



Workshop Manual

Audi A4 2015 ➤
Audi A4 Avant 2015 ➤
Audi A5 2016 ➤

4-cylinder TDI engine, 2.0 ltr. 4-valve common rail (EA 288 Gen. I)

Engine ID	DET A	DEU A	DEU B	DES A	CZH A	DEU C	DET B		
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Edition 05.2019



List of Workshop Manual Repair Groups

Repair Group

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- 13 - Crankshaft group
- 15 - Cylinder head, valve gear
- 17 - Lubrication
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00 – Technical data

1 Identification

(ARL006409; Edition 05.2019)

All information can be found in ⇒ Servicing 4-cylinder TDI engine,
common rail; Rep. gr. 00 ; Identification .



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2 Safety precautions

All information can be found in ⇒ Servicing 4-cylinder TDI engine,
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3 Repair instructions

All information can be found in ⇒ Servicing 4-cylinder TDI engine,
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10 – Removing and installing engine

1 Removing and installing engine

⇒ [“1.1 Removing engine”, page 4](#)

⇒ [“1.2 Securing engine to engine and gearbox support”, page 19](#)

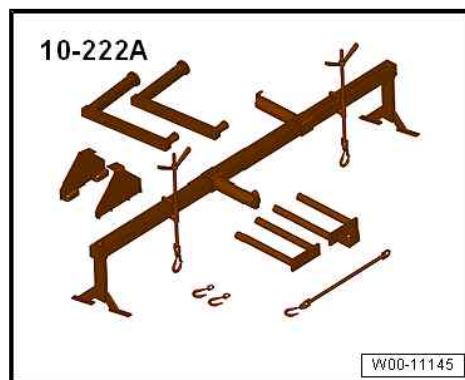
⇒ [“1.3 Installing engine”, page 19](#)

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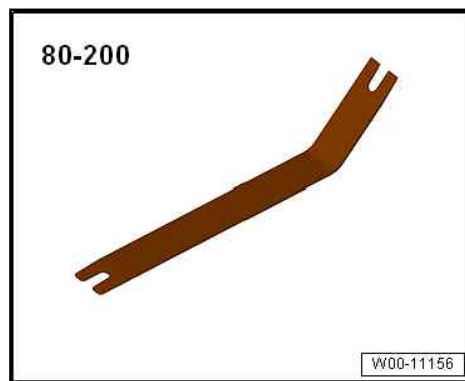
1.1 Removing engine

Special tools and workshop equipment required

◆ Support bracket - 10-222A-



◆ Removal lever - 80-200-

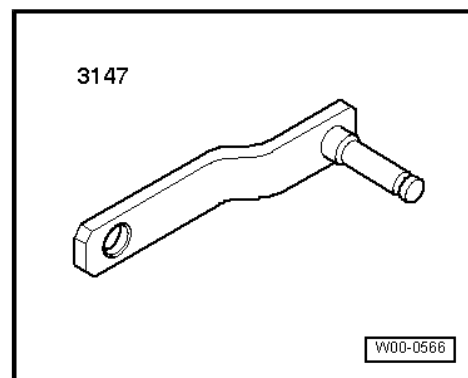


◆ Lifting tackle - 2024A-

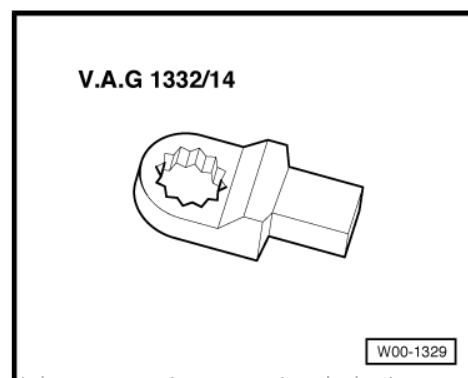




◆ Gearbox support - 3147-



◆ Ring spanner insert AF 16 - V.A.G 1332/14-

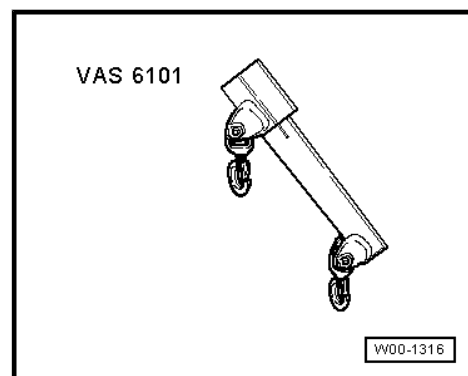


◆ Workshop hoist - VAS 6100-

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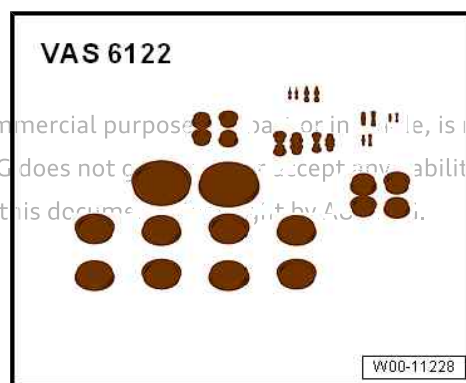
◆ Lift arm extension/workshop hoist - VAS 6101-





◆ Engine bung set - VAS 6122-

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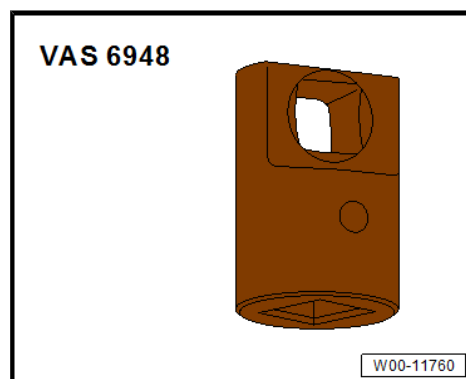
◆ Hose clip pliers - VAS 6362-



◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-

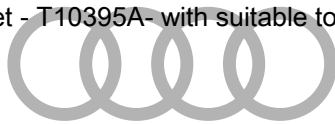


◆ Adapter - VAS 6948-

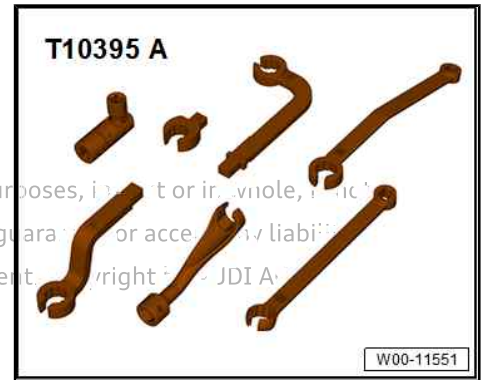




- ◆ Tool set - T10395A- with suitable tool insert



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- ◆ Safety goggles
- ◆ Protective gloves

Procedure

- The engine is removed upwards without gearbox.
- Re-install all cable ties in original positions.
- Disconnect earth wire from battery terminal ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Carefully pull engine cover panel off retaining pins one after another -arrows-. Do not jerk engine cover panel away, and do not try to pull on one side only.

⚠ CAUTION

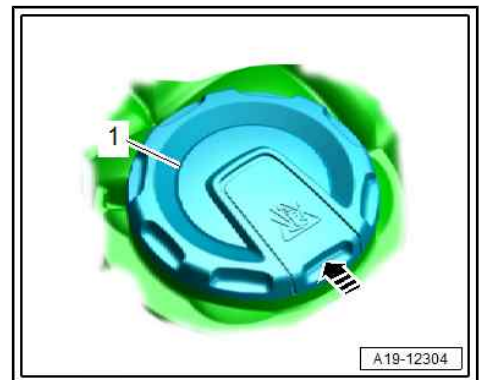
The cooling system is under pressure when the power unit is hot. Risk of scalding due to hot steam and hot coolant.

Danger of scalding skin and other parts of the body.

- Put on protective gloves.
- Put on safety goggles.
- Cover filler cap on expansion tank with a cloth and open carefully to release pressure.



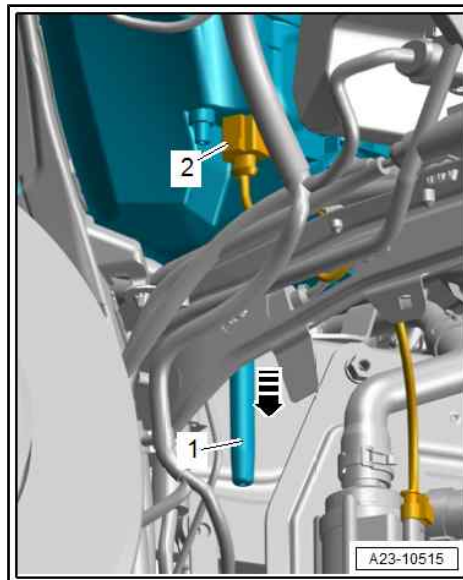
- Release fastener -arrow- and open filler cap -1- on coolant expansion tank.
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Remove front wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Remove wheel spoilers (left and right) and wheel housing liner (front right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .
- Unfasten front section of wheel housing liner (front left) and press slightly towards rear ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .





Air cleaner housing with secondary air intake:

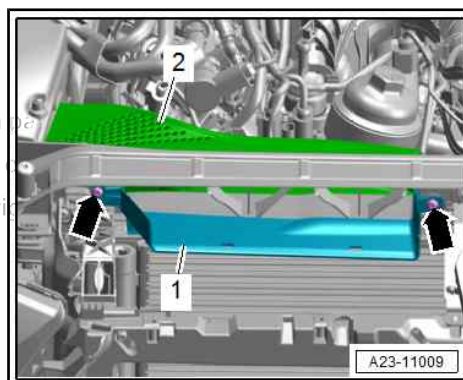
- Unplug electrical connector -2- for air filter bypass flap valve - N275- .
- Detach water drain -1- downwards -arrow-.



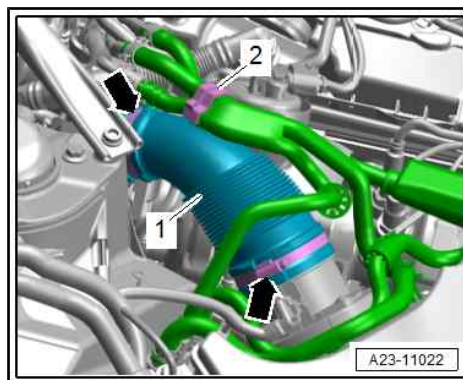
All vehicles (continued):

- Remove bolts -arrows- and detach air duct -2-.

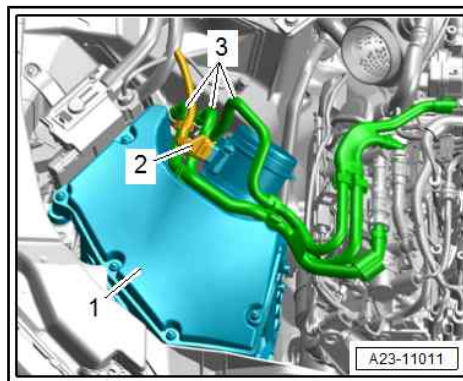
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- Move retaining clip -2- clear with fuel hoses.
- Release hose clips -arrows- and detach air pipe -1-.

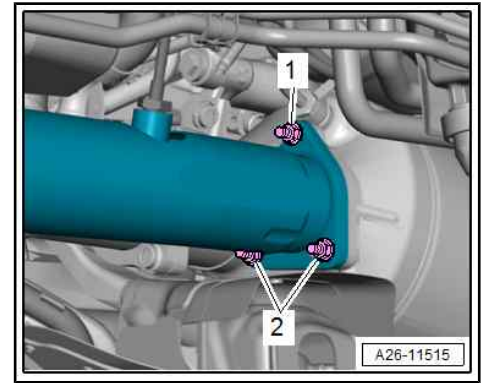


- Unplug electrical connector -2- for air mass meter - G70- .
- Move fuel hoses -3- clear and push to one side.
- Lift off air cleaner housing -1- and detach.





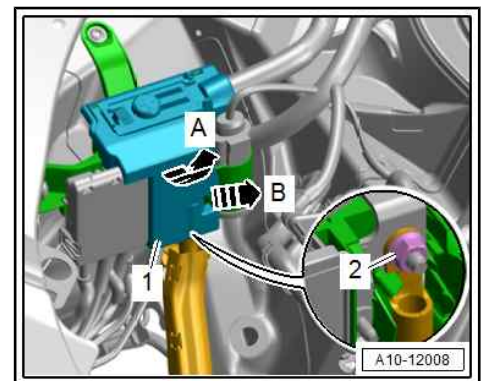
- Unscrew nut -1-. (Nuts -2- do not have to be removed at this stage.)



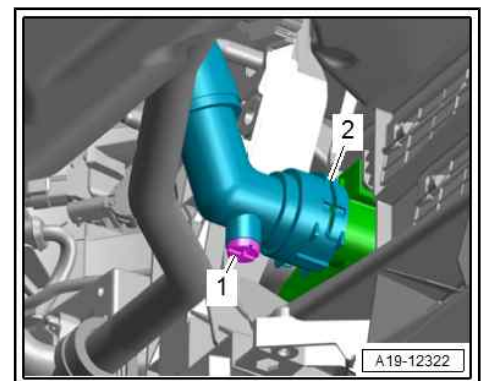
- Unscrew exhaust gas temperature sender 4 - G648- -arrow- using a tool from tool set - T10395A- .



- Release catch -arrow B- and open electronics box -1- -arrow A-.
- Remove nut -2- and move B+ wire clear.
- Move wiring duct (top) clear.



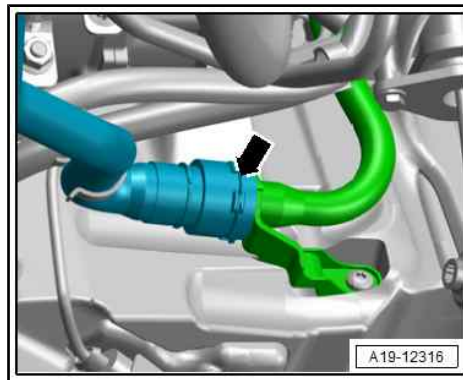
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Remove drain plug -1- and drain off coolant.
- Lift retaining clip -2- and detach coolant hose from radiator.



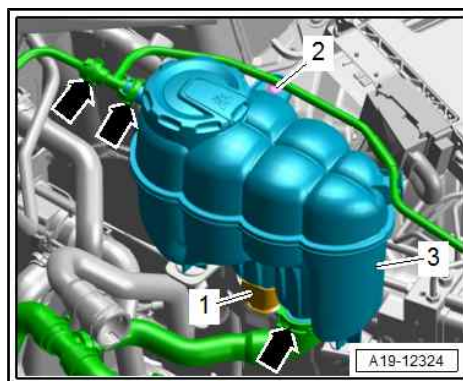
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- Move electrical wiring harness clear.
- Lift retaining clip -arrow-, disconnect coolant hose and drain off coolant.



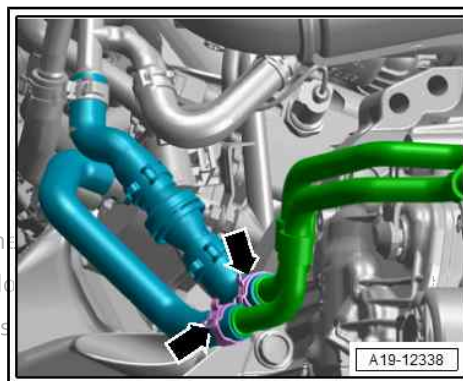
- Move electrical wiring harness clear.
- Lift retaining clips -arrows-, disconnect coolant hoses and move them clear.
- Unplug electrical connector -1- for coolant shortage indicator switch - F66- .
- Unscrew bolt -2- and detach coolant expansion tank -3-.



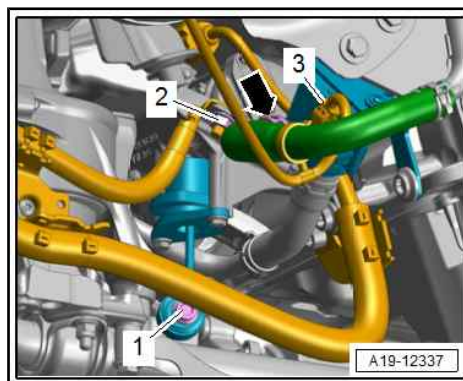
- Vehicles with dual clutch gearbox: Release hose clips -arrows-, disconnect coolant hoses from coolant pipes for gearbox and drain off coolant.



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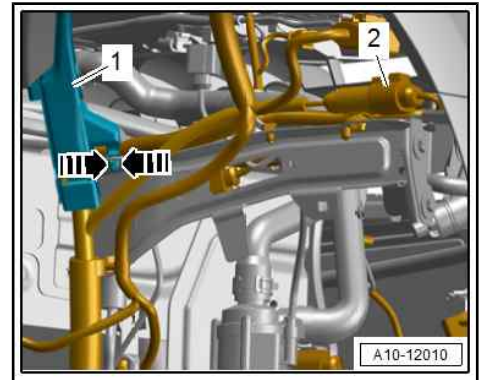


- Unplug electrical connector -3- for auxiliary pump for heating - V488- and move electrical wiring clear.
- Release hose clip -arrow-, disconnect coolant hose and drain off coolant.
- Remove nut -2- and move earth wire clear.
- Remove bolt -1- for support mounting (both sides).





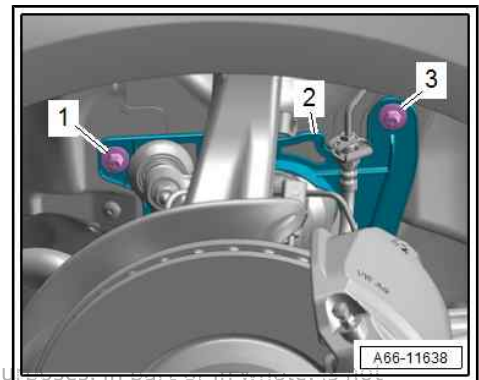
- Detach electrical connector -2- from bracket and unplug.
- Release fasteners -arrows- and move wiring duct -1- clear.



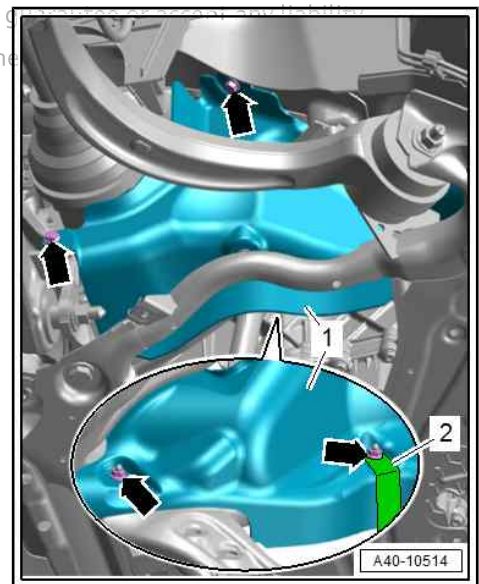
- Unscrew nuts -1, 3- and remove cover -2- for drive shaft (right-side).



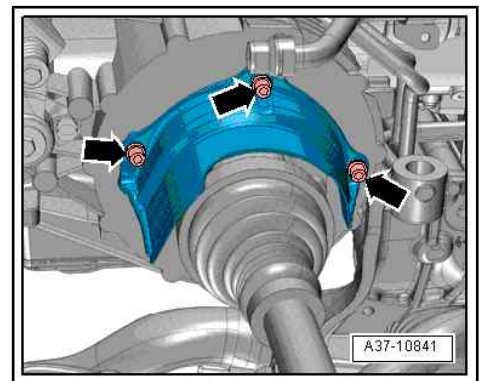
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- Unscrew bolted connections -arrows- and press subframe shield (right-side) -1- to the side (illustration shows shield on left side).

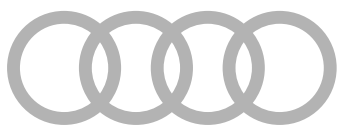


- Remove bolts -arrows- and detach heat shield for drive shaft (right-side).



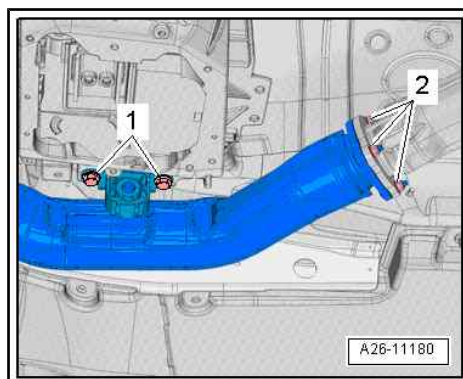
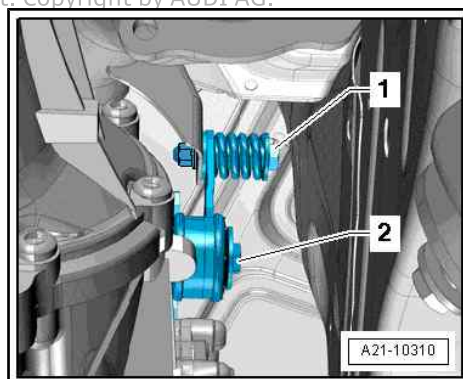
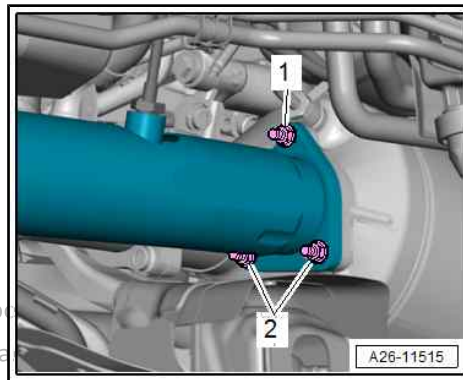


- Remove remaining nuts -2-.



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- Remove bolt -1- and turn retaining tab downwards.
- Bring subframe shield (right-side) back into installation position.



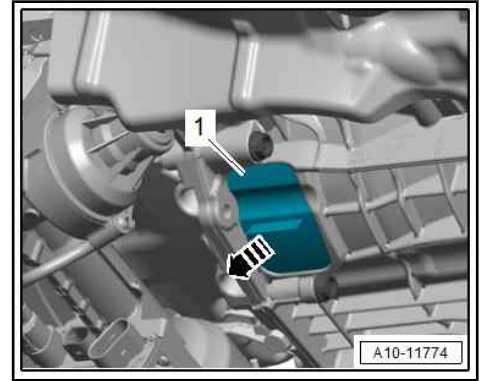
Risk of damage to flexible joint

The flexible joint can be damaged or develop leaks if it is handled incorrectly.

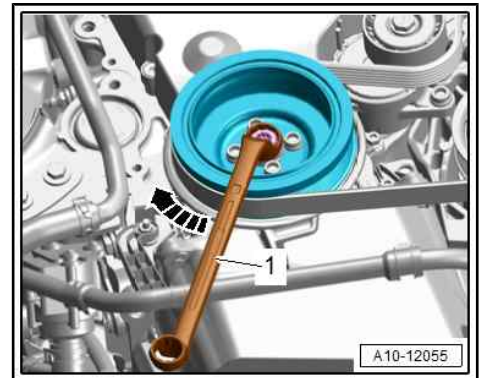
- Do not bend flexible joint more than 10°.
 - Install flexible joint so that it is not under tension.
-
- Remove nuts -2- and bolts -1- and detach front exhaust pipe.



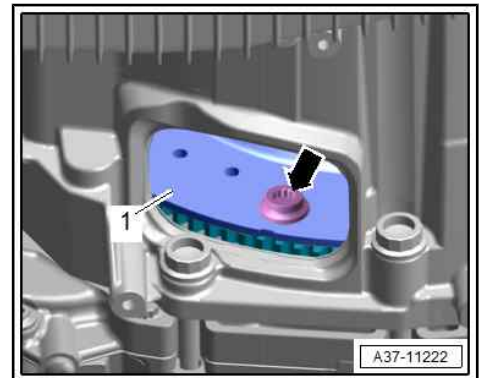
- Detach bottom cover -1- from gearbox -arrow-.



- Detach cap from vibration damper.
- Counterhold crankshaft on central bolt for vibration damper using angled ring spanner -1- when loosening bolts for flywheel.
- Then turn crankshaft in steps of 120° in direction of engine rotation -arrow-.



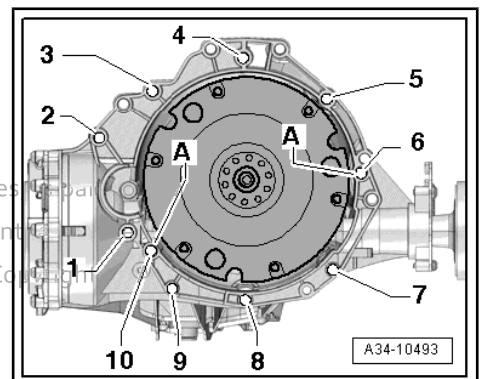
- Remove 3 bolts -arrow- for flywheel -1-.



Vehicles with manual gearbox:

- Unscrew bolt -1- using ring spanner insert, 16 mm - V.A.G 1332/14- and adapter - VAS 6948- .
- Remove bolts -6 ... 10- securing gearbox to engine.

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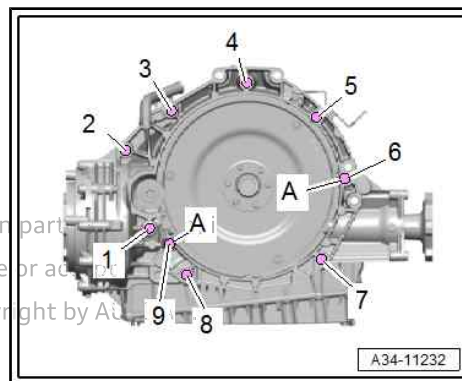




Vehicles with dual clutch gearbox:

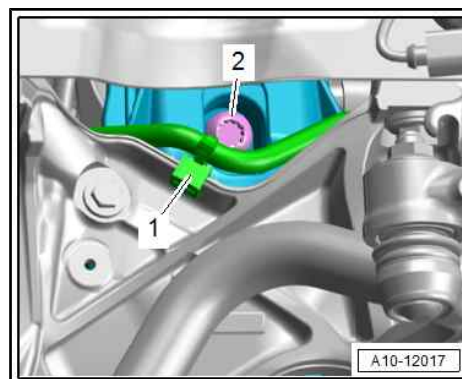
- Remove bolt -1- using ring spanner insert, 16 mm - V.A.G 1332/14- and adapter - VAS 6948- .
- Remove bolts -6 ... 9- securing gearbox to engine.

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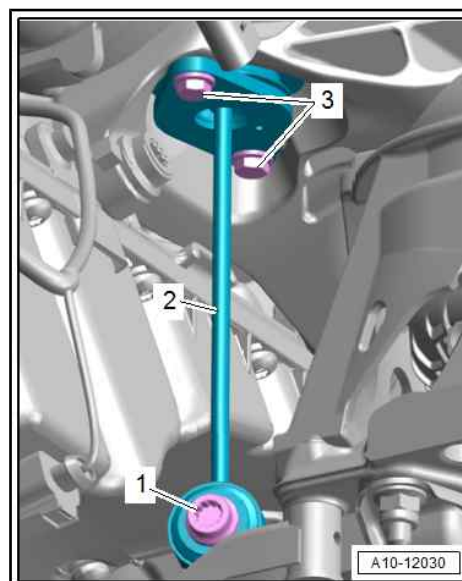


All vehicles (continued):

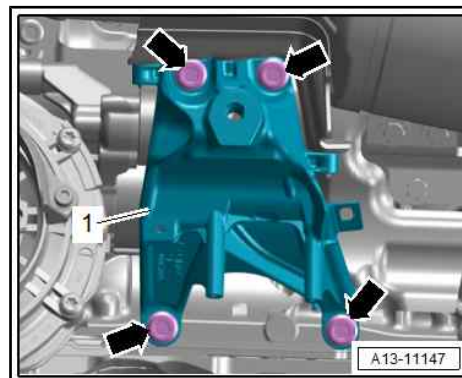
- Remove bolt -2- for engine mounting (left-side).



- Remove support mounting (right-side) ⇒ [page 32](#) .

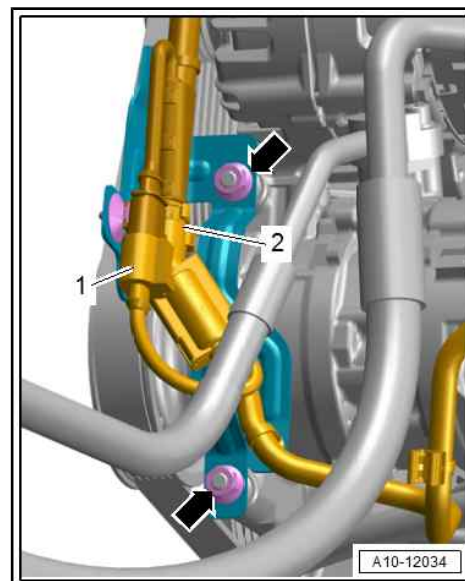


- Remove engine support (right-side)
⇒ [“1.7.2 Removing and installing engine support \(right-side\)”, page 36](#) .
- Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter .
- Re-install engine mounting (right-side) and engine support.





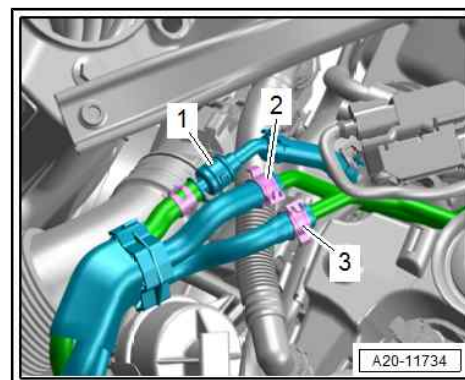
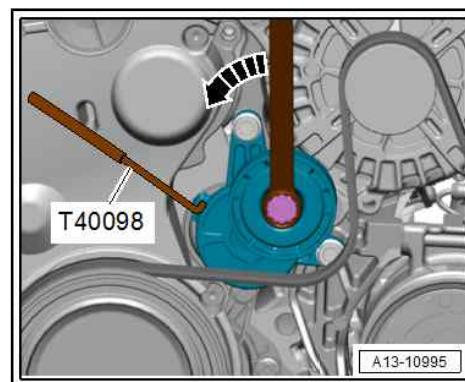
- Unplug electrical connector -1-.
- Disconnect SCR supply line -2- and move it clear ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Exploded view - reducing agent supply line .
- Remove nuts -arrows- and move bracket clear.



! NOTICE

Risk of irreparable damage due to running a used belt in the opposite direction when it is refitted.

- Mark running direction before removing.
- Pay attention to running direction when reinstalling.
- To slacken poly V-belt turn tensioner in anti-clockwise direction -arrow- using ring spanner.
- Lock tensioner with locking tool - T40098- .
- Take off poly V-belt.
- Remove air conditioner compressor from bracket ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket .
- Unbolt drive shaft (left and right) from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Disconnect fuel hose -1- ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Release hose clips:
 - 2 - For blue fuel hose
 - 3 - For white fuel hose
- Move coolant hoses clear and tie to right side.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .

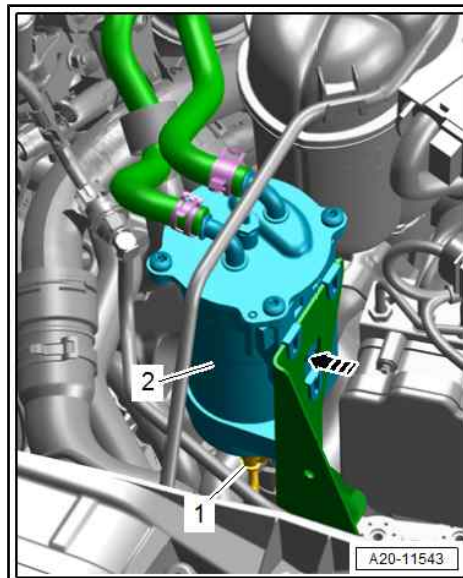


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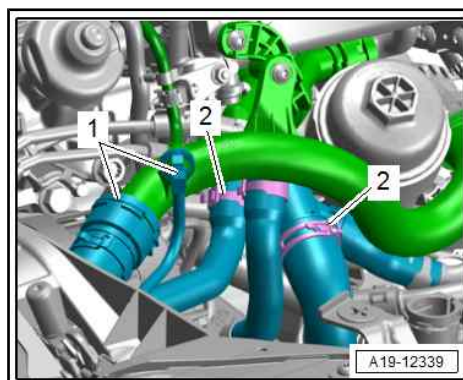
Vehicles with water separator:

- Unplug electrical connector -1- for water level sender - G120- .
- Release fastener -arrow-, lift water separator -2- off bracket and place it on engine.

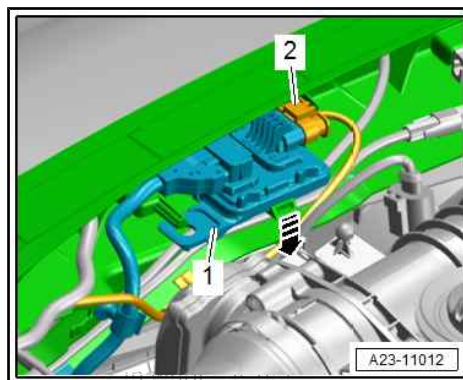
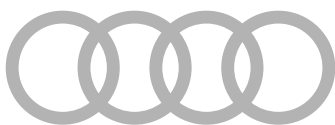


All vehicles (continued):

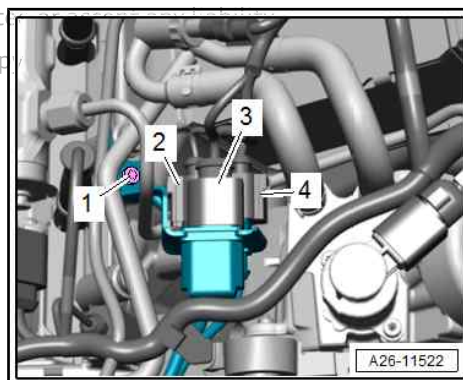
- Lift retaining clips -1- and disconnect coolant hose and coolant line.
- Release the two hose clips -2- and disconnect coolant hoses.



- Unplug electrical connector -2-.
- Release catch -arrow- and detach control unit for NOx sender - J583- -item 1-; move control unit clear and place it on engine.

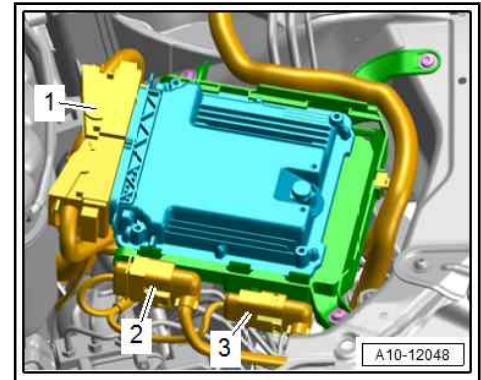


- Take electrical connectors -2, 3, 4- out of bracket, unplug connectors and move wiring harness clear.



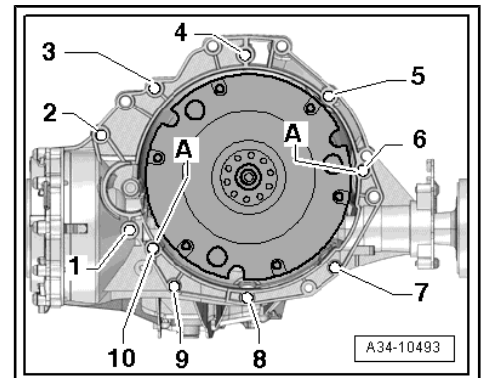


- Detach electrical connectors -2 and 3- from bracket and unplug.
- Unplug electrical connector -1- for engine control unit - J623- .
- Move electrical wiring harness clear and place on engine.
- Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .



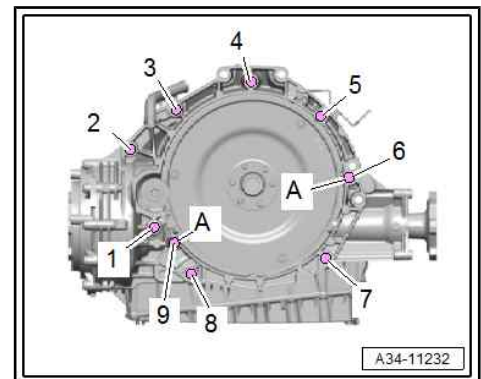
Vehicles with manual gearbox:

- Remove bolts -2 ... 5- (accessible from above) securing engine to gearbox.
- Separate starter slightly from gearbox and leave in position.



Vehicles with dual clutch gearbox:

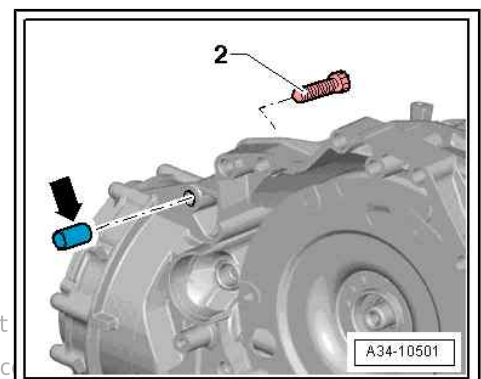
- Remove bolts -3, 4, 5- securing gearbox to engine.
- Separate starter from gearbox and leave in position.



All vehicles (continued):

Note:

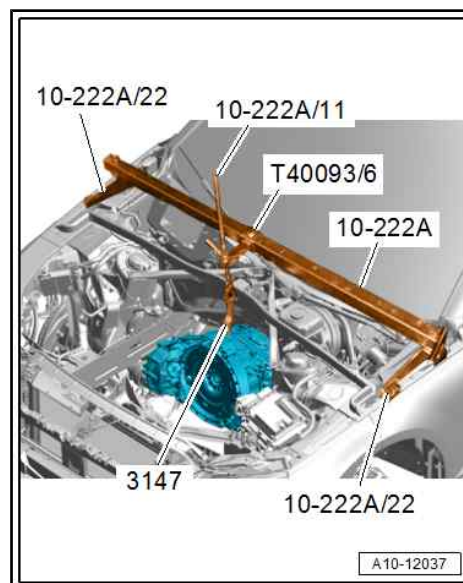
Bolt -2- secures the starter to the gearbox and is provided with a spacer sleeve -arrow-.



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- Set up support bracket - 10-222A- with adapters -10-222A/22- on bolted flanges of wing panels (left and right) as illustrated.
- Use gearbox support - 10-222A/11- to hook spindle - 3147- onto gearbox. (Engine has been removed in illustration).
- Take up weight of gearbox with spindle.

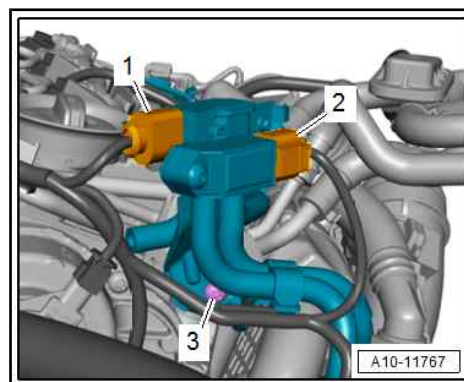


- Unplug electrical connectors -1, 2-.

NOTICE

Risk of damage to pressure differential sender if connection breaks off.

- Carefully disconnect hose from connection, taking care to keep hose straight.
- Remove bolt -3- and move bracket with exhaust gas pressure sensor 1 - G450- and pressure differential sender - G505- carefully to one side.



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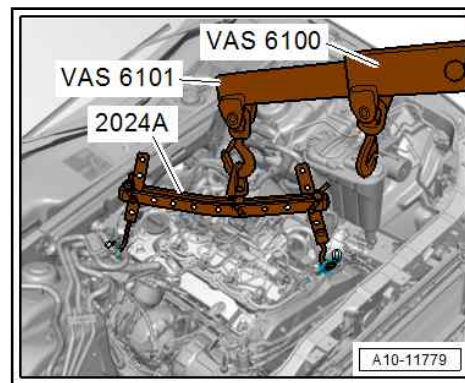


- Remove lifting eye of lifting tackle - 2024A- (pull out split pin and press out pin).
- Reinsert lifting eye in 4th hole from front on lifting tackle.
- Secure pin with split pin again.
- Attach lifting tackle - 2024A- to engine and workshop hoist - VAS 6100- with lift arm extension/workshop hoist - VAS 6101- as shown in illustration.

CAUTION

Accident risk from loose components of lifting tackle.

- The support hooks and retaining pins on the lifting tackle must be secured with locking pins.



- Raise engine until engine mountings are clear.
- Tighten spindle - 10-222A/11- further.

NOTICE

Risk of damage to lines/pipes, hoses and engine compartment when lowering engine/gearbox assembly.

- Check that all connections between engine, gearbox, sub-frame and body have been detached.
- Carefully guide out engine/gearbox assembly with subframe from engine compartment when lowering.
- Separate engine from gearbox and lift engine out of engine compartment.

1.2 Securing engine to engine and gearbox support

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10 ; Removing and installing engine; Securing engine to engine and gearbox support .

1.3 Installing engine

When installing a new base engine, you must check whether there is a sticker on the cylinder head cover.

If a sticker is attached which states Spannpratzen auf vorgeschriebenes Drehmoment angezogen (clamping pieces tightened to specified torque), the clamping pieces have already been tightened to the specified final torque at the factory.

If no sticker is attached, it is essential that the clamping pieces for the injectors are tightened to the specified torque after installing the high-pressure pipes. If these instructions are not observed, the engine could be damaged.

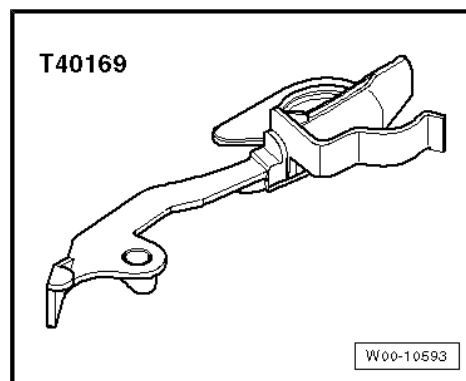
Special tools and workshop equipment required



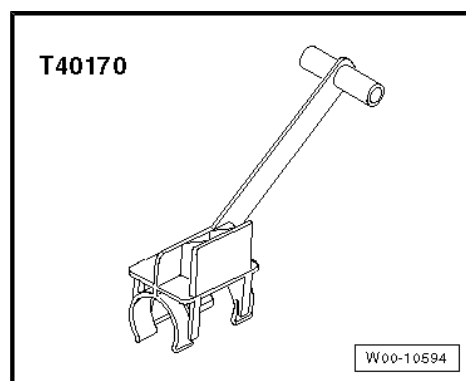
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◆ Assembly aid - T40169-



◆ Transportation lock - T40170-



◆ All special tools listed under "Removing engine"

Procedure

- After removing, renew bolts tightened with specified tightening angle.
- Renew self-locking nuts and bolts as well as seals, gaskets and O-rings after removal.
- Do not remove plugs or protective caps until you are ready to fit the relevant line.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Re-install all cable ties in original positions.
- Do not reuse coolant.



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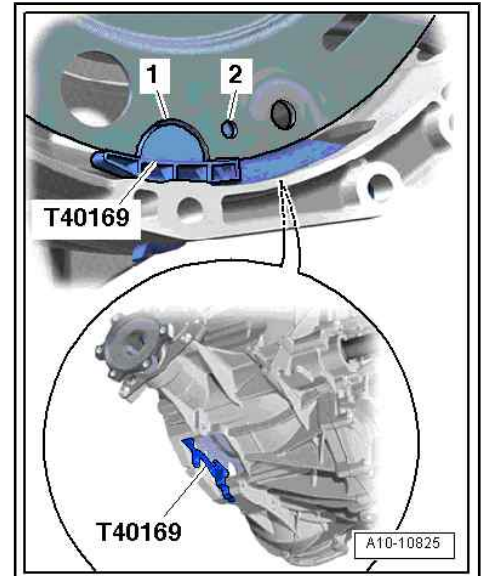


- The following preparations are required before joining engine and gearbox:
- Insert assembly aid - T40169- into gearbox housing between flywheel/torque converter and gearbox housing from below, as illustrated.
- The assembly aid must engage in the semi-circular recess -1- and in the inspection hole -2-.

Note:

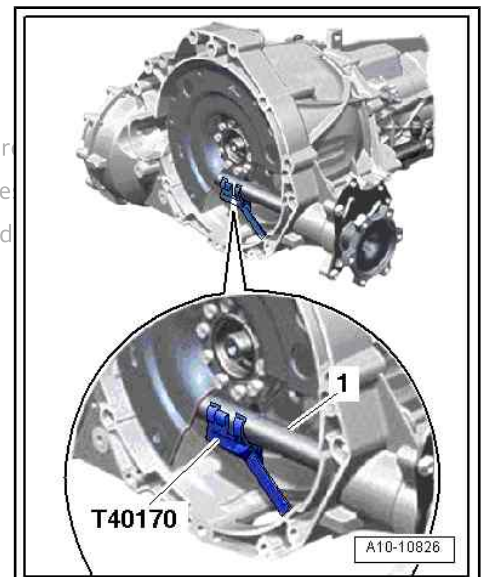
There is only one inspection hole on the circumference; turn the flywheel accordingly.

- Insert pin of assembly aid into hole on gearbox housing.

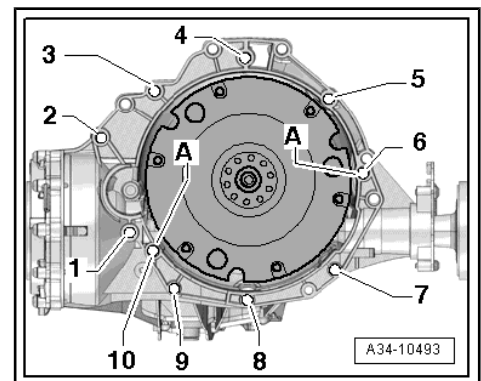


- Insert transportation lock - T40170- into gearbox housing from below and clamp onto flange shaft -1-.
- Check whether aluminium bolts securing engine to gearbox can be reused; if so, apply marking ⇒ Gearbox; Rep. gr. 34 ; Removing and installing gearbox; Tightening torques for gearbox .

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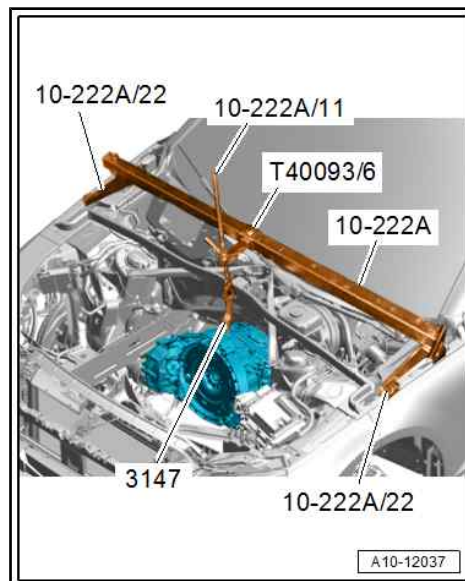


- Check whether dowel sleeves -A- for centring engine and gearbox are fitted in cylinder block (illustration shows manual gearbox).
- Bring engine into position on gearbox, guiding starter as necessary.
- Fit and tighten bolts -3 ... 5-.

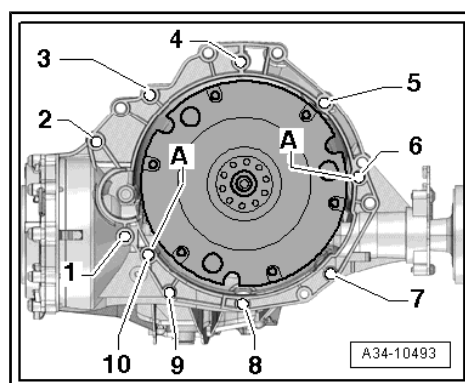




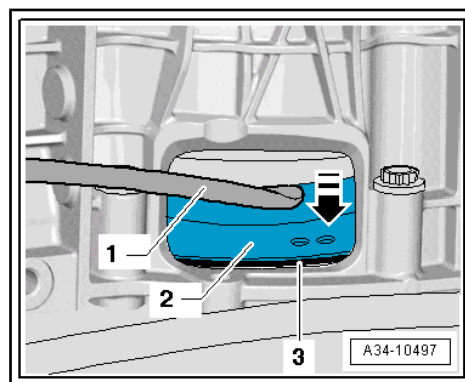
- Slacken spindle - 10-222A/11- .
- Lower workshop hoist and place engine/gearbox assembly onto engine mounting.
- Secure engine mounting ➤ [page 26](#) .
- Detach workshop hoist - VAS 6100- and lifting tackle - 2024 A- .



- Tighten bolts -6 ... 9- or -6 ... 10- to secure engine to gearbox (illustration shows manual gearbox).
- Remove transport lock - T40170- and assembly aid - T40169- .



- The following step is necessary to ensure that the flywheel is straight and that it makes even contact with the drive plate.
- Using assembly lever -1-, press flywheel -2- slightly against drive plate -3- -arrow-.

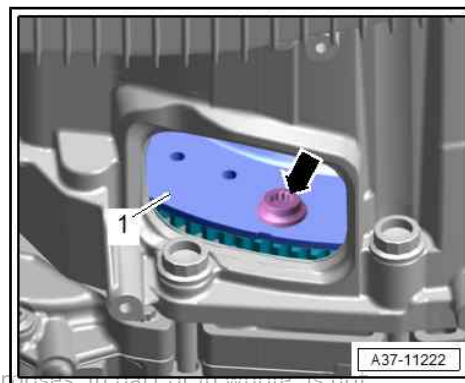


- Bolt flywheel onto drive plate as follows:

Note:

Use ring spanner insert AF 16 - V.A.G 1332/14- to tighten bolts.

- Tighten first bolt -arrow- to 10 Nm and loosen again; then tighten to 2 Nm (hand-tight).

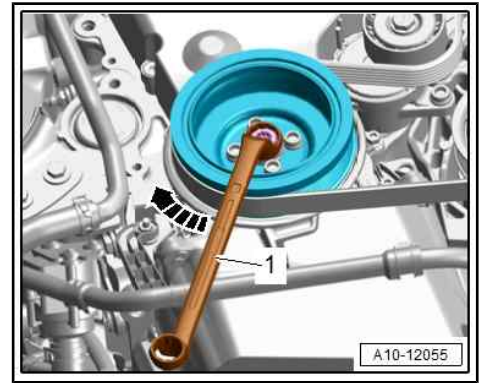


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- Turn crankshaft via vibration damper 120° further in normal direction of engine rotation -arrow- with an angled ring spanner -1-.
- Tighten bolt accessible in this crankshaft position to specified torque ⇒ Rep. gr. 30 ; Clutch; Exploded view - flywheel and dual clutch .
- When performing the next step, turn the crankshaft only in the normal direction of rotation -arrow-.
- Turn crankshaft by 120° each time and tighten remaining 2 bolts to specified torque.

Remaining installation steps are carried out in reverse sequence; note the following:



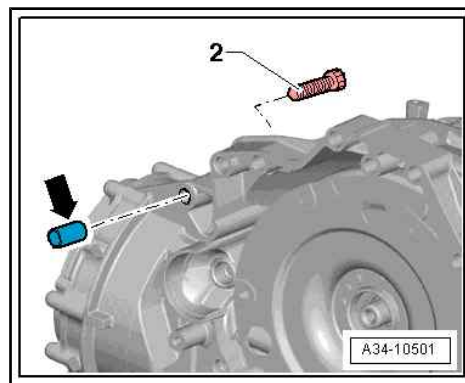
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Note:

Bolt -2- secures the starter to the gearbox and is provided with a spacer sleeve -arrow-.

- The spacer sleeve must be fitted between the starter and the gearbox.
- Install starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter .
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Install bracket for pressure sensors ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe .
- Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber partition panel .
- Connect fuel hoses ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Secure drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft .
- Install heat shield for drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing heat shield for drive shaft .
- Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit .
- Install poly V-belt ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- Connect SCR supply line ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Exploded view - reducing agent supply line .
- Install front exhaust pipe
⇒ ["1.2 Removing and installing front exhaust pipe", page 133](#) .
- Install subframe shield ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view - subframe .
- Install exhaust gas temperature sender 4 - G648- ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender 4 - G648- .
- Install air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 117](#) .
- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Connect coolant hoses with plug-in connector ⇒ [page 87](#) .
- Fill with engine oil and check oil level ⇒ Maintenance ; Booklet 830 .
- Fill up with coolant
⇒ ["1.3 Draining and filling cooling system", page 52](#) .
- Observe steps required after re-connecting battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .





! NOTICE

Risk of irreparable damage to control units because of excessive voltage.

- Do not use a battery charger to boost starting.
- Install wheel housing liners and wheel spoilers ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .
- Fit front wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Install noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .
- If engine has been renewed, perform adaption listed in Guided Function 01 - Functions component replacement ⇒ Vehicle diagnostic tester.

Tightening torques

- ◆ Tightening torques apply only to lightly greased, oiled, phosphated or black-finished nuts and bolts.
- ◆ Additional lubricants such as engine or gear oil may be used, but do not use lubricants containing graphite.
- ◆ Do not use degreased parts.
- ◆ Tolerance for tightening torques: $\pm 15\%$

Component		Nm
Bolts/nuts	M6	10
	M7	15
	M8	20
	M10	40
	M12	65

- ◆ ⇒ "2.1 Exploded view - assembly mountings", page 26
- ◆ Bolts securing engine to gearbox ⇒ Gearbox; Rep. gr. 34 ; Removing and installing gearbox; Tightening torques for gearbox



2 Assembly mountings

⇒ ["2.1 Exploded view - assembly mountings", page 26](#)

⇒ ["2.2 Supporting engine in installation position", page 29](#)

⇒ ["2.3 Removing and installing engine mountings", page 30](#)

⇒ ["2.4 Removing and installing gearbox mounting", page 32](#)

2.1 Exploded view - assembly mountings

Engine mounting

1 - Subframe

2 - Bolt

□ 20 Nm

3 - Bolt

□ 10 Nm

4 - Support mounting

□ Removing and installing

⇒ [page 32](#)

□ Installation position

⇒ [page 27](#)

5 - Bolt

□ 55 Nm

6 - Engine support

□ Removing and installing

⇒ [page 35](#)

7 - Heat shield

8 - Bolt

□ 10 Nm

9 - Bolt

□ 55 Nm

10 - Engine mounting

□ with

◆ Left electrohydraulic engine mounting solenoid valve - N144-

◆ Right electrohydraulic engine mounting solenoid valve - N145-

□ Removing and installing

⇒ [page 30](#)

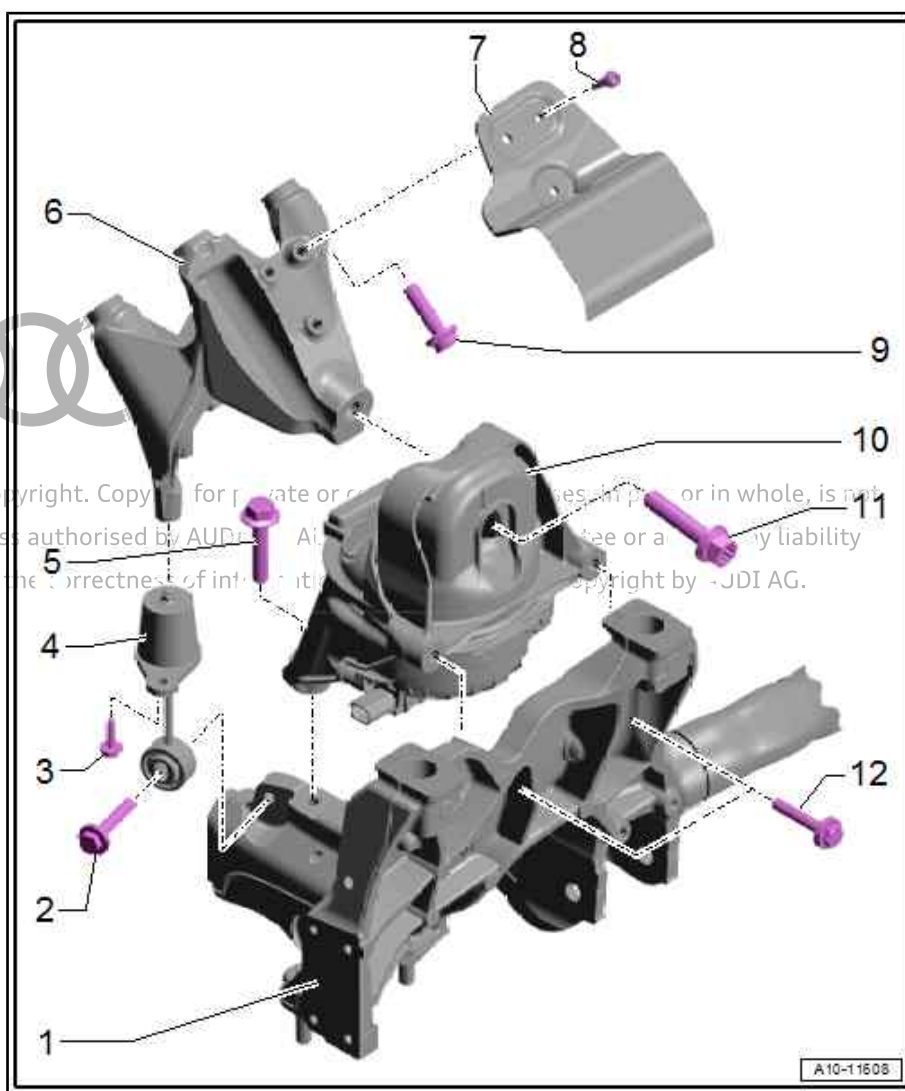
11 - Bolt

□ Renew after removing

□ 90 Nm +90°

12 - Bolt

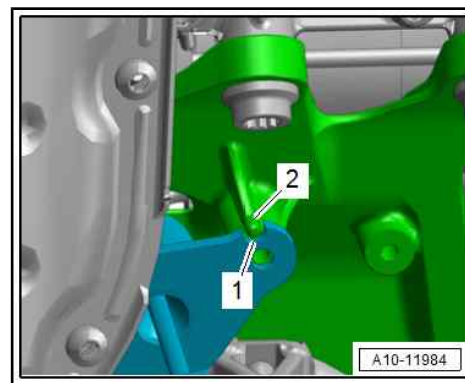
□ 30 Nm





Installation position of support mounting

- ◆ Projection -2- on engine support must engage in recess -1- on support mounting.



Gearbox mounting for manual gearbox

1 - Nut

- ❑ Only remove if detaching gearbox mounting from gearbox support
- ❑ Tightening torques ⇒ 6-speed manual gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

2 - Bolt

- ❑ Tightening torques ⇒ 6-speed manual gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

3 - Tunnel cross member

- ❑ Removing and installing ⇒ 6-speed manual gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

4 - Stop plate

- ❑ For gearbox mounting

5 - Gearbox mounting

- ❑ Removing and installing ⇒ [page 32](#)

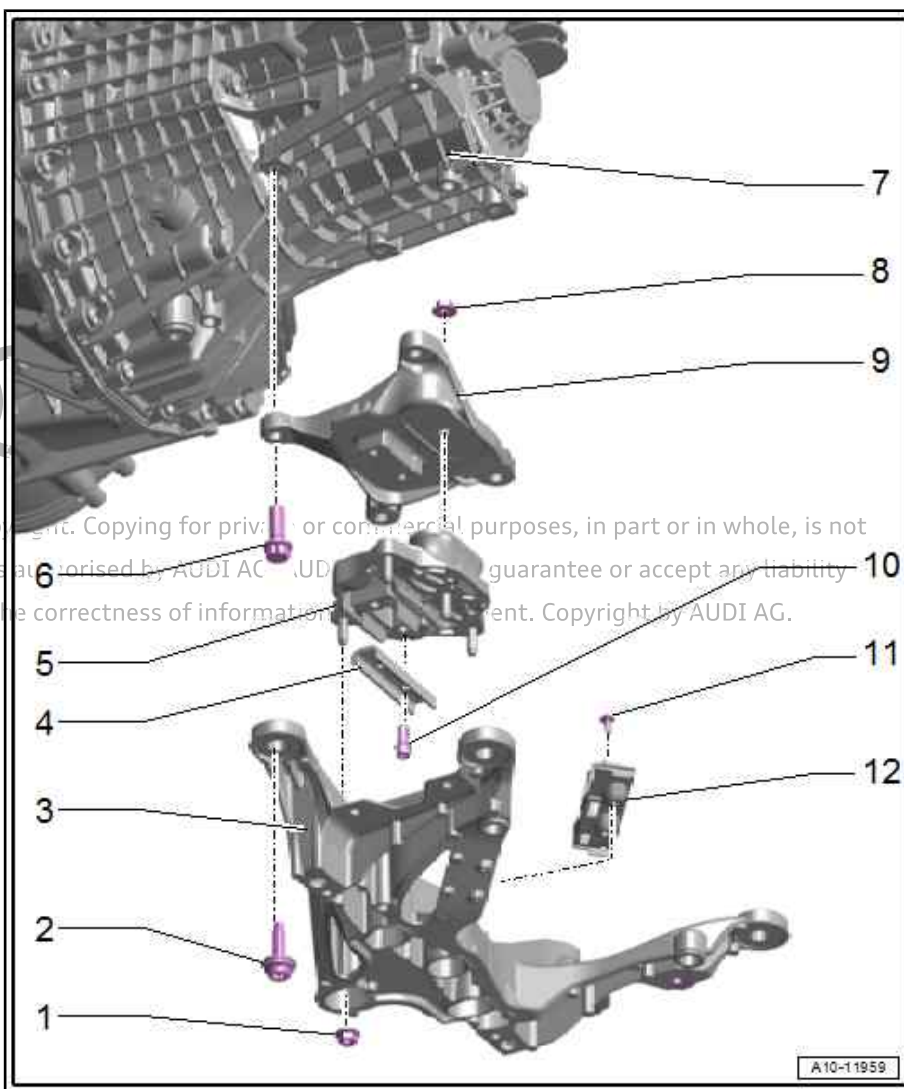
6 - Bolt

- ❑ Tightening torques ⇒ 6-speed manual gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

7 - Final drive

8 - Nut

- ❑ Only remove if detaching gearbox mounting from gearbox support
- ❑ Tightening torques ⇒ 6-speed manual gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings





9 - Gearbox support

- ❑ Removing and installing ⇒ [page 32](#)

10 - Bolt

- ❑ Tightening torques ⇒ 6-speed manual gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

11 - Bolt

- ❑ 9 Nm

12 - Bracket

- ❑ For electrical connector

Gearbox mounting for dual clutch gearbox

1 - Bolt

- ❑ Tightening torques ⇒ 7-speed dual clutch gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

2 - Tunnel cross member

- ❑ Removing and installing ⇒ 7-speed dual clutch gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

3 - Stop plate

- ❑ For gearbox mounting

4 - Gearbox mounting

- ❑ Removing and installing ⇒ [page 32](#)

5 - Final drive

6 - Nut

- ❑ Only remove if detaching gearbox mounting from gearbox support
- ❑ Tightening torques ⇒ 7-speed dual clutch gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

7 - Gearbox support

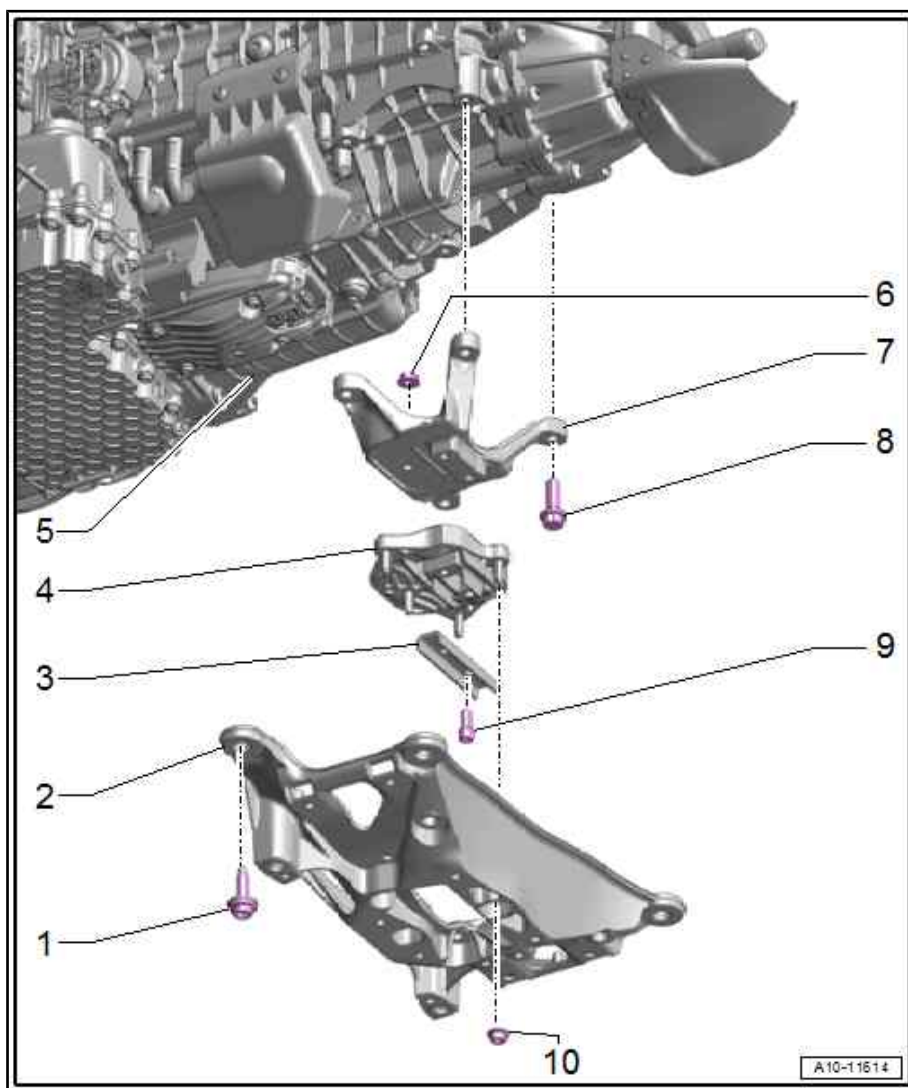
- ❑ Removing and installing ⇒ ["2.4 Removing and installing gearbox mounting", page 32](#)

8 - Bolt

- ❑ Tightening torques ⇒ 7-speed dual clutch gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

9 - Bolt

- ❑ Only remove if detaching gearbox mounting from gearbox support
- ❑ Tightening torques ⇒ 7-speed dual clutch gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings



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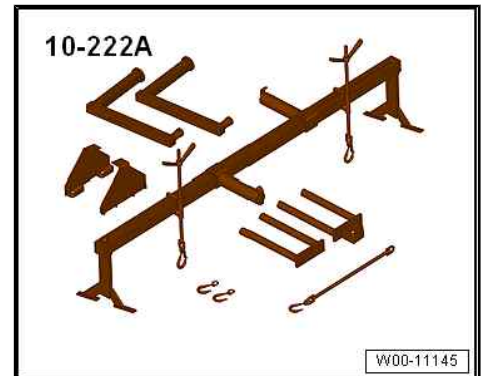
10 - Nut

- ☐ Only remove if detaching gearbox mounting from gearbox support
- ☐ Tightening torques ⇒ 7-speed dual clutch gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view
- assembly mountings

2.2 Supporting engine in installation position

Special tools and workshop equipment required

- ◆ Support bracket - 10-222A-



Procedure

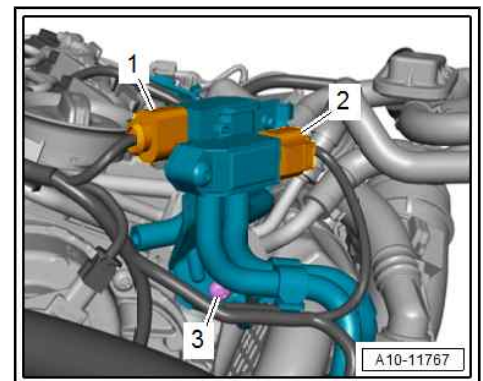
- Remove engine cover panel ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Unplug electrical connectors -1, 2-



NOTICE

Risk of damage to pressure differential sender if connection breaks off.

- Carefully disconnect hose from connection, taking care to keep hose straight.
- Remove bolt -3- and move bracket with exhaust gas pressure sensor 1 - G450- and pressure differential sender - G505- carefully to one side.



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- Set up support bracket - 10-222A- on wing mounting flanges (left and right) as illustrated.
- Attach spindles -10-222A/11- to engine lifting eyes.
- Partly take up weight of engine with spindles.

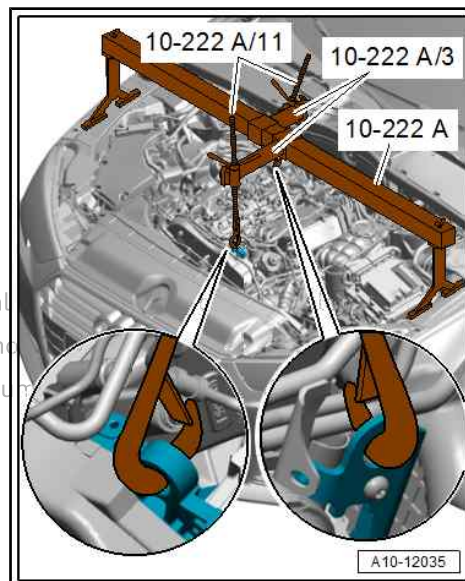
Assembling

Assembly is performed in reverse sequence; note the following:

- Install engine cover panel ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10; Engine cover panel; Removing and installing engine cover panel.

Tightening torques

- ♦ Bracket for exhaust gas pressure sensor 1 - G450- and pressure differential sender - G505- ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe



2.3 Removing and installing engine mountings

⇒ [“2.3.1 Removing and installing engine mountings”, page 30](#)

⇒ [“2.3.2 Removing and installing support mounting”, page 32](#)

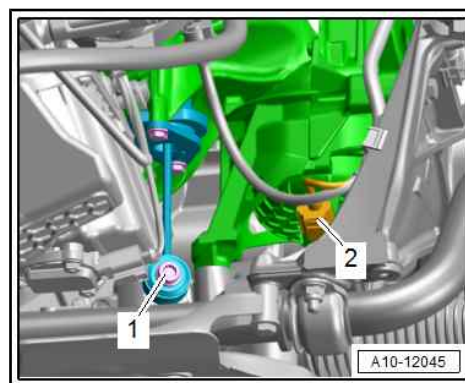
2.3.1 Removing and installing engine mountings

Removing

- Remove front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .
- Remove wheel spoiler (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Remove corresponding front wheel (left or right).

Engine mounting (left-side):

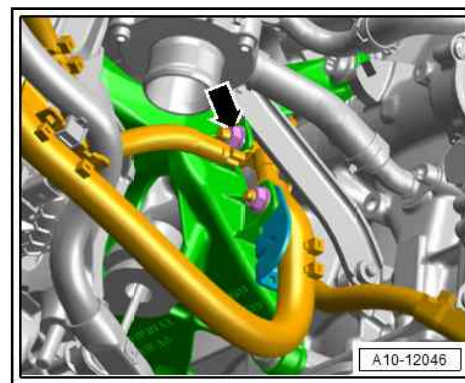
- Unplug electrical connector -2- for electrohydraulic engine mounting solenoid valve.
- Remove bolt -1- for support mounting.



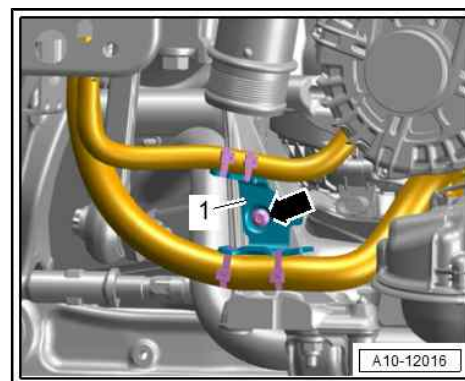


Engine mounting (right-side):

- Remove support mounting (right-side) ⇒ [page 32](#) .
- Remove nut -arrow- and move earth wire clear.



- Remove bolt -arrow- and move bracket -1- clear with electrical wiring harness.



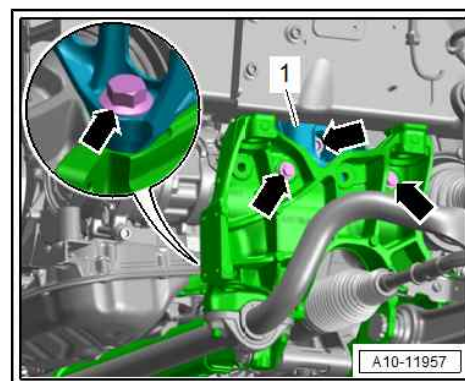
Both sides (continued):

- Support engine in installation position ⇒ [page 29](#) and take up weight with spindle - 10-222A/11- until load on engine mounting is relieved.
- Remove bolts -arrows- and detach engine mounting.

Installing

Installation is carried out in reverse order; note the following:

- After removing, renew bolts tightened with specified tightening angle.
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Fit corresponding front wheel (left or right) ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



Tightening torques

- ◆ ⇒ ["2.1 Exploded view - assembly mountings", page 26](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

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2.3.2 Removing and installing support mounting

Removing

- Remove front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .
- Unscrew bolts -1, 3- and detach support mounting -2-.

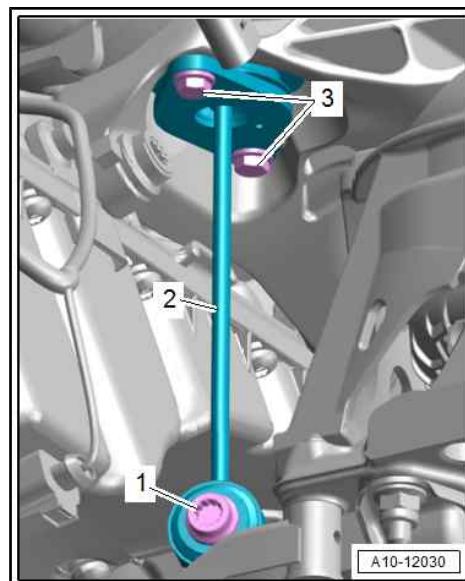
Installing

Installation is carried out in reverse order; note the following:

- After removing, renew bolts tightened with specified tightening angle.
- Observe correct installation position ⇒ [page 27](#) .

Tightening torques

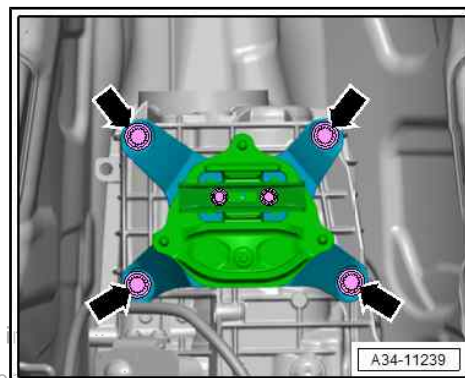
- ◆ ⇒ [“2.1 Exploded view - assembly mountings”, page 26](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



2.4 Removing and installing gearbox mounting

Removing gearbox support with gearbox mounting

- Remove tunnel cross member ⇒ 6-speed manual gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings , or ⇒ 7-speed dual clutch gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings .
- Remove bolts -arrows- and detach gearbox support and gearbox mounting from gearbox.



Removing gearbox mounting

- Unscrew bolts -1- and detach stop -2- for gearbox mounting.
- Remove nut -5- and detach gearbox mounting -3- from gearbox support -4-.

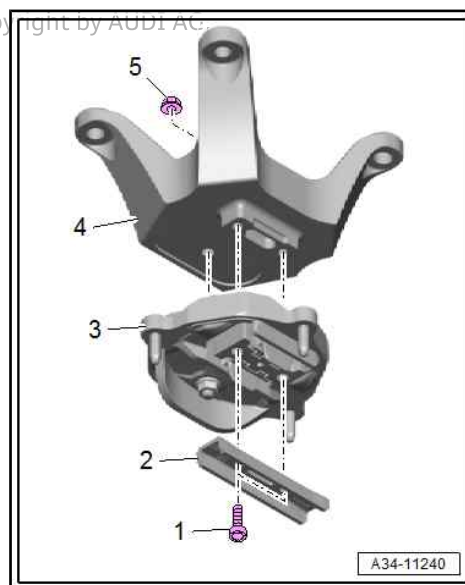
Installing

- Tighten nut -5- hand-tight initially.
- Tighten bolts -1- and then nut -5-.

The remaining installation steps are carried out in the reverse sequence.

Tightening torques

- ◆ ⇒ 6-speed manual gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings
- ◆ ⇒ 7-speed dual clutch gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings





3 Engine cover panel

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel .



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13 – Crankshaft group

1 Cylinder block (pulley end)

⇒ [“1.1 Exploded view - cylinder block \(pulley end\)”, page 34](#)

⇒ [“1.2 Exploded view - sealing flange \(pulley end\)”, page 34](#)

⇒ [“1.3 Removing and installing poly V-belt”, page 34](#)

⇒ [“1.4 Removing and installing tensioner for poly V-belt”, page 34](#)

⇒ [“1.5 Removing and installing vibration damper”, page 34](#)

⇒ [“1.6 Removing and installing bracket for ancillaries”, page 34](#)

⇒ [“1.7 Removing and installing engine support”, page 35](#)

⇒ [“1.8 Removing and installing sealing flange \(pulley end\)”, page 38](#)

1.1 Exploded view - cylinder block (pulley end)

All components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - cylinder block (pulley end) .

1.2 Exploded view - sealing flange (pulley end)

All components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - sealing flange (pulley end) .

1.3 Removing and installing poly V-belt

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

1.4 Removing and installing tensioner for poly V-belt

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .

1.5 Removing and installing vibration damper

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing vibration damper .

1.6 Removing and installing bracket for ancillaries

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries .

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1.7 Removing and installing engine support

⇒ [“1.7.1 Removing and installing engine support \(left-side\)”, page 35](#)

⇒ [“1.7.2 Removing and installing engine support \(right-side\)”, page 36](#)

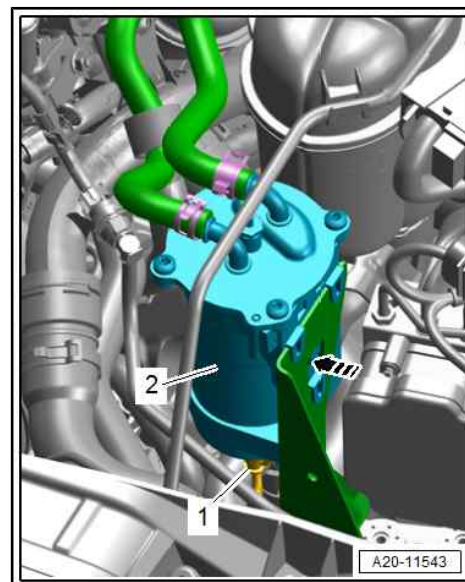
1.7.1 Removing and installing engine support (left-side)

Removing

- Remove engine mounting (left-side)
⇒ [“2.3.1 Removing and installing engine mountings”, page 30](#) .
- Remove poly V-belt ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- Remove air conditioner compressor from bracket with refrigerant lines still attached and tie up to left side ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket .

Vehicles with water separator:

- Unplug electrical connector -1- for water level sender - G120- .
- Release fastener -arrow-, lift water separator -2- off bracket and place it on engine.

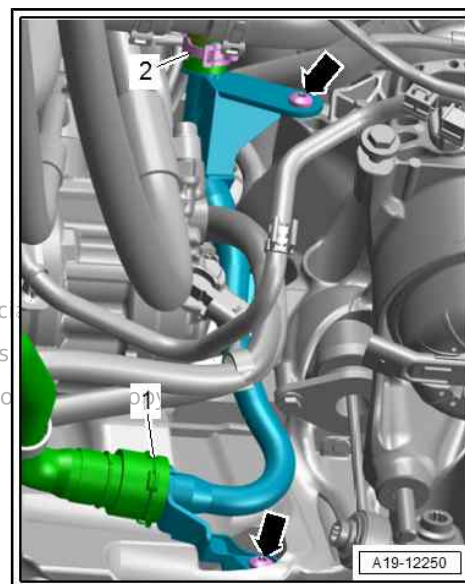


All vehicles (continued):

- Remove bolts -arrows- and press coolant pipe (bottom left) to the side.



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- Move electrical wiring -1- clear.
- Remove bolts -arrows- and detach engine support (left-side) -2-.

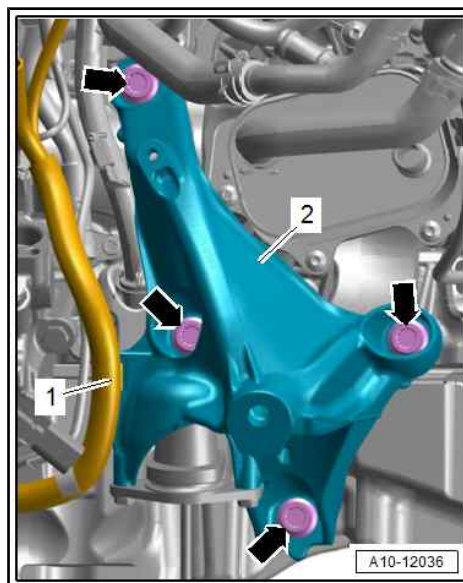
Installing

Installation is carried out in reverse order; note the following:

- After removing, renew bolts tightened with specified tightening angle.
- Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket .
- Install poly V-belt ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

Tightening torques

- ♦ ⇒ [“2.1 Exploded view - assembly mountings”, page 26](#)
- ♦ ⇒ [“3.1 Exploded view - coolant pipes”, page 67](#)



1.7.2 Removing and installing engine support (right-side)

Removing

Risk of irreparable damage to electronic components

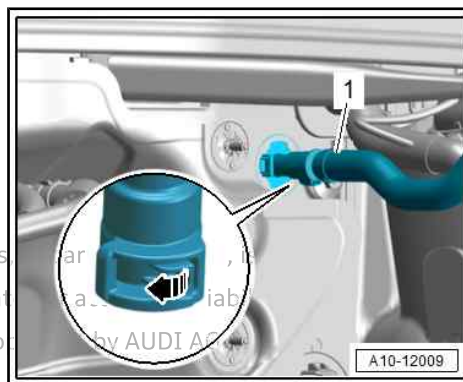
When disconnecting the battery there is a risk of irreparable damage to electronic components.

- Always switch off the ignition before disconnecting the battery.

- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Remove engine cover panel ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove support mounting (right-side) ⇒ [page 32](#) .
- Release catch -arrow- and disconnect vacuum hose -1-.



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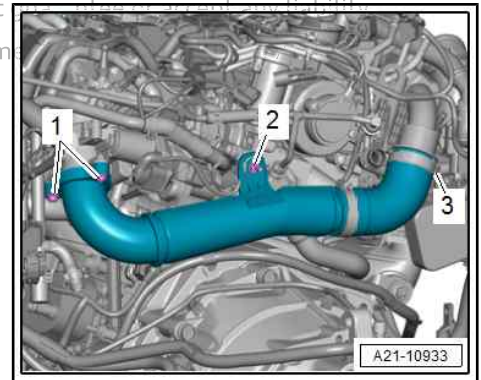
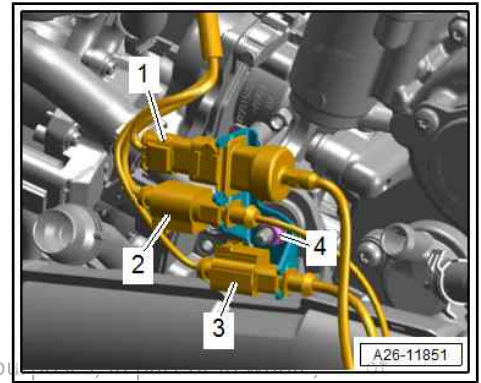


- Remove nut -4- and move bracket with electrical connectors -1, 2, 3- to one side.

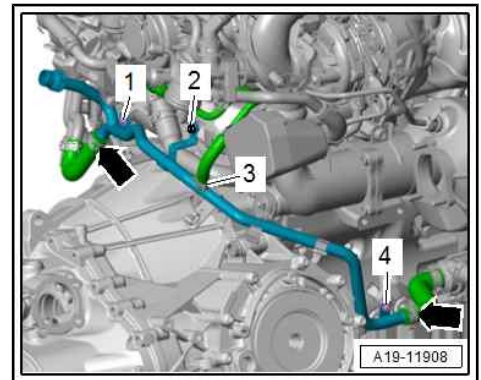


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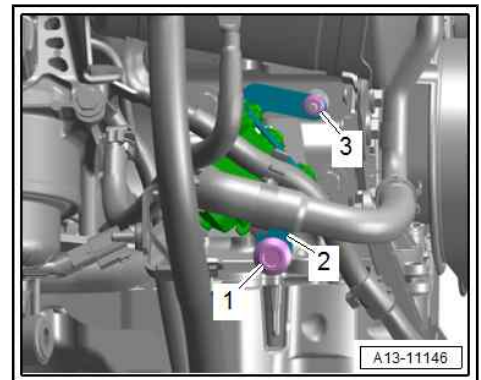
- Remove bolt -1- and centre hex stud -2-.
- Release hose clip -3- and detach air pipe.



- Remove nut -2- and bolts -1, 4- and push coolant pipe (rear) slightly to one side.
- Remove engine mounting (right-side)
⇒ ["2.3.1 Removing and installing engine mountings", page 30](#).



- Remove nut -3- and bolt -1- and push bracket -2- with auxiliary pump for heating - V488- clear to one side.



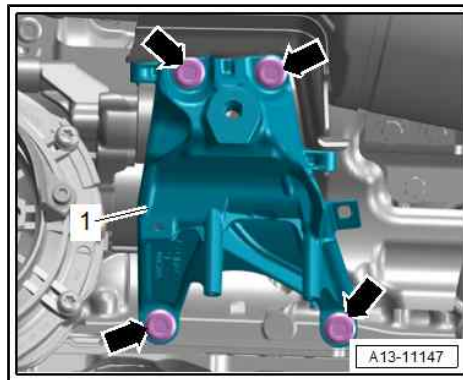


- Remove bolts -arrows- and detach engine support -1- (right-side).

Installing

Installation is carried out in reverse order; note the following:

- After removing, renew bolts tightened with specified tightening angle.
- Install engine cover panel ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Observe steps required after re-connecting battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



Tightening torques

- ◆ ⇒ [page 26](#)
- ◆ ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - charge air system
- ◆ ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

1.8 Removing and installing sealing flange (pulley end)

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing sealing flange (pulley end) .



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2 Cylinder block (gearbox end)

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (gearbox end) .



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3 Crankshaft

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Crankshaft .



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4 Pistons and conrods

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Pistons and conrods .



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15 – Cylinder head, valve gear

1 Toothed belt drive

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All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 15 ; Toothed belt drive .



2 Cylinder head

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head .



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3 Valve gear

⇒ [“3.1 Exploded view - valve gear”, page 44](#)

⇒ [“3.2 Removing and installing camshaft oil seal”, page 44](#)

⇒ [“3.3 Removing and installing valve stem oil seals”, page 44](#)

3.1 Exploded view - valve gear

All components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 15 ; Valve gear; Exploded view - valve gear .

3.2 Removing and installing camshaft oil seal

Removing

Note:

The following steps enable you to fit the special tool correctly.

- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Support engine in installation position ⇒ [page 29](#) .
- Remove bolt -1- for support mounting (both sides).

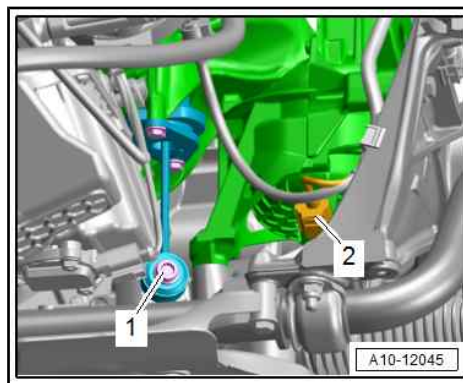
All further procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 15 ; Valve gear; Removing and installing camshaft oil seal .

Installing

- Detach support bracket
⇒ [“2.2 Supporting engine in installation position”, page 29](#) .

Tightening torques

- ◆ ⇒ [page 26](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



3.3 Removing and installing valve stem oil seals

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 15 ; Valve gear; Removing and installing valve stem oil seals .



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4 Inlet and exhaust valves

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 15 ; Inlet and exhaust valves .

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17 – Lubrication

1 Sump/oil pump

⇒ [“1.1 Exploded view - sump/oil pump”, page 46](#)

⇒ [“1.2 Engine oil”, page 46](#)

⇒ [“1.3 Removing and installing sump”, page 46](#)

⇒ [“1.4 Removing and installing oil pump”, page 46](#)

⇒ [“1.5 Removing and installing oil level and oil temperature sender G266”, page 46](#)

1.1 Exploded view - sump/oil pump

All components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump .

1.2 Engine oil

- ◆ Refer to ⇒ Maintenance ; Booklet 830 for instructions on draining and filling up engine oil, checking oil level, removing and installing oil filter element.
- ◆ Oil capacities, oil specifications and viscosity grades ⇒ Maintenance tables .

1.3 Removing and installing sump

Removing

- Engine oil drained ⇒ Maintenance ; Booklet 830
- Lower subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Lowering subframe .
- Remove engine support (left-side)
⇒ [“1.7.1 Removing and installing engine support \(left-side\)”, page 35](#) .

All further procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Removing and installing sump .

Installing

Additional work:

- Install engine support (left-side)
⇒ [“1.7.1 Removing and installing engine support \(left-side\)”, page 35](#) .
- Install subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Lowering subframe .

1.4 Removing and installing oil pump

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Removing and installing oil pump .

1.5 Removing and installing oil level and oil temperature sender - G266-

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Removing and installing oil level and oil temperature sender - G266- .



2 Engine oil cooler

Engine oil cooler must not be separated from oil filter housing. In the event of a fault, the engine oil cooler must be renewed with the oil filter housing ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches; Removing and installing oil filter housing .



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3 Oil filter/oil pressure switches

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches .



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19 – Cooling

1 Cooling system/coolant

⇒ [“1.1 Connection diagram - coolant hoses”, page 49](#)

⇒ [“1.2 Checking cooling system for leaks”, page 52](#)

⇒ [“1.3 Draining and filling cooling system”, page 52](#)

1.1 Connection diagram - coolant hoses

⇒ [“1.1.1 Connection diagram - coolant hoses, vehicles without auxiliary heater”, page 49](#)

⇒ [“1.1.2 Connection diagram - coolant hoses, vehicles with auxiliary heater”, page 51](#)

1.1.1 Connection diagram - coolant hoses, vehicles without auxiliary heater

- ◆ Blue = Large coolant circuit
- ◆ Red = Small coolant circuit
- ◆ Violet = Coolant circuit for charge air cooler.
- ◆ Brown = Heating circuit
- ◆ Green = Coolant circuit for gearbox
- ◆ Arrows = Direction of coolant flow

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1 - Water radiator for charge air cooling circuit

2 - Radiator

3 - Coolant pump

4 - Non-return valve

5 - Cylinder head/cylinder block

6 - Auxiliary pump for heating - V488-

7 - Turbocharger

8 - Coolant temperature sender - G62-

9 - Non-return valve

10 - Exhaust gas recirculation cooler

11 - Bleeder hole

12 - Heat exchanger for heater

13 - Non-return valve

14 - ATF cooler

- ☐ For equipment version with dual clutch gearbox

15 - Thermostat

- ☐ For coolant circuit for gearbox
- ☐ For equipment version with dual clutch gearbox

16 - Thermostat

17 - Throttle valve module - J338-

18 - Exhaust gas recirculation control motor - V338-

19 - Injector for reducing agent - N474-

20 - Filler cap

- ☐ For coolant expansion tank
- ☐ Checking pressure relief valve ⇒ [page 52](#)

21 - Coolant expansion tank

22 - Charge air cooler

23 - Restrictor

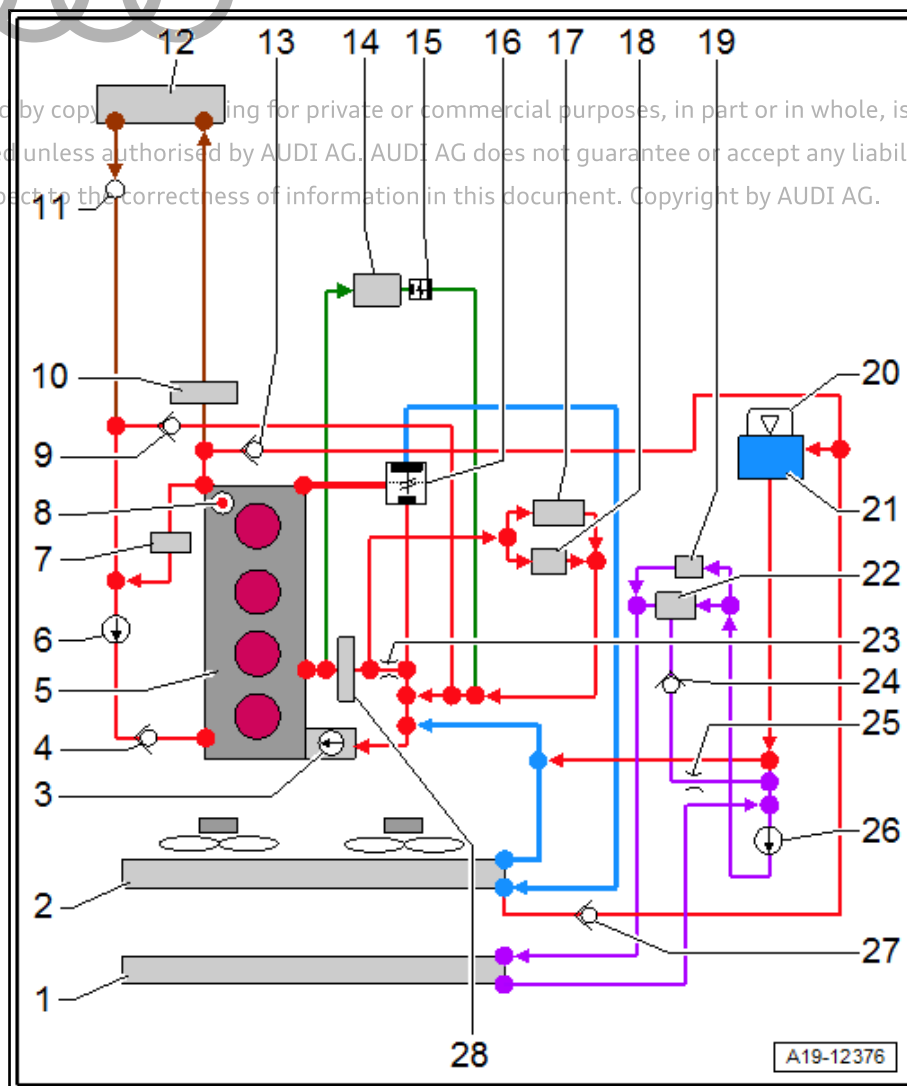
24 - Non-return valve

25 - Restrictor

26 - Charge air cooling pump - V188-

27 - Non-return valve

28 - Engine oil cooler





1.1.2 Connection diagram - coolant hoses, vehicles with auxiliary heater

- ◆ Blue = Large coolant circuit
- ◆ Red = Small coolant circuit
- ◆ Violet = Coolant circuit for charge air cooler.
- ◆ Brown = Heating circuit
- ◆ Green = Coolant circuit for gearbox
- ◆ Arrows = Direction of coolant flow

1 - Water radiator for charge air cooling circuit

2 - Radiator

3 - Coolant pump

4 - Non-return valve

5 - Auxiliary pump for heating - V488-

6 - Auxiliary heater

- ☐ With circulation pump - V55-

7 - Turbocharger

8 - Cylinder head/cylinder block

9 - Coolant temperature sender - G62-

10 - Non-return valve

11 - Non-return valve

12 - Heater coolant shut-off valve - N279-

13 - Bleeder hole

14 - Heat exchanger for heater

15 - Exhaust gas recirculation cooler

16 - Non-return valve

17 - ATF cooler

- ☐ For equipment version with dual clutch gearbox

18 - Thermostat

- ☐ For coolant circuit for gearbox
- ☐ For equipment version with dual clutch gearbox

19 - Thermostat

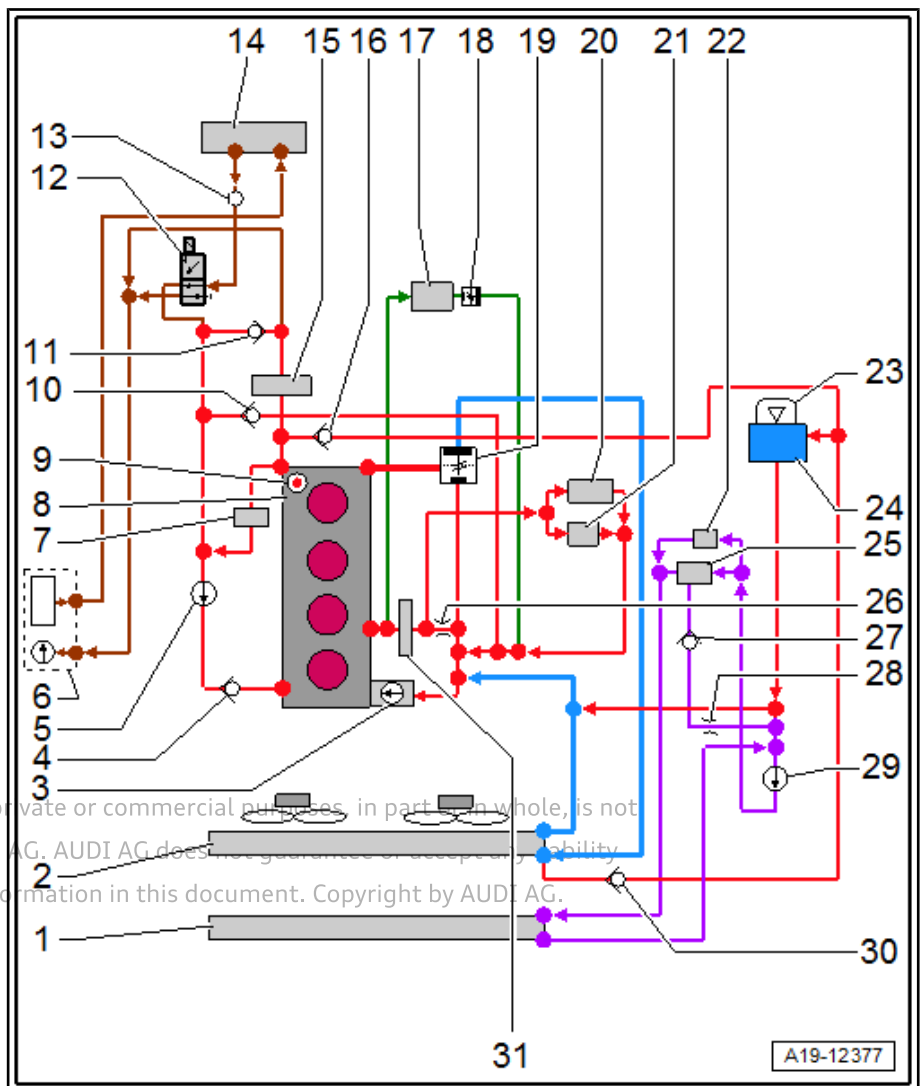
20 - Throttle valve module - J338-

21 - Exhaust gas recirculation control motor - V338-

22 - Injector for reducing agent - N474-

23 - Filler cap

- ☐ For coolant expansion tank





- ❑ Checking pressure relief valve ➔ [page 52](#)

24 - Coolant expansion tank

25 - Charge air cooler

26 - Restrictor

27 - Non-return valve

28 - Restrictor

29 - Charge air cooling pump - V188-

30 - Non-return valve

31 - Engine oil cooler

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1.2 Checking cooling system for leaks

All procedures are described in ➔ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks .

1.3 Draining and filling cooling system

Drain coolant ➔ [page 54](#) .

Fill and bleed coolant circuit ➔ [page 55](#) .

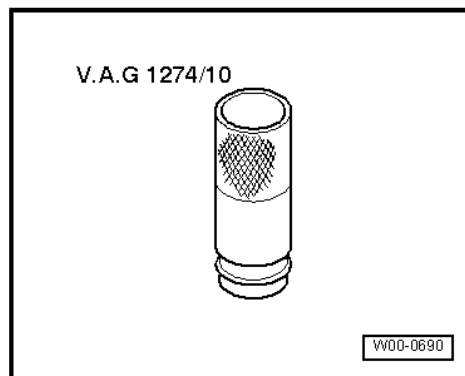
Bleed cooling system ➔ [page 59](#) .

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester
- ◆ Adapter for cooling system tester - V.A.G 1274/8-

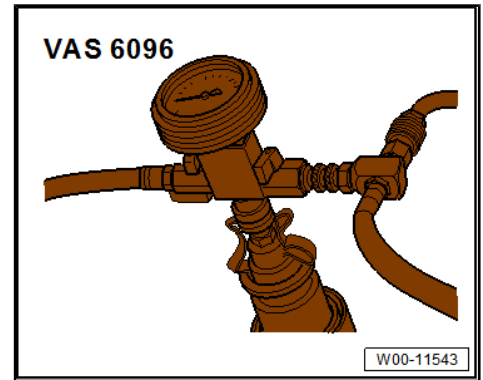


- ◆ Pipe for cooling system tester - V.A.G 1274/10-





- ◆ Cooling system charge unit - VAS 6096-



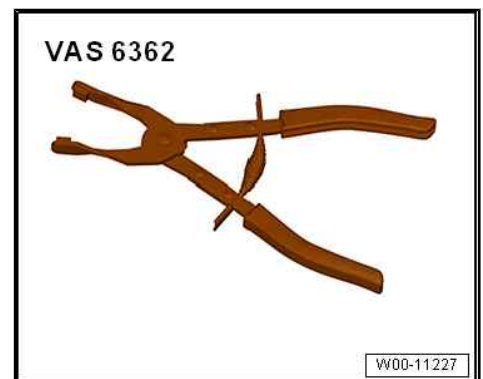
- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-



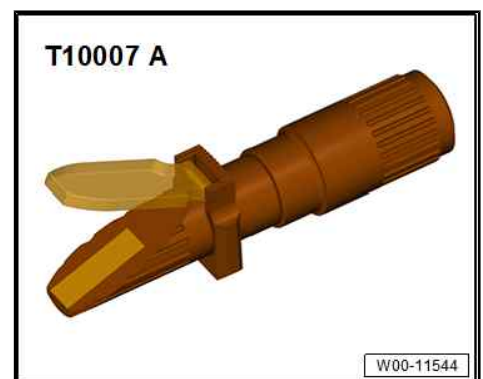
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- ◆ Hose clip pliers - VAS 6362-



- ◆ Refractometer - T10007A-



- ◆ Safety goggles
- ◆ Protective gloves



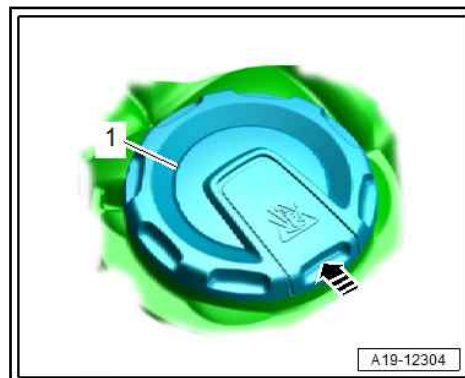
Draining coolant

CAUTION

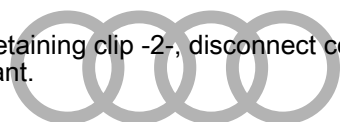
The cooling system is under pressure when the power unit is hot. Risk of scalding due to hot steam and hot coolant.

Danger of scalding skin and other parts of the body.

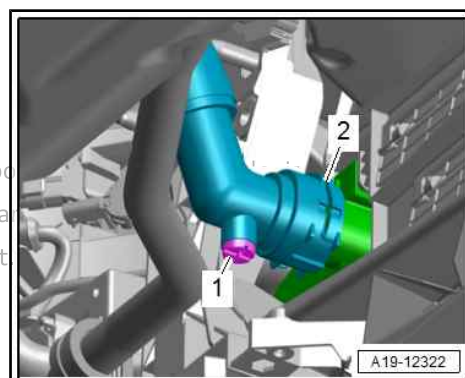
- Put on protective gloves.
 - Put on safety goggles.
 - Cover filler cap on expansion tank with a cloth and open carefully to release pressure.
-
- Release fastener -arrow- and open filler cap -1- on coolant expansion tank.
 - Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
 - Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.



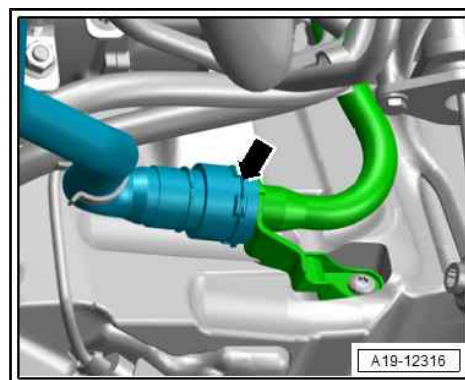
- Lift retaining clip -2-, disconnect coolant hose and drain off coolant.



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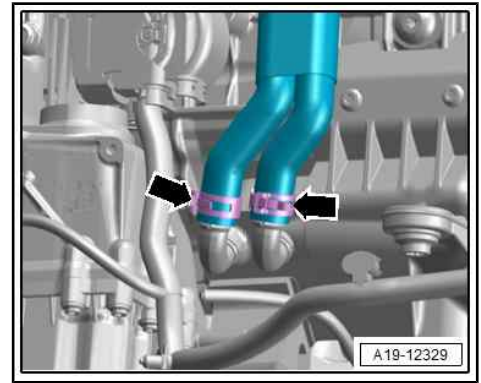


- Lift retaining clip -arrow-, disconnect coolant hose and drain off coolant.





- Vehicles with dual clutch gearbox: Release hose clips -arrows-, disconnect coolant hoses from ATF cooler and drain off coolant.



- Release hose clip -arrow-, disconnect coolant hose and drain off coolant.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Tighten drain plug and connect coolant hoses.
- Connect coolant hose with plug-in connector ⇒ [page 87](#) .

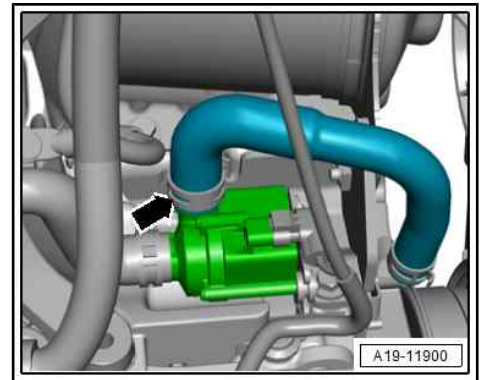
Filling and bleeding coolant circuit:



NOTICE

Risk of damage to engine if cooling system is insufficiently filled/bled.

- After it is filled, the cooling system must be bled using the
⇒ Vehicle diagnostic tester.



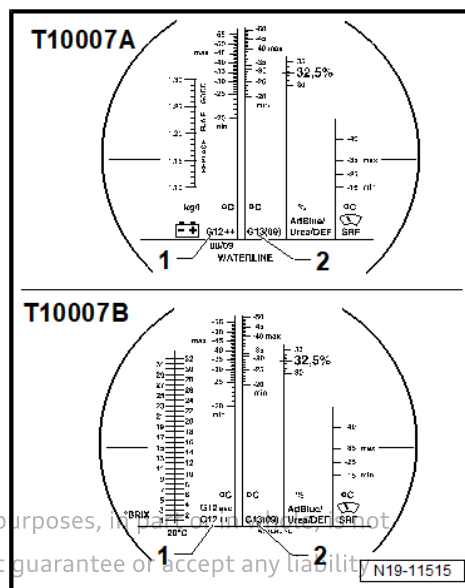
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**Note**

- ◆ *The effectiveness of the coolant is greatly influenced by the quality of the water with which it is mixed. Because water may contain different substances depending on the country or even the region, the water quality to be used for cooling systems has been specified. Distilled water meets all the requirements and is therefore recommended for use when topping up or filling up with coolant.*
- ◆ *Use only coolant additives listed in the ⇒ Electronic parts catalogue (ETKA). If you use other coolant additives, this can significantly impair in particular the corrosion protection effect. The resulting damage could lead to loss of coolant and consequently to serious engine damage.*
- ◆ *Coolant with the recommended mixture ratio prevents frost and corrosion damage and stops scaling. At the same time it raises the boiling point of the fluid in the system. For this reason the cooling system must be filled all year round with the correct coolant additive.*
- ◆ *Because of its high boiling point, the coolant improves engine reliability under heavy loads, particularly in countries with tropical climates.*
- ◆ *Refractometer - T10007A- or refractometer - T10007B- MUST be used to determine the current level of frost protection.*
- ◆ *Scale -1- on the refractometer applies to coolant additives G12 ++ and G12evo.*
- ◆ *Scale -2- on the refractometer applies to coolant additive G13.*
- ◆ *If more than one type of coolant additive has been used: Always use the scale for G13 to determine the anti-freeze protection.*
- ◆ *The mixture must guarantee frost protection down to at least -25 °C (in countries with arctic climate: down to -36 °C). The amount of antifreeze should only be increased if greater frost protection is required in very cold climates. This must only be down to -48 °C, however, as otherwise the cooling efficiency of the coolant is impaired.*
- ◆ *The coolant concentration must not be reduced by adding water even in warmer seasons and in warmer countries. Frost protection must be provided to at least -25 °C.*
- ◆ *The temperature indicated on the refractometer corresponds to the temperature at which the first ice crystals can form in the coolant.*
- ◆ *Do not reuse coolant.*
- ◆ *Only use water/coolant additive as a lubricant for coolant hoses.*

Recommended mixture ratio for coolant

- Coolant (40 %) and distilled water (60 %) for frost protection to -25 °C
- Coolant (50 %) and distilled water (50 %) for frost protection to -36 °C
- Coolant ⇒ Electronic parts catalogue (ETKA)





To fill up with coolant:

- Ignition switched off.
- Fill reservoir of cooling system charge unit -VAS 6096- with at least 8 litres of premixed coolant (according to recommended ratio):
- To simplify filling procedure, place reservoir on as high a surface as possible, e.g. on a workshop trolley or the engine and gearbox jack.
- Fit adapter for cooling system tester - V.A.G 1274/8- onto coolant expansion tank.
- Attach cooling system charge unit - VAS 6096- to adapter - V.A.G 1274/8- .
- Run vent hose -2- into a small container -3-.

Note:

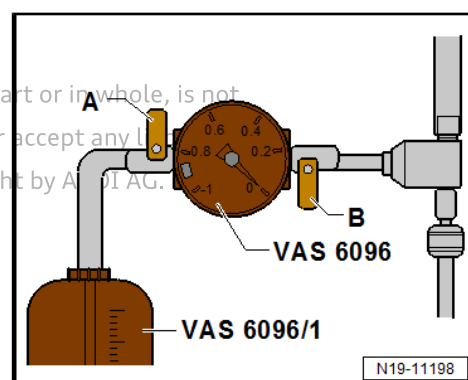
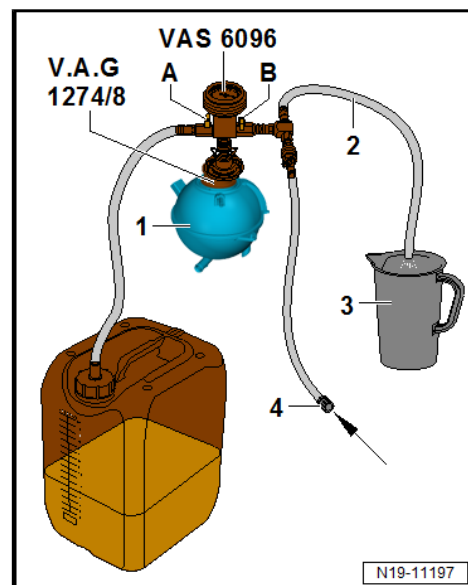
The vented air draws along a small amount of coolant, which should be collected.

- Close both valves -A- and -B- (turn lever at right angles to direction of flow).
- Connect hose -4- to compressed air supply.
- Pressure: 7 ... 10 bar.
- Open valve -B- by setting lever in direction of flow.

The suction jet pump generates a partial vacuum in the cooling system; the needle on the gauge should move into the green zone.

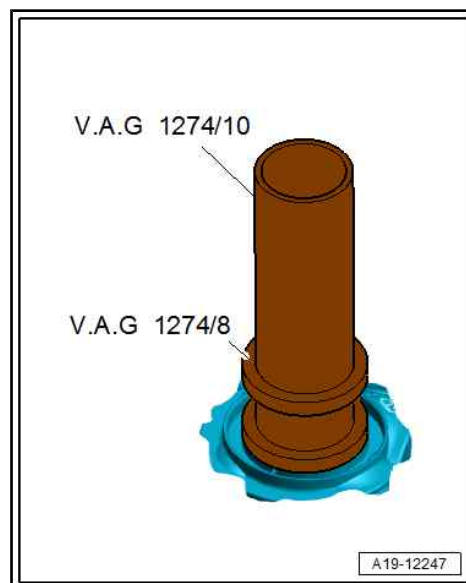
Also briefly open valve -A- (turn lever in direction of flow) so that hose on reservoir of -VAS 6096- can fill with coolant.

- Close valve -A- again.
- Leave valve -B- open for another 2 minutes.
- The suction jet pump continues to generate a partial vacuum in the cooling system; the needle on the gauge should remain in the green zone.
- Close valve -B-.
- The needle on the gauge should stop in the green zone. The vacuum level in the cooling system is then sufficient for subsequent filling.
- If the needle does not reach the green zone, repeat the process.
- Check cooling system for leaks if the vacuum is not maintained.
- Detach compressed air hose.
- Open valve -A-.
- The vacuum in the cooling system causes the coolant to be drawn out of the reservoir of -VAS 6096- ; the cooling system is then filled.
- Detach cooling system charge unit - VAS 6096- from adapter -V.A.G 1274/8- on coolant expansion tank.

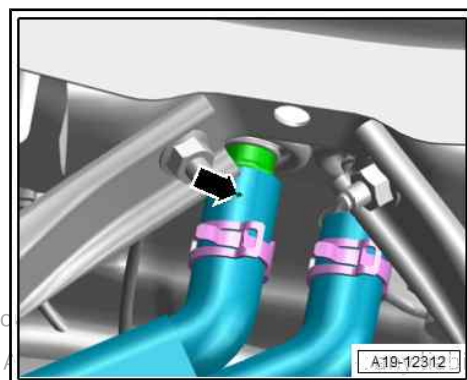




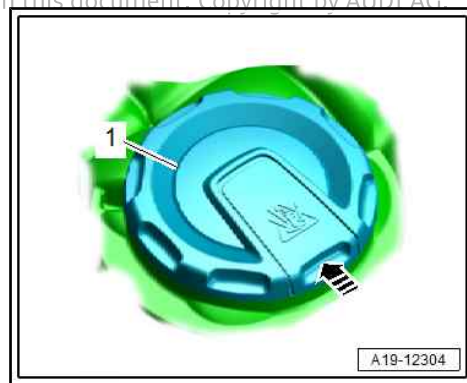
- Attach pipe -V.A.G 1274/10- onto adapter -V.A.G 1274/8- .
- Fill up with coolant until pipe for cooling system tester is filled. If required, add further coolant when performing bleeding procedure.
- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



- Release hose clip on coolant hose going to heat exchanger for heater and pull back hose until bleeder hole -arrow- in hose is no longer blocked by connection.
- Fill up with coolant until it flows out at bleeder hole in coolant hose.
- Push coolant hose back onto connection and secure with spring-type hose clip.



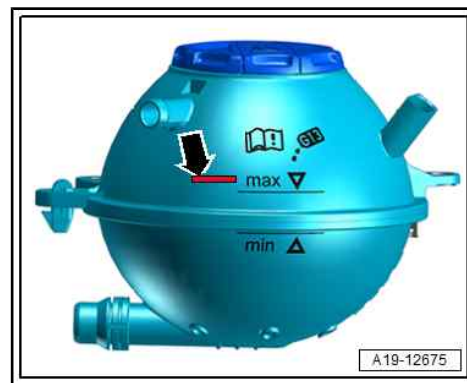
- Close filler cap -1- on coolant expansion tank (make sure it engages).





Bleeding cooling system:

- Coolant must be topped up to “max” mark.
- Start engine.
- Set temperature to “HI”.
- Switch off air conditioner compressor (press **AC** button).
 - LED in button should not light up.
- Set fresh air blower to lowest setting.
- Connect ⇒ Vehicle diagnostic tester.
- Switch on ignition and select following menu options:
- Start Guided Fault Finding.
- Choose **Select own test** tab and select following options one after the other:
 - ◆ **Drive train**
 - ◆ **Select engine code and engine**
 - ◆ **@1 - Self-diagnosis compatible systems**
 - ◆ **@1 - Engine electronics J623**
 - ◆ **@1 - Engine electronics, functions**
 - ◆ **@1 - Coolant circuit charge**
- Follow instructions shown on ⇒ Vehicle diagnostic tester.
- Switch off ignition and allow engine to cool down.



Checking coolant level:

CAUTION

The cooling system is under pressure when the power unit is hot. Risk of scalding due to hot steam and hot coolant.

Danger of scalding skin and other parts of the body.

- Put on protective gloves.
- Put on safety goggles.
- Cover filler cap on expansion tank with a cloth and open carefully to release pressure.



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- The coolant level must be at the “MAX” marking when the engine is cold.
- The coolant level can be above the “MAX” marking when the engine is warm.
- Top up with coolant again if necessary.
- Fill up coolant to approx. 5 mm above max. marking when engine is cold.
- Install engine cover panel.
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Erase event memory ⇒ Vehicle diagnostic tester.



Tightening torques

- ♦ ⇒ [“4.1 Exploded view - radiators/radiator fan”, page 85](#)
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



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2 Coolant pump/thermostat assembly

⇒ [“2.1 Exploded view - coolant pump/thermostat”, page 61](#)

⇒ [“2.2 Exploded view - electric coolant pump”, page 61](#)

⇒ [“2.3 Exploded view - coolant temperature senders”, page 62](#)

⇒ [“2.4 Removing and installing electric coolant pump”, page 62](#)

⇒ [“2.5 Removing and installing coolant pump”, page 65](#)

⇒ [“2.6 Removing and installing thermostat”, page 65](#)

⇒ [“2.7 Checking thermostat”, page 65](#)

⇒ [“2.8 Removing and installing coolant valve for cylinder head N489”, page 65](#)

⇒ [“2.9 Removing and installing coolant temperature sender G62”, page 66](#)

2.1 Exploded view - coolant pump/thermostat

All components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump/thermostat .

2.2 Exploded view - electric coolant pump



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1 - Bolt

- 40 Nm

2 - Bracket

- For auxiliary pump for heating - V488-

3 - Nut

- 9 Nm

4 - Grommet

5 - Bolt

- 2.7 Nm

6 - Spacer bush

7 - Charge air cooling pump - V188-

- Removing and installing
⇒ [page 62](#)

8 - Bracket

- For charge air cooling pump - V188-

9 - Nut

- 9 Nm

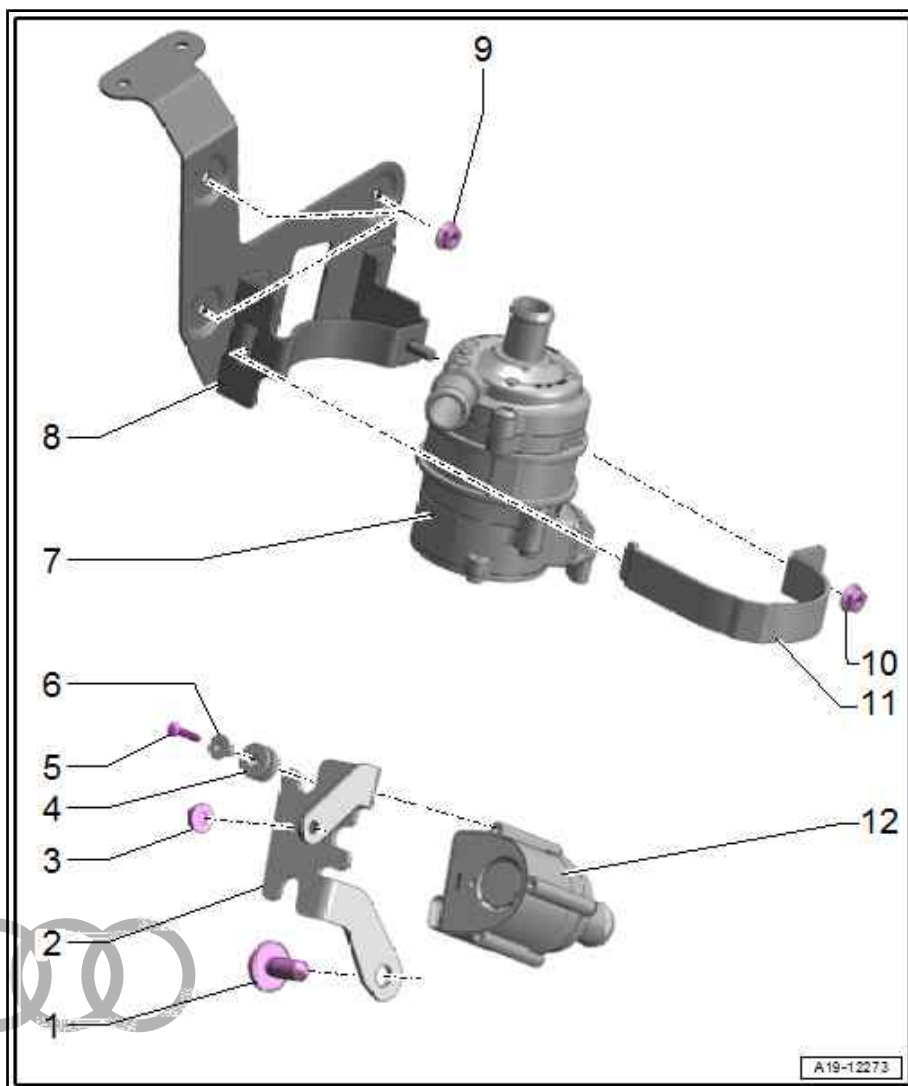
10 - Nut

- 9 Nm

11 - Retaining bracket

12 - Auxiliary pump for heating - V488-

- Removing and installing
⇒ [page 64](#)



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2.3 Exploded view - coolant temperature senders

All components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant temperature senders .

2.4 Removing and installing electric coolant pump

⇒ ["2.4.1 Removing and installing charge air cooling pump V188", page 62](#)

⇒ ["2.4.2 Removing and installing auxiliary pump for heating V488", page 64](#)

2.4.1 Removing and installing charge air cooling pump - V188-

Special tools and workshop equipment required

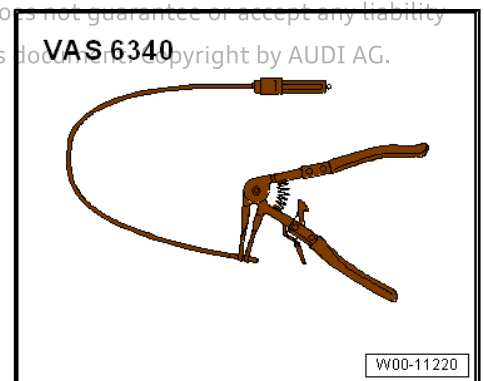
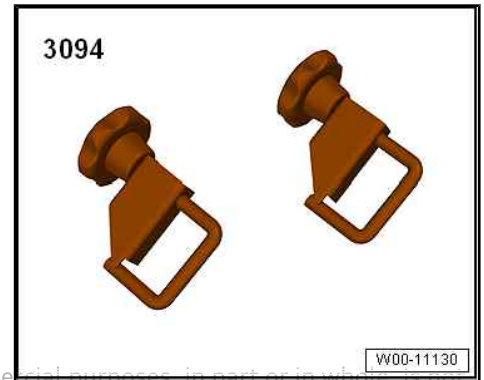


- ◆ Hose clamps up to 25 mm - 3094-

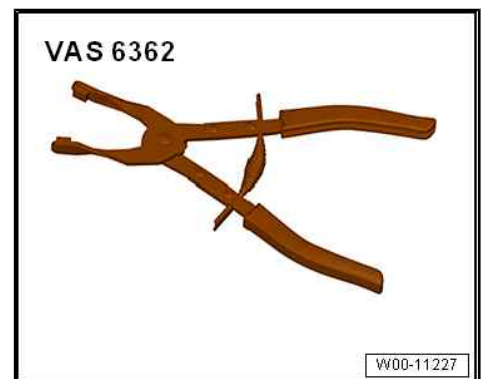


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- ◆ Hose clip pliers - VAS 6340-

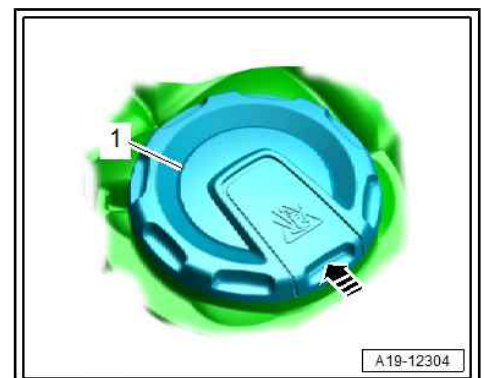


- ◆ Hose clip pliers - VAS 6362-



Removing

- Engine cold.
- Relieve residual pressure in cooling system by releasing fastener -arrow- and briefly opening filler cap -1- on coolant expansion tank (cover filler cap with a cloth beforehand and open carefully).
- Close filler cap -arrow- again.
- Remove wheel spoiler (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .





- Unplug electrical connector -1-.
- Place a cloth underneath to catch escaping coolant.
- Clamp off coolant hoses using hose clamps up to 25 mm - 3094- , release hose clips -2- and disconnect hoses.
- Clamp off coolant hose with hose clamps up to 25 mm - 3094- and detach coolant hose.
- Remove nut -3-, release retaining bracket and detach charge air cooling pump - V188- .

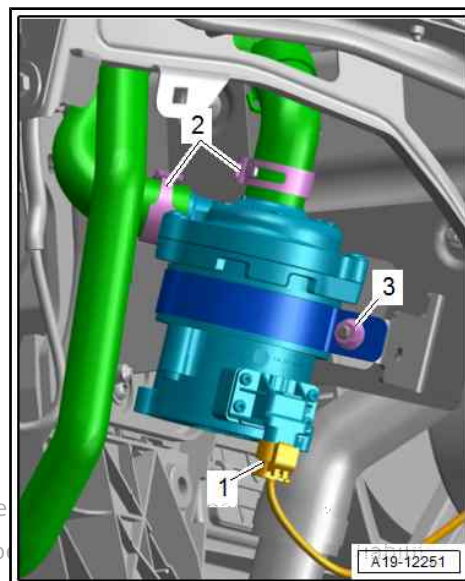
Installing

Installation is carried out in reverse order; note the following:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Bleed cooling system ⇒ [page 59](#).

Tightening torques

- ◆ ⇒ ["2.2 Exploded view - electric coolant pump", page 61](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)



2.4.2 Removing and installing auxiliary pump for heating - V488-

Special tools and workshop equipment required

- ◆ Hose clamps up to 25 mm - 3094-



- ◆ Hose clip pliers - VAS 6362-

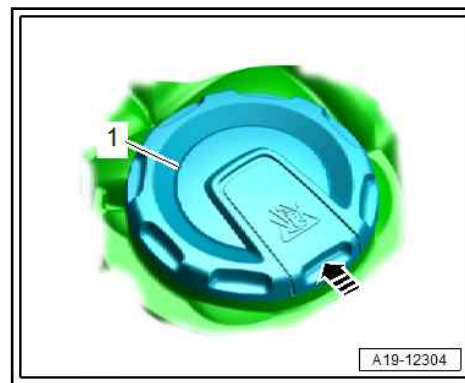


Removing

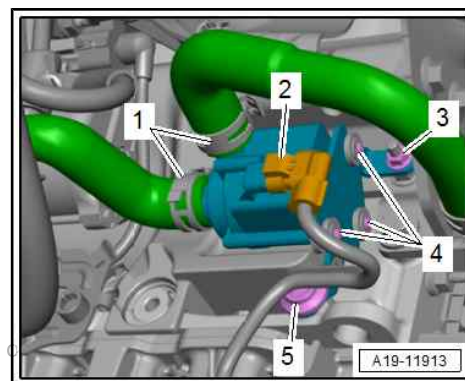
- Engine cold.



- Relieve residual pressure in cooling system by releasing fastener -arrow- and opening filler cap -1- on coolant expansion tank.
- Close filler cap -arrow- again.



- Remove front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .
- Unplug electrical connector -2-.
- Place a cloth underneath to catch escaping coolant.
- Clamp off coolant hoses with hose clamps up to 25 mm - 3094- .
- Release hose clips -1- and disconnect coolant hoses.
- Unscrew nut -3- and bolt -5- and disengage auxiliary pump for heating V488- with bracket.



- Remove bolts -4- to detach auxiliary pump for heating from bracket.

Installing

Installation is carried out in reverse order; note the following:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Bleed cooling system ⇒ [page 59](#) .

Tightening torques

- ◆ Noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

2.5 Removing and installing coolant pump

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant pump .

2.6 Removing and installing thermostat

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing thermostat .

2.7 Checking thermostat

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Checking thermostat .

2.8 Removing and installing coolant valve for cylinder head - N489-

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat as-



sembly; Removing and installing coolant valve for cylinder head
- N489- .

2.9 Removing and installing coolant temperature sender - G62-

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant temperature sender - G62- .

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3 Coolant pipes

⇒ [“3.1 Exploded view - coolant pipes”, page 67](#)

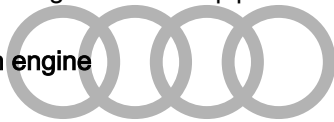
⇒ [“3.2 Removing and installing coolant pipes”, page 69](#)

⇒ [“3.3 Removing and installing coolant pipes for gearbox”, page 83](#)

3.1 Exploded view - coolant pipes

- The arrow markings on coolant pipes and on ends of hoses must align.

Coolant pipes on engine



1 - Bolt

- ☐ 20 Nm

2 - Coolant pipe (right-side)

- ☐ Removing and installing
⇒ [“3.2.6 Removing and installing coolant pipe \(right-side\)”, page 76](#)

3 - Bolt

- ☐ 10 Nm

4 - O-ring

- ☐ Renew after removing
- ☐ Lubricate with coolant

5 - Bolt

- ☐ 10 Nm

6 - Coolant pipe (rear)

- ☐ Removing and installing
⇒ [page 81](#)

7 - Coolant pipe (rear right)

- ☐ Removing and installing
⇒ [page 78](#)

8 - Bolt

- ☐ 10 Nm

9 - Bolt

- ☐ 10 Nm

10 - Nut

- ☐ 10 Nm

11 - Bolt

- ☐ 10 Nm

12 - Coolant pipes (rear left)

- ☐ Removing and installing ⇒ [page 71](#)

13 - Bolt

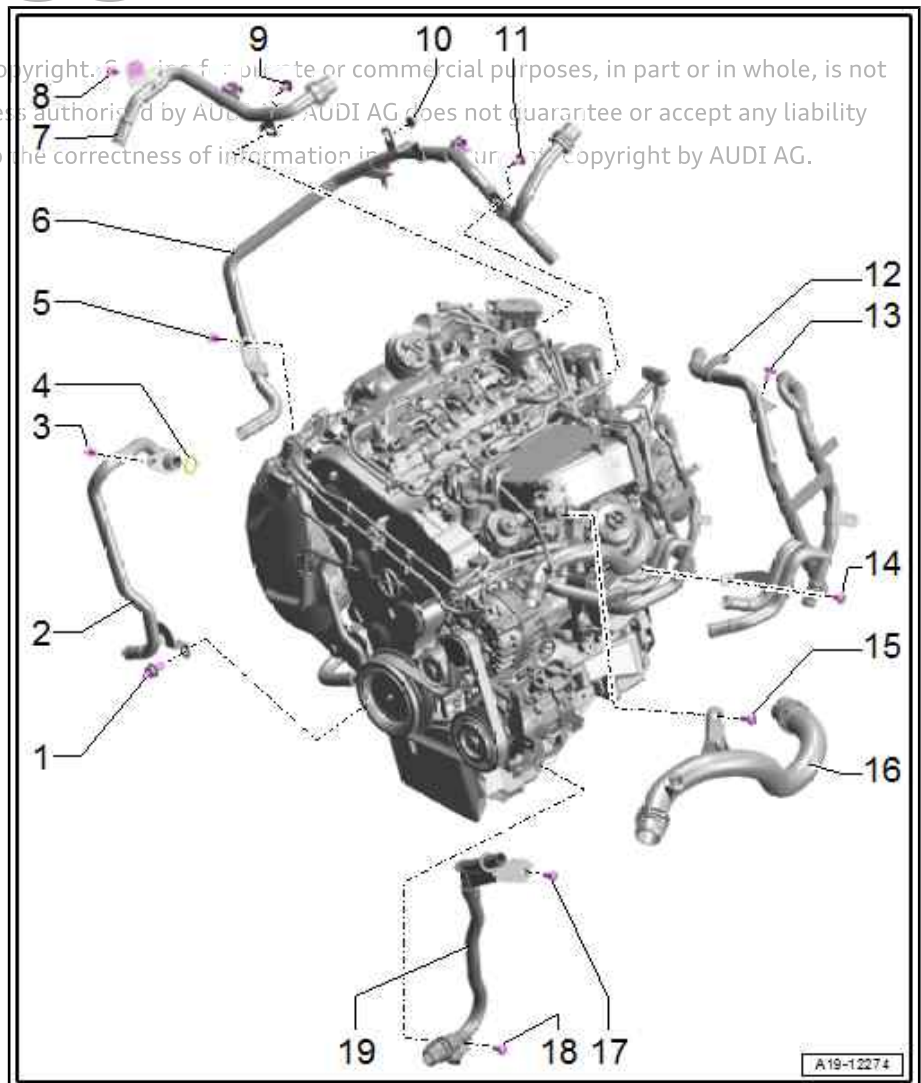
- ☐ 10 Nm

14 - Bolt

- ☐ 10 Nm

15 - Bolt

- ☐ 10 Nm





16 - Coolant pipe (top left)

- ❑ Removing and installing ⇒ [page 73](#)

17 - Bolt

- ❑ 10 Nm

18 - Bolt

- ❑ 10 Nm

19 - Coolant pipe (bottom left)

- ❑ Removing and installing ⇒ [page 74](#)

Coolant pipes for gearbox

1 - Coolant hoses

2 - Coolant hoses

3 - Bolt

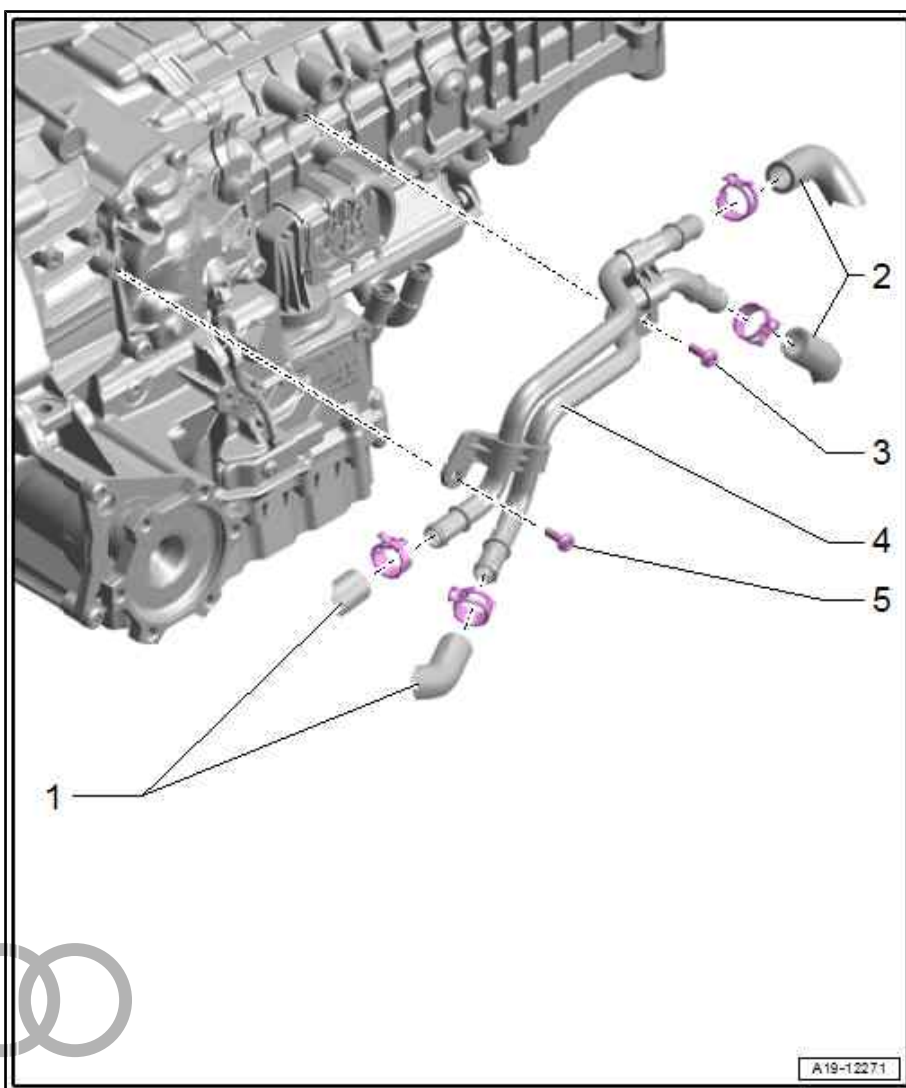
- ❑ 9 Nm

4 - Coolant pipes for gearbox

- ❑ Removing and installing
⇒ [page 83](#)

5 - Bolt

- ❑ 9 Nm



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3.2 Removing and installing coolant pipes

⇒ [“3.2.1 Installing coolant hoses with pre-tensioned spring-type clips”, page 69](#)

⇒ [“3.2.2 Removing and installing coolant pipe \(left-side\)”, page 70](#)

⇒ [“3.2.3 Removing and installing coolant pipes \(rear left\)”, page 71](#)

⇒ [“3.2.4 Removing and installing coolant pipe \(top left\)”, page 73](#)

⇒ [“3.2.5 Removing and installing coolant pipe \(bottom left\)”, page 74](#)

⇒ [“3.2.6 Removing and installing coolant pipe \(right-side\)”, page 76](#)

⇒ [“3.2.7 Removing and installing coolant pipe \(rear right\)”, page 78](#)

⇒ [“3.2.8 Removing and installing coolant pipe \(rear\)”, page 81](#)

3.2.1 Installing coolant hoses with pre-tensioned spring-type clips

Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-



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- ◆ Release tool - VAS 531 001-



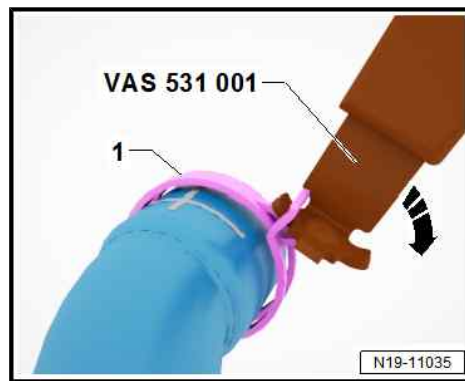
Opening clip:

- Use hose clip pliers to compress spring-type clips until clip engages.
- This opens clip, and coolant hose can be detached.
- Clip cannot be removed from coolant hose.



Closing clip:

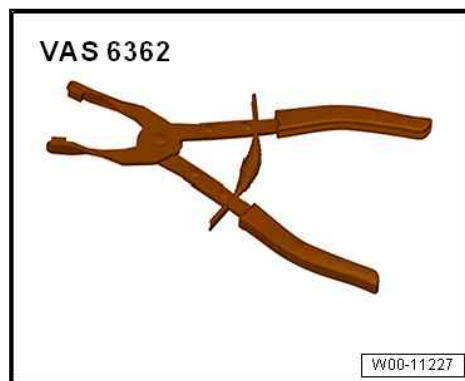
- Fit coolant hose.
- Release pre-tensioned spring-type clip by inserting release tool - VAS 531 001- into spring-type clip -1-, as shown. Release catch.
- Depending on space, use a suitable hook for releasing clip.



3.2.2 Removing and installing coolant pipe (left-side)

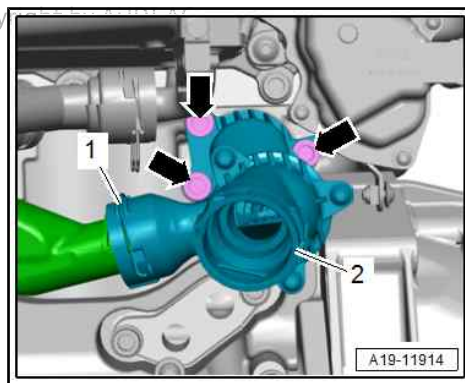
Special tools and workshop equipment required

- ♦ Hose clip pliers - VAS 6362-



Removing

- Remove oil filter housing => Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches; Removing and installing oil filter housing .
- Remove throttle valve module - J338- => Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Removing and installing throttle valve module - J338- .
- Remove bolts -arrows-.



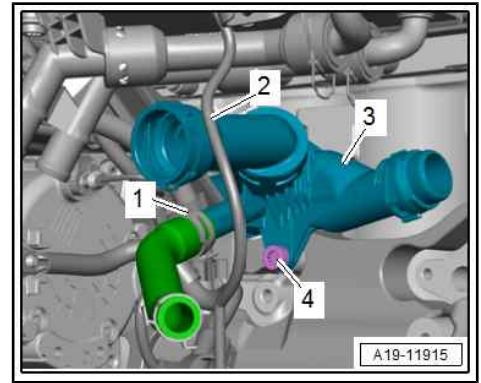


- Release hose clip -1- and disconnect coolant hose.
- Remove bolt -4-.
- Release retainer for vacuum line -2-.
- Detach and remove coolant pipe (left-side) -3-, taking care not to damage vacuum line -2-.

Installing

Installation is carried out in reverse order; note the following:

- Renew gaskets and O-rings after removal.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Before fitting, check vacuum line for damage and renew if necessary.
- Do not reuse coolant.
- Clean and smoothen sealing surfaces for seals and O-rings.
- Lubricate seals and O-rings with coolant.
- Install throttle valve module - J338- ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Removing and installing throttle valve module - J338- .
- Install oil filter housing ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches; Removing and installing oil filter housing .
- Fill and bleed coolant circuit ⇒ [page 55](#) .



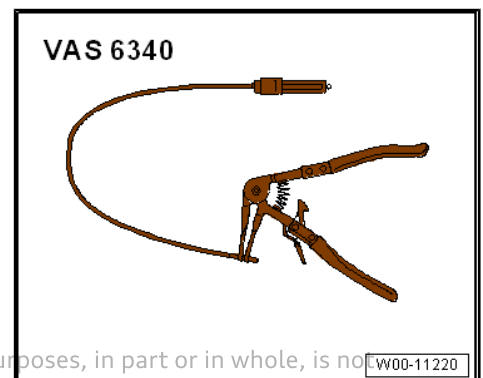
Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 67](#)

3.2.3 Removing and installing coolant pipes (rear left)

Special tools and workshop equipment required

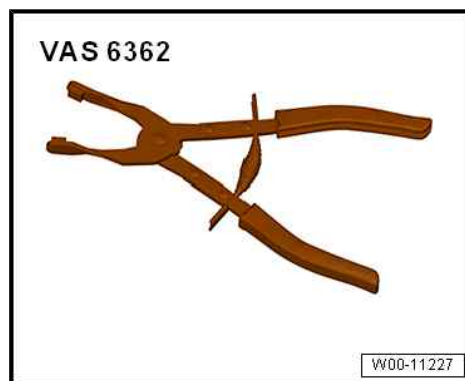
- ◆ Hose clip pliers - VAS 6340-



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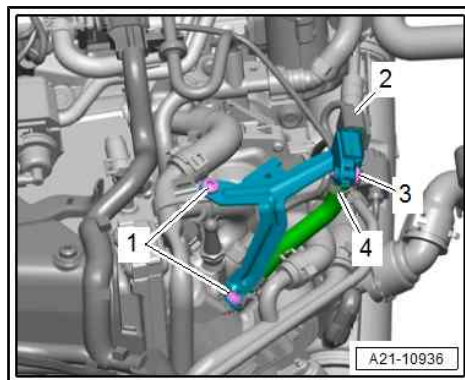


- ◆ Hose clip pliers - VAS 6362-



Removing

- Remove coolant pipe (top left)
⇒ [“3.2.4 Removing and installing coolant pipe \(top left\)”, page 73](#).
- Unplug electrical connector -2-.
- Remove bolts -1- and press charge pressure sender - G31- to side.

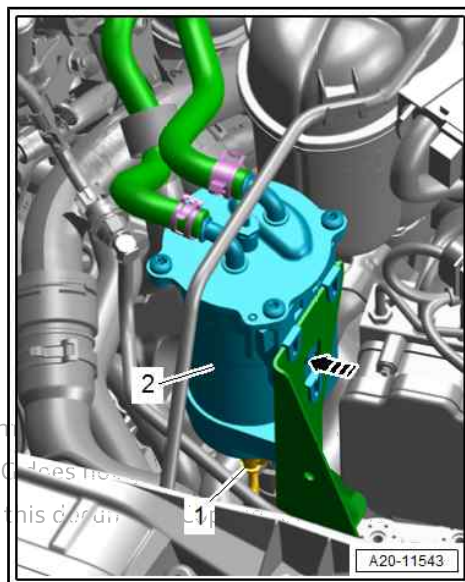


Version with water level sender - G120- :

- Unplug electrical connector -1-.
- Release fastener -arrow-, lift water separator -2- off bracket and place it on engine.



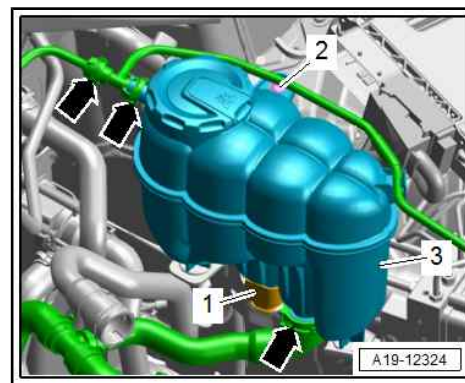
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All vehicles (continued):

- Lift retaining clips -arrows-, disconnect coolant hoses and move them clear.
- Unplug electrical connector -1- for coolant shortage indicator switch - F66- .
- Unscrew bolt -2- and detach coolant expansion tank.
- Move electrical wiring clear.



- Release hose clips -arrows- and disconnect coolant hoses.



Note

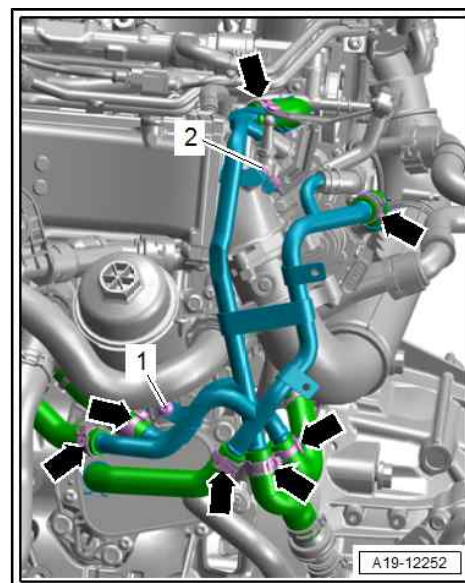
Take care not to damage coolant hoses when disconnecting.

- Remove bolts -1 and 2- and detach coolant pipes (rear left).

Installing

Installation is carried out in reverse order; note the following:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Install coolant pipe (top left)
⇒ [“3.2.4 Removing and installing coolant pipe \(top left\)”, page 73](#) .
- Connect coolant hose with plug-in connector ⇒ [page 87](#) .
- Fill and bleed coolant circuit ⇒ [page 55](#) .



Tightening torques

- ♦ ⇒ [“3.1 Exploded view - coolant pipes”, page 67](#)
 - ♦ ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system, Exploded view - charge air system
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3.2.4 Removing and installing coolant pipe (top left)

Removing

- Remove engine cover panel ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Drain coolant ⇒ [page 52](#) .

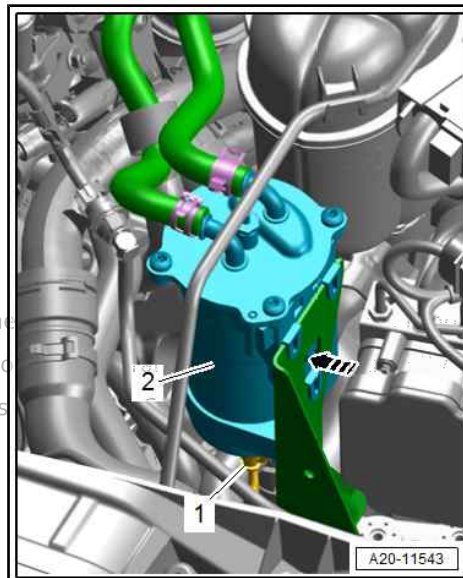


Version with water level sender - G120- :

- Unplug electrical connector -1-.
- Release fastener -arrow-, lift water separator -2- off bracket and place it on engine.

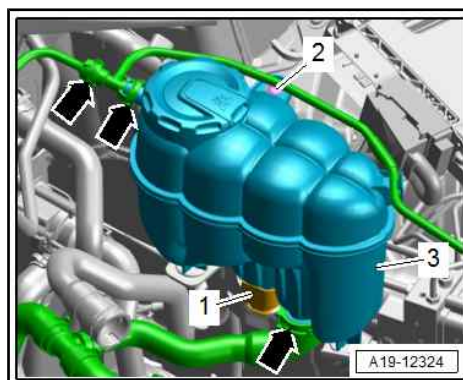


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All vehicles (continued):

- Lift retaining clips -arrows-, disconnect coolant hoses and move them clear.
- Unplug electrical connector -1- for coolant shortage indicator switch - F66- .
- Unscrew bolt -2- and detach coolant expansion tank.

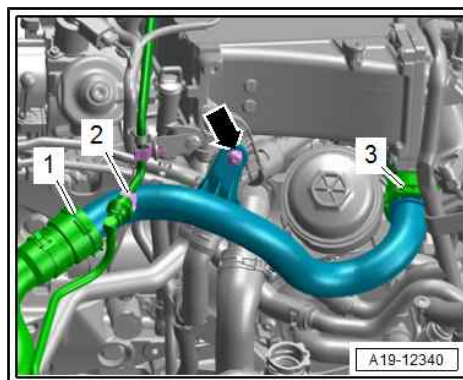


- Move coolant line clear at retaining clip -2-.
- Lift retaining clip -1- and disconnect coolant hose.
- Remove bolt -arrow-, lift retaining clip -3- and detach coolant pipe (top left).

Installing

Installation is carried out in reverse order; note the following:

- Renew O-ring after removal.
- Do not reuse coolant.
- Connect coolant hose with plug-in connector ⇒ [page 87](#) .
- Fill and bleed coolant circuit ⇒ [page 55](#) .
- Install engine cover panel ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

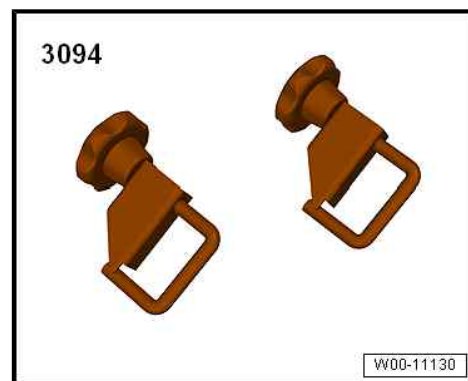
- ♦ ⇒ ["3.1 Exploded view - coolant pipes", page 67](#)

3.2.5 Removing and installing coolant pipe (bottom left)

Special tools and workshop equipment required



- ◆ Hose clamps up to 25 mm - 3094-



- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-



- ◆ Hose clip pliers - VAS 6362-



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Removing

- Remove poly V-belt ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

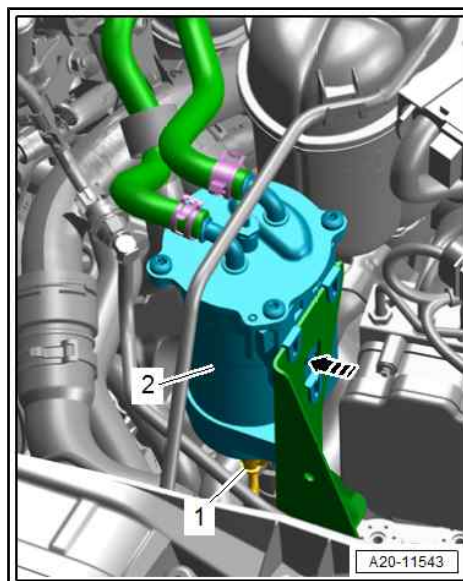


Version with water level sender - G120- :

- Unplug electrical connector -1-.
- Release fastener -arrow-, lift water separator -2- off bracket and place it on engine.

All vehicles (continued):

- Remove air conditioner compressor from bracket with refrigerant lines still attached and tie up to left side ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket .

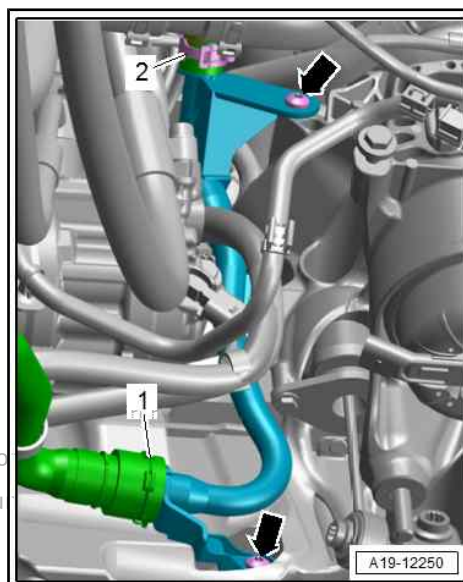


- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Clamp off coolant hoses with hose clamps up to 25 mm - 3094- .
- Lift retaining clip -1-, release hose clip -2- and disconnect coolant hoses.
- Remove bolts -arrows- and detach coolant pipe (bottom left).

Installing

Installation is carried out in reverse order; note the following:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue
- Do not reuse coolant.
- Install poly V-belt ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- Connect coolant hose with plug-in connector ⇒ [page 87](#) .
- Fill and bleed coolant circuit ⇒ [page 55](#) .



Tightening torques

- ♦ ⇒ [“3.1 Exploded view - coolant pipes”, page 67](#)
- ♦ ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit

3.2.6 Removing and installing coolant pipe (right-side)

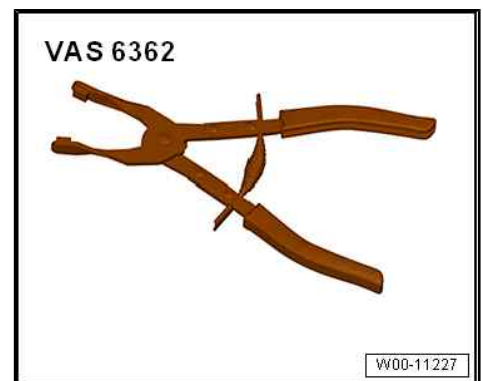
Special tools and workshop equipment required



- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-



- ◆ Hose clip pliers - VAS 6362-

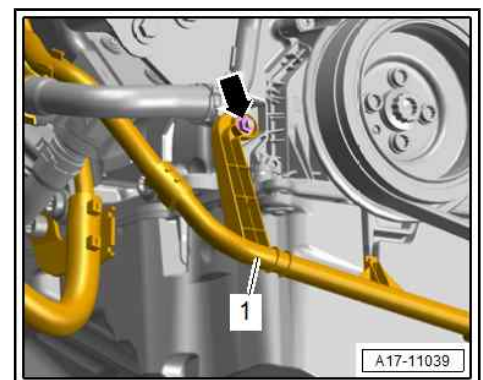


- ◆ U/J extension adapter with socket insert (commercially available)

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Removing

- Remove wheel housing liner (front right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Remove air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 117](#) .
- Remove front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .
- Remove nut -arrow-, move cable duct -1- clear and push it to one side.





- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Release hose clip -2- and disconnect coolant hose.
- Remove bolt -1- using U/J extension adapter with socket insert (commercially available).
- Unscrew centre hex stud -3- and remove coolant pipe (right-side).

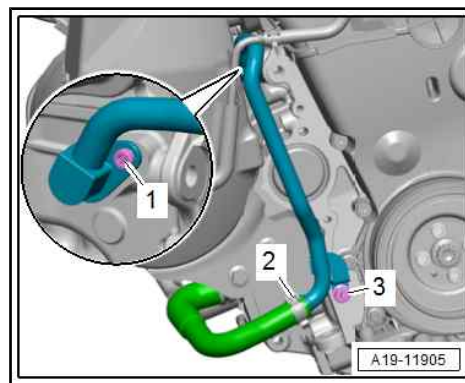
Installing

Installation is carried out in reverse order; note the following:

- Renew O-ring after removal.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Install air cleaner housing ⇒ [page 117](#) .
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Fill and bleed coolant circuit ⇒ [page 55](#) .

Tightening torques

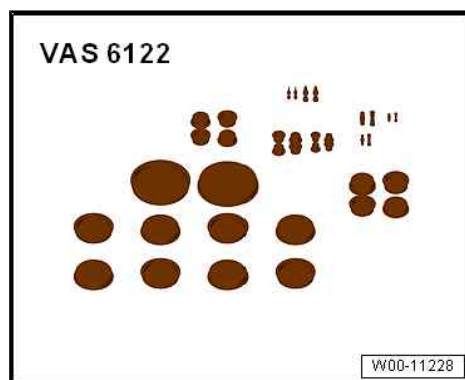
- ♦ ⇒ [“3.1 Exploded view - coolant pipes”, page 67](#)
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66; Wheel housing liners; Exploded view - wheel housing liner (front)
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Exploded view - noise insulation



3.2.7 Removing and installing coolant pipe (rear right)

Special tools and workshop equipment required

- ♦ Engine bung set - VAS 6122-

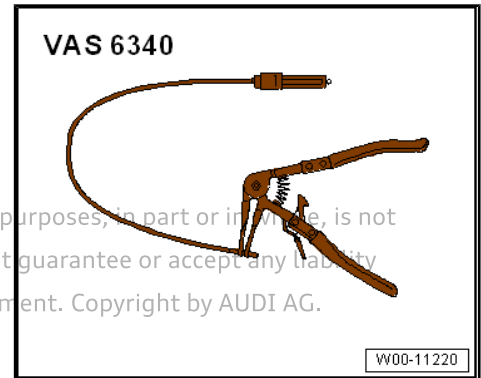




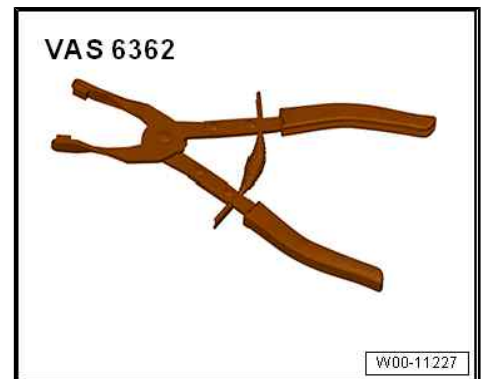
◆ Hose clip pliers - VAS 6340-



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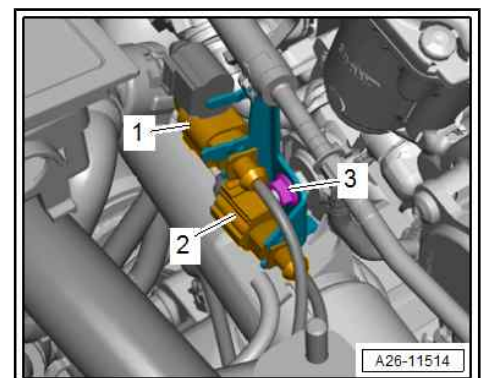


◆ Hose clip pliers - VAS 6362-



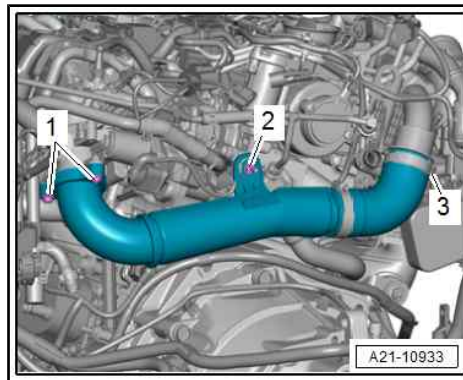
Removing

- Drain coolant ➔ [page 52](#) .
- Remove air cleaner housing
➔ ["3.2 Removing and installing air cleaner housing",
page 117](#) .
- Remove exhaust gas temperature sender 4 - G648- ➔ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender 4 - G648- .
- Remove plenum chamber partition panel ➔ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber partition panel .
- Remove nut -3- and move bracket with electrical connectors -1, 2- to one side.

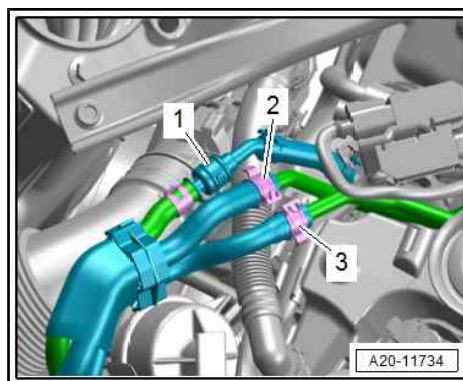




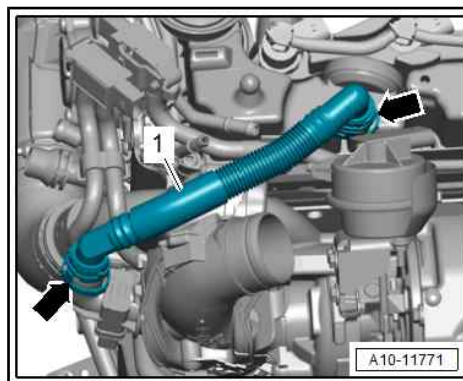
- Remove bolts -1- and centre hex stud -2-.
- Release hose clip -3- and detach air pipe.



- Disconnect fuel hoses -1- → Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Release hose clips:
 - 2 - For blue fuel hose
 - 3 - For white fuel hose
- Move coolant hoses clear and tie to right side.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .



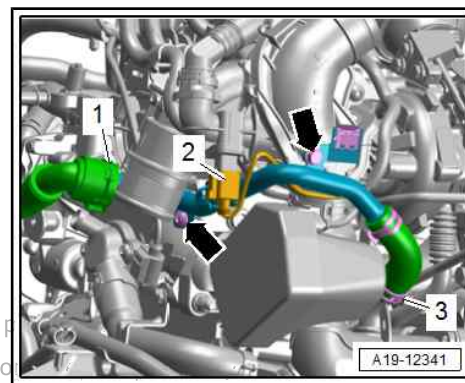
- Press release tabs -arrows- on both sides and disconnect crankcase breather hose -1-.



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- Move electrical wiring harness clear and unplug electrical connector -2-.
- Lift retaining clip -1- and disconnect coolant hose.
- Remove bolts -arrows-.
- Loosen hose clip -3- and detach coolant pipe (rear right).
- It is difficult to access the bolt -top arrow-; for this reason, use a small ratchet with a short bit to unscrew it.



Installing

Installation is carried out in reverse order; note the following:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Install exhaust gas temperature sender 4 - G648- ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender 4 - G648- .
- Install air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 117](#) .
- Connect fuel hoses ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Connect coolant hose with plug-in connector ⇒ [page 87](#) .
- Fill and bleed coolant circuit ⇒ [page 55](#) .

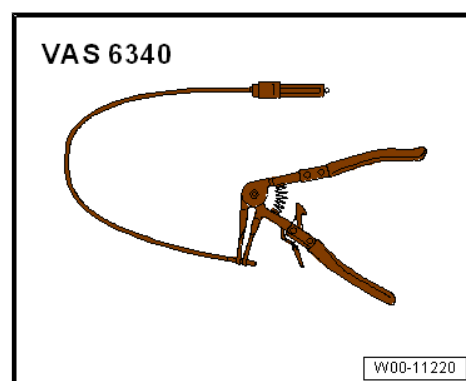
Tightening torques

- ◆ ⇒ ["3.1 Exploded view - coolant pipes", page 67](#)
- ◆ ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - charge air system
- ◆ ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ◆ ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber partition panel

3.2.8 Removing and installing coolant pipe (rear)

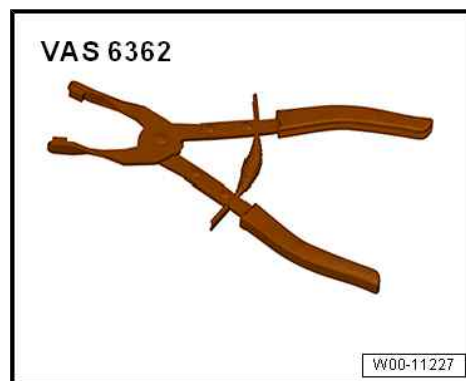
Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6340-



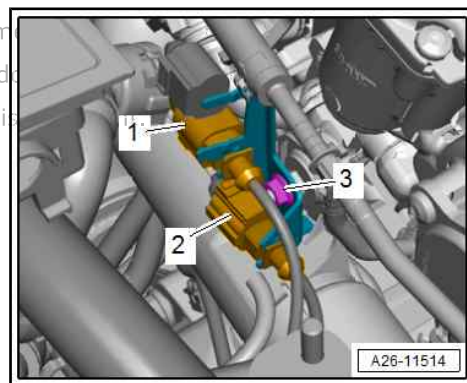


- ◆ Hose clip pliers - VAS 6362-

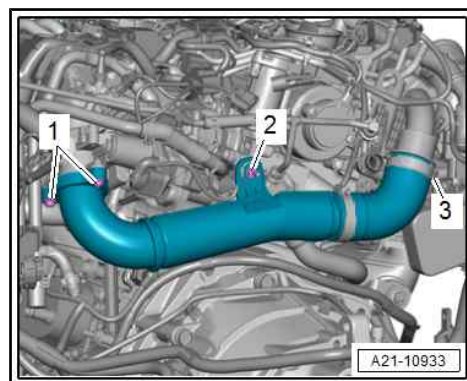


Removing

- Drain coolant ⇒ [page 52](#) .
- Remove support mounting (right-side) ⇒ [page 32](#) .
- Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50; Bulkhead; Exploded view - plenum chamber partition panel .
- Remove front exhaust pipe
⇒ ["1.2 Removing and installing front exhaust pipe", page 133](#) .
- Remove nut -3- and move bracket with electrical connectors -1, 2- to one side.



- Remove bolts -1- and centre hex stud -2-.
- Release hose clip -3- and detach air pipe.



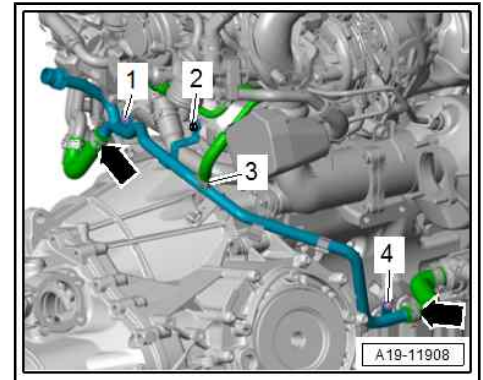


- Move electrical wiring clear.
- Remove nut -2- and bolts -1 and 4-.
- Release hose clips -3- and -arrows- and disconnect coolant hoses.
- Detach rear coolant pipe.

Installing

Installation is carried out in reverse order; note the following:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Install front exhaust pipe
⇒ [“1.2 Removing and installing front exhaust pipe”, page 133](#) .
- Install support mounting (right-side) ⇒ [page 32](#) .
- Fill and bleed coolant circuit ⇒ [page 55](#) .



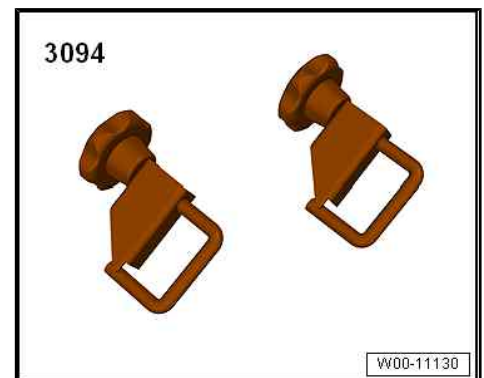
Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 67](#)
- ◆ ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ;
Charge air system; Exploded view - charge air system
- ◆ ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ;
Charge air system; Exploded view - hose connections for
charge air system
- ◆ ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead;
Exploded view - plenum chamber partition panel

3.3 Removing and installing coolant pipes for gearbox

Special tools and workshop equipment required

- ◆ Hose clamps up to 25 mm - 3094-





- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-



- ◆ Hose clip pliers - VAS 6362-



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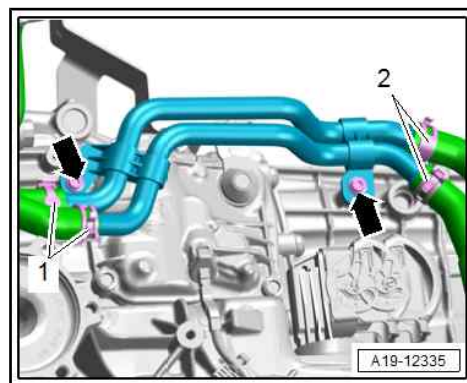
Removing

- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Remove bolts -arrows-.
- Clamp off coolant hoses using hose clamps up to 25 mm - 3094- , release hose clips -2- and disconnect hoses.
- Loosen hose clips -2- and detach coolant pipes.

Installing

Installation is carried out in reverse order; note the following:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Fill and bleed coolant circuit ⇒ [page 55](#) .



Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 67](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



4 Radiator/radiator fan

⇒ [“4.1 Exploded view - radiators/radiator fan”, page 85](#)

⇒ [“4.2 Removing and installing radiator”, page 90](#)

⇒ [“4.3 Removing and installing radiator blind \(top\)”, page 95](#)

⇒ [“4.4 Removing and installing radiator blind \(bottom\)”,
page 95](#)

⇒ [“4.5 Removing and installing radiator blind control motor \(top\)”,
page 96](#)

⇒ [“4.6 Removing and installing radiator blind control motor \(bot-
tom\)”, page 97](#)

⇒ [“4.7 Removing and installing water radiator for charge air cool-
ing circuit”, page 99](#)

⇒ [“4.8 Removing and installing radiator cowl”, page 101](#)

⇒ [“4.9 Removing and installing radiator fan V7 ”, page 103](#)

4.1 Exploded view - radiators/radiator fan

⇒ [page 85](#)

⇒ [page 87](#)

⇒ [page 87](#)

⇒ [page 88](#)

⇒ [page 89](#)

Radiator





1 - Radiator

- ☐ Removing and installing
⇒ [page 90](#)
- ☐ If there are slight impressions on the fins, refer to ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions; Installing radiators and condensers
- ☐ If renewed, change coolant in entire system

2 - Drain plug

- ☐ 1.5 ... 3 Nm

3 - O-ring

- ☐ Renew after removing

4 - Coolant hose

- ☐ Lift retaining clip to detach
- ☐ Connecting
⇒ [page 87](#)

5 - O-rings

- ☐ Renew if damaged
- ☐ Lubricate with coolant

6 - Coolant hose

- ☐ Lift retaining clip to detach
- ☐ Connecting
⇒ [page 87](#)

7 - Coolant pipe

- ☐ To coolant expansion tank
- ☐ Press release ring to detach
- ☐ Connecting ⇒ [page 87](#)

8 - O-ring

- ☐ Renew if damaged
- ☐ Lubricate with coolant

9 - Rubber bush

- ☐ For radiator

10 - Sleeve

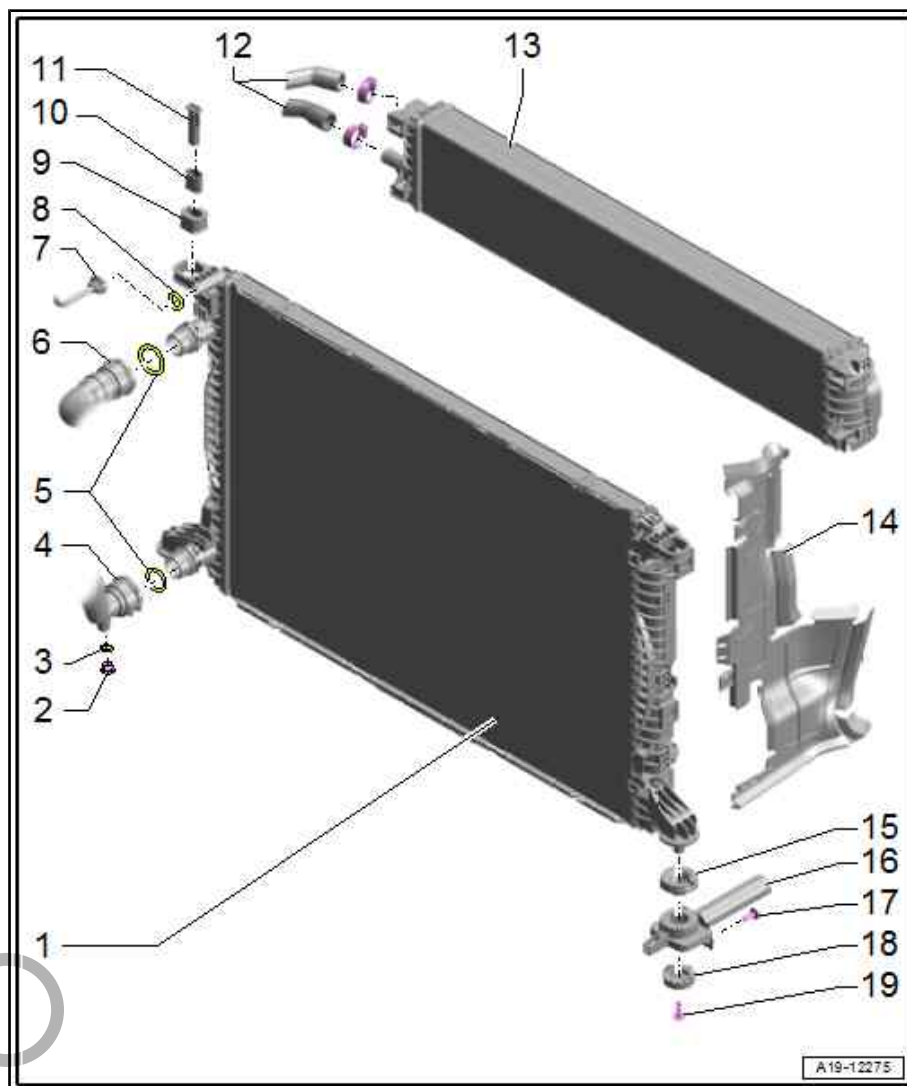
11 - Retaining pin

- ☐ Use screwdriver to release and pull off

12 - Coolant hoses

13 - Water radiator for charge air cooling circuit

- ☐ Removing and installing ⇒ [page 99](#)
- ☐ If there are slight impressions on the fins, refer to ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions; Installing radiators and condensers
- ☐ If renewed, change coolant in entire system



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14 - Air duct

15 - Rubber bush

- For radiator

16 - Radiator bracket

17 - Bolt

- 5 Nm

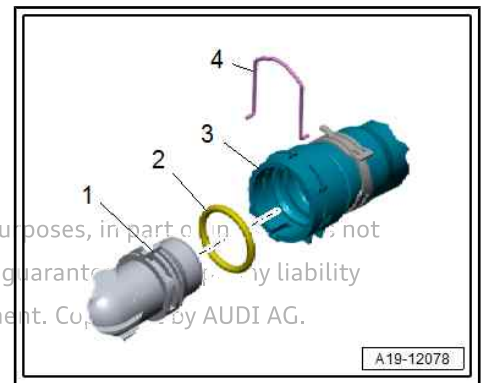
18 - Support

19 - Bolt

- 4.5 Nm

Connecting coolant hose with plug-in connector

- If damaged, renew retaining clip -4-.
- If damaged, renew O-ring. To do so, remove O-ring -2- from plug-in connector -3- using a suitable tool (do not use a sharp tool). Take care not to damage the plug-in connector or the surface on which the O-ring is seated.
- Lightly lubricate new O-ring with coolant and fit O-ring in coolant hose.
- Press coolant hose onto connection -1- until it engages audibly.
- Press coolant hose in again and then pull to check that plug-in connector is correctly engaged.



Radiator cowl and radiator fan



1 - Radiator cowl

- ❑ Removing and installing
⇒ [page 101](#)

2 - Bolt

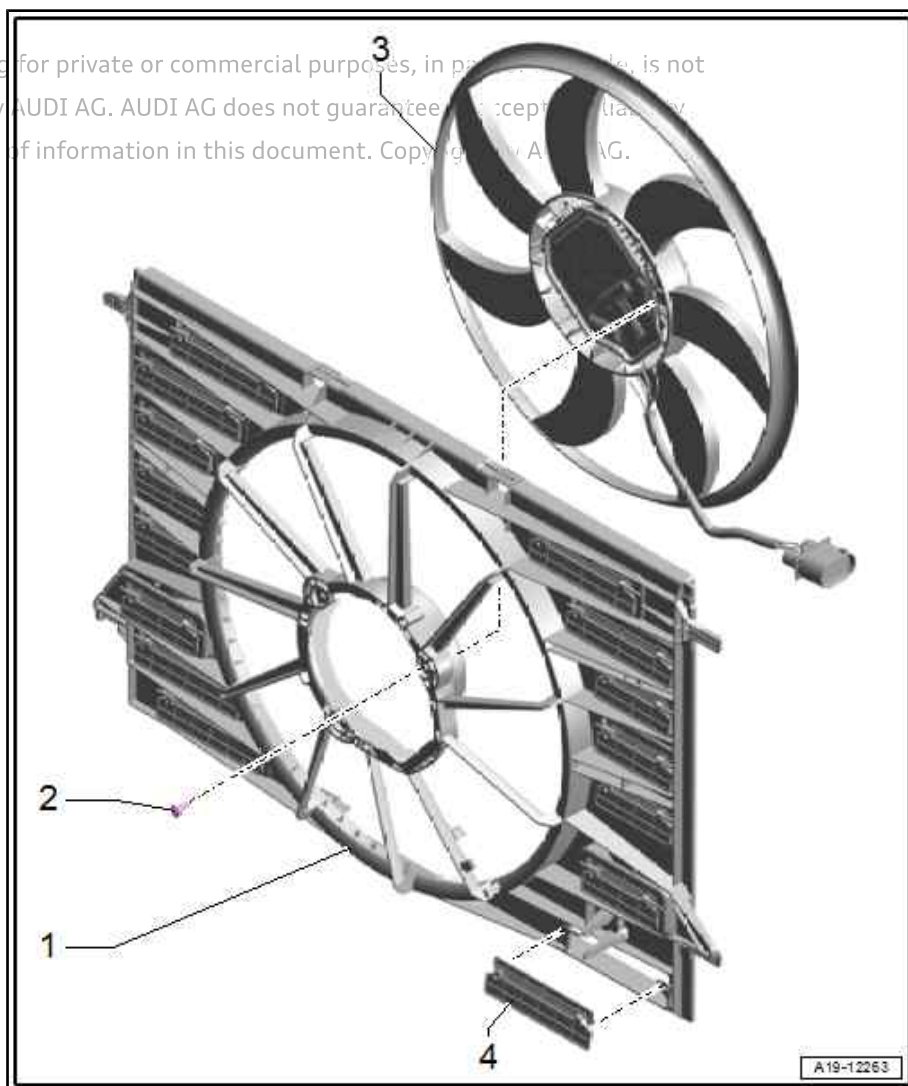
- ❑ 5 Nm

3 - Radiator fan - V7-

- ❑ With radiator fan control unit - J293-
- ❑ Removing and installing
⇒ [page 103](#)

4 - Air flow flap

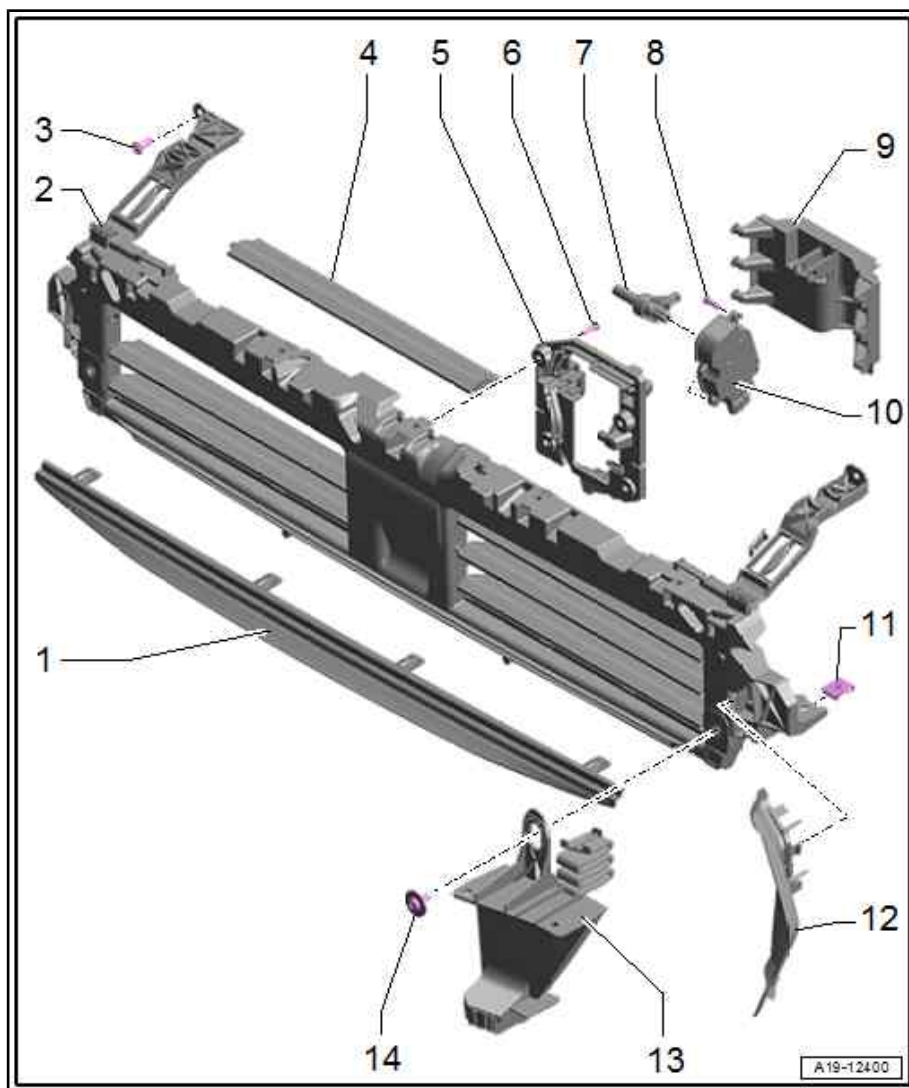
- ❑ Different versions available ⇒ Electronic parts catalogue



Radiator blind (top)



- 1 - Air duct
- 2 - Radiator blind (top)
 - ❑ Removing and installing
⇒ [page 95](#)
- 3 - Bolt
 - ❑ 5 Nm
- 4 - Fin
- 5 - Bracket
- 6 - Bolt
 - ❑ 8 Nm
- 7 - Carrier
- 8 - Bolt
 - ❑ 2.5 Nm
- 9 - Connecting piece
- 10 - Radiator blind control motor - V544-
 - ❑ Removing and installing
⇒ [page 96](#)
- 11 - Speed nut
- 12 - Air duct
- 13 - Spring element
- 14 - Bolt
 - ❑ 8 Nm



Radiator blind (bottom)



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1 - Air duct

2 - Radiator blind (bottom)

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

3 - Bolt

- ❑ 2.5 Nm

4 - Steel angle

5 - Bracket

6 - Bolt

- ❑ 1.5 Nm

**7 - Radiator blind control motor
2 - V550-**

- ❑ Removing and installing
⇒ [page 97](#)

8 - Fin

9 - Connecting piece

10 - Air duct

11 - Bolt

- ❑ 1.5 Nm

12 - Pop rivet

13 - Mounting bracket

- ❑ For impact bar

14 - Support

15 - Bracket

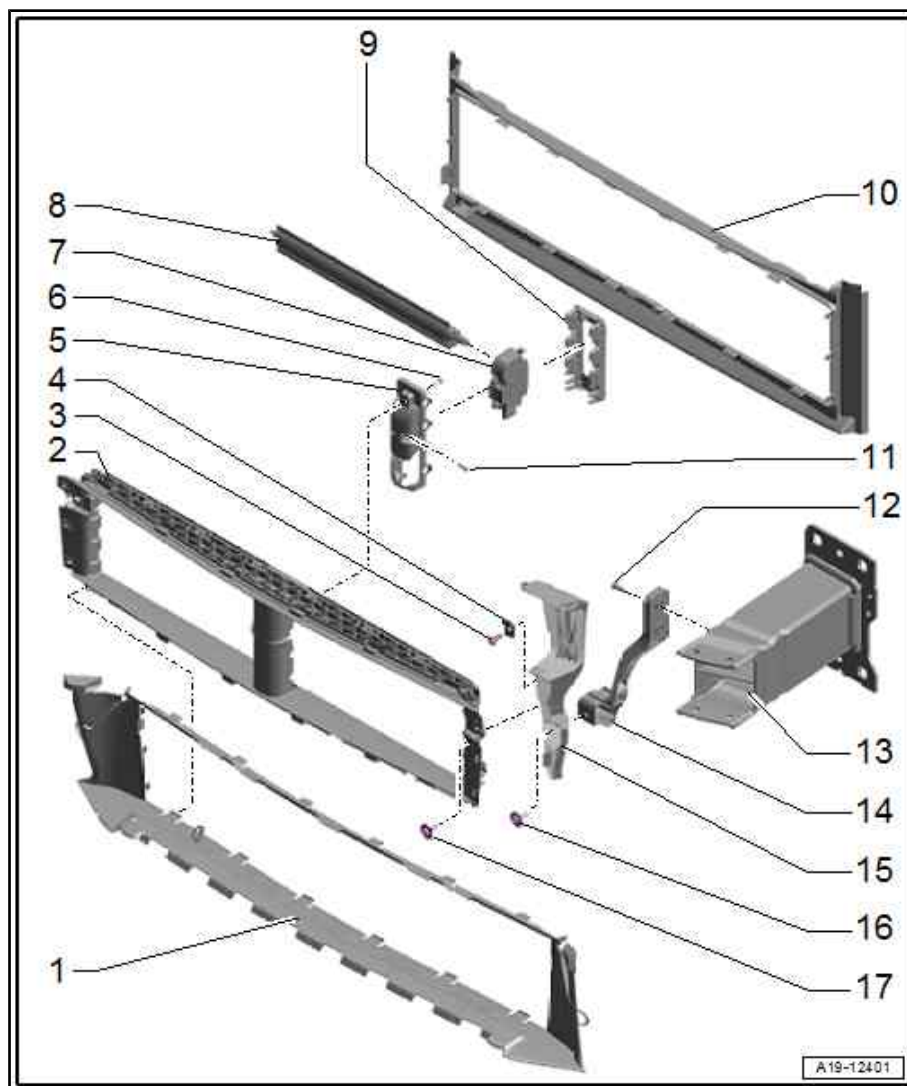
- ❑ For radiator blind

16 - Bolt

- ❑ 2.5 Nm

17 - Bolt

- ❑ 2.5 Nm



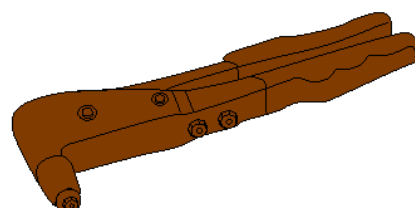
4.2 Removing and installing radiator

The radiator must be removed and installed together with the radiator cowl.

Special tools and workshop equipment required

- ♦ Pop rivet pliers - VAS 5072A-

VAS 5072 A



W00-11780



- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-

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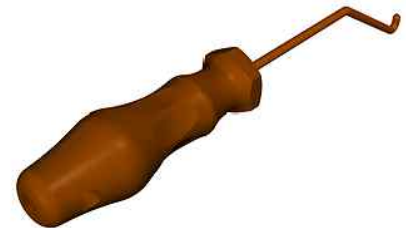
VAS 6208



W00-11209

- ◆ Assembly tool - T10118-

T10118



W00-11303

- ◆ Electric drill
- ◆ Pop rivets ⇒ Electronic parts catalogue

Removing

CAUTION

Risk of injury as the radiator fan may start up automatically.

- When working in the vicinity of the radiator, keep a safe distance from the radiator fan.

- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

The following step is required on A4 vehicles with LED headlights or matrix LED headlights:

- Remove headlight (left-side) ⇒ Electrical system; Rep. gr. 94 ; Headlights; Removing and installing headlights .

Vehicles without radiator blind:

- Remove bracket for bumper cover together with impact bar ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

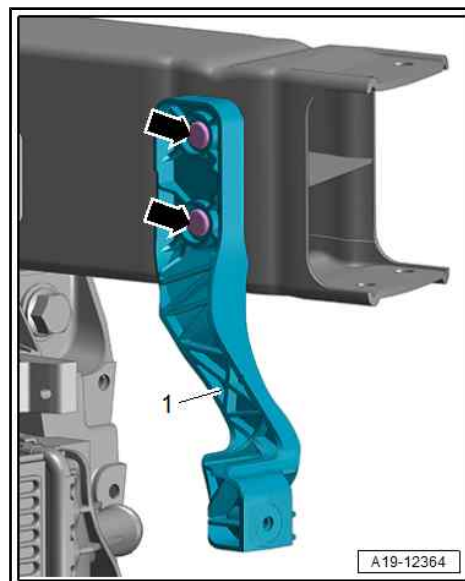


Vehicles with radiator blind:

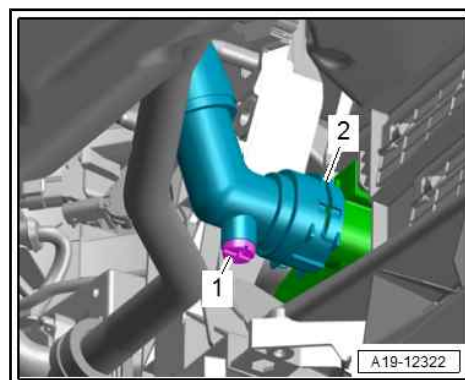
- Remove impact bar together with radiator blind (top)
⇒ [page 95](#) .
- Remove radiator blind (bottom) ⇒ [page 95](#) .
- Drill off rivet heads -arrows-, drive out rivet stems and remove any remaining rivet pieces.
- Detach bracket (left-side) -1- for radiator blind (bottom).

All vehicles (continued):

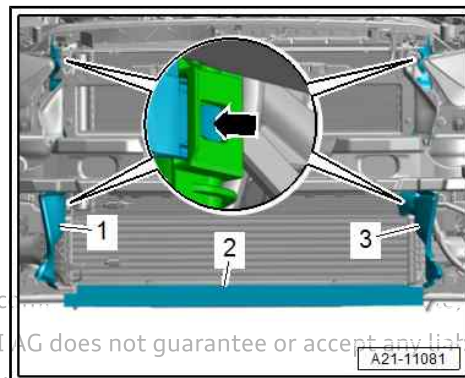
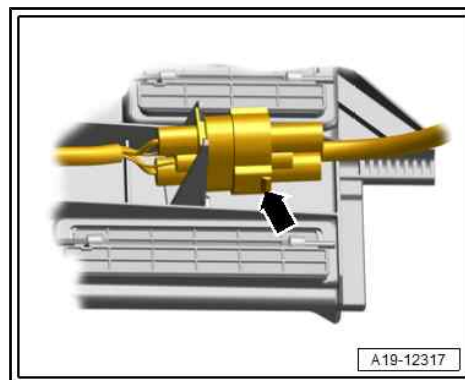
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Lift retaining clip -2- and disconnect coolant hose from radiator (bottom right).



- Unplug electrical connector -arrow- for radiator fan.



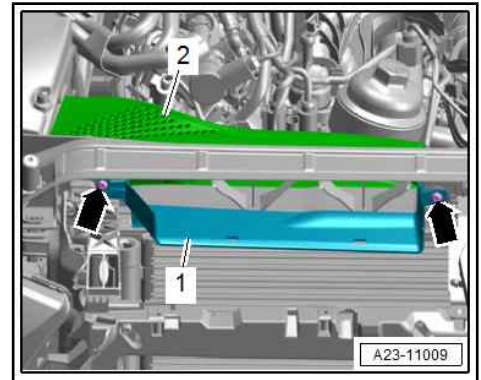
- Release catches -arrow- and detach air ducts -1, 3-.
- Unclip air duct -2-.



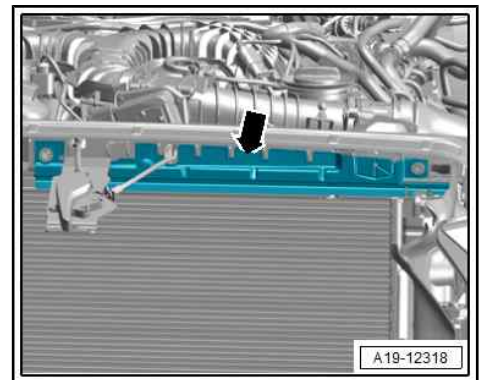
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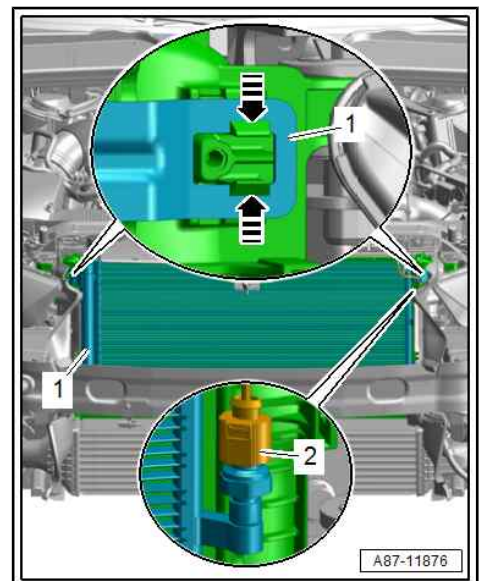
- Remove bolts -arrows- and detach air duct -1-.



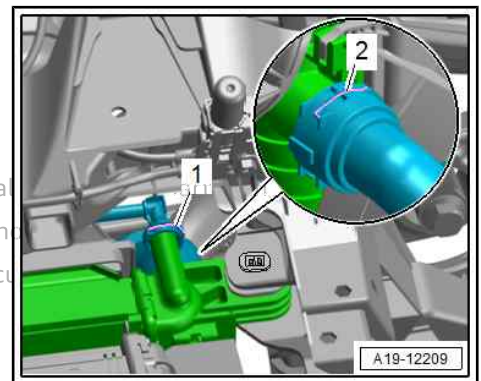
- Detach air duct (top) -arrow-.
- Remove water radiator for charge air cooling circuit
⇒ [page 99](#) .



- Unplug electrical connector -2- for high-pressure sender - G65- .
- Release fasteners -arrows- on both sides, disengage condenser -1- from radiator and tie up to one side.



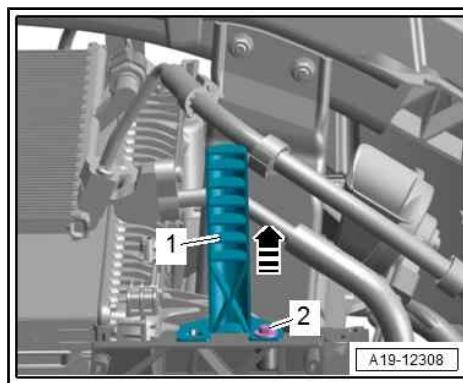
- Lift retaining clips -1, 2-, detach coolant connection from radiator and move connection clear.



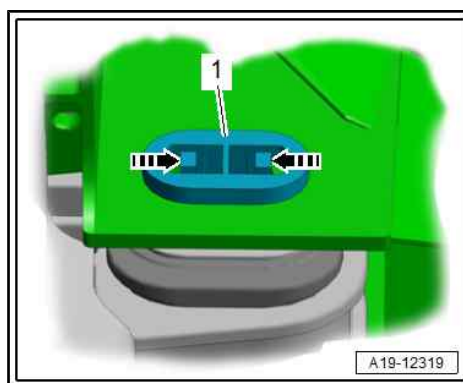
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- Remove bolt -2- on both sides and press radiator bracket -1- with radiator towards front -arrow-.



- Release fasteners -arrows- on both sides and pull retaining pins -1- for radiator out upwards.
- Detach radiator.

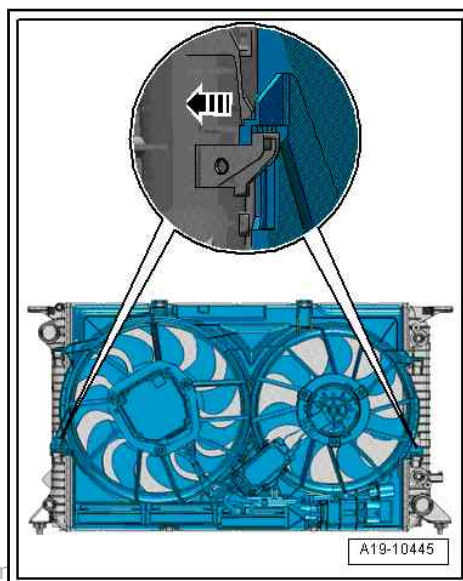


- Press locking tabs on left and right sides of radiator cowl together -arrow- and lift radiator cowl off radiator.

Installing

Installation is carried out in reverse order; note the following:

- If there are slight impressions on the fins, refer to ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions; Installing radiators and condensers .
- Do not reuse coolant.
- Install water radiator for charge air cooling circuit ⇒ [page 99](#) .
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Install headlight ⇒ Electrical system; Rep. gr. 94 ; Headlights; Removing and installing headlights .
- Connect coolant hose with plug-in connector ⇒ [page 87](#) .
- Fill and bleed coolant circuit ⇒ [page 55](#) .



Tightening torques

- ◆ ⇒ [“4.1 Exploded view - radiators/radiator fan”, page 85](#)
- ◆ ⇒ [“3.2 Removing and installing air cleaner housing”, page 117](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



4.3 Removing and installing radiator blind (top)

Removing

- Remove impact bar ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing impact bar .
- Vehicles with pedestrian protection: Unplug electrical connector -1- at crash sensor for pedestrian protection and move electrical wiring harness -2- clear.



- Unplug electrical connector -3- and move clear.

– Remove bolts -arrows- (left and right).
– Slide mounting bracket -2- with Bowden cable for operating lever for arrester towards lock carrier.
– Detach radiator blind (top) -1- towards front.

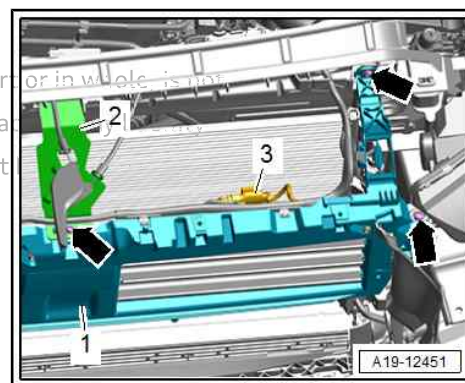
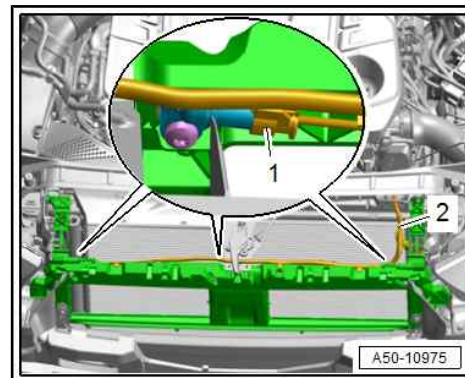
Installing

Installation is carried out in reverse order; note the following:

- Install impact bar ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing impact bar .

Tightening torques

- ◆ ⇒ [“4.1 Exploded view - radiators/radiator fan”, page 85](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 55 ; Bonnet; Exploded view - Bowden cable



4.4 Removing and installing radiator blind (bottom)

Removing

- Detach water radiator for charge air cooling circuit from radiator with coolant hoses connected, and tie it up to one side ⇒ [page 99](#) .



- Unplug electrical connector -1- at ambient temperature sensor - G17- and move electrical wiring harness clear. (Shown without the bumper cover.)
- Unplug electrical connector -3-.
- Remove bolts -arrows-.
- Detach radiator blind (bottom) -2-.

Installing

Installation is carried out in reverse order; note the following:

- Install water radiator for charge air cooling circuit
⇒ [page 99](#) .

Tightening torques

- ♦ ⇒ [“4.1 Exploded view - radiators/radiator fan”, page 85](#)

4.5 Removing and installing radiator blind control motor (top)

Special tools and workshop equipment required

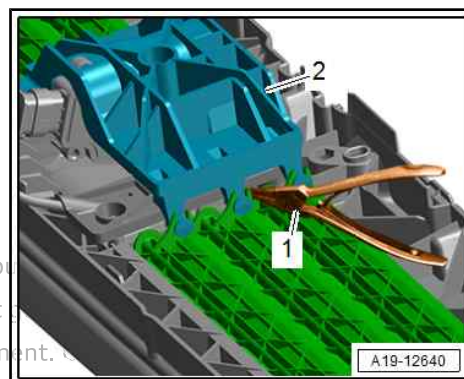
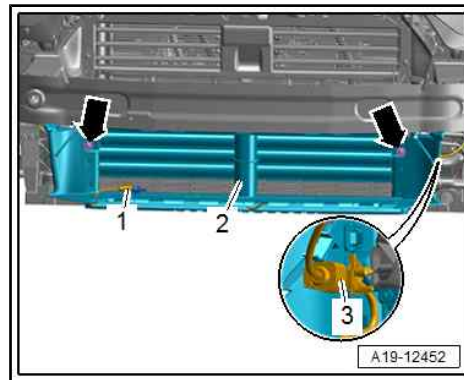
- ♦ Spreader tool (commercially available)

Removing

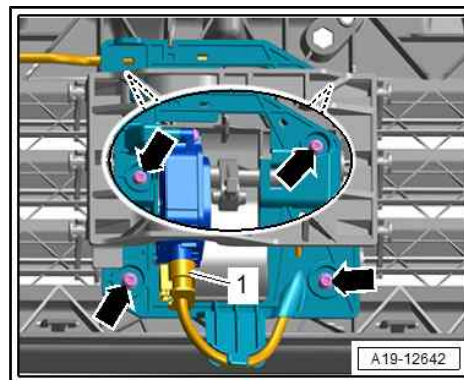
- Remove radiator blind (top) ⇒ [page 95](#) .
- Press connecting piece -2- off fins using spreader tool -1-.



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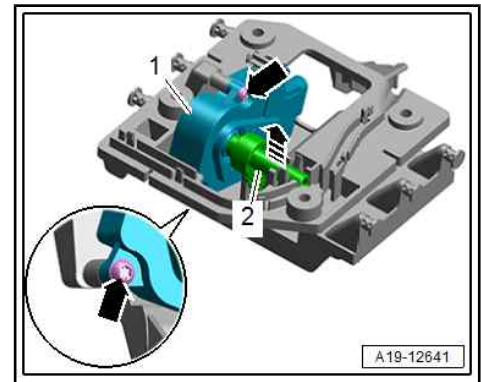


- Remove bolts -arrows-.
- Unplug electrical connector -1- for radiator blind control motor - V544- .





- Remove bolts -arrows-.
- Carefully unclip actuator -2- and pull slightly upwards.
- Swivel radiator blind control motor - V544- -1- downwards and detach.



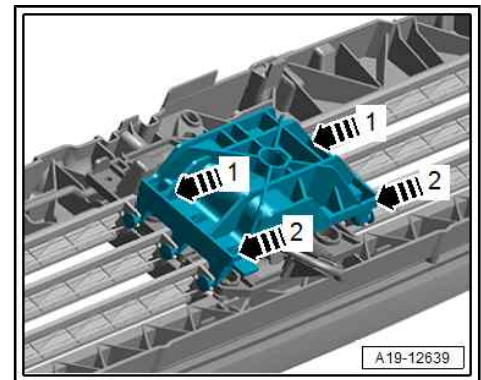
Installing

Installation is carried out in reverse order; note the following:

- To press on connecting piece, bring all fins into closed position as shown.
- Press on connecting piece -arrows- in the sequence -1, 2-.
- Install radiator blind (top) ➤ [page 95](#) .

Tightening torques

- ◆ ➤ [“4.1 Exploded view - radiators/radiator fan”, page 85](#)



4.6 Removing and installing radiator blind control motor (bottom)

Special tools and workshop equipment required

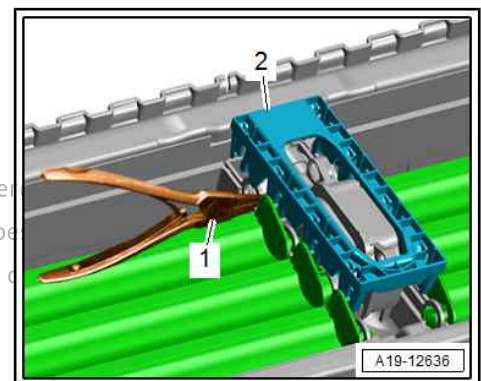
- ◆ Spreader tool (commercially available)

Removing

- Remove radiator blind (bottom) ➤ [page 95](#) .
- Press connecting piece -2- off fins using spreader tool -1-.

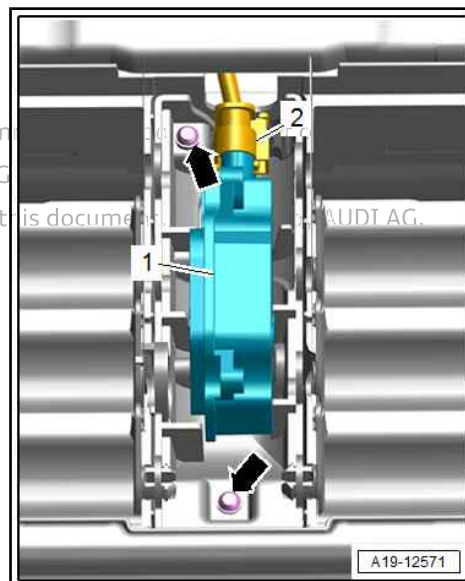


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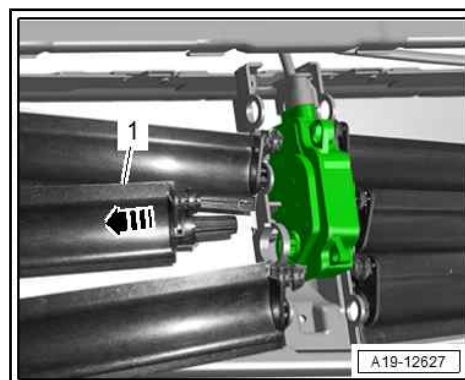




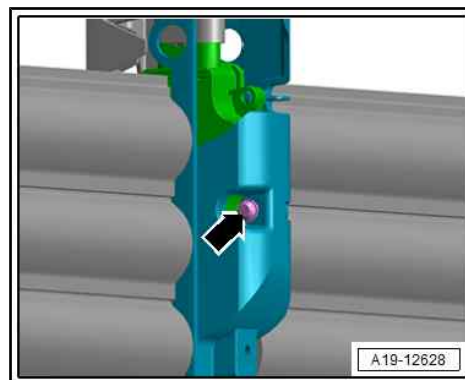
- Remove bolts -arrows-.
- Carefully lift motor -1- with fins.
- Unplug electrical connector -2- at radiator blind control motor 2 - V550- .
- Carefully lift out radiator blind control motor 2 - V550- -1- with fins.



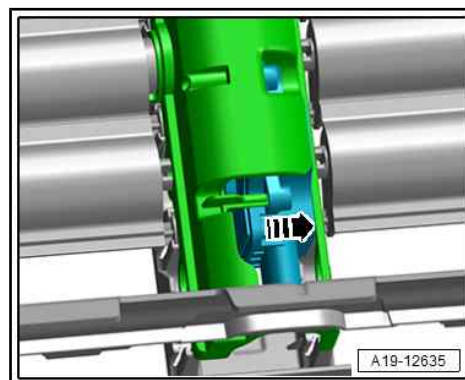
- Pull fin -1- off motor -arrow-.



- Remove bolt -arrow-.



- Pull radiator blind control motor 2 - V550- in direction of -arrow- and remove from mounting.





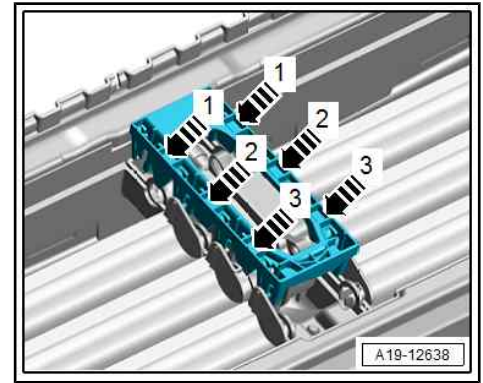
Installing

Installation is carried out in reverse order; note the following:

- To press on connecting piece, bring all fins into closed position as shown.
- Press on connecting piece -arrows- in the sequence -1, 2, 3-.
- Install radiator blind (bottom) ⇒ [page 95](#) .

Tightening torques

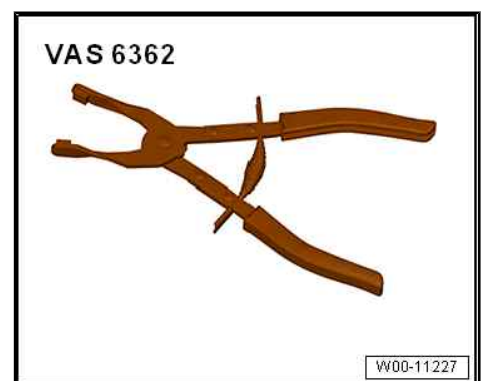
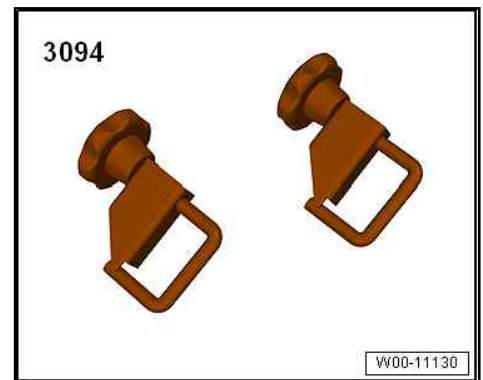
- ◆ ⇒ [“4.1 Exploded view - radiators/radiator fan”, page 85](#)



4.7 Removing and installing water radiator for charge air cooling circuit

Special tools and workshop equipment required

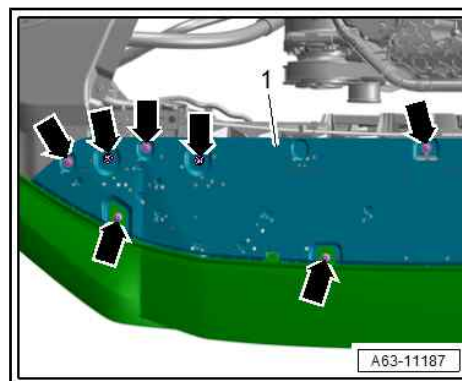
- ◆ Hose clamps up to 25 mm - 3094-
- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-
- ◆ Hose clip pliers - VAS 6362-



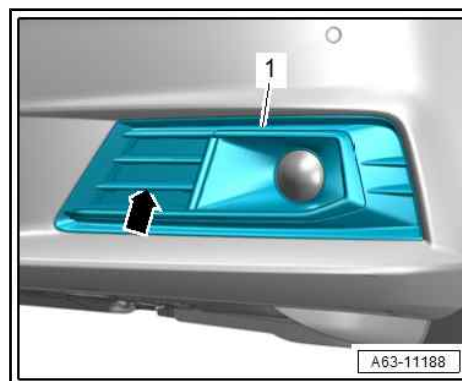


Removing

- Remove closure plate for bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .



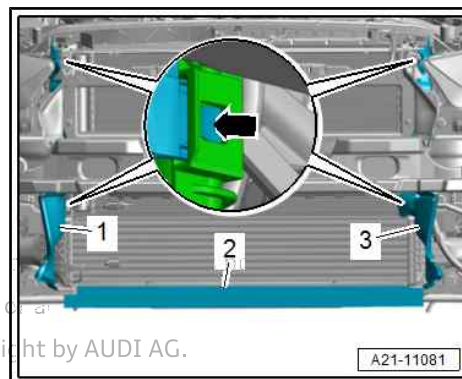
- Remove air intake grille on both sides ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .



- Move air guides -1, 3- (left and right) clear at water radiator for charge air cooling circuit.



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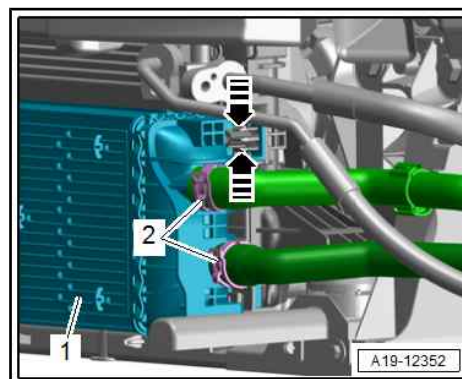


- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Clamp off coolant hoses using hose clamps up to 25 mm - 3094- , release hose clips -2- and disconnect hoses.
- Release fasteners on both sides and detach water radiator for charge air cooling circuit -1-.

Installing

Installation is carried out in reverse order; note the following:

- Do not reuse coolant.
- Fill and bleed coolant circuit ⇒ [page 55](#) .
- Install closure plate at bumper cover and air intake grille (left and right) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .





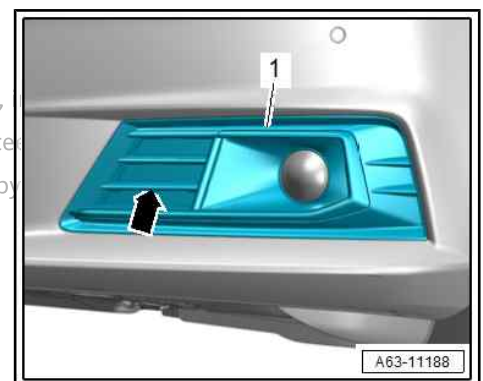
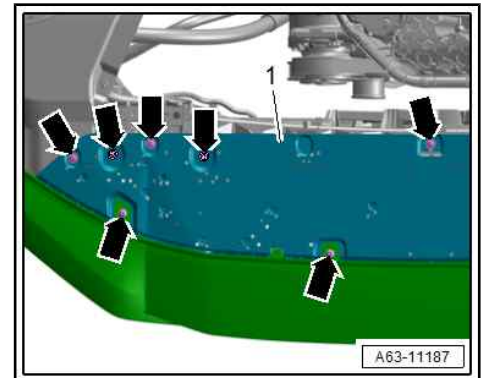
4.8 Removing and installing radiator cowl

Removing

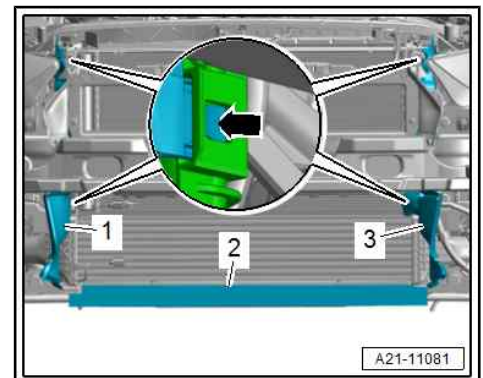
- Remove closure plate for bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .



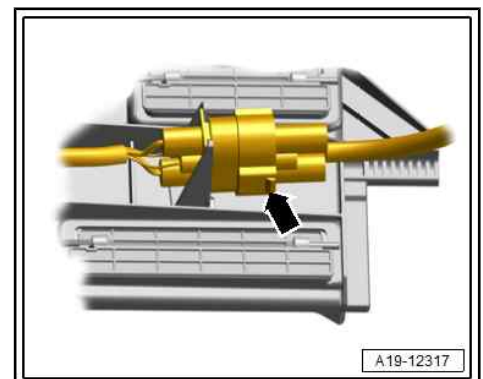
- Remove air intake grille on both sides ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
 - Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
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- Release catches -arrow- and detach air ducts -1, 3-.
- Unclip air duct -2-.
- Vehicles with radiator blind (bottom): Detach water radiator for charge air cooling circuit from radiator with coolant hoses connected, and tie it up to one side ⇒ [page 99](#) .

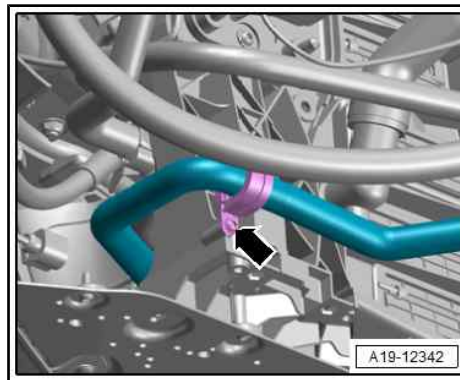


- Unplug electrical connector -arrow- for radiator fan.

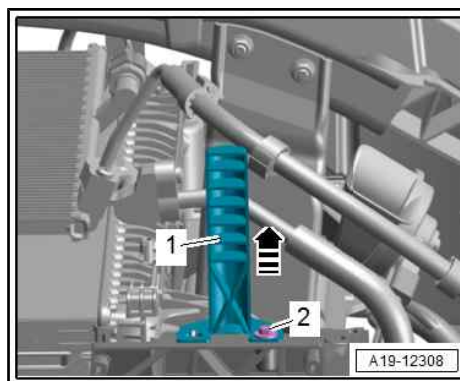




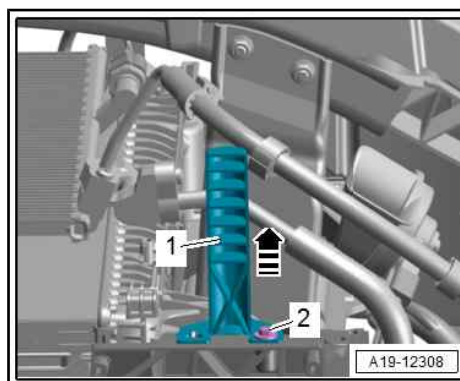
- Remove bolt -arrow- for retaining clip.



- Remove bolt -2- on both sides and press radiator bracket -1- with radiator towards front -arrow-.



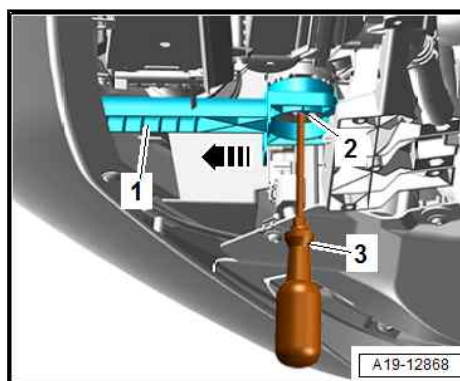
- Remove bolt -2- (both sides) for radiator bracket -1-.



- Remove bolt -2- (both sides) for radiator bracket -1- using suitable tool -3-.
- Detach radiator bracket -1- (both sides) in direction of -arrow-.

Note:

Mark installation position of radiator bracket relative to rubber bush (for re-installation).



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- Press locking tabs on left and right sides of radiator cowl -arrow- and at the same time lift radiator cowl off radiator.
- Take radiator cowl out downwards between radiator and lock carrier, pressing bottom of radiator module as far forwards as possible.

Installing

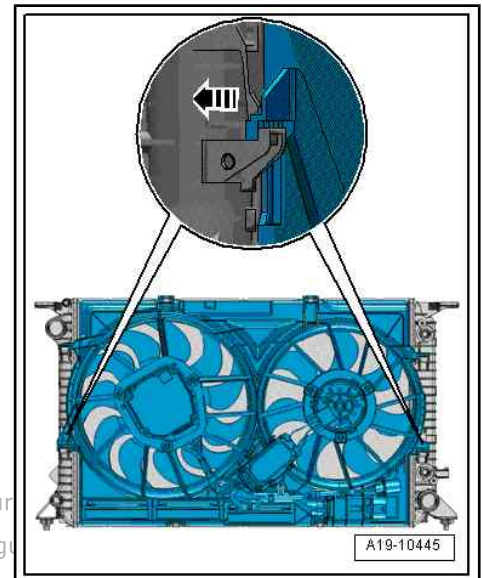
Installation is carried out in reverse order; note the following:

- Install lock carrier cover, air intake grille (left and right) and closure plate at bumper cover ➤ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .

Tightening torques

- ◆ ➤ [“4.1 Exploded view - radiators/radiator fan”, page 85](#)

- ◆ ➤ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view noise insulation



4.9 Removing and installing radiator fan - V7-

Removing

- Secure all cable ties in the same locations when re-installing.
- Remove radiator cowl ➤ [page 101](#) .
- Move electrical wiring harness clear.
- Unscrew bolts -arrows- and remove radiator fan.

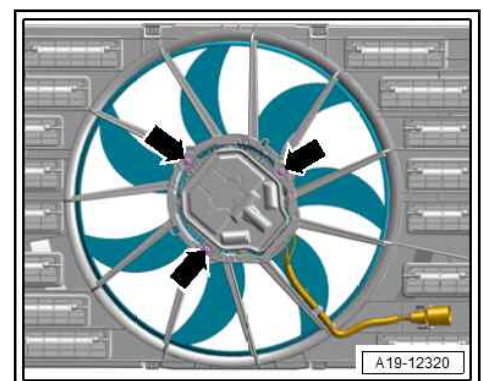
Installing

Installation is carried out in reverse order; note the following:

- Do not remove balancing clamps from fan wheel.
- Install radiator cowl ➤ [page 101](#) .

Tightening torques

- ◆ ➤ [“4.1 Exploded view - radiators/radiator fan”, page 85](#)





21 – Turbocharging/supercharging

1 Turbocharger

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger .



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2 Charge air system

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system .



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23 – Mixture preparation - injection

1 Injection system

⇒ “1.1 Overview - fuel system”, page 106

⇒ “1.2 Overview of fitting locations - injection system”, page 107

⇒ “1.3 Filling and bleeding fuel system”, page 114

⇒ “1.4 Checking fuel system for leaks”, page 114

1.1 Overview - fuel system

- ◆ Red = fuel supply
- ◆ Blue = fuel return
- ◆ Arrows = direction of fuel flow

1 - Fuel filter

2 - Water separator

- ☐ With water level sender - G120-
- ☐ Depending on vehicle equipment

3 - High-pressure pump

4 - Fuel metering valve - N290-

5 - Fuel temperature sender - G81-

6 - Restrictor

7 - Fuel pressure sender - G247-

8 - High-pressure reservoir (rail)

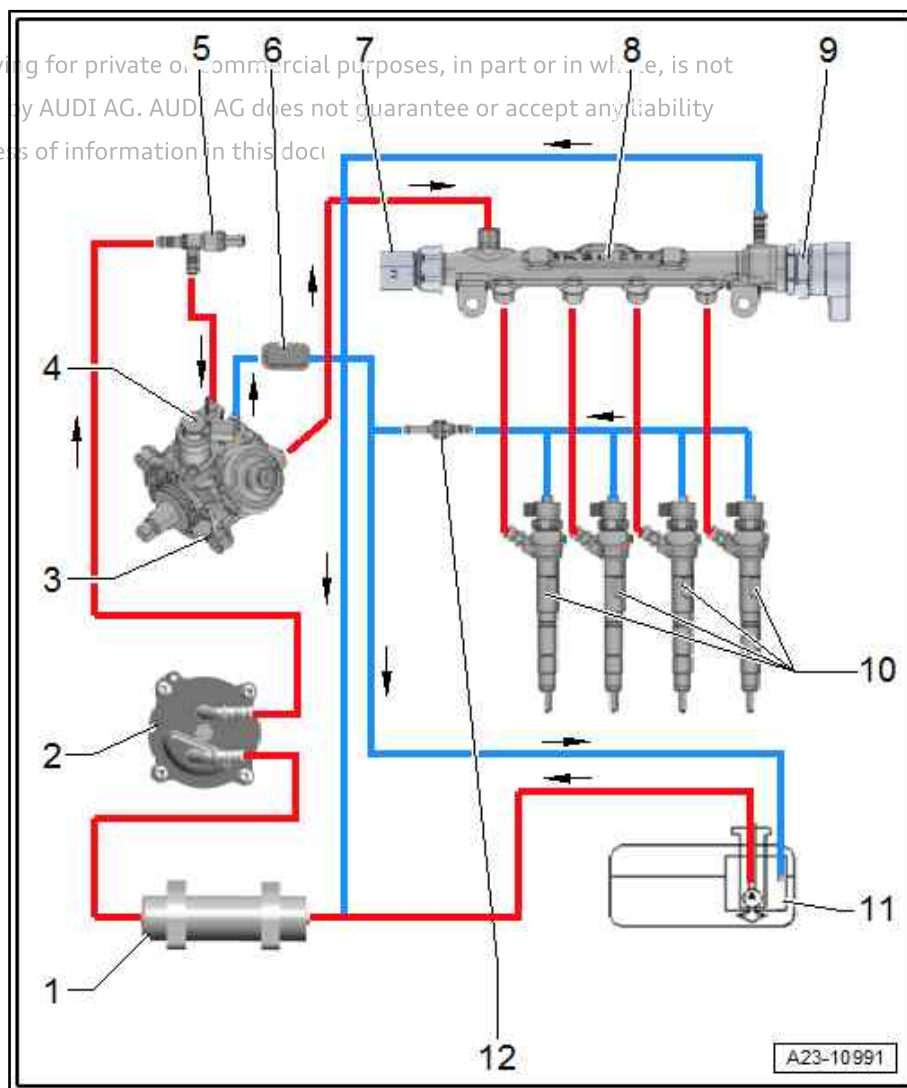
9 - Fuel pressure regulating valve - N276-

10 - Injectors

11 - Fuel tank

- ☐ With fuel system pressurisation pump - G6-

12 - Restrictor





1.2 Overview of fitting locations - injection system

Overview of fitting locations - engine compartment

1 - Air mass meter - G70-

- ☐ Exploded view
⇒ [page 116](#)

2 - Gear detection sensor - G604-

- ☐ Fitting location
⇒ [page 108](#)

3 - Automatic glow period control unit - J179-

4 - Exhaust flap control unit - J883-

- ☐ Fitting location
⇒ [page 109](#)

5 - Accelerator position sender - G79- and accelerator position sender 2 - G185-

- ☐ Fitting location
⇒ [page 108](#)

6 - Brake servo pressure sensor - G294-

7 - Brake light switch - F-

- ☐ Fitting location
⇒ [page 108](#)

8 - Clutch position sender - G476-

- ☐ Fitting location
⇒ [page 108](#)

9 - Engine control unit - J623-

- ☐ Exploded view
⇒ [page 126](#)

10 - Charge air cooling pump - V188-

- ☐ Fitting location ⇒ [page 109](#)

11 - Left electrohydraulic engine mounting solenoid valve - N144-

- ☐ Fitting location ⇒ [page 109](#)

12 - Water separator

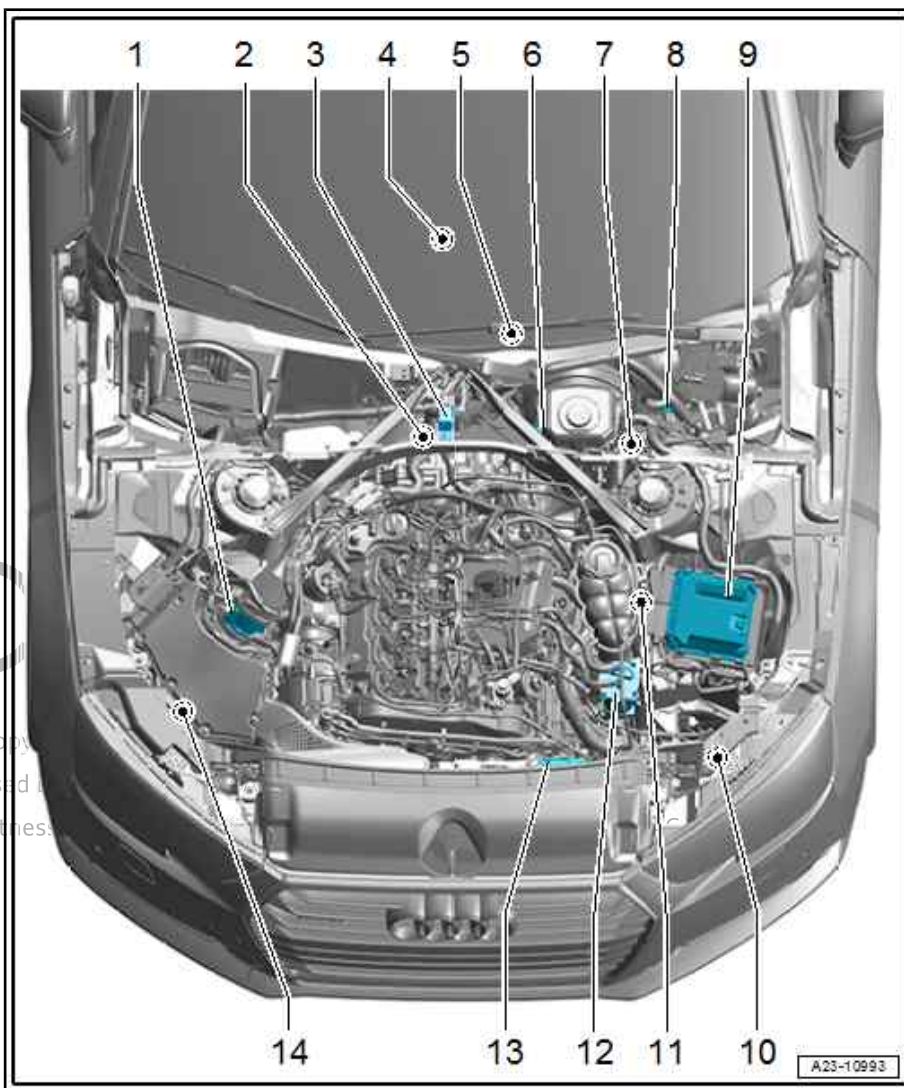
- ☐ With water level sender - G120-
- ☐ Depending on vehicle equipment

13 - Control unit for NOx sender - J583-

- ☐ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe

14 - Air filter bypass flap valve - N275-

- ☐ Depending on vehicle equipment; not installed on all vehicles
- ☐ Not applicable to more recent versions
- ☐ Fitting location ⇒ [page 109](#)

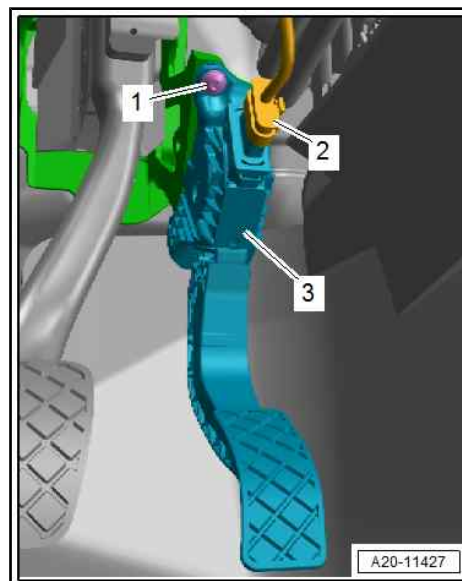




Fitting location of accelerator position sender - G79- / accelerator position sender 2 - G185-

- ◆ Integrated in accelerator pedal module -3-. Accelerator position senders cannot be renewed separately if defective.

Exploded view ⇒ Fuel supply system; Rep. gr. 20 ; Accelerator mechanism; Exploded view - accelerator pedal module

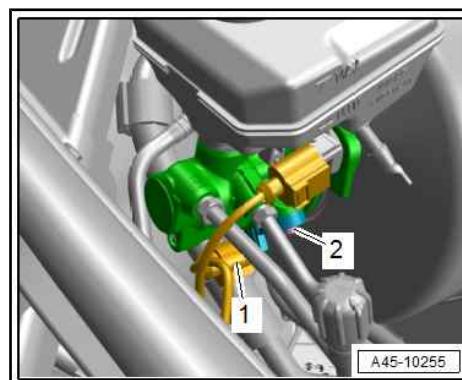


Fitting location of brake light switch - F-

- ◆ In plenum chamber on brake master cylinder

1 - Electrical connector for brake light switch - F-

Exploded view ⇒ Brake system; Rep. gr. 47 ; Brake servo/brake master cylinder; Exploded view - brake servo/brake master cylinder

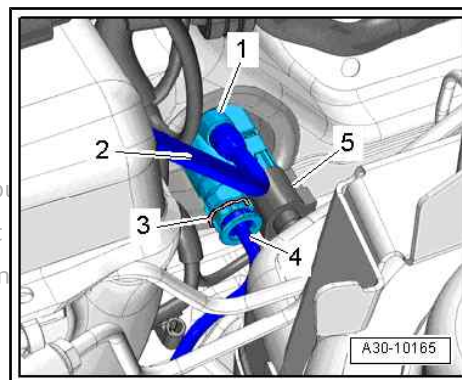


Fitting location of clutch position sender - G476-

- ◆ Integrated in clutch master cylinder in plenum chamber on driver's side. It cannot be renewed separately if defective.

5 - Electrical connector for clutch position sender - G476-

Exploded view ⇒ Rep. gr. 30 ; Clutch mechanism; Exploded view - pedal cluster

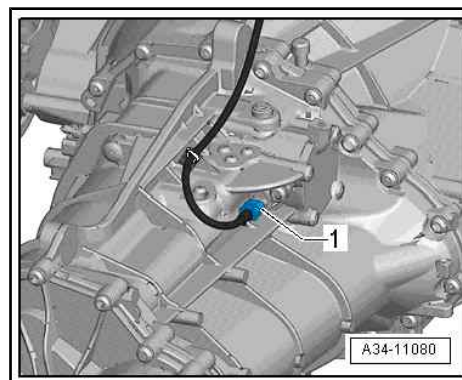


Fitting location of gear detection sensor - G604-

- ◆ At top right of manual gearbox

1 - Gear detection sensor - G604-

Removing and installing ⇒ Rep. gr. 34 ; Selector mechanism ; Removing and installing gear detection sensor - G604-





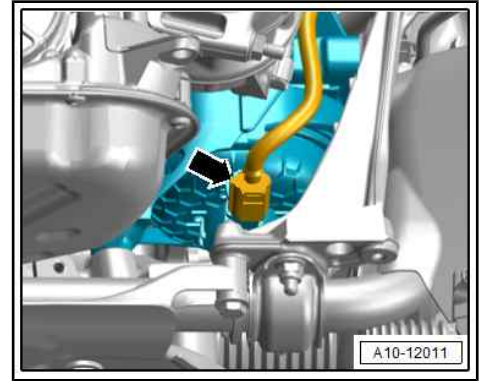
Fitting location of electrohydraulic engine mounting solenoid valves -N144- / -N145-

- ◆ Integrated in engine mounting. It cannot be renewed separately if defective.

Pfeil - Electrical connector for left electrohydraulic engine mounting solenoid valve - N144-

Removing and installing

⇒ [“2.3.1 Removing and installing engine mountings”, page 30](#)



Fitting location of charge air cooling pump - V188-

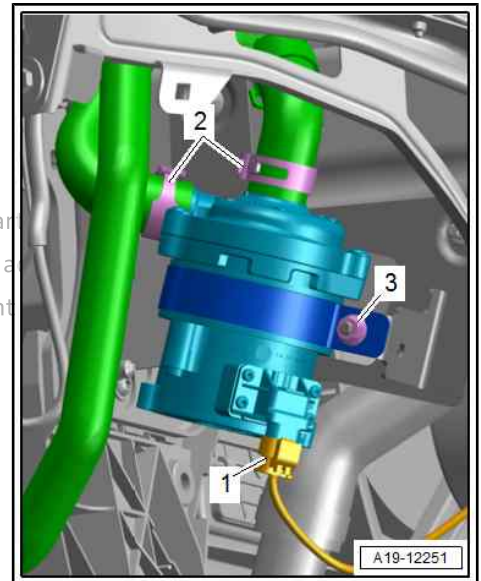
- ◆ In wheel housing (front left)

1 - Electrical connector for charge air cooling pump - V188-

Removing and installing

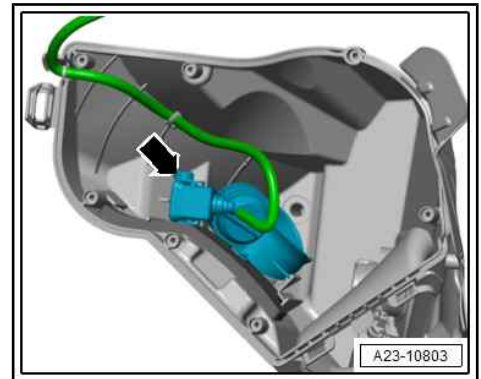
⇒ [“2.4.1 Removing and installing charge air cooling pump V188”, page 62](#)

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Fitting location of air filter bypass flap valve - N275-

- ◆ In air cleaner (bottom section) -arrow-
- ◆ Depending on vehicle equipment; not installed on all vehicles

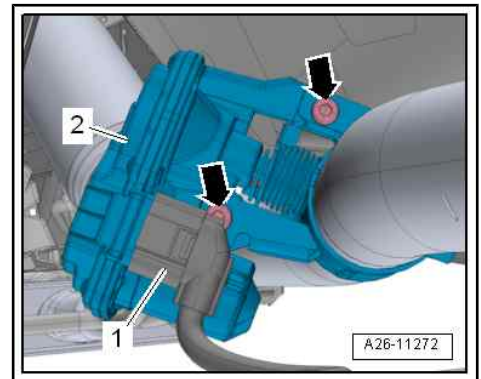


Fitting location of exhaust flap control unit - J883-

- ◆ On catalytic converter

1 - Electrical connector for exhaust flap control unit - J883-

Removing and installing ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Emission control system; Removing and installing exhaust flap control unit - J883- .



Overview of fitting locations - engine (view from left side)



1 - Oil level and oil temperature sender - G266-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump

2 - Valve for oil pressure control - N428-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump

3 - Hall sender - G40- (camshaft position sensor)

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

4 - Throttle valve module - J338-

- ❑ With throttle valve potentiometer - G69-
- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Exploded view - intake manifold

5 - Oil pressure switch for reduced oil pressure - F378-

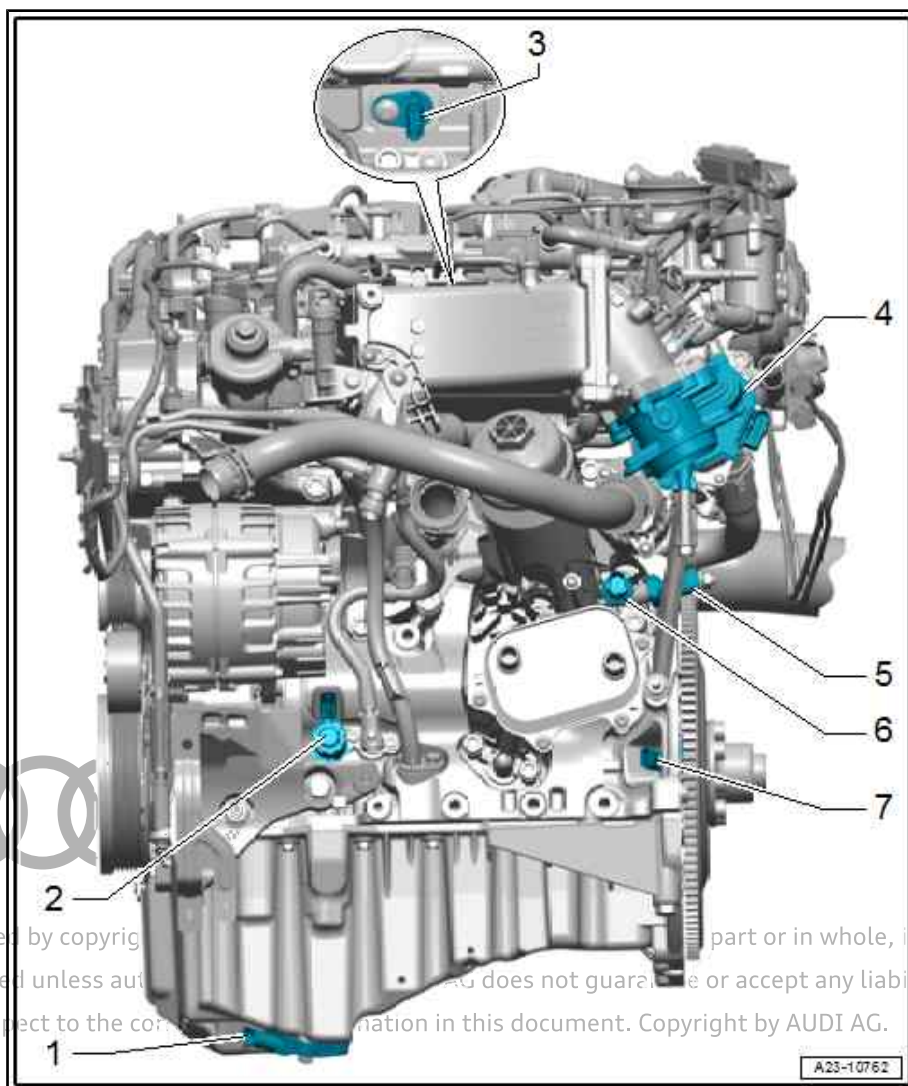
- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches; Exploded view - oil filter housing/oil pressure switches

6 - Oil pressure switch - F22-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches; Exploded view - oil filter housing/oil pressure switches

7 - Engine speed sender - G28-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system



Overview of fitting locations - engine (view from right side)



1 - Exhaust gas temperature sender 4 - G648-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Exploded view - exhaust gas temperature control

2 - Exhaust gas recirculation control motor 2 - V339-

- ❑ With exhaust gas recirculation potentiometer 2 - G466-
- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Exploded view - exhaust gas recirculation

3 - NOx sender - G295-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe

4 - Lambda probe - G39- with Lambda probe heater - Z19-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe

5 - Injector for reducing agent - N474-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Exploded view - reducing agent supply line

6 - Exhaust gas temperature sender 3 - G495-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Exploded view - exhaust gas temperature control

7 - Exhaust gas temperature sender 2 - G448-

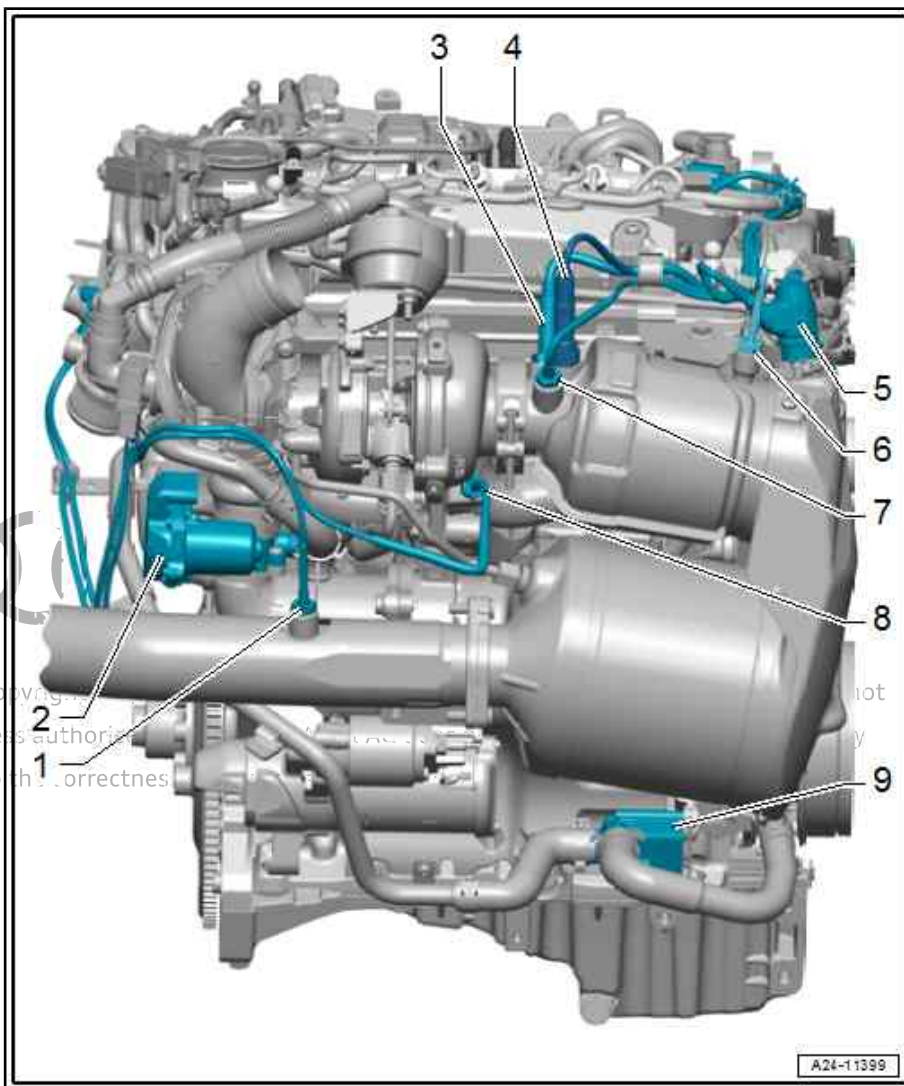
- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Exploded view - exhaust gas temperature control

8 - Exhaust gas temperature sender 1 - G235-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Exploded view - exhaust gas temperature control

9 - Auxiliary pump for heating - V488-

- ❑ Exploded view ⇒ ["2.4.2 Removing and installing auxiliary pump for heating V488", page 64](#)



Overview of fitting locations - engine (view from above)

**1 - Injector, cylinder 1 - N30-**

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors

2 - Injector, cylinder 2 - N31-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors

3 - Injector, cylinder 3 - N32-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors

4 - Injector, cylinder 4 - N33-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors

5 - Position sender for charge pressure positioner - G581-**6 - Exhaust gas pressure sensor 1 - G450-**

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe

7 - Pressure differential sender - G505-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe

8 - Fuel pressure regulating valve - N276-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - high-pressure reservoir (rail)

9 - Glow plug 4 - Q13-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

10 - Charge pressure sender - G31-

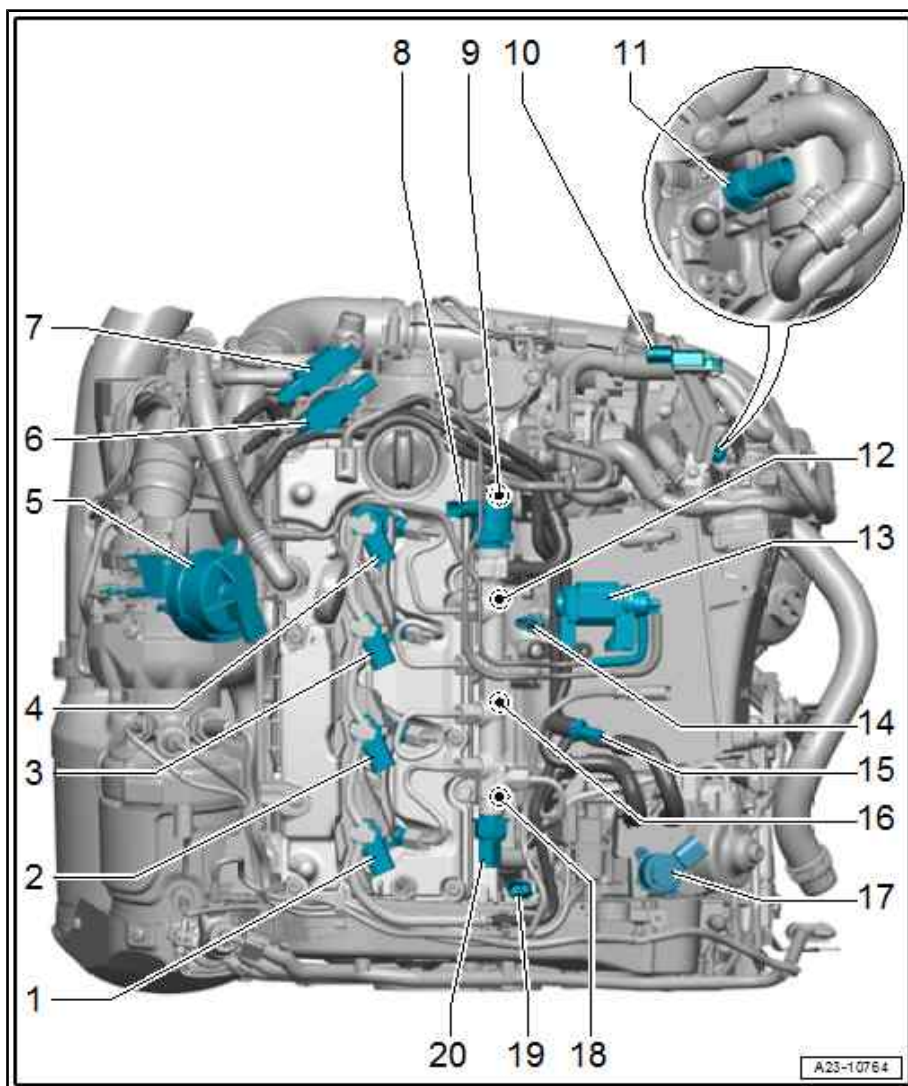
- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - charge air system

11 - Charge air temperature sender before charge air cooler - G810-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - charge air system

12 - Glow plug 3 - Q12-

- ❑ With internal cylinder pressure sender for cylinder 3 - G622-
- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system





13 - Charge pressure control solenoid valve - N75-

14 - Charge air temperature sender after charge air cooler - G811-

- ☐ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - charge air system

15 - Fuel temperature sender - G81-

- ☐ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - high-pressure reservoir (rail)

16 - Glow plug 2 - Q11-

- ☐ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

17 - Fuel metering valve - N290-

- ☐ Integrated in high-pressure pump

18 - Glow plug 1 - Q10-

- ☐ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

19 - Coolant valve for cylinder head - N489-

- ☐ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump/thermostat

20 - Fuel pressure sender - G247-

- ☐ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - high-pressure reservoir (rail)

Overview of fitting locations - engine (view from rear)



1 - Exhaust gas recirculation control motor - V338-

- ❑ With exhaust gas recirculation potentiometer - G212-
- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Exploded view - exhaust gas recirculation

2 - Not fitted

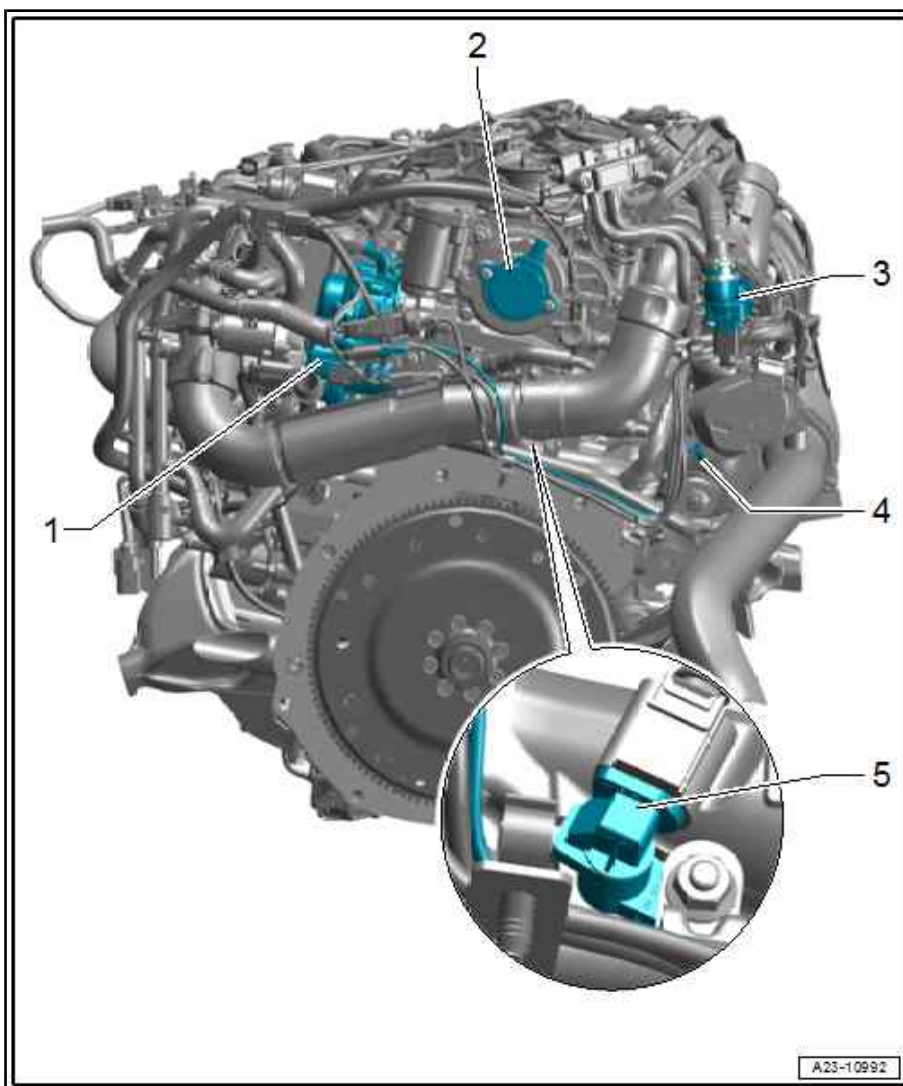
3 - Heating element for crankcase breather - N79-

4 - Exhaust gas recirculation temperature sensor - G98-

- ❑ Depending on vehicle equipment
- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Exploded view - exhaust gas recirculation

5 - Coolant temperature sender - G62-

- ❑ Exploded view ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant temperature senders



1.3 Filling and bleeding fuel system

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Injection system; Filling and bleeding fuel system .

1.4 Checking fuel system for leaks

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Injection system; Checking fuel system for leaks .



2 Vacuum system

⇒ [“2.1 Connection diagram - vacuum system”, page 115](#)

⇒ [“2.2 Checking vacuum system”, page 115](#)

2.1 Connection diagram - vacuum system

1 - Vacuum supply line

- ❑ Leading from vacuum pump to brake servo

2 - Vacuum line

- ❑ To charge pressure control solenoid valve - N75-

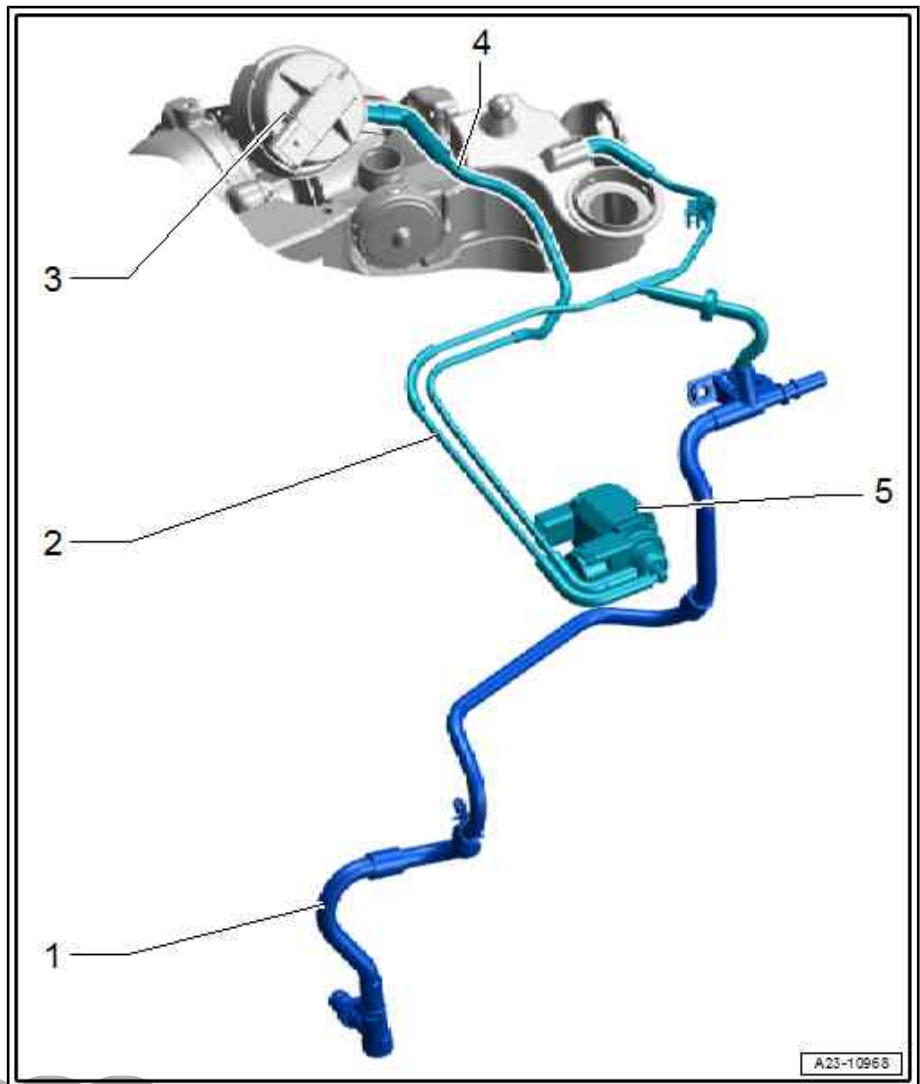
3 - Vacuum unit

- ❑ On turbocharger

4 - Control pipe for vacuum

- ❑ To vacuum unit on turbocharger

5 - Charge pressure control solenoid valve - N75-



2.2 Checking vacuum system

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 : Vacuum system; Checking vacuum system .

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3 Air cleaner

⇒ [“3.1 Exploded view - air cleaner housing”, page 116](#)

⇒ [“3.2 Removing and installing air cleaner housing”, page 117](#)

3.1 Exploded view - air cleaner housing

1 - Mounting

- ☐ For air cleaner housing

2 - Water drain

- ☐ Clean

3 - Air cleaner (bottom section)

- ☐ Remove any salt deposits or dirt
- ☐ Removing and installing
⇒ [“3.2 Removing and installing air cleaner housing”, page 117](#)

4 - Air duct

- ☐ For secondary air intake
- ☐ Observe installation markings
- ☐ Only installed on vehicles with air filter bypass flap valve - N275-

5 - Bolt

- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it is screwed into old thread. Then tighten bolt to torque
- ☐ 3.5 Nm

6 - Air cleaner (top section)

- ☐ Remove any salt deposits or dirt
- ☐ Removing and installing
⇒ Maintenance ; Booklet 830

7 - Bolt

- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it is screwed into old thread. Then tighten bolt to torque
- ☐ 3.5 Nm

8 - Air pipe

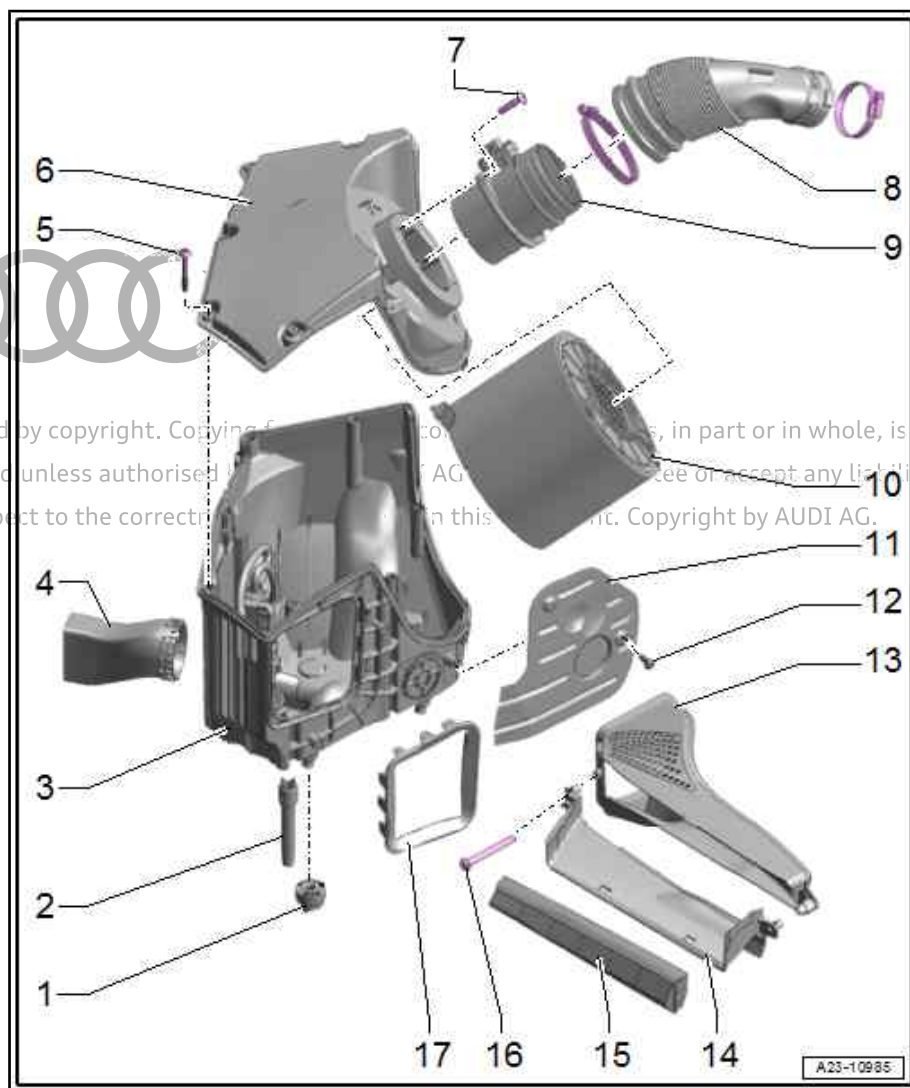
- ☐ Observe installation markings; fit on connection of turbocharger before fitting on air mass meter
- ☐ 3.5 Nm

9 - Air mass meter - G70-

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

10 - Air filter element

- ☐ Use genuine air filter element ⇒ Electronic parts catalogue
- ☐ Change intervals ⇒ Maintenance tables
- ☐ Removing and installing ⇒ Maintenance ; Booklet 830





11 - Heat shield

12 - Bolt

- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it is screwed into old thread. Then tighten bolt to torque
- ☐ 1.5 Nm

13 - Air duct

- ☐ On lock carrier
- ☐ Remove any salt deposits or dirt

14 - Air duct

- ☐ On lock carrier
- ☐ Remove any salt deposits or dirt

15 - Snow screen

- ☐ Depending on vehicle equipment

16 - Bolt

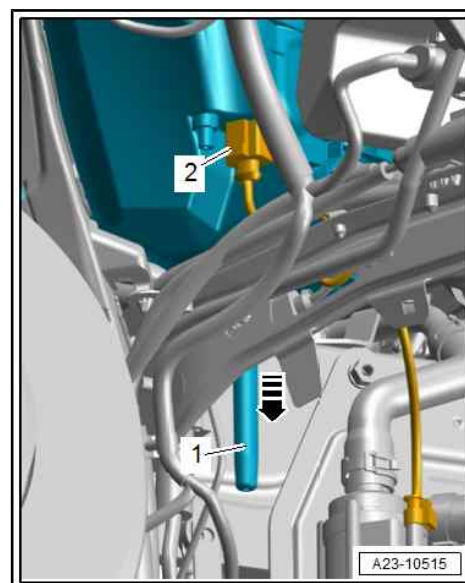
- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it is screwed into old thread. Then tighten bolt to torque
- ☐ 2.5 Nm

17 - Sealing element

3.2 Removing and installing air cleaner housing

Removing

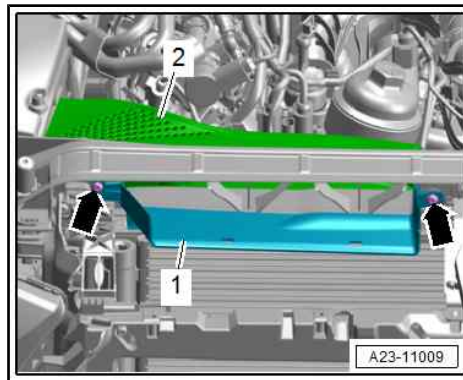
- Remove engine cover panel ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Depending on vehicle version, electrical connector -2- for air filter bypass flap valve - N275- must be unplugged.
- Remove wheel spoiler (front right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .
- Unplug electrical connector -2- for air filter bypass flap valve - N275- .
- Detach water drain -1- downwards -arrow-.



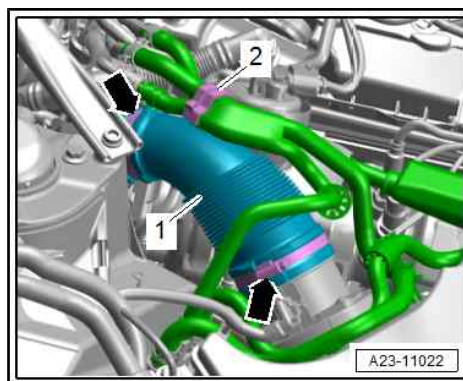


All vehicles (continued):

- Remove bolts -arrows- and detach air duct -2-.



- Move coolant hose clear at retaining clip -2-.
- Release hose clips -arrows- and detach air pipe -1-.



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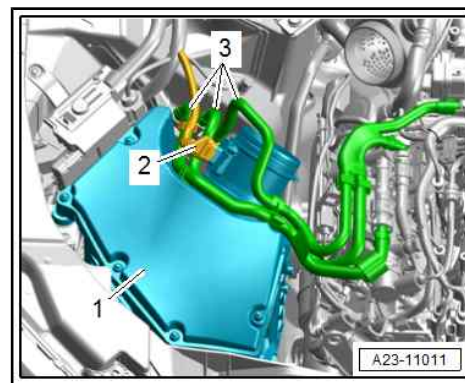


- Unplug electrical connector -2- for air mass meter - G70- .
- Move fuel hoses -3- clear and push to one side.
- Lift off air cleaner housing -1- and detach.

Installing

Installation is carried out in reverse order; note the following:

- If the air cleaner housing is being renewed and an air cleaner housing without air filter bypass flap valve - N275- is being fitted, the electrical connector at the wiring harness must be tied back and the vacuum line must be sealed off.
- The air cleaner housing must always be clean.
- To prevent malfunctions, cover critical parts of the engine air intake (air mass meter, air pipes, etc.) with a clean cloth when blowing out the air cleaner housing with compressed air.
- Hose connections and air pipes/hoses must be free of oil and grease prior to fitting.
- Use silicone-free lubricant when fitting air hoses.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Check air pipe for salt residue, dirt and leaves.
- First fit air pipe on connection of turbocharger, then fit on air mass meter.
- Check air duct leading from lock carrier to air cleaner housing for dirt and leaves.
- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Install engine cover panel ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

- ◆ ⇒ ["3.1 Exploded view - air cleaner housing", page 116](#)
- ◆ ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)



4 Intake manifold

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold .

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5 Injectors/high-pressure reservoir (rail)

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail) .



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6 High-pressure pump

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; High-pressure pump .



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7 Senders and sensors

⇒ [“7.1 Removing and installing air mass meter G70 ”, page 123](#)

⇒ [“7.2 Removing and installing fuel temperature sender G81 ”, page 124](#)

⇒ [“7.3 Removing and installing fuel pressure sender G247 ”, page 124](#)

⇒ [“7.4 Checking fuel pressure regulating valve N276 ”, page 124](#)

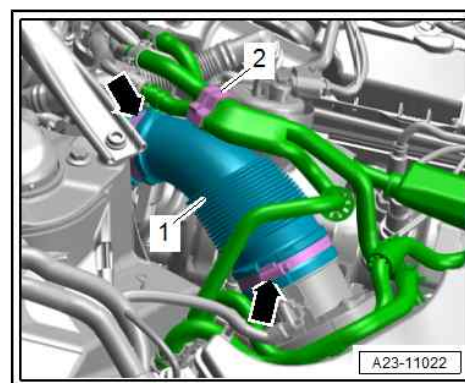
⇒ [“7.5 Removing and installing fuel pressure regulating valve N276 ”, page 124](#)

⇒ [“7.6 Removing and installing pressure differential sender G505 ”, page 124](#)

7.1 Removing and installing air mass meter - G70-

Removing

- Remove engine cover panel ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Move coolant hose clear at retaining clip -2-.
- Release hose clips -arrows- and detach air pipe -1-.

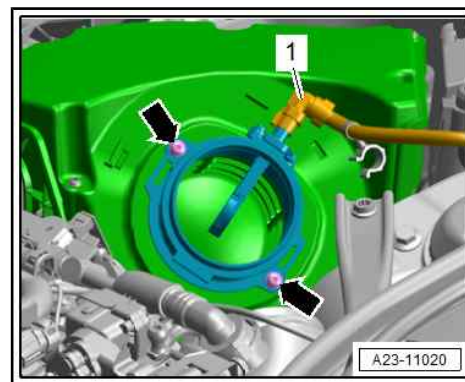


- Unplug electrical connector -1-.
- Unscrew bolts -arrows- and detach air mass meter - G70- .

Installing

Installation is carried out in reverse order; note the following:

- If the air filter element is very dirty or wet, dirt particles or water can reach the air mass meter and falsify the detected air mass values. This will cause a loss of power as the calculated injection quantities will be too low.
- Check air filter element and inside of air cleaner housing for dirt and clean if necessary ⇒ Maintenance ; Booklet 830 .
- Hose connections and air pipes/hoses must be free of oil and grease prior to fitting.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Install engine cover panel ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”, page 116](#)
- ◆ ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



7.2 Removing and installing fuel temperature sender - G81-

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Senders and sensors ; Removing and installing fuel temperature sender - G81- .

7.3 Removing and installing fuel pressure sender - G247-

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Senders and sensors; Removing and installing fuel pressure sender - G247- .

7.4 Checking fuel pressure regulating valve - N276-

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Senders and sensors; Checking fuel pressure regulating valve - N276- .

7.5 Removing and installing fuel pressure regulating valve - N276-

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Senders and sensors; Removing and installing fuel pressure regulating valve - N276- .

7.6 Removing and installing pressure differential sender - G505-

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Senders and sensors; Removing and installing pressure differential sender - G505- .



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8 Lambda probe

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe .



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9 Engine control unit

⇒ "9.1 Exploded view - engine control unit", page 126

⇒ "9.2 Removing and installing engine/motor control unit J623 ",
page 126

9.1 Exploded view - engine control unit

1 - Bolt

- 9 Nm

2 - Mounting

- For engine control unit - J623-

3 - Engine control unit - J623-

- Removing and installing
⇒ page 126

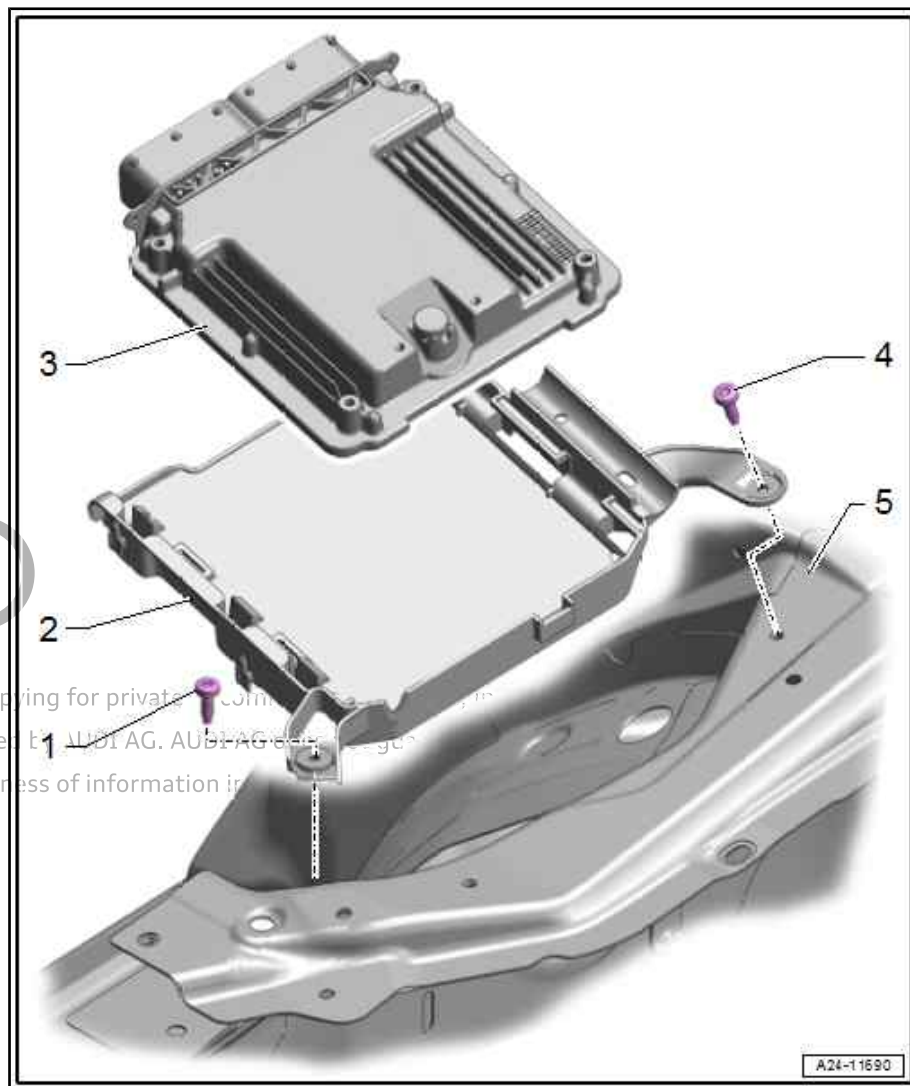
4 - Bolt

- 9 Nm

5 - Suspension turret



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9.2 Removing and installing engine/motor control unit - J623-

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester

Removing

- If the engine control unit - J623- is renewed, the adaption values must be read out and stored before the engine control unit - J623- is removed.
- Connect ⇒ Vehicle diagnostic tester.
- Select **Diagnosis** mode and then **Start diagnosis**.

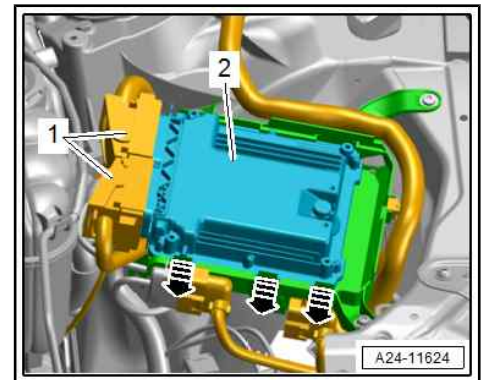


- Choose **Select own test** tab and select following options one after the other:
 - ◆ **Drive train**
 - ◆ **Select engine code and engine**
 - ◆ **01 - Self-diagnosis compatible systems**
 - ◆ **01 - Engine electronics J623**
 - ◆ **01 - Engine electronics, functions**
 - ◆ **01 - Functions component replacement**
- Switch off ignition and remove ignition key after storing electronic file containing adaption values.
- If the adaption values of the injectors cannot be read out of the old (defective) engine control unit, the adaption values must be entered into the new engine control unit manually and the adaption procedure must be performed accordingly.
- Release catches -arrows- and detach engine control unit - J623- -item 2-.
- Unplug electrical connectors -1-.

Installing

Installation is carried out in reverse order; note the following:

- If engine control unit - J623- has been renewed, perform adaptations in **Guided Functions** mode, function **01 - Functions component replacement**.



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26 – Exhaust system

1 Exhaust pipes/silencers

- ⇒ [“1.1 Exploded view - silencers”, page 128](#)
- ⇒ [“1.2 Removing and installing front exhaust pipe”, page 133](#)
- ⇒ [“1.3 Separating exhaust pipes/silencers”, page 136](#)
- ⇒ [“1.4 Removing and installing silencers”, page 138](#)
- ⇒ [“1.5 Stress-free alignment of exhaust system”, page 139](#)
- ⇒ [“1.6 Checking exhaust system for leaks”, page 140](#)

1.1 Exploded view - silencers

- ⇒ [“1.1.1 Exploded view - silencers, vehicles with front-wheel drive”, page 128](#)
- ⇒ [“1.1.2 Exploded view - silencers, vehicles with four-wheel drive”, page 131](#)

1.1.1 Exploded view - silencers, vehicles with front-wheel drive

- Observe safety precautions when working on exhaust system
 - ⇒ Servicing 4-cylinder TDI engine, common rail (EA 288 Gen. I); Rep. gr. 00 ; Safety precautions .



1 - Rear silencer

- ☐ Combined in one unit with centre silencer as original equipment. Can be renewed separately for repair purposes
- ☐ Cutting point between centre silencer and rear silencer ⇒ [page 136](#)
- ☐ Removing and installing ⇒ [page 138](#)
- ☐ Align exhaust system so it is free of stress ⇒ [page 139](#)

2 - Centre silencer

- ☐ Combined in one unit with rear silencers as original equipment. Can be renewed separately for repair purposes
- ☐ Cutting point between centre silencer and rear silencer ⇒ [page 136](#)
- ☐ Align exhaust system so it is free of stress ⇒ [page 139](#)

3 - Rubber mounting

- ☐ Renew if damaged

4 - Bolt

- ☐ 23 Nm

5 - Bracket

6 - Bolt

- ☐ 23 Nm

7 - Bracket

8 - Rubber mounting

- ☐ Renew if damaged

9 - Gasket

- ☐ Renew after removing

10 - Nut

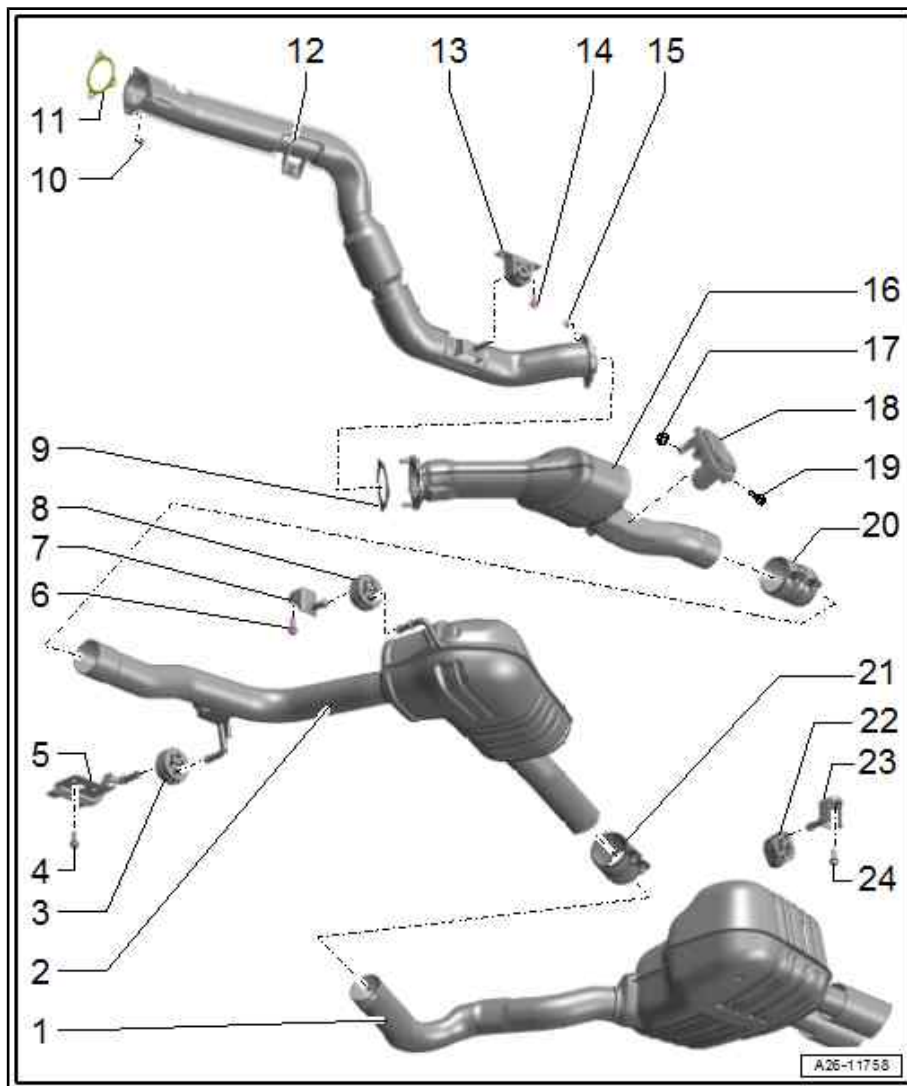
- ☐ Renew after removing
- ☐ Coat thread with high-temperature paste ⇒ [Electronic parts catalogue](#)
- ☐ 23 Nm

11 - Gasket

- ☐ Renew

12 - Front exhaust pipe

- ☐ With flexible joint
- ☐ Do not bend flexible joint more than 10°
- ☐ Install flexible joint so that it is not under tension.
- ☐ Take care not to damage wire mesh on flexible joint
- ☐ Removing and installing ⇒ [page 133](#)
- ☐ Align exhaust system so it is free of stress ⇒ [page 139](#)





13 - Mounting

- ☐ Renew if damaged
- ☐ Check preload ⇒ [page 139](#)

14 - Bolt

- ☐ 23 Nm

15 - Nut

- ☐ Renew after removing
- ☐ 25 Nm

16 - Catalytic converter

- ☐ Catalytic trap functions like an SCR catalytic converter or oxidation catalytic converter
- ☐ Protect against knocks and impact
- ☐ Removing and installing ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Emission control system; Removing and installing catalytic converter

17 - Nut

- ☐ 10 Nm

18 - Exhaust flap control unit - J883-

- ☐ Removing and installing ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Emission control system; Removing and installing exhaust flap control unit - J883-

19 - Bolt

20 - Clamp (front)

- ☐ Before tightening, align exhaust system so it is free of stress ⇒ [page 139](#)
- ☐ Installation position ⇒ [page 131](#)
- ☐ Tighten screw connections evenly to 23 Nm

21 - Clamp (rear)

- ☐ For separate replacement of centre and rear silencers
- ☐ Before tightening, align exhaust system so it is free of stress ⇒ [page 139](#)
- ☐ Installation position ⇒ [page 131](#)
- ☐ Tighten screw connections evenly to 23 Nm

22 - Rubber mounting

- ☐ Renew if damaged

23 - Bracket

24 - Bolt

- ☐ 23 Nm

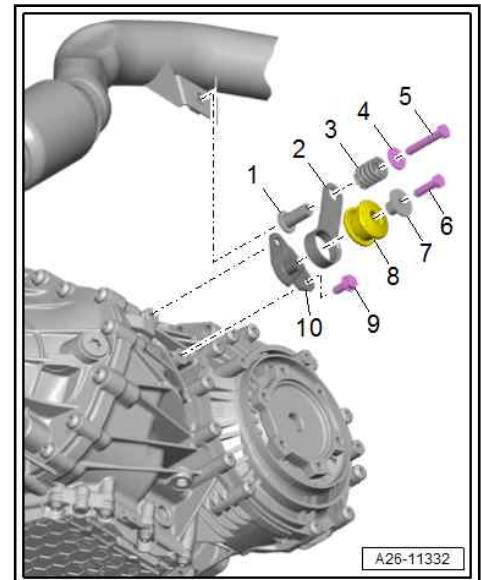


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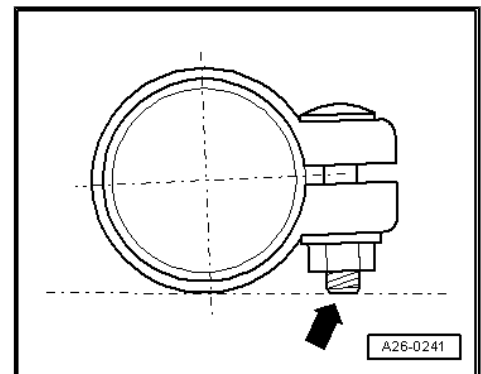
Components of mountings for front exhaust pipe

- 1 - Spacer sleeve
- 2 - Bracket
- 3 - Compression spring
- 4 - Washer
- 5 - Bolt, 23 Nm
- 6 - Bolt, 23 Nm
- 7 - Spacer sleeve
- 8 - Buffer
- 9 - Not fitted
- 10 - Not fitted



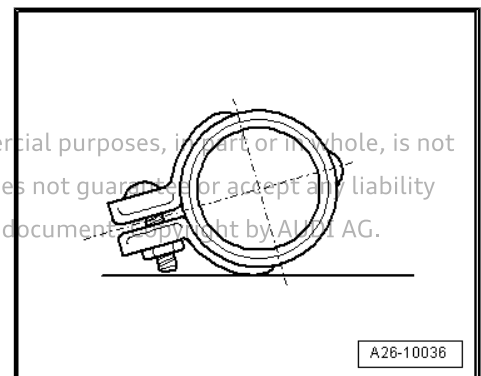
Installation position - front clamp

- Install clamp so that ends of bolts do not protrude beyond bottom of clamp.
- Bolt connection faces to right.



Installation position - clamp (rear) for vehicles with front-wheel drive

- Fit clamp in position shown.
- Bolt connections face to left
- Nuts face downwards
- Install clamp so that ends of bolts do not protrude beyond bottom of clamp.



1.1.2 Exploded view - silencers, vehicles with four-wheel drive



1 - Clamp (front)

- ❑ Before tightening, align exhaust system so it is free of stress
⇒ [page 139](#)
- ❑ Installation position
⇒ [page 131](#)
- ❑ Tighten screw connections evenly to 23 Nm

2 - Centre silencer

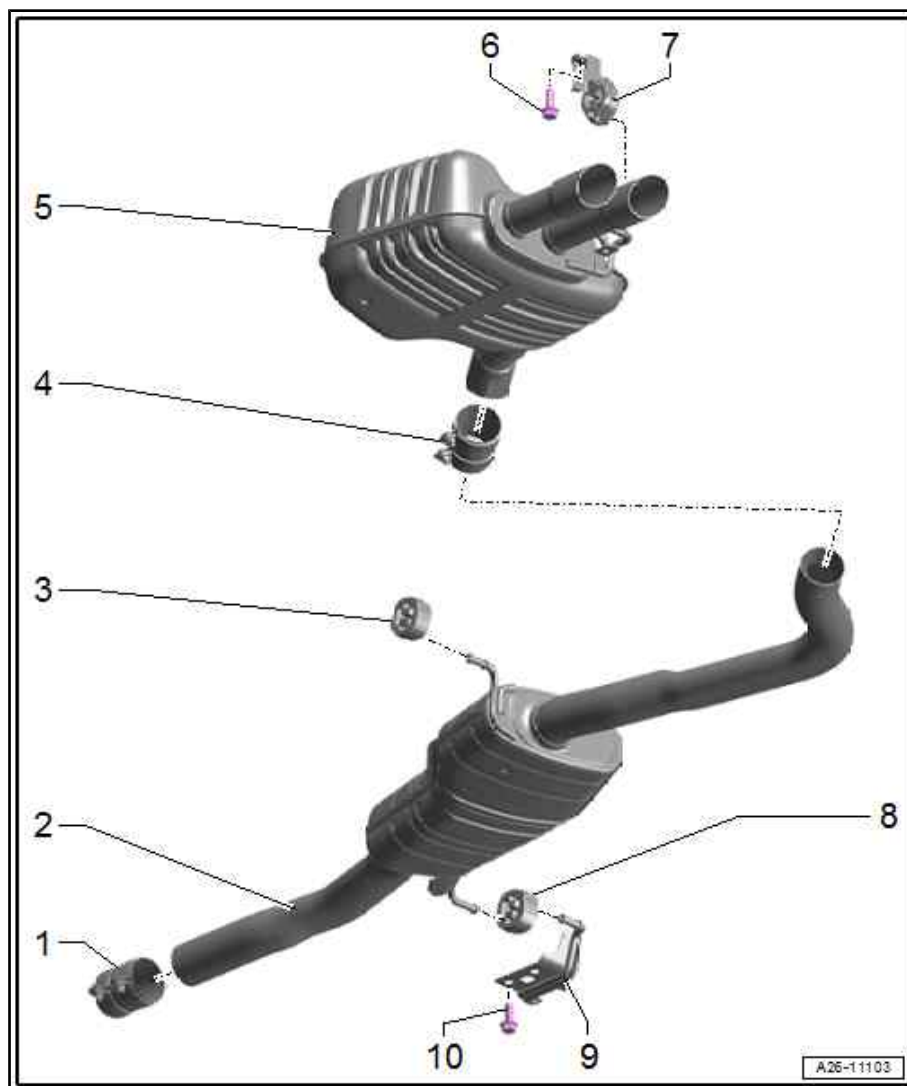
- ❑ Combined in one unit with rear silencers as original equipment. Can be renewed separately for repair purposes
- ❑ Cutting point between centre silencer and rear silencer ⇒ [page 136](#)
- ❑ Align exhaust system so it is free of stress
⇒ [page 139](#)

3 - Rubber mounting

- ❑ Renew if damaged

4 - Clamp (rear)

- ❑ For separate replacement of centre and rear silencers
- ❑ Before tightening, align exhaust system so it is free of stress
⇒ [page 139](#)
- ❑ Installation position
⇒ [page 131](#)
- ❑ Tighten screw connections evenly to 23 Nm



5 - Rear silencer

- ❑ Combined in one unit with centre silencer as original equipment. Can be renewed separately for repair purposes
- ❑ Cutting point between centre silencer and rear silencer ⇒ [page 136](#)
- ❑ Removing and installing ⇒ [page 138](#)
- ❑ Align exhaust system so it is free of stress ⇒ [page 139](#)

6 - Bolt

- ❑ 23 Nm

7 - Mounting

- ❑ Renew if damaged
- ❑ Check preload ⇒ [page 139](#)

8 - Rubber mounting

- ❑ Renew if damaged

9 - Bracket

10 - Bolt

- ❑ 23 Nm

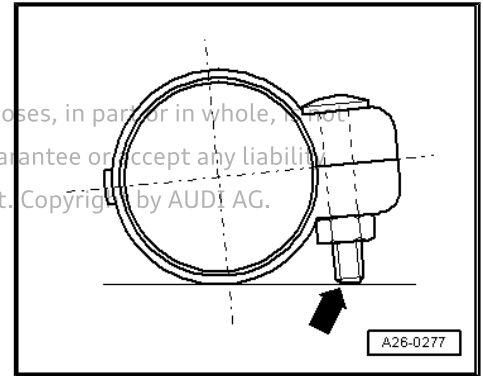


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Installation position - clamp (rear) for vehicles with four-wheel drive

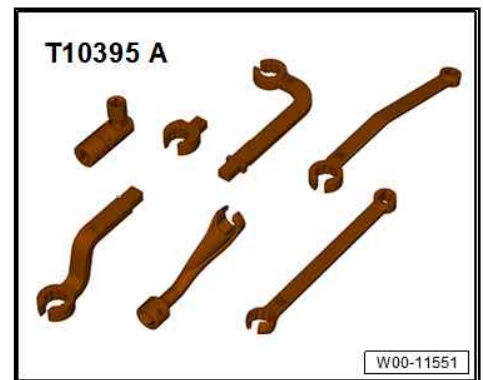
- Bolted connection facing towards right
- Nuts face downwards.
- Install clamp so that ends of bolts do not protrude beyond bottom of clamp - arrow.



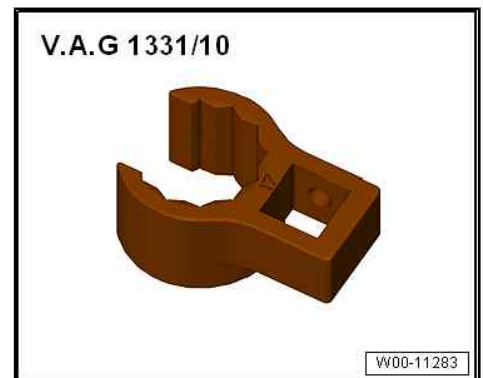
1.2 Removing and installing front exhaust pipe

Special tools and workshop equipment required

- ◆ Tool set - T10395 A- with suitable tool insert



- ◆ Supplement tool set - T10395/8-/10-
- ◆ Flared ring spanner tool insert (17 mm) - V.A.G 1331/10-



Removing

- Observe safety precautions when working on exhaust system
⇒ Servicing 4-cylinder TDI engine, common rail (EA 288 Gen. I); Rep. gr. 00 ; Safety precautions .
- Remove drive shaft (right-side); to do so, loosen bolt securing drive shaft (right-side) before raising vehicle ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Loosening and tightening bolt securing drive shaft .
- Remove front right wheel.
- Remove air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 117](#) .



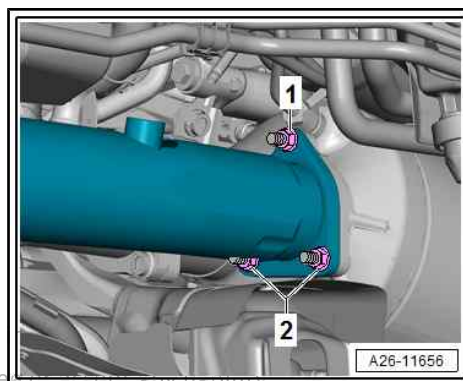
- Unscrew exhaust gas temperature sender 4 - G648- -arrow- from front exhaust pipe using a tool from tool set - T10395 A- .



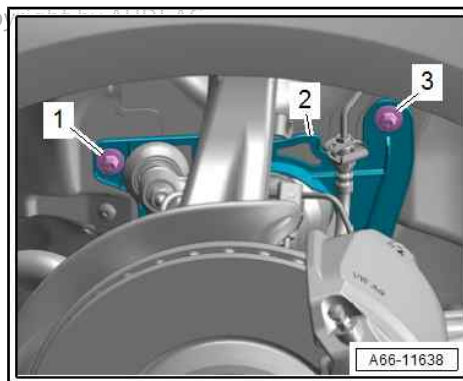
- Unscrew nut -1-. (Nuts -2- do not have to be removed at this stage.)
- Remove noise insulation (centre and rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



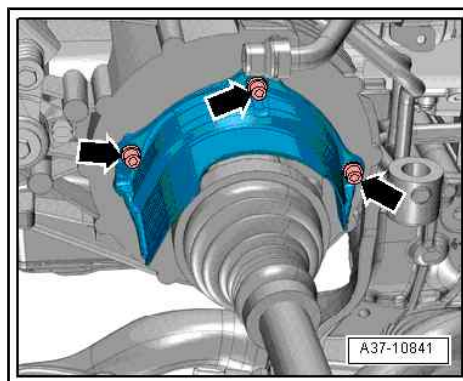
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- Unscrew nuts -1 and 3- and remove drive shaft cover (right-side) -2-.

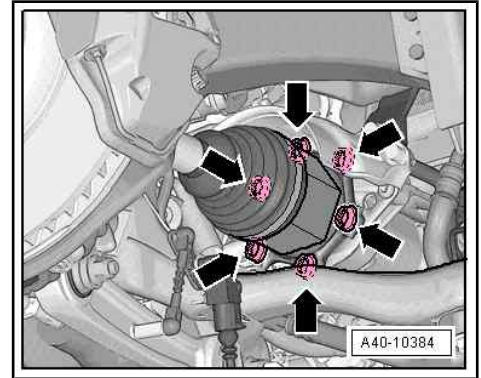


- Remove bolts -arrows- and detach heat shield for drive shaft (right-side).





- Remove bolts -arrows- securing drive shaft to flange shaft and take out drive shaft.
- Detach drive shaft, taking care not to damage boot and coating on drive shaft.



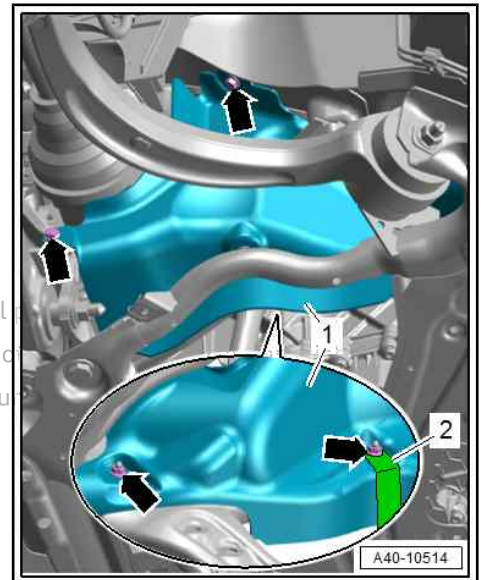
- Remove bolts -arrows- and take out subframe shield (right-side).

Note

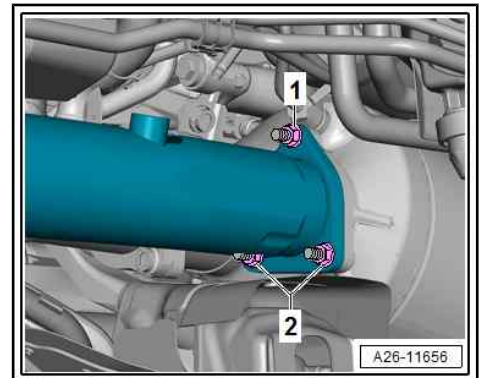
Guide shield out through opening by turning it (only possible in one position).



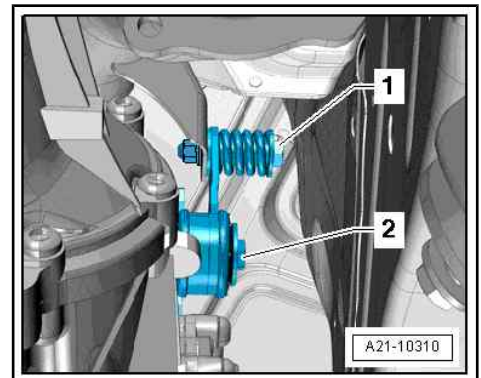
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- Remove nuts -2- using a small jointed socket wrench with an extension.

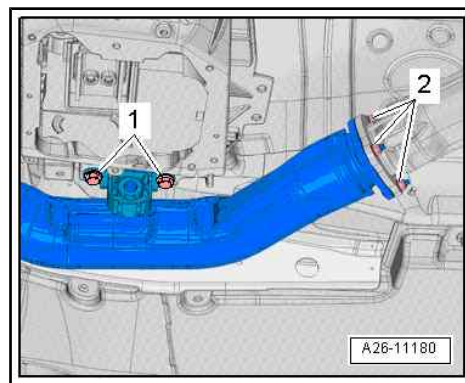


- Remove bolt -1- and turn retaining tab downwards.





- Remove nuts -2- and bolts -1- and detach front exhaust pipe.



Risk of damage to flexible joint

The flexible joint can be damaged or develop leaks if it is handled incorrectly.

- Do not bend flexible joint more than 10°.
- Install flexible joint so that it is not under tension.

Installing

Installation is carried out in reverse order; note the following:

- Renew gaskets and nuts after removing.
- Install exhaust gas temperature sender 4 - G648- ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender 4 - G648- .
- Install air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 117](#) .
- Install drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Align the exhaust system so it is free of stress ⇒ [page 139](#) .

Tightening torques

- ◆ ⇒ [“1.1 Exploded view - silencers”, page 128](#)
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing heat shield for drive shaft
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

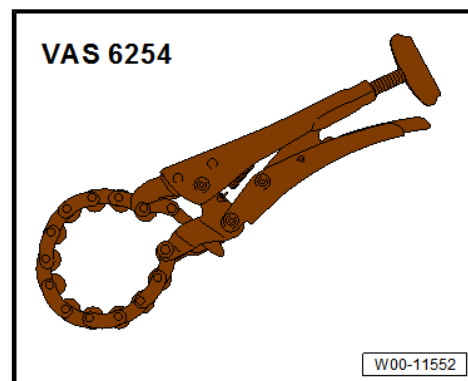
1.3 Separating exhaust pipes/silencers

- Observe safety precautions when working on exhaust system
⇒ Servicing 4-cylinder TDI engine, common rail (EA 288 Gen. I); Rep. gr. 00 ; Safety precautions .
- ◆ The connecting pipe can be cut through at the cutting point in order to renew the centre or rear silencer separately.
- ◆ The cutting point is marked by an indentation on the circumference of the exhaust pipe.

Special tools and workshop equipment required

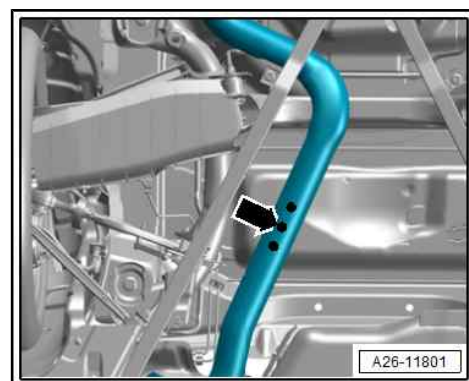


◆ Chain pipe cutter - VAS 6254-

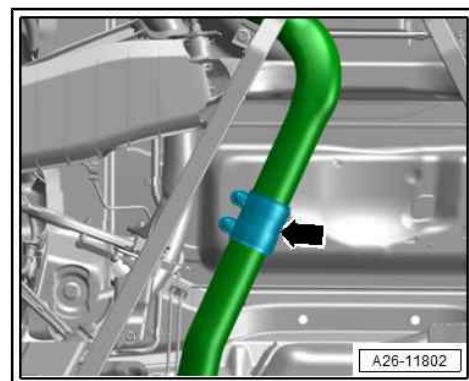


Version 1:

- Cut through exhaust pipe at right angle at centre notch -arrow- using chain pipe cutter - VAS 6254- .

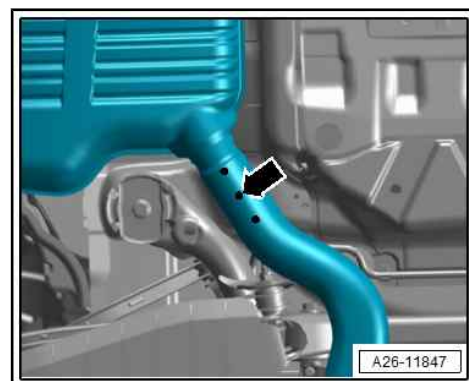


- Position centre of clamp -arrow- over cutting location.



Version 2:

- Cut through exhaust pipe at right angle at centre notch -arrow- using chain pipe cutter - VAS 6254- .



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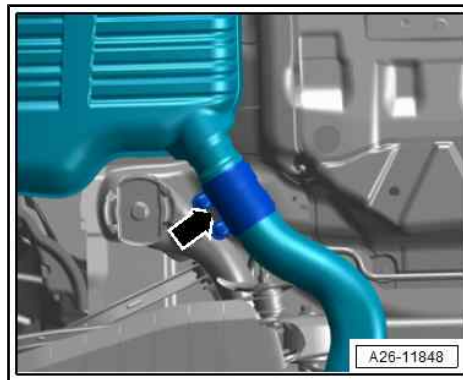
- Position centre of clamp -arrow- over cutting location.

All vehicles (continued):

- Fit clamp ⇒ [page 131](#) .
- Align the exhaust system so it is free of stress ⇒ [page 139](#) .

Tightening torques

- ◆ ⇒ [“1.1 Exploded view - silencers”, page 128](#)

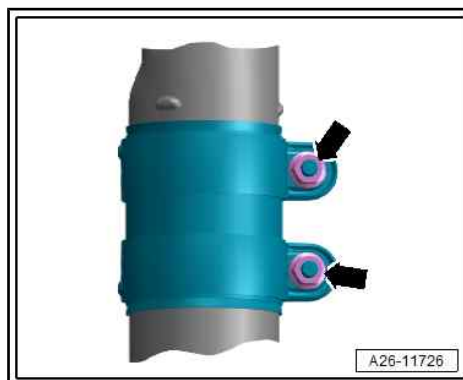


1.4 Removing and installing silencers

- Observe safety precautions when working on exhaust system
⇒ Servicing 4-cylinder TDI engine, common rail (EA 288 Gen. I); Rep. gr. 00 ; Safety precautions .

Removing

- Equipment version: Remove diagonal strut (left-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim .
- Loosen clamp -arrows- and push towards rear.

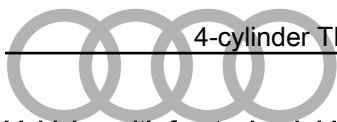


Risk of damage to flexible joint

The flexible joint can be damaged or develop leaks if it is handled incorrectly.

- Do not bend flexible joint more than 10°.
- Install flexible joint so that it is not under tension.

- Lower front exhaust pipe slightly and detach clamp.
- Tie up front exhaust pipe.

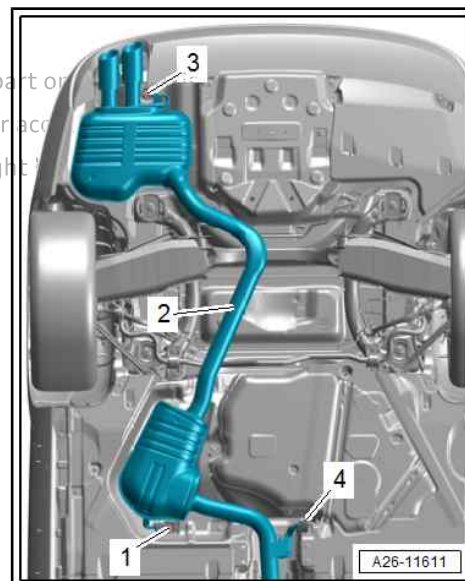


Vehicles with front-wheel drive:

- Disengage rubber mounting -4-.

Note

- A second mechanic is required for removal of the rear silencer.
- Unscrew bolts -1, 3- and remove silencer -2-.



Vehicles with four-wheel drive:

- Disengage rubber mountings -2, 4-.

Note

- A second mechanic is required for removal of the rear silencer.
- Unscrew bolt -3- and remove silencer -1-.

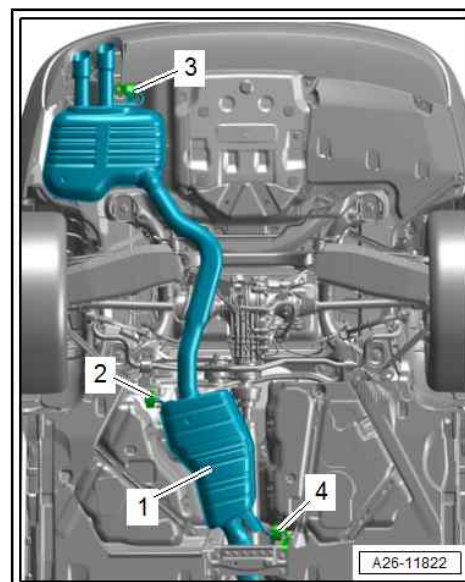
Installing

Installation is carried out in reverse order; note the following:

- Renew gaskets and nuts after removing.
- Align the exhaust system so it is free of stress ⇒ [page 139](#).

Tightening torques

- ◆ ⇒ [“1.1 Exploded view - silencers”, page 128](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim

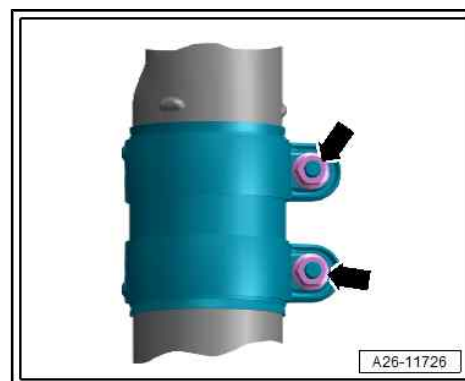


1.5 Stress-free alignment of exhaust system

- Observe safety precautions when working on exhaust system
⇒ Servicing 4-cylinder TDI engine, common rail (EA 288 Gen. I); Rep. gr. 00 ; Safety precautions .

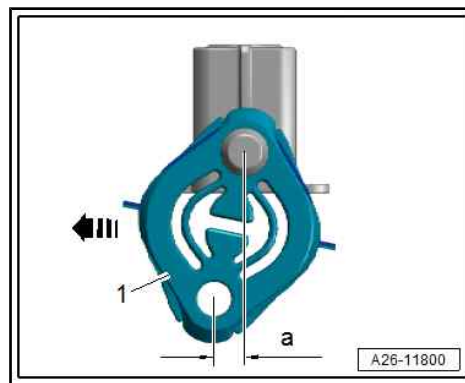
Procedure

- The exhaust system must be aligned when it is cool.
- Slacken front clamp -arrows-.





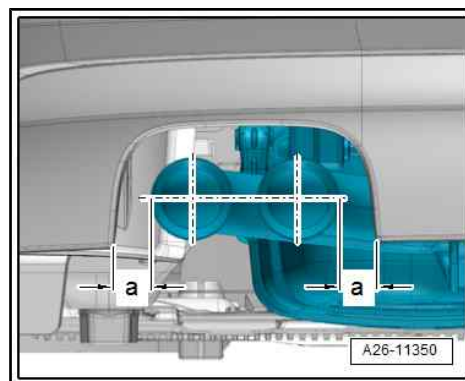
- Push exhaust system towards front of vehicle -arrow- so that mounting for exhaust pipe is preloaded by -a- = 6 ... 10 mm.
- Position clamp at front ➔ [page 131](#) and tighten bolted connections evenly.



- Check clearance between tailpipes and bumper:
- Distance -a- is the same on both sides.

Tightening torques

- ♦ ➔ [“1.1 Exploded view - silencers”, page 128](#)



1.6 Checking exhaust system for leaks

All procedures are described in ➔ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust pipes/silencers; Checking exhaust system for leaks .



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2 Emission control system

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Emission control system .



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3 SCR (selective catalytic reduction) system

⇒ "3.1 Exploded view - reducing agent tank", page 142

⇒ "3.2 Exploded view - reducing agent supply line", page 143

⇒ "3.3 Draining reducing agent tank", page 143

⇒ "3.4 Removing and installing reducing agent tank", page 145

⇒ "3.5 Removing and installing injector for reducing agent N474", page 147

⇒ "3.6 Removing and installing control unit for reducing agent metering system J880", page 147

⇒ "3.7 Removing and installing reducing agent quality sensor G849", page 148

3.1 Exploded view - reducing agent tank

1 - Bolt

- ☐ 2 Nm

2 - Reducing agent quality sensor - G849-

- ☐ Depending on vehicle equipment
- ☐ Removing and installing ⇒ page 148

3 - Seal

- ☐ Renew after removing

4 - Reducing agent tank

- ☐ With delivery unit for reducing agent metering system - GX19-
- ☐ The following components are integrated in the delivery unit for reducing agent metering system - GX19- :

◆ Filter

◆ Tank sender for reducing agent - G684-

◆ Temperature sender for reducing agent - G685-

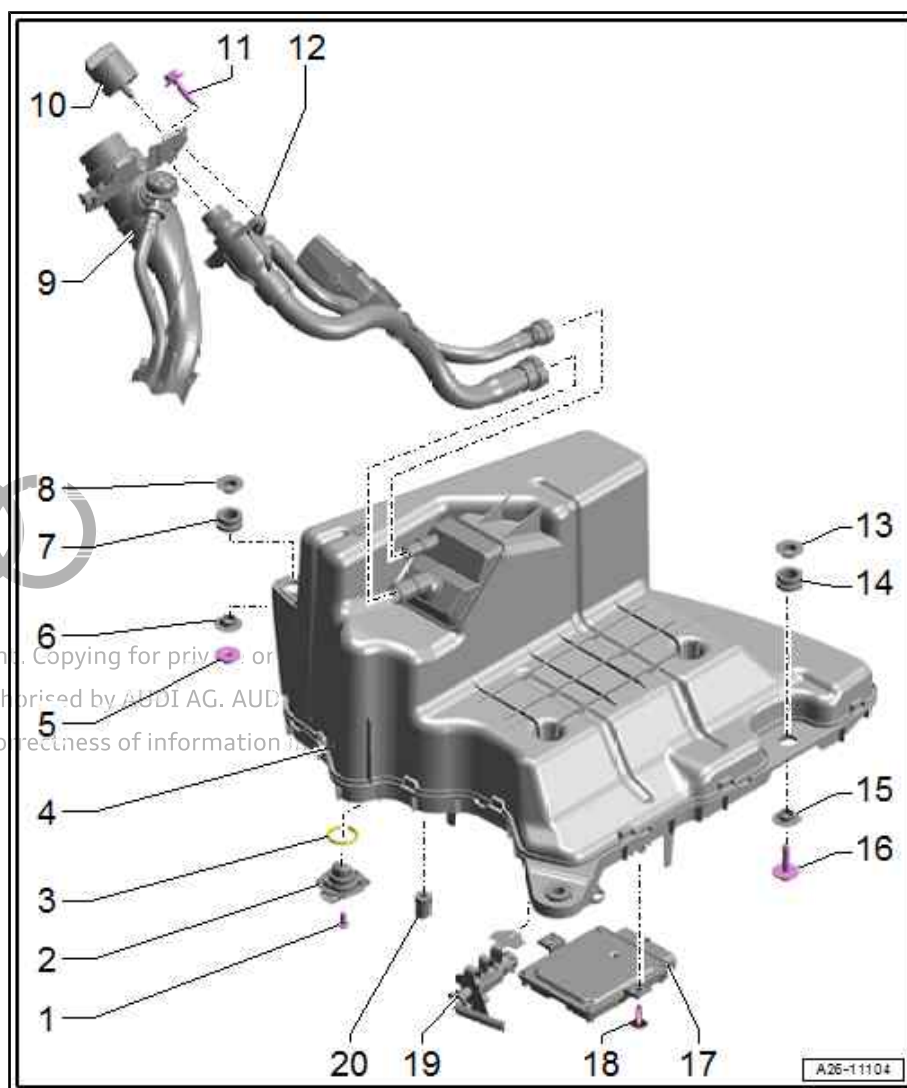
◆ Pressure sender for reducing agent metering system - G686-

◆ Pump for reducing agent - V437-

◆ Heater for reducing agent tank - Z102-

◆ Heater 2 for reducing agent tank (heater circuit 3) - Z167-

- ☐ Fitting location: on rear right under underbody
- ☐ Draining ⇒ page 143
- ☐ Removing and installing ⇒ page 145





5 - Nut

- ☐ 20 Nm

6 - Spacer sleeve

7 - Grommet

8 - Spacer sleeve

9 - Filler neck

- ☐ For fuel tank

10 - Filler cap

- ☐ For filler neck for reducing agent tank

11 - Bolt

- ☐ 8 Nm

12 - Filler neck

- ☐ For reducing agent tank

13 - Spacer sleeve

14 - Grommet

15 - Spacer sleeve

16 - Bolt

- ☐ 20 Nm

17 - Control unit for reducing agent metering system - J880-

- ☐ Checking ⇒ Vehicle diagnostic tester
- ☐ Removing and installing ⇒ [page 147](#)
- ☐ After renewing, perform adaption in Guided Functions ⇒ Servicing 4-cylinder TDI engine, common rail (EA 288 Gen. I); Rep. gr. 00 ; Repair instructions

18 - Bolt

- ☐ 3 Nm

19 - SCR supply line

20 - Sealing plug

- ☐ For drain pipe

3.2 Exploded view - reducing agent supply line

All components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Exploded view - reducing agent supply line .

3.3 Draining reducing agent tank

Special tools and workshop equipment required

- ◆ Safety goggles
- ◆ Protective gloves

Procedure

- Re-install all cable ties in original positions.
- Switch off ignition.



Note:

Wait until the reducing agent has been drawn back automatically, because large amounts of reducing agent can escape when the metering line is opened.

It can take up to 10 minutes after the ignition has been switched off for the reducing agent to be drawn back completely.

- Open tank flap.
- Unscrew filler cap -arrow- from filler neck for reducing agent.
- Remove underbody trim (rear right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim .

⚠ CAUTION

Risk of injury caused by escaping reducing agent

Reducing agent can cause eye and skin irritation, damage to the respiratory tract and poisoning.

- Put on safety goggles.
- Put on protective gloves.
- Wear protective clothing.
- Ensure that there is sufficient fresh air. In enclosed spaces, switch on the exhaust extraction system.



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- Place drip tray underneath.
- Press release tab and remove sealing plug -arrow-.
- Allow reducing agent to drain off into drip tray.

! NOTICE

Reducing agent must never be reused. For information regarding storage and disposal see ⇒ ServiceNet → Environmental protection → Workshop waste management . Contact Importer for country-specific information regarding storage and disposal.

Assembling

Assembly is performed in reverse sequence; note the following:

- Seal off drain pipe with sealing plug.
- Adapt learnt values after filling up reducing agent or renewing components.
- Connect ⇒ Vehicle diagnostic tester.
- Select **Diagnosis** mode and then **Start diagnosis**.
- Choose **Select own test** tab and select following options one after the other:
 - ◆ **Drive train**
 - ◆ **Select engine code and engine**
 - ◆ **01 - Self-diagnosis compatible systems**
 - ◆ **01 - Engine electronics J623**
 - ◆ **01 - Engine electronics, functions**
 - ◆ **01 - Work steps after component replacement**

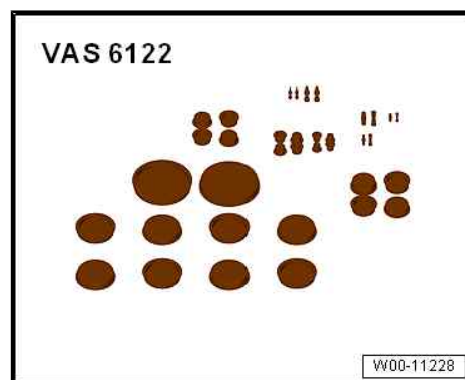
Tightening torques

- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim

3.4 Removing and installing reducing agent tank

Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-



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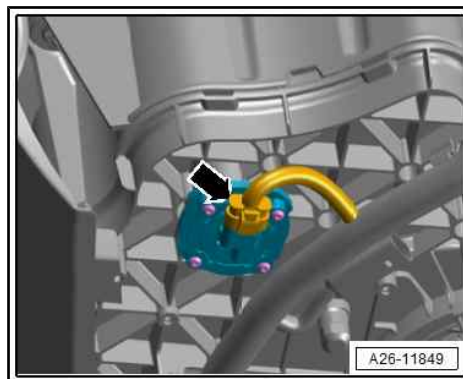
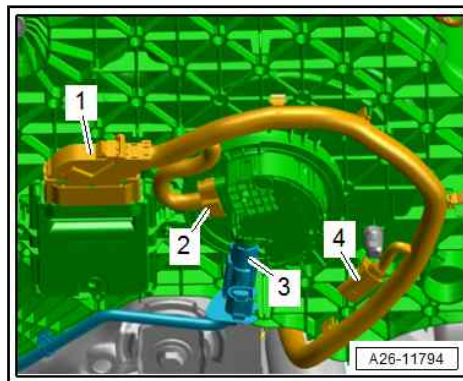
- Detach rear section of rear right wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (rear) .

A5 and A5 Cabriolet only:

- Remove rear bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (rear); Removing and installing bumper cover .

All vehicles:

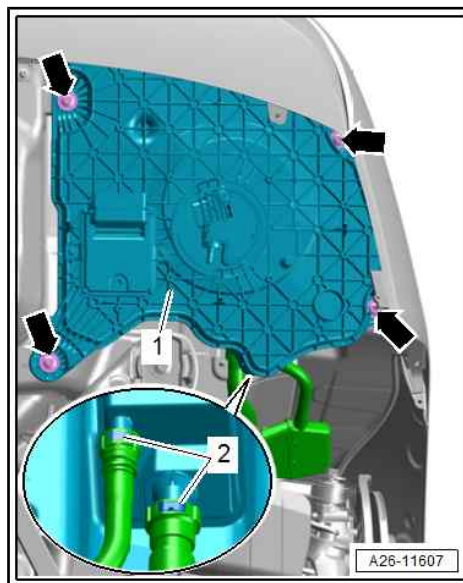
- Disconnect SCR supply line -3- and move it clear ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Exploded view - reducing agent supply line .
 - Detach electrical connector -4- from bracket.
 - Unplug electrical connectors -1, 2- and move electrical wiring harness clear.
 - Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .
-
- Vehicles with reducing agent quality sensor - G849- : Unplug electrical connector -arrow-.



- Unscrew connections -arrows-.
- Lower reducing agent tank -1- slightly.
- Press release tabs on both sides and disconnect hoses -2-.
- Detach reducing agent tank.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .

Installing

Installation is carried out in reverse order; note the following:



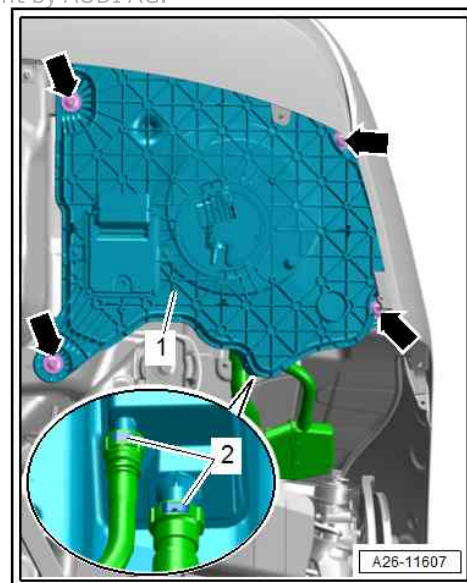
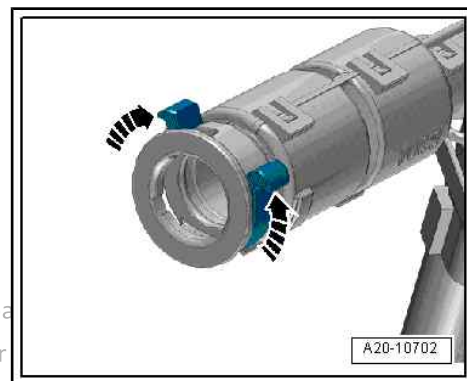
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- Connect SCR supply line.
- Plug-in connector must engage audibly when connecting.
- Pull to check that plug-in connectors are correctly engaged.
- Check that lines are clipped onto reducing agent tank.
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

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- Fit bolts -arrows-, then slide reducing agent tank towards rear of vehicle (with bolts in bolt holes) and finally tighten bolts -arrows-.
- Adapt learnt values after filling up reducing agent or renewing components.
- Connect ⇒ Vehicle diagnostic tester.
- Select **Diagnosis** mode and then **Start diagnosis**.
- Choose **Select own test** tab and select following options one after the other:
- ◆ **Drive train**
- ◆ **Select engine code and engine**
- ◆ **01 - Self-diagnosis compatible systems**
- ◆ **01 - Engine electronics J623**
- ◆ **01 - Engine electronics, functions**
- ◆ **01 - Work steps after component replacement**



Tightening torques

- ◆ ⇒ [“3.1 Exploded view - reducing agent tank”, page 142](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (rear)

3.5 Removing and installing injector for reducing agent - N474-

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Removing and installing injector for reducing agent - N474- .

3.6 Removing and installing control unit for reducing agent metering system - J880-

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester

Removing

- Switch off ignition.
- Remove underbody trim (rear right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim .

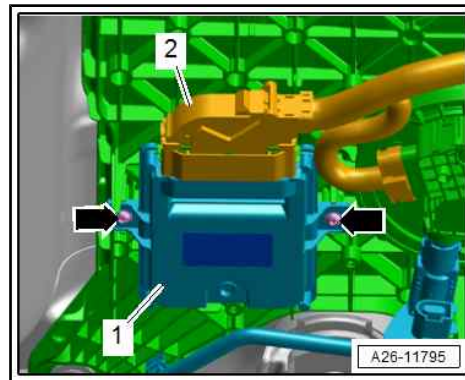


- Remove bolts -arrows- and detach control unit for reducing agent metering system - J880- -item 1-.
- Unplug electrical connector -2-.

Installing

Installation is carried out in reverse order; note the following:

- If control unit for reducing agent metering system - J880- was renewed, reset learnt values.
- Connect ⇒ Vehicle diagnostic tester.
- Select **Diagnosis** mode and then **Start diagnosis**.
- Choose **Select own test** tab and select following options one after the other:
 - ◆ **Drive train**
 - ◆ **Select engine code and engine**
 - ◆ **01 - Self-diagnosis compatible systems**
 - ◆ **01 - Engine electronics J623**
 - ◆ **01 - Engine electronics, functions**
 - ◆ **01 - Work steps after component replacement**



Tightening torques

- ◆ ⇒ [“3.1 Exploded view - reducing agent tank”, page 142](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim

3.7 Removing and installing reducing agent quality sensor - G849-

Removing

- Drain reducing agent tank ⇒ [page 143](#) .



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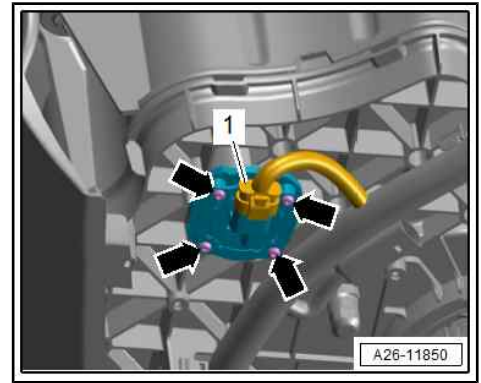


- Unplug electrical connector -1-.
- Unscrew bolts -arrows- and detach reducing agent quality sensor - G849- .

Installing

Installation is carried out in reverse order; note the following:

- Renew seal after removing.
- Adapt SCR learnt values after filling up reducing agent or re-newing components.
- Connect ⇒ Vehicle diagnostic tester.
- Select **Diagnosis** mode and then **Start diagnosis**.
- Choose **Select own test** tab and select following options one after the other:
 - ◆ **Drive train**
 - ◆ **Select engine code and engine**
 - ◆ **01 - Self-diagnosis compatible systems**
 - ◆ **01 - Engine electronics J623**
 - ◆ **01 - Engine electronics, functions**
 - ◆ **01 - Work steps after component replacement**



Tightening torques

- ◆ ⇒ [“3.1 Exploded view - reducing agent tank”, page 142](#)



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4 Exhaust gas temperature control

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control .



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5 Exhaust gas recirculation

All procedures and components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation .



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28 – Glow plug system

1 Glow plug system

⇒ [“1.1 Exploded view - glow plug system”, page 152](#)

⇒ [“1.2 Removing and installing glow plug”, page 152](#)

⇒ [“1.3 Removing and installing automatic glow period control unit J179”, page 152](#)

⇒ [“1.4 Removing and installing Hall sender G40”, page 152](#)

⇒ [“1.5 Removing and installing engine speed sender G28”, page 152](#)

1.1 Exploded view - glow plug system

All components are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system .

1.2 Removing and installing glow plug

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Removing and installing glow plug .

1.3 Removing and installing automatic glow period control unit - J179-

Removing

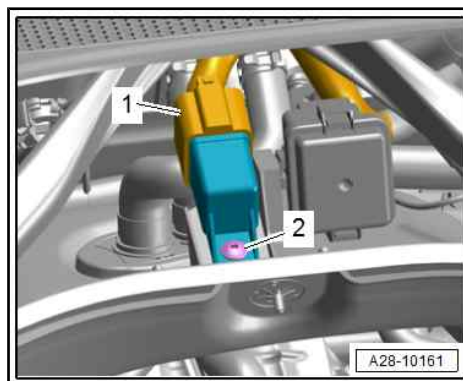
- Pull off seal and lift plenum chamber cover slightly.
- Remove bolt -arrow-.
- Unplug electrical connector -1- and detach automatic glow period control unit - J179- .

Installing

Installation is carried out in reverse sequence.

Tightening torques

Component	Nm
Automatic glow period control unit - J179- to plenum chamber	4.5



1.4 Removing and installing Hall sender - G40-

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Removing and installing Hall sender - G40- .

1.5 Removing and installing engine speed sender - G28-

All procedures are described in ⇒ Servicing 4-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Removing and installing engine speed sender - G28- .