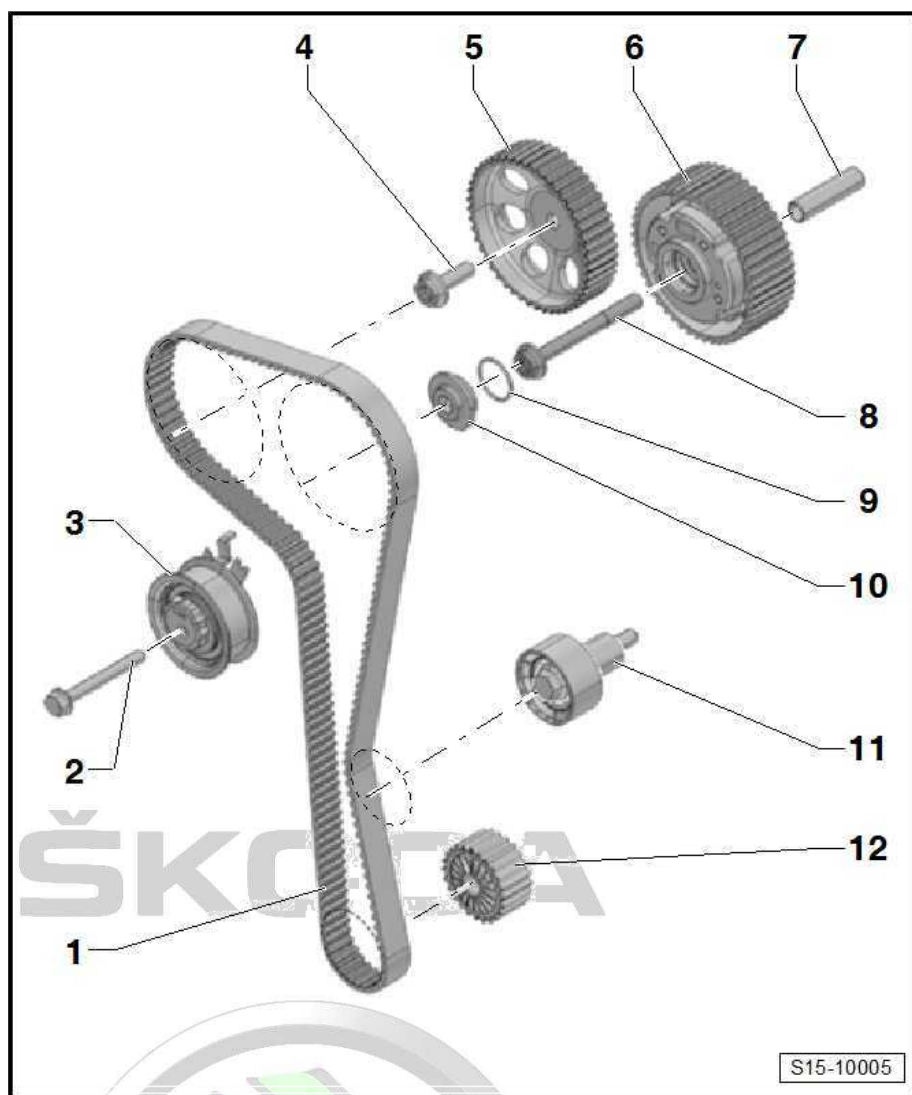
7 - Guide bushing

8 - Screw

- ☐ Replace after disassembly
- ☐ 50 Nm + 135°

9 - O-ring

- ☐ Replace after disassembly



10 - Plug

- 20 Nm

11 - Guide pulley

- 45 Nm

12 - Crankshaft toothed belt sprocket

- there must not be any oil present on the contact surface between the toothed belt sprocket and the crankshaft
- can be installed only in one position

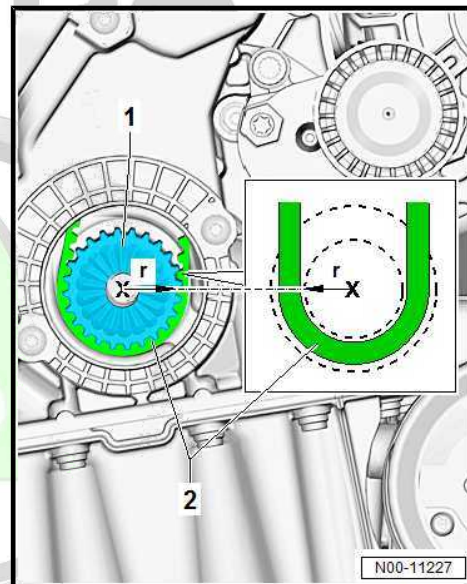
Bending radius of the toothed belt



NOTICE

Risk of damage to the toothed belt.

- ◆ The bending radius - r - of the toothed belt -2- must not be allowed to drop below the minimum of 25 mm (approx. half the \varnothing of the crankshaft-belt pulley)
⇒ Fig. ““Bending radius of the toothed belt””, page 93 .
- ◆ If the bending radius falls below the minimum of 25 mm, this will affect the lifetime of the belt.



Unscrew screw plug “TDC” bore at the cylinder block - tightening torque

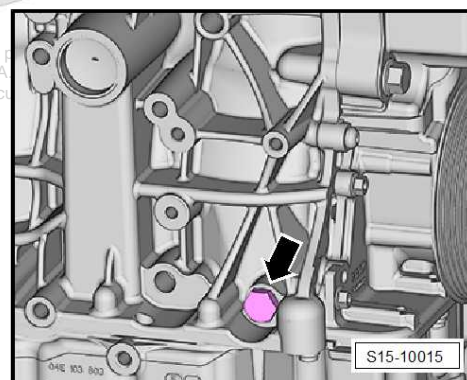
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Note

Replace the O-ring if it is damaged.

- Tighten bolts -arrows- to 30 Nm.



1 - Toothed belt

- ☐ mark the direction of rotation with chalk or a felt-tip pen before removing
- ☐ check for wear
- ☐ Bending radius of the toothed belt
⇒ [Fig. "Bending radius of the toothed belt", page 95](#).
- ☐ removing and installing (setting the timing)
⇒ ["2.3 Removing and installing toothed belt", page 95](#)

2 - Screw

- ☐ 25 Nm

3 - Tensioning roller

- ☐ for removing and installing, remove engine support
⇒ ["1.6 Removing and installing engine support", page 45](#)

4 - Screw

- ☐ Replace after disassembly
- ☐ 8 Nm + 45°

5 - Cover

6 - Screw

- ☐ Replace after disassembly
- ☐ 50 Nm + 135°

7 - Toothed belt pulley, exhaust camshaft

- ☐ With camshaft control
- ☐ Removing and installing camshaft control ⇒ ["3.4 Removing and installing camshaft control", page 182](#)

8 - Guide bushing

9 - Toothed belt pulley, inlet camshaft

- ☐ With camshaft control
- ☐ Removing and installing camshaft control ⇒ ["3.4 Removing and installing camshaft control", page 182](#)

10 - Screw

- ☐ Replace after disassembly
- ☐ 50 Nm + 135°

11 - O-ring

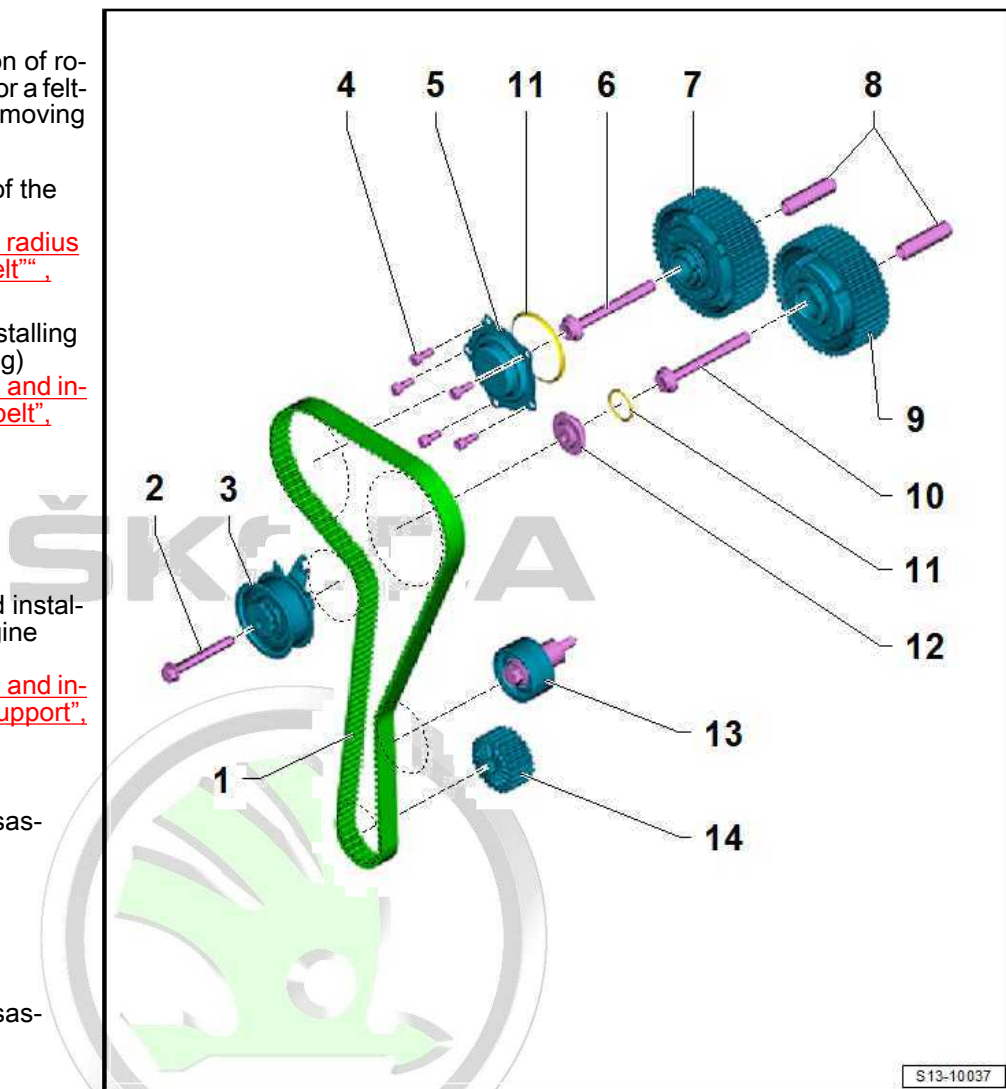
- ☐ Replace after disassembly

12 - Plug

- ☐ 20 Nm

13 - Guide pulley

- ☐ 45 Nm



14 - Crankshaft toothed belt sprocket

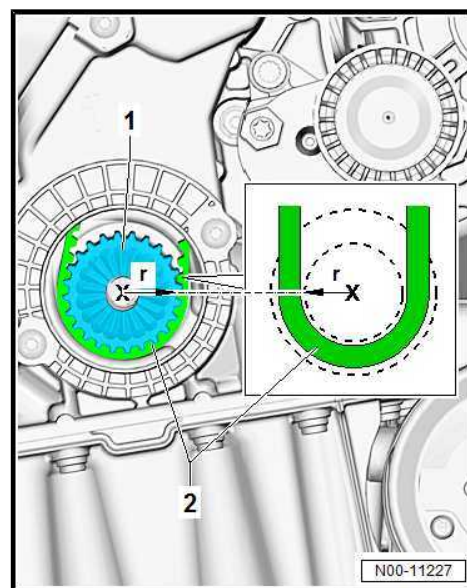
- ❑ there must not be any oil present on the contact surface between the toothed belt sprocket and the crankshaft
- ❑ can be installed only in one position

Bending radius of the toothed belt



Risk of damage to the toothed belt.

- ◆ The bending radius - r - of the toothed belt -2- must not be allowed to drop below the minimum of 25 mm (approx. half the \varnothing of the crankshaft-belt pulley)
⇒ Fig. "Bending radius of the toothed belt", page 95 .
- ◆ If the bending radius falls below the minimum of 25 mm, this will affect the lifetime of the belt.



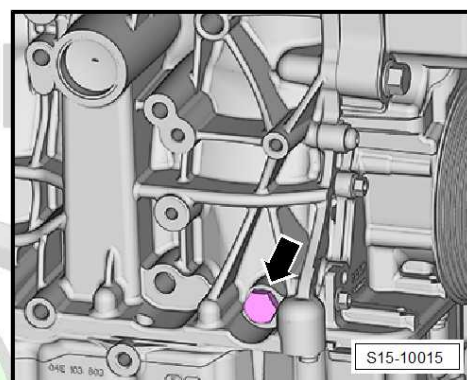
Unscrew screw plug "TDC" bore at the cylinder block - tightening torque



Note

Replace the O-ring if it is damaged.

- Tighten bolts -arrows- to 30 Nm.



2.3 Removing and installing toothed belt

⇒ "2.3.1 Removing and installing toothed belt - engine identification characters CZCA, CZDA", page 95

⇒ "2.3.2 Removing and installing toothed belt, engine identification characters CZEa", page 114

2.3.1 Removing and installing toothed belt - engine identification characters CZCA, CZDA

Special tools and workshop equipment required

- ◆ Counterholder - T10172A- with adapters -T10172/2-
- ◆ Support - T10554-
- ◆ Locating screw - T10340-
- ◆ Key - T10499A-
- ◆ Insertion tool - T10500-
- ◆ Torque wrench - V.A.G 1410- or -VAS 6583-

- ◆ Crankshaft arrester - T10494-
- ◆ Release tool -T10527-
- ◆ Release tool - T10527/1-
- ◆ Assembly device - T10487-
- ◆ Spark plug wrench , e.g. -3122 B-

Prepare the tools

- Screw the counterholder - T10172A- and holder - T10554- with knurled screws -arrows-.

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Insert support - T10554-

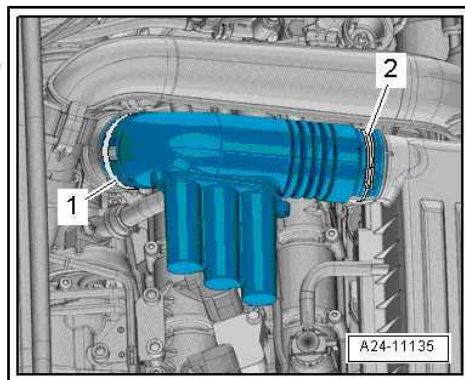
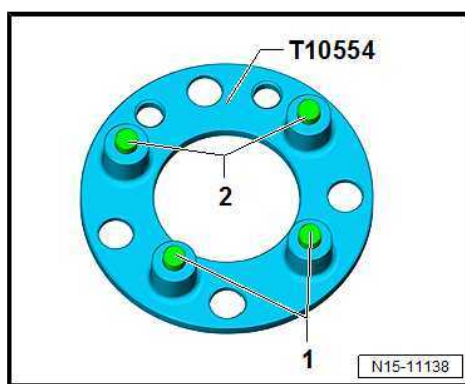
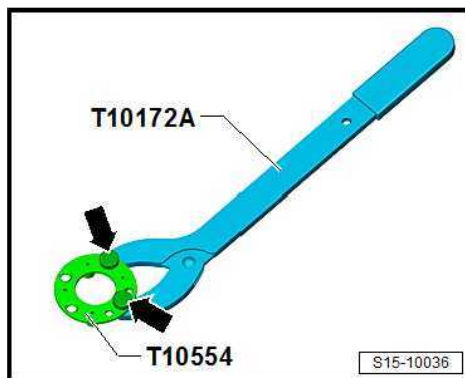
The row spacings -1- and -2- of the holder - T10554- are arranged unevenly.

They are equal to the hole spacings in the camshaft control.

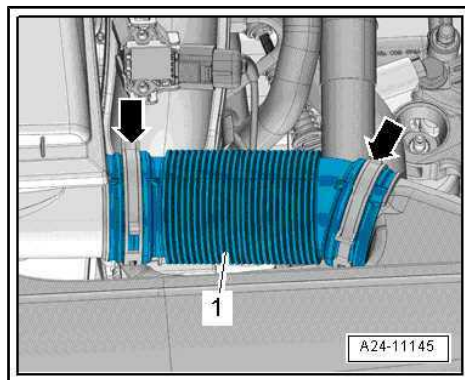
Removing

- Loosen hose clamps -1- and -2- and remove air guide pipes.

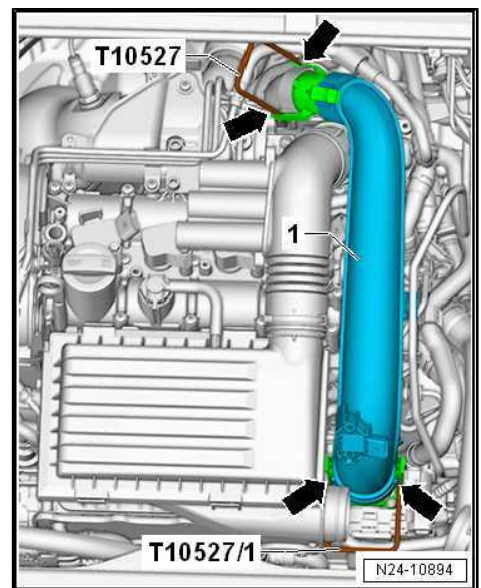
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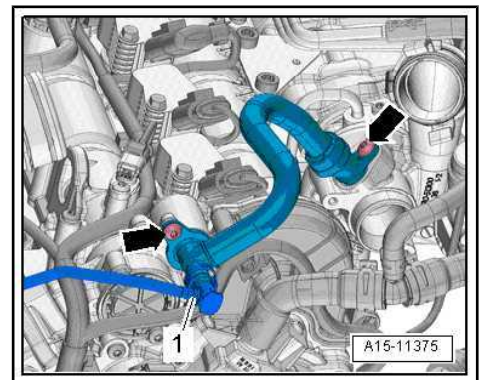
- Undo hose clamps -arrows-, remove air guide hose -1-.
- Remove plug from charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.



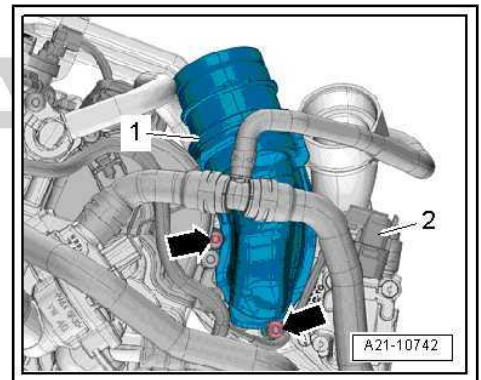
- Release retaining tabs -arrows- using the release tool - T10527- and -T10527/1- .
- Remove air guide pipe -1-.



- Press release buttons and remove hose -1- to the activated charcoal filter.
- Unscrew screws -arrows- and remove hose for crankcase ventilation.



- Release screws -arrows- and remove connection piece -1-.



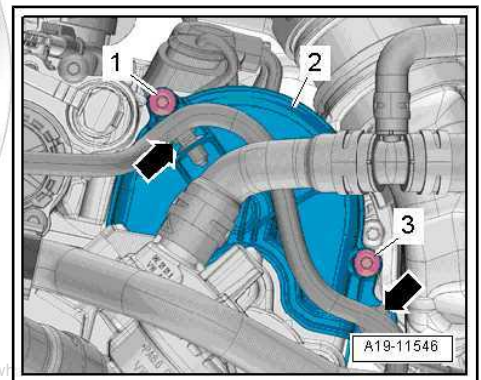
- Expose wiring loom -arrows-.
- Remove screws -1-, -3- and remove toothed belt guard -2- for coolant pump toothed belt.



Note

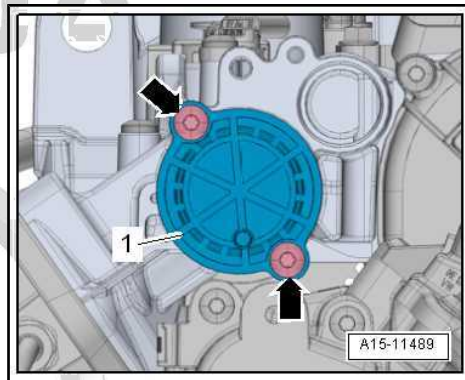
If engine oil touches the sealing ring for the coolant pump, it may be damaged chemically.

- Cover the coolant pump with a cloth.

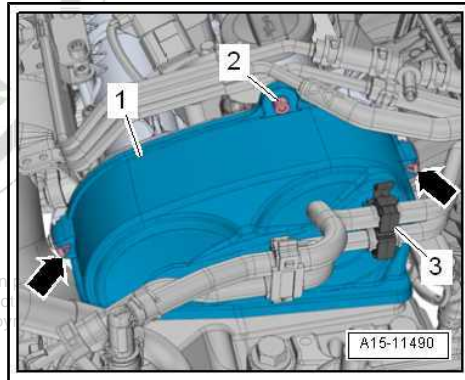


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- Remove screws -arrows- and remove cap -1-.



- Unclip holder -3- together with hoses from the toothed belt guard -1-.
- Unscrew bolt -2-.
- Loosen clips -arrows- and remove toothed belt guard -1- upwards.



For vehicles with engine identification characters CZDA

NOTICE

Risk of damage to the toothed belt due to leaking engine oil.

Contact points of the toothed belt, camshaft sprocket, crankshaft pulley, tensioning pulley and guide pulley are to be kept free of oil.

- Remove screws -arrows- and remove the cover from the camshaft control of the exhaust camshaft.

For vehicles with engine identification characters CZCA, CZDA

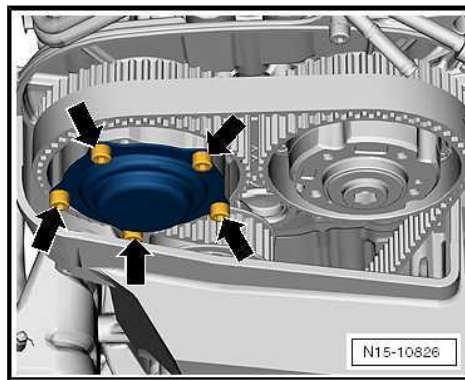
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .

Positioning crankshaft at “TDC”

CAUTION

Risk of engine damage.

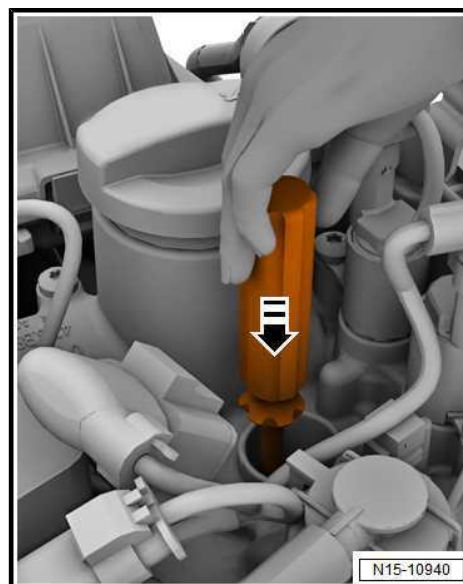
You must adjust the “TDC” position, as described!



- ◆ Locating screw - T10340- can collide with crankshaft in two positions.
- Remove ignition coil with power output stage 1
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#) .
- Remove ignition plug cylinder 1 with spark plug socket wrench , e. g. -3122 B- .

Set the correct position of the crankshaft for screwing in the locating screw:

- Carefully insert a screwdriver into the opening of the ignition plug, minimum length of shaft 250 mm, in -direction of arrow- so that it touches the piston head.
- Rotate the crankshaft in direction of rotation of engine on “TDC” for cylinder 1.



- Turn engine shaft further in direction of arrow so that the screwdriver just out at the top by approx 35 mm in the -direction of the arrow-.
- Unscrew screw plug “TDC” bore at the cylinder block.

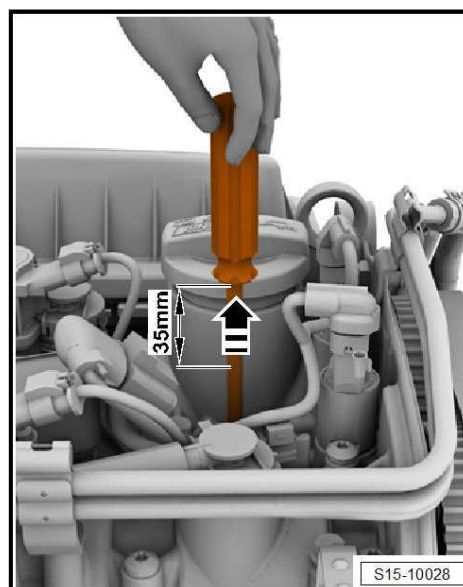
! NOTICE

Risk of damage to the engine if the locating screw - T10340- is screwed in at the wrong position.

If the locating screw - T10340- cannot be screwed in up to the stop, the crankshaft is not in the correct position.

In this case, proceed as follows:

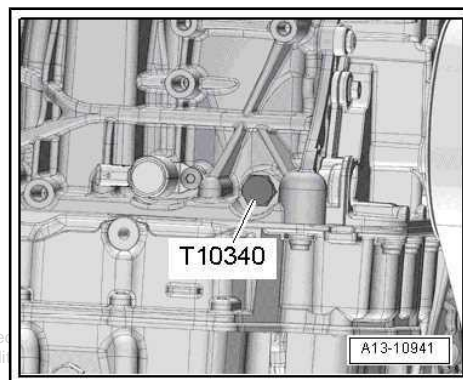
- Unscrew locking pin.
- Set the correct position of the crankshaft for screwing in the locating screw [⇒ page 99](#).
- Screw the locating screw - T10340- up to the stop into the cylinder block and tighten to 30 Nm.
- Turn crankshaft up to the stop in direction of rotation of engine.
- The crankshaft sprocket now lies on the locating screw and the “TCD” position is set.



Note

The crankshaft is only locked in direction of rotation of engine using the locating screw - T10340-

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- With the exhaust camshaft -A- and inlet valve -E-, the asymmetrically arranged grooves -arrows- must be above the camshaft centre.
- On the exhaust camshaft -A-, the grooves -arrows- are accessible through the recesses in the coolant pump driving wheel.

If the camshafts are not as described:

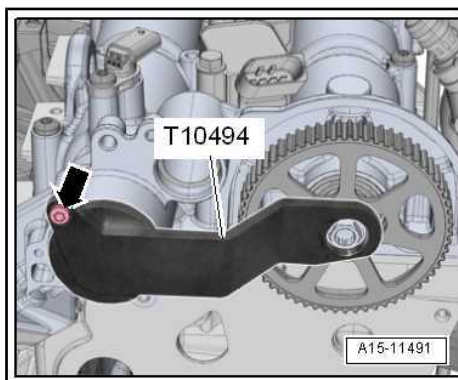
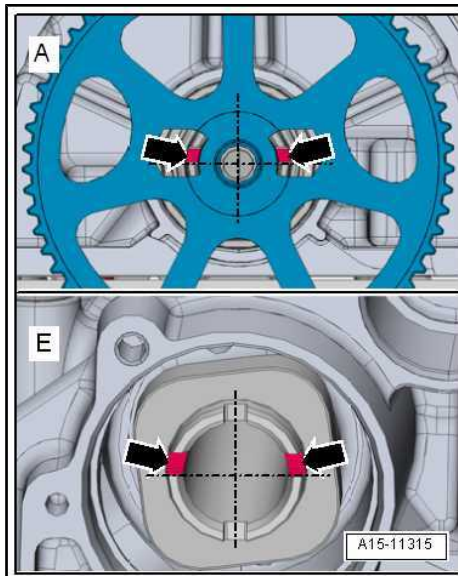
- Remove locating screw - T10340- and turn crankshaft another turn, set back to “TDC” ⇒ [page 99](#) .

If the camshafts are as described:



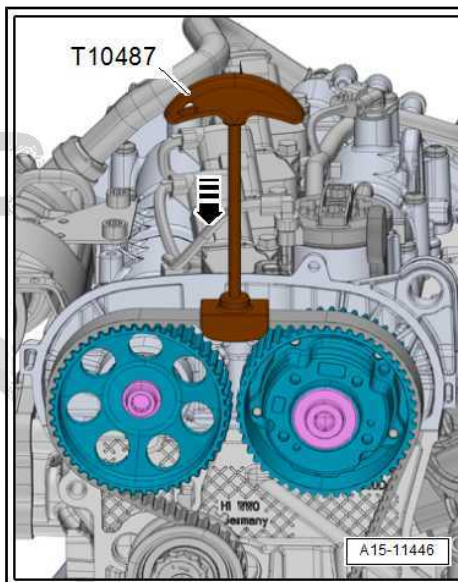
Note

- ◆ *The camshaft clamp - T10494- must move into position easily.*
- ◆ *The camshaft clamp must not be positioned using any kind of hammer.*
- Insert camshaft clamp -T10494- to stop into camshafts and tighten bolt -arrow- by hand.

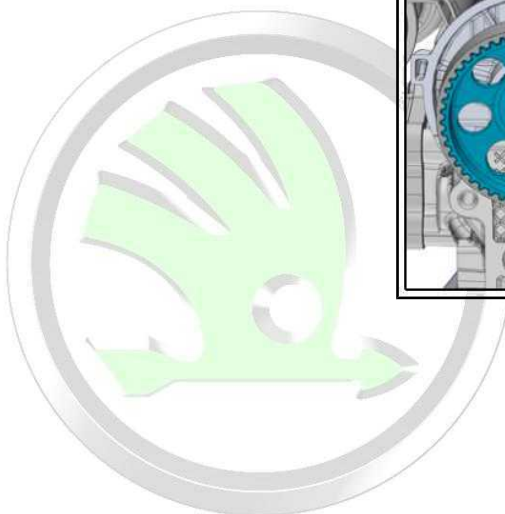


If camshaft clamp - T10494- cannot be installed:

- Using the assembly tool - T10487- in -direction of arrow- press on the toothed belt.



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- While doing so, insert camshaft clamp - T10494- up to the stop into the camshafts and tighten hand-tight with screw -arrow-.

! NOTICE

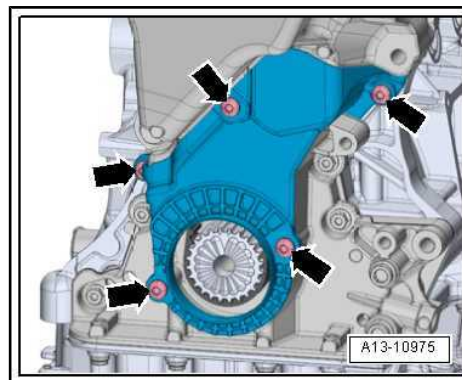
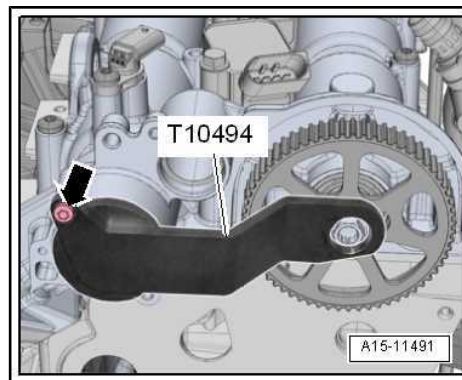
Risk of damage to camshaft clamp - T10494- and camshaft.

- ◆ Do not use the camshaft fixer/locator - T10494- as a counter-holder.
- Remove ribbed V-belt pulley from crankshaft
⇒ [“1.5 Installing and removing the vibration damper”, page 43](#) .
- Release screws -arrows- and remove bottom toothed belt guard.

! NOTICE

Risk of damage to the camshaft clamp - T10494- and the camshaft when loosening and tightening the belt pulley screws.

- ◆ The camshaft clamp - T10494- must not be put under load when loosening and tightening the camshaft sprockets in order to avoid damage to the tool and the camshaft.
- ◆ When loosening and tightening the camshaft sprockets, the camshaft sprockets must be secured.



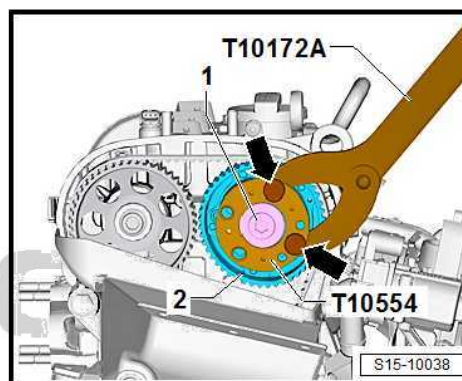
For vehicles with engine codes CZCA

- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Screw out screw plug -1-.

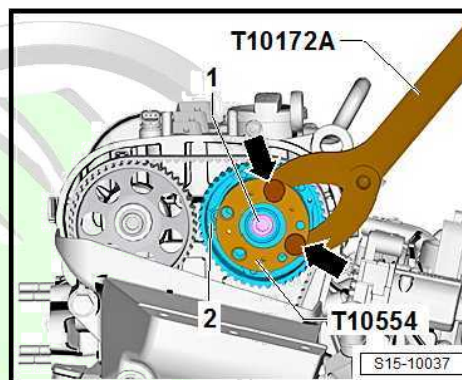


Note

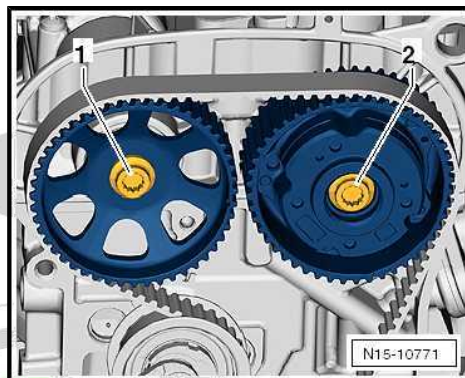
A minor loss of oil may occur when opening the screw plug -1-. The place of the oil leak must be covered with cloths.



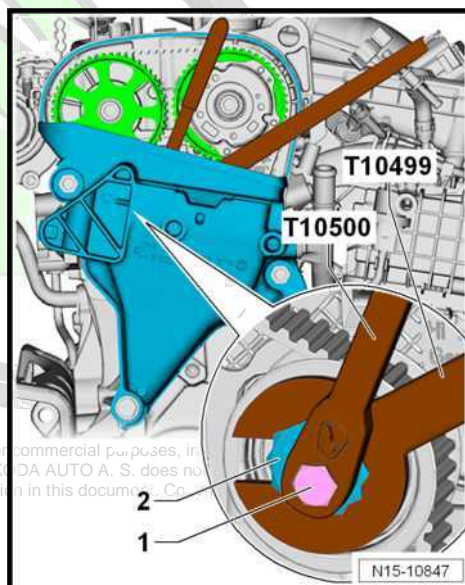
- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Release screw -1- by approx. one turn.



- Hold the exhaust camshaft sprocket with the counterholder - T10172A- and adapters -T10172/2- ..
- Release screw -1- by approx. one turn.



- Release screw -1- using insertion tool - T10500- .
- Slacken the tensioning pulley at the eccentric -2- using the wrench - T10499A- .



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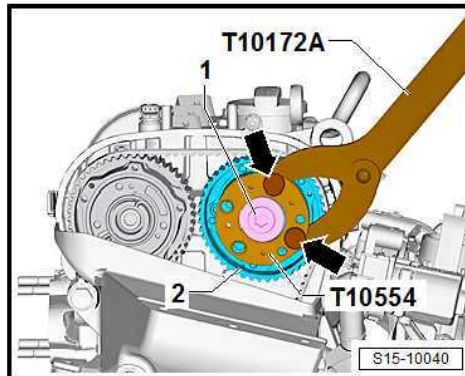
For vehicles with engine identification characters CZDA

- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Screw out screw plug -1-.

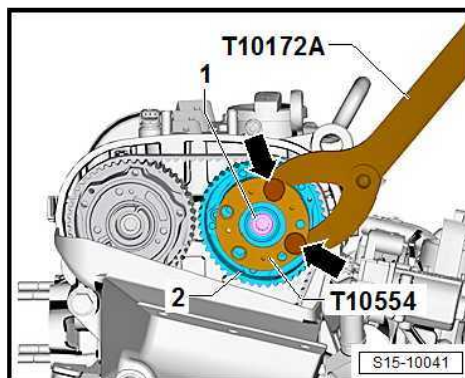


Note

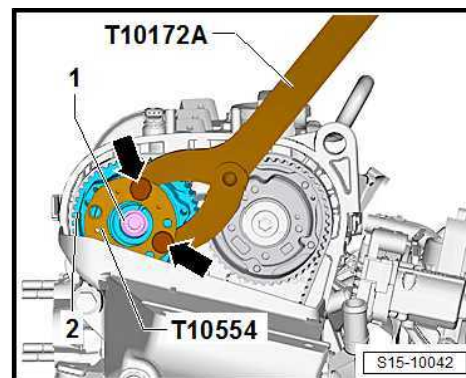
A minor loss of oil may occur when opening the screw plug -1-. The place of the oil leak must be covered with cloths.



- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Release screw -1- by approx. one turn.



- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Release screw -1- by approx. one turn.



- Release screw -1- using insertion tool - T10500- .
- Slacken the tensioning pulley at the eccentric -2- using the wrench - T10499A- .

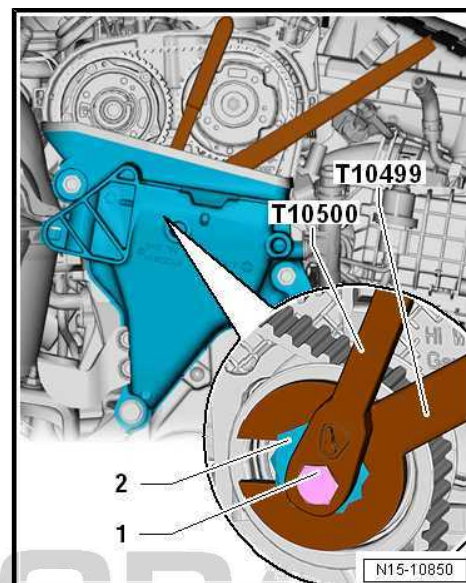
For vehicles with engine identification characters CZCA, CZDA



Note

There is a risk of destruction through reversing the rotation direction of an already used toothed belt.

- Mark the direction of rotation with chalk or a felt-tip pen for the re-installation before removing the toothed belt pulley.



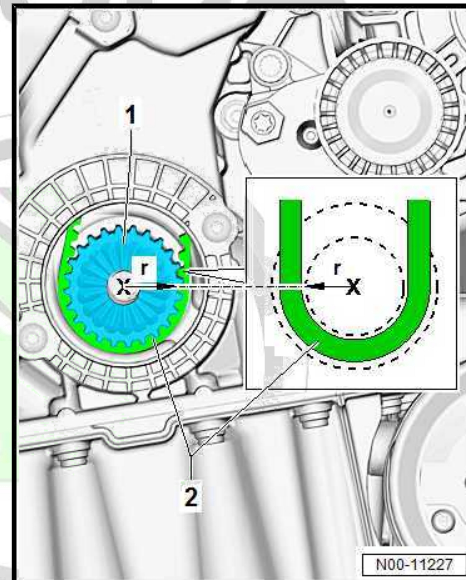
Bending radius of the toothed belt



NOTICE

There is a risk of destroying the toothed belt because of the substantial bend.

- ◆ The bending radius -r- of the toothed belt -2- must not be allowed to drop below the minimum of 25 mm (approx. half the Ø of the crankshaft-belt pulley).
- ◆ If the bending radius falls below the minimum of 25 mm, this will affect the lifetime of the belt.
- Remove timing belt.



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- Remove crankshaft toothed belt pulley -1- -arrow-.

Installing (set the timing)



Note

Renew O-ring of screw plug if damaged.

- “Check TDC” position of camshaft and crankshaft:

- Camshaft clamp - T10494- attached to camshaft housing.

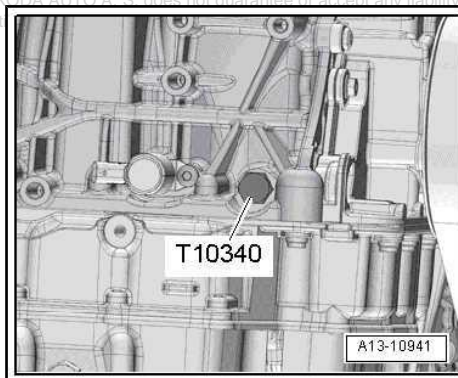
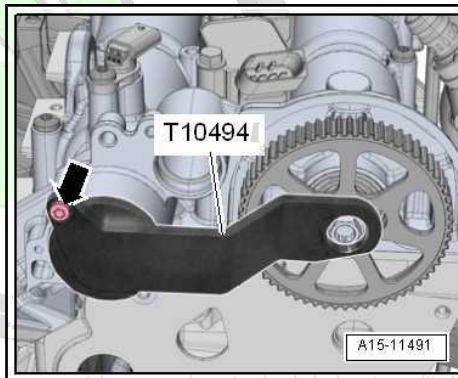
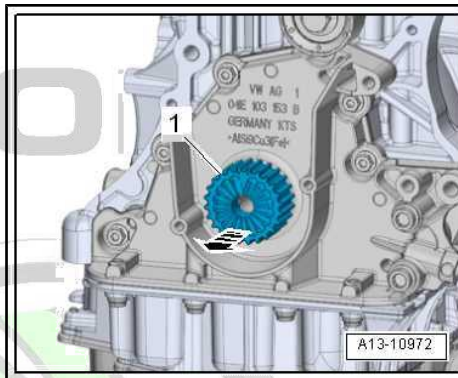


NOTICE

Risk of damage to camshaft clamp - T10494- and camshaft.

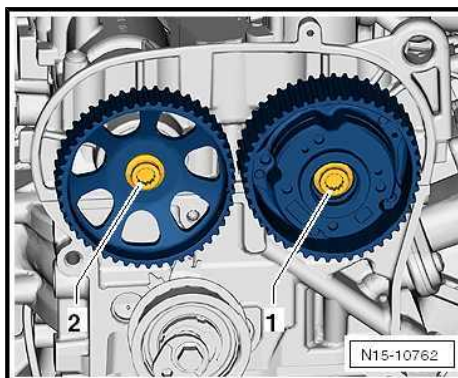
- ♦ Do not use the camshaft fixer/locator - T10494- as a counter-holder.

- Locating screw - T10340- turned up to the stop in the cylinder block and tightened to 30 Nm.
- Crankshaft in engine direction of rotation applied to the locating screw - T10340- = “TDC” position.

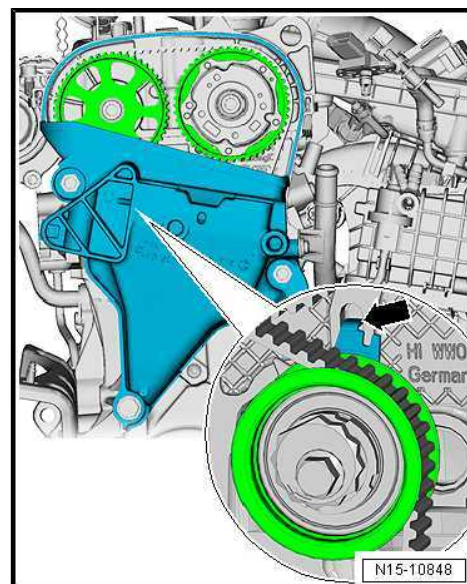


For vehicles with engine codes CZCA

- Replace screws -1- and -2- and insert them loosely.
- It must still be possible to turn the camshaft sprockets on the camshafts, however they must not tilt.

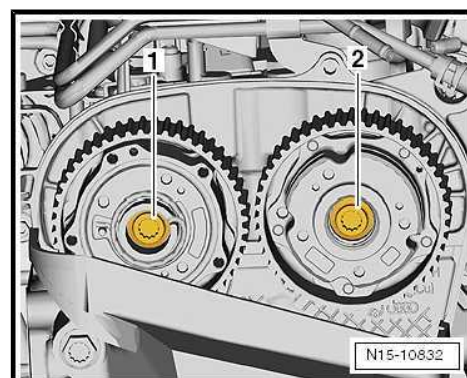


- The sheet peg -arrow- of the tensioning pulley must engage in the cast iron recess of the cylinder head.

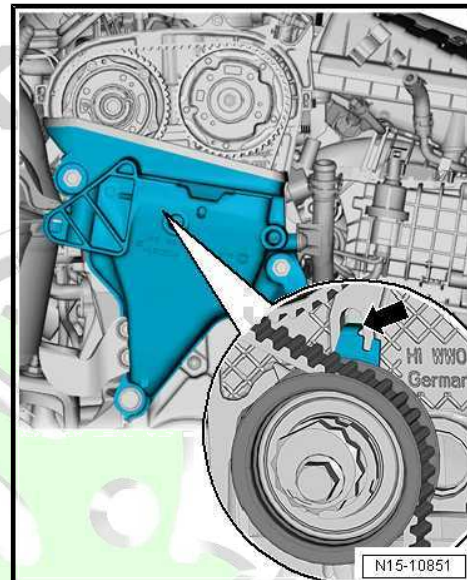


For vehicles with engine identification characters CZDA

- Replace camshaft sprocket screws -1- and -2- and insert new screws loosely.
- It must still be possible to turn the camshaft sprockets on the camshafts, however they must not hang loose.



- The sheet peg -arrow- of the tensioning pulley must engage in the cast iron recess of the cylinder head.



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For vehicles with engine identification characters CZCA, CZDA

- Fit crankshaft toothed belt pulley onto the crankshaft.
- The contact surface between the V-ribbed belt pulley and the crankshaft toothed belt pulley must be free of oil and grease.
- Milled surface -arrow- on the crankshaft toothed belt must be positioned on the crankshaft stub.

NOTICE

There is a risk of destroying the toothed belt because of the substantial bend.

- ◆ The bending radius -r- of the toothed belt -2- must not be allowed to drop below the minimum of 25 mm (approx. half the Ø of the crankshaft-belt pulley).
- ◆ If the bending radius falls below the minimum of 25 mm, this will affect the lifetime of the belt.



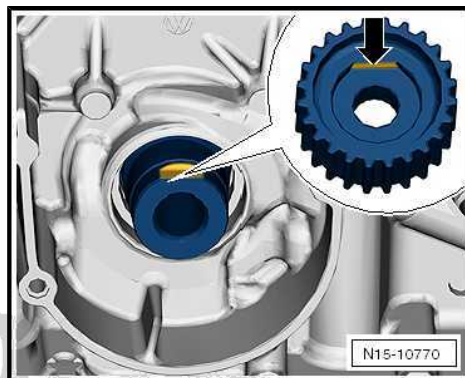
Note

Observe sequence when fitting the toothed belt.

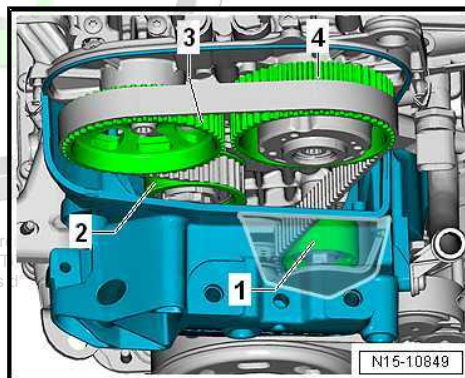
- Initially fit toothed belt from below on the crankshaft pulley.

For vehicles with engine codes CZCA

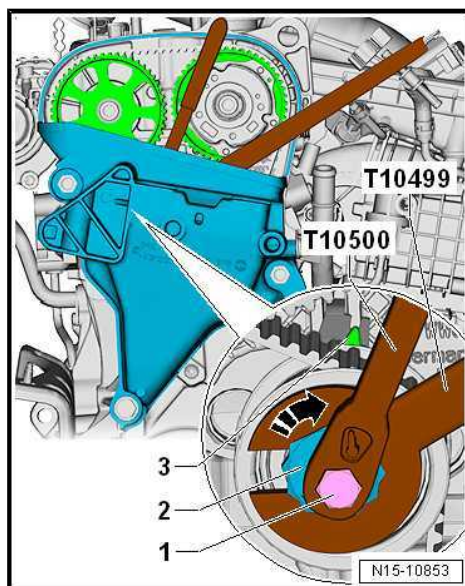
- Pull toothed belt upwards, then fit the tensioning pulley -2- and camshaft sprockets -3- and -4- onto the guide roller -1-.



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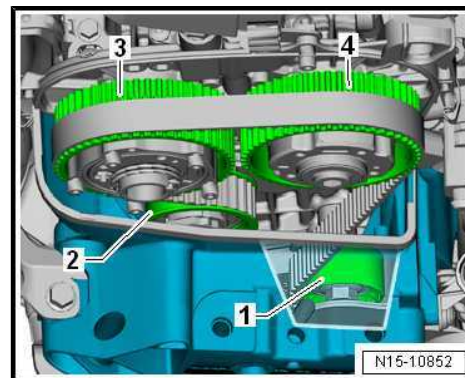


- Rotate the eccentric -2- of the tensioning pulley with the wrench - T10499A- in -direction of arrow- until the adjustment pointer -3- is located approx. 10 mm to the right from the adjustment window.
- Push eccentric so far back that the adjustment pointer is positioned exactly in the adjustment window.



For vehicles with engine identification characters CZDA

- Pull toothed belt upwards, then fit the tensioning pulley -2- and camshaft sprockets -3- and -4- onto the guide roller -1-.



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- Rotate the eccentric -2- of the tensioning pulley with the wrench - T10499A- in -direction of arrow- until the adjustment pointer -3- is located approx. 10 mm to the right from the adjustment window.
- Push eccentric so far back that the adjustment pointer is positioned exactly in the adjustment window.

For vehicles with engine identification characters CZCA, CZDA

NOTICE

Risk of damage to the engine when tightening to incorrect lightening torque!

To tighten, the torque wrench - VAS 6583- or torque wrench - V.A.G 1410- must be used!

- To tighten the reduced torque, no other torque wrench may be used!

Tighten with torque wrench VAS 6583

- Only use the torque wrench together with insertion tool - T10500- !
- When setting the tightening torque on the torque wrench - VAS 6583- the actual dimension specified on the tool insert - T10500- must be put into the torque wrench!
- Keep eccentric in this position and tighten screw -1- to 25 Nm. Use tool insert - T10500- with torque wrench - VAS 6583- to do this.

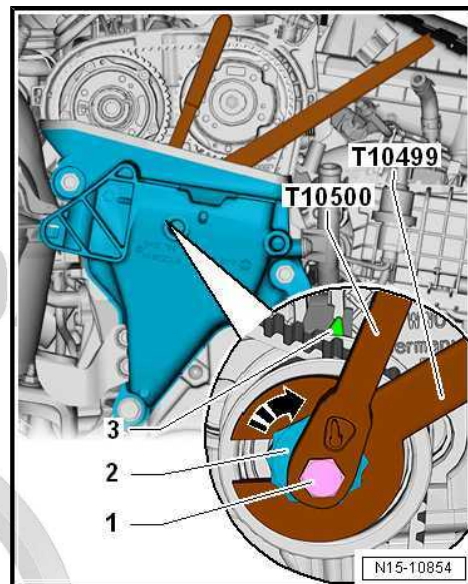
Tighten with torque wrench VAG 1410

- Only use the torque wrench together with insertion tool - T10500- !
- Set the reduced tightening torque of 12 Nm on the torque wrench - V.A.G 1410-
- The required tightening torque of 25 Nm is achieved by the extending the torque wrench - V.A.G 1410- around the tool insert - T10500- !
- Keep eccentric in this position and tighten screw -1- to 12 Nm. Use tool insert - T10500- with torque wrench - V.A.G 1410- to do this.

Continued

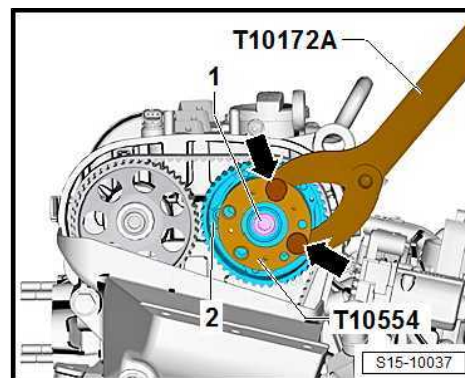
Note

If the engine continued to turn or has run, there may be slight deviations of the adjustment pointer -3- setting in the adjustment window. This has no influence on the toothed belt tensioning.



For vehicles with engine codes CZCA

- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Pre-tighten screw -1- to 50 Nm.

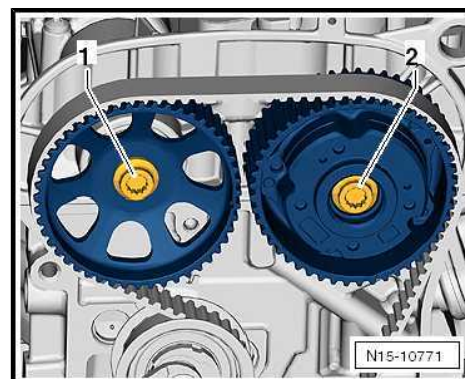


- Hold the exhaust camshaft sprocket with the counterholder - T10172A- and adapters -T10172/2- ..
- Pre-tighten screw -1- to 50 Nm.



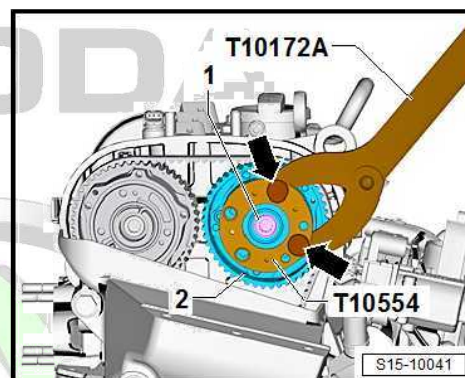
Note

The securing bolts are only turned a further angle after checking the timing at the end of the procedure.



For vehicles with engine identification characters CZDA

- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Pre-tighten screw -1- to 50 Nm.

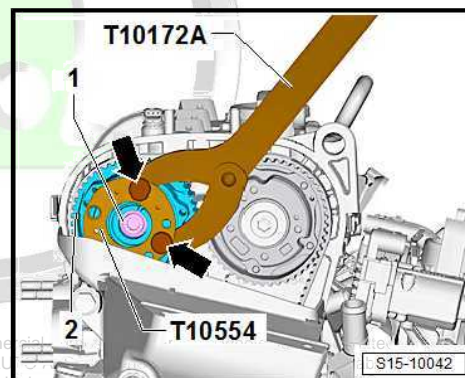


- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Pre-tighten screw -1- to 50 Nm.



Note

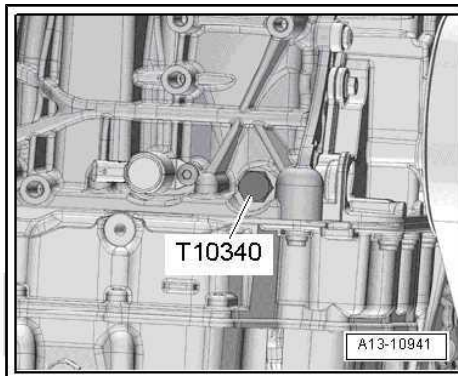
The securing bolts are only turned a further angle after checking the timing at the end of the procedure.



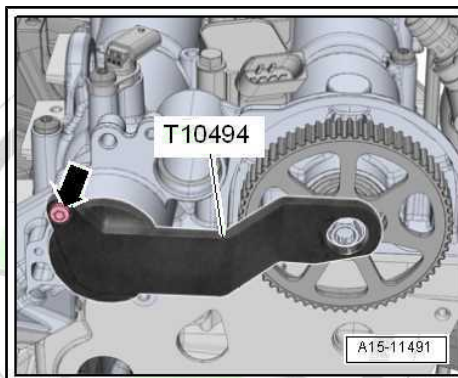
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For vehicles with engine identification characters CZCA, CZDA

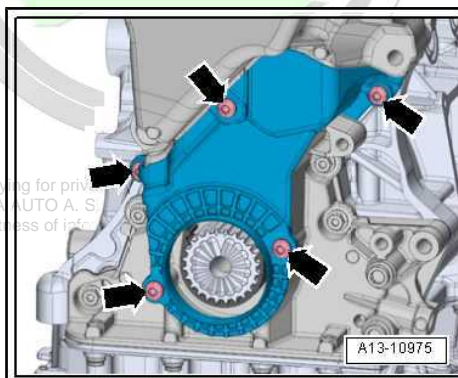
- Unscrew positioning screw - T10340- .



- Unscrew bolt -arrow- and remove camshaft clamp - T10494- .



- Install the bottom toothed belt guard -arrows-.
- Installing the V-ribbed belt pulley crankshaft
⇒ [“1.5 Installing and removing the vibration damper”, page 43](#) .



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Test timing

- Turn crankshaft 2 turns in the direction of running of the engine until the piston for cylinder 1 is again on “TDC”.
- Screw the locating screw - T10340- up to the stop into the cylinder block and tighten to 30 Nm.
- Turn crankshaft further up to the stop in direction of rotation of engine.
- The crankshaft cheek must now be resting on the locating screw.



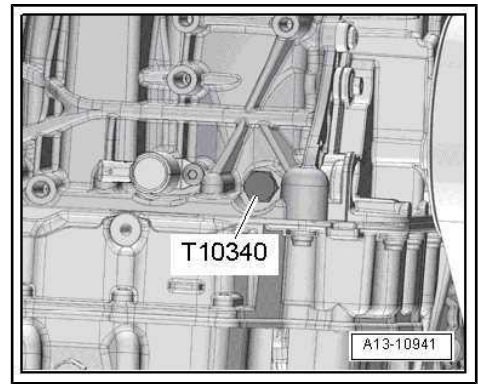
Note

The crankshaft is only locked in direction of rotation of engine using the locating screw - T10340- .

- The camshaft clamp -T10494- must move into position easily.
- The camshaft clamp must not be positioned using any kind of hammer.

If camshaft clamp - T10494- cannot be installed:

- Use the assembly device - T10487- to press onto the toothed belt in -direction of arrow-.



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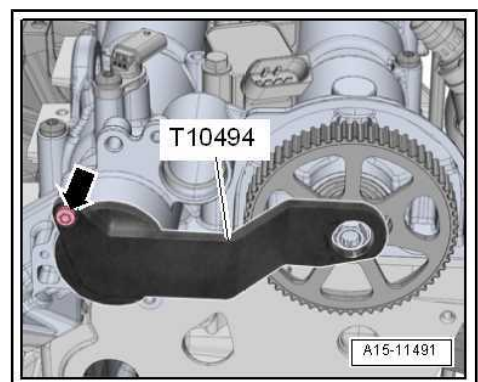
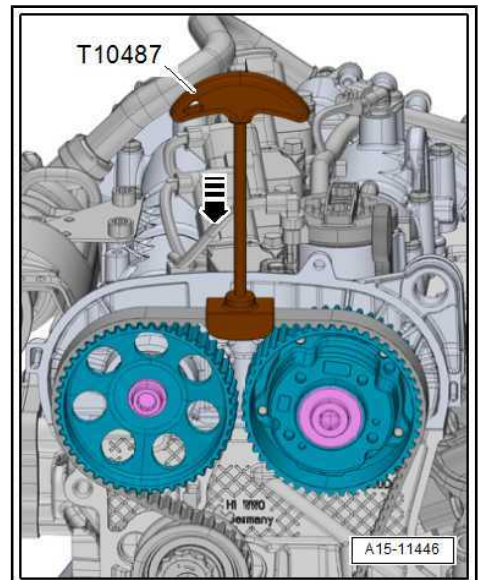
- While doing so, insert camshaft control -T10494- to stop into camshafts and tighten screw -arrow- hand-tight.

If it is not possible to insert the camshaft clamp -T10494- , the timing is NOK:

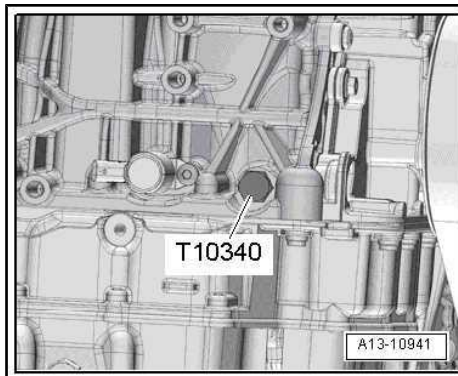
- Remove the toothed belt from the camshafts and repeat the timings
⇒ [“2.5.1 Removing the toothed belt from the camshafts, engine identification characters CZCA, CZDA”, page 140](#) .

If it is possible to insert the camshaft clamp - T10494- , the timing is OK:

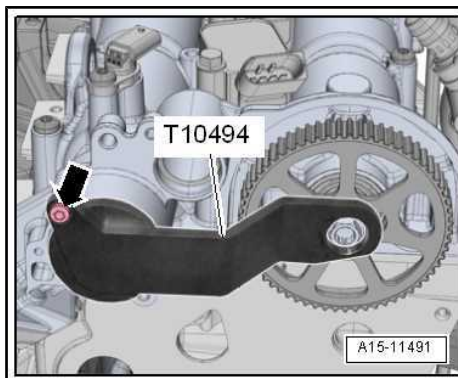
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- Unscrew positioning screw - T10340- .

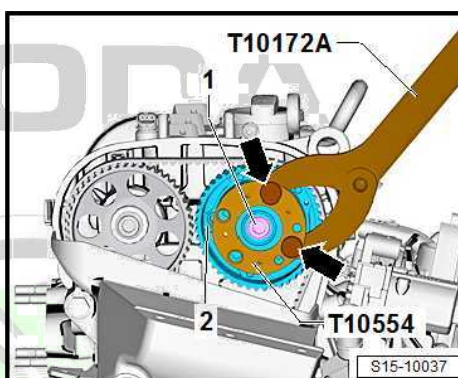


- Unscrew bolt -arrow- and remove camshaft clamp -T10494- .

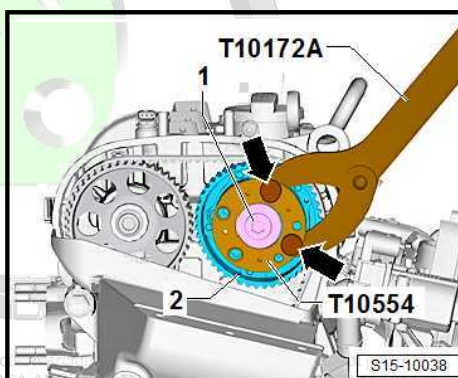


For vehicles with engine codes CZCA

- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten screw -1- to the final tightening torque
⇒ ["2.2.1 Summary of components - engine identification characters CZCA", page 92](#) .

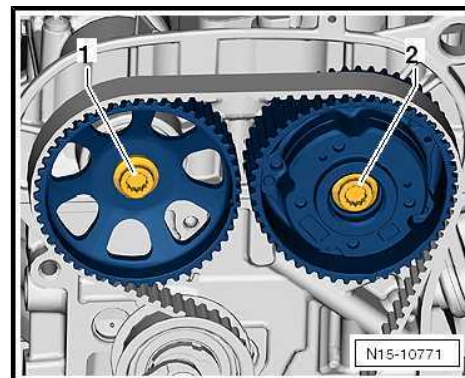


- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten the screw plug of the camshaft control -1- to the specified torque
⇒ ["2.2.1 Summary of components - engine identification characters CZCA", page 92](#) .



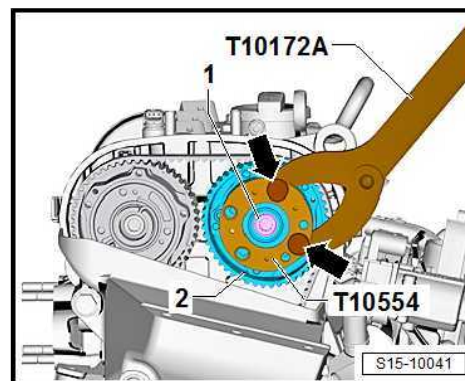
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- Hold the exhaust camshaft sprocket with the counterholder - T10172A- and adapters -T10172/2- ..
- Tighten screw -1- to the final tightening torque
⇒ [“2.2.1 Summary of components - engine identification characters CZCA”, page 92](#) .

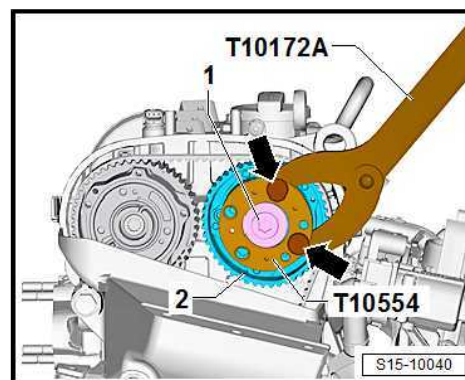


For vehicles with engine identification characters CZDA

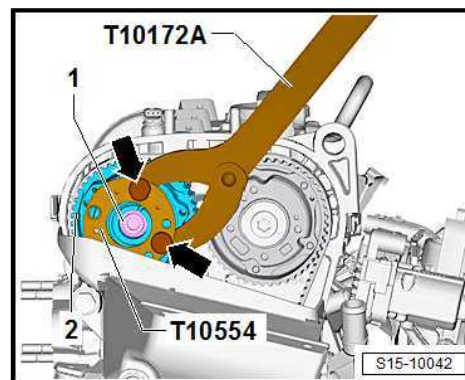
- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten screw -1- to the final tightening torque
⇒ [“2.2.2 Summary of components - engine identification characters CZDA, CZEa”, page 94](#) .



- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten the screw plug of the camshaft control -1- to the specified torque
⇒ [“2.2.2 Summary of components - engine identification characters CZDA, CZEa”, page 94](#) .



- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten screw -1- to the final tightening torque
⇒ [“2.2.2 Summary of components - engine identification characters CZDA, CZEa”, page 94](#) .



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- Put cover for camshaft adjuster of the exhaust camshaft in place and tighten screws -arrows-.

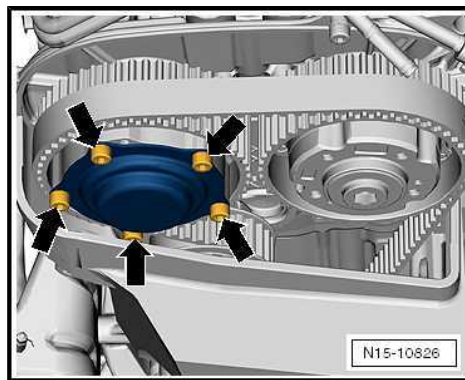
For vehicles with engine identification characters CZCA, CZDA

Further installation occurs in reverse order.



Risk of destruction of the engine.

- ◆ To complete the work, check that the locating screw - T10340- and camshaft clamp - T10494- have been removed from the engine.



Tightening torques

- ◆ V-ribbed belt drive
⇒ [“1.1 Assembly overview - ribbed V-belt drive”, page 36](#) .
- ◆ Toothed belt guard
⇒ [“2.1 Summary of components - toothed belt guard”, page 91](#) .
- ◆ Toothed belt drive
⇒ [“2.2 Summary of components - toothed belt”, page 92](#) .
- ◆ Screw plug for bore in cylinder block with engine identification characters CZCA
⇒ [Fig. “Unscrew screw plug TDC bore at the cylinder block - tightening torque””, page 93](#) .
- ◆ Screw plug for bore in cylinder block with engine identification characters CZDA
⇒ [Fig. “Unscrew screw plug TDC bore at the cylinder block - tightening torque””, page 95](#) .
- ◆ Camshaft housing with engine identification characters CZCA
⇒ [“1.2.1 Summary of components - camshaft housing, engine identification characters CZCA”, page 73](#) .
- ◆ Camshaft housing with engine identification characters CZDA
⇒ [“1.2.2 Summary of components - camshaft housing, engine identification characters CZDA”, page 76](#) .
- ◆ Crankcase ventilation
⇒ [“3.1 Summary of components - crankcase ventilation”, page 209](#) .
- ◆ Coolant pump
⇒ [“2.1 Summary of components - coolant pump/thermostat”, page 230](#) .
- ◆ Exhaust gas turbocharger
⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#) .
- ◆ Charge-air system
⇒ [“2.1 Summary of components - charge air system”, page 282](#) .
- ◆ Noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation.

2.3.2 Removing and installing toothed belt , engine identification characters CZE A

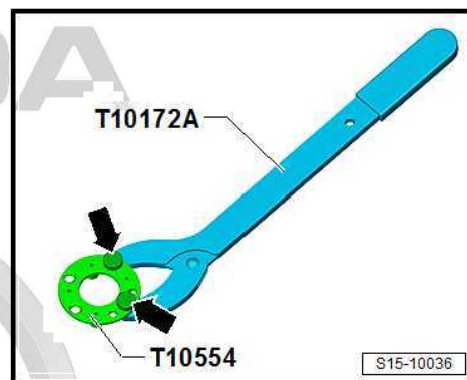
Special tools and workshop equipment required

- ◆ Counterholder - T10172A- with adapters -T10172/2-
- ◆ Support - T10554-

- ◆ Locating screw - T10340-
- ◆ Release tool -T10527-
- ◆ Release tool -T10527/1-
- ◆ Key - T10499A-
- ◆ Insertion tool - T10500-
- ◆ Crankshaft arrester - T10504-
- ◆ Rig pin - T10504/1-
- ◆ Test probe - T10504/2-
- ◆ Assembly device - T10487-
- ◆ Spark plug wrench , e.g. -3122 B-
- ◆ Torque wrench - V.A.G 1410- or -VAS 6583-

Prepare the tools

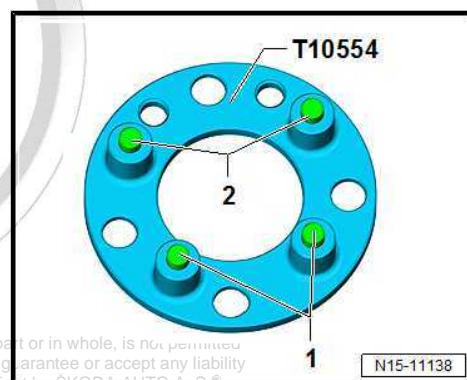
- Screw the counterholder - T10172A- and holder - T10554- with knurled screws -arrows-.



Insert support - T10554-

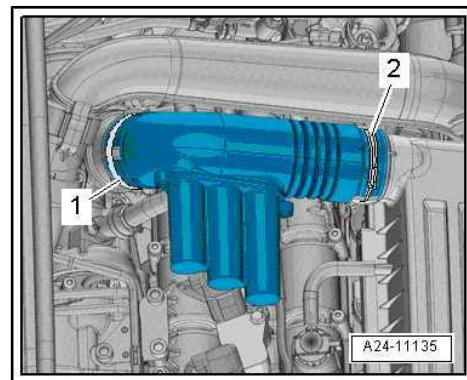
The row spacings -1- and -2- of the holder - T10554- are arranged unevenly.

They are equal to the hole spacings in the camshaft control.



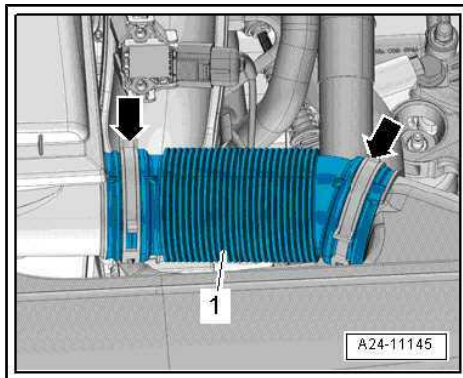
Removing

- Loosen hose clamps -1- and -2- and remove air guide pipes.

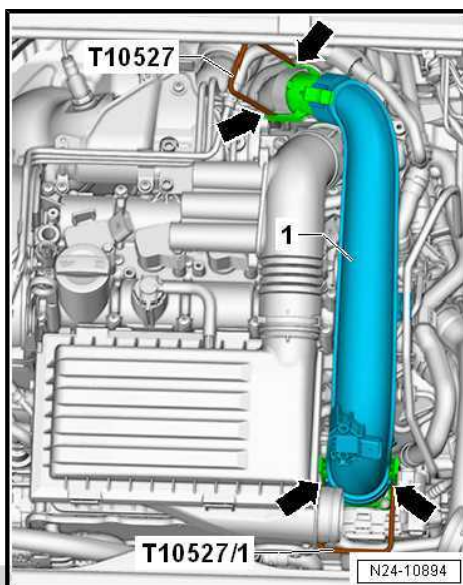


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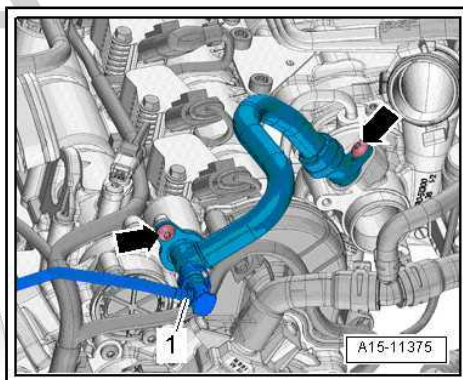
- Undo hose clamps -arrows-, remove air guide hose -1-.
- Remove plug from charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.



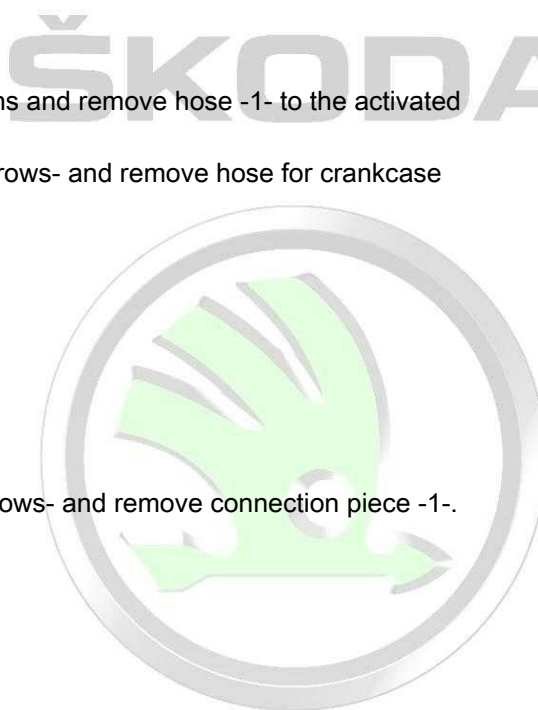
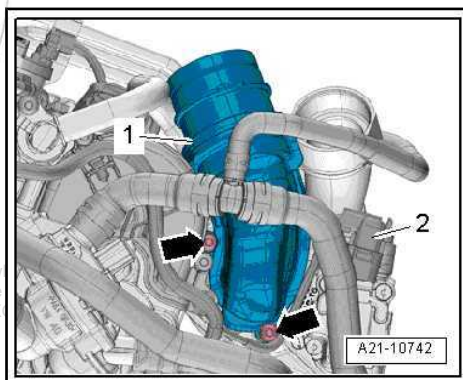
- Release retaining tabs -arrows- using the release tool - T10527- and -T10527/1- .
- Remove air guide pipe -1-.



- Press release buttons and remove hose -1- to the activated charcoal filter.
- Unscrew screws -arrows- and remove hose for crankcase ventilation.



- Release screws -arrows- and remove connection piece -1-.



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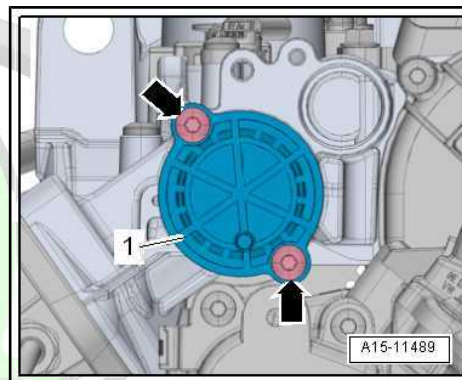
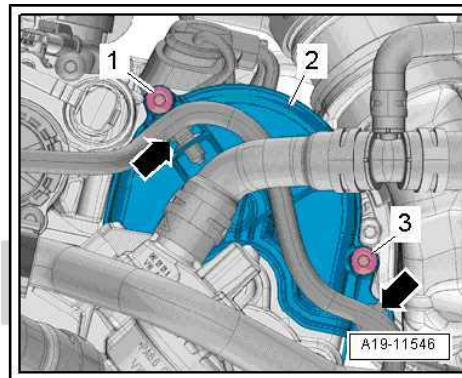
- Expose wiring loom -arrows-.
- Remove screws -1-, -3- and remove toothed belt guard -2- for coolant pump toothed belt.



Note

If engine oil touches the sealing ring for the coolant pump, it may be damaged chemically.

- Cover the coolant pump with a cloth.
- Remove screws -arrows- and remove cap -1-.



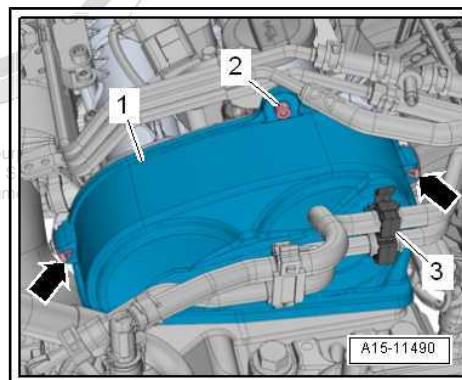
- Unclip holder -3- together with hoses from the toothed belt guard -1-.
- Unscrew bolt -2-.
- Loosen clips -arrows- and remove toothed belt guard -1- upwards.



NOTICE

Risk of damage to the toothed belt due to leaking engine oil.

Contact points of the toothed belt, camshaft sprocket, crankshaft pulley, tensioning pulley and guide pulley are to be kept free of oil.



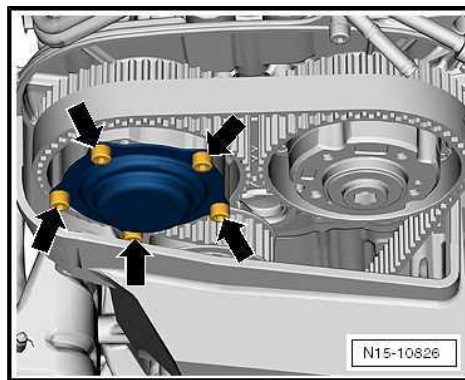
- Remove screws -arrows- and remove the cover from the camshaft control of the exhaust camshaft.
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .

Position crankshaft to “TDC”:

⚠ CAUTION

Risk of engine damage.

You must adjust the “TDC” position, as described!



- ◆ Locating screw - T10340- can collide with crankshaft in two positions.
- Remove ignition coil with power output stage 1
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#) .
- Remove ignition plug cylinder 1 with spark plug socket wrench , e. g. -3122 B- .

Set the correct position of the crankshaft to screw in the locating screw:

- Carefully insert a screwdriver into the opening of the ignition plug, minimum length of shaft 250 mm, in -direction of arrow- so that it touches the piston head.
- Rotate the crankshaft in direction of rotation of engine on “TDC” for cylinder 1.



- Turn engine shaft further in direction of arrow so that the screwdriver just out at the top by approx 35 mm in the -direction of the arrow-.
- Unscrew screw plug “TDC” bore at the cylinder block.

⚠ NOTICE

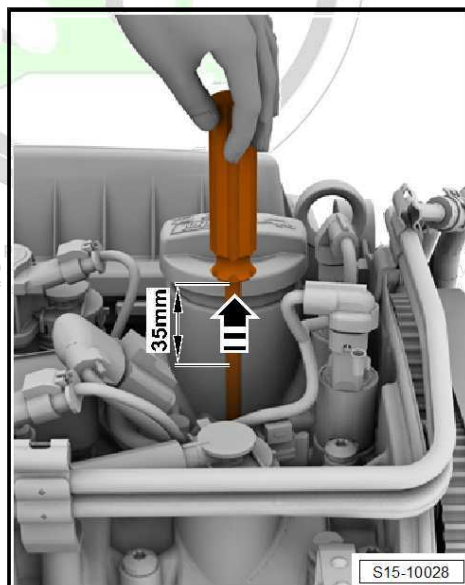
Risk of damage to the engine if the locating screw - T10340- is screwed in at the wrong position.

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If the locating screw - T10340- cannot be screwed in up to the stop, the crankshaft is not in the correct position.

In this case, proceed as follows:

- Unscrew locking pin.
- Set the correct position of the crankshaft for screwing in the locating screw ⇒ [page 118](#) .



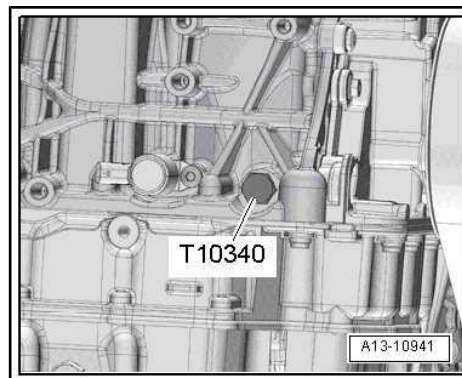
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liability
S.O

- Screw the locating screw - T10340- up to the stop into the cylinder block and tighten to 30 Nm.
- Turn crankshaft up to the stop in direction of rotation of engine.
- The crankshaft sprocket now lies on the locating screw and the “TCD” position is set.



Note

The crankshaft is only locked in direction of rotation of engine using the locating screw - T10340- .



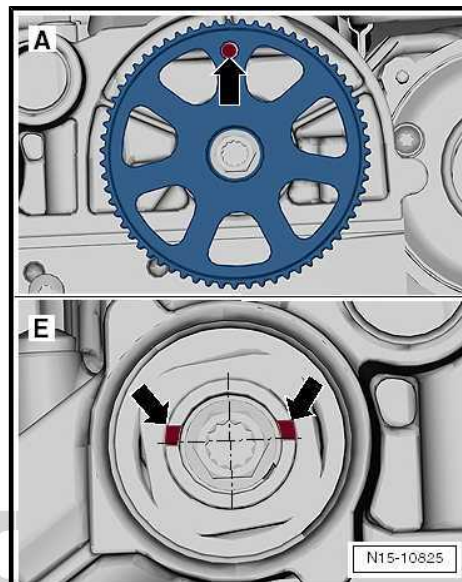
- For exhaust camshaft -A-, the bore in the toothed belt pulley for the coolant pump drive -arrow- must be located against the hole in the camshaft housing.
- For the inlet camshaft -E-, the grooves -arrows- are above the camshaft centre.

A - Exhaust camshaft

E - Inlet camshaft

If the camshafts are not as described:

- Remove locating screw - T10340- and turn crankshaft another turn, set back to “TDC” ⇒ [page 118](#) .
- Remove ribbed V-belt pulley from crankshaft
⇒ [“1.5 Installing and removing the vibration damper”, page 43](#) .



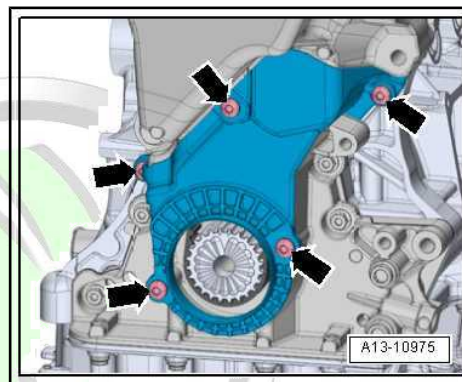
- Release screws -arrows- and remove bottom toothed belt guard.



NOTICE

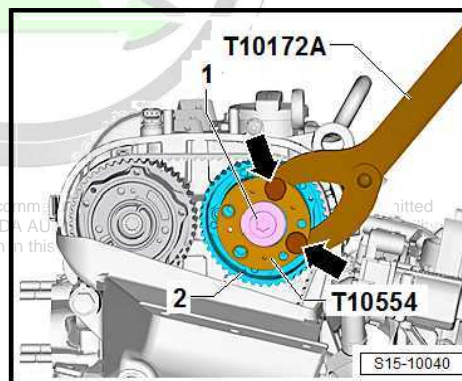
Risk of damage to the camshaft clamp - T10504- and the camshaft when loosening and tightening the belt pulley screws.

- ◆ The camshaft clamp - T10504- must not be put under load when loosening and tightening the camshaft sprockets in order to avoid damage to the tool and the camshaft.
- ◆ When loosening and tightening the camshaft sprockets, the camshaft sprockets must be secured.
- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Screw out screw plug -1-.

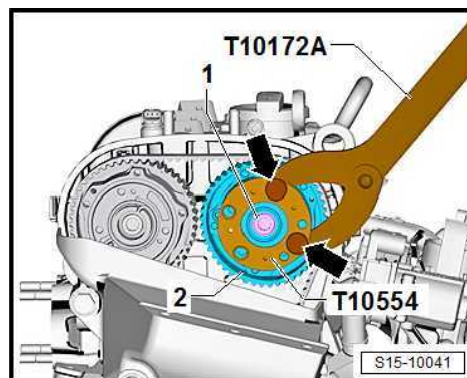


Note

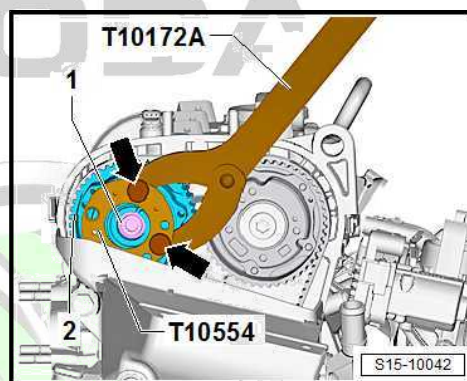
A minor loss of oil may occur when opening the screw plug -1-. The place of the oil leak must be covered with cloths.



- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Release screw -1- by approx. one turn.



- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Release screw -1- by approx. one turn.



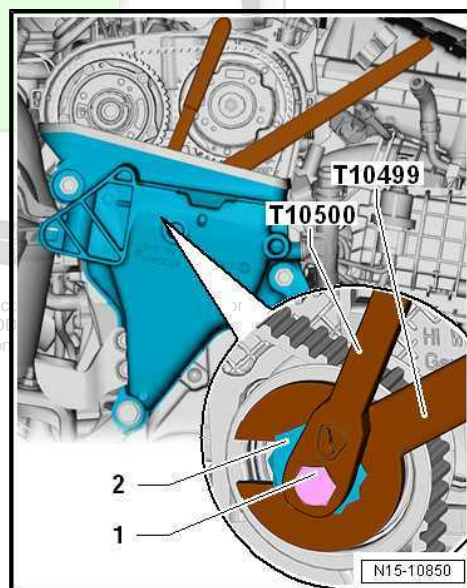
- Release screw -1- using insertion tool - T10500- .
- Slacken the tensioning pulley at the eccentric -2- using the wrench - T10499A- .



Note

There is a risk of destruction through reversing the rotation direction of an already used toothed belt.

- Mark the direction of rotation with chalk or a felt-tip pen for the re-installation before removing the toothed belt pulley.

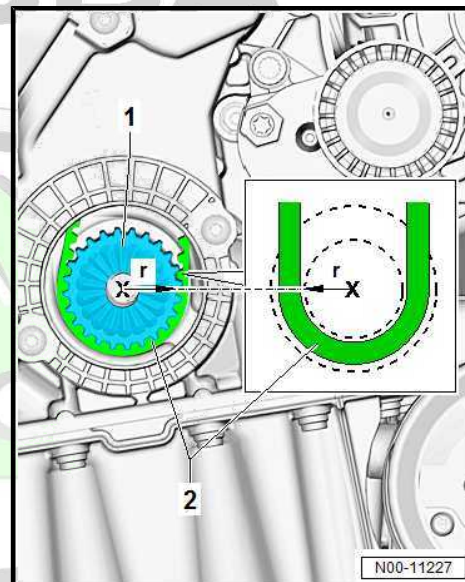


Bending radius of the toothed belt

NOTICE

There is a risk of destroying the toothed belt because of the substantial bend.

- ◆ The bending radius - r - of the toothed belt -2- must not be allowed to drop below the minimum of 25 mm (approx. half the \varnothing of the crankshaft-belt pulley).
- ◆ If the bending radius falls below the minimum of 25 mm, this will affect the lifetime of the belt.
- Remove timing belt.



- Remove crankshaft toothed belt pulley -1- -arrow-.

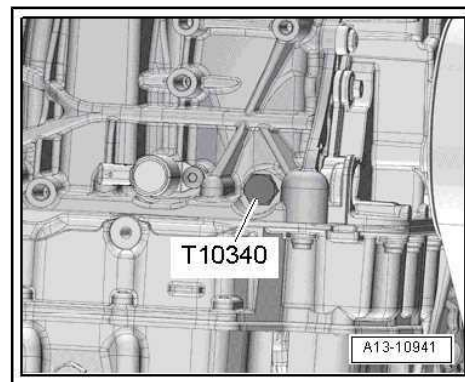
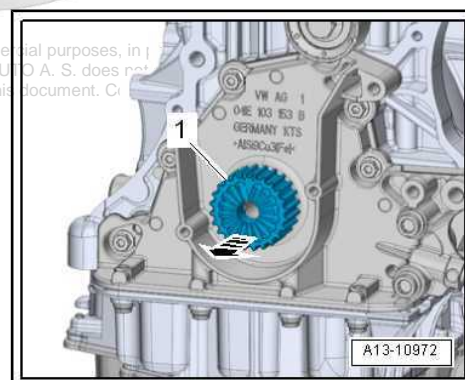
Installing (set the timing)



Note

Renew O-ring of screw plug if damaged.

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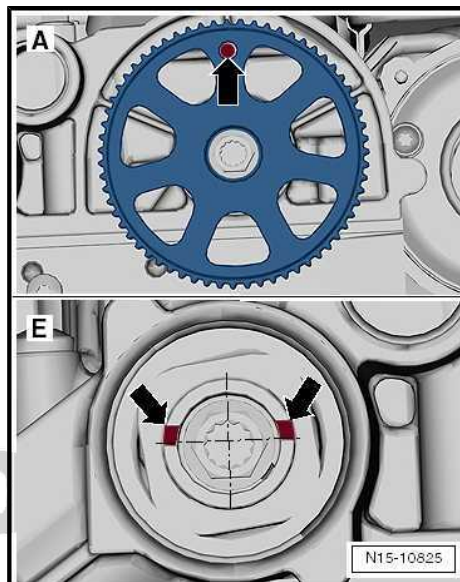


- Locating screw - T10340- turned up to the stop in the cylinder block and tightened to 30 Nm.
- Crankshaft in engine direction of rotation applied to the locating screw - T10340- = "TDC" position.
- For exhaust camshaft -A-, the bore in the toothed belt pulley for the coolant pump drive -arrow- must be located against the hole in the camshaft housing.
- For the inlet camshaft -E-, the grooves -arrows- are above the camshaft centre.

A - Exhaust camshaft

E - Inlet camshaft

- Mark the tooth over the bore on the coolant pump driving wheel from the top with waterproof marker.



Note

Marking makes it easier to insert the rig pin - T10504/1- .

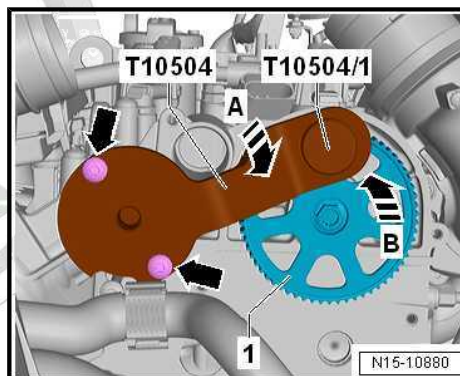
If the camshafts are not as described:

- Insert camshaft clamp - T10504- into the grooves of the inlet camshaft.
- Turn inlet camshaft with the camshaft clamp - T10504- in direction of arrow -A-.
- Turn toothed belt pulley for cooling pump drive -1- in direction of arrow -B- at the same time with the aid of a second mechanic.
- Insert the rig pin - T10504/1- up to the stop.



Note

If the rig pin - T10504/1- is not inserted up to the stop, the engine may be damaged because the valve timings are set incorrectly!



- Tighten screws -arrows- by hand.

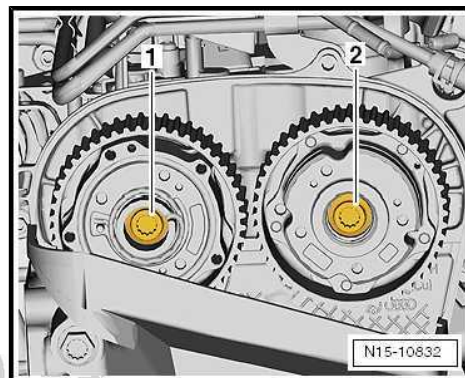


NOTICE

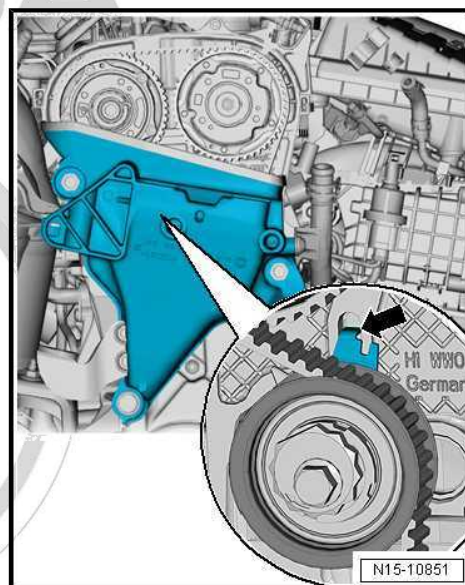
Risk of damage to the camshaft clamp - T10504- and the camshaft when loosening and tightening the belt pulley screws.

- ◆ The camshaft clamp - T10504- must not be put under load when loosening and tightening the camshaft sprockets in order to avoid damage to the tool and the camshaft.
- ◆ When loosening and tightening the camshaft sprockets, the camshaft sprockets must be secured.

- Replace camshaft sprocket screws -1- and -2- and insert new screws loosely.
- It must still be possible to turn the camshaft sprockets on the camshafts, however they must not hang loose.



- The sheet peg -arrow- of the tensioning pulley must engage in the cast iron recess of the cylinder head.

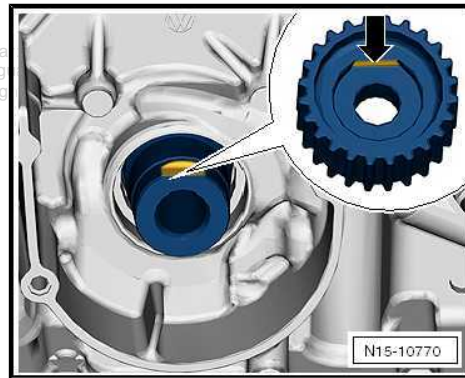


- Fit crankshaft toothed belt pulley onto the crankshaft.
- The contact surface between the V-ribbed belt pulley and the crankshaft toothed belt pulley must be free of oil and grease.
- Milled surface -arrow- on the crankshaft toothed belt must be positioned on the crankshaft stub.

! NOTICE

There is a risk of destroying the toothed belt because of the substantial bend.

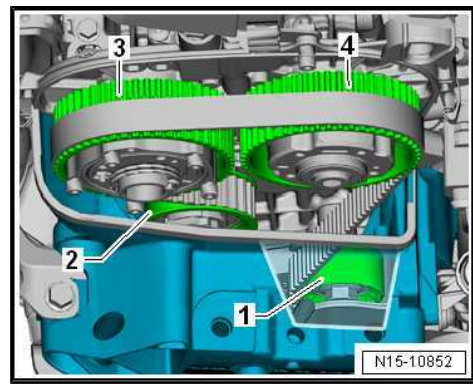
- ◆ The bending radius -r- of the toothed belt -2- must not be allowed to drop below the minimum of 25 mm (approx. half the Ø of the crankshaft-belt pulley).
- ◆ If the bending radius falls below the minimum of 25 mm, this will affect the lifetime of the belt.



Note

Observe sequence when fitting the toothed belt.

- Initially fit toothed belt from below on the crankshaft pulley.
- Pull toothed belt upwards, then fit the tensioning pulley -2- and camshaft sprockets -3- and -4- onto the guide roller -1-.



- Rotate the eccentric -2- of the tensioning pulley with the wrench - T10499A- in -direction of arrow- until the adjustment pointer -3- is located approx. 10 mm to the right from the adjustment window.
- Push eccentric so far back that the adjustment pointer is positioned exactly in the adjustment window.



NOTICE

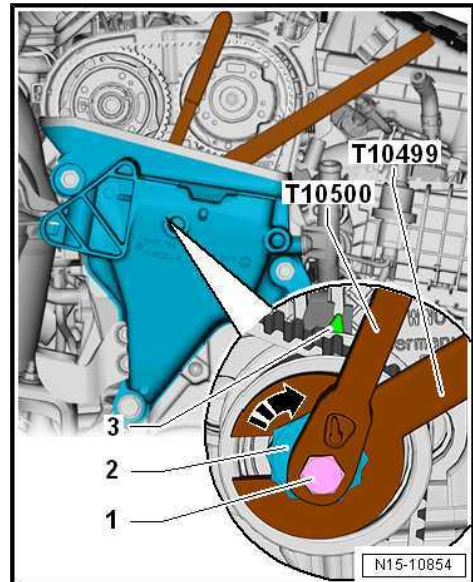
Risk of damage to the engine when tightening to incorrect lightening torque!

To tighten, the torque wrench - VAS 6583- or torque wrench - V.A.G 1410- must be used!

- To tighten the reduced torque, no other torque wrench may be used!

Tighten with torque wrench VAS 6583

- Only use the torque wrench together with insertion tool - T10500- !
- When setting the tightening torque on the torque wrench - VAS 6583- the actual dimension specified on the tool insert - T10500- must be put into the torque wrench!
- Keep eccentric in this position and tighten screw -1- to 25 Nm. Use tool insert - T10500- with torque wrench - VAS 6583- to do this.



Tighten with torque wrench VAG 1410

- Only use the torque wrench together with insertion tool - T10500- !
- Set the reduced tightening torque of 12 Nm on the torque wrench - V.A.G 1410-
- The required tightening torque of 25 Nm is achieved by the extending the torque wrench - V.A.G 1410- around the tool insert - T10500- !
- Keep eccentric in this position and tighten screw -1- to 12 Nm. Use tool insert - T10500- with torque wrench - V.A.G 1410- to do this.

Continued

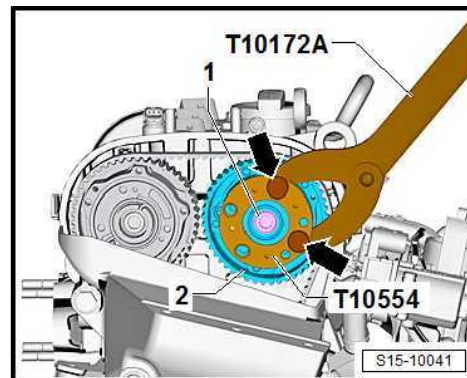
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Note

If the engine continued to turn or has run, there may be slight deviations of the adjustment pointer -3- setting in the adjustment window. This has no influence on the toothed belt tensioning.

- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Pre-tighten screw -1- to 50 Nm.

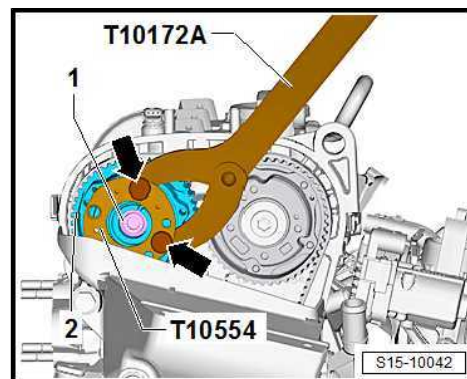


- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Pre-tighten screw -1- to 50 Nm.

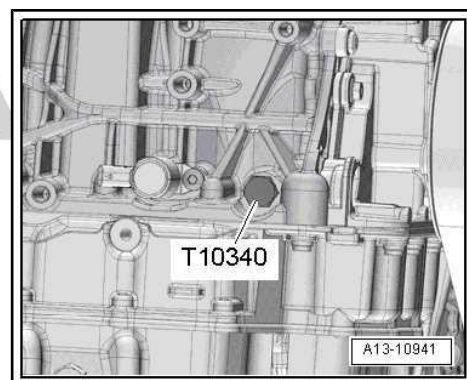


Note

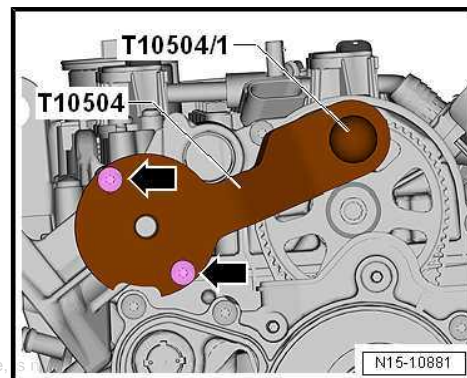
The securing bolts are only turned a further angle after checking the timing at the end of the procedure.



- Unscrew positioning screw - T10340- .

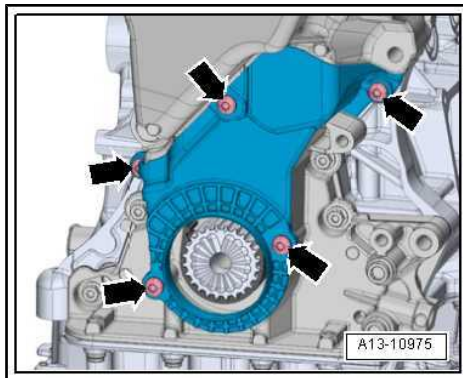


- Unscrew screws -arrow- and remove camshaft clamp - T10504- .



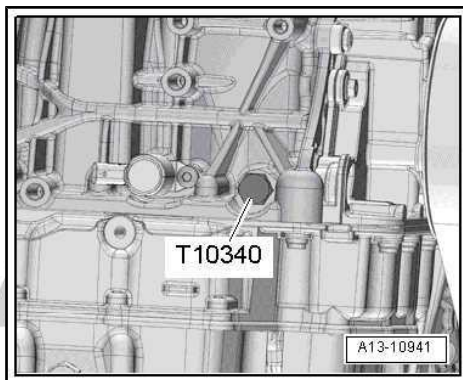
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- Install the bottom toothed belt guard -arrows-.
- Installing the V-ribbed belt pulley
⇒ "1.5 Installing and removing the vibration damper", page 43.



Test timing

- Turn crankshaft 2 turns in the direction of running of the engine until the piston for cylinder 1 is again on "TDC".
- Screw the locating screw - T10340- up to the stop into the cylinder block and tighten to 30 Nm.
- Turn crankshaft further up to the stop in direction of rotation of engine.
- The crankshaft cheek must now be resting on the locating screw.



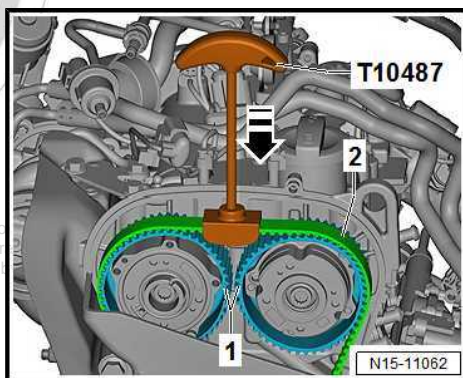
Note

The crankshaft is only locked in direction of rotation of engine using the locating screw - T10340-.

- The camshaft clamp -T10504- must move into position easily.
- The camshaft clamp must not be positioned using any kind of hammer.

If the camshaft clamp - T10504- cannot be inserted easily with the test probe - T10504/2- :

- Use the assembly device - T10487- to press onto the toothed belt in -direction of arrow-.



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- At the same time, insert camshaft clamp -T10504- up to the stop.
- Insert test probe - T10504/2- up to the stop.
- Tighten screws -arrows- by hand.

CAUTION

Risk of engine damage.

- The groove -arrow- on the test probe - T10504/2- must be in line with the camshaft clamp - T10504- .

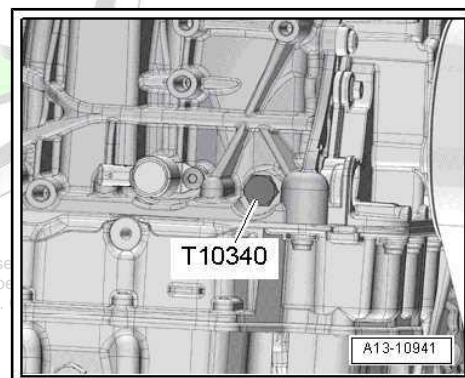
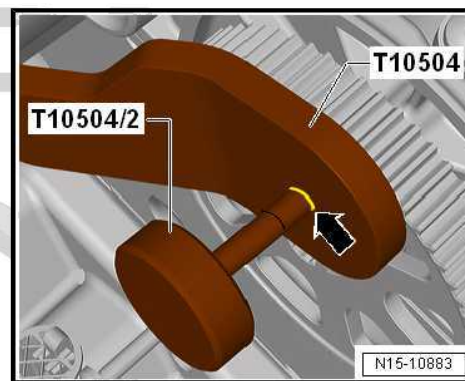
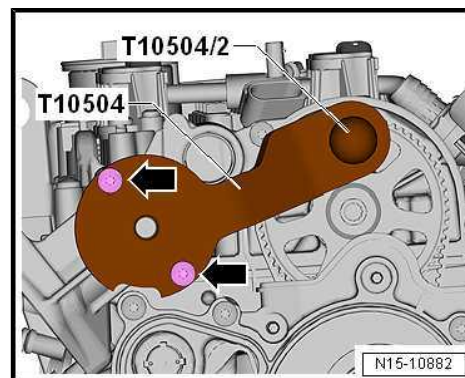
If the -groove- of the test probe - T10504/2- is not in line with the camshaft clamp - T10504- , the test probe - T10504/2- has not been inserted to sufficient depth.

If it is not possible to insert the camshaft clamp - T10504- with the test probe - T10504/2- , the valve timings are NOK:

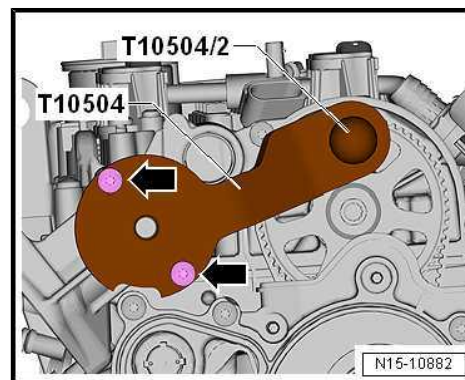
- Remove the toothed belt from the camshafts and repeat the timings
⇒ "2.5.2 Removing the toothed belt from the camshafts, engine identification characters CZEÄ", page 159 .

If it is possible to insert the camshaft clamp - T10504- with the test probe - T10504/2- , the valve timings are OK:

- Unscrew positioning screw - T10340- .



- Pull out the test probe - T10504/2- .
- Unscrew screws -arrow- and remove camshaft clamp - T10504- .

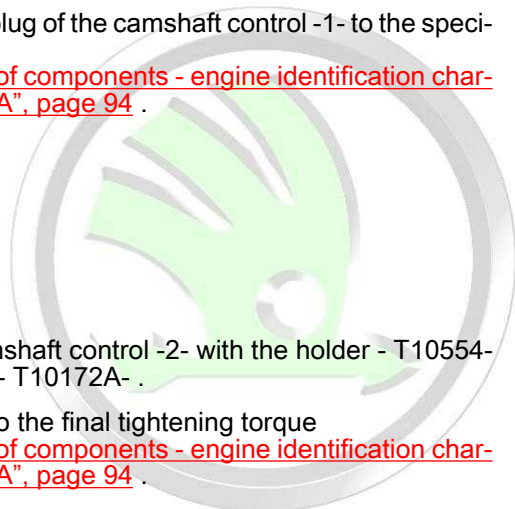


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- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten screw -1- to the final tightening torque
⇒ ["2.2.2 Summary of components - engine identification characters CZDA, CZEA", page 94](#) .

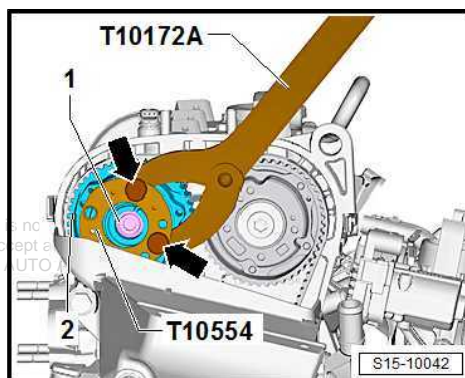
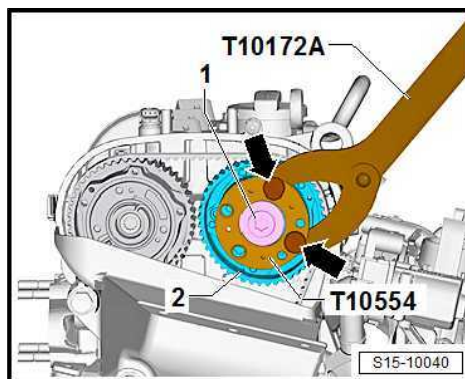
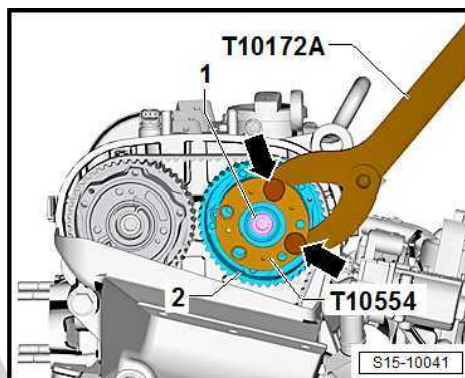
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- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten the screw plug of the camshaft control -1- to the specified torque
⇒ ["2.2.2 Summary of components - engine identification characters CZDA, CZEA", page 94](#) .



- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten screw -1- to the final tightening torque
⇒ ["2.2.2 Summary of components - engine identification characters CZDA, CZEA", page 94](#) .

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- Put cover for camshaft adjuster of the exhaust camshaft in place and tighten screws -arrows-.

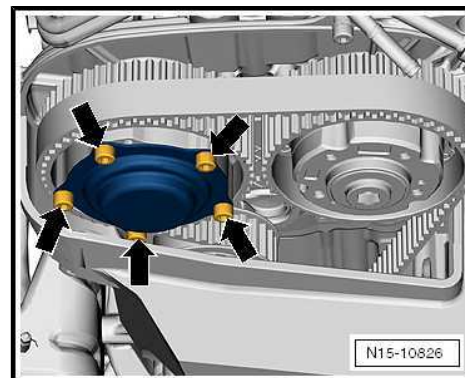
Further installation occurs in reverse order.



NOTICE

Risk of destruction of the engine.

- ◆ To complete the work, check that the locating screw - T10340- and camshaft clamp - T10504- have been removed from the engine.



Tightening torques

- ◆ V-ribbed belt drive
⇒ [“1.1 Assembly overview - ribbed V-belt drive”, page 36](#) .
- ◆ Toothed belt guard
⇒ [“2.1 Summary of components - toothed belt guard”, page 91](#) .
- ◆ Toothed belt drive
⇒ [“2.2 Summary of components - toothed belt”, page 92](#) .
- ◆ Screw plug for “TDC” bore in the cylinder block
⇒ [Fig. “Unscrew screw plug TDC bore at the cylinder block - tightening torque””, page 95](#) .
- ◆ Camshaft housing
⇒ [“1.2.3 Summary of components - camshaft housing, engine identification characters CZEА”, page 78](#) .
- ◆ Crankcase ventilation
⇒ [“3.1 Summary of components - crankcase ventilation”, page 209](#) .
- ◆ Coolant pump
⇒ [“2.1 Summary of components - coolant pump/thermostat”, page 230](#) .
- ◆ Exhaust gas turbocharger
⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#) .
- ◆ Charge-air system
⇒ [“2.1 Summary of components - charge air system”, page 282](#) .
- ◆ Noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation.

2.4 Test timing

⇒ [“2.4.1 Checking valve timing, engine identification characters CZCA, CZDA”, page 129](#)

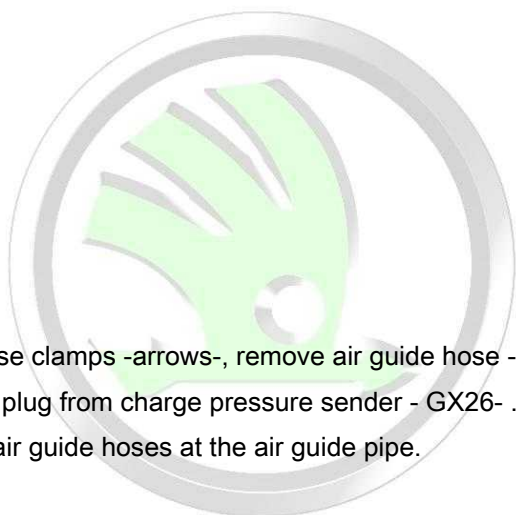
⇒ [“2.4.2 Checking valve timing, engine identification characters CZEА”, page 134](#)

2.4.1 Checking valve timing, engine identification characters CZCA, CZDA

Special tools and workshop equipment required

- ◆ Locating screw - T10340-
- ◆ Crankshaft arrester - T10494-
- ◆ Release tool -T10527-
- ◆ Release tool -T10527/1-

- ◆ Assembly device - T10487-
- Loosen hose clamps -1-, -2- and remove air guide pipes.

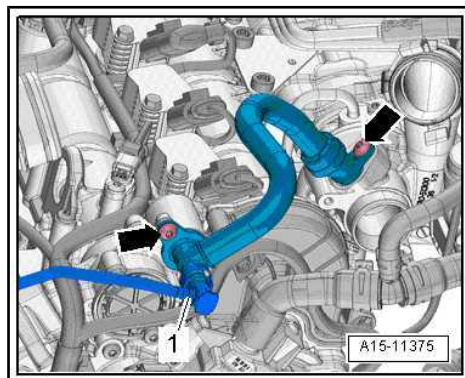
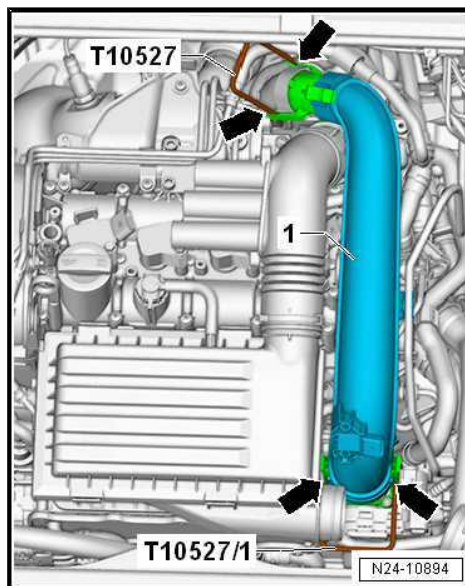
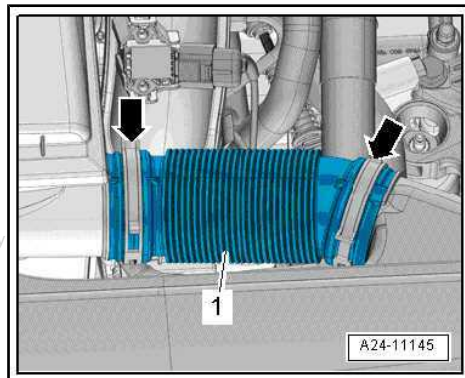
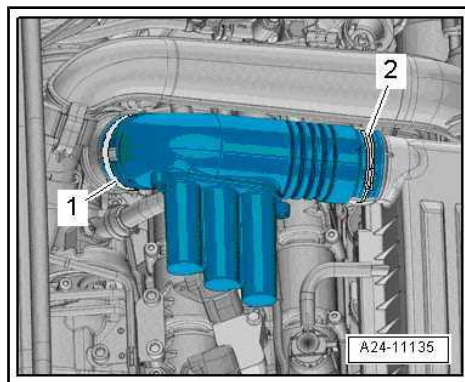


- Undo hose clamps -arrows-, remove air guide hose -1-.
- Remove plug from charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.

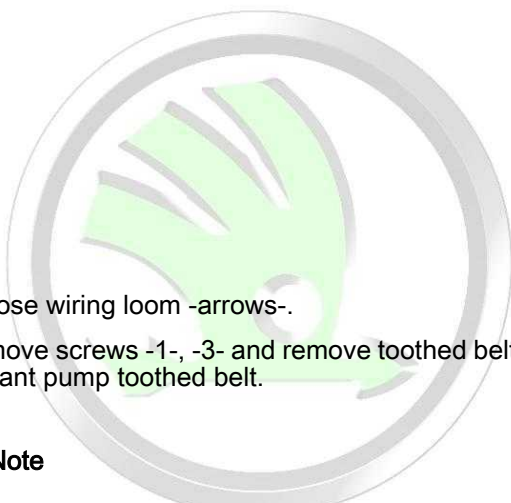
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- Release retaining tabs -arrows- using the release tool - T10527- and -T10527/1- .
- Remove air guide pipe -1-.

- Press release buttons and remove hose -1- to the activated charcoal filter.
- Unscrew screws -arrows- and remove hose for crankcase ventilation.



- Release screws -arrows- and remove connection piece -1-.



- Expose wiring loom -arrows-.
- Remove screws -1-, -3- and remove toothed belt guard -2- for coolant pump toothed belt.



If engine oil touches the sealing ring for the coolant pump, it may be damaged chemically.

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- Cover the coolant pump with a cloth.

- Remove screws -arrows- and remove cap -1-.

- Unclip holder -3- together with hoses from the toothed belt guard -1-.
- Unscrew bolt -2-.
- Loosen clips -arrows- and remove toothed belt guard -1- upwards.

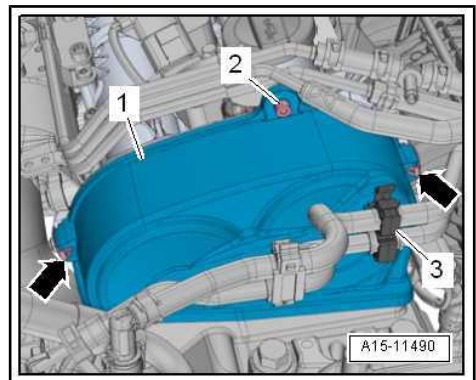
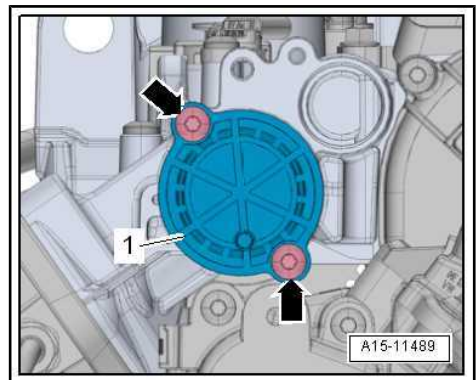
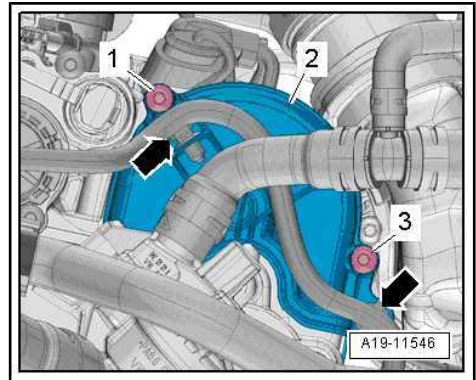
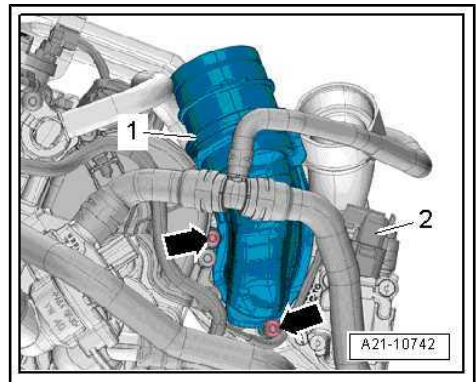
Position crankshaft to “TDC”:

CAUTION

Risk of engine damage.

You must adjust the “TDC” position, as described!

- ◆ Locating screw - T10340- can collide with crankshaft in two positions.
- Remove ignition coil with power output stage 1
⇒ **“1.2 Removing and installing ignition coils with output stage”, page 361** .
- Remove ignition plug cylinder 1 with spark plug socket wrench , e. g. -3122 B- .



Set the correct position of the crankshaft to screw in the locating screw:

- Carefully insert a screwdriver into the opening of the ignition plug, minimum length of shaft 250 mm, in -direction of arrow- so that it touches the piston head.
- Rotate the crankshaft in direction of rotation of engine on “TDC” for cylinder 1.



- Turn engine shaft further in direction of arrow so that the screwdriver just out at the top by approx 35 mm in the -direction of the arrow-.
- Unscrew screw plug “TDC” bore at the cylinder block.

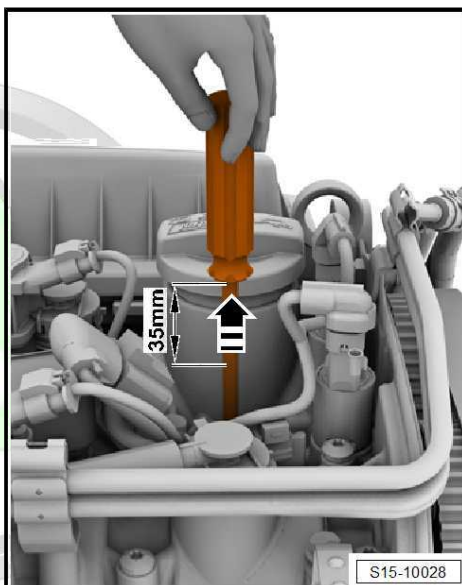
! NOTICE

Risk of damage to the engine if the locating screw - T10340- is screwed in at the wrong position.

If the locating screw - T10340- cannot be screwed in up to the stop, the crankshaft is not in the correct position.

In this case, proceed as follows:

- Unscrew locking pin.
- Set the correct position of the crankshaft for screwing in the locating screw ⇒ [page 132](#) .

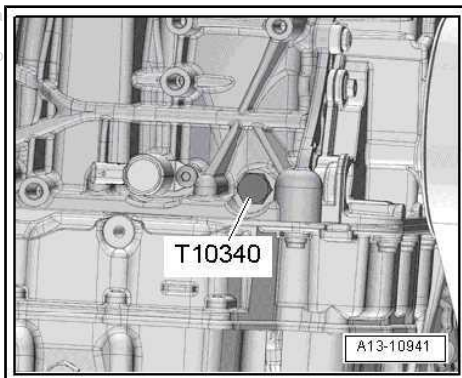


- Screw the locating screw - T10340- up to the stop into the cylinder block and tighten to 30 Nm.
- Turn crankshaft up to the stop in direction of rotation of engine.
- The crankshaft sprocket now lies on the locating screw and the “TCD” position is set.



Note

The crankshaft is only locked in direction of rotation of engine using the locating screw - T10340- .



- With the exhaust camshaft -A- and inlet valve -E-, the asymmetrically arranged grooves -arrows- must be above the camshaft centre.
- On the exhaust camshaft -A-, the grooves -arrows- are accessible through the recesses in the coolant pump driving wheel.

If the camshafts are not as described:

- Remove locating screw - T10340- and turn crankshaft another turn, set back to "TDC" → [page 132](#) .

If the camshafts are as described:

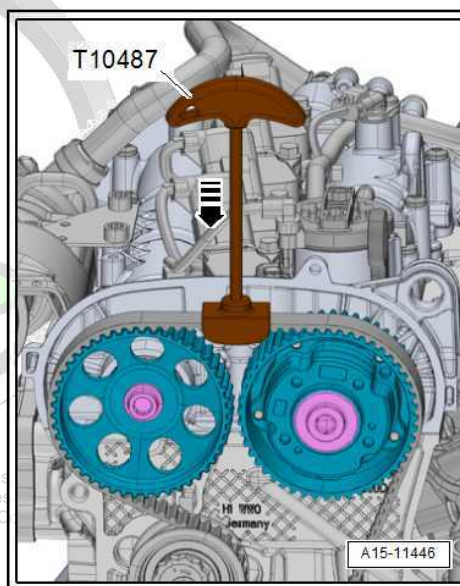
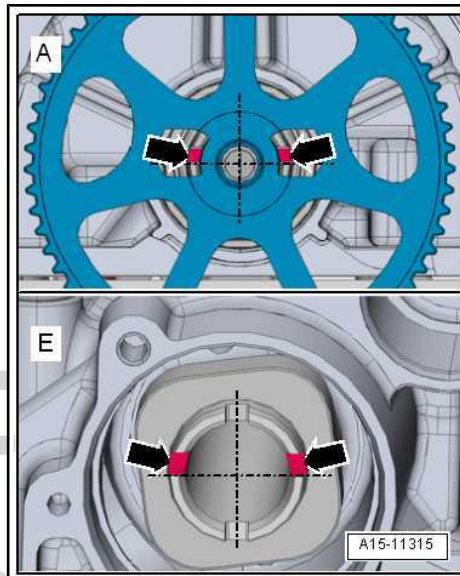


Note

- ◆ The camshaft clamp - T10494- must move into position easily.
- ◆ The camshaft clamp must not be positioned using any kind of hammer.

If camshaft clamp - T10477- cannot be installed:

- Using the assembly tool - T10487- in -direction of arrow- press on the toothed belt.



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- While doing so, insert camshaft clamp -T10494- up to the stop into the camshafts and tighten hand-tight with screw -arrow-.

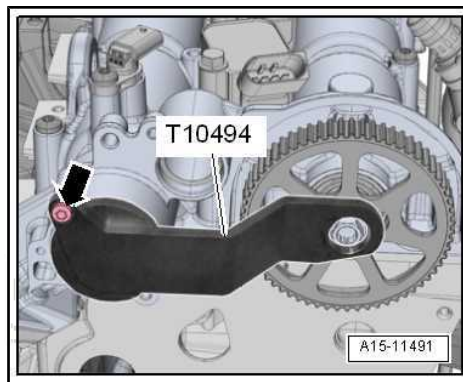
If camshaft clamp cannot be fitted:

- Remove the toothed belt from the camshafts and set the timings
⇒ [“2.5.1 Removing the toothed belt from the camshafts, engine identification characters CZCA, CZDA”, page 140](#) .

If camshaft clamp can be fitted:

- Valve timing is OK.

Further installation occurs in reverse order.



NOTICE

Risk of destruction of the engine.

- ◆ To complete the work, check that the locating screw - T10340- and camshaft clamp - T10494- have been removed from the engine.

Tightening torques

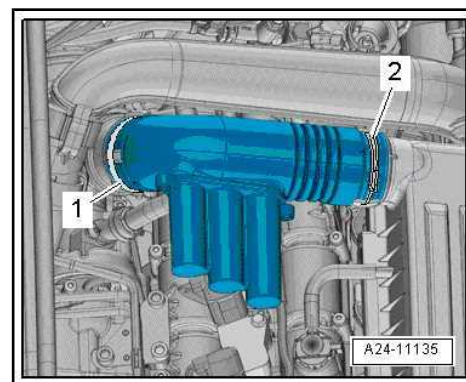
- ◆ Toothed belt drive
⇒ [“2.2 Summary of components - toothed belt”, page 92](#) .
- ◆ Screw plug for bore in cylinder block with engine identification characters CZCA
⇒ [Fig. “Unscrew screw plug TDC bore at the cylinder block - tightening torque”, page 93](#) .
- ◆ Screw plug for bore in cylinder block with engine identification characters CZDA
⇒ [Fig. “Unscrew screw plug TDC bore at the cylinder block - tightening torque”, page 95](#) .
- ◆ Camshaft housing with engine identification characters CZCA
⇒ [“1.2.1 Summary of components - camshaft housing, engine identification characters CZCA”, page 73](#) .
- ◆ Camshaft housing with engine identification characters CZDA
⇒ [“1.2.2 Summary of components - camshaft housing, engine identification characters CZDA”, page 76](#) .
- ◆ Crankcase ventilation
⇒ [“3.1 Summary of components - crankcase ventilation”, page 209](#) .
- ◆ Coolant pump
⇒ [“2.1 Summary of components - coolant pump/thermostat”, page 230](#) .
- ◆ Charge-air system
⇒ [“2.1 Summary of components - charge air system”, page 282](#) .

2.4.2 Checking valve timing, engine identification characters CZE A

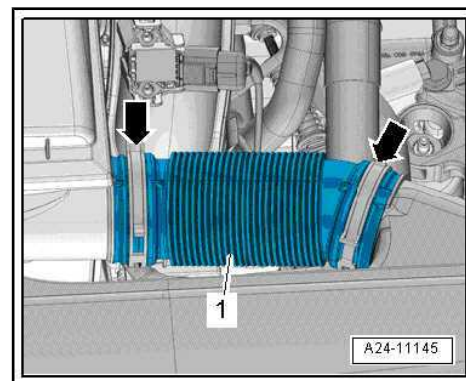
Special tools and workshop equipment required

- ◆ Locating screw - T10340-
- ◆ Crankshaft arrester - T10504-
- ◆ Test probe - T10504/2-
- ◆ Release tool -T10527-
- ◆ Release tool -T10527/1-

- ◆ Assembly device - T10487-
- Loosen hose clamps -1-, -2- and remove air guide pipes.

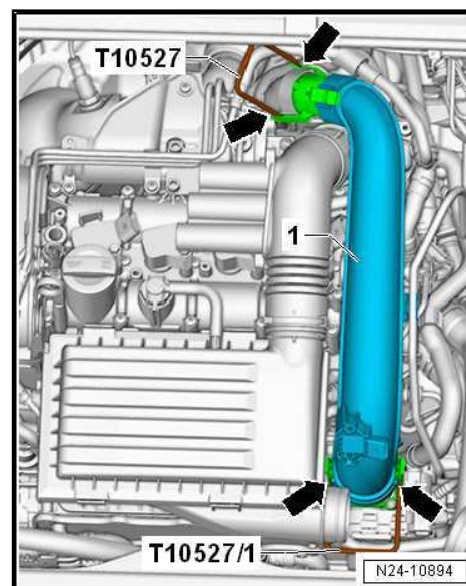


- Undo hose clamps -arrows-, remove air guide hose -1-.
- Remove plug from charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.

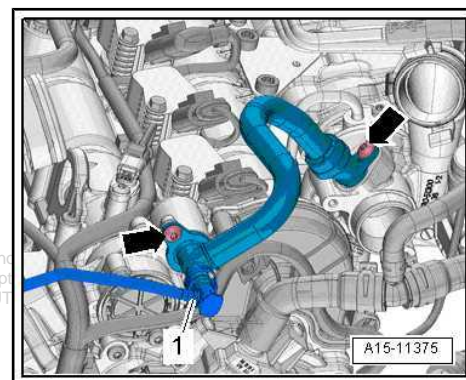


- Release retaining tabs -arrows- using the release tool - T10527- and -T10527/1- .
- Remove air guide pipe -1-.

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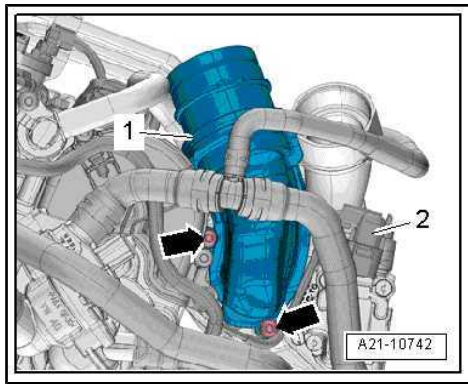


- Press release buttons and remove hose -1- to the activated charcoal filter.
- Unscrew screws -arrows- and remove hose for crankcase ventilation.



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- Release screws -arrows- and remove connection piece -1-.



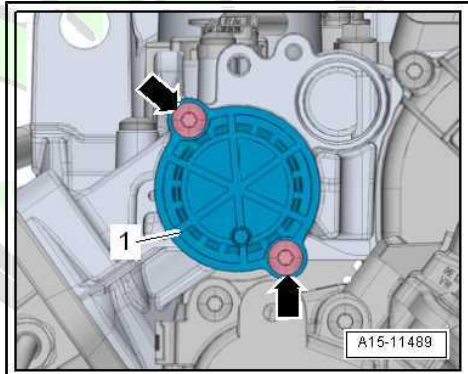
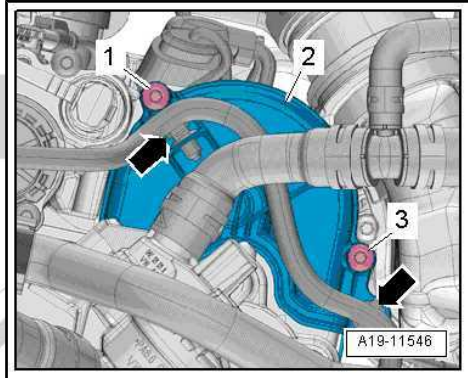
- Expose wiring loom -arrows-.
- Remove screws -1-, -3- and remove toothed belt guard -2- for coolant pump toothed belt.



Note

If engine oil touches the sealing ring for the coolant pump, it may be damaged chemically.

- Cover the coolant pump with a cloth.
- Remove screws -arrows- and remove cap -1-.



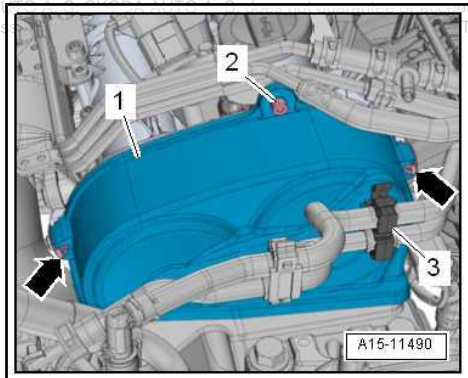
- Unclip holder -3- together with hoses from the toothed belt guard -1-.
- Unscrew bolt -2-.
- Loosen clips -arrows- and remove toothed belt guard -1- upwards.

Position crankshaft to "TDC":

CAUTION

Risk of engine damage.

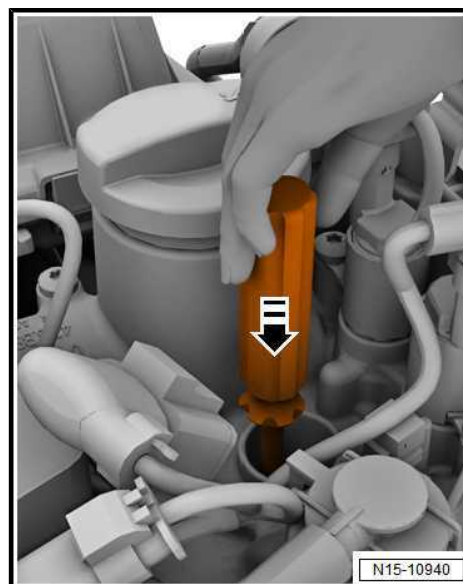
You must adjust the "TDC" position, as described!



- ♦ Locating screw - T10340- can collide with crankshaft in two positions.
- Remove ignition coil with power output stage 1
⇒ ["1.2 Removing and installing ignition coils with output stage", page 361](#).
- Remove ignition plug cylinder 1 with spark plug socket wrench , e. g. -3122 B- .

Set the correct position of the crankshaft to screw in the locating screw:

- Carefully insert a screwdriver into the opening of the ignition plug, minimum length of shaft 250 mm, in -direction of arrow- so that it touches the piston head.
- Rotate the crankshaft in direction of rotation of engine on “TDC” for cylinder 1.



- Turn engine shaft further in direction of arrow so that the screwdriver just out at the top by approx 35 mm in the -direction of the arrow-.
- Unscrew screw plug “TDC” bore at the cylinder block.

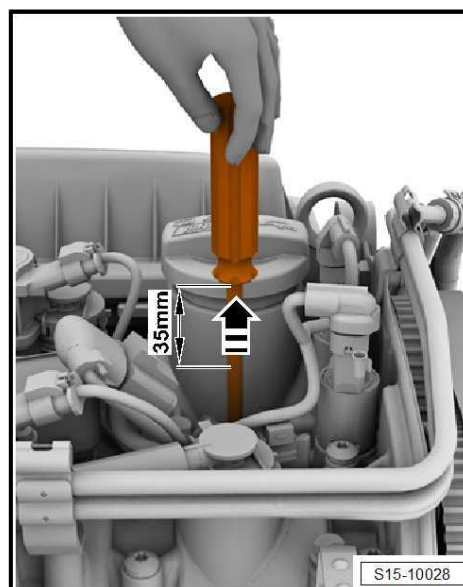
! NOTICE

Risk of damage to the engine if the locating screw - T10340- is screwed in at the wrong position.

If the locating screw - T10340- cannot be screwed in up to the stop, the crankshaft is not in the correct position.

In this case, proceed as follows:

- Unscrew locking pin.
- Set the correct position of the crankshaft for screwing in the locating screw => [page 137](#).

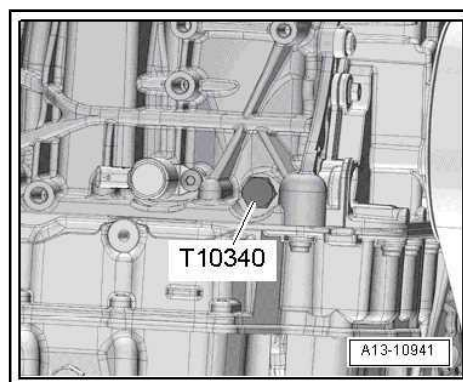


- Screw the locating screw - T10340- up to the stop into the cylinder block and tighten to 30 Nm.
- Turn crankshaft up to the stop in direction of rotation of engine.
- The crankshaft sprocket now lies on the locating screw and the “TCD” position is set.



Note

The crankshaft is only locked in direction of rotation of engine using the locating screw - T10340- .



- For exhaust camshaft -A-, the bore in the toothed belt pulley for the coolant pump drive -arrow- must be located against the hole in the camshaft housing.
- For the inlet camshaft -E-, the grooves -arrows- are above the camshaft centre.

A - Exhaust camshaft

E - Inlet camshaft

- If the camshafts are not positioned as described, unscrew the locating screw - T10340- and turn the crankshaft by one more turn and set it to "TDC" again [⇒ page 137](#) .



Note

- ◆ The camshaft clamp - T10504- must move into position easily with the test probe - T10504/2- .
- ◆ The camshaft clamp must not be positioned using any kind of hammer.

If the camshaft clamp - T10504- cannot be inserted easily with the test probe - T10504/2- :

- Use the assembly device - T10487- to press onto the toothed belt in -direction of arrow-.

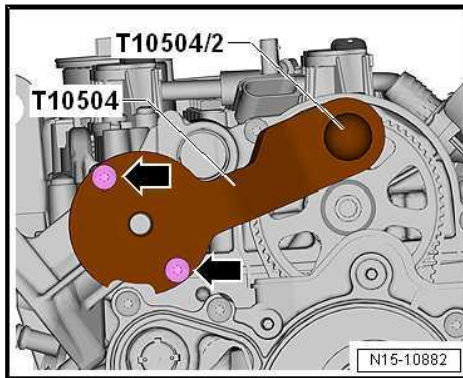
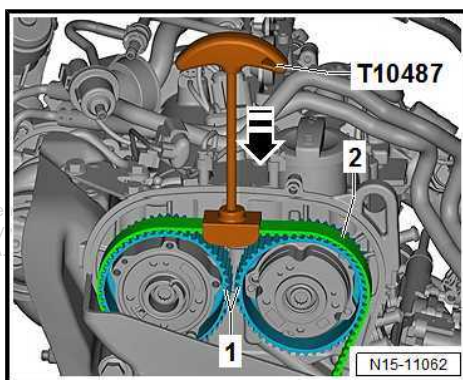
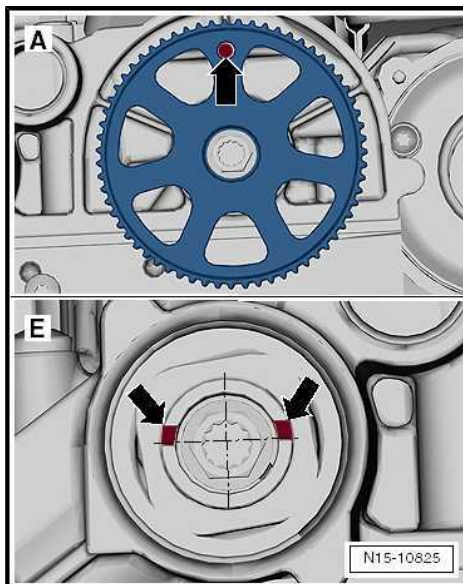
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- At the same time, insert camshaft clamp -T10504- up to the stop into the inlet camshaft.
- Insert test probe - T10504/2- up to the stop.
- Tighten screws -arrows- by hand.



CAUTION

Risk of engine damage.



- The groove -arrow- on the test probe - T10504/2- must be in line with the camshaft clamp - T10504- .

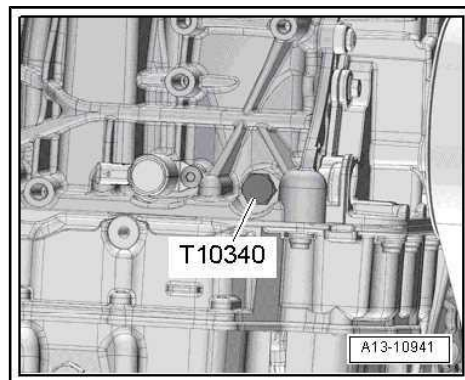
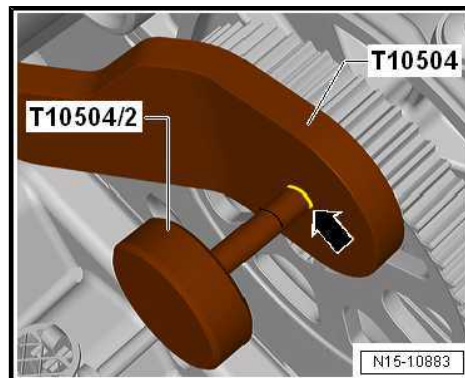
If the -groove- of the test probe - T10504/2- is not in line with the camshaft clamp - T10504- , the test probe - T10504/2- has not been inserted to sufficient depth.

If it is not possible to insert the camshaft clamp - T10504- with the test probe - T10504/2- , the valve timings are NOK:

- Remove toothed belt and set the valve timings
 ⇒ "2.5.2 Removing the toothed belt from the camshafts, engine identification characters CZEÄ", page 159 .

If it is possible to insert the camshaft clamp - T10504- with the test probe - T10504/2- , the valve timings are OK:

- Unscrew positioning screw - T10340- .



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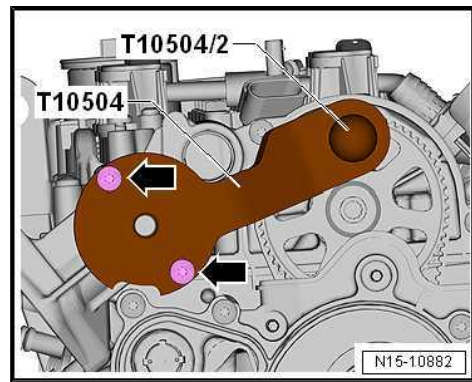
- Pull out the test probe - T10504/2- .
- Unscrew screws -arrow- and remove camshaft clamp - T10504- .

Further installation occurs in reverse order.



Risk of destruction of the engine.

- ◆ To complete the work, check that the locating screw - T10340- and camshaft clamp - T10504- have been removed from the engine.



Tightening torques

- ◆ Toothed belt drive
⇒ [“2.2.2 Summary of components - engine identification characters CZDA, CZEa”, page 94](#) .
- ◆ Toothed belt guard
⇒ [“2.1 Summary of components - toothed belt guard”, page 91](#) .
- ◆ Summary of components - camshaft housing
⇒ [“1.2.3 Summary of components - camshaft housing, engine identification characters CZEa”, page 78](#) .
- ◆ Coolant pump
⇒ [“2.1 Summary of components - coolant pump/thermostat”, page 230](#) .
- ◆ Screw plug for bore in the cylinder block
⇒ [Fig. “Unscrew screw plug TDC bore at the cylinder block - tightening torque”, page 95](#) .
- ◆ Camshaft housing
⇒ [“1.2.3 Summary of components - camshaft housing, engine identification characters CZEa”, page 78](#) .
- ◆ Crankcase ventilation
⇒ [“3.1 Summary of components - crankcase ventilation”, page 209](#) .
- ◆ Coolant pump
⇒ [“2.1 Summary of components - coolant pump/thermostat”, page 230](#) .
- ◆ Charge-air system
⇒ [“2.1 Summary of components - charge air system”, page 282](#) .

2.5 Remove the toothed belt from the camshaft

⇒ [“2.5.1 Removing the toothed belt from the camshafts, engine identification characters CZCA, CZDA”, page 140](#)

⇒ [“2.5.2 Removing the toothed belt from the camshafts, engine identification characters CZEa”, page 159](#)

2.5.1 Removing the toothed belt from the camshafts, engine identification characters CZCA, CZDA

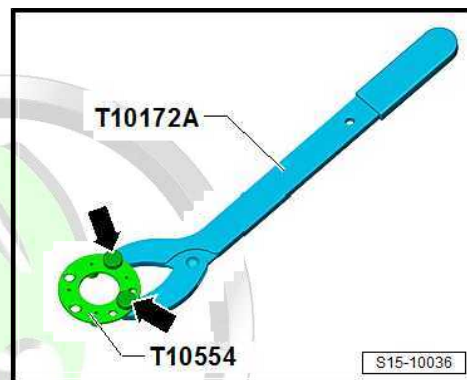
Special tools and workshop equipment required

- ◆ Counterholder - T10172A- with adapters -T10172/2-
- ◆ Support - T10554-

- ◆ Locating screw - T10340-
- ◆ Key - T10499A-
- ◆ Insertion tool - T10500-
- ◆ Torque wrench - V.A.G 1410- or -VAS 6583-
- ◆ Crankshaft arrester - T10494-
- ◆ Release tool -T10527-
- ◆ Release tool - T10527/1-
- ◆ Assembly device - T10487-
- ◆ Spark plug wrench , e.g. -3122 B-

Prepare the tools

- Screw the counterholder - T10172A- and holder - T10554- with knurled screws -arrows-.

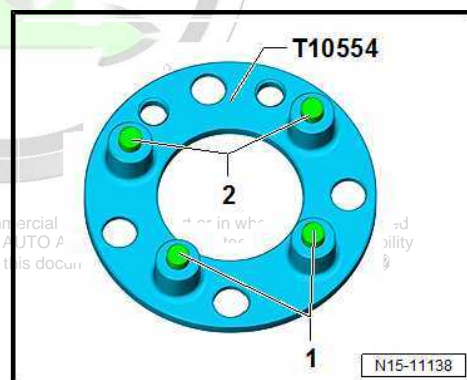


Insert support - T10554-

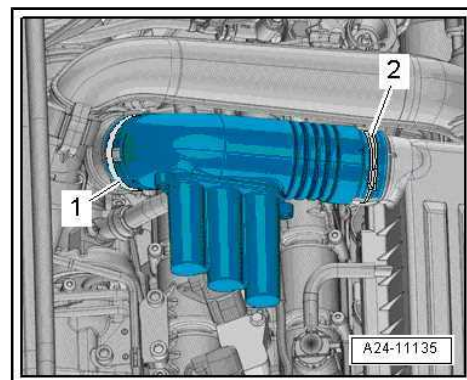
The row spacings -1- and -2- of the holder - T10554- are arranged unevenly.

They are equal to the hole spacings in the camshaft control.

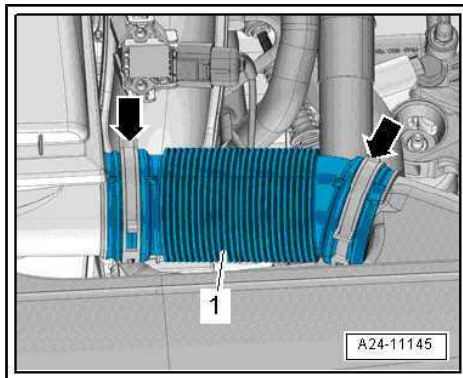
Removing



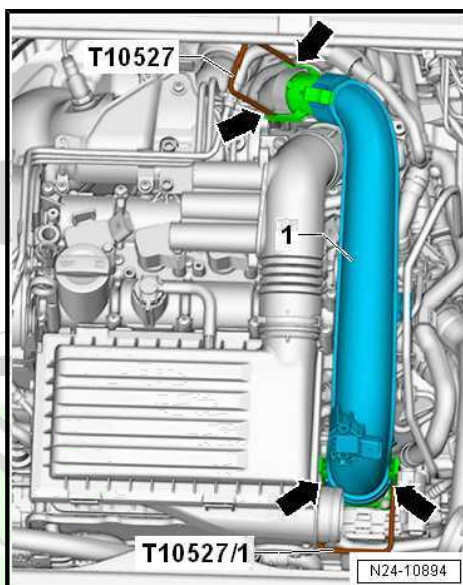
- Loosen hose clamps -1- and -2- and remove air guide pipes.



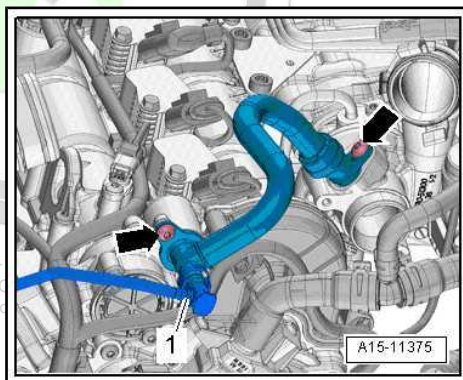
- Undo hose clamps -arrows-, remove air guide hose -1-.
- Remove plug from charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.



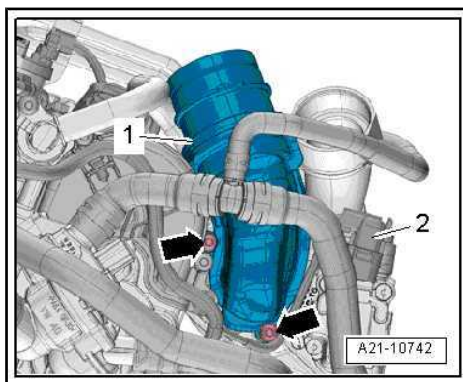
- Release retaining tabs -arrows- using the release tool - T10527- and -T10527/1- .
- Remove air guide pipe -1-.



- Press release buttons and remove hose -1- to the activated charcoal filter.
- Unscrew screws -arrows- and remove hose for crankcase ventilation.



- Release screws -arrows- and remove connection piece -1-.



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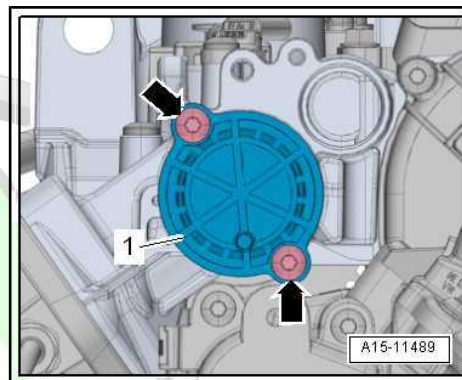
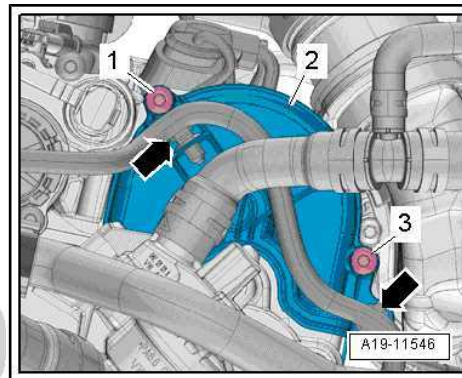
- Expose wiring loom -arrows-.
- Remove screws -1-, -3- and remove toothed belt guard -2- for coolant pump toothed belt.



Note

If engine oil touches the sealing ring for the coolant pump, it may be damaged chemically.

- Cover the coolant pump with a cloth.
- Remove screws -arrows- and remove cap -1-.



- Unclip holder -3- together with hoses from the toothed belt guard -1-.
- Unscrew bolt -2-.
- Loosen clips -arrows- and remove toothed belt guard -1- upwards.

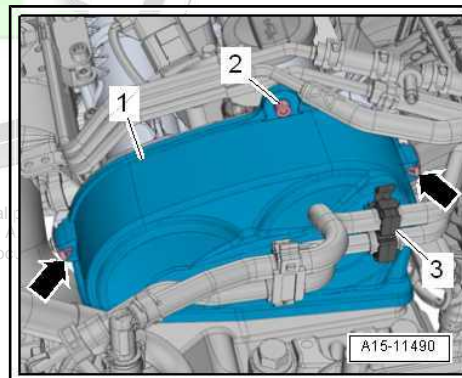
For vehicles with engine identification characters CZDA



NOTICE

Risk of damage to the toothed belt due to leaking engine oil.

Contact points of the toothed belt, camshaft sprocket, crankshaft pulley, tensioning pulley and guide pulley are to be kept free of oil.



- Remove screws -arrows- and remove the cover from the camshaft control of the exhaust camshaft.

For vehicles with engine identification characters CZCA, CZDA

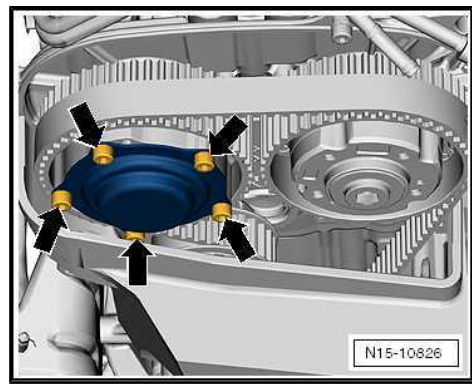
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .

Position crankshaft to "TDC".

⚠ CAUTION

Risk of engine damage.

You must adjust the "TDC" position, as described!



- ◆ Locating screw - T10340- can collide with crankshaft in two positions.
- Remove ignition coil with power output stage 1
⇒ ["1.2 Removing and installing ignition coils with output stage", page 361](#) .
- Remove ignition plug cylinder 1 with spark plug socket wrench , e. g. -3122 B- .

Set the correct position of the crankshaft to screw in the locating screw:

- Carefully insert a screwdriver into the opening of the ignition plug, minimum length of shaft 250 mm, in -direction of arrow- so that it touches the piston head.
- Rotate the crankshaft in direction of rotation of engine on "TDC" for cylinder 1.



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- Turn engine shaft further in direction of arrow so that the screwdriver just out at the top by approx 35 mm in the -direction of the arrow-.
- Unscrew screw plug “TDC” bore at the cylinder block.

! NOTICE

Risk of damage to the engine if the locating screw - T10340- is screwed in at the wrong position.

If the locating screw - T10340- cannot be screwed in up to the stop, the crankshaft is not in the correct position.

In this case, proceed as follows:

- Unscrew locking pin.
- Set the correct position of the crankshaft for screwing in the locating screw ⇒ [page 144](#) .
- Screw the locating screw - T10340- up to the stop into the cylinder block and tighten to 30 Nm.
- Turn crankshaft up to the stop in direction of rotation of engine.
- The crankshaft sprocket now lies on the locating screw and the “TCD” position is set.

i Note

The crankshaft is only locked in direction of rotation of engine using the locating screw - T10340- .

- With the exhaust camshaft -A- and inlet valve -E-, the asymmetrically arranged grooves -arrows- must be above the camshaft centre.
- On the exhaust camshaft -A-, the grooves -arrows- are accessible through the recesses in the coolant pump driving wheel.

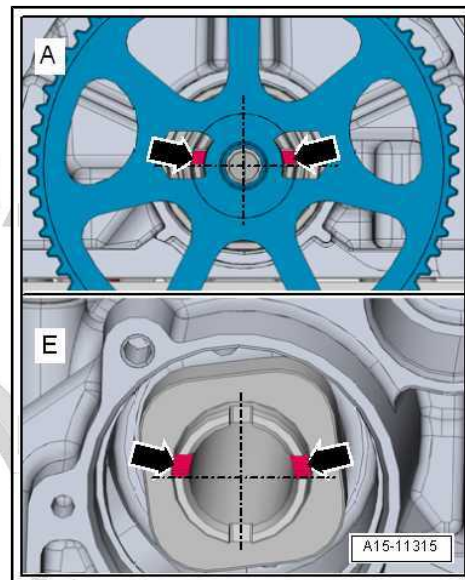
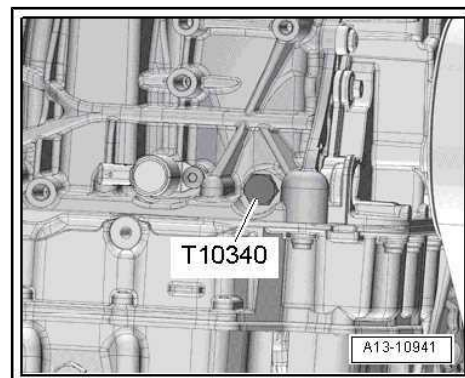
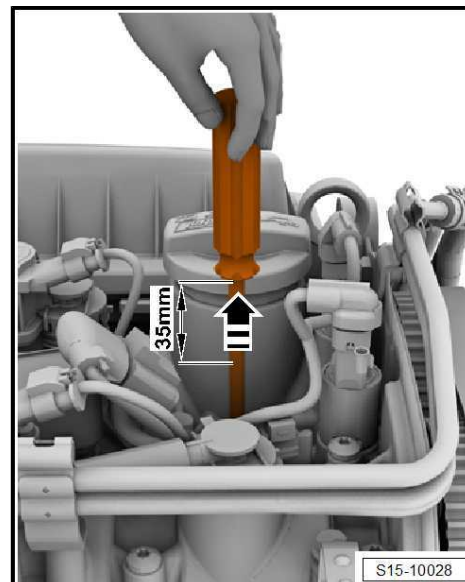
If the camshafts are not as described:

- Remove locating screw - T10340- and turn crankshaft another turn, set back to “TDC” ⇒ [page 144](#) .

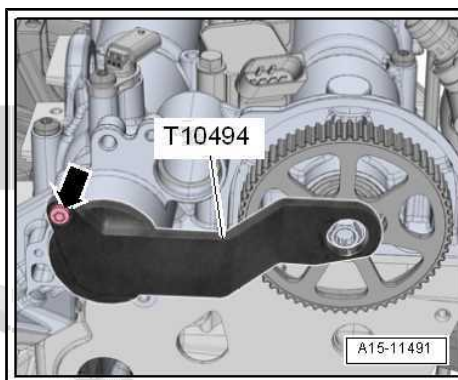
If the camshafts are as described:

i Note

- ◆ *The camshaft clamp -T10494- must be inserted easily.*
- ◆ *The camshaft clamp must not be positioned using any kind of hammer.*

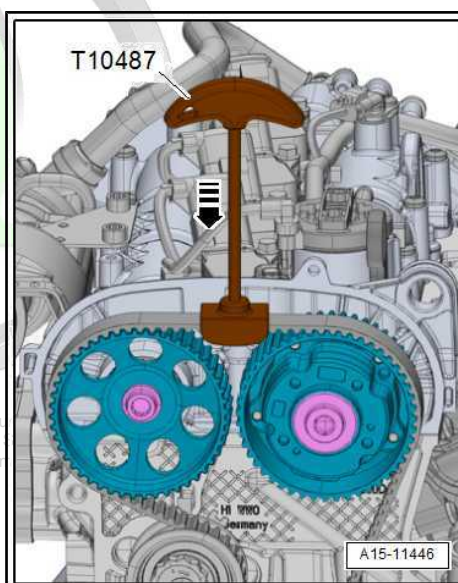


- Insert camshaft clamp -T10494- to stop into camshafts and tighten bolt -arrow- by hand.



If camshaft clamp - T10494- cannot be installed:

- Using the assembly tool - T10487- in -direction of arrow- press on the toothed belt.



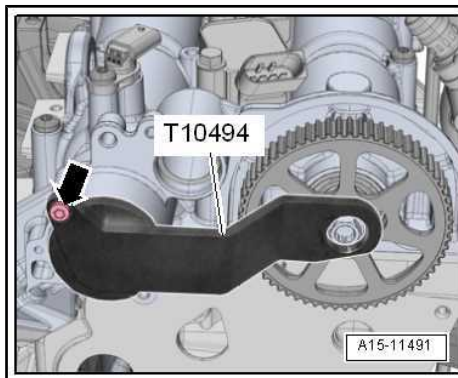
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- While doing so, insert camshaft clamp -T10494- up to the stop into the camshafts and tighten hand-tight with screw -arrow-.

NOTICE

Risk of damage to camshaft clamp - T10494- and camshaft.

- ♦ Do not use the camshaft fixer/locator - T10494- as a counter-holder.



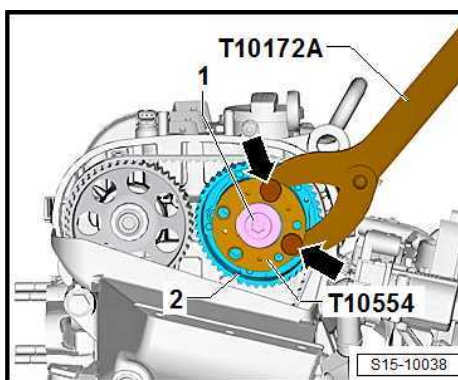
For vehicles with engine codes CZCA

- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Screw out screw plug -1-.

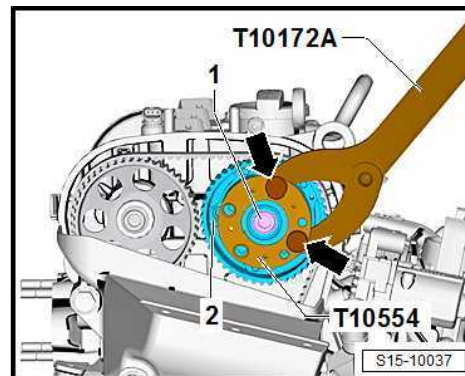


Note

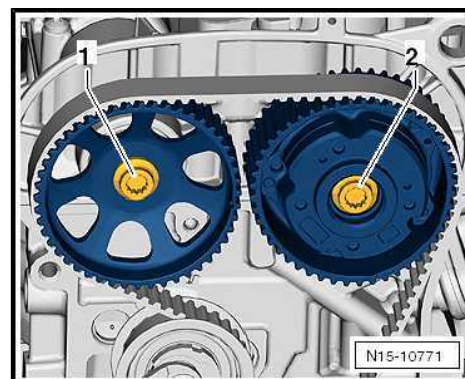
A minor loss of oil may occur when opening the screw plug -1-. The place of the oil leak must be covered with cloths.



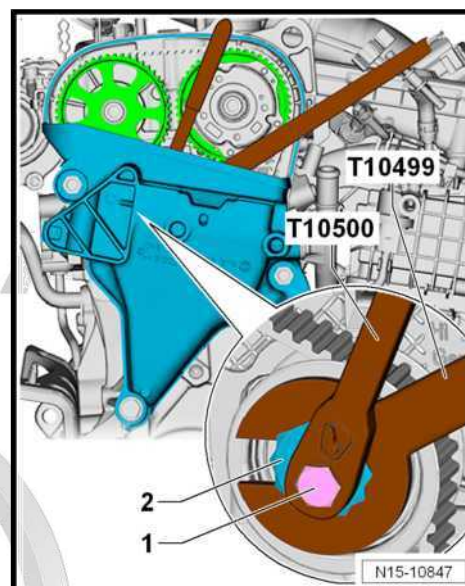
- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Release screw -1- by approx. one turn.



- Hold the exhaust camshaft sprocket with the counterholder - T10172A- and adapters -T10172/2- ..
- Release screw -1- by approx. one turn.



- Release screw -1- using insertion tool - T10500- .
- Slacken the tensioning pulley at the eccentric -2- using the wrench - T10499A- .



For vehicles with engine identification characters CZDA

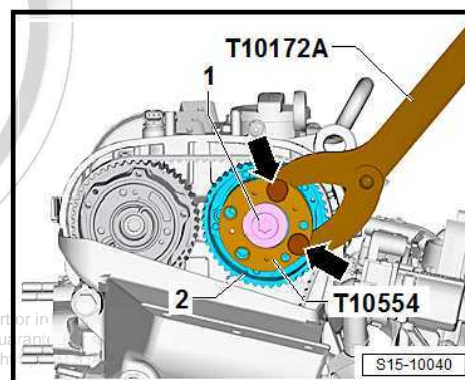
- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Screw out screw plug -1-.



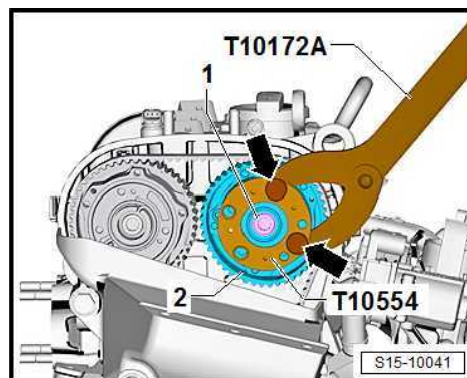
Note

A minor loss of oil may occur when opening the screw plug -1-. The place of the oil leak must be covered with cloths.

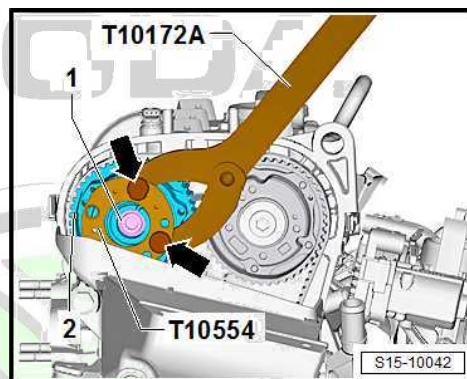
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- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Release screw -1- by approx. one turn.



- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Release screw -1- by approx. one turn.



- Release screw -1- using insertion tool - T10500- .
- Slacken the tensioning pulley at the eccentric -2- using the wrench - T10499A- .

For vehicles with engine identification characters CZCA, CZDA

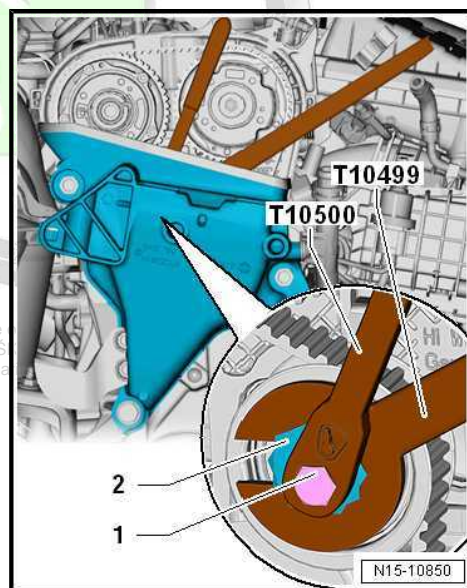


Note

There is a risk of destruction through reversing the rotation direction of an already used toothed belt.

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- Mark the direction of rotation with chalk or a felt-tip pen for the re-installation before removing the toothed belt pulley.



Bending radius of the toothed belt

! NOTICE

There is a risk of destroying the toothed belt because of the substantial bend.

- ◆ The bending radius - r - of the toothed belt -2- must not be allowed to drop below the minimum of 25 mm (approx. half the \varnothing of the crankshaft-belt pulley).
- ◆ If the bending radius falls below the minimum of 25 mm, this will affect the lifetime of the belt.
- Remove the toothed belt from the camshaft sprockets.

Installing (set the timing)



Note

Renew O-ring of screw plug if damaged.

- “Check TDC” position of camshaft and crankshaft:

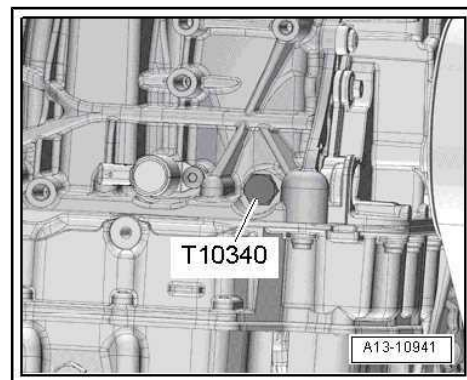
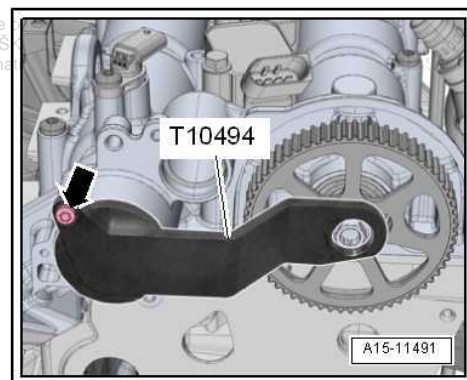
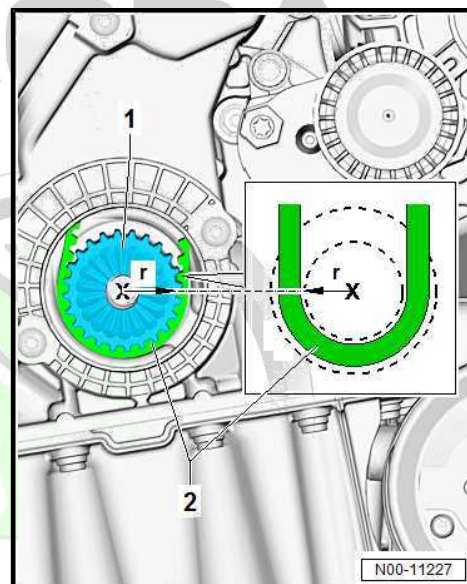
- Camshaft clamp - T10494- attached to camshaft housing.

! NOTICE

Risk of damage to camshaft clamp - T10494- and camshaft.

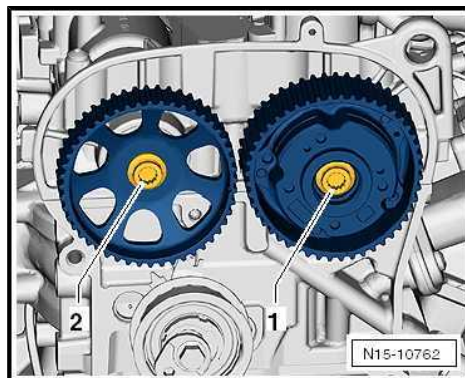
- ◆ Do not use the camshaft fixer/locator - T10494- as a counter-holder.

- Locating screw - T10340- turned up to the stop in the cylinder block and tightened to 30 Nm.
- Crankshaft in engine direction of rotation applied to the locating screw - T10340- = “TDC” position.



For vehicles with engine codes CZCA

- Replace screws -1- and -2- and insert them loosely.
- It must still be possible to turn the camshaft sprockets on the camshafts, however they must not tilt.

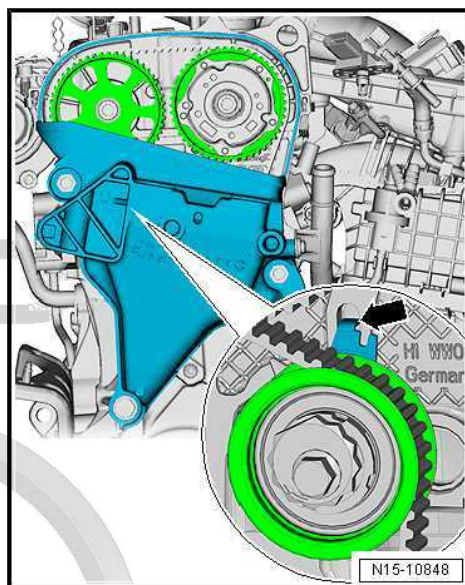


- The sheet peg -arrow- of the tensioning pulley must engage in the cast iron recess of the cylinder head.

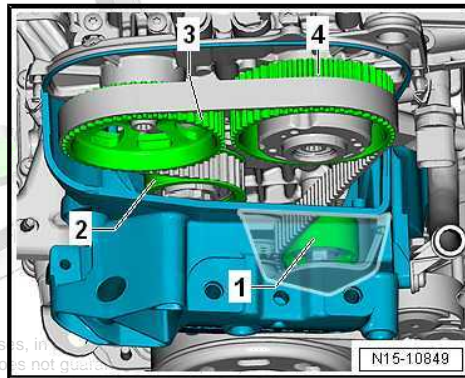


Note

Observe sequence when fitting the toothed belt.

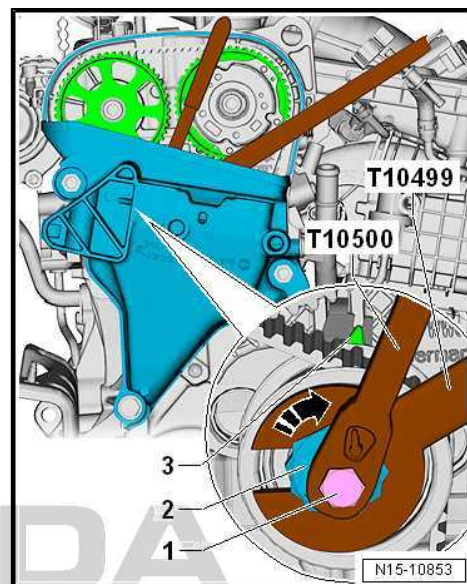


- Pull toothed belt upwards, place onto the guide pulley -1- and the tensioning pulley -2- and the camshaft sprockets -3- and -4-.



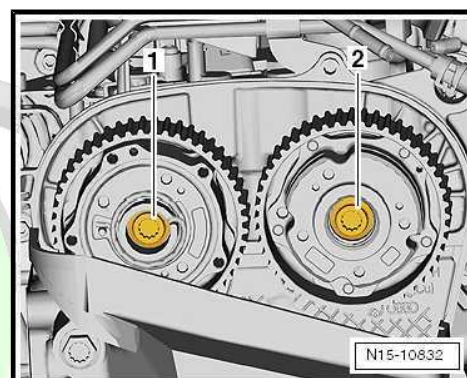
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- Turn the eccentric -2- of the tensioning pulley with the wrench -T10499A- in the -direction of arrow- until the setting pointer -3- is approx. 10 mm to the right of the setting window.
- Push eccentric so far back that the adjustment pointer is positioned exactly in the adjustment window.



For vehicles with engine identification characters CZDA

- Replace camshaft sprocket screws -1- and -2- and insert new screws loosely.
- It must still be possible to turn the camshaft sprockets on the camshafts, however they must not hang loose.



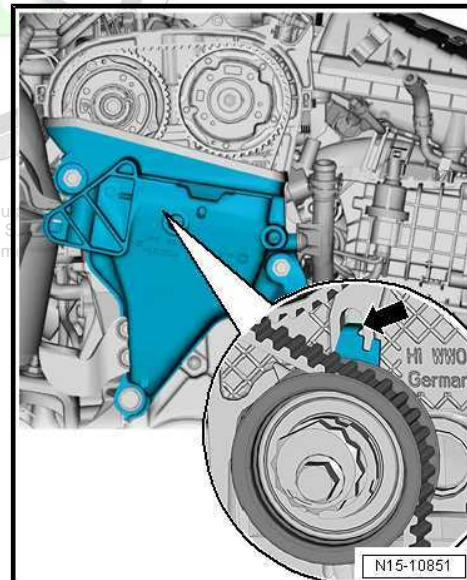
- The sheet peg -arrow- of the tensioning pulley must engage in the cast iron recess of the cylinder head.



Note

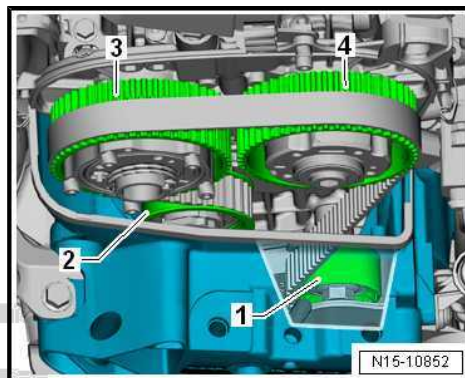
Observe sequence when fitting the toothed belt.

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- Pull toothed belt upwards, place onto the guide pulley -1- and the tensioning pulley -2- and the camshaft sprockets -3- and -4-.

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- Rotate the eccentric -2- of the tensioning pulley with the wrench - T10499A- in -direction of arrow- until the adjustment pointer -3- is located approx. 10 mm to the right from the adjustment window.
- Push eccentric so far back that the adjustment pointer is positioned exactly in the adjustment window.

For vehicles with engine identification characters CZCA, CZDA



NOTICE

Risk of damage to the engine when tightening to incorrect lightening torque!

To tighten, the torque wrench - VAS 6583- or torque wrench - V.A.G 1410- must be used!

- To tighten the reduced torque, no other torque wrench may be used!

Tighten with torque wrench VAS 6583

- Only use the torque wrench together with insertion tool - T10500- !
- When setting the tightening torque on the torque wrench - VAS 6583- the actual dimension specified on the tool insert - T10500- must be put into the torque wrench!
- Keep eccentric in this position and tighten screw -1- to 25 Nm. Use tool insert - T10500- with torque wrench - VAS 6583- to do this.

Tighten with torque wrench VAG 1410

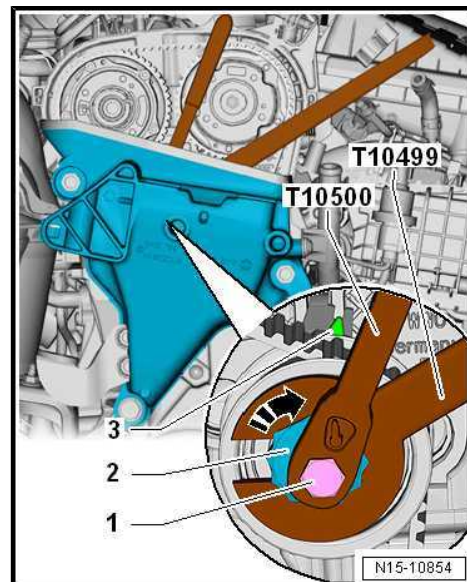
- Only use the torque wrench together with insertion tool - T10500- !
- Set the reduced tightening torque of 12 Nm on the torque wrench - V.A.G 1410-
- The required tightening torque of 25 Nm is achieved by the extending the torque wrench - V.A.G 1410- around the tool insert - T10500- !
- Keep eccentric in this position and tighten screw -1- to 12 Nm. Use tool insert - T10500- with torque wrench - V.A.G 1410- to do this.

Continued



Note

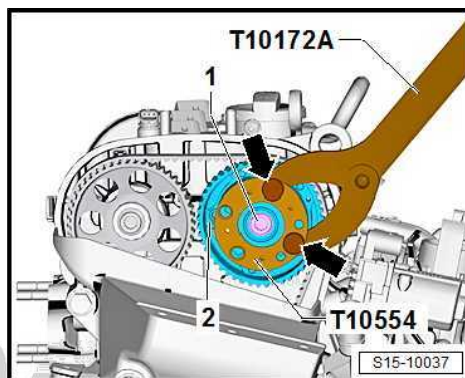
If the engine continued to turn or has run, there may be slight deviations of the adjustment pointer -3- setting in the adjustment window. This has no influence on the toothed belt tensioning.



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For vehicles with engine codes CZCA

- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Pre-tighten screw -1- to 50 Nm.

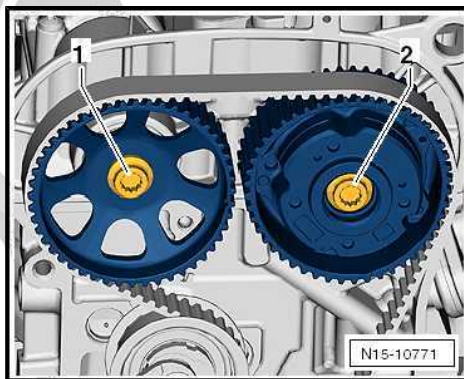


- Hold the exhaust camshaft sprocket with the counterholder - T10172A- and adapters -T10172/2- ..
- Pre-tighten screw -1- to 50 Nm.



Note

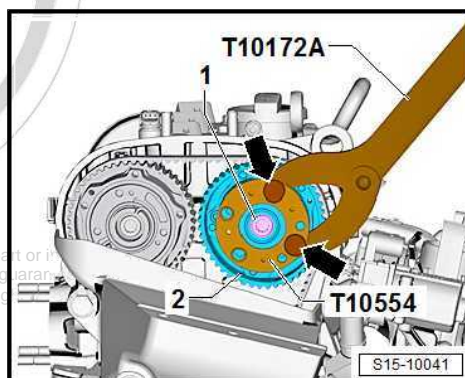
The securing bolts are only turned a further angle after checking the timing at the end of the procedure.



For vehicles with engine identification characters CZDA

- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Pre-tighten screw -1- to 50 Nm.

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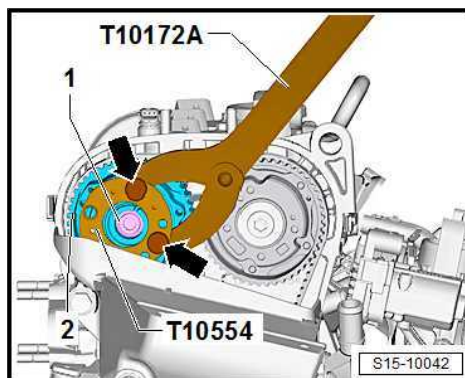


- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Pre-tighten screw -1- to 50 Nm.



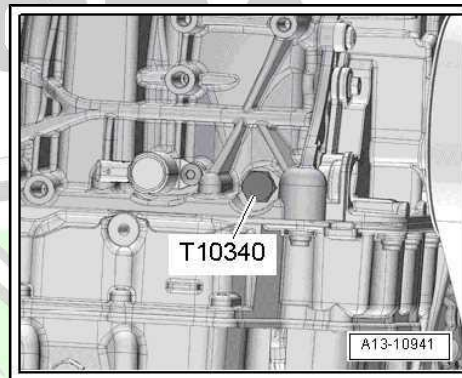
Note

The securing bolts are only turned a further angle after checking the timing at the end of the procedure.

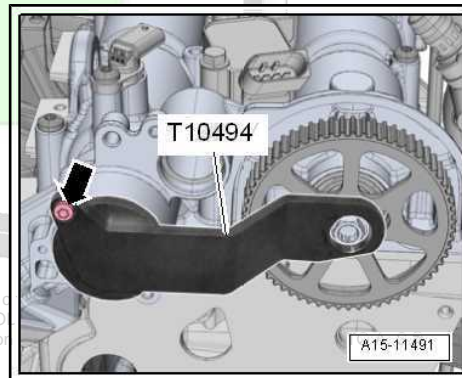


For vehicles with engine identification characters CZCA, CZDA

- Unscrew positioning screw - T10340- .



- Unscrew bolt -arrow- and remove camshaft clamp - T10494- .



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Test timing

- Turn the crankshaft in direction of rotation of engine by 2 turns.
- Screw the locating screw - T10340- up to the stop into the cylinder block and tighten to 30 Nm.
- Turn crankshaft further up to the stop in direction of rotation of engine.
- The crankshaft cheek must now be resting on the locating screw.

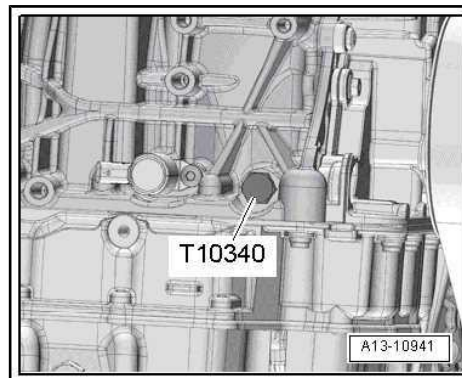


Note

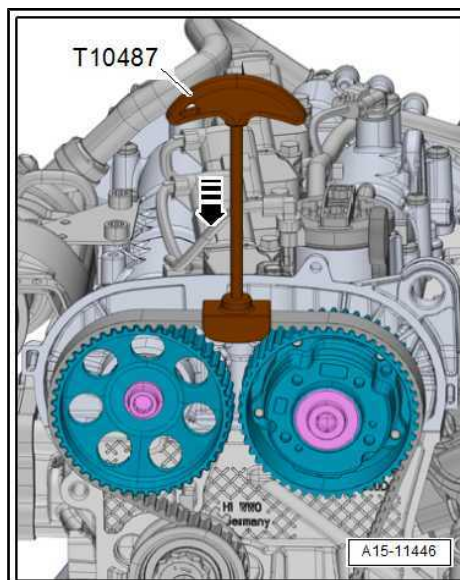
The crankshaft is only locked in direction of rotation of engine using the locating screw - T10340- .

- The camshaft clamp -T10494- must move into position easily.
- The camshaft clamp must not be positioned using any kind of hammer.

If camshaft clamp - T10494- cannot be installed:



- Use the assembly device - T10487- to press onto the toothed belt in -direction of arrow-.

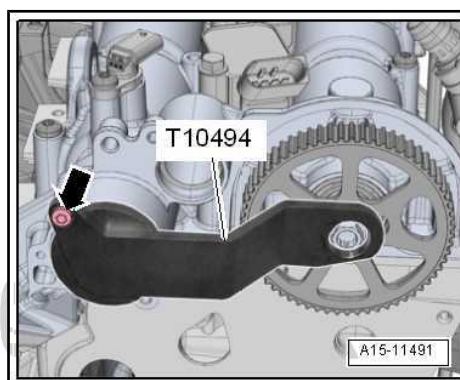


- While doing so, insert camshaft control -T10494- to stop into camshafts and tighten screw -arrow- hand-tight.

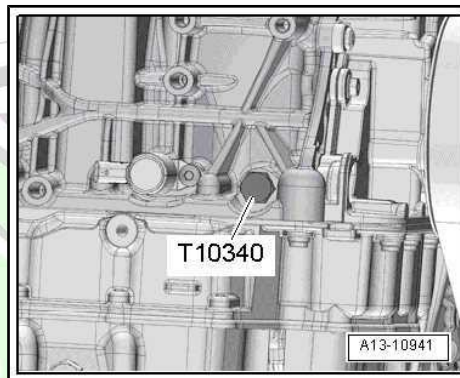
If it is not possible to insert the camshaft clamp -T10494- , the timing is NOK:

- Repeat control time settings.

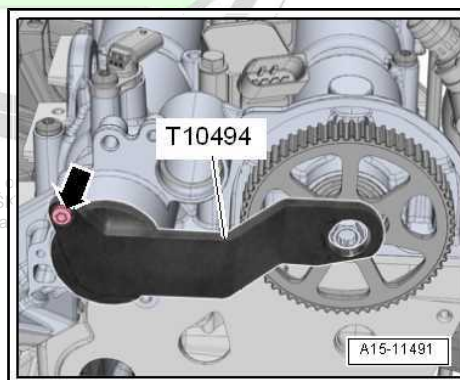
If it is possible to insert the camshaft clamp -T10494- , the timing is OK:



- Unscrew positioning screw - T10340- .



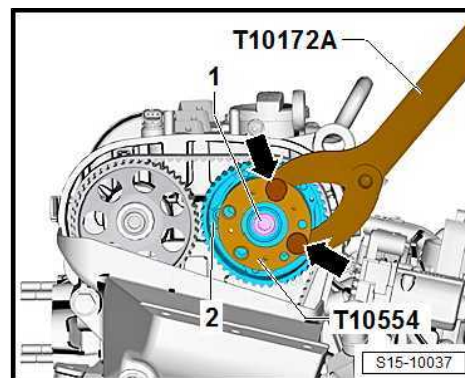
- Unscrew bolt -arrow- and remove camshaft clamp -T10494- .



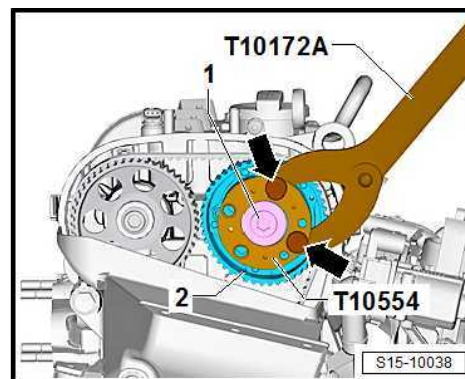
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For vehicles with engine codes CZCA

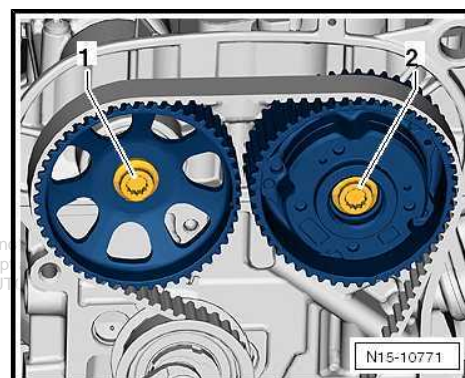
- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten screw -1- to the final tightening torque
⇒ [“2.2.1 Summary of components - engine identification characters CZCA”, page 92](#) .



- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten the screw plug of the camshaft control -1- to the specified torque
⇒ [“2.2.1 Summary of components - engine identification characters CZCA”, page 92](#) .



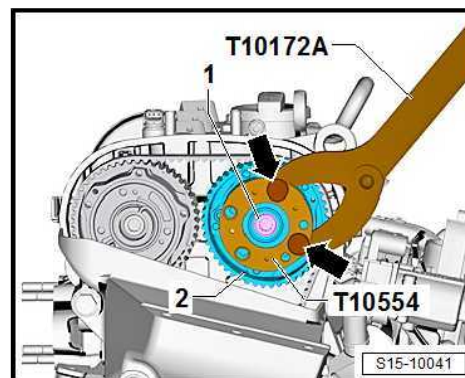
- Hold the exhaust camshaft sprocket with the counterholder - T10172A- and adapters -T10172/2- ..
- Tighten screw -1- to the final tightening torque
⇒ [“2.2.1 Summary of components - engine identification characters CZCA”, page 92](#) .



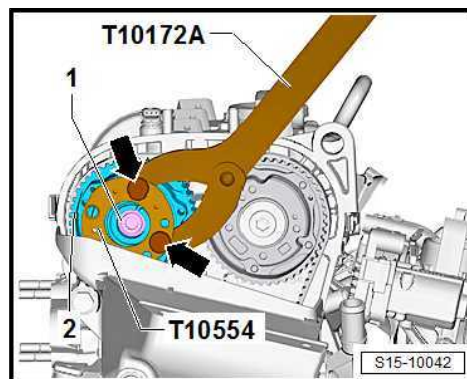
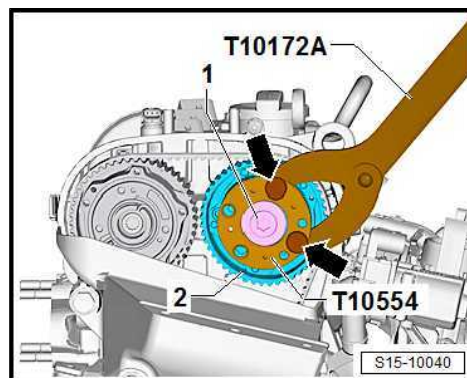
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For vehicles with engine identification characters CZDA

- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten screw -1- to the final tightening torque
⇒ [“2.2.2 Summary of components - engine identification characters CZDA, CZEa”, page 94](#) .



- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten the screw plug of the camshaft control -1- to the specified torque
 ⇒ [“2.2.2 Summary of components - engine identification characters CZDA, CZE A”, page 94](#) .
- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten screw -1- to the final tightening torque
 ⇒ [“2.2.2 Summary of components - engine identification characters CZDA, CZE A”, page 94](#) .



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- Put cover for camshaft adjuster of the exhaust camshaft in place and tighten screws -arrows-.

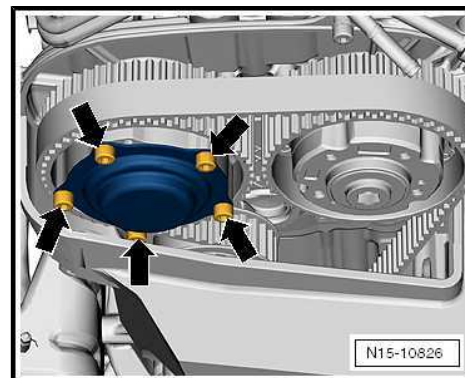
For vehicles with engine identification characters CZCA, CZDA

Further installation occurs in reverse order.



Risk of destruction of the engine.

- ◆ To complete the work, check that the locating screw - T10340- and camshaft clamp - T10494- have been removed from the engine.



Tightening torques

- ◆ V-ribbed belt drive
⇒ [“1.1 Assembly overview - ribbed V-belt drive”, page 36](#) .
- ◆ Toothed belt guard
⇒ [“2.1 Summary of components - toothed belt guard”, page 91](#) .
- ◆ Toothed belt drive
⇒ [“2.2 Summary of components - toothed belt”, page 92](#) .
- ◆ Screw plug for bore in cylinder block with engine identification characters CZCA
⇒ [Fig. “Unscrew screw plug TDC bore at the cylinder block - tightening torque””, page 93](#) .
- ◆ Screw plug for bore in cylinder block with engine identification characters CZDA
⇒ [Fig. “Unscrew screw plug TDC bore at the cylinder block - tightening torque””, page 95](#) .
- ◆ Camshaft housing with engine identification characters CZCA
⇒ [“1.2.1 Summary of components - camshaft housing, engine identification characters CZCA”, page 73](#) .
- ◆ Camshaft housing with engine identification characters CZDA
⇒ [“1.2.2 Summary of components - camshaft housing, engine identification characters CZDA”, page 76](#) .
- ◆ Crankcase ventilation
⇒ [“3.1 Summary of components - crankcase ventilation”, page 209](#) .
- ◆ Coolant pump
⇒ [“2.1 Summary of components - coolant pump/thermostat”, page 230](#) .
- ◆ Exhaust gas turbocharger
⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#) .
- ◆ Charge-air system
⇒ [“2.1 Summary of components - charge air system”, page 282](#) .
- ◆ Noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation.

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2.5.2 Removing the toothed belt from the camshafts, engine identification characters CZEA

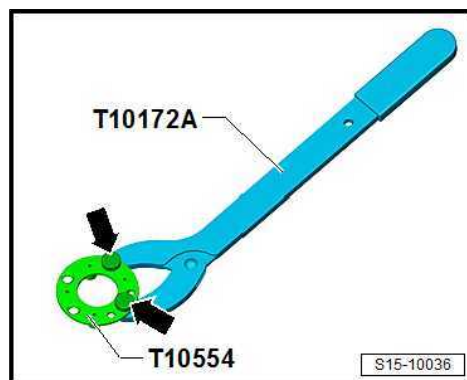
Special tools and workshop equipment required

- ◆ Counterholder - T10172A- with adapters -T10172/2-

- ◆ Support - T10554-
- ◆ Locating screw - T10340-
- ◆ Release tool -T10527-
- ◆ Release tool -T10527/1-
- ◆ Key - T10499A-
- ◆ Insertion tool - T10500-
- ◆ Crankshaft arrester - T10504-
- ◆ Rig pin - T10504/1-
- ◆ Test probe - T10504/2-
- ◆ Assembly device - T10487-
- ◆ Spark plug wrench , e.g. -3122 B-
- ◆ Torque wrench - V.A.G 1410- or -VAS 6583-

Prepare the tools

- Screw the counterholder - T10172A- and holder - T10554- with knurled screws -arrows-.



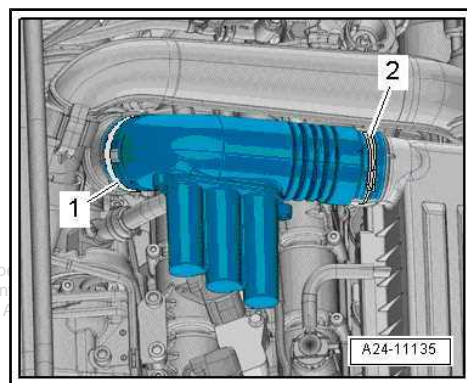
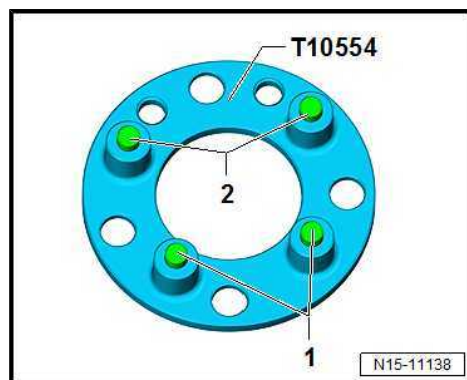
Insert support - T10554-

The row spacings -1- and -2- of the holder - T10554- are arranged unevenly.

They are equal to the hole spacings in the camshaft control.

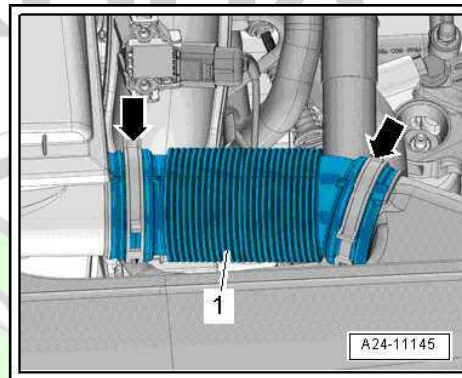
Removing

- Loosen hose clamps -1- and -2- and remove air guide pipes.

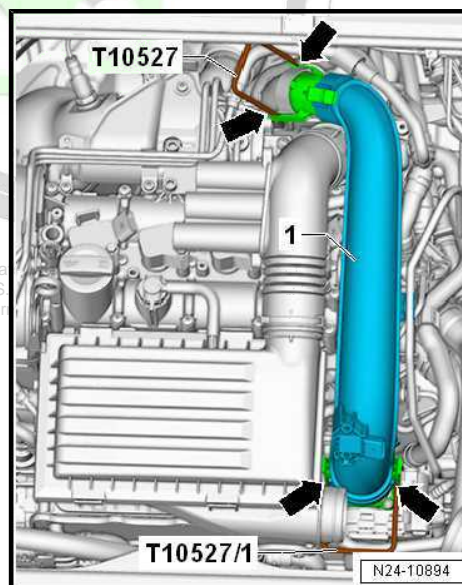


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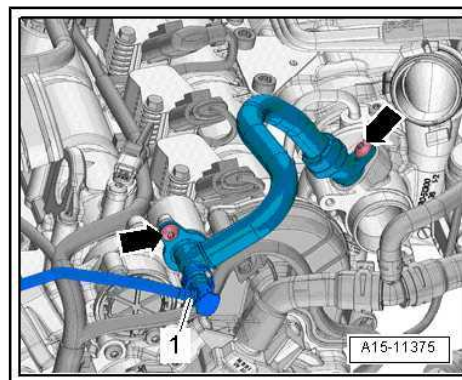
- Undo hose clamps -arrows-, remove air guide hose -1-.
- Remove plug from charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.



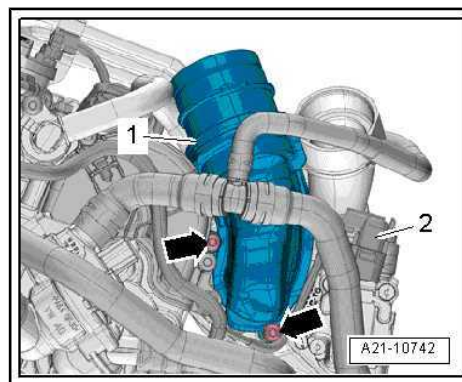
- Release retaining tabs -arrows- using the release tool - T10527- and -T10527/1- .
- Remove air guide pipe -1-.



- Press release buttons and remove hose -1- to the activated charcoal filter.
- Unscrew screws -arrows- and remove hose for crankcase ventilation.



- Release screws -arrows- and remove connection piece -1-.



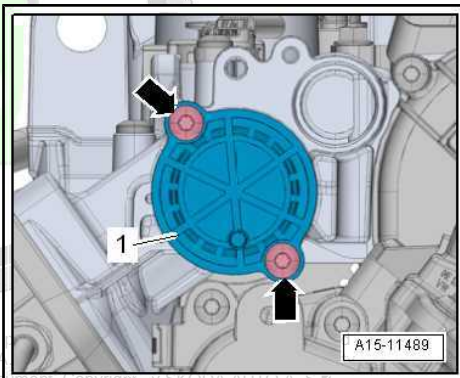
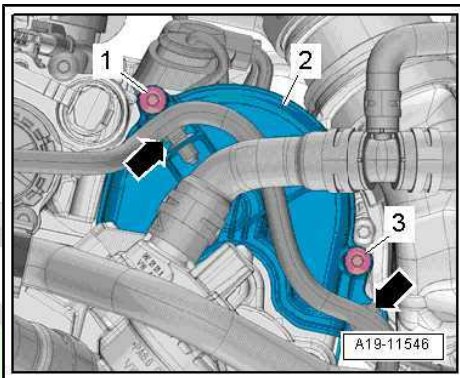
- Expose wiring loom -arrows-.
- Remove screws -1-, -3- and remove toothed belt guard -2- for coolant pump toothed belt.



Note

If engine oil touches the sealing ring for the coolant pump, it may be damaged chemically.

- Cover the coolant pump with a cloth.
- Remove screws -arrows- and remove cap -1-.



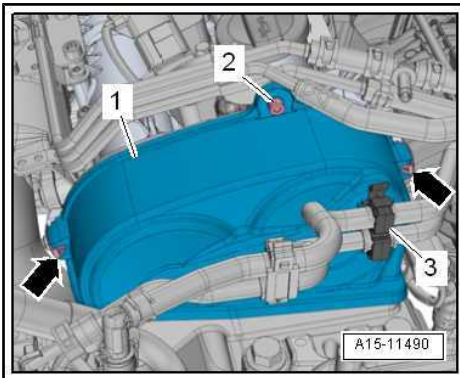
- Unclip holder -3- together with hoses from the toothed belt guard -1-.
- Unscrew bolt -2-.
- Loosen clips -arrows- and remove toothed belt guard -1- upwards.



NOTICE

Risk of damage to the toothed belt due to leaking engine oil.

Contact points of the toothed belt, camshaft sprocket, crankshaft pulley, tensioning pulley and guide pulley are to be kept free of oil.



- Remove screws -arrows- and remove the cover from the camshaft control of the exhaust camshaft.
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .

Position crankshaft to “TDC”:

⚠ CAUTION

Risk of engine damage.

You must adjust the “TDC” position, as described!

- ◆ Locating screw - T10340- can collide with crankshaft in two positions.
- Remove ignition coil with power output stage 1
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#) .
- Remove ignition plug cylinder 1 with spark plug socket wrench , e. g. -3122 B- .

Set the correct position of the crankshaft to screw in the locating screw:

- Carefully insert a screwdriver into the opening of the ignition plug, minimum length of shaft 250 mm, in -direction of arrow- so that it touches the piston head.
- Rotate the crankshaft in direction of rotation of engine on “TDC” for cylinder 1.

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- Turn engine shaft further in direction of arrow so that the screwdriver just out at the top by approx 35 mm in the -direction of the arrow-.
- Unscrew screw plug “TDC” bore at the cylinder block.

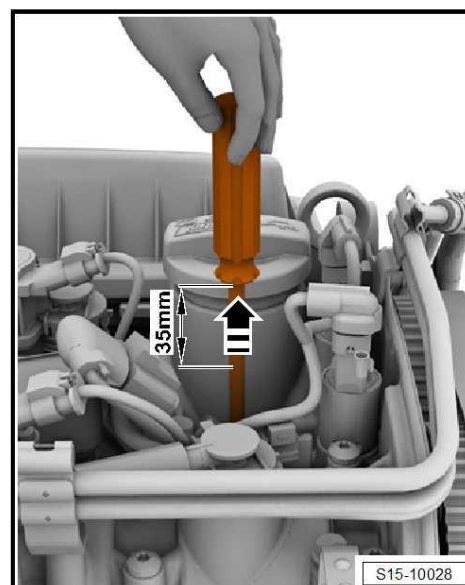
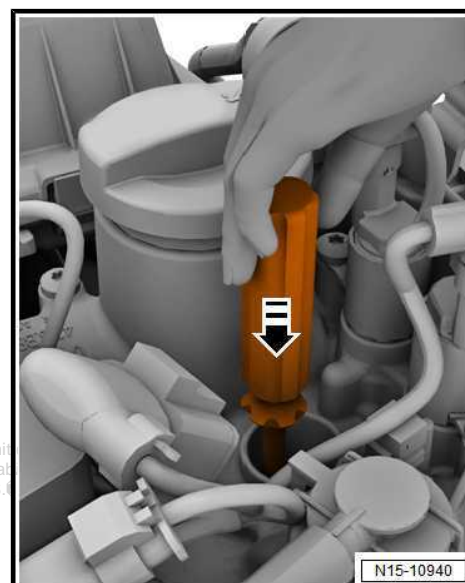
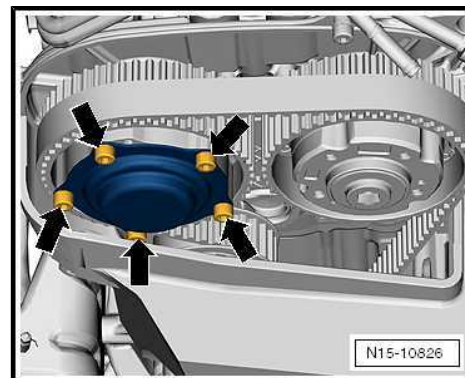
ⓘ NOTICE

Risk of damage to the engine if the locating screw - T10340- is screwed in at the wrong position.

If the locating screw - T10340- cannot be screwed in up to the stop, the crankshaft is not in the correct position.

In this case, proceed as follows:

- Unscrew locking pin.
- Set the correct position of the crankshaft for screwing in the locating screw ⇒ [page 163](#) .

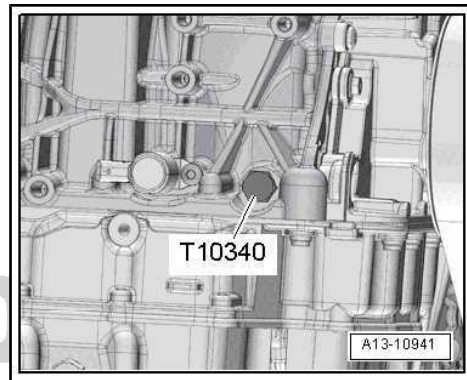


- Screw the locating screw - T10340- up to the stop into the cylinder block and tighten to 30 Nm.
- Turn crankshaft up to the stop in direction of rotation of engine.
- The crankshaft sprocket now lies on the locating screw and the “TCD” position is set.



Note

The crankshaft is only locked in direction of rotation of engine using the locating screw - T10340- .



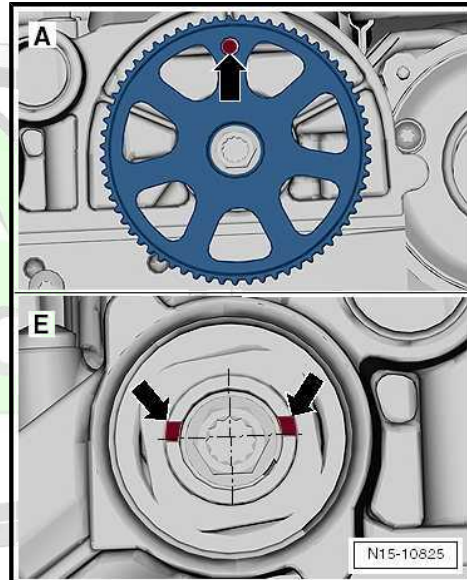
- For exhaust camshaft -A-, the bore in the toothed belt pulley for the coolant pump drive -arrow- must be located against the hole in the camshaft housing.
- For the inlet camshaft -E-, the grooves -arrows- are above the camshaft centre.

A - Exhaust camshaft

E - Inlet camshaft

If the camshafts are not as described:

- Remove locating screw - T10340- and turn crankshaft another turn, set back to “TDC” ⇒ [page 163](#) .



NOTICE

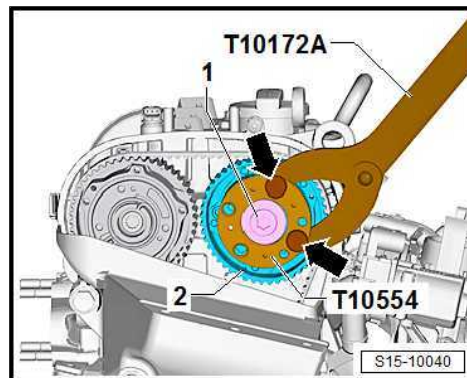
Risk of damage to the camshaft clamp - T10504- and the camshaft when loosening and tightening the belt pulley screws.

- ◆ The camshaft clamp - T10504- must not be put under load when loosening and tightening the camshaft sprockets in order to avoid damage to the tool and the camshaft.
- ◆ When loosening and tightening the camshaft sprockets, the camshaft sprockets must be secured.
- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Screw out screw plug -1-.

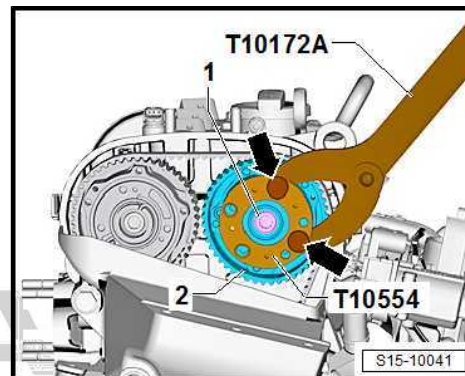


Note

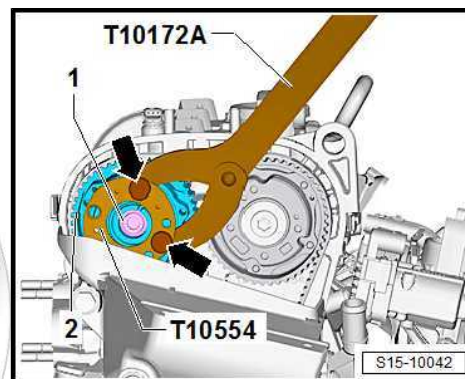
A minor loss of oil may occur when opening the screw plug -1-. The place of the oil leak must be covered with cloths.



- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Release screw -1- by approx. one turn.

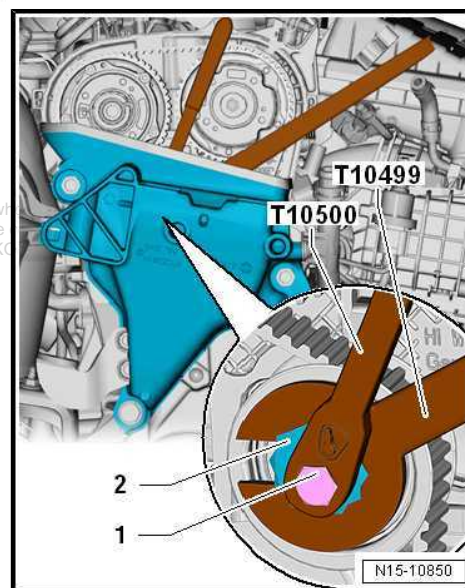


- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Release screw -1- by approx. one turn.



- Release screw -1- using insertion tool - T10500- .
- Slacken the tensioning pulley at the eccentric -2- using the wrench - T10499A- .
- Mark the direction of rotation with chalk or a felt-tip pen for the re-installation before removing the toothed belt pulley.

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Bending radius of the toothed belt

NOTICE

There is a risk of destroying the toothed belt because of the substantial bend.

- ◆ The bending radius - r - of the toothed belt -2- must not be allowed to drop below the minimum of 25 mm (approx. half the \varnothing of the crankshaft-belt pulley).
- ◆ If the bending radius falls below the minimum of 25 mm, this will affect the lifetime of the belt.
- Remove the toothed belt from the camshaft sprockets.

Installing (set the timing)



Note

Renew O-ring of screw plug if damaged.



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- Locating screw - T10340- turned up to the stop in the cylinder block and tightened to 30 Nm.
- Crankshaft in engine direction of rotation applied to the locating screw - T10340- = "TDC" position.
- For exhaust camshaft -A-, the bore in the toothed belt pulley for the coolant pump drive -arrow- must be located against the hole in the camshaft housing.
- For the inlet camshaft -E-, the grooves -arrows- are above the camshaft centre.

A - Exhaust camshaft

E - Inlet camshaft

- Mark the tooth over the bore on the coolant pump driving wheel from the top with waterproof marker.

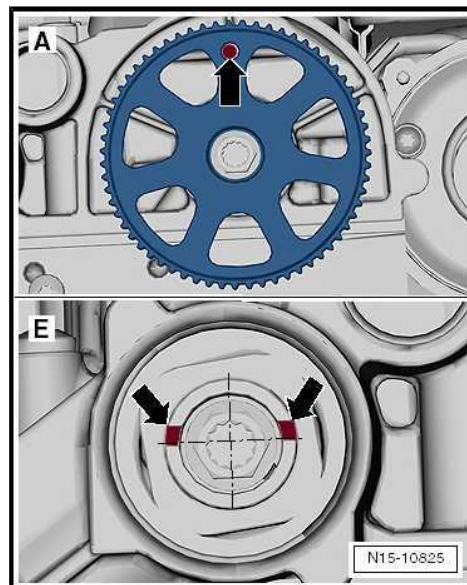
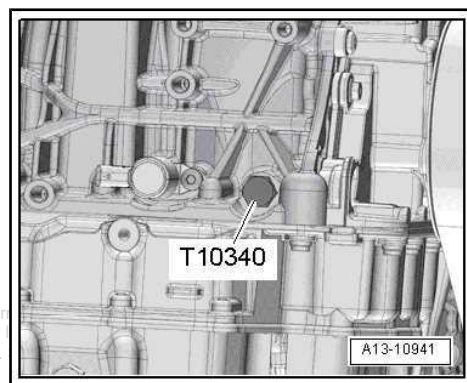
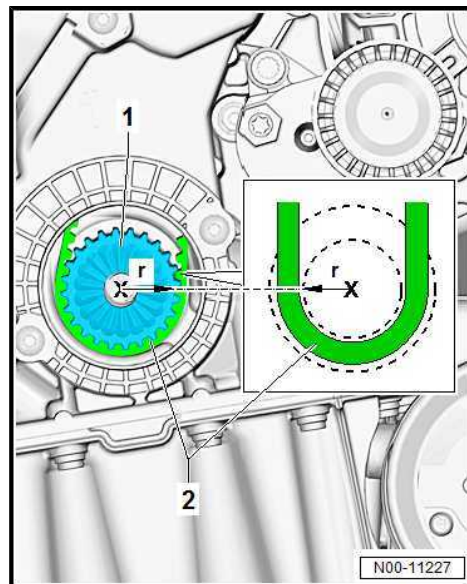


Note

Marking makes it easier to insert the rig pin - T10504/1-.

If the camshafts are not as described:

- Insert camshaft clamp - T10504- into the grooves of the inlet camshaft.

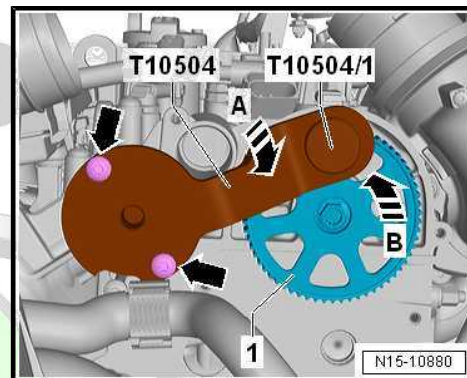


- Turn inlet camshaft with the camshaft clamp - T10504- in direction of arrow -A-.
- Turn toothed belt pulley for cooling pump drive -1- in direction of arrow -B- at the same time with the aid of a second mechanic.
- Insert the rig pin - T10504/1- up to the stop.



Note

If the rig pin - T10504/1- is not inserted up to the stop, the engine may be damaged because the valve timings are set incorrectly!



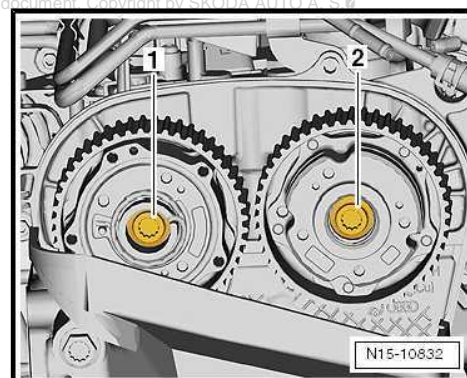
- Tighten screws -arrows- by hand.



NOTICE

Risk of damage to the camshaft clamp - T10504- and the camshaft when loosening and tightening the belt pulley screws.

- ◆ The camshaft clamp - T10504- must not be put under load when loosening and tightening the camshaft sprockets in order to avoid damage to the tool and the camshaft.
- ◆ When loosening and tightening the camshaft sprockets, the camshaft sprockets must be secured.
- Replace camshaft sprocket screws -1- and -2- and insert new screws loosely.
- It must still be possible to turn the camshaft sprockets on the camshafts, however they must not hang loose.



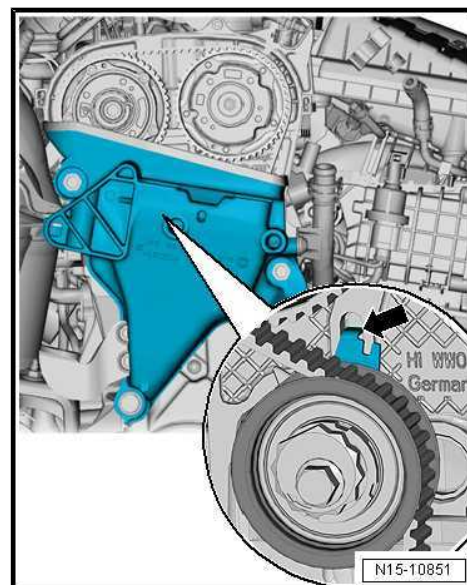
- The sheet peg -arrow- of the tensioning pulley must engage in the cast iron recess of the cylinder head.



NOTICE

There is a risk of destroying the toothed belt because of the substantial bend.

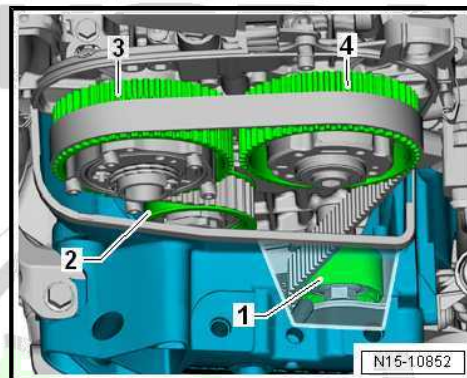
- ◆ The bending radius -r- of the toothed belt -2- must not be allowed to drop below the minimum of 25 mm (approx. half the Ø of the crankshaft-belt pulley).
- ◆ If the bending radius falls below the minimum of 25 mm, this will affect the lifetime of the belt.



Note

Observe sequence when fitting the toothed belt.

- Pull toothed belt upwards, then fit the tensioning pulley -2- and camshaft sprockets -3- and -4- onto the guide roller -1-.



- Rotate the eccentric -2- of the tensioning pulley with the wrench - T10499A- in -direction of arrow- until the adjustment pointer -3- is located approx. 10 mm to the right from the adjustment window.
- Push eccentric so far back that the adjustment pointer is positioned exactly in the adjustment window.

NOTICE

Risk of damage to the engine when tightening to incorrect lightening torque!

To tighten, the torque wrench - VAS 6583- or torque wrench - V.A.G 1410- must be used!

- To tighten the reduced torque, no other torque wrench may be used!

Tighten with torque wrench VAS 6583

- Only use the torque wrench together with insertion tool - T10500- !
- When setting the tightening torque on the torque wrench - VAS 6583- the actual dimension specified on the tool insert - T10500- must be put into the torque wrench!
- Keep eccentric in this position and tighten screw -1- to 25 Nm. Use tool insert - T10500- with torque wrench - VAS 6583- to do this.

Tighten with torque wrench VAG 1410

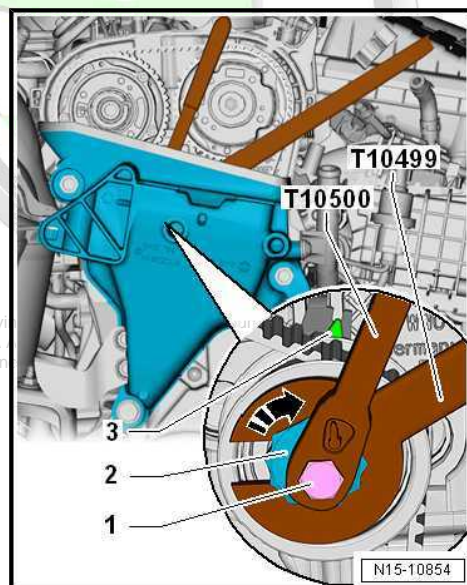
- Only use the torque wrench together with insertion tool - T10500- !
- Set the reduced tightening torque of 12 Nm on the torque wrench - V.A.G 1410-
- The required tightening torque of 25 Nm is achieved by the extending the torque wrench - V.A.G 1410- around the tool insert - T10500- !
- Keep eccentric in this position and tighten screw -1- to 12 Nm. Use tool insert - T10500- with torque wrench - V.A.G 1410- to do this.

Continued

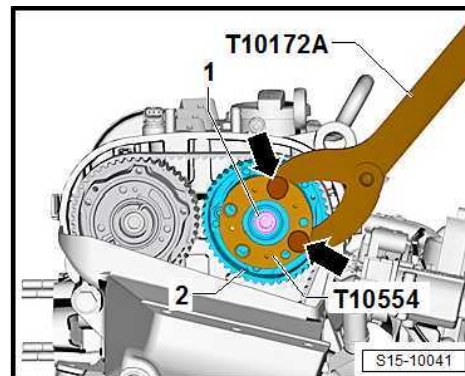


Note

If the engine continued to turn or has run, there may be slight deviations of the adjustment pointer -3- setting in the adjustment window. This has no influence on the toothed belt tensioning.



- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Pre-tighten screw -1- to 50 Nm.

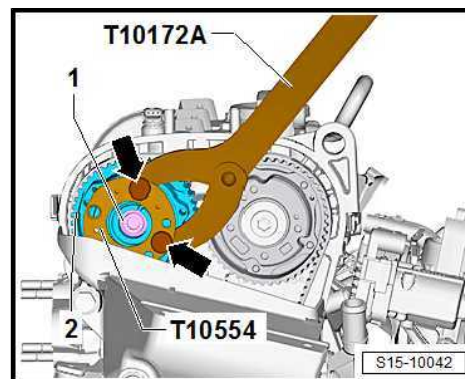


- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Pre-tighten screw -1- to 50 Nm.

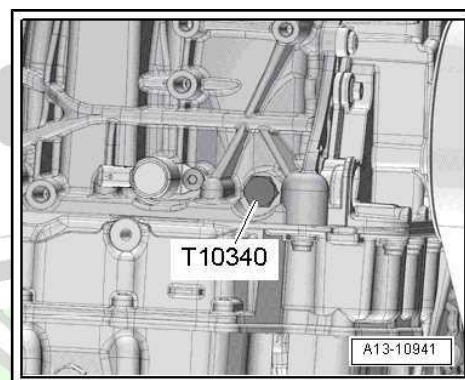


Note

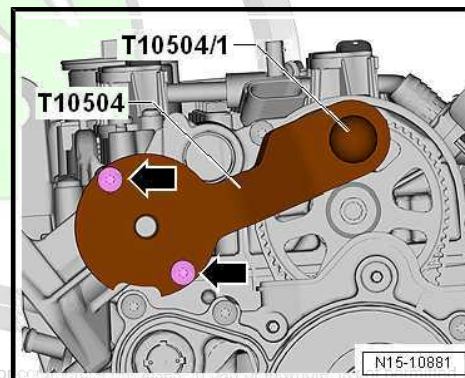
The securing bolts are only turned a further angle after checking the timing at the end of the procedure.



- Unscrew positioning screw - T10340- .



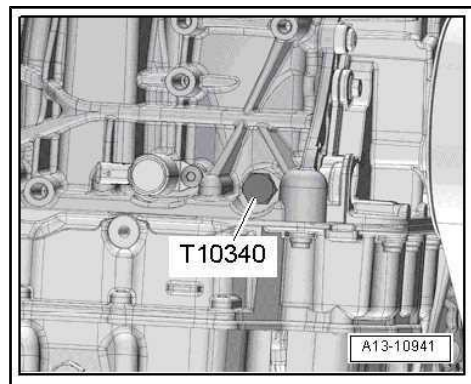
- Unscrew screws -arrow- and remove camshaft clamp - T10504- .



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Test timing

- Turn crankshaft 2 turns in the direction of running of the engine until the piston for cylinder 1 is again on “TDC”.
- Screw the locating screw - T10340- up to the stop into the cylinder block and tighten to 30 Nm.
- Turn crankshaft further up to the stop in direction of rotation of engine.
- The crankshaft cheek must now be resting on the locating screw.



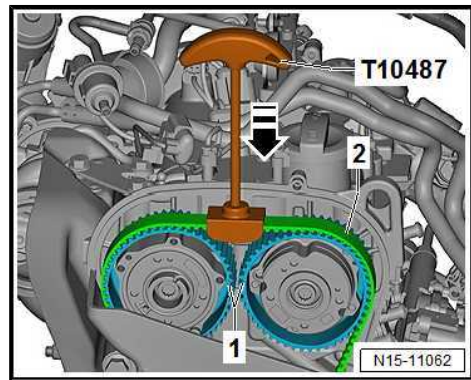
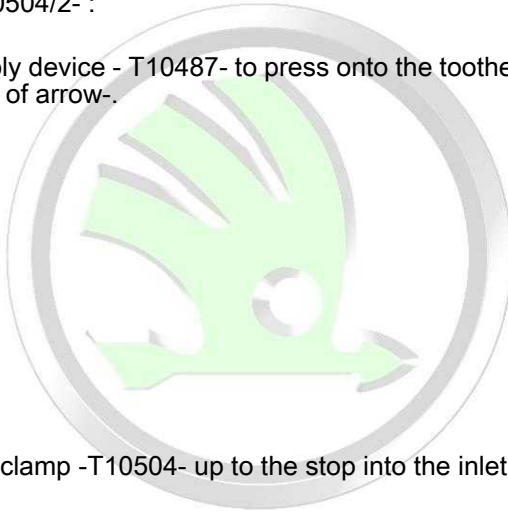
Note

The crankshaft is only locked in direction of rotation of engine using the locating screw - T10340- .

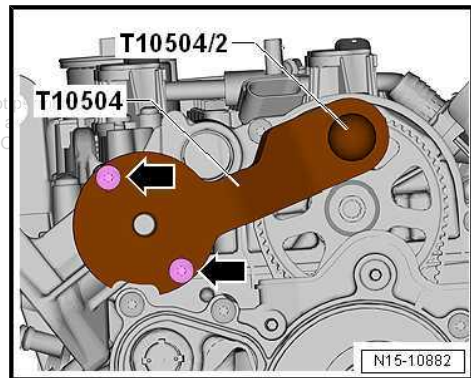
- The camshaft clamp -T10504- must move into position easily.
- The camshaft clamp must not be positioned using any kind of hammer.

If the camshaft clamp - T10504- cannot be inserted easily with the test probe - T10504/2- :

- Use the assembly device - T10487- to press onto the toothed belt in -direction of arrow-.



- Insert camshaft clamp -T10504- up to the stop into the inlet camshaft.
- Insert test probe - T10504/2- up to the stop.
- Tighten screws -arrows- by hand.



CAUTION

Risk of engine damage.

- The groove -arrow- on the test probe - T10504/2- must be in line with the camshaft clamp - T10504- .

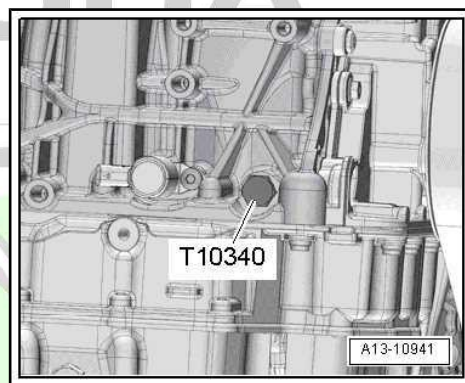
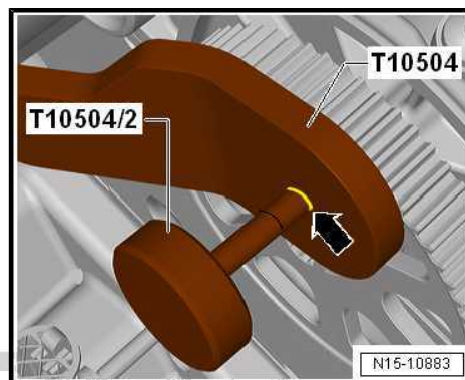
If the -groove- of the test probe - T10504/2- is not in line with the camshaft clamp - T10504- , the test probe - T10504/2- has not been inserted to sufficient depth.

If it is not possible to insert the camshaft clamp - T10504- with the test probe - T10504/2- , the valve timings are NOK:

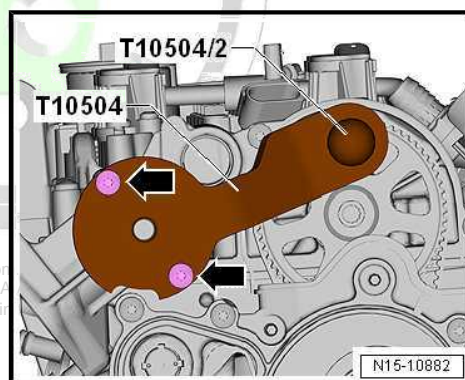
- Repeat control time settings ⇒ [page 166](#) .

If it is possible to insert the camshaft clamp - T10504- with the test probe - T10504/2- , the valve timings are OK:

- Unscrew positioning screw - T10340- .

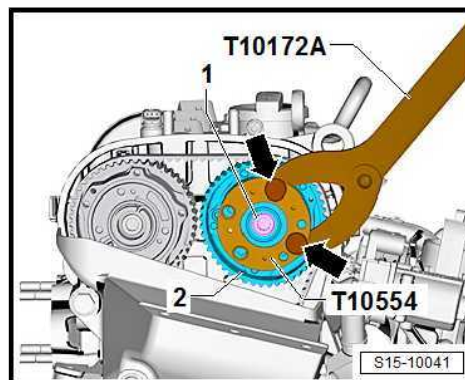


- Pull out the test probe - T10504/2- .
- Unscrew screws -arrow- and remove camshaft clamp - T10504- .

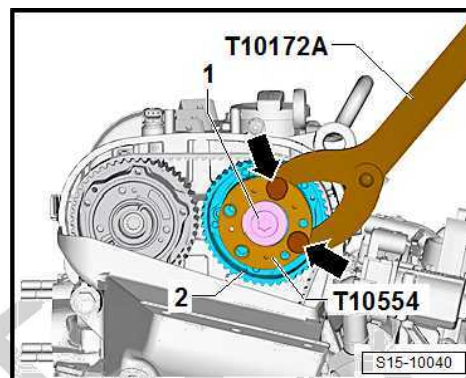


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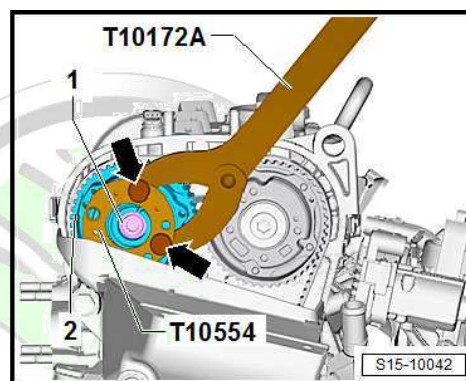
- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten screw -1- to the final tightening torque
⇒ [“2.2.2 Summary of components - engine identification characters CZDA, CZE A”, page 94](#) .



- Hold the inlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten the screw plug of the camshaft control -1- to the specified torque
⇒ [“2.2.2 Summary of components - engine identification characters CZDA, CZEa”, page 94](#) .



- Hold the outlet camshaft control -2- with the holder - T10554- and counterholder - T10172A- .
- Tighten screw -1- to the final tightening torque
⇒ [“2.2.2 Summary of components - engine identification characters CZDA, CZEa”, page 94](#) .



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- Put cover for camshaft adjuster of the exhaust camshaft in place and tighten screws -arrows-.

Further installation occurs in reverse order.

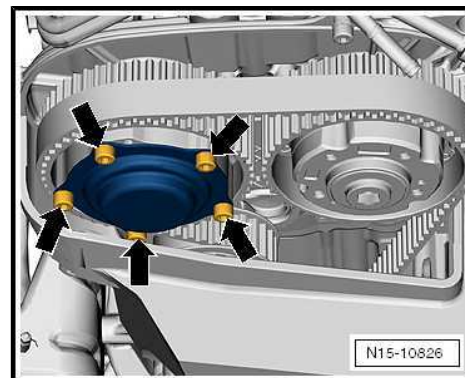


Risk of destruction of the engine.

- ◆ To complete the work, check that the locating screw - T10340- and camshaft clamp - T10504- have been removed from the engine.

Tightening torques

- ◆ V-ribbed belt drive
⇒ [“1.1 Assembly overview - ribbed V-belt drive”, page 36](#) .
- ◆ Toothed belt guard
⇒ [“2.1 Summary of components - toothed belt guard”, page 91](#) .
- ◆ Toothed belt drive
⇒ [“2.2 Summary of components - toothed belt”, page 92](#) .
- ◆ Screw plug for bore in the cylinder block
⇒ [Fig. “Unscrew screw plug TDC bore at the cylinder block - tightening torque””, page 95](#) .
- ◆ Camshaft housing
⇒ [“1.2.3 Summary of components - camshaft housing, engine identification characters CZE A”, page 78](#) .
- ◆ Crankcase ventilation
⇒ [“3.1 Summary of components - crankcase ventilation”, page 209](#) .
- ◆ Coolant pump
⇒ [“2.1 Summary of components - coolant pump/thermostat”, page 230](#) .
- ◆ Exhaust gas turbocharger
⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#) .
- ◆ Charge-air system
⇒ [“2.1 Summary of components - charge air system”, page 282](#) .
- ◆ Noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation.



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3 Valve gear

⇒ [“3.1 Assembly overview - valve gear”, page 174](#)

⇒ [“3.2 Measuring axial play of camshaft”, page 175](#)

⇒ [“3.3 Removing and installing gasket ring for camshaft”, page 176](#)

⇒ [“3.4 Removing and installing camshaft control”, page 182](#)

⇒ [“3.5 Removing and installing cam adjuster”, page 183](#)

⇒ [“3.6 Removing and installing N205 the camshaft adjustment valve 1”, page 188](#)

⇒ [“3.7 Removing and installing camshaft control valve 1 in the exhaust N318”, page 188](#)

⇒ [“3.8 Removing and installing valve stem seals”, page 189](#)

3.1 Assembly overview - valve gear

1 - Inlet valve

- ☐ do not rework, only grinding in is permissible
- ☐ Valve dimensions
⇒ [“4.3 Valve dimensions”, page 194](#)
- ☐ inspecting valve guides
⇒ [“4.1 Inspect valve guides”, page 194](#)

2 - Exhaust valve

- ☐ do not rework, only grinding in is permissible
- ☐ Valve dimensions
⇒ [“4.3 Valve dimensions”, page 194](#)
- ☐ inspecting valve guides
⇒ [“4.1 Inspect valve guides”, page 194](#)

3 - Cylinder head

4 - Valve stem seal

- ☐ Replace after disassembly
- ☐ removing and installing
⇒ [“3.8 Removing and installing valve stem seals”, page 189](#)

5 - Valve spring

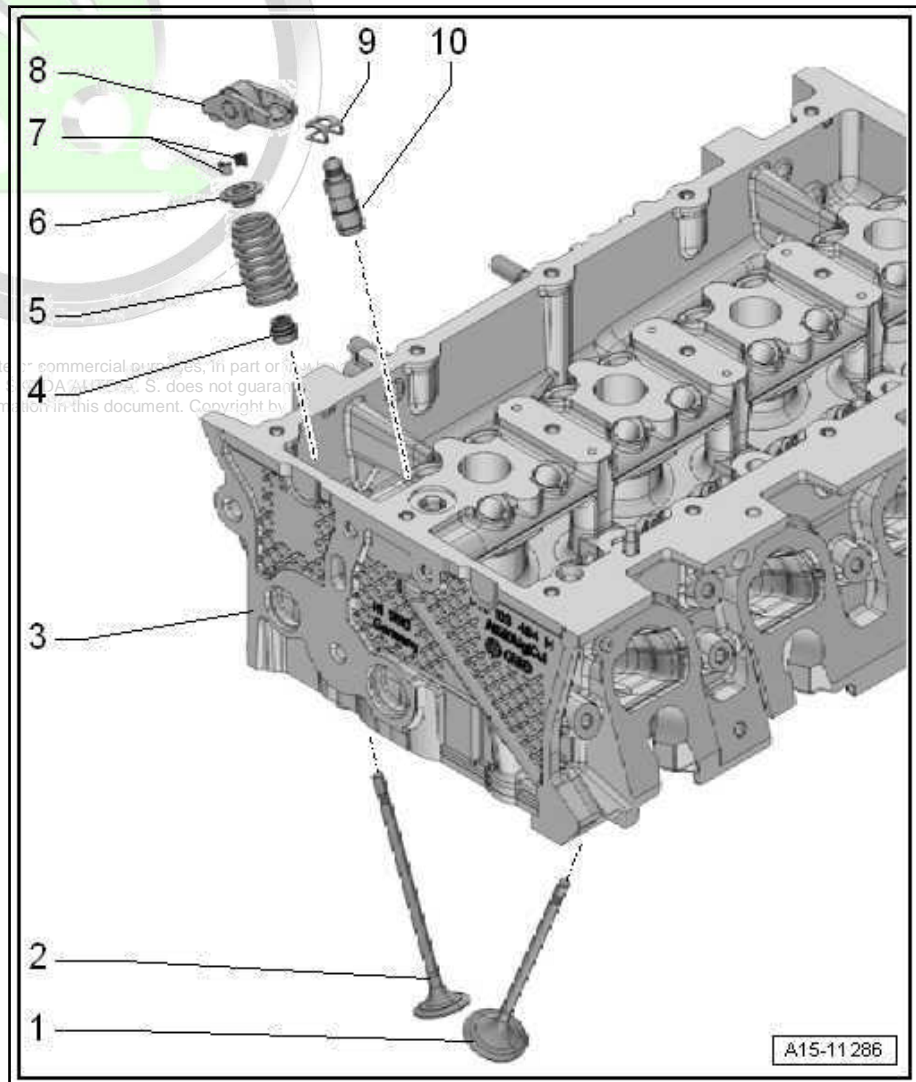
- ☐ Fitting position
⇒ [Fig. “Fitting position of the valve spring””, page 175](#)

6 - Valve spring retainer

7 - Valve collets

8 - Roller rocker arm

- ☐ removing and installing ⇒ [“1.4 Removing and installing camshaft housing”, page 84](#)



- ☐ mark the fitting position for re-installation
- ☐ inspect roller bearings for smooth operation
- ☐ oil the contact surfaces before installing

9 - Locking clip

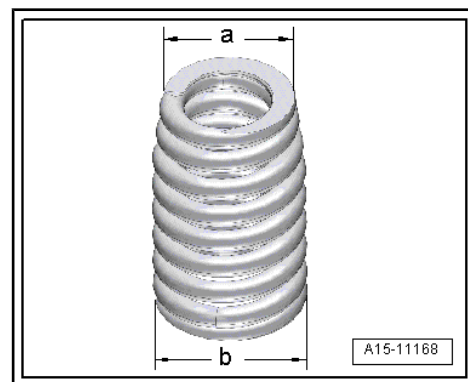
- ☐ for hydraulic balancing element

10 - Hydraulic supporting element

- ☐ Do not interchange
- ☐ Oil contact surface.

Fitting position of the valve spring

- The small \varnothing -a- points to the valve spring plate.
- The small \varnothing -b- points to the cylinder head.



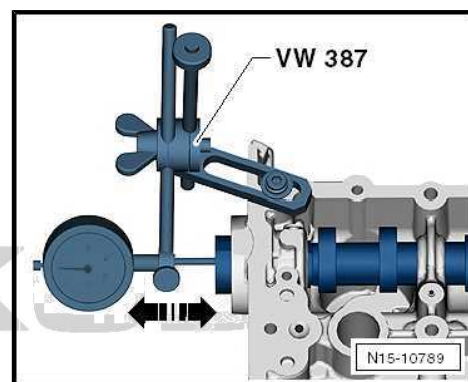
3.2 Measuring axial play of camshaft

Special tools and workshop equipment required

- ◆ Universal dial gauge holder - MP3-447 (VW 387)-
- ◆ Dial gauge , e.g. -VAS 6079-

Checking camshaft axial clearance

- Remove camshaft housing
⇒ ["1.4 Removing and installing camshaft housing", page 84](#) .
- Secure dial gauge e.g. -VAS 6079- with the universal dial gauge bracket - VW 387- to the camshaft housing, as shown in the illustration.
- Press the camshaft by hand against the dial gauge.
- Position dial gauge to "0".
- Press the camshaft off the dial gauge and read the value:



Axial clearance:

- Wear limit 0.25 mm.



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3.3 Removing and installing gasket ring for camshaft

⇒ [“3.3.1 Removing and installing the inlet camshaft on the belt pulley side”, page 176](#)

⇒ [“3.3.2 Removing and installing the exhaust camshaft on the belt pulley side”, page 177](#)

⇒ [“3.3.3 Removing and installing exhaust camshaft on gearbox side, engine identification characters CZCA, CZDA”, page 179](#)

⇒ [“3.3.4 Removing and installing sealing ring for exhaust camshaft on gearbox side, engine identification characters CZE A”, page 181](#)

3.3.1 Removing and installing the inlet camshaft on the belt pulley side

Special tools and workshop equipment required

- ◆ Assembly device - T10478 B-
- ◆ Extractor - T20143/1-

Removing

- Remove inlet camshaft control
⇒ [“3.4 Removing and installing camshaft control”, page 182](#) .
- Remove seal -1- using extractor hook -T20143/1- .

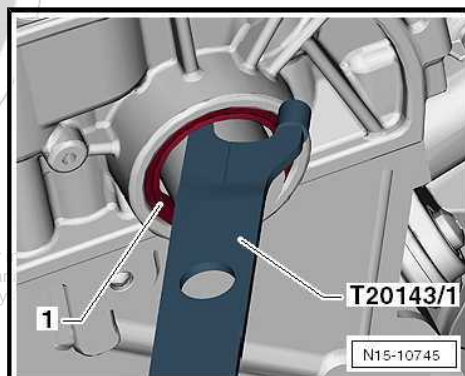
Install



Note

Do not oil new sealing ring.

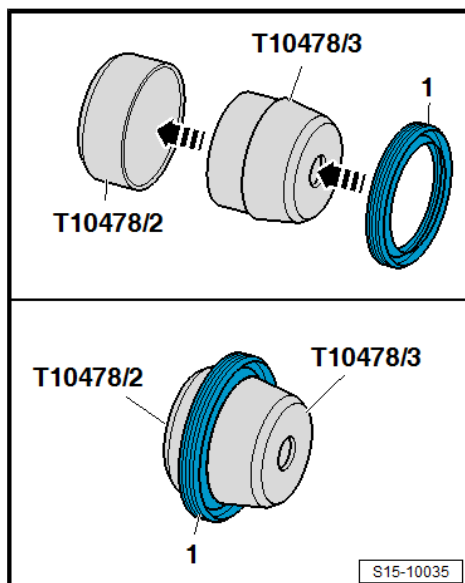
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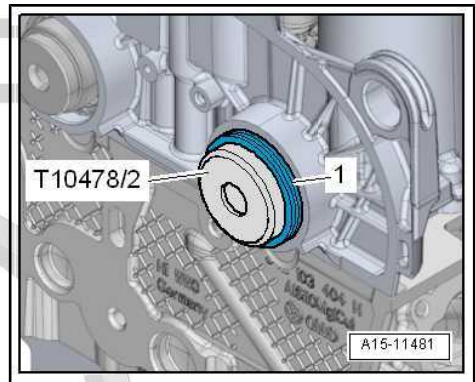
- Push sealing ring -1- over the receiver tube -T10478/3- onto the guide bushing -T10478/2- .

Fitting position:

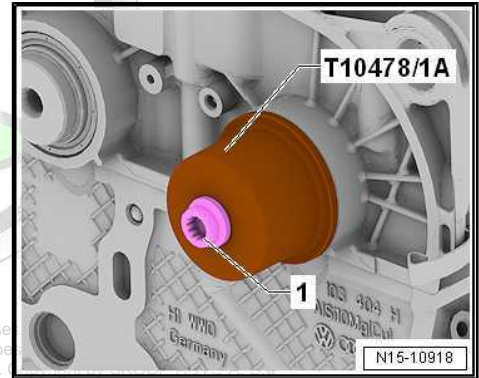
- Closed side of sealing ring points to the receiver tube.
- Disconnect receiver tube and guide bushing.



- Fit guide bushing -T10478/2- with seal -1- onto camshaft.



- Pull sealing ring in to the stop using the thrust piece - T10478/1A- and the camshaft sprocket screw -1-.
- Install inlet camshaft control with a new screw and tighten by hand
⇒ [“3.4 Removing and installing camshaft control”, page 182](#) .
- install (set the timing)
⇒ [“2.5 Remove the toothed belt from the camshaft”, page 140](#) .



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3.3.2 Removing and installing the exhaust camshaft on the belt pulley side

Special tools and workshop equipment required

- ◆ Assembly device - T10478 B-
- ◆ Extractor - T20143/1-

Removing

For vehicles with engine codes CZCA

- Remove the toothed belt from the camshafts
⇒ [“2.5 Remove the toothed belt from the camshaft”, page 140](#) .
- Unscrew screw -2- and remove camshaft sprocket.

For vehicles with engine identification characters CZDA, CZEA

- Remove outlet camshaft control
⇒ [“3.4 Removing and installing camshaft control”, page 182](#) .



Continued for all vehicles

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

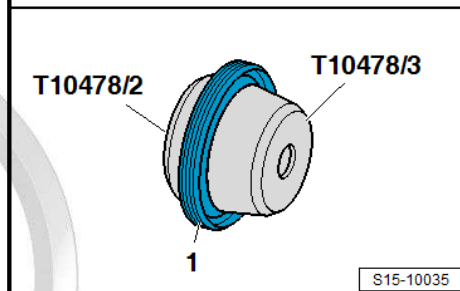
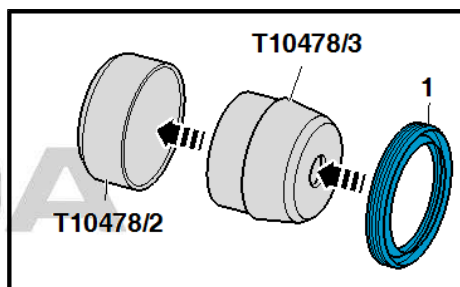
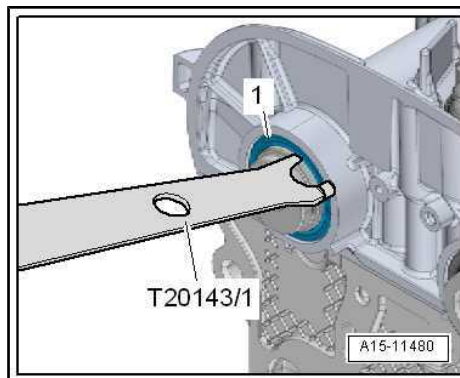
Install



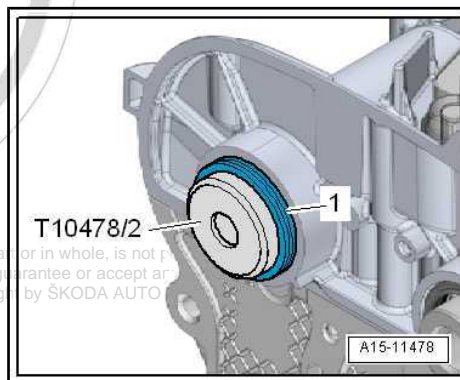
Note

Do not oil new sealing ring.

- Push sealing ring -1- over the receiver tube -T10478/3- onto the guide bushing -T10478/2- .
- Fitting position: Closed side of sealing ring points to the receiver tube.
- Disconnect receiver tube and guide bushing.

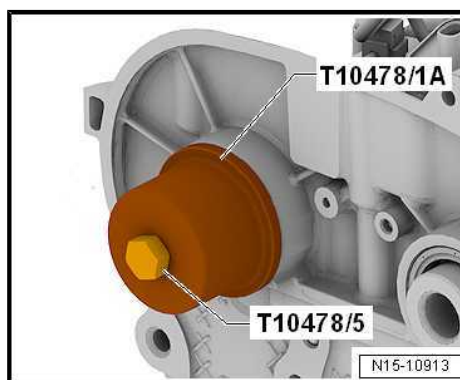


- Fit guide bushing -T10478/2- with seal -1- onto camshaft.



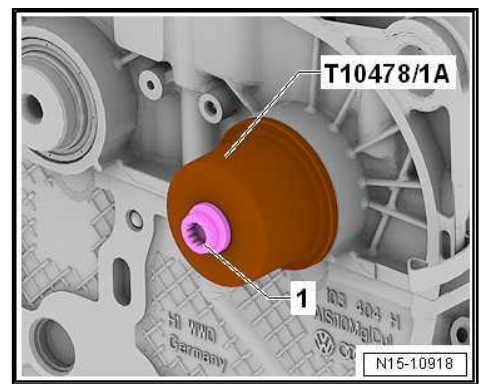
For vehicles with engine codes CZCA

- Press guide sleeve with assembly tool -T10478/1A- and screw -T10478/5- up to stop.



For vehicles with engine identification characters CZDA, CZEa

- Pull sealing ring in to the stop using the thrust piece - T10478/1A- and the camshaft sprocket screw -1-.
- Install inlet camshaft control with a new screw and tighten by hand
⇒ [“3.4 Removing and installing camshaft control”, page 182](#) .

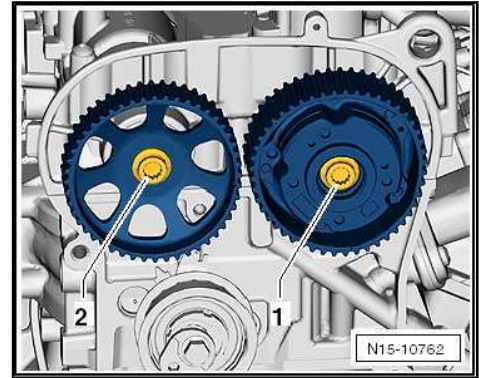


For vehicles with engine codes CZCA

- Install exhaust camshaft sprocket with a new screw -2- and tighten by hand.

Continued for all vehicles

- install (set the timing)
⇒ [“2.5 Remove the toothed belt from the camshaft”, page 140](#) .



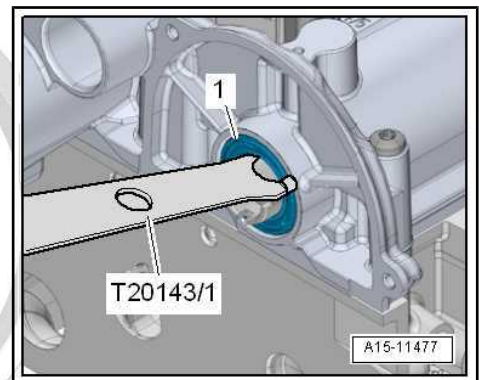
3.3.3 Removing and installing exhaust camshaft on gearbox side, engine identification characters CZCA, CZDA

Special tools and workshop equipment required

- ◆ Assembly device - T10479 A-
- ◆ Extractor - T20143/1-

Removing

- Remove the pulley for coolant pump drive
⇒ [“2.7 Removing and installing toothed belt pulley for coolant pump”, page 242](#) .
- Carefully fit extractor hook -T20143/1- between camshaft and seal -1-.
- Remove sealing ring.



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Install

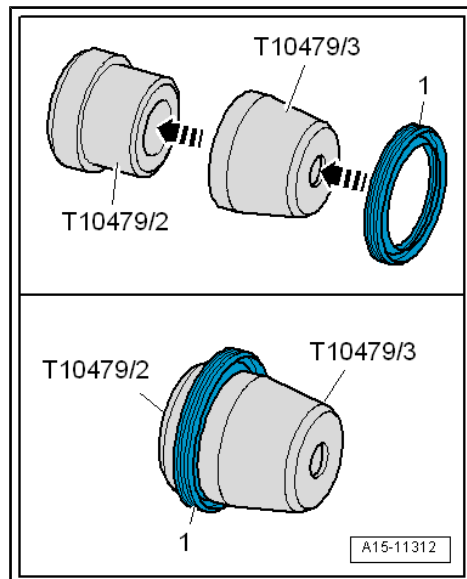
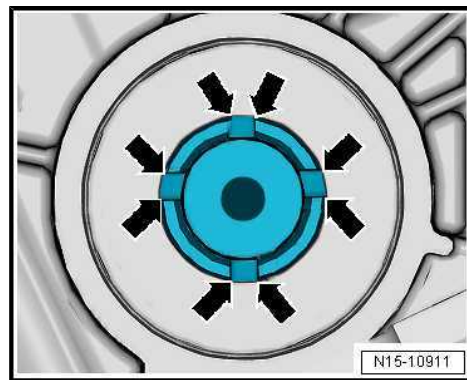
- Remove any burrs in the area of the grooves on the exhaust camshaft -arrows- with sandpaper (220...1000x grain size).



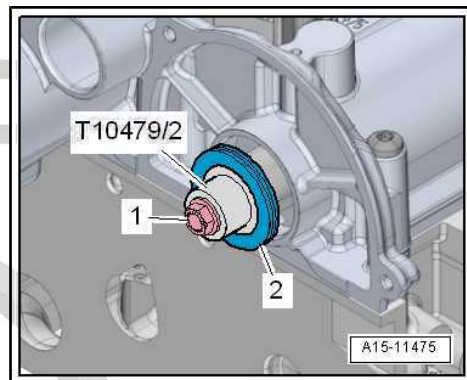
Note

Do not oil new sealing ring.

- Push sealing ring -1- over the receiver tube -T10479/3- onto the guide bushing -T10479/2- .
- Fitting position: Closed side of sealing ring points to the receiver tube.
- Disconnect receiver tube and guide bushing.



- Fit guide bushing -T10479/2- with sealing ring -2- centrally onto the camshaft.
- Fix guide bushing with screw -1- for coolant pump driving wheel onto the camshaft.
- Push sealing ring onto camshaft, unscrew guide bushing.



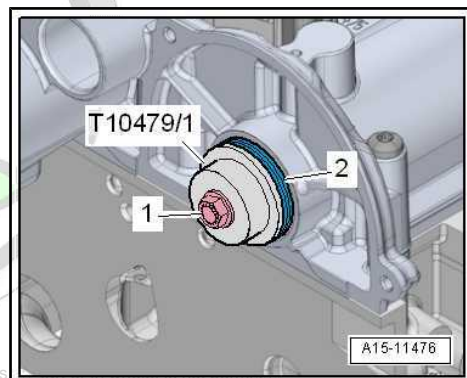
- Pull sealing ring -2- into the stop using the thrust piece -T10479/1- and the screw -1- for coolant pump driving wheel.
- Thoroughly clean up any engine oil that has escaped from the camshaft housing when the sealing ring was removed.



Note

If engine oil touches the sealing ring for the coolant pump, it may be damaged chemically.

- Install toothed belt pulley for coolant pump
⇒ ["2.7 Removing and installing toothed belt pulley for coolant pump", page 242](#) .



3.3.4 Removing and installing sealing ring for exhaust camshaft on gearbox side, engine identification characters CZEA

Special tools and workshop equipment required

- ◆ Assembly device - T10479 A- with screw -T10479/4-
- ◆ Thrust piece - T10505-

Removing

- Remove the pulley for coolant pump drive
⇒ [“2.7 Removing and installing toothed belt pulley for coolant pump”, page 242](#) .
- Carefully fit extractor hook -T20143/1- between camshaft and seal -1-.
- Remove sealing ring.

Install

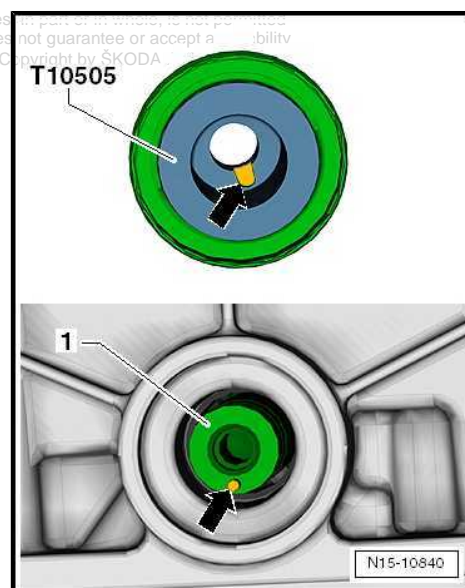
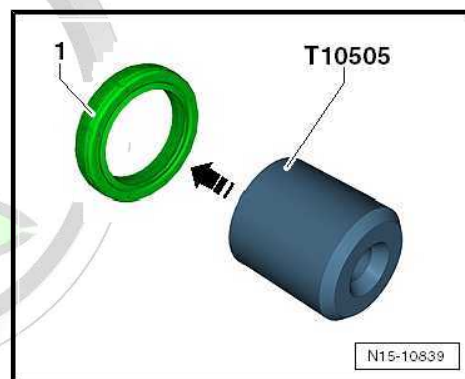
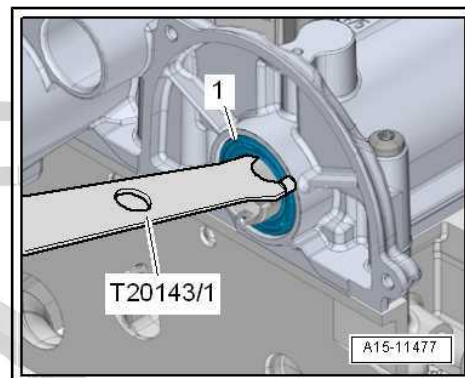


Note

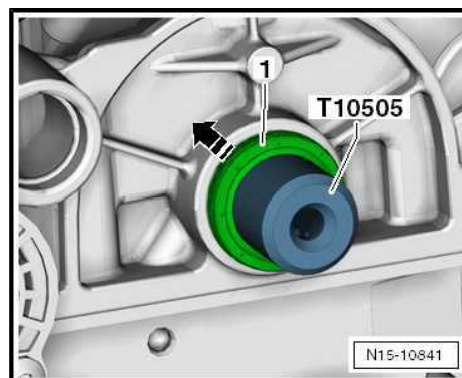
Do not oil new sealing ring.

- Insert thrust piece - T10505- into the sealing ring -1- in -direction of arrow-.
- Fitting position: Closed side of sealing ring points to the receiver tube.

- The pin on the camshaft -arrow- must be in the recess of the thrust piece - T10505- -arrow- above.



- Slide sealing ring -1- in -direction of arrow- onto the camshaft.



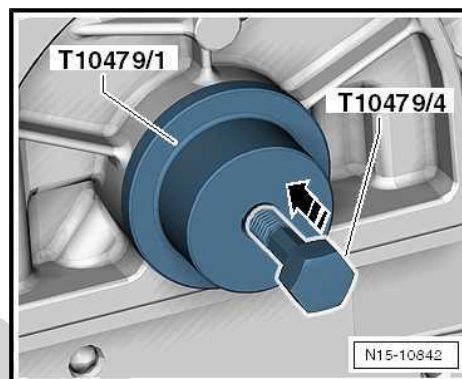
- Insert sealing ring with thrust piece -T10479/1- and screw -T10479/4- as far as it can go.
- Thoroughly clean up any engine oil that has escaped from the camshaft housing when the sealing ring was removed.



Note

If engine oil touches the sealing ring for the coolant pump, it may be damaged chemically.

- Install toothed belt pulley for coolant pump
⇒ [“2.7 Removing and installing toothed belt pulley for coolant pump”, page 242](#).



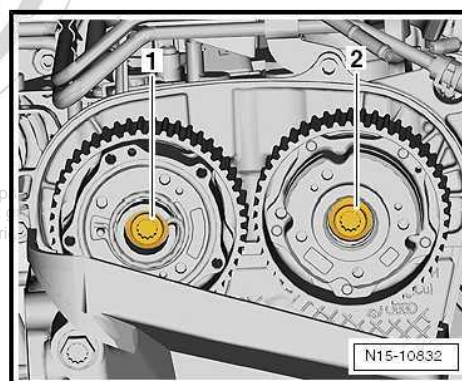
3.4 Removing and installing camshaft control

Removing

- Remove the toothed belt from the camshafts
⇒ [“2.5 Remove the toothed belt from the camshaft”, page 140](#).

Camshaft control for exhaust camshaft- for engines with identification characters CZEA, CZDA

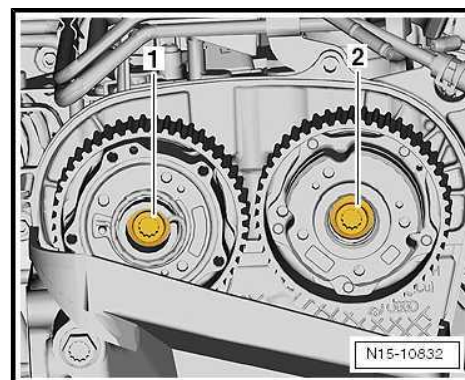
- Remove engine support
⇒ [“1.6 Removing and installing engine support”, page 45](#).
- Unscrew bolt -1- and remove camshaft control.



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Camshaft control for inlet camshaft- for engines with identification characters CZEA, CZDA

- Unscrew bolt -2- and remove camshaft control.



Camshaft control for inlet camshaft - for engines with identification characters CZCA

- Unscrew bolt -1- and remove camshaft control.

Install

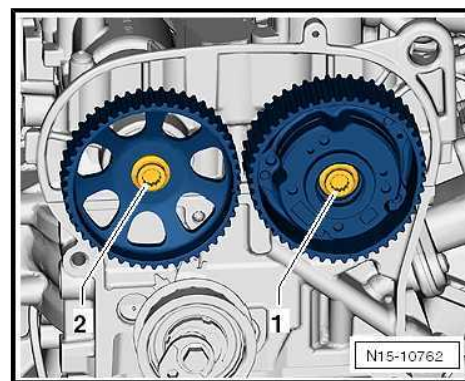
Installation is performed in the reverse order, pay attention to the following points:

For vehicles with engine identification characters CZDA, CZEA

- Install engine support
⇒ [“1.6 Removing and installing engine support”, page 45](#) .

Continued for all vehicles

- Fit the timing belt (set timings)
⇒ [“2.5 Remove the toothed belt from the camshaft”, page 140](#) .



Tightening torques

- ♦ Camshaft control
⇒ [“2.2 Summary of components - toothed belt”, page 92](#) .

3.5 Removing and installing cam adjuster

⇒ [“3.5.1 Removing and installing inlet cam for cylinder 2 N583”, page 183](#)

⇒ [“3.5.2 Removing and installing inlet cam for cylinder 3 N591”, page 184](#)

⇒ [“3.5.3 Removing and installing exhaust cam for cylinder 2 N587”, page 185](#)

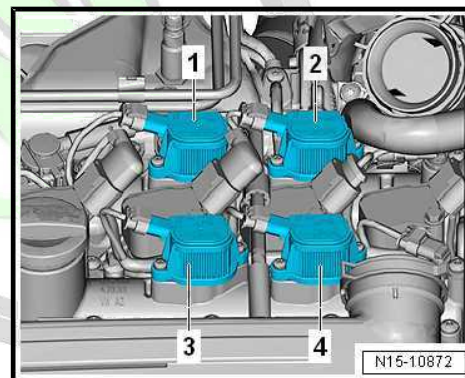
⇒ [“3.5.4 Removing and installing exhaust cam for cylinder 3 N595”, page 186](#)

3.5.1 Removing and installing inlet cam for cylinder 2 - N583-

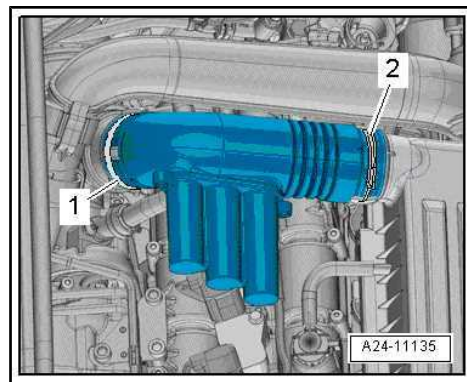
Installation overview - cam adjuster

- 1 - Exhaust cam adjuster for cylinder 2 - N587-
- 2 - Exhaust cam adjuster for cylinder 3 - N595-
- 3 - Inlet cam adjuster for cylinder 2 - N583-
- 4 - Inlet cam adjuster for cylinder 3 - N591-

Removing



- Loosen hose clamps -1-, -2- and remove air guide pipes.



- Disconnect applicable plug connection -1-.
- Unscrew screws -arrows- and remove cam adjuster.

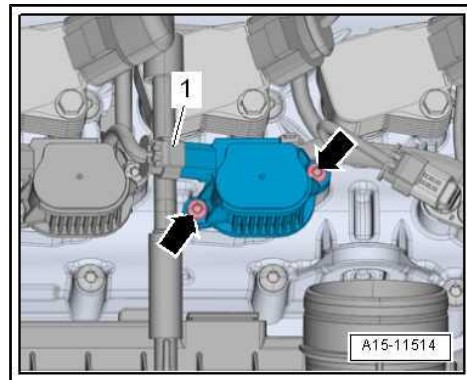
Install

Installation is carried out in the reverse order; pay attention to the following points:



Note

Replace O-ring.

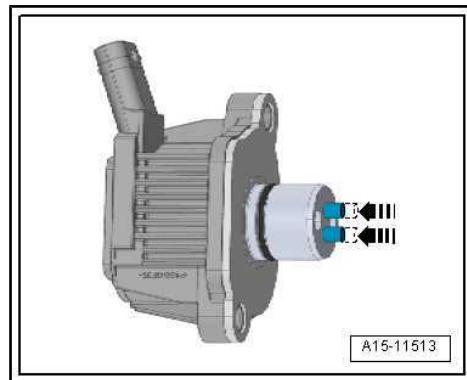


- Bring pins of the control element for the cam adjuster into installation position.

The pins of the control element must be fully inserted -arrows-.

Tightening torques

- ♦ Inlet cam adjuster for cylinder 2 - N583-
⇒ ["1.2.3 Summary of components - camshaft housing, engine identification characters CZEÄ", page 78](#) .

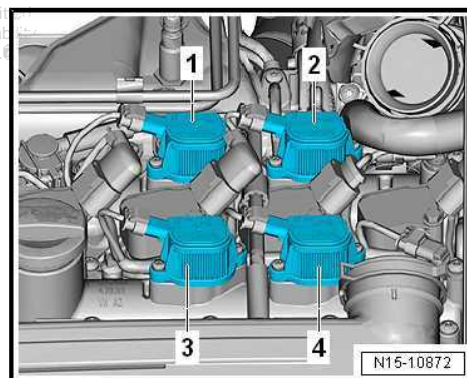


3.5.2 Removing and installing inlet cam for cylinder 3 - N591-

Installation overview - cam adjuster

- 1 - Exhaust cam adjuster for cylinder 2 - N587-
- 2 - Exhaust cam adjuster for cylinder 3 - N595-
- 3 - Inlet cam adjuster for cylinder 2 - N583-
- 4 - Inlet cam adjuster for cylinder 3 - N591-

Removing



- Loosen hose clamps -1-, -2- and remove air guide pipes.

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- Disconnect applicable plug connection -1-.
- Unscrew screws -arrows- and remove cam adjuster.

Install

Installation is carried out in the reverse order; pay attention to the following points:



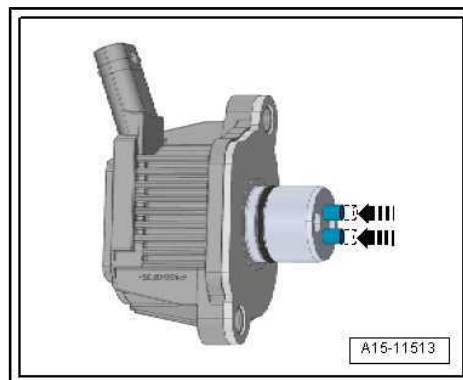
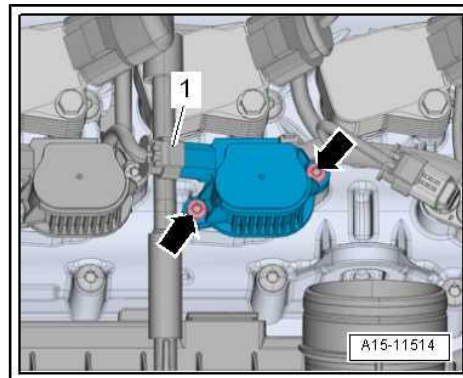
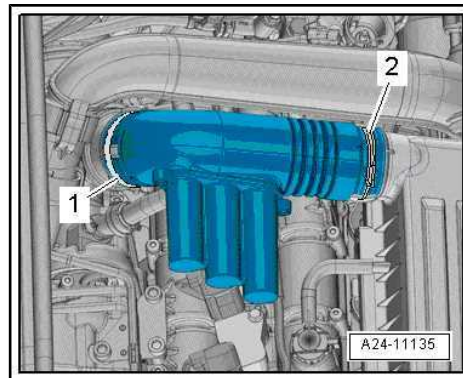
Note

Replace O-ring.

- Bring pins of the control element for the cam adjuster into installation position.
- The pins of the control element must be fully inserted -arrows-.

Tightening torques

- ◆ Inlet cam adjuster for cylinder 3 - N591-
⇒ ["1.2.3 Summary of components - camshaft housing, engine identification characters CZEA", page 78](#).

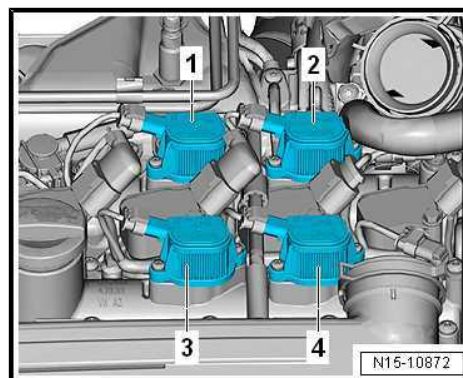


3.5.3 Removing and installing exhaust cam for cylinder 2 - N587-

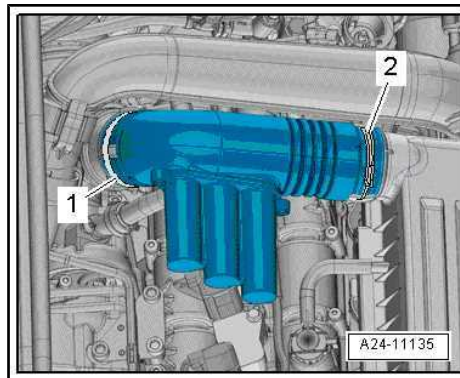
Installation overview - cam adjuster

- 1 - Exhaust cam adjuster for cylinder 2 - N587-
- 2 - Exhaust cam adjuster for cylinder 3 - N595-
- 3 - Inlet cam adjuster for cylinder 2 - N583-
- 4 - Inlet cam adjuster for cylinder 3 - N591-

Removing



- Loosen hose clamps -1-, -2- and remove air guide pipes.



- Disconnect applicable plug connection -1-.
- Unscrew screws -arrows- and remove cam adjuster.

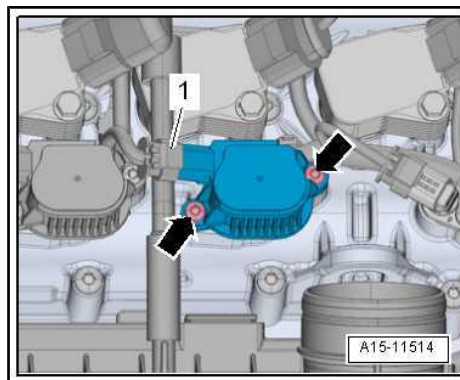
Install

Installation is carried out in the reverse order; pay attention to the following points:



Note

Replace O-ring.

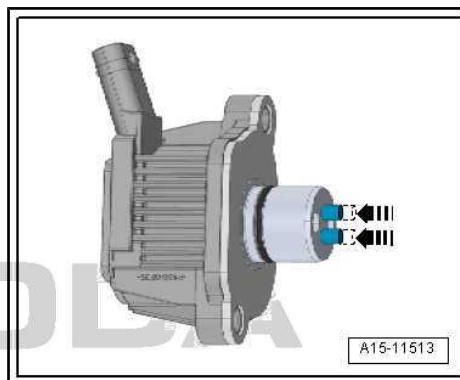


- Bring pins of the control element for the cam adjuster into installation position.

The pins of the control element must be fully inserted -arrows-.

Tightening torques

- ♦ Exhaust cam adjuster for cylinder 2 - N587-
⇒ ["1.2.3 Summary of components - camshaft housing, engine identification characters CZEÄ", page 78](#) .

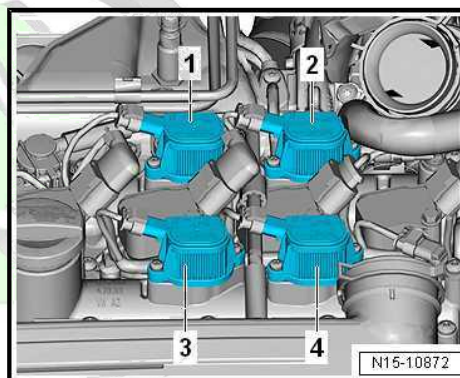


3.5.4 Removing and installing exhaust cam for cylinder 3 - N595-

Installation overview - cam adjuster

- 1 - Exhaust cam adjuster for cylinder 2 - N587-
- 2 - Exhaust cam adjuster for cylinder 3 - N595-
- 3 - Inlet cam adjuster for cylinder 2 - N583-
- 4 - Inlet cam adjuster for cylinder 3 - N591-

Removing



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- Loosen hose clamps -1-, -2- and remove air guide pipes.

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- Press release buttons and remove hose -1- to the activated charcoal filter.
- Unscrew screws -arrows- and remove hose for crankcase ventilation.

- Disconnect applicable plug connection -1-.
- Unscrew screws -arrows- and remove cam adjuster.

Install

Installation is carried out in the reverse order; pay attention to the following points:

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Note

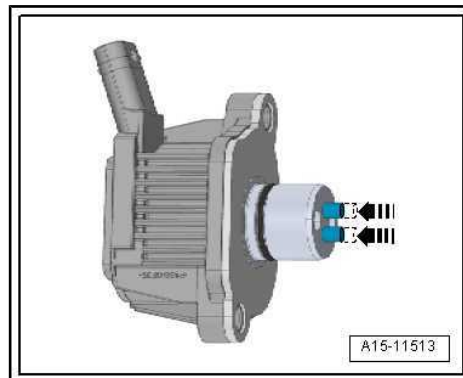
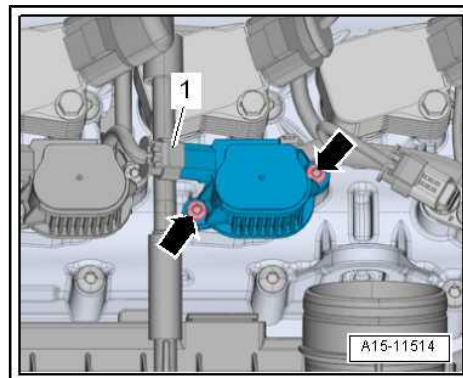
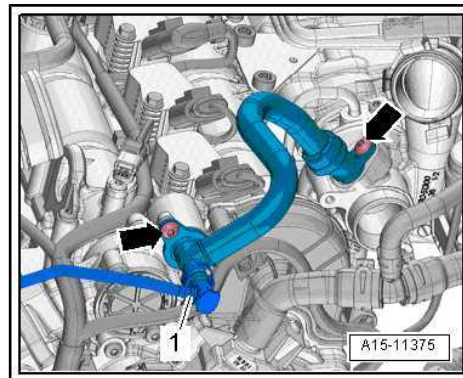
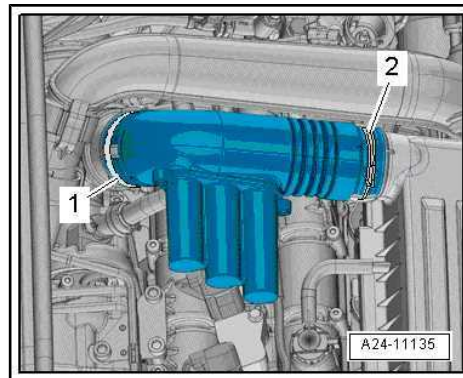
Replace O-ring.

- Bring pins of the control element for the cam adjuster into installation position.

The pins of the control element must be fully inserted -arrows-.

Tightening torques

- ◆ Exhaust cam adjuster for cylinder 3 - N595-
⇒ ["1.2.3 Summary of components - camshaft housing, engine identification characters CZE", page 78](#) .

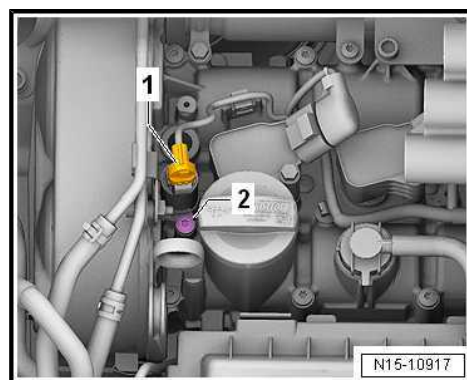


3.6 Removing and installing - N205- the camshaft adjustment valve 1

Removing

For vehicles with engine codes CZCA

- Separate electrical plug connection -1-.
- Unscrew screw -2- and remove camshaft control valve 1 - N205- .



For vehicles with engine identification characters CZDA, CZEA

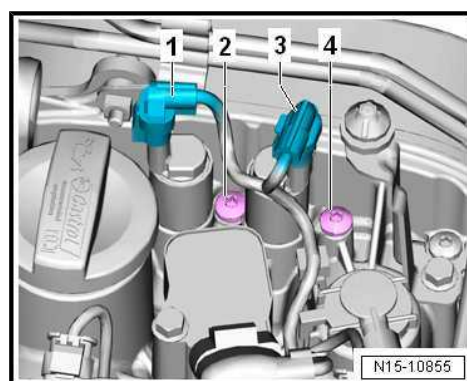
- Separate electrical plug connection -1-.
- Unscrew screw -2- and remove camshaft control valve 1 - N205- .

Install

Installation is performed in the reverse order, pay attention to the following points:

Tightening torques

- ♦ Camshaft control valve 1 - N205-
⇒ [“1.2 Summary of components - camshaft housing”, page 73](#)



3.7 Removing and installing camshaft control valve 1 in the exhaust - N318-

Removing

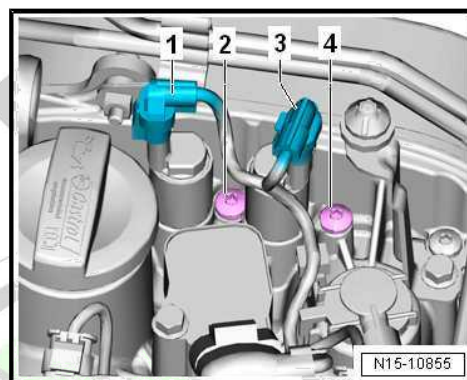
- Separate electrical plug connection -3-.
- Unscrew screw -4- and remove camshaft control valve 1 in the exhaust - N318- .

Install

Installation is performed in the reverse order, pay attention to the following points:

Tightening torques

- ♦ Camshaft control valve 1 in the exhaust - N318-
⇒ [“1.2 Summary of components - camshaft housing”, page 73](#) .



3.8 Removing and installing valve stem seals

⇒ [“3.8.1 Removing and installing valve stem seals with cylinder head installed”, page 189](#)

⇒ [“3.8.2 Removing and installing valve stem seals with cylinder head removed”, page 191](#)

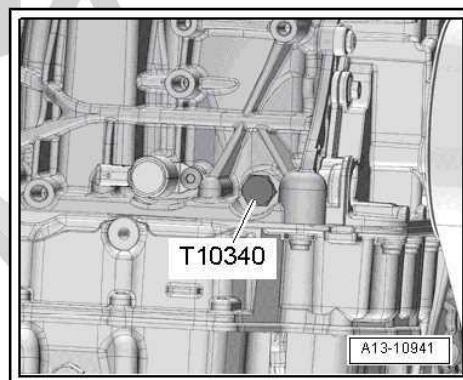
3.8.1 Removing and installing valve stem seals with cylinder head installed

Special tools and workshop equipment required

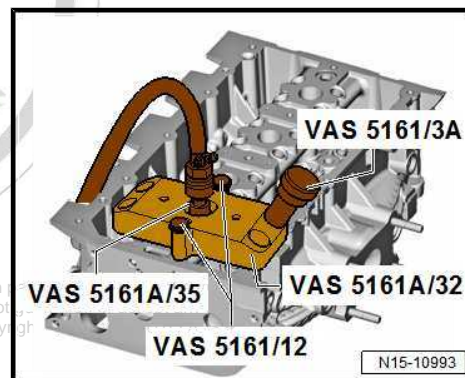
- ◆ Spark plug wrench , e.g. -3122 B-
- ◆ Disassembly and assembly device for valve collets - VAS 5161A- with set - VAS 5161A/32-
- ◆ Adapter - VAS 5161A/35- or -T40012-
- ◆ Valve stem seal insertion tool - MP1-233 (3365)-
- ◆ Valve shaft pliers , e.g. -VAS 6770-

Removing

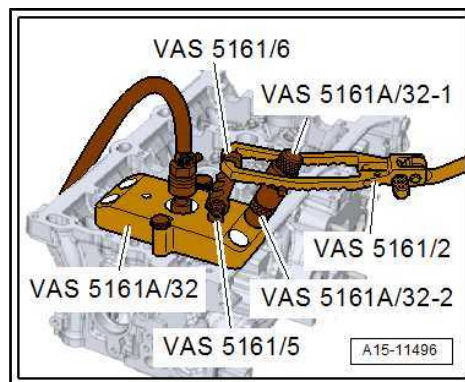
- Remove camshaft housing
⇒ [“1.4 Removing and installing camshaft housing”, page 84](#) .
- Unscrew the spark plugs with spark plug wrench - 3122 B- .
- Unscrew positioning screw - T10340- .
- Position piston of the relevant cylinder in “BDC”.



- Place guide plate -VAS 5161A/32- on the cylinder head and screw on using the knurled screws -VAS 5161/12- .
- Screw the adapter - VAS 5161A/35- or -T40012- with sealing ring into the relevant spark plug thread by hand.
- Connect the adapter to the compressed air with a commercially available intermediate piece and apply constant pressure.
- Minimum pressure: 0.6 MPa (6 bar)
- Insert the impact drift -VAS 5161/3A- into the guide plate and knock off the tightly fitted valve collets using a plastic hammer.

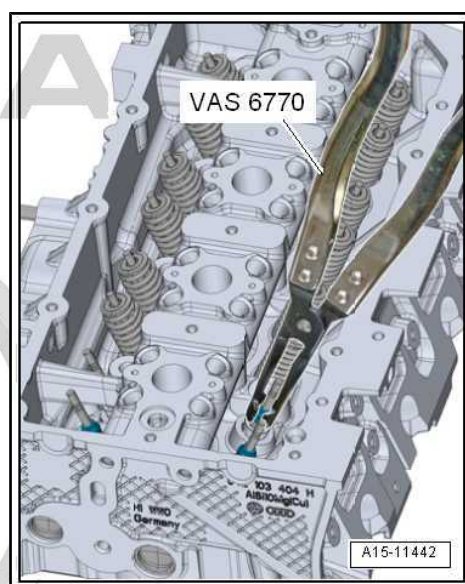


- Screw the detent part -VAS 5161/6- with the interlocking fork -VAS 5161/5- into the guide plate.
- Insert assembly cartridge -VAS 5161A/32-1- with sleeve mounted -VAS 5161A/32-2- into the guide plate.
- Hook the pressure fork -VAS 5161/2- onto the detent part and push the assembly cartridge downwards.
- Turn simultaneously the knurled screw of the assembly cartridge to the right, until the tips click into the valve collets.
- Rotate the knurled screw to the left and to the right, by doing so the valve collets are pressed apart and are installed in the assembly cartridge.
- Release the pressure fork.
- Remove assembly cartridge.
- Unscrew guide plate and turn it to the side.
- T compressed air hose remains connected.
- Remove the valve spring with the valve spring retainer.
- Use valve shaft pliers - VAS 6770- to pull off valve stem seal.

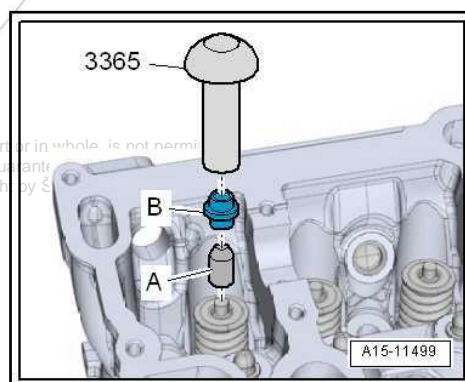


NOTICE

Risk of damage to the valve stem seals during installation.

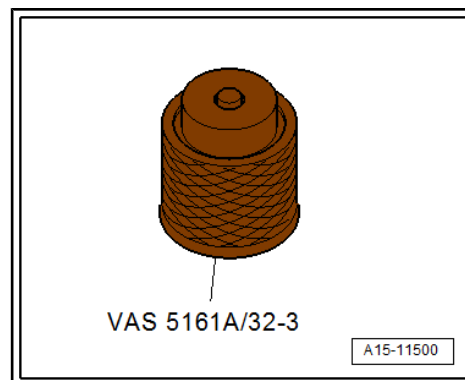


- Fit the plastic bushing -A-, which is attached to the new valve stem seals -B-, onto the valve stem.
- Lightly oil sealing lip of the valve stem seal.
- Slide the valve stem seal onto the plastic bushing.
- Carefully press the valve stem seal with the valve stem seal insertion tool - MP1-233 (3365)- onto the valve guide.
- Remove plastic sleeve.



If the valve collets were removed from the assembly cartridge, they must be inserted into the insertion device - VAS 5161A/32-3- first.

- The large diameter of the valve collets points to the top.
- Press the assembly cartridge from the top onto the insertion device and lift up the valve collets.
- Insert the valve spring and the valve spring retainer, installation position of valve spring
⇒ Fig. “Fitting position of the valve spring”, page 175 .

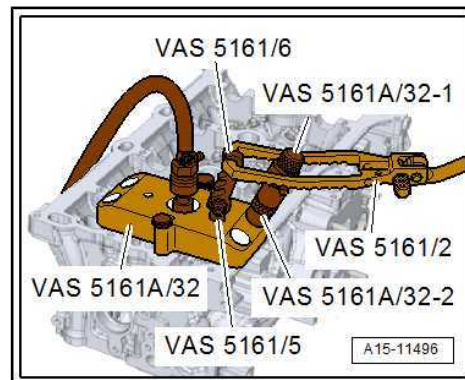


- Screw the guide plate -VAS 5161A/32- onto the cylinder head.
- Insert assembly cartridge -VAS 5161A/32-1- with sleeve -VAS 5161A/32-2- mounted into the guide plate.
- Press down the pressure fork and turn the knurled screw to the left and to the right while pulling it upwards, by doing so the valve collets are inserted.
- Release the pressure fork on tightened knurled screw.
- Repeat the procedure for each valve.

Install

The installation occurs in reverse order, while paying attention to the following.

- Install spark plugs:
 - ◆ ⇒ Maintenance ; Booklet Superb III
 - ◆ ⇒ Maintenance ; Booklet Kodiaq
- Install camshaft housing
⇒ “1.4 Removing and installing camshaft housing”, page 84 .

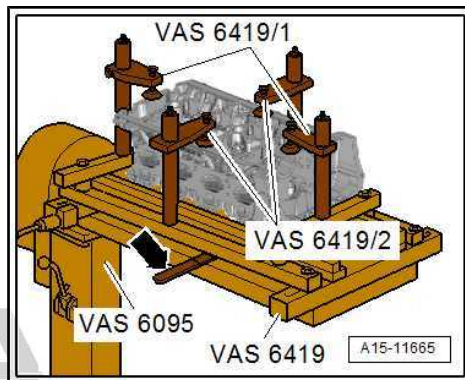


3.8.2 Removing and installing valve stem seals with cylinder head removed

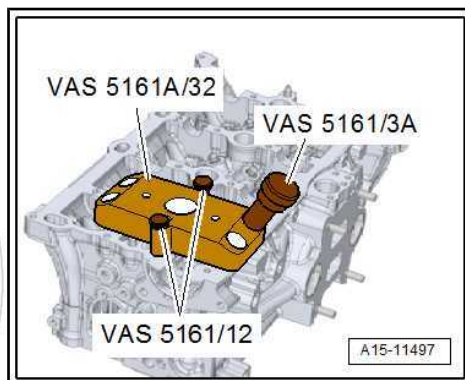
Special tools and workshop equipment required

- ◆ Disassembly and assembly device for valve collets - VAS 5161A- with set - VAS 5161A/32-
- ◆ Engine and gearbox support - VAS 6095-
- ◆ Cylinder head tensioning device - VAS 6419-
- ◆ Valve shaft pliers - VAS 6770-
- ◆ Valve stem seal insertion tool - 3365-

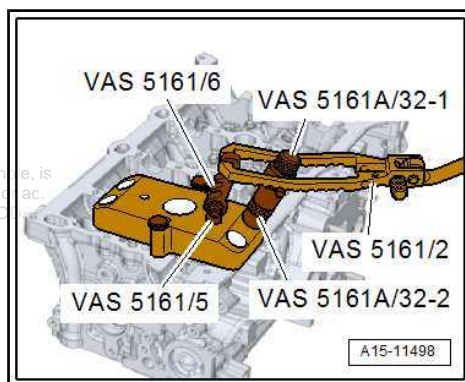
- Remove cylinder head
⇒ [“1.3 Removing and installing the cylinder head”, page 79](#) .
- Insert the cylinder head tensioning device - VAS 6419- into the engine and gearbox jack - VAS 6095- .
- Tension the cylinder head in the cylinder head tensioning device, as shown in the illustration.
- Connect cylinder head tensioning device to compressed air.
- Adjust the air bellows with the lever -arrow- below the combustion chamber on which the valve stem seals should be removed.
- Allow just enough air to flow into the air bag so that it applied to the valve disc.



- Place guide plate -VAS 5161A/32- on the cylinder head and screw on using the knurled screws -VAS 5161/12- .
- Insert the impact drift -VAS 5161/3A- into the guide plate and knock off the tightly fitted valve collets using a plastic hammer.



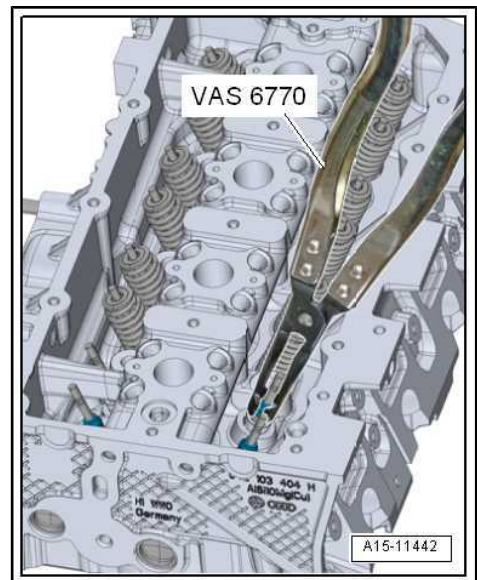
- Screw the detent part -VAS 5161/6- with the interlocking fork -VAS 5161/5- into the guide plate.
- Insert assembly cartridge -VAS 5161A/32-1- with sleeve mounted -VAS 5161/32-2- into the guide plate.
- Hook the pressure fork -VAS 5161/2- onto the detent part and push the assembly cartridge downwards.
- Turn simultaneously the knurled screw of the assembly cartridge to the right, until the tips click into the valve collets.
- Rotate the knurled screw to the left and to the right, by doing so the valve collets are pressed apart and are installed in the assembly cartridge.
- Release the pressure fork.
- Remove assembly cartridge.
- Unscrew guide plate and turn it to the side.
- Remove the valve spring with the valve spring retainer.



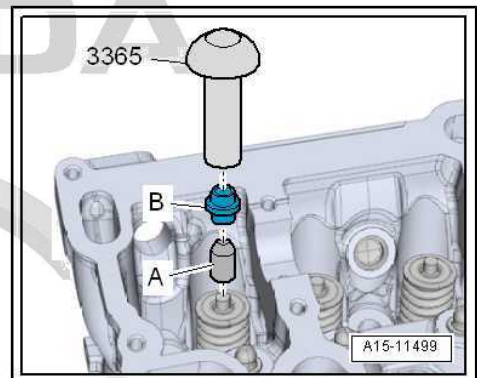
- Use valve shaft pliers - VAS 6770- to pull off valve stem seal.

! NOTICE

Risk of damage to the valve stem seals during installation.



- Fit the plastic bushing -A-, which is attached to the new valve stem seals -B-, onto the valve stem.
- Lightly oil sealing lip of the valve stem seal.
- Slide the valve stem seal onto the plastic bushing.
- Carefully press the valve stem seal with the valve stem seal insertion tool - MP1-233 (3365)- onto the valve guide.
- Remove plastic sleeve.

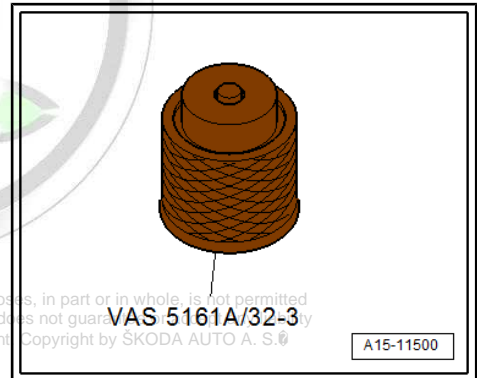


If the valve collets were removed from the assembly cartridge, they must be inserted into the insertion device - VAS 5161A/32-3- first.

- The large diameter of the valve collets points to the top.
- Press the assembly cartridge from the top onto the insertion device and lift up the valve collets.
- Insert the valve spring and the valve spring retainer, installation position of valve spring

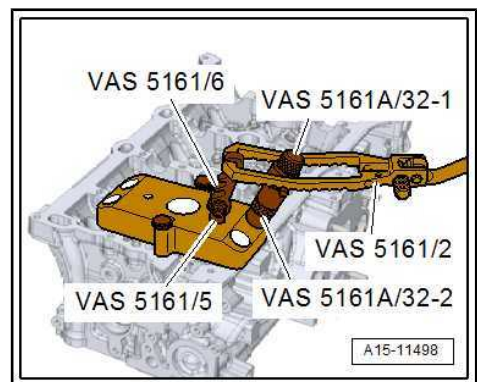
⇒ Fig. "Fitting position of the valve spring", page 175.

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- Screw the guide plate -VAS 5161A/32- onto the cylinder head.
- Insert assembly cartridge -VAS 5161A/32-1- with sleeve -VAS 5161A/32-2- mounted into the guide plate.
- Press down the pressure fork and turn the knurled screw to the left and to the right while pulling it upwards, by doing so the valve collets are inserted.
- Release the pressure fork on tightened knurled screw.
- Repeat the procedure for each valve.
- Install cylinder head

⇒ "1.3 Removing and installing the cylinder head", page 79 .



4 Inlet and exhaust valves

⇒ "4.1 Inspect valve guides", page 194

⇒ "4.2 Testing valves", page 194

⇒ "4.3 Valve dimensions", page 194

4.1 Inspect valve guides

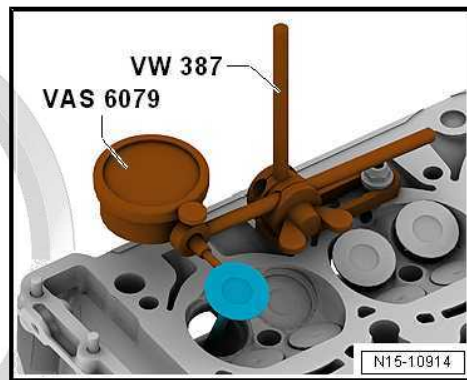
Special tools and workshop equipment required

- ♦ Universal dial gauge holder - MP3-447 (VW 387)-
- ♦ Dial gauge , e.g. -VAS 6079-
- Insert valve into guide. The end of the valve stem must be flush with the guide. On account of differing stem diameters, only use inlet valve in inlet valve guide and exhaust valve in exhaust valve guide.
- Determine valve rock.
- Wear limit: 0.5 mm
- If the wear limit is exceeded, repeat measurement with new valves.
- If the wear limit is again exceeded, replace cylinder head.



Note

The valve guides cannot be changed.



4.2 Testing valves

- Check valves on the shank and seat surface for scoring.
- If scoring is clearly visible, change valve.

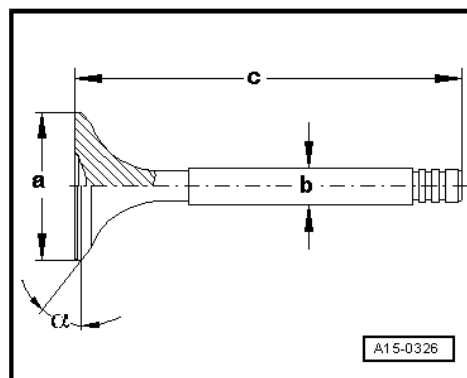
4.3 Valve dimensions



Note

Inlet and exhaust valves must not be reworked. Only lapping-in is permitted.

Dimension		Inlet valve	Exhaust valve
Ø a	mm	28,5	25,0
Ø b	mm	4,973	4,963
c	mm	110,25	110,09
α	°	45	30



1 Sump, oil pump

⇒ [“1.1 Assembly overview - sump/oil pump”, page 195](#)

⇒ [“1.2 Engine oil”, page 199](#)

⇒ [“1.3 Removing and installing oil sump bottom part”, page 199](#)

⇒ [“1.4 Removing and installing oil sump top part”, page 202](#)

⇒ [“1.5 Removing and installing oil pump”, page 204](#)

⇒ [“1.6 Removing and installing oil level and oil temperature sender G266”, page 205](#)

1.1 Assembly overview - sump/oil pump



Note

- ◆ *If considerable quantities of metal swarf or abrasion are found when carrying out an engine repair, this may indicate damage to the crankshaft and conrod bearings. In order to prevent consequential damage, the following tasks must be performed after the repair: Clean oil channels carefully; change oil injection nozzles, engine oil cooler and oil filter.*
- ◆ *Oil spray nozzle and pressure relief valve ⇒ [Fig. “Oil spray nozzle and pressure relief valve”, page 70](#).*

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1 - Nut

- ☐ 9 Nm

2 - Oil level and oil temperature sender - G266-

- ☐ removing and installing
⇒ [“1.6 Removing and installing oil level and oil temperature sender G266”, page 205](#)

3 - Sealing ring

- ☐ Replace after disassembly

4 - Oil drain plug



Note

- ◆ Replace the oil drain plug when it has an integrated sealing ring.
- ◆ Always replace the gasket ring.

- ☐ 30 Nm

5 - Sealing ring

- ☐ Replace after disassembly
- ☐ for oil drain plug with replaceable gasket ring
⇒ [page 198](#)

6 - Sump bottom part

- ☐ removing and installing
⇒ [“1.3 Removing and installing oil sump bottom part”, page 199](#)

7 - Screw

- ☐ Replace after disassembly
- ☐ 8 Nm + 90°

8 - Fitting sleeve

- ☐ 2 pieces

9 - Cover

- ☐ for drive chain of the oil pump

10 - Drive chain

- ☐ for oil pump
 - ☐ mark the direction of rotation in colour before removing
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11 - Screw

- ☐ Replace after disassembly
- ☐ order of tightening ⇒ [Fig. “Oil sump top part - tightening torque and tightening order”](#), page 198
- ☐ 8 Nm + 90°

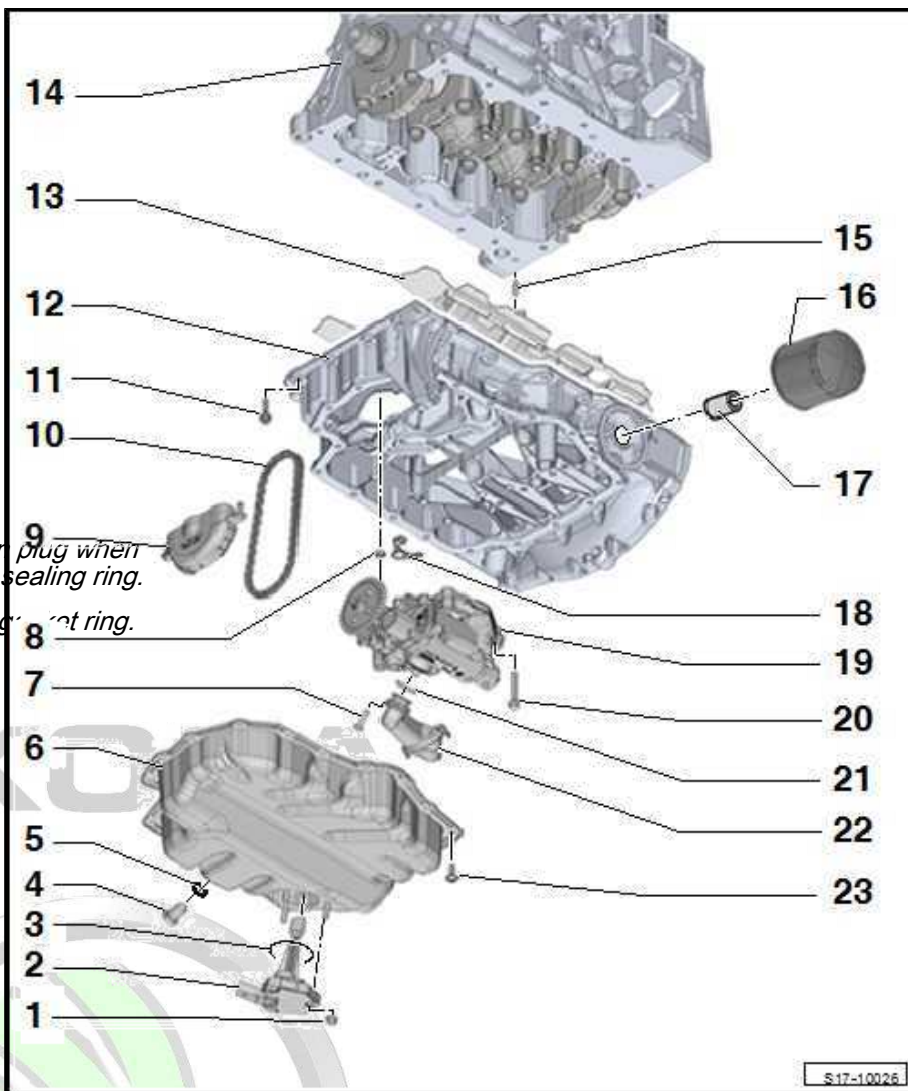
12 - Sump top part

- ☐ removing and installing ⇒ [“1.4 Removing and installing oil sump top part”, page 202](#)

13 - Partition panel

14 - Sprocket

- ☐ for oil pump drive



15 - Fit pin

16 - Oil filter

- ☐ Remove and install with oil filter tool - 3417- .
- ☐ Before installing, lightly coat sealing ring with clean engine oil
- ☐ 20 Nm

17 - Supports

- ☐ for the oil filter
- ☐ Tighten loosened screw connector ⇒ [Fig. “Secure the oil filter screw connector”](#) , page 199

18 - Gasket

- ☐ With oil strainer

19 - Oil pump

- ☐ removing and installing ⇒ [“1.5 Removing and installing oil pump”](#) , page 204

20 - Screw

- ☐ 10 Nm

21 - O-ring

- ☐ Replace after disassembly

22 - Oil suction pipe

- ☐ Clean strainer if dirty

23 - Screw

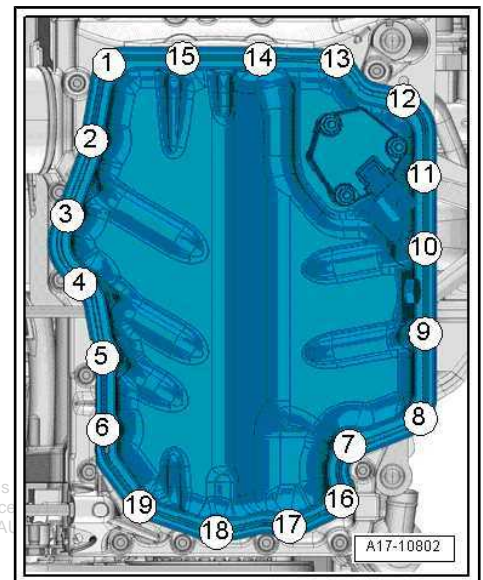
- ☐ Replace after disassembly
- ☐ order of tightening ⇒ [Fig. “Oil sump bottom part - tightening torque and tightening order”](#) , page 197
- ☐ 12 Nm

Oil sump bottom part - tightening torque and tightening order

– Tighten screws gradually in the given sequence:

Stage	Screws	Specified torque
1.	-1...19-	by hand as far as the stop
2.	-1...19-	12 Nm

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Oil sump top part - tightening torque and tightening order

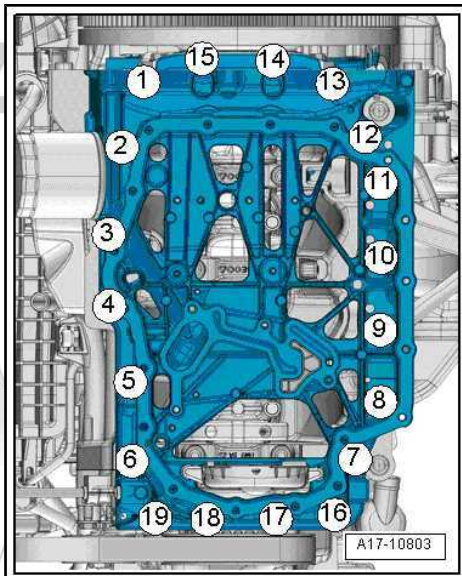


Note

Screws which have been tightened firmly to a torquing angle must be replaced.

- Tighten screws gradually in the given sequence:

Stage	Screws	Tightening torque/torquing angle
1.	-1...19-	by hand as far as the stop
2.	-1...19-	8 Nm
3.	-1...19-	Turn 90° further



Markings on dipstick

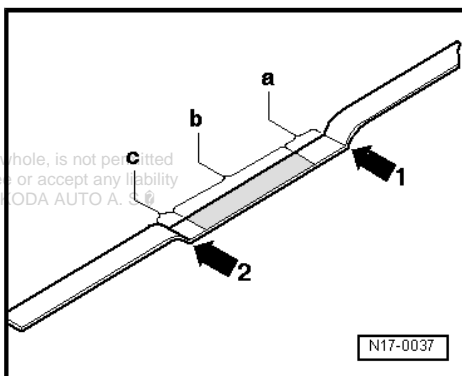
1 - Max. mark

2 - Min. mark

a - Range above shaded field up to MAX marking: Do not top up with oil!

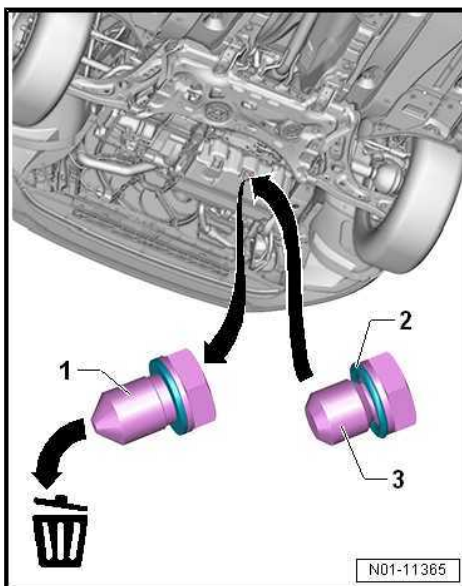
b - Actual status in shaded region: The engine oil can be topped up.

c - MIN marking range up to shaded field: Replenish engine oil by max. 0.5 l!



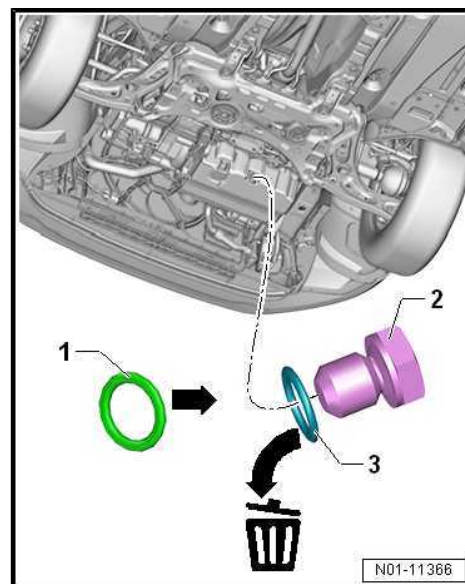
Oil drain plug with captive gasket ring (factory-fitted)

- Unscrew and dispose of oil drain plug with captive gasket ring -1-.
- Install new oil drain plug -3- with captive gasket ring -2-.



Oil drain plug with replaceable gasket ring (all next oil change service)

- Unscrew oil drain plug -2- and dispose of used sealing ring -3-.
- Install new oil drain plug -2- with new captive gasket ring -1-.

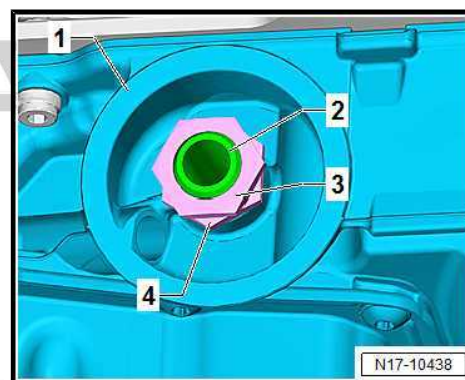


Secure the oil filter screw connector

If the screw connector -2- was released from the upper part of the oil pan -1-, attach it as follows:

For this purpose, use:

- ◆ 2 x hexagon nuts 068 115 723 ⇒ Electronic Catalogue of Original Parts “ETKA” .
- Screw on nuts -3- and -4- onto the screw connector -2- and tighten against each other.
- Retighten the screw connectors -2- by tighten the nuts -3-.
- Undo nuts -3- and -4- in a way that prevents the screw connector from undoing.



Tightening torques

Component	Specified torque
Screw connector -2-	50 Nm

1.2 Engine oil

- Check oil capacity using the oil dipstick after oil filling
⇒ Fig. “Markings on dipstick” , page 198 .
- The oil level must not be above the max. mark - danger of damage to catalytic converter!

Oil capacity and engine oil specification:

- ◆ ⇒ Maintenance ; Booklet Superb III
- ◆ ⇒ Maintenance ; Booklet Kodiaq

Engine oil change “Engine oil: Drain”:

- ◆ ⇒ Maintenance ; Booklet Superb III
- ◆ ⇒ Maintenance ; Booklet Kodiaq

1.3 Removing and installing oil sump bottom part

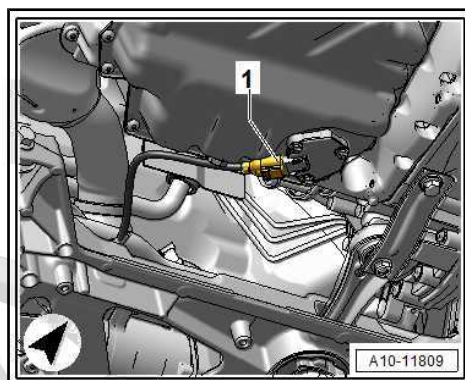
Special tools and workshop equipment required

- ◆ Allen key, long reach - T10058-

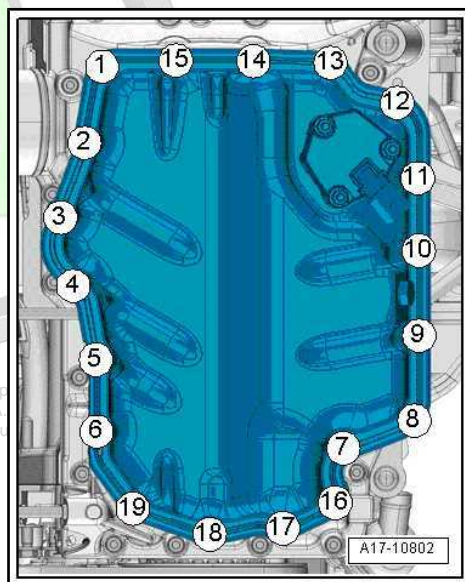
- ◆ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- ◆ Silicone sealant ⇒ ETKA - Electronic catalogue of original parts
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Protective goggles and gloves
- ◆ Catch pan , e.g. -VAS 6208-

Removing

- Drain engine oil:
- ◆ ⇒ Maintenance ; Booklet Superb III
- ◆ ⇒ Maintenance ; Booklet Kodiaq
- Disconnect plug -1- at the oil level and oil temperature sender - G266- .



- Loosen the screws in the sequence -19- to -1- and unscrew them.



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- At the point identified by an -arrow-, carefully lever out the oil sump bottom part using a screwdriver.
- Remove lower part of oil sump. If necessary, undo the oil pan by applying slight blows with a rubber-headed hammer.

Install



NOTICE

Risk of contamination of the lubrication system.

- Cover open parts of the engine.



CAUTION

Risk of injury.

Wear safety gloves and safety goggles.

- Remove the remaining sealant on the cylinder block and on the oil pan with chemical sealant remover.
- Degrease the sealing surfaces.



Note

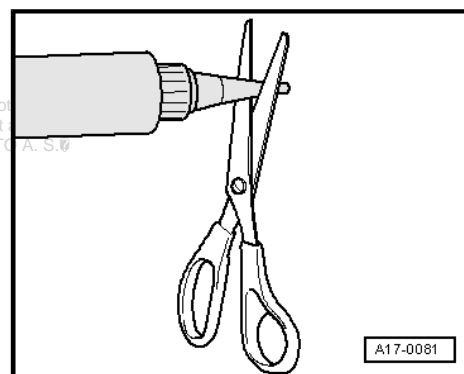
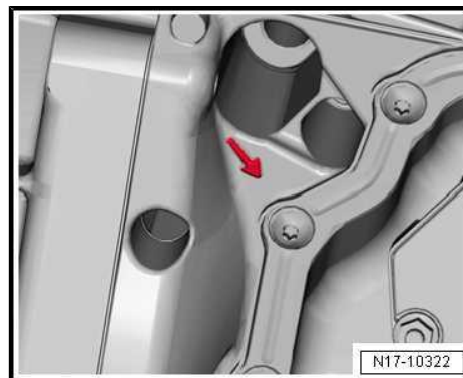
- ◆ *Pay attention to the use by date on sealant.*
- ◆ *The oil pan can be better and more securely installed if 2 M6 threaded pins are screwed on the sump top part for the insertion.*
- Cut off nozzle tube at the front marking (Ø of nozzle approx. 2 mm).



NOTICE

Risk of blockage of the lubrication system through excess sealant.

- Do not apply a thicker sealant bead than indicated.



- Apply sealant bead -arrow- onto the clean sealing surface of the oil sump bottom part, as shown in the illustration.

Sealant bead must

- ◆ be 2...3 mm thick
- ◆ run past the area around the bolt holes on the inside arrow



Note

Take particular care when applying sealant bead in the area of the sealing flange.

- After applying the sealant, the oil sump bottom part must be installed within 5 minutes.
- Position oil sump bottom part and tighten screws.
- After installing the lower part of the oil pan, allow the sealant to dry for about 30 minutes. Only then may engine oil be filled in.
- Fill with engine oil and check the oil level:
- ◆ ⇒ Maintenance ; Booklet Superb III
- ◆ ⇒ Maintenance ; Booklet Kodiaq

Tightening torques

- ◆ Lower part of the oil pan
⇒ [“1.1 Assembly overview - sump/oil pump”, page 195](#) .

1.4 Removing and installing oil sump top part

Special tools and workshop equipment required

- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- ◆ Silicone sealant ⇒ ETKA - Electronic catalogue of original parts
- ◆ Protective goggles and gloves

Removing

For vehicles with air conditioning

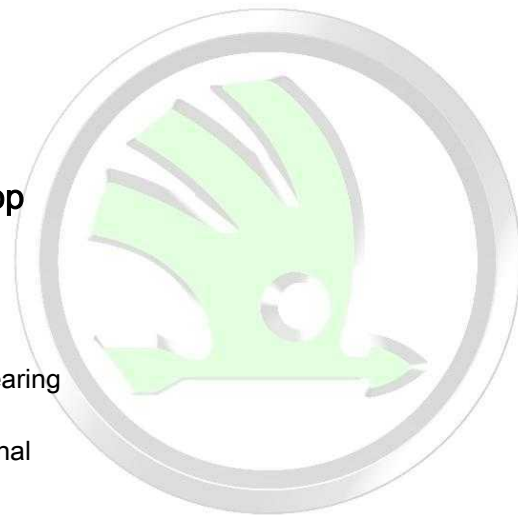
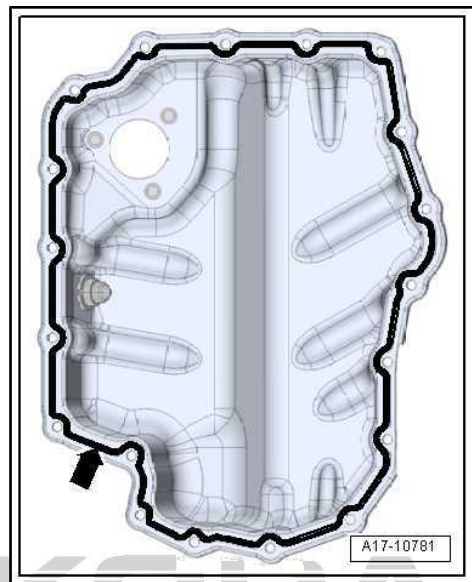
Pay attention to the notes

⇒ [“3.6.1 Additional instructions when undertaking assembly work on the air-conditioning system”, page 7](#) .

- Removing AC compressor ⇒ Heating, Air Conditioning; Rep. gr. 87 ; AC compressor; installing and removing AC compressor .
- Attach AC compressor to lock carrier.

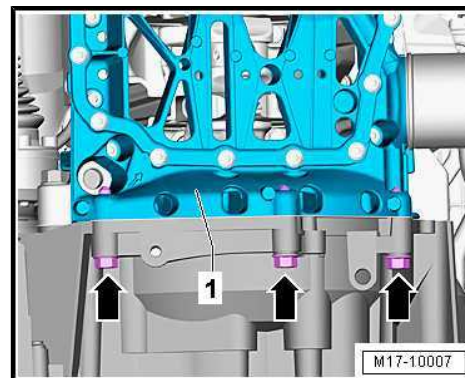
Continued for all vehicles

- Remove oil pump
⇒ [“1.5 Removing and installing oil pump”, page 204](#) .



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- Undo fastening screws -arrows- for gearbox/sump top part.



- Loosen the screws in the sequence -19- to -1- and unscrew them.
- Loosening oil sump top part carefully from the bonding.
- Remove baffle.

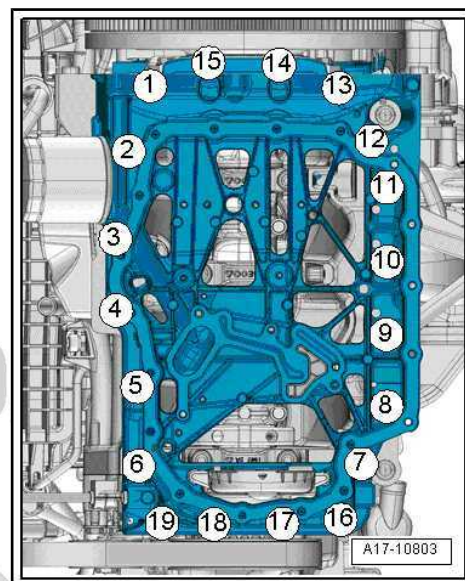
Install



Note

Replace the gaskets, sealing rings and self-locking nuts.

- Check oil channels in the oil sump top part and in the cylinder block for contamination.
- Clean oil and grease from sealing surfaces.



Note

Pay attention to the use by date on sealant.

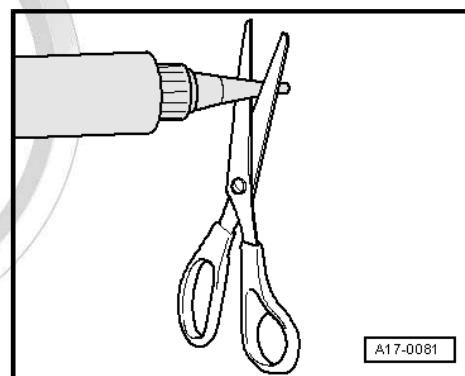
- Cut off nozzle tube at the front marking (\varnothing of nozzle approx. 2 mm).



NOTICE

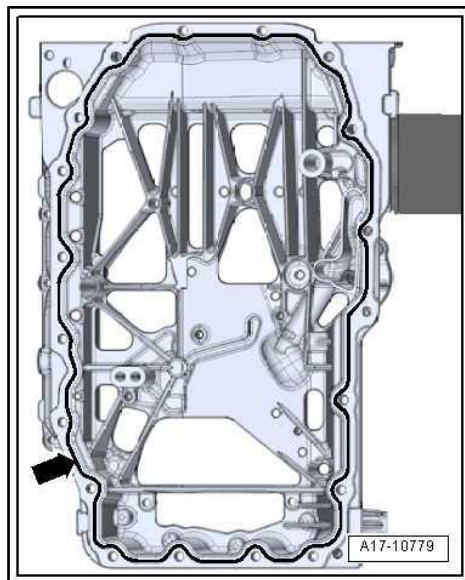
Risk of blockage of the lubrication system through excess sealant.

- Do not apply a thicker sealant bead than indicated.



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- Apply sealant bead -arrow- onto the clean sealing surface of the oil sump top part, as shown in the illustration.
- Thickness of sealant bead: 2...3 mm
- After applying the sealant, the oil sump top part must be installed within 5 minutes.



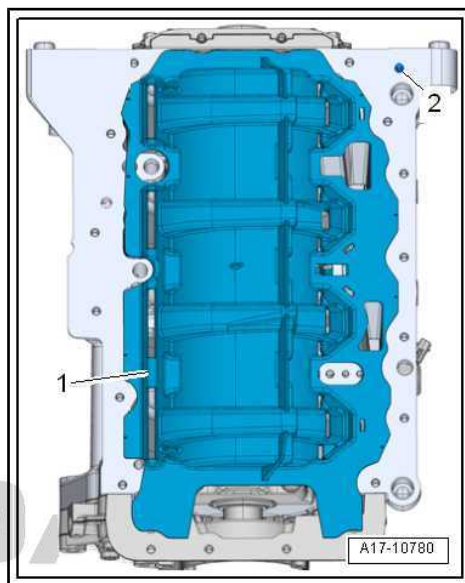
- Check firm seating of the fit pin -2- in the cylinder block.
- Position the gasket -1- at the cylinder block.
- Position oil sump top part and tighten screws.

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

- Install oil pump
⇒ [“1.5 Removing and installing oil pump”, page 204](#) .
- Install AC compressor ⇒ Heating, Air Conditioning; Rep. gr. 87 ; AC compressor; Removing and installing AC compressor .
- Fill with engine oil and check the oil level:
 - ◆ ⇒ Maintenance ; Booklet Superb III
 - ◆ ⇒ Maintenance ; Booklet Kodiaq

Tightening torques

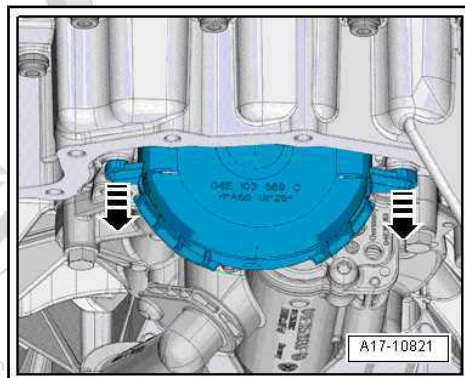
- ◆ Sump top part
⇒ [“1.1 Assembly overview - sump/oil pump”, page 195](#) .



1.5 Removing and installing oil pump

Removing

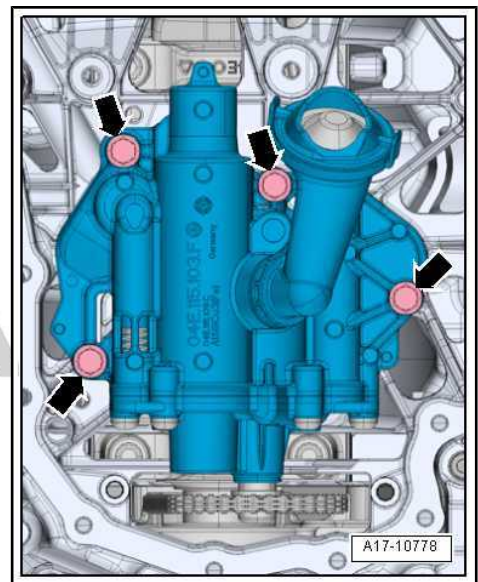
- Remove oil sump bottom part
⇒ [“1.3 Removing and installing oil sump bottom part”, page 199](#) .
- Unclip cover for oil pump drive chain sprocket -arrows-.



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- Release screws -arrows-.
- Guide oil pump out with drive chain sprocket below the drive chain.

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Install

- Check that the dowel sleeves -1- and -3- are inserted into the oil pump.
- Insert gasket with strainer -2- into the oil pump.

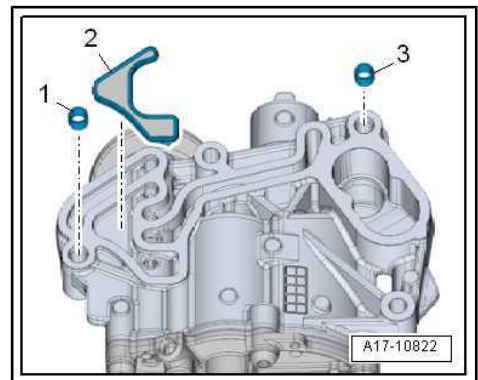
Installation is performed in the reverse order, pay attention to the following points:

- Check smooth operation of drive chain sprocket of the oil pump, to do so turn the toothed belt sprocket with a finger.



Note

A sluggish oil pump must be replaced. Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



- Insert drive chain sprocket into drive chain and screw tight.
- Install oil sump bottom part
⇒ [“1.3 Removing and installing oil sump bottom part”, page 199](#).
- Fill with engine oil and check the oil level:
 - ◆ ⇒ Maintenance ; Booklet Superb III
 - ◆ ⇒ Maintenance ; Booklet Kodiah

Tightening torques

- ◆ Oil pump
⇒ [“1.1 Assembly overview - sump/oil pump”, page 195](#).

1.6 Removing and installing oil level and oil temperature sender - G266-

Removing

- Drain engine oil:
 - ◆ ⇒ Maintenance ; Booklet Superb III
 - ◆ ⇒ Maintenance ; Booklet Kodiah

- Separate electrical plug connection -3-.
- Unscrew nuts -1- and remove oil level and oil temperature sender - G266- -4-.

Install

Installation is performed in the reverse order, pay attention to the following points:



Note

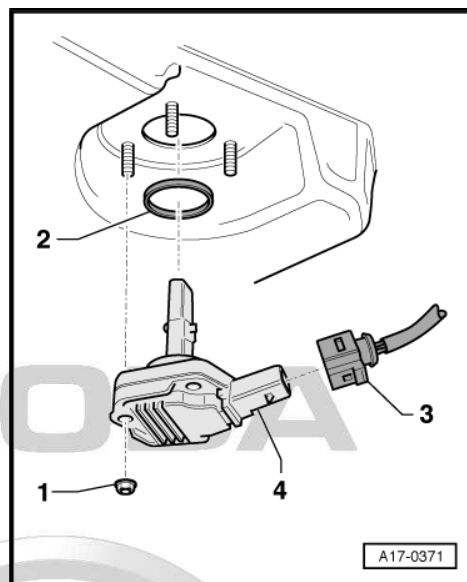
Replace the gasket ring -2-.

- Fill with engine oil and check the oil level:

- ◆ ⇒ Maintenance ; Booklet Superb III
- ◆ ⇒ Maintenance ; Booklet Kodiaq

Tightening torques

- ◆ Oil level and oil temperature sender - G266-
⇒ [“1.1 Assembly overview - sump/oil pump”, page 195](#) .



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2 Engine oil cooler

⇒ [“2.1 Summary of components - engine oil cooler”, page 207](#)

⇒ [“2.2 Removing and installing engine oil cooler”, page 207](#)

2.1 Summary of components - engine oil cooler

1 - Engine oil cooler

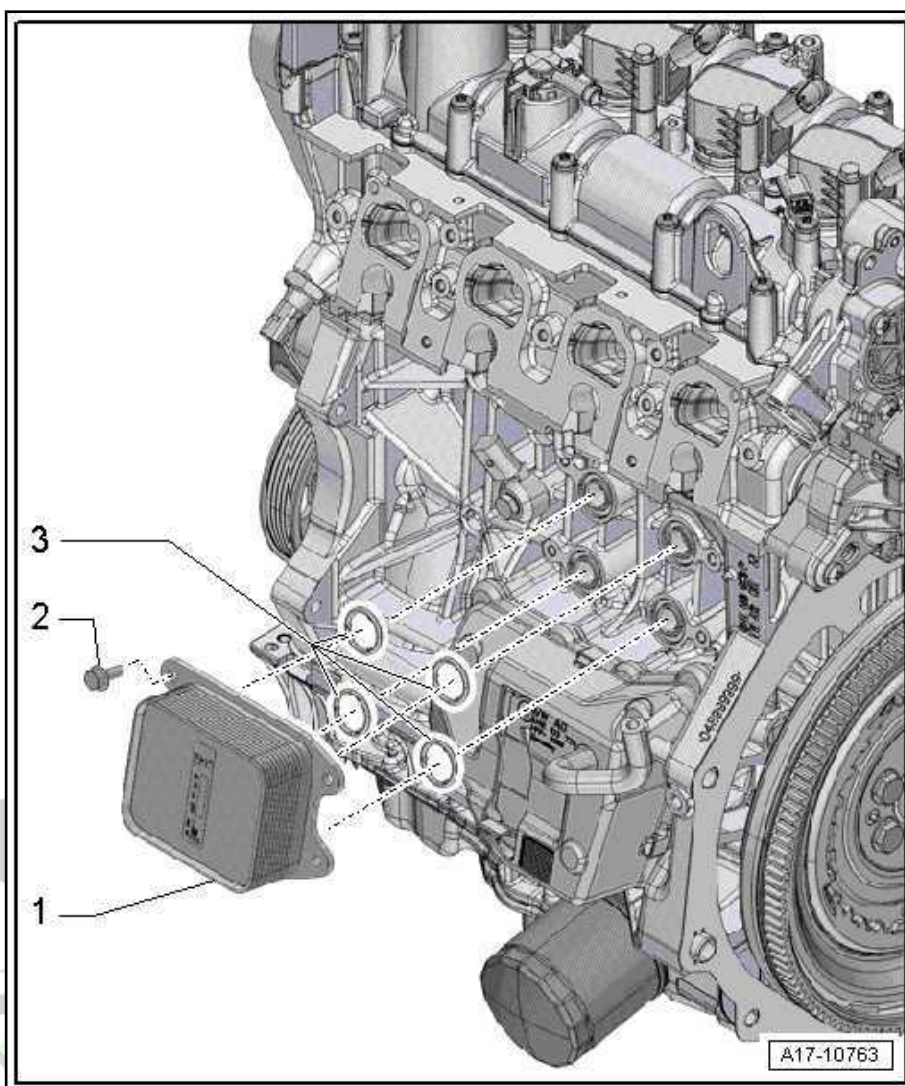
- ☐ removing and installing
⇒ [“2.2 Removing and installing engine oil cooler”, page 207](#)
- ☐ After replacing, also replace coolant

2 - Screw

- ☐ Replace after disassembly
- ☐ 8 Nm + 90°

3 - Gasket rings

- ☐ Replace after disassembly



2.2 Removing and installing engine oil cooler

Removing

- Drain coolant
⇒ [“1.3 Draining and filling up coolant”, page 225](#) .
- Removing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 305](#) .

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- Release screws -arrows- and remove engine oil cooler -1-.

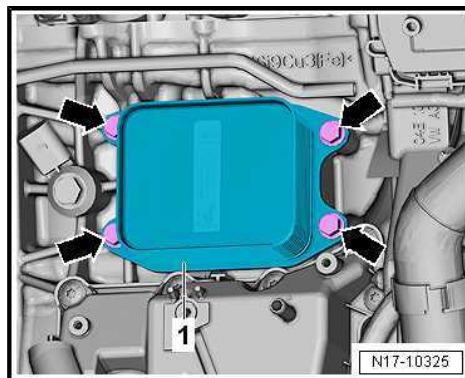
Install

Installation is performed in the reverse order, pay attention to the following points:

- Insert new O-rings.
- Installing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 305](#) .
- Top up coolant ⇒ [page 229](#) .

Tightening torques

- ◆ Engine oil cooler
⇒ [“2.1 Summary of components - engine oil cooler”, page 207](#) .



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3 Crankcase ventilation

⇒ [“3.1 Summary of components - crankcase ventilation”, page 209](#)

⇒ [“3.2 Removing and installing oil separator”, page 209](#)

3.1 Summary of components - crankcase ventilation

1 - Hose

- ☐ for crankcase ventilation

2 - Cover

- ☐ For oil separator

3 - Oil separator

- ☐ removing and installing
⇒ [“3.2 Removing and installing oil separator”, page 209](#)
- ☐ replace if damaged

4 - O-ring

- ☐ Replace after disassembly
- ☐ Moisten with oil before installing

5 - Connection fittings

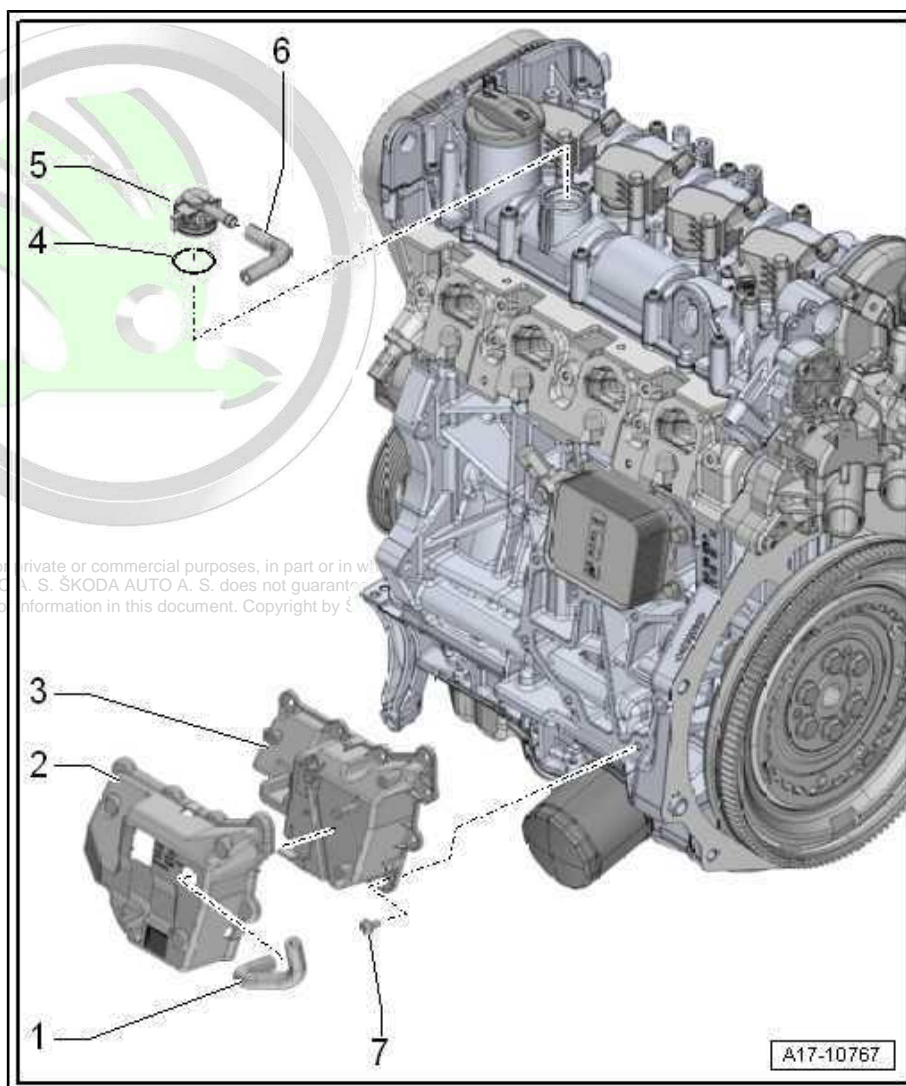
- ☐ Ensure proper positioning

6 - Hose

- ☐ for crankcase ventilation

7 - Screw

- ☐ Replace after disassembly
- ☐ order of tightening
⇒ [Fig. “Oil separator - tightening torque and tightening order””, page 212](#)
- ☐ 9 Nm



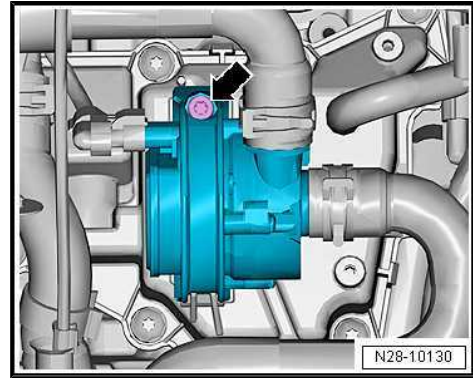
3.2 Removing and installing oil separator

Special tools and workshop equipment required

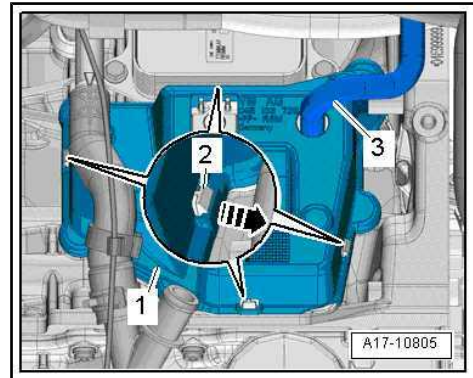
- ◆ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Silicone sealant ⇒ ETKA - Electronic catalogue of original parts
- ◆ Protective goggles and gloves
- ◆ 2 M6X20 mm bolts

Removing

- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Undo screw -arrow- and place charge air cooler pump - V188- to one side.



- Pull off hose -3- for crankcase ventilation.
- Unlock -1- oil separator cover at catches -2- -arrow- and remove.



- Loosen the screws in the sequence -9...1- and unscrew them.
- Loosen oil separator carefully from the bonding.

Install



NOTICE

Risk of contamination of the lubrication system.

- Cover open parts of the engine.

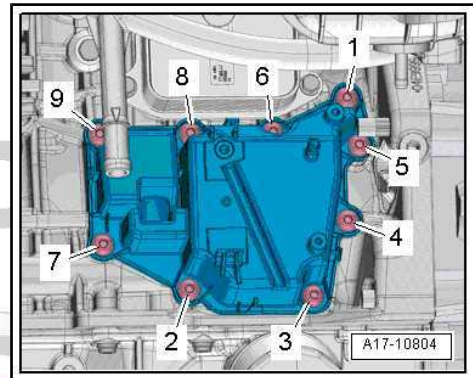


CAUTION

Risk of injury.

Wear safety gloves and safety goggles.

- Remove residual sealant on the cylinder head and on the oil trap using a chemical sealant remover.
- Degrease the sealing surfaces.



- Insert 2 M6X20 mm bolts a few revolutions into the holes -arrows-.



Note

Pay attention to the use by date on sealant.

- Cut off nozzle tube at the front marking (Ø of nozzle approx. 2 mm).



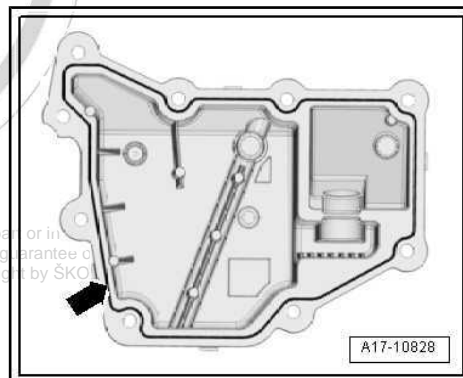
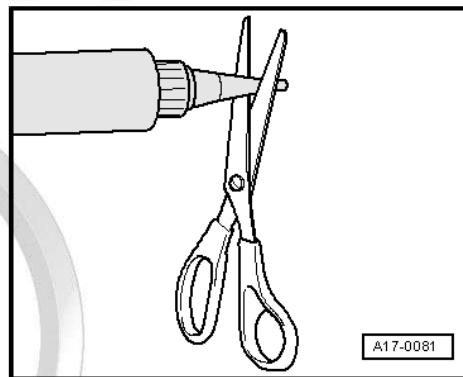
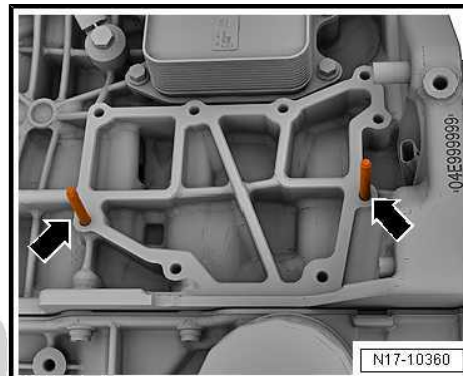
NOTICE

Risk of blockage of the lubrication system through excess sealant.

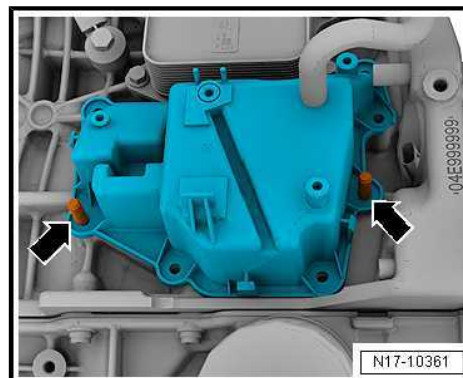
- Do not apply a thicker sealant bead than indicated.
- Apply sealant bead -arrow- onto the clean sealing surface of the oil separator, as shown in the illustration.
- Thickness of sealant bead: 2 mm

After applying the sealant, the oil separator must be installed within 5 minutes.

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- Insert oil trap onto the bolts -arrows- and place onto the crankcase.
- Insert the securing bolts and remove the 2 M6x20 mm bolts.
- Tighten locating screws.



Oil separator - tightening torque and tightening order

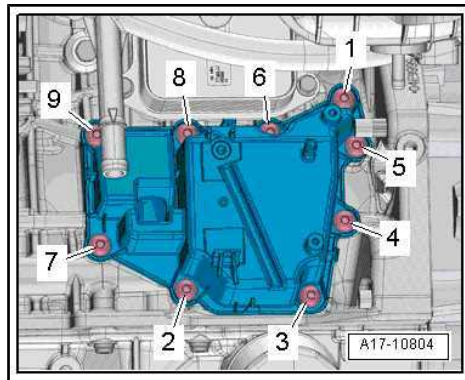
- Tighten screws in the sequence -1 ... 9-.

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

- Install the noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .

Tightening torques

- ◆ Charge air cooler pump - V188-
⇒ [“2.2 Summary of components - electric coolant pump”, page 233](#)
- ◆ Oil separator
⇒ [“3.1 Summary of components - crankcase ventilation”, page 209](#) .



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4 Oil filter, oil pressure switch

⇒ [“4.1 Summary of components - oil filter/oil pressure switch”, page 213](#)

⇒ [“4.2 Removing and installing oil pressure switch F1”, page 214](#)

⇒ [“4.3 Removing and installing oil pressure switch for reduced oil pressure F378”, page 215](#)

⇒ [“4.4 Checking oil pressure and oil pressure switch”, page 216](#)

⇒ [“4.5 Removing and installing oil filter housing”, page 218](#)

⇒ [“4.6 Removing and installing valve for oil pressure control N428”, page 219](#)

4.1 Summary of components - oil filter/oil pressure switch

1 - Oil filter

- ☐ pay attention to the notes ⇒ [page 195](#)
- ☐ Tighten loosened screw connector
⇒ [Fig. “Secure the oil filter screw connector”, page 199](#)
- ☐ removing and installing:

◆ ⇒ Maintenance ; Booklet Superb III

◆ ⇒ Maintenance ; Booklet Kodiaq

- ☐ 20 Nm

2 - Oil pressure switch for reduced oil pressure - F378-

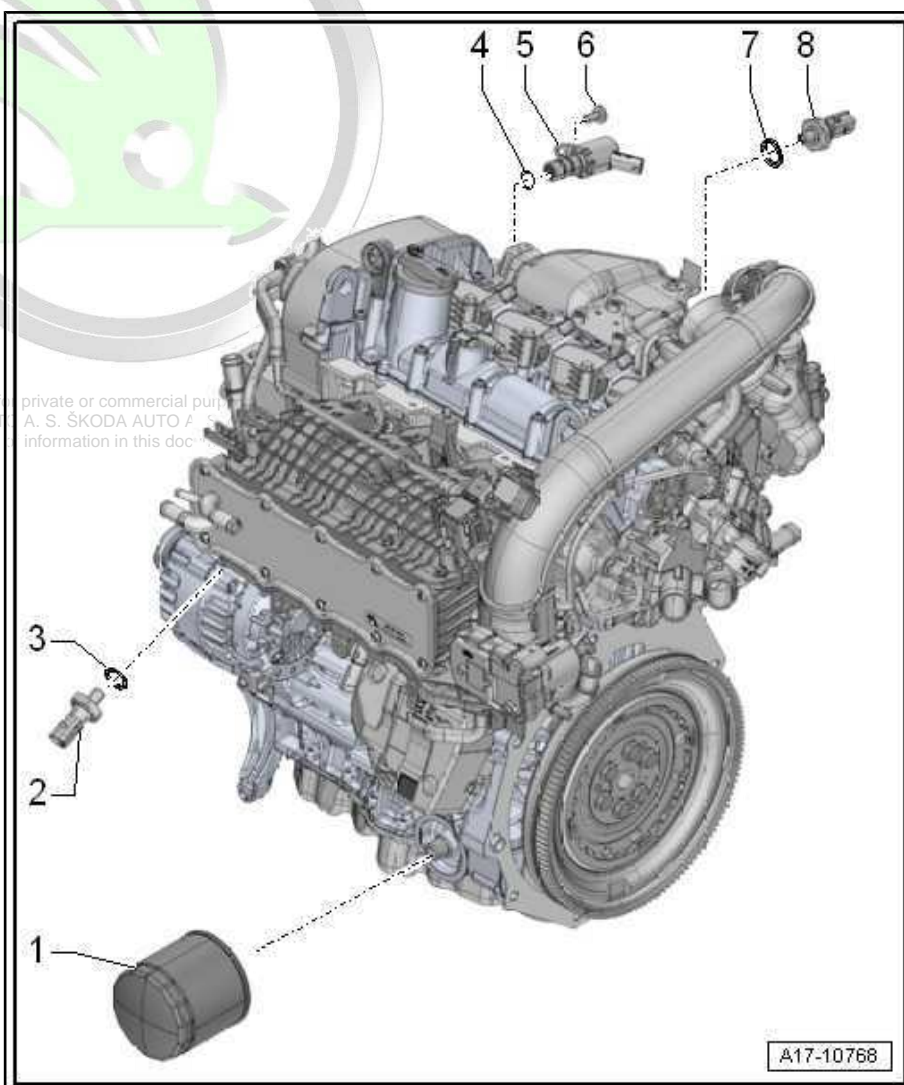
- ☐ Replace after disassembly
- ☐ Switching pressure 0.03 ... 0.06 MPa (0.3... 0.6 bar)
- ☐ check
⇒ [“4.4 Checking oil pressure and oil pressure switch”, page 216](#)
- ☐ removing and installing
⇒ [“4.3 Removing and installing oil pressure switch for reduced oil pressure F378”, page 215](#)
- ☐ 20 Nm

3 - Sealing ring

- ☐ is a component part of position -2-
- ☐ replace oil pressure switch if leaking

4 - O-ring

- ☐ Replace after disassembly



5 - Oil pressure control valve - N428-

- ☐ removing and installing

⇒ [“4.6 Removing and installing valve for oil pressure control N428 ”, page 219](#)

6 - Screw

- ☐ 8 Nm

7 - Sealing ring

- ☐ not available separately

8 - Oil pressure switch - F1-

- ☐ Replace after disassembly
- ☐ Switching pressure 0.215 ... 0.295 MPa (2.15 ... 2.95 bar)
- ☐ check ⇒ [“4.4 Checking oil pressure and oil pressure switch”, page 216](#)
- ☐ removing and installing ⇒ [“4.2 Removing and installing oil pressure switch F1 ”, page 214](#)
- ☐ 20 Nm

4.2 Removing and installing oil pressure switch - F1-

Special tools and workshop equipment required

- ◆ Flexible-head wrench SW 24 - T40175-

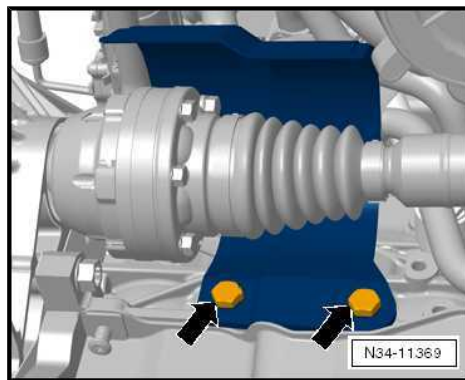
Removing



Note

Fit all heat protection sleeves on again in the same place when installing.

- Remove the sound dampening system ⇒ [General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation](#).
- Release screws -arrows- and remove heat shield for right car-dan shaft, if present.



- Disconnect plug connection -arrow-.
- Collect any engine oil which flows out with a cloth.
- Screw out oil pressure switch - F1- .

Install

Installation is performed in the reverse order, pay attention to the following points:



Note

- ◆ *Sealing ring not replaceable individually.*
- ◆ *Replace oil pressure switch if leaking.*
- To prevent oil loss, immediately insert a new oil pressure switch - F1- into the bore hole.
- Checking the oil level:
 - ◆ ⇒ Maintenance ; Booklet Superb III
 - ◆ ⇒ Maintenance ; Booklet Kodiaq

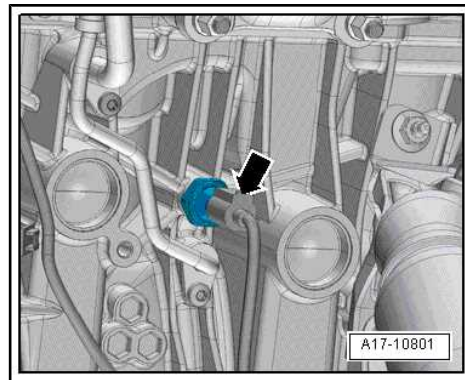
Tightening torques

- ◆ Oil pressure switch - F1-
⇒ ["4.1 Summary of components - oil filter/oil pressure switch", page 213](#) .
- ◆ Cardan shaft guard ⇒ Chassis, axles, steering; Rep. gr. 40 ; Cardan shaft; Removing and installing cardan shaft.

4.3 Removing and installing oil pressure switch for reduced oil pressure - F378-

Special tools and workshop equipment required

- ◆ Flexible-head wrench SW 24 - T40175-



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Removing

- Pull solenoid valve 1 for activated charcoal filter - N80- -3- off the intake manifold and press downwards slightly.
- Separate electrical plug connection -2-.



Note

Place a cloth below to absorb leaking engine oil.

- Unscrew the oil pressure switch for reduced oil pressure - F378- -1-.

Install

Installation is performed in the reverse order, pay attention to the following points:



Note

- ♦ *Sealing ring not replaceable individually.*
- ♦ *Replace oil pressure switch if leaking.*
- Screw in new oil pressure switch for reduced oil pressure - F378- immediately into the bore in order to avoid loss of oil.
- Checking the oil level:
 - ♦ ⇒ Maintenance ; Booklet Superb III
 - ♦ ⇒ Maintenance ; Booklet Kodiaq

Tightening torques

- ♦ Oil pressure switch for reduced oil pressure - F378-
⇒ [“4.1 Summary of components - oil filter/oil pressure switch”, page 213](#).

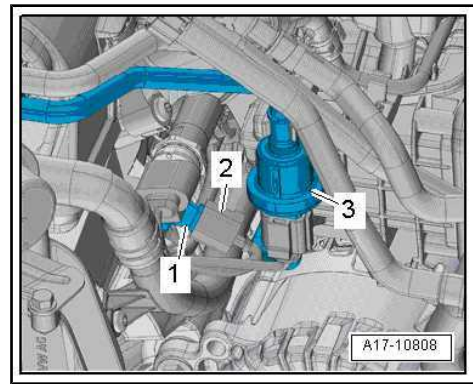
4.4 Checking oil pressure and oil pressure switch

Special tools and workshop equipment required

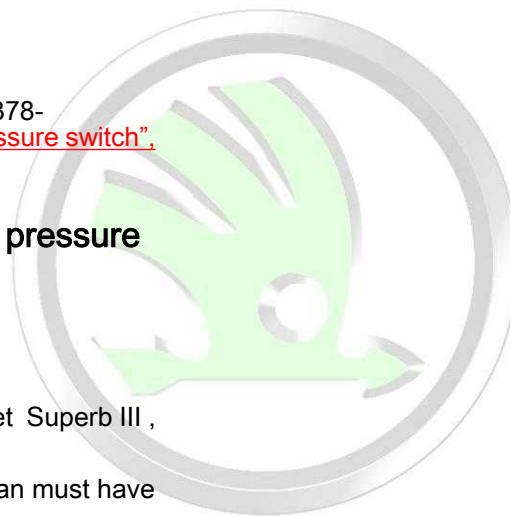
- ♦ Oil pressure tester - V.A.G 1342-
- Engine oil level OK, test ⇒ Maintenance ; Booklet Superb III ,
⇒ Maintenance ; Booklet Kodiaq .
- Engine oil temperature at least 80 °C (radiator fan must have run once).
- Remove oil pressure switch for reduced oil pressure - F378-
⇒ [“4.3 Removing and installing oil pressure switch for reduced oil pressure F378”, page 215](#) .
- Screw oil pressure switch tester - V.A.G 1342- onto the oil pressure switch bore.
- Screw oil pressure switch for reduced oil pressure - F378- into the oil pressure tester - V.A.G 1342- bore to close it.
- Start engine.

Check oil pressure when idling and at a speed of 2000/min

- Oil pressure in idle: min. 0.06 MPa (0.6 bar)
- Oil pressure at 2000 rpm: min. 0.15 MPa (1.5 bar)



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- Switch off engine.

Check oil pressure at a speed of 3800/min

- Disconnect the plug connection for valve for oil pressure control - N428-
⇒ [“4.6 Removing and installing valve for oil pressure control N428”, page 219](#) .
- Start engine.
- Oil pressure at 3800 rpm: min. 0.28 MPa (2.8 bar)

If the specification is not attained:

- Connect the plug connection for valve for oil pressure control - N428-
⇒ [“4.6 Removing and installing valve for oil pressure control N428”, page 219](#) .
- Querying and erasing event memory of engine control unit
⇒ Vehicle diagnostic tester.
- Check oil pressure control valve - N428- ⇒ Vehicle diagnostic tester.



Note

Mechanical damage such as a worn bearing may also be the cause of oil pressure that is too low.

If no fault is found:

- Replace oil pump
⇒ [“1.5 Removing and installing oil pump”, page 204](#) .

Oil pressure switch for reduced oil pressure - F378- .

- Switch off engine.

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- Connect brown wire of tester to earth (-).
- Connect the voltage tester - V.A.G 1527 B- with adapter cables from measuring tool set - V.A.G 1594 C- to the plus pole on the battery (+) and oil pressure switch for reduced oil pressure - F378- (green).
- The LED must not light up.
- If the LED is illuminated, replace the oil pressure switch for reduced oil pressure - F378- .

If the LED does not light up:

- Start the engine: At a pressure of 0.03...0.06 MPa (0.3...0.6 bar) the LED must light up, otherwise replace the oil pressure switch.

Test oil pressure switch - F1-

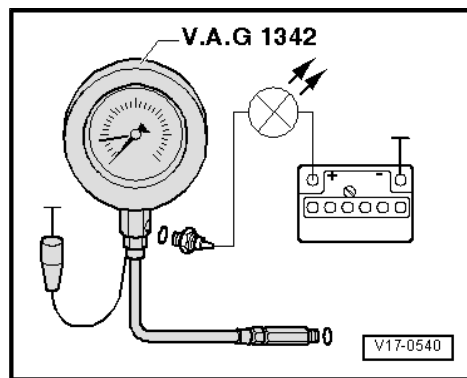
- Switch off engine.
- Connect voltage tester - V.A.G 1527B- with auxiliary cables from auxiliary measuring set - V.A.G 1594 C- to battery positive (+) and oil pressure switch - F1- (blue).
- The LED must not light up.
- If the LED lights up, replace the oil pressure switch - F1- .

If the LED does not light up:

- Disconnect the plug connection for valve for oil pressure control - N428-
⇒ [“4.6 Removing and installing valve for oil pressure control N428”, page 219](#) .
- Start engine and increase engine speed: At a pressure of 0.215...0.295 MPa (2.15...2.95 bar) the LED must light up, otherwise replace the oil pressure switch.
- Connect the plug connection for valve for oil pressure control - N428-
⇒ [“4.6 Removing and installing valve for oil pressure control N428”, page 219](#) .
- Install oil pressure switch for reduced oil pressure - F378-
⇒ [“4.3 Removing and installing oil pressure switch for reduced oil pressure F378”, page 215](#) .

Tightening torques

- ◆ Oil pressure switch - F1-
⇒ [“4.1 Summary of components - oil filter/oil pressure switch”, page 213](#) .
- ◆ Oil pressure switch for reduced oil pressure - F378-
⇒ [“4.1 Summary of components - oil filter/oil pressure switch”, page 213](#) .



4.5 Removing and installing oil filter housing

Special tools and workshop equipment required

- ◆ Oil filter tool - 3417-

Removing

- Drain engine oil:
- ◆ ⇒ Maintenance ; Booklet Superb III
- ◆ ⇒ Maintenance ; Booklet Kodiaq

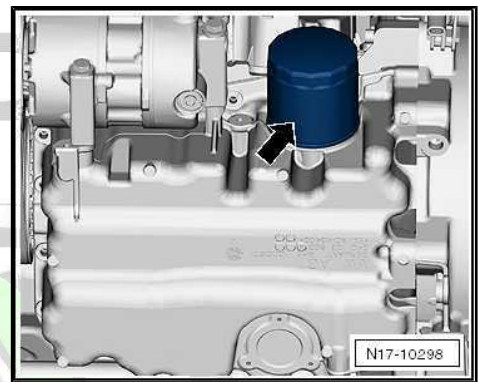
- Remove oil filter -arrow- with oil filter tool - 3417- .

Install

- Lightly lubricate gasket ring with clean engine oil.
- Tighten oil filter with oil filter wrench - 3417- .
- Top up with engine oil:
- ♦ ⇒ Maintenance ; Booklet Superb III
- ♦ ⇒ Maintenance ; Booklet Kodiaq

Tightening torques

- ♦ Oil filter
⇒ [“1.1 Assembly overview - sump/oil pump”, page 195](#) .



4.6 Removing and installing valve for oil pressure control - N428-

Removing



Note

Fit all heat protection sleeves on again in the same place when installing.

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- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Remove heat protection sleeves.
- Separate electrical plug connection -1-.



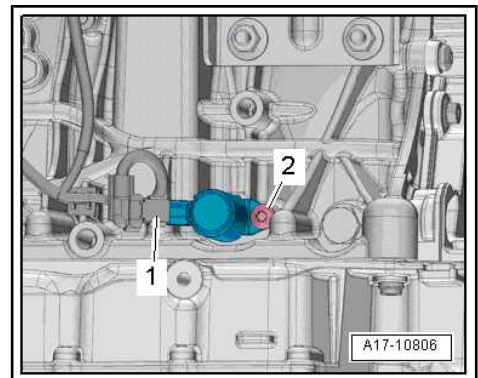
Note

Place a cloth below to absorb leaking engine oil.

- Remove screw -2- and remove oil pressure control valve - N428- .

Install

Installation is performed in the reverse order, pay attention to the following points:



Note

Replace O-ring.

- Install the noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .

Tightening torques

- ♦ Oil pressure control valve - N428-
⇒ [“4.1 Summary of components - oil filter/oil pressure switch”, page 213](#) .

1 Cooling system, coolant

⇒ [“1.1 Connection diagram - coolant hoses”, page 220](#)

⇒ [“1.2 Checking the coolant system for leaktightness”, page 221](#)

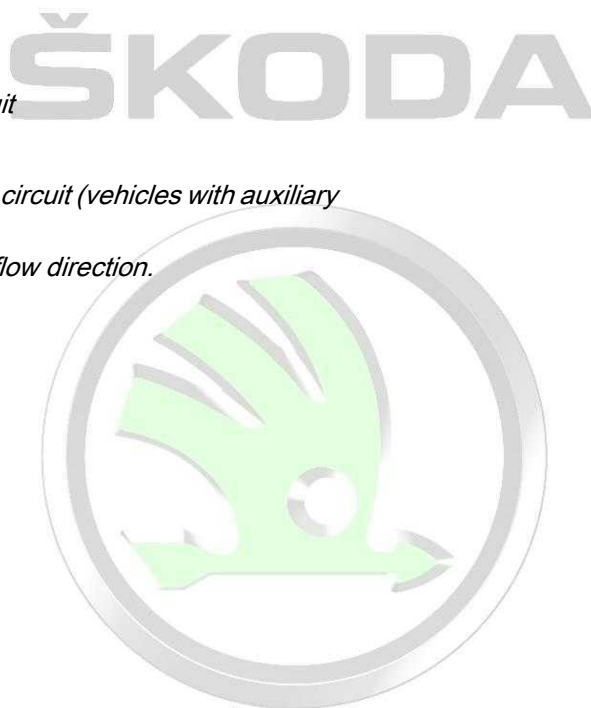
⇒ [“1.3 Draining and filling up coolant”, page 225](#)

1.1 Connection diagram - coolant hoses



Note

- ◆ *Blue = large coolant circuit.*
- ◆ *Green = charge-air coolant circuit*
- ◆ *Red = small coolant circuit.*
- ◆ *brown= auxiliary heating coolant circuit (vehicles with auxiliary heating only)*
- ◆ *The arrows point in the coolant flow direction.*



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1 - Coolant expansion tank

2 - Screw cap

- ☐ for coolant expansion tank
- ☐ Check pressure relief valve ⇒ [page 225](#)

3 - Cylinder head and cylinder block

- ☐ After replacing, also replace coolant

4 - Engine preheating heater element - Z97-

- ☐ not fitted

5 - Exhaust gas turbocharger

6 - Integrated exhaust manifold

7 - Heat exchanger for heating

- ☐ After replacing, also replace coolant

8 - Coolant temperature sender - G62-

9 - Coolant pump

- ☐ with thermostat housing

10 - Engine oil cooler

11 - Coolant temperature sender at radiator outlet - G83-

12 - Coolant radiator

- ☐ After replacing, also replace coolant

13 - Charge air cooler pump - V188-

- ☐ removing and installing ⇒ [“2.4 Removing and installing electric coolant pump”, page 234](#)

14 - Cooler for charge air circuit

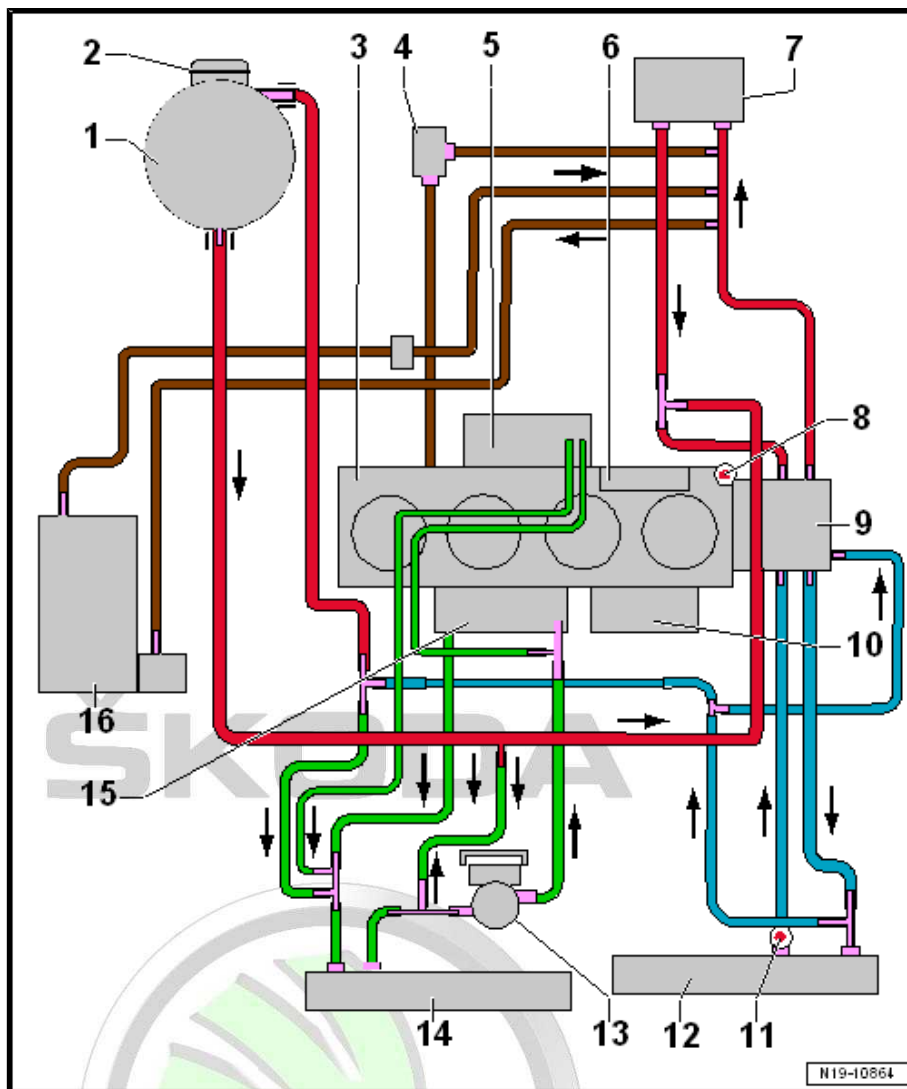
- ☐ After replacing, also replace coolant

15 - Charge-air cooler in intake manifold

- ☐ After replacing, also replace coolant

16 - Auxiliary heating

- ☐ for vehicles with auxiliary heating only



1.2 Checking the coolant system for leak-tightness

⇒ [“1.2.1 Inspecting coolant system for leaktightness, with cooling system testing device V.A.G 1274”, page 221](#)

⇒ [“1.2.2 Inspecting coolant system for leaktightness, with cooling system testing device V.A.G 1274 B”, page 223](#)

1.2.1 Inspecting coolant system for leaktightness, with cooling system testing device - V.A.G 1274-

Special tools and workshop equipment required

- ◆ Cooling system testing device , e.g. -V.A.G 1274-
- ◆ Adapter for cooling system testing device , e.g. -V.A.G 1274/8-
- ◆ Adapter for cooling system testing device , e.g. -V.A.G 1274/9-

Test condition

- Engine must be warm.

CAUTION

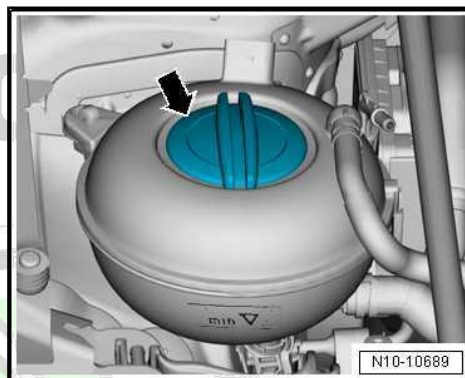
Risk of injury due to hot steams.

Wear safety goggles, safety gloves and safety clothing.

When the engine is warm, the cooling system is under overpressure.

Hot steam may escape when the compensation bottle is opened.

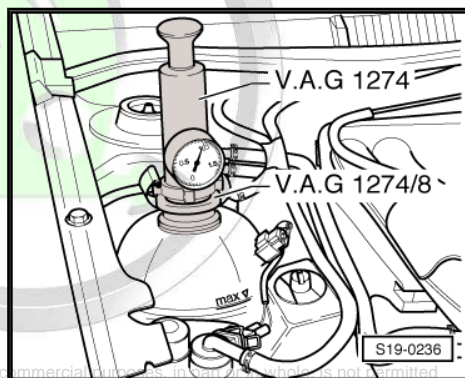
- Cover the cap -arrow- of the coolant expansion tank with a cloth and open carefully.



- Position the cooling system testing device - V.A.G 1274- with adapter - V.A.G 1274/8 - on the coolant expansion reservoir.
- Using the hand pump of the testing device generate an overpressure of approx. 0.15 MPa (1.5 bar).
- The pressure must not drop below 0.02 MPa (0.2 bar) after 10 minutes.

If the pressure falls below 0.02 MPa (0.2 bar):

- Search position of the leak and repair fault.



Note

- ◆ *A fall in pressure of 0.02 MPa (0.2 bar) within 10 minutes is caused by cooling of the coolant.*
- ◆ *The colder the engine, the lower the pressure loss.*

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Testing the pressure relief valve in the cap

- Screw the screw cap into the adapter for cooling system testing device - V.A.G 1274/9- .
- Build up overpressure using hand pump on cooling system testing device - V.A.G 1274- .

Blue filler cap:

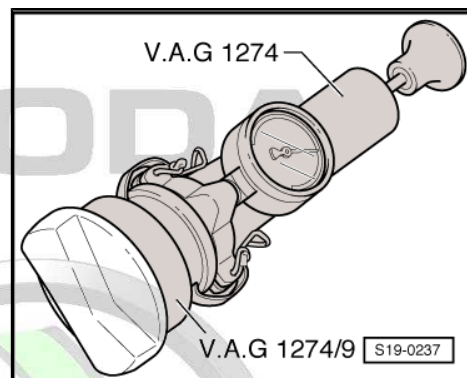
- ◆ The pressure relief valve must open at 0.14... 0.16 MPa (1.4 ... 1.6 bar).

Black filler cap:

- ◆ The pressure relief valve must open at 0.16... 0.18 MPa (1.6 ... 1.8 bar).

If the pressure relief valve opens too early or too late:

- Renew cap.



1.2.2 Inspecting coolant system for leaktightness, with cooling system testing device - V.A.G 1274 B-

Special tools and workshop equipment required

- ◆ Cooling system testing device , e.g. -V.A.G 1274 B-
- ◆ Adapter for cooling system testing device , e.g. -V.A.G 1274/8-
- ◆ Adapter for cooling system testing device , e.g. -V.A.G 1274/9-



Note

To ensure that the leaktightness test can be carried out correctly, first carry out the test (self-test) of the cooling system testing device - V.A.G 1274 B- .

Test (self-test) of the cooling system testing device - V.A.G 1274 B-

- Use the cooling system testing device - V.A.G 1274 B- to build up the pressure to 0.3 MPa (3.0 bar).
- Monitor the pressure on the pressure manometer of the cooling system testing device - V.A.G 1274 B- 30 seconds long.

Pressure is not established or the pressure drops:

The cooling system testing device - V.A.G 1274 B- is not OK and cannot be used for the test.

Pressure is built up and does not drop:

The cooling system testing device - V.A.G 1274 B- is OK and can be used for the test.

Checking the coolant system for leaktightness

- Engine must be warm.

CAUTION

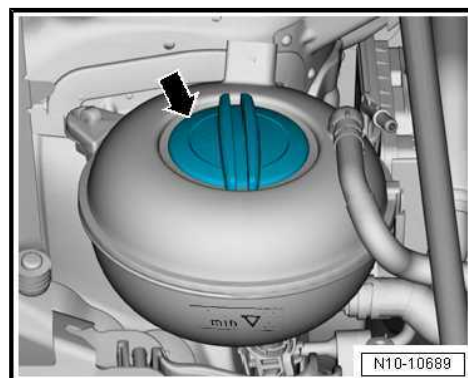
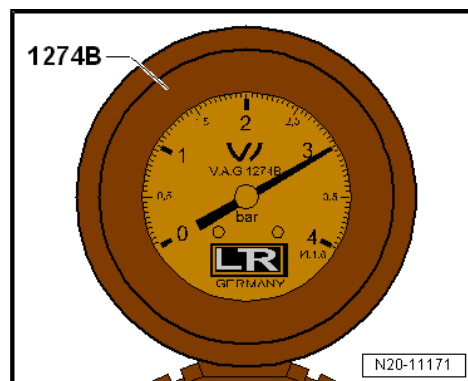
Risk of injury due to hot steams.

Wear safety goggles, safety gloves and safety clothing.

When the engine is warm, the cooling system is under overpressure.

Hot steam may escape when the compensation bottle is opened.

- Cover the cap -arrow- of the coolant expansion tank with a cloth and open carefully.



- Screw the adapter for cooling system testing device - V.A.G 1274/8- into the coolant expansion bottle.
- Build up a pressure of approximately 0.15 MPa (1.5 bar) using hand pump on cooling system testing device - V.A.G 1274 B- .
- The pressure must not drop below 0.02 MPa (0.2 bar) after 10 minutes.

If the pressure falls below 0.02 MPa (0.2 bar):

- Search position of the leak and repair fault.



Note

- ◆ A fall in pressure of 0.02 MPa (0.2 bar) within 10 minutes is caused by cooling of the coolant.
- ◆ The colder the engine, the lower the pressure loss.



CAUTION

Risk of injury due to hot steams.

Wear safety goggles, safety gloves and safety clothing.

- ◆ Before the cooling system testing device - V.A.G 1274 B- is separated from the connecting hose or the connecting piece V.A.G 1274 B/1- , the existing pressure must absolutely be released.
- ◆ For this step, press the pressure relief valve on the cooling system testing device - V.A.G 1274 B- until the pressure gauge indicates the value »0«.

Check pressure relief valve in cap.

- Screw the screw cap into the adapter for cooling system testing device - V.A.G 1274/9- .
- Build up overpressure using hand pump on cooling system testing device - V.A.G 1274 B- .

Blue filler cap:

- ◆ The pressure relief valve must open at 0.14... 0.16 MPa (1.4 ... 1.6 bar).

Black filler cap:

- ◆ The pressure relief valve must open at 0.16... 0.18 MPa (1.6 ... 1.8 bar).

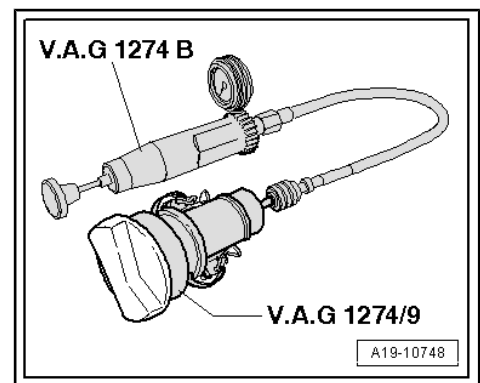
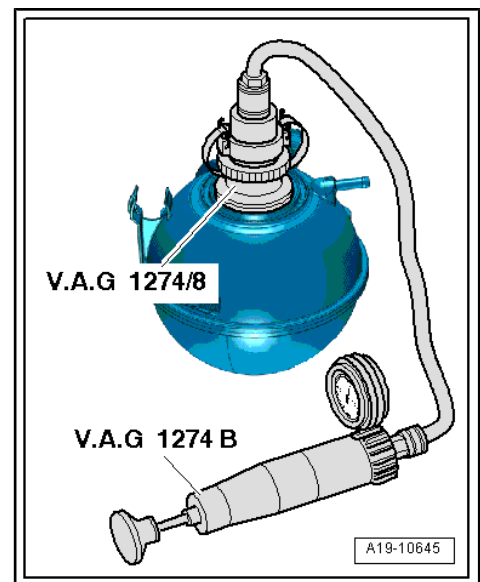
If the pressure relief valve opens too early or too late:

- Renew cap.

1.3 Draining and filling up coolant

Special tools and workshop equipment required

- ◆ Refractometer
- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Pliers for spring strap clamps
- ◆ Cooling system charge unit e.g. -VAS 6096-
- ◆ Adapter for cooling system testing device , e.g. -V.A.G 1274/8-
- ◆ Protective goggles and gloves



The drained coolant must not be re-used.

- ◆ Collect and dispose of drained coolant in a container.
- ◆ Observe the disposal instructions.

Draining

⚠ CAUTION

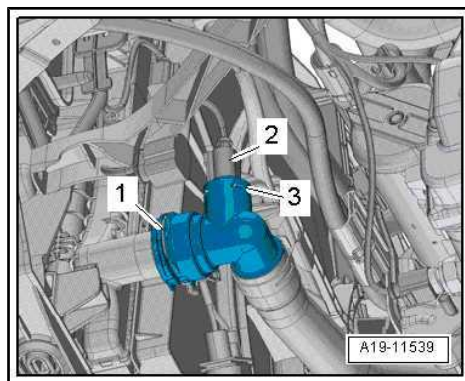
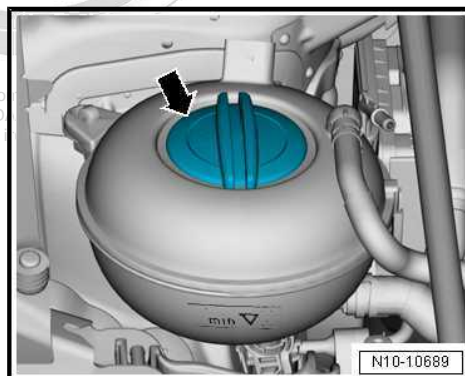
Risk of injury due to hot steams.

Wear safety goggles, safety gloves and safety clothing.

When the engine is warm, the cooling system is under overpressure.

Hot steam may escape when the compensation bottle is opened.

- Cover the cap -arrow- of the coolant expansion tank with a cloth and open carefully.
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Place catch pan - VAS 6208- underneath.
- Disconnect plug connection -2- on the coolant temperature sender at radiator outlet - G83- -3-.
- Raise holding clamp -1-, remove bottom left coolant hose from radiator, allow coolant to drain.



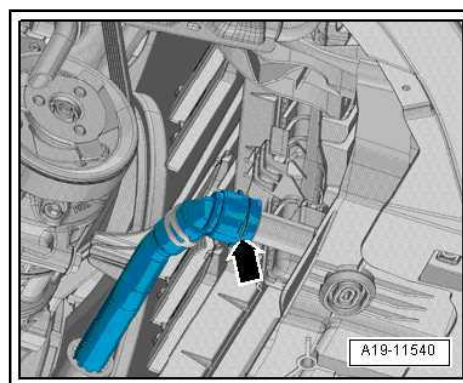
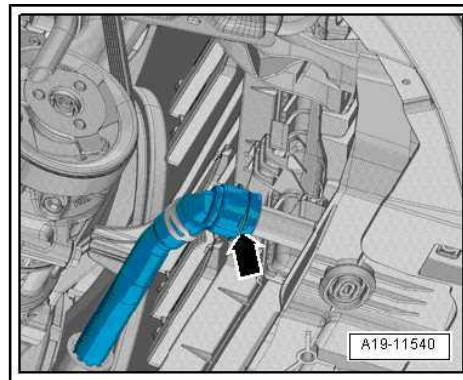
- Raise holding clamp -arrow-, remove bottom right coolant hose from radiator, allow coolant to drain.

Filling up

The drained coolant must not be re-used.

Select the appropriate coolant additive from the ⇒ ETKA - Electronic catalogue of original parts .

- In a clean reservoir, mix distilled water and coolant additive in the specified mixing ratio:
- ◆ ⇒ Maintenance ; Booklet Superb III
- ◆ ⇒ Maintenance ; Booklet Kodiaq
- Connect coolant hose with quick coupling to radiator bottom left
⇒ Fig. ““Connect coolant hose with quick coupling”“, page 253 .
- Connect coolant hose bottom right to radiator -arrow-.



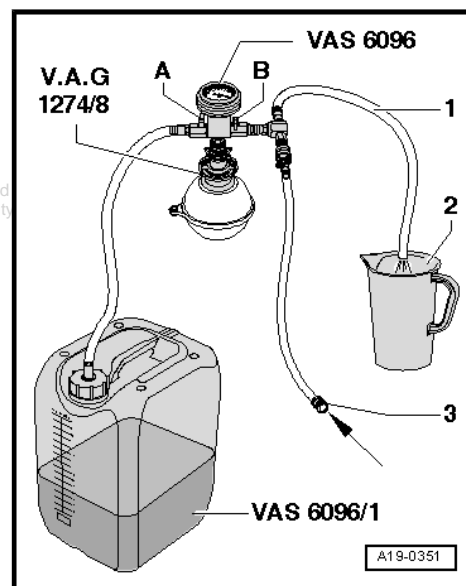
- Fill up the coolant reservoir -VAS 6096- with at least 10 litres of pre-mixed coolant mixed to the correct ratio ⇒ Maintenance ; Booklet Superb III , ⇒ Maintenance ; Booklet Kodiaq .
- For example, screw the adapter for cooling system testing device - V.A.G 1274/8- to the coolant expansion tank.
- Connect the cooling system charge unit - VAS 6096- with the adapter -V.A.G 1274/8- .
- Lead the air hose -1- into a small container -2-.



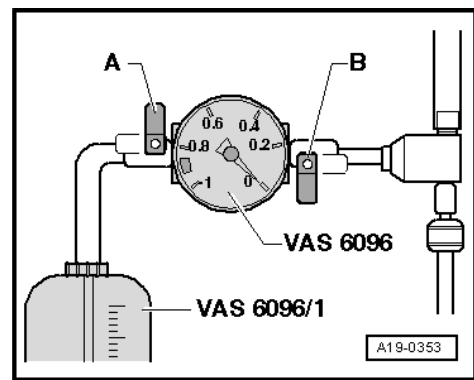
Note

A small amount of coolant, which is entrained with the exhaust air, must be collected.

- Close the valves -A- and -B-, while doing so turn the lever at right angles to the direction of flow.
- Connect hose -3- to compressed air.
- Pressure: 0.6 -1 MPa (6...10 bar) overpressure.



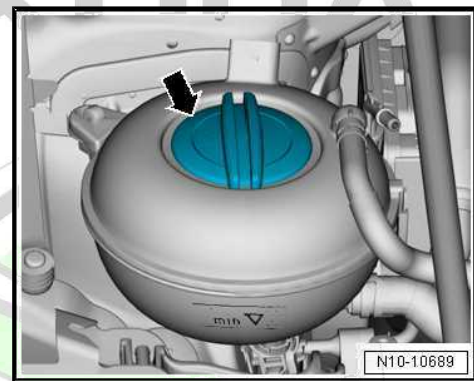
- Open the valve -B-, while doing so turn the lever in the direction of flow.
- Vacuum is generated in the cooling system by the suction jet pump. The display instrument pointer must be in the green area.
- In addition, briefly open the valve -A- by turning the lever in the direction of flow, so that the hose of the coolant expansion bottle of the -VAS 6096- is filled with coolant.
- Close the valve -A- again.
- Leave the valve -B- open a further 2 minutes.
- A vacuum pump is created in the cooling system by the vacuum pump; the display instrument pointer must remain in the green area.
- Close the valve -B-.
- The display instrument pointer must remain unaffected in the green area. The vacuum in the cooling system is now sufficient for subsequent filling.



If the pointer is below the green area, repeat the process.

If the vacuum drops, check the cooling system for leak points.

- Disconnect pneumatic hose.
- Open valve -A-.
- The vacuum pump in the cooling system draws the coolant out of the coolant reservoir -VAS 6096- and fills the cooling system.
- Remove the cooling system charge unit - VAS 6096- from the coolant expansion tank.
- Fill up coolant to “Max” marking.
- Install the noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Set temperature to “HI”.
- Switch off AC compressor. Press **AC** button to do so.
- The LED in the button must not illuminate.
- Start engine and run for not more than 2 minutes at 1500 rpm.
- With the engine running, fill coolant up to the overflow hole on the coolant expansion tank.
- Tighten cap for coolant expansion tank tighten until it clicks into place.
- Run engine at idling speed until the two large coolant hoses at the radiator are hot.
- Switch off engine and allow it to cool down.

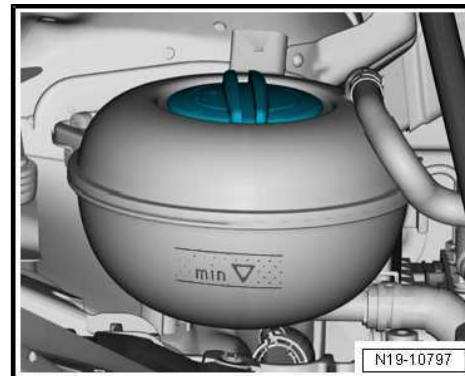
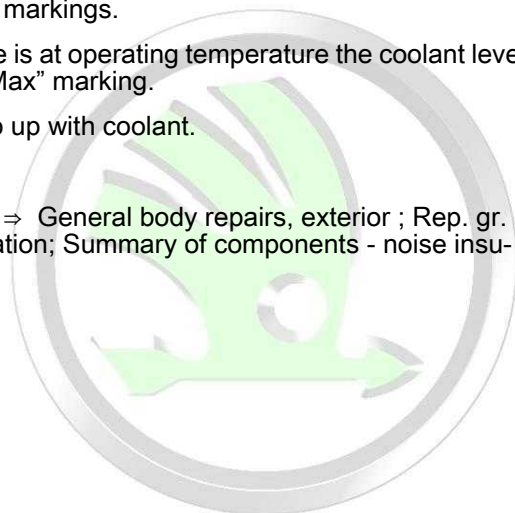


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- Check coolant level.
- If the engine is cold the coolant level must be between the “Min” and “Max” markings.
- When the engine is at operating temperature the coolant level may be at the “Max” marking.
- If necessary, top up with coolant.

Tightening torques

- ◆ Noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation.



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2 Coolant pump, regulation of cooling system

⇒ "2.1 Summary of components - coolant pump/thermostat", page 230

⇒ "2.2 Summary of components - electric coolant pump", page 233

⇒ "2.3 Summary of components - coolant temperature sender", page 234

⇒ "2.4 Removing and installing electric coolant pump", page 234

⇒ "2.5 Removing and installing coolant pump", page 235

⇒ "2.6 Removing and installing thermostat", page 239

⇒ "2.7 Removing and installing toothed belt pulley for coolant pump", page 242

⇒ "2.8 Removing and installing coolant temperature sender G62", page 246

⇒ "2.9 Removing and installing coolant temperature sender at radiator outlet G83", page 247

2.1 Summary of components - coolant pump/thermostat

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1 - Thermostat housing

- ☐ removing and installing
⇒ [“2.6.2 Removing and installing thermostat for large coolant circuit”, page 241](#)
- ☐ Observe tightening sequence when tightening to coolant pump
⇒ [“2.5 Removing and installing coolant pump”, page 235](#).

2 - Thermostat

- ☐ For large coolant circuit
- ☐ Start opening at approx. 105°C
- ☐ different versions ⇒ Electronic Catalogue of Original Parts“ETKA”
- ☐ removing and installing
⇒ [“2.6.2 Removing and installing thermostat for large coolant circuit”, page 241](#)

3 - Gasket

- ☐ Replace after disassembly
- ☐ Observe proper seating of gasket
- ☐ before installing, slightly moisten with coolant

4 - Coolant pump

- ☐ removing and installing
⇒ [“2.5 Removing and installing coolant pump”, page 235](#)

- ☐ Replace toothed belt Pos. -10- when replacing coolant pump

5 - Screw

- ☐ order of tightening
⇒ [Fig. “Tightening sequence for thermostat housing to coolant pump - tightening torque and tightening sequence”, page 232](#)
- ☐ 8 Nm

6 - Gasket

- ☐ Replace after disassembly
- ☐ Observe proper seating of gasket
- ☐ before installing, slightly moisten with coolant

7 - Toothed belt guard

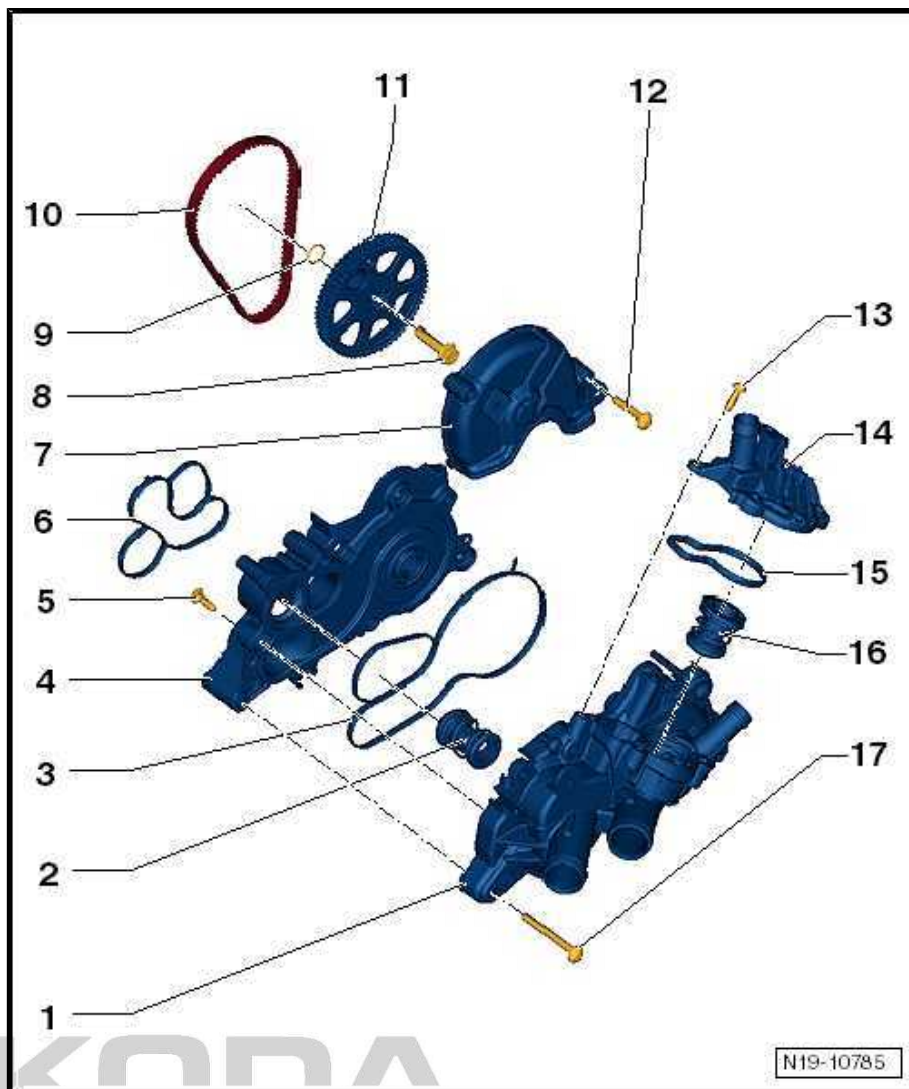
- ☐ For coolant pump toothed belt

8 - Screw

- ☐ Replace after disassembly
- ☐ 20 Nm + 90°

9 - O-ring

- ☐ Replace after disassembly
- ☐ Only fitted for engine identification characters CZE*
- ☐ removing and installing ⇒ [page 242](#)



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10 - Toothed belt

- ☐ For coolant pump drive
- ☐ Replace after disassembly
- ☐ removing and installing ⇒ [“2.5 Removing and installing coolant pump”, page 235](#)

11 - Toothed belt pulley

- ☐ For coolant pump drive
- ☐ removing and installing
⇒ [“2.7 Removing and installing toothed belt pulley for coolant pump”, page 242](#)

12 - Screw

- ☐ 8 Nm

13 - Screw

- ☐ order of tightening
⇒ [Fig. “Tightening sequence for thermostat cover to the thermostat housing - Tightening torque””, page 233](#)

14 - Cover

- ☐ for thermostat

15 - Gasket

- ☐ Replace after disassembly
- ☐ before installing, slightly moisten with coolant

16 - Thermostat

- ☐ For small coolant circuit
- ☐ Start of opening approx. 87 °C
- ☐ removing and installing
⇒ [“2.6.1 Removing and installing thermostat for small coolant circuit”, page 239](#)
- ☐ Fitting position ⇒ [Fig. “Installation position of thermostat for small coolant circuit””, page 232](#)

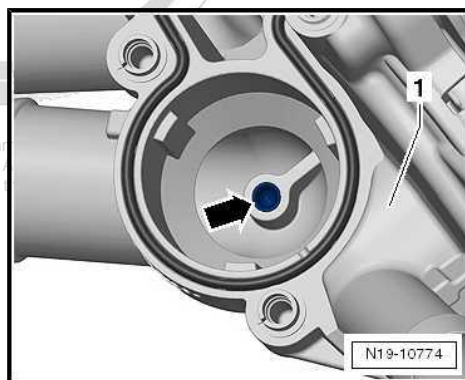
17 - Screw

- ☐ Tightening torque and tightening order ⇒ [page 238](#)

Installation position of thermostat for small coolant circuit

- Must be fitted with the centring pin into guide -arrow- on thermostat housing.

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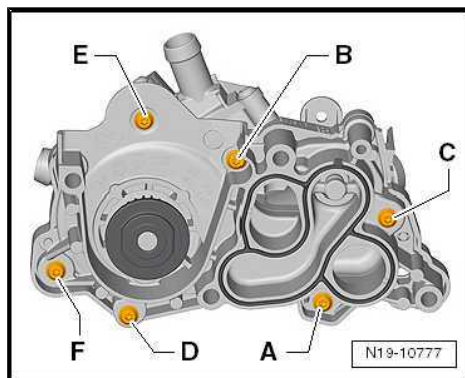
Tightening sequence for thermostat housing to coolant pump - tightening torque and tightening sequence



Note

Self-cutting screws must be positioned by hand in such a way that they find the old thread turn. Then tighten the screw to torque.

- Tighten screws in the sequence -A...F- to 8 Nm.



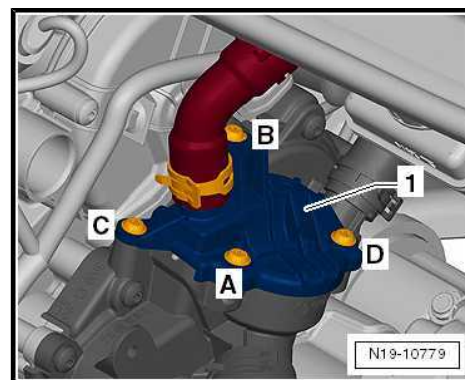
Tightening sequence for thermostat cover to the thermostat housing - Tightening torque



Note

Self-cutting screws must be positioned by hand in such a way that they find the old thread turn. Then tighten the screw to torque.

- Tighten cover screws -1- in the sequence -A...D- to 8 Nm.



2.2 Summary of components - electric coolant pump

1 - Charge air cooler pump - V188-

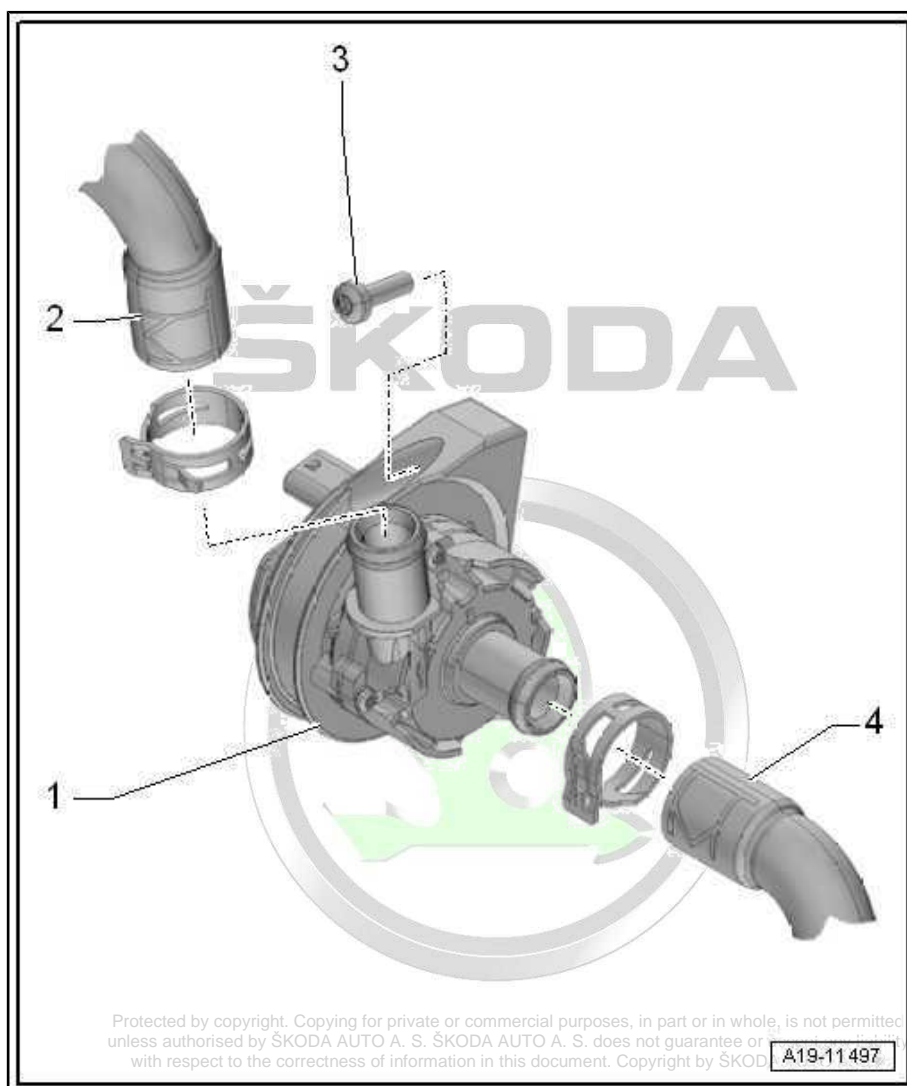
- ☐ With holder
- ☐ removing and installing
⇒ ["2.4 Removing and installing electric coolant pump"](#), page 234

2 - Coolant hose

3 - Screw

- ☐ 8 Nm

4 - Coolant hose



2.3 Summary of components - coolant temperature sender

1 - O-ring

- ❑ Replace after disassembly

2 - Coolant temperature sender at radiator outlet - G83-

- ❑ removing and installing
⇒ ["2.9 Removing and installing coolant temperature sender at radiator outlet G83"](#),
[page 247](#)

3 - Support ring

4 - O-ring

- ❑ Replace after disassembly

5 - Coolant temperature sender - G62-

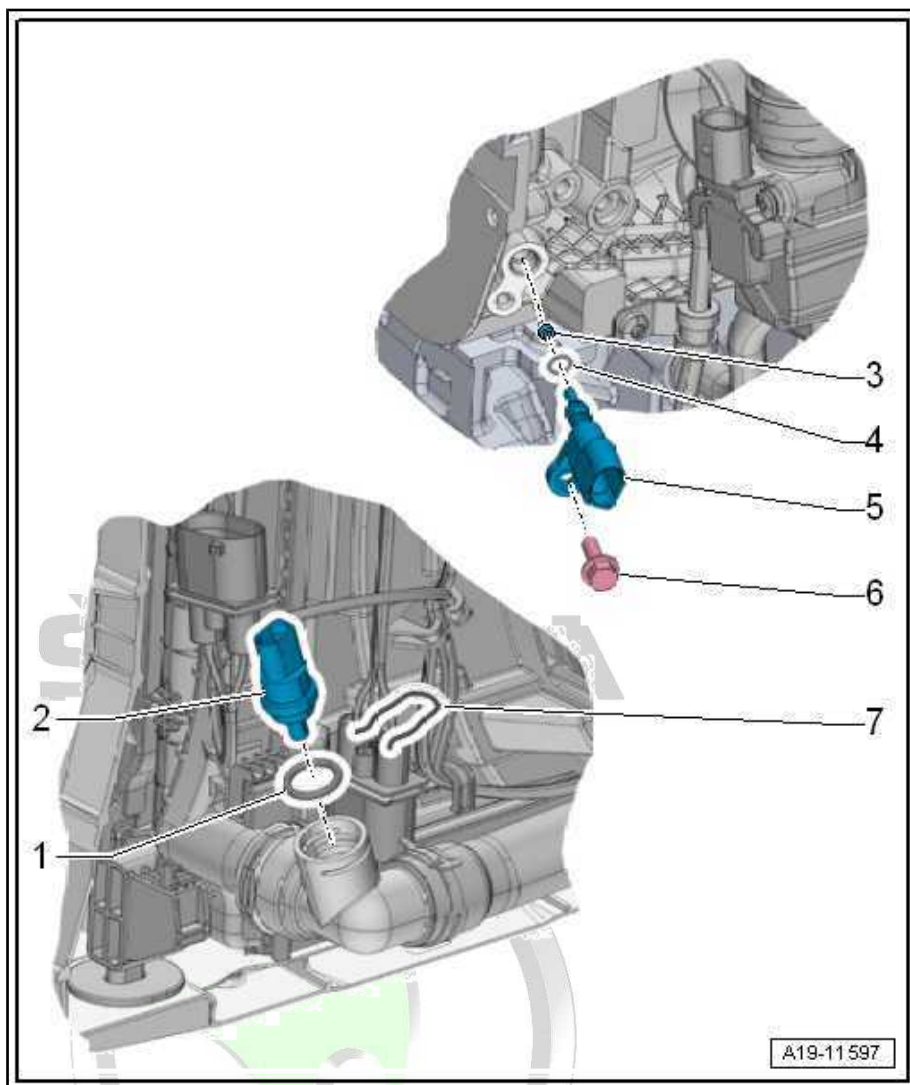
- ❑ removing and installing
⇒ ["2.8 Removing and installing coolant temperature sender G62"](#),
[page 246](#)

6 - Screw

- ❑ 8 Nm

7 - Retaining clip

- ❑ check tightness



2.4 Removing and installing electric coolant pump

⇒ ["2.4.1 Removing and installing charge air cooler pump V188"](#),
[page 234](#)

2.4.1 Removing and installing charge air cooler pump - V188-

Special tools and workshop equipment required

- ◆ Hose clamps up to 25 mm - MP7-602 (3094)-
- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Pliers for spring strap clamps

Removing

CAUTION

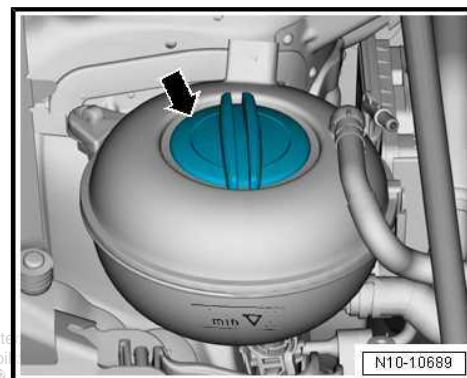
Risk of injury due to hot steams.

Wear safety goggles, safety gloves and safety clothing.

When the engine is warm, the cooling system is under overpressure.

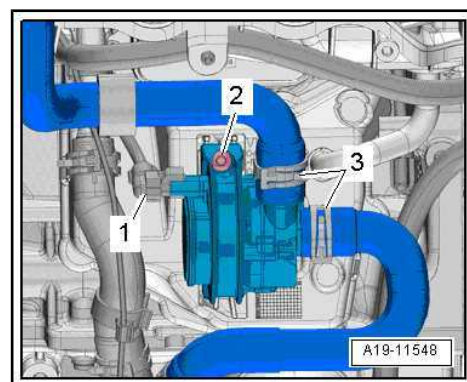
Hot steam may escape when the compensation bottle is opened.

- Cover the cap -arrow- of the coolant expansion tank with a cloth and open carefully.
- Open cap -arrow- for coolant expansion tank.
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .



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- Separate electrical plug connection -1-.
- Place catch pan - VAS 6208- underneath.
- At the charge air cooler pump - V188- disconnect coolant hoses with hose clamps -3094- .
- Loosen hose clamps -3- and remove coolant hoses.
- Undo screw -2- and remove charge air cooler pump - V188- .



Install

Installation is performed in the reverse order, pay attention to the following points:



Note

Secure all hose connections with hose clamps which comply with the series design ⇒ *Electronic Catalogue of Original Parts* "ET-KA." .

- Install the noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Check coolant level ⇒ [page 229](#) .

Tightening torques

- ♦ Charge air cooler pump - V188-
⇒ ["2.2 Summary of components - electric coolant pump", page 233](#)

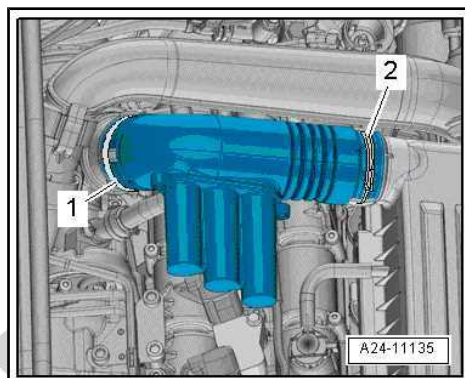
2.5 Removing and installing coolant pump

Special tools and workshop equipment required

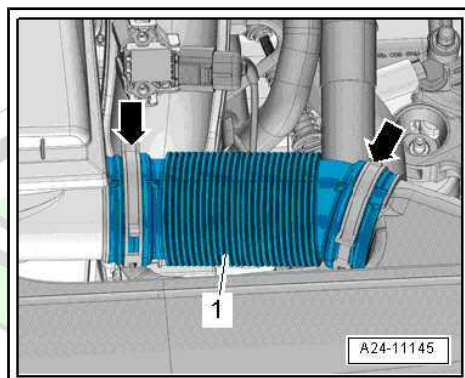
- ♦ Pliers for spring strap clamps

Removing

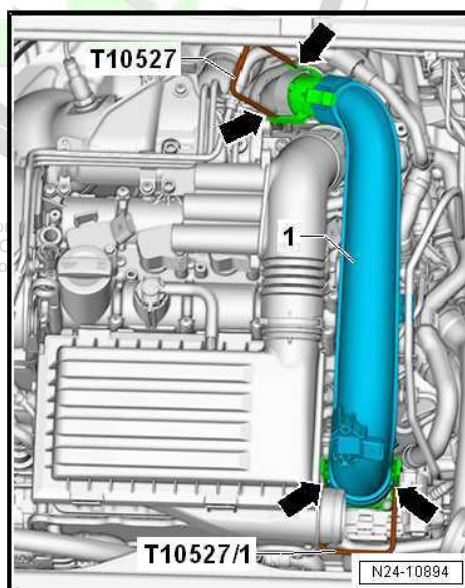
- Drain coolant
⇒ ["1.3 Draining and filling up coolant", page 225](#) .
- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery;
Removing and installing battery .
- Loosen hose clamps -1-, -2- and remove air guide pipes.



- Undo hose clamps -arrows-, remove air guide hose -1-.
- Remove plug from charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.



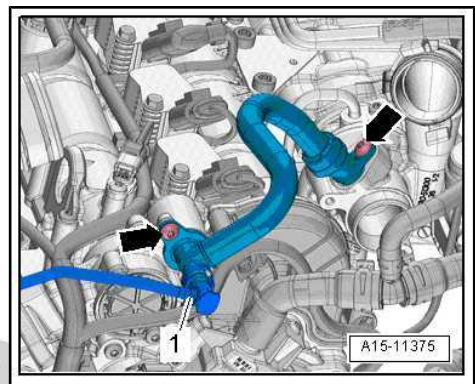
- Release retaining tabs -arrows- using the release tool - T10527- and -T10527/1- .
- Remove air guide pipe -1-.



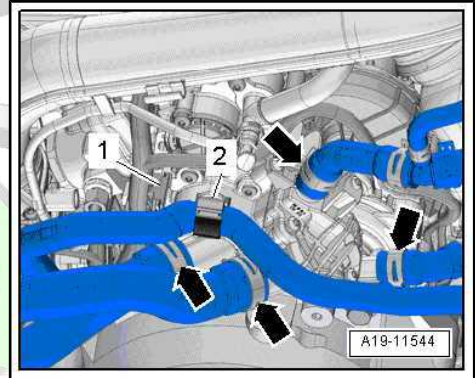
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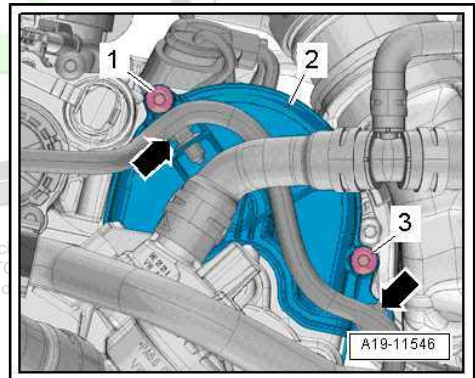
- Press release buttons and remove hose -1- to the activated charcoal filter.
- Unscrew screws -arrows- and remove hose for crankcase ventilation.



- Expose electric wiring loom -1- and coolant hose -2-.
- Loosen hose clamps -arrows- and remove coolant hoses.



- Expose wiring loom -arrows-.
- Remove screws -1-, -3- and remove toothed belt guard -2- for coolant pump toothed belt.



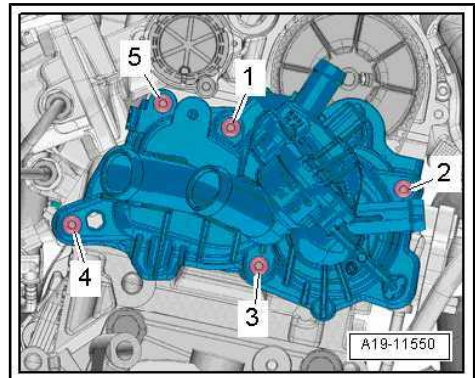
- Loosen the screws in the sequence -5- to -1- and unscrew them.
- Remove coolant pump with toothed belt.
- Remove thermostat when coolant pump is replaced
⇒ ["2.6.1 Removing and installing thermostat for small coolant circuit", page 239](#) .

Install



Note

- ◆ Always replace the toothed belt for the coolant pump drive after disassembly.
- ◆ Secure hose connection ends with spring clips that comply with the series design ⇒ ETKA - Electronic Catalogue of Original Parts .



- Replace seal for thermostat housing -arrows-.
- Ensure proper seating of gaskets -arrows-.
- Moisten gasket for coolant pump with coolant.

Always adhere to the sequence of work steps given below when installing the coolant pump.

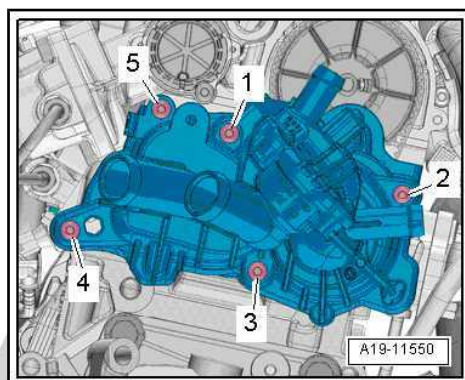
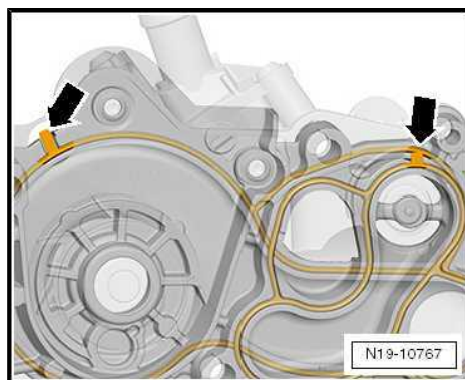
This ensures that the toothed belt is correctly tensioned.

The following steps must be performed with the assistance of a second mechanic.

- Set cylinder 1 to TDC ⇒ [“2.4 Test timing”, page 129](#) .
- Fit toothed belt centrally, move coolant pump to installation position.
- Mount coolant pump on cylinder head with securing bolts.
- Initially tighten screws in the specified order:

Stage	Screws	Specified torque
1.	-1 ... 5-	by hand as far as the stop
2.	-1 ... 5-	10 Nm

- Loosen all screws by 1 turn.



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- Fit torque wrench e. g. -VAS 6583- with hexagon socket SW10 insert Pos. -6- to the coolant pump.
- Preload coolant pump to 30 Nm clockwise with a 10 mm hexagon socket insert -6- with extension and torque wrench e.g. -VAS 6583- .
- Position the torque wrench vertically for better handling.



Note

- ◆ *Do not support torque wrench with the other hand.*
- ◆ *In order to avoid the belt tension being too high the torque wrench must not be »put under excessive pressure«.*
- Keep coolant pump pretensioned.
- At the same time, have a second mechanic pre-tighten the locating screws on the coolant pump to 10 Nm clockwise in sequence from right to left, beginning with screw -2-, -1- and -5- »stage 3«.
- Then tighten the locating screws to »stage 4«.

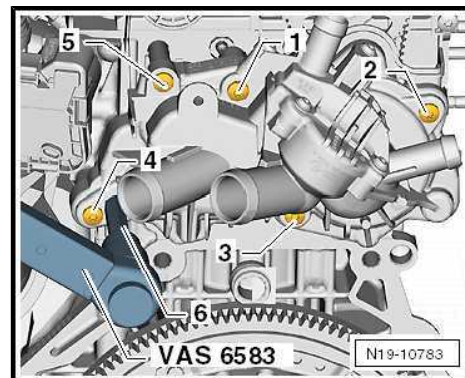
Stage	Screws	Specified torque
3.	-2, 1, 5-	10 Nm
4.	-3, 4, 5, 1, 2-	12 Nm

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

- Top up coolant ⇒ [page 229](#) .

Tightening torques

- ◆ Exhaust turbocharger - Summary of components
⇒ ["1.1 Summary of components - exhaust gas turbocharger", page 268](#) .



2.6 Removing and installing thermostat

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⇒ ["2.6.1 Removing and installing thermostat for small coolant circuit", page 239](#)

⇒ ["2.6.2 Removing and installing thermostat for large coolant circuit", page 241](#)

2.6.1 Removing and installing thermostat for small coolant circuit

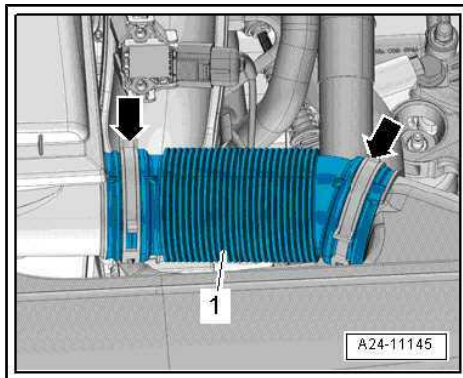
Special tools and workshop equipment required

- ◆ Pliers for spring strap clamps
- ◆ Key - T10508-
- ◆ Release tool -T10527-
- ◆ Release tool -T10527/1-

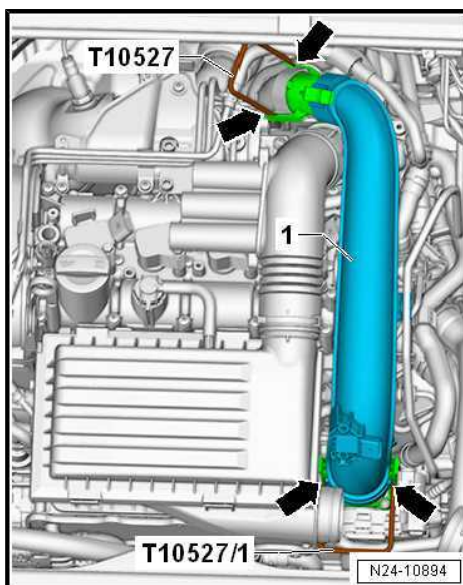
Removing

- Drain coolant
⇒ ["1.3 Draining and filling up coolant", page 225](#) .

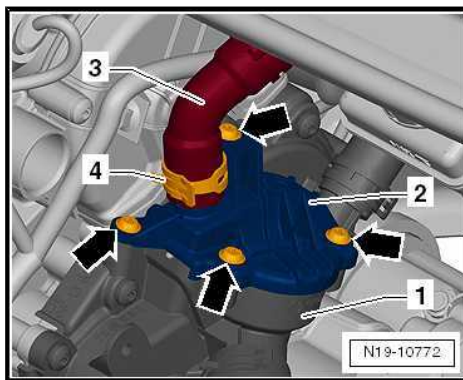
- Undo hose clamps -arrows-, remove air guide hose -1-.
- Remove plug from charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.



- Release retaining tabs -arrows- using the release tool - T10527- and -T10527/1- .
- Remove air guide pipe -1-.

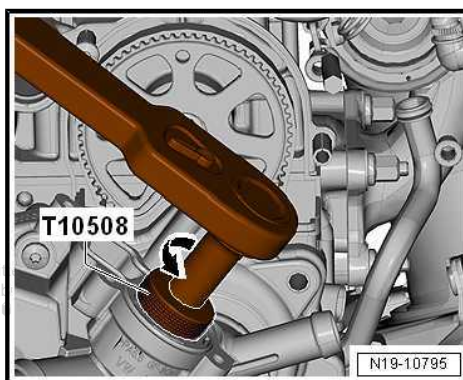


- Loosen hose clamp -4- and remove coolant hose -3-.
- Screw out screws -arrows- and remove cover -2- from thermostat housing -1-.



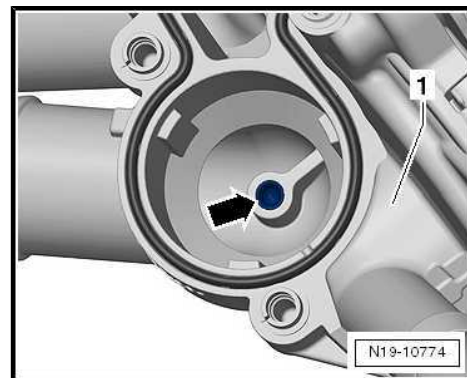
- Remove thermostat with spanner - T10508- .
- Light press the wrench - T10508- down, while doing so, turn in the -direction of the arrow-.

Install



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- Insert thermostat. Fit the centring pin in into the guide-arrow-.



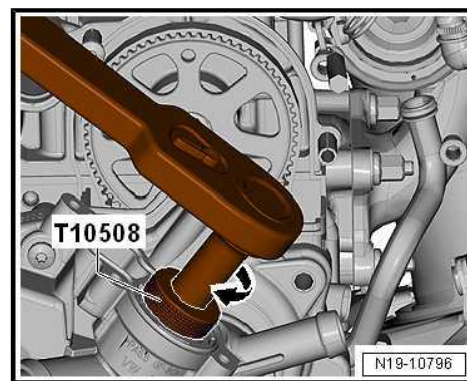
- Install thermostat with spanner - T10508- .
- Light press the wrench - T10508- down, while doing so, turn in the -direction of the arrow- as far as it can go.

Installation is performed in the reverse order, pay attention to the following points:

- Replace gasket.
- Moisten gasket with coolant.
- Top up coolant
⇒ [“1.3 Draining and filling up coolant”, page 225](#) .

Tightening torques

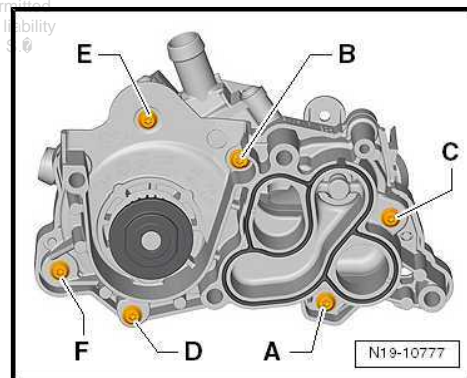
- ◆ Cover for thermostat
⇒ [Fig. “Tightening sequence for thermostat cover to the thermostat housing - Tightening torque”](#), page 233 .



2.6.2 Removing and installing thermostat for large coolant circuit

Removing

- Remove coolant pump
⇒ [“2.5 Removing and installing coolant pump”, page 235](#) .
- Unscrew and remove the screws in the order **F- to -A-**.
- Remove coolant pump from thermostat housing.

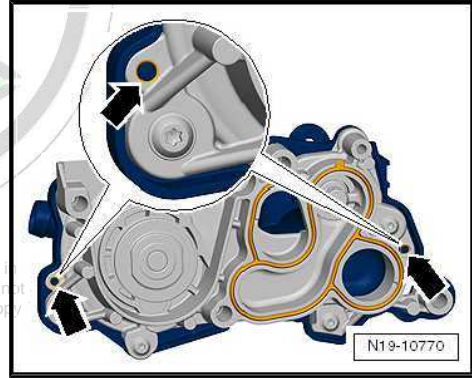
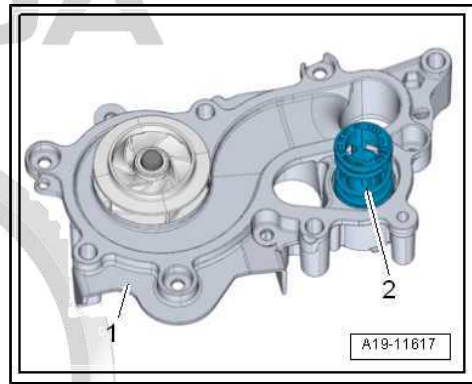


- Remove thermostat -2- from coolant pump -1-.

Install

Installation is performed in the reverse order, pay attention to the following points:

- Replace gasket.
- Moisten gasket with coolant.
- Position thermostat housing on coolant pump.
- The centring bolts on the thermostat must be inserted into the guides -arrows- on the coolant pump.
- Tighten screws for thermostat housing
⇒ [Fig. “Tightening sequence for thermostat housing to coolant pump - tightening torque and tightening sequence”](#), [page 232](#).
- Install coolant pump
⇒ [“2.5 Removing and installing coolant pump”](#), [page 235](#).
- Top up coolant
⇒ [“1.3 Draining and filling up coolant”](#), [page 225](#).



Tightening torques

- ♦ Thermostat housing
⇒ [“2.1 Summary of components - coolant pump/thermostat”](#), [page 230](#).

2.7 Removing and installing toothed belt pulley for coolant pump

⇒ [“2.7.1 Removing and installing toothed belt pulley for coolant pump drive, engine identification characters CZCA, CZDA”](#), [page 242](#)

⇒ [“2.7.2 Removing and installing toothed belt pulley for coolant pump drive, engine identification characters CZEA”](#), [page 243](#)

2.7.1 Removing and installing toothed belt pulley for coolant pump drive, engine identification characters CZCA, CZDA

Special tools and workshop equipment required

- ♦ Counterholder - T10172A- with adapters -T10172/2-

The toothed belt for coolant pump drive must be replaced!

The toothed belt for coolant pump drive must not be reused, because it would no longer create the necessary pretension!

Removing

- Remove coolant pump
⇒ [“2.5 Removing and installing coolant pump”](#), [page 235](#).

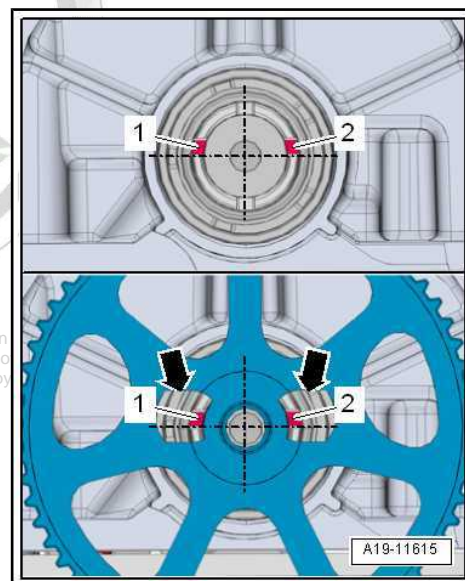
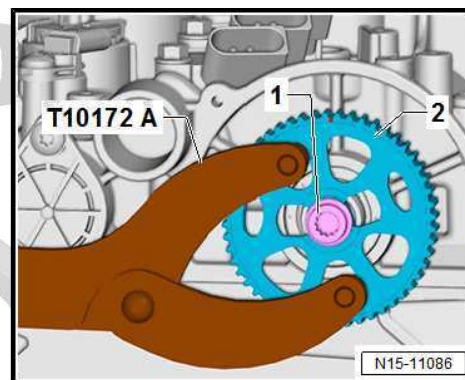
- Secure toothed belt pulley -2- with counterhold - T10172A- and unscrew securing bolt -1-.
- Remove the toothed belt -2- from the camshaft.

Install

Installation is performed in the reverse order, pay attention to the following points:

- Place the toothed belt pulley on the camshaft so that the asymmetrical grooves are exactly in the centre of the recesses.
- Grooves -1- and -2- in the camshaft are arranged asymmetrically.
- The recesses-arrows- in the toothed belt pulley are also arranged asymmetrically.

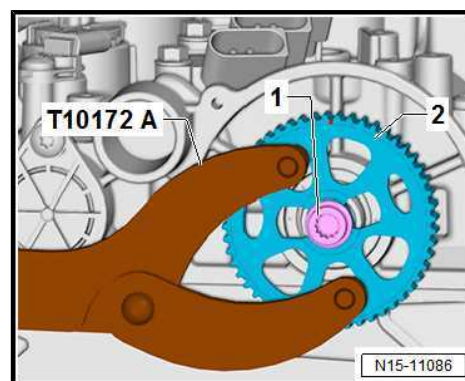
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- Secure toothed belt pulley -2- with counterhold - T10172A- and screw in securing bolt -1-.
- Install coolant pump
⇒ [“2.5 Removing and installing coolant pump”, page 235](#) .

Tightening torques

- ◆ Toothed belt pulley
⇒ [“2.1 Summary of components - coolant pump/thermostat”, page 230](#) .



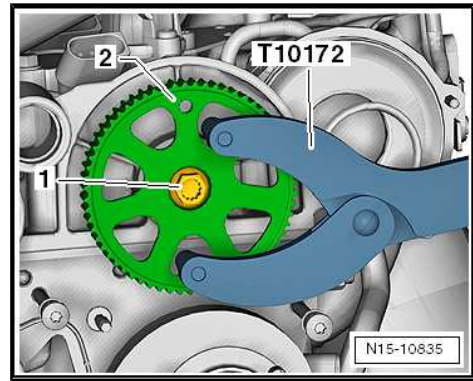
2.7.2 Removing and installing toothed belt pulley for coolant pump drive, engine identification characters CZE A

Special tools and workshop equipment required

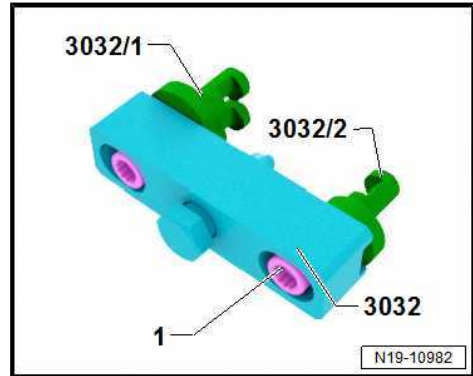
- ◆ Counterholder - T10172- with adapters -T10172/2-
- ◆ Removal tool - T10498-
- ◆ Assembly sleeve - T10505-
- ◆ Extractor - 3032A- or -3032 + 3032/1 + 3032/2-

Removing

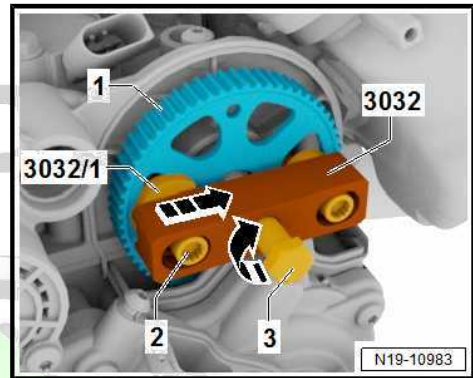
- Remove coolant pump
⇒ [“2.5 Removing and installing coolant pump”, page 235](#) .
- Unscrew screw -1-, using counterholder - T10172- with adapter -T10172/2- to do so.
- Screw in screw -1- by 3 turns.



- Tighten screw -1- of adapter - 3032/2- in the centre of the bore.



- Position the extractor - 3032- on the toothed belt pulley -1-, as shown.
- Push the adapter - 3032/1- in -direction of arrow- as far as the stop.
- Tighten screw -2- hand-tight.
- Use the screw -3- to turn in -direction of arrow- until the toothed belt pulley has been removed.

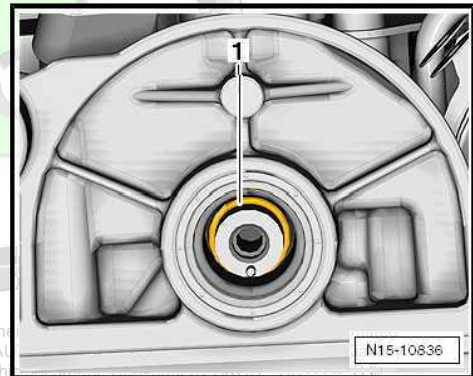


Note

After removing the toothed belt pulley, the O-ring on the camshaft must be replaced.

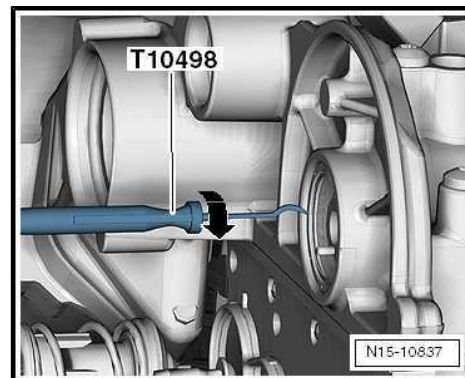
Removing O-ring

- Guide removal tool - T10498- over the camshaft up to the O-ring -1-.



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- Insert the tip of the removal tool - T10498- under the O-ring with a rotary movement in -direction of arrow-.
- Remove the O-ring from the camshaft.



Installing O-ring

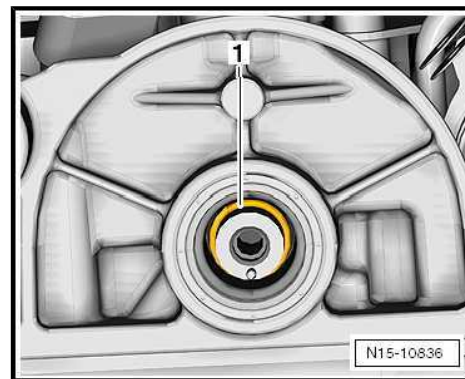
The installation position of the O-ring -1- is approx. 15 mm from the end of the camshaft.

- Slide the new O-ring -1- onto the camshaft.



Note

The pin on the camshaft must be in the recess of the assembly sleeve - T10505- .



- Position the assembly sleeve - T10505- onto the camshaft and slide the sleeve in -direction of arrow- by hand up to the stop.
- Remove the assembly sleeve - T10505- .

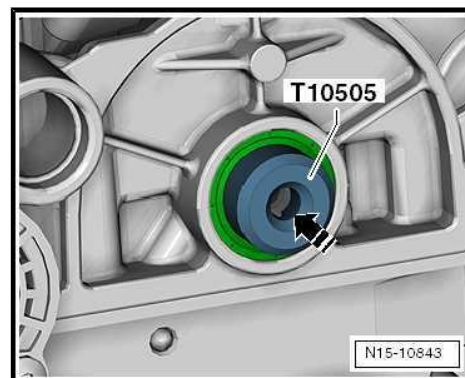
The O-ring must sit in the groove of the camshaft.

Install



Note

- ◆ *Do not use any impact tools!*
- ◆ *The toothed belt pulley may only be slid onto the camshaft by hand.*
- ◆ *This avoids axial displacement of the camshaft.*



Position toothed belt pulley:

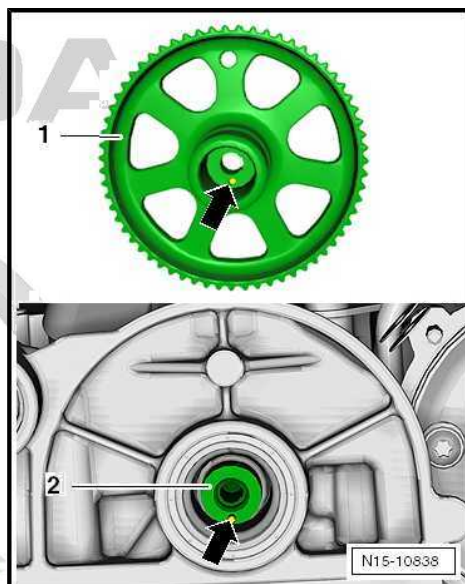


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- Position the toothed belt pulley -1- on the camshaft -2- so that the pin of the camshaft is in the bore of the toothed belt pulley -arrows-.
- Install coolant pump
⇒ [“2.5 Removing and installing coolant pump”, page 235](#) .

Tightening torques

- ◆ Toothed belt pulley
⇒ [“2.1 Summary of components - coolant pump/thermostat”, page 230](#) .

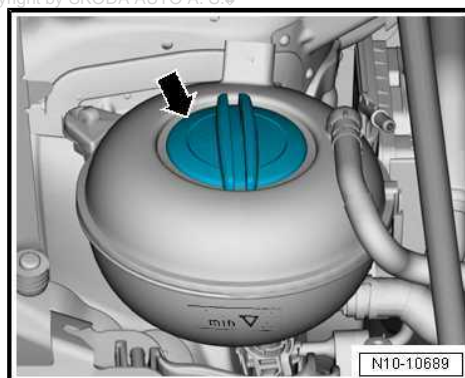


2.8 Removing and installing coolant temperature sender - G62-

Removing

- Engine cold.
- Briefly open the cap -arrow- for the coolant expansion tank in order to remove the remaining pressure in the coolant system, then close until it clicks into place.
- Disconnect plug connection from the coolant temperature sender - G62- .
- Place a cloth below to absorb leaking coolant.

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- Undo screw -1- and remove coolant temperature sender - G62- Pos. -2-.

Install

Installation is performed in the reverse order, pay attention to the following points:

- Replace O-ring -3-.



Note

If the O-ring -3- with support ring -4- remains in the cylinder head, lift out the O-ring with support ring using a wire.

- Insert new coolant temperature sender - G62- immediately into cylinder head in order to avoid loss of coolant.
- Check coolant level ⇒ [page 229](#) .

Tightening torques

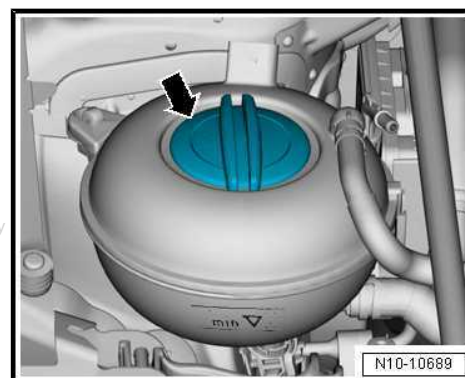
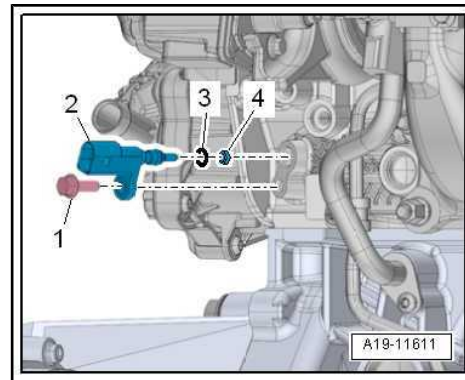
- ♦ Coolant temperature sender - G62-
⇒ [“2.3 Summary of components - coolant temperature sender”, page 234](#)

2.9 Removing and installing coolant temperature sender at radiator outlet - G83-

Removing

- Engine cold.
- Briefly open the cap -arrow- for the coolant expansion tank in order to remove the remaining pressure in the coolant system, then close until it clicks into place.
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .

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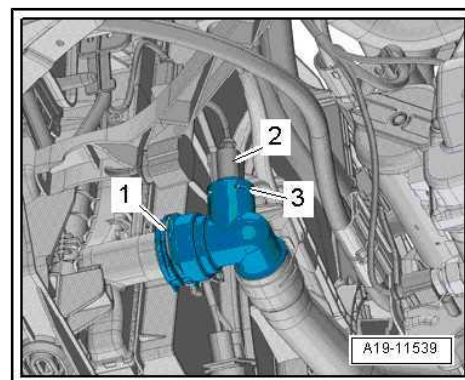


- Separate electrical plug connection -2-.
- Place a cloth below to absorb leaking coolant.
- Pull out holding clamp -3- and pull coolant temperature sender at radiator outlet - G83- out of the connection piece.

Install

Installation is performed in the reverse order, pay attention to the following points:

- Replace O-ring.
- Insert a new coolant temperature sender at radiator outlet - G83- immediately into the neck to avoid loss of coolant.
- Install front sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Check coolant level ⇒ [page 229](#) .



3 Coolant pipes

⇒ “3.1 Summary of components - coolant pipe”, page 248

⇒ “3.2 Removing and installing coolant pipes”, page 248

3.1 Summary of components - coolant pipe

1 - Coolant hose

- ❑ to Charge air cooling circuit radiator

2 - Coolant pipe

- ❑ below clipped onto the intake manifold
- ❑ removing and installing
⇒ “3.2 Removing and installing coolant pipes”, page 248

3 - Screw

- ❑ 8 Nm

4 - Coolant hose

- ❑ from the expansion tank

5 - Coolant hose

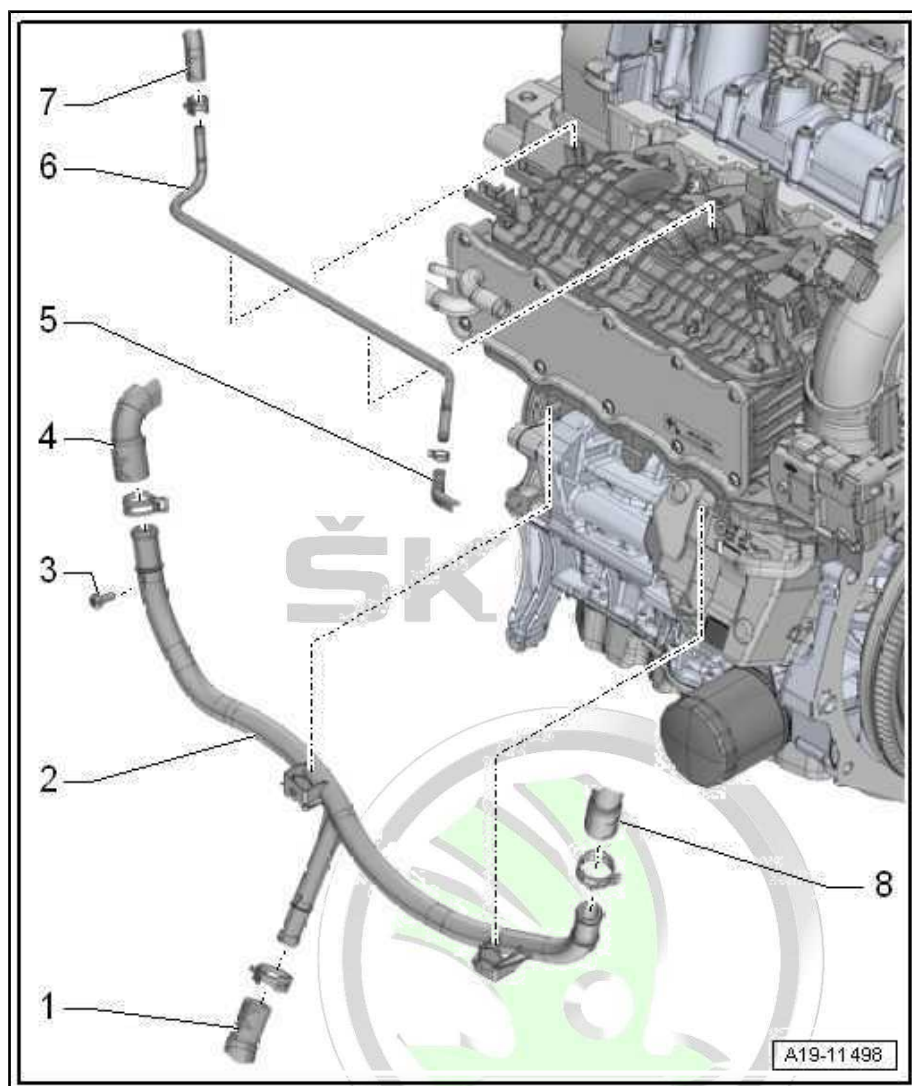
- ❑ from coolant radiator

6 - Coolant line

- ❑ above clipped onto the intake manifold

7 - Coolant hose

8 - Coolant hose



Note

The arrows on the coolant pipes and the coolant hose ends must face each other.

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3.2 Removing and installing coolant pipes

Special tools and workshop equipment required

- ◆ Hose clamps up to 25 mm - MP7-602 (3094)-
- ◆ Pliers for spring strap clamps

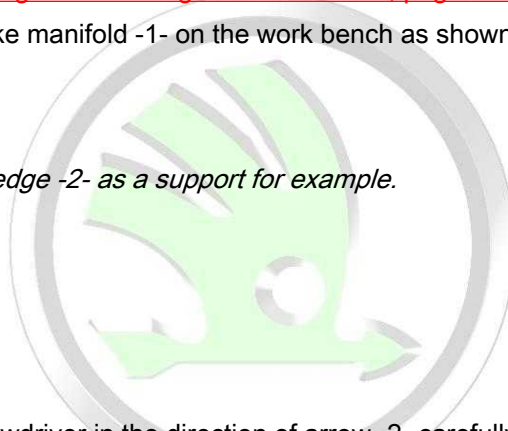
Removing

- Removing the intake manifold
⇒ “4.2 Removing and installing intake manifold”, page 305 .
- Place the intake manifold -1- on the work bench as shown.



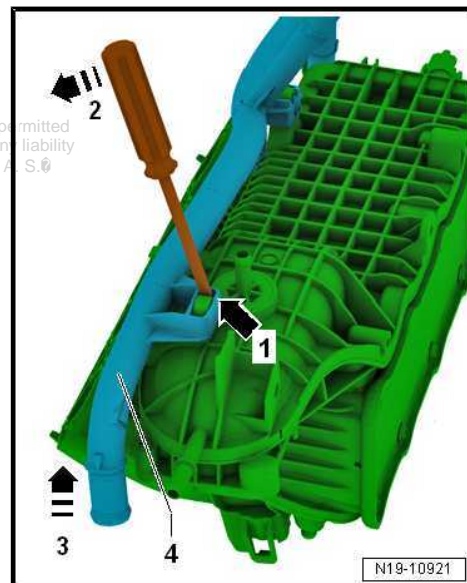
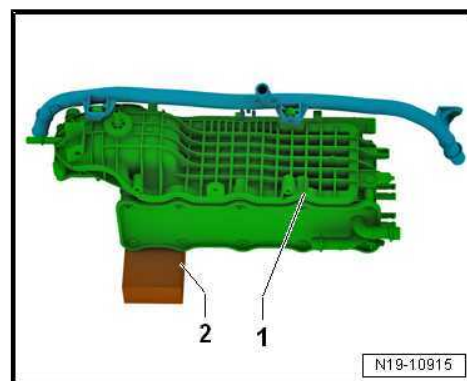
Note

Use a wooden wedge -2- as a support for example.

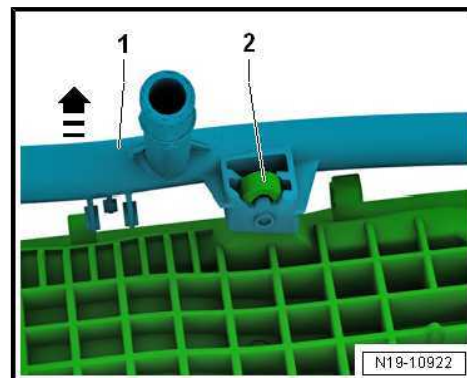


- Using the screwdriver in the direction of arrow -2- carefully press and at the same time raise the coolant pipe -4- in direction of arrow -3- until it is released from the locking mechanism.

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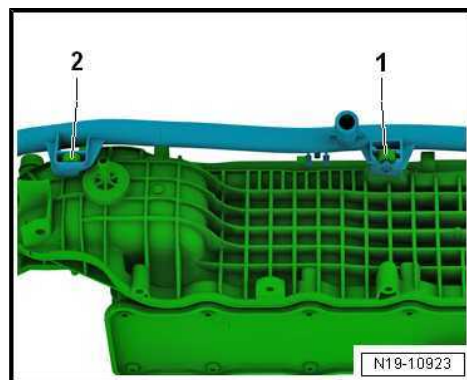
- Remove the coolant pipe -1- in -direction of arrow- upwards, and release it from the locking mechanism -2-.



Install

Installation is performed in the reverse order, pay attention to the following points:

- Press the coolant pipe onto the bearings -1- and -2- until it latches.
- By pulling in the opposite direction, check that both bearings are locked.
- Installing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 305](#) .
- Secure all hose connection ends with spring-type clips that comply with the series design ⇒ ETKA - Electronic Catalogue of Original Parts .



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4 Coolers, radiator, radiator fan

⇒ [“4.1 Assembly overview - radiator/radiator fan”, page 251](#)

⇒ [“4.2 Summary of components - fan shroud and radiator fan”, page 254](#)

⇒ [“4.3 Summary of components - radiator blind”, page 255](#)

⇒ [“4.4 Removing and installing radiator cowling with radiator fan”, page 257](#)

⇒ [“4.5 Removing and installing radiator fan V7 ”, page 258](#)

⇒ [“4.6 Removing and installing radiator with charge air cooler”, page 259](#)

⇒ [“4.7 Removing and installing radiator blind”, page 263](#)

⇒ [“4.8 Removing and installing the radiator blind control motor V544 ”, page 264](#)

4.1 Assembly overview - radiator/radiator fan



Note

The arrows on the coolant pipes and the coolant hose ends must face each other.

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1 - Coolant radiator

- ❑ removing and installing
⇒ [“4.6 Removing and installing radiator with charge air cooler”](#), page 259
- ❑ After replacing, fill with fresh coolant
⇒ [“1.3 Draining and filling up coolant”](#), page 225

2 - Coolant hose

- ❑ to remove, raise the holding clamps
- ❑ connect
⇒ Fig. [““Connect coolant hose with quick coupling”](#)”, page 253

3 - Retaining clip

4 - O-ring

- ❑ Replace after disassembly

5 - Coolant temperature sender at radiator outlet - G83-

- ❑ removing and installing
⇒ [“2.9 Removing and installing coolant temperature sender at radiator outlet G83”](#), page 247

6 - O-ring

- ❑ Replace after disassembly

7 - Coolant hose

- ❑ to remove, raise the holding clamps
- ❑ connect ⇒ Fig. [““Connect coolant hose with quick coupling”](#)”, page 253

8 - O-ring

- ❑ Replace after disassembly

9 - Coolant hose

- ❑ to remove, raise the holding clamps
- ❑ connect ⇒ Fig. [““Connect coolant hose with quick coupling”](#)”, page 253

10 - O-ring

- ❑ Replace after disassembly

11 - Top radiator bearing

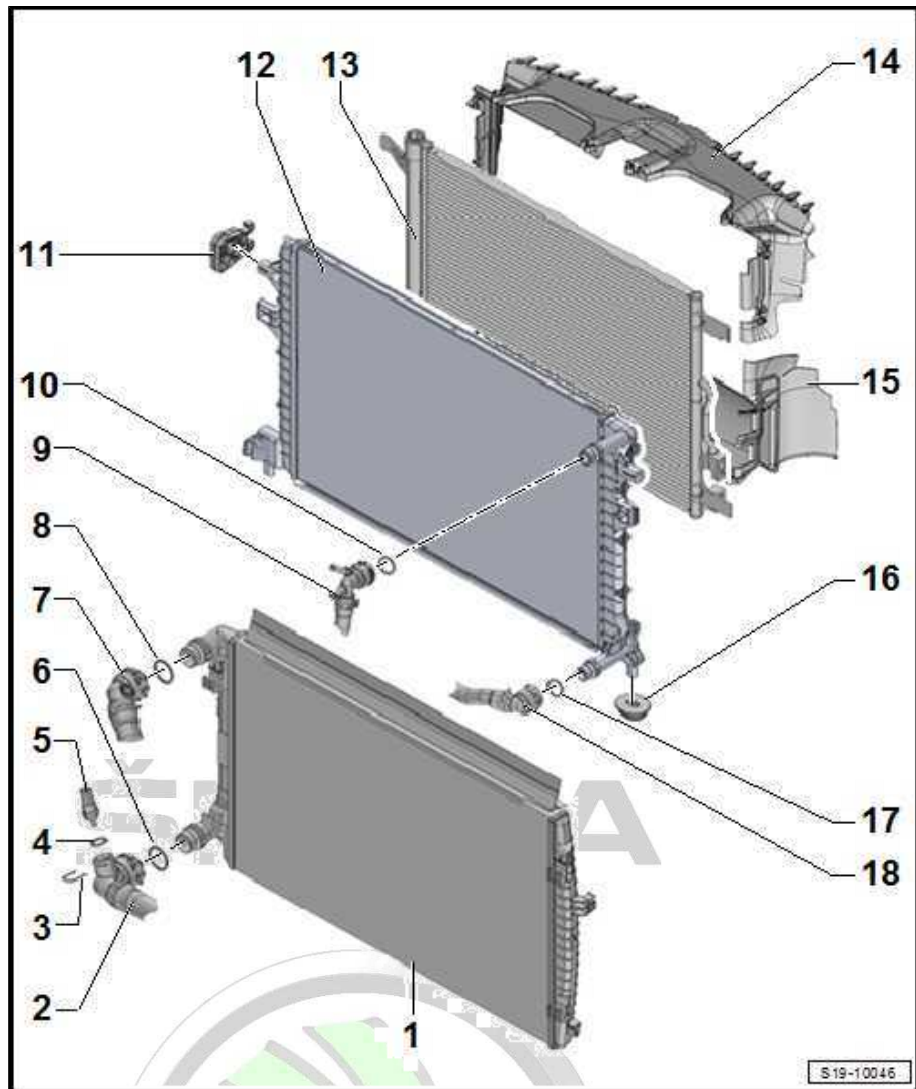
- ❑ If the securing latches break, you will not need to replace the top radiator mounting; the securing mechanism can be replaced by a special screw ⇒ Electronic Catalogue of Original Parts “ETKA”.
- ❑ Screw tightening torque for top radiator bearing, 5 Nm.

12 - Cooler for charge air circuit

- ❑ removing and installing ⇒ [“4.6 Removing and installing radiator with charge air cooler”](#), page 259
- ❑ After replacing, fill with fresh coolant ⇒ [“1.3 Draining and filling up coolant”](#), page 225

13 - Condenser

- ❑ installing and removing ⇒ Heating, Air Conditioning; Rep. gr. 87 ; Refrigerant circuit; installing and removing condenser .



14 - Top air guide

15 - Bottom air guide

16 - Bottom radiator bearing

- ❑ for radiator

17 - O-ring

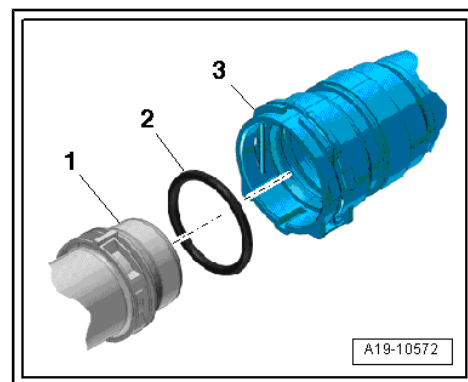
- ❑ Replace after disassembly

18 - Coolant hose

- ❑ to remove, raise the holding clamps
- ❑ connect ⇒ Fig. ““Connect coolant hose with quick coupling”“, page 253

Connect coolant hose with quick coupling

- Remove old O-ring -2- in coolant hose -3-.
- Moisten new O-ring with coolant and insert into coolant hose.
- Press coolant hose onto connection -1- until there is an audible click.
- Press coolant hose down again and check by pulling that the plug-in connector is fully engaged.



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4.2 Summary of components - fan shroud and radiator fan

1 - Screw

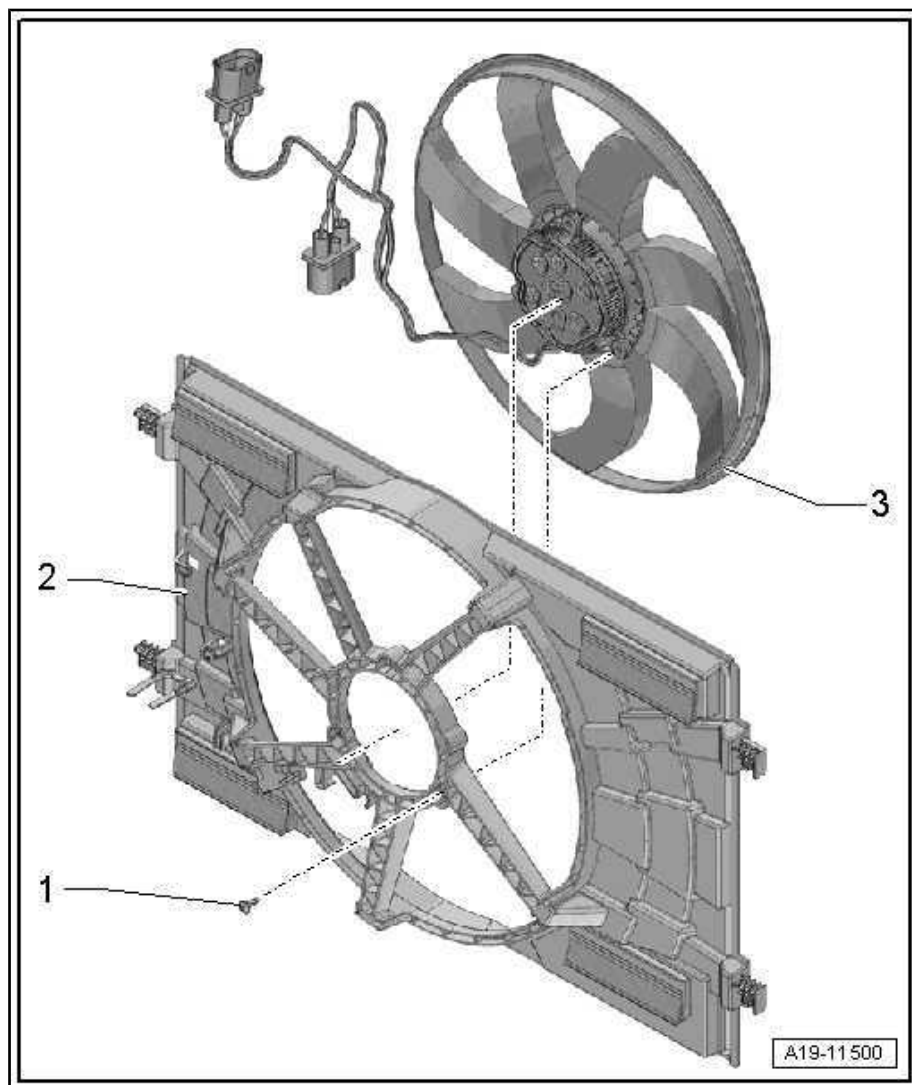
- 5 Nm

2 - Fan shroud

- removing and installing
⇒ [“4.4 Removing and installing radiator cowling with radiator fan”](#),
[page 257](#)

3 - Radiator fan - V7-

- removing and installing
⇒ [“4.5 Removing and installing radiator fan V7”](#),
[page 258](#)



4.3 Summary of components - radiator blind

⇒ [“4.3.1 Summary of components - radiator blind”, page 255](#)

⇒ [“4.3.2 Summary of components - component parts of the radiator blind”, page 256](#)

4.3.1 Summary of components - radiator blind

1 - Bumper bracket

2 - Air deflector

- ☐ Bottom

3 - Control motor for radiator blind - V544-

- ☐ removing and installing
⇒ [“4.8 Removing and installing the radiator blind control motor V544”, page 264](#)

4 - Catch pegs

- ☐ for seal

5 - Radiator blind

- ☐ removing and installing
⇒ [“4.7 Removing and installing radiator blind”, page 263](#)

6 - Connector

- ☐ Control motor for radiator blind - V544-
- ☐ attached to bracket Pos. -7-
- ☐ ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

7 - Support

- ☐ for plug

8 - Screw

- ☐ 8 Nm

9 - Catch pegs

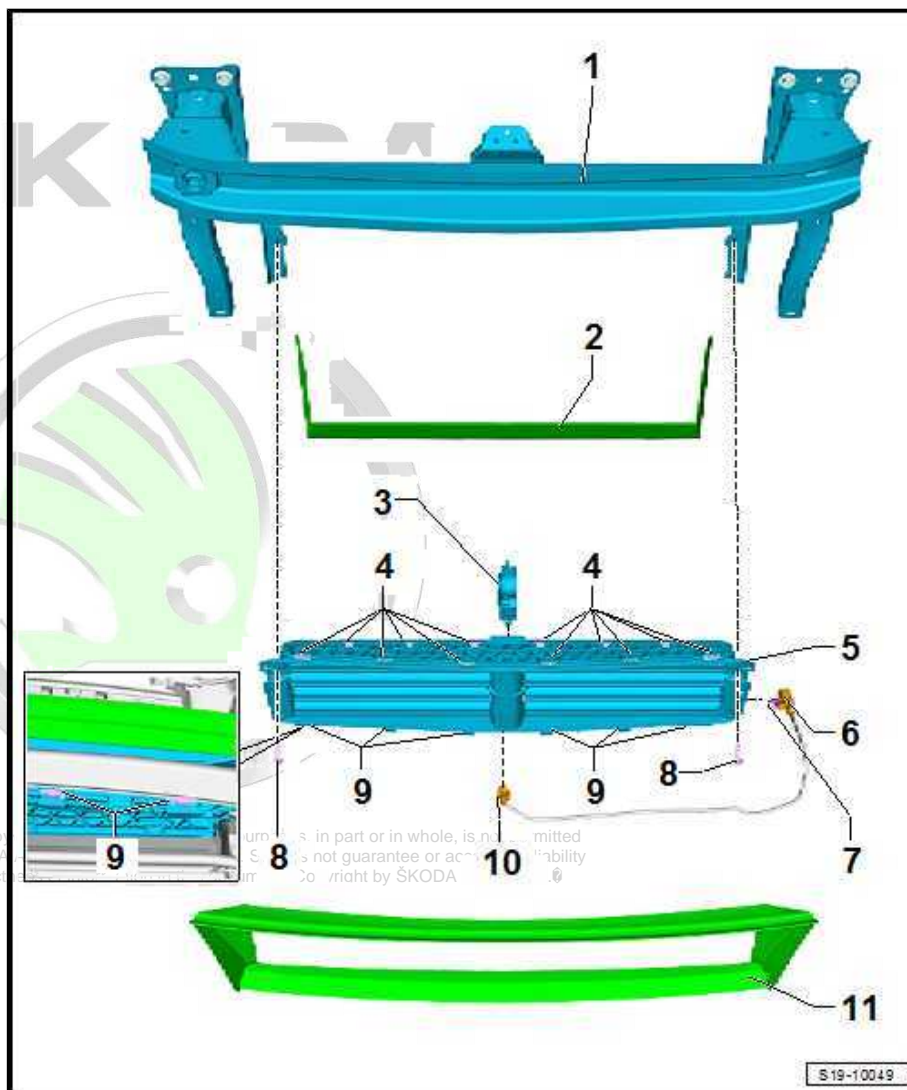
- ☐ for seal

10 - Wiring loom

- ☐ Control motor for radiator blind - V544-

11 - Gasket

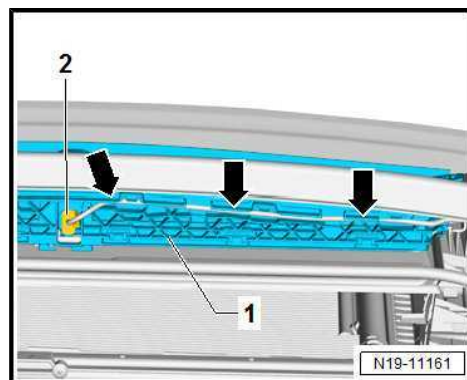
- ☐ front



Wiring loom placement on the frame of the radiator blind

- Wiring loom -2- for the control motor for radiator blind - V544- is attached in the retaining tab in the frame of the radiator blind -1- -arrows-.

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4.3.2 Summary of components - component parts of the radiator blind

1 - Connecting bridge

2 - Screw

- ☐ for engine mount Pos. -8-
- ☐ 2 Nm

3 - Control motor for radiator blind - V544-

- ☐ removing and installing
⇒ ["4.8 Removing and installing the radiator blind control motor V544"](#),
[page 264](#)

4 - Flaps

- ☐ Note arrangement
⇒ [Fig. "Arrangement of the lamellas"](#),
[page 257](#)

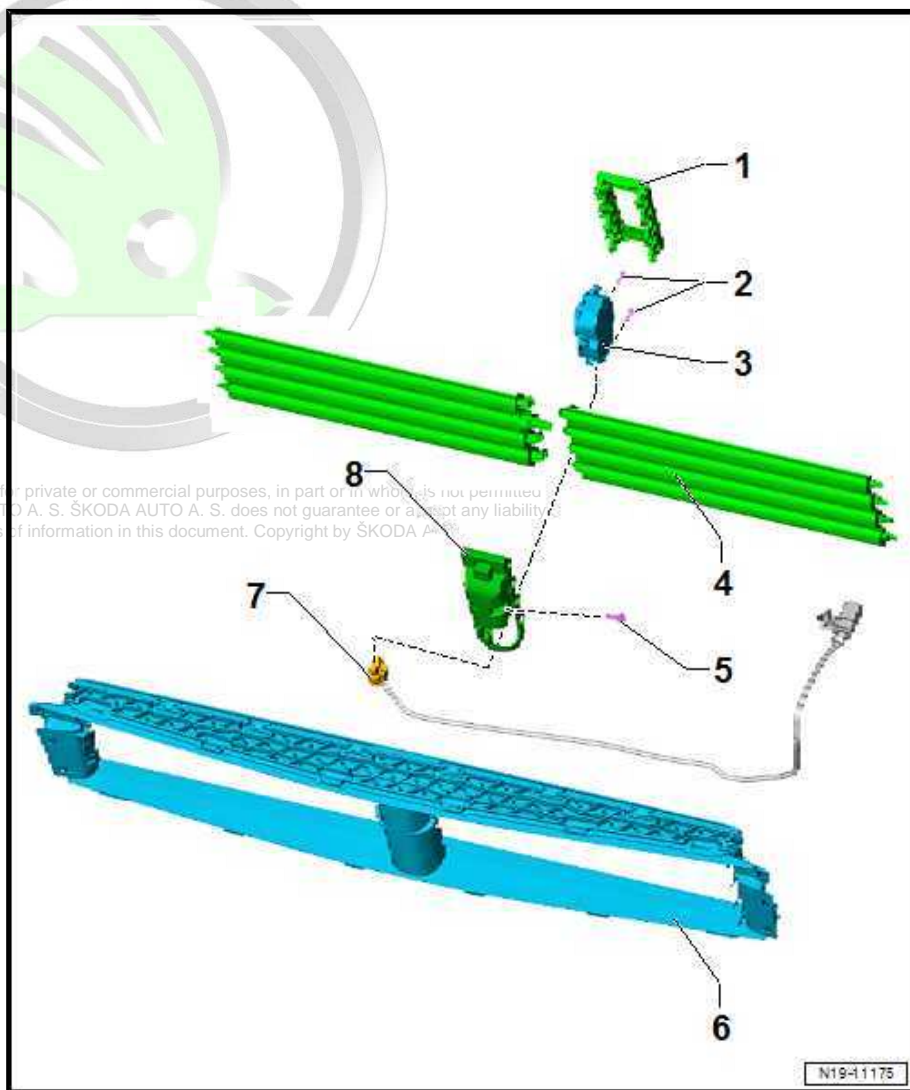
5 - Screw

- ☐ for radiator blind control motor - V544- Pos. -3-
- ☐ 2 Nm

6 - Surround

7 - Wiring loom

8 - Engine mount

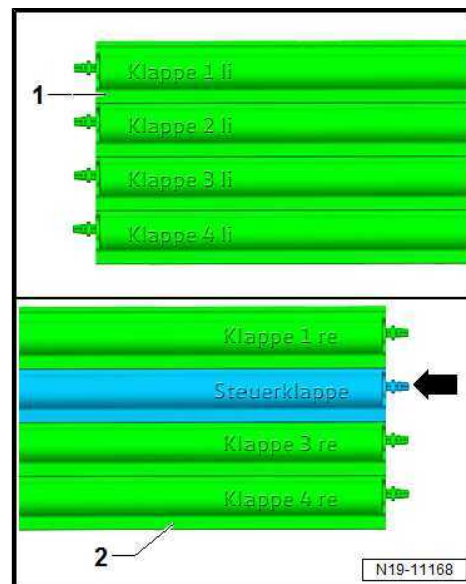


Arrangement of the lamellas

1 - Left flaps

2 - Right flaps

Šipka - Control flap



4.4 Removing and installing radiator cowl- ing with radiator fan

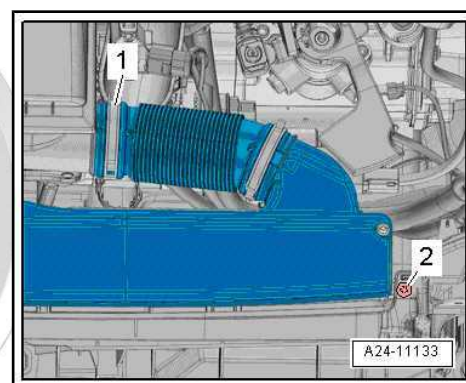
WARNING

There is risk of injury from radiator fans starting up automatically.

- Before carrying out work in the fan shroud area, disconnect the electrical plug connections of the fan.

Removing

- Loosen hose clamp -1- and remove air guide hose.
- Release screw left and right arrow -2-.
- Unclip and remove the air guide on the lock carrier.



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- Remove plug -1- for radiator fan, for this purpose slide screw clamp backwards arrow -A- and press release button down.
- Press locking lugs for fan shroud left and right simultaneously arrow -B- and remove fan shroud downwards from the radiator.

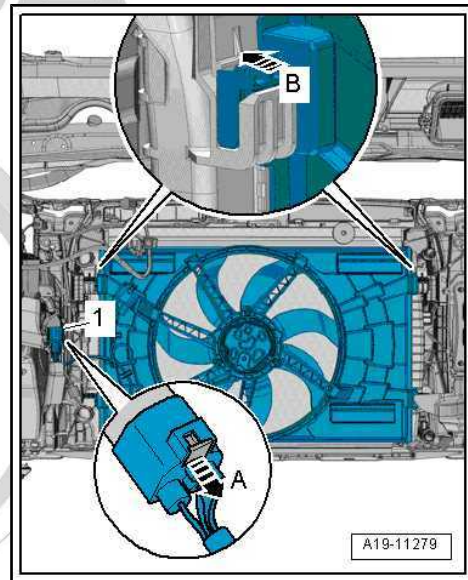
Install

Installation is carried out in the reverse order.

Electrical connections and proper routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Tightening torques

- ♦ Screw for air guide
⇒ [“3.1 Assembly overview - air filter housing”, page 301](#) .



4.5 Removing and installing radiator fan - V7-

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! WARNING

There is risk of injury from radiator fans starting up automatically.

- Before carrying out work in the fan shroud area, disconnect the electrical plug connections of the fan.

Removing

- Removing fan shroud
⇒ [“4.4 Removing and installing radiator cowl with radiator fan”, page 257](#) .
- Release screws -arrows- and remove radiator fan - V7- .

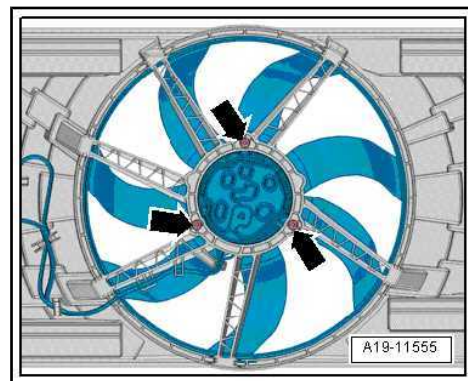
Install

Installation is performed in the reverse order, pay attention to the following points:

- Install fan shroud
⇒ [“4.4 Removing and installing radiator cowl with radiator fan”, page 257](#) .

Tightening torques

- ♦ Radiator fan
⇒ [“4.2 Summary of components - fan shroud and radiator fan”, page 254](#) .



4.6 Removing and installing radiator with charge air cooler

⇒ [“4.6.1 Removing and installing radiator with charge air cooler”, page 259](#)

⇒ [“4.6.2 Removing and installing radiator, Kodiaq”, page 262](#)

4.6.1 Removing and installing radiator with charge air cooler

WARNING

There is risk of injury from radiator fans starting up automatically.

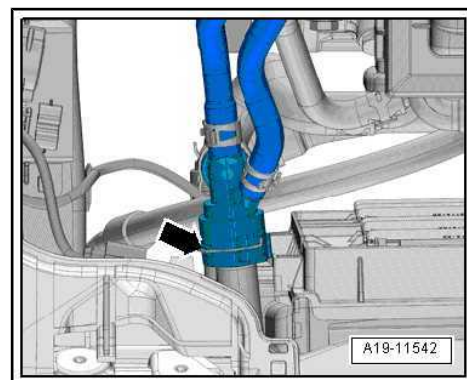
- Before carrying out work in the fan shroud area, disconnect the electrical plug connections of the fan.

Note

Coolant radiator and charge air circulation cooler are removed together.

Removing

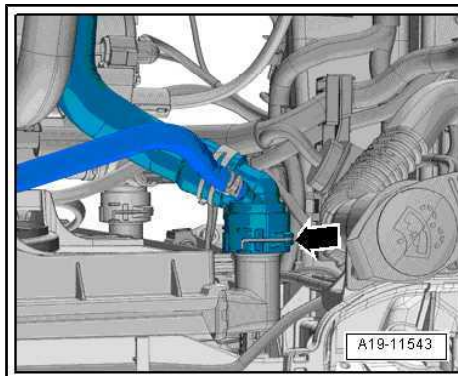
- Remove the sound dampening system ⇒ Exterior body work; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Remove front bumper ⇒ Exterior body work; Rep. gr. 63 ; Front bumper; Removing and installing front bumper .
- Removing fan shroud
⇒ [“4.4 Removing and installing radiator cowl with radiator fan”, page 257](#) .
- Drain coolant from the radiator
⇒ [“1.3 Draining and filling up coolant”, page 225](#) .
- Raise holding clamp -arrow- and disconnect coolant hose right above radiator for charge air circuit.



- Raise holding clamp -arrow- and remove top left coolant hose from radiator.

For Superb III vehicles

- Remove radiator blind
⇒ [“4.7 Removing and installing radiator blind”, page 263](#) .



- Unlock expanding rivets -2- on top air guide pipe -3-.

Continued for all vehicles

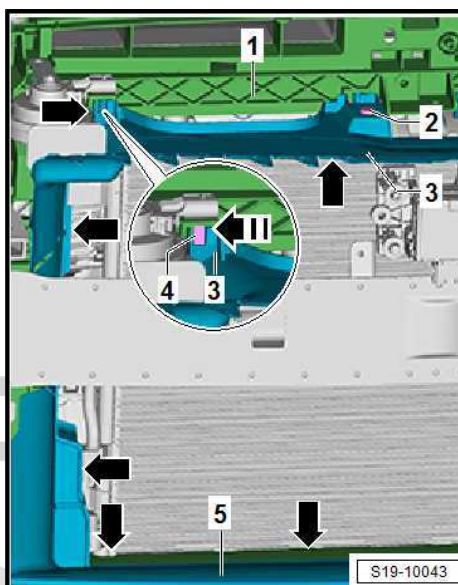
- Unlock catches -4- for air guide pipe -arrows-.
- Press top air guide -3- and bottom air guide -5- off lock carrier.

For Kodiaq vehicles

- Remove the guide profile from the bumper bracket ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Summary of components - bumper .

Continued for all vehicles

- Remove top and bottom air guides.



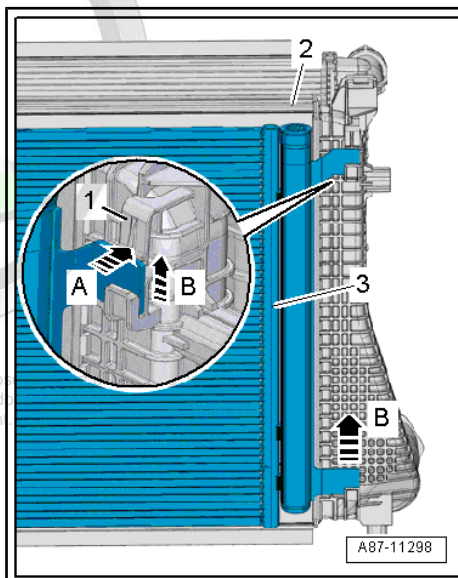
CAUTION

Risk of frost due to refrigerant.

Do not open the refrigerant circuit of the air conditioning system.

In order to avoid damage to the condenser as well as to the refrigerant lines and hoses, ensure that the lines and hoses are not over-tensioned, kinked or bent.

- Press locking tabs -1- on both sides in direction of arrow -A- and release.
- Pull condenser -3- upwards in direction of arrow -B- and unhook from the radiator -2-.
- Strap condenser to the lock support.



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- Pinch off left and right catches -arrows- of the radiator bearing and press coolant radiator with the charge air circuit radiator in direction of the engine compartment.



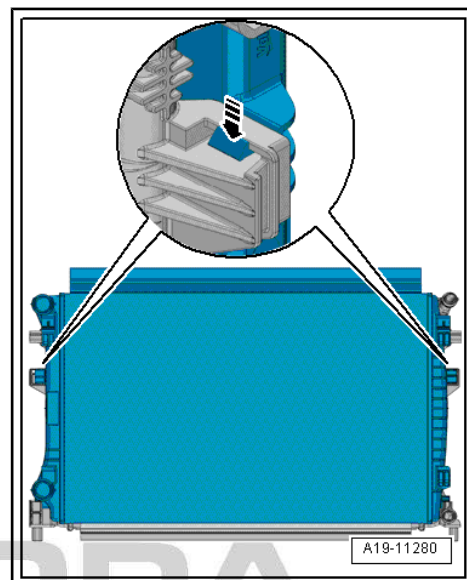
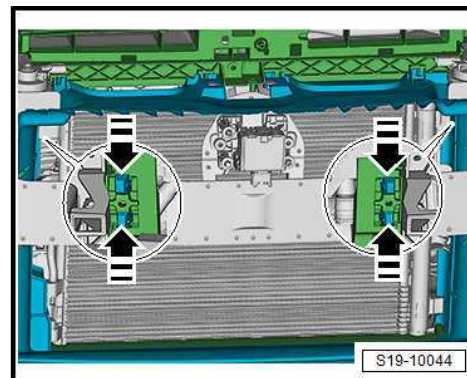
Note

The radiator bearing is used again for installation. Secure by screwing onto the lock carrier with a special screw ⇒ ETKA - Electronic Catalogue of Original Parts .

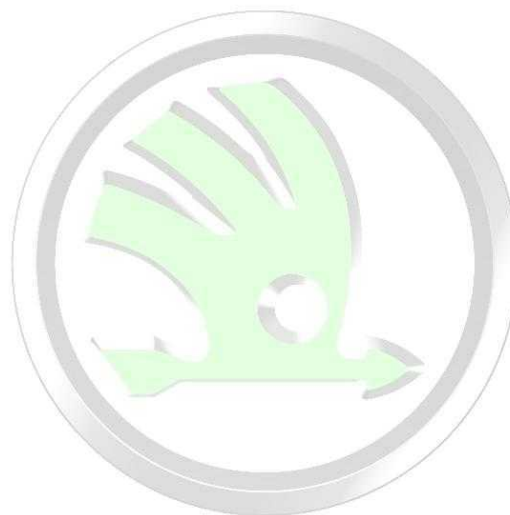
- Remove the coolant radiator from the vehicle together with the charge air circuit radiator.
- Press left and right radiator locking lugs simultaneously -arrow- and remove coolant radiator from the charge air circuit radiator.

Install

Installation is performed in the reverse order, pay attention to the following points:



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Screw the radiator bearing with screws -arrows- to the lock carrier after the locking tabs have been pinched off ⇒ ETKA - Electronic Catalogue of Original Parts .

Tightening torque ⇒ [page 262](#) .



Note

- ◆ Do not replace the cooler when there is light pressure on the fins ⇒ [“3.5 Assembly of radiators and condensers”, page 7](#) .
- ◆ Replace O-rings.

For Superb III vehicles

- Install radiator blind
⇒ [“4.7 Removing and installing radiator blind”, page 263](#) .

Continued for all vehicles

- Install fan shroud
⇒ [“4.4 Removing and installing radiator cowl with radiator fan”, page 257](#) .
- Connect coolant hoses with quick coupling
⇒ [Fig. ““Connect coolant hose with quick coupling””, page 253](#) .
- Top up coolant
⇒ [“1.3 Draining and filling up coolant”, page 225](#) .

Tightening torques

- ◆ Screw for top radiator bearing
⇒ [“4.1 Assembly overview - radiator/radiator fan”, page 251](#) .

4.6.2 Removing and installing radiator, Kodiaq



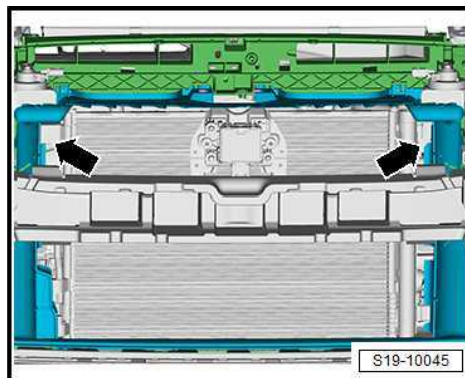
WARNING

There is risk of injury from radiator fans starting up automatically.

- Before carrying out work in the fan shroud area, disconnect the electrical plug connections of the fan.

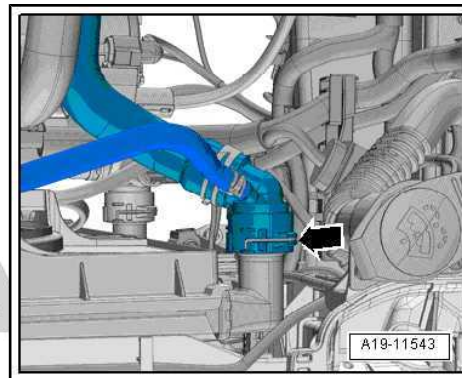
Removing

- Remove the sound dampening system ⇒ Exterior body work; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Removing fan shroud
⇒ [“4.4 Removing and installing radiator cowl with radiator fan”, page 257](#) .
- Drain coolant from the radiator
⇒ [“1.3 Draining and filling up coolant”, page 225](#) .

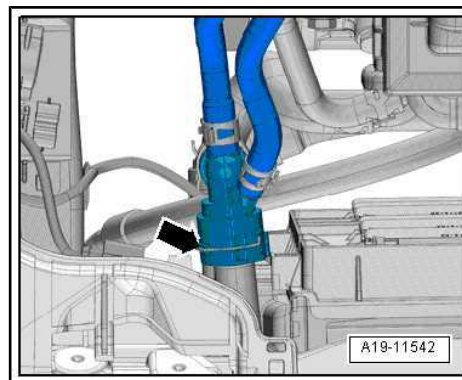


- Raise holding clamp -arrow- and remove top left coolant hose from radiator.

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- Raise holding clamp -arrow- and disconnect coolant hose right above radiator for charge air circuit.



- Push the screwdriver from the engine compartment in direction of arrow -B- between the catch arrow -A- and the catch mechanism.

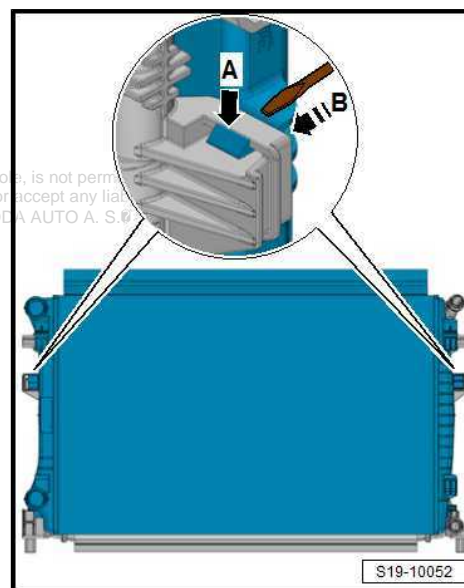


Note

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- ◆ *When releasing the catch, take care to ensure that you do not break the mechanism.*
- ◆ *Replace the release procedure on the left and right sides of the radiator.*

- Turn the screwdriver slightly to release the catch.
- Push the radiator upwards into the engine compartment at the same time.
- Pull the radiator downwards off the fixtures.
- Remove the radiator downwards out of the vehicle.



Install

Installation is performed in the reverse order, pay attention to the following points:

- Install fan shroud
⇒ [“4.4 Removing and installing radiator cowling with radiator fan”, page 257](#) .
- Connect coolant hoses with quick coupling
⇒ [Fig. “Connect coolant hose with quick coupling”, page 253](#) .
- Top up coolant
⇒ [“1.3 Draining and filling up coolant”, page 225](#) .

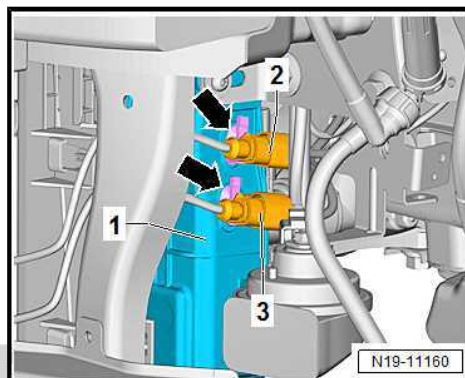
4.7 Removing and installing radiator blind

Special tools and workshop equipment required

- ◆ Removal tool for inner lining of the door panel - MP8-602/1-
- ◆ Disassembly wedge - 3409-

Removing

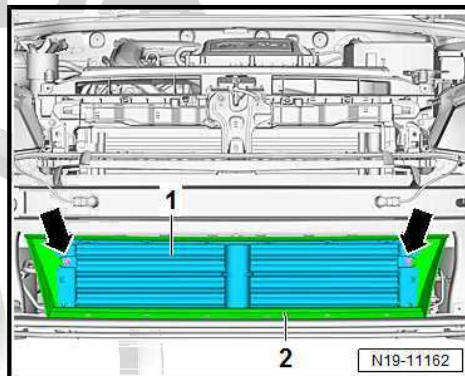
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Remove the front bumper ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; removing and installing bumper .
- Separate electrical plug connection -2-.
- Disconnect plug connection -2- from the connector holder -arrow- on lock carrier -1-.



- Release screws -arrows-.
- Press radiator blind -1- with seal -2- down slightly and remove to front.

Install

Installation is performed in the reverse order, pay attention to the following points:

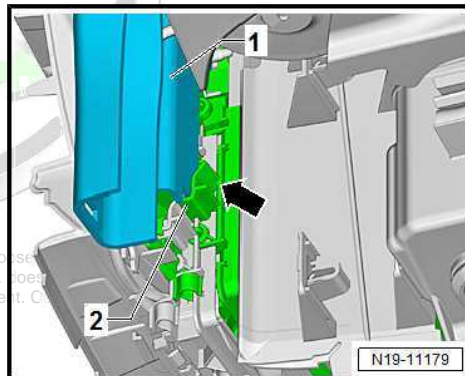


- Make sure that the guides of the radiator blind -2- correctly engage in the bumper carrier -1- -arrow-.

After replacing the radiator blind, perform basic setup ⇒ Vehicle diagnostic tester.

- Erase the event memory ⇒ Vehicle diagnostic tester.
- Connect vehicle diagnosis tester and perform basic setup ⇒ Vehicle diagnostic tester.

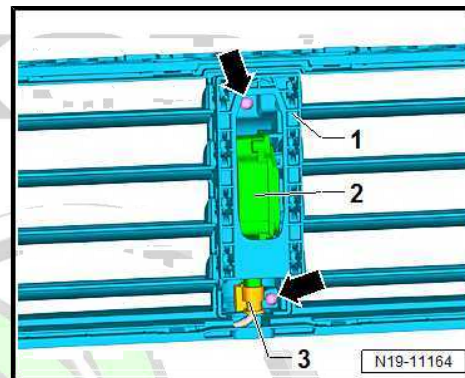
- ◆ 0001 - Adaptation of the control motor for radiator blind - V544



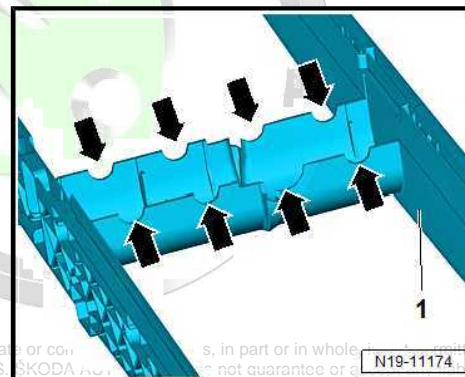
4.8 Removing and installing the radiator blind control motor - V544-

- Remove radiator blind
⇒ ["4.7 Removing and installing radiator blind", page 263](#) .

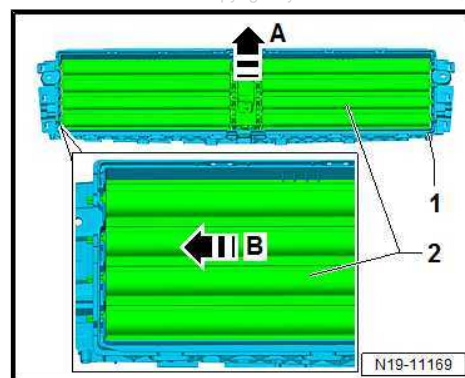
- Put the flaps of the radiator blind to “open”, as shown in the illustration.
- To do so, move the connecting bridge -1-.
- Separate electrical plug connection -3-.
- Release screws -arrows-.



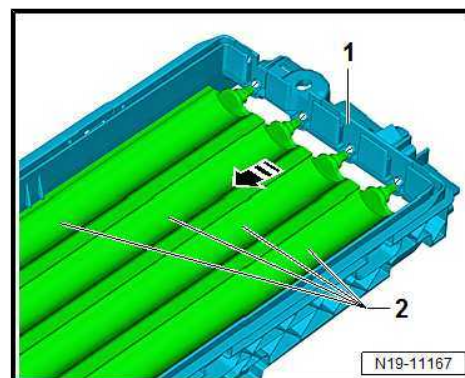
- Raise the engine mount Pos. 8 ⇒ **Item 8 (page 256)** with the flaps upwards out of the support -arrows- in the frame -1-.



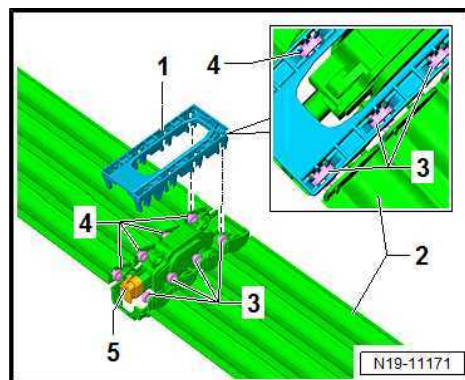
- Slide the engine mount with flaps -2- as far as possible to the left arrow -B-.



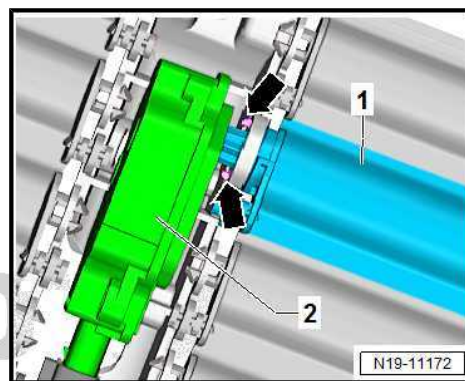
- Pry the flaps -2- on the right side out of the frame -1-.



- Mark the fitting position of the connecting bridge -1-.
- Use the plug -5- as reference point.
- Pry the connecting bridge -1- out of the guide rollers -3- and -4- of the flaps -2-.



- Remove the control flap -1- from the radiator blind control motor - V544- -2-.
- To do this, release locking tabs -arrows-.



- If used, unscrew screw -3-.
- Swivel the radiator blind control motor - V544- upwards in -direction of arrow-.
- Remove the radiator blind control motor - V544- from the pin -4-.

If necessary, then detach and remove the flaps from the engine mount Pos. 8 → [Item 8 \(page 256\)](#) .

Install

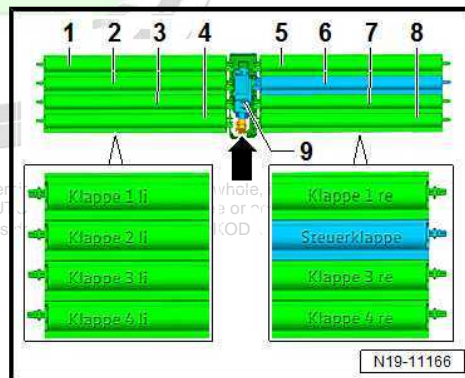
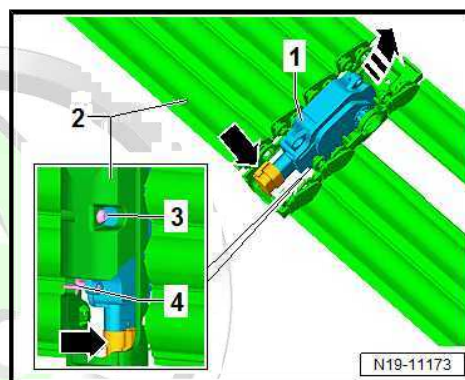
Installation is performed in the reverse order, while paying attention to the following:

- Position and secure the flaps -1- to -8- as shown.
- Slide on and secure the control flap -6-.

During assembly, note the position of the plug connection -arrow-, which points downwards.

- Note the arrangement of the flaps - the flaps overlap.

The top flap partially overlaps the next flap attached below it.

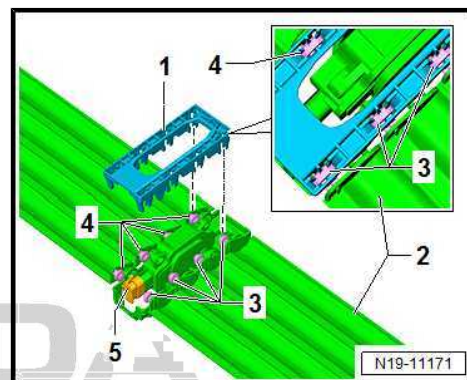


Num-ber	Left flaps	Num-ber	Right flaps
1	Flap 1, left	5	Flap 1, right
2	Flap 2, left	6	Control flap
3	Flap 3, left	7	Flap 3, right
4	Flap 4, left	8	Flap 4, right

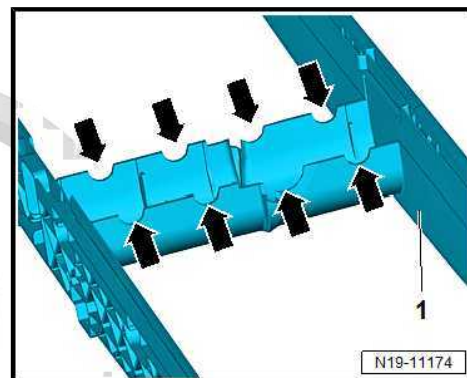
- Bring connecting bridge -1- to correct fitting position.

To do this, use the mark prepared earlier or use the plug -5- as reference point.

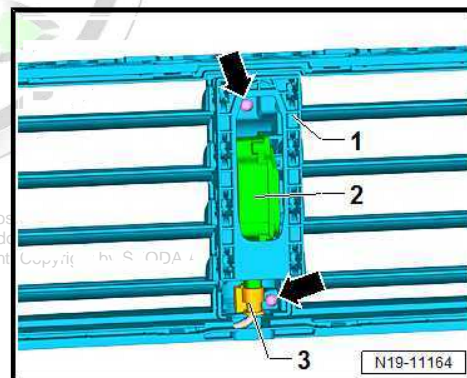
- Make sure that the connecting bridge is lying correctly on the guide rollers when you lock it.



- Insert engine mount Pos. 8 ⇒ [Item 8 \(page 256\)](#) with the flaps onto the support in the frame -1-.
- Make sure that the engine mount correctly engages with the flaps into the supports -arrows-.



- Screw in screws -arrow-.

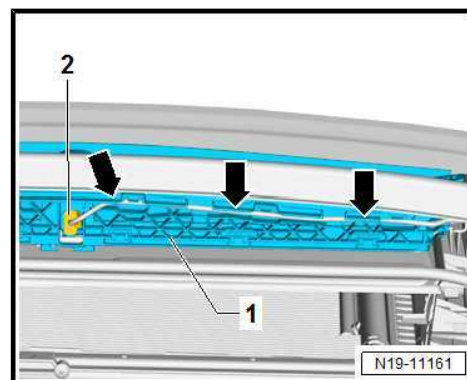


- Reconnect connector -2-.
- Secure the wiring loom in the retaining tabs -arrows-.

After replacing the radiator blind control motor - V544- , perform basic setup ⇒ Vehicle diagnostic tester.

- Erase the event memory ⇒ Vehicle diagnostic tester.
- Connect vehicle diagnosis tester and perform basic setup ⇒ Vehicle diagnostic tester.

- ◆ 0001 - Adaptation of the control motor for radiator blind - V544



1 Exhaust gas turbocharger

⇒ “1.1 Summary of components - exhaust gas turbocharger”,
page 268

⇒ “1.2 Removing and installing exhaust gas turbocharger”,
page 271

⇒ “1.3 Removing and installing charge pressure regulator V465”,
page 277

1.1 Summary of components - exhaust gas turbocharger

⇒ “1.1.1 Summary of components - exhaust gas turbocharger,
variant 1”, page 268

⇒ “1.1.2 Summary of components - exhaust gas turbocharger,
variant 2”, page 269

⇒ “1.1.3 Summary of components - exhaust gas turbocharger
line”, page 270

1.1.1 Summary of components - exhaust gas turbocharger, variant 1

1 - Exhaust gas turbocharger

- ☐ removing and installing
⇒ “1.2 Removing and installing exhaust gas turbocharger”, page 271

2 - Screw

- ☐ 8 Nm

3 - Supports

4 - O-ring

- ☐ Replace after disassembly

5 - Gasket

- ☐ Replace after disassembly

6 - Heat shield

7 - Screw

- ☐ 25 Nm

8 - Screw

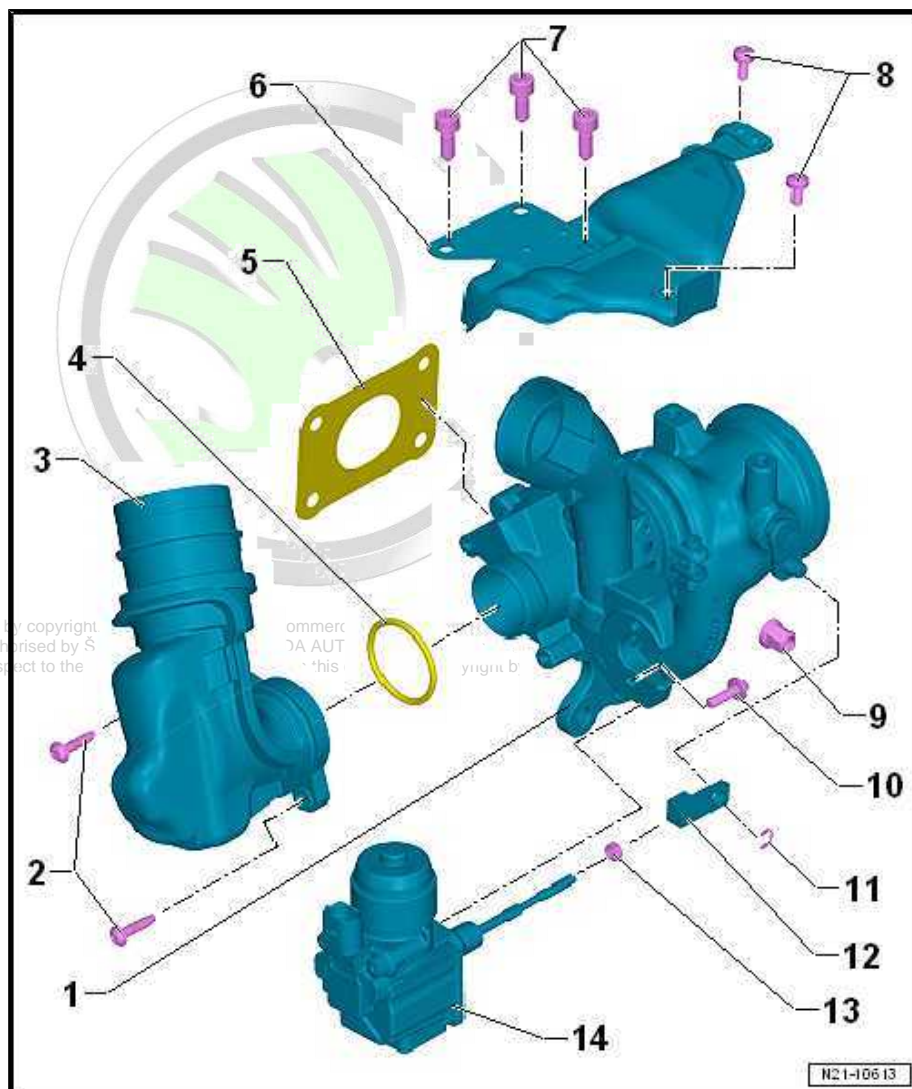
- ☐ 8 Nm

9 - Nut

- ☐ Replace after removing
⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ 14 Nm

10 - Screw

- ☐ Replace after disassembly
- ☐ 9 Nm



11 - Locking clip

- ☐ Replace after disassembly

12 - Driver

13 - Locknut

- ☐ Secure with sealant
- ☐ 6 Nm

14 - Charge pressure regulator - V465-



Note

- ◆ Always observe when installing!
- ◆ Different variants of the charge pressure regulator can be installed.

- ☐ removing and installing

⇒ ["1.3.1 Removing and installing the charge pressure regulator V465 , variant 1", page 277](#)

1.1.2 Summary of components - exhaust gas turbocharger, variant 2

1 - Screw

- ☐ 25 Nm

2 - Screw

- ☐ 8 Nm

3 - Heat shield

4 - Exhaust gas turbocharger

- ☐ removing and installing
⇒ ["1.2 Removing and installing exhaust gas turbocharger", page 271](#)

5 - Locking clip

- ☐ Replace after disassembly

6 - Driver

7 - Control rod

8 - Locknut

- ☐ Secure with sealant
- ☐ 6 Nm

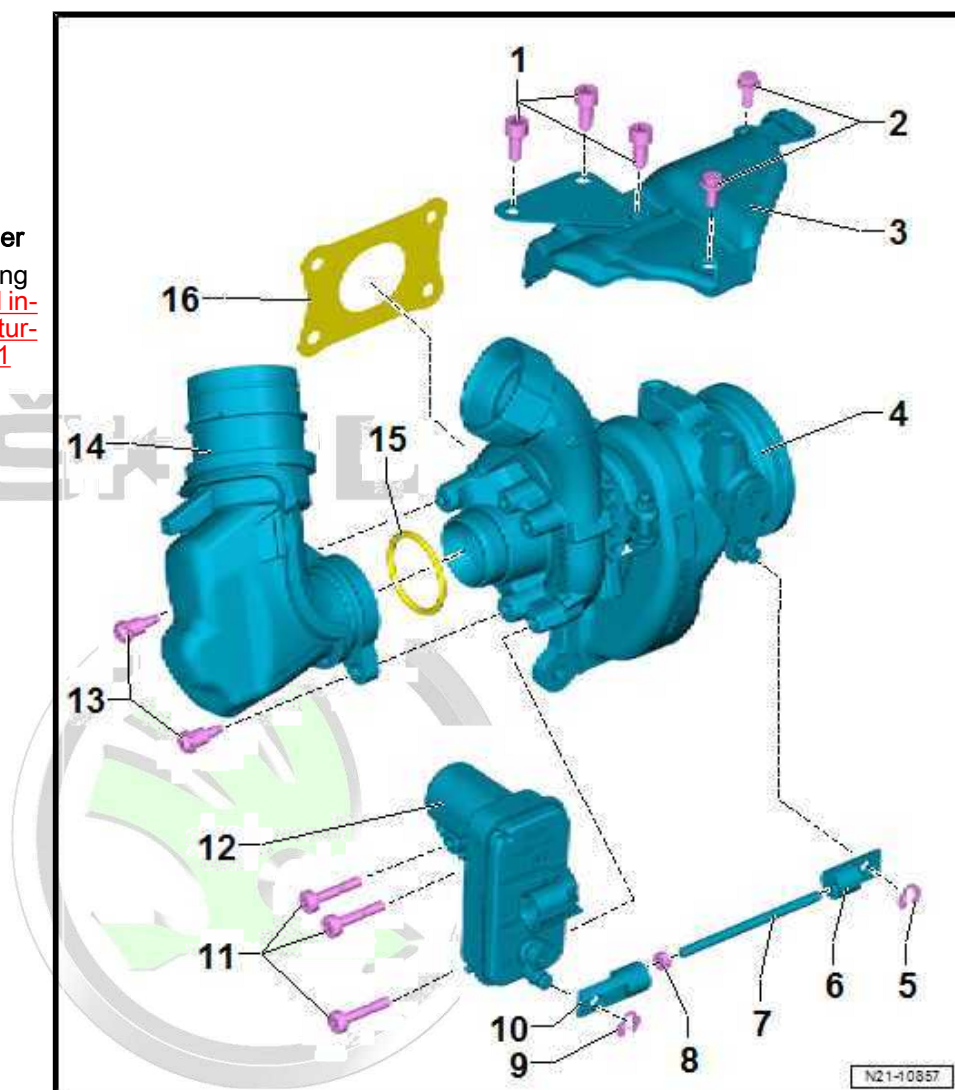
9 - Locking clip

- ☐ Replace after disassembly

10 - Driver

11 - Screw

- ☐ Replace after disassembly
- ☐ 9 Nm



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12 - Charge pressure regulator - V465-



Note

- ◆ Always observe when installing!
- ◆ Different variants of the charge pressure regulator can be installed.

- ☐ removing and installing

⇒ ["1.3.2 Removing and installing the charge pressure regulator V465 , variant 2", page 278](#)

13 - Screw

- ☐ 8 Nm

14 - Supports

15 - O-ring

- ☐ Replace after disassembly

16 - Gasket

- ☐ Replace after disassembly

1.1.3 Summary of components - exhaust gas turbocharger line

1 - Oil return-flow line

2 - O-ring

- ☐ Replace after disassembly
- ☐ wet with engine oil

3 - Screw

- ☐ 9 Nm

4 - O-ring

- ☐ Replace after disassembly

5 - Screw

- ☐ 9 Nm

6 - Oil feed line

7 - O-ring

- ☐ Replace after disassembly
- ☐ wet with engine oil

8 - Screw

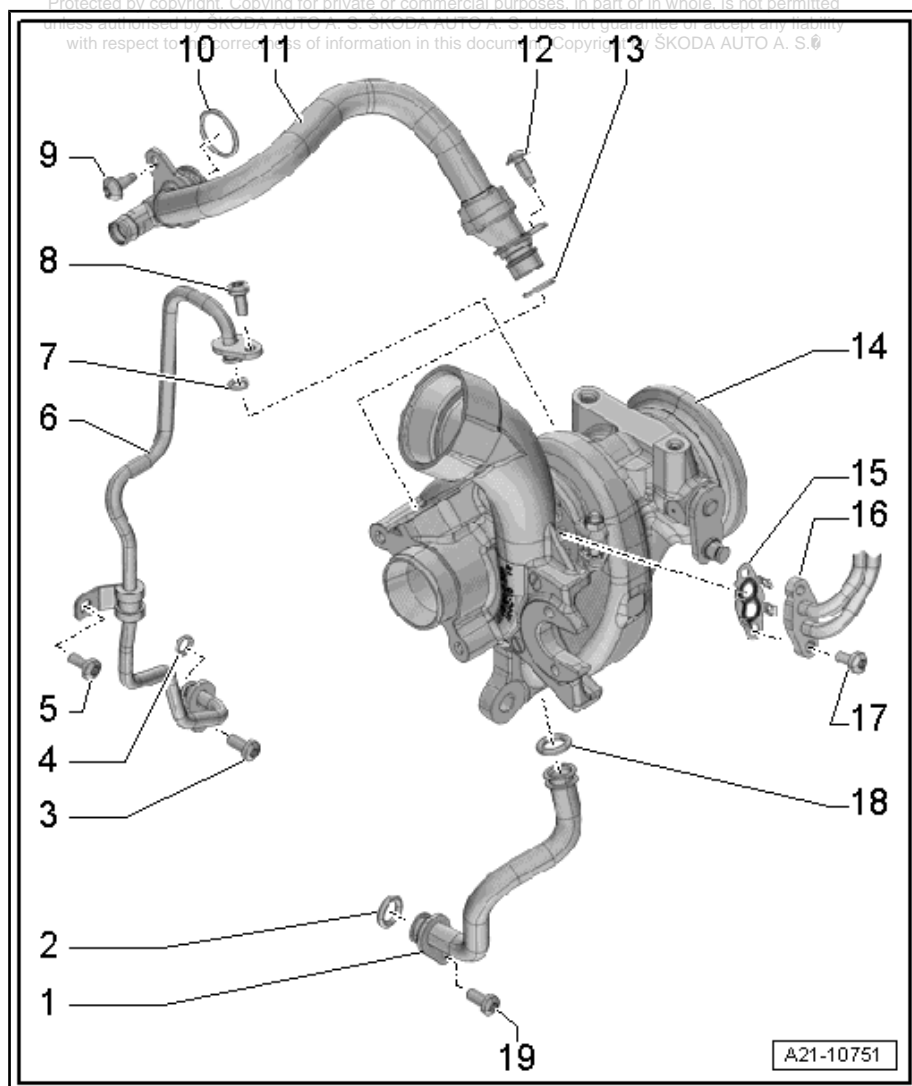
- ☐ 9 Nm

9 - Screw

- ☐ Replace after disassembly
- ☐ 5 Nm

10 - O-ring

- ☐ Replace crankcase ventilation hose Pos. -11- if it is damaged or leaking
- ☐ wet with engine oil



11 - Hose

- ☐ for crankcase ventilation

12 - Screw

- ☐ Replace after disassembly
- ☐ 5 Nm

13 - O-ring

- ☐ Replace crankcase ventilation hose Pos. -11- if it is damaged or leaking
- ☐ wet with engine oil

14 - Exhaust gas turbocharger

- ☐ removing and installing ⇒ [“1.2 Removing and installing exhaust gas turbocharger”, page 271](#)

15 - Gasket

- ☐ Replace after disassembly

16 - Coolant line

- ☐ Feed line and return-flow line

17 - Screw

- ☐ 8 Nm

18 - O-ring

- ☐ Replace after disassembly
- ☐ wet with engine oil

19 - Screw

- ☐ 9 Nm

1.2 Removing and installing exhaust gas turbocharger

Special tools and workshop equipment required

- ◆ Screw plug set for engine , e.g. -VAS 6122-
- ◆ Hose clamps up to 25 mm - MP7-602 (3094)-
- ◆ Pliers for spring strap clamps -VAS 6362-
- ◆ Release tool -T10527-
- ◆ Release tool -T10527/1-

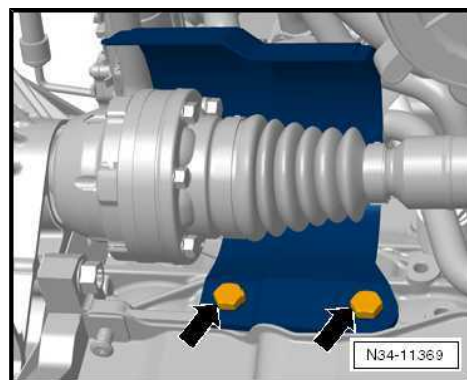
Removing

Observe rules for cleanliness ⇒ [“3.1 Cleanliness rules”, page 6](#) .

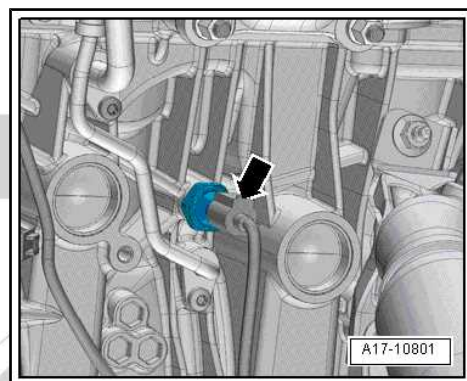
In case a mechanical damage to the exhaust gas turbocharger is found, (e.g. damage to the compressor wheel), it is not sufficient to only replace the turbocharger. In order to avoid consequential damage, the following tasks must be performed:

- ◆ Inspect the air filter housing, the air filter element and air guide hoses for contamination.
- ◆ Inspect the whole charge-air routing and charge air cooler for foreign bodies.
- ◆ If foreign bodies are found in the charge air system, clean the charge air duct and replace the charge air cooler if necessary.
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .

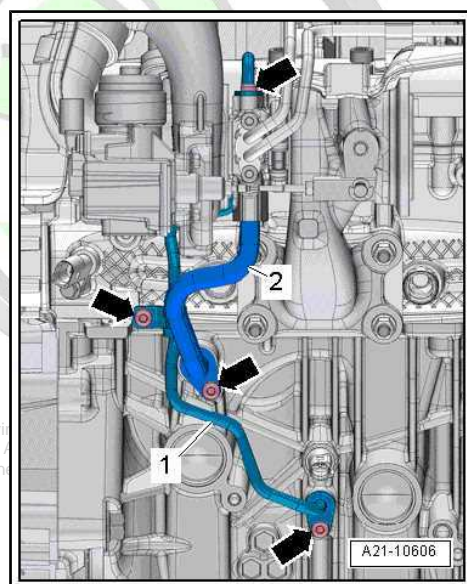
- Release screws -arrows- and remove heat shield for right car-dan shaft, if present.



- Remove plug -arrow- at the oil pressure switch for reduced oil pressure - F378- .



- Screw out the screws -arrows-, remove oil feed line -1- and oil return pipe -2-.

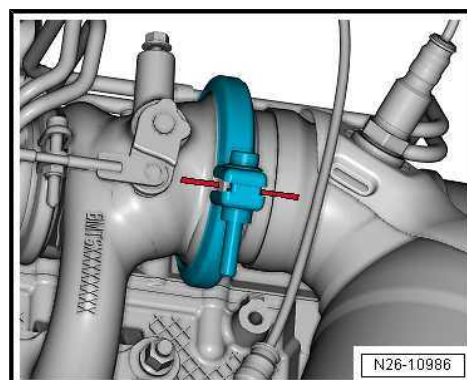


- Mark the position of the clamp.



Note

- ◆ *Before loosening the coupling point between catalytic converter and turbocharger, mark the position of the clamp!*
- ◆ *Re-establish the position of the clamp when assembling.*



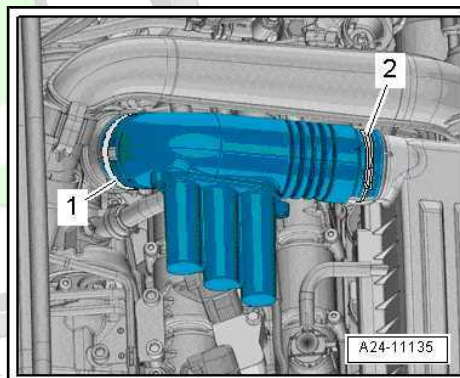
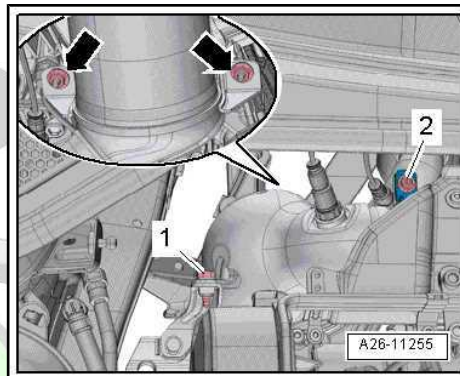
- Unscrew screw -2- and remove screw clamp.
- Remove screw -1-, remove nuts -arrows- and strap up catalytic converter to the bodyshell so as not to damage the decoupling element.



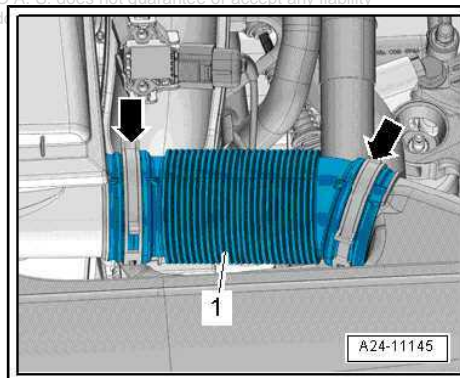
Note

do not twist decoupling element in the exhaust pipe more than 10° - risk of damage

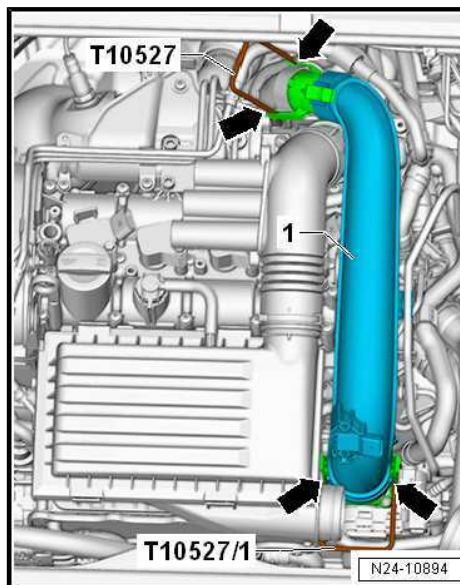
- Loosen hose clamps -1-, -2- and remove air guide pipes.
- Expose air guide hoses at the air guide pipe.



- Undo hose clamps -arrows-, remove air guide hose -1-.
- Remove plug from charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.



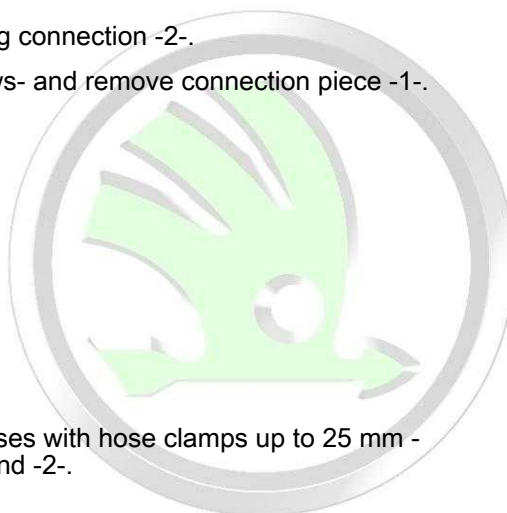
- Release retaining tabs -arrows- using the release tool - T10527- and -T10527/1- .
- Remove air guide pipe -1-.



- Press release buttons and remove hose -1- to the activated charcoal filter.
- Unscrew screws -arrows- and remove hose for crankcase ventilation.

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- Separate electrical plug connection -2-.
- Release screws -arrows- and remove connection piece -1-.



- Disconnect coolant hoses with hose clamps up to 25 mm - MP7-602 (3094)- -1- and -2-.

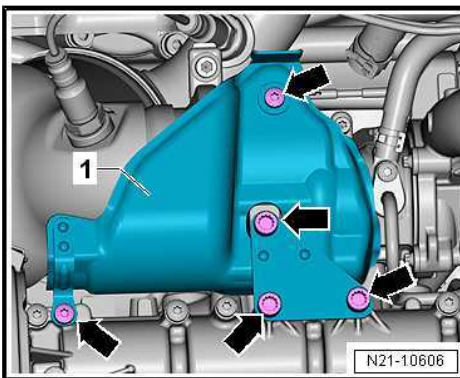
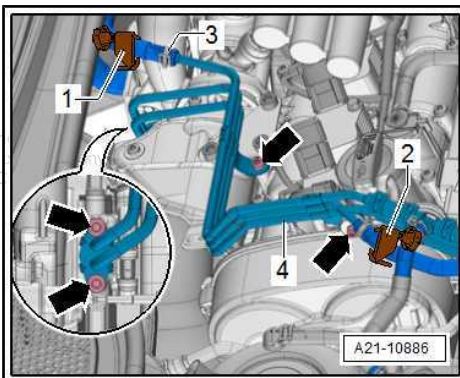
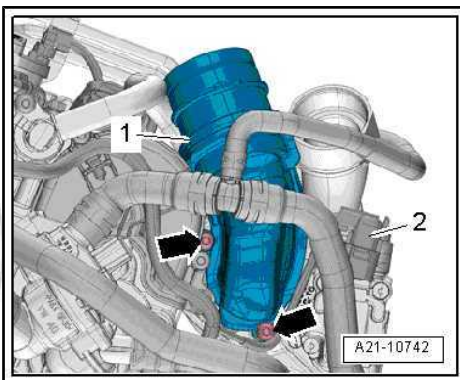
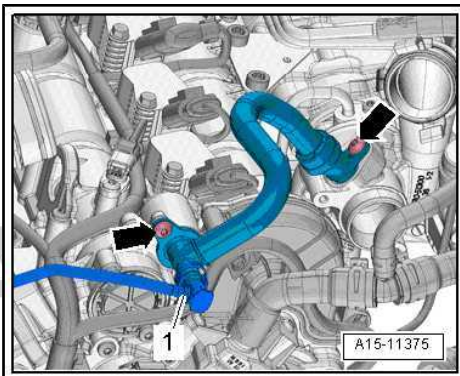


Note

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Place a cloth below to absorb leaking coolant.

- Loosen hose clamp -3- and remove coolant hose.
- Unscrew -arrows- screws and swivel coolant lines -4- to the right side.
- Release screws -arrows- and remove mount with heat shield -1-.

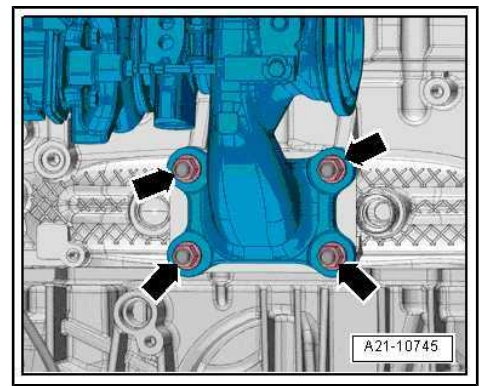


- Unscrew nuts -arrows- and remove exhaust gas turbocharger.

Install

Installation is performed in the reverse order, pay attention to the following points:

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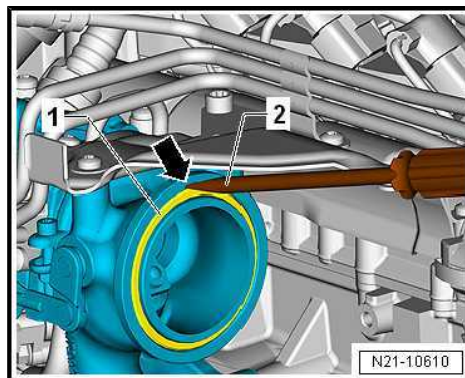


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- Push screwdriver -2- into the recess -arrow- of the exhaust gas turbocharger and lever out the sealing ring -1-.

Tighten nuts -arrows- in succession in the clockwise direction in several stages:

Stage	Nut	Specified torque
1.	-1...4-	tighten to 7 Nm
2.	-1...4-	tighten to 10 Nm
3.	-1...4-	tighten again to 10 Nm
4.	-1...4-	tighten to 14 Nm



- Replace gaskets and O-rings.
- Fill the exhaust turbocharger with engine oil at the connection fitting for the oil feed line.

Secure all hose connections with hose clamps which comply with the series design ⇒ ETKA - Electronic Catalogue of Original Parts . Secure all hose connections with hose clamps which comply with the series design ⇒ ETKA - Electronic Catalogue of Original Parts .

- Check coolant level
⇒ [“1.3 Draining and filling up coolant”, page 225](#) .



Note

*If a new exhaust gas turbocharger with charge pressure regulator - V465- has been installed, perform adaption
⇒ [“1.3 Removing and installing charge pressure regulator V465”, page 277](#) .*

To ensure the oil supply to the exhaust gas turbocharger, leave the engine running for about 1 minute after installing the exhaust gas turbocharger; do not rev up immediately.

- Electrical connections and proper routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Tightening torques

- ♦ Exhaust gas turbocharger
⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#) .
- ♦ Air guide
⇒ [Fig. “Install air guide pipes with screw clamps””, page 284](#) .
- ♦ Exhaust pipe with catalytic converter
⇒ [Fig. “Installing catalytic converter - tightening torque and tightening order””, page 349](#) .
- ♦ Cardan shaft guard ⇒ Chassis, axles, steering; Rep. gr. 40 ; Cardan shaft; Removing and installing cardan shaft.

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1.3 Removing and installing charge pressure regulator - V465-

⇒ [“1.3.1 Removing and installing the charge pressure regulator V465 , variant 1”, page 277](#)

⇒ [“1.3.2 Removing and installing the charge pressure regulator V465 , variant 2”, page 278](#)

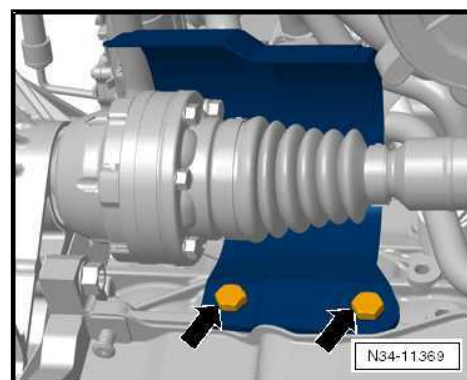
1.3.1 Removing and installing the charge pressure regulator - V465- , variant 1

Special tools and workshop equipment required

◆ Extractor - T40265-

Removing

- Switch off ignition.
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Release screws -arrows- and remove heat shield for right car-dan shaft, if present.



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- Separate electrical plug connection -1-.
- Pull off locking clip -2- using extractor - T40265- .
- Remove screws -arrows- and remove charge pressure regulator - V465- .

Install

Installation is performed in the reverse order, pay attention to the following points:



Note

Different variants of the charge pressure regulator can be installed.

- Replace locating screws and locking clips.

Charge pressure regulator without adjustable linkage

- Adapting the engine control unit - J623- to the charge pressure regulator - V465- → Vehicle diagnostic tester.

Charge pressure regulator with adjustable linkage

- Screw thread of charge pressure regulator - V465- into the driver at the centre.

Set charge pressure regulator - V465- as follows:

- Switch on the ignition and choose → Vehicle diagnostic tester.
- On the display tap consecutively the following buttons:

◆ 01 - Engine electronics

◆ 01 - Guided functions

◆ 01 - Basic setting

◆ 01 - Charge pressure regulator - V465 - setting

- Set specified value by adjusting the operating rod; specified value → Vehicle diagnostic tester.
- Tighten counter nut to 6 Nm and secure using sealant.
- Adapting the engine control unit - J623- to the charge pressure regulator - V465- → Vehicle diagnostic tester.

Tightening torques

- ◆ Charge pressure regulator - V465-
⇒ ["1.1 Summary of components - exhaust gas turbocharger", page 268](#) /

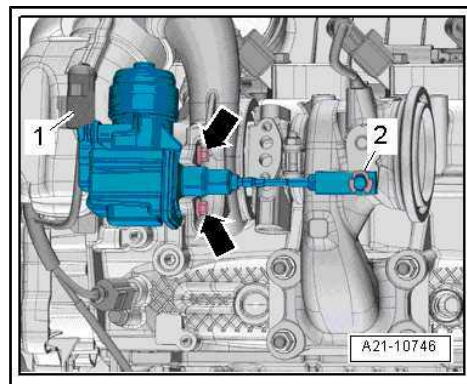
1.3.2 Removing and installing the charge pressure regulator - V465- , variant 2

Special tools and workshop equipment required

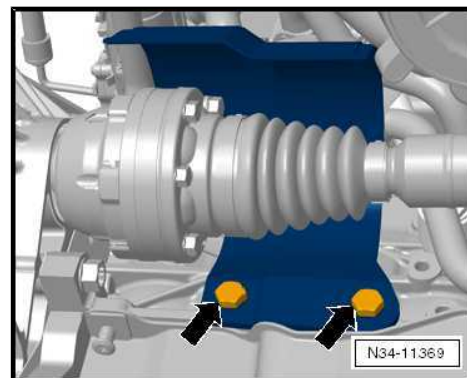
- ◆ Extractor - T40265-
- ◆ Release tool -T10527-
- ◆ Release tool -T10527/1-

Removing

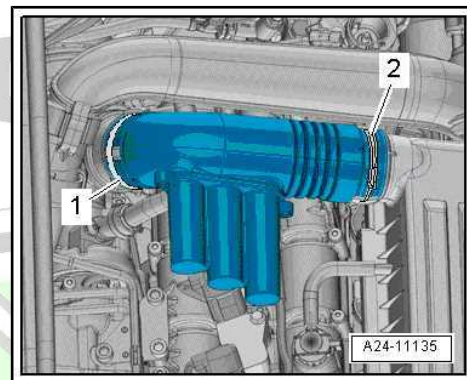
- Switch off ignition.



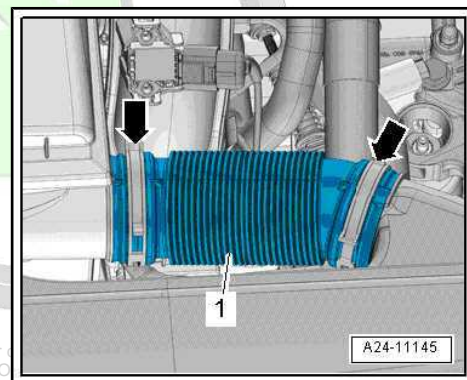
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Release screws -arrows- and remove heat shield for right car-dan shaft, if present.



- Loosen hose clamps -1-, -2- and remove air guide pipes.

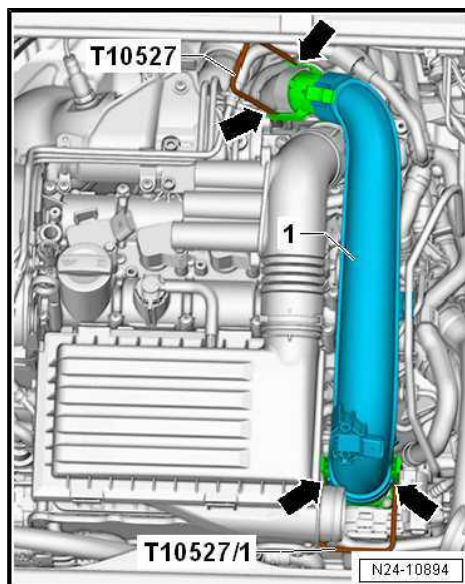


- Undo hose clamps -arrows-, remove air guide hose -1-.
- Remove plug from charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.

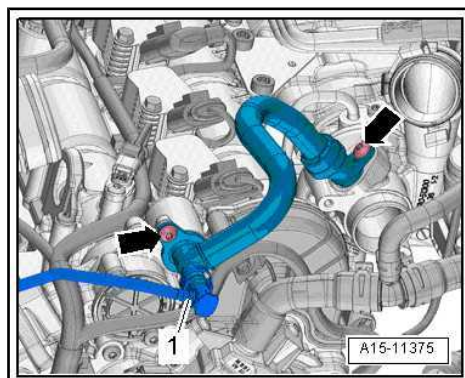


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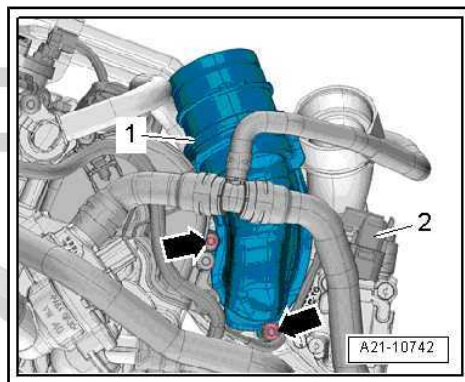
- Release retaining tabs -arrows- using the release tool - T10527- and -T10527/1- .
- Remove air guide pipe -1-.



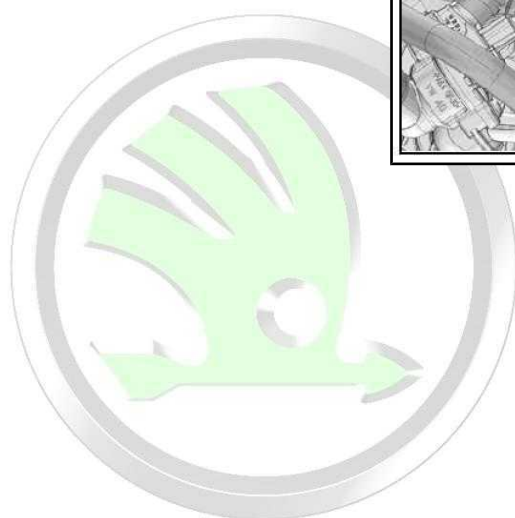
- Press release buttons and remove hose -1- to the activated charcoal filter.
- Unscrew screws -arrows- and remove hose for crankcase ventilation.



- Release screws -arrows- and remove connection piece -1-.



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- Separate electrical plug connection -2-.
- Disconnect locking clips -3- and remove control rod -4-.
- Remove screws -arrows- and remove charge pressure regulator - V465- .
- Mark or measure installation position of the control rod.

Install

Installation is performed in the reverse order, pay attention to the following points:

- Replace locating screws and locking clips.
- Screw on control rod as per previous markings.

Set charge pressure regulator - V465- as follows:

- Switch on the ignition and choose ⇒ Vehicle diagnostic tester.
- On the display tap consecutively the following buttons:

◆ 01 - Engine electronics

◆ 01 - Guided functions

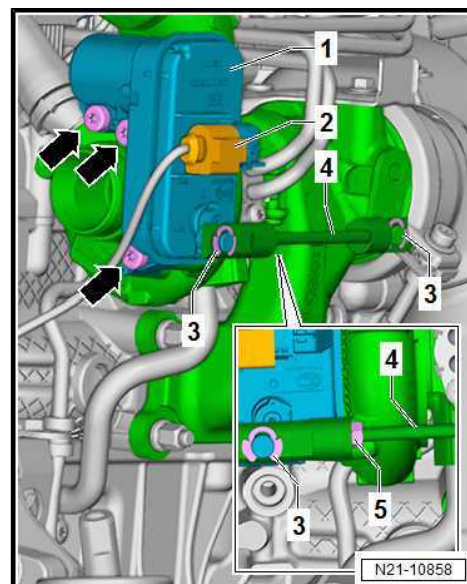
◆ 01 - Basic setting

◆ 01 - Charge pressure regulator - V465 - setting

- Set specified value by adjusting the operating rod; specified value ⇒ Vehicle diagnostic tester.
- Tighten counter nut to 6 Nm and secure using sealant.
- Adapting the engine control unit - J623- to the charge pressure regulator - V465- ⇒ Vehicle diagnostic tester.

Tightening torques

- ◆ Charge pressure regulator - V465-
⇒ "1.1 Summary of components - exhaust gas turbocharger",
page 268 /



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2 Charge-air system

⇒ [“2.1 Summary of components - charge air system”, page 282](#)

⇒ [“2.2 Removing and installing charge air cooler”, page 284](#)

⇒ [“2.3 Removing and installing charge pressure sender GX26 ”, page 286](#)

⇒ [“2.4 Checking the charge-air system for leaktightness”, page 286](#)

2.1 Summary of components - charge air system

Before a test or repair, check all charge air pipes, charge air hoses and vacuum lines for tight connection and leaktightness.

Observe rules for cleanliness ⇒ [“3.1 Cleanliness rules”, page 6](#) .

1 - Coolant hose

2 - Screw

- ☐ thread forming
- ☐ position and screw in by to allow the screw to find the old thread, then tighten the screw to the torque
- ☐ 15 Nm

3 - Coolant hose

4 - Coolant hose

5 - Charge air cooler

- ☐ removing and installing
⇒ [“2.2 Removing and installing charge air cooler”, page 284](#)
- ☐ After replacing, fill with fresh coolant
⇒ [“1.3 Draining and filling up coolant”, page 225](#)

6 - Sealing section

7 - Gasket

- ☐ Replace after disassembly

8 - Intake manifold

removing and installing
⇒ [“4.2 Removing and installing intake manifold”, page 305](#)

9 - Screw

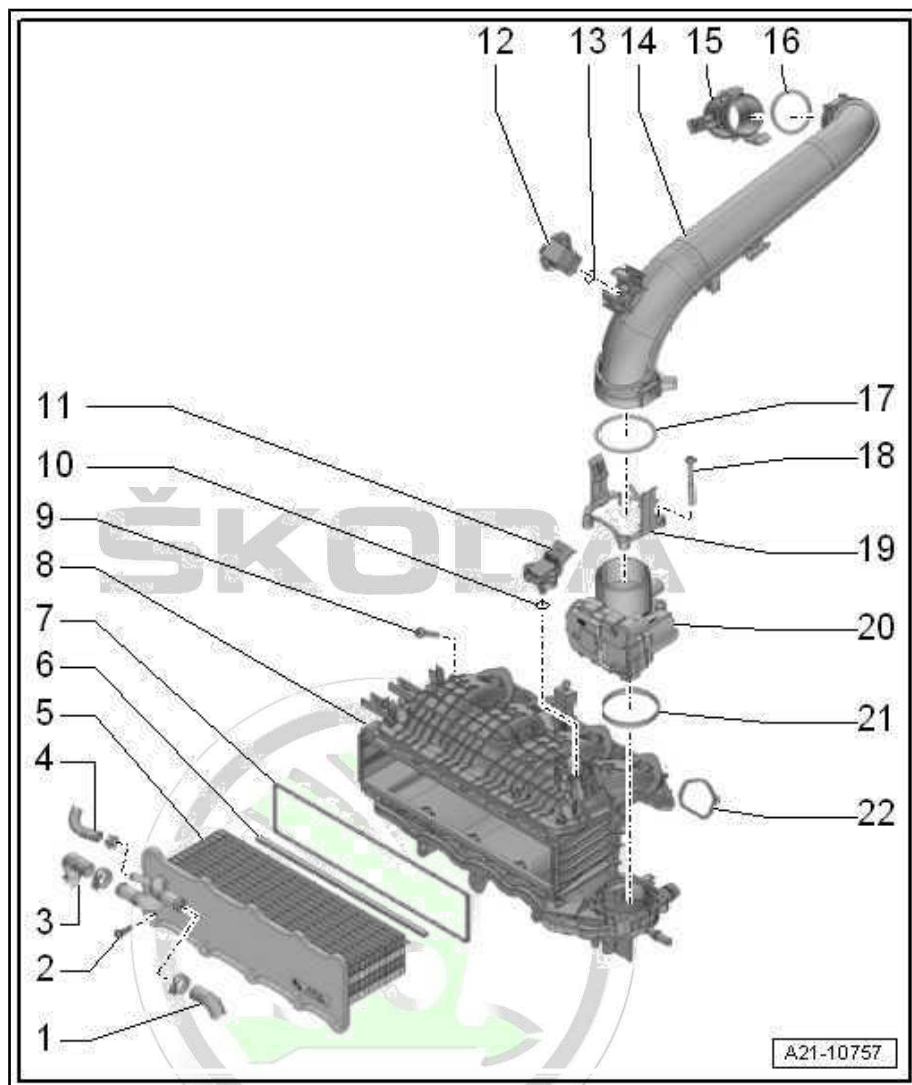
- ☐ Tightening torque and tightening order
⇒ [Fig. “Intake manifold - tightening torque and tightening order””, page 304](#)
- ☐ 8 Nm

10 - O-ring

- ☐ Replace after disassembly

11 - Intake manifold pressure sender - GX9-

- ☐ comprises:



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◆ Intake air temperature sender 2 - G299-

◆ Intake manifold pressure sender - G71-

☐ removing and installing

⇒ [“5.3 Removing and installing intake manifold pressure sender GX9”, page 313](#)

12 - Charge pressure sender - GX26-

☐ comprises:

◆ Charge pressure sender - G31-

◆ Intake air temperature transmitter - G42-

☐ removing and installing ⇒ [“2.3 Removing and installing charge pressure sender GX26”, page 286](#)

13 - O-ring

☐ Replace after disassembly

14 - Air guide pipe

☐ Remove with release tool -T10527-

15 - Connection fittings

16 - O-ring

☐ Replace after disassembly

17 - O-ring

☐ Replace after disassembly

18 - Screw

☐ thread forming

☐ position and screw in by to allow the screw to find the old thread, then tighten the screw to the torque

☐ 7 Nm

19 - Retaining clip

☐ For air guide pipe

20 - Throttle flap control unit - GX3-

☐ comprises:

◆ Throttle flap control unit - J338-

◆ Throttle flap drive - G186-

◆ Throttle flap drive angle sender 1 - G187-

◆ Throttle flap drive angle sender 2 - G188-

☐ removing and installing ⇒ [“4.3 Removing and installing the throttle flap control unit GX3”, page 308](#)

21 - Sealing ring

☐ Replace after disassembly

22 - Gasket

☐ 4 pieces

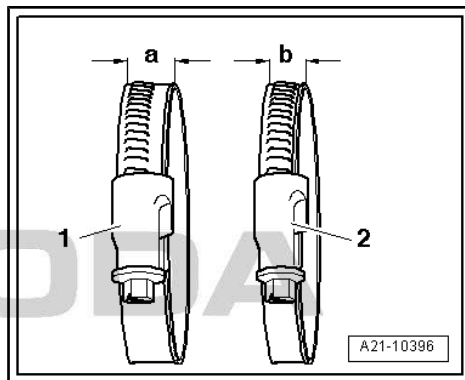
☐ Replace after disassembly

Install air guide pipes with screw clamps



Note

- ◆ *Hose connections and air guide pipes and hoses must be free of oil and grease before being installed.*
- ◆ *Secure all hose connection ends with spring-type clips that comply with the series design ⇒ ETKA - Electronic Catalogue of Original Parts .*
- ◆ *In order to secure the air guide hoses securely on their connection fittings, the screw threads must be sprayed with rust solvent before installing if the screw clamps have been used beforehand.*



Tightening torque for

- 1 - Hose clamp -a- = 13 mm wide: 5.5 Nm
- 2 - Screw clamp -b- = 9 mm wide: 3 Nm

2.2 Removing and installing charge air cooler

Special tools and workshop equipment required

- ◆ Hose clamps up to 25 mm - MP7-602 (3094)-
- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Radiator protection mat - VAS 531003-
- ◆ Pliers for spring strap clamps

Removing

- Removing fan shroud
⇒ ["4.4 Removing and installing radiator cowl with radiator fan", page 257](#) .
- Cover radiator with radiator protection mat - VAS 531003- .

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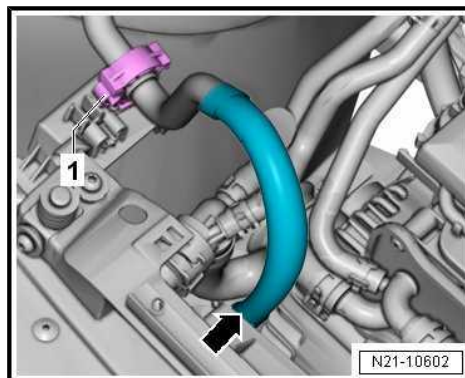
- Open the clamp -1- and push hose -arrow- to the side.



CAUTION

Risk of frost due to refrigerant.

Do not open the refrigerant circuit of the air conditioning system.

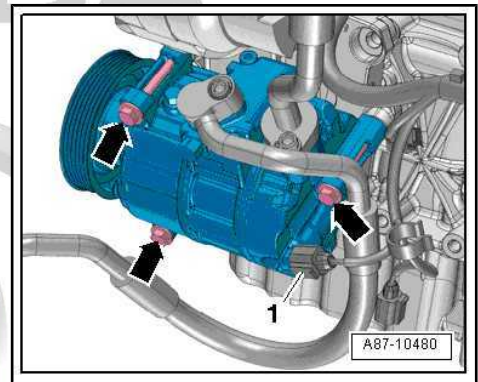


- Disconnect plug connection -1- on the control valve for the air conditioning system compressor - N280- .
- Release screws -arrows- for AC compressor.

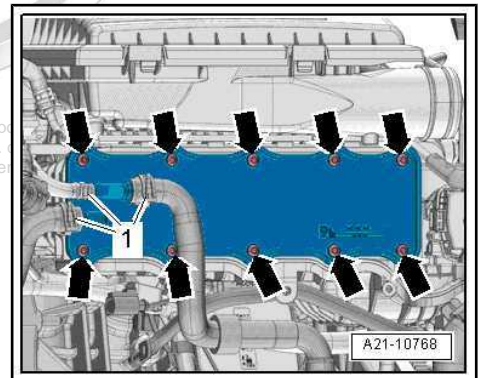
! NOTICE

Risk of damaging AC compressor, refrigerant lines and hoses.

- ◆ Do not over-tension, buckle or bend refrigerant lines and hoses.
- Remove AC compressor with connected refrigerant hoses and strap up to the right side.
- Place catch pan - VAS 6208- underneath.
- Disconnect coolant hoses at coolant pipe with hose clamps - MP7-602 (3094)- .
- Loosen hose clamps -1- and remove coolant hoses.
- Release screws -arrows- and remove charge air cooler.



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- Pull charge air cooler -1- backwards and forwards simultaneously in -direction of the arrow- out of the intake manifold.

Install

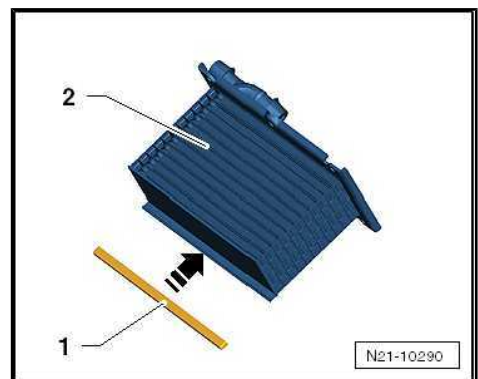
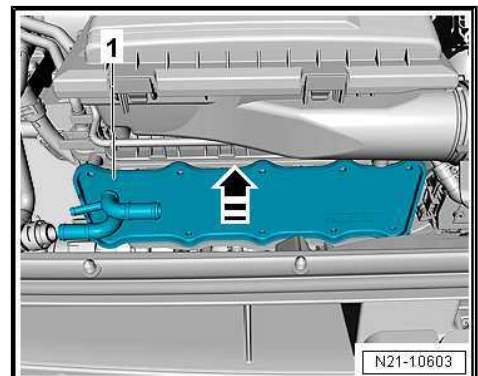


Note

*When replacing the charge air cooler, replace all the coolant
⇒ "1.3 Draining and filling up coolant", page 225 .*

Installation is performed in the reverse order, pay attention to the following points:

- Fit sealing strip -1- in -direction of the arrow- to the charge air cooler -2-.
- Insert new gasket into the groove at the intake manifold.



- Tighten screws -arrows- from centre to outside crosswise.
- Attach hose clamps -1-.



Note

When there is light pressure on the fins
 ⇒ ["3.5 Assembly of radiators and condensers", page 7](#) .

- Install fan shroud
 ⇒ ["4.4 Removing and installing radiator cowling with radiator fan", page 257](#) .
- Check coolant level ⇒ [page 229](#) .

Tightening torques

- ◆ Charge air cooler
 ⇒ ["2.1 Summary of components - charge air system", page 282](#) .

2.3 Removing and installing charge pressure sender - GX26-

The charge pressure sender - GX26- consists:

- ◆ Charge pressure sender - G31-
- ◆ Intake air temperature transmitter - G42-

Removing

- Separate electrical plug connection -1-.
- Release catches -arrows- and remove the charge pressure sender - GX26- .

Install

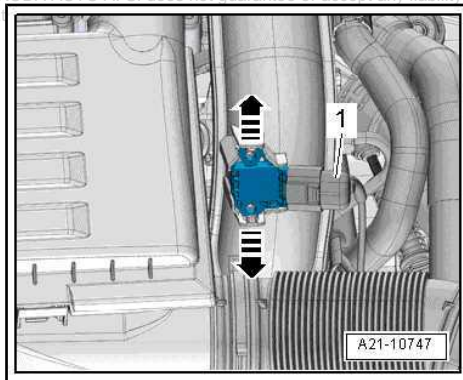
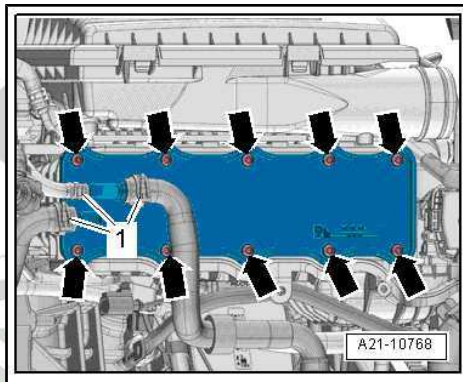
Installation is performed in the reverse order, pay attention to the following points:

- Replace O-ring.



Note

If the locking lugs brake, the sender can be secured with two screws to 3 Nm ⇒ *ETKA - Electronic Catalogue of Original Parts* .



2.4 Checking the charge-air system for leaktightness

Special tools and workshop equipment required

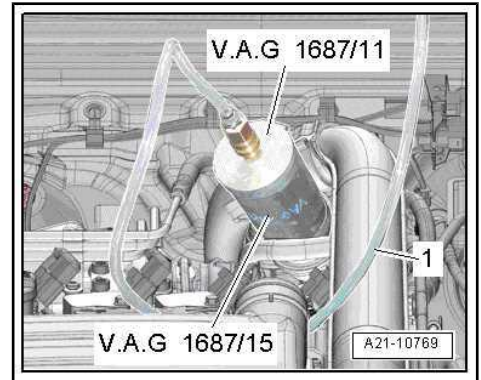
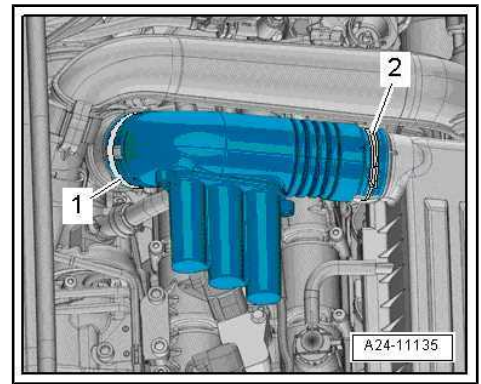
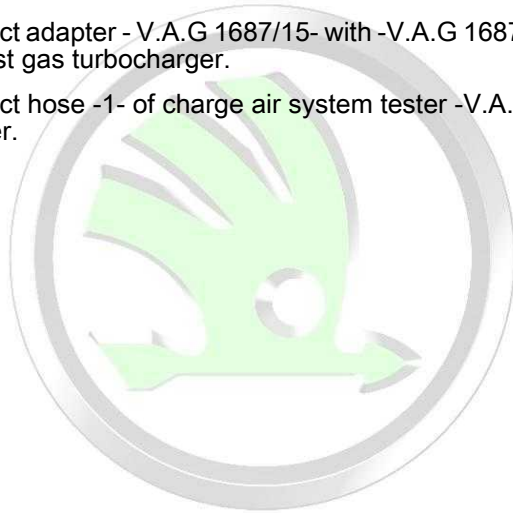
- ◆ Charge-air system testing device , e. g. -V.A.G 1687-

Work procedure

- Loosen hose clamps -1- and -2- and remove air guide pipes.

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- Connect adapter - V.A.G 1687/15- with -V.A.G 1687/11- to the exhaust gas turbocharger.
- Connect hose -1- of charge air system tester -V.A.G 1687- to adapter.



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Prepare tester for charge air system - V.A.G 1687- as follows:

- Unscrew pressure control valve -2- fully and close the valves -3- and -4-.
- The rotary knob must be pulled to the top in order to rotate the pressure control valve -2-.
- Connect tester for charge air systems - V.A.G 1687- to compressed air using a commercially available intermediate piece -1-.



Note

If there is water in the inspection glass, drain water via the drain plug -6-.

- Open valve -3-.



NOTICE

Risk of damage owing to pressure being set too high.

- The pressure must not be greater than 0.05 MPa (0.5 bar)!
- Set the pressure to 0.05 MPa (0.5 bar) with the pressure control valve -2-.
- Open valve -4- and wait until the test circuit is filled. If necessary regulate the pressure to 0.05 MPa (0.5 bar).
- Listen to, touch or use commercially available leak search spray or the ultrasonic measuring device - V.A.G 1842- to check the charge-air system for leak points.



Note

- ◆ *A small amount of air escapes via the valves into the engine. For this reason no pressure test is possible.*
- ◆ *Use of ultrasonic measuring device -V.A.G 1842- → Operating instructions .*
- ◆ *Before removing the adapter, depressurize the test circuit by detaching the hose coupling.*

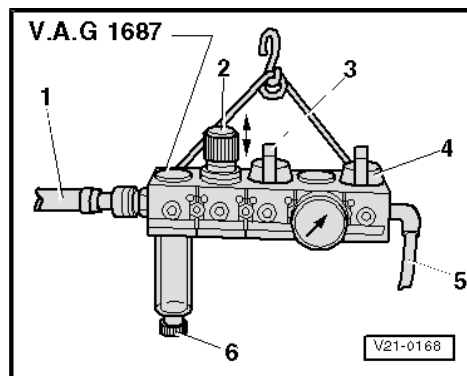
Install

Installation is performed in the reverse order, pay attention to the following points:

- Replace gaskets and O-rings.

Tightening torques

- ◆ Screw clamps
⇒ [Fig. "Install air guide pipes with screw clamps" , page 284](#) .



1 Injection system

⇒ [“1.1 Installation location overview - fuel injection system”, page 289](#)

⇒ [“1.2 Reduce fuel pressure”, page 292](#)

1.1 Installation location overview - fuel injection system

⇒ [“1.1.1 Installation location overview - engine compartment”, page 289](#)

⇒ [“1.1.2 Installation overview - engine from front”, page 291](#)

⇒ [“1.1.3 Installation overview - engine from rear”, page 292](#)

1.1.1 Installation location overview - engine compartment

1 - Inlet camshaft control valve 1 - N205-

- ☐ removing and installing
⇒ [“3.6 Removing and installing N205 the camshaft adjustment valve 1”, page 188](#)
- ☐ with integrated oil strainer

2 - Camshaft control valve 1 in the exhaust - N318-

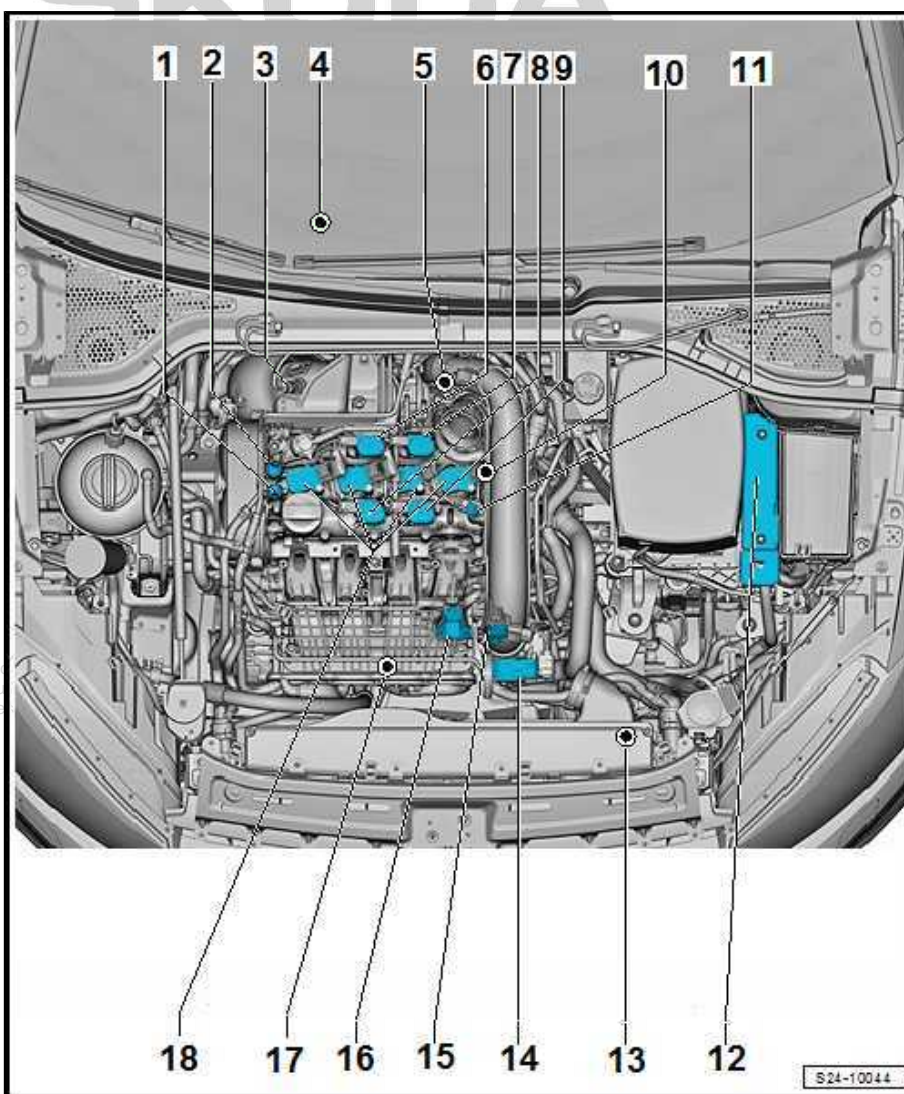
- ☐ Only fitted for engine identification characters CZDA, CZEA
- ☐ removing and installing
⇒ [“3.6 Removing and installing N205 the camshaft adjustment valve 1”, page 188](#)
- ☐ with integrated oil strainer

3 - Lambda probe 1 in front of the catalytic converter - GX10-

- ☐ comprises:
 - ◆ Lambda probe - G39-
 - ◆ Heating for lambda probe - Z19-
- ☐ removing and installing
⇒ [“8.2.1 Removing and installing Lambda probe 1 after catalytic converter GX10”, page 324](#)

4 - Lambda probe 1 after catalytic converter - GX7-

- ☐ comprises:
 - ◆ Lambda probe after catalytic converter - G130-
 - ◆ Lambda probe 1 heater after catalytic converter - Z29-



- ☐ removing and installing
⇒ ["8.2.2 Removing and installing Lambda probe 1 after catalytic converter GX7", page 325](#)
- 5 - Charge pressure regulator - V465-**
 - ☐ removing and installing ⇒ ["1.3 Removing and installing charge pressure regulator V465", page 277](#)
- 6 - Exhaust cam adjuster for cylinder 2 - N587-**
 - ☐ Only fitted for engine identification characters CZEА
 - ☐ removing and installing ⇒ ["3.5.3 Removing and installing exhaust cam for cylinder 2 N587", page 185](#)
- 7 - Exhaust cam adjuster for cylinder 3 - N595-**
 - ☐ Only fitted for engine identification characters CZEА
 - ☐ removing and installing ⇒ ["3.5.4 Removing and installing exhaust cam for cylinder 3 N595", page 186](#)
- 8 - Inlet cam adjuster for cylinder 2 - N583-**
 - ☐ Only fitted for engine identification characters CZEА
 - ☐ removing and installing ⇒ ["3.5.1 Removing and installing inlet cam for cylinder 2 N583", page 183](#)
- 9 - Inlet cam adjuster for cylinder 3 - N591-**
 - ☐ Only fitted for engine identification characters CZEА
 - ☐ removing and installing ⇒ ["3.5.2 Removing and installing inlet cam for cylinder 3 N591", page 184](#)
- 10 - Hall sender 3 - G300-**
 - ☐ Only fitted for engine identification characters CZDA, CZEА
 - ☐ removing and installing ⇒ ["1.4.2 Removing and installing hall sender 3 G300", page 364](#)
- 11 - Hall sender - G40-**
 - ☐ removing and installing ⇒ ["1.4.1 Removing and installing Hall sender G40", page 364](#)
- 12 - Engine control unit - J623-**
 - ☐ removing and installing ⇒ ["6 Engine control unit", page 315](#)
- 13 - Coolant temperature sender at radiator outlet - G83-**
 - ☐ removing and installing
⇒ ["2.9 Removing and installing coolant temperature sender at radiator outlet G83", page 247](#)
- 14 - Throttle flap control unit - GX3-**
 - ☐ comprises:
 - ◆ Throttle flap control unit - J338-
 - ◆ Throttle flap drive - G186-
 - ◆ Throttle flap drive angle sender 1 - G187-
 - ◆ Throttle flap drive angle sender 2 - G188-
 - ☐ removing and installing ⇒ ["4.3 Removing and installing the throttle flap control unit GX3", page 308](#)
- 15 - Charge pressure sender - GX26-**
 - ☐ comprises:
 - ◆ Charge pressure sender - G31-
 - ◆ Intake air temperature transmitter - G42-
 - ☐ removing and installing ⇒ ["2.3 Removing and installing charge pressure sender GX26", page 286](#)
- 16 - Intake manifold pressure sender - GX9-**
 - ☐ comprises:
 - ◆ Intake air temperature sender 2 - G299-
 - ◆ Intake manifold pressure sender - G71-
 - ☐ removing and installing
⇒ ["5.3 Removing and installing intake manifold pressure sender GX9", page 313](#)
- 17 - Charge air cooler pump - V188-**
 - ☐ removing and installing ⇒ ["2.4 Removing and installing electric coolant pump", page 234](#)

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18 - Ignition coils with a power 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 ⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#)
 - ❑ When installing new spark plugs, grease the ignition coils with power output stage with lubricating paste G 052 565 A1.

1.1.2 Installation overview - engine from front

1 - Knock sensor 1 - G61-

- ❑ Summary of components
⇒ [“1.1 Assembly overview - ignition system”, page 360](#)

2 - Oil pressure switch for reduced oil pressure - F378-

- ❑ Summary of components
⇒ [“4.3 Removing and installing oil pressure switch for reduced oil pressure F378”, page 215](#)

3 - Fuel pressure sender - G247-

- ❑ Summary of components
⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 294](#)

4 - Activated charcoal filter solenoid valve 1 - N80-

5 - Injection valves

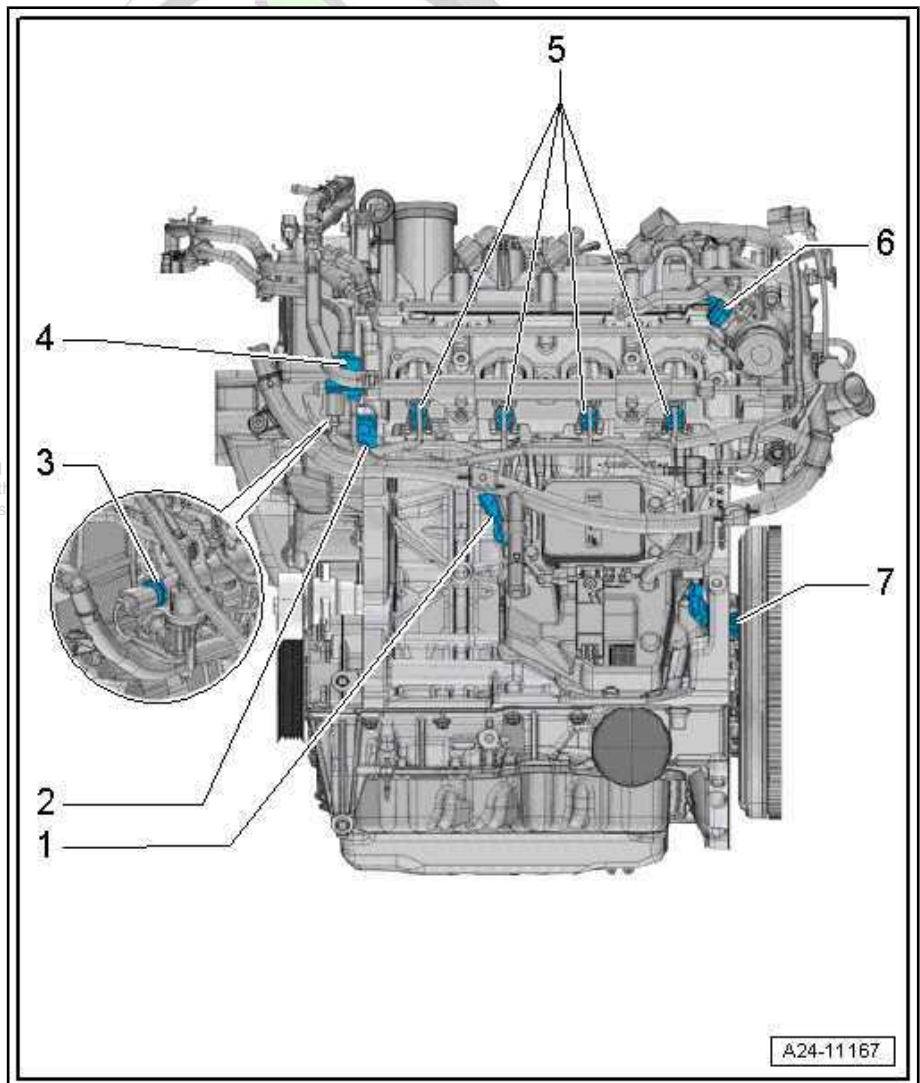
- ◆ Injector, cylinder 1 - N30-
- ◆ Injector, cylinder 2 - N31-
- ◆ Injector, cylinder 3 - N32-
- ◆ Injector, cylinder 4 - N33-
 - ❑ Summary of components
⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 294](#)

6 - Control valve for fuel pressure - N276-

- ❑ on the high pressure pump
- ❑ Summary of components ⇒ [“7.1 Summary of components - high pressure pump”, page 318](#)

7 - Engine speed sender - G28-

- ❑ Summary of components ⇒ [“1.1 Assembly overview - ignition system”, page 360](#)



1.1.3 Installation overview - engine from rear

1 - Oil level and oil temperature sender - G266-

- ❑ removing and installing
⇒ [“1.6 Removing and installing oil level and oil temperature sender G266”](#), page 205

2 - Coolant temperature sender - G62-

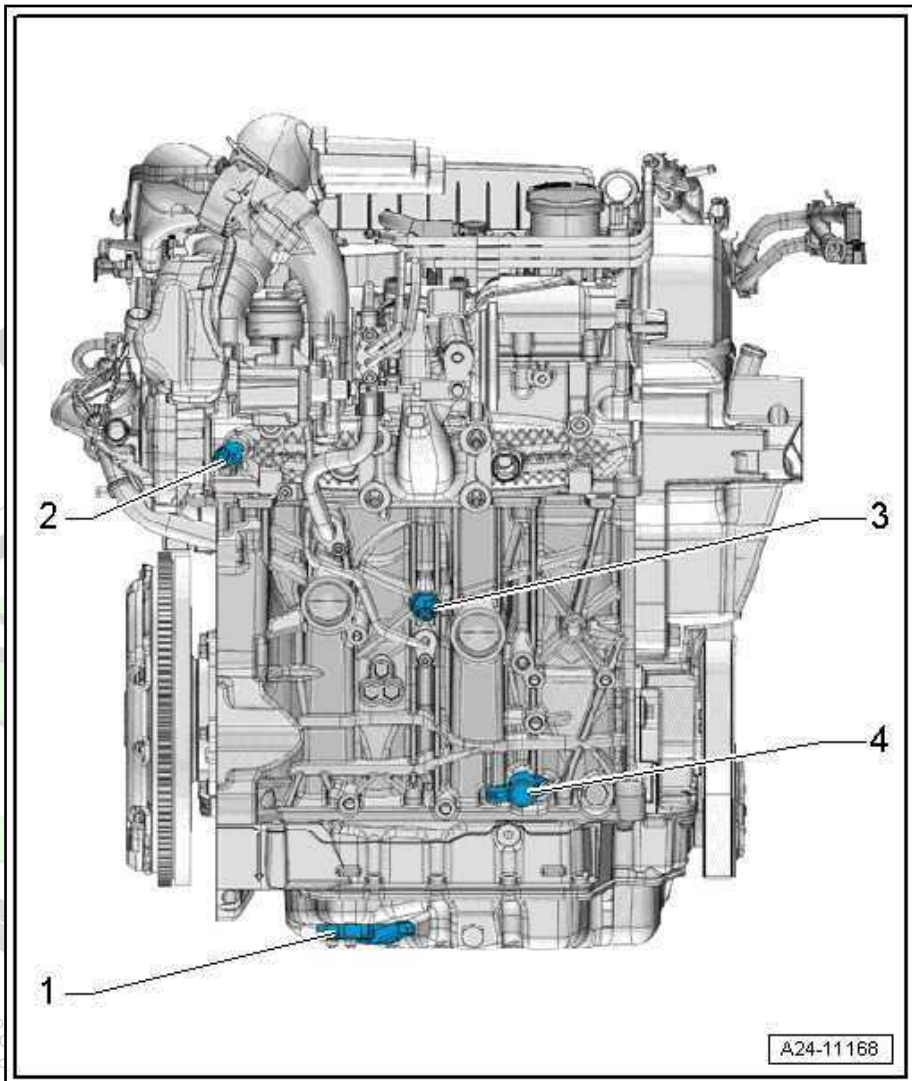
- ❑ removing and installing
⇒ [“2.8 Removing and installing coolant temperature sender G62”](#), page 246

3 - Oil pressure switch - F1-

- ❑ removing and installing
⇒ [“4.2 Removing and installing oil pressure switch F1”](#), page 214

4 - Oil pressure control valve - N428-

- ❑ removing and installing
⇒ [“4.6 Removing and installing valve for oil pressure control N428”](#), page 219



1.2 Reduce fuel pressure

⚠ WARNING

Fuel under very high pressure creates a risk of injury.

Wear safety gloves and safety goggles.

- ◆ The injection system consists of a high pressure part (max. pressure of 12 MPa = 120 bar) and a low pressure part (pressure of approx. 0.7 MPa = 7 bar).
- ◆ The fuel system is under pressure! Before opening the injection system high-pressure system, the fuel high pressure must be reduced to residual pressure.
- ◆ After the pressure has been reduced to residual pressure (approx. 0.7 MPa = 7 bar), the connection point must be opened »immediately«. To do this place a cloth around the connection point.
- Connect the ⇒ Vehicle diagnostic tester and carry out the targeted function “remove high fuel pressure”.

- The fuel pressure drops to a predetermined value.
- Switch off ignition.
- Interrupt the supply voltage to the fuel pump before opening the fuel system
⇒ “2.1 Safety precautions when working on fuel supply system”, page 3.
- Before opening the high pressure system, lay cleaning cloths around the connection point.
- Open fuel system carefully to reduce the residual pressure of 0.7 MPa (7 bar) and when doing so collect fuel that is flowing out.



Note

- ◆ *If the high-pressure system is not opened immediately the pressure increases again as a result of the reheating effect.*
- ◆ *The ignition system must no longer be switched on, since otherwise the pressure will increase again.*
- ◆ *Interrogate the event memory of the engine control unit at the end of the following work and delete all the event memory entries.*
- ◆ *The readiness code must be generated if the event memory has been cleared ⇒ Vehicle diagnostic tester.*

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2 Injection valves

⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 294](#)

⇒ [“2.2 Removing and installing the fuel distributor”, page 295](#)

⇒ [“2.3 Removing and installing injectors”, page 295](#)

⇒ [“2.4 Clean injection valves”, page 299](#)

2.1 Assembly overview - fuel rail with injectors

1 - Fuel pressure sender - G247-

- ☐ check
 - ⇒ [“5.2 Check fuel pressure sender G247”, page 311](#)
- ☐ removing and installing
 - ⇒ [“5.1 Removing and installing fuel pressure sender G247”, page 311](#)
- ☐ Moisten the cone with clean engine oil; the thread must not be oiled
- ☐ 22 Nm

2 - Fuel distributor

- ☐ removing and installing
 - ⇒ [“2.2 Removing and installing the fuel distributor”, page 295](#)

3 - High pressure tube

- ☐ Replace after disassembly
- ☐ do not change bending form
- ☐ removing and installing
 - ⇒ [“7.3 Removing and installing high pressure pipe”, page 321](#)
- ☐ 16 Nm + 45°

4 - Screw

- ☐ removing and installing
 - ⇒ [“2.2 Removing and installing the fuel distributor”, page 295](#)
- ☐ 9 Nm

5 - Support ring

- ☐ Replace after disassembly
- ☐ connected with valve Pos. -8-

6 - O-ring

- ☐ Replace after disassembly
- ☐ Moisten with engine oil

7 - Distance ring

- ☐ replace if damaged



8 - Injector

- ❑ removing and installing ⇒ [“2.3 Removing and installing injectors”, page 295](#)

9 - Combustion chamber sealing ring

- ❑ Do not grease or treat using any other lubricant
- ❑ Replace. ⇒ [“2.3 Removing and installing injectors”, page 295](#) .

2.2 Removing and installing the fuel distributor

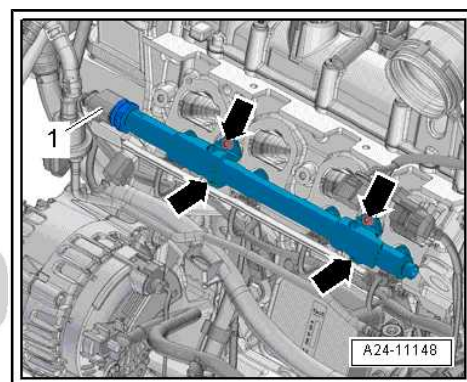
Removing

- Removing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 305](#) .
- Remove high pressure pipe
⇒ [“7.3 Removing and installing high pressure pipe”, page 321](#) .
- Separate electrical plug connection -1-.
- Place a cloth below to absorb any fuel.
- Release the screws -arrows- and disconnect the fuel distributor from the injection valves.

Install

Installation is performed in the reverse order, pay attention to the following points:

- Replace O-ring.
- Position fuel distributor on the injectors.
- Press fuel distributor first to the right, then to the left onto the injectors up to the stop.
- Press fuel distributor down firmly in the holder area and tighten screws by 2 turns.
- Tighten screws crosswise uniformly.
- Install high pressure pipe
⇒ [“7.3 Removing and installing high pressure pipe”, page 321](#) .
- Installing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 305](#) .



Tightening torques

- ◆ Fuel distributor
⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 294](#) .

2.3 Removing and installing injectors

Special tools and workshop equipment required

- ◆ Pulling device - T10133- with removal tool - T10133/16A- and extractor - T10133/19-

Removing



Risk of malfunctions caused by soiling.

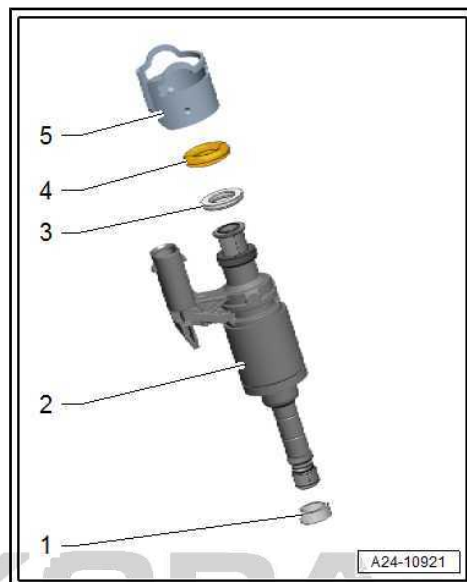
Observe safety measures and rules for cleanliness
⇒ [“3.1 Cleanliness rules”, page 6](#) .



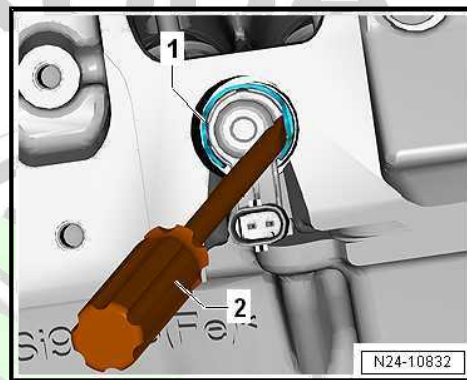
Note

Injectors must not be removed while the engine is cold.

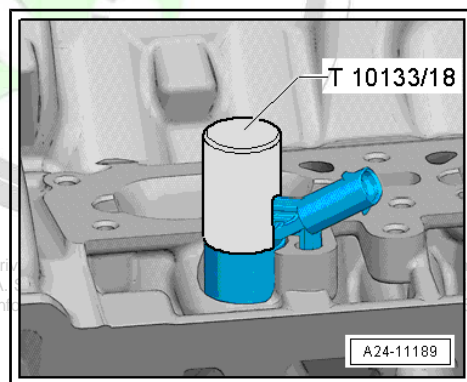
- Removing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 305](#) .
- Remove fuel distributor
⇒ [“2.2 Removing and installing the fuel distributor”, page 295](#) .
- Remove O-ring -4- from injector -2-.
- Disconnect the plug connections from affected injector.



- Lever off caps -1- from injector using a screwdriver -2-.



- Push impact sleeve -T10133/18- over the injector.



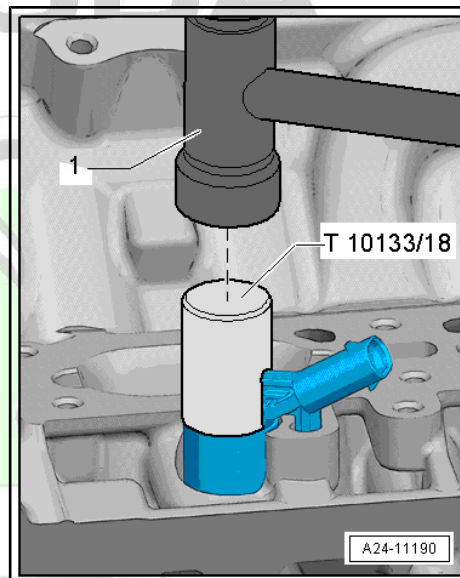
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- Gently apply a few knocks to the impact sleeve to loosen the injector.

Note

- ◆ Use a torque wrench to pull out the injector.
- ◆ Set 5 Nm on the torque wrench.



- Insert extractor -T10133/19- into the groove at the injector.
- Position removal tool -T10133/16 A- on extractor.
- Pull the injector out by screwing in the screw -1-.

NOTICE

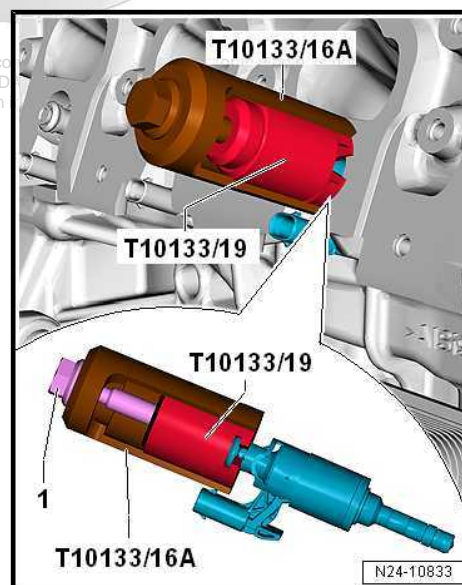
Risk of injector destruction.

- ◆ Failure to observe the torque threatens the destruction of the injector.

If the limit torque of 5 Nm is reached without the injector loosening, remove the extractor and begin to loosen the injector again using the impact sleeve.

Repeat the procedure for each injector.

- Remove gasket for intake manifold.

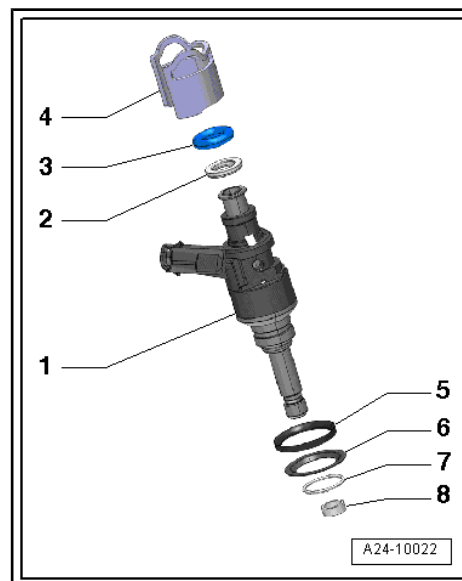


Disassembling the injector

- Pull off support ring -4- and distance ring -2-.
- Remove circlip -7-, sealing disc -5- and sealing disc -6-.
- Carefully remove old combustion chamber sealing ring -8-, to do so, cut open to the ring using a knife and remove.

Note

Ensure that the injector groove is not damaged. If the groove is damaged the injector must be replaced.



Install

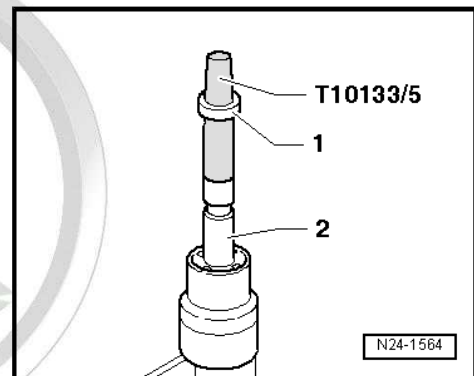
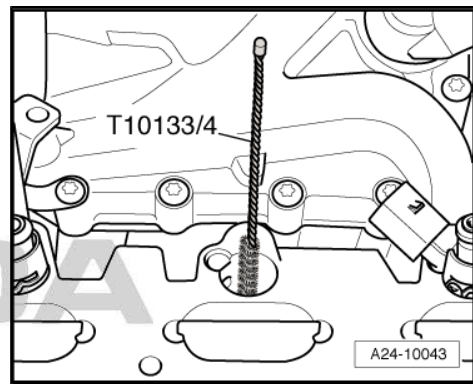
- Clean hole in the cylinder head using a nylon cylinder brush - T10133/4- .
- The combustion chamber sealing ring must always be replaced before the injector is pre-installed.



Note

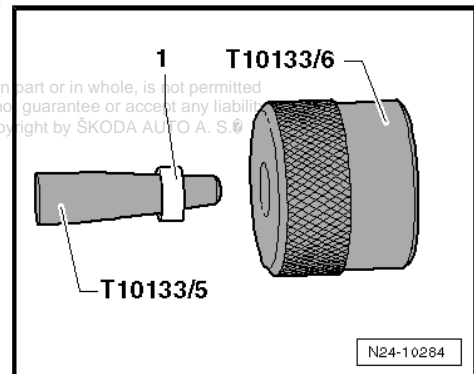
Replace distance ring if it is damaged.

- When reinstalling an injector, clean combustion residues from the groove for the combustion chamber sealing ring and injector shaft using a clean cloth clean.
- Fit assembly cone -T10133/5- with the new combustion chamber sealing ring -1- onto the injector -2-.

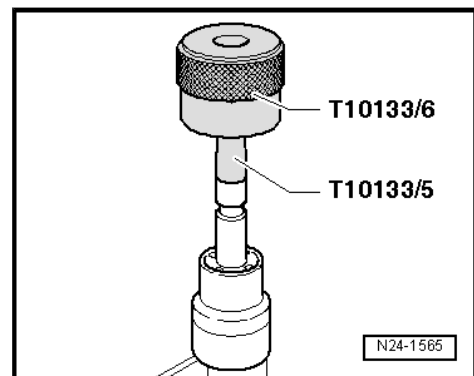


- Push combustion chamber sealing ring with assembly sleeve -T10133/6- as far as possible onto the assembly cone -T10133/5- .

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- Turn assembly sleeve -T10133/6- , push combustion chamber sealing ring into the sealing ring groove.

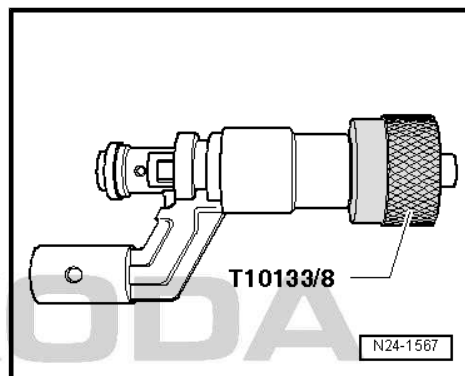
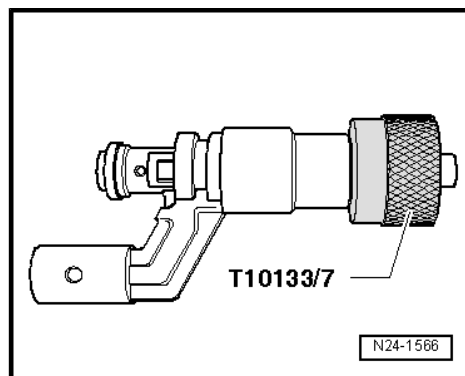




Note

When sliding on the injector the combustion chamber sealing ring is widened. It must therefore be reduced in width again in two steps, as described below.

- Press calibrating sleeve -T10133/7- with a gentle rotary movement (approximately 180°) up to the stop on the injector.
- Turn calibrating sleeve -T10133/7- off again in the opposite direction.
- Press calibrating sleeve -T10133/8- with a gentle rotary movement (approximately 180°) up to the stop on the injector.
- Turn calibrating sleeve -T10133/8- off again in the opposite direction.
- Pull support ring -5- and distance ring -3- onto the injector -2-.



- Before installing injector -2-, moisten new O-ring -4- with clean engine oil.



Note

The combustion chamber sealing ring -1- must not be oiled.

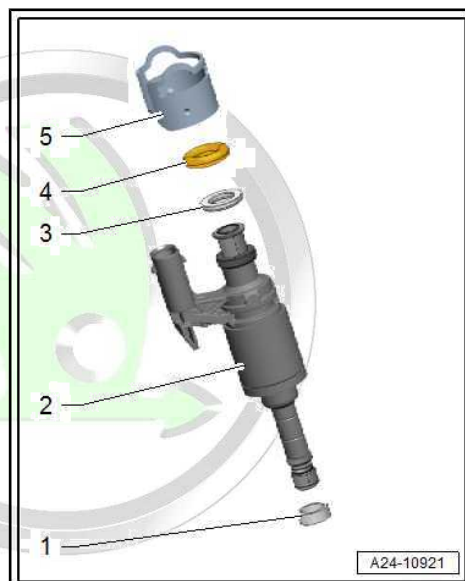
- Press the injectors into the cylinder head bores (free of oil and grease) by hand up to the stop. Pay attention to the correct position of the injection valves in the cylinder head.



Note

The injectors must fit easily. If necessary, wait until the width of the combustion chamber sealing ring has reduced sufficiently.

- Pay attention to the correct seating and fitting position of the injection valves in the cylinder head.
- The electrical connection of the injector must reach into the recess provided in the cylinder head.
- Install fuel distributor
⇒ [“2.2 Removing and installing the fuel distributor”, page 295](#).
- Installing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 305](#).
- Connect ⇒ Vehicle diagnostic tester and perform targeted function “delete adaption values”.
- Switch off ignition.



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2.4 Clean injection valves

Special tools and workshop equipment required

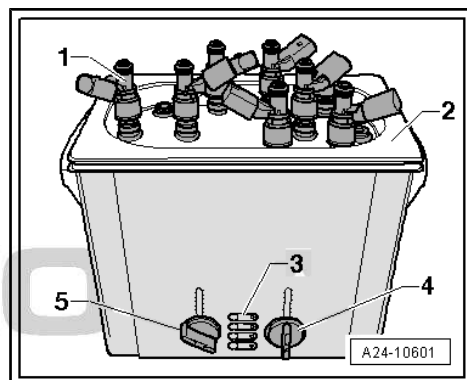
- ◆ Ultrasonic cleaning device - VAS 6418-
- ◆ Feeder plate for injection units - VAS 6418/1-
- ◆ Cleaning fluid ⇒ Electronic Catalogue of Original Parts“ETKA”

Observe the safety and operating instructions of the ultrasound device.

- The ultrasound device must be filled with cleaning agent up to the top of the holes (see inset).

Clean

- Remove injection valves
⇒ [“2.3 Removing and installing injectors”, page 295](#) .
- Insert injectors -1- into the feeder plate for injection units - VAS 6418/1- Pos. -2-.
- Immerse injectors with the feeder plate for injection units - VAS 6418/1- into the cleaning fluid - VAS 6418/2- .
- On the rotating head -4-, set a temperature of 50 °C.
- On the rotating head -5-, set a cleaning time of 30 minutes.
- Switch on ultrasound device using the button -3-.



Note

Once the cleaning temperature has reached 50 °C the set time begins to elapse.

- Replace the combustion chamber sealing ring at each injector after cleaning
⇒ [“2.3 Removing and installing injectors”, page 295](#) .



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3 Air filter

⇒ "3.1 Assembly overview - air filter housing", page 301

⇒ "3.2 Removing and installing air filter housing", page 302

3.1 Assembly overview - air filter housing

1 - Air guide lower part

- ☐ on the lock support

2 - air guide pipe top

- ☐ on the lock support

3 - Cover

- ☐ for air guide

4 - Screw

- ☐ 2 Nm

5 - Air filter bottom part

- ☐ remove mechanical foreign particles

6 - Air filter element

- ☐ Change intervals

◆ ⇒ Maintenance ; Booklet Superb III

◆ ⇒ Maintenance ; Booklet Kodiaq

7 - Air filter top part

8 - Hose

- ☐ for crankcase ventilation

9 - Air guide hose

10 - Rubber bush

11 - Screw

- ☐ 2 Nm

12 - Air guide hose

13 - O-ring

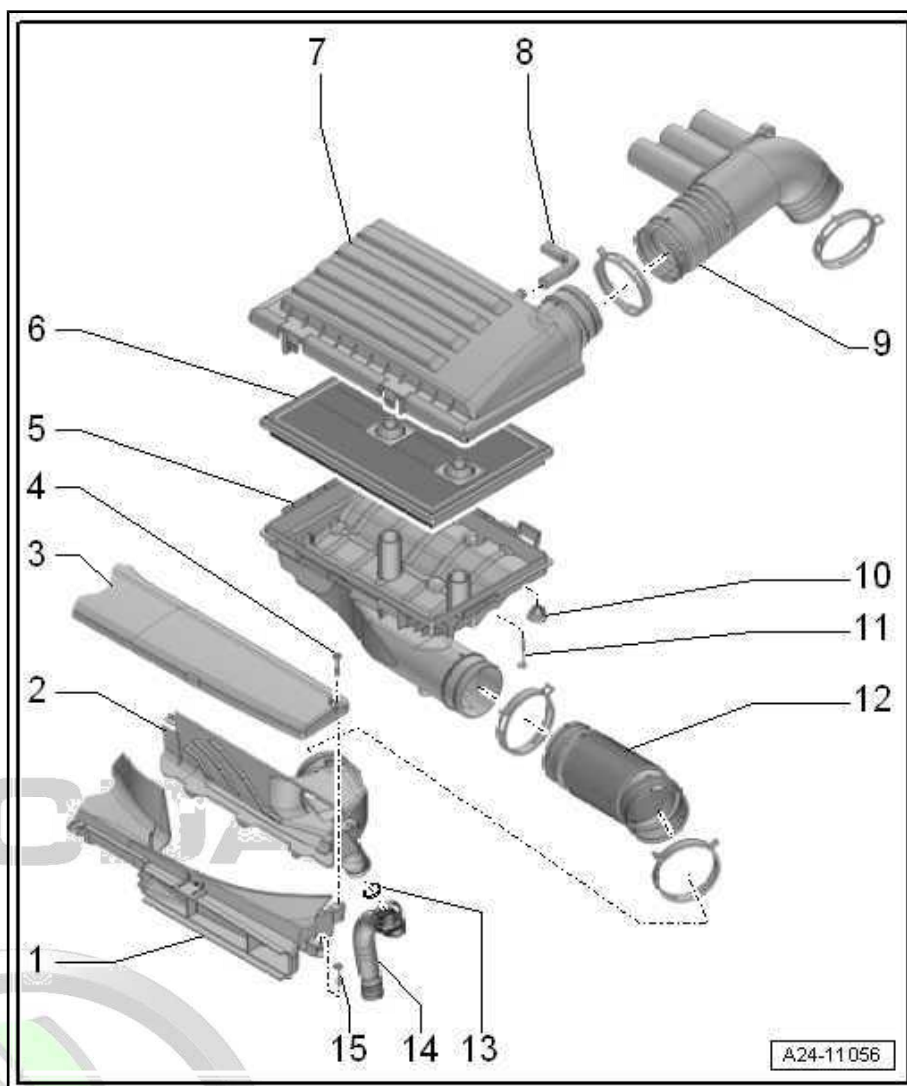
- ☐ replace if damaged

14 - Water drain hose

- ☐ clean

15 - Screw

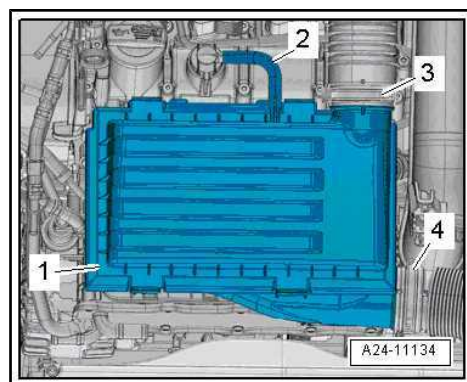
- ☐ 2 Nm



3.2 Removing and installing air filter housing

Removing

- Pull off air guide hose -2-.
- Loosen hose clamps -3- and -4- and remove air guides.



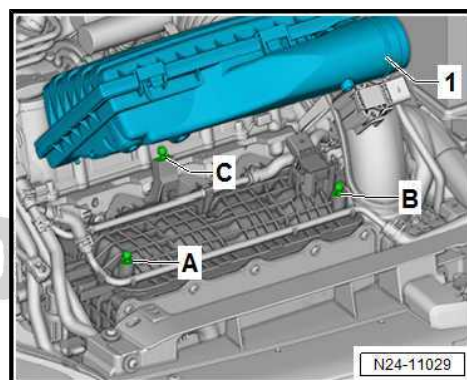
- Remove air filter -1- to top, by first pulling off ball stud -C-.
- The remove the air filter housing from the ball studs -B- and -A-.

Install



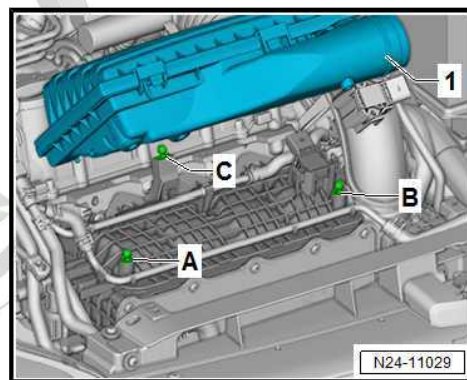
Note

- ◆ *It is imperative for the air filter housing to be clean.*
- ◆ *Use a silicone-free lubricant to assemble the air guide hoses.*
- ◆ *Secure all hose connections with hose clamps which comply with the series design ⇒ Electronic Catalogue of Original Parts "ETKA".*
- Moisten ball stud on air filter housing with water.
- Start by putting the air filter housing -1- onto ball studs -A- and -B-.
- Then place on ball stud -C-.



Tightening torques

- ◆ Summary of components
⇒ ["3.1 Assembly overview - air filter housing", page 301](#) .



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4 Intake manifold

⇒ [“4.1 Assembly overview - intake manifold”, page 303](#)

⇒ [“4.2 Removing and installing intake manifold”, page 305](#)

⇒ [“4.3 Removing and installing the throttle flap control unit GX3”, page 308](#)

⇒ [“4.4 Clean throttle flap control unit GX3”, page 310](#)

4.1 Assembly overview - intake manifold

1 - Coolant pipe

- ☐ clipped onto the intake manifold
- ☐ removing and installing
⇒ [“3.2 Removing and installing coolant pipes”, page 248](#)

2 - Intake manifold

- ☐ Building unit with charge air cooler
- ☐ removing and installing
⇒ [“4.2 Removing and installing intake manifold”, page 305](#)

3 - Coolant pipe

- ☐ clipped onto the intake manifold

4 - Screw

- ☐ Tightening torque and tightening order
⇒ [Fig. “Intake manifold - tightening torque and tightening order”, page 304](#)

5 - O-ring

- ☐ Replace after disassembly

6 - Intake manifold pressure sender - GX9-

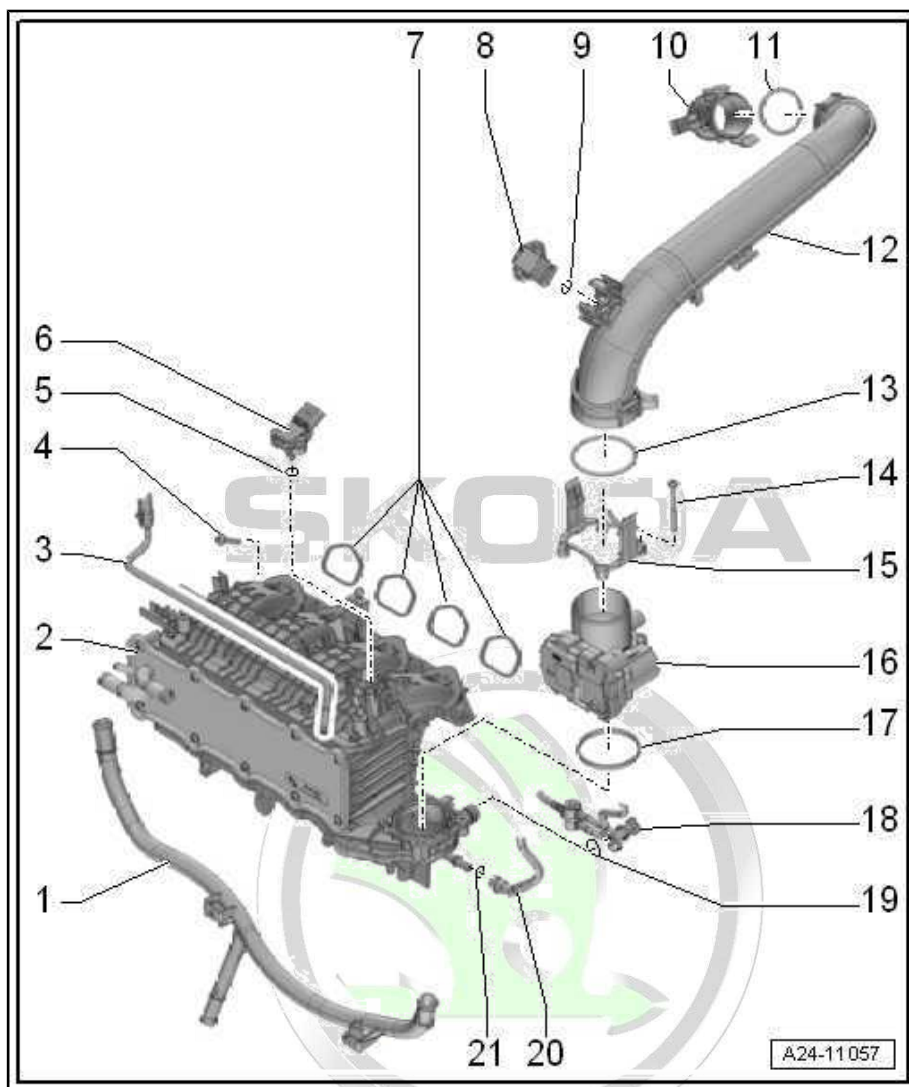
- ☐ comprises:
 - ◆ Intake air temperature sender 2 - G299-
 - ◆ Intake manifold pressure sender - G71-
- ☐ removing and installing
⇒ [“5.3 Removing and installing intake manifold pressure sender GX9”, page 313](#)

7 - Gasket

- ☐ Replace after disassembly

8 - Charge pressure sender - GX26-

- ☐ comprises:
 - ◆ Charge pressure sender - G31-
 - ◆ Intake air temperature transmitter - G42-
- ☐ removing and installing ⇒ [“2.3 Removing and installing charge pressure sender GX26”, page 286](#)



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9 - O-ring

- ☐ Replace after disassembly

10 - Connection fittings

11 - O-ring

- ☐ Replace after disassembly

12 - Air guide pipe

13 - O-ring

- ☐ Replace after disassembly

14 - Screw

- ☐ thread forming
- ☐ Position and screw in by hand to allow the screw to find the old thread, then tighten the screw to the tightening torque
- ☐ 7 Nm

15 - Retaining clip

- ☐ For air guide pipe

16 - Throttle flap control unit - GX3-

- ☐ comprises:

◆ Throttle flap control unit - J338-

◆ Throttle flap drive - G186-

◆ Throttle flap drive angle sender 1 - G187-

◆ Throttle flap drive angle sender 2 - G188-

- ☐ removing and installing ⇒ ["4.3 Removing and installing the throttle flap control unit GX3 ", page 308](#)
- ☐ cleaning ⇒ ["4.4 Clean throttle flap control unit GX3 ", page 310](#)
- ☐ After replacing the throttle flap control unit - GX3- this must be readjusted to the engine control unit - J623- ⇒ Vehicle diagnostic tester

17 - Sealing ring

- ☐ Replace after disassembly

18 - Vacuum line

19 - O-ring

- ☐ Replace after disassembly

20 - Vacuum line

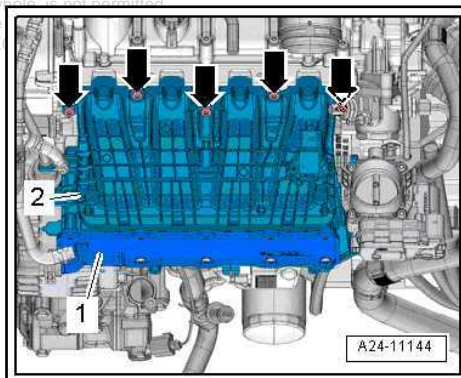
21 - O-ring

- ☐ replace vacuum line if damaged

Intake manifold - tightening torque and tightening order

- Tighten screws in steps as follows:

Stage	Screws	Specified torque
1.	-Arrows-	Insert in the centre, starting alternately, by hand as far as the stop
2.	-Arrows-	In the centre, starting alternately, 8 Nm



4.2 Removing and installing intake manifold

Removing

Special tools and workshop equipment required

- ◆ Hose clamps up to 25 mm - MP7-602 (3094)-
- ◆ Release tool -T10527-
- ◆ Release tool -T10527/1-
- ◆ Radiator protection mat - VAS 531003-
- Remove air filter housing
⇒ ["3.2 Removing and installing air filter housing", page 302](#) .
- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Removing fan shroud
⇒ ["4.4 Removing and installing radiator cowl with radiator fan", page 257](#) .
- Cover radiator with radiator protection mat - VAS 531003- .
- Drain coolant
⇒ ["1.3 Draining and filling up coolant", page 225](#) .

CAUTION

Risk of injury caused by fuel which is under high pressure.

Lay a clean cloth around the connection point and carefully slacken the connection point in order to relieve the pressure in the fuel system.

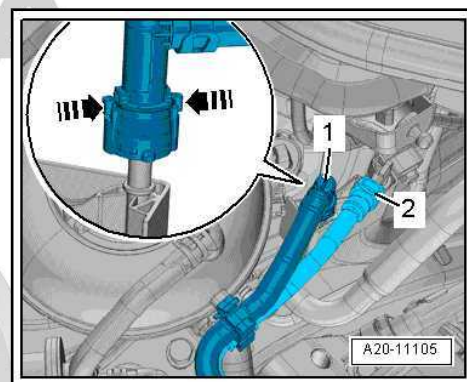
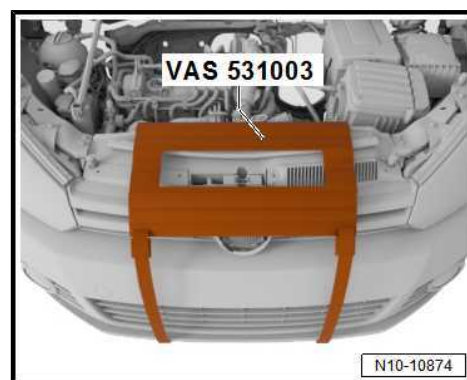
NOTICE

Risk of malfunctions caused by soiling.

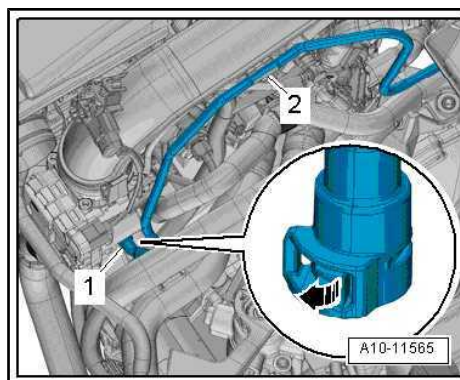
Observe safety measures and rules for cleanliness

⇒ ["3.1 Cleanliness rules", page 6](#) .

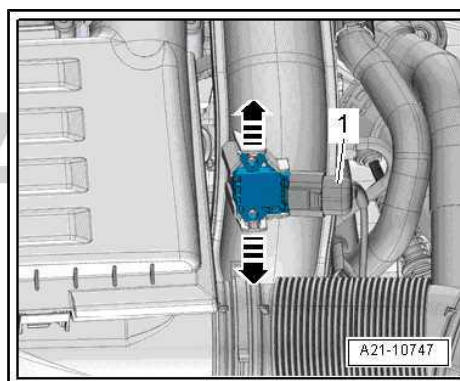
- Separate fuel feed line -1- and the line to activated charcoal filter -2-.



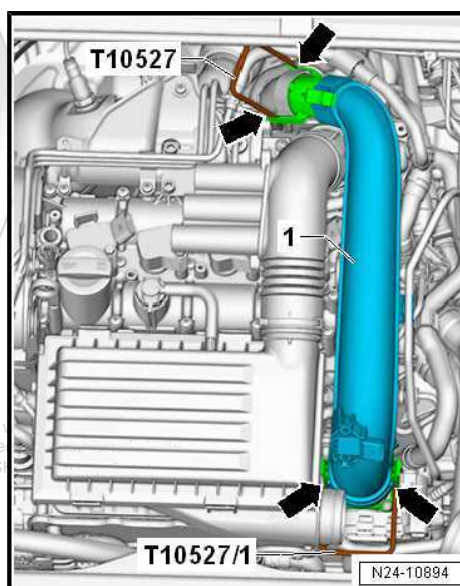
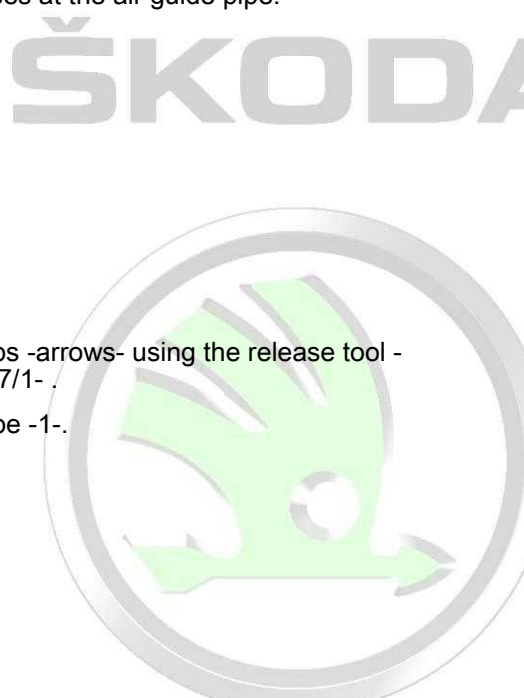
- Unlock catch -arrow- and remove vacuum hose -1-.
- Expose vacuum hose on the air guide pipe -2-.
- Expose air guide hoses at the charge air pipe.



- Disconnect plug -1- of the charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.



- Release retaining tabs -arrows- using the release tool - T10527- and -T10527/1- .
- Remove air guide pipe -1-.



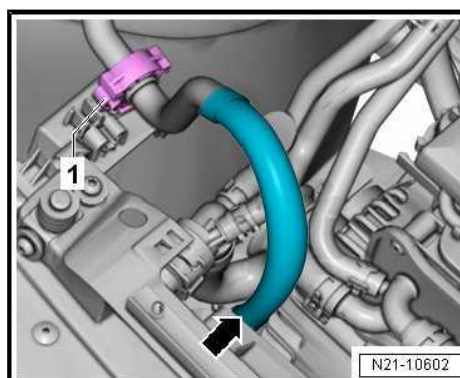
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- Open the clamp -1- and push hose -arrow- to the side.

CAUTION

Risk of frost due to refrigerant.

Do not open the refrigerant circuit of the air conditioning system.

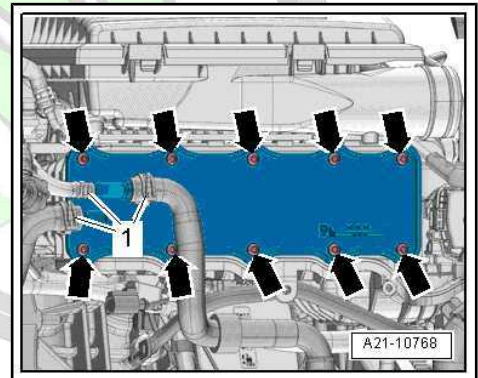
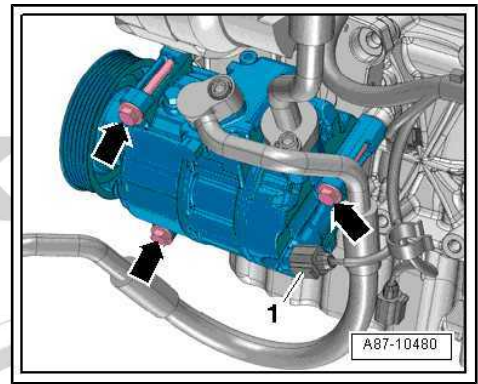


- Disconnect plug connection -1- on the control valve for the air conditioning system compressor - N280- .
- Release screws -arrows- for AC compressor.

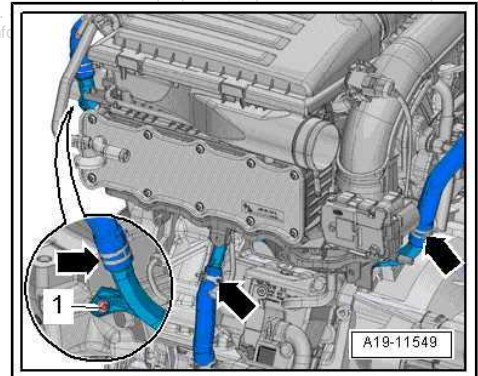
! NOTICE

Risk of damaging AC compressor, refrigerant lines and hoses.

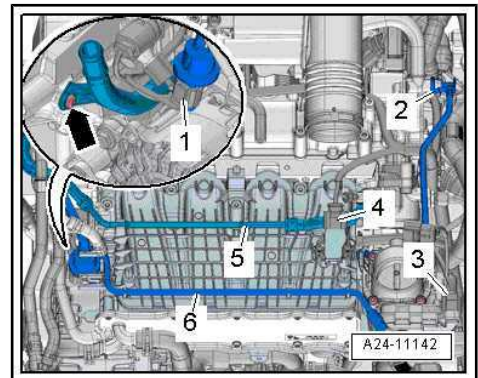
- ◆ Do not over-tension, buckle or bend refrigerant lines and hoses.
- Remove AC compressor with connected refrigerant hoses and strap up to the right side.
- Place the catch pan , e.g. -VAS 6208- underneath.
- Disconnect coolant hoses at coolant pipe with hose clamps - MP7-602 (3094)- .
- Loosen hose clamps -1- and remove coolant hoses.



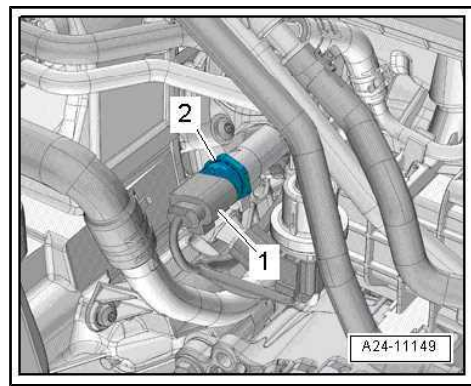
- Disconnect coolant hoses with hose clamps -MP7-602 (3094)- .
- Release screw -1- and remove clamps -arrows-.
- Disconnect coolant hoses.
- Loosen the wiring harness from the clips in the lower part of the intake manifold.



- Disconnect the plug connections:
 - 1 - For solenoid valve 1 for activated charcoal filter - N80-
 - 3 - Throttle flap control unit - J338-
 - 4 - For intake manifold pressure sender - G71-
- Press release buttons and remove hose -2- for activated charcoal filter.
- Unclip fuel feed line -5- and coolant line -6- at the intake manifold and push to the side.



- Disconnect the plug connection -1- from the fuel pressure sender - G247- .

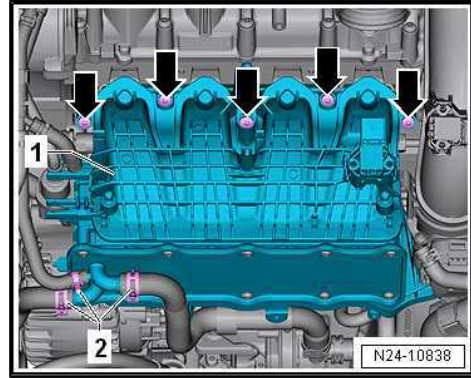


- Release screws -arrows-.
- Remove intake manifold -1-.

Install

Installation is performed in the reverse order, pay attention to the following points:

- Replace gaskets and O-rings.
- Secure all hose connection ends with spring-type clips that comply with the series design ⇒ ETKA - Electronic Catalogue of Original Parts .
- Install fan shroud
⇒ [“4.4 Removing and installing radiator cowling with radiator fan”, page 257](#) .
- Install the noise insulation ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .
- Install air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 302](#) .
- Check coolant level
⇒ [“1.3 Draining and filling up coolant”, page 225](#) .



Tightening torques

- ♦ Intake manifold
⇒ [“4.1 Assembly overview - intake manifold”, page 303](#) .

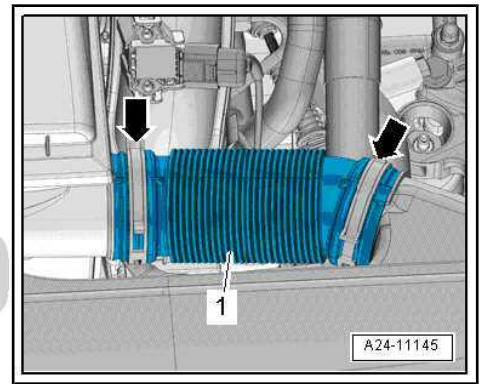
4.3 Removing and installing the throttle flap control unit - GX3-

Throttle flap control unit - GX3- comprises:

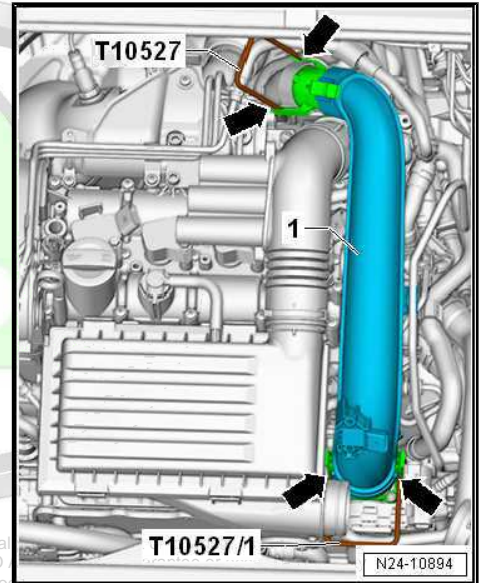
- ♦ Throttle flap control unit - J338-
- ♦ Throttle valve drive - G186-
- ♦ Throttle valve drive angle sender 1 - G187-
- ♦ Throttle valve drive angle sender 2 - G188-

Removing

- Undo hose clamps -arrows-, remove air guide hose -1-.
- Remove plug from charge pressure sender - GX26- .
- Expose air guide hoses at the air guide pipe.



- Release retaining tabs -arrows- using the release tool -T10527- and -T10527/1- .
- Remove air guide pipe -1-.

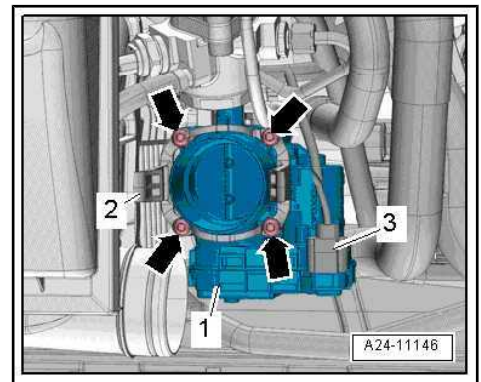


- Separate electrical plug connection -3-.
- Unscrew the screws -arrows- and remove throttle flap control unit - GX3- -1- with adapter -2-.

Install

Installation is performed in the reverse order, pay attention to the following points:

- Clean the original throttle flap control unit - GX3- before re-installation
⇒ ["4.4 Clean throttle flap control unit GX3", page 310](#) .
- After replacing the throttle flap control unit - GX3- this must be readjusted to the engine control unit - J623- ⇒ Vehicle diagnostic tester.



Tightening torques

- ◆ Throttle valve control unit - GX3-
⇒ ["4.1 Assembly overview - intake manifold", page 303](#) .

4.4 Clean throttle flap control unit - GX3-



Note

- ◆ If a new engine control unit - J623- is installed the throttle flap module must be adjusted.
- ◆ Soiling and carbonisation in the limit stop can lead to incorrect adjustment values.
- ◆ The throttle valve support must not be scratched when cleaning.

Special tools and workshop equipment required

- ◆ Paint brush
- ◆ Acetone
- Remove throttle flap control unit - J338-
⇒ ["4.3 Removing and installing the throttle flap control unit GX3", page 308](#).
- Open throttle valve by hand and lock in open position using wood or a plastic wedge -arrow-.

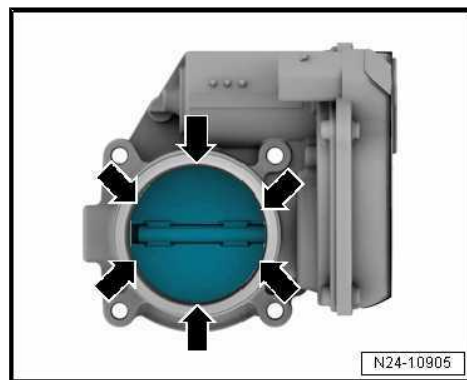


CAUTION

Danger when working with easily inflammable liquids.

Wear safety goggles and safety clothing.

- ◆ Accident prevention regulations and the safety instructions must be observed when handling easily inflammable fluids.
- ◆ Do not use compressed air when cleaning the throttle valve.
- ◆ Wear safety goggles and safety clothing, in order to avoid injuries and skin contact.
- Thoroughly clean the throttle valve housing using Acetone and a paint brush, particularly in the area -arrows- of the closed throttle valve.
- Wipe the throttle valve support with a lint-free cloth.
- Allow Acetone to dry off completely.
- Install throttle flap control unit - GX3-
⇒ ["4.3 Removing and installing the throttle flap control unit GX3", page 308](#).
- Erase initialisation values and adapt the engine control unit - J623- to the throttle flap control unit - GX3- ⇒ Vehicle diagnostic tester.



5 Senders and sensors

⇒ ["5.1 Removing and installing fuel pressure sender G247", page 311](#)

⇒ ["5.2 Check fuel pressure sender G247", page 311](#)

⇒ ["5.3 Removing and installing intake manifold pressure sender GX9", page 313](#)

5.1 Removing and installing fuel pressure sender - G247-

Special tools and workshop equipment required

- ◆ Assembly device - T10118-
- ◆ Socket insert size 27 - T40218- or commercially available 27 mm socket insert

Removing



WARNING

Fuel under very high pressure creates a risk of injury.

- ◆ Before opening the injection system high-pressure system, the fuel pressure must be reduced to residual pressure
⇒ ["1.2 Reduce fuel pressure", page 292](#) .



NOTICE

Risk of malfunctions caused by soiling.

Observe safety measures and rules for cleanliness

⇒ ["3.1 Cleanliness rules", page 6](#) .

- Separate electrical plug connection -1-.
- Place a cloth below to absorb any fuel.
- Unscrew the fuel pressure sender - G247- -2- with the socket insert SW 27 - T40218- .

Install

Installation is performed in the reverse order, pay attention to the following points:



Note

The thread of the fuel pressure sender must not be moistened.

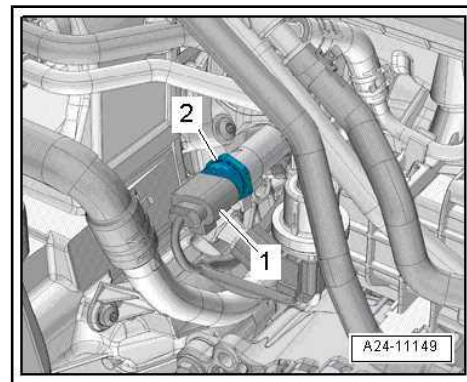
Tightening torques

- ◆ Fuel pressure sender - G247-
⇒ ["2.1 Assembly overview - fuel rail with injectors", page 294](#) .

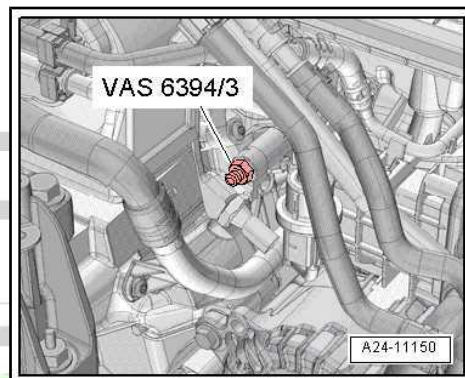
5.2 Check fuel pressure sender - G247-

Special tools and workshop equipment required

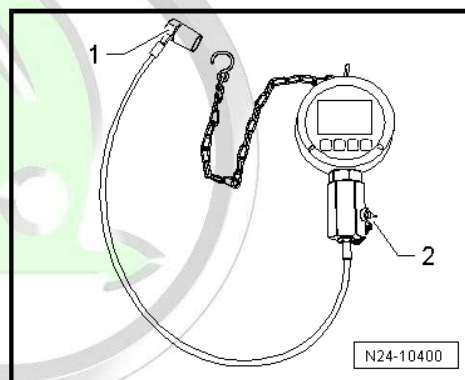
- ◆ Adapter for measuring method/DSO (3-pin) , e.g. -VAS 5570-
- ◆ Tester for pressure sensor e.g. -VAS 6394-
- ◆ Socket insert size 27 - T40218- or commercially available 27 mm socket insert



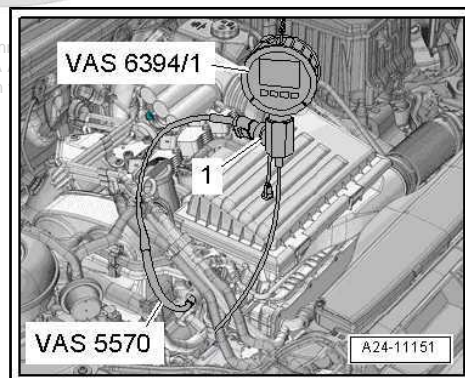
- Remove fuel pressure sender - G247-
⇒ [“5.1 Removing and installing fuel pressure sender G247”](#),
[page 311](#) .
- Lightly lubricate the sealing cone of the adapter -VAS 6394/3-
with clean engine oil and screw it into the fuel distributor to
22 Nm.



- Release the screw plug -2- and screw the fuel pressure sender
- G247- into the tester -VAS 6394/1- .
- Connect the pressure line -1- of the tester -VAS 6394/1- to the
adapter - VAS 6394/3- .



- Use the adapter for measuring method/DSO (3-pin) - VAS
5570- to produce the electrical connection between vehicle
and fuel pressure sender - G247- .



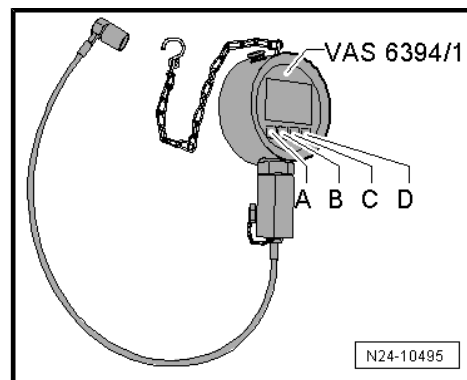
- Switch on the tester -VAS 6394/1- , for this step, briefly press the button -A-.



Note

- ◆ If the button -A- is pressed for 2 seconds, the illumination is switched on for 20 seconds.
- ◆ If the tester -VAS 6394/1- does not indicate 0 MPa (0 bar), carry out a zero point of the balance ⇒ operating instructions .

- Connect diagnostic unit ⇒ Vehicle diagnostic tester.
- Start engine and run in idle.
- Select the “Engine electronics” in the self-diagnosis.
- Then select “measured values”.
- Select “fuel pressure” in the selection list.
- Compare the displayed tester fuel pressure tester -VAS 6394/1- with the actual value displayed at the vehicle diagnosis tester .
- Read fuel pressure on vehicle diagnosis tester.
- The pressures may deviate maximum 0.5 MPa (5 bar) from one another.
- If the deviation is greater than 0.5 MPa (5 bar), replace the fuel pressure sender - G247- .
- Repeat the test with the new fuel pressure sender - G247- and compare both measured values.
- If the measurements now match, install new fuel pressure sender - G247- .
- If the measured values still do not match, test electrical line connection between fuel pressure sender - G247- and engine control unit - J623- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



Tightening torques

- ◆ Fuel pressure sender - G247-
⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 294](#) .

5.3 Removing and installing intake manifold pressure sender - GX9-

The intake manifold pressure sender - GX9- comprises:

- ◆ Intake air temperature sender 2 - G299-
- ◆ Intake manifold pressure sender - G71-

Removing

- Remove air filter housing
⇒ [“3.2 Removing and installing air filter housing”, page 302](#) .

- Separate electrical plug connection -1-.
- Unlock catches -arrows- and remove intake manifold pressure sender - GX9- .

Install

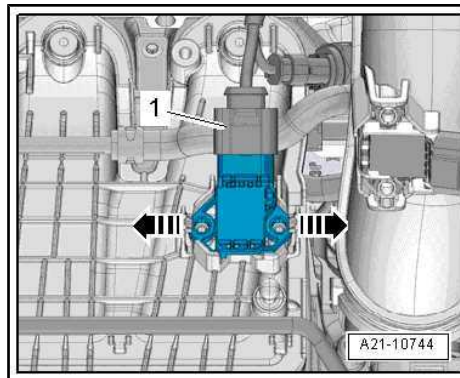
Installation is performed in the reverse order, pay attention to the following points:

- Replace O-ring.



Note

If the locking lugs brake, the sender can be secured with two screws to 3 Nm ⇒ ETKA - Electronic Catalogue of Original Parts .



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6 Engine control unit

⇒ "6.1 Removing and installing engine control unit J623 ", page 315

⇒ "6.2 Removing and installing engine control unit J623 with protective housing", page 315

6.1 Removing and installing engine control unit - J623-

Removing

- Switch off ignition and pull out ignition key.



Note

If the engine control unit is replaced, vehicle diagnosis tester ⇒ Vehicle diagnostic tester must be connected and the function "replace engine control unit" must be carried out.

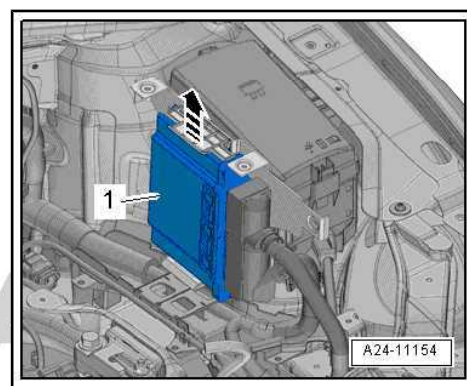
- Unlock catch in -direction of the arrow- and remove the engine control unit -1-.
- Unlock plug connections for engine control unit - J623- and pull off.

Install

Installation is carried out in the reverse order.

After installing a new engine control unit, the following work step must be performed:

- Connect diagnostic unit ⇒ Vehicle diagnostic tester.
- Activate the engine control unit in mode "Software version management" or "Targeted functions" under Replace engine control unit.



6.2 Removing and installing engine control unit - J623- with protective housing

Special tools and workshop equipment required

- ◆ Hot air blowers - VAS 1978/14A- with push-on nozzle from the wiring harness repair set - VAS 1978 B-
- ◆ commercially available miniature grinder

Removing

- Switch off ignition and pull out ignition key.

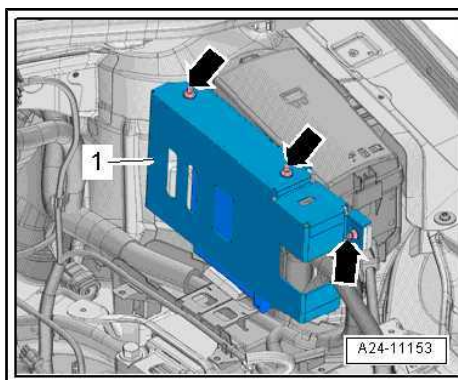


Note

If the engine control unit is replaced, vehicle diagnosis tester ⇒ Vehicle diagnostic tester must be connected and the function "replace engine control unit" must be carried out.

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Unscrew shear bolts -arrows- to remove the protective housing
-1- as follows:

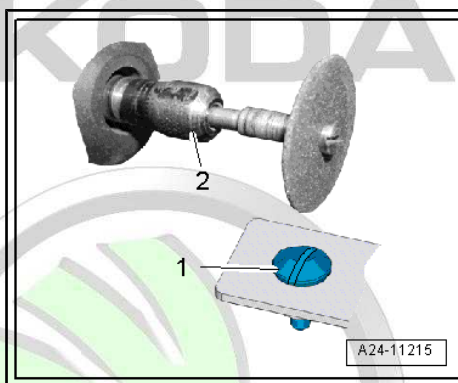


- In the shear bolt head -1-, using a miniature grinder -2-, make a slot for a screwdriver.



Note

- ♦ The threads of the pull-off screws are equipped with safety agent. Warming the pull-off screw when grinding a slot for a screwdriver makes it easier to undo it afterwards.
- ♦ If the pull-off screws still cannot be undone, warm the, up with a hot air blower.



Undoing pull-off screws with a hot air blower

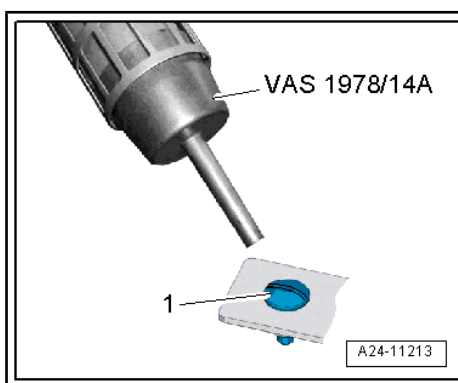
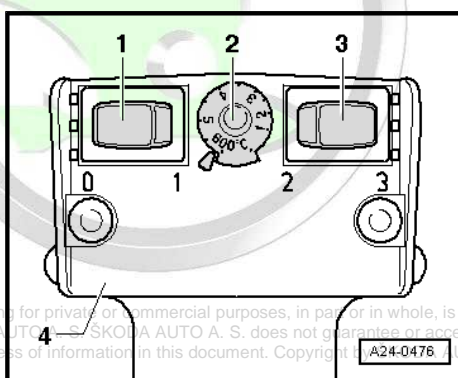
- Set the temperature adjustment potentiometer -2- to maximum heating performance and set the air flow two stage switch -3- to position 3.



CAUTION

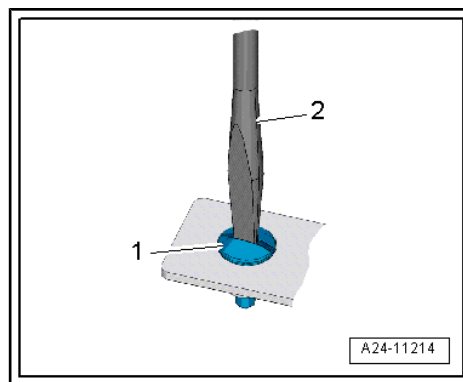
Risk of burns from hot air blower.

- ♦ Only warm up the pull-off screws with a hot air blower.
 - ♦ By warming the pull-off screws, the cover plate and parts in its vicinity are heated up strongly too. Where necessary, protect these parts by a piece of sheet covering.
- Heat the shear bolt head -1- for approximately 20 to 30 seconds.



Continued for slackened screws

- Release shear bolt -1- using the screwdriver -2-.

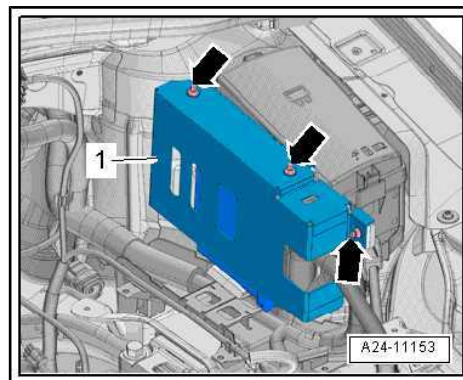


- Remove protective housing -1-.



Risk of engine control unit destruction.

If the engine control unit touches the plus pole of the battery, this will destroy it.

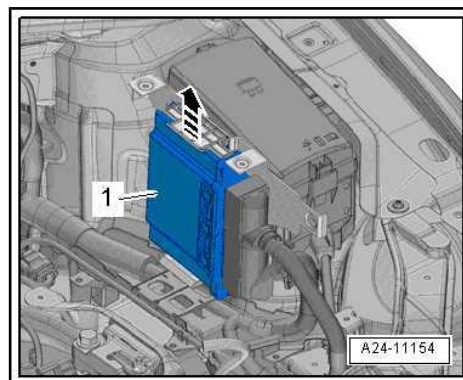


- Unlock catch in -direction of the arrow- and remove the engine control unit -1-.
- Unlock plug connections for engine control unit - J623- and pull off.

Install

Installation is performed in the reverse order, pay attention to the following points:

- It is imperative for the protective housing to be put back in place on the engine control unit - J623- .
- Clean the threaded holes for the shear bolts to remove safety agent residues. Cleaning can be done using a taper.
- Use new shear bolts.



After installing a new engine control unit, the following work step must be performed:

- Connect diagnostic unit ⇒ Vehicle diagnostic tester.
- Activate the engine control unit in mode “Software version management” or “Targeted functions” under Replace engine control unit.

7 High pressure pump

⇒ [“7.1 Summary of components - high pressure pump”, page 318](#)

⇒ [“7.2 Removing and installing the high pressure pump”, page 320](#)

⇒ [“7.3 Removing and installing high pressure pipe”, page 321](#)

7.1 Summary of components - high pressure pump

⇒ [“7.1.1 Summary of components - high pressure pump, variant 1”, page 318](#)

⇒ [“7.1.2 Summary of components - high pressure pump, variant 2”, page 319](#)

7.1.1 Summary of components - high pressure pump, variant 1

1 - Roller tappet

- ☐ Moisten with engine oil during installation

2 - O-ring

- ☐ Replace after disassembly
- ☐ Moisten with engine oil during installation

3 - High pressure pump

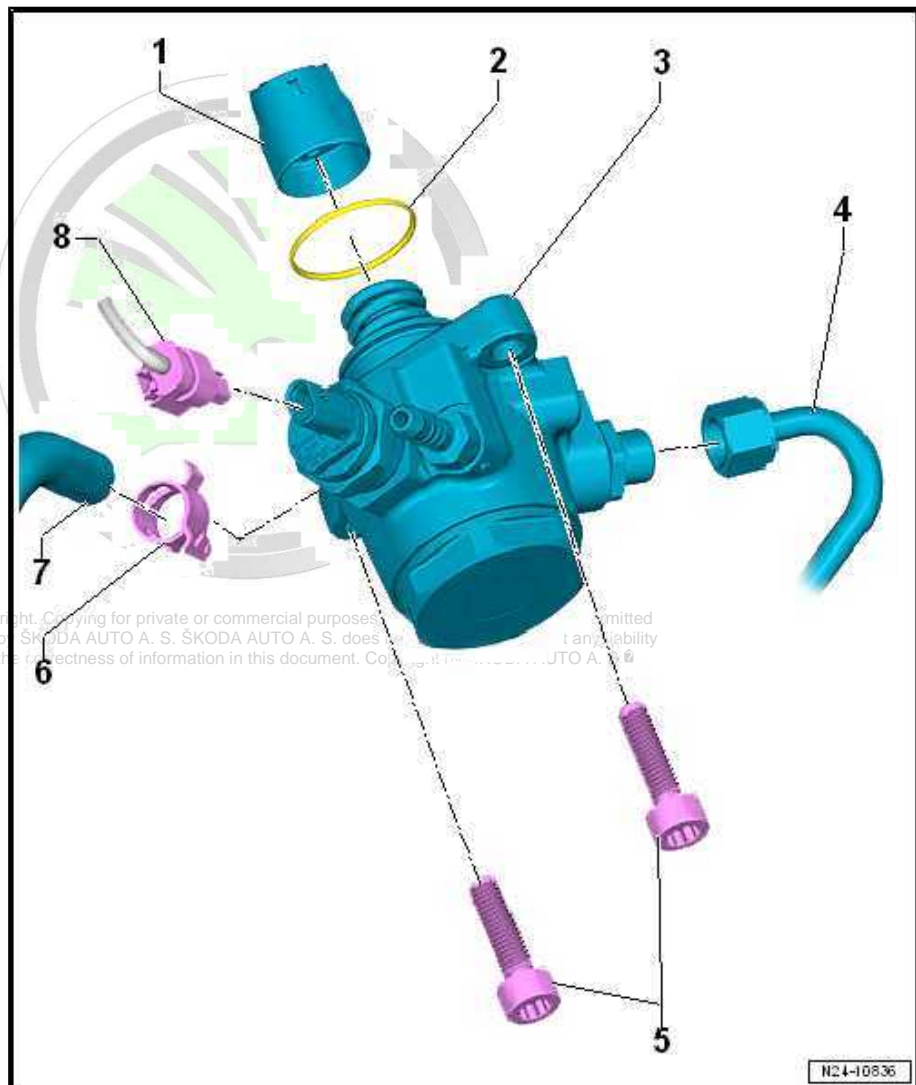
- ☐ with fuel dosage valve - N290-
- ☐ do not disassemble
- ☐ removing and installing ⇒ [“7.2 Removing and installing the high pressure pump”, page 320](#)

4 - High pressure tube

- ☐ removing and installing ⇒ [“7.3 Removing and installing high pressure pipe”, page 321](#)
- ☐ Replace after disassembly
- ☐ Connections must not be damaged
- ☐ Moisten thread of the union nuts with clean engine oil
- ☐ 16 Nm + 45°

5 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque and tightening order ⇒ [Fig. “High pressure pump - tightening torque and tightening order””, page 319](#)



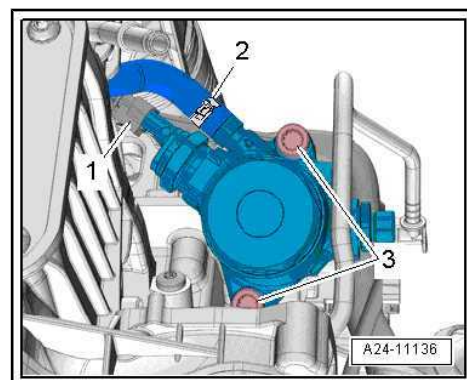
- 6 - Hose clamp
- 7 - Fuel feed line
- 8 - Connector

High pressure pump - tightening torque and tightening order

To prevent the flange of the high pressure pump from becoming deformed during installation, attach high pressure pump as follows:

- Tighten screws in steps as follows:

Stage	Screws M8	Tightening torque/torquing angle
1.	-3-	by hand as far as the stop
2.	-3-	Tighten by 1 turn alternately until the flange of the high pressure pump is at the camshaft housing
3.	-3-	20 Nm
4.	-3-	Turn 90° further



7.1.2 Summary of components - high pressure pump, variant 2

1 - Roller tappet

- ☐ Moisten with engine oil during installation

2 - O-ring

- ☐ Replace after disassembly
- ☐ Moisten with engine oil during installation

3 - High pressure pump

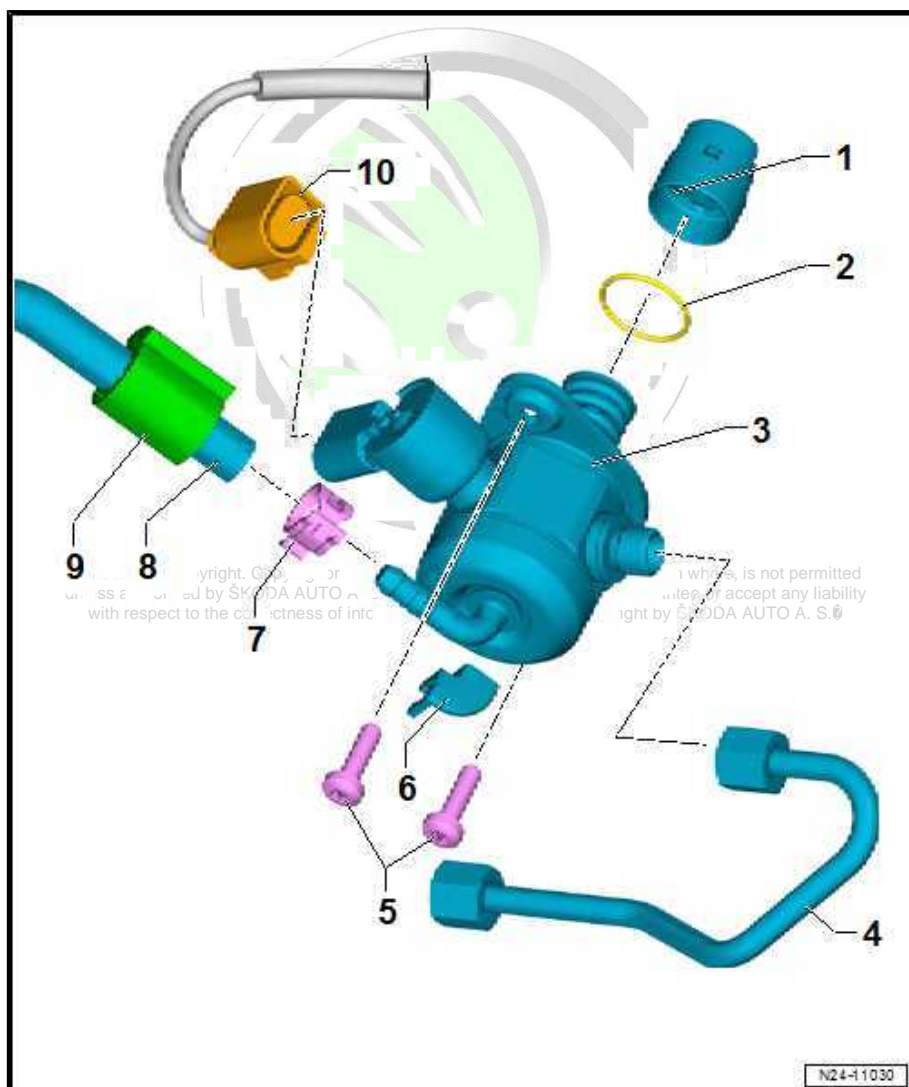
- ☐ with fuel dosage valve - N290-
- ☐ do not disassemble
- ☐ removing and installing
⇒ ["7.2 Removing and installing the high pressure pump", page 320](#)

4 - High pressure tube

- ☐ removing and installing
⇒ ["7.3 Removing and installing high pressure pipe", page 321](#)
- ☐ Replace after disassembly
- ☐ Connections must not be damaged
- ☐ Moisten thread of the union nuts with clean engine oil
- ☐ 16 Nm + 45°

5 - Screw

- ☐ Replace after disassembly



- Tightening torque and tightening order ⇒ [Fig. “High pressure pump - tightening torque and tightening order”](#), page 320

6 - Retaining clip

7 - Hose clamp

8 - Fuel feed line

9 - Ring with serration

- install behind hose clamp
- the fastener points to the control valve for fuel pressure - N276-

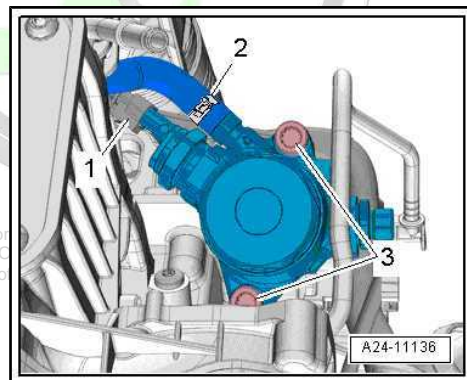
10 - Connector

High pressure pump - tightening torque and tightening order

To prevent the flange of the high pressure pump from becoming deformed during installation, attach high pressure pump as follows:

- Tighten screws in steps as follows:

Stage	Screws M6	Tightening torque/torquing angle
1.	-3-	by hand as far as the stop
2.	-3-	Tighten by 1 turn alternately until the flange of the high pressure pump is at the camshaft housing
3.	-3-	8 Nm
4.	-3-	Turn 90° further



7.2 Removing and installing the high pressure pump

Removing

- Engine cold.

WARNING

Fuel under very high pressure creates a risk of injury.

- ◆ Before opening the injection system high-pressure system, the fuel pressure must be reduced to residual pressure
⇒ [“1.2 Reduce fuel pressure”](#), page 292 .

NOTICE

Risk of malfunctions caused by soiling.

Observe safety measures and rules for cleanliness
⇒ [“3.1 Cleanliness rules”](#), page 6 .

- Remove high pressure pipe
⇒ [“7.3 Removing and installing high pressure pipe”](#), page 321 .

- Separate electrical plug connection -1-.



Note

Place a cloth below to absorb leaking fuel.

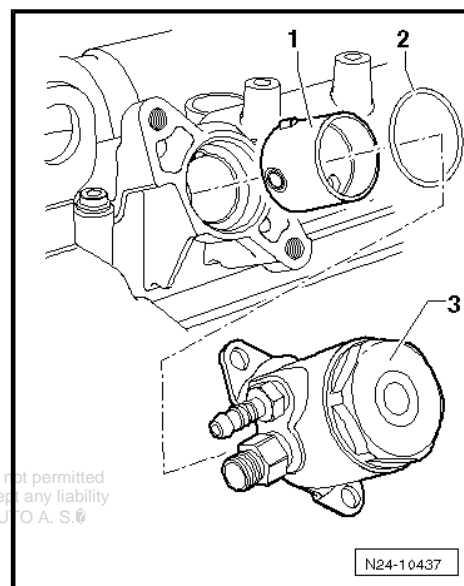
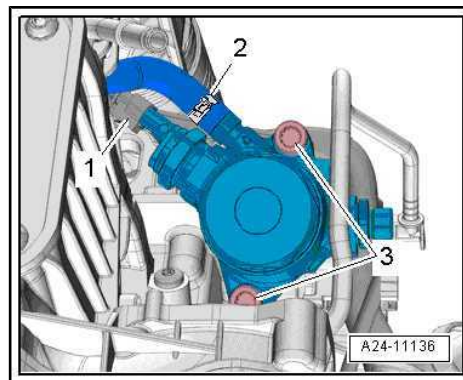
- Loosen hose clamp -2- and remove fuel intake hose.
- Unscrew screws -3- and remove high pressure pump with roller tappet.

Install

- Inspect roller tappet for damage, if necessary replace.
- Moisten roller tappet -1- with clean engine oil.
- Insert the oiled roller tappet -1- into the camshaft housing.
- Replace O-ring.
- Turn crankshaft in direction of engine rotation until the roller tappet is at the lowest point.
- Insert a new, oiled O-ring -2- into the slot of the high pressure pump -3-.
- Tighten screws until hand-tight.
- Tighten the screws to the specified tightening torque
⇒ [page 319](#).
- Check the fuel system for tightness.

Tightening torques

- ◆ High pressure pump
⇒ [“7.1 Summary of components - high pressure pump”, page 318](#).



7.3 Removing and installing high pressure pipe

Removing

- Remove throttle flap control unit - GX3-
⇒ [“4.3 Removing and installing the throttle flap control unit GX3”, page 308](#).



WARNING

Fuel under very high pressure creates a risk of injury.

- ◆ Before opening the injection system high-pressure system, the fuel pressure must be reduced to residual pressure
⇒ [“1.2 Reduce fuel pressure”, page 292](#).



NOTICE

Risk of malfunctions caused by soiling.

Observe safety measures and rules for cleanliness
⇒ [“3.1 Cleanliness rules”, page 6](#).

- Place a cloth below to absorb any fuel.

- Unscrew union nuts -arrows- and remove high pressure line.

Install

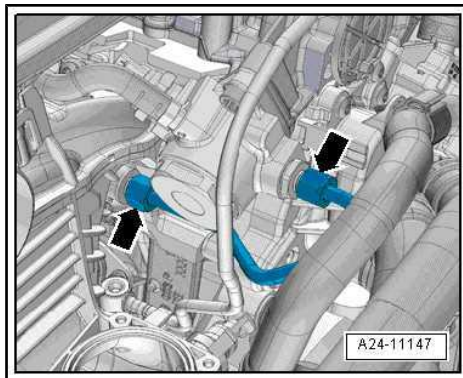
Installation is performed in the reverse order, pay attention to the following points:

- Moisten thread of union nuts with clean engine oil.
- Hand-tighten union nuts for high pressure pipe, ensure that the fit is tension-free.
- Tighten union nuts.



Note

When tightening to final tightening torque, the counterhold the screw at on the high pressure pump with open-jawed wrench.



- Install throttle flap control unit - GX3-
⇒ [“4.3 Removing and installing the throttle flap control unit GX3”, page 308](#) .

Tightening torques

- ◆ Union nut for high-pressure pump
⇒ [“7.1 Summary of components - high pressure pump”, page 318](#) .
- ◆ Union nut for fuel distributor
⇒ [“2.1 Assembly overview - fuel rail with injectors”, page 294](#) .

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8 Lambda probe

⇒ ["8.1 Summary of components - lambda probe", page 323](#)

⇒ ["8.2 Removing and installing Lambda probe", page 324](#)

8.1 Summary of components - lambda probe



Note

- ◆ *New lambda probes are coated with assembly paste. This paste must not come into contact with the slots of the lambda probe body.*
- ◆ *For a re-used lambda probe, only coat the thread with hot bolt paste. This paste must not come into contact with the slots of the lambda probe body. Hot screw paste ⇒ Electronic Catalogue of Original Parts "ETKA".*
- ◆ *The electrical cable wire connection of the lambda probe must be secured again at the same points during installation. Contact between the electrical cable connection and the exhaust pipe must be prevented.*

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1 - Lambda probe 1 after catalytic converter - GX7-

- ☐ comprises:

- ◆ Lambda probe after catalytic converter - G130-
- ◆ Lambda probe 1 heater after catalytic converter - Z29-

- ☐ removing and installing
⇒ ["8.2.2 Removing and installing Lambda probe 1 after catalytic converter GX7", page 325](#)

- ☐ 55 Nm

2 - Connector

- ☐ Lambda probe 1 in front of the catalytic converter - GX10-

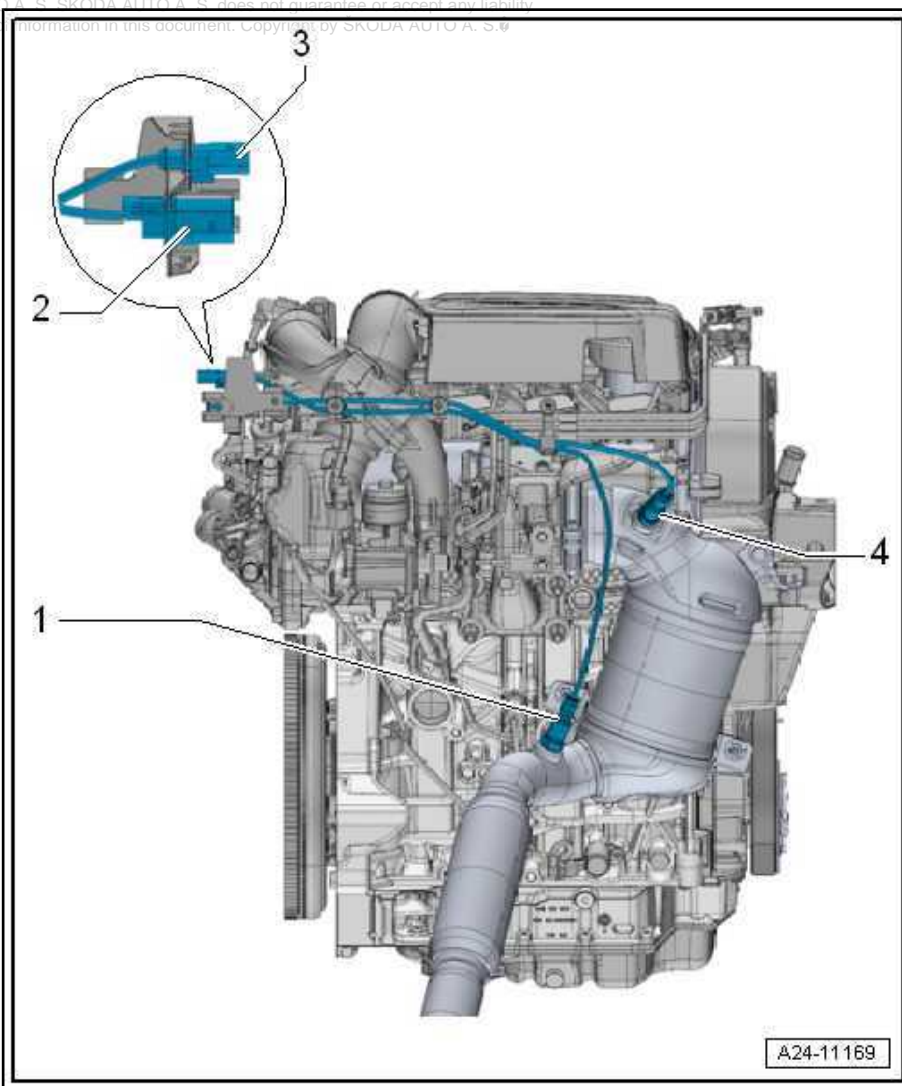
3 - Connector

- ☐ Lambda probe 1 after catalytic converter - GX7-

4 - Lambda probe 1 in front of the catalytic converter - GX10-

- ☐ comprises:

- ◆ Lambda probe - G39-
- ◆ Heating for lambda probe - Z19-
- ☐ removing and installing
⇒ ["8.2.1 Removing and installing Lambda probe 1 after catalytic converter GX10", page 324](#)



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8.2 Removing and installing Lambda probe

⇒ ["8.2.1 Removing and installing Lambda probe 1 after catalytic converter GX10", page 324](#)

⇒ ["8.2.2 Removing and installing Lambda probe 1 after catalytic converter GX7", page 325](#)

8.2.1 Removing and installing Lambda probe 1 after catalytic converter - GX10-

Lambda probe 1 in front of catalytic converter - GX10- comprises:

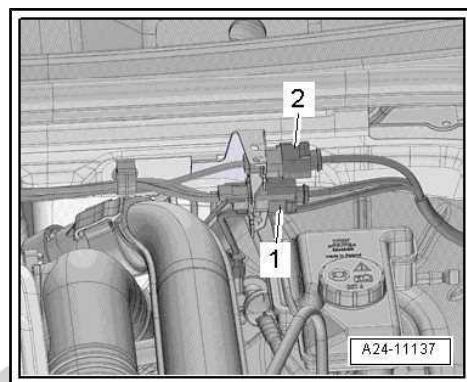
- ◆ Lambda probe - G39-
- ◆ Heating for lambda probe - Z19-

Special tools and workshop equipment required

- ◆ Set of tools - 3337-

Removing

- Disconnect plug -1- for lambda probe 1 in front of the catalytic converter - GX10- .



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- Unscrew lambda probe -2- with a spanner from the lambda probe ring spanner set - 3337- .

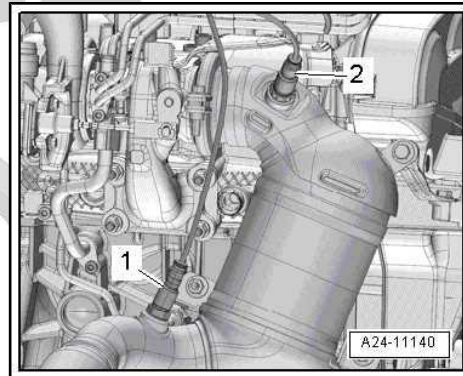
Install

Installation is performed in the reverse order, pay attention to the following points:



Note

- ◆ *New lambda probes are coated with assembly paste. This paste must not come into contact with the slots of the lambda probe body.*
- ◆ *For a re-used lambda probe, only coat the thread with hot bolt paste. This paste must not come into contact with the slots of the lambda probe body. Hot bolt paste ⇒ Electronic Catalogue of Original Parts“ETKA”*
- ◆ *The electrical cable wire connection of the lambda probe must be secured again at the same points during installation. Contact between the electrical cable connection and the exhaust pipe must be prevented.*



After replacing the lambda probe, erase the initialisation values and adapt the engine control unit - J623- ⇒ Vehicle diagnostic tester.

Tightening torques

- ◆ Lambda probe
⇒ [“8.1 Summary of components - lambda probe”, page 323](#) .

8.2.2 Removing and installing Lambda probe 1 after catalytic converter - GX7-

Lambda probe 1 after catalytic converter - GX7- comprises:

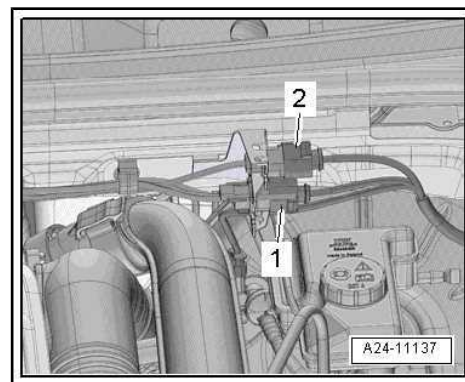
- ◆ Lambda probe after catalytic converter - G130-
- ◆ Lambda probe 1 heater after catalytic converter - Z29-

Special tools and workshop equipment required

- ◆ Set of tools - 3337-

Removing

- Disconnect plug -2- for lambda probe 1 downstream of catalytic converter - GX7- .



- Unscrew lambda probe -1- with a spanner from the lambda probe ring spanner set - 3337- .

Install

Installation is performed in the reverse order, pay attention to the following points:



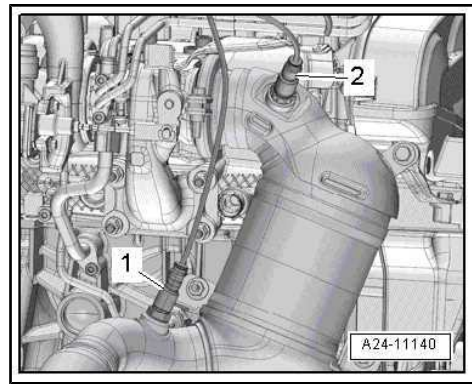
Note

- ◆ *New lambda probes are coated with assembly paste. This paste must not come into contact with the slots of the lambda probe body.*
- ◆ *For a re-used lambda probe, only coat the thread with hot bolt paste. This paste must not come into contact with the slots of the lambda probe body. Hot bolt paste ⇒ Electronic Catalogue of Original Parts“ETKA”*
- ◆ *The electrical cable wire connection of the lambda probe must be secured again at the same points during installation. Contact between the electrical cable connection and the exhaust pipe must be prevented.*

After replacing the lambda probe, erase the initialisation values and adapt the engine control unit - J623- ⇒ Vehicle diagnostic tester.

Tightening torques

- ◆ Lambda probe
⇒ [“8.1 Summary of components - lambda probe”, page 323](#) .



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1 Exhaust pipes/silencers

⇒ [“1.1 Summary of components- silencer”, page 327](#)

⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#)

⇒ [“1.3 Removing and installing silencers”, page 339](#)

⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

⇒ [“1.5 Inspecting the exhaust system for leaktightness”, page 347](#)

1.1 Summary of components- silencer

⇒ [“1.1.1 Summary of components - Superb III, with front-wheel drive”, page 327](#)

⇒ [“1.1.2 Summary of components - Superb III, with four-wheel drive”, page 329](#)

⇒ [“1.1.3 Summary of components - Kodiaq, with front-wheel drive, engine identification characters CZCA”, page 331](#)

⇒ [“1.1.4 Summary of components - Kodiaq, with front-wheel drive, engine identification characters CZDA”, page 332](#)

⇒ [“1.1.5 Summary of components - Kodiaq, with front-wheel drive, engine identification characters CZEa”, page 334](#)

⇒ [“1.1.6 Summary of components - Kodiaq, with four-wheel drive, engine identification characters CZDA”, page 336](#)

⇒ [“1.1.7 Summary of components - Kodiaq, with four-wheel drive, engine identification characters CZEa”, page 337](#)

1.1.1 Summary of components - Superb III, with front-wheel drive

1 - Retaining strap

- ☐ Replace if damaged

2 - Support

- ☐ Replace if damaged

3 - Screw

- ☐ 20 Nm

4 - Front silencer

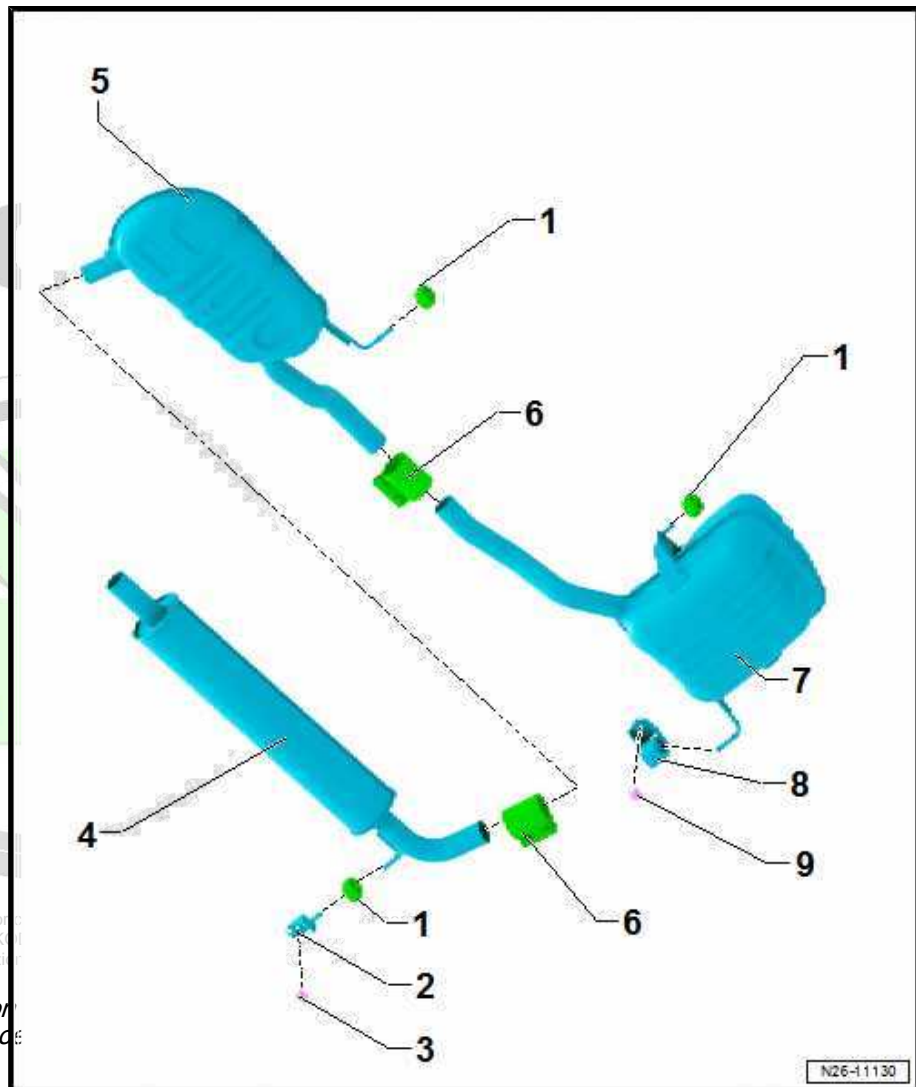
- ☐ for first equipment, a unit with middle silencer and rear silencer; replace individually when carrying out repairs
- ☐ removing and installing
⇒ [“1.3.1 Removing and installing silencers - Superb III, with front-wheel drive”, page 339](#)
- ☐ Separate exhaust pipes/silencers
⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#)
- ☐ Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

5 - The middle silencer



Note

*For engine identification
CZCA, no middle silencer.*



- ☐ for first equipment, a unit with front silencer and rear silencer; replace individually when carrying out repairs
- ☐ removing and installing
⇒ [“1.3.1 Removing and installing silencers - Superb III, with front-wheel drive”, page 339](#)
- ☐ Separate exhaust pipes/silencers ⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#)
- ☐ Align exhaust system free of stress ⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

6 - Clamping sleeve

- ☐ Fitting position ⇒ Fig. [“Installation position of rear clamp”](#), page 329
- ☐ align exhaust system free of stress before tightening
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)
- ☐ Tighten screwed connections uniformly ⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

7 - Rear silencer

- ☐ for first equipment, a unit with middle silencer and front silencer; replace individually when carrying out repairs
- ☐ removing and installing
⇒ [“1.3.1 Removing and installing silencers - Superb III, with front-wheel drive”, page 339](#)
- ☐ Separate exhaust pipes/silencers ⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#)
- ☐ Align exhaust system free of stress ⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

8 - Mount with retaining strap

- ☐ replace if damaged

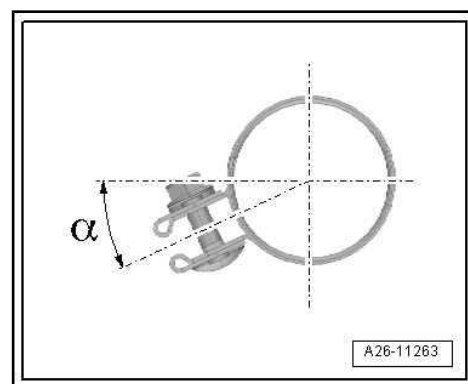
9 - Screw

- 20 Nm

Installation position of rear clamp

- Clamping sleeve is installed in the position shown.
- Angle α = approximately 20°.
- Screws connections face to rear.
- Nuts upwards.

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1.1.2 Summary of components - Superb III, with four-wheel drive

1 - Clamping sleeve

- Front installation position
⇒ [Fig. "Installation position of front clamp", page 349](#)
- Rear installation position
⇒ [Fig. "Installation position of rear clamp", page 330](#)
- align exhaust system free of stress before tightening
⇒ ["1.4 Aligning exhaust system free of stress", page 345](#)
- Tighten screwed connections uniformly
⇒ ["1.4 Aligning exhaust system free of stress", page 345](#)

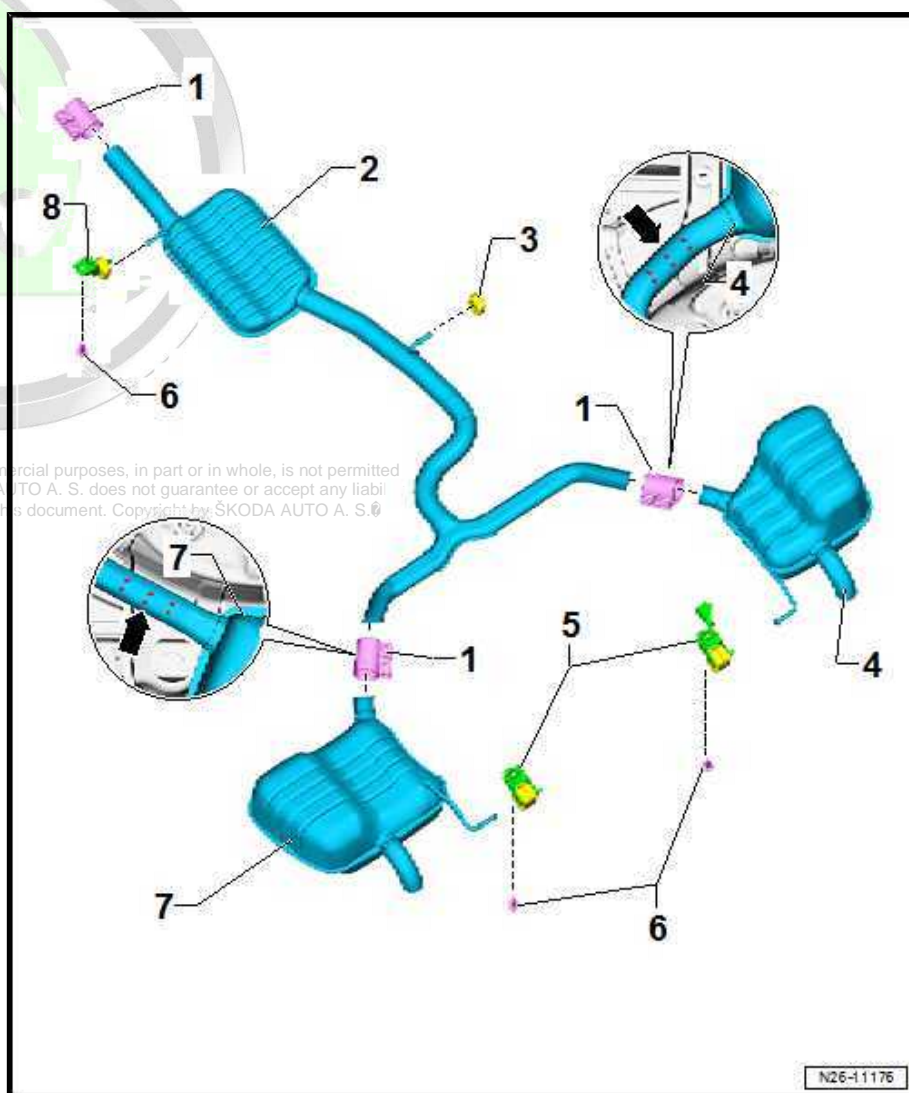
2 - The middle silencer

- as first equipment, this is a single unit with rear silencer; replace individually when carrying out repairs
- removing and installing
⇒ ["1.3.2 Removing and installing silencers - Superb III, with four-wheel drive", page 341](#)
- Separate exhaust pipes/silencers
⇒ ["1.2 Separating exhaust pipes, silencers", page 337](#)

- Align exhaust system free of stress ⇒ ["1.4 Aligning exhaust system free of stress", page 345](#)

3 - Retaining strap

- replace if damaged



4 - Rear silencer

- ☐ with marked separation point
- ☐ as first equipment, this is a single unit with middle silencer; replace individually when carrying out repairs
- ☐ removing and installing
⇒ ["1.3.2 Removing and installing silencers - Superb III, with four-wheel drive", page 341](#)
- ☐ Separate exhaust pipes/silencers ⇒ ["1.2 Separating exhaust pipes, silencers", page 337](#)
- ☐ Align exhaust system free of stress ⇒ ["1.4 Aligning exhaust system free of stress", page 345](#)

5 - Mount with retaining strap

- ☐ replace if damaged

6 - Screw

- ☐ 20 Nm

7 - Rear silencer

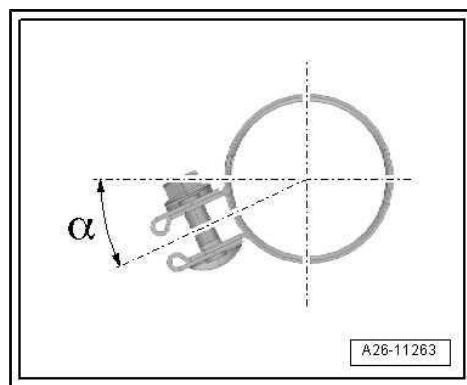
- ☐ with marked separation point
- ☐ as first equipment, this is a single unit with middle silencer; replace individually when carrying out repairs
- ☐ removing and installing
⇒ ["1.3.2 Removing and installing silencers - Superb III, with four-wheel drive", page 341](#)
- ☐ Separate exhaust pipes/silencers ⇒ ["1.2 Separating exhaust pipes, silencers", page 337](#)
- ☐ Align exhaust system free of stress ⇒ ["1.4 Aligning exhaust system free of stress", page 345](#)

8 - Mount with retaining strap

- ☐ replace if damaged
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Installation position of rear clamp

- Clamping sleeve is installed in the position shown.
- Angle α = approximately 20° .
- Screws connections face to rear.
- Nuts upwards.



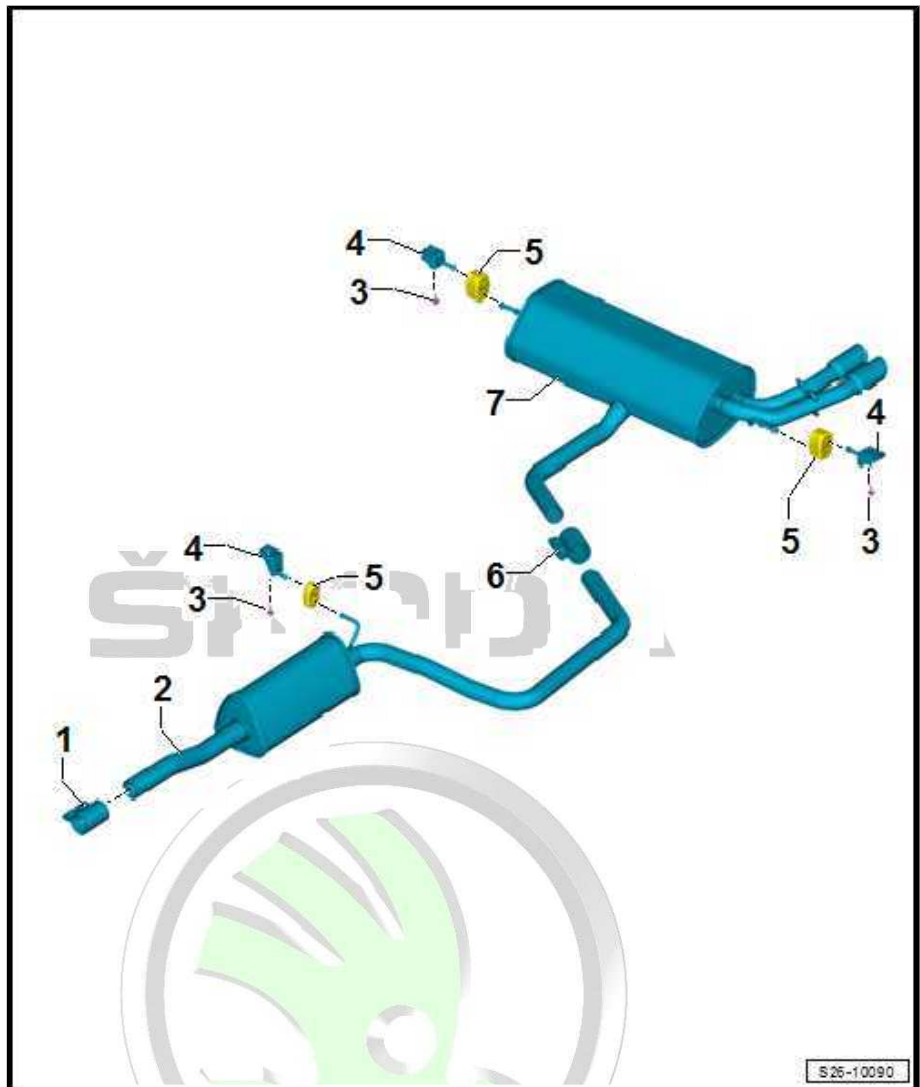
1.1.3 Summary of components - Kodiaq, with front-wheel drive, engine identification characters CZCA

1 - Clamping sleeve

- ☐ Fitting position
⇒ [“2.1.2 Summary of components - exhaust gas cleaning, Kodiaq, with front-wheel drive”, page 350](#)
- ☐ align exhaust system free of stress before tightening
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)
- ☐ Tighten screwed connections uniformly
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

2 - Front silencer

- ☐ as first equipment, this is a single unit with rear silencer; replace individually when carrying out repairs
- ☐ removing and installing
⇒ [“1.3.3 Removing and installing silencers – Kodiaq, vehicles with front-wheel drive”, page 343](#)
- ☐ Separate exhaust pipes/silencers
⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#)
- ☐ Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)



3 - Screw

- ☐ 20 Nm

4 - Support

- ☐ replace if damaged

5 - Retaining strap

- ☐ replace if damaged

6 - Clamping sleeve

- ☐ Fitting position ⇒ [Fig. “Installation position of rear clamp”, page 332](#)
- ☐ align exhaust system free of stress before tightening
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)
- ☐ Tighten screwed connections uniformly ⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

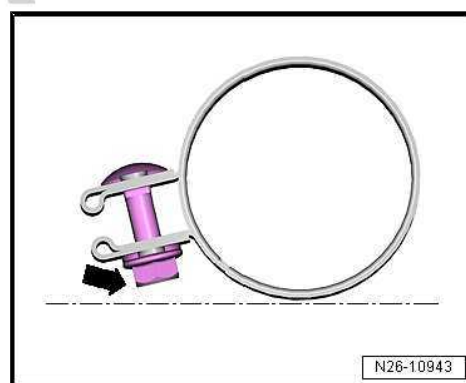
7 - Rear silencer

- ☐ as first equipment, this is a single unit with front silencer; replace individually when carrying out repairs
- ☐ removing and installing
⇒ [“1.3.3 Removing and installing silencers – Kodiaq, vehicles with front-wheel drive”, page 343](#)

- ❑ Separate exhaust pipes/silencers ⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#)
- ❑ Align exhaust system free of stress ⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

Installation position of rear clamp

- Re-install clamping sleeve in the position shown.
- Bolted connections to the left.
- The bolted connection -arrow- must not protrude beyond the bottom edge of the clamping sleeve.



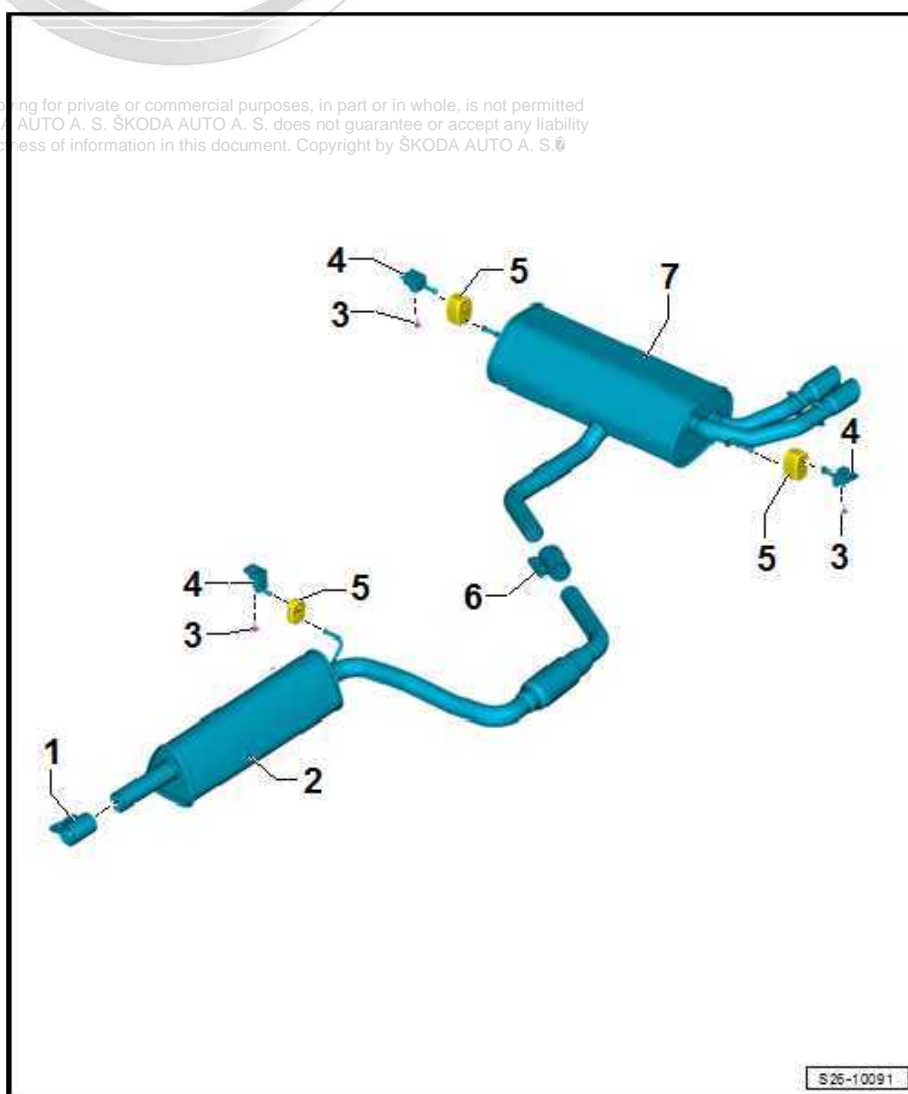
1.1.4 Summary of components - Kodiaq, with front-wheel drive, engine identification characters CZDA

1 - Clamping sleeve

- ❑ Fitting position
⇒ [“2.1.2 Summary of components - exhaust gas cleaning, Kodiaq, with front-wheel drive”, page 350](#)
- ❑ align exhaust system free of stress before tightening
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)
- ❑ Tighten screwed connections uniformly
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

2 - Front silencer

- ❑ as first equipment, this is a single unit with rear silencer; replace individually when carrying out repairs
- ❑ removing and installing
⇒ [“1.3.3 Removing and installing silencers – Kodiaq, vehicles with front-wheel drive”, page 343](#)
- ❑ Separate exhaust pipes/silencers
⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#)
- ❑ Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)



3 - Screw

- ☐ 20 Nm

4 - Support

- ☐ replace if damaged

5 - Retaining strap

- ☐ replace if damaged

6 - Clamping sleeve

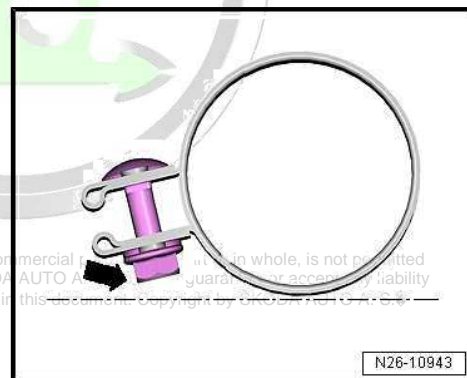
- ☐ Fitting position ⇒ [Fig. “Installation position of rear clamp”](#), page 333
- ☐ align exhaust system free of stress before tightening
⇒ [“1.4 Aligning exhaust system free of stress”](#), page 345
- ☐ Tighten screwed connections uniformly ⇒ [“1.4 Aligning exhaust system free of stress”](#), page 345

7 - Rear silencer

- ☐ as first equipment, this is a single unit with front silencer; replace individually when carrying out repairs
- ☐ removing and installing
⇒ [“1.3.3 Removing and installing silencers – Kodiak, vehicles with front-wheel drive”](#), page 343
- ☐ Separate exhaust pipes/silencers ⇒ [“1.2 Separating exhaust pipes, silencers”](#), page 337
- ☐ Align exhaust system free of stress ⇒ [“1.4 Aligning exhaust system free of stress”](#), page 345

Installation position of rear clamp

- Re-install clamping sleeve in the position shown.
- Bolted connections to the left.
- The bolted connection -arrow- must not protrude beyond the bottom edge of the clamping sleeve.



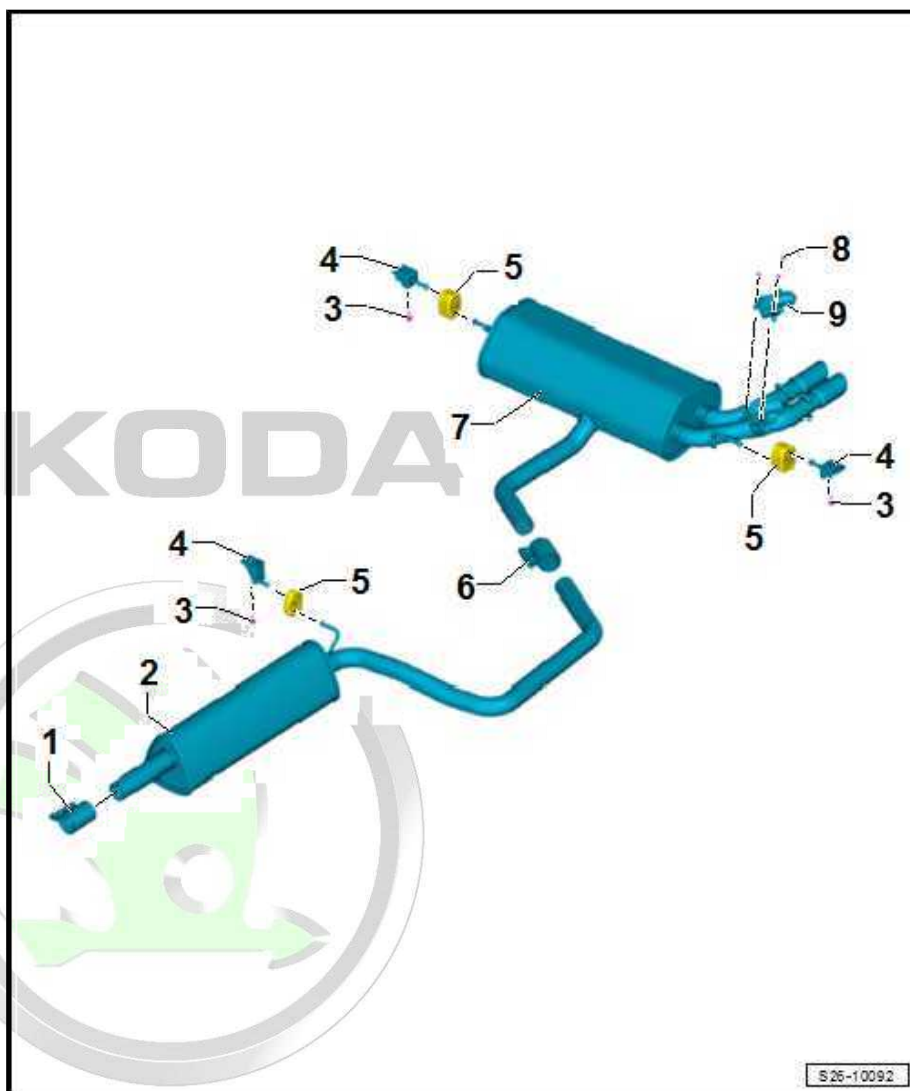
1.1.5 Summary of components - Kodiaq, with front-wheel drive, engine identification characters CZEA

1 - Clamping sleeve

- ☐ Fitting position
⇒ [“2.1.2 Summary of components - exhaust gas cleaning, Kodiaq, with front-wheel drive”, page 350](#)
- ☐ align exhaust system free of stress before tightening
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)
- ☐ Tighten screwed connections uniformly
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

2 - Front silencer

- ☐ as first equipment, this is a single unit with rear silencer; replace individually when carrying out repairs
- ☐ removing and installing
⇒ [“1.3.3 Removing and installing silencers – Kodiaq, vehicles with front-wheel drive”, page 343](#)
- ☐ Separate exhaust pipes/silencers
⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#)
- ☐ Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)



3 - Screw

- ☐ 20 Nm

4 - Support

- ☐ replace if damaged

5 - Retaining strap

- ☐ replace if damaged

6 - Clamping sleeve

- ☐ Fitting position ⇒ [Fig. “Installation position of rear clamp”, page 335](#)
- ☐ align exhaust system free of stress before tightening
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)
- ☐ Tighten screwed connections uniformly ⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

7 - Rear silencer

- ☐ as first equipment, this is a single unit with front silencer; replace individually when carrying out repairs
- ☐ removing and installing
⇒ [“1.3.3 Removing and installing silencers – Kodiaq, vehicles with front-wheel drive”, page 343](#)

- ☐ Separate exhaust pipes/silencers ⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#)
- ☐ Align exhaust system free of stress ⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

8 - Nut

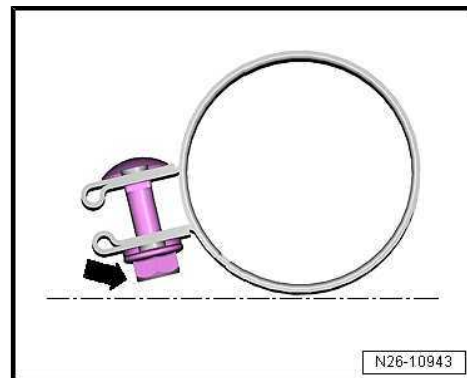
- ☐ Replace after disassembly
- ☐ 3 Nm

9 - Exhaust flap control unit - J883-

- ☐ removing and installing ⇒ [“2.3 Removing and installing the exhaust flap control unit J883”, page 358](#)

Installation position of rear clamp

- Re-install clamping sleeve in the position shown.
- Bolted connections to the left.
- The bolted connection -arrow- must not protrude beyond the bottom edge of the clamping sleeve.



ŠKODA



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1.1.6 Summary of components - Kodiaq, with four-wheel drive, engine identification characters CZDA

1 - Clamping sleeve

- ☐ Fitting position
⇒ [“2.1.3 Summary of components - exhaust gas cleaning, Kodiaq, with four-wheel drive”, page 352](#)
- ☐ align exhaust system free of stress before tightening
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)
- ☐ Tighten screwed connections uniformly
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

2 - Rear silencer

- ☐ removing and installing
⇒ [“1.3.4 Removing and installing silencers – Kodiaq, with four-wheel drive”, page 344](#)
- ☐ Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

3 - Screw

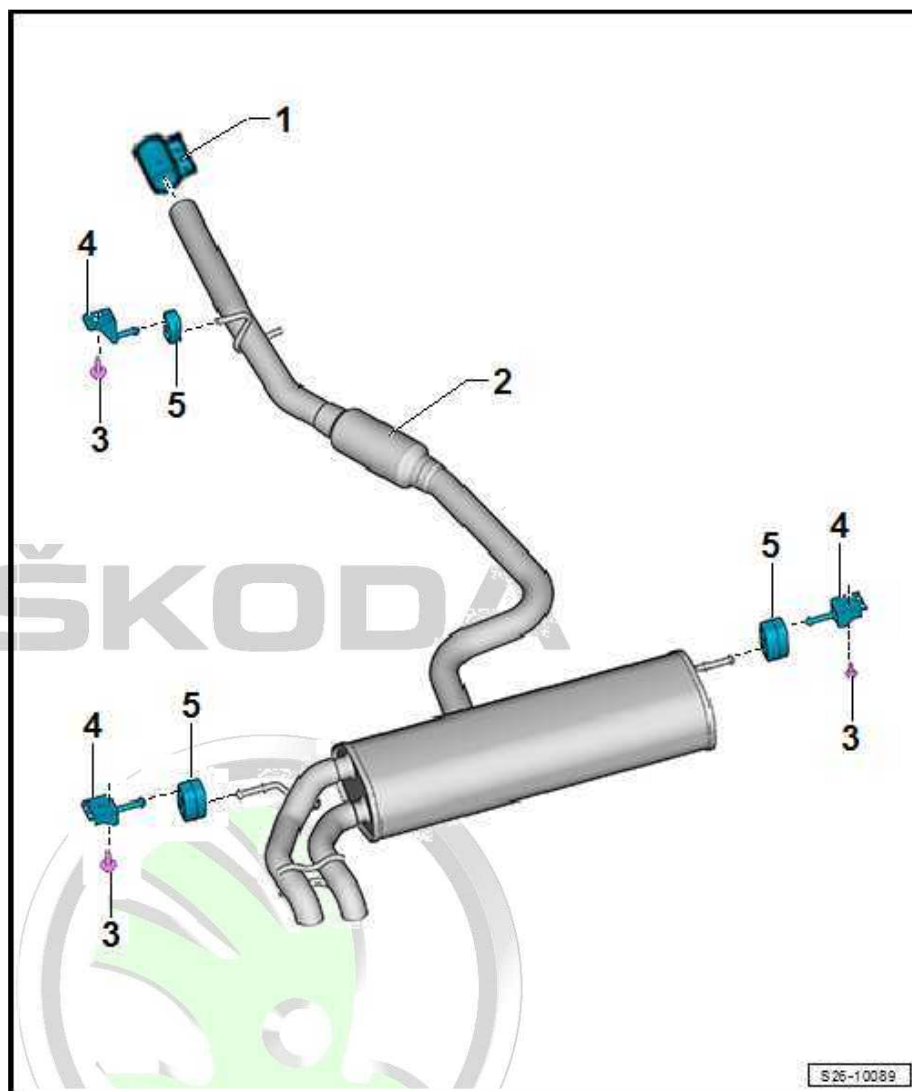
- ☐ 20 Nm

4 - Support

- ☐ replace if damaged

5 - Retaining strap

- ☐ replace if damaged



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1.1.7 Summary of components - Kodiaq, with four-wheel drive, engine identification characters CZEA

1 - Clamping sleeve

- ☐ Fitting position
⇒ [“2.1.3 Summary of components - exhaust gas cleaning, Kodiaq, with four-wheel drive”, page 352](#)
- ☐ align exhaust system free of stress before tightening
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)
- ☐ Tighten screwed connections uniformly
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

2 - Rear silencer

- ☐ removing and installing
⇒ [“1.3.4 Removing and installing silencers – Kodiaq, with four-wheel drive”, page 344](#)
- ☐ Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

3 - Screw

- ☐ 20 Nm

4 - Support

- ☐ replace if damaged

5 - Retaining strap

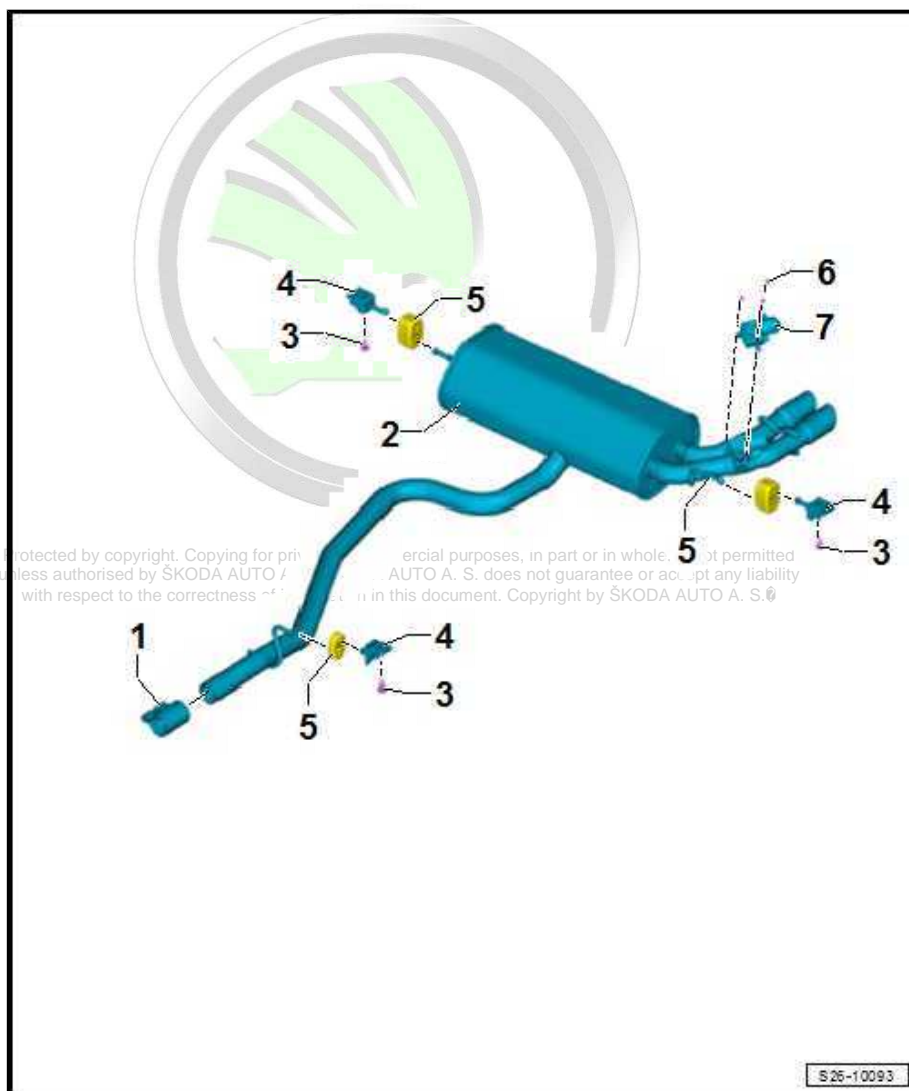
- ☐ replace if damaged

6 - Nut

- ☐ Replace after disassembly
- ☐ 3 Nm

7 - Exhaust flap control unit - J883-

- ☐ removing and installing ⇒ [“2.3 Removing and installing the exhaust flap control unit J883”, page 358](#)



1.2 Separating exhaust pipes, silencers

Special tools and workshop equipment required

- ◆ Body saw - V.A.G 1523A- or chain pipe cutter - VAS 6254-



Note

- ◆ A separating point has been provided in the connecting pipe to remove parts of the exhaust system separately.
- ◆ The separating point is marked around the perimeter of the exhaust pipe.

CAUTION

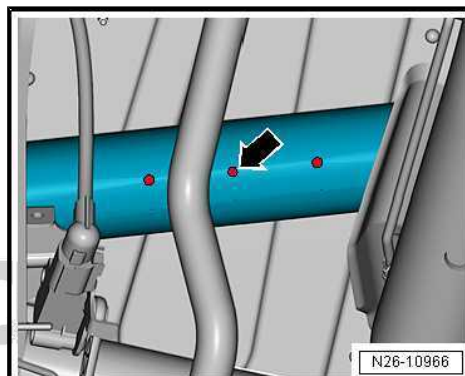
Risk of injury from ejected swarf.

Wear safety goggles and safety clothing.

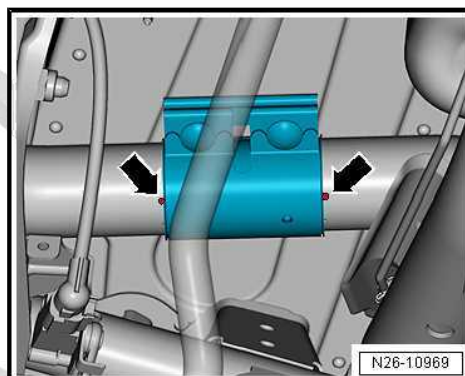
For Superb III vehicles

Separation point between middle and rear silencer above the rear axle

- Cut through exhaust pipe at separation point -arrow- at right angle with body saw - V.A.G 1523A- or chain pipe cutter - VAS 6254- .

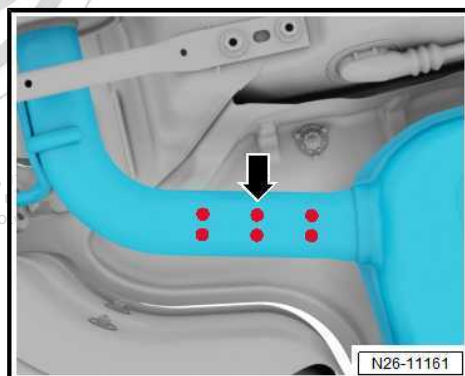


- Position clamping sleeve in the centre between outer markings -arrows-.
- Installing the clamping sleeve
⇒ Fig. “Installation position of rear clamp”, page 329 .



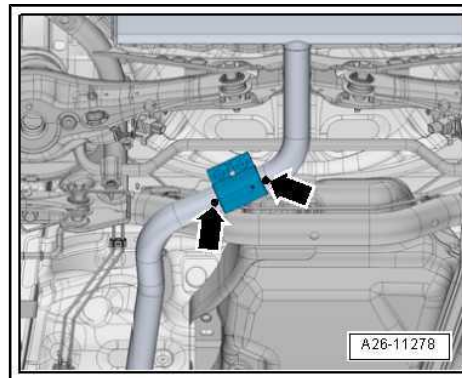
Separation point between front and middle silencers

- Cut through exhaust pipe at separating point -arrow- at right angle e.g. with body saw - V.A.G 1523A- or chain pipe cutter - VAS 6254- .



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- Position clamping sleeve in the centre between outer markings -arrows-.
- Installing the clamping sleeve
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#) .

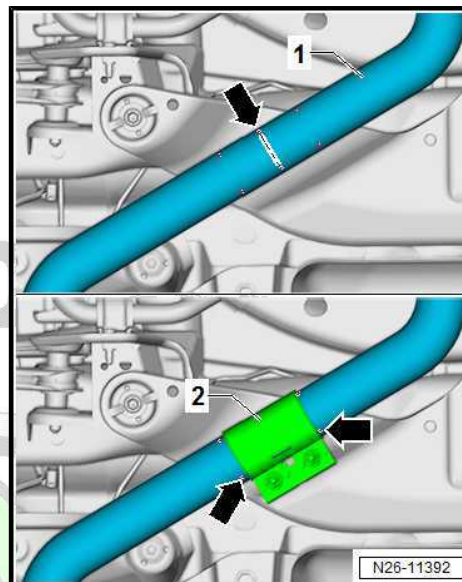


For Kodiah vehicles

- Cut through exhaust pipe at separation point -arrow- at right angle with body saw - V.A.G 1523A- or chain pipe cutter - VAS 6254- .
- Position clamping sleeve in the centre between outer markings -arrows-.
- Installing the clamping sleeve
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#) .

Continued for all vehicles

- Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#) .



1.3 Removing and installing silencers

⇒ [“1.3.1 Removing and installing silencers - Superb III, with front-wheel drive”, page 339](#)

⇒ [“1.3.2 Removing and installing silencers - Superb III, with four-wheel drive”, page 341](#)

⇒ [“1.3.3 Removing and installing silencers – Kodiah, vehicles with front-wheel drive”, page 343](#)

⇒ [“1.3.4 Removing and installing silencers – Kodiah, with four-wheel drive”, page 344](#)

1.3.1 Removing and installing silencers - Superb III, with front-wheel drive

⚠ CAUTION

Risk of accident from silencer weight.

- ◆ A second mechanic is required to remove the silencers.

Removing the rear silencer

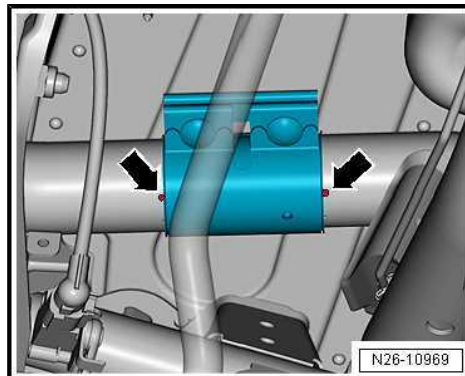
- If present, remove rear left underfloor trim panel ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel .

Separation point without clamping sleeve

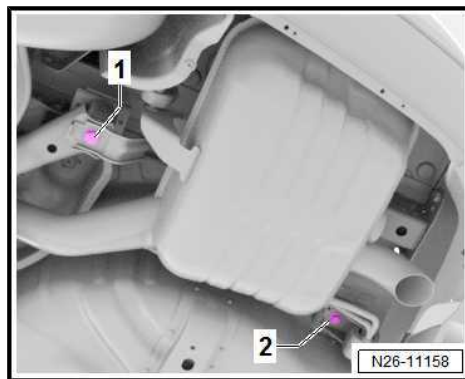
- Disconnect rear silencer from middle silencer
⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#) .

Separation point with clamping sleeve

- Loosen clamping sleeve between middle and rear silencer.



- Unscrew screws -1- and -2-.
- Remove rear silencer.

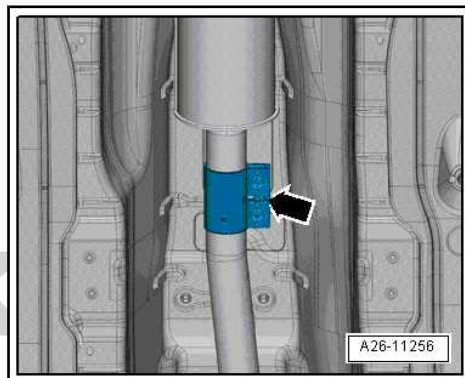


Removing front and middle silencer

- Loosen clamping sleeve -arrow- between exhaust pipe with catalytic converter and front silencer and slide backwards.

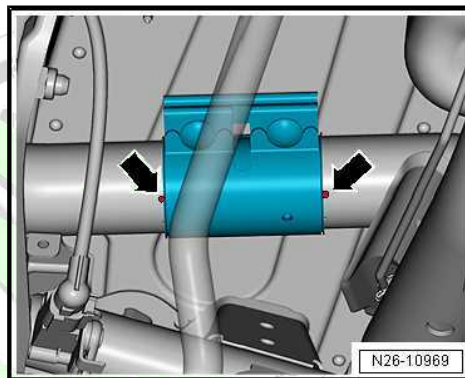
Separation point without clamping sleeve

- Disconnect rear silencer from middle silencer
⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#) .



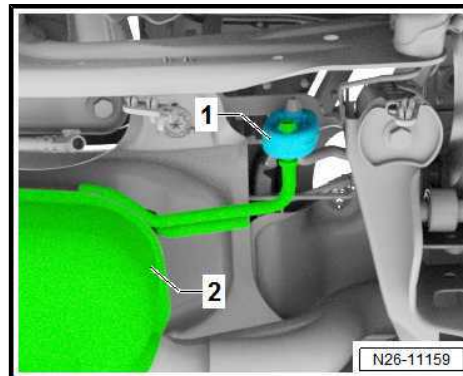
Separation point with clamping sleeve

- Loosen clamping sleeve between middle and rear silencer.



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- Unhook retaining strap -1- of the middle silencer -2-.

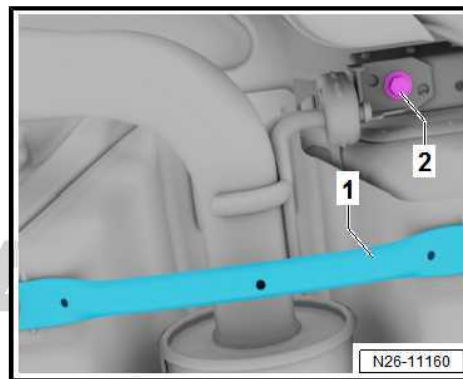


- Remove rear tunnel bridge -1- ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel; installing and removing tunnel bridge .
- Unscrew bolt -2-.
- Gently slide forwards front and middle silencer and remove.

Install

Installation is carried out in the reverse order. Pay attention to the following:

- Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#) .
- Note installation position of clamping sleeve
⇒ [Fig. “Installation position of rear clamp””, page 329](#) .
- Note installation position of clamping sleeve
⇒ [Fig. “Installation position of front clamp””, page 349](#) .



Tightening torques

- ◆ Exhaust system
⇒ [“1.1.1 Summary of components - Superb III, with front-wheel drive”, page 327](#) .
- ◆ Underfloor trim panel ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel .

1.3.2 Removing and installing silencers - Superb III, with four-wheel drive

⚠ CAUTION

Risk of accident from silencer weight.

- ◆ A second mechanic is required to remove the silencers.
- If present, remove rear underfloor trim panel ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel .

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- Loosen clamping sleeve between exhaust pipe with catalytic converter and front silencer and slide forwards.



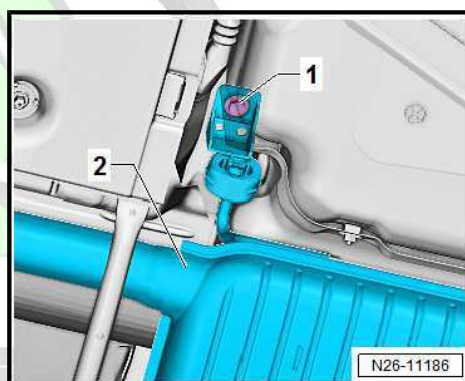
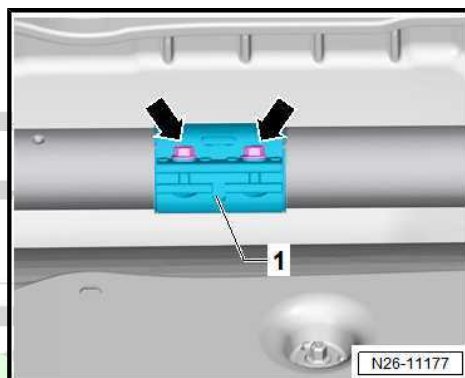
Note

As first equipment, the middle silencer and rear silencer form a single unit. Replace individually when carrying out repairs.

Separate exhaust pipes/silencers

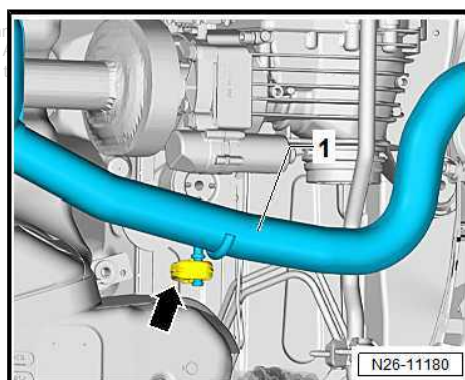
⇒ ["1.2 Separating exhaust pipes, silencers", page 337](#) .

- Unscrew screw -1- and place exhaust pipe -2- on the tunnel bridge.

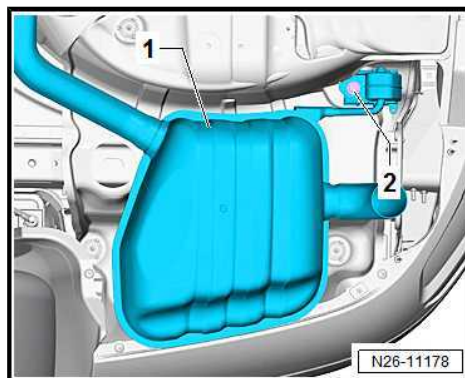


- Unhook the retaining strap -arrow- from the bold of the exhaust pipe -1-.

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- Unscrew screw -2- for bracket of the rear silencer on the right side -1-.

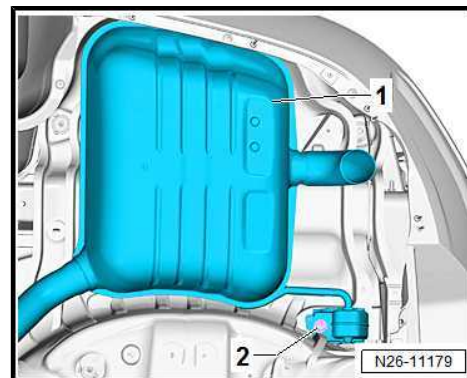


- Unscrew screw -2- for bracket of the rear silencer on the left side -1-.
- Remove silencer.

Install

Installation is carried out in the reverse order. Pay attention to the following:

- Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#) .
- Note installation position of clamping sleeve
⇒ [Fig. “Installation position of rear clamp””, page 329](#) .
- Note installation position of clamping sleeve
⇒ [Fig. “Installation position of front clamp””, page 349](#) .



Tightening torques

- ◆ Exhaust system
⇒ [“1.1.2 Summary of components - Superb III, with four-wheel drive”, page 329](#) .
- ◆ Underfloor trim panel ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel .

1.3.3 Removing and installing silencers – Kodiaq, vehicles with front-wheel drive

Special tools and workshop equipment required

- ◆ Engine and gearbox jack , e.g. -V.A.G 1383A- or -VAS 6931-

⚠ CAUTION

Risk of accident from silencer weight.

- ◆ A second mechanic is required to remove the silencers.
- Remove rear tunnel bridge ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel; Removing and installing tunnel bridge .
- If present, remove rear left underfloor trim panel ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel .

For vehicles fitted with exhaust flap control unit - J883-

- Disconnect electrical plug connection on the exhaust flap control unit - J883-
⇒ [“2.3 Removing and installing the exhaust flap control unit J883”, page 358](#) .

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Continued - removing silencers separately

Separation point without clamping sleeve

- Disconnect rear silencer -5- from the front silencer -2-
⇒ [“1.2 Separating exhaust pipes, silencers”, page 337](#) .

Separation point with clamping sleeve

- Loosen clamping sleeve between front silencer -2- and rear silencer -5-.

Removing silencers together and removing silencer separately

- Support the silencer with engine/gearbox jack e.g. -V.A.G 1383A- or -VAS 6931- .
- Slacken clamping sleeve -1-.
- Unscrew screws -4- from the mounting brackets -3-.
- Remove silencer.

Install

Installation is carried out in the reverse order. Pay attention to the following:

- Align the holes of the front brackets -arrows- with the markings on the heat shield.
- Align the holes of the rear brackets -arrows- parallel to the frame side rail.
- Note installation position of clamp
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#) .
- Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#) .

Tightening torques

- ♦ Exhaust system
⇒ [“1.1 Summary of components- silencer”, page 327](#) .
- ♦ Underfloor trim panel ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel .

1.3.4 Removing and installing silencers – Kodiaq, with four-wheel drive

Special tools and workshop equipment required

- ♦ Engine and gearbox jack , e.g. -V.A.G 1383A- or -VAS 6931-

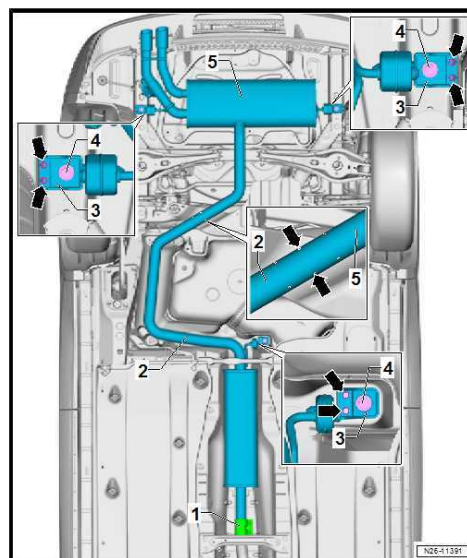
⚠ CAUTION

Risk of accident from silencer weight.

- ♦ A second mechanic is required to remove the silencers.

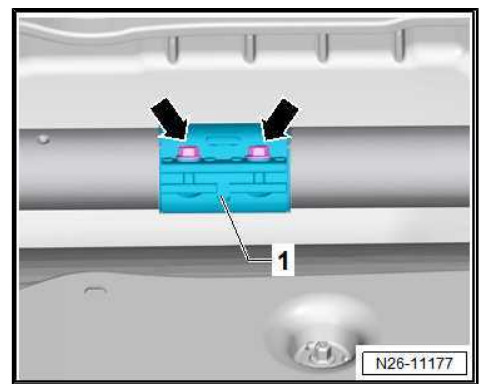
For vehicles fitted with exhaust flap control unit - J883-

- Disconnect electrical plug connection on the exhaust flap control unit - J883-
⇒ [“2.3 Removing and installing the exhaust flap control unit J883”, page 358](#) .

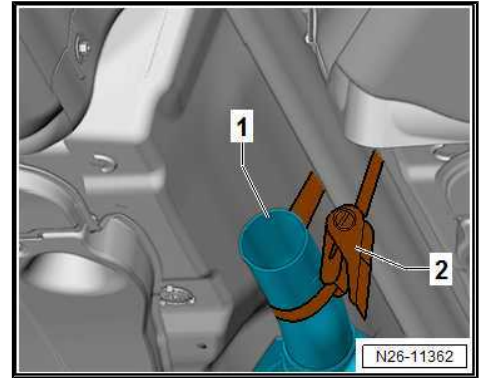


Continued - silencers separately

- Loosen the screws -arrows- of the clamping sleeve -1- and slide the sleeve backwards.



- Secure the exhaust pipe -1- with tensioning strap -2- to the propshaft.

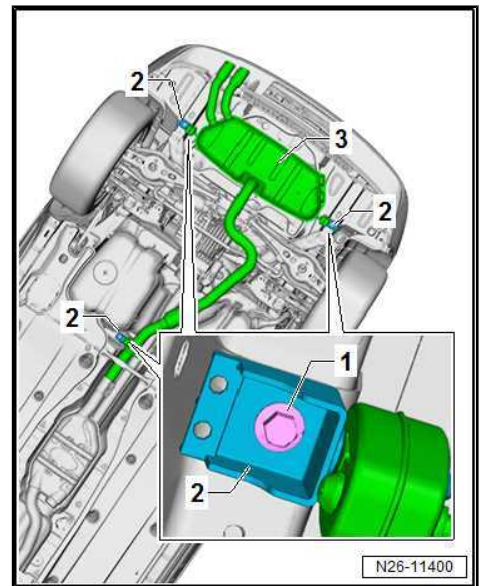


- Unscrew screws -1- of the retaining strap -2-.
- Remove silencer -3-.

Install

Installation is carried out in the reverse order. Pay attention to the following:

- Align the brackets for the retaining straps so that the straps are parallel.
- Align the holes of the rear brackets parallel to the frame side rail.
- Note installation position of clamp
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#).
- Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#).



Tightening torques

- ◆ Exhaust system
⇒ [“1.1 Summary of components- silencer”, page 327](#).
- ◆ Underfloor trim panel ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel .

1.4 Aligning exhaust system free of stress

- The exhaust system is aligned when cold.

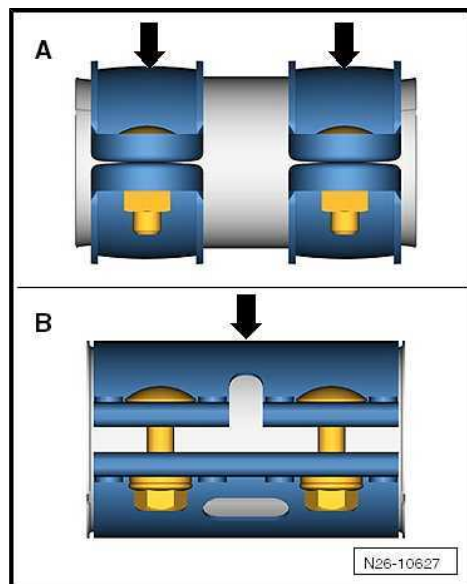


Note

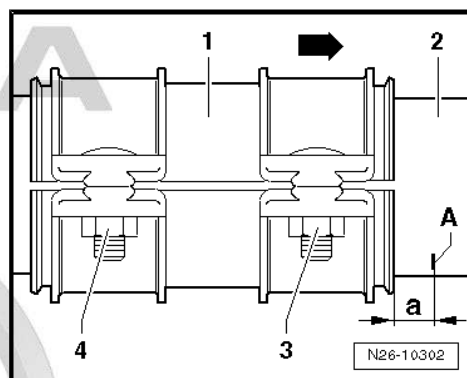
Two variants of clamping sleeves can be fitted to the exhaust system.

Difference between clamping sleeves:

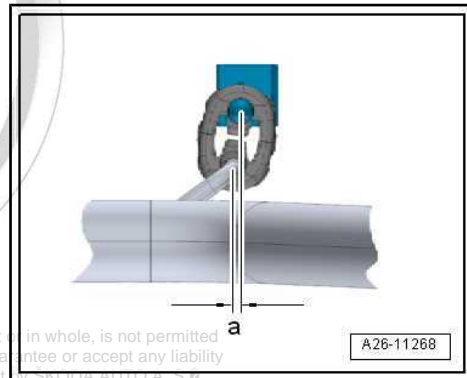
- ◆ Clamping sleeve -A-: 95 mm long.
- ◆ Clamping sleeve -B-: 88 mm long.



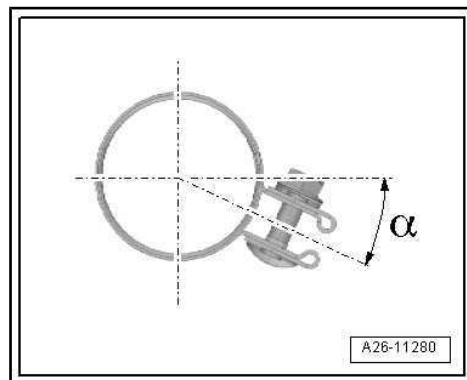
- Slacken the nuts -3- and -4- at the clamping sleeve -1- and align the intermediate pipe -2- (-arrow- points in direction of travel).
- Set the clamping sleeve at a distance -a- from the marking -A- on the pre-exhaust pipe:
- ◆ Dimension -a- for clamping sleeves version -A- = 5 mm
- ◆ Dimension -a- for clamping sleeves version -B- = 8.5 mm



- Push the exhaust system so far forward in the direction of travel until the retaining strap is pre-tensioned -a- = 5mm.



- Re-install clamping sleeve in the position shown.
- Angle α = approximately 20° .
- Bolted connection to the right.
- Nuts upwards.



Align exhaust tailpipe

- Align rear silencer in such a way that there is an equal distance -a- and -b- between bumper opening and exhaust tailpipes.

Vehicles with an exhaust tailpipe

- Align rear silencer in such a way that there is an equal distance between bumper opening and exhaust tailpipe.

All vehicles



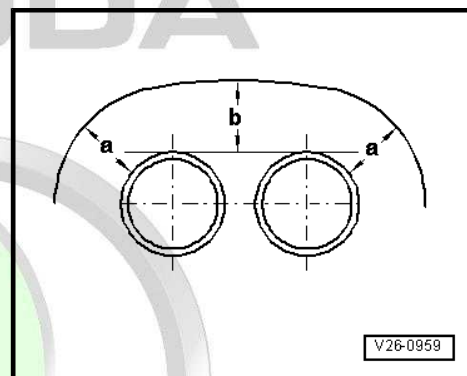
Note

For aligning the exhaust tailpipes, if necessary loosen hanger on the rear silencer.

- Tighten screwed connections uniformly.

Tightening torques

- ◆ Clamping sleeve version -A-: 23 Nm.
- ◆ Clamping sleeve version -B-: 30 Nm.



1.5 Inspecting the exhaust system for leak-tightness

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Work procedure

- Start engine and run in idle.
- Close off exhaust tailpipes for the duration of the leak test, using cloths or plugs.
- Check connection points on exhaust manifold for leak-tightness by listening:
- Eliminate any leak found.

2 Cleansing exhaust emissions

⇒ [“2.1 Summary of components - exhaust gas cleaning”, page 348](#)

⇒ [“2.2 Removing and installing catalytic converter”, page 354](#)

⇒ [“2.3 Removing and installing the exhaust flap control unit J883”, page 358](#)

2.1 Summary of components - exhaust gas cleaning

⇒ [“2.1.1 Summary of components - exhaust gas cleaning, Superb III”, page 348](#)

⇒ [“2.1.2 Summary of components - exhaust gas cleaning, Kodiaq, with front-wheel drive”, page 350](#)

⇒ [“2.1.3 Summary of components - exhaust gas cleaning, Kodiaq, with four-wheel drive”, page 352](#)

2.1.1 Summary of components - exhaust gas cleaning, Superb III

1 - Screw

- 20 Nm

2 - Support

- replace if damaged

3 - Nut

- Tightening torque and tightening order
⇒ [Fig. “Installing catalytic converter - tightening torque and tightening order”](#), page 349

4 - Screw

- 20 Nm

5 - Nut

- Tightening torque and tightening order
⇒ [Fig. “Installing catalytic converter - tightening torque and tightening order”](#), page 349

6 - Support

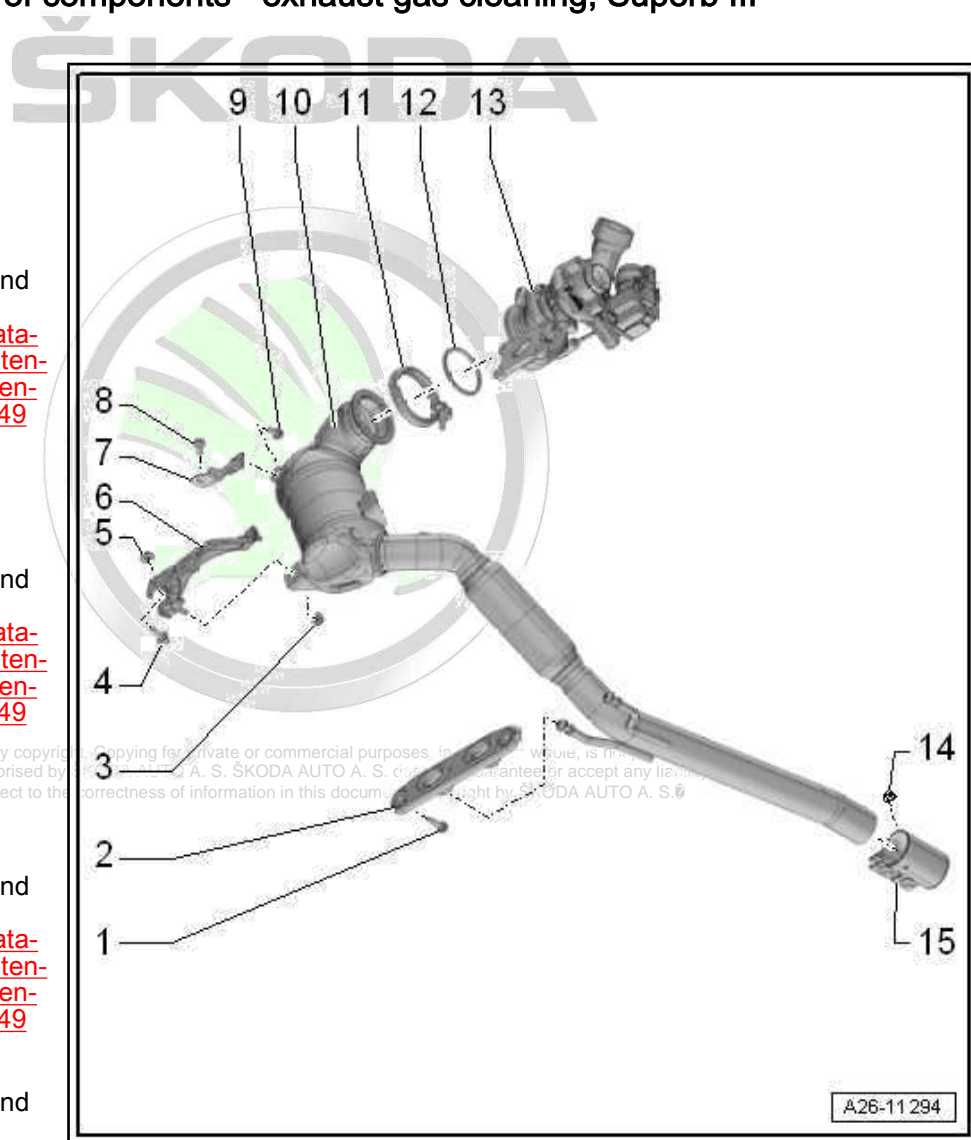
7 - Support

8 - Screw

- Tightening torque and tightening order
⇒ [Fig. “Installing catalytic converter - tightening torque and tightening order”](#), page 349

9 - Screw

- Tightening torque and tightening order
⇒ [Fig. “Installing catalytic converter - tightening torque and tightening order”](#), page 349



10 - Exhaust pipe with catalytic converter

- ❑ do not twist decoupling element more than 10° - risk of damage
- ❑ Do not load decoupler with tensile stress
- ❑ Do not damage wire mesh on decoupling element
- ❑ protect catalytic converter against shocks and blows
- ❑ removing and installing ⇒ [“2.2 Removing and installing catalytic converter”, page 354](#)
- ❑ Remove the protection for the decoupling element -T10403- on the spare part as late as possible
- ❑ Align exhaust system free of stress ⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

11 - Screw clamp

- ❑ Tightening torque and tightening order
⇒ [Fig. “Installing catalytic converter - tightening torque and tightening order””, page 349](#)

12 - Gasket

- ❑ Replace after disassembly

13 - Exhaust gas turbocharger

- ❑ Summary of components ⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#)
- ❑ removing and installing ⇒ [“1.2 Removing and installing exhaust gas turbocharger”, page 271](#)
- ❑ Tightening torque and tightening order
⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#)

14 - Nut

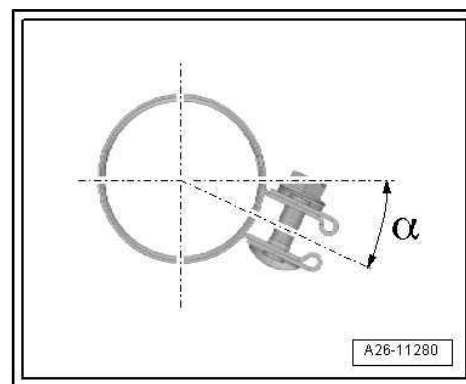
- ❑ 30 Nm

15 - Clamping sleeve

- ❑ before tightening, align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)
- ❑ Tighten screwed connections uniformly
- ❑ Fitting position ⇒ [Fig. “Installation position of front clamp””, page 349](#)

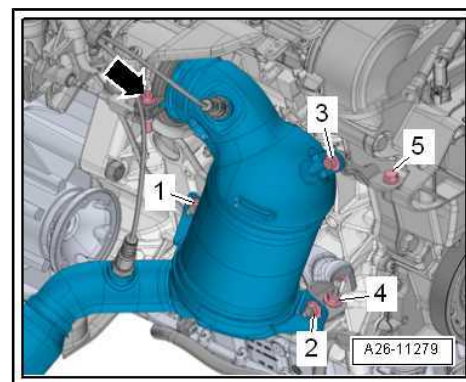
Installation position of front clamp

- Install clamping sleeve in the position shown.
- Angle α = approximately 20°.
- Bolted connection to the right.
- Nuts upwards.



Installing catalytic converter - tightening torque and tightening order

1.	– Position catalytic converter on exhaust gas turbocharger, loosely tighten clamp -arrow-	
2.	– Loosely screw in screws -3-, -5- and nuts -1-, -2- and -4- by hand	• It must still be possible to move the catalytic converter and the bracket
3.	– Tighten screw clamp -arrow-	15 Nm
4.	– Tighten screws and nuts in the order -1...5-	20 Nm



2.1.2 Summary of components - exhaust gas cleaning, Kodiaq, with front-wheel drive

1 - Screw

- ☐ Tightening torque and tightening order
⇒ [Fig. "Installing catalytic converter - tightening torque and tightening order", page 351](#)

2 - Support

3 - Screw

- ☐ Tightening torque and tightening order
⇒ [Fig. "Installing catalytic converter - tightening torque and tightening order", page 351](#)

4 - Lambda probe 1 in front of the catalytic converter - GX10-

- ☐ comprises:
 - ◆ Lambda probe - G39-
 - ◆ Heating for lambda probe - Z19-
- ☐ removing and installing
⇒ ["8.2.1 Removing and installing Lambda probe 1 after catalytic converter GX10", page 324](#)
- ☐ Tightening torque
⇒ ["8.1 Summary of components - lambda probe", page 323](#)

5 - Lambda probe 1 after catalytic converter - GX7-

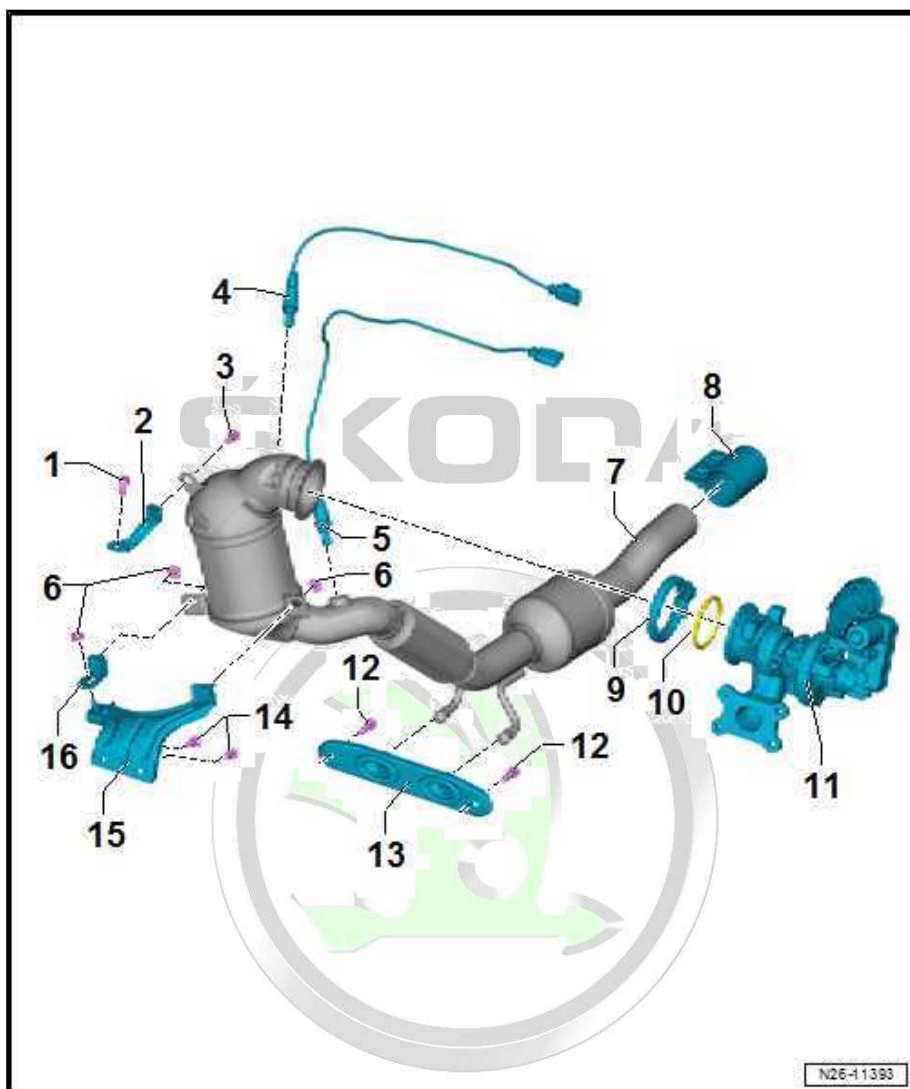
- ☐ comprises:
 - ◆ Lambda probe after catalytic converter - G130-
 - ◆ Lambda probe 1 heater after catalytic converter - Z29-
- ☐ removing and installing
⇒ ["8.2.2 Removing and installing Lambda probe 1 after catalytic converter GX7", page 325](#)
- ☐ Tightening torque ⇒ ["8.1 Summary of components - lambda probe", page 323](#)

6 - Nut

- ☐ Tightening torque and tightening order
⇒ [Fig. "Installing catalytic converter - tightening torque and tightening order", page 351](#)

7 - Exhaust pipe with catalytic converter

- ☐ do not twist decoupling element more than 10° - risk of damage
- ☐ Do not load decoupler with tensile stress
- ☐ Do not damage wire mesh on decoupling element
- ☐ protect catalytic converter against shocks and blows
- ☐ removing and installing ⇒ ["2.2 Removing and installing catalytic converter", page 354](#)
- ☐ Remove the protection for the decoupling element -T10403- on the spare part as late as possible
- ☐ Align exhaust system free of stress ⇒ ["1.4 Aligning exhaust system free of stress", page 345](#)



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8 - Clamping sleeve

- ☐ before tightening, align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)
- ☐ Tighten screwed connections uniformly
- ☐ Fitting position ⇒ [Fig. “Installation position of front clamp”, page 351](#)
- ☐ Tightening torque ⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

9 - Screw clamp

- ☐ Tightening torque and tightening order
⇒ [Fig. “Installing catalytic converter - tightening torque and tightening order”, page 351](#)

10 - Gasket

- ☐ Replace after disassembly

11 - Exhaust gas turbocharger

- ☐ Summary of components ⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#)
- ☐ removing and installing ⇒ [“1.2 Removing and installing exhaust gas turbocharger”, page 271](#)
- ☐ Tightening torque and tightening order
⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#)

12 - Screw

- ☐ 20 Nm

13 - Support

- ☐ replace if damaged

14 - Screw

- ☐ Tightening torque and tightening order
⇒ [Fig. “Installing catalytic converter - tightening torque and tightening order”, page 351](#)

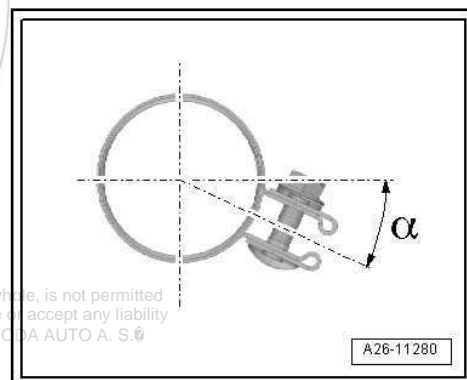
15 - Support

16 - Support

Installation position of front clamp

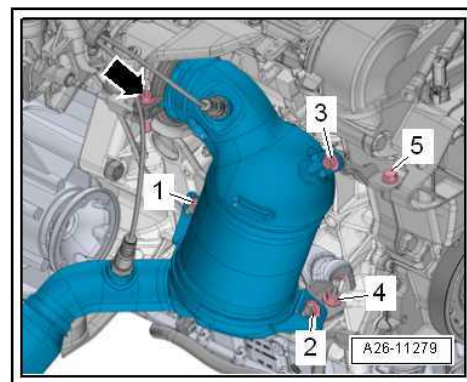
- Install clamping sleeve in the position shown.
- Angle α = approximately 20°.
- Bolted connection to the right.
- Nuts upwards.

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Installing catalytic converter - tightening torque and tightening order

1.	– Position catalytic converter on exhaust gas turbocharger, loosely tighten clamp -arrow-	
2.	– Loosely screw in screws -3-, -5- and nuts -1-, -2- and -4- by hand	• It must still be possible to move the catalytic converter and the bracket
3.	– Tighten screw clamp -arrow-	15 Nm
4.	– Tighten screws and nuts in the order -1...5-	20 Nm



2.1.3 Summary of components - exhaust gas cleaning, Kodiaq, with four-wheel drive

1 - Screw

- ☐ Tightening torque and tightening order
⇒ [Fig. "Installing catalytic converter - tightening torque and tightening order"](#), page 353

2 - Support

3 - Screw

- ☐ Tightening torque and tightening order
⇒ [Fig. "Installing catalytic converter - tightening torque and tightening order"](#), page 353

4 - Lambda probe 1 in front of the catalytic converter - GX10-

- ☐ comprises:
 - ♦ Lambda probe - G39-
 - ♦ Heating for lambda probe - Z19-
- ☐ removing and installing
⇒ ["8.2.1 Removing and installing Lambda probe 1 after catalytic converter GX10"](#), page 324
- ☐ Tightening torque
⇒ ["8.1 Summary of components - lambda probe"](#), page 323

5 - Lambda probe 1 after catalytic converter - GX7-

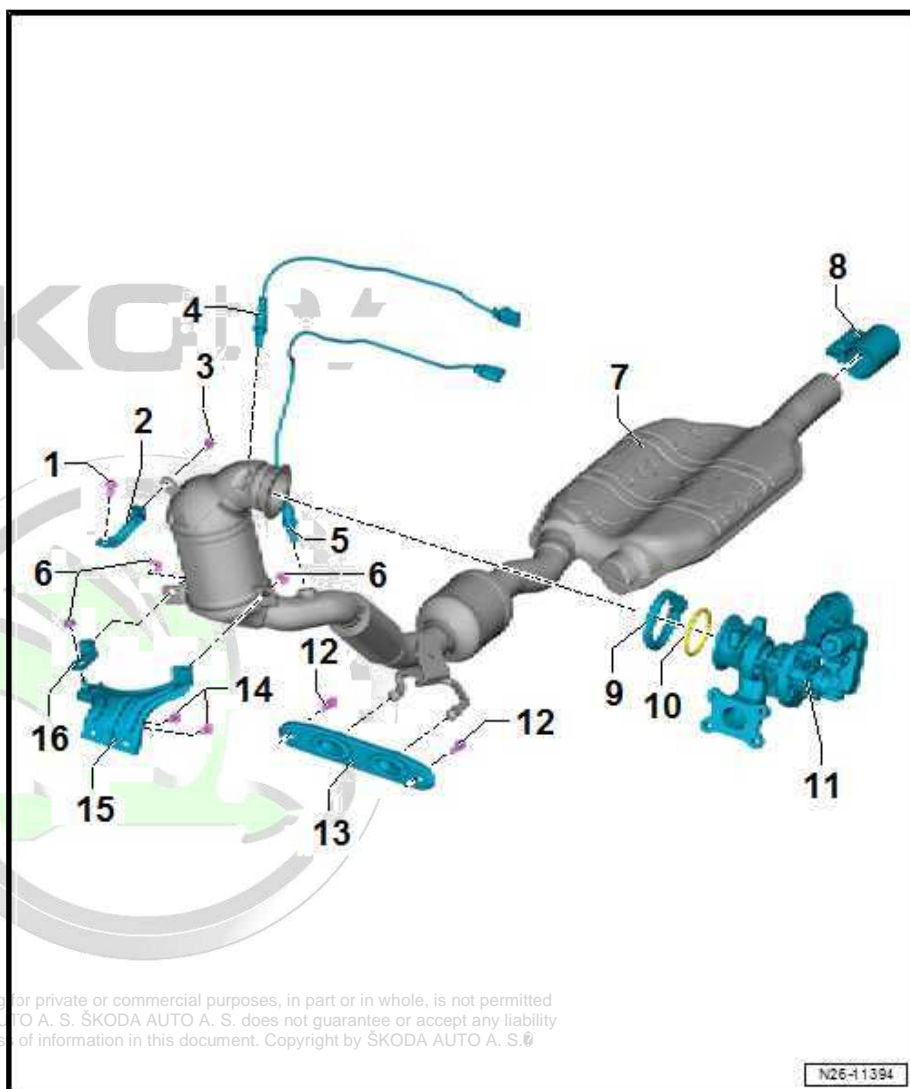
- ☐ comprises:
 - ♦ Lambda probe after catalytic converter - G130-
 - ♦ Lambda probe 1 heater after catalytic converter - Z29-
- ☐ removing and installing
⇒ ["8.2.2 Removing and installing Lambda probe 1 after catalytic converter GX7"](#), page 325
- ☐ Tightening torque ⇒ ["8.1 Summary of components - lambda probe"](#), page 323

6 - Nut

- ☐ Tightening torque and tightening order
⇒ [Fig. "Installing catalytic converter - tightening torque and tightening order"](#), page 353

7 - Exhaust pipe with catalytic converter

- ☐ do not twist decoupling element more than 10° - risk of damage
- ☐ Do not load decoupler with tensile stress
- ☐ Do not damage wire mesh on decoupling element
- ☐ protect catalytic converter against shocks and blows
- ☐ removing and installing ⇒ ["2.2 Removing and installing catalytic converter"](#), page 354
- ☐ Remove the protection for the decoupling element -T10403- on the spare part as late as possible
- ☐ Align exhaust system free of stress ⇒ ["1.4 Aligning exhaust system free of stress"](#), page 345



8 - Clamping sleeve

- ☐ before tightening, align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)
- ☐ Tighten screwed connections uniformly
- ☐ Fitting position ⇒ [Fig. “Installation position of front clamp”, page 353](#)
- ☐ Tightening torque ⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#)

9 - Screw clamp

- ☐ Tightening torque and tightening order
⇒ [Fig. “Installing catalytic converter - tightening torque and tightening order”, page 353](#)

10 - Gasket

- ☐ Replace after disassembly

11 - Exhaust gas turbocharger

- ☐ Summary of components ⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#)
- ☐ removing and installing ⇒ [“1.2 Removing and installing exhaust gas turbocharger”, page 271](#)
- ☐ Tightening torque and tightening order
⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 268](#)

12 - Screw

- ☐ 20 Nm

13 - Support

- ☐ replace if damaged

14 - Screw

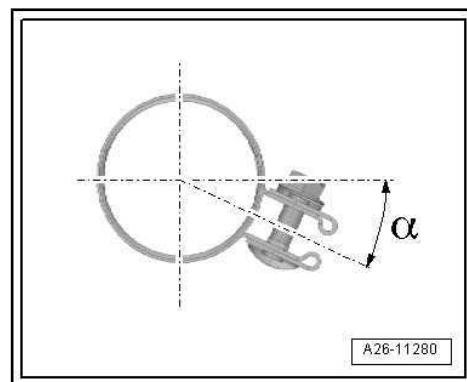
- ☐ Tightening torque and tightening order
⇒ [Fig. “Installing catalytic converter - tightening torque and tightening order”, page 353](#)

15 - Support

16 - Support

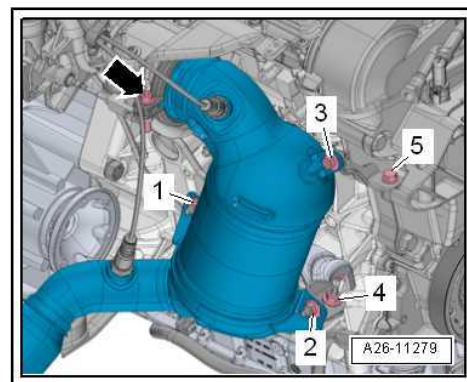
Installation position of front clamp

- Re-install clamping sleeve in the position shown.
- Bolted connections to the left.
- The bolted connection -arrow- must not protrude beyond the bottom edge of the clamping sleeve.



Installing catalytic converter - tightening torque and tightening order

1.	– Position catalytic converter on exhaust gas turbocharger, loosely tighten clamp -arrow-	
2.	– Loosely screw in screws -3-, -5- and nuts -1-, -2- and -4- by hand	• It must still be possible to move the catalytic converter and the bracket
3.	– Tighten screw clamp -arrow-	15 Nm
4.	– Tighten screws and nuts in the order -1...5-	20 Nm



2.2 Removing and installing catalytic converter

Special tools and workshop equipment required

- ♦ Engine support bracket - T10533-
- ♦ Hot bolt paste ⇒ ETKA - Electronic Catalogue of Original Parts

Removing

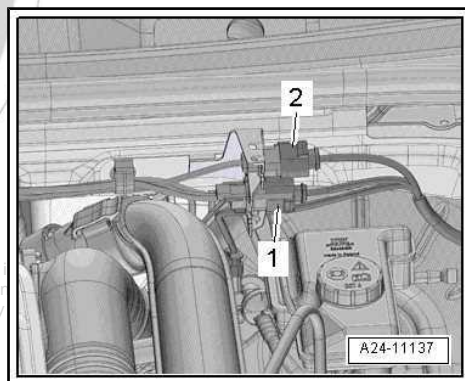


Note

The catalytic converter is remove with the pre-exhaust pipe.

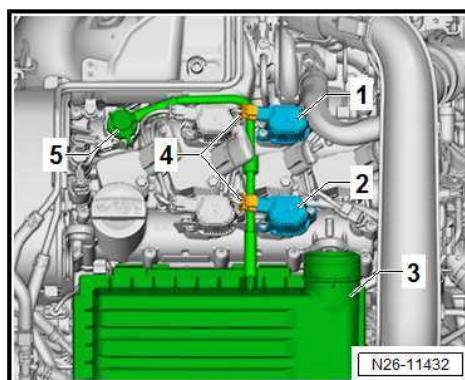
- Fit all cable straps on again in the same place when installing.
- Take plug connections -1- and -2- out of the holder, disconnect and expose electric cables.

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For vehicles with ACT

- Disconnect electrical plug connections -4- for the exhaust cam adjuster for cylinder 3 - N595- -1- and inlet cam adjuster for cylinder 3 - N591- -2-.
- Remove hose between vent -5- and air filter housing -3-.



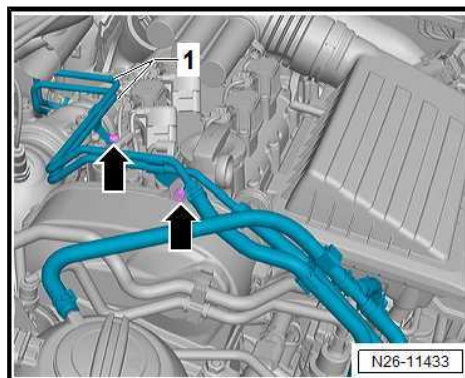
Continued for all vehicles

- Unscrew the screws -arrows- from the camshaft housing.



Note

- ♦ Do not loosen screws on the exhaust gas turbocharger.
- ♦ Coolant lines are not detached from the exhaust gas turbocharger.



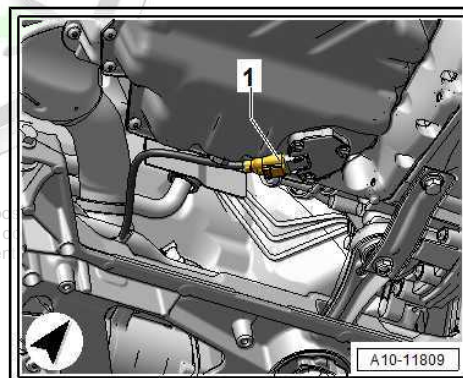
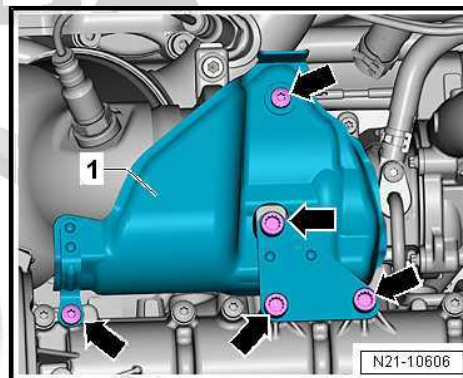
- Release screws -arrows-.
- Raise coolant line and remove heat shield -1-.
- Remove the sound dampening system ⇒ Exterior body work; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation .

For Superb III vehicles with four-wheel drive

- Remove both lambda probes
⇒ [“8.2 Removing and installing Lambda probe”, page 324](#) .

Continued for all vehicles

- Remove pendulum support
⇒ [“2.4 Removing and installing pendulum support”, page 30](#) .
- Disconnect plug connection -1- at oil level and oil temperature sender - G266- .



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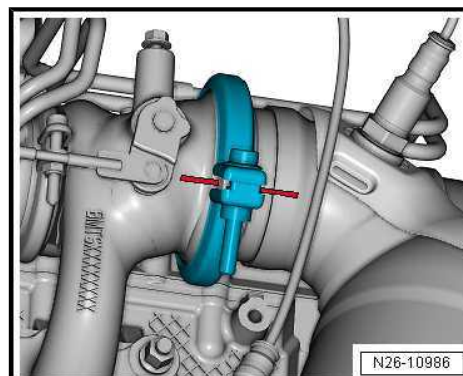
Continued for all vehicles

- Mark the position of the clamp.

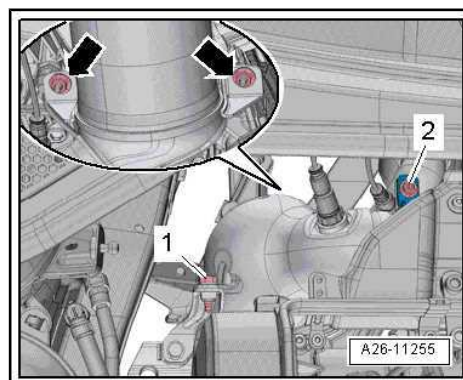


Note

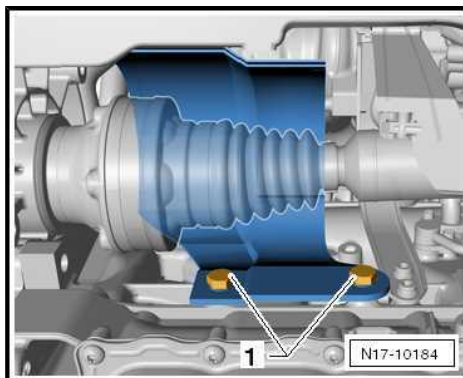
- ◆ *Before loosening the separation point between catalytic converter and turbocharger, mark the position of the clamp.*
- ◆ *Put the clamp back into position when assembling!*



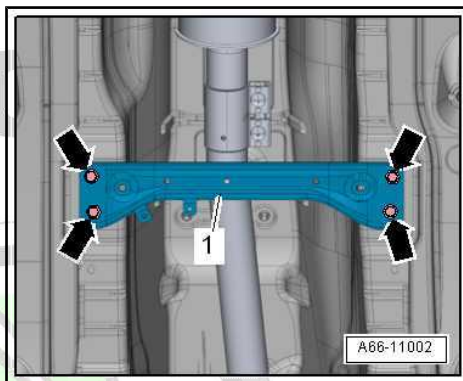
- Unscrew screw -2- and remove screw clamp.
- Unscrew screws -1- and nuts -arrows-.



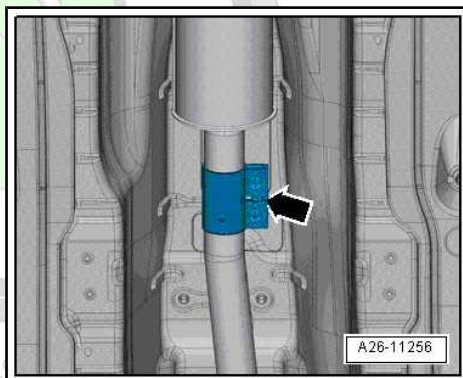
- Release screws -1- and remove heat shield for right cardan shaft, if present.
- Remove the plastic cover for floor tunnel ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel .



- Remove tunnel bridge -1-.



- Loosen the clamping sleeve -arrow- and slide it backwards.

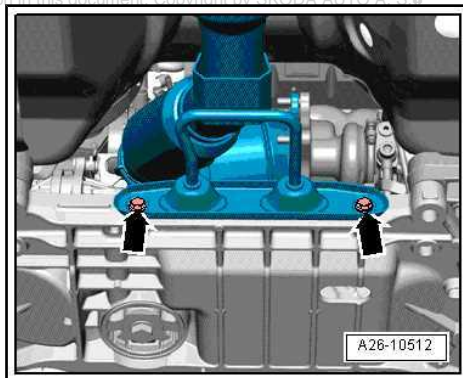


- Release screws -arrows-.



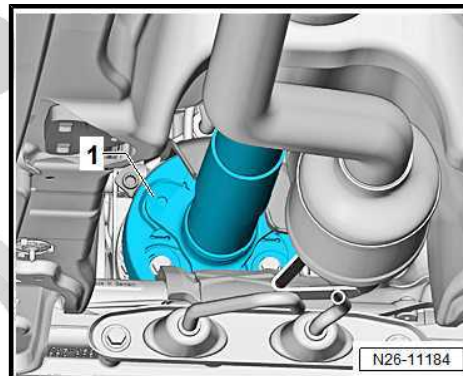
Note

- ◆ *do not twist decoupling element in the exhaust pipe more than 10° - risk of damage*
- ◆ *Do not damage the wire mesh of the decoupling element.*

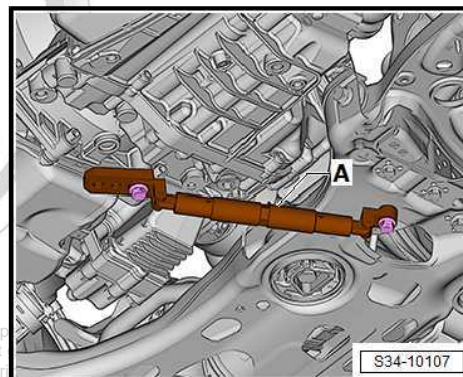


For vehicles with four-wheel drive

- Unscrew propshaft -1- from angle gearbox ⇒ Rep. gr. 34 ; Angle gearbox; Remove angle gearbox .

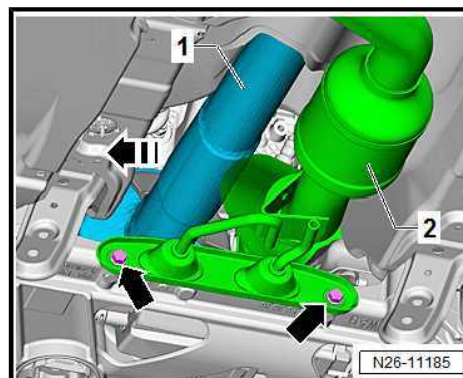


- Position engine support bracket - T10533- -A- as shown in the illustration.
- Screw original screw of the pendulum support into the front threaded hole to secure the pendulum support.
- Screw an M8x40 screw with washer into the left threaded hole to secure the cover for noise insulation.
- Tighten screws until hand-tight.
- Push the engine with the engine support bracket - T10533- forwards as far as possible.



- Release screws -arrows-.
- Press propshaft -1- to the side in -direction of arrow-.

Continued for all vehicles



- Remove catalytic converter backwards.
- Push screwdriver -2- into the recess -arrow- of the exhaust gas turbocharger and lever out the sealing ring -1-.

Install

Installation is performed in the reverse order, pay attention to the following points:



Note

- ♦ *do not twist decoupling element in the exhaust pipe more than 10° - risk of damage*
- ♦ *Do not damage the wire mesh of the decoupling element.*
- Replace the gasket and the self-locking nuts.
- Coat bolts and catalytic converter screws with hot bolt paste
⇒ ETKA - Electronic Catalogue of Original Parts .
- Align exhaust system free of stress
⇒ [“1.4 Aligning exhaust system free of stress”, page 345](#) .

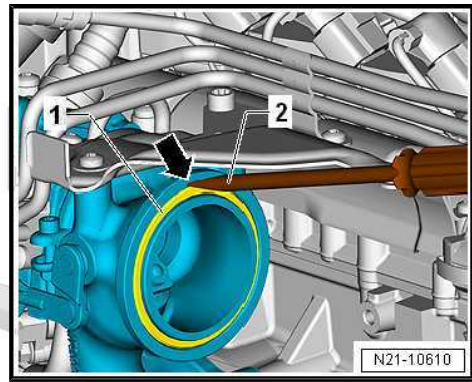
Tightening torques

- ♦ Exhaust pipe with catalytic converter
⇒ [“2.1 Summary of components - exhaust gas cleaning”, page 348](#) .
- ♦ Front clamping sleeve
⇒ [“2.1 Summary of components - exhaust gas cleaning”, page 348](#) .
- ♦ Underfloor trim panel ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel .
- ♦ Tunnel bridge ⇒ General body repairs, exterior; Rep. gr. 66 ; Underfloor trim panel; installing and removing tunnel bridge.
- ♦ Right cardan shaft guard ⇒ Chassis, axles, steering; Rep. gr. 40 ; Cardan shaft; Removing and installing cardan shaft. .

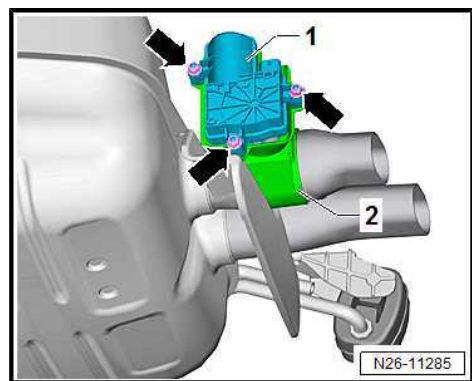
2.3 Removing and installing the exhaust flap control unit - J883-

Removing

- Disconnect electrical plug connection on the exhaust flap control unit - J883- .
- Unscrew nuts -arrows- and remove exhaust flap control unit - J883- -1-.



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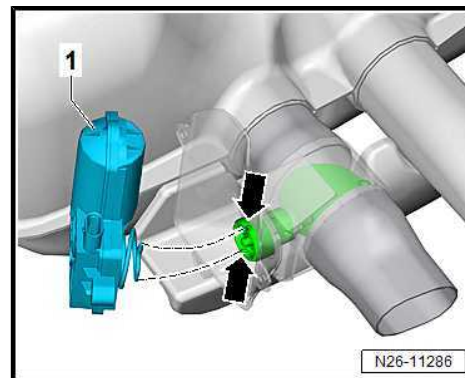


Install

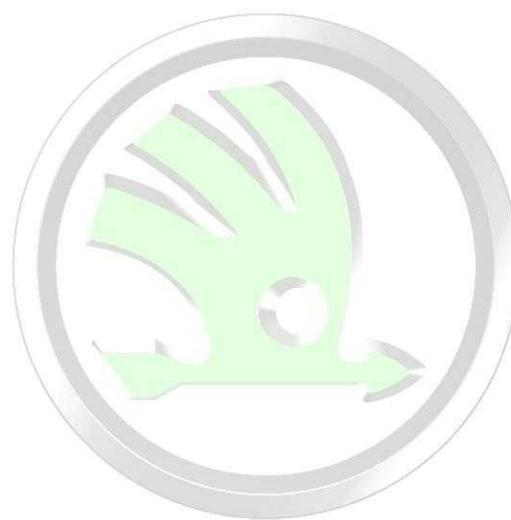
- The springs of the exhaust flap control unit - J883- -1- must engage in the grooves -arrows- of the exhaust flap.
- Tighten the new nuts to the specified tightening torque.
- Connect electrical plug connection on the exhaust flap control unit - J883- .

Tightening torques

- ◆ Exhaust flap control unit - J883-
⇒ ["1.1.5 Summary of components - Kodiag, with front-wheel drive, engine identification characters CZE", page 334](#) .



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1 Ignition system

⇒ [“1.1 Assembly overview - ignition system”, page 360](#)

⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#)

⇒ [“1.3 Removing and installing knock sensor 1 G61”, page 363](#)

⇒ [“1.4 Removing and installing Hall sender”, page 364](#)

⇒ [“1.5 Removing and installing engine speed sender G28”, page 365](#)

1.1 Assembly overview - ignition system

1 - Screw

- ☐ The tightening torque influences the knock sensor function
- ☐ 20 Nm

2 - Knock sensor 1 - G61-

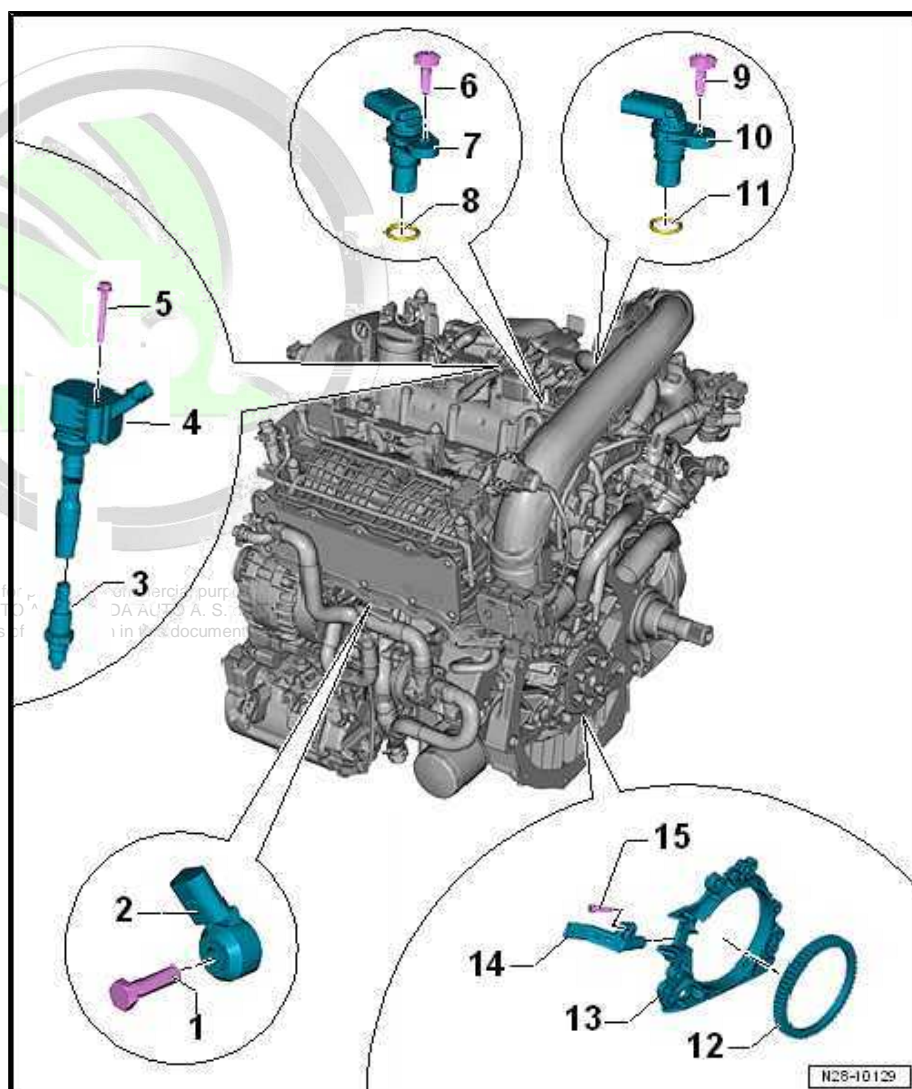
- ☐ removing and installing
⇒ [“1.3 Removing and installing knock sensor 1 G61”, page 363](#)

3 - Spark plug

- ☐ use spark plug wrench e.g. -3122 B- for removing and installing
- ☐ When installing new spark plugs, grease the ignition coils with power output stage Pos. -4- with lubricating paste G 052 565 A1.
- ☐ Change interval
- ◆ ⇒ Maintenance ; Booklet Superb III
- ◆ ⇒ Maintenance ; Booklet Kodiaq
- ☐ Observe part number ⇒ Electronic Catalogue of Original Parts “ETKA”
- ☐ 22 Nm

4 - Ignition coil with a power 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 ⇒ [“1.2 Removing and installing ignition coils with output stage”, page 361](#)



- ☐ When installing new spark plugs, grease the ignition coils with power output stage with lubricating paste G 052 565 A1.

5 - Screw

- ☐ 8 Nm

6 - Screw

- ☐ 8 Nm

7 - Hall transmitter - G40-

- ☐ removing and installing ⇒ [“1.4.1 Removing and installing Hall sender G40”, page 364](#)

8 - O-ring

- ☐ Check O-ring for damage
- ☐ O-ring is not available separately; in the event of damage, replace together with Hall sender - G40- .

9 - Screw

- ☐ for engines with engine identification characters CZDA, CZEА
- ☐ 8 Nm

10 - Hall sender 3 - G300-

- ☐ removing and installing ⇒ [“1.4.2 Removing and installing hall sender 3 G300”, page 364](#)
- ☐ for engines with engine identification characters CZDA, CZEА

11 - O-ring

- ☐ for engines with engine identification characters CZDA, CZEА
- ☐ Check O-ring for damage
- ☐ O-ring is not available separately; in the event of damage, replace together with Hall sender 3 - G300- .

12 - Rotor

- ☐ Engine speed sender - G28-
- ☐ cannot be removed separately, only with sealing flange Pos. -10-

13 - Sealing flange on the gearbox side

- ☐ removing and installing ⇒ [“2.3 Removing and installing sealing flange on gearbox side”, page 54](#)

14 - Engine speed sender - G28-

- ☐ removing and installing ⇒ [“1.5 Removing and installing engine speed sender G28”, page 365](#)

15 - Screw

- ☐ 5 Nm

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1.2 Removing and installing ignition coils with output stage

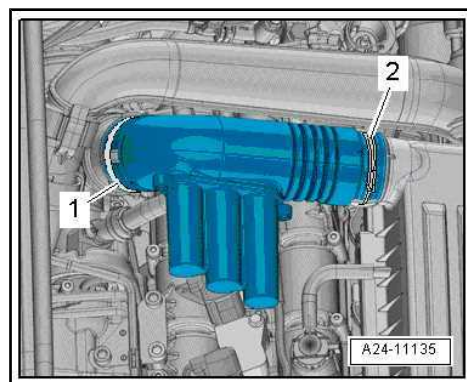
Special tools and workshop equipment required

- ◆ Extractor -T10530-

Removing

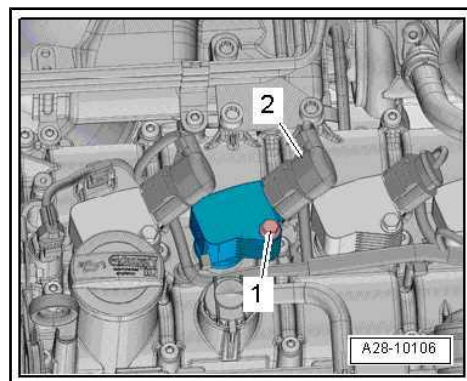
Ignition coils "cyl. 2, 3, 4"

- Loosen hose clamps -1- and -2- and remove air guide pipes.

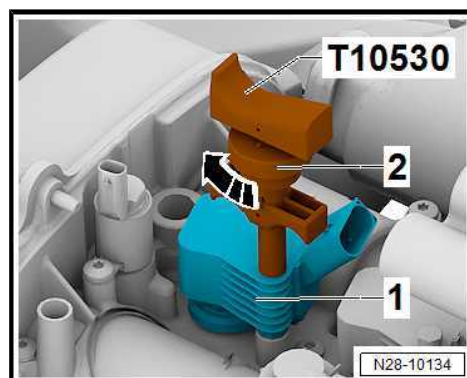


Continued for all ignition coils

- Separate electrical plug connection -2-.
- Unscrew bolt -1-.



- Press extractor -T10530- into the bore of the ignition coil -1- as far as the stop.
- Tighten nuts -2- in -direction of arrow-.



- Remove ignition coil with extractor -T10530- in -direction of arrow- out of the camshaft housing.

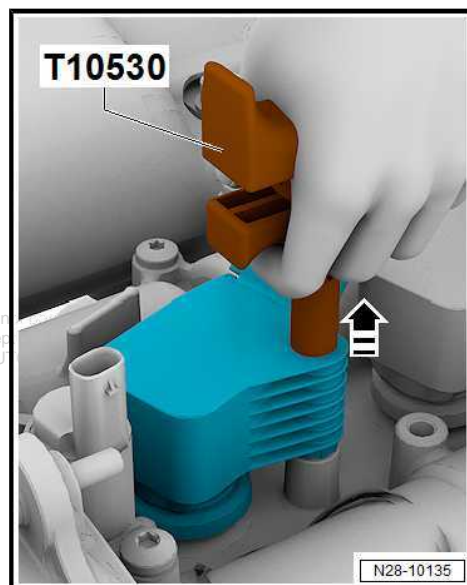
Install



Note

When installing new spark plugs, grease the ignition coils with power output stages with lubricating paste G 052 565 A1.

Installation is performed in the reverse order, pay attention to the following points:



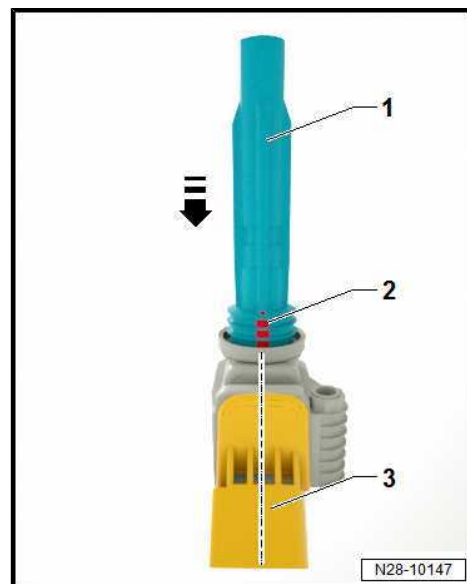
- Insert the plug connector -1- onto the ignition coil by hand as far as it can go.

The ventilation duct -2- must be oriented towards the middle of the connector sleeve -3-.

- Place all ignition coils loosely into the spark plug shaft.
- Align ignition coils to the connectors and simultaneously attach all connections to the ignition coils.
- Press ignition coils onto the spark plugs evenly by hand (do not use an impact tool).

Tightening torques

- ◆ Ignition coil with power output stage
⇒ [“1.1 Assembly overview - ignition system”, page 360](#) .



1.3 Removing and installing knock sensor 1 - G61-

Removing

- Remove the AC compressor from the mounting bracket and tie it up ⇒ Heating, Air Conditioning; Rep. gr. 87 ; AC compressor; removing and installing the AC compressor .
- Separate electrical plug connection -1-.
- Release screw -2- and remove knock sensor 1 - G61- .

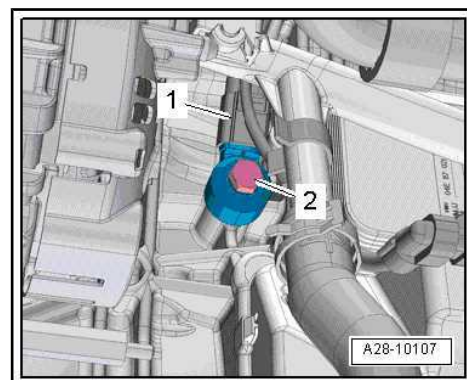
Install

Installation is performed in the reverse order, pay attention to the following points:

- Install AC compressor ⇒ Heating, Air Conditioning; Rep. gr. 87 ; AC compressor; Removing and installing AC compressor .

Tightening torques

- ◆ Knock sensor 1 - G61-
⇒ [“1.1 Assembly overview - ignition system”, page 360](#) .



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1.4 Removing and installing Hall sender

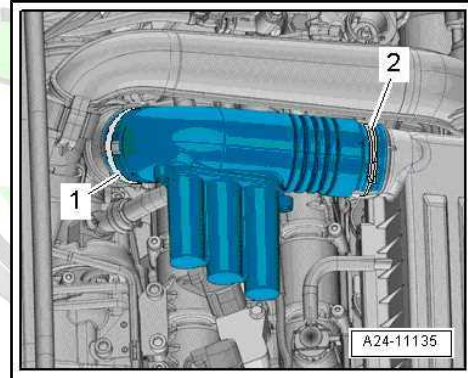
⇒ ["1.4.1 Removing and installing Hall sender G40", page 364](#)

⇒ ["1.4.2 Removing and installing hall sender 3 G300", page 364](#)

1.4.1 Removing and installing Hall sender - G40-

Removing

- Loosen hose clamps -1- and -2- and remove air guide pipes.



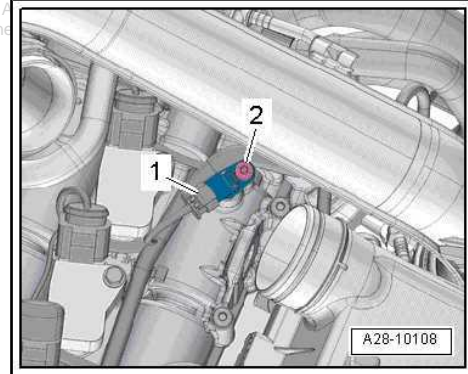
- Separate electrical plug connection -1-.
- Unscrew screw -2- and remove Hall sender - G40- .

Install

- Installation is carried out in the reverse order.

Tightening torques

- ♦ Hall sender - G40-
⇒ ["1.1 Assembly overview - ignition system", page 360](#) .



1.4.2 Removing and installing hall sender 3 - G300-

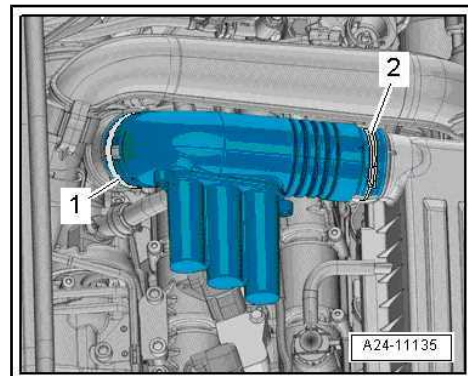


Note

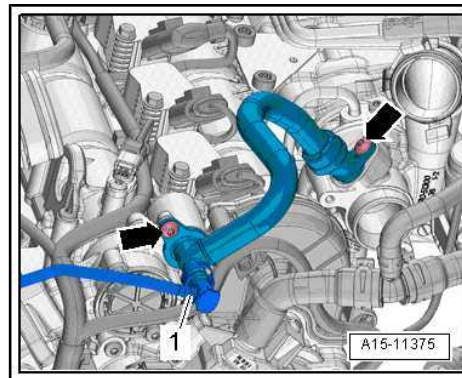
Only for engines with engine identification characters CZDA, CZE A.

Removing

- Loosen hose clamps -1-, -2- and remove air guide pipes.



- Press release buttons and remove hose -1- to the activated charcoal filter.
- Unscrew screws -arrows- and remove hose for crankcase ventilation.



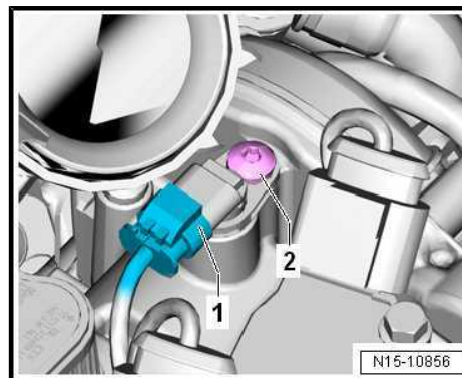
- Separate electrical plug connection -1-.
- Release screw -2- and remove Hall sender 3 - G300- .

Install

- Installation is carried out in the reverse order.

Tightening torques

- ◆ Hall sender - G300-
⇒ ["1.1 Assembly overview - ignition system", page 360](#) .



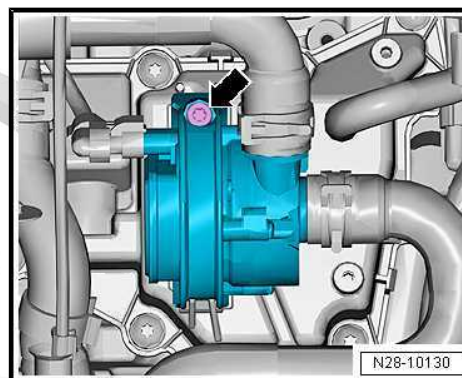
1.5 Removing and installing engine speed sender - G28-

Special tools and workshop equipment required

- ◆ Socket insert 4 mm - T10370-

Removing

- Remove the sound dampening system ⇒ General body repairs, exterior ; Rep. gr. 66 ; Noise insulation; Summary of components; noise insulation -1-.
- Undo screw -arrow- and place charge air cooler pump - V188- to one side.



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- Separate electrical plug connection -1-.
- Unscrew screw -2- and pull out engine speed sender - G28 - .

Install



Note

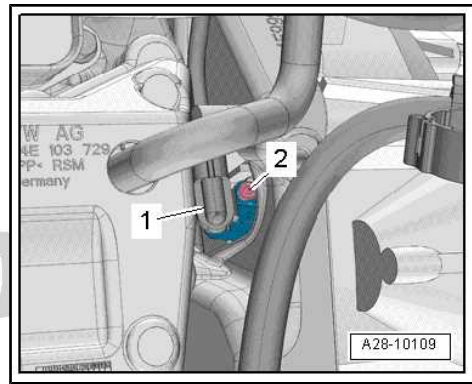
Carefully insert engine speed sender - G28- into the bore, so that it does not fall between engine and gearbox.

Installation is performed in the reverse order, pay attention to the following points:

- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Summary of components - noise insulation -1-.

Tightening torques

- ◆ Engine speed sender - G28-
⇒ [“1.1 Assembly overview - ignition system”, page 360](#) .
- ◆ Charge air cooler pump - V188-
⇒ [“2.2 Summary of components - electric coolant pump”, page 233](#)



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